SQL DIAGNOSTIC MANAGER 12.3

IDERA

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Go to Version 12.2

24x7 SQL performance monitoring, alerting, and diagnostics

- Performance monitoring for physical, virtual, and cloud environments
- Monitor queries and query plans to see the causes of blocks and deadlocks
- Adaptive & automated alerting with 100+ pre-defined and configurable alerts
- Capacity planning to see database growth trends and minimize server sprawl
- Monitor application transactions with SQL Workload Analysis add-on
- View expert recommendations from SQL Doctor to optimize performance
- View summary of top issues and alerts with the web console add-ons

Access the SQL Diagnostic Manager Release Notes

IDERA SQL Diagnostic Manager provides an unprecedented level of diagnostic information on the health, performance, and status of SQL Server instances across your environment. You can view, diagnose, and report on critical performance statistics from a central point of control.

Using a unique agent-less architecture, SQL Diagnostic Manager gathers diagnostic information in real-time, keeping database administrators and managers informed by providing customized alerts. Easy to install and use, SQL Diagnostic Manager is an indispensable SQL Server management tool that benefits both experienced and junior database administrators.

To get a glimpse into the newest features, fixed issues, and known issues in this release of SQL Diagnostic Manager, review the following sections of the Release Notes:

- See new features in this release
- Review issues fixed by this release
- Review previous features and fixed issues
- See known issues
- See list of recommended IDERA Solutions

To see the summary of the Support Status for SQL Diagnostic Manager click here.

New features and fixed issues

SQL Diagnostic Manager provides the following new features and fixed issues.

12.3 New Features

SQL Diagnostic Manager presents the following features and enhancements:

- An Improved User Interface with the following changes:
  - A new organization Grid View which allows a better glance at your instance metrics and properties.
  - An updated Windows Console Grid View similar to SQL Diagnostic Web Console.
  - A renovated Card View style, providing you with the same reliable information with a better-summarized look.
- An improved administration dialog to change the scale Health Index Factor for SQL Diagnostic Manager Console.
- A new Search feature for handling long lists across your servers, filters, alerts, and more.
- A Step Forward or Backward with the drill-down option.

> ⓘ Administrative actions are not included, only the actions associated with drill-downs are maintained.

- A new Automated Responses for ServiceNow action providers. To configure it, you must provide the Service Now information such as URL, Username, Password, and Alert Source.

12.3 Fixed Issues

Reports

SQLDM-32143 The "Server Uptime" report records the correct values for the uptime and downtime of a specific instance.

SQLDM-31873 The Database Statistics report is now generating data correctly for a custom range of time.

SQLDM-31680 The "Top Tables by Fragmentation" report now correctly identifies fragmented tables in the latest version of SQL Diagnostic Manager.

SQLDM-31683 SQL Diagnostic Manager correctly identifies query records where query plans have been successfully collected.

SQLDM-30535 SQL Diagnostic Manager successfully generates the "Template Comparison" report.

Alerts

SQLDM-32393 SQL Diagnostic Manager accurately displays alert data in the Historical Snapshots tooltip for a specific instance.

SQLDM-32347 SQL Diagnostic Manager correctly applies the "Where metric severity has changed is in place" alert rule.

SQLDM-32194 The default value for the user field under the "Alternative Windows Authorization" feature is Blank now.

SQLDM-32182 The Page Life Expectancy (Baseline) now works as expected, raising alerts according to the baseline thresholds.

SQLDM-32173 The Resuming Alerts window displays all available alerts that can be snoozed or resumed successfully.

SQLDM-32021 SQL Diagnostic Manager provides all the information of the Blocking Session Wait Time (Seconds) alert when enabling Capture Blocking (SQL 2005+).

SQLDM-31941 You can successfully configure e-mail notifications, including "and" conditions.

SQLDM-31737 You can successfully generate "Alert Forecasts" for Active Alerts in SQL Diagnostic Manager 12.3.

SQLDM-31256 The "Deadlock" alert is generated as expected and sends alert emails with correct and complete details.

SQLDM-28938 SQL Diagnostic Manager only displays the active alerts on the environment views.

Alerts Response

SQLDM-32215 SQL Diagnostic Manager improved the Alert Response Rules performance. Now you can successfully receive e-mails when creating or updating a rule.

SQLDM-32030 After upgrading to SQLDM 12, SQL Diagnostic Manager maintains the "Email (SMTP) Provider" alert response configuration.

SQLDM-31876 With SQL Diagnostic Manager you can correctly import a delete alert response containing an SMTP action provider.

SQLDM-30889 You can successfully export and import SMTP alert responses using SQL Diagnostic Manager 12.3.

Custom Counters

SQLDM-32148 SQL Diagnostic Manager keeps a Server's Custom Counter configuration after changing its tags configurations.

SQLDM-30385 SQL Diagnostic Manager successfully applies Custom Counter in new Servers when using templates.

SQLDM-32040 SQL Diagnostic Manager allows selecting and applying custom counters to all servers when creating metric alert responses for cluster environments.

SQLDM-32034 When using the SQL Diagnostic Manager manual Maintenance Mode, the instances remain linked to Custom Counters.

General

SQLDM-31974 SQL Diagnostic Manager supports Extended Event Options for the Activity Monitor and the Query Monitor properties.

SQLDM-31303 SQL Diagnostic Manager allows user accounts to apply alert templates to a monitor instance.

SQLDM-30861 SQL Diagnostic Manager improved the analyzer's performance, providing more accurate analysis recommendations.

DM Console

SQLDM-32339 SQL Diagnostic Manager allows you to successfully add a new user through the Application Security tab.

SQLDM-32267 SQL Diagnostic Manager fixed the performance of the Analyze view, generating recommendations properly.

SQLDM-32256 With SQL Diagnostic Manager, you can personalize the dashboard view by choosing a specific dashboard to display.

SQLDM-32232 SQL Diagnostic Manager now allows you to grant users access to specific instances through the Application Security window.

SQLDM-32227 You can successfully export the Analyze report of a monitored instance.

SQLDM-32178 SQL Diagnostic Manager successfully displays the history browser for SQL Server Azure-managed instances.

SQLDM-32063 SQL Diagnostic Manager successfully monitors and displays information for scale-out installations, showing the correct version.

On-Premises

SQLDM-31859 The Permissions Script for User Creation was successfully improved and now works as expected.

IDERA Web Console

SQLDM-32333 SQLDM Web Console successfully displays all the alerts of the monitored instances after an upgrade.

SQLDM-32291 Dates are now displayed in the proper format on SQLDM Web Console.

SQLDM-32274 SQL Diagnostic Manager correctly displays graphics in the Web Console, since the graphics order has been fixed.

SQLDM-32242 SQL Diagnostic Manager fixed the performance of the Analyze view, generating recommendations properly.

SQLDM-32228 The Alerts view of SQLDM Web Console allows users to set up Advanced Filters effectively.

High Availability Groups

SQLDM-32147 The "Days since the last backup" alert functions as intended according to the backup preference settings for High Availability Groups.

SQLDM-31875 SQL Diagnostic Manager successfully monitors listener status in a High Availability environment while monitoring replicas.

Upgrade

SQLDM-32421 SQL Diagnostic Manager displays consistent values for CPU usage metrics and graphics after upgrading to 12.2.4

SQLDM-32299 After upgrading, SQL Diagnostic Manager does not raise any unhandled exception related to missing files.

SQLDM-32181 You can successfully upgrade SQL Diagnostic Manager to 12.0.x keeping your Alert Templates and Responses as well as your configured Tags.

SQLDM-32150 SQL Diagnostic Manager successfully updates snapshots and refreshes alerts after an upgrade.

SQLDM-32026 SQL Diagnostic Manager successfully triggers notifications for "SQL Server Agent Job Failure" alerts after an upgrade.

DBaaS

SQLDM-32221 SQL Diagnostic Manager keeps the last Sever selection and Time Period for using them when configuring a new report.

Metrics

SQLDM-32130 SQL Diagnostic Manager increased the maximum critical threshold value for the "Version Store Size (MB)" metric.

SQLDM-32109 SQL diagnostic Manager successfully displays the "SQL Server CPU Usage" metric after upgrading to SQLDM 12.

SQLDM-31812 The "Procedure Cache Hit Ratio" metric has been improved on Azure SQL Managed Instance and Azure DB.

Charts

SQLDM-31870 SQL Diagnostic Manager correctly shows the Total Deadlock data in the Overview and Sessions charts after an upgrade.

History Browser

SQLDM-32019 SQL Diagnostic Manager successfully collects historical data in the History Browser for all the monitored servers.

SQLDM-31951 SQL Diagnostic Manager correctly displays historical data for TempDB summary in the history browser and across multiple time ranges.

Known issues

IDERA strives to ensure our products provide quality solutions for your SQL Server needs. If you need further assistance with any issue, please contact Customer Support Portal.

In this section you can find information on:

- Known issues in this version
- Known issues in recent releases
- Known issues in releases previous to SQL Diagnostic Manager 9.x

Known issues in version 12.3

DM Console

After upgrading SQLDM to version 12.3, the Tags column is no longer visible on the list view of the All Server page.

Reports

The stepping forward and backward feature shows the latest performed action on the Reports tab.

Previous known issues

Known issues in version 12.2

IDERA Dashboard

Installing or upgrading to SQL Diagnostic Manager 12.2 unregisters SQLDM from the IDERA Dashboard. To register your environment again, do it manually.

DM Console

SQL Diagnostic Manager 12.2 requires .NET 4.8. If .NET 4.8 is not installed, an upgrade may require a server reboot to install it.

Known issues in version 12.0

Users with SQLDM 11.1.13 or 11.1.14 versions should not upgrade to SQLDM 12.0. Contact Product Support for the availability of a release with those recent fixes.

Application Security

Selecting viewable instances for a user in Application Security may generate an error.

License

The available license count in the Manage Servers dialog may display zero instances available, this is only a UI issue. Instance counts continue to be enforced based on the license key(s).

Custom Counters

An error may be generated when editing Custom Counters while using the new SQLDM 12.0 architecture.

Add Servers

To prevent difficulties when adding instances to the correct SQLDM installation, first, select the installation where you want to add your instance, then go to **All Servers > Manage Servers** and follow the usual steps. To verify you are in the correct SQL installation, check the name of the database installation located next to the title bar of the product on the top of the screen.

DMSO Licensing

To avoid applying the license key in a clustered installation to the wrong SQLDM installation, first, click the root node in the tree to successfully apply the license.

Known Issues in version 11.1

Installation

SQLDM does not support the repository installation on a Chinese Language SQL Server.

Licensing

When entering a license key, the SQL Diagnostic Manager License Key Wizard may throw an exception while referencing a Windows registry path. To avoid this error, launch the SQLDM Desktop Client using the 'Run as Administrator option.

Disk Size

SQL Diagnostic Manager will not be able to determine the available Disk Size of Mount Points for any SQL Server version older than SQL Server 2008 R2.

Drive metrics

SQL Diagnostic Manager drive metrics cannot detect the disk drives using OLE Automation, it is only possible when using WMI.

Known Issues in version 11.0

Reports

The 'Days since last backup metric' is based on the last time any kind of backup (Full, differential, or transaction log) was made on the database.

Azure Monitored Instances

The load time is longer for Azure screens because some features have been upgraded, such as:

- The 'Batch Collection' metric that has been replaced with individual collections makes the load time longer.

- The 'Initial Collections' in which the load time can be longer.

Reports

The Blocked Process Threshold is automatically updated when the activity monitor trace/extended event session starts, even if it already has the correct value.
By changing the Blocked Process Threshold, SQL Server reports that a configuration setting has changed. The "correct" value is set in the SQLDM instance properties under the Activity Monitor tab.

Sessions

The Session tab may not be visible if the database is unloaded and SQL Diagnostic Manager and System sessions are filtered.

Known issues in version 10.6

Buttons

Refresh and Pause

The Refresh and Pause buttons are not currently working. Use the Function Keys temporarily, until this issue is fixed.

Reports

Deploy Report

The Deploy Report link under the Custom Report tab is temporarily unavailable, this link will be restored in SQLDM 11.0. The SQL Server Reporting Services can be used as a workaround.

Analyze tab

Overview

When you are in the Analyze tab you may not be able to return to the Overview tab. As a workaround, go to any other screen first and go back to Overview.

Known issues in version 10.5.1

There are no Known Issues in SQL Diagnostic Manager 10.5.1

Known Issues in version 10.5

Analysis

Workload Category

The Workload Analysis alerts categories are disabled by default to avoid inadvertent load. To run and ad hoc analysis, scroll down in the Run Analysis window and enable them.

Query Monitor

Estimated plan collection

On-demand estimated plan collection are not working for queries with bind variables.

> ❗ Customers on SQL Diagnostic Manager 10.4.2 and 10.4.3 should not attempt to upgrade to 10.5. If you have attempted to upgrade and encountered a failure, please contact IDERA Technical Support.

> ⓘ All the fixes included in 10.4.2 and 10.4.3 have not been integrated in SQL Diagnostic Manager 10.5. These Fix Versions are included in the upcoming version SQL Diagnostic Manager 10.5.1.

Known Issues in version 10.4

Query Store

Enabling

Query Store must be enabled on the monitored instance, along with Query Monitor and Query Waits.

IDERA Dashboard

Upgrading

Upgrading the IDERA Dashboard may fail if you have previously upgraded from version 3.8. Please contact IDERA support when encountering this problem.

Extended Events

Updates

When using Extended Events for Query Wait collections, updates happen at the snapshot interval. For real time updates, deselect Extended Event collection for the default of DMV sampling of Query Waits. Then, the graph will update with real-time collection intervals.

Query Details

Query Plan Diagram

When exporting a Query Plan Diagram you may encounter a Security Alert window with the following message "Your current security settings do not allow this file to be downloaded". Prevent this alert following these instructions:

1. Close SQLDM.
2. Open Internet Explorer.
3. In the menu bar, select **Internet Options**.
4. The Internet Options window opens, click the Security tab, select **Custom Level**, search for Downloads, and enable File Downloads.
5. Click **OK**.

Known Issues 10.3

Installation

Native client

SQL Diagnostic Manager installation may fail if Microsoft SQL Server Native Client is not installed on the machine. To avoid the failure, install the SQL Server native client first, and then run SQLDM installer. The native client installer can be found on the following page: Microsoft® SQL Server® 2012 Native Client - QFE

Privilege Minimization

User configuration

When configuring a privileged minimized user, the collection of WaitStatistics and QueryMonitoringStatistics could stop after SQLDM restarts.

IDERA Dashboard

Upgrade

In certain upgrades of the IDERA Dashboard, DM registration gets unregister. If users attempt to register the product manually, it will fail because SQL Diagnostic Manager keeps unregistering on service restart.

Query Waits

Extended Events

When Query Waits is enabled with Extended Events selected, the CPU utilization will increase dramatically. To prevent this problem, deselect Extended Events for Query Wait collection.

Known Issues in version 10.2.3

IDERA Dashboard

Upgrade

When you upgrade SQL Diagnostic Manager, the installation wizard shows a message detecting the current version of your IDERA Dashboard. However, this message may also show that the Dashboard would be upgraded to an incorrect one.

Known issues in version 10.2.2

Licenses

License Library

The license library has changed. If you encounter problems with your current license, contact Licensing.

Installation and upgrade

Upgrading SQL Diagnostic Manager

When a local user that is not created as an administrator, but later is added to the local administrator group, runs the upgrade. It results in a restart through the upgrade and a partially completed upgrade.

Prevent this issue by running the upgrade under a user ID created or configured as a local administrator.

Known issues in version 10.2.1

IDERA Dashboard

Dashboard upgrade

After upgrading to SQL Diagnostic Manager 10.2.1 is necessary to stop and restart the SQLDM and the Dashboard services:

- Idera Dashboard Web Application Service
- Idera Dashboard Core Service
- SQLdm Rest Service
- SQLdm Predictive Analytics Service
- SQLdm Management Service
- SQLdm Collection Service

Follow the mentioned steps so that the Dashboard works as expected.

IDERA Dashboard

Dashboard Upgrade

IDERA Dashboard is not included in SQL Diagnostic Manager 10.2 upgrade. If you require IDERA Dashboard, you have three options:

1. Wait for SQLDM 10.2.1. A new release including a new IDERA Dashboard SQLDM interface is coming soon.
2. Upgrade SQLDM 10.1.4 with SQLDM 10.2 and leave the IDERA Dashboard in place. SQLDM 10.2 upgrade works with previous IDERA Dashboard integration, but new registrations are not supported.
3. Volunteer for the SQLDM 10.2.1 Beta. This release includes the IDERA Dashboard, but some known bugs may be present in the SQLDM integration with IDERA Dashboard.

Known issues in version 10.1.4

Installation

Failed installation on SQL Server 2005.

SQLDM is failing to install on SQL Server 2005 version. SQLDM 10.1.4 has encountered this issue when it is installed on SQL Server 2005 SP4.

WMI

WMI Service

WMI service must be running and be properly configured for disk space alerts to function normally.

Dashboard

Widgets

The instance status widget in the Dashboard is not loading any data.

Known issues in version 10.1.1

Installation

Failed SQLDM installation on Windows 10 or Windows 12.

Installation fails when the .Net 2.0/3.5 feature is not installed on Windows 10 or Windows 12. Therefore, install the .Net 2.0/3.5 feature before the SQLDM installation, once the installation is complete, the .Net 2.0/3.5 feature can be removed.

Known issues in version 10.1

PowerShell

Instance friendly name is not displayed in the UI.

The friendly name assigned to an instance through PowerShell is not being automatically refreshed and is not being displayed in the Desktop Console UI. Right-click **All Servers** in the tree pane and select **Refresh** to manually refresh the instances information and visualize the assigned friendly name.

IDERA Dashboard

Unsuccessful registration of SQLDM instances.

Installations of the IDERA Dashboard in 32 bit Operating Systems are unable to successfully register SQLDM instances hosted on 64 bit Operating Systems.

Known issues in version 10.0

License Manager

The Generate License Keys link fails to direct to License Manager.

SQL Diagnostic Manager version 10.0 is designed to integrate with License Manager 2.0, allowing for a self-service licensing model. However, an issue in the Generate License Keys link of the License Keys window fails to direct to License Manager. For additional information on this feature and a workaround, see Generate a new license key.

IDERA Dashboard and web console

Views with list of instances available take longer to populate in the SQL Diagnostic Manager web console.

Some SQL Diagnostic Manager users may find that it takes approximately a minute for any of their monitored instances to display in views of the SQL Diagnostic Manager web console where a list of instances is available.

Known Issues in version 9.x

Known issues in version 9.1

General

The option to collect non-query activities data using Extended Events is incorrectly set by default for SQL Server 2008R2 instances.

SQL Diagnostic Manager is designed to support collection of non-query activities data with Extended Events only for instances running SQL Server 2012 or higher. In SQL Diagnostic Manager 9.1 for instances running SQL Server 2008R2 the Use Extended Events radio button is selected by default instead of the Use SQL Trace radio button.

Clicking the ‘launch SQLdm’ icon takes users to the corresponding instance dashboard screen but sometimes it fails to highlight the specific instance in the Servers tree.

SQL Diagnostic Manager is designed to allow users access to the SQL Diagnostic Manager Console from the Thumbnail, Heatmap, and Alerts Detail views. In SQL Diagnostic Manager 9.1 clicking the ‘launch SQLdm’ icon takes users to the corresponding instance dashboard screen but occasionally fails to clearly mark the specific instance it refers to in the Servers tree

Alerting

SQL Diagnostic Manager fails to display one alert response when multiple metric thresholds are breached

SQL Diagnostic Manager version 8.5 and later is designed to trigger an alert response only after multiple metric thresholds are breached when the “Where all metrics are in specified list” condition is selected. However, an issue in the “Send a Network Management (SNMP) Trap Message”, “Send an email to recipient”, and “Run the following SQL Script” actions of the Alert Response Window cause these actions to execute several times, resulting in multiple alerts.

The action “Run the following program” fails to execute when configuring automated responses to alerts

Users with SQL Diagnostic Manager version 8.0 and later may find that when creating an alert response with the associated action “Run the following program” in the Alert Response window, the specified program does not run once the condition is met.

SQL Diagnostic Manager returns PoweredOff alerts for the VM Power State metric when servers are not turned off

Some SQL Diagnostic Manager users may view PoweredOff alerts when reviewing the generated “VM Power State” alerts for their servers linked to vCenter or Hyper-V host servers. These alerts display even though the servers are not turned off.

The actions “Write an event to the Windows event log” and “Send an email to recipient” in the Alert Response Window fail to deliver multiple alert statuses

Users with SQL Diagnostic Manager version 8.5 and later may find that when creating an alert response with multiple metrics as a condition and associated actions “Write an event to the Windows event log” and/or “Send an email to recipient” in the Alert Response window, the feature fails to deliver complete alert information and displays only one alert status when condition is met.

VM Configuration

SQL Diagnostic Manager fails to update fields in the VM Configuration window after the virtualization host server is edited

Users with SQL Diagnostic Manager version 8.5 and later may find that fields such as the Virtual Machine name, Type, and Computer Name in the VM Configuration window are not updated correctly after the virtualization host server is changed.

Known issues in version 9.0

General

SQL Diagnostic Manager fails to update fields in the VM Configuration window after the virtualization host server is edited

Users with SQL Diagnostic Manager version 8.5 and later may find that fields such as the Virtual Machine name, Type, and Computer Name in the VM Configuration window are not updated correctly after the virtualization host server is changed.

Web Application Service

The IDERA Dashboard's Web Application Service fails to restart after reboot

Users with SQL Diagnostic Manager version 9.0 may find that the IDERA Dashboard's Web Application Service does not automatically restart after a machine reboot.

Alerting

SQL Diagnostic Manager fails to display one alert response when multiple metric thresholds are breached

SQL Diagnostic Manager version 8.5 and later is designed to trigger an alert response only after multiple metric thresholds are breached when the “Where all metrics are in specified list” condition is selected. However, an issue in the “Send a Network Management (SNMP) Trap Message”, “Send an email to recipient”, and “Run the following SQL Script” actions of the Alert Response Window cause these actions to execute several times, resulting in multiple alerts.

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Users with SQL Diagnostic Manager version 8.5 and later may find that when creating an alert response with multiple metrics as a condition and associated actions “Write an event to the Windows event log” and/or “Send an email to recipient” in the Alert Response window, the feature fails to deliver complete alert information and displays only one alert status when condition is met.

Known Issues in version 8.x

Known issues in version 8.6

Alerting

SQL Diagnostic Manager fails to update statistics for some monitored SQL servers and triggers a persistent alert ‘Unable To Monitor’ for the same

Users with SQL Diagnostic Manager version 8.0.1 and later may find that some servers are not returning any statistics due to an issue in the Activity Monitor settings that causes the entire refresh of servers to fail.

SQL Diagnostic Manager fails to display one alert response when multiple metric thresholds are breached

SQL Diagnostic Manager version 8.5 and later is designed to trigger an alert response only after multiple metric thresholds are breached when the “Where all metrics are in specified list” condition is selected. However, an issue in the “Send a Network Management (SNMP) Trap Message”, “Send an email to recipient”, and “Run the following SQL Script” actions of the Alert Response Window cause these actions to execute several times, resulting in multiple alerts.

The action “Run the following program” fails to execute when configuring automated responses to alerts

Users with SQL Diagnostic Manager version 8.0 and later may find that when creating an alert response with the associated action “Run the following program” in the Alert Response window, the specified program does not run once the condition is met.

The actions “Write an event to the Windows event log” and “Send an email to recipient” in the Alert Response Window fail to deliver multiple alert statuses

Users with SQL Diagnostic Manager version 8.5 and later may find that when creating an alert response with multiple metrics as a condition and associated actions “Write an event to the Windows event log” and/or “Send an email to recipient” in the Alert Response window, the feature fails to deliver complete alert information and displays only one alert status when condition is met.

SQL Diagnostic Manager returns PoweredOff alerts for the VM Power State metric when servers are not turned off

Some SQL Diagnostic Manager users may view PoweredOff alerts when reviewing the generated “VM Power State” alerts for their servers linked to vCenter or Hyper-V host servers. These alerts display even though the servers are not turned off.

SQL Diagnostic Manager fails to stop alert generation after the Availability Group Preferred Replica alert is un-checked

Users with SQL Diagnostic Manager version 8.6 that have the Availability Group Preferred Replica alert configured may find that when un-checking the alert in the Alert Configuration window to stop raising the alert, SQL Diagnostic Manager continues to generate the alert which also displays in the Alerts View. Un-checking the configured database in the Configuration tab of the Alert Configuration window solves this issue.

General

SQL Diagnostic Manager fails to update fields in the VM Configuration window after the virtualization host server is edited

Users with SQL Diagnostic Manager version 8.5 and later may find that fields such as the Virtual Machine name, Type, and Computer Name in the VM Configuration window are not updated correctly after the virtualization host server is changed.

Known issues in version 8.5

General

The Query Monitor trace in SQL Diagnostic Manager does not return queries in progress

Users with SQL Diagnostic Manager version 8.0 and later may find that when using the Query Monitor functionality, the queries returned and displayed do not include queries in progress.

SQL Diagnostic Manager fails to update fields in the VM Configuration window after the virtualization host server is edited

Users with SQL Diagnostic Manager version 8.5 may find that fields such as the Virtual Machine name, Type, and Computer Name in the VM Configuration window are not updated correctly after the virtualization host server is changed.

Alerting

SQL Diagnostic Manager returns Blocking Session Wait Time alerts with session 0 and missing information when blocking-process node is empty

Some users may experience Blocking Session Wait Time alerts with missing information and session 0 when the blocking-process node is empty in SQL Server. In SQL Diagnostic Manager 8.01 and later versions, this issue may occur only if the trace that is collecting blocking data doesn't return a SPID for a blocking process.

SQL Diagnostic Manager fails to display one alert response when multiple metric thresholds are breached.

SQL Diagnostic Manager version 8.5 and later is designed to trigger an alert response only after multiple metric thresholds are breached when the “Where all metrics are in specified list” condition is selected. However, an issue in the “Send a Network Management (SNMP) Trap Message”, “Send an email to recipient”, and “Run the following SQL Script” actions of the Alert Response Window cause these actions to execute several times, resulting in multiple alerts.

The action “Run the following program” fails to execute when configuring automated responses to alerts.

Users with SQL Diagnostic Manager version 8.0 and later may find that when creating an alert response with the associated action “Run the following program” in the Alert Response window, the specified program does not run once the condition is met.

The actions “Write an event to the Windows event log” and “Send an email to recipient” in the Alert Response Window fail to deliver multiple alert statuses.

Users with SQL Diagnostic Manager version 8.5 and later may find that when creating an alert response with multiple metrics as a condition and associated actions “Write an event to the Windows event log” and/or “Send an email to recipient” in the Alert Response window, the feature fails to deliver complete alert information and displays only one alert status when condition is met.

SQL Diagnostic Manager returns PoweredOff alerts for the VM Power State metric when servers are not turned off.

Some SQL Diagnostic Manager users may view PoweredOff alerts when reviewing the generated “VM Power State” alerts for their servers linked to vCenter or Hyper-V host servers. These alerts display even though the servers are not turned off.

Known issues in version 8.0

Installation and configuration issues

The SQLdm Setup Wizard is interrupted after selecting the SQL server instance on which you want to install the SQL Diagnostic Manager Repository

Some users may experience an interruption due to memory corruption in their SQL Diagnostic Manager installation after selecting the SQL Server instance on which they want to install their SQL Diagnostic Manager Repository. Note that the SQL Diagnostic Manager installer does not complete on machines where memory corruption prevents connections to SQL Server. Furthermore, in these types of environments other applications such as SQL Server Management Studio also do not function.

Negative values received from vCenter as a warning message do not impact VM data collection

Some users may receive negative values from vCenter as a warning message. The message is logged as in the SQL Diagnostic Manager Services. Note that this does not have any impact in terms of VM data collection and users are able to view VM and VM Host data.

Console crashes when upgrading to SQL Diagnostic Manager 8.0 while logged in the IDERA Newsfeed account

Users who remain logged in the IDERA Newsfeed account and upgrade to SQL Diagnostic Manager 8.0 may experience console crashes. Note that an upgrade from SQL Diagnostic Manager 8.0 to 8.0.1 will solve this issue.

Known Issues in version 7.x

Known issues in version 7.5

General

SQL Diagnostic Manager 7.5 no longer supports Microsoft Windows 2000 or the .Net 2.0 framework

SQL Diagnostic Manager 7.5 does not support Windows 2000 or the .Net 2.0 framework. While SQL Diagnostic Manager 7.2 and prior versions continue to operate with Windows 2000, SQL Diagnostic Manager 7.5 and later require the .Net 4.0 Full framework to take advantage of the additional features.

Server Overview

Timeline refresh causes a memory leak

SQL Diagnostic Manager experiences a memory leak when you are viewing the Timeline and click Refresh. To free the memory, you must restart the SQL Diagnostic Manager Management Console.

Queries

Queries view filter may not properly filter in some situations

In environments with large databases, the Queries view filter may not properly filter if you attempt to change filter properties during a refresh.

Resources

File Activity displays an unhelpful error message when WMI credentials are invalid

SQL Diagnostic Manager displays the error message, "An error occurred while refreshing the active view," when you attempt with access the Resources > File Activity view if your WMI credentials are invalid. If this message appears, verify your WMI access credentials and try again.

Installation and configuration considerations

SQL Diagnostic Manager Repository computer must run Microsoft SQL Server 2005 or later

SQL Diagnostic Manager 7.0 and later require Microsoft SQL Server 2005 or later running on the computer that hosts the SQL Diagnostic Manager Repository database for all installations.

SQL Diagnostic Manager Console only users cannot upgrade to the full version without uninstalling SQL Diagnostic Manager

Users who have an installation of SQL Diagnostic Manager Console only on a computer can use the upgrade to update their current version of the desktop client console, but cannot use the upgrade program to install the full version of SQL Diagnostic Manager.

Registering a SQL Server instance that uses an Alias Name requires an alias on the host computer

When registering a SQL Server instance using the alias name, an alias must first be created on the computer that hosts the SQLdm Management and Collection Services. If the instance uses Named Pipes, Named Pipes must be enabled in the SQL Server network configuration of the aliased SQL Server instance.

Management Service does not start when the account permissions are incorrect

If the account you specified for the SQL Diagnostic Manager services does not have System Administrator privileges on the SQL Server instance hosting the Repository database, the setup program cannot start the SQLdm Management Service. This issue only occurs during installation.

Some users may receive an error message when opening the SQL Diagnostic Manager stating that there is no valid license available

To resolve this issue, use the Management Service Configuration wizard to specify credentials for a Windows account or SQL Server login that has System Administrator privileges on the SQL Server instance hosting the Repository database. You can start the Management Service Configuration wizard from the Programs menu.

SQL Diagnostic Manager Reporting does not support Microsoft Reporting Services 2000

SQL Diagnostic Manager only supports Microsoft Reporting Services 2005 and later.

SQL Diagnostic Manager requires Predictive Analytics for baseline-related results

SQL Diagnostic Manager 7.5 requires the Predictive Analytics Service in order to display baseline-related results. During installations and upgrades, SQL Diagnostic Manager installs the Predictive Analytic service with the other included services. If Predictive Analytics is not detected or is disabled, SQL Diagnostic Manager cannot generate baseline data for the requested report. The following reports require the Predictive Analysis Service to include baseline-related results:

- Baseline Statistics
- CPU Statistics
- Memory Statistics
- Session Statistics
- Disk Statistics
- Replication Statistics

Phase out SQL Diagnostic Manager mobile manager

IDERA is announcing end of life for SQL mobile manager (SQLmm). On October 1, 2012, all support for SQLmm will stop and the SQLmm trial site will be decommissioned. Also, any remaining installations of SQLmm 3.6 or earlier that use the IDERA redirectors will no longer work.

To continue using a Web-based monitoring solution that is accessible from your smart phones or tablet devices, upgrade to SQL Diagnostic Manager 7.0 or later, and deploy SQLdm Mobile. IDERA discontinued distribution of SQL mobile manager in October 2011.

SQLdm Mobile does not support Microsoft IIS Express

SQLdm Mobile requires the standard version of the Microsoft IIS Web Server, version 7.0 or later. For more information, see the SQLdm Mobile requirements.

SQLdm Mobile & Newsfeed installation cannot be changed or repaired using Add/Remove Programs

To successfully change or repair your SQLdm Mobile & Newsfeed installation, uninstall the application and components, and then run the setup program to reinstall your deployment.

SQLdm may not properly link to vCenter from some monitored virtual SQL Server instances

The SQLdm VM Configuration window displays a list of your monitored virtual SQL Server instances, but the link between an instance and the associated vCenter may not work properly. To access this window, click Tools > VM Configuration.

VM Host Server Change alert not always triggered when a VM moves from one host server to another

Even if the circumstances warrant SQL Diagnostic Manager to trigger the VM Host Server Change alert, users who have virtual machines running on an ESX host managed by vCenter 5.0 or later may not receive the alert when they move a VM from one host to another.

Negative values received from vCenter as a warning message do not impact VM data collection

Some users may receive negative values from vCenter as a warning message. The message is logged as in the SQL Diagnostic Manager Services. Note that this does not have any impact in terms of VM data collection and users are able to view VM and VM Host data.

Query Monitor disregards filter for SQL Server 2000 users

Some SQL Server 2000 users may notice that SQLdm Query Monitor includes SQL Diagnostic Manager queries in the results even if the Exclude SQL Diagnostic Manager queries check box is checked in the Advanced Query Monitor Configuration window.

SQLdm Mobile Server Dashboard charts display “Data not available” error

This error indicates that SQLdm Mobile was not able to collect all the performance metrics tracked by these charts. This issue is more likely to occur with the I/O and Per Read/Write charts on the Disk dashboard. To correct this issue, use the Microsoft IIS Manager console to restart the SQLdm Mobile Web site (virtual directory).

Start and Stop service actions not supported for virtual SQL Server instances

The Start and Stop service actions are not supported for virtual SQL Server instances (instances located on a Windows cluster node). To start or stop a service on a virtual SQL Server 2008 instance, use the Microsoft Failover Cluster Management tool. For SQL Server 2005 or earlier, use the Microsoft Cluster Administrator tool to manage services.

Gaps between the real-time view and back-filled historical data can be seen on the CPU view

This occurs only when the CPU view is accessed via the Server tree. To view the information, without any gaps, access the CPU view via the ribbon.

Free disk space reported as zero on databases with special characters

For servers and path names that include special characters such as % or #, SQL Diagnostic Manager may incorrectly report the remaining disk space as zero.

Known Issues in versions previous to 7.5

Known issues in versions previous to 7.5

General

SQL Diagnostic Manager displays a refresh error when a user attempts to view data for an instance to which he does not have admin rights

SQL Diagnostic Manager displays a refresh error message when a user tries to view data for a monitored SQL Server instance to which the user does not have administrative rights. The message states that, "An error occurred while refreshing the active view."

SQL Diagnostic Manager displays an error when a user attempts to configure disk collection for an instance to which he does not have admin rights

SQL Diagnostic Manager displays an error message on the Server Properties Disk Drives window if a user's collection service credentials do not have administrative access to the monitored SQL Server instance, and the user attempts to view the list of attached disk drives on that instance. Note that WMI credentials are not used to retrieve disk drive information on this page.

Drives may not appear in the Resources Disk view when you switch to direct WMI collection

Users who select to collect OS metrics using direct WMI collection may notice mounted drives appearing in some areas of SQL Diagnostic Manager but not on the Resources Disk view. To refresh this list, you must restart the SQL Diagnostic Manager Management Console.

Dashboard

Custom Counters dashboard panel does not return to default after deleting all counters

The Custom Counters dashboard panel includes a drop-down list to allow you to select from the available counters. If you delete all counters, the panel does not return to the default title and continues to display one of the counter names.

Resources

Disk Filter Columns does not work on a blank chart

The Filter Columns selection does not work in the Resources > Disk view if you receive a blank chart due to your WMI credentials being invalid.

Alerts

OS Disk Time (Percent) and OS Disk Time Per Disk (Percent) alerts may not trigger for some users

Users with Windows Server 2008 SP1 and SQL Server 2000 SP4, and who select direct WMI collection for their OS metrics may experience an issue preventing OS Disk Time (Percent) and OS Disk Time Per Disk (Percent) alerts from triggering. If this issue occurs, switch to using OLE automation.

Virtualization-related alerts occasionally raise more than once

In some circumstances, SQL Diagnostic Manager may repeatedly raise virtualization-related alerts when there is no change in the status.

Custom Counters

SQL Diagnostic Manager does not automatically add unassociated custom counters to an alert template created from an instance

If you use alert templates and create a custom counter, SQL Diagnostic Manager automatically adds the new counter to your existing alert templates. However, if you create a custom counter not associated with an instance, and then create an alert template based on the alert configuration of one of your monitored instances, SQL Diagnostic Manager does not add the new counter to your alert template nor can you manually add the counter.

To avoid this issue, add the missing custom counter to any SQL Server instance, create an alert template from that instance, and then clear any undesired custom counters from that instance.

SQLdm Mobile

SQLdm Mobile My Servers view filter does not work

The filter on this view will consistently display the message, “You have no favored or followed servers or the servers list has not been cached yet,” regardless of the filter option you choose. This issue occurs even when you are following servers or have marked servers as favorites.

Recommended IDERA Solutions

IDERA strives to ensure our products provide quality solutions for your database needs. The following IDERA Solutions have been recently added to the knowledge base at the Customer Service Portal.

ID Number	Title
4337	SQLDM alert, "Session 0 has been blocking other sessions..."
4287	Disk Full Percent fires at or near 100% for a disk that still has plenty of space.
4281	A SQL Diagnostic Manager with wait type MSQL XP uses constant CPU resources and never finishes on a monitored server.
4088	Disk Busy per Disk counter reports 100% when the disk is known to be idle.
3511	SQLDM always shows "The SQLDM Collection Service has too many outstanding connections" in the overview pane for a specific server, and SPIDs stall on the audited server.
2286	When Upgrading SQL Diagnostic Manager, you receive the error message "The repository is an invalid version."
2109	CPU Used, Memory Paging and Disk Queue Length show question marks in the Summary view.
2102	What alerting Event Codes are used in SQLDM 5.0 or later?

Get started

SQL Diagnostic Manager (SQLDM) is a database management system (DBMS) solution designed exclusively for Microsoft SQL Server diagnosis and performance tuning. SQL Diagnostic Manager lets you discover potential and existing problems, analyze the state of your SQL Server enterprise, and generate reports.

Upgrade to this release

Upgrading SQL Diagnostic Manager to the most recent version allows you to take advantage of the new features available. An up-to-date list of new features and fixed issues is available in the SQL Diagnostic Manager Release Notes.

Upgrade from SQL Diagnostic Manager 5.x or higher checklist

To successfully upgrade your Microsoft SQL Server environment to this build, complete the steps included in the following table:

✓	**Follow these steps ...**
	Back up your SQL Diagnostic Manager Repository before upgrading.
	Ensure that your environment meets the product requirements for the newer version of SQL Diagnostic Manager.
	Verify that no SQL Diagnostic Manager desktop clients are running.
	Upgrade your environment to the latest version of SQL Diagnostic Manager on the computer where the SQL Diagnostic Manager services reside. SQL Diagnostic Manager 10.0 and later versions integrate with the IDERA Dashboard.
	Test your new SQL Diagnostic Manager deployment and setup.

Upgrade to SQLDM 9.0 or higher versions

Customers upgrading from previous SQL Diagnostic Manager versions to SQL Diagnostic Manager 9.0 or higher versions need a new license key or it is not possible to continue with the upgrade process. Users can access the IDERA Customer Portal at the moment of upgrade from the license management window in SQL Diagnostic Manager (**Help > Manage Licenses**) or directly at https://idera.secure.force.com. The license management screen or the portal provides the necessary information to generate a new license key.

Perform a standard upgrade

Use the following procedures to upgrade a distributed SQL Diagnostic Manager environment.

Upgrade your SQLDM Repository and/or SQLDM Services

Install the SQLDM Repository database on a SQL Server instance that meets the product requirements. You do not need to install your Repository in the same domain as the SQLDM Console, but a two-way trust between the target domains must exist. You can install the SQLDM services on the Repository computer (recommended) or a different computer.

> ✓ SQL Diagnostic Manager 10.1 and later requires Microsoft SQL Server 2005 running on the computer that hosts the SQLdm Repository database for all installations.

To upgrade the SQLDM Repository and/or Services:

1. Use an administrator account to log on to the computer on which you want to upgrade the SQLDM Repository database and/or Services.
2. Run `Setup.exe` in the root of the installation kit.
3. On the IDERA SQL Diagnostic Manager Quick Start window, click **SQL Diagnostic Manager** under the Install heading.
4. Read the Upgrade Wizard Welcome window, and then click **Next**.
5. Upgrade your Repository by verifying the authentication method and connection credentials, and then click **Next**.
6. Upgrade your Service account by specifying the account credentials that you want the SQLDM services to use to connect to the SQLDM Repository and the monitored SQL Server instances, and then click **Next**. This account must belong to the sysadmin role on the Repository database and each instance you plan to monitor.
7. Click **Upgrade** to begin your upgrade.
8. Click **Finish** to exit the upgrade program.

Upgrade your SQLDM Console

> ✓ You must have a full installation of SQL Diagnostic Manager already running in your environment before attempting to upgrade the SQLDM desktop client console.

To upgrade the SQLdm Console:

1. Use an administrator account to log on to the computer on which you want to upgrade the SQLDM Console.
2. Navigate to the location where the SQLDM Console file resides in the distribution media.
3. ***If you use an x64 operating system***, run `SQLDiagnosticManager-x64_c.exe`. ***If you use an x86 OS***, run `SQLDiagnosticManager_c.exe.`
4. On the Welcome window of the setup program, click **Next**.
5. Click **Upgrade** to begin your upgrade.
6. Click **Finish** to exit the upgrade program.

Upgrade SQL Diagnostic Manager in a clustered environment

Use the following steps to upgrade your SQL Diagnostic Manager installation in a clustered environment.

> ✓ SQL Diagnostic Manager 10.0 and later requires Microsoft SQL Server 2005 running on the computer that hosts the SQL Diagnostic Manager Repository database for all installations.

Upgrade in a Microsoft Windows Server 2003 Clustered Environment

To upgrade SQL Diagnostic Manager in a clustered environment:

1. Log on to the cluster node using the Administrator account.
2. In Cluster Administrator, select the resource group that contains the SQL Diagnostic Manager services.
3. Take the SQLDM Management and Collection services offline.

Perform the following steps on each node, starting with the active node:

1. Upgrade SQL Diagnostic Manager components previously deployed to the node.
2. In Windows Services, stop the SQLDM Collection, SQLDM Management, and SQLDM Predictive Analytics services.
3. Set the SQLDM services to manually start, and then restart the services.

Once the previous steps are complete, perform the following steps on each cluster node:

1. In Cluster Administrator, bring the SQLDM Management Service online.
2. Use the Management Service Configuration wizard to force the services to re-register on the active node.

Upgrade in a Microsoft Windows Server 2008 Clustered Environment

To upgrade SQL Diagnostic Manager in a clustered environment:

1. Log on to the cluster node using the Administrator account.
2. In the Failover Cluster Management tool, select the resource group that contains the SQL Diagnostic Manager services.
3. Take the SQLdm Management and Collection services offline.

Perform the following steps on each node, starting with the active node:

1. Upgrade SQL Diagnostic Manager components previously deployed to the node.
2. In Windows Services, stop the SQLDM Collection, SQLDM Management, and SQLDM Predictive Analytics services.
3. Set the SQL Diagnostic Manager services to manually start, and then restart the services.

Once the previous steps are complete, perform the following steps on each cluster node:

1. Bring the SQLdm Management Service online.
2. Use the Management Service Configuration wizard to force the services to re-register on the active node.

Upgrade SQLDM console only

SQL Diagnostic Manager allows users to install a full version, which includes the SQL Diagnostic Manager Repository, Management Service, and Management Console, or you can install the SQLDM desktop client console by itself when you already have a full version of SQL Diagnostic Manager installed in your environment.

Users who have an installation of SQLDM Console only on a computer can use the upgrade to update their current version of the desktop client console, but cannot use the upgrade program to install the full version of SQL Diagnostic Manager.

Test your deployment

To test your upgrade, you can immediately begin collecting and alerting on performance data. Verify that you are able to monitor the target SQL Server instances and that the data you are retrieving is valid.

Installation and deployment

You can install SQL Diagnostic Manager in an environment of any size.

Get ready for your SQL Diagnostic Manager and SQLDM Web Console deployment

- Check the supported installation scenarios
- Learn about the components and architecture
- Review system requirements
- View the installation instructions

ⓘ IDERA Dashboard is no longer part of the SQL Diagnostic Manager installation. However, it still supports SQL Diagnostic Manager 12.2 and prior versions. Check IDERA Dashboard installation and deployment settings and remember to register SQL Diagnostic Manager in the IDERA Dashboard.

Get ready for your SQL Diagnostic Manager Console-only deployment

- Check the supported installation scenarios
- Learn about the components and architecture
- Review system requirements
- View the installation instructions

Supported installation scenarios

You can install and deploy SQL Diagnostic Manager to meet your unique SQL Server environment needs. SQL Diagnostic Manager also offers a SQL Diagnostic Manager console-only installation in environments that already have SQL Diagnostic Manager fully installed. For additional information about this type of installation, see deploy SQL Diagnostic Manager Console only.

The following installation scenario descriptions assume you are deploying SQL Diagnostic Manager in your environment.

✓ SQL Diagnostic Manager supports monitoring virtual SQL Server instances, such as those using VMware or other virtualization software. For additional information about how SQL Diagnostic Manager works with virtualization, see How SQL Diagnostic Manager works with a virtual environment.

ⓘ SQL Diagnostic Manager supports running **from** Amazon EC2 or Azure IaaS environments.

Typical environment

This configuration includes the following installations:

- SQL Diagnostic Manager Console on your workstation
- SQLDM Web Console
- SQL Diagnostic Manager Repository on the same SQL Server instance

Clustered environment

You can install and configure SQL Diagnostic Manager to monitor virtual SQL Servers. A virtual SQL Server is a SQL Server running on a Microsoft failover cluster managed by Microsoft Cluster Services.

For SQL Diagnostic Manager to monitor virtual SQL Servers, you need to point SQLDM at the "Virtual" SQL Server rather than the individual members of the cluster.

You can install and configure SQL Diagnostic Manager with its core services and repository databases on a Microsoft failover cluster managed by Microsoft Cluster Services. For more information, review Deploy SQL Diagnostic Manager in a clustered environment.

Non-trusted environment

You can install and configure SQL Diagnostic Manager and SQLDM Web Console to monitor SQL Server instances running in non-trusted domains or workgroups.

This configuration includes the following installations:

- SQL Diagnostic Manager Console on your workstation in a trusted or non-trusted domain
- SQLDM Web Console in a trusted or non-trusted domain
- SQL Diagnostic Manager Repository on the same SQL Server instance, in a trusted or non-trusted domain

Deploy SQLDM Web Console and SQL Diagnostic Manager

Use the following links to prepare for your SQLDM Web Console and SQL Diagnostic Manager deployment:

- Check the supported installation scenarios
- Learn about the components and architecture
- Review system requirements for the SQLDM Web console and SQL Diagnostic Manager
- View the installation instructions
- Log in to the SQLDM Web Console

ⓘ Idera SQLDM Web Console is now part of the installation of SQL Diagnostic Manager 12.2 and later versions. However, Idera Dashboard still supports SQL Diagnostic Manager 12.2 and prior versions.

Product components and architecture

The SQL Diagnostic Manager and SQLDM Web Console consist of a light, unobtrusive architecture that efficiently runs in your SQL Server environment with minimal configuration. All components run outside and are separate from SQL Server processes.

- Learn about the components and architecture of the SQL Diagnostic Manager Console and Web Console.
- Learn about the components and architecture of the SQL Diagnostic Manager Scale-Out Installations.

ⓘ IDERA Dashboard is no longer part of the SQL Diagnostic Manager installation. However, it still supports SQL Diagnostic Manager 12.2 and prior versions. Learn more about IDERA Dashboard components and architecture.

SQL Diagnostic Manager components and architecture

SQL Diagnostic Manager consists of a light, unobtrusive architecture that easily runs in your SQL Server environment with minimal configuration. All SQL Diagnostic Manager components run outside and are separated from SQL Server processes.

SQL Diagnostic Manager Console

Use the SQL Diagnostic Manager Console to:

- View real-time status
- Configure alert notifications on specific metric thresholds at the server and database levels
- View historical reports
- Perform administrative functions

The SQL Diagnostic Manager Console retrieves historical information directly from the SQL Diagnostic Manager Repository. All real-time requests use the SQL Diagnostic Manager services to poll the monitored SQL Server.

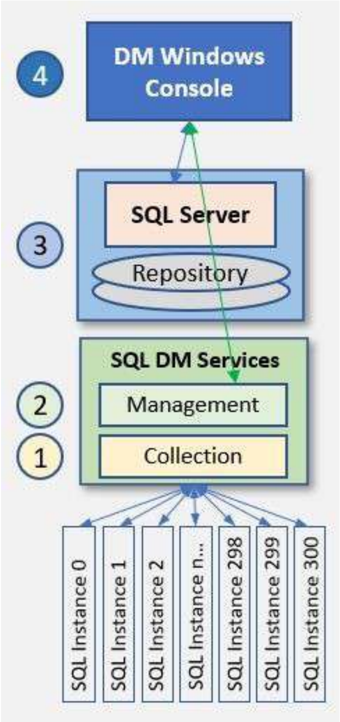
SQLDM Web Console

Use SQLDM Web Console to monitor in real-time your SQL Diagnostic Manager environment. When installing SQLDM Web Console two services are added:

- Idera SQLDM Web Console UI service
- Idera SQLDM Web Console REST API service

> ⓘ Unlike IDERA Dashboard, SQLDM Web Console does not have a repository any or other components than the UI files installed with the UI service.

> ⓘ SQLDM Web Console is compatible with the Index Repository of DMSO, displaying a full overview of all instances for all Diagnostic Manager installation registered with the index repository.



SQL Diagnostic Manager Architecture

SQL Diagnostic Manager's architecture is a compound of four separate subsystems that help you to monitor your SQL Server environment.

1. **Collection service** - periodically contacts numerous monitored instances to gather statistics.
2. **Management service** - takes data from the collection service and places it in a repository.
3. **SQL Server** - implements the repository structure.
4. **Windows Cons oles** (one or more) - sends requests to repository and management service.

Below you can find more information about its importance during the monitoring process.

SQL Diagnostic Manager Services

SQL Diagnostic Manager has four centralized services, the Management Service, the Collection Service, the Predictive Service, and Rest Service. These four services reside on the same computer.

The Management Service

The Management Service performs the following primary functions:

- Provides real-time data to the SQL Diagnostic Manager Console
- Receives historical data from the Collection Service for storage in the Repository
- Raises alerts and sends alert notifications

The Collection Service

The Collection Service performs on-demand and scheduled collection from the monitored SQL Servers.

The Predictive Service

The Predictive Service is used for Alert Forecasting and performs the following primary functions:

- Calculates the Alert Forecast every hour
- Builds a forecasting model once a day

The Rest Service

SQL Diagnostic Manager Plug-in

When SQL Diagnostic Manager is registered with the IDERA Dashboard, the product plug-in module is deployed. The SQL Diagnostic Manager plug-in consists of web views and widgets and a .NET based add-in module (SQL Diagnostic Manager add-in). The web views and widgets are deployed in the Web Application Service of the IDERA Dashboard, and the SQL Diagnostic Manager add-in in the Core Service of the same.

The Web Application Service dynamically loads in SQL Diagnostic Manager's views and widgets and makes them available to web console users. The views and widgets use the SQL Diagnostic Manager add-in REST APIs to retrieve data. Likewise, the SQL Diagnostic Manager add-in retries data from the product services and Repository.

SQL Diagnostic Manager Repository

The SQL Diagnostic Manager Repository is a centralized SQL Server database that stores collected metrics on a scheduled basis, historical data, and alerts information. The SQL Diagnostic Manager Repository also stores configuration information, such as the credentials used to monitor a registered SQL Server instance.

> ✓ SQL Diagnostic Manager 10.1 and later requires Microsoft SQL Server 2005 or above running on the computer that hosts the SQL Diagnostic Manager Repository database for all installations.

Authentication in SQL Diagnostic Manager

SQL Diagnostic Manager uses the same types of authentication available in the SQL Server security model. When specifying account credentials for the SQL Diagnostic Manager services, you can use Windows Authentication or SQL Server Authentication.

When considering which authentication to use, keep in mind that SQL Server Authentication is required when no domain trust exists between the SQL Diagnostic Manager Services computer and the computers hosting the monitored SQL Server instances. For example, if the monitored SQL Server instances are located in an untrusted domain or behind a firewall, you must use SQL Server Authentication to successfully deploy SQL Diagnostic Manager. In this case, you must use the **sa** account or a SQL Server login that has System Administrator permissions.

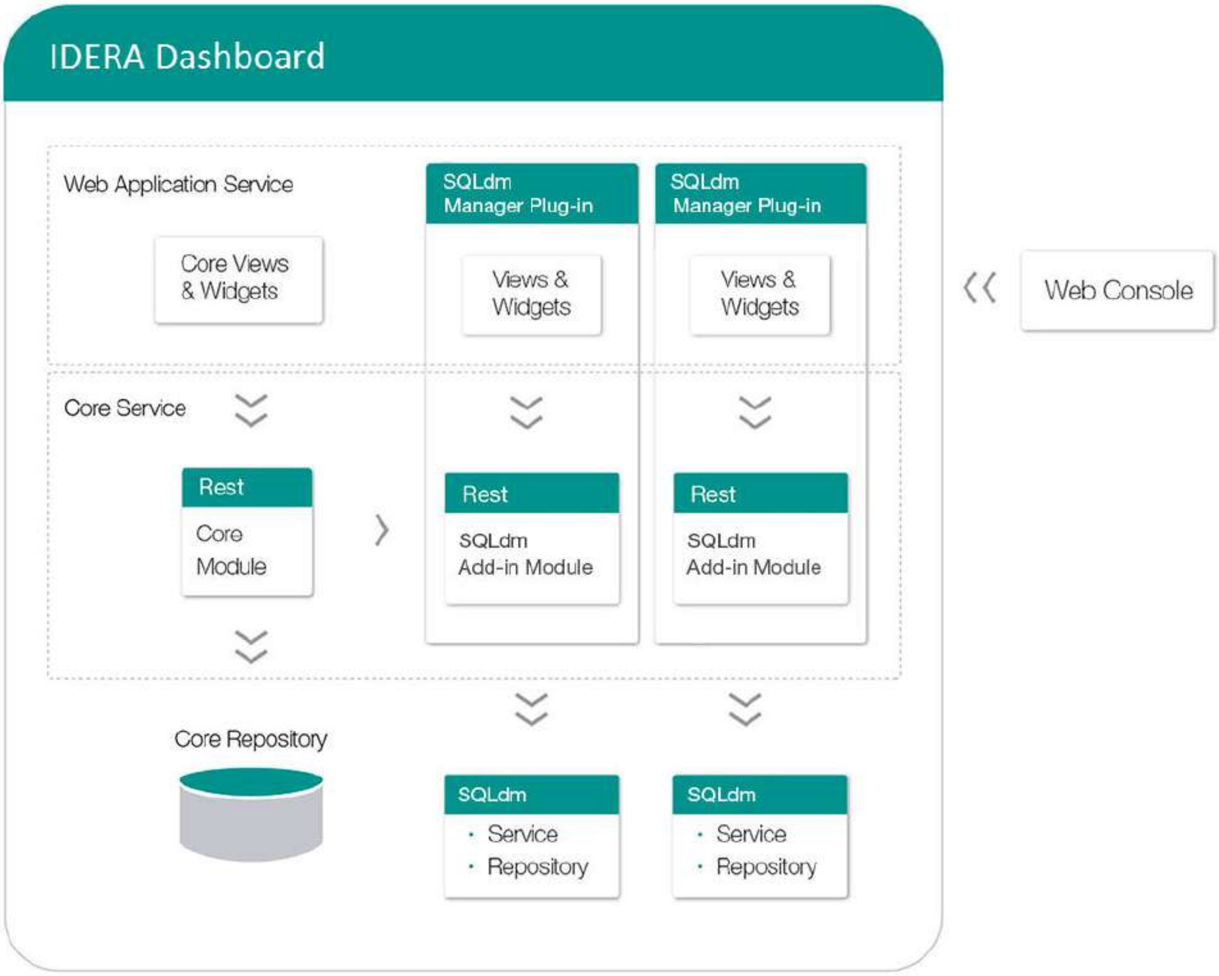
For more information about these authentication types and the SQL Server security model, see the Microsoft document, Authentication in SQL Server.

IDERA Dashboard components and architecture

The IDERA Dashboard provides web and back-end services, shared across multiple IDERA products. To learn more about the IDERA Dashboard and how it works, see Navigate the IDERA Dashboard.

The IDERA Dashboard consists of the following components:

- Web Application Service
- Core Service
- Core Repository



Web Application Service

The Web Application Service is a Windows service that wraps Apache Tomcat server. The Web Application Service serves up dashboard (IDERA Dashboard) and SQLdm views and widgets that are displayed in the web console. The Web Application Service requires three ports:

- Standard HTTP port (by default 9290)
- Monitor port (9094)
- SSL port (9291)

Core Service

The Core Service is a C# (.NET 4.0 Framework) based Windows service that hosts dashboard and SQLDM REST APIs that are used by the Web Application Service to configure and retrieve data. In addition, the Core Service handles product registration, security, configuration, product data, and event aggregation.

The Core Service uses two ports, one for REST API and the other for .NET remoting:

- Core Service REST API port (by default 9292)
- .NET remoting port (by default 9293)

Core Repository

The Core Repository is a database where all dashboard configuration and aggregated data is stored. The Core Repository database is hosted on a SQL Server instance and is accessed by the Core Service to retrieve data.

Product requirements

The SQLDM Web Console and SQL Diagnostic Manager consist of a light, unobtrusive architecture that efficiently runs in your SQL Server environment with minimal configuration. Review system requirements for the SQLDM Web Console and SQL Diagnostic Manager.

- Learn about the SQLDM Web Console requirements.
- Learn about the SQL Diagnostic Manager requirements.

ⓘ IDERA Dashboard is no longer part of the SQL Diagnostic Manager installation. However, it still supports SQL Diagnostic Manager 12.2 and prior versions. Learn more about IDERA Dashboard requirements.

SQL Diagnostic Manager requirements

There are three types of SQL Diagnostic Manager installation (Trial, General, and Production). Refer to the following list of requirements for each type of installation.

✓ SQL Diagnostic Manager 10.5 requires Microsoft SQL Server 2005 or above running on the computer that hosts the SQL Diagnostic Manager Repository database for all installations.

⚠ Tempdb monitoring is supported on SQL Server 2005 and above servers only.

ⓘ To run PowerShell scripts, upgrade to PowerShell 3.0 or higher. This upgrade is required to use the PowerShell snap-in.

Trial requirements

Consider the following requirements when installing all SQL Diagnostic Manager components on one computer.

Type	Requirement
SQL Server Standard or Enterprise Edition	• SQL Server 2014 • SQL Server 2016 Only on Windows and Linux • SQL Server 2017 • SQL Server 2019 • SQL Server 2022 ⓘ SQL Diagnostic Manager monitors and supports older versions of SQL Server on a best-effort basis.
Hard Disk Space	200 MB for all SQL Diagnostic Manager components
Windows Permissions	Your Windows Logon account includes local Administrator permissions
SQL Server Privileges	Either a Windows user account or SQL Server login that includes System Administrator privileges on the monitored SQL Server instances

General requirements

The following requirements apply to all SQL Diagnostic Manager components.

Type	Requirement
CPU	2.0 GHz or higher

Type	Requirement
Memory	1 GB
Operating System 64-bit	• Windows 10 • Windows 11 • Windows Server 2012 • Windows Server 2012 R2 • Windows Server 2016 • Windows Server 2019 • Windows Server 2022
Port Access	5166, 5167, 5169
Client Browser	• Microsoft Edge • Google Chrome • Mozilla Firefox • Safari 9+

Production requirements

Consider the following requirements when installing SQL Diagnostic Manager in an environment where the components are on separate computers.

SQL Diagnostic Manager Console

Type	Requirement
Disk Space	40 MB
SQL Server Permissions	Your Windows login account includes Read Access to the SQL Diagnostic Manager Repository. You can specify a SQL Server login instead.
Monitor Resolution	1280 x 1024 with small text for the best viewing of the SQL Diagnostic Manager Dashboard

SQL Diagnostic Manager Services

Type	Requirement
Disk Space	50 MB
Collection Service Permissions	For more information, review the User Creation Scripts.
Management Service Permissions	Sysadmin fixed server role on SQL Diagnostic Manager Repository instance

Type	Requirement
Windows Runtime Components	• Microsoft .NET 4.8+ (Required) • MDAC 2.8

SQL Diagnostic Manager 11.0 installer checks for your current .NET framework version and prompts the required .NET update. After installing the latest version of .NET Framework you need to reboot your machine. Otherwise, SQLDM installation fails.

SQL Diagnostic Manager Repository

SQL Diagnostic Manager 7.2 and later includes a repository autogrow setting at 32 MB, which is sufficient for trial and small environments in production. Environments with larger, multi-server installations should change the repository autogrow setting to 250 MB or higher to prevent frequent data file autogrow, which can cause performance problems. Using percentage-based autogrow is not recommended.

Type	Requirement
Disk Space	1GB to 3GB for one year of data per monitored SQL Server instance
SQL Server Standard or Enterprise/Datacenter Edition	• SQL Server 2016 Only on Windows and Linux: • SQL Server 2017 • SQL Server 2019 • SQL Server 2022 SQL Diagnostic Manager monitors and supports older versions of SQL Server on a best-effort basis.
Cloud Deployment	• Azure IaaS VM Windows • Azure IaaS VM Linux • Amazon AWS IaaS VM Windows • Amazon AWS IaaS Linux

SQL Diagnostic Manager supports any IaaS deployment if the version of SQL Server used is supported.

Monitored SQL Server Instances

Type	Requirement
SQL Server Express, Standard, or Enterprise/Datacenter Edition	• SQL Server 2014 • SQL Server 2016 • SQL Azure • Amazon RDS Only on Windows and Linux • SQL Server 2017 • SQL Server 2019 • SQL Server 2022 ⓘ SQL Diagnostic Manager monitors and supports older versions of SQL Server on a best-effort basis.
Cloud Deployment	• Azure DB • Single • Elastic Pool • Managed Instance • Amazon RDS SQL • SQL Server 2016 • SQL Server 2017 • SQL Server 2019 • SQL Server 2022 • Azure IaaS VM Windows (All SQL Versions) • Azure IaaS VM Linux • SQL Server 2017 • SQL Server 2019 • SQL Server 2022 • Amazon AWS IaaS VM Windows (All SQL Versions) • Amazon AWS IaaS VM Linux • SQL Server 2017 • SQL Server 2019 • SQL Server 2022

⚠ SQL Diagnostic Manager supports any IaaS deployment if the version of SQL Server used is supported.

ⓘ **Azure SQL and Amazon RDS permissions**

Review the Minimum and Recommended Permissions for Amazon RDS and the Minimum and Recommended Permissions for Azure SQL to create a SQL Server user on the server to monitor a cloud instance.

This topic provides the minimum requirements for installing SQL Diagnostic Manager. For more information about installation requirements, view SQL Diagnostic Manager Hardware Sizing guidelines.

SQL Diagnostic Manager Management Pack and SCOM support requirements

The IDERA SQL Diagnostic Manager Management Pack for integration with SCOM is designed for System Center Operations Manager 2007 R2 and above. For more information about SQL Diagnostic Manager MP and SCOM installation, see Install and configure the SQL Diagnostic Manager Management Pack for SCOM.

Minimum and Recommended Permissions for Amazon RDS

To monitor an Amazon RDS instance using SQL Diagnostic Manager, you have to create a SQL Server user on the instance with the following minimum permissions:

Server Roles

- public
- processadmin
- setupadmin

Databases

- public on TempDB
- sysadmin server role equivalent privileges for monitored databases

Securable

Server Object:

- Alter any connection
- Alter any linked server
- Alter any login
- Alter any server role
- Alter server state
- Alter trace
- Connect SQL
- Create any database
- Create server role
- View any database
- View any definition
- View server state

SQL Diagnostic Manager Hardware Sizing guidelines

The following guidelines estimate the hardware resources required to deploy SQL Diagnostic Manager depending on the number of servers you want to monitor with SQLDM.

Installs under 20 servers

Single-server deployment - Includes the SQL Diagnostic Manager Services and the SQL Server hosting the SQLdm Repository (clustered for redundancy).

Type	Requirement
Operating System	Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Windows Server 2019 Windows Server 2022 Windows 10 Windows 11
Memory	8 GB
CPU	6 Core
SQLdm Repository size	Approximately 50GB
SQL Server version	SQL Server 2008 R2 standard edition or higher

ⓘ The expected repository growth is approximately 1.5-3 GB per monitored instance for a year worth of collected data. Monitoring 15 instances could gather approximately 45 GB over the course of a year.

Installs 20-50 servers

Single-server deployment - Includes the SQL Diagnostic Manager Services and the SQL Server hosting the SQLdm Repository (virtualized/clustered for redundancy).

Type	Requirement
Operating System	Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Windows Server 2019 Windows Server 2022 Windows 10 Windows 11
Memory	16 GB
CPU	6 Core
SQLdm Repository size	Approximately 150GB
SQL Server version	SQL Server 2008 R2 standard edition or higher

ⓘ The expected repository growth is approximately 1.5-3 GB per monitored instance for a year worth of collected data. Monitoring 30 instances could gather approximately 90 GB over the course of a year.

Installs 51-200 servers

Dual-server deployment - The first server hosts the SQL Diagnostic Manager Services and the second server hosts the SQL Server and the SQLdm Repository database.

- **Machine 1** - Hosting the SQL Diagnostic Manager services (virtualized/clustered for redundancy)

Type	Requirement
Operating System	Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Windows Server 2019 Windows Server 2022 Windows 10 Windows 11
Memory	8-16 GB

Type	Requirement
CPU	6 Core

- **Machine 2** - Hosting the SQL Server and the SQLdm Repository (clustered for redundancy)

Type	Requirement
Operating System	Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Windows Server 2019 Windows Server 2022 Windows 10 Windows 11
Memory	16 GB
CPU	6 Core
SQLdm Repository size	200-600GB
SQL Server version	SQL Server 2008R2 standard edition or higher

Installs 201-300 servers

Dual-server deployment - The first server hosts the SQL Diagnostic Manager Services and the second server hosts the SQL Server and the SQLdm Repository database.

- **Machine 1** - Hosting the SQL Diagnostic Manager services (virtualized/clustered for redundancy)

Type	Requirement
Operating System	Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Windows Server 2019 Windows Server 2022 Windows 10 Windows 11
Memory	16 GB
CPU	8 Core

- **Machine 2** - Hosting the SQL Server and the SQLdm Repository (clustered for redundancy)

Type	Requirement
Operating System	Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Windows Server 2019 Windows Server 2022 Windows 10 Windows 11
Memory	32 GB
CPU	8 Core
SQLdm Repository size	600 GB or more
SQL Server version	SQL Server 2008R2 standard edition or higher

Installs over 300 servers

Dual-server deployment - The first server hosts the SQL Diagnostic Manager Services and the second server hosts the SQL Server and the SQLdm Repository database.

- **Machine 1** - Hosting the SQL Diagnostic Manager services (virtualized/clustered for redundancy)

Type	Requirement
Operating System	Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Windows Server 2019 Windows Server 2022 Windows 10 Windows 11
Memory	32 GB
CPU	8 Core

- **Machine 2**- Hosting the SQL Server and the SQLdm Repository (virtualized/clustered for redundancy)

Type	Requirement
Operating System	Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Windows Server 2019 Windows Server 2022 Windows 10 Windows 11
Memory	32 GB
CPU	8 Core
SQLdm Repository size	900 GB or more
SQL Server version	SQL Server 2008R2 standard/enterprise edition

Sample installations in large environments

See the following sample customer installations for users with large environments:

Installs 51-100 servers

Type	In-House Use
Number of monitored servers	52
Services and Repository installed on same machine	Hyper-V - 4 quad core processors - 14 GB of memory - Windows Server 2008 R2 Enterprise
Data storage and grooming options	- Repository size: 120 GB - Retain 60 days of history
Monitoring features	Monitor Windows and SQL Server performance and error log monitoring

Type	In-House Use
Number of monitored servers	90
Services machine	- 2 vCPU - 8 GB of memory - Windows Server 2008 R2 Enterprise
Services machine	- 2 vCPU - 8 GB of memory - Windows 2008 R2 Enterprise - Repository: SQL Server 2008 R2
Data storage and grooming options	- Repository size: 100 GB - Retain 60 days of history
Monitoring features	Monitor Windows and SQL Server performance

Installs 201- 300 servers

Type	In-House Use
Number of monitored servers	234

Type	In-House Use
Services and Repository installed on same machine	• Dell 2950 • 2 quad core processors • 16 GB of memory • Windows Server 2003
Data storage and grooming options	• Repository size: 140 GB • Retain 30 days of history
Monitoring features	Monitor Windows and SQL Server performance and use Query Waits for specific periods of diagnostics
Integrations	Send alerts to HP Open View via a command line program (opcmsg)

Type	In-House Use
Number of monitored servers	274
Services and Repository installed on same machine	• 4 quad core processors • 128 GB of memory • Windows Server 2008 R2
Data storage and grooming options	• Repository size: 1.5 TB • Retain 365 days of history
Monitoring features	Monitor Windows and SQL Server performance

SQLDM Web Console Software Requirements

> ⓘ IDERA Dashboard is no longer part of the SQL Diagnostic Manager installation. However, it still supports SQL Diagnostic Manager 12.2 and prior versions. To successfully install the IDERA Dashboard make sure you meet the requirements described on the Software Requirements page and install it manually.

To successfully install the SQLDM Web Console make sure to comply with the requirements described below.

SQLDM Web Console services and repository requirements

The SQLDM Web Console services and repository requirements are the same as the SQL Diagnostic Manager Console requirements.

Browser requirements

You can access the SQLDM Web Console user interface via the web with the following browsers:

- Microsoft Edge
- Google Chrome
- Firefox
- Google Chrome and Stock Browser on Android 4.3+
- Safari 9+

Windows runtime components

Make sure you have installed the following Windows runtime components:

- Microsoft .Net 6.0+

Port requirements

The SQLDM Web Console uses the following ports by default:

- Core Services port: **9294**
- Application Service port: **9295**
- Application Monitor port: **9296**
- Application SSL port: **9297**

IDERA Dashboard requirements

To successfully install the IDERA Dashboard and SQL Diagnostic Manager web console you need to comply with the requirements described on the Software Requirements page for the IDERA Dashboard.

> The IDERA Dashboard Web Application service comes with SSL already set up. For more information on running the IDERA Dashboard over SSL, see Run the Idera Dashboard over SSL (HTTPS).

How to install the SQLDM Web Console and SQL Diagnostic Manager

This procedure guides you through the installation of the SQLDM Web Console and SQL Diagnostic Manager.

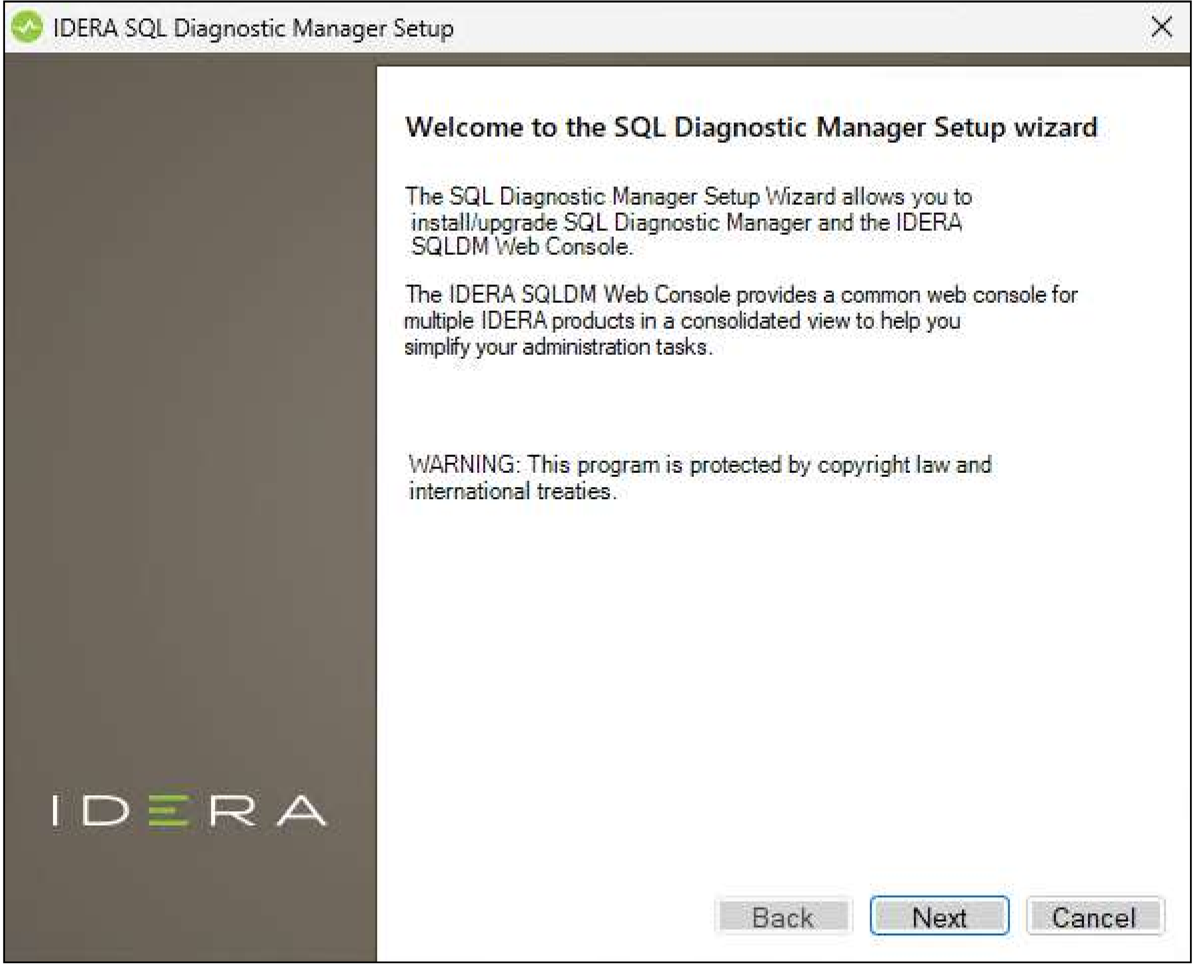
> ⚠ To perform a silent mode installation, see Install SQL Diagnostic Manager in silent mode.

Start your IDERA SQL Diagnostic Manager installation

You can install the SQLDM Web Console and SQL Diagnostic Manager on any computer that meets or exceeds the product requirements.

To start installing the SQLDM Web Console and SQL Diagnostic Manager:

1. Log on with an administrator account to the computer on which you want to install SQL Diagnostic Manager.
2. Run `Setup.exe` in the root of the installation kit.
3. Click **Install SQL Diagnostic Manager** on the **Quick Start** window.
4. On the **Welcome** window of the setup program, click **Next**.



IDERA SQL Diagnostic Manager Setup

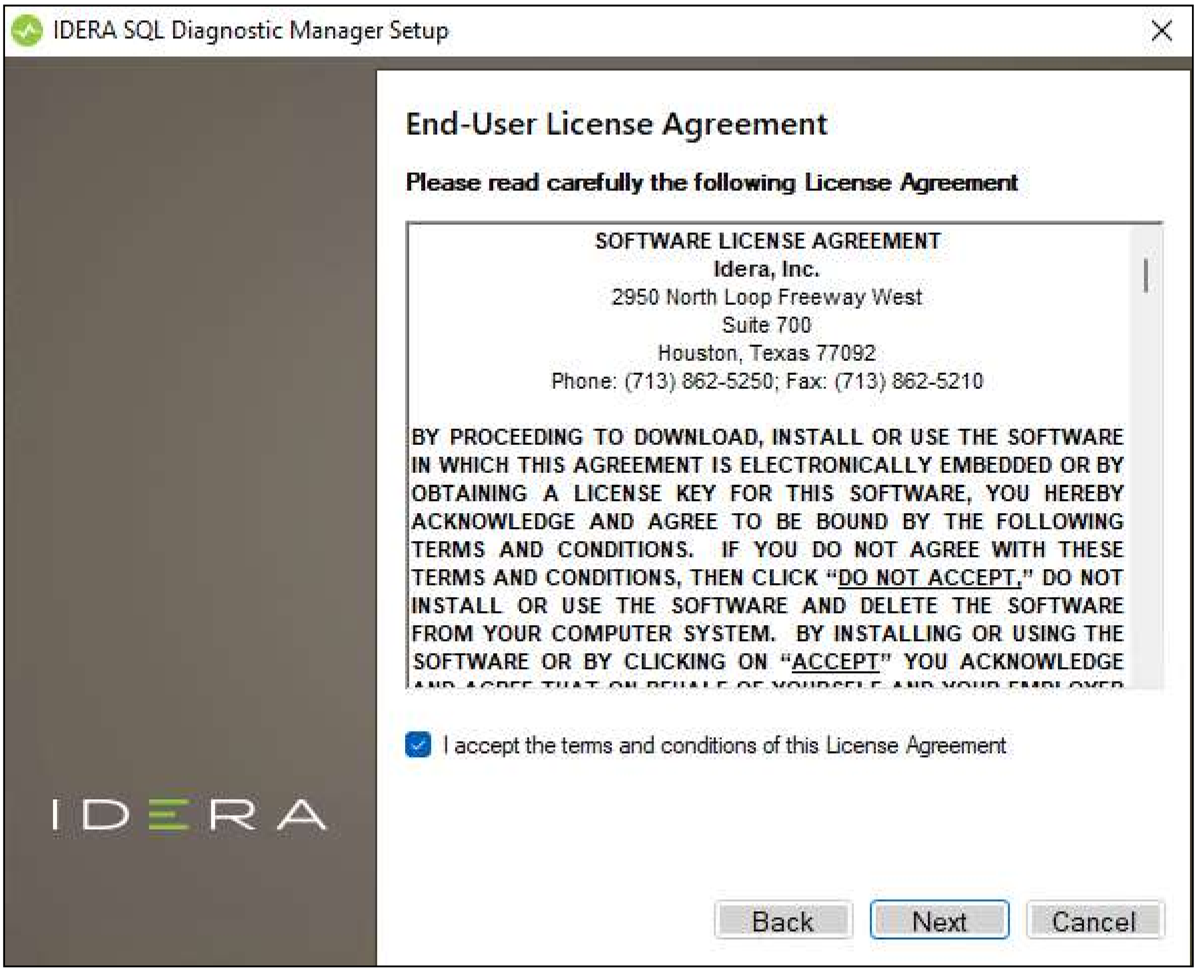
Welcome to the SQL Diagnostic Manager Setup wizard

The SQL Diagnostic Manager Setup Wizard allows you to install/upgrade SQL Diagnostic Manager and the IDERA SQLDM Web Console.

The IDERA SQLDM Web Console provides a common web console for multiple IDERA products in a consolidated view to help you simplify your administration tasks.

WARNING: This program is protected by copyright law and international treaties.

5. Review the license agreement. To accept this license agreement, click **I accept the terms and conditions of this License Agreement** and then click **Next**.



IDERA SQL Diagnostic Manager Setup

End-User License Agreement

Please read carefully the following License Agreement

SOFTWARE LICENSE AGREEMENT
Idera, Inc.
2950 North Loop Freeway West
Suite 700
Houston, Texas 77092
Phone: (713) 862-5250; Fax: (713) 862-5210

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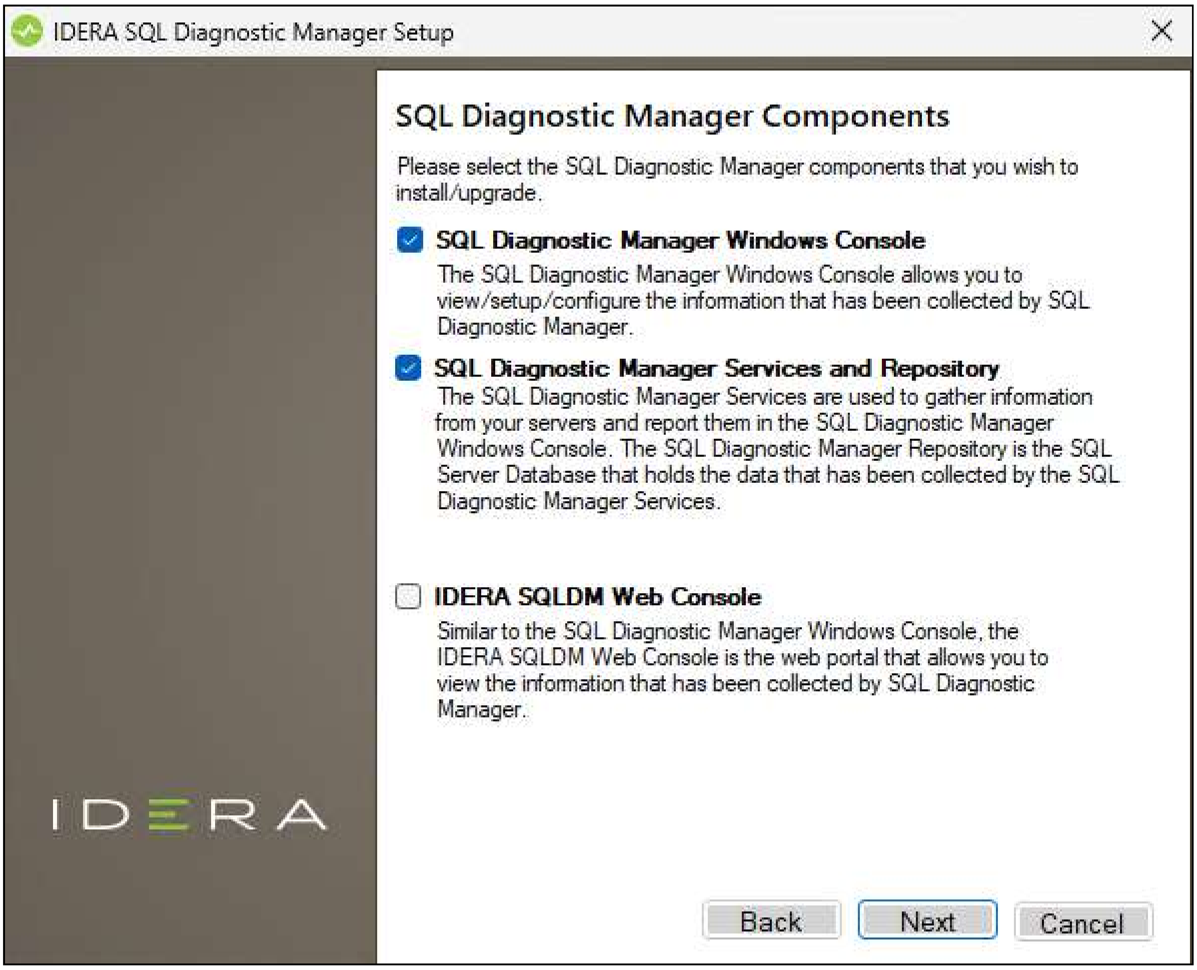
☑ I accept the terms and conditions of this License Agreement

6. Choose the components you want to install by selecting the respective check boxes. By default, the setup program installs SQL Diagnostic Manager Windows Console and SQL Diagnostic Manager Services and Repository, allowing you to immediately begin monitoring your SQL Server environment. Select the SQLDM Web Console checkbox if you want a complete installation. By default, the SQLDM Web Console is not selected.



SQL Diagnostic Manager Components

Please select the SQL Diagnostic Manager components that you wish to install/upgrade.

☑ **SQL Diagnostic Manager Windows Console**
The SQL Diagnostic Manager Windows Console allows you to view/setup/configure the information that has been collected by SQL Diagnostic Manager.

☑ **SQL Diagnostic Manager Services and Repository**
The SQL Diagnostic Manager Services are used to gather information from your servers and report them in the SQL Diagnostic Manager Windows Console. The SQL Diagnostic Manager Repository is the SQL Server Database that holds the data that has been collected by the SQL Diagnostic Manager Services.

□ **IDERA SQLDM Web Console**
Similar to the SQL Diagnostic Manager Windows Console, the IDERA SQLDM Web Console is the web portal that allows you to view the information that has been collected by SQL Diagnostic Manager.

> ⓘ By default, the Management Service, Collection Service, Predictive Service, and Rest Service are installed on the local computer where you are running the setup program.

> ⓘ Idera SQLDM Web Console is now part of the installation of SQL Diagnostic Manager 12.2 and later versions. However, Idera Dashboard still supports SQL Diagnostic Manager 12.2 and prior versions. If you want to use Idera Dashboard you should manually install it.

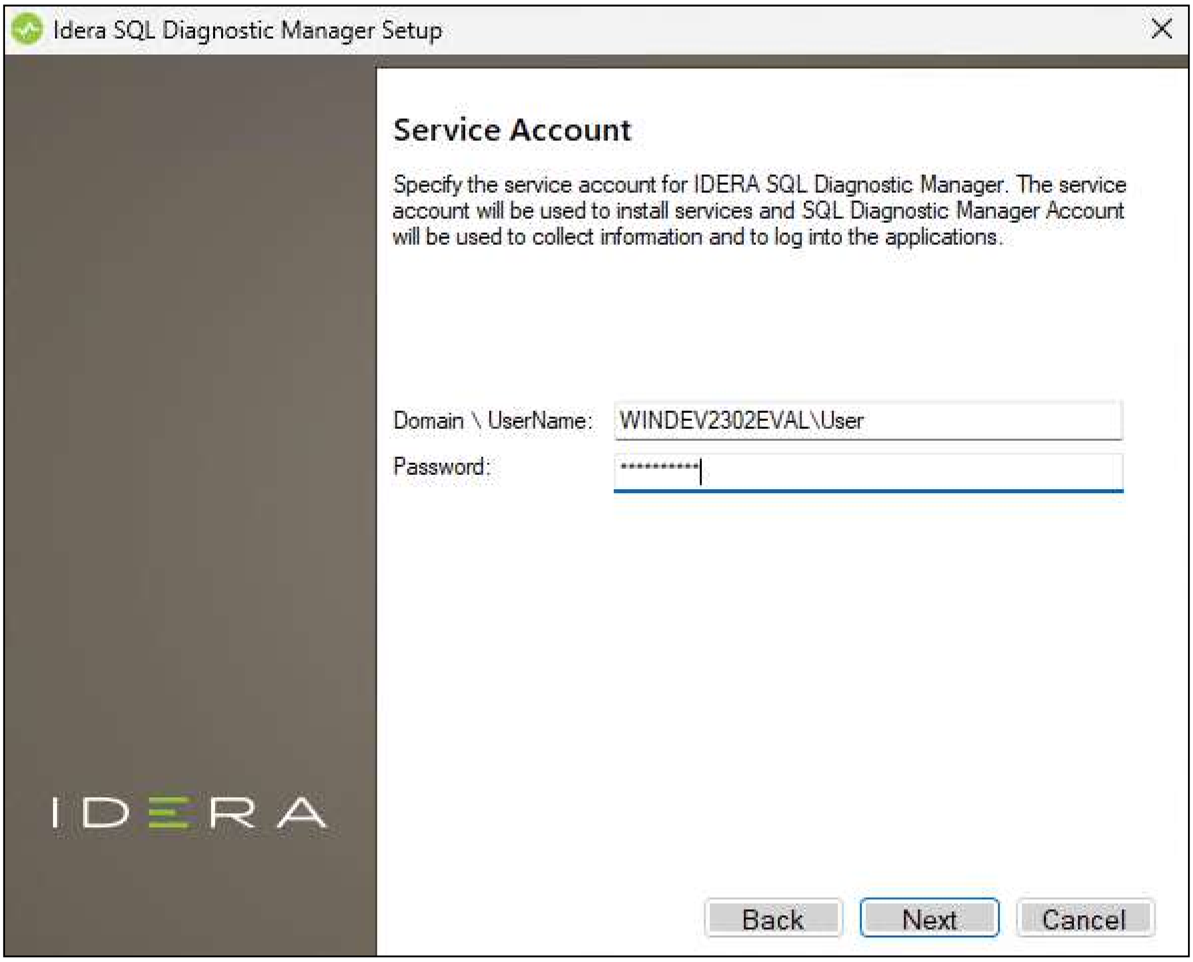
7. Click **Next**.

Select a Windows user account to use for the service account

SQL Diagnostic Manager uses the service account to communicate between the monitored SQL Server instance and the SQL Diagnostic Manager Repository. The SQLDM Web Console uses this account to connect, discover, and gather configuration information from SQL Servers in your Business environment. The installer grants the "Log on as a Service" right to the account that you specify.

To specify a service account:

1. On the Service Account window, type appropriate credentials in the provided fields under which the services run.


Idera SQL Diagnostic Manager Setup

Service Account

Specify the service account for IDERA SQL Diagnostic Manager. The service account will be used to install services and SQL Diagnostic Manager Account will be used to collect information and to log into the applications.

Domain \ UserName: WINDEV2302EVAL\User

Password: ***********

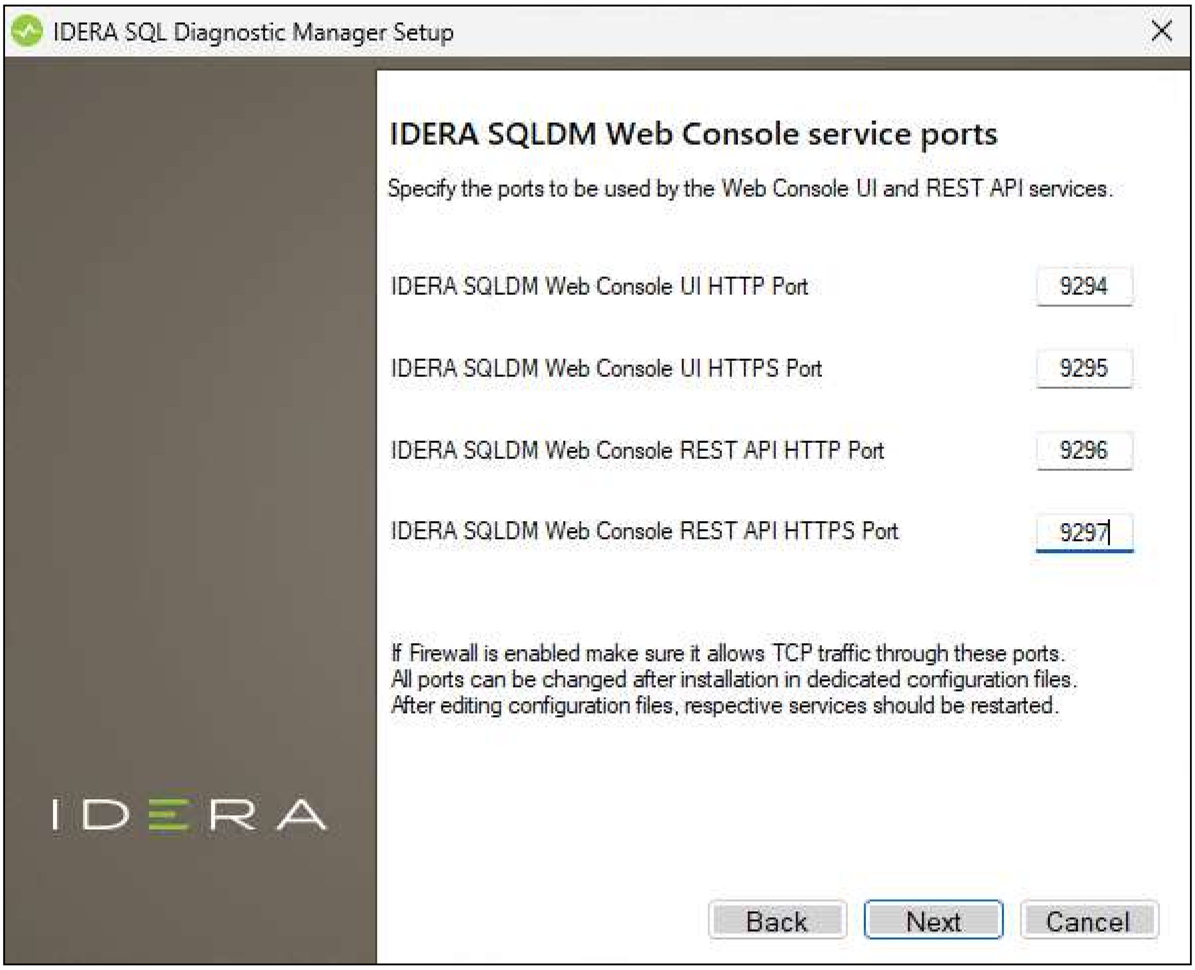
2. Click **Next**. SQL Diagnostic Manager verifies the connection before continuing.

Select service ports to use for the SQLDM Web Console service ports

The SQLDM Web Console uses ports **9294, 9295**, **9296**, and **9297** for the web application and web services respectively. However, you can specify different service ports.

To specify a service port:

1. On the Service Ports window, specify the ports you want the web application and web console services to use.



IDERA SQL Diagnostic Manager Setup

IDERA SQLDM Web Console service ports

Specify the ports to be used by the Web Console UI and REST API services.

IDERA SQLDM Web Console UI HTTP Port	9294
IDERA SQLDM Web Console UI HTTPS Port	9295
IDERA SQLDM Web Console REST API HTTP Port	9296
IDERA SQLDM Web Console REST API HTTPS Port	9297

If Firewall is enabled make sure it allows TCP traffic through these ports.
All ports can be changed after installation in dedicated configuration files.
After editing configuration files, respective services should be restarted.

2. Click **Next**.

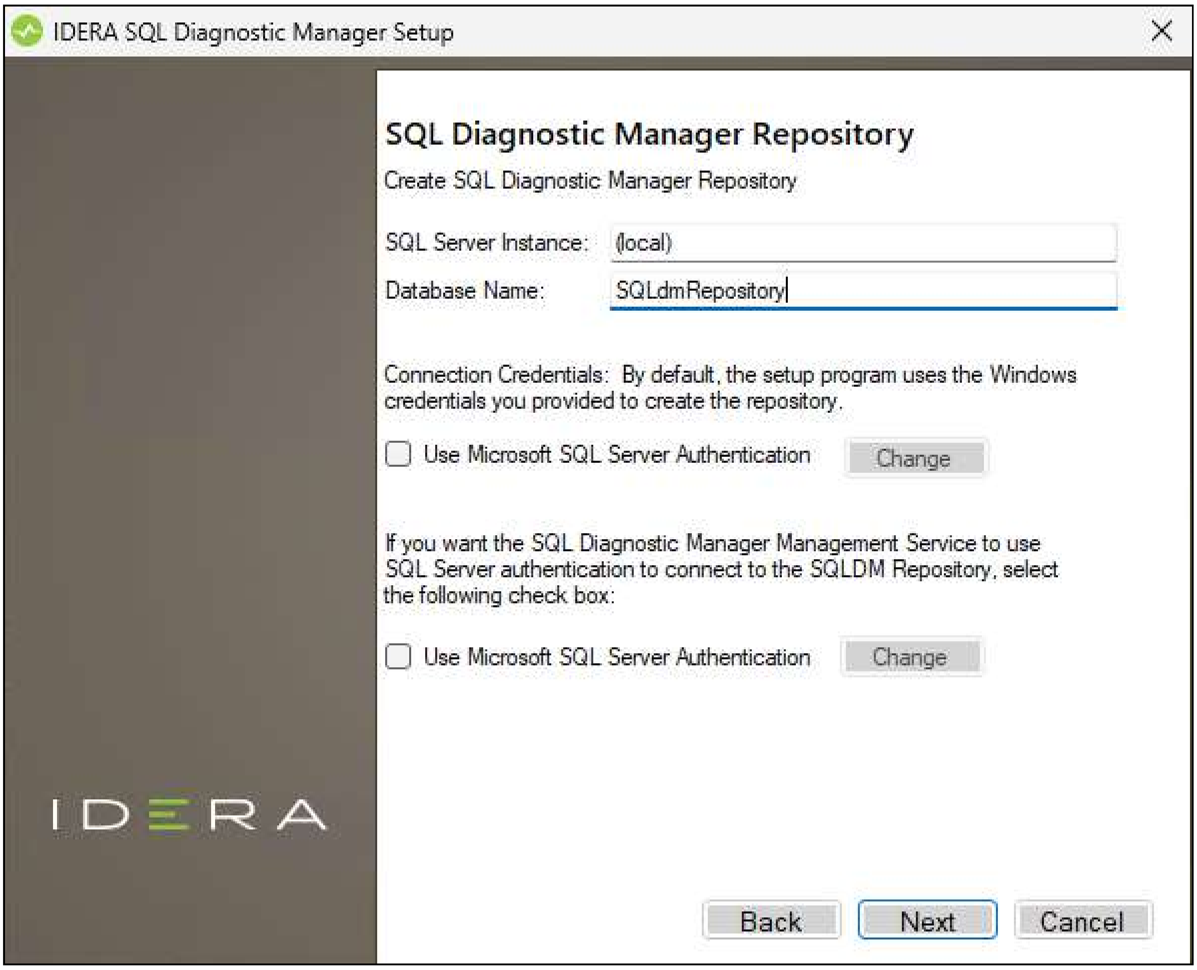
ⓘ Verify that the Firewall allows TCP (Transmission Control Protocol) traffic through your specified ports.

Select a SQL Server instance to use for the SQL Diagnostic Manager Repository database

The SQL Diagnostic Manager Repository is where the collected data, alert information, and alert configuration settings are stored.

To specify the SQL Server instance to install the SQL Diagnostic Manager Repository on:

1. On the **SQL Diagnostic Manager Repository** screen, specify the SQL Server instance you want to use for the repository database.
2. Type the name for the SQLDM Repository Database.
3. If your SQL Server environment uses SQL Server Authentication, select the respective check box and click **Change** to enter SQL Server credentials. By default, SQL Diagnostic Manager uses your Windows credentials when connecting to the Repository.
4. If want the SQL Diagnostic Management Service to use SQL Server Authentication, select the respective check box and click **Change** to enter SQL Server credentials. By default, SQL Diagnostic Manager uses your Windows credentials when connecting to the Repository.


IDERA SQL Diagnostic Manager Setup

SQL Diagnostic Manager Repository

Create SQL Diagnostic Manager Repository

SQL Server Instance: (local)

Database Name: SQLdmRepository

Connection Credentials: By default, the setup program uses the Windows credentials you provided to create the repository.

□ Use Microsoft SQL Server Authentication

If you want the SQL Diagnostic Manager Management Service to use SQL Server authentication to connect to the SQLDM Repository, select the following check box:

□ Use Microsoft SQL Server Authentication

5. Click **Next**.

SQL Diagnostic Manager 10.3 requires Microsoft SQL Server 2005 or above running on the computer that hosts the SQL Diagnostic Manager Repository database for all installations.

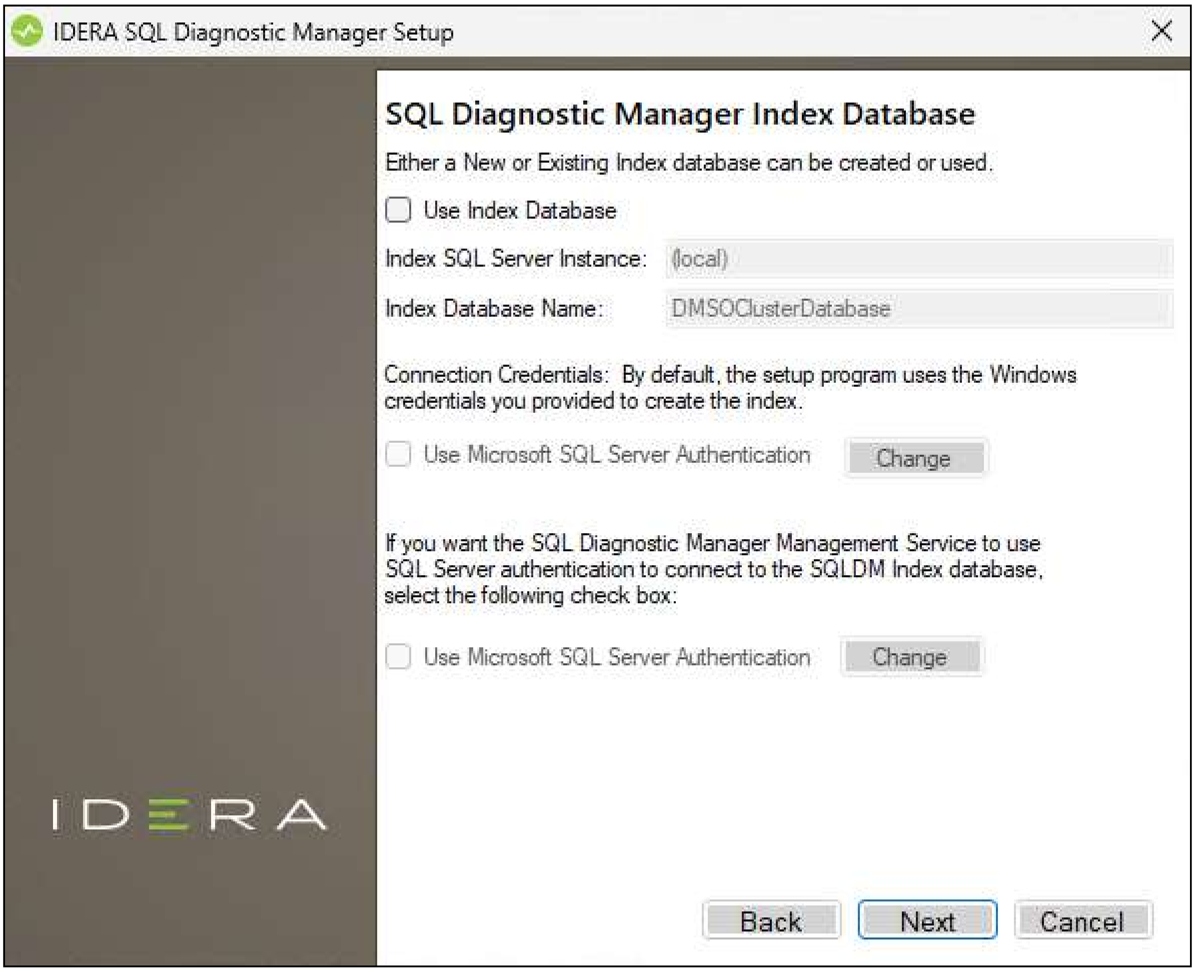
Select a SQL Server instance to use for the SQL Diagnostic Manager Index Database

The SQL Diagnostic Manager Index Database stores information related to the various installations of SQL Diagnostic Manager that may be distributed in your environment. Note that the SQLDM Desktop Client should connect to the index database to manage the different installations of SQL Diagnostic Manager.

Creating an Index Database is optional. Remember that it is only used when the Windows Client needs to simultaneously manage multiple DM installations (DMSO).

To specify the SQL Server instance to install the index database on:

1. On the **SQL Diagnostic Manager Index Database** screen, check the **Use Index Database** option. By default, SQL Diagnostic Manager does not create an index database.



IDERA SQL Diagnostic Manager Setup

SQL Diagnostic Manager Index Database

Either a New or Existing Index database can be created or used.

□ Use Index Database

Index SQL Server Instance: (local)

Index Database Name: DMSOClusterDatabase

Connection Credentials: By default, the setup program uses the Windows credentials you provided to create the index.

□ Use Microsoft SQL Server Authentication

If you want the SQL Diagnostic Manager Management Service to use SQL Server authentication to connect to the SQLDM Index database, select the following check box:

□ Use Microsoft SQL Server Authentication

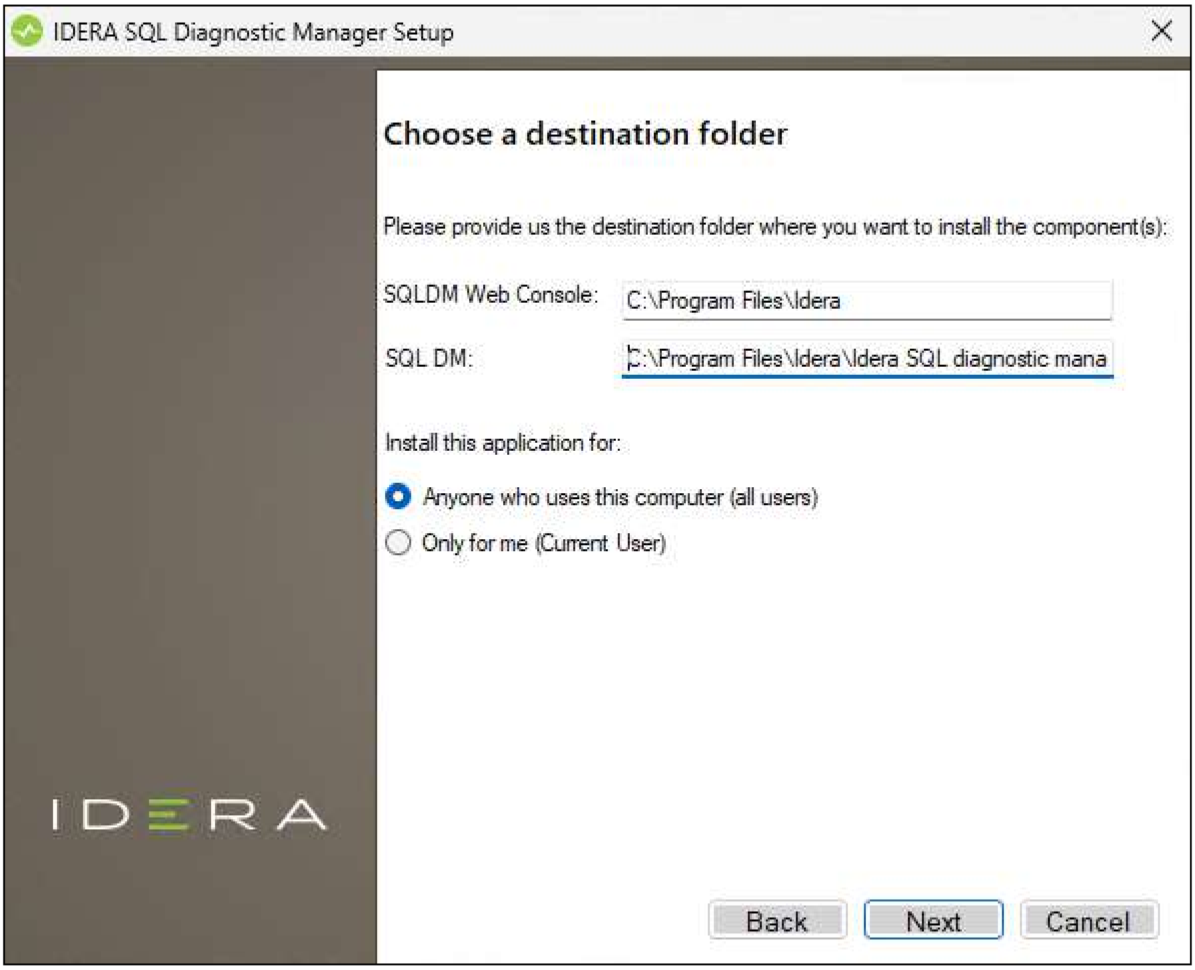
2. Specify the SQL Server instance you want to use for the index database.
3. Type the name for the index database
4. If your SQL Server environment uses SQL Server Authentication, select the respective check box and click **Change** to enter SQL Server credentials. By default, the SQLDM Web Console uses your Windows credentials when connecting to the Repository database.

   > ⓘ If you use Microsoft SQL Server Authentication, a new window displays where you can type the respective SQL Server login and password.

5. Click **Next**.

Select an installation location and type a display name for your instance

You can use the default install location or specify a different path. For your first installation, we recommend using the default location. Click **Next** to continue with the installation.



Choose a destination folder

Please provide us the destination folder where you want to install the component(s):

SQLDM Web Console: C:\Program Files\Idera

SQL DM: C:\Program Files\Idera\Idera SQL diagnostic mana

Install this application for:

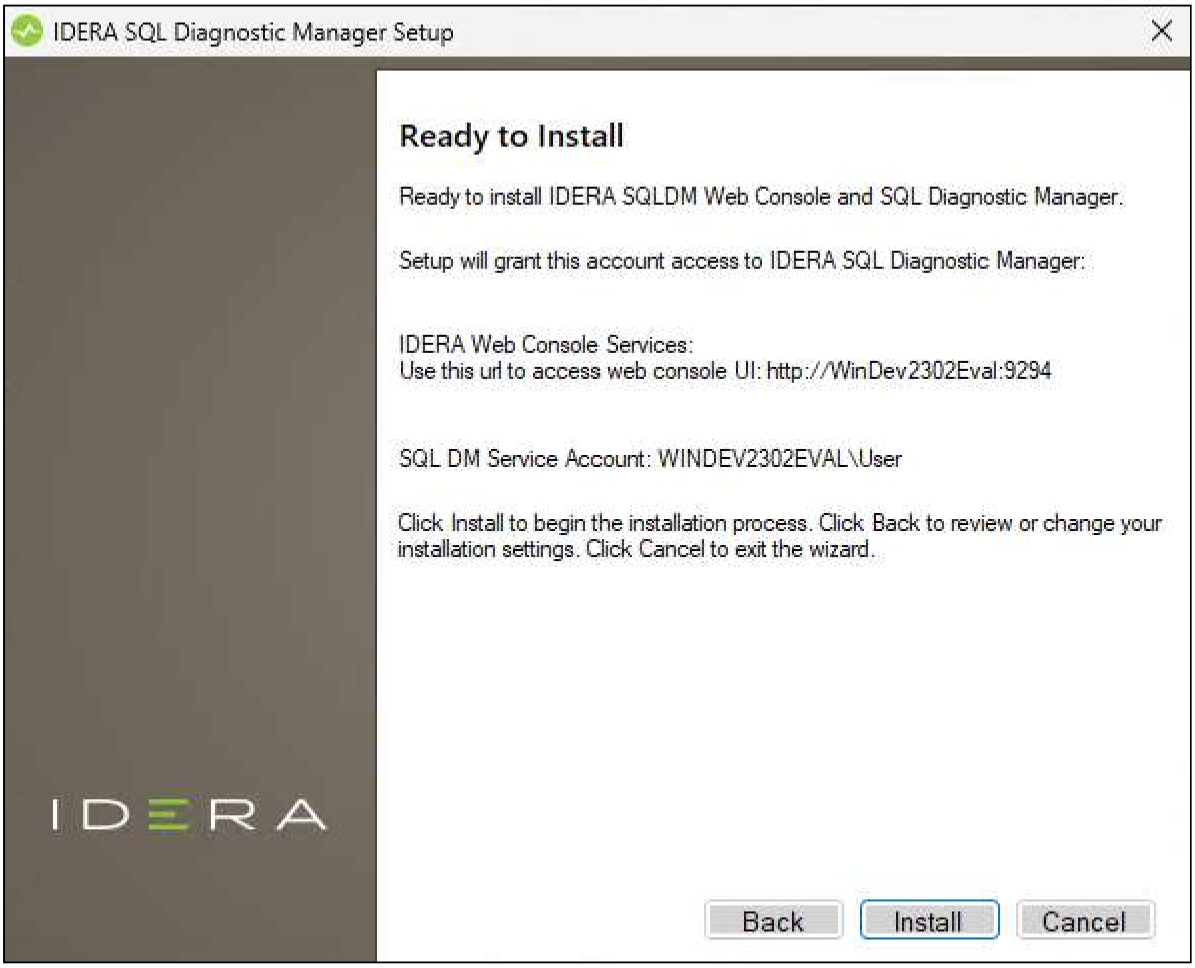
● Anyone who uses this computer (all users)

○ Only for me (Current User)

Complete the install

The setup will grant the provided accounts access to SQL Diagnostic Manager and the SQLDM Web Console. The user that installs the SQLDM Web Console has access to this application by default as an Administrator. You can choose whether you want other users to have access to the SQLDM Web Console in the Administration view.

1. Click **Install** to indicate that you are ready to complete your installation with the configurations you specified. If you want to review or change any of your settings, click **Back.**



Ready to Install

Ready to install IDERA SQLDM Web Console and SQL Diagnostic Manager.

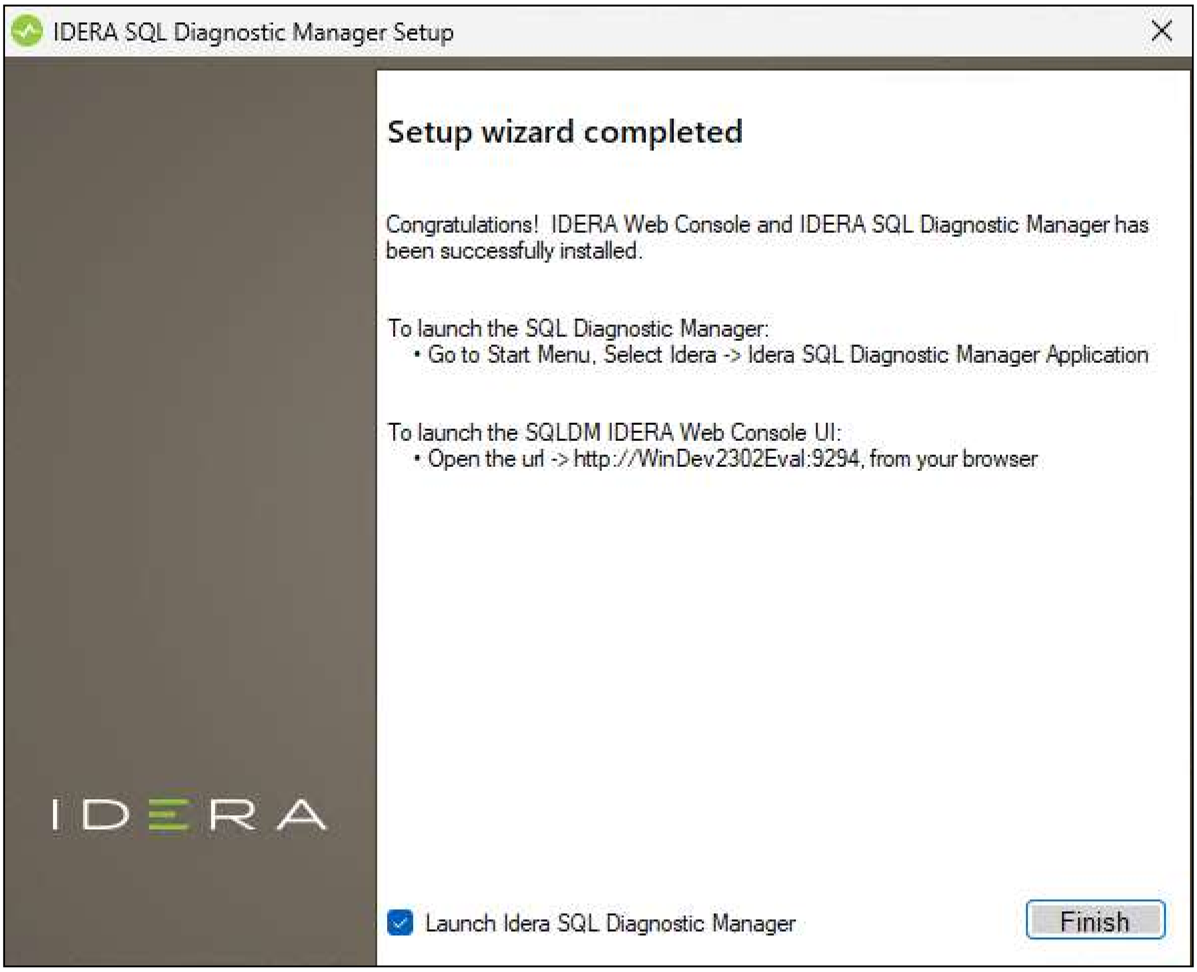
Setup will grant this account access to IDERA SQL Diagnostic Manager:

IDERA Web Console Services:
Use this url to access web console UI: http://WinDev2302Eval:9294

SQL DM Service Account: WINDEV2302EVAL\User

Click Install to begin the installation process. Click Back to review or change your installation settings. Click Cancel to exit the wizard.

2. Click **Finish** to exit the IDERA SQL Diagnostic Manager Setup Wizard.



Setup wizard completed

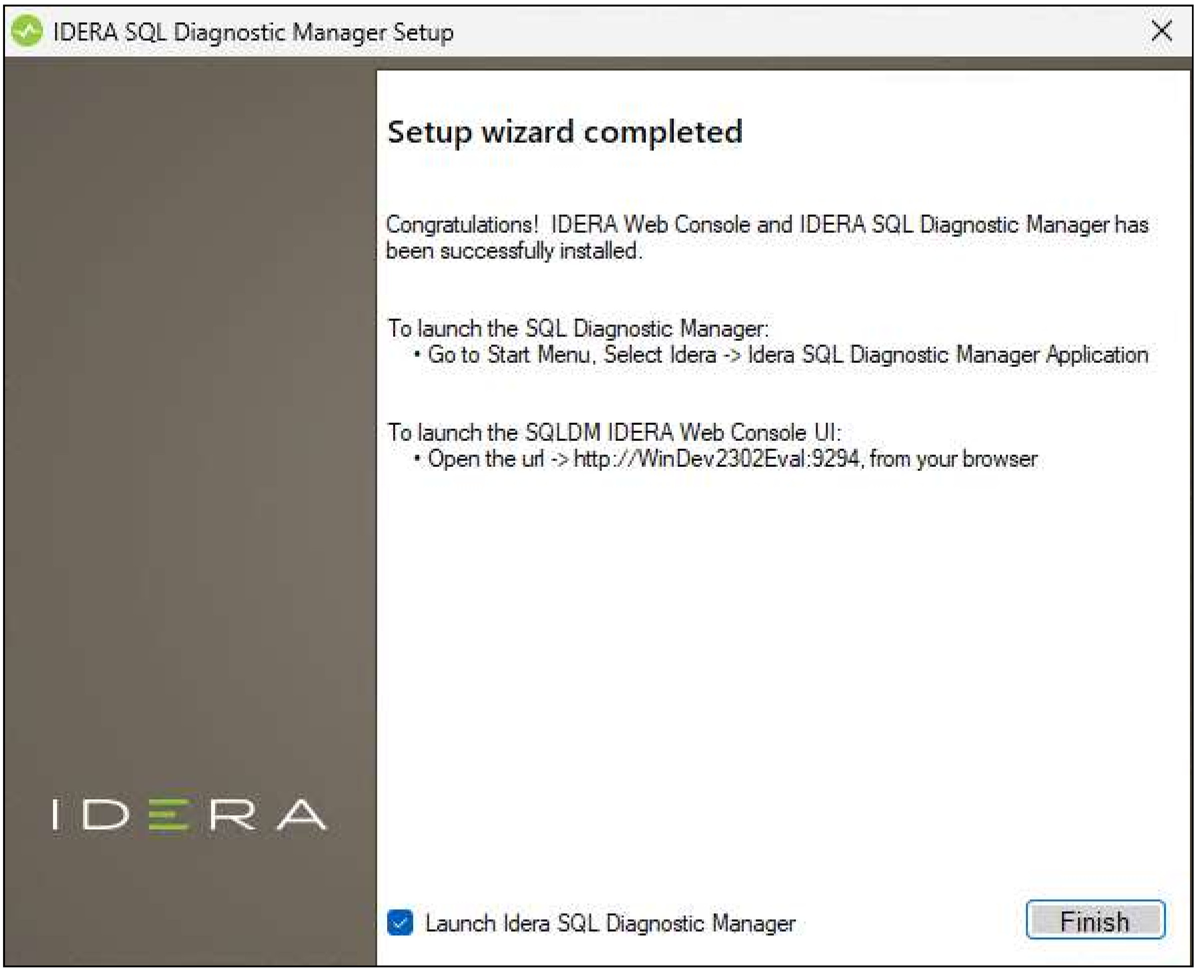
Congratulations! IDERA Web Console and IDERA SQL Diagnostic Manager has been successfully installed.

To launch the SQL Diagnostic Manager:
- Go to Start Menu, Select Idera -> Idera SQL Diagnostic Manager Application

To launch the SQLDM IDERA Web Console UI:
- Open the url -> http://WinDev2302Eval:9294, from your browser

☑ Launch Idera SQL Diagnostic Manager

When you finish the installation, the Welcome window opens allowing you to **Visit the IDERA Trial Center**, **Add New Servers (Recommended)**, **Configure Default Alert Thresholds**, or **Start the Desktop Console**.



Setup wizard completed

Congratulations! IDERA Web Console and IDERA SQL Diagnostic Manager has been successfully installed.

To launch the SQL Diagnostic Manager:
- Go to Start Menu, Select Idera -> Idera SQL Diagnostic Manager Application

To launch the SQLDM IDERA Web Console UI:
- Open the url -> http://WinDev2302Eval:9294, from your browser

☑ Launch Idera SQL Diagnostic Manager

Finish

SQLDM Web Console access

If you want to know how to access the SQLDM Web Console, visit the Log in to the SQLDM Web Console page.

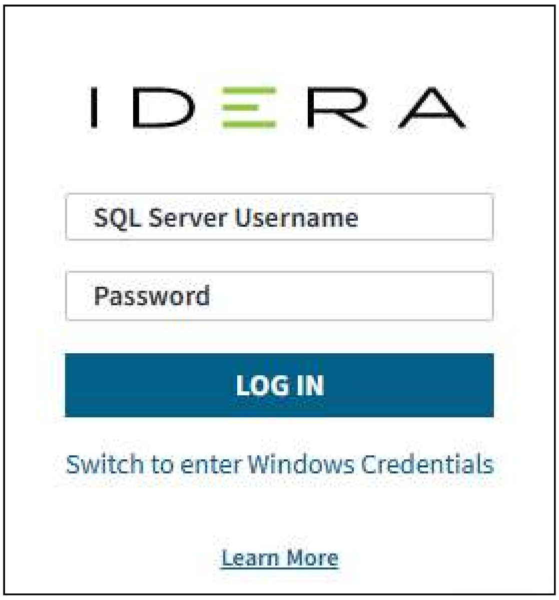
Log in the SQLDM Web Console

Once you have installed and configured your SQLDM Web Console and SQL Diagnostic Manager deployments, you can log in to the web console by doing the following:

1. Open your selected Browser and make sure it is compatible with the SQLDM Web Console requirements.
2. Type the SQLDM Web Console product URL: `http://<machinename>:<port>` where `<machinename>` is the name of your host or machine, and `<port>` is the port specified during the installation. The default URL is `https://<localhost>:9295` or `https://<machinename>:9295` .

   ✓ Port 9294 is used for HTTP protocol, while port 9295 is used for HTTPS protocol.

3. When the SQLDM Web Console launches on your browser, use your Windows user account `<domain\user>` with the respective password to log into the product.



By default, you log in with SQL Server credentials. If you previously defined a Windows Credential login, click *Switch to enter Windows Credentials*.
Remember that SQLDM Web Console is case-sensitive.

IDERA Dashboard is no longer part of the SQL Diagnostic Manager installation. However, it still supports SQL Diagnostic Manager 12.2 and prior versions. If you want to access the IDERA Dashboard visit Log in the IDERA Dashboard.

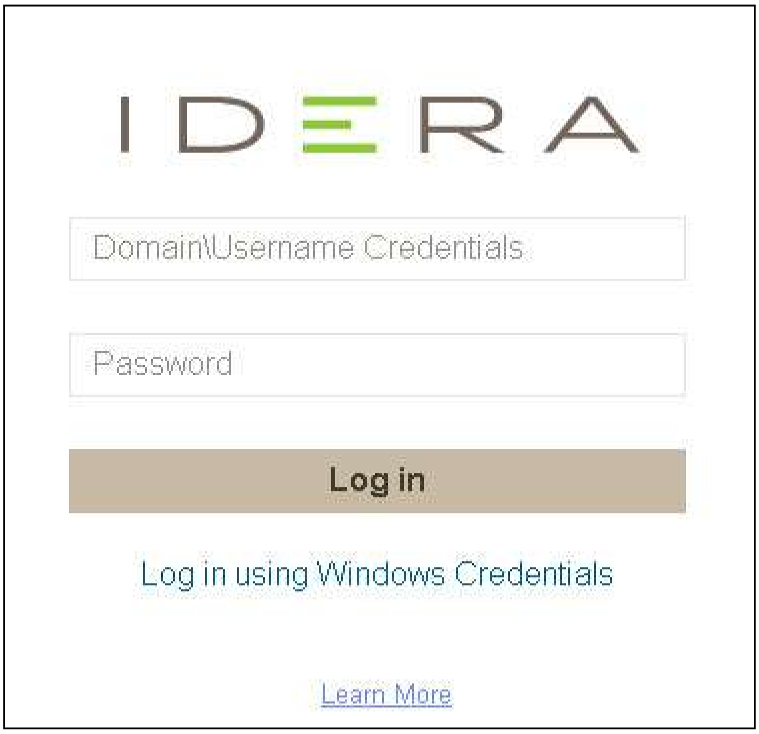
Log in the IDERA Dashboard

Once you have installed and configured your IDERA Dashboard and SQL Diagnostic Manager deployments, you can log in to the web console by doing the following:

1. Open your selected Browser and make sure it is compatible with the IDERA Dashboard console requirements.
2. Type the IDERA Dashboard product URL: `http://<machinename>:<port>` where **`<machinename>`** is the name of your host or machine, and **`<port>`** is the port specified during installation. The default URL is `https://<localhost>:9291` or **`https://<machinename>:9291`**.

   ✓ Port 9290 is used for http protocol, while port 9291 is used for https protocol.

3. When the IDERA Dashboard web console launches on your browser, use your Windows user account **`<domain\user>`** with the respective password to log into the product.



The IDERA Dashboard Web Application service comes with SSL already set up. For more information on running the IDERA Dashboard over SSL, see Run the IDERA Dashboard over SSL (HTTPS)

Install SQL Diagnostic Manager in silent mode

In addition to the Setup Wizard, SQL Diagnostic Manager allows you to use the Microsoft installer in silent or quiet mode and to simplify SQL Diagnostic Manager deployment.

ⓘ The silent mode is only for SQLDM console installation.

1. Open an elevated command prompt.
2. Enter the following command line:
   " *PathToSQLDiagnosticManager-x64_c.exe* " /v"/L*v " *PathToSQLdmInstall.log* " SETUPTYPE="Console" /quiet"

   Example

   ```
   "\\SQLdmServerNameHere\c$\Program Files\Idera\SQLdm x64 Installation
   Kit\x64\SQLDiagnosticManager-x64_c.exe" /v"/L*v C:
   \Windows\Temp\IderaSDMInstall.log SETUPTYPE="Console" /quiet"
   ```

   If you want to specify a different installation directory, enter the following command:

   ```
   "PathToSQLDiagnosticManager-x64_c.exe" /v"/L*v "PathToSQLdmInstall.log"
   INSTALLDIR="""PathToInstallDirectory""" SETUPTYPE="Console" /quiet"
   ```
3. Launch SQL Diagnostic Manager as an administrator.

   After the installation is completed, configure the executable to always run as administrator, review Run your program as an administrator.

How to install SQL Diagnostic Manager Console only

This procedure guides you through the installation of the SQL Diagnostic Manager Console only.

✓ You must have a full installation of SQL Diagnostic Manager already running in your environment before attempting to install the SQL Diagnostic Manager desktop client console.

Perform your installation

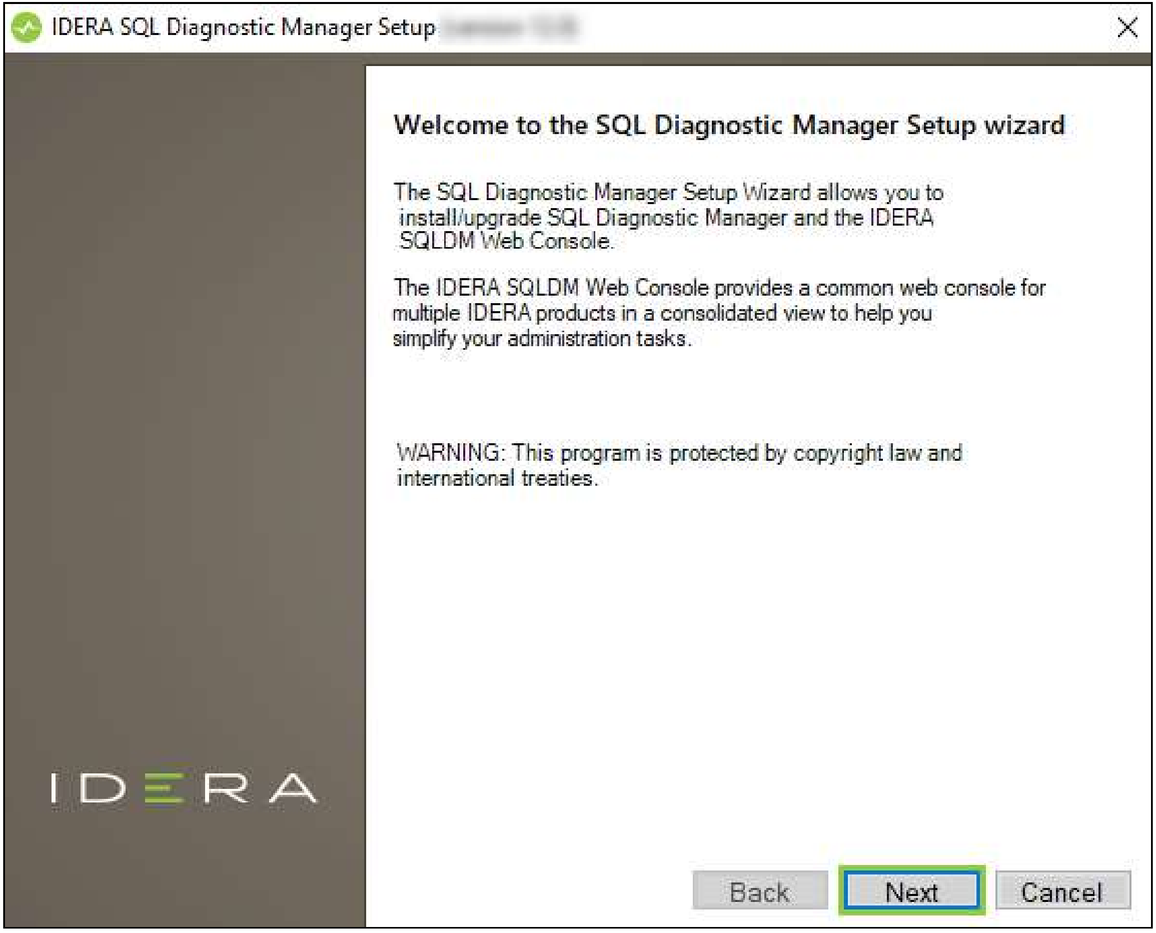
You can install SQL Diagnostic Manager desktop client console on any computer that meets or exceeds the product requirements.

Besides, SQL Diagnostic Manager allows you to perform a manual and silent installation.

Manual installation

To perform a manual installation:

1. Log on with an administrator account to the computer you want to install the SQL Diagnostic Manager desktop client console.
2. Run `Setup.exe` in the root of the installation kit.
3. On the Welcome screen, click **Next**.



IDERA SQL Diagnostic Manager Setup

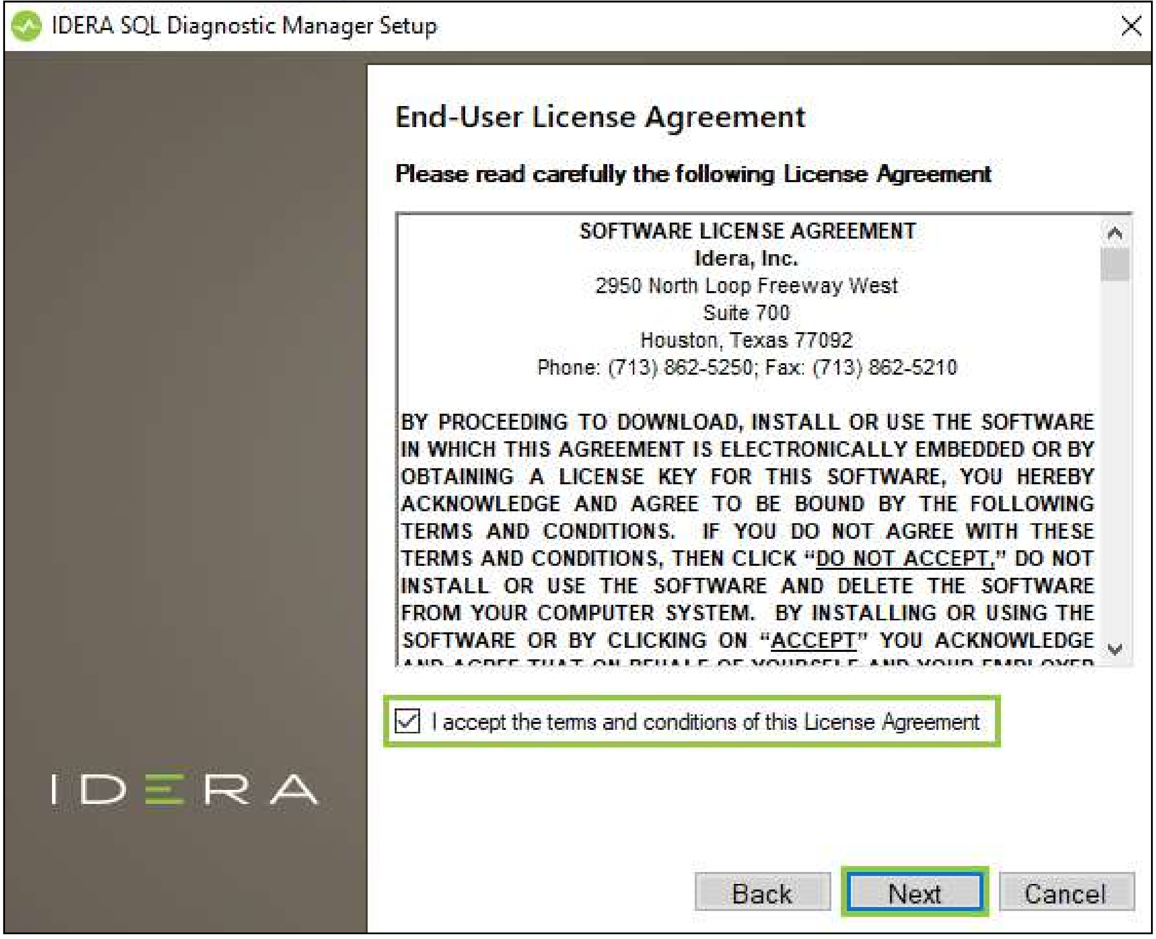
Welcome to the SQL Diagnostic Manager Setup wizard

The SQL Diagnostic Manager Setup Wizard allows you to install/upgrade SQL Diagnostic Manager and the IDERA SQLDM Web Console.

The IDERA SQLDM Web Console provides a common web console for multiple IDERA products in a consolidated view to help you simplify your administration tasks.

WARNING: This program is protected by copyright law and international treaties.

4. Review the *E*nd-User License Agreement and accept the terms and conditions and click **Next.**



End-User License Agreement

Please read carefully the following License Agreement

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Idera, Inc.
2950 North Loop Freeway West
Suite 700
Houston, Texas 77092
Phone: (713) 862-5250; Fax: (713) 862-5210

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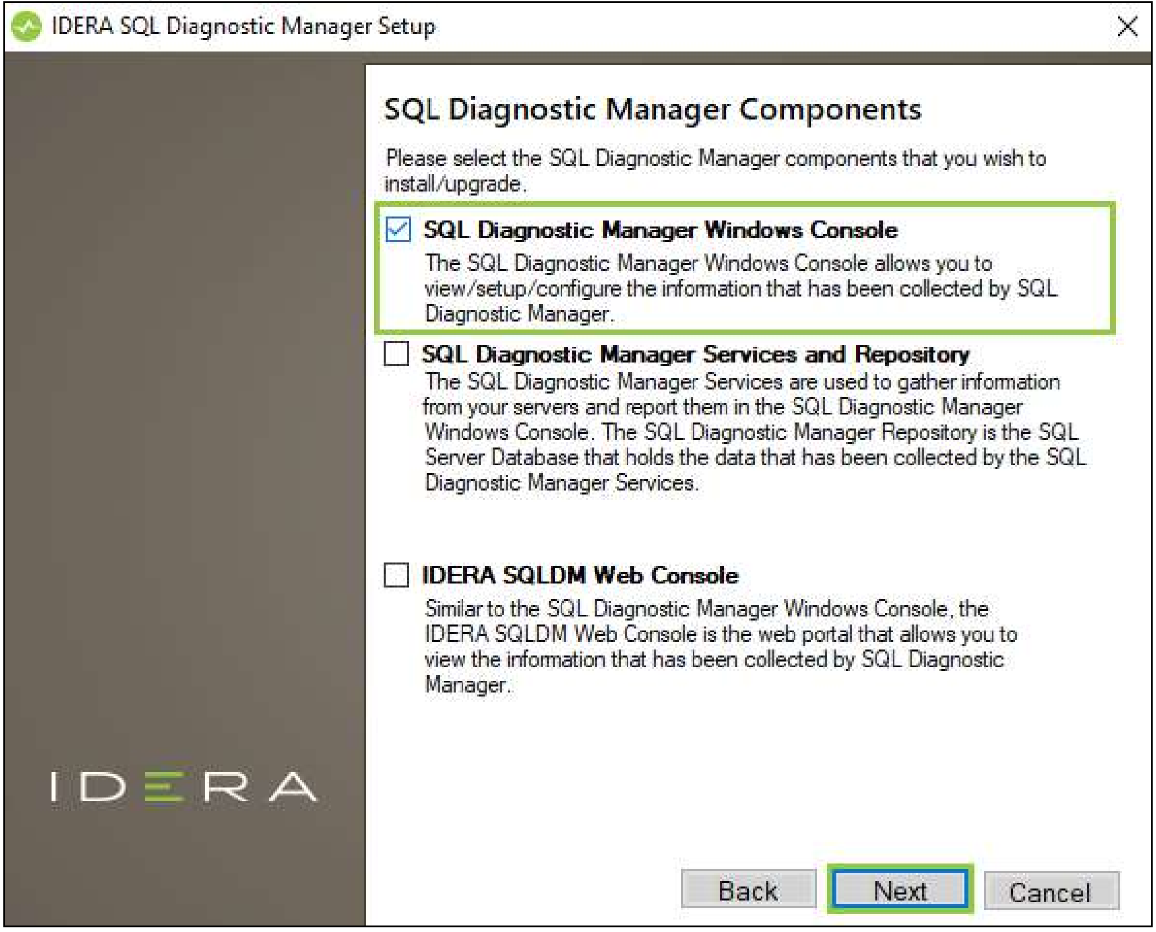
5. On the SQL Diagnostic Manager screen, select only the **SQL Diagnostic Manager Windows Console** component. Click **Next**.



SQL Diagnostic Manager Components

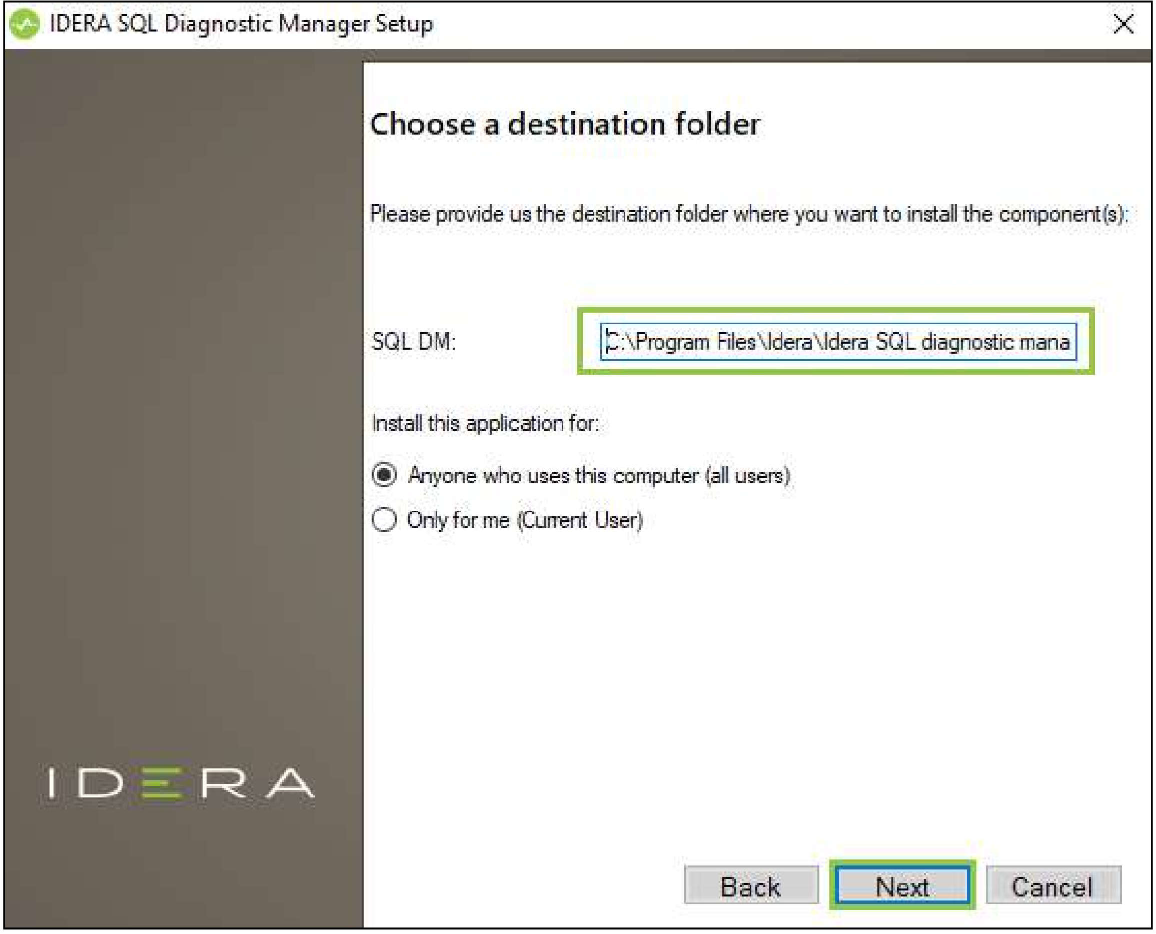
Please select the SQL Diagnostic Manager components that you wish to install/upgrade.

☑ **SQL Diagnostic Manager Windows Console**
The SQL Diagnostic Manager Windows Console allows you to view/setup/configure the information that has been collected by SQL Diagnostic Manager.

□ **SQL Diagnostic Manager Services and Repository**
The SQL Diagnostic Manager Services are used to gather information from your servers and report them in the SQL Diagnostic Manager Windows Console. The SQL Diagnostic Manager Repository is the SQL Server Database that holds the data that has been collected by the SQL Diagnostic Manager Services.

□ **IDERA SQLDM Web Console**
Similar to the SQL Diagnostic Manager Windows Console, the IDERA SQLDM Web Console is the web portal that allows you to view the information that has been collected by SQL Diagnostic Manager.

6. Specify the installation path and click **Next**.



IDERA SQL Diagnostic Manager Setup

Choose a destination folder

Please provide us the destination folder where you want to install the component(s):

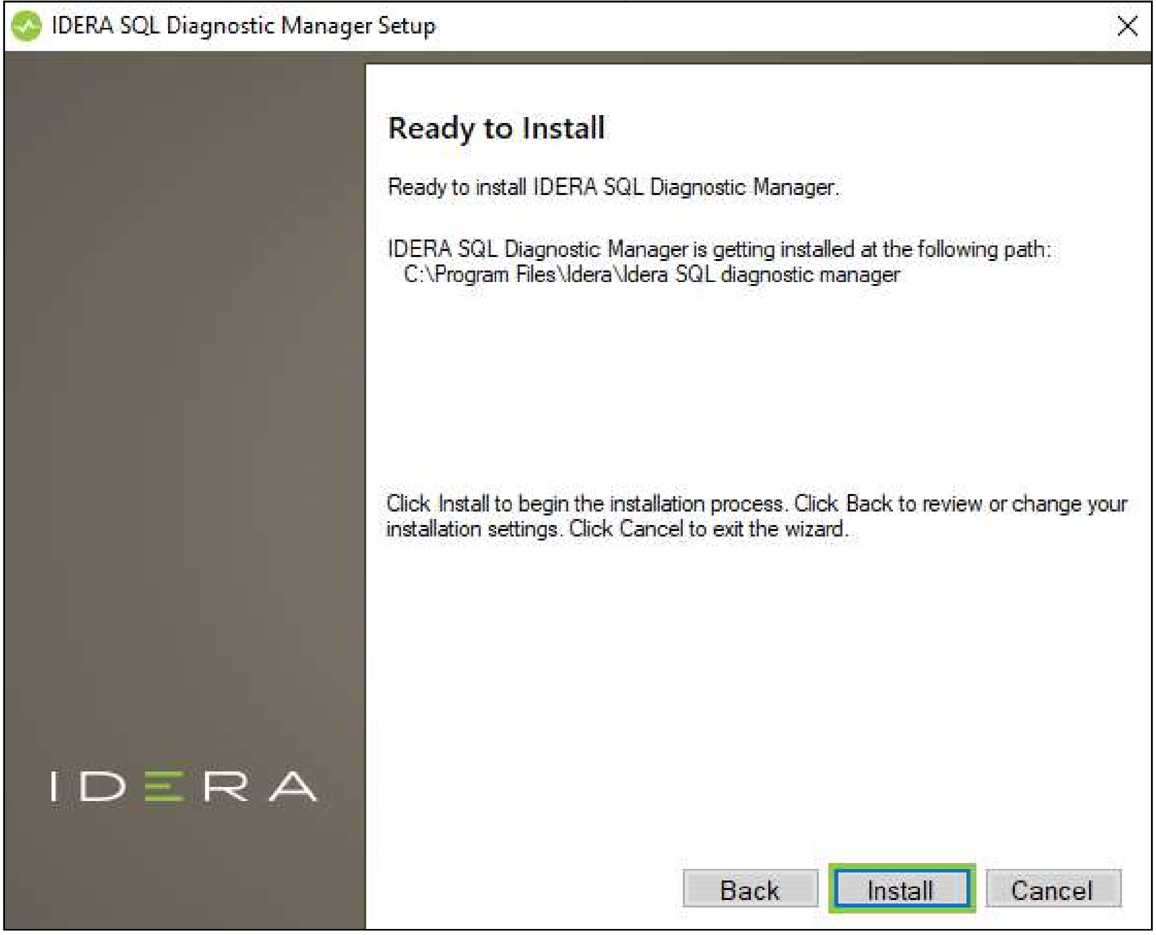
SQL DM: C:\Program Files\Idera\Idera SQL diagnostic mana

Install this application for:

● Anyone who uses this computer (all users)

○ Only for me (Current User)

7. Click **Install** to complete your installation with the configuration you specified.



IDERA SQL Diagnostic Manager Setup

Ready to Install

Ready to install IDERA SQL Diagnostic Manager.

IDERA SQL Diagnostic Manager is getting installed at the following path:
C:\Program Files\Idera\Idera SQL diagnostic manager

Click Install to begin the installation process. Click Back to review or change your installation settings. Click Cancel to exit the wizard.

8. Click **Finish** to exit the setup program.

Silent installation

To perform a silent installation, open the Command Prompt (cmd) as administrator user and use the command below:

```
"C:\Program Files\IDERA\SQLdm x64 Installation Kit\x64\SQLDiagnosticManager-
x64.exe" /v"/l*V InstallSQLDM.log INSTALLDIR="""C:\Program Files\Idera\Idera SQL
diagnostic manager""" SETUPTYPE=Console ApplicationUsers=AllUsers ALLUSERS=1 /
quiet"
```

```
"<Path To SQLDiagnosticManager-x64.exe>" /v"/l*V InstallSQLDM.log
INSTALLDIR=""" <
    Installation Directory Target> """ SETUPTYPE=Console
ApplicationUsers=AllUsers ALL USERS=1 /quiet"
```

Complete the post-installation steps

When you first open the SQL Diagnostic Manager desktop client console, you must complete the fields necessary to connect to your existing SQL Diagnostic Manager Repository. It is important that you have the information available to connect to the proper SQL Server instance and SQL Diagnostic Manager Repository database using the proper authentication credentials.

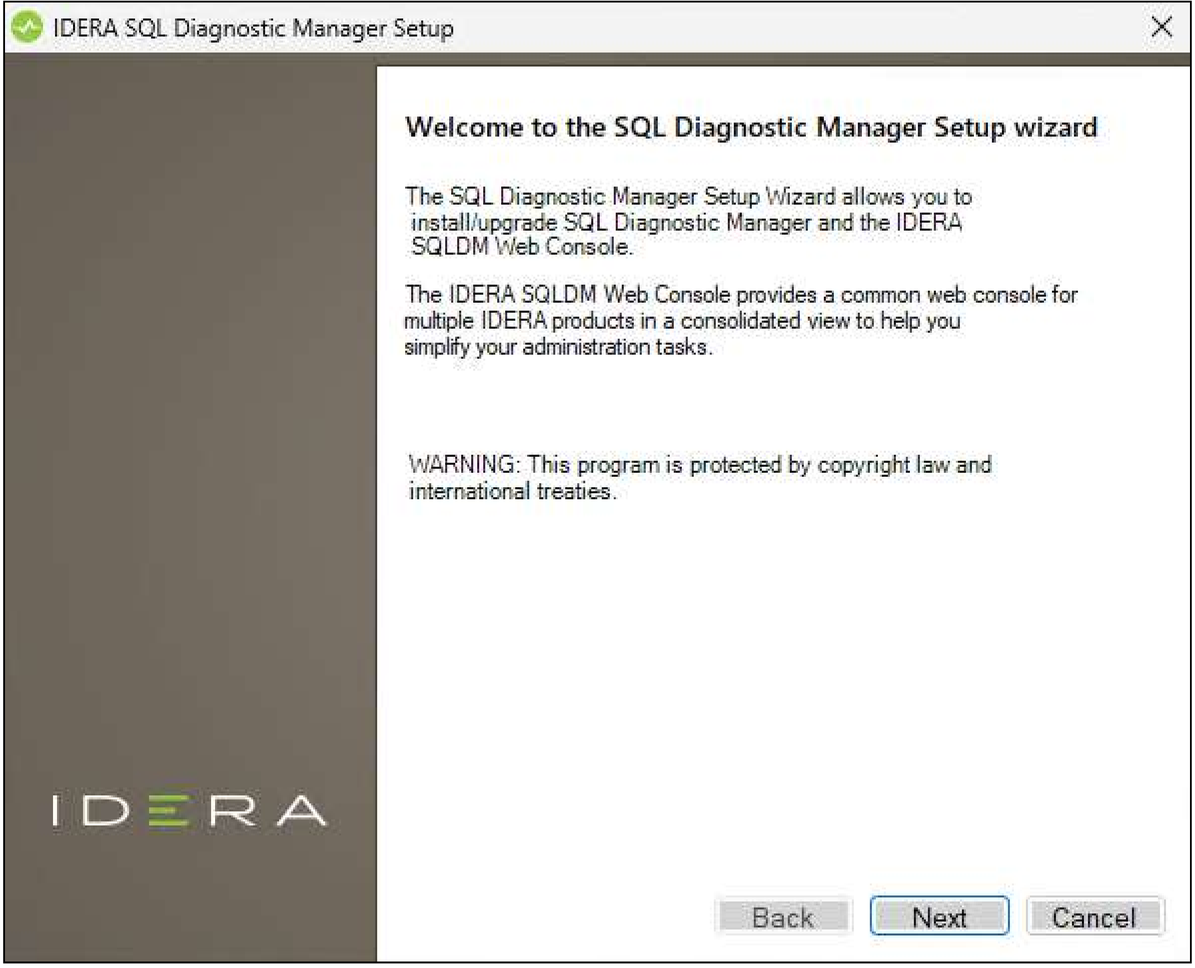
Deploy SQL Diagnostic Manager in a high availability group

The following steps guide you through the installation and deployment of SQL Diagnostic Manages and the IDERA Dashboard while hosting the repository databases in an AlwaysOn environment.

- Install SQL Diagnostic Manager in an AlwaysOn Environment
- Configure the Databases for High Availability
- Validate SQL Diagnostic Manager configuration

Install SQL Diagnostic Manager in an AlwaysOn Environment

1. In the **IDERA SQL Diagnostic Manager Quick Start** window, click **Install SQL Diagnostic Manager.**
2. In the **Welcome to the SQL Diagnostic Manager Setup Wizard** screen, click **Next.**



IDERA SQL Diagnostic Manager Setup

Welcome to the SQL Diagnostic Manager Setup wizard

The SQL Diagnostic Manager Setup Wizard allows you to install/upgrade SQL Diagnostic Manager and the IDERA SQLDM Web Console.

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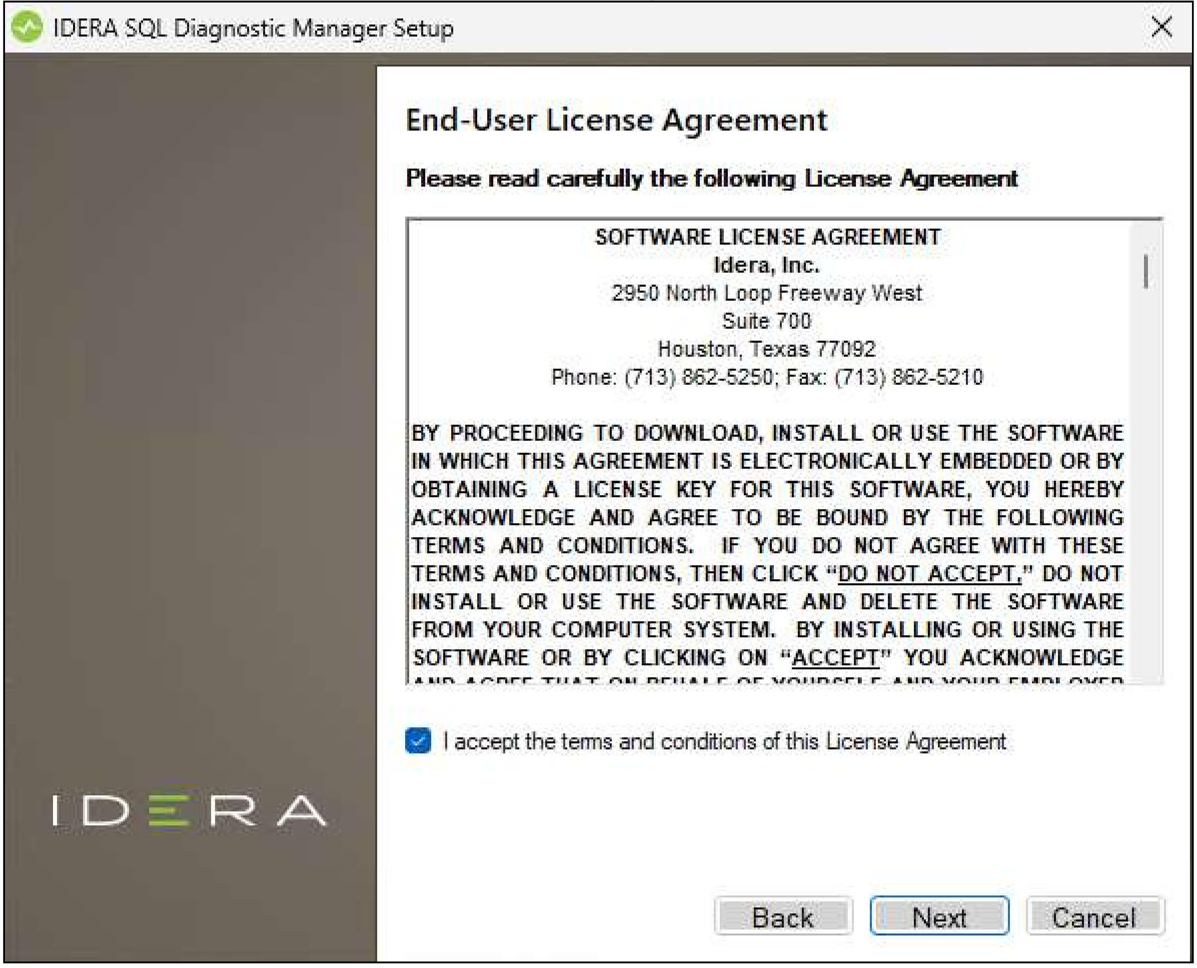
3. Accept the terms and conditions of the End-User License Agreement, and click **Next**.



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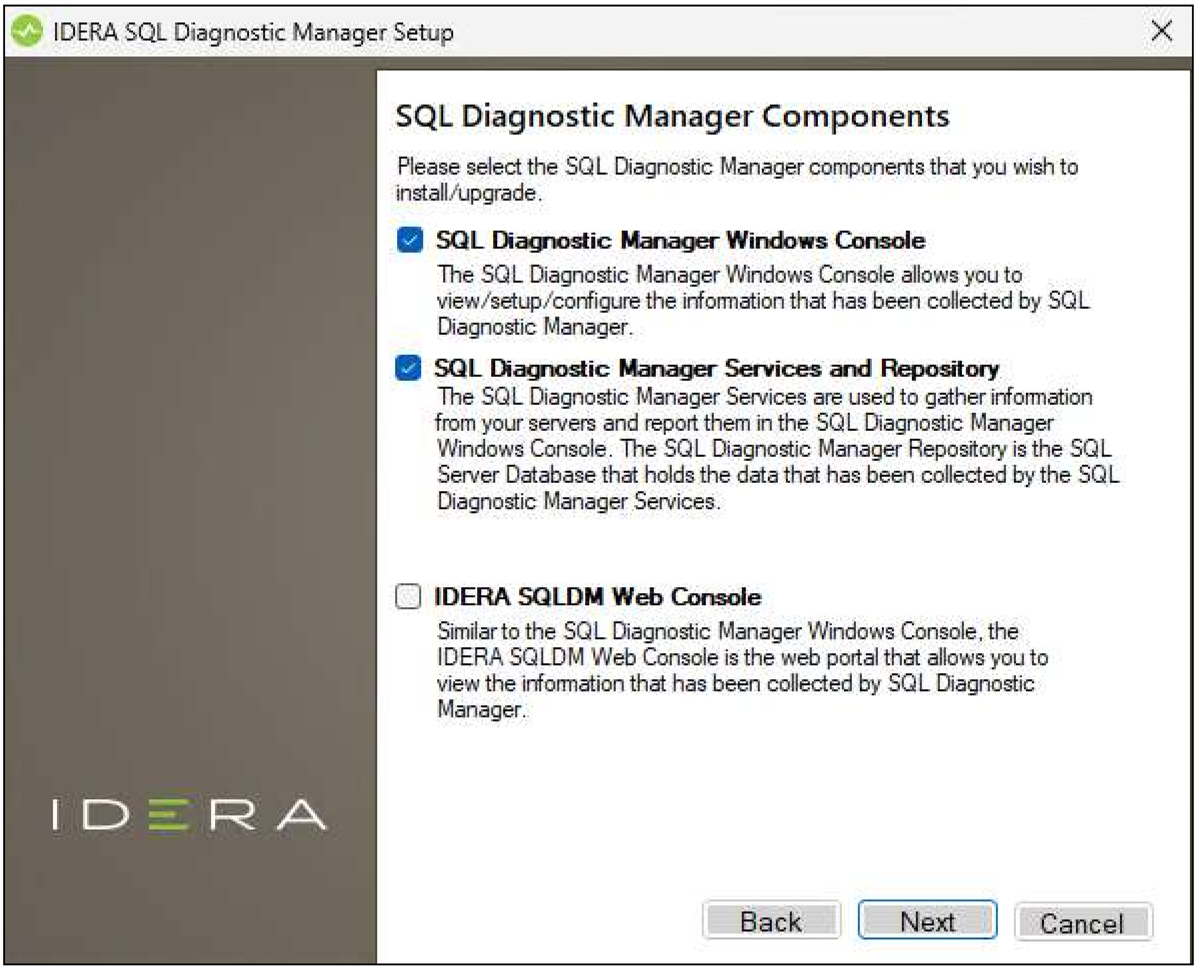
4. Select the **SQLDM Console**, **SQLDM Services and Repository**, and the **SQLDM Web Console** components and click **Next.**



IDERA SQL Diagnostic Manager Setup

SQL Diagnostic Manager Components

Please select the SQL Diagnostic Manager components that you wish to install/upgrade.

☑ **SQL Diagnostic Manager Windows Console**

The SQL Diagnostic Manager Windows Console allows you to view/setup/configure the information that has been collected by SQL Diagnostic Manager.

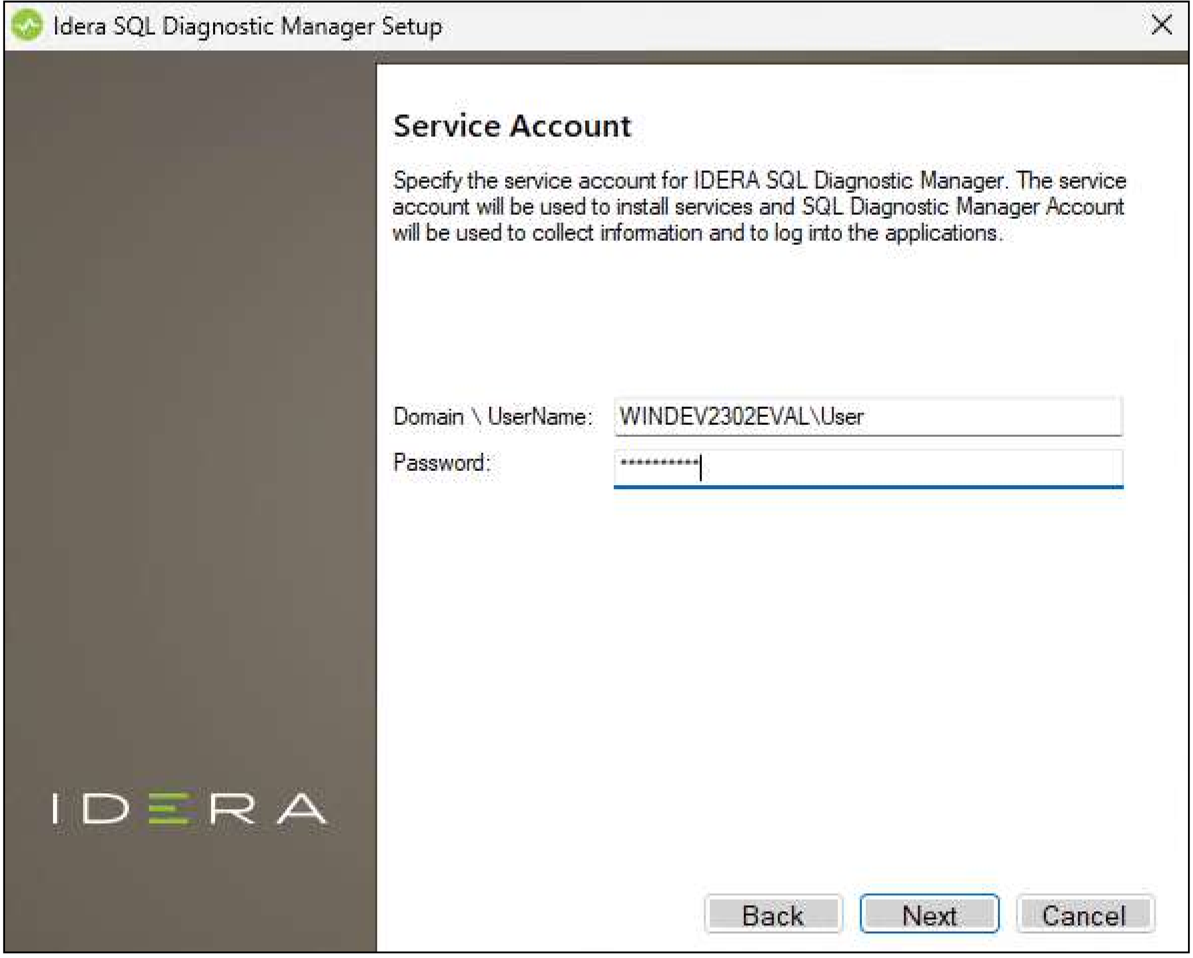
☑ **SQL Diagnostic Manager Services and Repository**

The SQL Diagnostic Manager Services are used to gather information from your servers and report them in the SQL Diagnostic Manager Windows Console. The SQL Diagnostic Manager Repository is the SQL Server Database that holds the data that has been collected by the SQL Diagnostic Manager Services.

□ **IDERA SQLDM Web Console**

Similar to the SQL Diagnostic Manager Windows Console, the IDERA SQLDM Web Console is the web portal that allows you to view the information that has been collected by SQL Diagnostic Manager.

5. Enter the credential to be used by the IDERA services and click **Next.**



Idera SQL Diagnostic Manager Setup

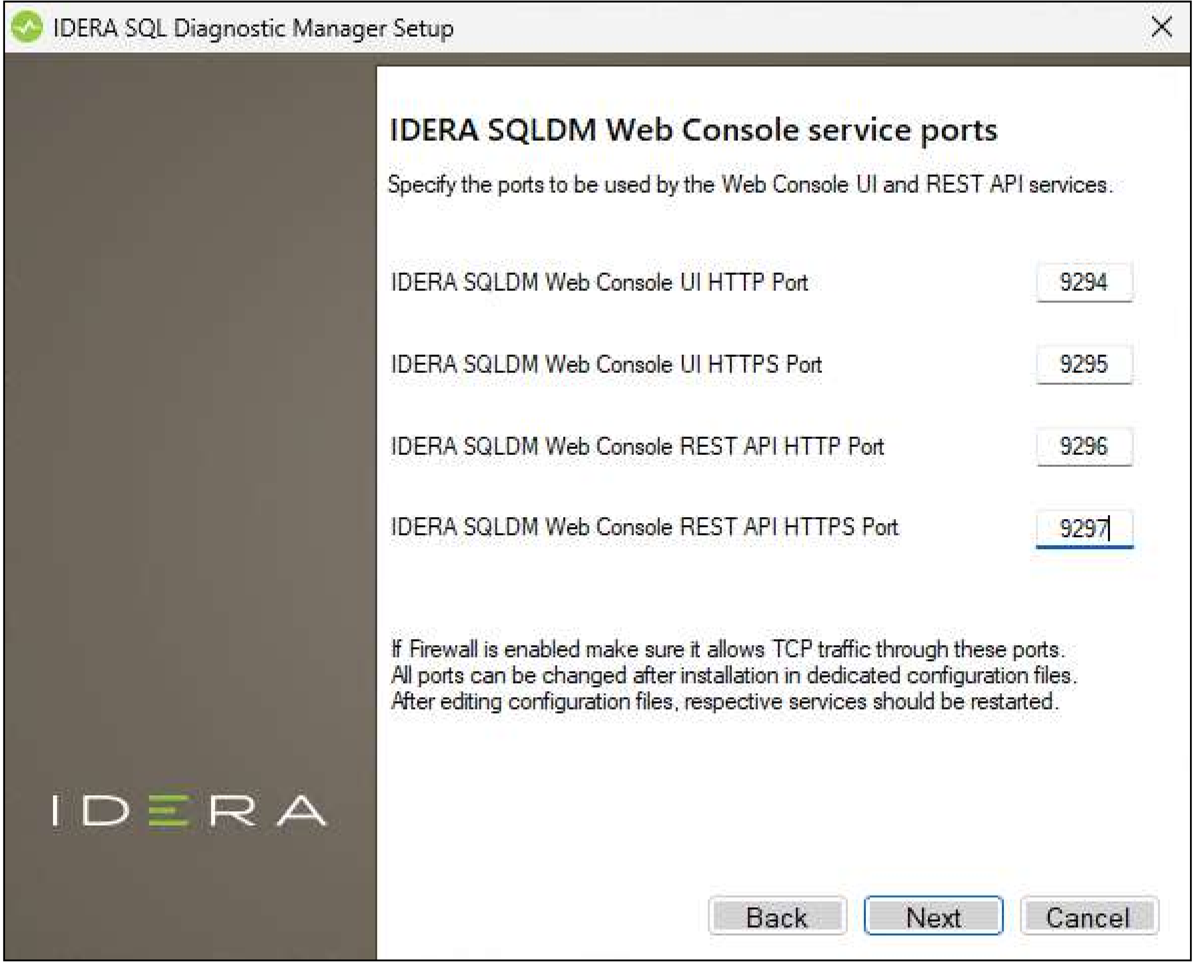
Service Account

Specify the service account for IDERA SQL Diagnostic Manager. The service account will be used to install services and SQL Diagnostic Manager Account will be used to collect information and to log into the applications.

Domain \ UserName: WINDEV2302EVAL\User

Password: ***********

6. Review the ports that are to be used by the SQLDM Web Console services and click **Next**.



IDERA SQL Diagnostic Manager Setup

IDERA SQLDM Web Console service ports

Specify the ports to be used by the Web Console UI and REST API services.

IDERA SQLDM Web Console UI HTTP Port 9294

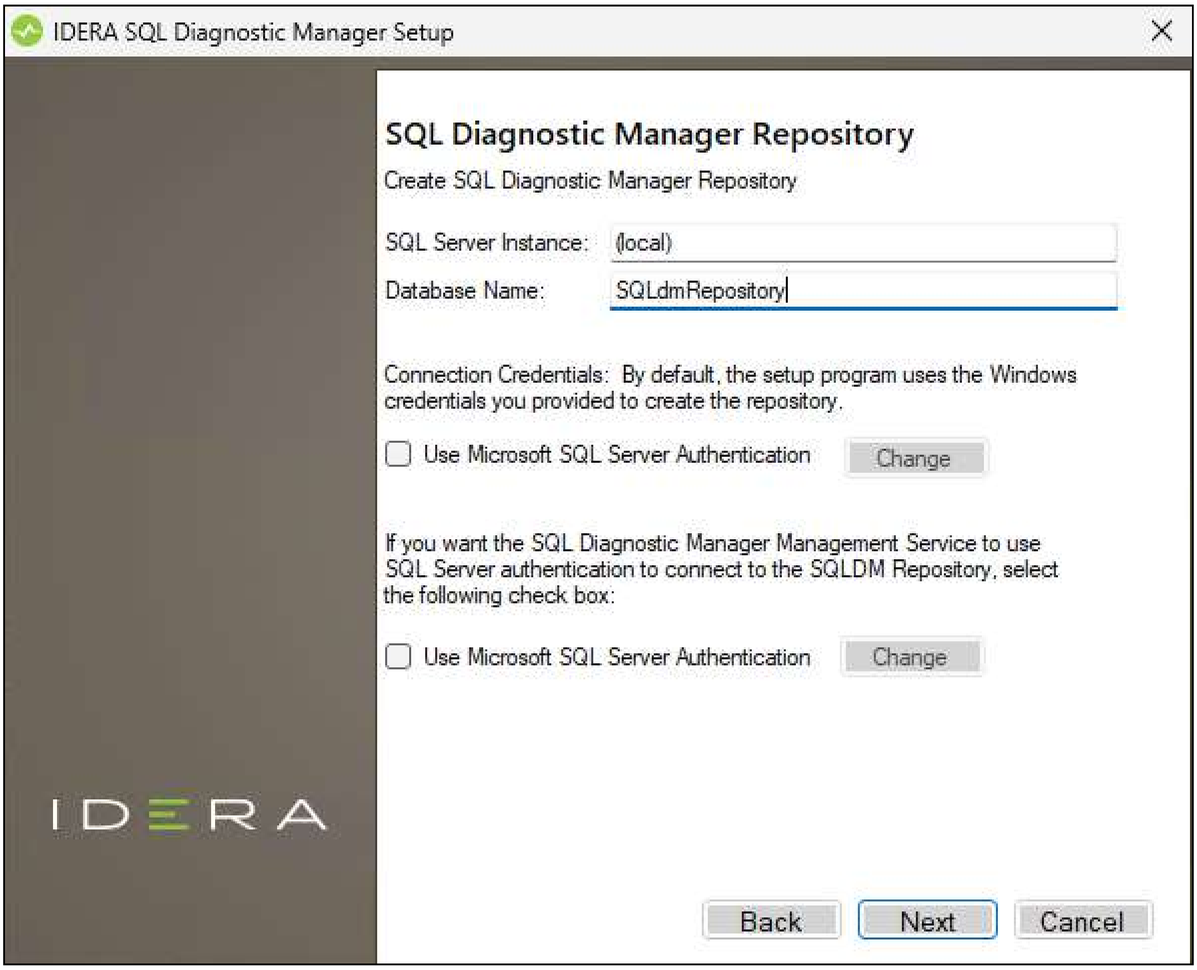
IDERA SQLDM Web Console UI HTTPS Port 9295

IDERA SQLDM Web Console REST API HTTP Port 9296

IDERA SQLDM Web Console REST API HTTPS Port 9297

If Firewall is enabled make sure it allows TCP traffic through these ports.
All ports can be changed after installation in dedicated configuration files.
After editing configuration files, respective services should be restarted.

7. Specify the SQL Server instance and database name for the SQL Diagnostic Manager Repository and click **Next**.



IDERA SQL Diagnostic Manager Setup

SQL Diagnostic Manager Repository

Create SQL Diagnostic Manager Repository

SQL Server Instance: (local)

Database Name: SQLdmRepository

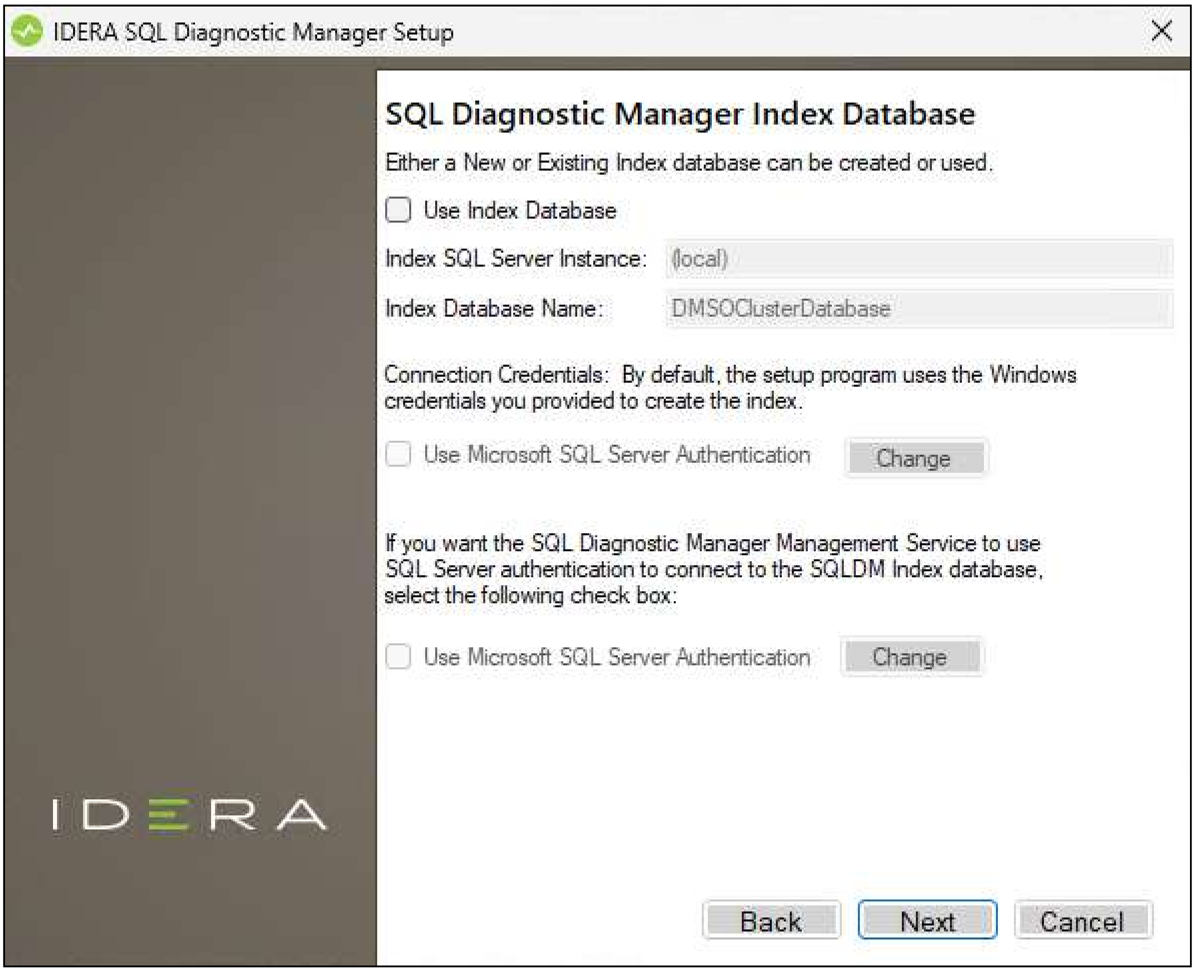
Connection Credentials: By default, the setup program uses the Windows credentials you provided to create the repository.

□ Use Microsoft SQL Server Authentication Change

If you want the SQL Diagnostic Manager Management Service to use SQL Server authentication to connect to the SQLDM Repository, select the following check box:

□ Use Microsoft SQL Server Authentication Change

8. In case you want to monitor more than one SQL Diagnostic Manager installation, check the **Use Index Database** checkbox, specify the SQL Server instance and database name, set the credential configuration of your preference, and click **Next**. Otherwise, skip this step by clicking **Next**.



SQL Diagnostic Manager Index Database

Either a New or Existing Index database can be created or used.

□ Use Index Database

Index SQL Server Instance: (local)

Index Database Name: DMSOClusterDatabase

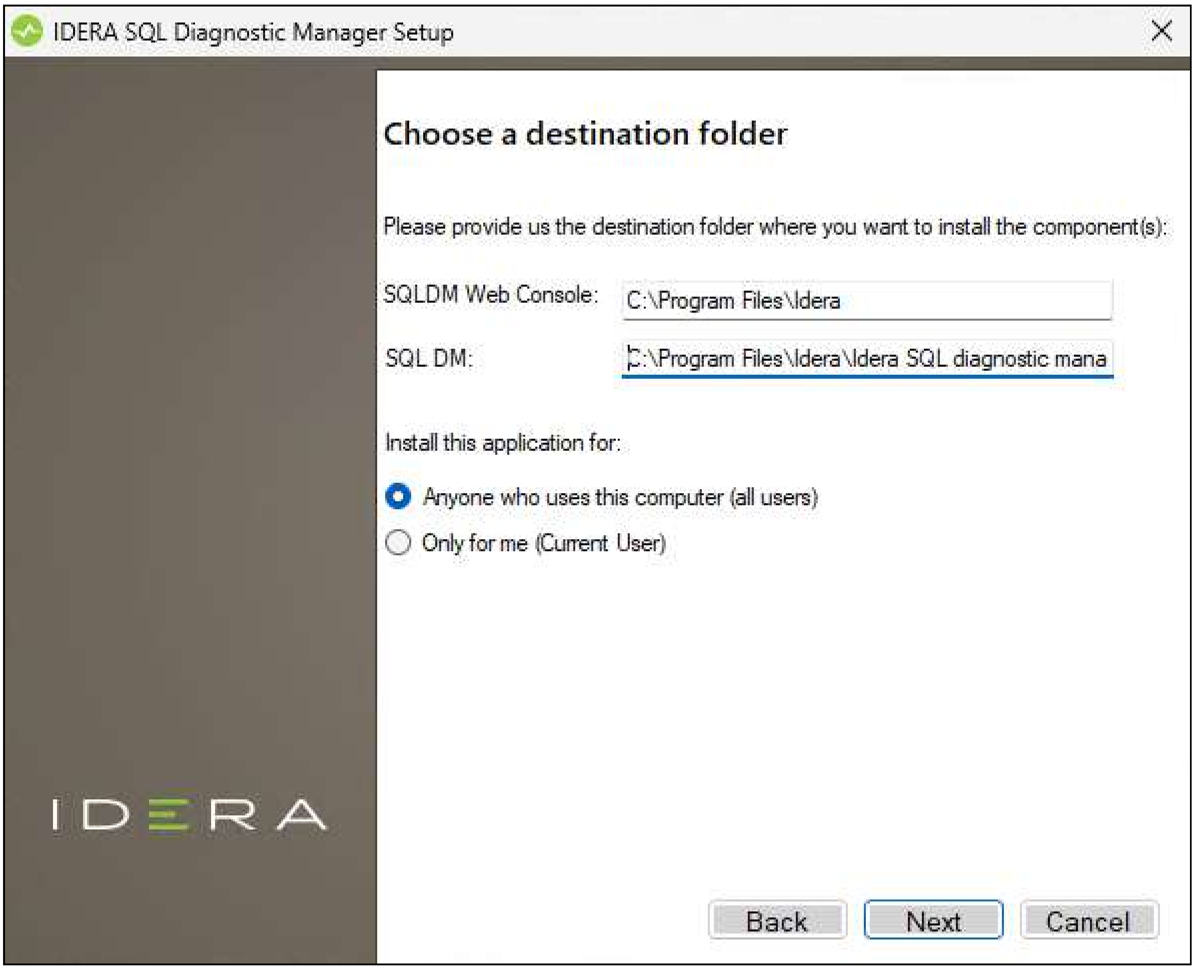
Connection Credentials: By default, the setup program uses the Windows credentials you provided to create the index.

□ Use Microsoft SQL Server Authentication

If you want the SQL Diagnostic Manager Management Service to use SQL Server authentication to connect to the SQLDM Index database, select the following check box:

□ Use Microsoft SQL Server Authentication

9. Provide the installation directory for the SQL DM Web Console and SQL Diagnostic Manager and click **Next**.


IDERA SQL Diagnostic Manager Setup

Choose a destination folder

Please provide us the destination folder where you want to install the component(s):

SQLDM Web Console: C:\Program Files\Idera

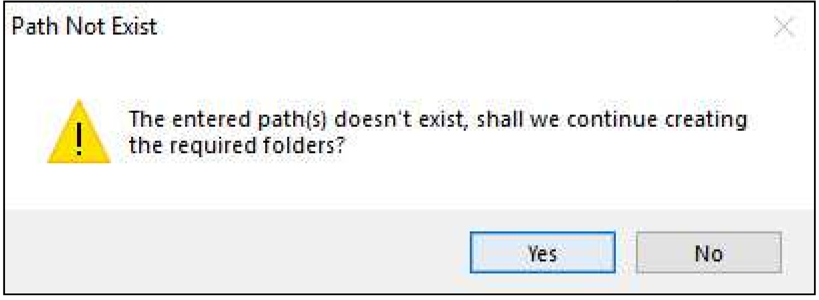
SQL DM: C:\Program Files\Idera\Idera SQL diagnostic mana

Install this application for:

● Anyone who uses this computer (all users)

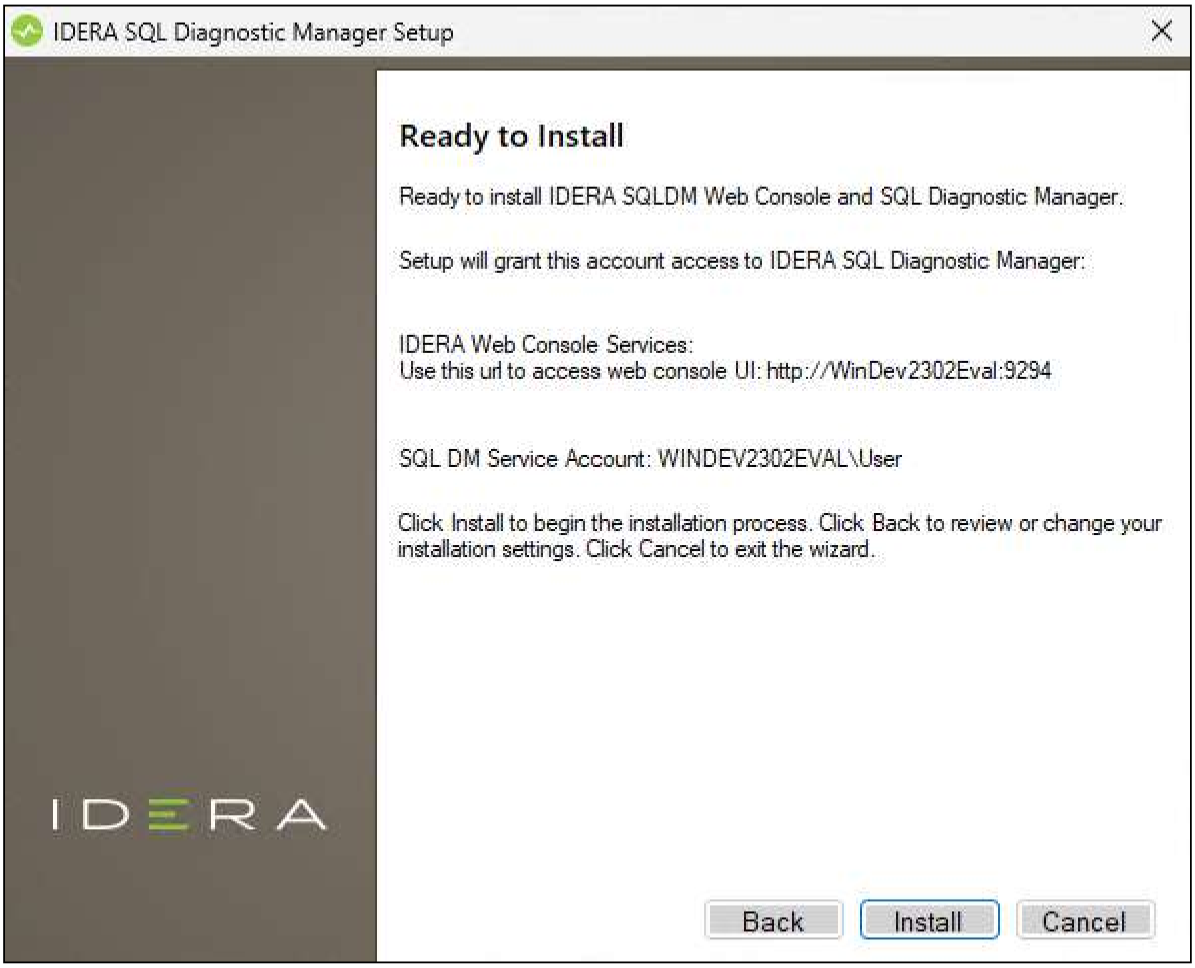
○ Only for me (Current User)

10. If the specified paths do not exist on the system, the following window prompts. Click **Yes** to proceed.


Path Not Exist

The entered path(s) doesn't exist, shall we continue creating the required folders?

11. Click **Install** to start the installation.



Ready to Install

Ready to install IDERA SQLDM Web Console and SQL Diagnostic Manager.

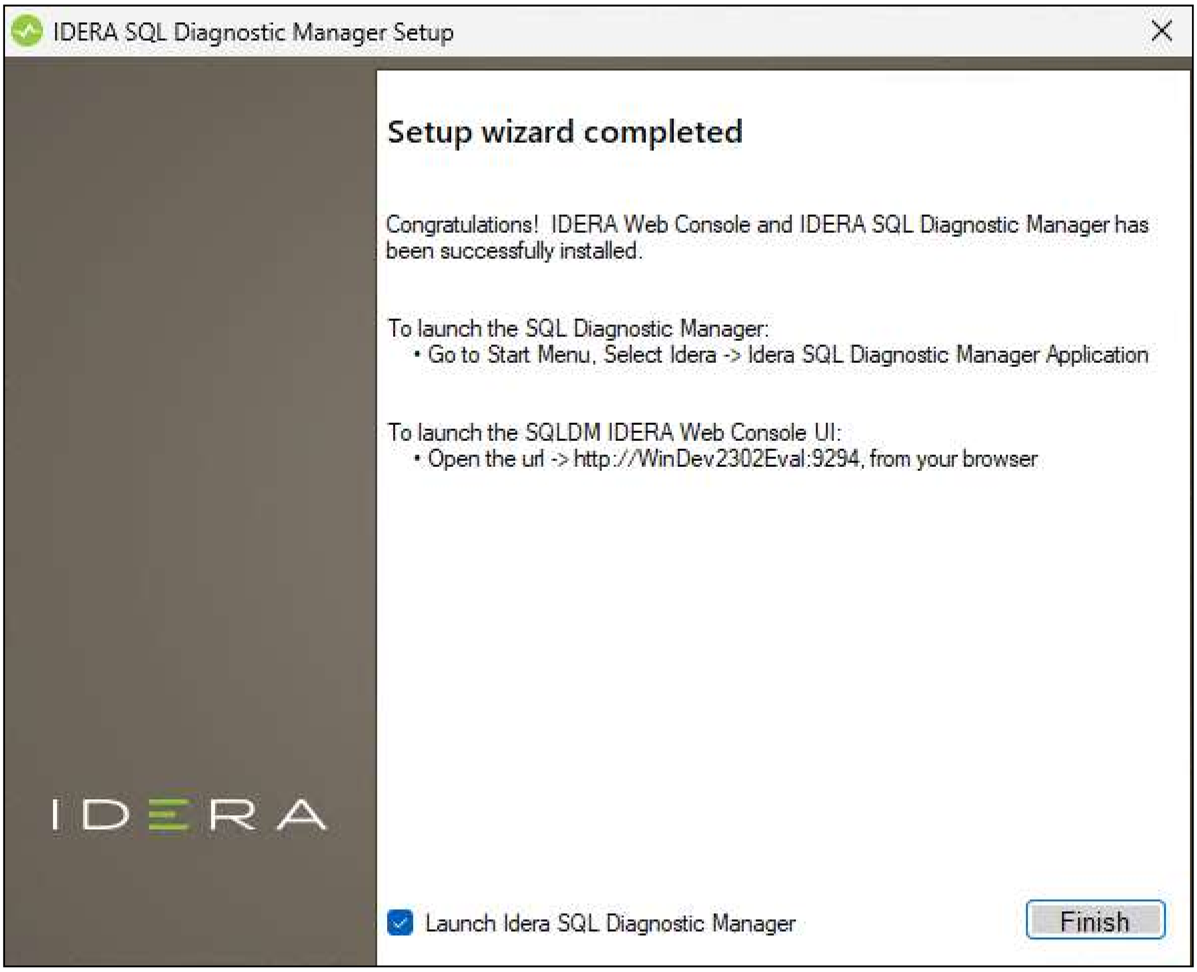
Setup will grant this account access to IDERA SQL Diagnostic Manager:

IDERA Web Console Services:
Use this url to access web console UI: http://WinDev2302Eval:9294

SQL DM Service Account: WINDEV2302EVAL\User

Click Install to begin the installation process. Click Back to review or change your installation settings. Click Cancel to exit the wizard.

12. After the installation has been completed, disable the **Launch IDERA SQL Diagnostic Manager** checkbox and click **Finish**.



Setup wizard completed

Congratulations! IDERA Web Console and IDERA SQL Diagnostic Manager has been successfully installed.

To launch the SQL Diagnostic Manager:
- Go to Start Menu, Select Idera -> Idera SQL Diagnostic Manager Application

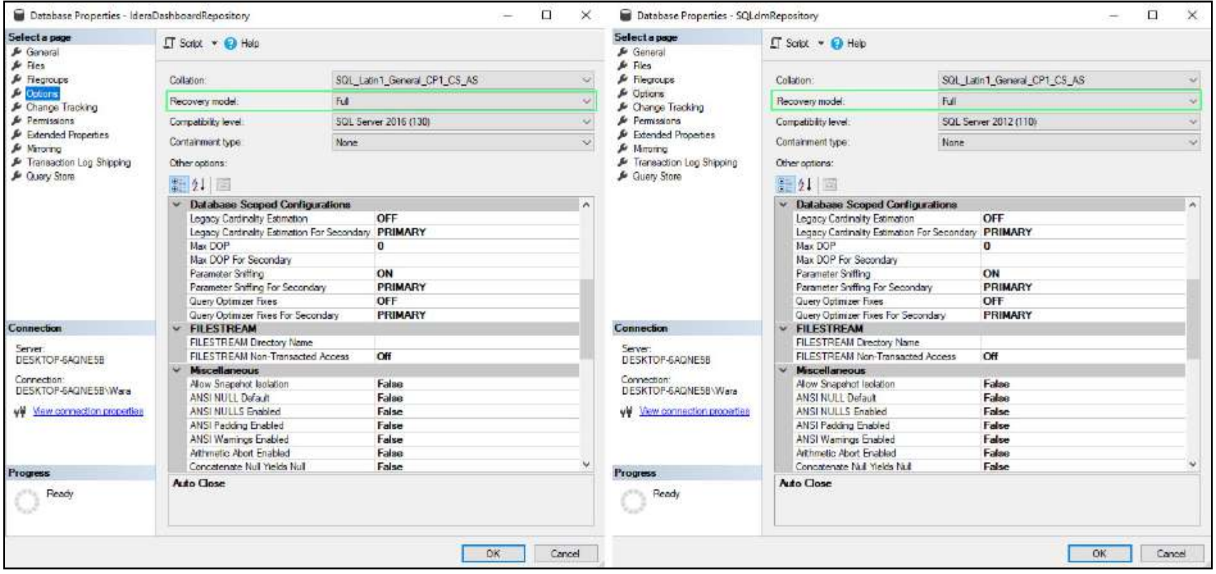
To launch the SQLDM IDERA Web Console UI:
- Open the url -> http://WinDev2302Eval:9294, from your browser

☑ Launch Idera SQL Diagnostic Manager

Configure the Databases for High Availability

1. Open *SQL Server Management Studio (SSMS)* on the primary node and connect the listener name.

2. Set the **Recovery Model** of the *IderaDashboardRepository* and *SQLdmRepository* databases to **Full**.



Collation: SQL_Latin1_General_CP1_CS_AS

Recovery model: Full

Compatibility level: SQL Server 2016 (130)

Containment type: None

Other options:

Database Scoped Configurations	
Legacy Cardinality Estimation	**OFF**
Legacy Cardinality Estimation For Secondary	**PRIMARY**
Max DOP	**0**
Max DOP For Secondary	
Parameter Sniffing	**ON**
Parameter Sniffing For Secondary	**PRIMARY**
Query Optimizer Fixes	**OFF**
Query Optimizer Fixes For Secondary	**PRIMARY**
FILESTREAM	
FILESTREAM Directory Name	
FILESTREAM Non-Transacted Access	**Off**
Miscellaneous	
Allow Snapshot Isolation	**False**
ANSI NULL Default	**False**
ANSI NULLS Enabled	**False**
ANSI Padding Enabled	**False**
ANSI Warnings Enabled	**False**
Arithmetic Abort Enabled	**False**
Concatenate Null Yields Null	**False**

Auto Close

Server: DESKTOP-6AQNE5B

Connection: DESKTOP-6AQNE5B\Wara

Ready

Collation: SQL_Latin1_General_CP1_CS_AS

Recovery model: Full

Compatibility level: SQL Server 2012 (110)

Containment type: None

Other options:

Database Scoped Configurations	
Legacy Cardinality Estimation	**OFF**
Legacy Cardinality Estimation For Secondary	**PRIMARY**
Max DOP	**0**
Max DOP For Secondary	
Parameter Sniffing	**ON**
Parameter Sniffing For Secondary	**PRIMARY**
Query Optimizer Fixes	**OFF**
Query Optimizer Fixes For Secondary	**PRIMARY**
FILESTREAM	
FILESTREAM Directory Name	
FILESTREAM Non-Transacted Access	**Off**
Miscellaneous	
Allow Snapshot Isolation	**False**
ANSI NULL Default	**False**
ANSI NULLS Enabled	**False**
ANSI Padding Enabled	**False**
ANSI Warnings Enabled	**False**
Arithmetic Abort Enabled	**False**
Concatenate Null Yields Null	**False**

Auto Close

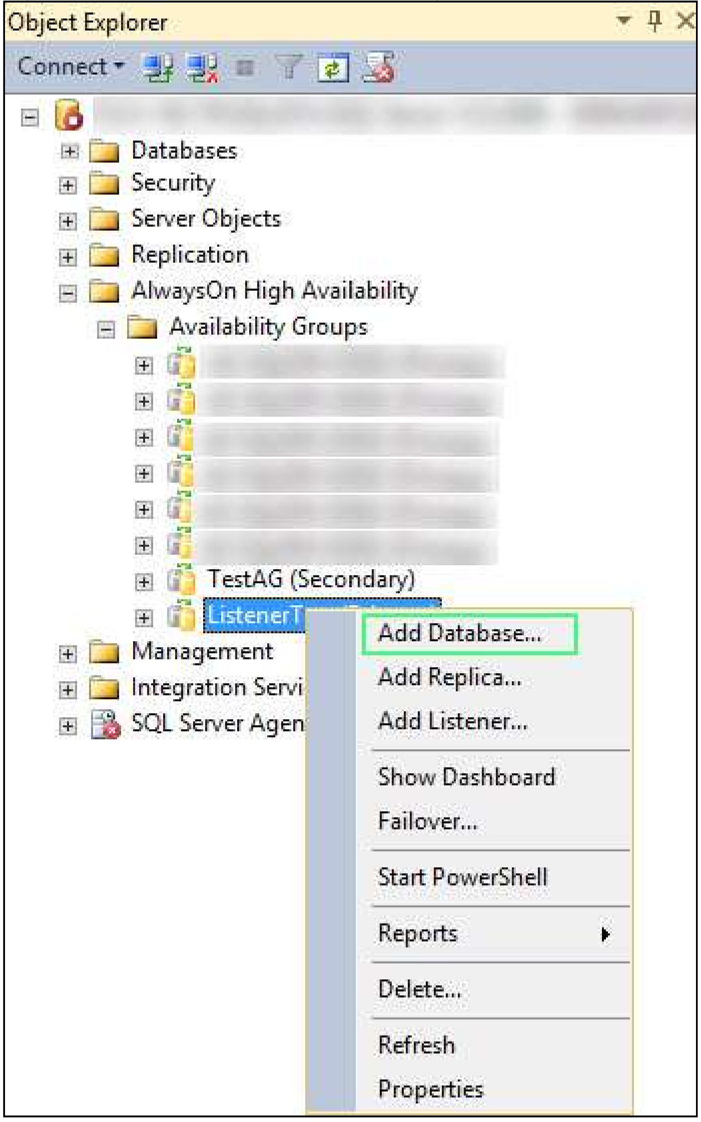
Server: DESKTOP-6AQNE5B

Connection: DESKTOP-6AQNE5B\Wara

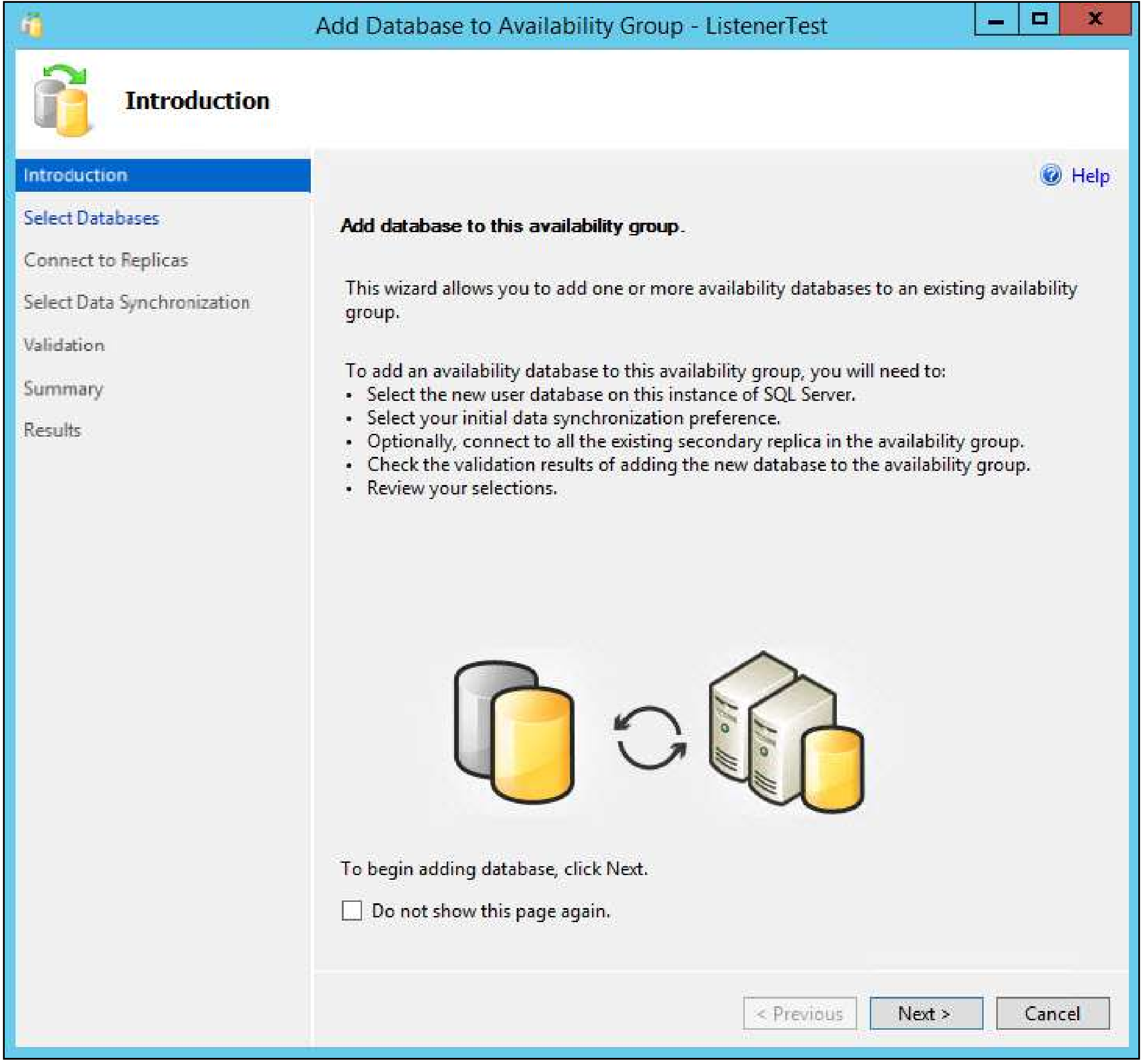
Ready

3. Perform a full backup of the *IderaDashboardRepository* and *SQLdmRepository databases*.

4. Right-click the appropriate availability group and select **Add Database...**



5. On the Introduction screen of the **Add Database to Availability Group** wizard, click **Next**.



Add database to this availability group.

This wizard allows you to add one or more availability databases to an existing availability group.

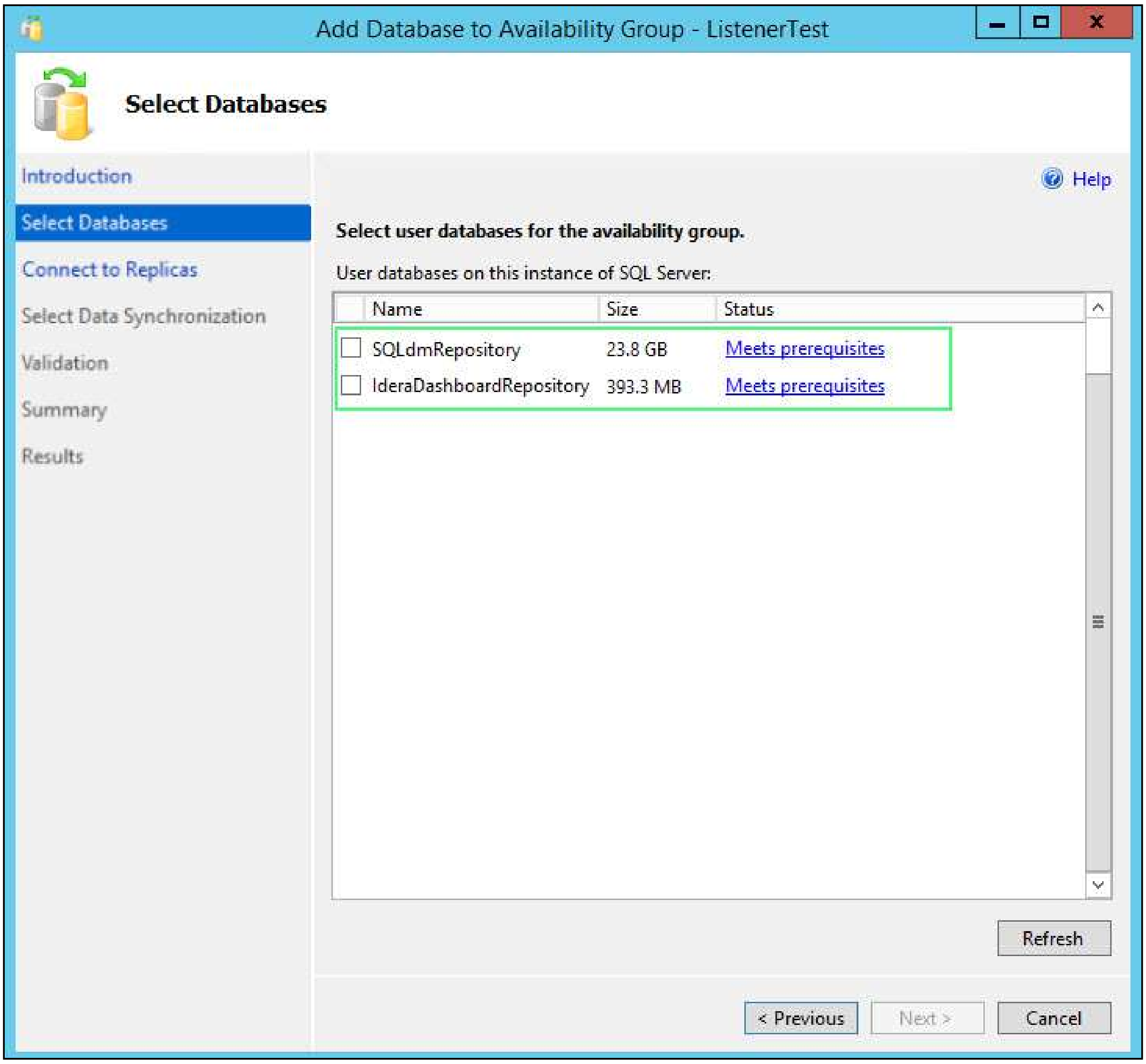
To add an availability database to this availability group, you will need to:

- Select the new user database on this instance of SQL Server.
- Select your initial data synchronization preference.
- Optionally, connect to all the existing secondary replica in the availability group.
- Check the validation results of adding the new database to the availability group.
- Review your selections.

To begin adding database, click Next.

☐ Do not show this page again.

6. On the **Select Database** tab, select the *IderaDashboardRepository* and *SQLdmRepository* databases, and click **Next**.



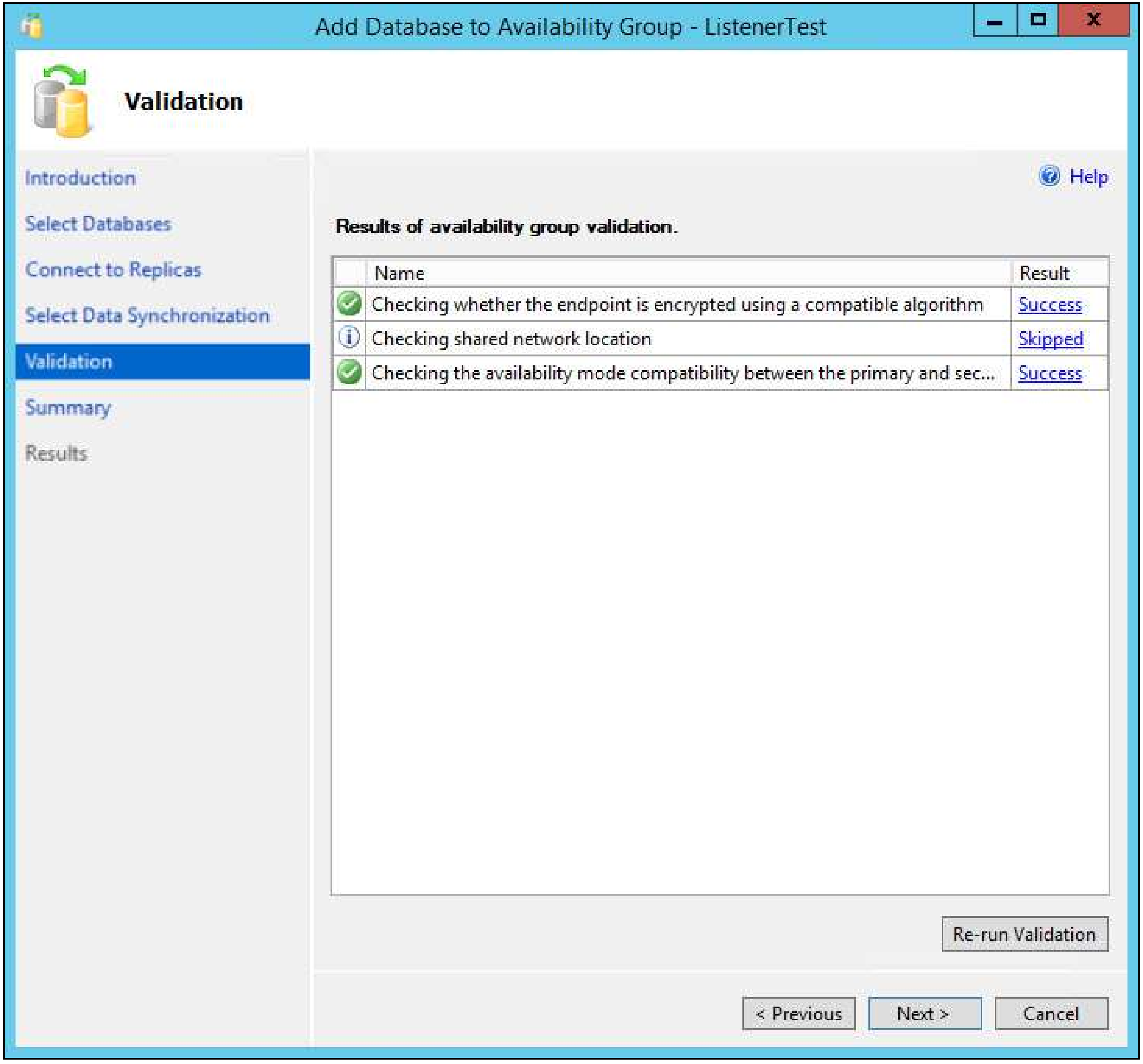
Select user databases for the availability group.

User databases on this instance of SQL Server:

	Name	Size	Status
□	SQLdmRepository	23.8 GB	Meets prerequisites
□	IderaDashboardRepository	393.3 MB	Meets prerequisites

7. On the **Connect to Replicas** tab, connect to the other replica(s) in the availability groups by clicking **Connect...** next to the Server Instances, and click **Next**.
8. On the **Select Data Synchronization** tab, select one of the following options for your environment, and click **Next**.
    a. Automatic Seeding
    b. Full database and log backup
    c. Join only
    d. Skip initial data synchronization

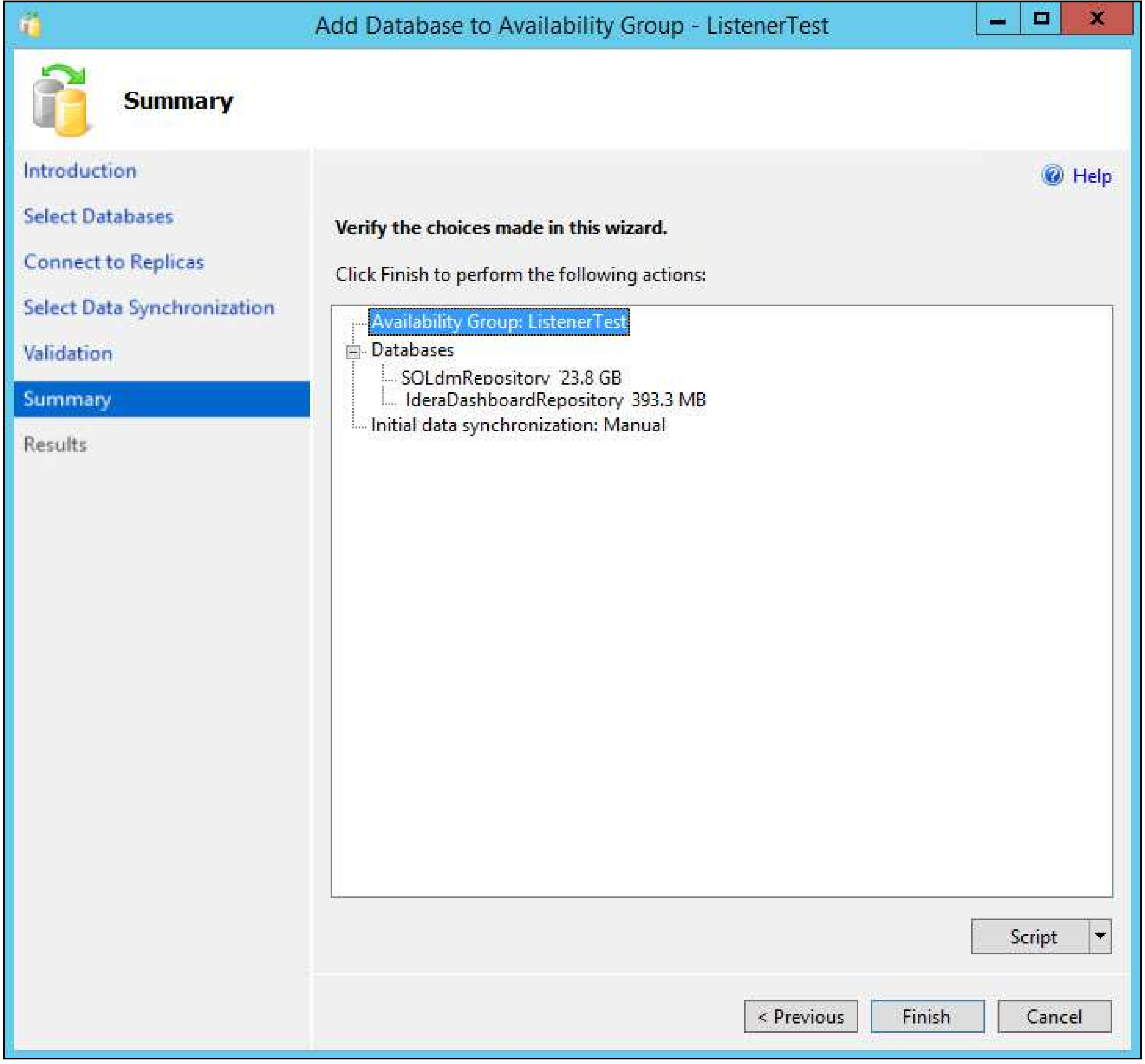
9. On the **Validation** screen, ensure that all tests are successful and click **Next**.



Results of availability group validation.

	Name	Result
✓	Checking whether the endpoint is encrypted using a compatible algorithm	Success
ⓘ	Checking shared network location	Skipped
✓	Checking the availability mode compatibility between the primary and sec...	Success

10. On the **Summary** screen, verify the actions you selected in the previous steps, and click **Finish**.



Verify the choices made in this wizard.

Click Finish to perform the following actions:

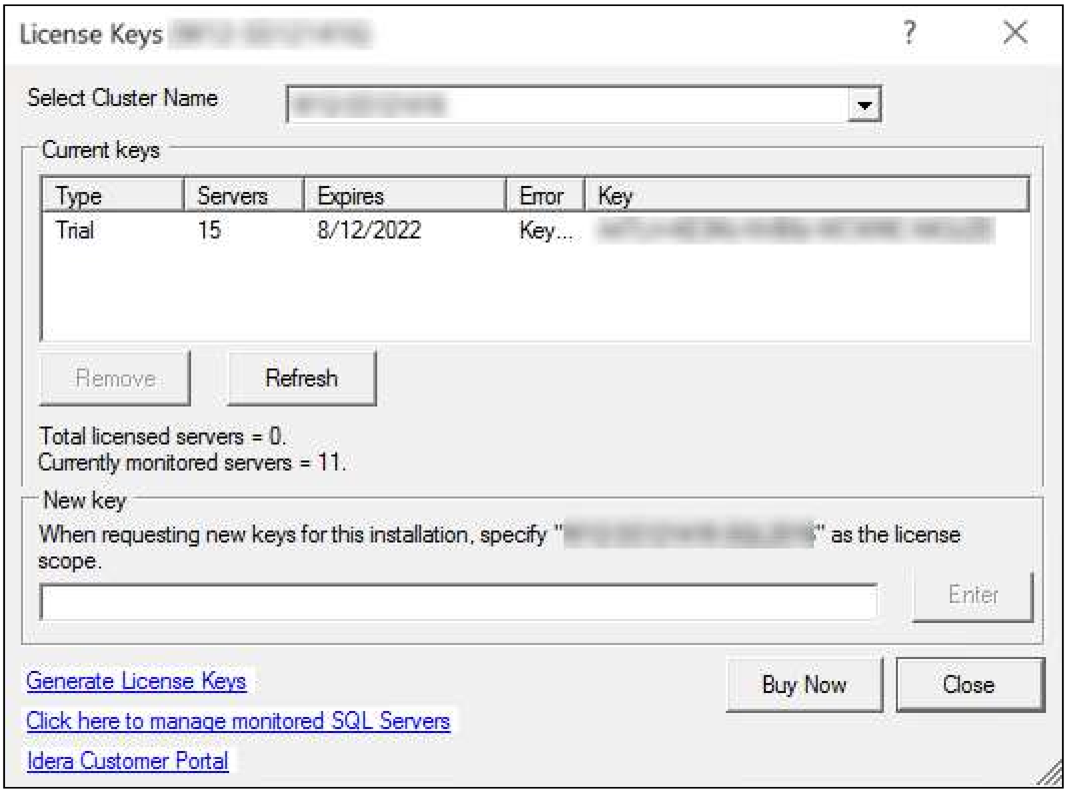
Availability Group: ListenerTest
Databases
SQLdmRepository 23.8 GB
IderaDashboardRepository 393.3 MB
Initial data synchronization: Manual

11. The **Results** screen displays the summary of the performed actions and their results, click **Close** to exit the wizard.
12. In SSMS connect to the secondary replica(s) and ensure that the databases were added successfully.
13. On the server where SQL Diagnostic Manager is installed, restart the services listed below:
    a. IDERA Dashboard Core Service
    b. IDERA Dashboard Web Service
    c. SQLdm Collection Service
    d. SQLdm Management Service
    e. SQLdm Predictive Analytics Service
    f. SQLdm Rest Service

Validate SQL Diagnostic Manager configuration

1. To validate the SQL Diagnostic Manager configuration, launch the Desktop Client.

2. Go to ? **> Manage License**. In the New Key section, you should see the name of the listener and the port instead of the primary node name.



Select Cluster Name: [redacted]

Current keys

Type	Servers	Expires	Error	Key
Trial	15	8/12/2022	Key...	[redacted]

Total licensed servers = 0.
Currently monitored servers = 11.

New key

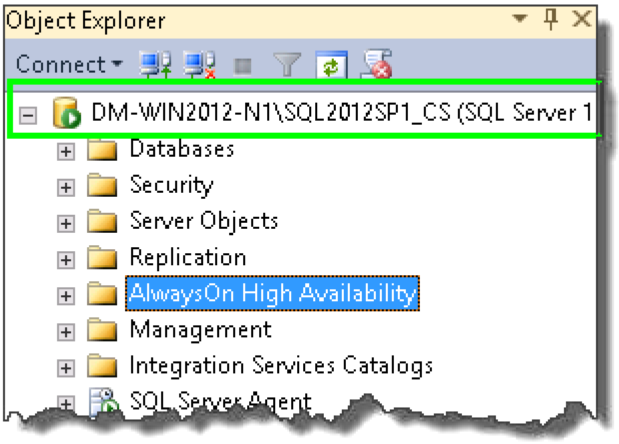
When requesting new keys for this installation, specify "[redacted]" as the license scope.

If you see the listener and port as shown in the image above, you have successfully configured the repository databases in an availability group.

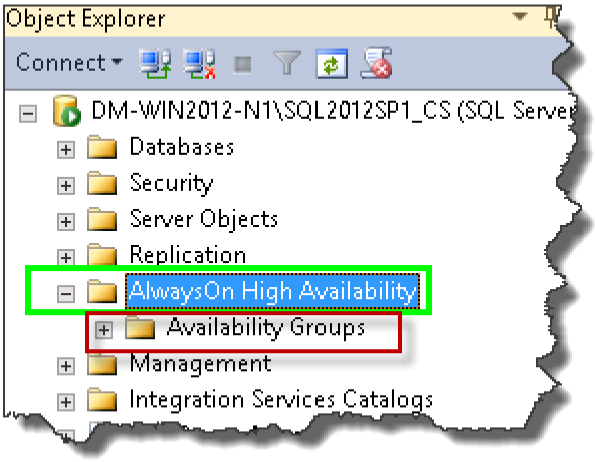
AlwaysOn availability group listener name and port designation

This procedure guides you through the necessary steps to capture an availability group's listener name and port designation. This information is essential for IDERA Sales to generate a special license that allows you to host the SQL Diagnostic Manager Repository in an availability group. As a pre-requisite the SQL Diagnostic Manager Repository needs to be hosted in an availability group within the primary replica.

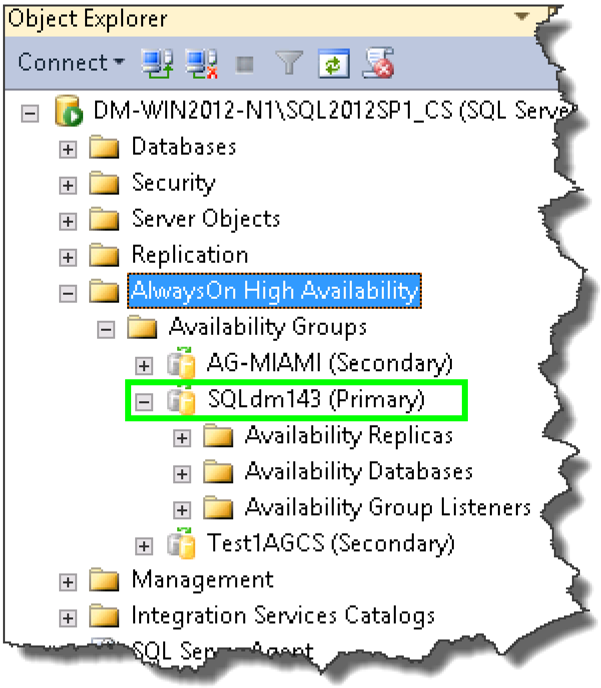
1. Within SSMS, go to node that contains the availability group that hosts the SQL Diagnostic Manager Repository and is the primary replica.


Object Explorer
Connect
DM-WIN2012-N1\SQL2012SP1_CS (SQL Server 1
Databases
Security
Server Objects
Replication
AlwaysOn High Availability
Management
Integration Services Catalogs
SQL Server Agent

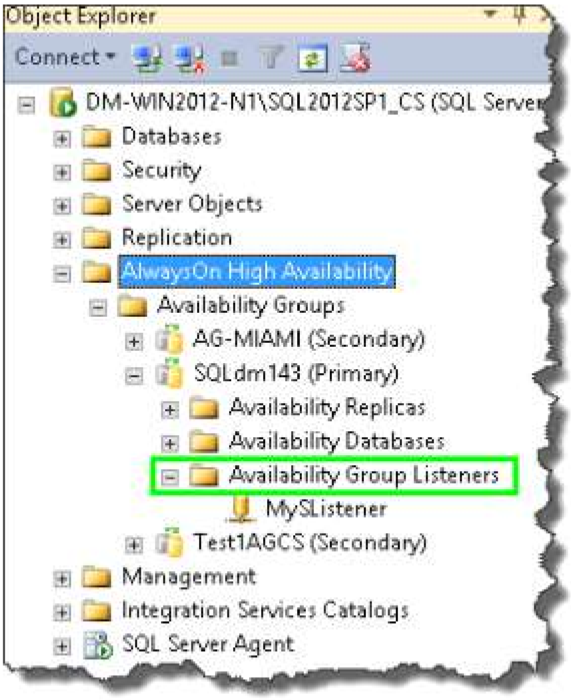
2. Expand the **AlwaysOn High Availability** folder and then the **Availability Groups** Folder.


Object Explorer
Connect
DM-WIN2012-N1\SQL2012SP1_CS (SQL Serve
Databases
Security
Server Objects
Replication
AlwaysOn High Availability
Availability Groups
Management
Integration Services Catalogs

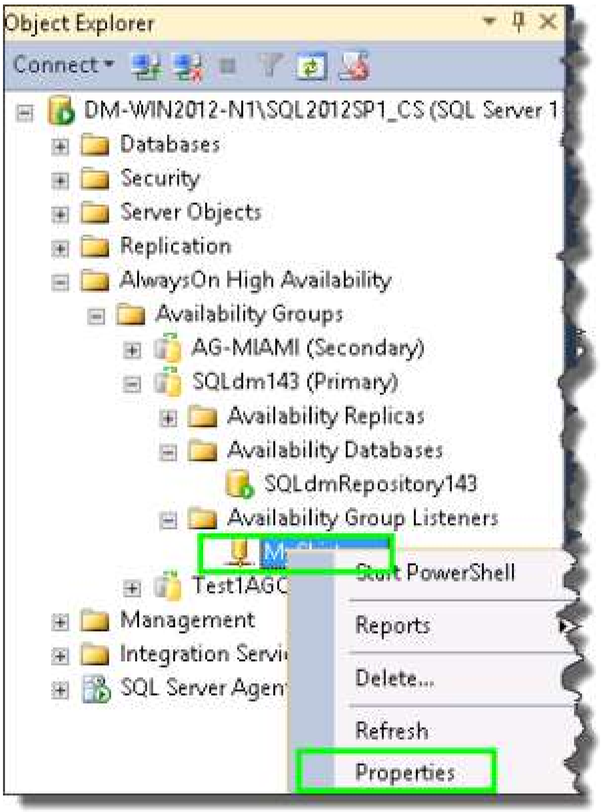
3. Expand the availability group that is the primary replica.



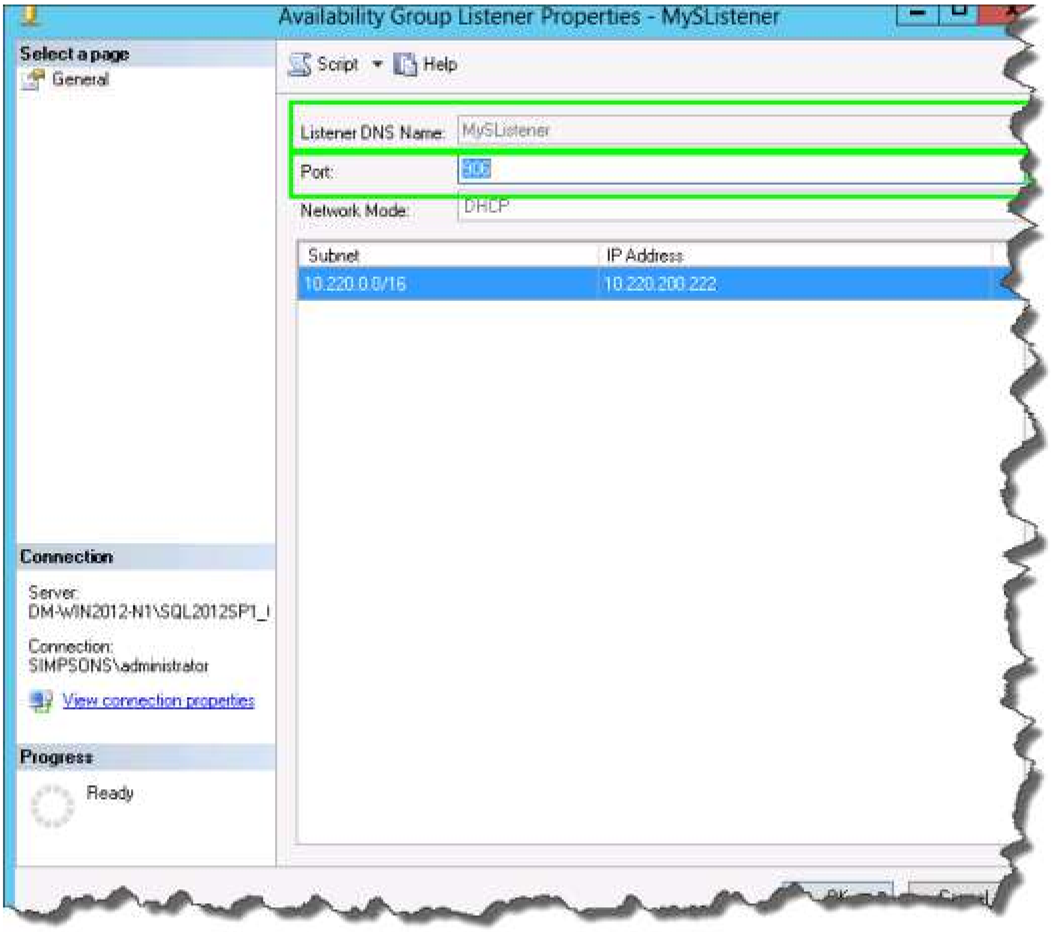
4. Expand the **Availability Group Listeners** Folder.



5. Right-click the listener, select **Properties**, and the Availability Group Listener Properties dialog Displays.



Send IDERA Sales the **Listener DNS Name** and **Port designation** information to obtain a new license to host the SQL Diagnostic Manager Repository in an availability group.



Availability Group Listener Properties - MySListener

Listener DNS Name: MySListener

Port: 306

Network Mode: DHCP

Subnet	IP Address
10.220.0.0/16	10.220.200.222

Server:
DM-WIN2012-N1\SQL2012SP1_I

Connection:
SIMPSONS\administrator

How SQL Diagnostic Manager works with a virtual environment

Virtual environments, such as those provided by Hyper-V or VMware, allow you to run multiple instances of computers or "virtual machines" on a single, physical host server. These VMs create a virtual environment that enables IT shops to more fully utilize the hardware they already have, allowing administrators to maintain fewer physical servers which then consume less power, take up less real estate, and generate less heat.

While there are many advantages to using a virtual environment, there are some disadvantages. One is that a virtual machine currently is not as fast or efficient as a standalone physical machine. Administrators must closely monitor and manage their virtual environments because over-utilized hardware can quickly and severely impact the performance of their servers, which are constantly waiting for physical resources to become available to process their workloads.

SQL Diagnostic Manager includes VM monitoring to allow administrators to get a glimpse of what is going on inside the virtual environment in which their SQL Servers are running, to make sure that their VMs and their host machines are running at peak efficiency. This topic is a general outline of how SQL Diagnostic Manager works in a virtual environment and includes links to other areas where you can find additional VM-specific information.

Using the hypervisor to manage resources

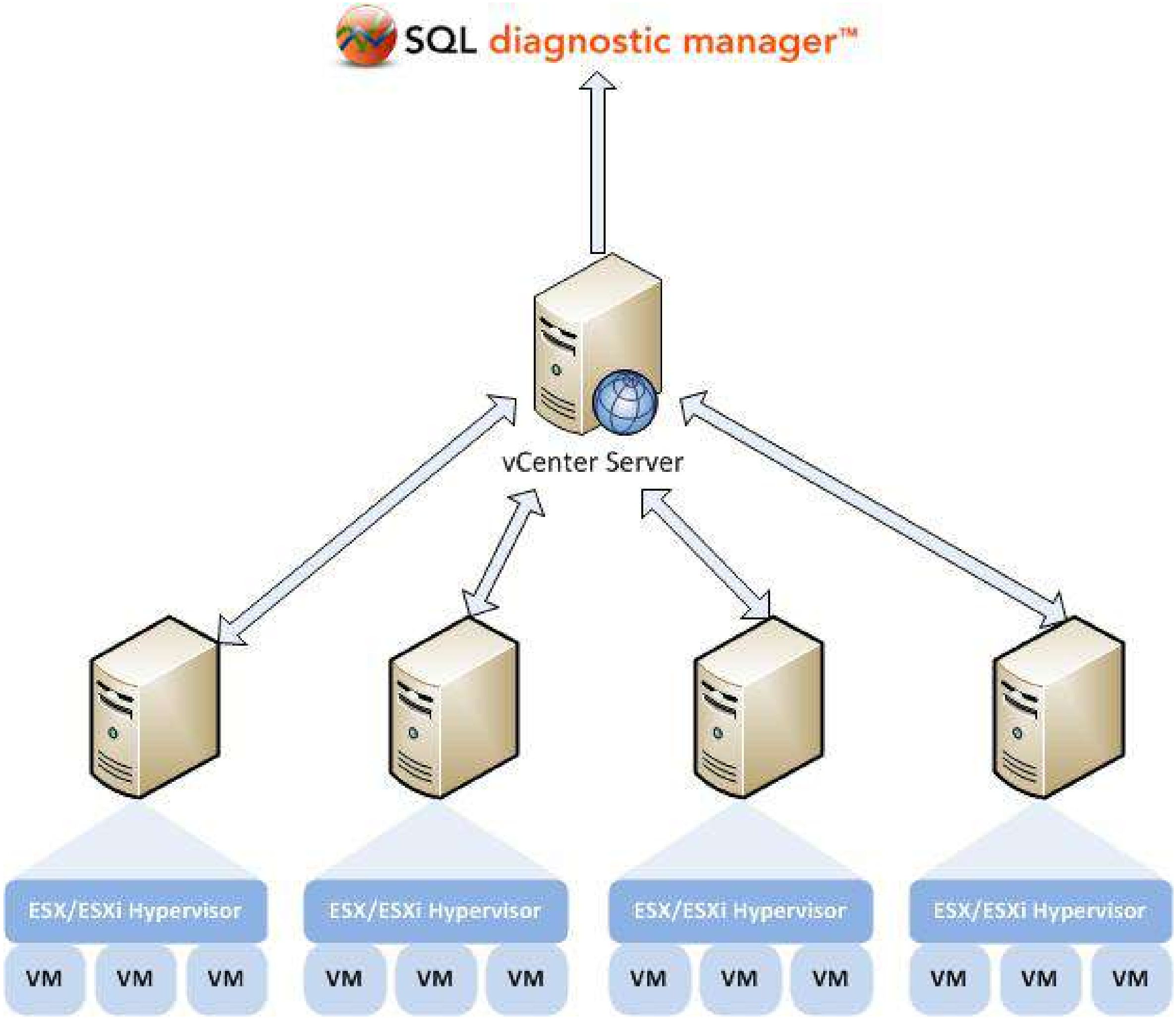
On the physical server hosting a virtual environment, there is a process called the hypervisor or virtualization manager running in the background. The hypervisor manages the interactions between the virtual machines and the physical hardware, manages resources, and then distributes the physical resources as required by each of the VMs it is hosting.

An administrator can intentionally over commit resources on a physical host with the idea that it is unlikely that all of the VMs need to utilize all of the resources on the host at the same time. The hypervisor is also affected by this shift, and manages any occasion when all of the active VMs need more physical resources than is available from the host. Note that there are ramifications for the extra processing that is occurring when the hypervisor is taxed. This additional processing is the overhead for a virtual environment and consumes CPU, memory, and network resources.

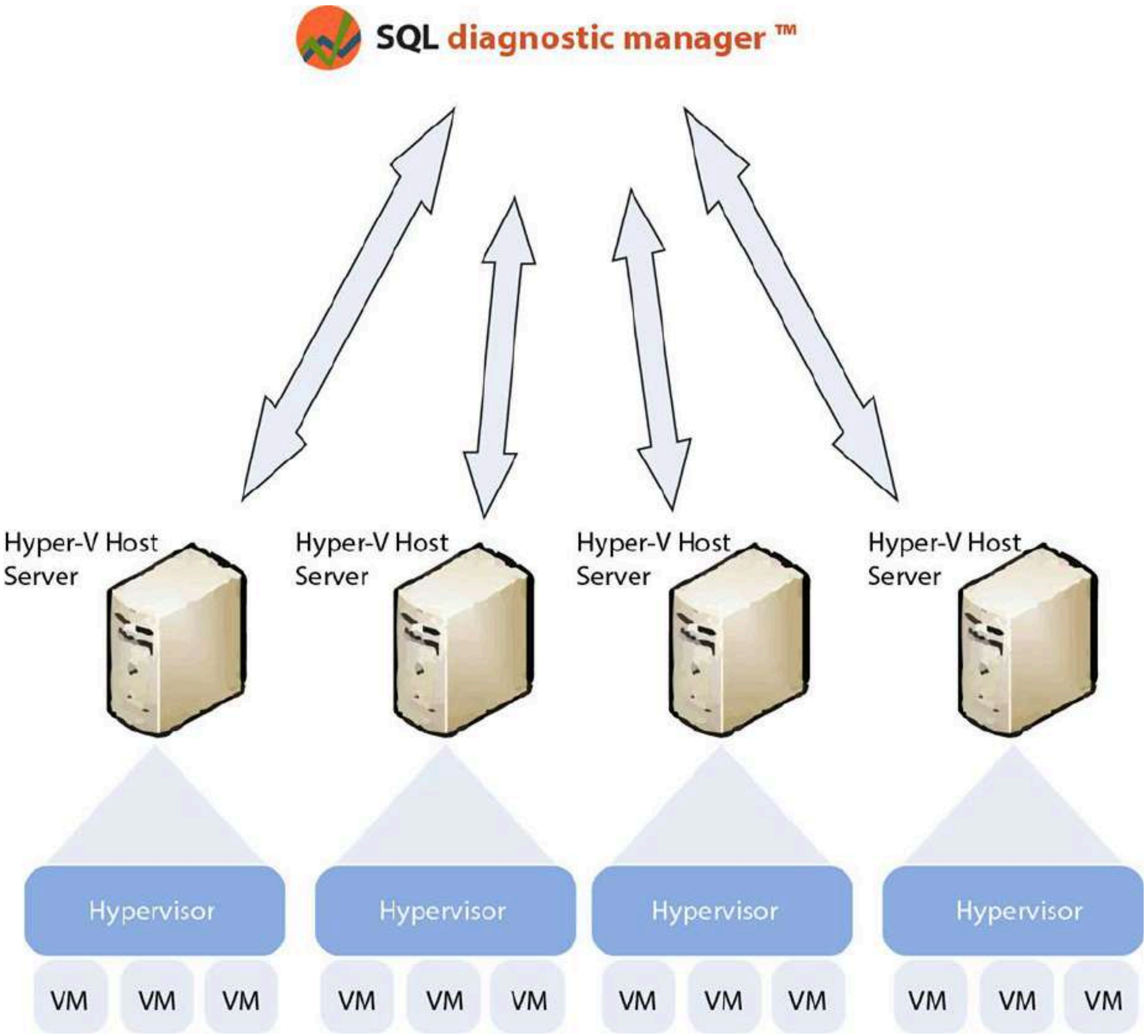
How SQL Diagnostic Manager collects and presents metrics involving a virtual environment

The guest operating system on a VM operates no differently than it does when running on a physical machine with full access to all of the resources at its disposal. But the machine hosting the VM operates differently because of the virtual environment. The physical resources of the host are shared with the other VMs on the host. Due to the additional overhead of virtualization, and the hypervisor managing contention for resources, the metrics that the guest OS reads as utilization of its resources are not entirely accurate as they do not take into account that virtualization overhead, nor does it measure that it is waiting on physical resources to process its workload.

The image below shows a typical virtualized environment with VMware. In this environment, the ESX/ESXi hypervisor on each individual host server collects the performance statistics and reports the data back to a central vCenter Server. SQL Diagnostic Manager then collects that information from the vCenter Server in order to show those statistics along with the other SQL related performance information.



In virtualized environment with Hyper-V, the process of how SQL Diagnostic Manager collects and presents metrics is slightly different from that of a VMware setup. In this environment, SQL Diagnostic Manager collects all the required performance statistics from the Hyper-V host server and virtual machines using the WMI interface. See Hyper-V user requirements for information on how to successfully collect host and VM metrics.



SQL Diagnostic Manager displays virtual machine and host metrics as collected from the perspective of the physical host. In other words, these are the “true” physical metrics. Whereas, the metrics that SQL Diagnostic Manager displays for the OS on a virtualized machine are what Microsoft Windows calculates as using without regard to any overhead. For example, SQL Diagnostic Manager displays the OS CPU Usage at 35%, but metric displayed for the VM CPU Usage is 38%. This discrepancy results from the additional overhead within the hypervisor used to run the VM, and the VM is charged for the additional processing.

Link a monitored virtual SQL Server instance to the vCenter Server or Hyper-V host server

To link a monitored virtual SQL Server instance to the host server that manages your VMs, click **Tools > VM Configuration** to access the VM Configuration window. SQL Diagnostic Manager displays the current relationships between your available virtualization host servers and your monitored SQL Server instances. For more information about linking a monitored virtual SQL Server instance to a vCenter Server or Hyper-V host server, see Configure your virtual machine connections.

VM data collection

The VM collector connects to your virtualization host server (vCenter Server or Hyper-V host server) during the scheduled refresh for each of your monitored virtual SQL Server instances. If the SQL Diagnostic Manager Management Console is open to the Overview Dashboard or any Resources view for a specific instance, data is also collected based on the Server View Refresh setting in the Console Options page. In this situation, it is possible that the collector connects to the virtualization host server and virtual machines every few seconds.

You can adjust the scheduled refresh rate for a monitored virtual SQL Server instance by right-clicking the instance name and then selecting **Properties**.

Differences in statistics

You may notice some differences in your statistics, such as SQL Diagnostic Manager displaying a higher OS CPU usage than your VM CPU usage. While the hypervisor manages resources efficiently, it is possible that the demand for physical resources is greater than what is available. For example, a guest OS on a virtual machine submits a batch of work to a CPU. However, all of the physical CPUs are committed to other work, so there is no physical CPU available on the host to process the work. In this situation, the VM waits for a CPU to become available to process its work. While it is waiting, the guest OS is unaware of the wait and assumes that it is simply taking longer for the CPU to process this batch of work, and the OS thinks it is using more CPU power than it is actually using.

Remember that SQL Diagnostic Manager uses the additional overhead of the hypervisor to calculate the VM metrics. In this situation, the hypervisor knows the VM is just waiting for a CPU, so it does not charge the VM for CPU processing power while it is waiting. The result is that the guest OS reports that it is using the additional processing power, however, the hypervisor simply reports what is actually used. In this situation, your CPU usage metrics that are reported by Windows are higher than what is reported by VMware or Hyper-V for that VM.

Available metrics related to your VMs

A monitored virtual SQL Server instance appears in the Servers pane in the same way as a monitored physical SQL Server instances. Click the appropriate virtual instance, and SQL Diagnostic Manager displays the same dashboard panels as for a monitored physical SQL Server instance, but also includes specific metrics for the VM and host server.

The following dashboard panels include VM- or host-related information:

- CPU panel - Includes VM and Host usage metrics. The information available in this panel comes from the Server Details and Resources Summary views.
- Memory panel - Includes the VM Memory Usage and Host Memory Usage charts. The information available in this panel comes from the Server Details and Resources Summary views.
- Network panel - Includes the VM Network Usage Throughput and Host Network Usage Throughput charts. The information available in this panel comes from the Server Details and Resources Summary views.
- VM Disk Usage panel - Includes the amount of data read from and written to disk for this VM during the sample interval. The information available in this panel comes from the Resources Disk view.
- Host Disk Usage panel - Includes the amount of data read from and written to disk for this host server during the sample interval. The information available in this panel comes from the Resources Disk view.
- Virtualization panel - Includes the Virtual Memory Usage and Virtual Disk Usage charts plus the CPU Ready Wait Time gauge. The information available in this panel comes from the Server Details view.

Use the available virtualization alerts and VM-related reports to get the most information regarding your monitored virtual SQL Server instances and host servers.

Available VM-related reports

- Virtualization Statistics Report

- Virtualization Summary Report

Available virtualization alerts

- Host CPU Usage Alert
- Host Memory Swap Detected alert
- Host Memory Usage Alert
- Host Power State Alert
- VM CPU Ready Wait Time Alert
- VM CPU Usage Alert
- VM Host Server Change Alert
- VM Memory Swap Delay Detected Alert
- VM Memory Usage Alert
- VM Power State Alert
- VM Reclaimed Ballooned Memory Alert
- VM Resource Configuration Change Alert
- VM Resource Limits Detected Alert

Hyper-V user requirements

In virtualized environment with Hyper-V, the process of how SQL Diagnostic Manager collects and presents metrics is slightly different from that of a VMware setup. To successfully collect Hyper-V host metrics, the user needs access to the WMI credentials on the host server. These credentials are established on the **Virtualization Host Configuration** window (Tools >VM Configuration >New or Tools >VM Configuration >View/Edit)

In addition, to successfully collect VM metrics, the user needs access to the WMI credentials on the VM. These credentials are established under on the **OS Metrics** tab of the **Monitored SQL Server Properties** window (right-click on the monitored instance name and select Properties).

Configure your deployment

After initially installing SQL Diagnostic Manager, use the following configuration tasks to help you get the most out of SQL Diagnostic Manager:

- Connect to a SQL Diagnostic Manager Repository
- Add your SQL Server instances
- Configure your virtual machine connections
- Configure console options
- Set your Repository grooming schedule
- Use tags to organize your monitoring environment
- Use custom counters to track metrics
- Work with tags
- Create Scripts

Connect to the SQL Diagnostic Manager Repository

The first time you open the SQL Diagnostic Manager Management Console, SQL Diagnostic Manager displays the Connect to SQL Diagnostic Manager Repository window. Use this window to select the SQL Server instance, the SQL Diagnostic Manager Repository database name, and enter the authentication details the SQL Diagnostic Manager Console uses to communicate with the SQL Diagnostic Manager Repository.

The SQL Diagnostic Manager Console requires Read Access on the SQL Diagnostic Manager Repository database. You can use either Windows Authentication or SQL Server Authentication for this connection.

Access the Connect to SQL Diagnostic Manager Repository window

You can open the Connect to SQL Diagnostic Manager Repository window from the SQL Diagnostic Manager Console, selecting 🗔 > **Connect to SQLDM Repository**. The ability to connect to another Repository is important in disaster recovery situations where you need to change the location of your SQL Diagnostic Manager Repository.

Add your SQL Server instances

The Add Servers wizard allows you to add the SQL Server instances you want to monitor. The Add Servers wizard also allows you to configure all the common options you use for monitoring SQL Server collection settings and alerts, and apply an alert template.

> ✓ If you are adding several SQL Server instances and you want to configure the same alert thresholds on each instance, consider setting up an alert template before adding any of your SQL Server instances.

Access the Add Servers wizard

You can open the Add Servers wizard from the SQL Diagnostic Manager Console menu by selecting 🗔 **> Manage Servers**, and clicking **Add** in the Manage Servers window.

Other configurations that need attention when adding a virtualized SQL Server instance

If the monitored SQL Server instance you want to add resides on a virtual machine, add the instance using the Add Servers wizard, and then access the VM configuration window to associate the instance with the correct virtual machine and host.

> ✓ IDERA recommends that you register individual instances in the Add Servers wizard when looking to monitor availability replicas. Note that registering an Availability Group Listener may result in misleading data due to the failovers between availability replicas.

About alert templates

SQL Diagnostic Manager allows you to configure generic alert settings as a template that you can apply to servers and groups of servers in your organization. Select 🔧 **> Alert Configuration Template,** and complete the required fields to configure an alert template.

Delete a SQL Server instance

You can easily delete a SQL Server instance at any time by right-clicking the appropriate instance, and selecting **Delete**. SQL Diagnostic Manager displays a confirmation message that asks, "Would you like to retain the data collected for the selected instance?" Click **Yes** and SQL Diagnostic Manager retains data for the instance and includes it in some reports, such as the Server Inventory report. Click **No** and SQL Diagnostic Manager deletes the SQL Server instance and all related data.

Configure authentication

The Configure Authentication window of the Add Servers wizard allows you to select the authentication credentials SQL Diagnostic Manager uses when collecting performance and statistics information from your SQL Server instances. You can also set encryption to secure the connection.

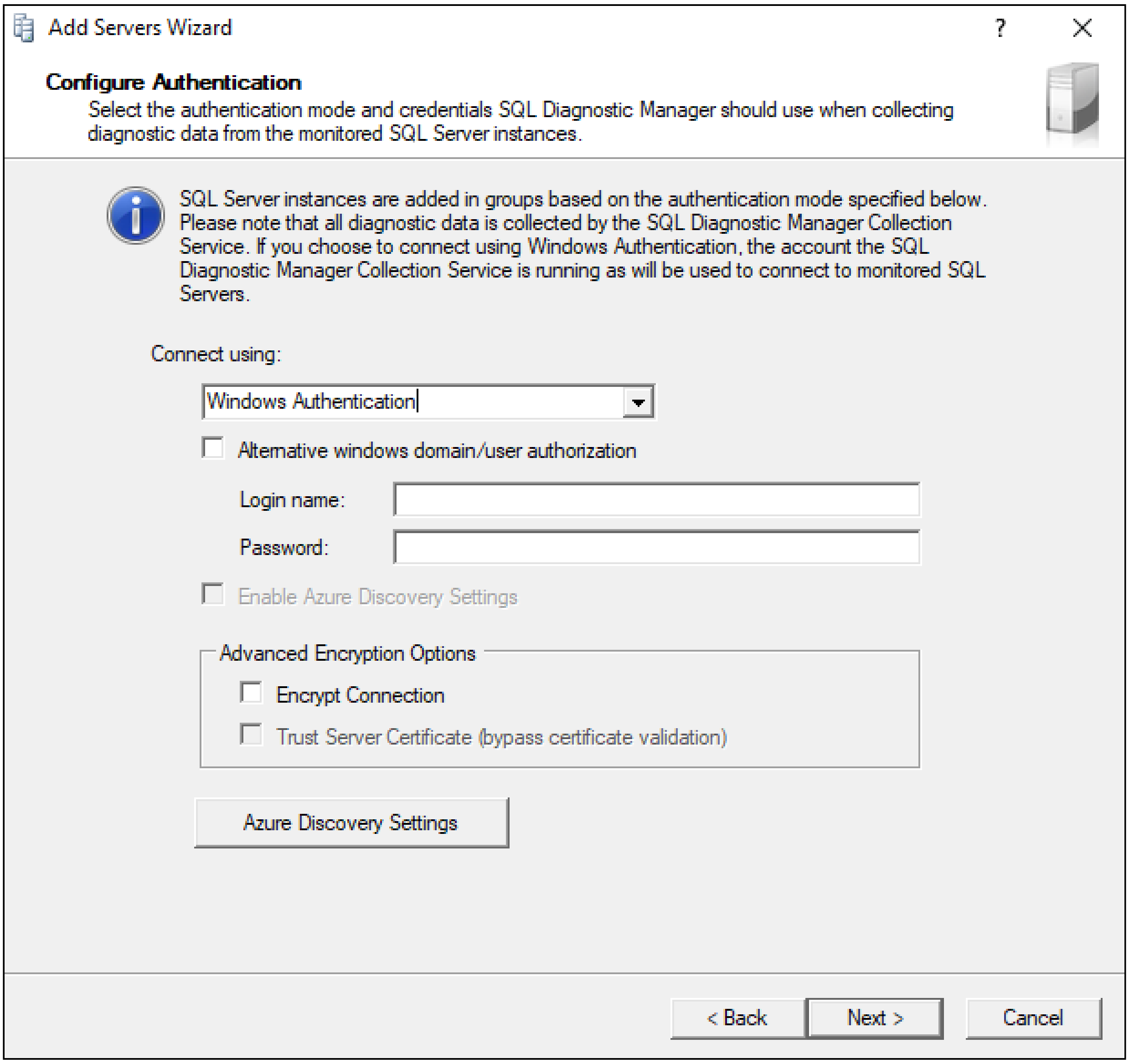
After selecting a connection type and encryption, click **Next** to continue.

Access the Add Servers wizard

You can open the Add Servers wizard from the SQL Diagnostic Manager Console menu by selecting ▤ **> Manage Servers**, and clicking **Add** in the Manage Servers window.

Select a connection type

Windows Authentication is the recommended collection type as SQL Diagnostic Manager uses a number of SQL trace statements that require a trusted connection. When you select and use **Windows Authentication**, the account the SQLdm Collection Service is running as is used to connect to the SQL Server instance.



Add Servers Wizard

Configure Authentication

Select the authentication mode and credentials SQL Diagnostic Manager should use when collecting diagnostic data from the monitored SQL Server instances.

SQL Server instances are added in groups based on the authentication mode specified below. Please note that all diagnostic data is collected by the SQL Diagnostic Manager Collection Service. If you choose to connect using Windows Authentication, the account the SQL Diagnostic Manager Collection Service is running as will be used to connect to monitored SQL Servers.

Connect using: Windows Authentication

□ Alternative windows domain/user authorization

Login name:

Password:

□ Enable Azure Discovery Settings

Advanced Encryption Options

□ Encrypt Connection

□ Trust Server Certificate (bypass certificate validation)

From SQL Diagnostic Manager 12.0, you can monitor across untrusted domains by selecting the **Alternative windows domain/user authorization.**

Select encryption

SQL Diagnostic Manager allows you to designate encryption methods used to encrypt data between the SQLdm Collection Service and the monitored SQL Server instance:

- **Encrypt Connection.**
- **Trust Server Certificate (Bypass Certificate Validation)**: Only available after you select **Encrypt Connection**.

Select instances to monitor

The Select Servers to Monitor window of the Add Servers wizard allows you to select one or more of the SQL Server instances you want to monitor using SQL Diagnostic Manager. If the name of the SQL Server instance you want to monitor does not appear in the list, type the instance name in the space provided in the Available Servers area. You can also designate specific ports for your SQL Server instances by entering a comma between the instance name and port number, for example, domain\instance name, port.

The **Available Licenses** field shows you the number of instances your current license permits SQL Diagnostic Manager to monitor.

> The Select Servers to Monitor window lists all the SQL Server instances provided by your domain controller. This list can include unsupported SQL Server instances. Be sure to select only SQL Server instances that are supported by SQL Diagnostic Manager.

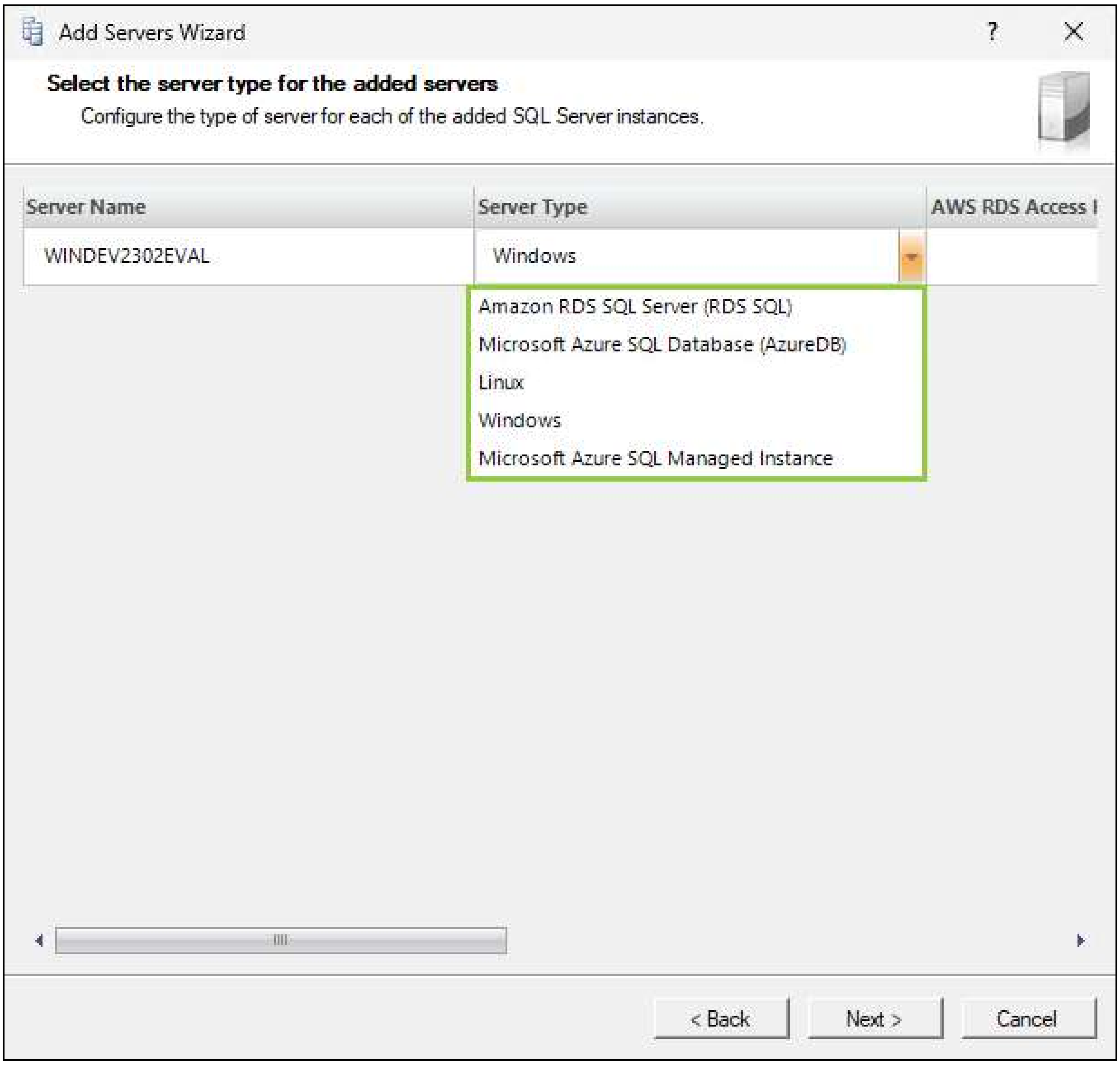
Access the Add Servers wizard

You can open the Add Servers wizard from the SQL Diagnostic Manager Console menu by selecting ▣ > **Manage Servers**, and clicking **Add** in the Manage Servers window.

Select cloud or Linux provider

Configure the type of server for each of the added SQL Server instances

- Amazon RDS SQL Server (RDS SQL)
- Microsoft Azure SQL Database (AzureDB)
- Linux
- Windows
- Microsoft Azure SQL Managed Instance



Add Servers Wizard

Select the server type for the added servers

Configure the type of server for each of the added SQL Server instances.

Server Name	Server Type	AWS RDS Access I
WINDEV2302EVAL	Windows	

?
Amazon RDS SQL Server (RDS SQL)
Microsoft Azure SQL Database (AzureDB)
Linux
Windows
Microsoft Azure SQL Managed Instance
< Back
Next >
Cancel

The select cloud providers for the added servers window allows you to choose a cloud provider for your monitored SQL Server instances that are hosted on the cloud (PaaS). SQL Diagnostic Manager supports Amazon RDS and Microsoft SQL Azure (SQL Azure Database, elastic pool, and managed instances).

Azure SQL and Amazon RDS permissions

Review the Minimum and Recommended Permissions for Amazon RDS and the Minimum Permissions for Azure SQL to create a SQL Server user on the server to monitor a cloud instance.

In addition, SQLDM supports the monitoring of images hosted on virtualized or cloud IaaS environments such as SQL Server on Azure virtual machines and Amazon EC2. Monitoring a virtualized instance requires no cloud-specific configuration. Select "Not a cloud instance" for a virtualized or cloud IaaS instance.

Access the Add Servers wizard

You can open the Add Servers wizard from the SQL Diagnostic Manager Console menu by selecting 🗔 **> Manage Servers,** and clicking **Add** in the Manage Servers window.

Instances hosted on the cloud

SQL Diagnostic Manager allows you to view a wide range of information collected for your PaaS-monitored instances hosted on Amazon RDS and Microsoft SQL Azure (Azure SQL Database, elastic pool, and managed instances).

> When monitoring Amazon RDS servers, SQL Diagnostic Manager cannot monitor or alert on SQL Agent jobs.

> In addition, SQLDM supports monitoring images with SQL Server installed hosted on virtualized or cloud IaaS environments (e.g., Azure virtual machines, Amazon EC2, or Google Compute Engine). Monitoring a virtualized instance requires no cloud-specific configuration.

> SQL Diagnostic Manager has new DBaaS metrics and alerts, for more information review the Metric Alerts.

For more information on metrics, check the Metric Alerts page. Below is some information about the additional metrics data available for cloud instances.

> For more information on Amazon RDS and Microsoft SQL Azure user permission, visit the User Creation Scripts page.

Additional metrics for Amazon RDS and Microsoft SQL Azure in SQL Diagnostic Manager

For monitored SQL Server instances hosted on **Amazon RDS**:

- CPU Credit Balance High
- CPU Credit Balance Low
- CPU Credit Usage
- Disk Queue Depth
- Read Latency High
- Read Latency Low
- Read Throughput
- Swap Usage
- Write Latency High
- Write Latency Low
- Write Throughput

For monitored SQL Server instances hosted on **Microsoft SQL Azure**:

- Average Data IO Percent High
- Average Data IO Percent Low
- Average Log Write Percent High
- Average Log Write Percent Low
- Database Average Memory Usage Percent High
- Database Average Memory Usage Percent Low
- In-Memory Storage Usage Percent High
- In-Memory Storage Usage Percent Low
- Max Session Percent High
- Max Session Percent Low
- Max Worker Percent High
- Max Worker Percent Low

- Service Tier Changes

User Permissions for Azure

The minimum permission required for Azure SQL is *Server admin*.

> ⓘ For more information about the characteristics of the Server admin and Azure Active Directory admin accounts, review Authorize database access to SQL Database, SQL Managed Instance, and Azure Synapse Analytics.

Configure data collection

The Configure SQL Diagnostic Manager Collection window of the All Servers wizard allows you to set the interval at which you want to collect diagnostic data and raise alerts, and whether you want to enable query monitoring.

The collection interval you specify refers to the time SQL Diagnostic Manager waits to collect statistical information on your SQL Server instance. This data includes the resource, session, database and tables, query, and service information.

The Query Monitor is a standard SQL Server trace that collects events occurring on your SQL Server instance over a period of time.

> ⚠ Enabling the Query Monitor can cause SQL Server performance degradation while it runs. Enable the Query Monitor only when diagnosing specific query issues.

After making any changes to the collection interval or enabling the Query Monitor, click **Next** to continue.

Access the Add Servers wizard

You can open the Add Servers wizard from the SQL Diagnostic Manager Console menu by selecting 🗔 **> Manage Servers**, and clicking **Add** in the Manage Servers window.

Select a collection interval

Choosing the appropriate interval depends on your specific monitoring needs. When your SQL Server instance performs poorly, you can decrease the collection interval so that you can track changes more often. When monitoring a SQL Server instance that has a very heavy client load and a large number of databases, you can increase the time period between collections to reduce the possibility of the frequent collections causing a performance impact on your clients.

Monitoring your environment by collecting query activities

When you experience query timeouts or other performance issues, you can collect query-related activities through the Query Monitor. Note that enabling these options can degrade performance on the monitored SQL Server instance because of the additional data collection and storage. To help alleviate degradation, SQL Diagnostic Manager allows you to select only those types of queries you want to monitor such as batches, statements, procedures, and triggers. Additional threshold fields allow you to set the levels at which you consider a query as performing poorly.

> ✓ It is important to remember that once you complete your problem diagnosis, you can disable the Query Monitor on the Monitored SQL Server Properties window by selecting the Query Monitor tab and then clearing the **Enable the Query Monitor** check box.

Using advanced Query Monitor options

Query Monitor includes advanced options that allow you to filter applications, databases, and SQL text from collection. Use semicolons (;) to separate multiple entries. You can also use the percent character (%) as a wildcard.

You can access this window by clicking the **Advanced** button in the Query Monitor tab of the monitored SQL Server Properties window.

Configure OS metric collection

The Configure OS Metric Collection window of the Add Servers wizard lets you select which type of operating system metrics collection you want to use or whether you do not want to collect any OS metrics from a SQL Server instance:

- Do not collect Operating System data
- Collect Operating System data using OLE Automation
- Collect Operating System data using direct WMI (selected by default when adding a new SQL Server instance)

SQL Diagnostic Manager uses OLE automation or a direct connection to the Windows Management Interface (WMI) when collecting OS metrics and service status data on clustered SQL Servers. For additional information about OS metrics collection, see Configure OS metrics monitoring.

> SQL Diagnostic Manager retains your previous settings upon upgrade if OLE automation is the default for your monitored SQL Server instance.

After selecting your method for OS metrics collection, click **Next** to continue.

Access the Add Servers wizard

You can open the Add Servers wizard from the SQL Diagnostic Manager Console menu by selecting ▤ **> Manage Servers**, and clicking **Add** in the Manage Servers window.

Disabling OS metric collection

SQL Diagnostic Manager does not require OS metrics collection. However, if you disable this feature, SQL Diagnostic Manager ceases to collect OS metrics and does not raise any previously-associated alerts. You can easily enable OS metric collection at any time if you decide that you want to continue collecting these metrics.

Permissions for direct WMI collection

It is preferred that the WMI user is a local administrator on the monitored SQL Server instance. However, if you do not want to grant administrator access, use the following steps to configure remote WMI access in Microsoft Windows:

1. Add the user account to the Performance Log Users and Distributed COM users groups.
2. Grant privileges to WMI.

You also may need to add the WMI user account to the following policies:

- Act as part of the operating system
- Log on as a batch job
- Log on as a service
- Replace a process level token

For more information about using a direct WMI connection, see the Microsoft document, Securing a Remote WMI Connection.

Using direct WMI when the collection service is on a different domain than the SQL Server

In environments where cross-domain trust security is enforced, data from the asynchronous collection is not returned from an untrusted domain to a trusted domain. As a result, the collection service does not receive the data.

If you select **Collect Operating System data using direct WMI** and the machine used for your collection service is in a different domain than your monitored SQL Server instance, you must make some configuration changes on your collection service machine. If you do not make these changes, change your OS metrics collection to **Collect Operating System data using OLE automation** if you want OS and disk statistics plus the auto-discovery of mount points.

Select an alert template and tags

The Select Alert Template and Tags window lets you assign an alert template and tags while you add an instance. Alert templates allow you to configure generic alert settings to apply to your servers or groups of servers. Tags are labels that help you organize server instances into meaningful groups.

To apply an alert template, select the appropriate template from the list. If you do not have an existing custom alert template, you can create an alert template after you add your SQL Server instance, and then apply the template to your server. You may select one or more existing tags from the list, or create new tags by clicking **Add Tag**.

If you create an instance before creating any custom alert templates, SQL Diagnostic Manager applies the default alert template automatically. You can then create an alert template and apply it to the server once the new template is available.

After selecting your baseline collection, click **Next** to continue.

Access the Add Servers wizard

You can open the Add Servers wizard from the SQL Diagnostic Manager Console menu by selecting **> Manage Servers**, and clicking **Add** in the Manage Servers window.

Using tags

Tags are customizable to suit your needs. For example, you may want to view only server instances used by a particular department (like Accounting), in a specific location, or by some other method (like SQL Server version).

You can assign multiple tags to each instance so that the instance appears in several different groups.

Configure your virtual machine connections

The VM Configuration window allows you to associate your monitored virtual SQL Server instances with the virtualization host server that manages your VMs and the VM on which the monitored SQL Server instance is running.

Virtual machines appearing in the list are based on the permissions for the user account typed into the **Virtualization Host Configuration** dialog box. To view a specific VM, you must have the View permission on all parent folders.

✓ Remember to renew your link after changing the name of a virtual machine. Once the name change is complete, simply open the VM Configuration window and wait until after SQL Diagnostic Manager is done contacting the vCenter server or Hyper-V Host server to get a list of your VM names. Note that your updated VM name already appears in the list. Click **OK** to save the new name to the list of VMs. If you do not update the name, this action occurs again the next time you access the VM Configuration window.

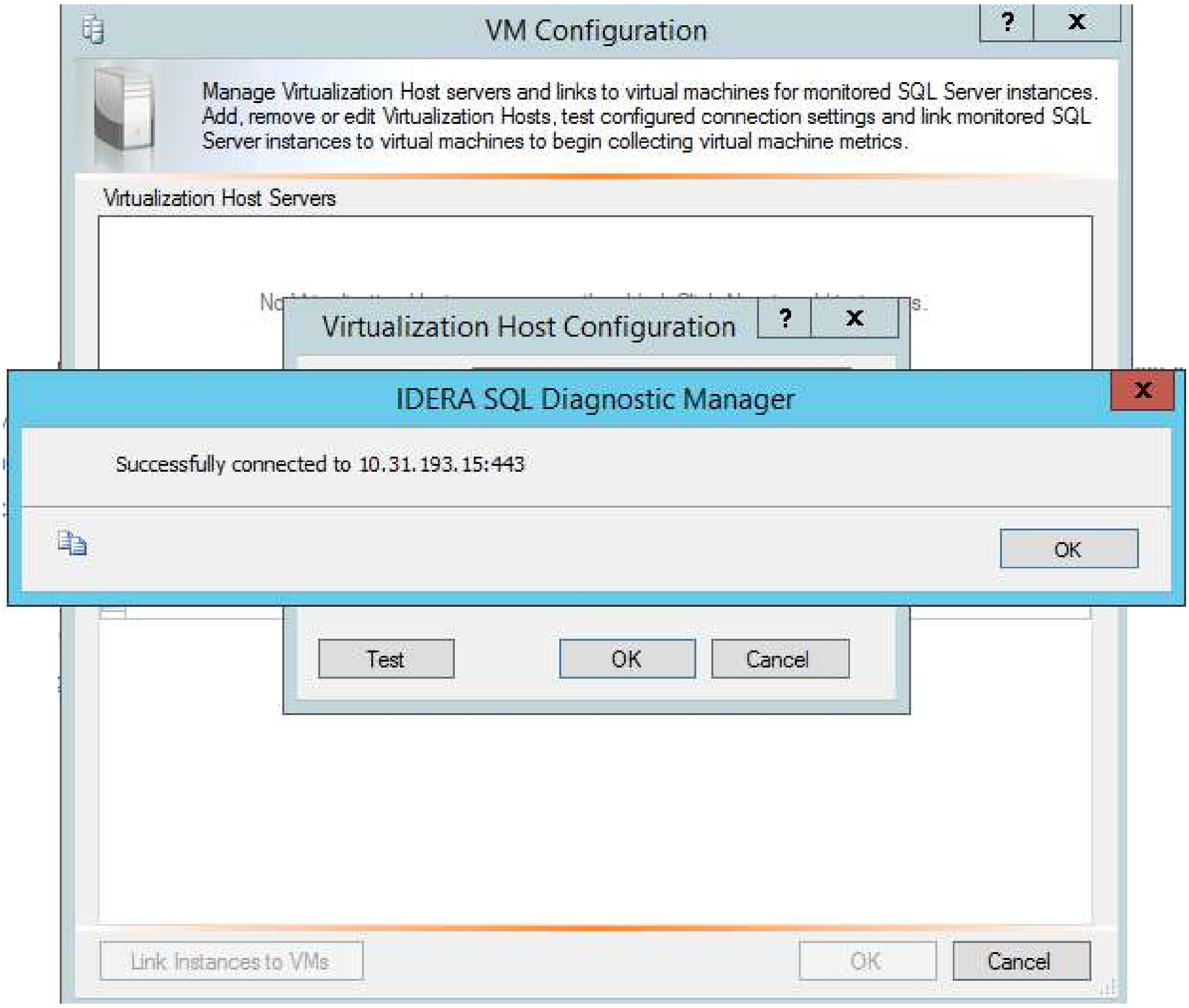
Access the VM Configuration window

To open the VM Configuration window, select **Tools > VM Configuration**, or click **VM Configuration** from the Manage Servers window. You can also access this window from the Virtualization tab of the Server Properties window by clicking the **VM Configuration** button.

Add a host server

SQL Diagnostic Manager allows you to add a new vCenter Server through the VM Configuration window, follow these steps to add one:

1. Click **New**.
2. In the Virtualization Host Configuration window fill in the blanks as follows:
   a. **Server:** The vCenter server that has to be written as the **IP or vCenter Server name:443** (Default port #443).
   b. **Name:** Use a friendly name to distinguish your server from other vCenters.
   c. **User and password:** Use the domain account that is running the SQLDM Services that has read access to vCenter.
3. Click **Test** to test the configuration data.
4. Click **OK** to add the vCenter Server to the list of Virtualization Host Servers.



VM Configuration
?
x
Manage Virtualization Host servers and links to virtual machines for monitored SQL Server instances. Add, remove or edit Virtualization Hosts, test configured connection settings and link monitored SQL Server instances to virtual machines to begin collecting virtual machine metrics.
Virtualization Host Servers
Virtualization Host Configuration
IDERA SQL Diagnostic Manager
Test
OK
Cancel
Link Instances to VMs
OK
Cancel

Successfully connected to 10.31.193.15:443

OK

Hyper-V and metrics collection

See Hyper-V user requirements for information on how to successfully collect Hyper-V host and VM metrics.

Verify your connection to the host server

You can test the connection to your listed host servers by selecting the appropriate server from the list, and then clicking **Test**.

SQL Diagnostic Manager displays an icon with your current connection status. If the connection fails, click **View/ Edit** and verify your connection details. Make the necessary changes to access your host server, click **Test**, and then click **OK** to save your changes after a successful test.

Associate a monitored SQL Server instance to a VM

Once you add your SQL Server instances to SQL Diagnostic Manager for monitoring, you must associate them with their host server and virtual machine.

To associate a monitored SQL Server instance to a virtual machine:

1. Verify that the instance you want to associate to the host appears in the list.
2. Click the **Virtualization** column for the appropriate virtual instance, and then select the associated host server from the drop-down list.
3. Click the **Virtual Machine** column, and then select the name of the virtual machine where this instance resides. SQL Diagnostic Manager populates this drop-down list based on the servers on the selected host server.
4. Click **Link Instances to VMs**.
5. Click **OK** to save your changes and close this window.

Configure your VM host server connection

The vCenter Connection Configuration window allows you to add or update connection details for your virtual machine host servers. Complete the access information for the server, and the click **Test** to make sure you typed the correct access credentials. Click **OK** after a successful test.

Occasionally, a connection test fails. Make sure you typed accurate information in the appropriate fields, and then click **Test**. If the test fails again, there may be an issue with the server to which you are trying to connect.

Access the vCenter Connection Configuration window

To access the vCenter Connection Configuration window, first access the VM Configuration window by selecting 🔧 **> VM Configuration**, or by clicking **VM Configuration** from the Manage Servers window. You can also access this window from the Virtualization tab of the Server Properties window. Once in the VM Configuration window, click **New**.

vCenter Server port requirements

The vCenter Server requires that you open the ports included in the following table. For the most current list of ports, see the VMware Knowledge Base article regarding network port requirements.

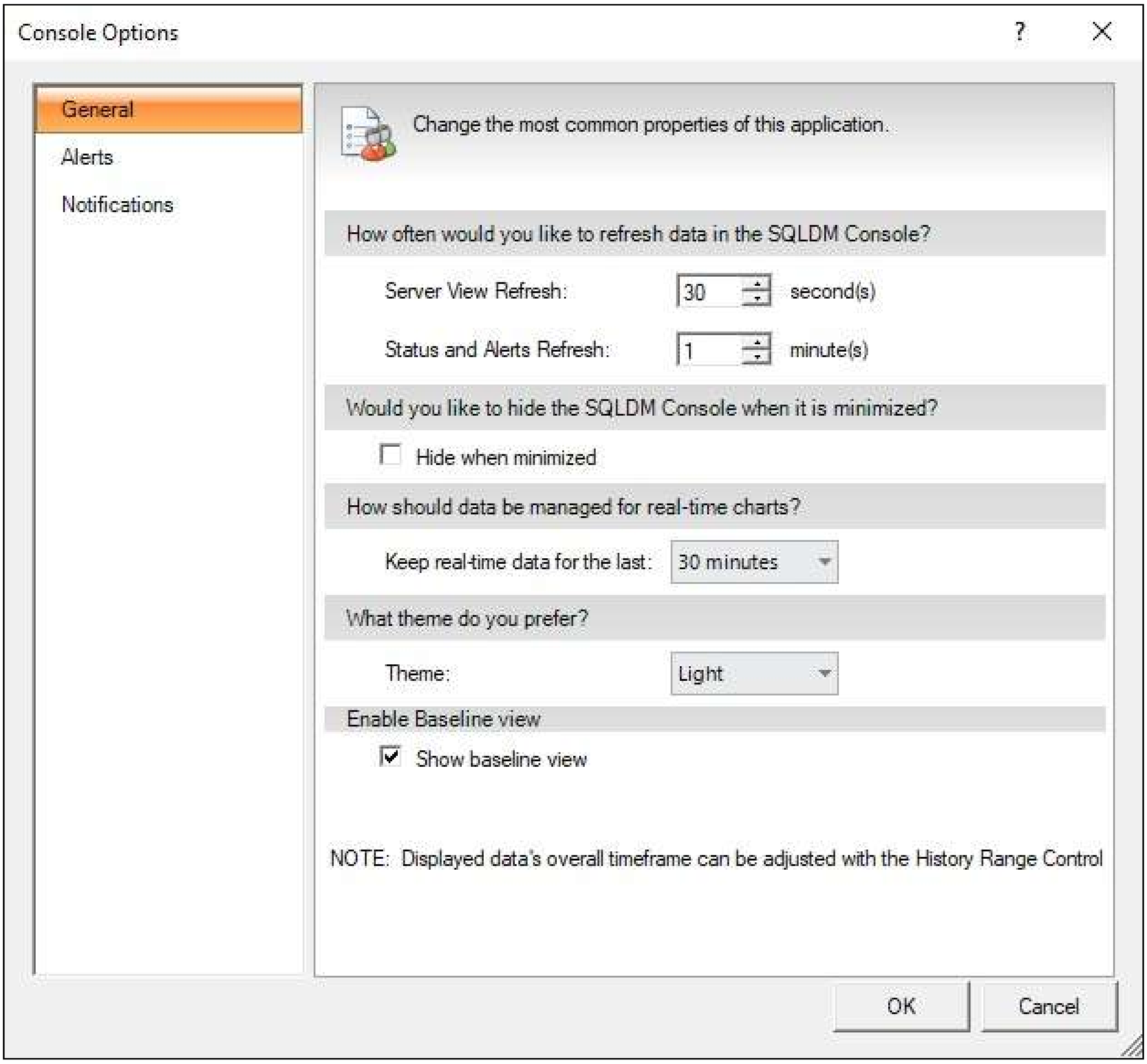
Port	Description
80	Required for direct HTTP connections. Note that this port redirects requests to HTTPS Port 443.
389	Active Directory Services for the vCenter Server group.
443	Listens for connection from the vSphere Client, vSphere Web Access Client, and other SDL clients.
636	SSL port of the local instance for vCenter Linked Mode.
902 (UDP)	Used to send data to managed hosts.
902/903	Used by the vSphere Client to display virtual machine consoles.
5989 (TCP)	CIM transaction traffic (Hardware Status).
8080	vCenter Management Webservices HTTP.
8443	Secure connection for vCenter Management Webservices HTTPS.

Port	Description
60099	Used to stream inventory object changes to SDK clients. Firewall rules for this port on the vCenter Server can be set to block all, except from and to localhosts if the clients are installed on the same host as the vCenter Server service.

Configure console options

You can specify the number of console options in the Console Options window that affect overall product behavior. To access the Console Options window, select 🔧 **> Console Options** from the SQL Diagnostic Manager Console toolbar.

The following tabs are available on the Console Options window:



Change the most common properties of this application.

How often would you like to refresh data in the SQLDM Console?

Server View Refresh: 30 second(s)

Status and Alerts Refresh: 1 minute(s)

Would you like to hide the SQLDM Console when it is minimized?

□ Hide when minimized

How should data be managed for real-time charts?

Keep real-time data for the last: 30 minutes

What theme do you prefer?

Theme: Light

Enable Baseline view

☑ Show baseline view

NOTE: Displayed data's overall timeframe can be adjusted with the History Range Control

General

The General tab allows you to set how often the console refreshes data, hide the Console when minimized, select how SQL Diagnostic Manager manages chart data, choose what colors you want SQL Diagnostic Manager to use, and enable the Baseline view.

Alerts

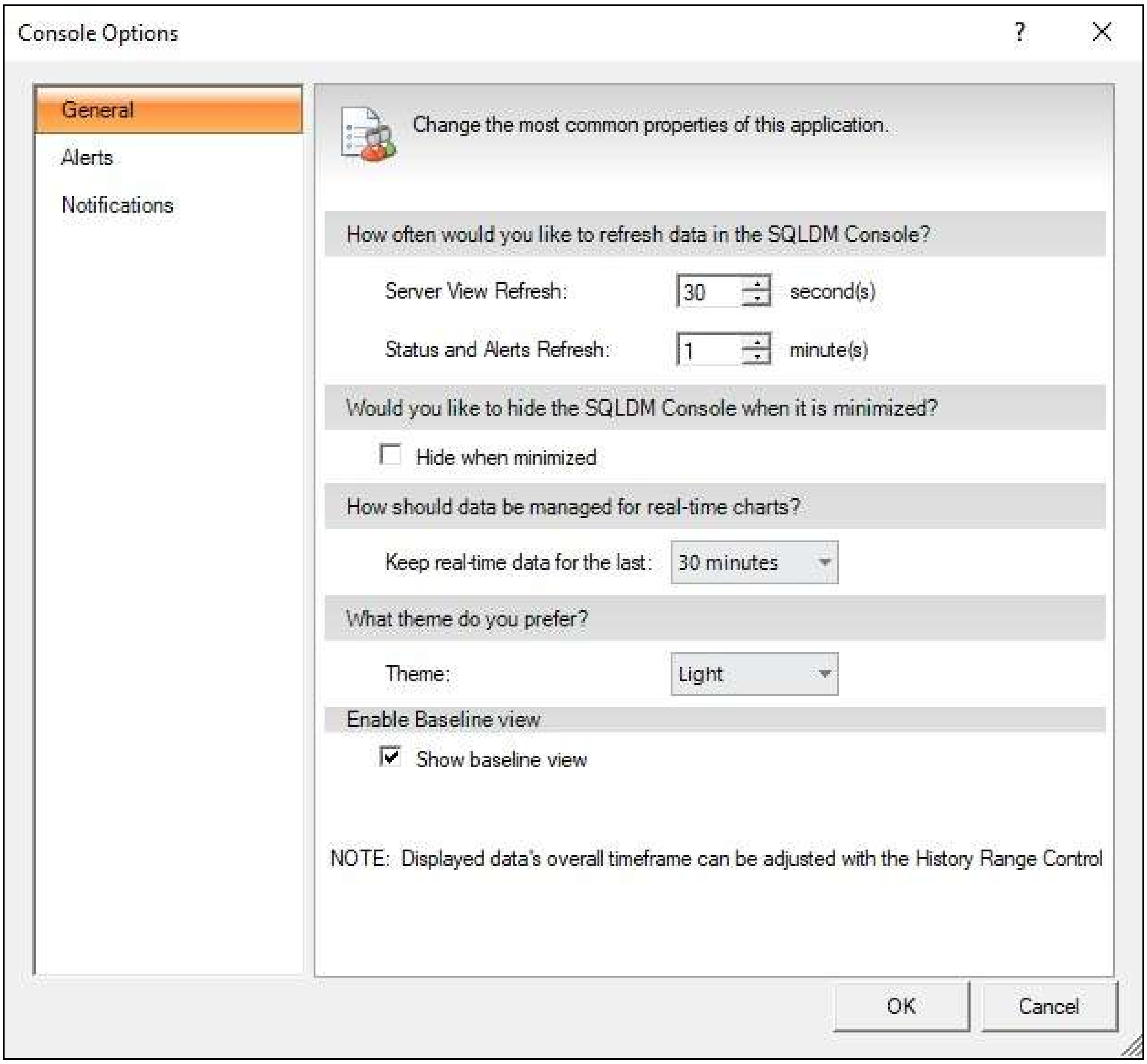
The Alerts tab allows you to limit the number of historical alerts displayed in the Alerts view, which can improve the performance of the view when there is a large number of alerts.

Notifications

The Notifications tab allows you to configure how SQL Diagnostic Manager notifies you when alert data crosses a threshold.

Define common properties

The options on the **General** tab represent the most common properties users can change in the SQL Diagnostic Manager Console.



Change the most common properties of this application.

How often would you like to refresh data in the SQLDM Console?

Server View Refresh: 30 second(s)

Status and Alerts Refresh: 1 minute(s)

Would you like to hide the SQLDM Console when it is minimized?

□ Hide when minimized

How should data be managed for real-time charts?

Keep real-time data for the last: 30 minutes

What theme do you prefer?

Theme: Light

Enable Baseline view

☑ Show baseline view

NOTE: Displayed data's overall timeframe can be adjusted with the History Range Control

Access the Console Options window General tab

You can open the General tab of the Console Options window from the SQL Diagnostic Manager Console by selecting **> Console Options**. The General tab is available by default.

Set your refresh intervals

The Refresh Interval refers to the amount of time the SQL Diagnostic Manager Console waits before gathering data from the SQL Diagnostic Manager Repository. There are two types of refreshes. Each type is associated with different SQL Console components:

Server View Refresh

Refers to the amount of time the SQL Diagnostic Manager Console waits before refreshing the currently active view. When you first open a view, the view is refreshed with the latest data SQL Diagnostic Manager has collected directly from the monitored SQL Server instance. You may want to lower the amount of time between refreshes if you are trying to diagnose a specific problem that requires a shorter interval. The interval for this field is between one and 300 seconds.

Status and Alerts Refresh

Refers to the amount of time the SQL Diagnostic Manager Console waits before polling every monitored SQL Server instance and displaying notification pop-ups, updating the monitored SQL Server instance tree with status changes, and updating the SQLDM Today view with status changes. The interval for this field is between one and 60 minutes.

Hide the desktop client

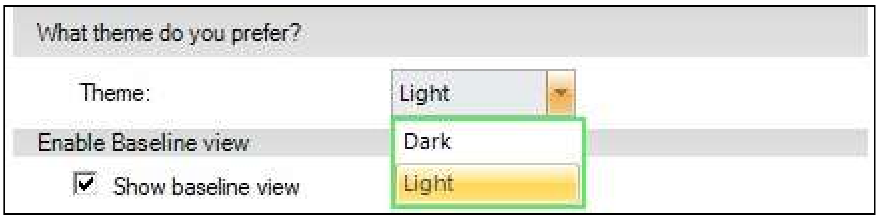
The **Hide when minimized** toggle determines whether SQL Diagnostic Manager displays as an active application in your Windows taskbar. When you want to open your SQL Diagnostic Manager Console again, double-click the **IDERA SQL Diagnostic Manager** icon in your taskbar. Enabling or disabling this option has no effect on data collection or the refresh rate of your currently active view.

Use chart options

Chart options allow you to determine how much data is kept in your real-time charts and select from the following options: 1 minute, 5 minutes, 10 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, 4 hours, 8 hours, 12 hours, and one day.

Use a theme

The color theme field allows you to select the background color you prefer for the SQL Diagnostic Manager Management Console, select between Dark and Light. By default, the scheme is set to Light.



What theme do you prefer?

Theme: Light

Dark

Light

Enable Baseline view

☑ Show baseline view

Enable Baseline view

The Baseline view can be enabled and disabled by checking the **Show baseline view** box.

Configure the Alerts view

The Alerts tab of the Console Options window allows you to enter the number of rows you want displayed in the historical Alerts view. While this restriction limits the historical view, there is no limit to the number of rows used for your active alerts. The default entry is **0**, which does not limit the number of rows in your historical view.

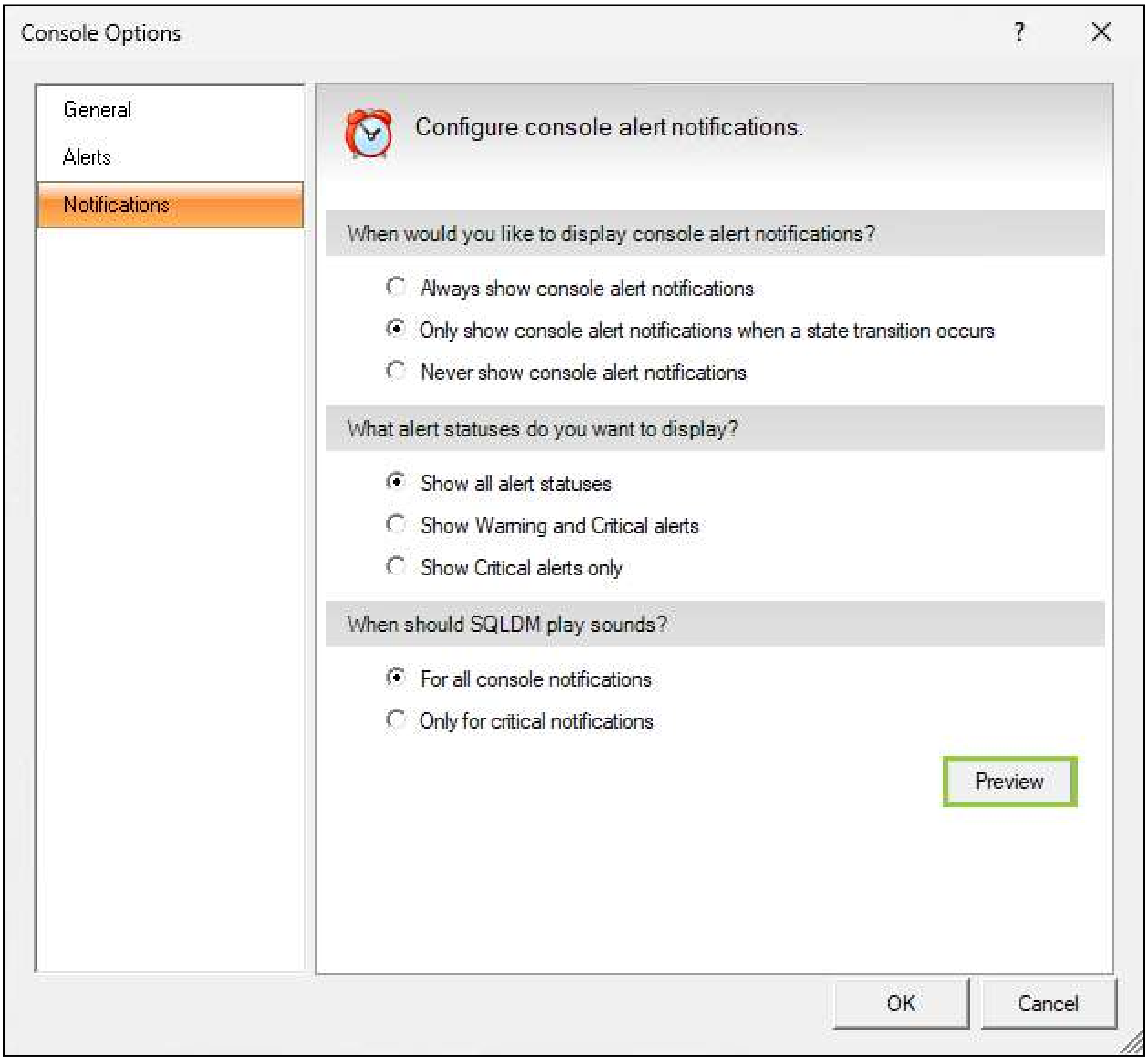
Access the Console Options window Alerts tab

You can open the Alerts tab of the Console Options window from the SQLDM Console by selecting 🔧 **> Console Options**, and then selecting the Alerts tab.

Configure notification settings

The Notifications tab of the Console Options window allows you to configure when and how the SQL Diagnostic Manager Console displays alert notifications. When you select an option to show notifications, SQL Diagnostic Manager displays a pop-up notification in your task bar each time it reaches a threshold.

To see an example of a console alert, click **Preview**, and the alert pop-up appears as shown in the following image.



Configure console alert notifications.

When would you like to display console alert notifications?

○ Always show console alert notifications
● Only show console alert notifications when a state transition occurs
○ Never show console alert notifications

What alert statuses do you want to display?

● Show all alert statuses
○ Show Warning and Critical alerts
○ Show Critical alerts only

When should SQLDM play sounds?

● For all console notifications
○ Only for critical notifications

Access the Console Options window Notifications tab

You can open the Notifications tab of the Console Options window from the SQL Diagnostic Manager Console by selecting 🔧 **> Console Options**, and then selecting the Notifications tab.

Selecting visual notifications

SQL Diagnostic Manager allows you to select when and for which alert states you receive alert notifications. You can select from the following options regarding when you want SQL Diagnostic Manager to display notifications:

Always show console alert notifications

Provides alert notifications occur after every refresh.

Only show console alert notifications when a state transition occurs

Limits the alert notifications you receive on refreshes to only those that change states.

Never show console alert notifications

Prevents the occurrence of all console notifications, but you continue to receive all email alerts. This setting is dependent upon your particular needs and you can modify the alert at any point. If you receive too many notifications, consider limiting notifications to occur only after an alert state transition. However, if you monitor a problematic SQL Server and want to know when a threshold is met, consider monitoring all alert states.

Select from the following options regarding which alert statuses trigger notifications:

Show all alert statuses

Display notifications for all alert state changes.

Show Warning and Critical alerts

Display notifications only when an event triggers a Warning or Critical alert.

Show Critical alerts only

Display notifications only when an event triggers a Critical alert.

Selecting audible notifications

The options in the When should SQL Diagnostic Manager play sounds section allow you to toggle whether you want to hear an audible notification along with the alert in SQL Diagnostic Manager whenever an event triggers a critical alert. The default **For all console notifications** option helps to let you know of any notification within SQL Diagnostic Manager. Select **Only for critical notifications** and SQL Diagnostic Manager plays the audible notification only when an event triggers a critical alert.

Set your SQL Diagnostic Manager Repository grooming schedule

The Grooming Options window allows you to schedule and configure SQL Diagnostic Manager Repository grooming. Grooming is the process of deleting metrics stored in the SQL Diagnostic Manager Repository that are older than a given date and time. It is important to groom data from your Repository to optimize the performance of processes such as report generation and data collection.

> You can limit the amount of data stored in the SQL Diagnostic Manager Repository by lowering the number of days data is stored. This is particularly important when monitoring a large number of servers or when storing Query information at a low threshold.

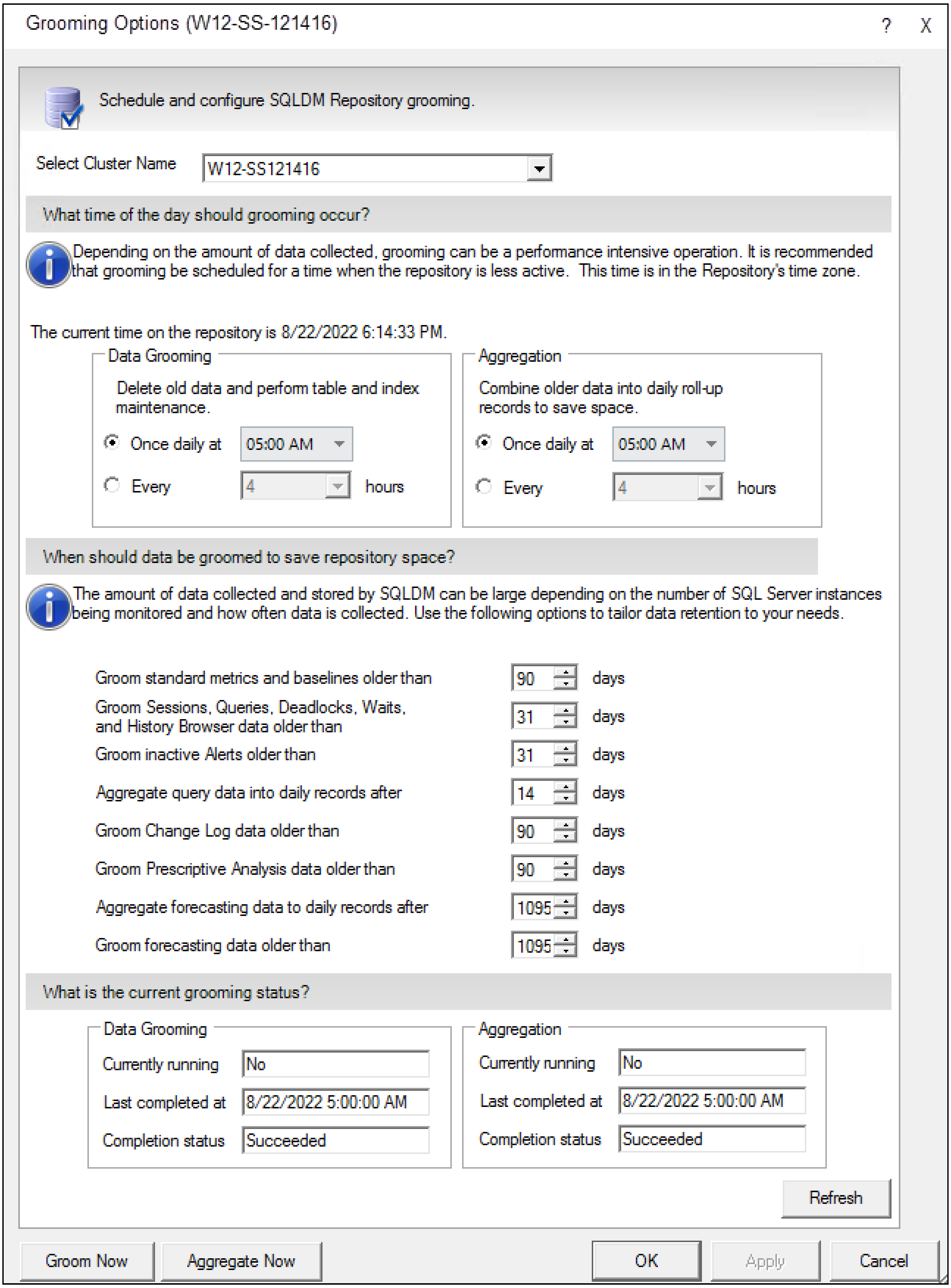
Access the Grooming Options window

To open the Grooming Options window, select 🔧 **> Grooming Options** from the toolbar menu.

In the Grooming Options window, you can set a specific hour or determine after how many hours you want to groom your data and aggregate queries.

Also, you can define when your data should be groomed to save repository space, under the following options (in days):

- Groom standard metrics and baselines older than
- Groom Sessions, Queries, Deadlocks, Waits, and History Browser data older than
- Groom inactive Alerts older than
- Aggregate query data into daily records after
- Groom Change Log data older than
- Groom Prescriptive Analysis data older than
- Aggregate forecasting data to daily records after
- Groom forecasting data older than



Grooming Options (W12-SS-121416)

Schedule and configure SQLDM Repository grooming.

Select Cluster Name: W12-SS121416

What time of the day should grooming occur?

Depending on the amount of data collected, grooming can be a performance intensive operation. It is recommended that grooming be scheduled for a time when the repository is less active. This time is in the Repository's time zone.

The current time on the repository is 8/22/2022 6:14:33 PM.

Data Grooming

Delete old data and perform table and index maintenance.

● Once daily at 05:00 AM

○ Every 4 hours

Aggregation

Combine older data into daily roll-up records to save space.

● Once daily at 05:00 AM

○ Every 4 hours

When should data be groomed to save repository space?

The amount of data collected and stored by SQLDM can be large depending on the number of SQL Server instances being monitored and how often data is collected. Use the following options to tailor data retention to your needs.

Groom standard metrics and baselines older than	90	days
Groom Sessions, Queries, Deadlocks, Waits, and History Browser data older than	31	days
Groom inactive Alerts older than	31	days
Aggregate query data into daily records after	14	days
Groom Change Log data older than	90	days
Groom Prescriptive Analysis data older than	90	days
Aggregate forecasting data to daily records after	1095	days
Groom forecasting data older than	1095	days

What is the current grooming status?

Data Grooming

Currently running	No
Last completed at	8/22/2022 5:00:00 AM
Completion status	Succeeded

Aggregation

Currently running	No
Last completed at	8/22/2022 5:00:00 AM
Completion status	Succeeded

The current grooming status is shown at the bottom of the Grooming Options window, it displays the current status of the grooming and the aggregation actions. It also displays the date and time of the latest operation, and the current completion status. Click **Refresh** to get the updated information of these actions at any time.

Click the options **Groom Now** and **Aggregate Now** located at the bottom of the Grooming Options window, to perform these actions instantly.

Use custom counters to track metrics

SQL Diagnostic Manager, displays a wide variety of the most common SQL Server and Operating System performance metrics, by default. In addition to providing these common metrics, custom counters provide the ability to add additional performance metrics to the SQL Diagnostic Manager Console used for historical trending, on-demand monitoring, and schedule refresh alerting.

> ✓ **Import or export a custom counter**
>
> In the IDERA community site you can share or import custom counters created by other SQL Diagnostic Manager users.

You can find a list of operating system counters by searching for "Windows Performance Counters" on technet.microsoft.com.

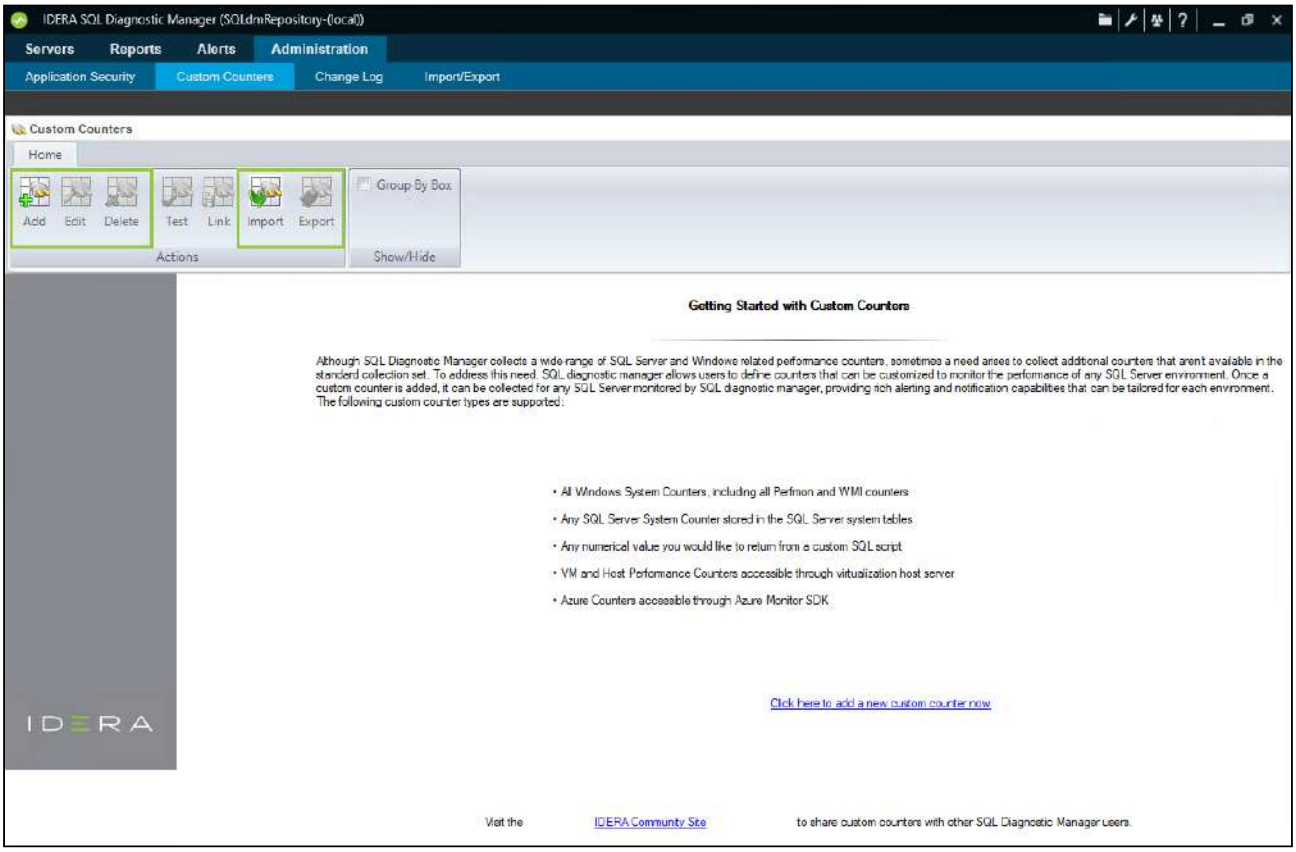
You can add the following types of counters:

- All Windows System Counters, including all Perfmon and WMI counters
- Any SQL Server System Counter stored in the sysperfinfo system table
- Any numerical value you would like to return from a custom SQL script
- VM and host server performance counters accessible through the host Server
- Azure Server System Counter to monitor counters that are collected using API supplied by Azure.

> ✓ In addition to providing all of the above counters, you can add any additional counters contained in a new Windows or SQL Server Service Pack. This allows you the flexibility to monitor any metric that is important to your enterprise.

Access the Custom Counters view

To open the Custom Counters view, click **Administration > Custom Counters.**



Getting Started with Custom Counters

Although SQL Diagnostic Manager collects a wide-range of SQL Server and Windows related performance counters, sometimes a need arises to collect additional counters that arent available in the standard collection set. To address this need. SQL diagnostic manager allows users to define counters that can be customized to monitor the performance of any SQL Server environment. Once a custom counter is added, it can be collected for any SQL Server monitored by SQL diagnostic manager, providing rich alerting and notification capabilities that can be tailored for each environment. The following custom counter types are supported:

- All Windows System Counters, including all Perfmon and WMI counters
- Any SQL Server System Counter stored in the SQL Server system tables
- Any numerical value you would like to return from a custom SQL script
- VM and Host Performance Counters accessible through virtualization host server
- Azure Counters accessible through Azure Monitor SDK

Click here to add a new custom counter now

Visit the IDERA Community Site to share custom counters with other SQL Diagnostic Manager users.

Create a custom counter

To add a custom counter:

1. Select the **Administration** tab and click **Custom Counters**.
2. Click **Add** to create a Custom Counter.
3. Click **Next** on the Add Custom Counter wizard Welcome page.
4. Select a counter type, and click **Next**.
5. Select the counter you want to monitor, and click **Next**.
6. Select the counter calculation type and scale factor, and click **Next**.
7. Type a name for the custom counter, select a **Category**, add a **Description**, and click **Next**.
8. Configure your alert settings related to the new custom counter, and click **Next**.
9. Click **Finish**.

Using custom SQL scripts

Use custom SQL scripts to monitor metrics that are not connected to system or SQL counters, under-utilized SQL 2005 DMVs, or metrics that are very specific to your environment, such as row count for a production table.

SQL Diagnostic Manager does not scrub custom SQL batches for SQL Injection protection. Use caution when entering custom SQL scripts as it is an advanced feature. The go command is not a Transact-SQL statement and you cannot use this command in custom SQL batches. The go command is a batch separator for Management Studio, Query Analyzer, sqlcmb, and osql.

Locate your custom counters

Custom counters appear in the following places in the SQL Diagnostic Manager Console:

Alert Configuration window

Your new custom counters appear in the Alert Configuration and the Default Alert Configuration windows in the Custom category. You can edit the alert thresholds, and even decide whether you want an alert associated with the new counter.

Server Details view

The Server Details view lists all the metrics monitored by SQL Diagnostic Manager, including all your new custom counters. You can filter this view to display only your custom counters by selecting the Custom Counters radio-button in the Filter ribbon. You can access this window by selecting details on the Server view or by double-clicking Custom Counters in the Servers tree.

Custom Counters table

SQL Diagnostic Manager provides a list of all your custom counters in the Custom Counters table on the Administration window. In addition to viewing a list of custom counters, you can add a new counter, edit a counter, delete a counter, test a counter, or link a counter to a SQL Server instance for monitoring.

Add a custom counter

Custom counters are Windows Operating System or SQL Server metrics that are not monitored, by default, by SQL Diagnostic Manager. In addition to Windows Operating System and SQL Server metrics, you can enter T-SQL scripts to monitor any variable in your environment or select from a list of virtualization performance counters if you have monitored servers hosted on a virtual machine. Once added to the SQL Diagnostic Manager interface, you can monitor the results, view historical trending of the metric, configure alerts and receive notifications on them, and generate reports based on collected data.

Access the Add Custom Counter wizard

You can open the Add Custom Counter wizard by clicking **Administration > Custom Counters,** and selecting **Add** in the Custom Counters view.

Select counter type

The Select Counter Type window of the Add Custom Counter wizard allows you to choose the method you want SQL Diagnostic Manager to use when collecting the counter. SQL Diagnostic Manager offers the following counter types:

Windows System Counter

Select this option to pick from counters that include both those available in Windows System Performance Monitor (PerfMon) and Windows Management Instrumentation (WMI) performance counter types.

SQL Server System Counter

Select this option to pick from counters that are gathered via standard T-SQL from SQL Server.

Custom SQL Script

Select this option to enter a custom T-SQL script to monitor variables such as those which are not connected to the operating system or SQL Server counters or metrics that are very specific to your environment such as a row count on a particular production table. Note that your script must return a single numeric value.

Virtual Machine Counter

Select this option to pick from counters collected using an API from VMware or Hyper-V.

Azure Server System Counter

Select this option to pick from counters collected using API supplied by Azure.

Access the Add Custom Counter wizard

You can open the Add Custom Counter wizard by clicking **Administration > Custom Counters** and clicking **Add** in the Custom Counters view.

Select Windows system counter

The Select Windows System Counter window of the Add Custom Counter wizard allows you to select the counter you want from a list populated from those currently available on an existing monitored SQL Server instance, or you can enter the counter information manually.

Access the Add Custom Counter wizard

You can open the Add Custom Counter wizard by clicking **Administration > Custom Counters** and clicking **Add** in the Custom Counters view.

Select a counter from the list

As you select from a populated list from those currently available on an existing monitored SQL Server instance, the next drop-down list populates (filtered by your selection). This allows you to quickly find the specific counter you want to add to SQL Diagnostic Manager.

1. Select whether you want to populate the list with counters that are contained in PerfMon, or populate it with every WMI counter.
2. Pick the SQL Server instance to populate counter information from the drop-down list.
3. Select the object name from the drop-down list.
4. Select the name of the specific counter you want to add from the drop-down list.
5. Select the instance from the drop-down list. The instance name is used to distinguish objects of a given type. For example, _Total refers to all instances, a drive letter such as C: for a specific disk drive, or the name of an application.

✓ Click the **Details** button for information on the object name and counter name you have selected.

Manually add a counter

If you have the counter information available, you can enter the information quickly by simply pasting or typing the Object Name, Counter Name, and Instance name into their associated fields. The counter information entered must be the exact complicated name or the counter does not work correctly.

For example, to enter the Processor object name (as seen in PerfMon), use the following programmatic name entry depending on the system configuration:

```
Win32_PerfFormattedData_PerfOS_Processor
```

✓ You can find custom counter programmatic names on Microsoft TechNet.

Enable SQL Diagnostic Manager Performance counters

Follow these steps to enable SQL Diagnostic Manager Performance Counters:

1. Go to the SQLDM installation folder path *C:\Program Files\Idera\Idera SQLdiagnostic manager*
2. Open **SQLdmManagementService.exe.Config** or **SQLdmCollectionService.exe.Config** as Administrator (depending on which SQLDM Performance Counters you want to enable)
3. Edit it and add the following parameter *publishPerformanceCounters=”true”* and restart the services.

Review the following examples:

SQLdmCollectionService.exe

```
<configuration>
<Idera.SQLdm>
<Services>

<CollectionService
instanceName="Default" managementServiceAddress="ServerName"
publishPerformanceCounters="true"/>

</Services>
</Idera.SQLdm>
</configuration>
```

SQLdmManagementService.exe

```
<configuration>
<Idera.SQLdm>
<Services>

<ManagementService instanceName="Default"
repositoryServer="SQLInstanceName\Name"
servicePort="5166" repositoryDatabase="SQLdmRepositoryName"
publishPerformanceCounters="true"/>

</Services>
</Idera.SQLdm>
</configuration>
```

⚠ If you no longer want to publish the SQLDM Performance Counters, set the parameter as follows *publishPerformanceCounters=”false”* or delete the property from the configuration and restart the services.

ⓘ Review the available internal SQLDM PerfMon counters list for the *SQLdmManagementService* and *SQLdmCollectionService*: Internal SQLDM perfmon counters.

Add custom counter alerts

Follow these steps to add internal SQLDM performance custom counter alerts:

1. Go to the Aministration tab in the SQL Diagnostic Manager desktop and select Custom Counters.
2. Click **Add** to start configuring the custom counter.
3. In the Welcome screen of the Custom counter Wizard click **Next**.
4. Select the Windows System Counter type, and click Next.
5. Under the Select Windows System Counter screen, select the ***Select a counter from an existing monitored SQL Server host (Recommended)*** and in the Select Counter check the ***Show only those counters available in Windows System Performance Monitor (Perfmon) (Recommended)*** option.
    a. In the SQL Server drop-down list, select the SQL Server instance where you would like to add the custom counter.
    b. In the Object Name field, select the *SQLdmCollectionService$Default* or *SQLdmManagementService$Default* option to retrieve the internal counters.

    > The *SQLdmCollectionService$Default* or *SQLdmManagementService$Default* options will not appear unless you enable the SQL Diagnostic Manager performance counters.

    c. Choose the counter you preferred from the Counter Name drop-down list and click **Next**. Review the list of Internal SQLDM perfmon counters.
    d. Select an instance or the instances if applied.
    e. Click **Next**.
6. Under the Customize Counter Value screen, choose the Calculation Type by selecting either the ***Use collected value*** or the ***Use per second value since last collection***.

    > By default, the value for a custom counter is interpreted as the value collected.

    Also, Customize the Scale Factor by selecting the value from the drop-down list.
    a. After configuring the values Click **Test...** to open the Test Custom counter window.
    b. In the Test custom Counter window, select the instances to test the custom counter that is being configured, and click **Test**. You can review the result of the test under the Result column.
    c. Click **Done**.
7. Click **Next**.
8. Under the Customize Counter Definition step, type a name for the counter. By default, these counters are under the Custom Category but you can select an existing category or enter a category of your own. Click **Next**.
9. Under the Configure Alert Settings screen, select how your counter value should be evaluated for alerting: ***Higher values are worse than lower values*** or ***Lower values are worse than higher values***.
    a. Configure your Alert Thresholds, the values you provide for Informational, Warning, and Critical Thresholds are used as defaults and can be customized for each monitored instance.

> When you click **Advanced**, you can generate choose to generate an alert or not when the value for the custom counter fails to be collected.

b. Check the box to enable the counter alert by default when is linked to a monitored SQL Server. Click **Next**.

9. In the Completing the Custom Counter Wizard screen, click **Finish** to complete the configuration of your custom counter.

When you complete the Custom Counter configuration, the "Would you like to link your counter to monitored SQL Server instances now?" message pops up, select **Yes** or **No** to continue:

- If you click Yes, the Link Custom Counter window opens. This window includes the Counter Summary information and the Linked Servers, you can select a SQLDM tag or specific monitored SQL Server instances, when you complete the configuration of the linked servers click **OK**.

Internal SQLDM perfmon counters

SQLdmManagementService$Default

- Active Workers
- Avg. Task Time
- Blocking Statistics inserts/sec
- Blocking Statistics sec/insert
- Custom Statistics inserts/sec
- Custom Statistics sec/insert
- Database Statistics inserts/sec
- Database Stats sec/insert
- Deadlock inserts/sec
- Deadlock sec/insert
- Disk Statistics inserts/sec
- Disk Statistics sec/insert
- ESX Config Data Statistics inserts/sec
- ESX Config Data Statistics sec/insert
- ESX Statistics inserts/sec
- ESX Statistics sec/insert
- Lock Statistics inserts/sec
- Lock Statistics sec/insert
- Mirror Participants grooming ops/sec
- Mirror Participants grooming sec/op
- Mirror Preferred Config ops/sec
- Mirror Preferred Config sec/op
- Mirror Replication Topology ops/sec
- Mirror Replication Topology sec/op
- Mirroring Statistics inserts/sec
- Mirroring Statistics sec/insert
- OS Statistics inserts/sec
- OS Statistics sec/insert
- Query Monitor Statistics inserts/sec
- Query Monitor Statistics sec/insert
- Query Wait Statistics inserts/sec
- Query Wait Statistics sec/insert
- Replication topology distributor inserts/sec
- Replication topology distributor sec/insert
- Replication topology inserts/sec
- Replication topology sec/insert
- Replication topology subscriber inserts/sec
- Replication topology subscriber sec/insert
- Server Statistics inserts/sec
- Server Stats sec/insert
- Session And Locks Statistics inserts/sec
- Session And Locks Statistics sec/insert
- Task Queue Length
- Tasks Queued/sec
- Temp Database File inserts/sec
- Temp Database File sec/insert
- VM Config Data Statistics inserts/sec
- VM Config Data Statistics sec/insert

- VM Statistics inserts/sec
- VM Statistics sec/insert
- Wait Statistics Details inserts/sec
- Wait Statistics Details written/sec
- Wait Statistics inserts/sec
- Wait Statistics written/sec
- Wait Type Statistics inserts/sec
- Wait Type Statistics written/sec
- Waiting Workers

SQLdmCollectionService$Default

- # Monitores Servers
- # Servers in Maintenance Mode
- Active Workers
- Avg. Task Time
- Task Queue Length
- Tasks Queued/sec
- WaitingWorkers

SQLdmCollectionService$Default$PERINSTANCE

- # Alerts Raised
- # Databases
- # Dropped Scheduled Refreshes
- # Failed Collections
- # Query Monitor Statements
- # Queued Scheduled Refreshes
- # Wait Statistic Statements
- Collection Run Time

Select SQL Server system counters

The Select SQL Server System Counter window of the Add Custom Counter wizard allows you to manually enter counter information or select counters from a list populated from those currently available on an existing monitored SQL Server.

If you have the counter information available, you can enter the information quickly by simply pasting or typing the **Object Name**, **Counter Name**, and **Instance** name into their associated fields. The counter information entered must be exact or the counter does not work correctly.

To select a SQL Server system counter:

1. Select the appropriate SQL Server instance from the drop-down list.
2. Select the object name.
3. Select the name of the specific counter you want to add.
4. Select the instance, if applicable. The instance name is what distinguishes it from other similar objects.

If no counters appear in the drop-down list, either the counters are not installed or they are disabled, possibly by a recent Windows Service Pack.

Access the Add Custom Counter wizard

You can open the Add Custom Counter wizard by clicking **Administration> Custom Counters** and selecting **Add** in the Custom Counters view.

How to calculate this metric

For more information about the algorithm used to calculate a specific metric, see SQL Diagnostic Manager cannot load the performance counters needed for the statistics view pane - Solution *#00000133* IDERA Solution available at the Customer Support Portal.

Understand why the SQL Server counter grows

Many SQL Server counter values start at zero when a server starts and then grow persistently from there, including most of the values in the sysperfinfo system table.

For example, the Buffer Manager Page Lookups/Sec counter in the value collected mode always shows the total number of page lookups since the server was first started, while when in the value per second mode, it shows the number of lookups per second during the monitored period.

Provide custom SQL script

The Provide Custom SQL Script window of the Add Custom Counter wizard allows you to enter or paste a T-SQL script for your custom counter. For more information about T-SQL scripts, see SQL Server Books Online.

Refer to the following tips when using custom SQL Scripts:

- Dangerous or destructive T-SQL that is entered as a custom counter is executed as entered, which could result in a negative impact on the linked monitored SQL Server instances.
- The `go` command is not a Transact-SQL statement and you cannot use this command in custom SQL batches. The go command is a batch separator for Management Studio, Query Analyzer, sqlcmd, and osql.
- Custom counter scripts run at every scheduled refresh and on-demand on the Custom Counters view. For best performance, custom scripts should run in under 30 seconds. If the script takes longer than two minutes to execute, timeouts may occur.
- Custom SQL scripts must return a single result set with a single numeric field. Additional fields or non-numeric values result in an error.
- Custom SQL scripts are displayed in Queries tab with "User Defined Counter" in their application name.
- The following options are set by default for custom counter scripts. If you need to use a different value, particularly another transaction isolation level, you should add the appropriate SET statement to the beginning of the script.
  - `set transaction isolation level read uncommitted`
  - `set lock_timeout 20000`
  - `set implicit_transactions off`
  - `set language us_english`
  - `set cursor_close_on_commit off`
  - `set query_governor_cost_limit 0`
  - `set numeric_roundabort off`

Access the Add Custom Counter wizard

You can open the Add Custom Counter wizard by clicking **Administration > Custom Counters**, and then clicking **Add** in the Custom Counters view.

Select virtual machine system counter

The Select Virtual Machine System Counter window of the Add Custom Counter wizard allows you to select the counter you want from a list populated by those counters currently available on an existing monitored SQL Server host server, or you can enter the counter information manually.

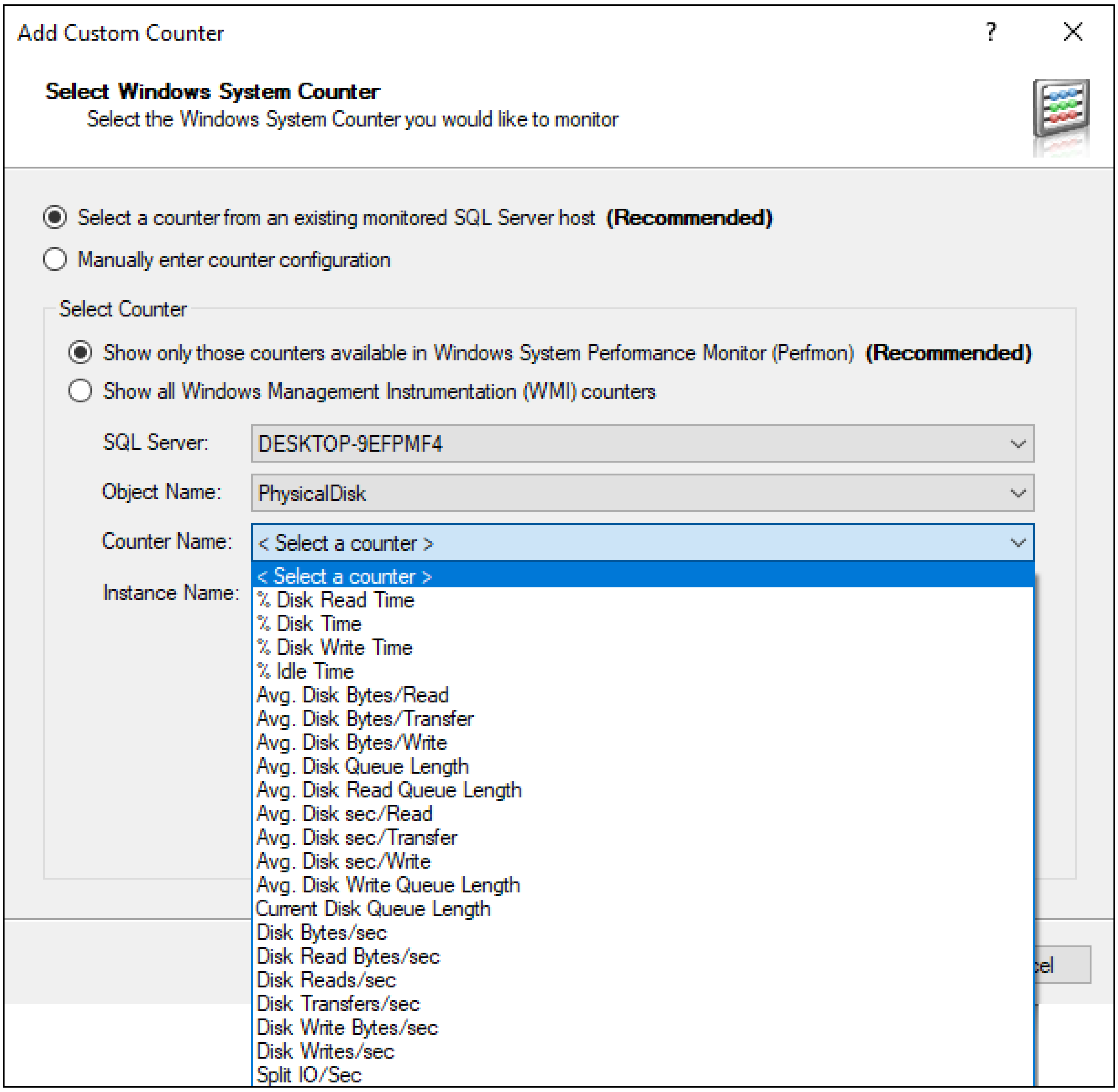
✓ You can select virtual machine counters for both the Hyper-V and VMware server virtualization platforms.

Access the Add Custom Counter wizard

You can open the Add Custom Counter wizard by clicking **Administration > Custom Counters** and selecting **Add** in the Custom Counters view.

Select the counter from the list

As you select from a populated list from those currently available on an existing monitored SQL Server host, the next drop-down list populates (filtered by your selection). This allows you to quickly find the specific counter you want to add to SQL Diagnostic Manager.



Add Custom Counter

Select Windows System Counter
Select the Windows System Counter you would like to monitor

● Select a counter from an existing monitored SQL Server host **(Recommended)**
○ Manually enter counter configuration

Select Counter

● Show only those counters available in Windows System Performance Monitor (Perfmon) **(Recommended)**
○ Show all Windows Management Instrumentation (WMI) counters

SQL Server: DESKTOP-9EFPMF4

Object Name: PhysicalDisk

Counter Name: < Select a counter >

Instance Name:

1. Pick the monitored SQL Server instance to populate counter information from the drop-down list.
2. Select the object name from the drop-down list.
3. Select the name of the specific counter you want to add from the drop-down list.
4. Select the instance (if applicable) from the drop-down list. The instance name is what distinguishes it from other similar objects.

Add a counter manually

If you have the counter information available, you can enter the information quickly by selecting **Manually enter counter configuration**, and simply pasting or typing the name of the object, counter, and SQL Server instance into the associated fields. The counter information entered must be exact or the counter does not work correctly.

Specify counter value

The Custom Counter Value window of the Add Custom Counter wizard allows you to select the type of calculation used by your counter and set a scale factor so that your counter information displays values in their correct format. While the **Scale** drop-down list displays the same scale factors available in PerfMon, you can also type in a custom scale factor to use.

Custom Calculation Type

Choose to either have your counter display the value collected or calculate the value per second between refreshes.

Customize Scale Factor

Select a custom scale to convert the value into a more manageable number.

Access the Add Custom Counter wizard

You can open the Add Custom Counter wizard by clicking **Administration > Custom Counters** and clicking **Add** in the Custom Counters view.

Scale factor examples

The following table covers some conversion factors that allow you to precisely convert common units:

Collected Value	**Desired Value**	**Scale Factor**
Kilobyte	Byte	1024
Megabyte	Byte	1048576
Megabyte	Kilobyte	1024
Gigabyte	Kilobyte	1048576
Terabyte	Megabyte	1048576
Terabyte	Gigabyte	1024
Byte	Kilobyte	0.0009765625
Byte	Megabyte	0.000000953674316
Kilobyte	Megabyte	0.0009765625
Kilobyte	Gigabyte	0.0009765625

Collected Value	Desired Value	Scale Factor
Megabyte	Gigabyte	0.0009765625
Megabyte	Terabyte	0.000000953674316
Gigabyte	Terabyte	0.0009765625
Kilobyte	SQL Server Page	0.125
Megabyte	SQL Server Page	128
Gigabyte	SQL Server Page	131072
SQL Server Page	Kilobyte	8
SQL Server page	Megabyte	0.007813
SQL Server Page	Gigabyte	0.000007629395
Kilobyte	SQL Server Extent	0.015625
Megabyte	SQL Server Extent	16
Gigabyte	SQL Server Extent	16384
SQL Server Extent	Kilobyte	64
SQL Server Extent	Megabyte	0.0625
SQL Server Extent	Gigabyte	0.000061035156

Specify counter definition

The Customize Counter Definition window of the Add Custom Counter wizard is where you name, assign to a category, and enter a description of your new custom counter. The information entered on the Custom Counter Definition window appears in various places in the SQL Diagnostic Manager interface.

> ❗ You cannot change the name or category of a counter once you create it.

Name

The name you give your new custom counter is the most important way to distinguish your custom counters. You should give them a name that directly relates to the information monitored.

Category

The category you assign to your new custom counter is important for organizing your custom counters, if you have many, on the Custom Counters window and on the Alert Configuration window.

Description

The description you give your custom counter is an important way of distinguishing your custom counters if the name you give them does not provide enough of a difference.

Access the Add Custom Counter wizard

You can open the Add Custom Counter wizard by clicking **Administration> Custom Counters** and clicking **Add** in the Custom Counters view.

Configure alert settings for this counter

The Configure Alert Settings window of the Add Custom Counter wizard allows you to configure how SQL Diagnostic Manager uses and monitors your new custom counter information.

Configure Alert Evaluation

This option allows you configure whether lower values are worse than higher values such as the percent of free disk space on a drive, or higher values are worse than lower values such as the percentage of free memory used.

Configure Alert Thresholds

The informational, warning, and critical thresholds you enter dictate the values that trigger alerts. Once configured, you can change these values on the Alert Configuration window.

Access the Add Custom Counter wizard

You can open the Add Custom Counter wizard by clicking **Administration > Custom Counters** and clicking **Add** in the Custom Counters view.

Configure a custom response when SQL Diagnostic Manager generates an alert

SQL Diagnostic Manager allows you to configure when and how alerts generate responses. You can select from the following alert responses (providers):

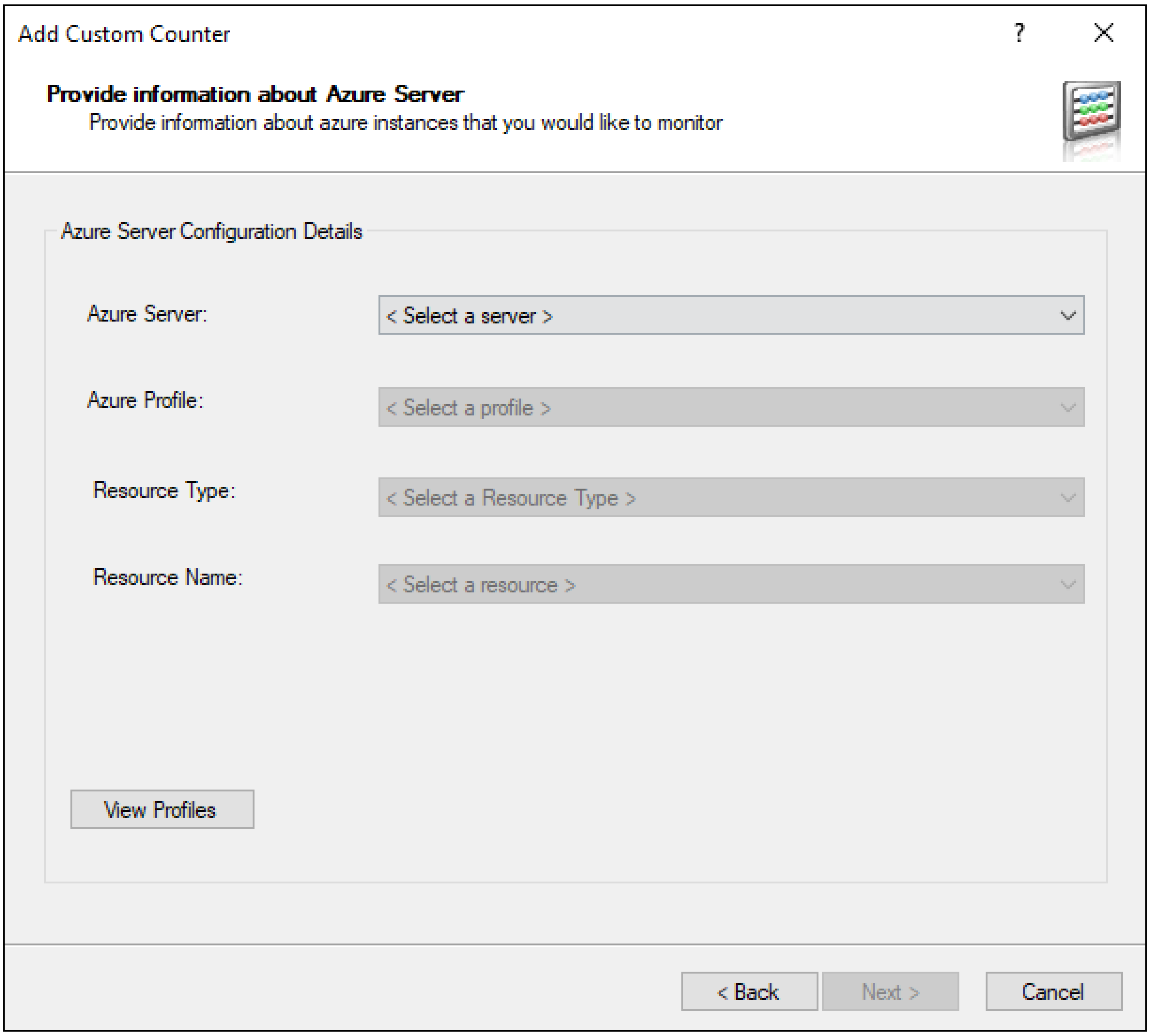
- Send an email to a person or group of people
- Log an event in the Windows Event Log
- Enable the Query Monitor
- Execute a program or utility
- Send an event to your Network Management tool
- Execute a SQL Agent Job
- Execute a Script

To configure a custom response when an alert is generated, select 🔧 **> Alert Actions and Responses** from the console toolbar.

Select Azure Server System Counter

The Azure Server System counter allows SQL Diagnostic Manager to monitor counters that are collected using API, which is supplied by Azure.

After you select the Azure Server System Counter type when adding a Custom Counter, you need to provide some configuration details of your Azure server:


Add Custom Counter

Provide information about Azure Server

Provide information about azure instances that you would like to monitor

Azure Server Configuration Details

Azure Server: < Select a server >

Azure Profile: < Select a profile >

Resource Type: < Select a Resource Type >

Resource Name: < Select a resource >

1. Select a server from the drop-down list of the Azure Server option.
2. Select a profile from the drop-down list of the Azure Profile option.
3. Select a type from the drop-down list of the Resource Type option.
4. And, select a name from the drop-down list of the Resource Name option.

To view the Azure profiles that are registered in SQL Diagnostic Manager click **View Profiles**.

To complete the addition of the Azure Server System Counter, select the metric details from the drop-down metric list.

Azure Monitor Custom Counter Limitations

- The Azure Counter import is disabled, by default.
- The linking of the Azure Custom Counter is not supported.
- The Azure Counters are only visible in monitored Azure servers.
- The Azure Counters are not supported for tags.

The 'Monitor ManagementClient.Metrics' library collects data for the Azure Custom Counters. It takes input parameters like metric name and interval and returns values for the metrics in that particular interval. However, based on the Azure instance activity at that interval, the returned value of the metric is null when those values are zero or inexistent.

Azure Profiles

The Azure Profiles Configuration window allows you to view the registered Azure profiles and the details of how these profiles are linked. Also, it allows you to add, view/edit, remove, and test the accessibility of the Azure subscriptions.

1. Under the Application Profiles section, click **New**.
2. In the Azure Application Profile, select a Name, and add a Description.
3. Under the Azure subscription section, click **New** to open the Azure Subscription configuration window, enter the Subscription, add a description, and click **OK**.
4. Under the Azure Application section, click **New**, fill in the fields in the Azure Application Configuration window: Name, Tenant Id, Client Id, Secret, and Description. Click **OK**.

To review or edit any information of the Azure Linked Profiles, click **View/Edit** to open the Azure Linked Profile window which allows you to edit or view the Azure Profile description, select the Azure Server, and select the Application Profile.

Additionally, you can access the available resources to link by clicking **Available Resources.**

1. In the Available Azure Resources window, select an Azure server from the drop-down list.
2. Select an Application Profile from the drop-down list to review all the available resources for the selection.

Edit a custom counter

The Edit Custom Counter wizard allows you to edit your custom counter settings. To edit a custom counter, select the counter from the list on the Custom Counters window and click the **Edit** button.

⚠ You cannot change the custom counter name and category once you create a Counter.

Delete a custom counter

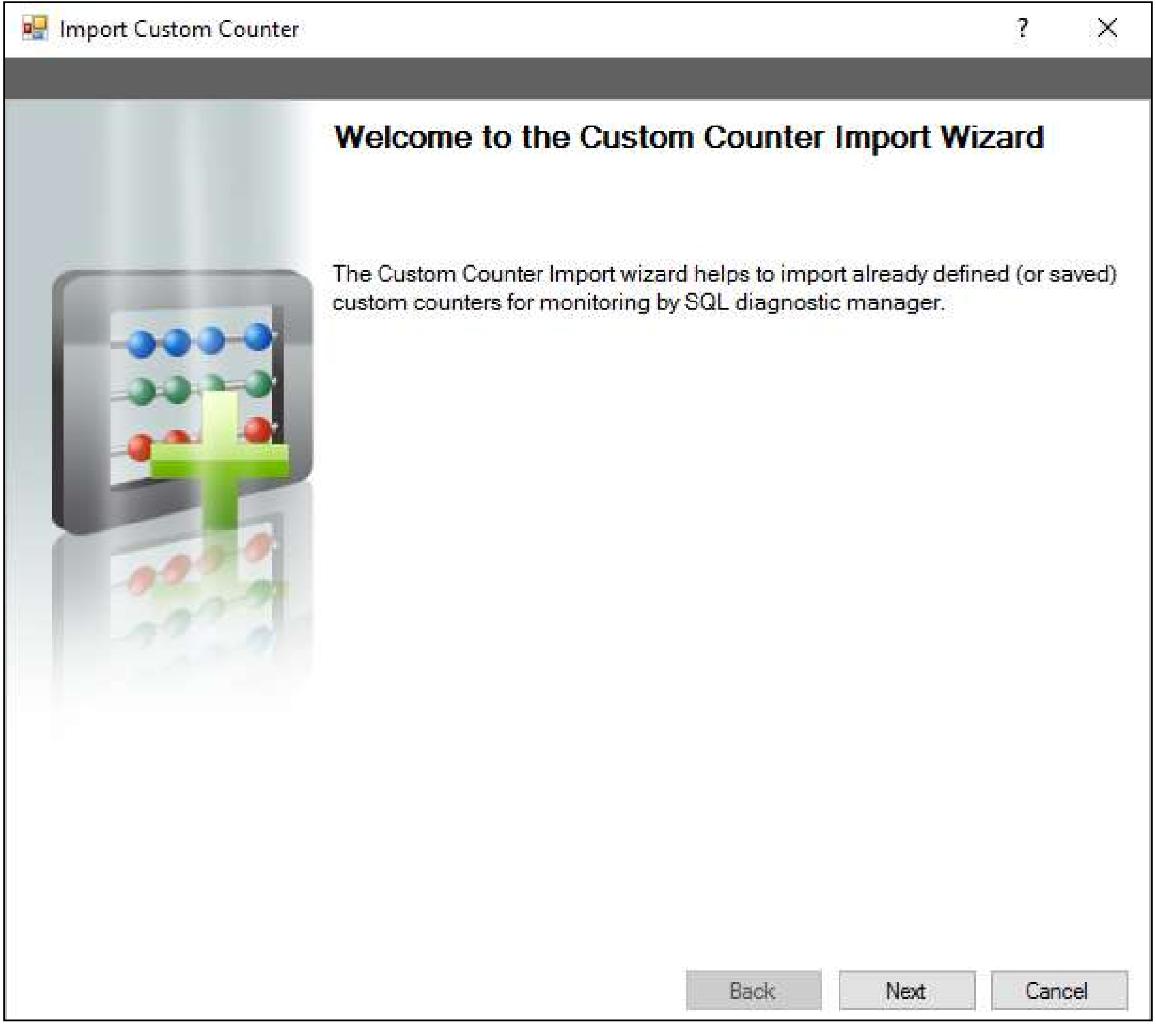
Deleting a custom counter from SQL Diagnostic Manager removes it from the interface and stops collection. Select a custom counter on the **Custom Counters** window and click **Delete** to remove it from SQL Diagnostic Manager.

Import a custom counter

Custom counters are Windows Operating System or SQL Server metrics that are not monitored, by default, by SQL Diagnostic Manager. You can import already created custom counters from the IDERA community site through the Custom Counter Import Wizard. Once added to the SQL Diagnostic Manager interface, you can monitor the results, view historical trending of the metric, configure alerts and receive notifications on them, and generate reports based on collected data.

To import a custom counter:

1. Open the Custom Counter Import Wizard by clicking **Administration> Custom Counters** and selecting **Import** in the Custom Counters view.



Import Custom Counter

Welcome to the Custom Counter Import Wizard

The Custom Counter Import wizard helps to import already defined (or saved) custom counters for monitoring by SQL diagnostic manager.

2. On the **Welcome to the Custom Counter Import** page, click **Next**.
3. On the **Select custom counters to import** page, browse for custom counters' XML files to import.
4. On the **Summary of imported custom counters** page, you can verify that the selected counters were imported correctly or if there are any errors you can view details by clicking **View validation errors** or review any steps by clicking **Back**.
5. Click **Finish** to import the valid custom counters and exit the wizard.

✓ **Export a custom counter**

For instructions on exporting a custom counter, see Export a custom counter.

Export a custom counter

Custom counters are Windows Operating System or SQL Server metrics that are not monitored, by default, by SQL Diagnostic Manager. You can export and share already created custom counters in the IDERA community site through the **Actions** group on the **Home** tab or through the Import/Export wizard.

To export a custom counter:

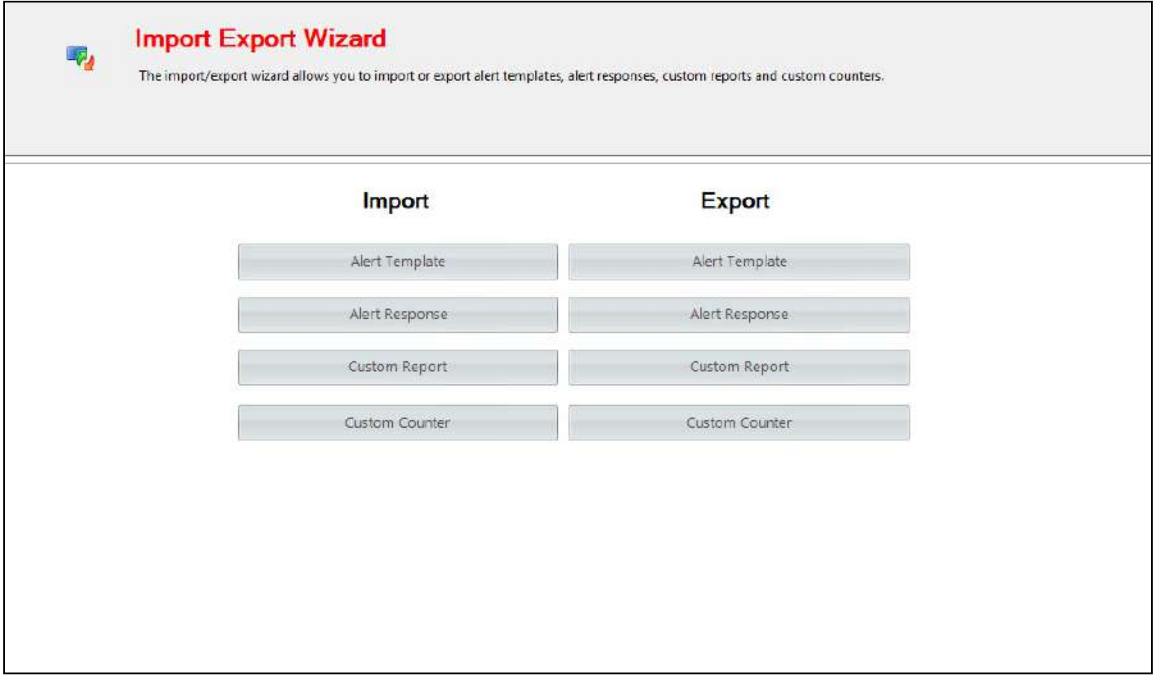
1. Select the Administration tab.
2. Select **Custom Counters**.
3. Select the custom counter you wish to export from the list and click **Export** in the **Actions** group.
4. In the **Browse For Folder** dialog box, indicate in which folder you want to save the custom counter XML file.
5. In the "Selected custom counters exported to the selected directory" notification, click **OK**.

✓ **Import a custom counter**

For instructions on importing a custom counter, see Import a custom counter.

To export all your custom counters:

1. Select **Administration > Import/Export** and click **Custom Counter** in the export column.



Import Export Wizard

The import/export wizard allows you to import or export alert templates, alert responses, custom reports and custom counters.

2. In the **Browse For Folder** dialog box, indicate in which folder you want to save the custom counters XML files.
3. Click **OK** in the "Custom counters exported to selected directory" notification.

Test a custom counter

The Test Custom Counter window allows you to verify that the custom counter is what you want to collect on the SQL Server instances you have linked it to and that the value returned is the value expected. A successful test displays the value of the metric collected, while a failed test provides the associated failure details.

✓ Common causes for failed custom counter tests include inaccurate counter information entered manually and counters that do not exist on a particular SQL Server instance.

Link custom counter to monitored instance

The Link Custom Counter window allows you to select the monitored SQL Server instances upon which you want your custom counter to appear. Select Server tags from the Tags drop-down list or choose New tag from the list.

Use the **Add** and **Remove** buttons to select the SQL Server instances to link to your custom counter and click **OK** to save your changes.

Automatically add a custom counter to a new registered SQL Server instance

You can set SQL Diagnostic Manager to automatically add any custom counter to a newly-registered SQL Server instance by using links and tags.

To set SQL Diagnostic Manager to automatically add a customer counter to a new registered SQL Server instance:

1. Create a custom counter or import a custom counter if the appropriate counter does not exist.
2. Create a tag if the appropriate tag does not exist.
3. Link a custom counter to a tag by selecting the custom counter, and then clicking **Link**. You can include more than one custom counter per tag.
4. Select the tag you want to use, and then click **OK**. The custom counter is now associated with the tag.
5. Select the tag you just linked when adding a new SQL Server instance.

Work with tags

Tags are customizable labels that allow you to organize and view your monitored resources in a manner best suited to your needs. You can assign tags to monitored SQL Server instances, custom counters, and permissions.

By creating and assigning tags to different objects, you can better manage how SQL Diagnostic Manager presents information. For example, you may create an "Accounting" tag for all SQL Server instances used by the Accounting department. You could then copy alert configuration and assign custom counters and permissions to all the instances labeled "Accounting."

Tags are also accessible to all users. This gives you greater freedom, allowing users to work with the same tags across all SQL Diagnostic Manager consoles.

Manage tags

The Manage tags window allows you to Add, Edit, and Remove Tags. For more information on tags and their functionality, see Working with tags.

> ⚠ This window is available only to SQL Diagnostic Manager Administrators.

The Manage Tags window shows a list of all existing tags and you can perform the following actions:

- Modify the list of servers, custom counters, and permissions associated with a tag.
- Create a new tag.
- Edit an existing tag.
- Remove a tag (Removing a tag does not delete items associated with that tag).

Access the Manage Tags window

To access the Manage Tags window, select 🔧 > **Manage Tags**.

Add a new tag

The **Add Tag** window allows you to create and assign a tag while adding an instance. Tags are labels that allow you to organize server instances into meaningful groups.

Tags are customizable for your needs. For example, you may want to view only server instances used by a particular department, in a specific location, or by some other method, such as SQL Server version. You can assign multiple tags to each instance so that the instance appears in several different groups.

You may select one or more existing tags from the list, or create new ones by clicking **Add Tag**.

Edit a tag

The Tag Properties window allows you to view and change the properties of an existing Tag. To access the Tag Properties window, right-click a Tag and select **Tag Properties**.

The following information is available and editable in the Tag Properties window:

Servers

> The Servers tab lists the SQL Server instances monitored by SQL Diagnostic Manager and allows you to select or deselect the servers included in the tag.

Custom Counters

> The Custom Counters tab allows you to choose the custom counters you want to include in your tag.

Application Security

> The Application security tab allows you to select the application security permissions you want to apply to your tag.

User Creation Scripts

SQL Diagnostic Manager includes scripts, which are used to create new users with the required permissions for the product to function. For more information, review the following links:

- User Creation Scripts On-Premises
- User Creation Scripts Azure SQL

User Creation Scripts On Premises

The following documentation allows you to create a user with the necessary permissions for SQL Diagnostic Manager, allowing the new user to gather diagnostic data from a monitored instance successfully.

Recommended permissions on-premises

Follow the next steps to create a new user with recommended permissions for SQL Diagnostic Manager to function.

1. Open the script with the source code editor of your preference.
2. Find and replace all the following instances:
   a. `'$SQLdmMonitorRole'` with the desired name of the custom server role.
   b. `'$username'` with the account name that SQLDM will use to collect diagnostic data. You may use a SQL account (e.g. `SQLdmService`) or a domain account (e.g. `DOMAIN\SQLdmService`).
   c. `'$password'` with the password related to the account. Only if you are using a SQL account.

   ✓ Use the Find/Replace function to locate and replace all references from the script.
3. Execute the script against the target monitored instance using an account with sysadmin rights. This means you should execute the script on each instance you intend to monitor with the user created.

Below you can find the script for user creation on-premises, also you can download it by clicking here.

Create a user with recommended permission on-premises

```
USE master
IF NOT EXISTS(SELECT [name] FROM [sys].[server_principals] WHERE [type]='R' AND [name]
='$SQLdmMonitorRole')
    CREATE SERVER ROLE [$SQLdmMonitorRole]
IF NOT EXISTS(SELECT [name] FROM [sys].[server_principals] WHERE ([type]=N'S' OR
 [type]=N'U') AND [name]='$username')
    BEGIN TRY
        IF CHARINDEX('\','$username') <> 0
            CREATE LOGIN [$username] FROM WINDOWS WITH DEFAULT_DATABASE=[master]
        ELSE
            CREATE LOGIN [$username] WITH PASSWORD=N'$password',
DEFAULT_DATABASE=[master], DEFAULT_LANGUAGE=[us_english], CHECK_EXPIRATION=ON,
CHECK_POLICY=ON
    END TRY
    BEGIN CATCH
        SELECT ERROR_NUMBER() AS ErrorNumber
            , ERROR_SEVERITY() AS ErrorSeverity
            , ERROR_STATE() AS ErrorState
            , ERROR_PROCEDURE() AS ErrorProcedure
            , ERROR_LINE() AS ErrorLine
            , ERROR_MESSAGE() AS ErrorMessage;
        RETURN;
    END CATCH

IF NOT EXISTS(SELECT [name] FROM [sys].[database_principals] WHERE [type] = N'S' AND
[name] ='$username')
        CREATE USER [$username] FOR LOGIN [$username]

ALTER SERVER ROLE [$SQLdmMonitorRole] ADD MEMBER [$username]

GRANT EXECUTE on xp_loginconfig to [$username]
GRANT EXECUTE on xp_regread to [$username]
GRANT EXECUTE on xp_readerrorlog to [$username]
GRANT EXECUTE on xp_instance_regread to [$username]
GRANT EXECUTE on sp_OACreate to [$username]

-- GRANT SERVER LEVEL PERMISSIONS --
GRANT VIEW ANY DEFINITION TO [$SQLdmMonitorRole]
GRANT VIEW ANY DATABASE TO [$SQLdmMonitorRole]
GRANT VIEW SERVER STATE TO [$SQLdmMonitorRole]
GRANT ALTER SETTINGS TO [$SQLdmMonitorRole]

-- GRANT ADDITIONAL XEVENTS AND TRACE PERMISSIONS --
GRANT ALTER ANY EVENT SESSION TO [$SQLdmMonitorRole]
GRANT ALTER TRACE TO [$SQLdmMonitorRole]
GRANT CREATE ANY DATABASE TO [$SQLdmMonitorRole]
```

```
/** The following script adds the user to the database with the required
permissions**/

SET @cmd = '
    USE [?]
    IF ((SELECT is_read_only FROM sys.databases WHERE name = DB_NAME()) = 0)
        BEGIN
            IF ((SELECT state FROM sys.databases WHERE name = DB_NAME())=0)
                BEGIN
                    IF NOT EXISTS(SELECT [name] FROM [sys].[database_principals]
WHERE ([type] = N''S'' OR [type] = N''U'') AND [name]=''$username'')
                            CREATE USER [$username] FOR LOGIN [$username]

                    ALTER ROLE [db_owner] ADD MEMBER [$username]
                    IF (DB_NAME()=''msdb'')
                        ALTER ROLE [SQLAgentOperatorRole] ADD MEMBER [$username]

                    IF (SELECT COUNT(*)FROM [sys].[database_mirroring] WHERE
 [mirroring_guid] IS NOT NULL) > 0
                        ALTER SERVER ROLE [dbm_monitor] ADD MEMBER
[$SQLdmMonitorRole]
                END
        END'

EXEC sp_MSforeachdb @cmd
```

When running the script above, it is added:

- A new user (a Windows or a SQL Server account) to the SQL Server instance.
- A new SQL Server level role.
- The `db_owner` role to view Databases > Summary.
- The `SQLAgentOperatorRole` role to the `msdb` database. Which lets you view, start, or stop SQL Agent Jobs.
- The `dbm_monitor` role, allowing you to monitor the database mirroring. Only required if there are any databases participating in mirroring.

GRANT DATABASE PERMISSIONS

Restored databases onto the instance later must have the monitor account added as a bd_owner.

Welcome to SQL Diagnostic Manager

SQL Diagnostic Manager is a powerful performance monitoring and diagnostics solution that proactively alerts administrators to health, performance and availability problems within the SQL Server environment. SQL Diagnostic Manager now integrates with the IDERA Dashboard, a common technology framework, designed to support the IDERA product suite. Users are able to obtain an overview of the status of their SQL Servers and hosted databases all in a consolidated view and navigate to individual product dashboards for details. The IDERA Dashboard provides a central set of services for managing users, product registry, instance registry, aggregated alerts across IDERA applications, a central web server, and tags for grouping instances. For additional information, see Navigate the IDERA Dashboard.

To get started, see the following topics for more information:

- Upgrade to this build of SQL Diagnostic Manager
- Configure SQL Diagnostic Manager
- Migrate your SQL Diagnostic Manager installation

What is SQL Diagnostic Manager?

SQL Diagnostic Manager provides an unprecedented level of diagnostic information on the health, performance, and status of SQL Server instances across your environment. You can view, diagnose, and report on critical performance statistics from a central point of control. Using a unique agentless architecture, SQL Diagnostic Manager gathers real-time diagnostic information, keeping database administrators and managers informed by providing customized alerts. Easy to install and use, SQL Diagnostic Manager is an indispensable SQL Server management tool that benefits both experienced and junior database administrators.

What is the SQLDM Web Console?

The SQLDM Web Console is a common technology framework that supports SQL Diagnostic Manager. The SQLDM Web Console allows users to get an overview of the status of their SQL Servers and hosted databases all in a consolidated view while providing users the means to drill into individual product dashboards for details.

It is designed to provide quick access to the overall status of your SQL Server environment to help diagnose any issues. To learn more about the SQLDM Web Console, visit Navigate the SQLDM Web Console.

ⓘ **IDERA Dasboard support**

The prior browser interface for SQL Diagnostic Manager in IDERA Dashboard will continue to be supported in addition to the new SQLDM browser interface. If you want to use the IDERA Dashboard, you can install it separately and manually register SQL Diagnostic Manager.

How does SQL Diagnostic Manager help me?

Whether you need immediate diagnostic information or want to gather data for long-term capacity planning, you can use SQL Diagnostic Manager to help:

- Increase SQL Server availability
- Provide a comprehensive view of current performance
- Provide continuous, unattended monitoring
- Store data in the centralized SQLdm Repository database
- Improve the productivity of both skilled and novice database administrators

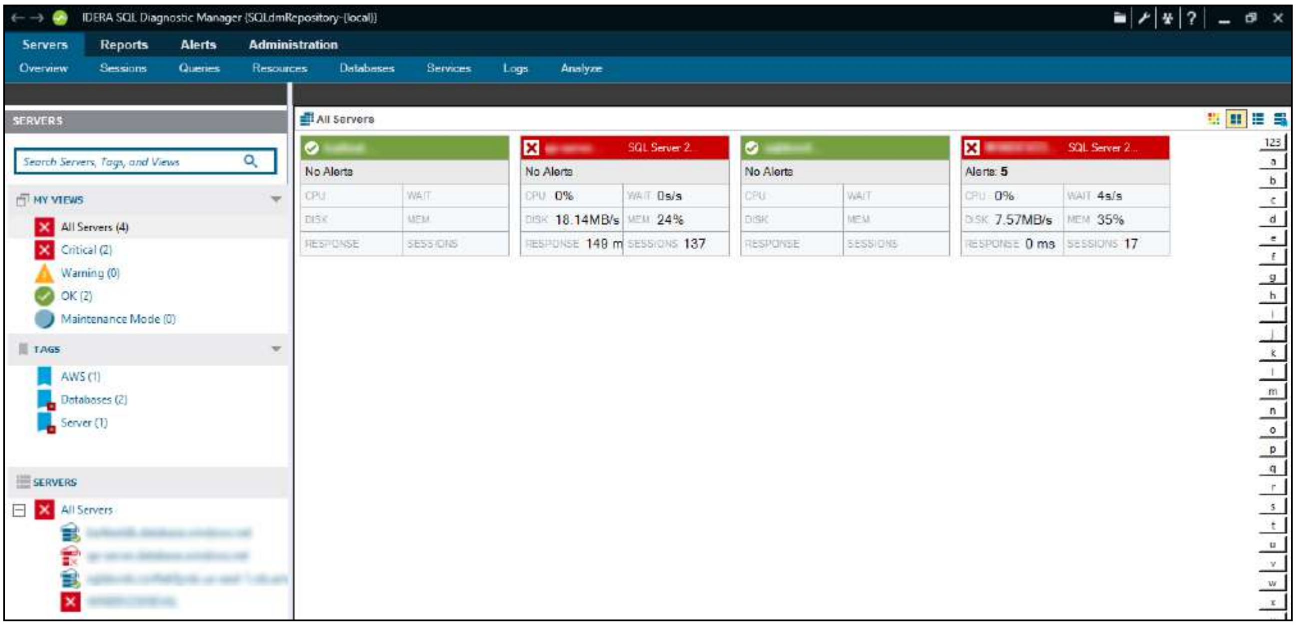
With clear, easy-to-understand charts and reports, you can track standard SQL Server performance metrics, trend historical performance data over time, and proactively identify potential performance problems.

Use the SQL Diagnostic Manager interface

SQL Diagnostic Manager uses a graphically enhanced user interface to display the current state of your SQL Server instances. A mixture of graphs, charts, and color coding makes problem identification quick and easy, allowing you to resolve issues before they reach critical levels.

Navigation pane

The Navigation pane displays on the left side of the SQLDM Console as shown in the following image, and it is called **SERVERS**.



The SERVERS window has three sections **MY VIEWS**, **TAGS**, and **SERVERS**. Below you can find a wider description for each one.

MY VIEWS

The MY VIEWS section helps you organize your SQL Server instances by status and includes any custom views you have set up.

TAGS

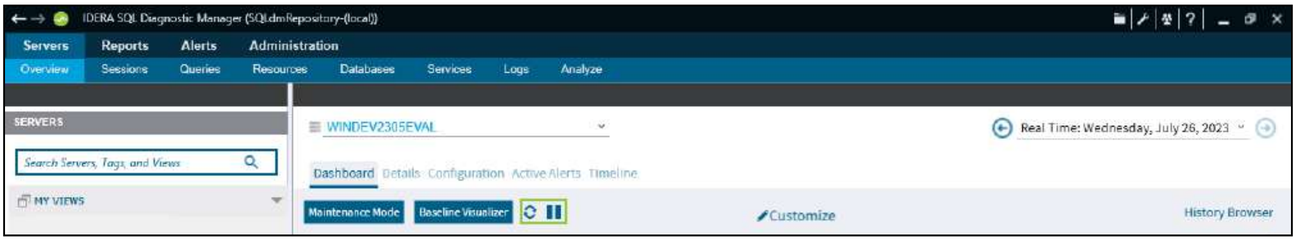
The TAGS section allows you to manage tags or keywords that you can use to quickly find the appropriate monitored SQL Server instances, custom counters, and permissions. Also, it allows you to view the '
Tags' properties to see which custom counters and permissions are linked to them.

SERVERS

The SERVERS section lists the SQL Server instances contained in the currently selected view. To view all registered instances, select **All Servers** from the MY VIEWS list, review the page Monitor multiple SQL Server instances.

Refresh and pause views

To let you control the information refresh on a particular view, SQLDM includes the **Refresh** and **Pause** buttons, as shown in the following image:



You can edit the scheduled refresh of your views for more current information. SQL Diagnostic Manager offers the following refresh controls:

Refresh button

The **Refresh** button tells SQL Diagnostic Manager to immediately collect data and refresh the current Console view. Depending on the view, the refresh could take several seconds to complete. SQL Diagnostic Manager displays the current refresh status in the lower-right corner of the SQLDM Console.

Pause button

The **Pause** button tells SQL Diagnostic Manager to stop refreshing the console. If you click **Pause** during a refresh, the pause occurs after the refresh completes. To continue refreshing, click **Pause** again. Pausing the refresh allows you to maintain the currently monitored state so you can see what is happening on your SQL Server instance without incoming information overwriting the data. This feature also gives you time to export or print the displayed statistics before retrieving the next data set.

Charts

Charts are populated from the point at which you navigate to the window with the chart. This allows you to view real-time charts for the data point selected. Real-time viewing is dependent on your refresh interval. Once populated, you can manipulate the type of chart you want to display and export the chart or copy it to the clipboard to paste into other programs.

> ✓ In the Server Details view, click the **Maximize** button on the upper-right corner of a chart to display a large version of the chart. The **Restore** button returns the chart to the default view.

All-time charts in the web console and desktop console have time-range drill-down functionality modeled after SQL Workload Analysis.

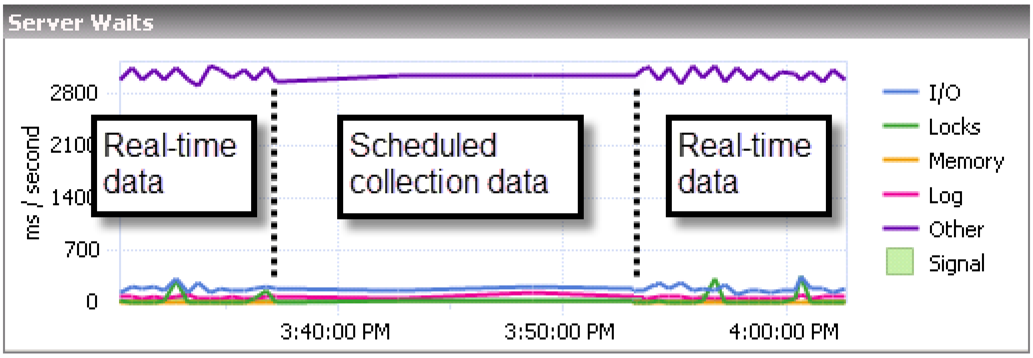
1. Click on your preferred graph and hold the left mouse button.
2. Drag to the left or to the right.
3. Release the mouse button.

The time range selected with the previous steps is the new display history range on all the graphs displayed on different tabs.

Understanding your chart data and refresh interval

SQL Diagnostic Manager charts provide data whether collected in real-time or as part of a scheduled collection event. When you open a view, SQL Diagnostic Manager begins populating the chart with real-time data collected on the interval specified in the **Server View Refresh** field on the Console Options window (🔧 **> Console Options**).

If you pause or leave this view and return during the same Console session, SQL Diagnostic Manager displays the real-time data points as previously viewed, followed by a period of data points from any scheduled collections that occurred while you were away. The chart returns to populating with new real-time data points, as shown in the following image:



The displayed data is determined by the last range selected in the top right corner drop-down.

Customize your charts

SQL Diagnostic Manager contains charts that are populated by selecting the appropriate data items collected. Once populated, you can manipulate the type of chart you want to display and export the chart or copy it to the clipboard to paste into other programs.

You can personalize charts by right-clicking anywhere inside the chart and selecting **Toolbar** from the menu. The chart toolbar contains the following options:

Copy To Clipboard

The **Copy To Clipboard** button allows you to copy the chart to your Windows clipboard in various formats.

Print

The **Print** button allows you to print the chart.

Gallery

The **Gallery** menu includes a number of options that allow you to change the type of chart used to represent your data.

Anti-Aliasing

The **Anti-Aliasing** button smooths the lines between your data points to more easily view your data.

Palette Selector

The **Palette Selector** menu includes a number of color choices for you to change the color scheme of your chart.

3D/2D

The **3D/2D** toggle lets you choose to view your results in three- or two-dimensional plots. Additional options become active based on your choice and allow you to rotate your view or cluster your results on the z-axis.

Axes Settings

The **Axes Settings** menu lets you choose how to view each axis, whether to display labels and additional properties for your view.

Point Labels

The **Point Labels** toggle lets you choose to view the actual data at each point.

Data Grid

The **Data Grid** toggle places a table below your chart that displays the data included in your chart.

Legend Box

The **Legend Box** toggle lets you choose to view a legend for your displayed data.

Zoom

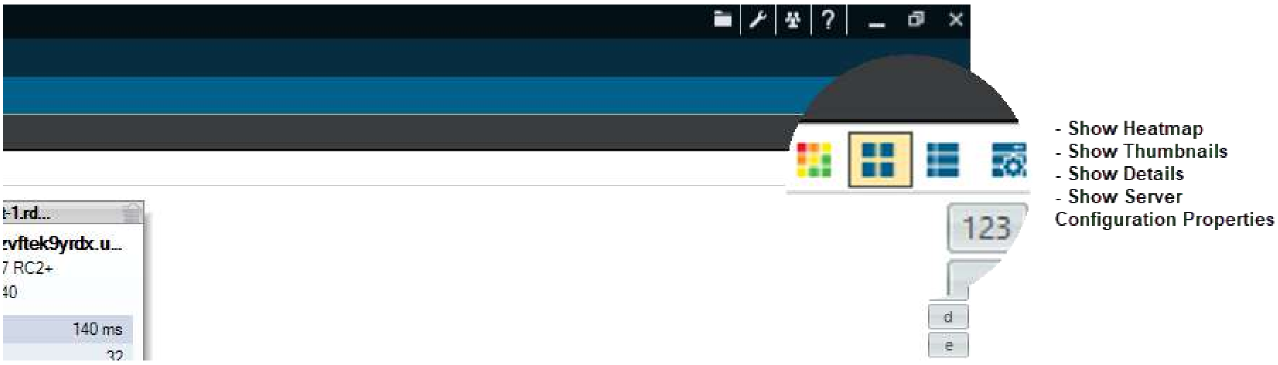
The **Zoom** button allows you to zoom in on a point in your chart.

Properties

The **Properties** button displays additional properties for further customization of your chart.

Customize Servers View

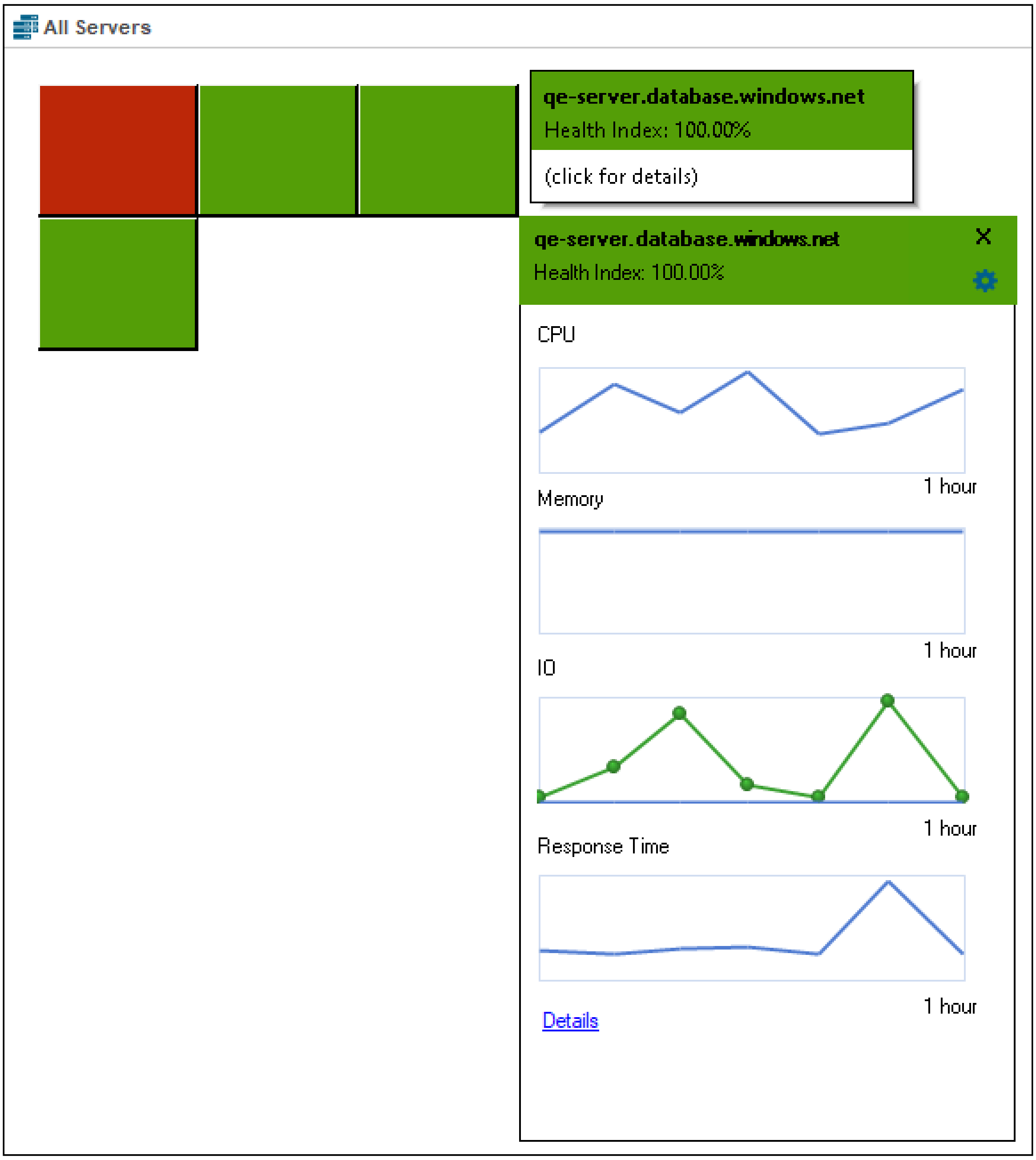
SQL Diagnostic Manager allows you to monitor multiple instances using different views, such as heatmap, thumbnails of mini-monitors, a list of instances and their important details, or a list of instances and their server properties. SQL Diagnostic Manager defaults to the thumbnail view.



✓ If any metrics are missing from this view you may need to enable OS metrics collection.

Heatmap

The heatmap sub-view provides a visual overall status of your SQL Server environment in the form of a grid of color-coded squares that contain a health index. Through its color scheme and health index, you can easily identify which of your monitored instances needs the most attention. Each square in the heatmap sub-view represents a monitored instance. With each square, you can access basic statistics, drill down for details, and the health index as well.



Additionally, you can access the Health Index of each instance and make some calculations.

Health Index

The Health Index is a percentage value that provides an estimate of the relative health of your monitored SQL Server instance. The Health Index is based on the following raw calculations:

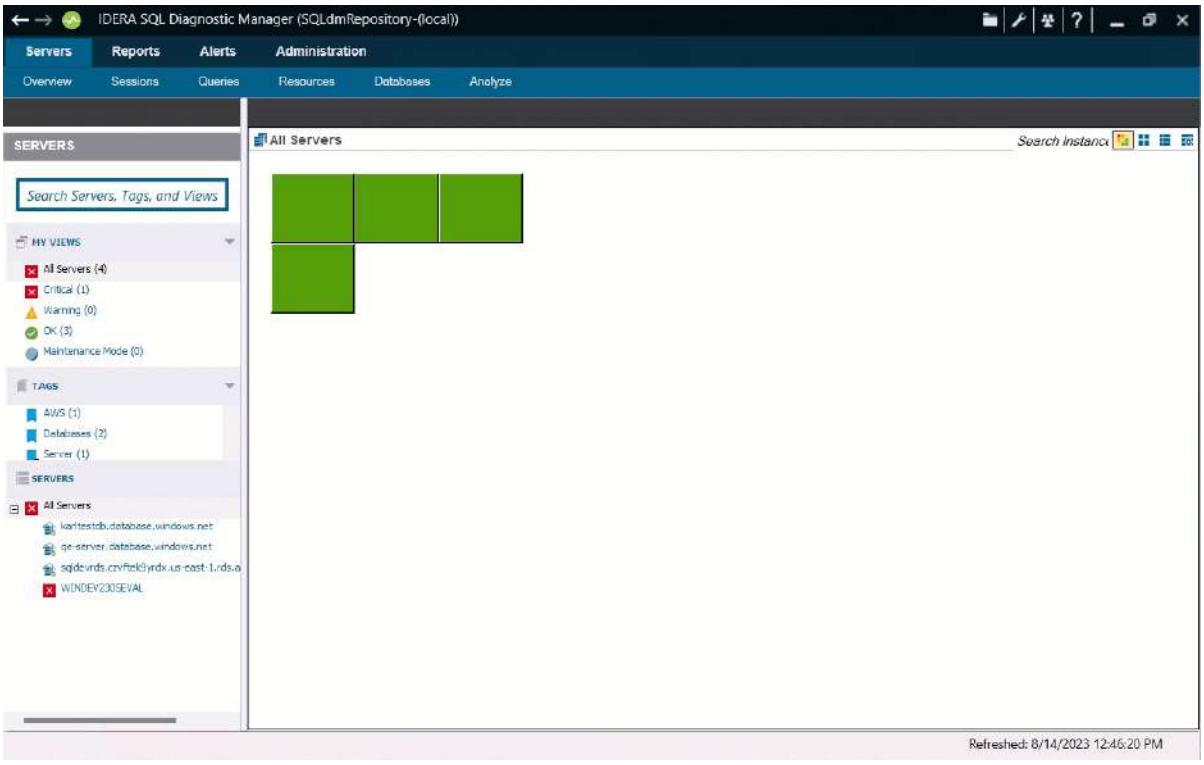
```
Health Index Raw Calculation = Instance or Tag Scale Factor * (#Critical Alerts *
Critical Scale Factor + #Warning Alerts * Warning Scale Factor + #Informational
Alerts * Informational Scale Factor)
```

The raw score is normalized between a 100% and 0% range. SQL Server is healthier the closer its health index is to 100% and it is in a critical state the closer its health index is to 0%.

> ⓘ Use the severity factors to change the relative weight in the calculation. Use tag and instance factors to assign instances of more or less importance in the overall heat map ranking.

The Health Index wizard allows you to make calculations by configuring the scale factor and selecting the instances and tags for each calculation. To do so, follow the next steps:

1. Click one of the Heatmap's squares. When the heatmap sub-views appear, click the gear icon ⚙ to display the Health Index wizard.



2. Type the **Alerts Scale Factor** fields with the values of your preference.

> ⓘ IDERA recommends **Alert Scale Factor**'s values fall between zero and ten.

3. Choose an instance from the registered instances dropdown, set a distinctive scale factor, and click + to add it to the calculations. You can add as many instances as you need by repeating the process. To disable an instance, click ✖ .
4. Follow step 3 in the Tag section, to add the tags you need.
5. Click **Submit**.

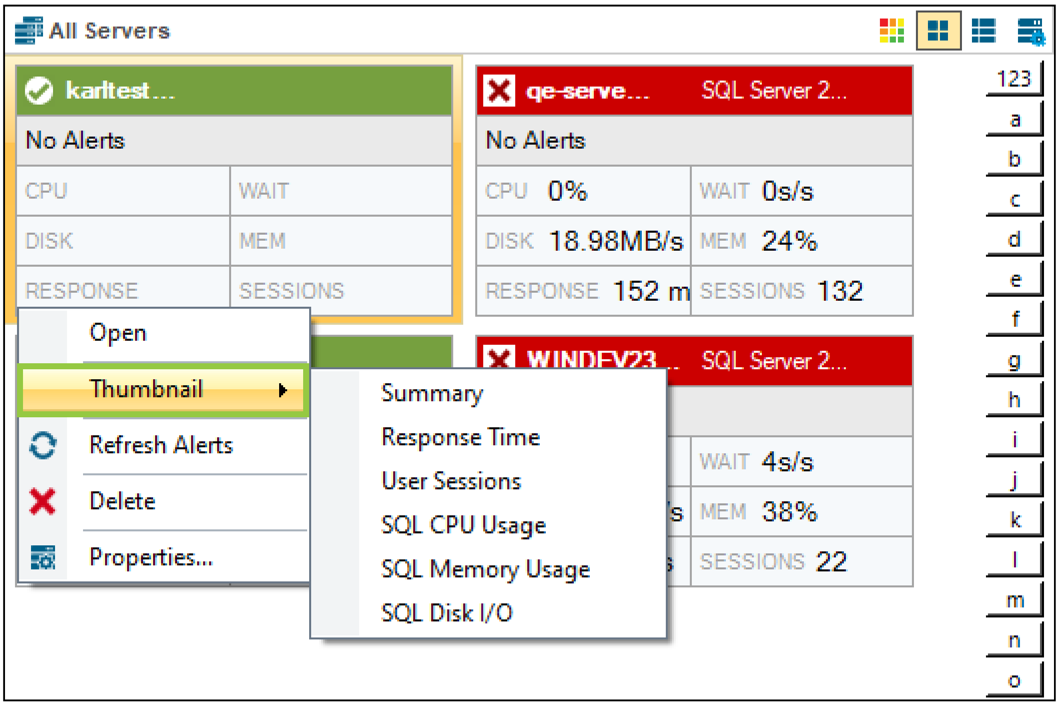
Thumbnails

The thumbnail sub-view is the default view in the SQL Diagnostic Manager web console's dashboard and provides you with a graphical replication of your monitored SQL servers. Access additional details in the Single Instance Dashboard by clicking on a thumbnail's instance name or easily spot categories that have active alerts as marked by a critical icon.

To customize your view:

1. Click **All Servers** under the SERVERS screen.
2. Under the **All Servers** main screen, right-click the instance you want to customize, select **Thumbnail**, and select the information type you want to display on it

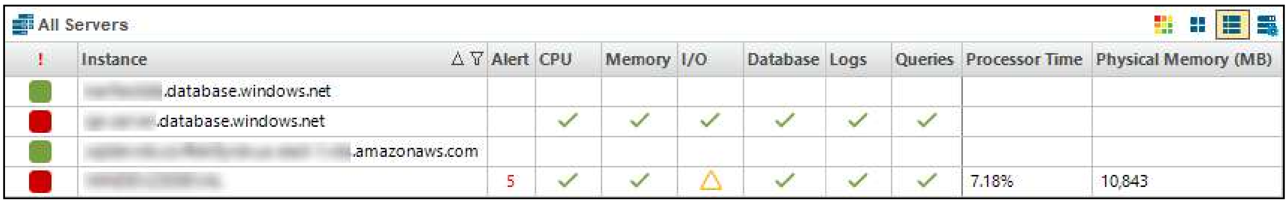
Instead of listing statistics for the server, SQL Diagnostic Manager displays the individual chart of the data item you selected. To revert, select **Summary** from the Thumbnail list.



These views list all the data collected at the last refresh for all your monitored SQL Server instances. The Details and Server Configuration Properties views can assist you with comparing the status of a specific metric or property between two or more of your SQL Server instances.

Details

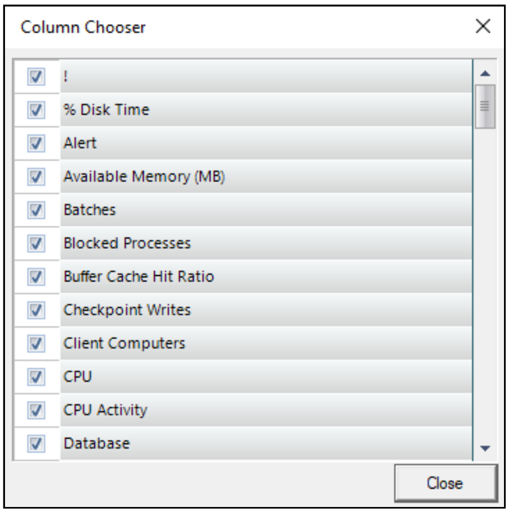
This view allows you to see the overall status of your monitored instances and specific information based on the metrics you configured.



!	Instance	Alert	CPU	Memory	I/O	Database	Logs	Queries	Processor Time	Physical Memory (MB)
🟩	[redacted].database.windows.net									
🟥	[redacted].database.windows.net		✓	✓	✓	✓	✓	✓		
🟩	[redacted].amazonaws.com									
🟥	[redacted]	5	✓	✓	△	✓	✓	✓	7.18%	10,843

To configure the columns in this view, follow these steps:

1. Right-click any title top row of the main **Details** screen and select **Column Chooser**.
2. Check or uncheck the options you want to add or remove for this view.



Column Chooser

☑ !
☑ % Disk Time
☑ Alert
☑ Available Memory (MB)
☑ Batches
☑ Blocked Processes
☑ Buffer Cache Hit Ratio
☑ Checkpoint Writes
☑ Client Computers
☑ CPU
☑ CPU Activity
☑ Database

Add a custom view

You may want to add a custom view to the My Views list to organize your SQL Server instances into specific groups for monitoring purposes. This is especially important if you are monitoring a large number of SQL Server instances and want information for a specific group of SQL Server instances. If you create views before adding your SQL Server instances to SQL Diagnostic Manager for monitoring, you can have these new instances added to your views by selecting the new view you create and then adding the SQL Server instances. To add a new view:

1. To create a new view from the Files menu, select 🗔 **> Create View**. If you want to create a new view from My Views, right-click within the My Views section, and select **Create View**.
2. Type a name for the view.
3. Select the monitored SQL Server instances you want to include in this view.
4. Click **Add >** to move the selected instances from Monitored Instances to View Instances.

Server Configuration Properties

The Server Configuration Properties view provides the current configuration settings for each of your monitored SQL Server instances and allows for some changes directly in this window rather than leaving this view to access the properties page. The grid layout allows you to quickly scroll down in the column for a specific setting, and verify that the setting is correct in all of your instances.

You can sort your results in ascending or descending order for each column by clicking the column header. Right-click a column header to select other column options, including grouping by the selected column, hiding a column, or opening the **Group By** box for additional options.

Access the Server Configuration Properties view

SQL Diagnostic Manager provides two paths to access the Server Configuration Properties view. The first access path is by clicking **All Servers**, and then clicking the **Show Server Configuration Properties** icon on the far right. The second access path is by right-clicking **All Servers**, and then clicking **View All Server Properties**. By default, the All Servers view displays your monitored SQL Server instances in the thumbnail view.

Performing general tasks in this view

The Server Configuration Properties view provides the following actions by right-clicking a row, and then selecting the task you want to perform:

Open

Opens the Dashboard view for the selected monitored SQL Server instance.

Refresh Alerts

Gathers the alert status and refreshes the tree view information for the selected monitored SQL Server instance.

Delete

Allows you to delete the SQL Server instance from your SQLDM installation. When you select **Delete**, SQL Diagnostic Manager displays a message asking whether you want to retain the collected data for the SQL Server instance, and it also allows you to cancel out of the deletion process.

> ✓ You cannot retrieve collected data once it is deleted from the SQLdm Repository. Use the **Delete** option with care.

Collapse All Groups

Allows you to collapse the contents of a group of monitored SQL Server instances.

Expand All Groups

Allows you to expand the contents of a group of monitored SQL Server instances.

Print

Allows you to print the grid of your monitored SQL Server instances and their configured properties.

Export To Excel

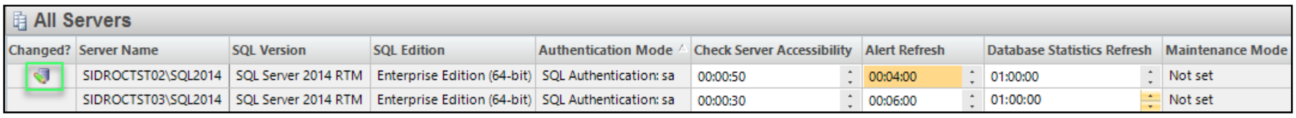
Allows you to export the grid of your monitored SQL Server instances and their configured properties to Microsoft Excel.

Properties

Opens the Monitored SQL Server Properties window for the selected instance.

Server Configuration Properties view contents

When you select the Server Configuration Properties view, SQL Diagnostic Manager displays a grid containing each of the settings for all of your monitored SQL Server instances. This information is updated each time the SQLdm Collection Service runs. Some cells allow you to make changes on this view while others are managed in other areas in SQL Diagnostic Manager, which are accessible by double-clicking the cell you want to change. SQL Diagnostic Manager displays the Change icon in the **Changed?** column for the row in which you made the change. Make sure you click **Save Changes** once you made the necessary change. Click **Reset Changes** to revert all unsaved changes you made on this view. The Change icon helps remind you to save your changes as shown in the following image.



All Servers

Changed?	Server Name	SQL Version	SQL Edition	Authentication Mode	Check Server Accessibility	Alert Refresh	Database Statistics Refresh	Maintenance Mode
✓	SIDROCTST02\SQL2014	SQL Server 2014 RTM	Enterprise Edition (64-bit)	SQL Authentication: sa	00:00:50	00:04:00	01:00:00	Not set
	SIDROCTST03\SQL2014	SQL Server 2014 RTM	Enterprise Edition (64-bit)	SQL Authentication: sa	00:00:30	00:06:00	01:00:00	Not set

The Server Configuration Properties view contains the following properties:

Active Cluster Node

Displays the name of the active cluster node on this monitored SQL Server instance. For more information about this setting, see Configure cluster settings.

Alert Refresh

Displays the interval (in hours, minutes, and seconds) between times when the service collects diagnostic data and raises the associated alerts. Use a value between 30 seconds and 30 minutes. Lower values result in a faster triggered alert, but also cause more frequent refreshes, which may increase monitoring overhead. You can modify this setting directly in this view. Click in the appropriate field, make your change, and then click **Save Changes**. For more information about this setting, see Set general server options.

Authentication Mode

Displays the authentication mode used by the SQLdm Collection Service to collect diagnostic data from the monitored SQL Server instance. For more information about this setting, see Set general server options.

Activity Monitor Enabled

Displays whether monitoring of non-query activities is enabled. The monitoring of non-query activities captures autogrow events, deadlocks, and blocks. For more information about this setting, see Set activity monitor options.

Baseline Date Range

Displays the period of time over which the server baseline is calculated. For more information about this setting, see Set server baseline options.

Baseline Time Period

Displays the date range over which the server baseline is calculated. For more information about this setting, see Set server baseline options.

Changed?

Displays an edit icon to indicate that this row includes a change from the last time the data was saved. Click **Save Changes** to retain any changes made in this view. Click **Reset Changes** to revert to the most-recently saved server configuration properties.

Check Server Accessibility

Displays the interval (in hours, minutes, and seconds) between times when the server availability is verified. Use a value between 30 seconds and 10 minutes. If a select 1 query cannot execute in this timeframe, then the server is considered unresponsive. Setting your server availability check to a very low value may result in false positive alerts. You can modify this setting directly in this view. Click in the appropriate field, make your change, and then click **Save Changes**. For more information about this setting, see Set general server options.

Database Statistics Refresh

Displays the interval (in hours, minutes, and seconds) between times when the database space-related data is collected and associated alerts are raised. Use a value between one minute and 24 hours. Setting your database statistics refresh to a low value may result in false positive alerts. A low setting also causes refreshes to occur more often, which increases the monitoring overhead. In environments with a large number of databases whose sizes do not change rapidly, setting this refresh to a long interval can greatly reduce your monitoring footprint. You can modify this setting directly in this view. Click in the appropriate field, make your change, and then click **Save Changes**. For more information about this setting, see Set general server options.

Deadlock Monitoring

Displays the current state of deadlock monitoring, which raises alerts for deadlocked sessions on your monitored SQL Server instance. Deadlock monitoring is supported on monitored servers running SQL Server 2005 or greater and is dependent on enabling the monitoring of non-query activities in the Activity Monitor window. For more information about this setting, see Set activity monitor options.

Disk Collection Settings

Displays whether the connected disk drives are discovered automatically. For more information about this setting, see Customize disk statistics.

Error Log Alerting Enabled

Displays whether error log alerting is enabled, causing a specific error log collector to run. Error log alerting is considered enabled if either the SQL Server Agent Log or SQL Server Error Log alert is enabled. Note that these collectors may negatively affect performance. You can reduce the impact of error log reading by regularly cycling the server error logs. For more information about error log alerting, see Configure alerts.

Fragmentation Min. Table Size (KB)

Displays the minimum size, in kilobytes, a table must meet before fragmentation statistics are collected. Use a value between 0 KB and 999999 KB. Fragmentation statistics are only gathered on tables with clustered indexes. You can modify this setting directly in this view. Click in the appropriate field, make your change, and then click **Save Changes**. For more information about this setting, see Edit table statistics options.

InputBuffer Limiter

Displays the limit of the executions performed by the DBCC Inputbuffer. This command retrieves the actual input command for the Session Details view, among others. Note that on busy servers, limiting this value can reduce monitoring impact. For more information about this setting, see Set general server options.

Job Alerting Enabled

Displays whether job alerting is enabled, causing a specific job alerts collector to run. Job alerting is considered enabled if one of the following alerts is enabled:

- SQL Server Agent Job Completion
- SQL Server Agent Job Failure
- SQL Server Agent Long Running Job (Minutes)
- SQL Server Agent Long Running Job (Percent)

For more information about job alerting, see Configure alerts.

Last Fragmentation Collection

Displays the date and time of the most recent, successful table fragmentation collection. This timestamp is local to the monitored SQL Server instance. For more information about this setting, see Edit table statistics options.

Last Table Growth Collection

Displays the date and time of the most recent, successful table statistics collection. This timestamp is local to the monitored SQL Server instance. For more information about this setting, see Edit table statistics options.

Linked Custom Counters (Count)

Displays the total number of custom counters monitored on this SQL Server instance. For more information about this setting, see Link or tag custom counters.

Linked Custom Counters (List)

Displays the name for each custom counter monitored on this SQL Server instance. For more information about this setting, see Link or tag custom counters.

Maintenance Mode

Displays the occasions when this server is in maintenance mode. Options include **Never**, **Until further notice**, **Recurring every week at the specified time**, and **Occurring once at the specified time**. For more information about this setting, see Schedule maintenance mode.

OS Metrics Collection

Displays whether SQL Diagnostic Manager uses OLE automation or a direct connection to Windows Management Interface (WMI) to collect operating system and disk statistics. Disabling this setting prevents the collection of certain metrics in SQL Diagnostic Manager, but may lessen the monitoring overhead. For more information about this setting, see Configure OS metrics.

Preferred Cluster Node

Displays the name of the preferred cluster node on this monitored SQL Server instance. You can modify this setting directly in this view. Click in the appropriate field, make your change, and then click **Save Changes**. For more information about this setting, see Configure cluster settings.

Query Monitor Enabled

Displays whether query monitoring is enabled. The Query Monitor collects poorly-performing queries such as SQL batches, statements, stored procedures, and triggers. Low thresholds for query monitoring may impact performance. For more information about this setting, see Set Query Monitor options.

Query Monitor Thresholds

Displays the various threshold types for query monitoring. Note that low thresholds for the query monitoring impacts performance. For more information about these settings, see Set Query Monitor options.

Query Waits

Displays the date and time when the query-level wait statistics are collected or whether they are collected indefinitely. By default, these statistics are available only when the Query Waits view is open. Collection of query waits is a performance-intensive operation. For more information about this setting, see Configure wait monitoring.

Query Waits Filters

Displays the filter configuration of the query-level wait statistics for this monitored SQL Server instance, including which applications, databases, and SQL text you want to exclude from the query wait statistics collection. Collection of query waits is a performance-intensive operation and excluding unnecessary data can reduce the monitoring footprint. For more information about this setting, see Configure advanced query wait options.

Replication Monitoring Disabled

Displays whether replication statistics collection is disabled. Replication monitoring can cause excess monitoring overhead in some environments and is not necessary for all servers. You can modify this setting directly in this view. Click in the appropriate field to make your change, and then click **Save Changes**. For more information about this setting, see Disable replication statistics collection.

Server Name

Displays the name of the monitored SQL Server instance.

Session History Browser Collection Disabled

Displays whether extended session data collection is disabled, including a collection of session details, locks, and blocks. Collection of this data allows you to view past session detail, lock, and block information but incurs extra monitoring overhead to provide this data. This data also requires extra space in the SQLdm Repository. You can modify this setting directly in this view. Click in the appropriate field to make your change, and then click **Save Changes**. For more information about this setting, see Set general server options.

SQL Edition

Displays the edition of SQL Server software used in this instance.

SQL Server ID

Displays the identification number of the monitored SQL Server as used internally by SQL Diagnostic Manager. You cannot modify this value.

SQL Version

Displays the version of SQL Server software used in this instance.

Table Fragmentation Collection

Displays the days of the week and time of day when an attempt at table statistics collection occurs. For more information about this setting, see Edit table statistics options.

Table Growth Collection

Displays the days of the week and time of day when an attempt at table statistics collection occurs. For more information about this setting, see Edit table statistics options.

Table Statistics Excluded Databases (Count)

Displays the total number of databases excluded from table statistic collection. For more information about this setting, see Edit table statistics options.

Table Statistics Excluded Databases (List)

Displays the name of each database excluded from table statistic collection. For more information about this setting, see Edit table statistics options.

Virtualization Host Name

Displays the name of the host server on which this monitored SQL Server instance is running. This field applies only to SQL Server instances running on a virtual machine. For more information about virtualization configuration, see Configure virtualization.

VM Name

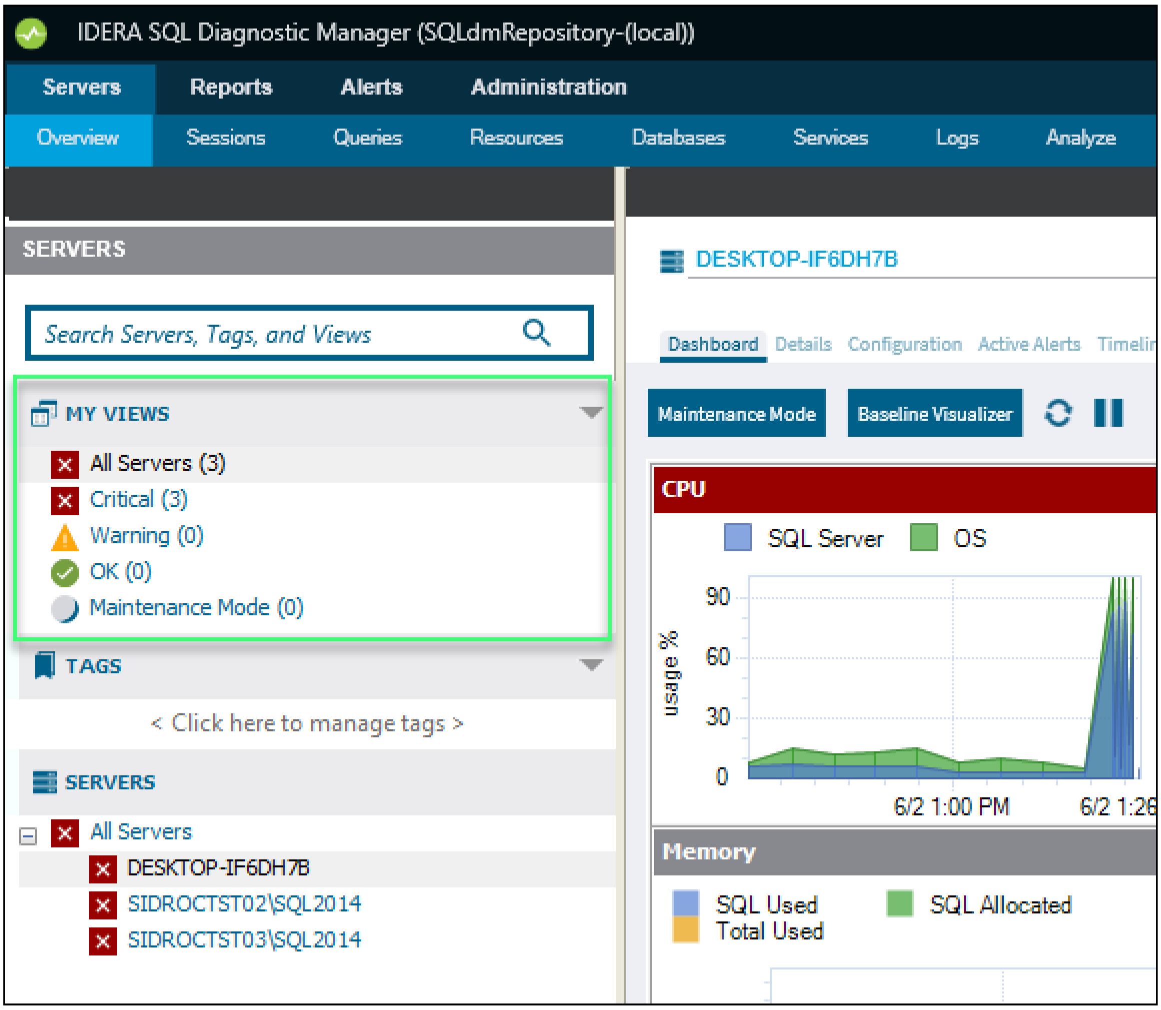
Displays the name of the virtual machine on which this monitored SQL Server instance is running. This field applies only to SQL Server instances running on a virtual machine. For more information about virtualization configuration, see Configure virtualization.

Monitor multiple SQL Server instances

MY VIEWS allows you to group servers to provide a high-level, global view of multiple monitored servers. This view includes basic statistics about your registered SQL Server instances and quick links to more detailed information. A monitor displays statistics for each SQL Server instance included in the group.

Access My Views

MY VIEWS is available at all times as part of the navigation pane as shown in the following image:



Use the group list

SQL Diagnostic Manager updates the data shown in the thumbnails view of the group list according to the interval entered in the **Status and Alerts Refresh** field on the Console Options window, accessed by selecting **> Console Options**. This information is collected from the last data point stored in the SQLDM Repository.

By default, the group list displays basic statistics for each of the SQL Server instances monitored by SQL Diagnostic Manager. This information includes the following statistics for each instance:

Response Time

Refers to the time it takes for a query to go from the SQLDM Console to the SQL Server instance and back.

User Sessions

Refers to the total number of SQL Server user sessions.

SQL CPU Usage

Refers to the average percentage of SQL Server processor usage on the computer hosting the SQL Server instance.

SQL Memory Usage/Allocated

Refers to the amount of memory in use by the monitored SQL Server instance.

SQL Disk I/O

Refers to the number of physical reads and physical writes made by the SQL Server instance between refreshes. ***If you see a high percentage of physical reads*** , you can improve performance by allocating more memory to the SQL data cache.

Use the SQL Diagnostic Manager web console

The SQL Diagnostic Manager web console helps users identify and diagnose problems quickly in their SQL Server environment. The SQL Diagnostic Manager web console provides key overview information simply through dashboards and high-level views.

- Access the overall status of your SQL Server environment from any connected browser. **No SQL Diagnostic Manager Desktop Console required**.
- Provide an easy-to-use web console without giving access to the entire management console.
- Quickly view the status of a single instance or instance groups (tags) and drill down for details.
- View all active alerts in your SQL Server environment and access detailed information.
- Select different sub-views to diagnose performance issues faster.
- Monitor overall health of queries and drill down through advanced query views for details.
- View your top values for selected metrics.

Find answers

This documentation set includes a comprehensive online Help system as well as additional resources that support you as you install and use the product. You can also search IDERA Solutions, available at the IDERA Customer Service portal

View help topics

SQL Diagnostic Manager Help supports the following web browser minimum requirements:

- Microsoft Edge
- Google Chrome
- Mozilla Firefox
- Safari 9+

Print help topics

You can print a help topic by selecting the topic in the table of contents, and then clicking the **Print this topic** icon on the right side of the Help window.

Use the PDF if you want to print more than a single topic. To print, click the PDF tab, and then click the **Print file** button. In the Print dialog box, select the pages you want to print before clicking **Print** .

Customer support portal

The IDERA Customer Support Portal offers 24x7 worldwide support to all customers who hold a current maintenance contract with IDERA and provides an easy and convenient way to:

- Submit or track technical support cases.
- Search the IDERA Knowledge Base.
- Download the latest version of your IDERA products.
- Access information about your support plan and licenses.
- Access IDERA resources such as the community site, blog, product videos, and white papers.

Access the IDERA Customer Support Portal

IDERA SQL product customers can click this link to enter the portal: https://idera.secure.force.com/

For any questions regarding access to the Customer Support Portal, contact your IDERA Sales representative.

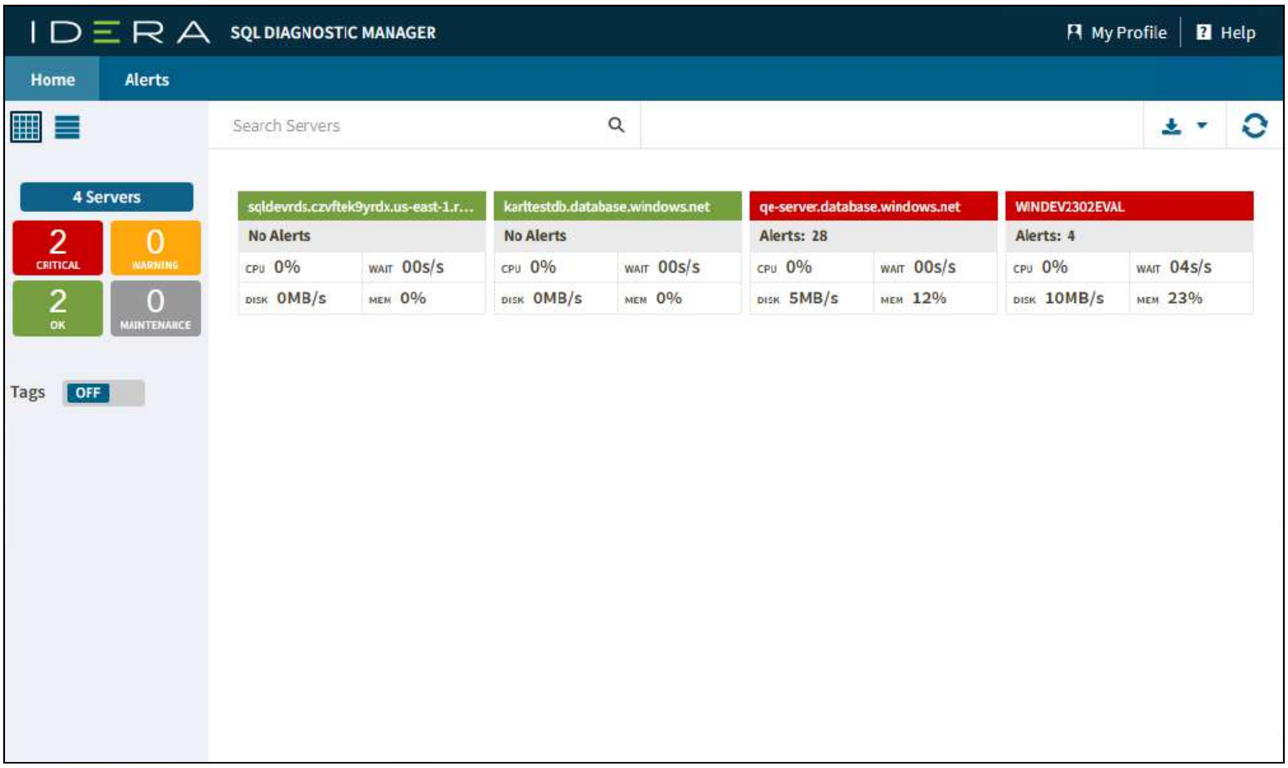
Support Status

For Support Status, please see the SQL Tools Supported Versions page.

Navigate the SQLDM Web Console

The SQLDM Web Console is a development that allows users to get an overview of the status of small and large SQL Diagnostic Manager deployments, which you can use on your computer or mobile device. At the same time, it is an interface that boasts an easy-to-navigate dashboard comprised of different views and tabs that provide a complete synopsis of your SQL Diagnostic Manager environment.

To start navigating the SQLDM Web Console, you must previously install and log in to SQLDM Web Console.



When navigating SQLDM Web Console you can find two main tabs which allow you to track your SQL Server instances:

- Home tab - Gives you an overview of your SQL Server monitored instances.
- Alerts tab - Summarizes the warning and critical alerts of your SQL Server instances.

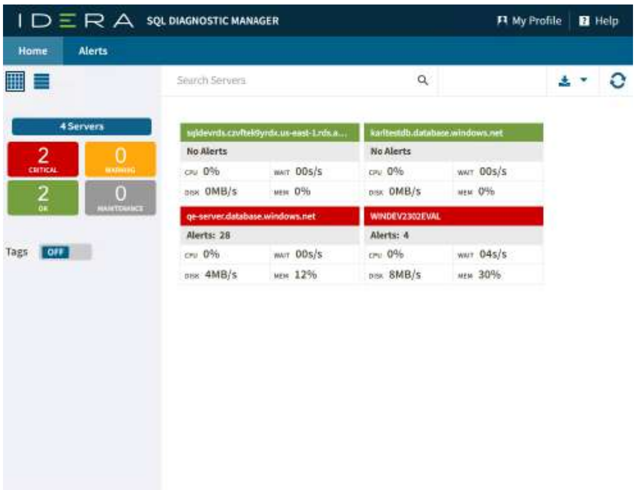
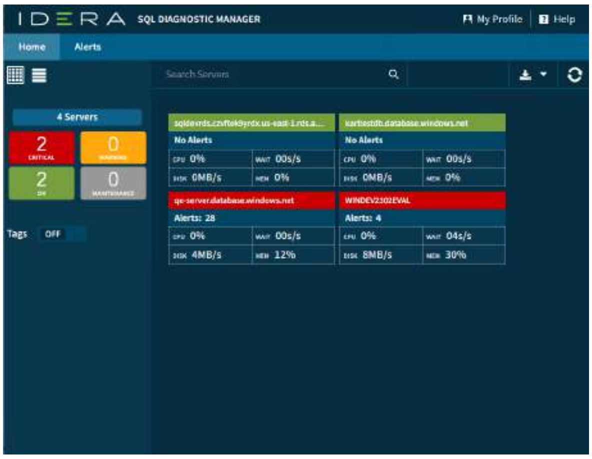
Besides, SQLDM Web Console allows you to perform some other actions such as personalizing the interface and finding SQL Diagnostic Documentation support with the following options:

My Profile

SQLDM Web Console now allows you to personalize the interface, change the repository connection, or log out of your session by selecting one of these features from the **My Profile** option.

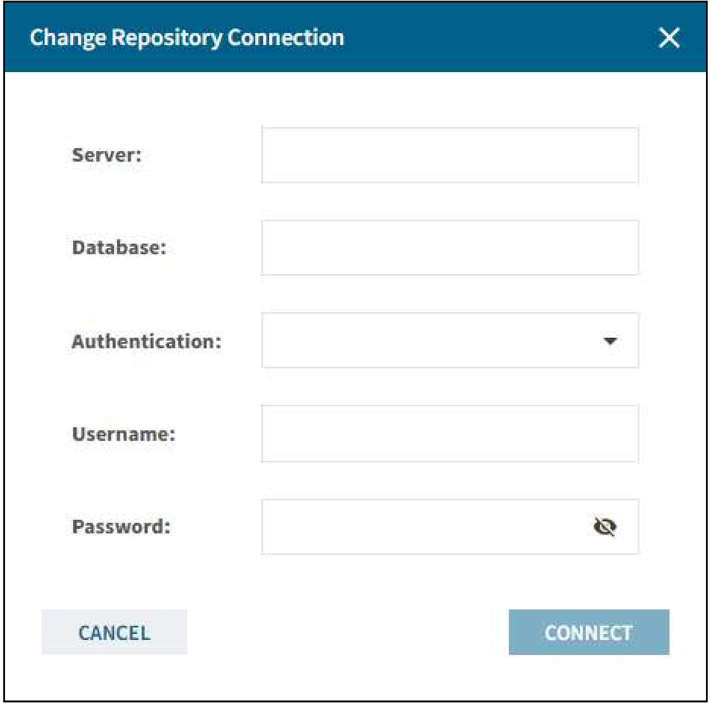
Switch Mode

You can personalize the interface by selecting between the following modes.

Light Mode	Dark Mode
	

Change Repository Connection

You can connect to the Repository by entering its information such as the Server, Database, Authentication type, and credentials.



Change Repository Connection

Server:

Database:

Authentication:

Username:

Password:

Log Out

You can log out of your session by clicking on this option.

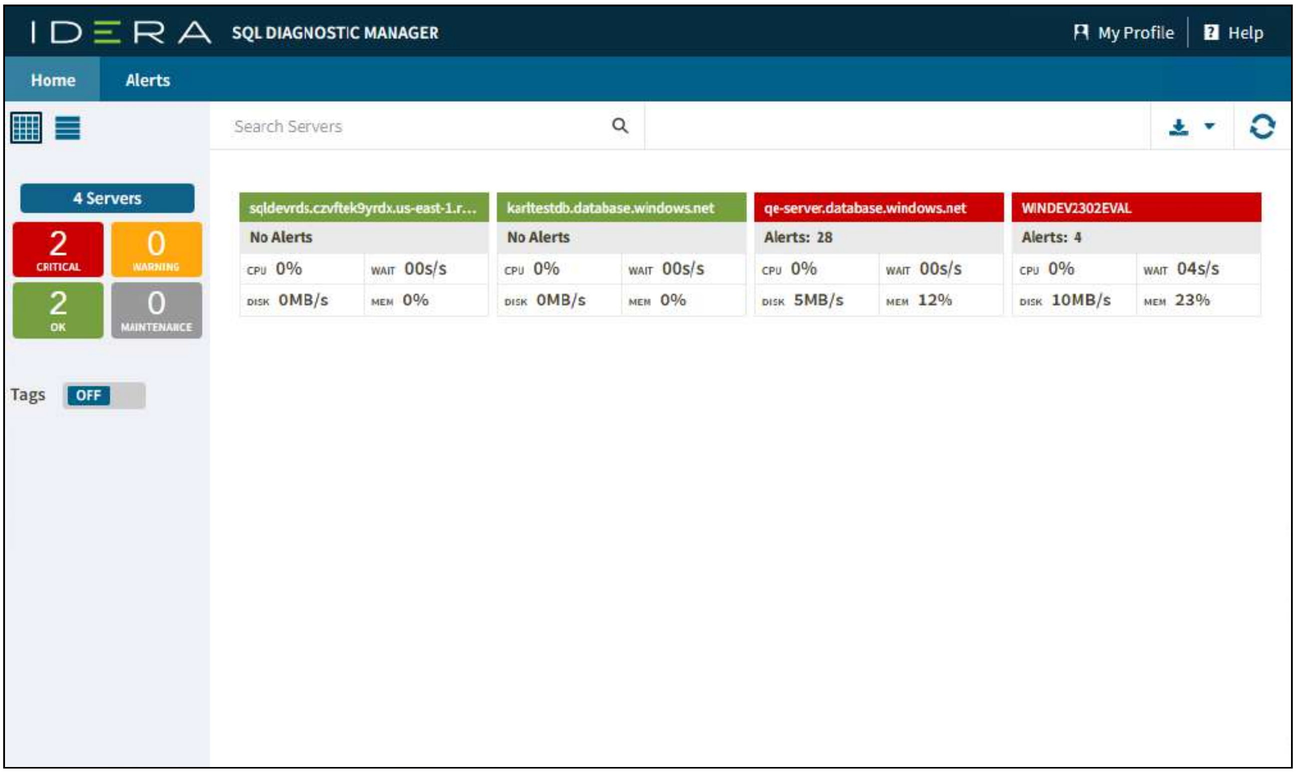
Help

In case you have any doubts using the SQLDM Web Console or SQL Diagnostic Manager, you can have product help when clicking the **Help** option that will redirect you to the documentation wiki.

Get an Overview of SQL Diagnostic Manager in the SQLDM Web Console

SQLDM Web Console gives you a glance at your SQL Diagnostic Manager environment through the **Home** tab, allowing you to perform different tasks such as:

- Get an overview of SQL Server instances
- Identify and diagnose issues across your environment
- Navigate the web console through a single instance view



Also, it is composed of different options that will help you to easily search instances, export reports, and refresh data, all this is described below.

Search Server bar

It will help you to search for a particular instance by name. If you do not remember the full name of the instance you are looking for, there is no problem, you can always type part of it, and SQLDM Web Console will show you the instances containing your search.

Download

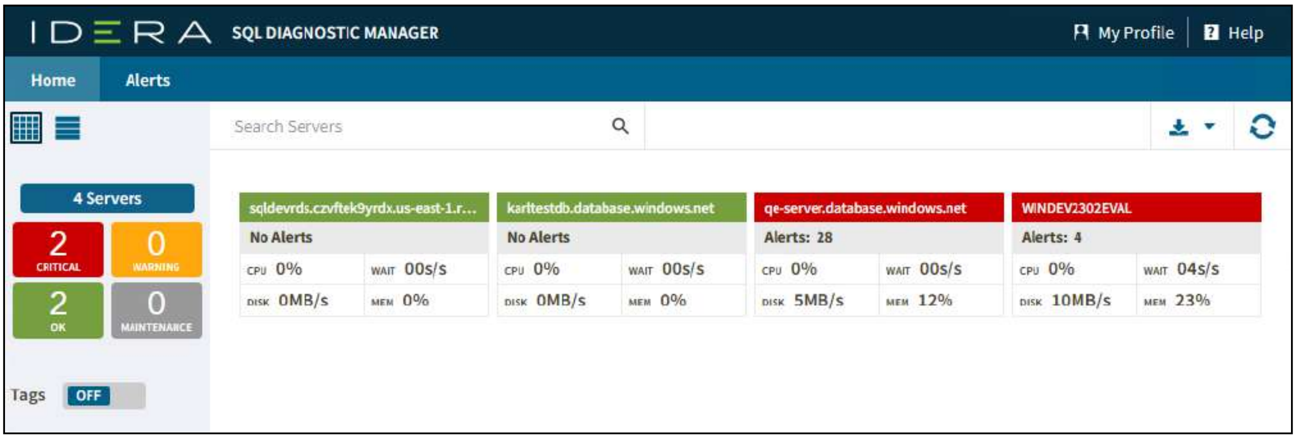
Allows you to export the current view in a PDF or Excel report file by clicking the ⬇ ▾ icon.

Refresh

The Refresh button ⟳ allows you to manually refresh displayed data.

Use views to get an overview of your environment

In the Home tab, you can check your monitored SQL Server instances status and drill down for details. Each view is expandable and information is grouped by server status or tags.



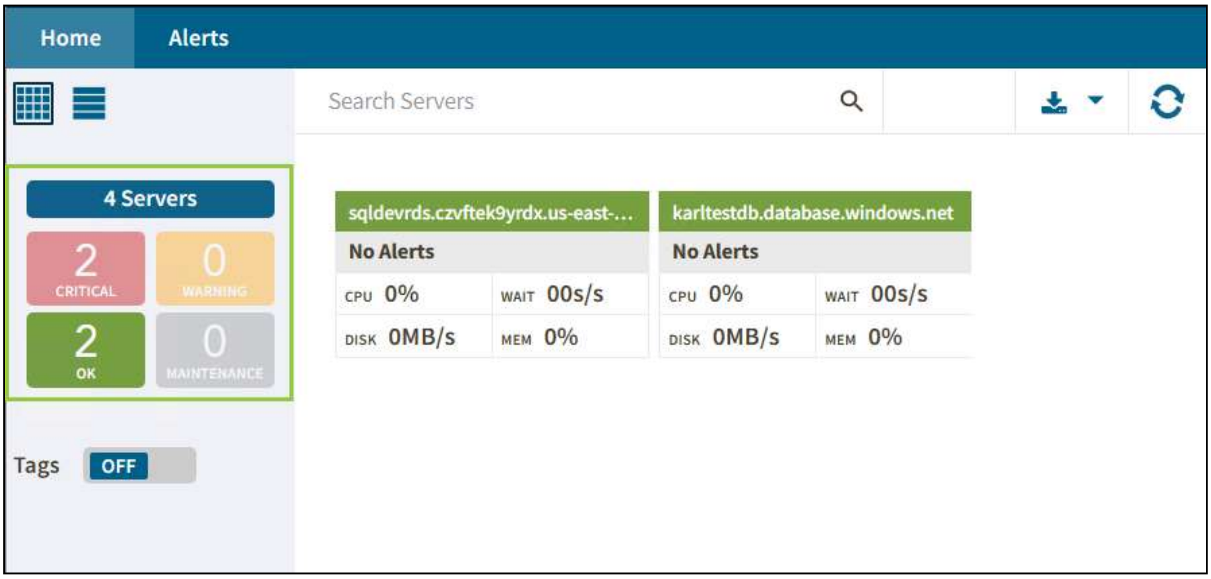
sqldevrds.czvftek9yrdx.us-east-1.r...		karltestdb.database.windows.net		qe-server.database.windows.net		WINDEV2302EVAL	
No Alerts		No Alerts		Alerts: 28		Alerts: 4	
CPU 0%	WAIT 00s/s	CPU 0%	WAIT 00s/s	CPU 0%	WAIT 00s/s	CPU 0%	WAIT 04s/s
DISK 0MB/s	MEM 0%	DISK 0MB/s	MEM 0%	DISK 5MB/s	MEM 12%	DISK 10MB/s	MEM 23%

Server Status

You can easily identify the status of your monitored SQL Server instances and take action by clicking on one of the following boxes:

- 4 Servers Servers
- 2 CRITICAL Critical
- 2 OK Successful
- 0 WARNING Warning
- 0 MAINTENANCE Maintenance

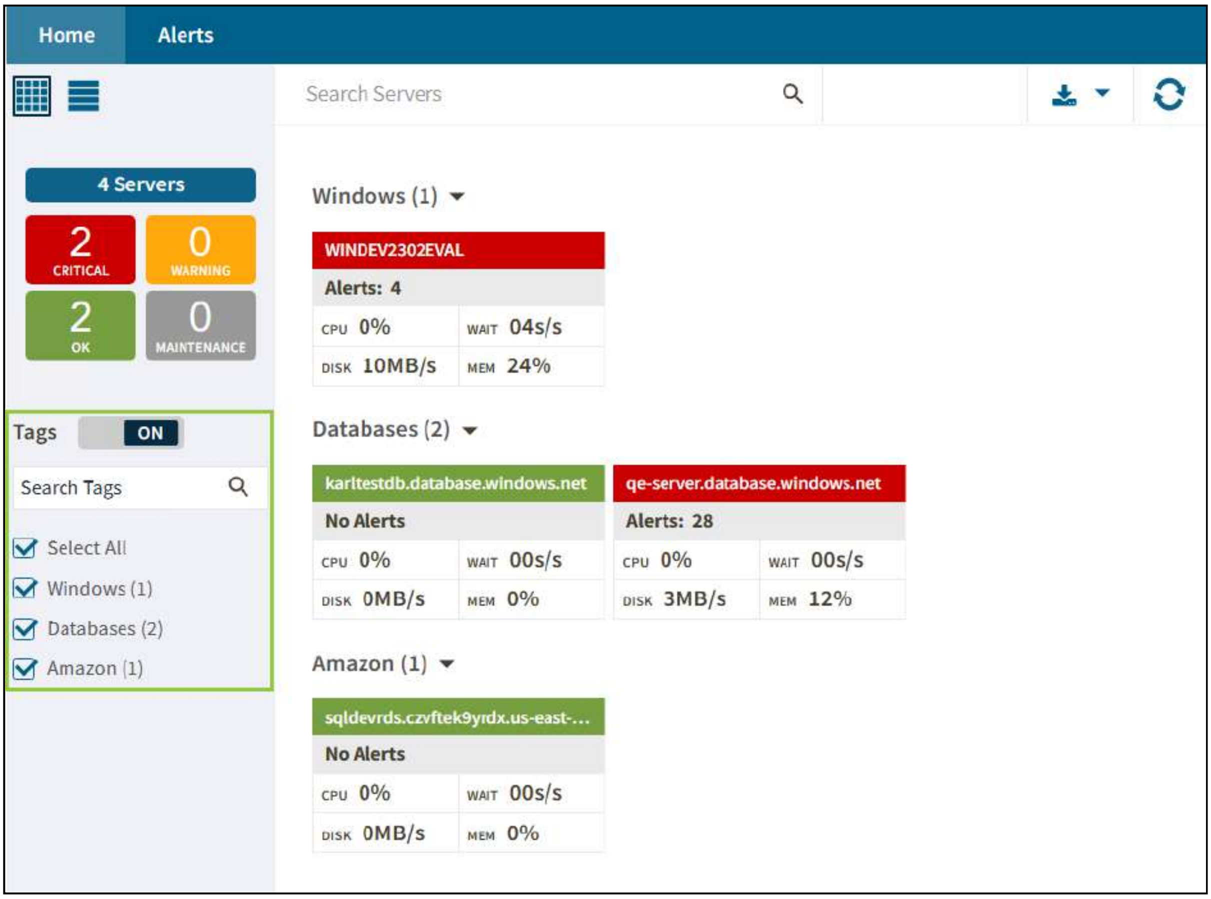
If you select all instances with an **OK** status in the server view, the panel displays information only about those instances.



ⓘ The number of instances shown on the boxes depends on the number of current servers.

Tags

SQLDM Web Console allows you to use tags to view the status filtered by tags or groups of instances and drill down to details.



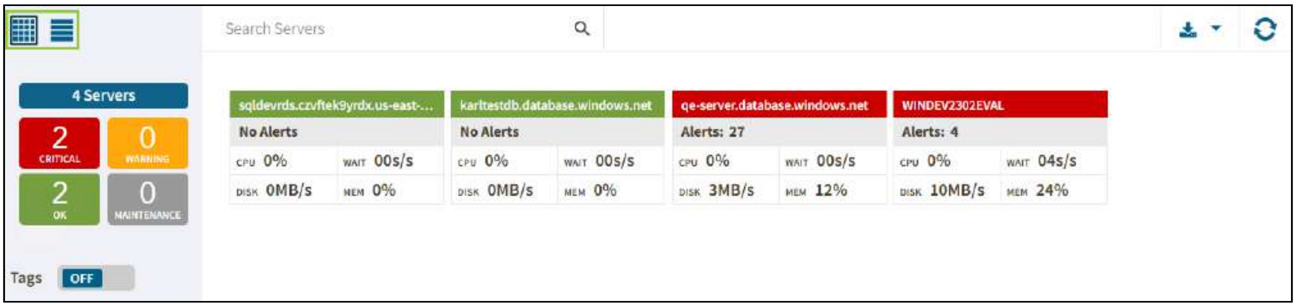
ⓘ Remember to turn on the Tags option. Otherwise, you will not be able to select the created tags. For additional information on tags, see Work with tags.

Use views to identify and diagnose issues

SQLDM Web Console helps you to identify and diagnose issues through two main views in the home tab:

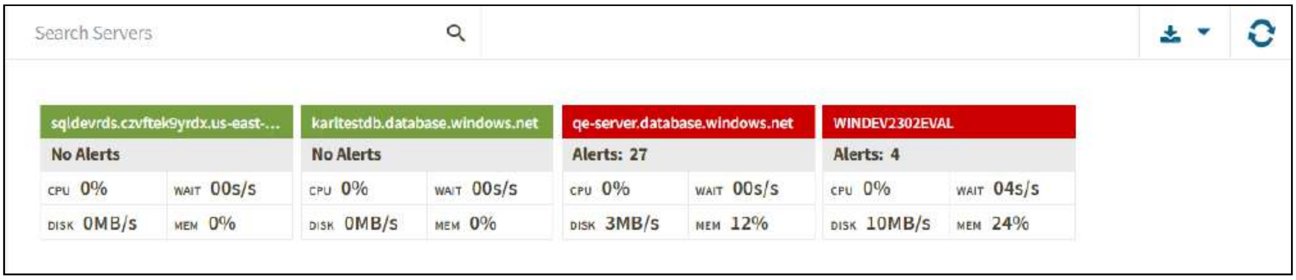
- Thumbnails
- List

These views display all data collected at the last refresh for all your monitored SQL Server instances. To access any view, click the appropriate button in the left panel of the dashboard as shown in the following image.



Thumbnails

The thumbnail view is set by default in the SQLDM Web Console and provides you with a graphical replication of your monitored SQL servers. Access additional details in the single instance view by clicking on a thumbnail instance.



The thumbnail view displays basic statistics about your SQL Servers:

Server Name

Displays the server name. The SQLDM Web Console only displays 30 characters in the thumbnail. If the name is longer, you can see the entire name by hovering the mouse over the card.

Alerts/No Alerts

Displays the number of triggered alerts in the instance according to the state of the card. For example, if the card is critical, the Alert field shows only the number of critical alerts.

Blocked Status

Displays a BLOCKED or BLOCKING red message next to the Alert field when the server is blocking or is blocked by another.

CPU

Refers to the average percentage of SQL Server processor usage on the computer hosting the SQL Server instance.

Wait

Displays the Total Server Waits for the monitored SQL Server instance

Disk

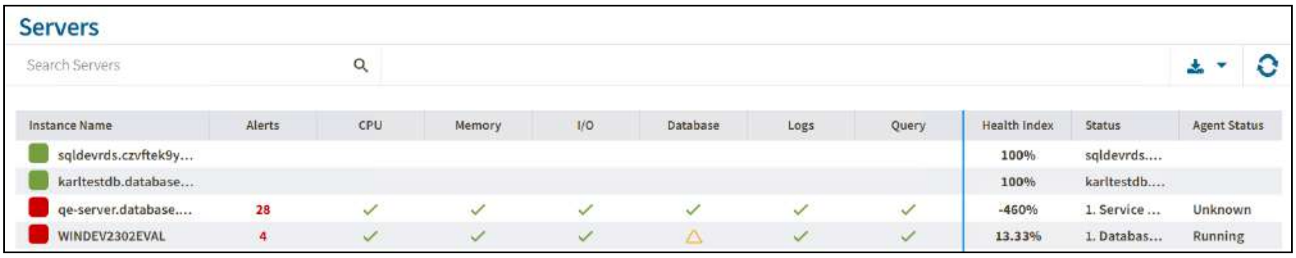
Refers to the number of physical reads and physical writes made by the SQL Server instance between refreshes.

Mem

Refers to the percentage of allocated memory by the monitored SQL Server instance.

Lists

The List view offers a means to quickly identify the status of instances, as well as the possibility to navigate to the single instance dashboard when clicking on a specific row.



Servers

Instance Name	Alerts	CPU	Memory	I/O	Database	Logs	Query	Health Index	Status	Agent Status
🟩 sqldevrds.czvftek9y...								100%	sqldevrds....	
🟩 karltestdb.database...								100%	karltestdb....	
🟥 qe-server.database....	28	✓	✓	✓	✓	✓	✓	-460%	1. Service ...	Unknown
🟥 WINDEV2302EVAL	4	✓	✓	✓	△	✓	✓	13.33%	1. Databas...	Running

The list view provides you with the following SQL Server information:

Instance Name

Displays the name of the monitored SQL Server instance.

Alert

Displays the number of triggered alerts in the instance.

CPU, Memory, I/O, Database, Logs, and Query

Displays the overall health index icon for each option.

Health Index

Displays the health index in percentage.

SQL Server Status

Displays the status of the SQL Server service such as running, stopped, and paused.

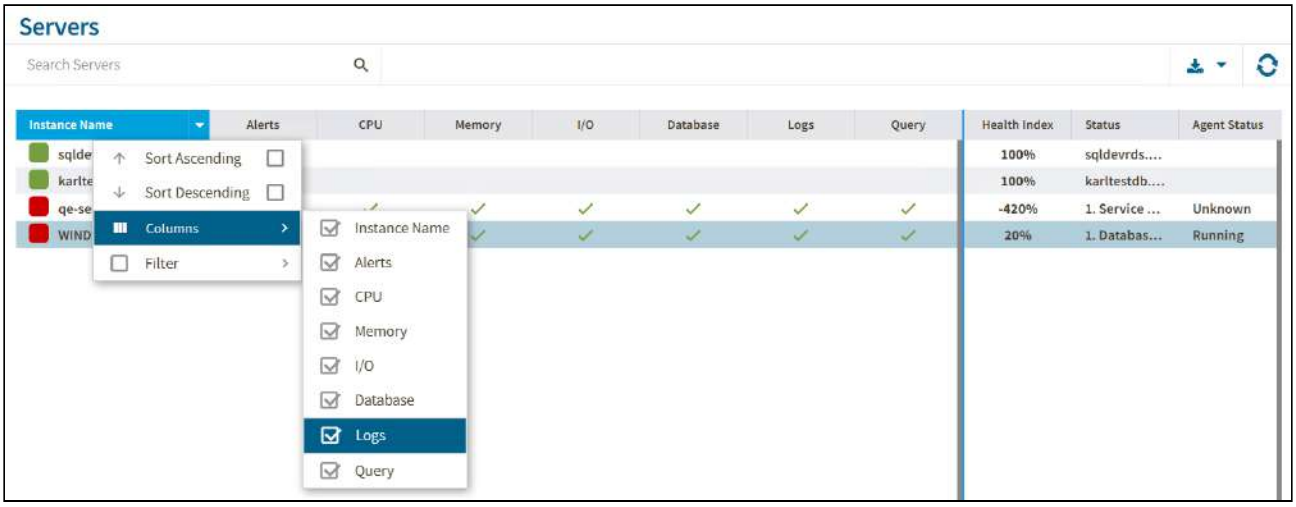
SQL Agent Status

Displays the status of the SQL Server Agent service such as running or stopped.

Actions

The Web Console console has custom filters that help you organize the list columns in your most convenient way.

To do so, hover the mouse over the column name and the ▾ icon appears next to the column name, click the icon to expand the drop-down menu. This menu allows you to sort your criteria by Sort Ascending or Sort Descending, remove or add columns, and create filters with selected criteria by column.



Servers

Instance Name	Alerts	CPU	Memory	I/O	Database	Logs	Query	Health Index	Status	Agent Status
🟩 sqlde								100%	sqldevrds....	
🟩 karlte								100%	karltestdb....	
🟥 qe-se		✓	✓	✓	✓	✓	✓	-420%	1. Service ...	Unknown
🟥 WIND			✓	✓	✓	✓	✓	20%	1. Databas...	Running

Also, you can perform other actions such as sort and search servers:

Sort

Instances on the details sub-view are sorted by severity. To re-organize information, click a column header to sort it.

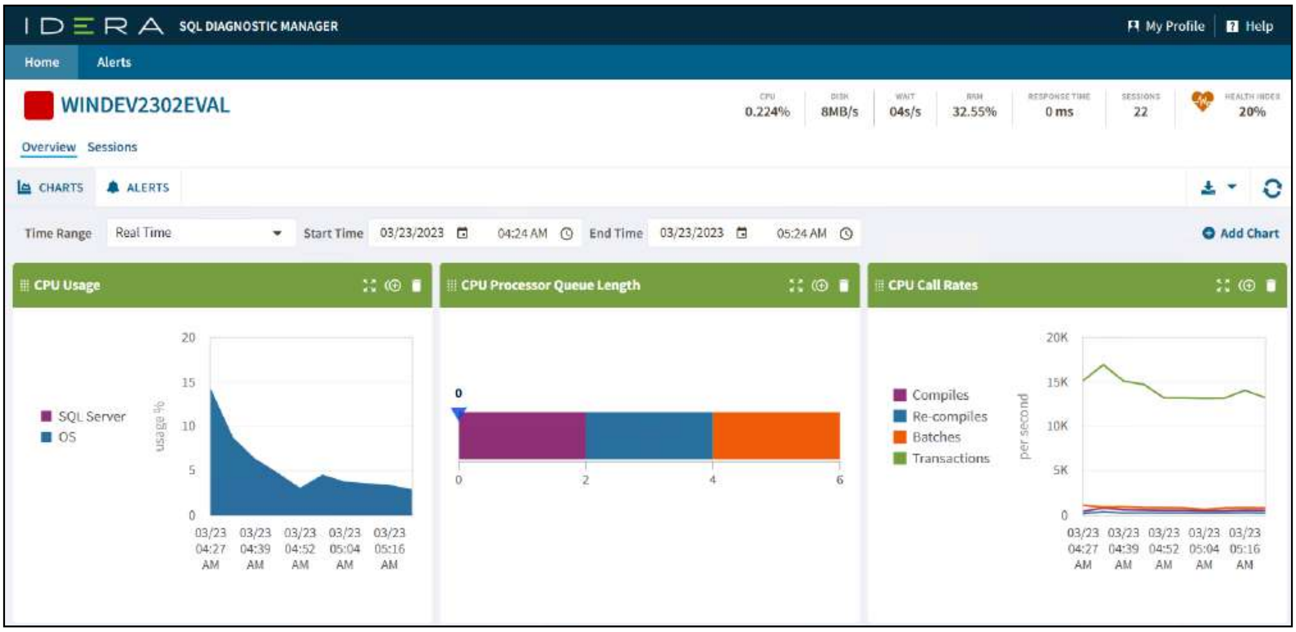
Search Servers

The Search Servers bar allows you to find instances by typing the instance name you are looking for.

Navigate the web console single instance view

One of the features included in the SQLDM Web Console is the single instance view. You can access this view by double-clicking on the thumbnail of your selected SQL Server instance. By doing this, you will be able to check your SQL Server instance status.

For better control, the single instance view presents the Overview and Sessions options that help you to easily monitor your instance.



CPU 0.224% | DISK 8MB/s | WAIT 04s/s | RAM 32.55% | RESPONSE TIME 0 ms | SESSIONS 22 | HEALTH INDEX 20%

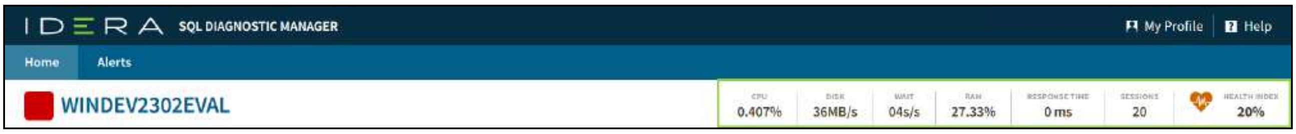
Time Range: Real Time | Start Time: 03/23/2023 04:24 AM | End Time: 03/23/2023 05:24 AM

Besides, the single instance view provides you with instance management tools and options, such as:

- Dashboard Header
- Time Range Filter

Dashboard Header

The Dashboard Header summarizes the SQL Server instance performance.



CPU 0.407% | DISK 36MB/s | WAIT 04s/s | RAM 27.33% | RESPONSE TIME 0 ms | SESSIONS 20 | HEALTH INDEX 20%

In this section, you can find the server summary that shows the metrics of the selected instance, such as:

Server Name

Displays the server name of your instance.

CPU

Refers to the average percentage of SQL Server processor usage on the computer hosting the SQL Server instance.

Disk

Refers to the number of physical reads and writes made by the SQL Server instance between refreshes.

Wait

Displays the Total Server Waits for the monitored SQL Server instance.

RAM

Displays the percentage of allocated memory to SQL Server instance in usage.

Response Time

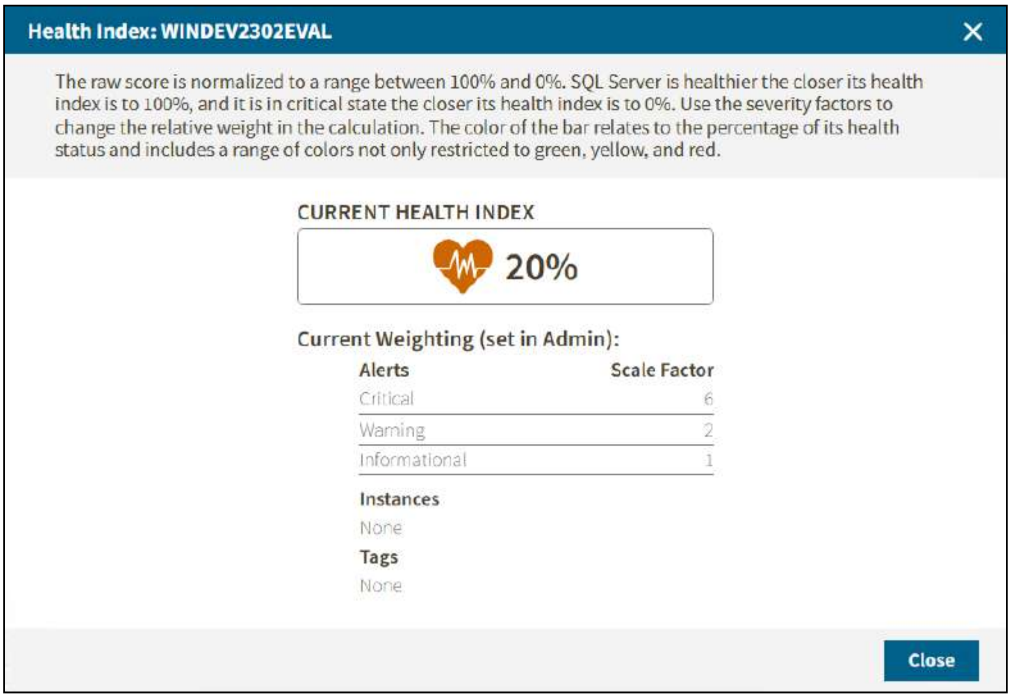
Displays the calculated time that SQL Diagnostic Manager needs to send a simple SQL command to the instance, have it processed, and receive the returned result set.

Sessions

Displays the current number of sessions in an SQL Server instance.

Health Index

Shows the current instance health in percentage. To have a wider view of this option click on the metric and the following window will pop up.



Health Index: WINDEV2302EVAL

The raw score is normalized to a range between 100% and 0%. SQL Server is healthier the closer its health index is to 100%, and it is in critical state the closer its health index is to 0%. Use the severity factors to change the relative weight in the calculation. The color of the bar relates to the percentage of its health status and includes a range of colors not only restricted to green, yellow, and red.

CURRENT HEALTH INDEX

20%

Current Weighting (set in Admin):

Alerts	Scale Factor
Critical	6
Warning	2
Informational	1

Instances

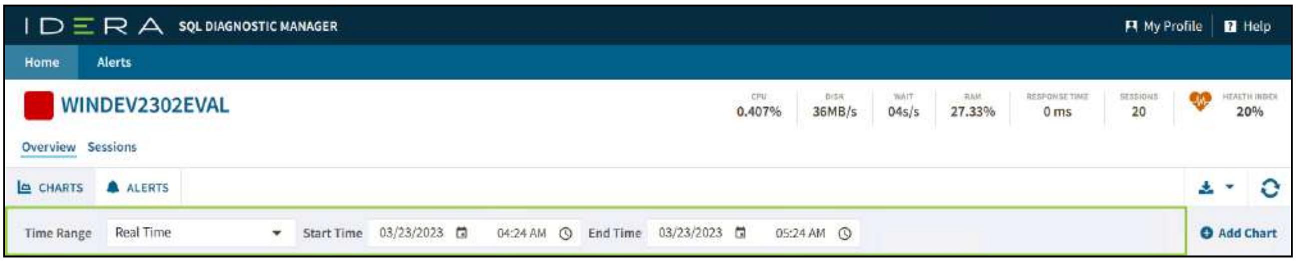
None

Tags

None

Time Range Filter

The Time Range Filter provides SQL Server instance information pertaining to its state at the time a standard snapshot is taken. You can use this information to diagnose and resolve issues to keep the issue from happening again. You can modify it by changing the start and end time and date.



CPU 0.407%

DISK 36MB/s

WAIT 04s/s

RAM 27.33%

RESPONSE TIME 0 ms

SESSIONS 20

HEALTH INDEX 20%

Time Range Real Time

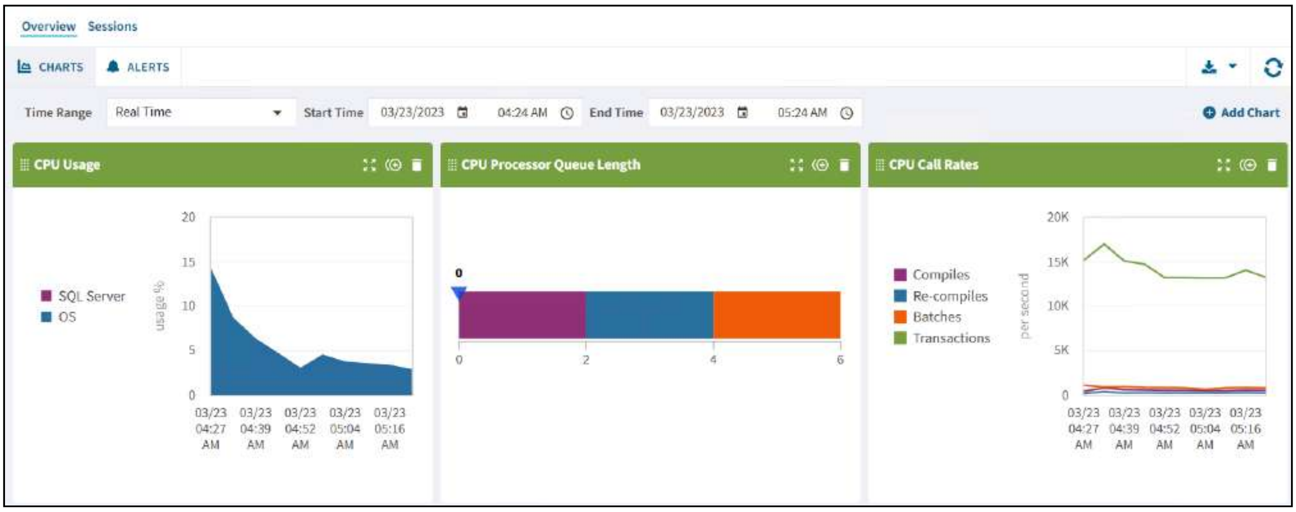
Start Time 03/23/2023 04:24 AM

End Time 03/23/2023 05:24 AM

Navigate through the single instance overview

The single instance view provides the **Overview** tab, which helps you to check your alerts in a graphic and detailed way with the following sections.

- Charts
- Alerts



Time Range: Real Time

Start Time: 03/23/2023 04:24 AM

End Time: 03/23/2023 05:24 AM

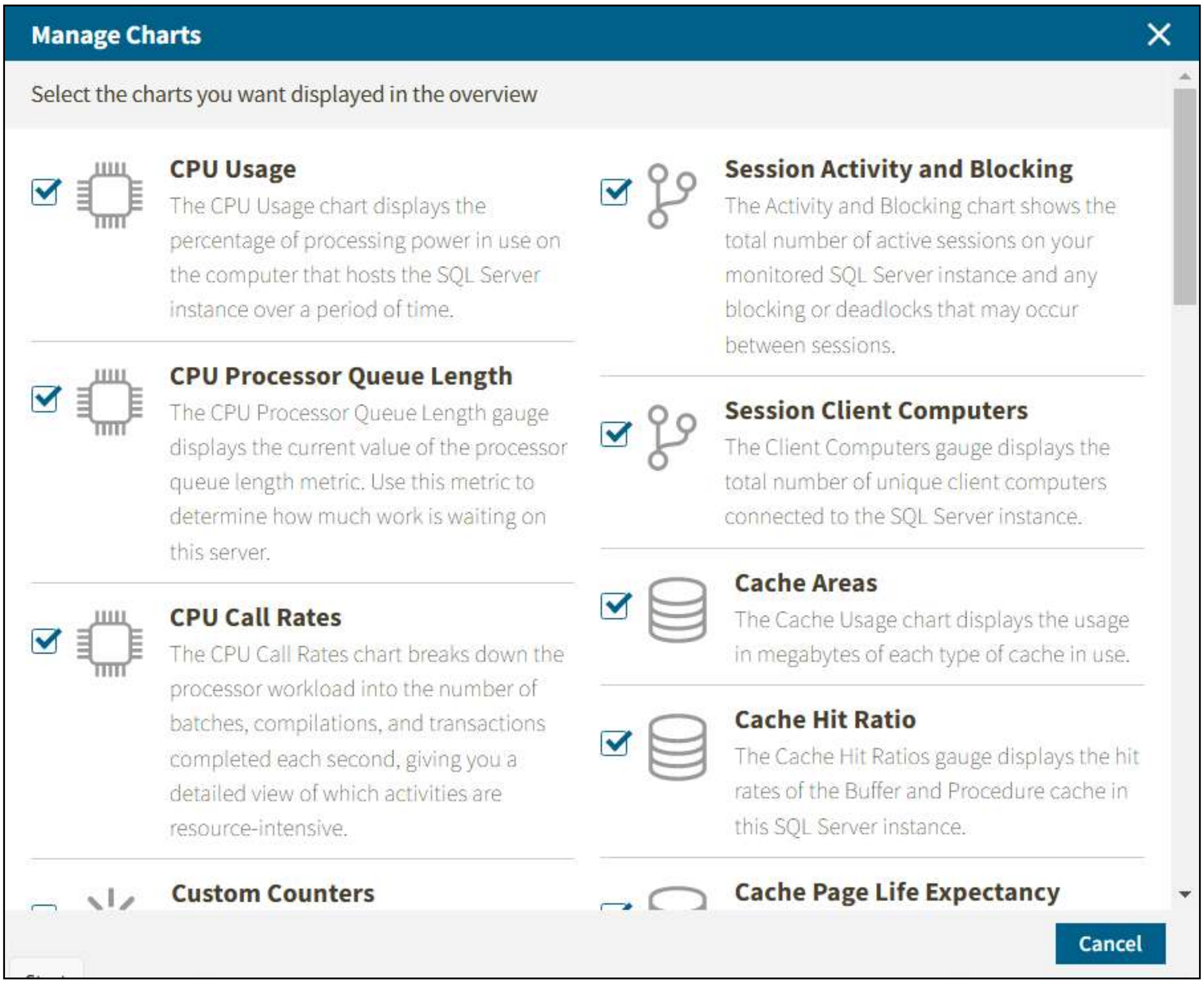
Charts

The **Charts** view provides you with complete graphic instance monitoring from the SQL Diagnostic Manager Server application. Each chart has the following capabilities:

- **Drag and drop** - To change the position of a chart, drag it by clicking the ⠿ icon and moving the chart to the position you like.
- **Expand and contract** - To get a wider view of the chart, click the ⛶ icon.
- **Duplicate** - To duplicate a chart click the ⊕ icon.
- **Remove** - To delete a chart from the overview view, click the 🗑 icon.

> ⓘ You can find the options above in the header of each chart.

The single instance dashboard also includes the option **Add Chart**. Click it and the **Manage Charts** window will pop up, allowing you to choose the graphs to be displayed in the overview single instance view.



Manage Charts

Select the charts you want displayed in the overview

☑ **CPU Usage**
The CPU Usage chart displays the percentage of processing power in use on the computer that hosts the SQL Server instance over a period of time.

☑ **CPU Processor Queue Length**
The CPU Processor Queue Length gauge displays the current value of the processor queue length metric. Use this metric to determine how much work is waiting on this server.

☑ **CPU Call Rates**
The CPU Call Rates chart breaks down the processor workload into the number of batches, compilations, and transactions completed each second, giving you a detailed view of which activities are resource-intensive.

□ **Custom Counters**

☑ **Session Activity and Blocking**
The Activity and Blocking chart shows the total number of active sessions on your monitored SQL Server instance and any blocking or deadlocks that may occur between sessions.

☑ **Session Client Computers**
The Client Computers gauge displays the total number of unique client computers connected to the SQL Server instance.

☑ **Cache Areas**
The Cache Usage chart displays the usage in megabytes of each type of cache in use.

☑ **Cache Hit Ratio**
The Cache Hit Ratios gauge displays the hit rates of the Buffer and Procedure cache in this SQL Server instance.

☑ **Cache Page Life Expectancy**

The **Manage Charts** window allows you to choose as many charts as you want from the following options:

CPU Usage

The CPU Usage chart displays the percentage of the processing power on the computer that hosts the SQL Server instance over a period of time.

CPU Processor Queue Lenght

The CPU Processor Queue Length graph displays the current value of the processor queue length metric. Use this metric to determine how much work is waiting on this server.

CPU Call Rates

The CPU Call Rates chart breaks down the processor workload into the number of batches, compilations, and transactions completed each second. Through this chart, you can get a detailed view of the resource-intensive activities.

Cache Areas

The Cache Usage chart displays the usage in megabytes of each type of cache in use on your instance.

Cache Hit Ratio

The Cache Hit Ratios gauge displays the hit rates of the Buffer and Procedure cache in the monitored SQL Server instance. Configure the Procedure Cache Hit Ratio (Percent) alert to warn you about any issue related.

Custom Counters

The Custom Counters panel displays the statistics of a selected custom counter on a monitored SQL Server instance.

Databases

The Databases panel tracks the performance of the databases on your monitored SQL Server.

Disk Latency

The Disk Latency chart plots the average time (in milliseconds) required to complete disk reads and writes, tracking the disk IO speed over time.

Cache Page Life Expectancy

The Page Life Expectancy chart provides the time in seconds that a page remains in the cache or buffer pool. The longer your page stays in the cache, the more likely the chance that SQL Server finds that data quickly without a read of physical media and minimizes processing resource use. Use the Page Life Expectancy alert to warn you of issues.

File Activity

The File Activity panel displays the top five database files with the highest relative activity since the last refresh.

Lock Waits

The Lock Waits panel tracks the total number waits caused when a task is waiting to acquire a lock on your monitored SQL Server.

Disk SQL Server Physical I/O

The SQL Server Physical I/O chart breaks down the SQL Server throughput into its key component pieces, giving you a detailed view of how well the SQL Server is processing your data requests and updates.

Disk Throughput

The Disk Throughput chart plots the number of disk reads and writes over time.

Memory SQL Server Usage

The SQL Server Usage chart compares the amount of memory allocated and used by SQL Server to the total memory consumed by a computer.

Memory Paging

The SQL Server Paging chart plots the number of swapped pages per second, over time, as calculated by the memory paging metric.

Memory Usage

The Memory Usage chart compares the amount of memory allocated and used by SQL Server to the total memory consumed by this virtual machine.

Network Response Time

The Response Time gauge displays the time (in milliseconds) SQL diagnostic manager currently needs to send a simple SQL command to the SQL Server instance, have it processed, and receive the returned result set.

Network Throughput

The Throughput chart plots how many packets this SQL Server sends and receives over time.

Server Waits

The Server Waits panel tracks the total number and time spent on waits affecting your monitored SQL Server.

Session Activity and Blocking

The Activity and Blocking chart displays the total number of active sessions on your monitored SQL Server instance and any blocking or deadlocks that may occur between sessions.

Session Client Computers

The Client Computers graph displays the total number of unique client computers connected to the SQL Server instance.

Tempdb Contention

The Tempdb Contention chart provides the latch wait time for the allocation pages of your tempdb.

Tempdb Space Used

The Tempdb Space Used chart provides different views of how your database is used over time based on the object type.

Tempdb Version Store Cleanup Rate

The Version Store Cleanup Rate gauge displays the current version store cleanup rate and the version generation rate of the data rows necessary to support snapshot isolation.

Virtualization CPU Ready Wait Time

The CPU Ready Wait Time gauge displays the current gauge value of the vCPU Ready Time metric available on the Server Details view.

Virtualization Disk Usage

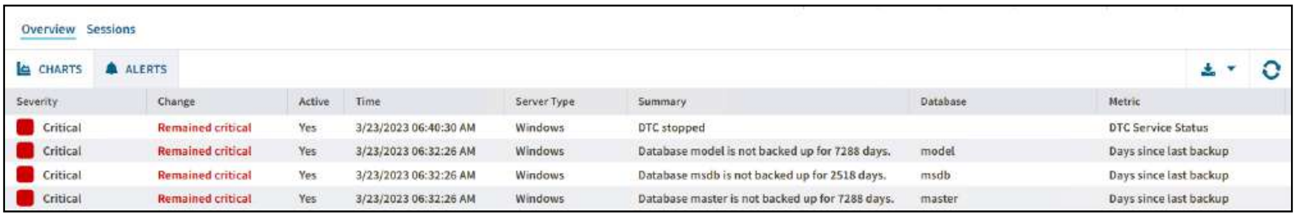
The Virtual Disk Usage chart displays the amount of data read from and written to disk for the VM or host server during the sample interval.

Virtualization Memory Usage

The Virtual Memory Usage chart displays the amount of memory allocated and used by SQL Server to the total memory consumed on this VM or host server.

Alerts

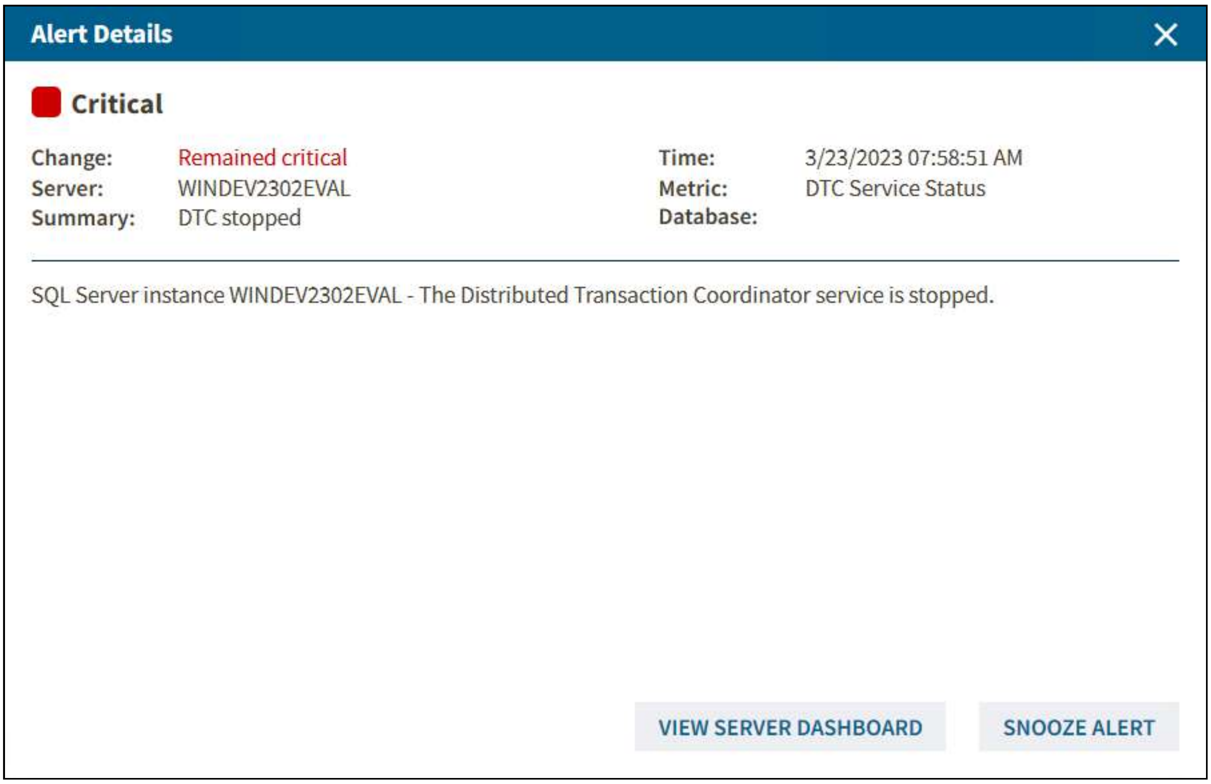
The single instance dashboard summarizes the critical and warning alerts of your instance in a detailed view, shown as follows.



Severity	Change	Active	Time	Server Type	Summary	Database	Metric
🟥 Critical	Remained critical	Yes	3/23/2023 06:40:30 AM	Windows	DTC stopped		DTC Service Status
🟥 Critical	Remained critical	Yes	3/23/2023 06:32:26 AM	Windows	Database model is not backed up for 7288 days.	model	Days since last backup
🟥 Critical	Remained critical	Yes	3/23/2023 06:32:26 AM	Windows	Database msdb is not backed up for 2518 days.	msdb	Days since last backup
🟥 Critical	Remained critical	Yes	3/23/2023 06:32:26 AM	Windows	Database master is not backed up for 7288 days.	master	Days since last backup

In this view, you can review and organize under the following columns **Severity**, **Change**, **Active**, **Time**, **Server Typer**, **Summary**, **Database**, and **Metric**.

Besides, you can check all the alert details in a new window with all the meaningful information by double-clicking the alert.



🟥 Critical

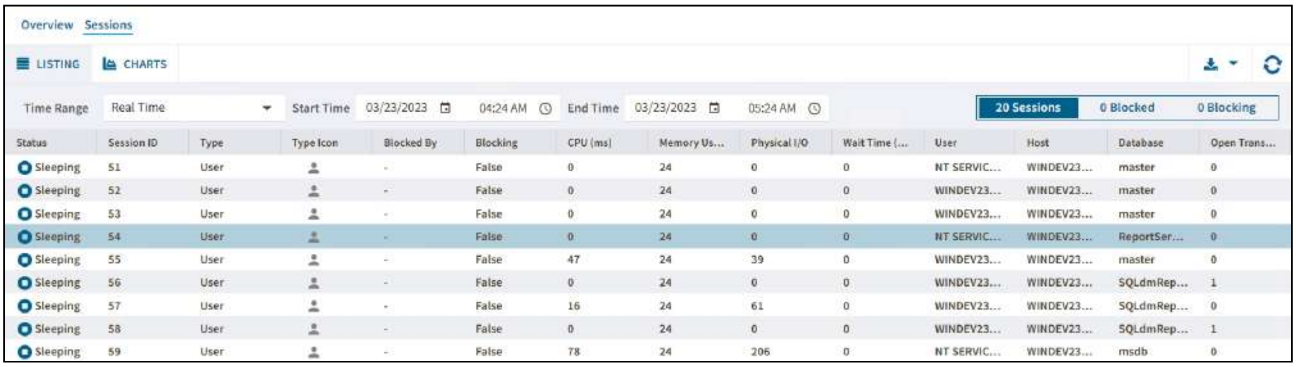
Change: Remained critical
Server: WINDEV2302EVAL
Summary: DTC stopped
Time: 3/23/2023 07:58:51 AM
Metric: DTC Service Status
Database:

SQL Server instance WINDEV2302EVAL - The Distributed Transaction Coordinator service is stopped.

View your SQL Server sessions information

The single instance dashboard provides you with the **Sessions** tab which allows you to quickly view key diagnostic statistics for sessions on your SQL Server instance and contains the following tabs:

- Listing
- Charts



Time Range: Real Time | Start Time: 03/23/2023 04:24 AM | End Time: 03/23/2023 05:24 AM

20 Sessions | 0 Blocked | 0 Blocking

Status	Session ID	Type	Type Icon	Blocked By	Blocking	CPU (ms)	Memory Us...	Physical I/O	Wait Time (...	User	Host	Database	Open Trans...
Sleeping	51	User	👤	-	False	0	24	0	0	NT SERVIC...	WINDEV23...	master	0
Sleeping	52	User	👤	-	False	0	24	0	0	WINDEV23...	WINDEV23...	master	0
Sleeping	53	User	👤	-	False	0	24	0	0	WINDEV23...	WINDEV23...	master	0
Sleeping	54	User	👤	-	False	0	24	0	0	NT SERVIC...	WINDEV23...	ReportSer...	0
Sleeping	55	User	👤	-	False	47	24	39	0	WINDEV23...	WINDEV23...	master	0
Sleeping	56	User	👤	-	False	0	24	0	0	WINDEV23...	WINDEV23...	SQLdmRep...	1
Sleeping	57	User	👤	-	False	16	24	61	0	WINDEV23...	WINDEV23...	SQLdmRep...	0
Sleeping	58	User	👤	-	False	0	24	0	0	WINDEV23...	WINDEV23...	SQLdmRep...	1
Sleeping	59	User	👤	-	False	78	24	206	0	NT SERVIC...	WINDEV23...	msdb	0

Listing

The **Listing** tab helps you to monitor your SQL Server instances. To do so, you can choose one or more of the diagnostic statistics metrics:

- Status
- Session ID
- Type
- Host
- Blocked By
- Blocking
- CPU (ms)
- Memory Usage
- Physical I/O
- Wait Time (ms)
- User
- Host
- Database
- Open Transaction
- Command
- Application
- Execution Context
- Wait Type
- Wait Resource
- CPU Delta (ms)
- Loging Time
- Physical I/O Delta
- Last Batch
- Blocking Count
- Net Address
- Net Library
- Version Elapsed Seconds
- Transaction

- Current Session
- Session User Space Allocated (kb)
- Session User Space Deallocated (kb)
- Current Task User Space (kb)
- Task User Space Allocated (kb)
- Task User Space Deallocated (kb)
- Current Session Internal Space (kb)
- Session Internal Space Allocated (kb)
- Session Internal Space Deallocated (kb)
- Current Task Internal Space (kb)
- Task Internal Space Allocated (kb)
- Task Internal Space Deallocated (kb)
- Last Command

You can configure the columns displayed in the Listing view by clicking the option ▾ icon, hovering the mouse over the column option, and choosing the metrics of your interest.

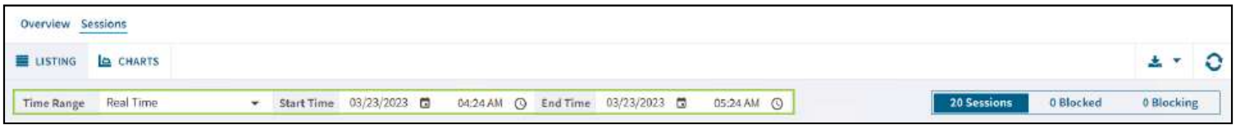
Besides displaying diagnostic statistics of the monitored SQL Server instance, the Lisinting view allows you to perform the following actions:

Filter Information

The Sessions view presents ways of filtering your session instance information using the following options:

Time Range Filter

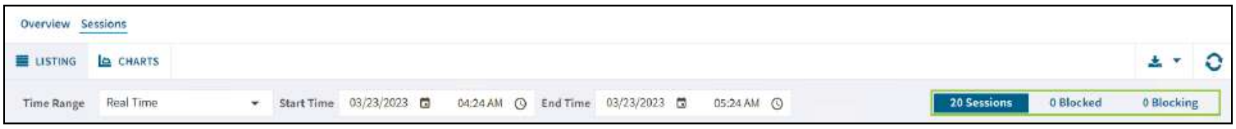
To monitor the session's server status in a frame of time use the time range filter. Modify the start and end time and date according to your needings.



Time Range: Real Time
Start Time: 03/23/2023 04:24 AM
End Time: 03/23/2023 05:24 AM

Session Filter

To monitor your sessions by type, you can click on one of the next options to display data:

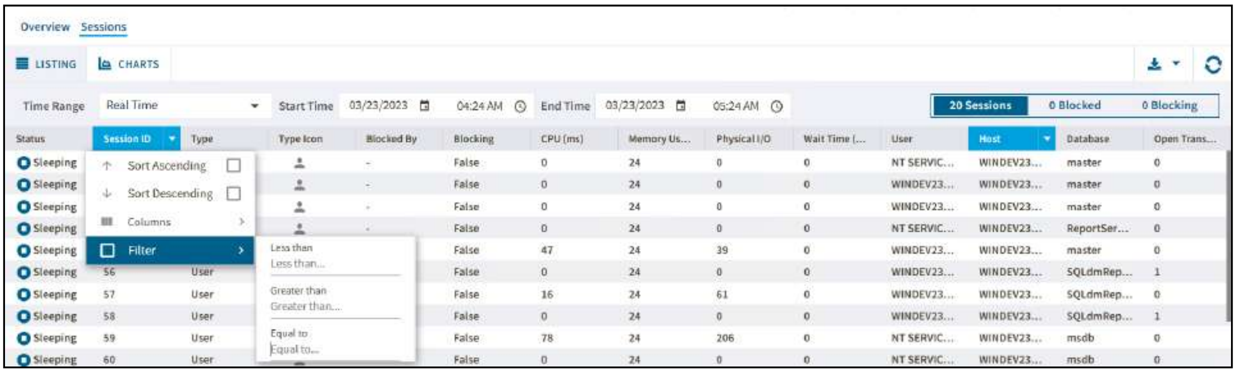


Time Range: Real Time
Start Time: 03/23/2023 04:24 AM
End Time: 03/23/2023 05:24 AM

- **Sessions** - Filters all the sessions across your SQL Server instances
- **Blocked** - Filters the blocked SQL Server instances
- **Blocking** - Filter the blocking SQL Server instances

Column Filter

To filter specific criteria by column, select a column, click on the ▾ icon next to the icon's name, select the **Filter** option, and select or type the searching criteria.



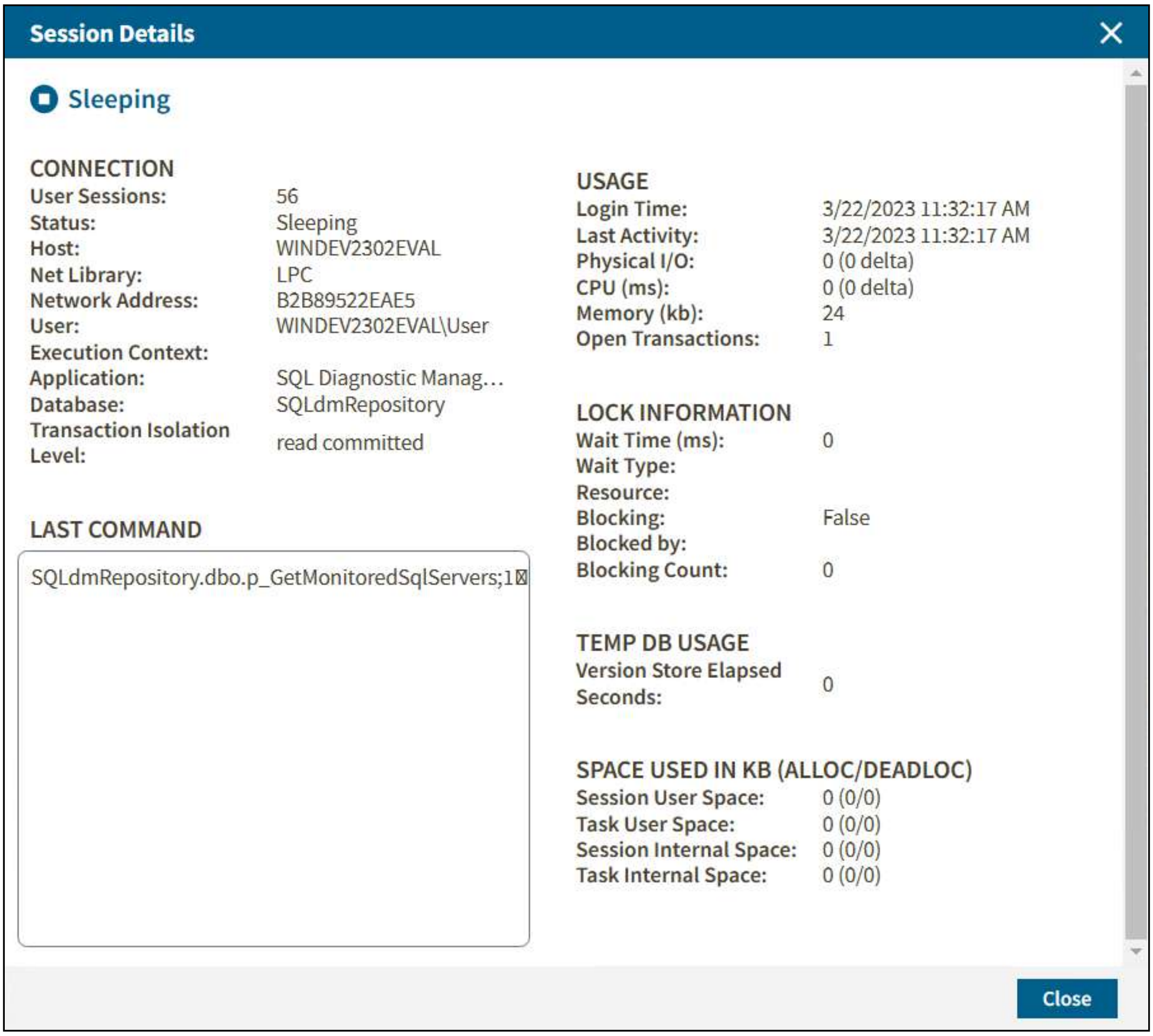
Time Range: Real Time
Start Time: 03/23/2023 04:24 AM
End Time: 03/23/2023 05:24 AM

Status	Session ID	Type	Type Icon	Blocked By	Blocking	CPU (ms)	Memory Us...	Physical I/O	Wait Time (...	User	Host	Database	Open Trans...
Sleeping			👤	-	False	0	24	0	0	NT SERVIC...	WINDEV23...	master	0
Sleeping			👤	-	False	0	24	0	0	WINDEV23...	WINDEV23...	master	0
Sleeping			👤	-	False	0	24	0	0	WINDEV23...	WINDEV23...	master	0
Sleeping			👤	-	False	0	24	0	0	NT SERVIC...	WINDEV23...	ReportSer...	0
Sleeping					False	47	24	39	0	WINDEV23...	WINDEV23...	master	0
Sleeping	56	User			False	0	24	0	0	WINDEV23...	WINDEV23...	SQLdmRep...	1
Sleeping	57	User			False	16	24	61	0	WINDEV23...	WINDEV23...	SQLdmRep...	0
Sleeping	58	User			False	0	24	0	0	WINDEV23...	WINDEV23...	SQLdmRep...	1
Sleeping	59	User			False	78	24	206	0	NT SERVIC...	WINDEV23...	msdb	0
Sleeping	60	User			False	0	24	0	0	NT SERVIC...	WINDEV23...	msdb	0

ⓘ When using the Column filter, consider that each column has its own selection criteria.

Check Session Details

The Session tab allows you to get a detailed summary of each session. To check the session details, double-click on a specific session and the following window will pop up.



Sleeping

CONNECTION

User Sessions:	56
Status:	Sleeping
Host:	WINDEV2302EVAL
Net Library:	LPC
Network Address:	B2B89522EAE5
User:	WINDEV2302EVAL\User
Execution Context:	
Application:	SQL Diagnostic Manag…
Database:	SQLdmRepository
Transaction Isolation Level:	read committed

LAST COMMAND

SQLdmRepository.dbo.p_GetMonitoredSqlServers;1⊠

USAGE

Login Time:	3/22/2023 11:32:17 AM
Last Activity:	3/22/2023 11:32:17 AM
Physical I/O:	0 (0 delta)
CPU (ms):	0 (0 delta)
Memory (kb):	24
Open Transactions:	1

LOCK INFORMATION

Wait Time (ms):	0
Wait Type:	
Resource:	
Blocking:	False
Blocked by:	
Blocking Count:	0

TEMP DB USAGE

Version Store Elapsed Seconds:	0

SPACE USED IN KB (ALLOC/DEADLOC)

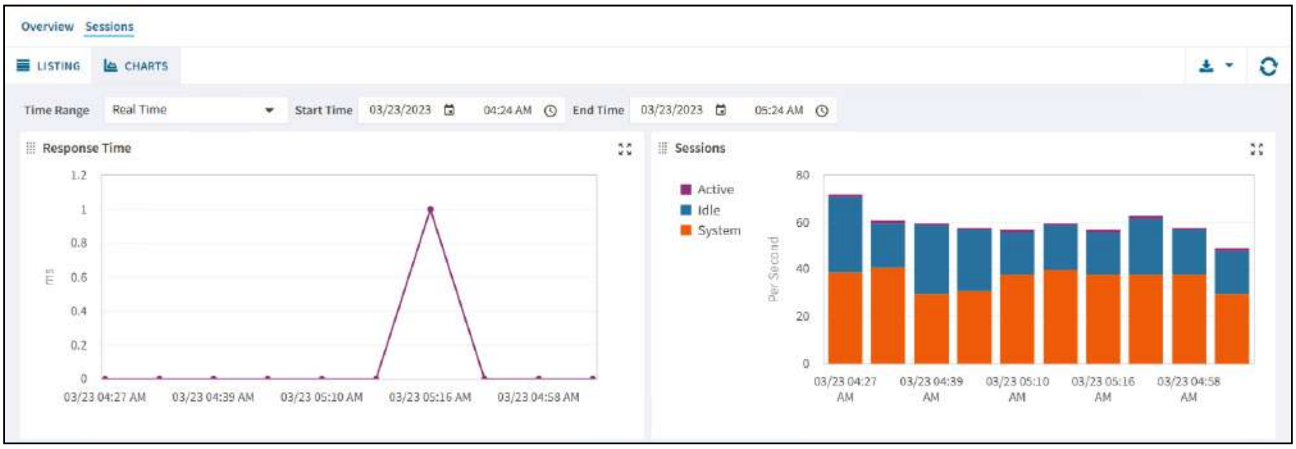
Session User Space:	0 (0/0)
Task User Space:	0 (0/0)
Session Internal Space:	0 (0/0)
Task Internal Space:	0 (0/0)

In the Session Details window, you will find sessions data regarding:

- Connection information
- Usage metrics
- Last Command used
- Lock Information metrics
- Temp DB Usage metrics
- Space used in kb (alloc/deadloc) metrics

Charts

The **Charts** tab gives you a graphic status session report containing the following charts :



Response Time (ms)

The Response Time chart displays the response time (in milliseconds) it takes a Select SQL statement to go to the SQL Server instance and back. This chart indicates the current speed and congestion of the network as well as the speed with which SQL Server processes small queries.

Sessions

The Session Activity chart displays the number of concurrent connections to the monitored SQL Server instance over time. The total number of sessions includes the active, idle, and system sessions.

Blocked Sessions

The Blocked Sessions chart lists all the Blocked Sessions, Lead Blockers, and Total Deadlocks for the selected SQL Server instance. This allows you to easily view blocks as they occur.

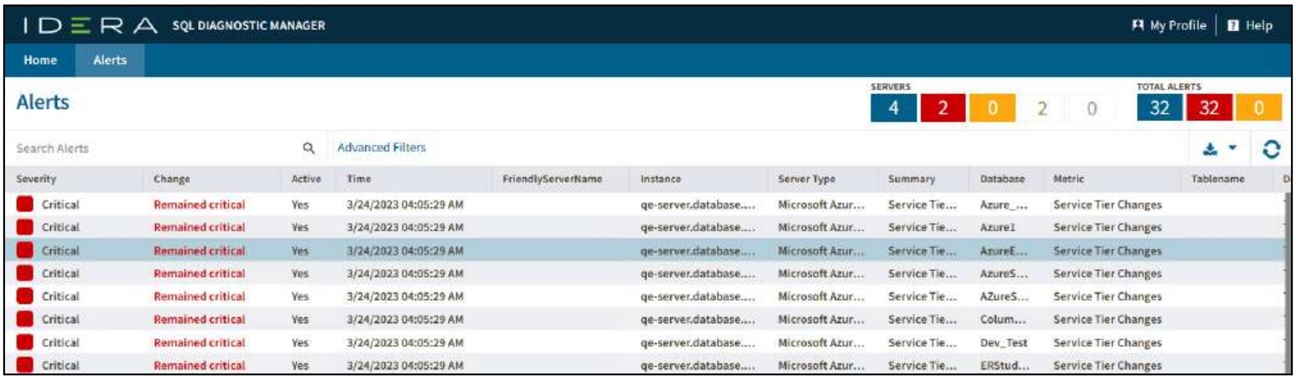
Lock Statistics

The Lock Statistics chart displays all the lock object statistics, helping you to pinpoint, correct, or reschedule automated applications that cause extensive row, table, or database locking. The chart includes the following objects.

- **AllocUnit** - Represents a lock on an allocation unit.
- **Application** - Represents a lock on an application-specific resource.
- **Database** - Represents a lock on a database, including all objects in the database.
- **Extent -** Represents a lock on a contiguous group of eight pages.
- **File** - Represents a lock on a database file.
- **HoBT** - (Heap or BTree) Represents a lock on a heap of data pages, or on the BTree structure of an index.
- **Key** - Represents a lock on a row in an index.
- **Latch** - Represents a lock on a latch.
- **Metadata** - Represents a lock on a piece of catalog information, also called metadata.
- **Object** - Represents a lock on an item such as a table, stored procedure, or view, including all data and indexes. The object represents anything that has an entry in sys.all_objects.
- **Page** - Represents a lock on an 8 KB page in a database.
- **RID** - (Row ID) Represents a lock on a single row in a heap.
- **Table** - Represents a lock on a table.

View all your alerts in the web console

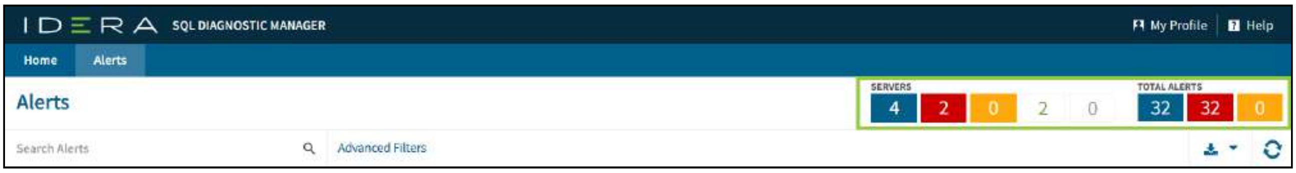
SQLDM Web Console allows you to view all the triggered alerts in a single view in your server's environment, to access this view go to the **Alerts** tab.



Severity	Change	Active	Time	FriendlyServerName	Instance	Server Type	Summary	Database	Metric	Tablename	D
Critical	Remained critical	Yes	3/24/2023 04:05:29 AM		qe-server.database....	Microsoft Azur...	Service Tie...	Azure_...	Service Tier Changes		
Critical	Remained critical	Yes	3/24/2023 04:05:29 AM		qe-server.database....	Microsoft Azur...	Service Tie...	Azure1	Service Tier Changes		
Critical	Remained critical	Yes	3/24/2023 04:05:29 AM		qe-server.database....	Microsoft Azur...	Service Tie...	AzureE...	Service Tier Changes		
Critical	Remained critical	Yes	3/24/2023 04:05:29 AM		qe-server.database....	Microsoft Azur...	Service Tie...	AzureS...	Service Tier Changes		
Critical	Remained critical	Yes	3/24/2023 04:05:29 AM		qe-server.database....	Microsoft Azur...	Service Tie...	AZureS...	Service Tier Changes		
Critical	Remained critical	Yes	3/24/2023 04:05:29 AM		qe-server.database....	Microsoft Azur...	Service Tie...	Colum...	Service Tier Changes		
Critical	Remained critical	Yes	3/24/2023 04:05:29 AM		qe-server.database....	Microsoft Azur...	Service Tie...	Dev_Test	Service Tier Changes		
Critical	Remained critical	Yes	3/24/2023 04:05:29 AM		qe-server.database....	Microsoft Azur...	Service Tie...	ERStud...	Service Tier Changes		

Monitor your alerts by status server

The **Alerts** tab gives you a summary of the number of servers and alerts of your SQL Server instances grouped by the status server. You can find the status server overview at the right top of the SQLDM Web Console.



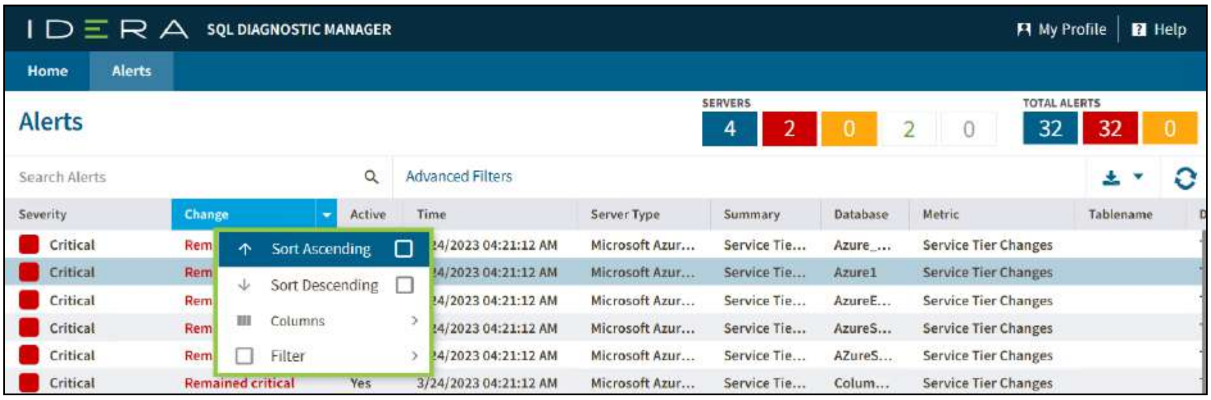
Selecting one of the server status options allows you to filter your alerts. Each option represents a status server:

- 4 **All Servers** - All SQL Server instances added to your SQL Diagnostic Manager environment
- 2 **Critical** - Instances with at least one critical alert
- 0 **Warning** - Instances with at least one warning but no critical alerts
- 2 **Ok** - Instance with no alerts
- 0 **Maintenance -** Servers that are in maintenance

Organize your alerts

The SQLDM Web Console has custom filters and fort options that help you organize your alerts in your most convenient way.

Click the ▾ icon located next to the column name to expand the drop-down menu. This menu allows you to sort your criteria by Sort Ascending or Sort Descending, you can remove or add columns, and filter information by column criteria.



Alerts

Severity	Change	Active	Time	Server Type	Summary	Database	Metric	Tablename
🟥 Critical	Rem		24/2023 04:21:12 AM	Microsoft Azur...	Service Tie...	Azure_...	Service Tier Changes	
🟥 Critical	Rem		24/2023 04:21:12 AM	Microsoft Azur...	Service Tie...	Azure1	Service Tier Changes	
🟥 Critical	Rem		24/2023 04:21:12 AM	Microsoft Azur...	Service Tie...	AzureE...	Service Tier Changes	
🟥 Critical	Rem		24/2023 04:21:12 AM	Microsoft Azur...	Service Tie...	AzureS...	Service Tier Changes	
🟥 Critical	Rem		24/2023 04:21:12 AM	Microsoft Azur...	Service Tie...	AZureS...	Service Tier Changes	
🟥 Critical	Remained critical	Yes	3/24/2023 04:21:12 AM	Microsoft Azur...	Service Tie...	Colum...	Service Tier Changes	

Your alerts are organized under the following columns:

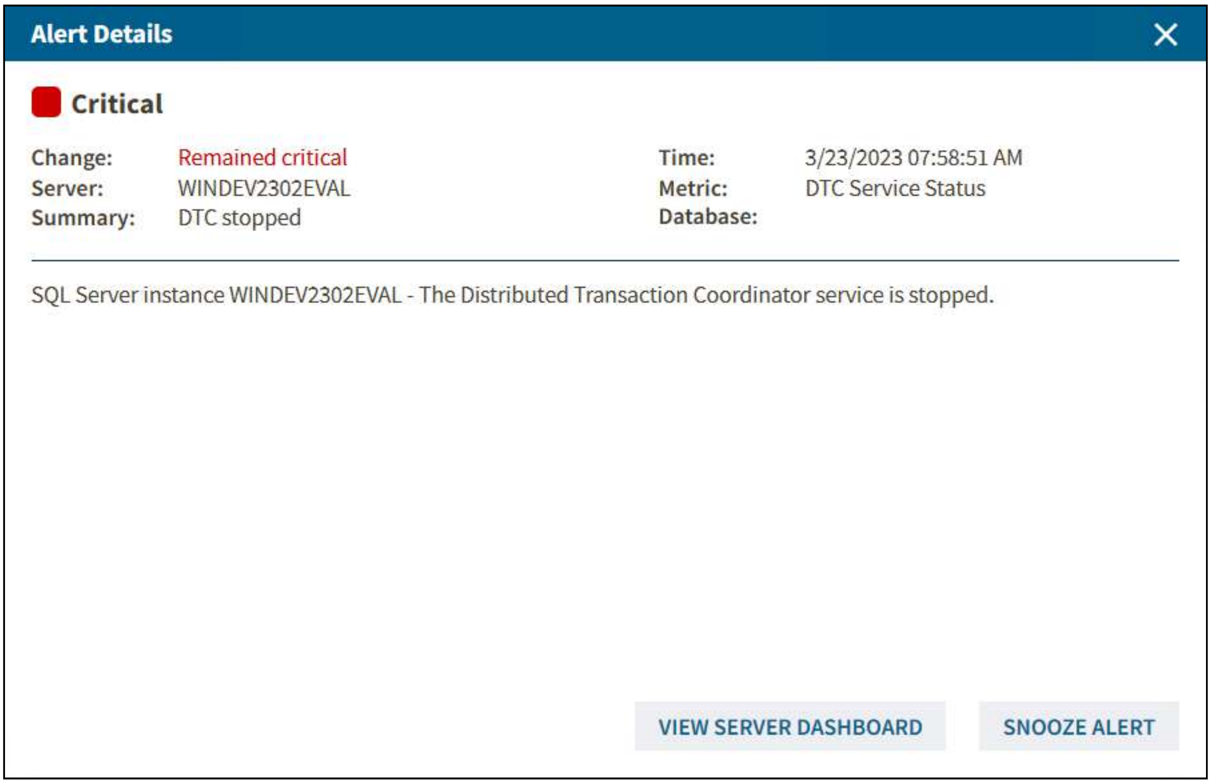
- **Severity**
- **Active**
- **Time**
- **FriendlyServerName**
- **Instance**
- **Server Type**
- **Summary**
- **Database**
- **Table name**
- **Details**
- **Metric**
- **Category**
- **SQLdmRepository**

Additional options

- Access the Alert Details by clicking any field of an alert row.
- Search Alerts using the **Search Alerts** search bar.
- Filter your alerts with the Advanced Filter by clicking it.

Access alert details

The **Alerts Detail** screen in the SQLDM Web Console provides you with detailed statistics on your alerts.



Alert Details

Critical

Change: Remained critical
Server: WINDEV2302EVAL
Summary: DTC stopped

Time: 3/23/2023 07:58:51 AM
Metric: DTC Service Status
Database:

SQL Server instance WINDEV2302EVAL - The Distributed Transaction Coordinator service is stopped.

On the Alerts Detail screen you can find the following information:

- Alert Status
- Change
- Server
- Summary
- Time
- Metric
- Database
- Alert Details

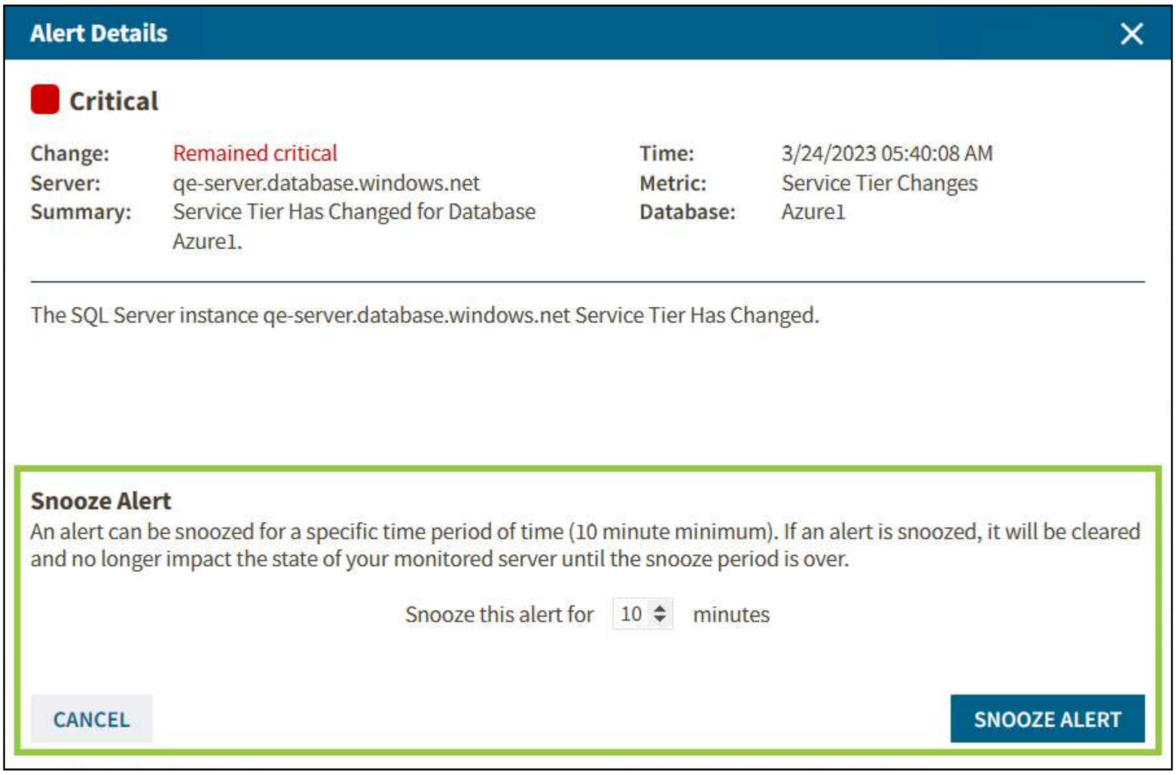
Additional button options

View Server Dashboard

You can access the Overview tab of a single instance directly from the Alert Details window by clicking the **VIEW SERVER DASHBOARD** button to check specific category views such as sessions, queries, query waits, resources, databases, and alerts.

Snooze Alert

You can snooze a specific alert by clicking the **SNOOZE ALERT** button and configuring the snooze time as shown in the image.



Alert Details

🟥 Critical

Change:	Remained critical	Time:	3/24/2023 05:40:08 AM
Server:	qe-server.database.windows.net	Metric:	Service Tier Changes
Summary:	Service Tier Has Changed for Database Azure1.	Database:	Azure1

The SQL Server instance qe-server.database.windows.net Service Tier Has Changed.

Snooze Alert

An alert can be snoozed for a specific time period of time (10 minute minimum). If an alert is snoozed, it will be cleared and no longer impact the state of your monitored server until the snooze period is over.

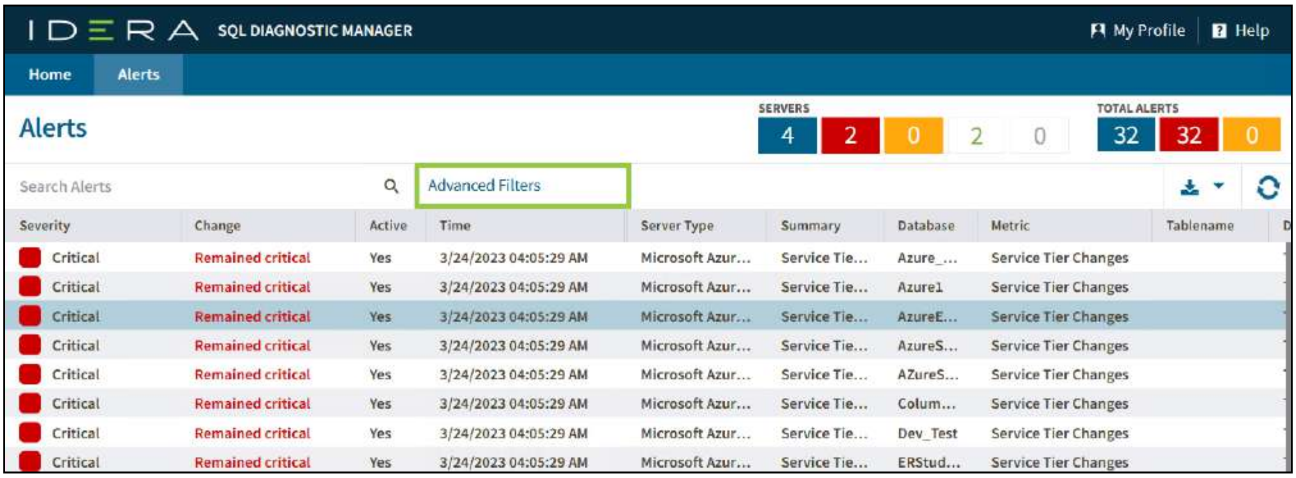
Snooze this alert for 10 minutes

Access the Alerts Detail screen

SQLDM Web Console provides several paths to access the **Alerts Detail** screen. The first access path is by clicking any row in the alerts roll-up view of the Alerts tab. The second access path is by clicking over an alert row in the Alerts section of the single instance Overview tab.

Advanced Filter

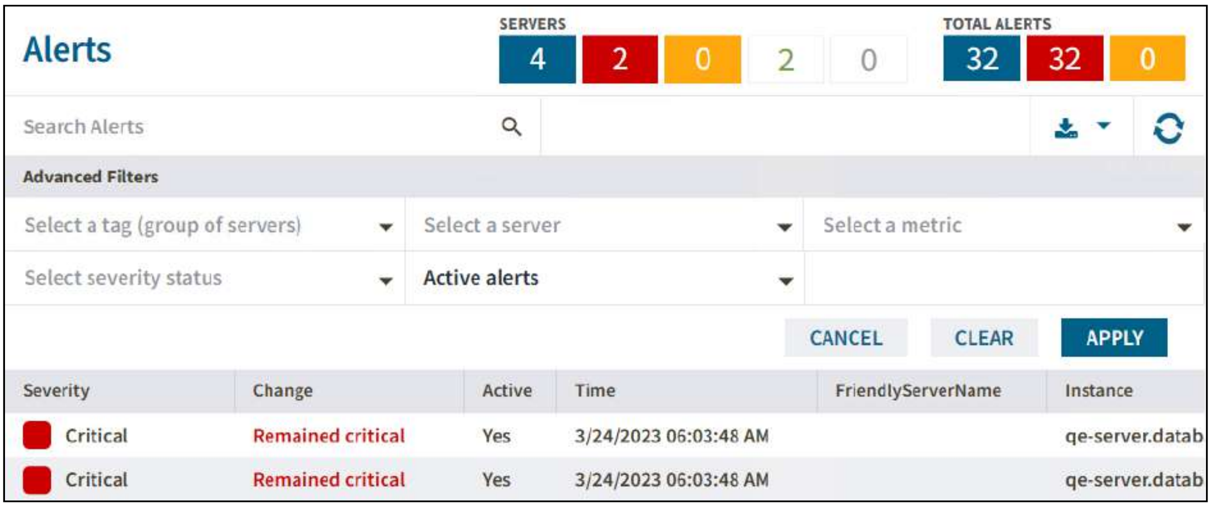
The **Advanced Filters** option allows you to create custom filters that help you segment instances using single or multiple conditions. Access this feature by clicking on the **Advanced Filters** option.



Severity	Change	Active	Time	Server Type	Summary	Database	Metric	Tablename
🟥 Critical	Remained critical	Yes	3/24/2023 04:05:29 AM	Microsoft Azur...	Service Tie...	Azure_...	Service Tier Changes	
🟥 Critical	Remained critical	Yes	3/24/2023 04:05:29 AM	Microsoft Azur...	Service Tie...	Azure1	Service Tier Changes	
🟥 Critical	Remained critical	Yes	3/24/2023 04:05:29 AM	Microsoft Azur...	Service Tie...	AzureE...	Service Tier Changes	
🟥 Critical	Remained critical	Yes	3/24/2023 04:05:29 AM	Microsoft Azur...	Service Tie...	AzureS...	Service Tier Changes	
🟥 Critical	Remained critical	Yes	3/24/2023 04:05:29 AM	Microsoft Azur...	Service Tie...	AZureS...	Service Tier Changes	
🟥 Critical	Remained critical	Yes	3/24/2023 04:05:29 AM	Microsoft Azur...	Service Tie...	Colum...	Service Tier Changes	
🟥 Critical	Remained critical	Yes	3/24/2023 04:05:29 AM	Microsoft Azur...	Service Tie...	Dev_Test	Service Tier Changes	
🟥 Critical	Remained critical	Yes	3/24/2023 04:05:29 AM	Microsoft Azur...	Service Tie...	ERStud...	Service Tier Changes	

Advanced Filters custom fields

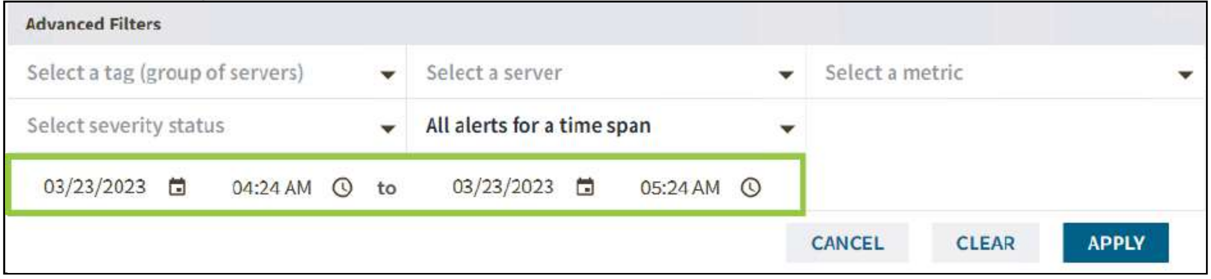
The **Advanced Filters** feature allows you to configure a filter according to your needs. Set it up with the drop-down fields described below.



Severity	Change	Active	Time	FriendlyServerName	Instance
🟥 Critical	Remained critical	Yes	3/24/2023 06:03:48 AM		qe-server.datab
🟥 Critical	Remained critical	Yes	3/24/2023 06:03:48 AM		qe-server.datab

- **Select a tag (group of servers) -** Configure your filter by tags previously created in your SQL Diagnostic Manager environment.
- **Select a server** - Select a server from the drop-down servers list.
- **Select a metric** - Pick a specific metric from the drop-down metric list.
- **Select server status** - Choose a server status among **All**, **Warning**, and **Critical** statuses.
- **Active alerts** - The Advance Filter allows you to filter your active alerts by **Active alerts** or **Active alerts by time span**. When you select **Active alerts by time span** you can configure the time range by modifying the

time and date ranges.



Advanced Filters

Select a tag (group of servers) | Select a server | Select a metric

Select severity status | All alerts for a time span

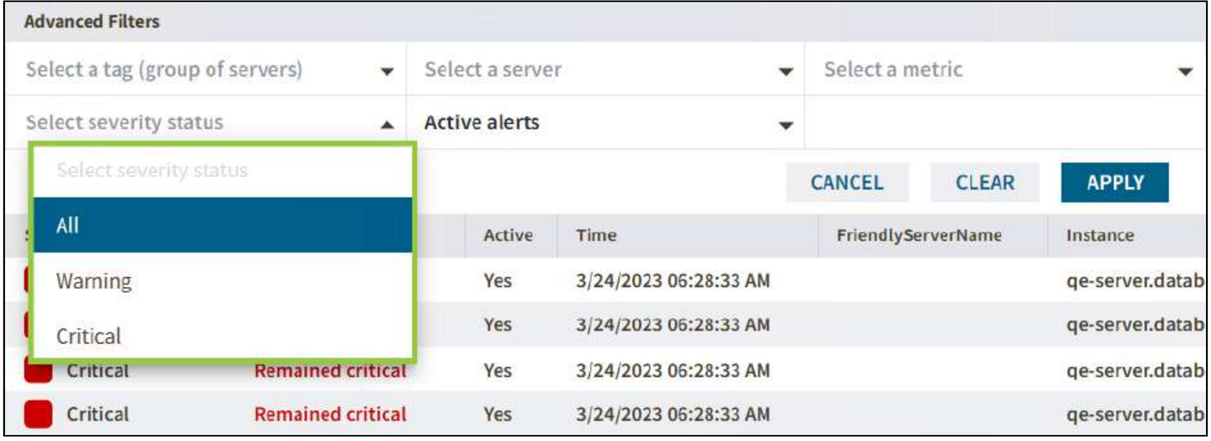
03/23/2023 04:24 AM to 03/23/2023 05:24 AM

ⓘ The Advanced Filters fields configuration by default is **All**. Meaning you will have the entire Alert report of your SQL Diagnostic Manager environment.

Configure an Advanced Filter

Configure an advanced filter follow these instructions:

1. Go to the Alerts tab.
2. Click **Advanced Filter**.
3. Use the drop-down menus to configure all the fields with your desired criteria.



Advanced Filters

Select a tag (group of servers) | Select a server | Select a metric

Select severity status | Active alerts

			Active	Time	FriendlyServerName	Instance
🟥			Yes	3/24/2023 06:28:33 AM		qe-server.datab
🟥			Yes	3/24/2023 06:28:33 AM		qe-server.datab
🟥	Critical	Remained critical	Yes	3/24/2023 06:28:33 AM		qe-server.datab
🟥	Critical	Remained critical	Yes	3/24/2023 06:28:33 AM		qe-server.datab

5. Click **Apply** to get the desired alert report.

In case you want to clear all the selections click **Clear.** Otherwise, if you want to exit the Advanced Filter feature click **Cancel**.

Navigate the IDERA Dashboard

The IDERA Dashboard is a common technology framework designed to support the entire IDERA product suite. The IDERA Dashboard allows users to get an overview of the status of their SQL Servers and hosted databases all in a consolidated view while providing users the means to drill into individual product dashboards for details. It also includes widgets that consolidate data across the products and supports multiple copies of SQL Diagnostic Manager installations. For more information, please review the Manage the IDERA Dashboard.

The Administration view of the IDERA Dashboard provides a central set of services related to specific actions, register SQL Diagnostic Manager in the IDERA Dashboard review the Register SQL Diagnostic Manager in the IDERA Dashboard.

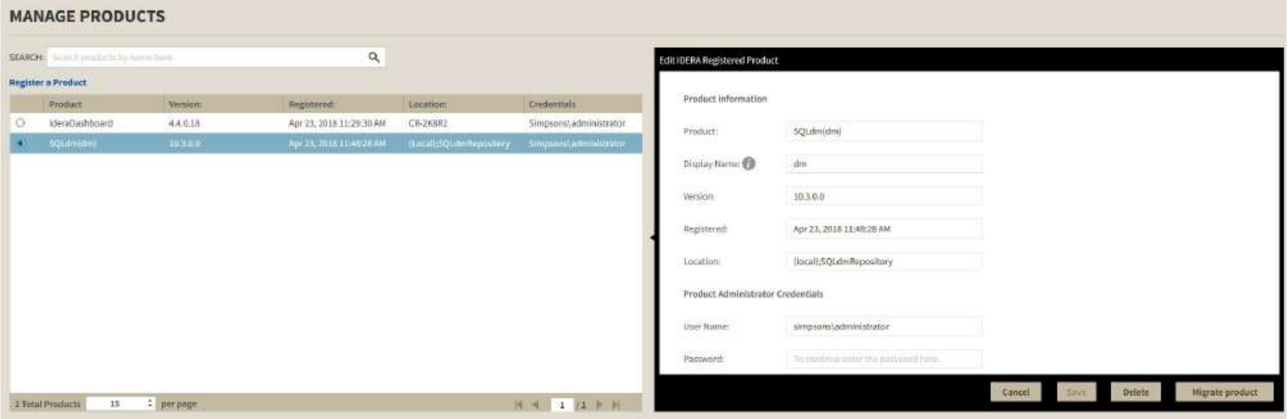
Register SQL Diagnostic Manager in the IDERA Dashboard

The IDERA Dashboard hosts IDERA products that register with the Dashboard. Click the **Manage Products** option in the Administration view to open the respective window.

In the **Manage Products** window you can perform the following actions on registered products:

Edit a Product

To edit a product, select it from the Products list. The Dashboard displays the settings for the selected product on the panel to the right. Make the necessary modifications and click **Save.**



MANAGE PRODUCTS

SEARCH: Search products by name here

Register a Product

	Product	Version:	Registered:	Location:	Credentials
○	IderaDashboard	4.4.0.18	Apr 23, 2018 11:29:30 AM	CR-2K8R2	Simpsons\administrator
●	SQLdm(dm)	10.3.0.0	Apr 23, 2018 11:48:28 AM	(Local);SQLdmRepository	Simpsons\administrator

2 Total Products 15 per page 1 /1

Edit IDERA Registered Product

Product Information

Product: SQLdm(dm)

Display Name: dm

Version: 10.3.0.0

Registered: Apr 23, 2018 11:48:28 AM

Location: (local);SQLdmRepository

Product Administrator Credentials

User Name: simpsons\administrator

Password: To continue enter the password here.

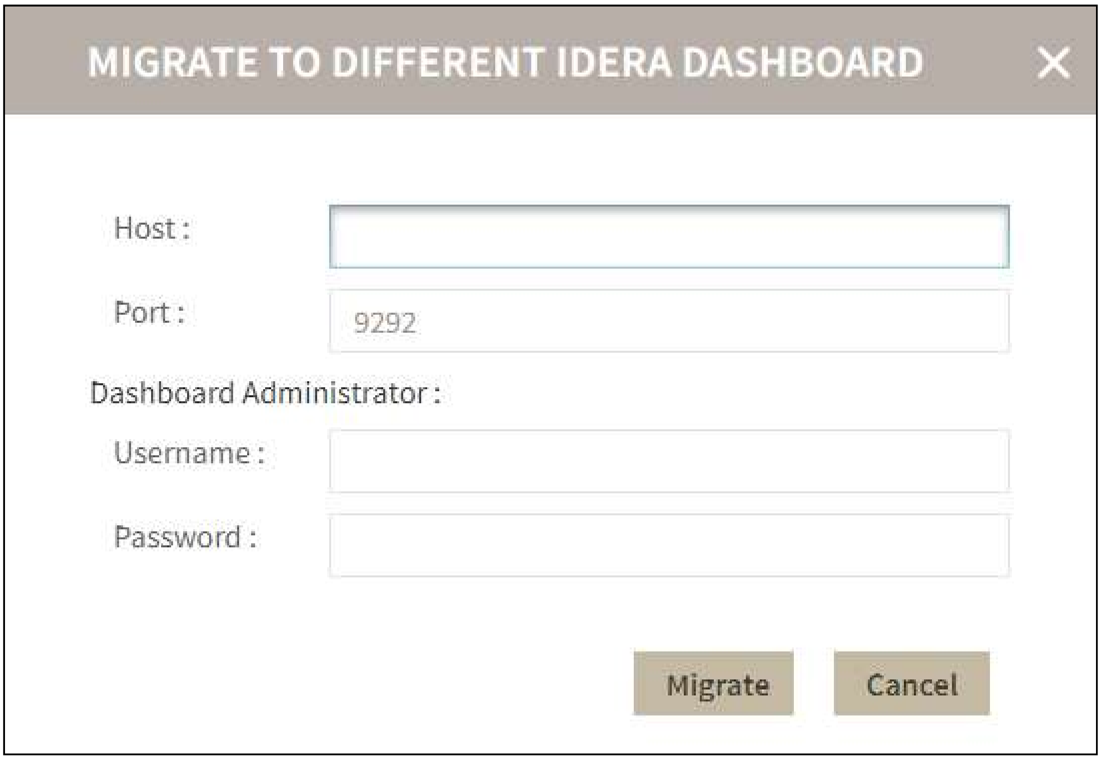
Delete a Product

To remove a product, select it from the Products list and click **Delete** on the panel to the right. A confirmation dialog displays; click **Yes** to remove or **No** to cancel.

> If you want to uninstall the IDERA Dashboard, make sure to delete all registered products before uninstalling.

Migrate Product

Allows you to migrate the registered product to a different IDERA Dashboard. Select the product from the Products list and click **Migrate product**.



MIGRATE TO DIFFERENT IDERA DASHBOARD

Host :

Port : 9292

Dashboard Administrator :

Username :

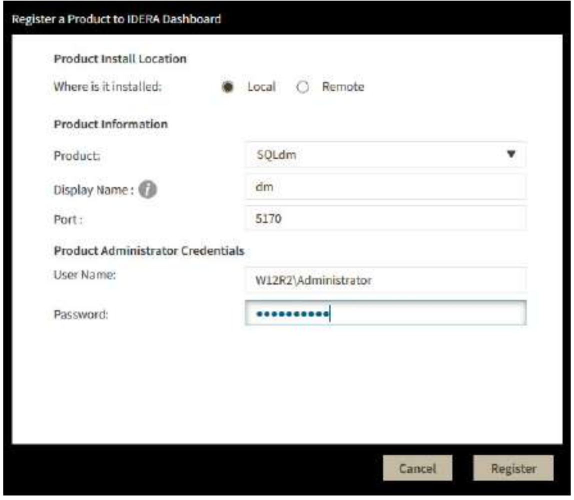
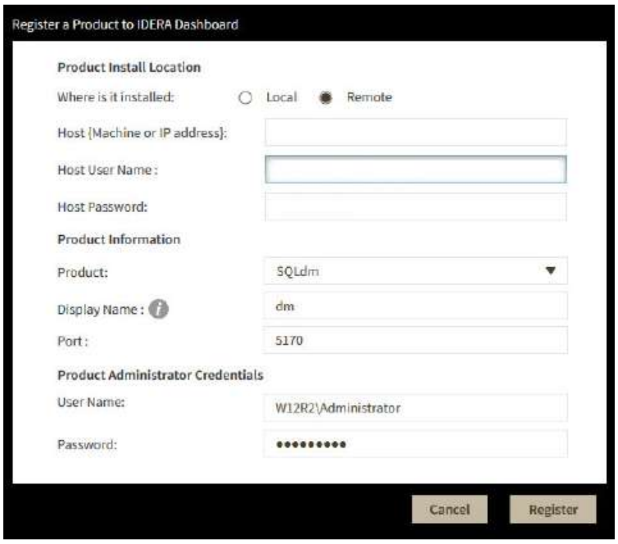
Password :

Fill in the requested information and click **Migrate**.

Register SQL Diagnostic Manager

Register SQL Diagnostic Manager in your IDERA Dashboard. Click **Register a Product** to display the configuration settings.

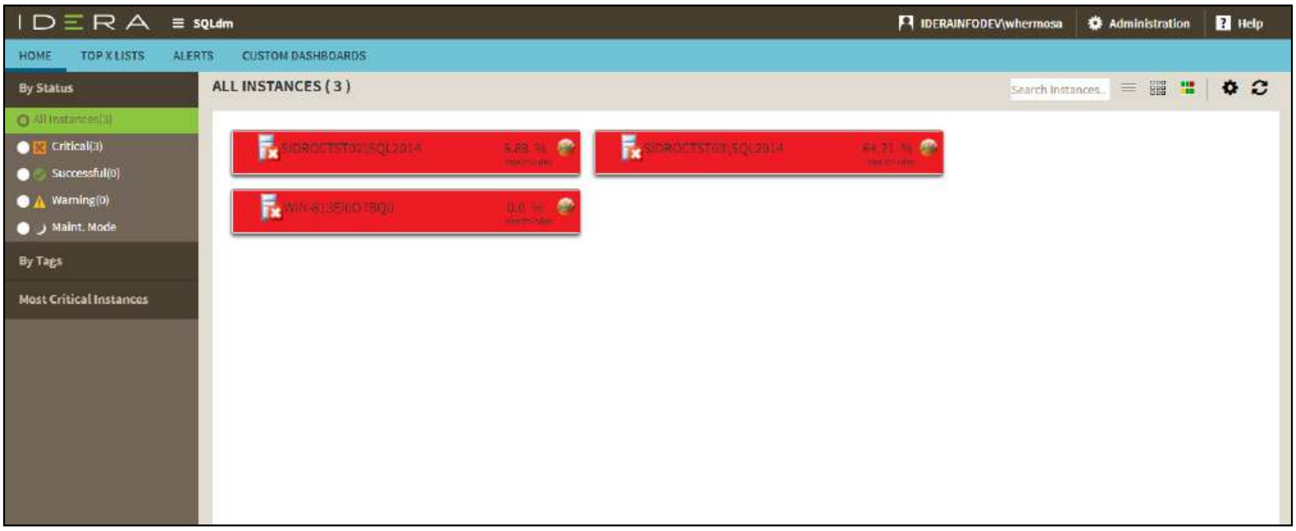
When the Register a Product to IDERA Dashboard window displays, first select the product installation location (Local or Remote) and fill out the information as follows:

Local	Remote
1. In the **Product** field enter the product name, SQLdm (As it shows in the image below). 2. In the **Display Name** field enter any name you want. Choose a unique display name to help you distinguish different instances of the same product. 3. Enter the **Port** number used by SQLdm Rest Service. By default, the port number is 5170. 4. Under Product Administrator enter your credentials. 5. Type all the requested information and click **Register.**  Register a Product to IDERA Dashboard Product Install Location Where is it installed: ● Local ○ Remote Product Information Product: SQLdm Display Name : dm Port : 5170 Product Administrator Credentials User Name: W12R2\Administrator Password: •••••••••• 	1. Enter the Host name or IP Address. 2. In the **Host User Name** and **Host Password**, enter the requested information. 3. In the **Product Information**,type the Product name: SQLdm. 4. In the **Display Name** field enter any name you want. Choose a unique display name to help you distinguish different instances of the same product. 5. Enter the **Port** number used by SQLdm Rest Service. By default, the port number is 5170. 6. Under Product Administrator enter your credentials, and click **Register.**  Register a Product to IDERA Dashboard Product Install Location Where is it installed: ○ Local ● Remote Host (Machine or IP address): Host User Name : Host Password: Product Information Product: SQLdm Display Name : dm Port : 5170 Product Administrator Credentials User Name: W12R2\Administrator Password: •••••••••

ⓘ SQL Diagnostic Manager is unregistered from the IDERA Dashboard when you uninstall it.

IDERA Dashboard support

The IDERA Dashboard console interface boasts an easy-to-navigate dashboard comprised of several views, sub-views, tabs, and widgets that provide a complete synopsis of your SQL Diagnostic Manager environment. Click the image to view the full size.



On the dashboard you can find the following sections:

- Views by Status, Tags, or Critical Instances
- List, thumbnail and heatmap sub-views
- Top X Lists tab
- Alerts tab
- Custom Dashboards tab

Additional options

Search

In the IDERA dashboard, you can search for a particular instance by name. Use the percent (%) wildcard character if you do not remember the full name of the instance that you are looking for.

Heatmap Calculation Configuration

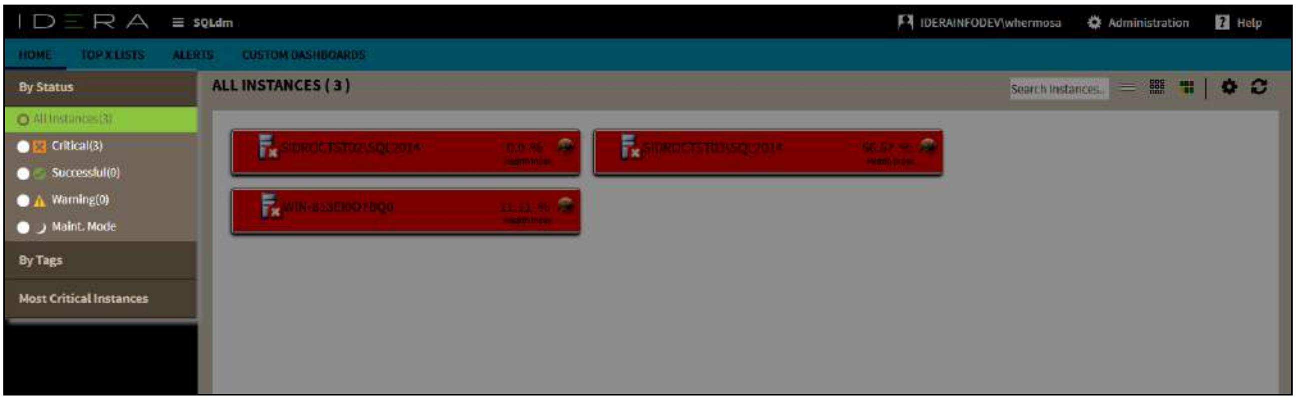
The ⚙ icon, located next to the search instances option, allows you to configure the scale factors to calculate the health index displayed in the heatmap.

Refresh

The Refresh button allows you to manually refresh displayed data.

Get an environment overview through IDERA Dashboard views

In the Views section of the home tab you can see at a glance if there are any problems in your monitored SQL Server instances and drill-down for details. Each view is expandable and information is grouped By Status, By Tags, or by Most Critical Instances. SQL Diagnostic Manager displays this information in the panel to the right.



By Status

In the By Status view you can easily identify the status of your monitored SQL Server instances and take action.

Instances are grouped as follows:

- All Instances
  - ☒ Critical
  - ✓ Successful
  - ⚠ Warning
  - ☽ Maintenance Mode

If you select all instances with an **OK** status in the By Status view, the panel displays information only pertaining to those instances.

By Tags

In the By Tags view, you can view the status of different tags or group of instances, and drill down to details. For additional information on tags, see Work with tags.

By Most Critical Instances

The Most Critical Instances view lists all the critical SQL servers in your environment and provides links to the single instance dashboard so you can quickly review the issue. The instance with the largest number of alerts shows up at the top of the list.

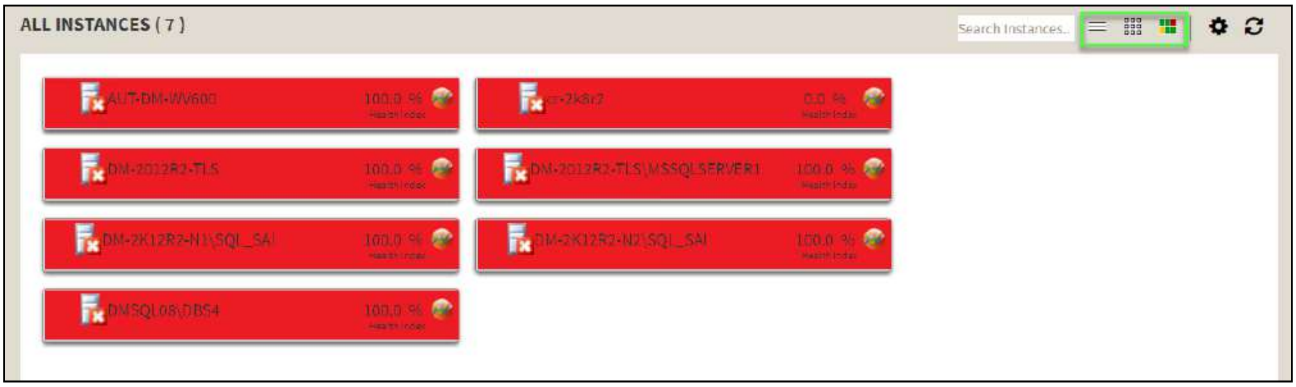
If you click any of the listed critical instances, the web console displays the single instance dashboard.

Diagnose issues with IDERA Dashboard

The web console's main dashboard is comprised of three main sub-views:

- List sub-view
- Thumbnail sub-view
- Heatmap sub-view

These sub-views display all data collected at the last refresh for all your monitored SQL Server instances. To access any sub-view, click the appropriate button in the upper-right corner of the dashboard as shown in the following image:



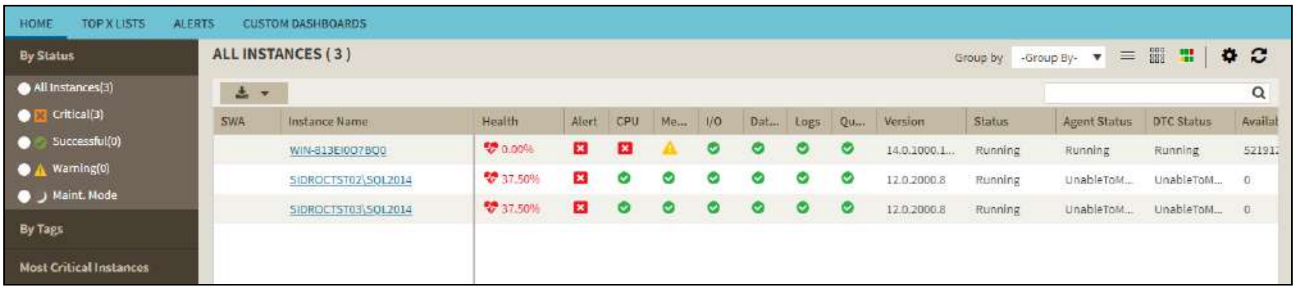
ALL INSTANCES (7)

Search Instances...

Instance	Health Index
AUT-DM-WV600	100.0 %
cr-2k8r2	0.0 %
DM-2012R2-TLS	100.0 %
DM-2012R2-TLS\MSSQLSERVER1	100.0 %
DM-2K12R2-N1\SQL_SAI	100.0 %
DM-2K12R2-N2\SQL_SAI	100.0 %
DMSQL08\DBS4	100.0 %

List sub-view

The list sub-view offers a means to quickly identify the status of instances, as well as the possibility to navigate to the single instance dashboard when clicking on a specific row.



ALL INSTANCES (3)

SWA	Instance Name	Health	Alert	CPU	Me...	I/O	Dat...	Logs	Qu...	Version	Status	Agent Status	DTC Status	Availat
	WIN-813EI0O7BQ0	0.00%	☒	☒	⚠	✓	✓	✓	✓	14.0.1000.1...	Running	Running	Running	521912
	SIDROCTST02\SQL2014	37.50%	☒	✓	✓	✓	✓	✓	✓	12.0.2000.8	Running	UnableToM...	UnableToM...	0
	SIDROCTST03\SQL2014	37.50%	☒	✓	✓	✓	✓	✓	✓	12.0.2000.8	Running	UnableToM...	UnableToM...	0

The list sub-view provides you with the following SQL Server information:

SWA

Displays the SWA icon when the instance is registered in SQL Workload Analysis.

Instance Name

Displays the name of the monitored SQL Server instance.

Health

Displays the health index in percentage in a red square.

Alert

Displays the current severity of the value of the instance.

CPU, Memory, I/O, Database, Logs, and Queries

Displays the overall health index icon for each option.

SQL Server Version

Displays the edition and version of SQL Server software used in this instance.

SQL Server Status

Displays the status of the SQL Server service such as running, stopped, and paused.

SQL Agent Status

Displays the status of the SQL Server Agent service such as running or stopped.

DTC Status

Displays the status of the Distributed Transaction Coordinator service such as running or stopped.

Available Memory (MB)

Indicates how much available memory is allocated for SQL Server.

Blocked Sessions

Displays blocked process sessions information on the SQL Server instance.

CPU Activity

Displays the percentage of CPU consumed by your SQL Server, virtual machine, and host server.

Disk Queue Length

Displays the average number of system requests that are waiting for disk access on the computer hosting the SQL Server instance

Actions

Sort

Instances on the list sub-view are sorted by severity. To re-organize information, click a column header or select the option to group by severity, tags, or SQLdmRepo (**Group By**).

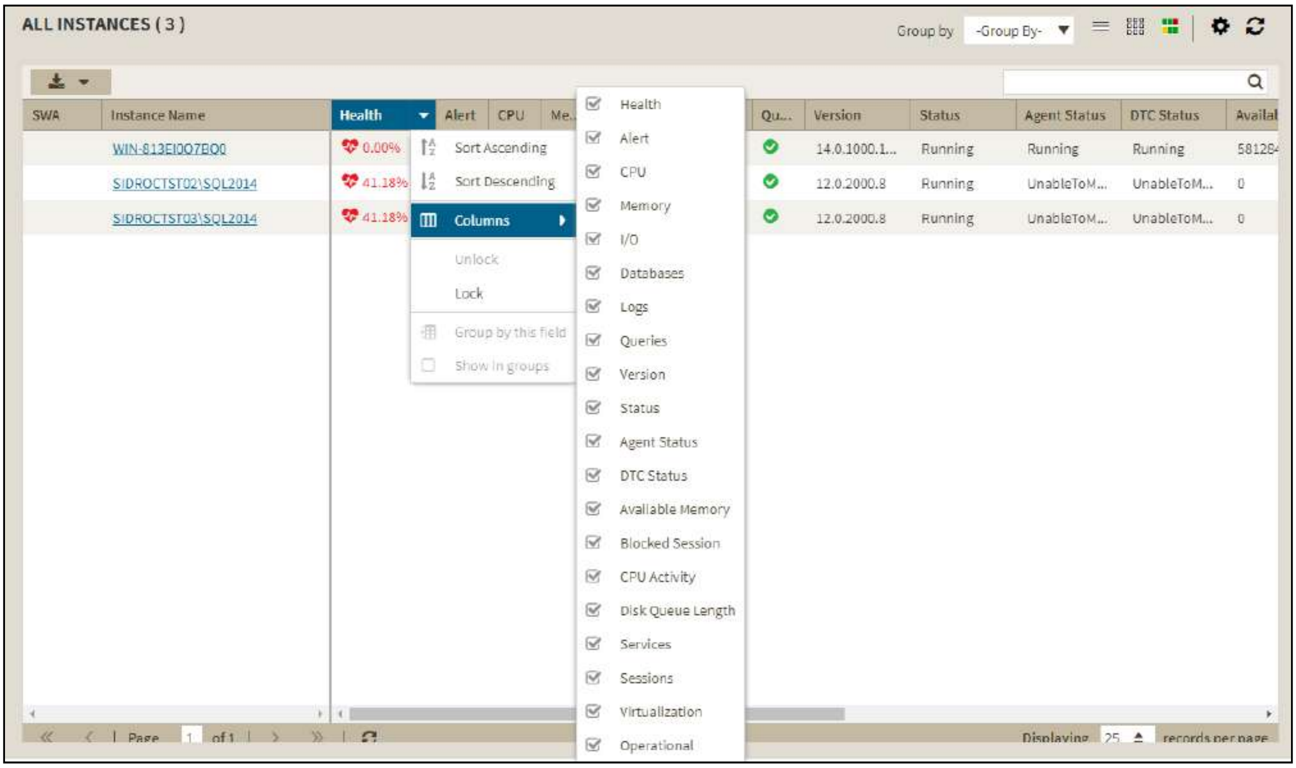
Search Instance

Type the name of the instance you are looking for.

Options

Choose the columns to display in the list view.

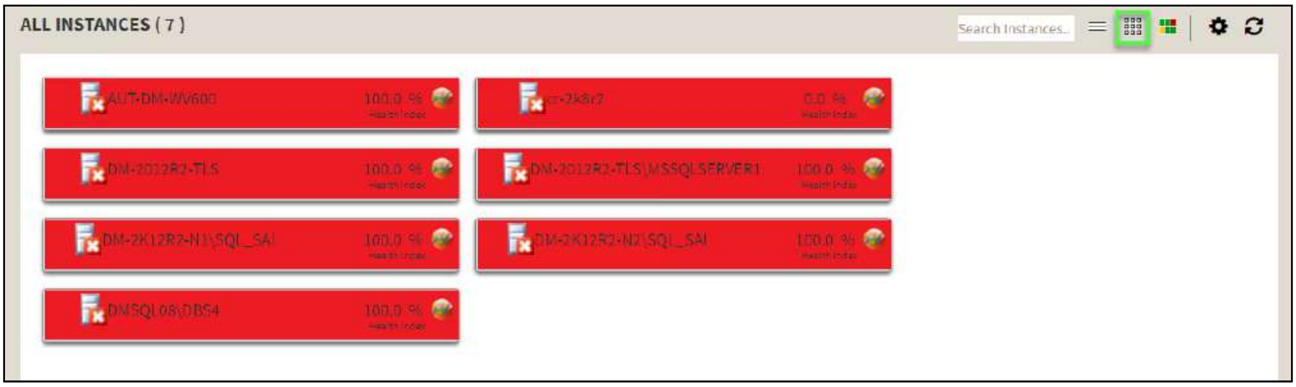
The Dashboard console has a new alert grid and custom filters that help you organize the list columns in your most convenient way. Click the ▼ icon located next to the column name to expand the drop down menu. This menu allows you to sort your criteria by Sort Ascending or Sort Descending, you can remove or add columns, lock and unlock, and group the information by fields.



SWA	Instance Name	Health	Alert	CPU	Me..	Qu...	Version	Status	Agent Status	DTC Status	Availal
	WIN-813EI007BQ0	0.00%				✓	14.0.1000.1...	Running	Running	Running	581284
	SIDROCTST02\SQL2014	41.18%				✓	12.0.2000.8	Running	UnableToM...	UnableToM...	0
	SIDROCTST03\SQL2014	41.18%				✓	12.0.2000.8	Running	UnableToM...	UnableToM...	0

Thumbnail sub-view

The thumbnail sub-view is the default view in the SQL Diagnostic Manager web console's dashboard and provides you with a graphical replication of your monitored SQL servers. Access additional details in the single instance dashboard by clicking on a thumbnail's instance name or easily spot categories that have active alerts as marked by a critical icon. Navigate to an instance's specific category view in case it has active alerts by clicking on the marked category icon. You can also launch the SQL Diagnostic Manager console directly from the thumbnail sub-view by clicking the SQL Diagnostic Manager icon .



The thumbnail sub-view displays basic statistics about your SQL Servers:

SQL Server version

Displays the edition and version of SQL Server software used in this instance.

Response Time

Refers to the time it takes for a query to go from the SQL Diagnostic Manager Console to the SQL Server instance and back.

User Sessions

Refers to the total number of SQL Server user sessions.

SQL CPU Usage

Refers to average percentage of SQL Server processor usage on the computer hosting the SQL Server instance.

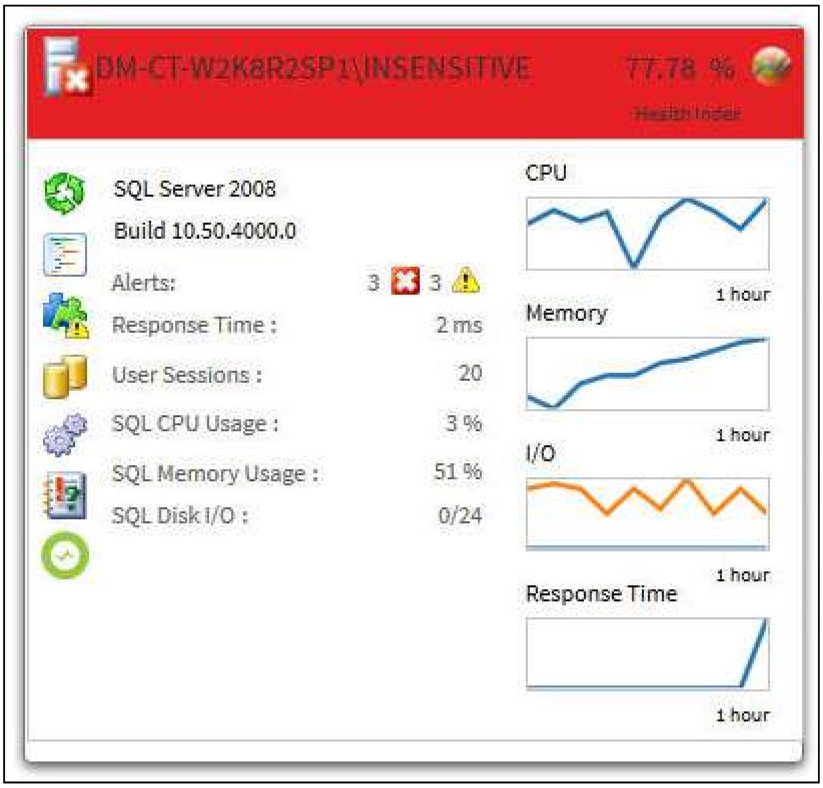
SQL Memory Usage

Refers to amount of memory in use by the monitored SQL Server instance.

SQL Disk I/O

Refers to the number of physical reads and physical writes made by the SQL Server instance between refreshes.

In addition, the thumbnail sub-view includes CPU, Memory, I/O, and Response Time sparkline graphs for a 1 hour-view so that users can obtain an overview of key metrics quickly.



DM-CT-W2K8R2SP1\INSENSITIVE 77.78 %
Health Index

SQL Server 2008
Build 10.50.4000.0

Alerts: 3 ☒ 3 ⚠
Response Time : 2 ms
User Sessions : 20
SQL CPU Usage : 3 %
SQL Memory Usage : 51 %
SQL Disk I/O : 0/24

Category icons and actions

In the thumbnail sub-view, use your mouse cursor to hover on a category icon in the left of the thumbnail. If the category icon contains active alerts, you can click it to access the Alerts Detail screen.

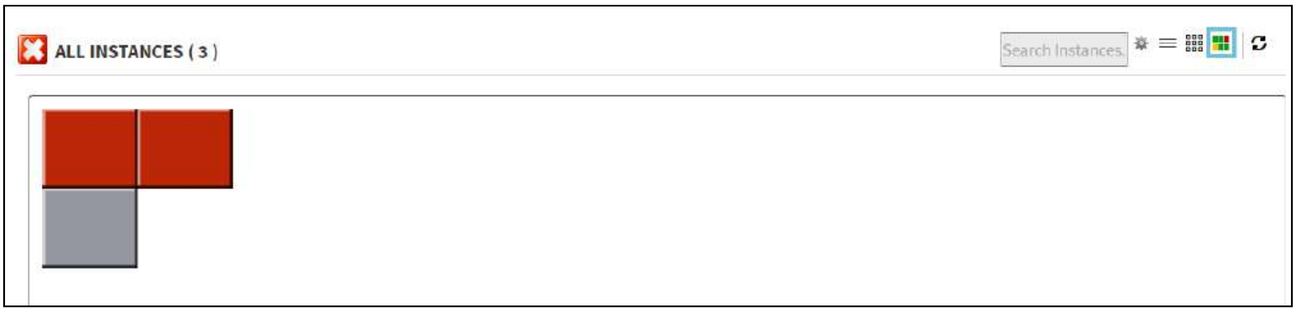
If there are no active alerts, you can click a category icon, and you are directed to a specific category view in the single instance dashboard. The table below shows the relationship between the category icons and their corresponding views:

Icon	Category
♻	Sessions tab of the single instance dashboard
📄	Queries tab of the single instance dashboard
🧩	Resources tab of the single instance dashboard
⛁	Databases tab of the single instance dashboard
⚙	Alerts Detail screen
📓	Overview tab of the single instance dashboard
◎	Launch SWA

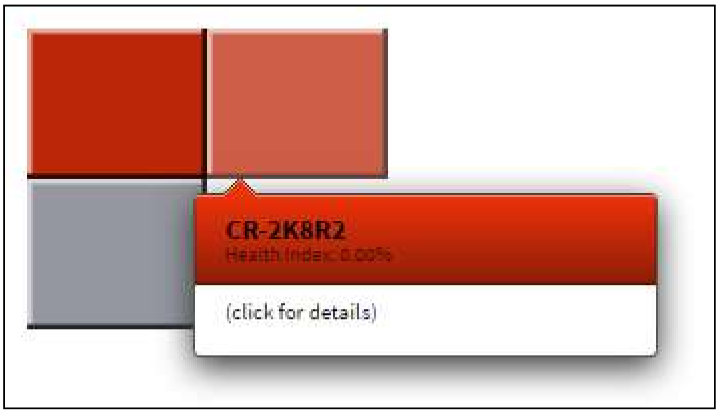
ⓘ Instances in thumbnail sub-view display according to severity. This means that critical instances show up on the top of the dashboard.

Heatmap sub-view

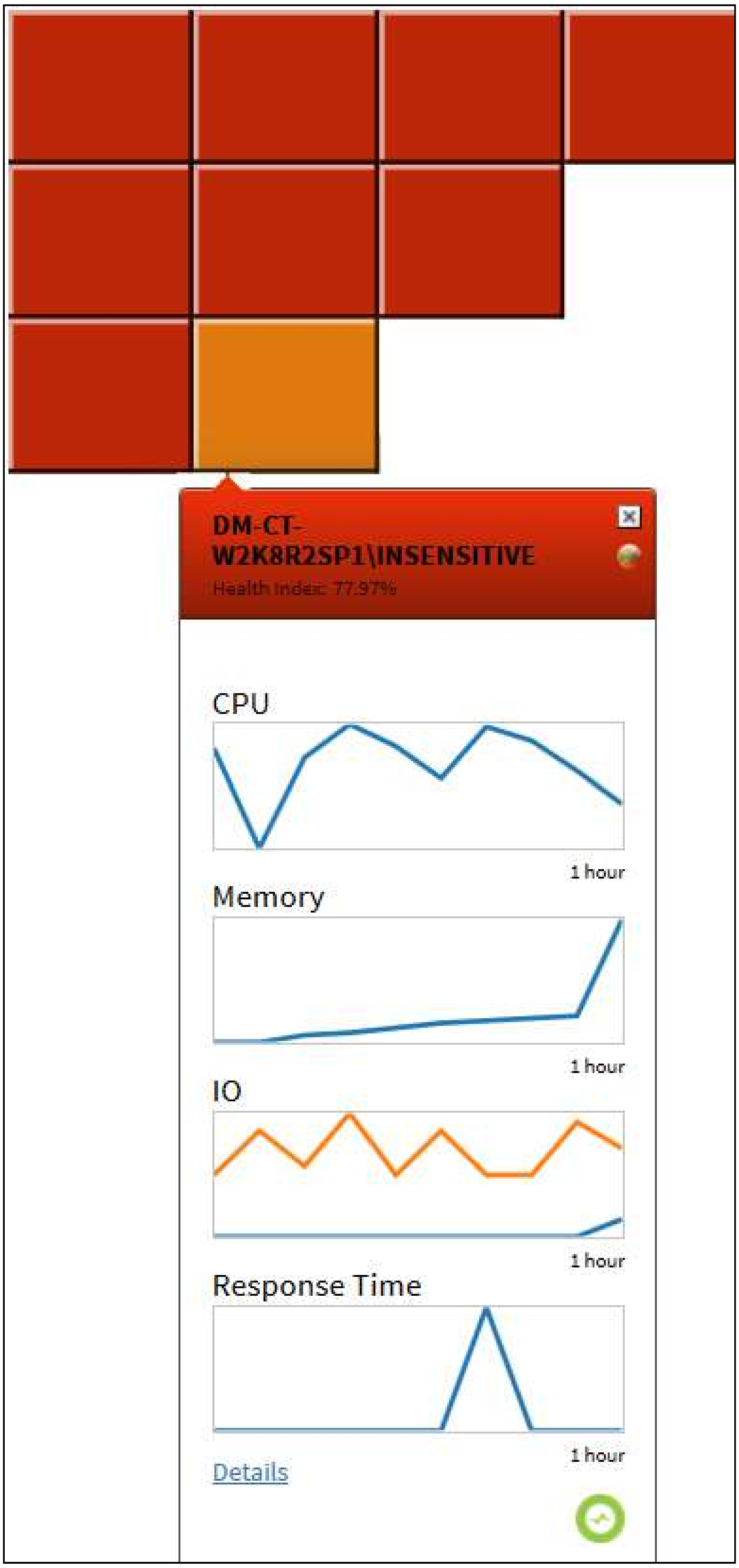
The heatmap sub-view provides you with a visual overall status of your SQL Server environment in the form of a grid of color-coded squares that contain a health index. Through its color scheme and health index, you can easily identify which of your monitored instances need the most attention. Each square in the heatmap sub-view represents a monitored instance. From each square, you can access basic statistics but also drill down for details.



To glance at instance health information just hover over a specific square to see its health index.



Upon clicking a specific square, the health index displays performance line charts for CPU, Memory, IO, and Response Time from the past hour.



DM-CT-W2K8R2SP1\INSENSITIVE

Health Index: 77.97%

Additionally, you can:

- Click **Details** to access the Overview tab of the single instance dashboard.
- Launch the SQL Diagnostic Manager console by clicking the SQL Diagnostic Manager icon .
- Launch SQL Workload Analysis by clicking the SWA icon .

How to interpret the health index in the heat map sub-view?

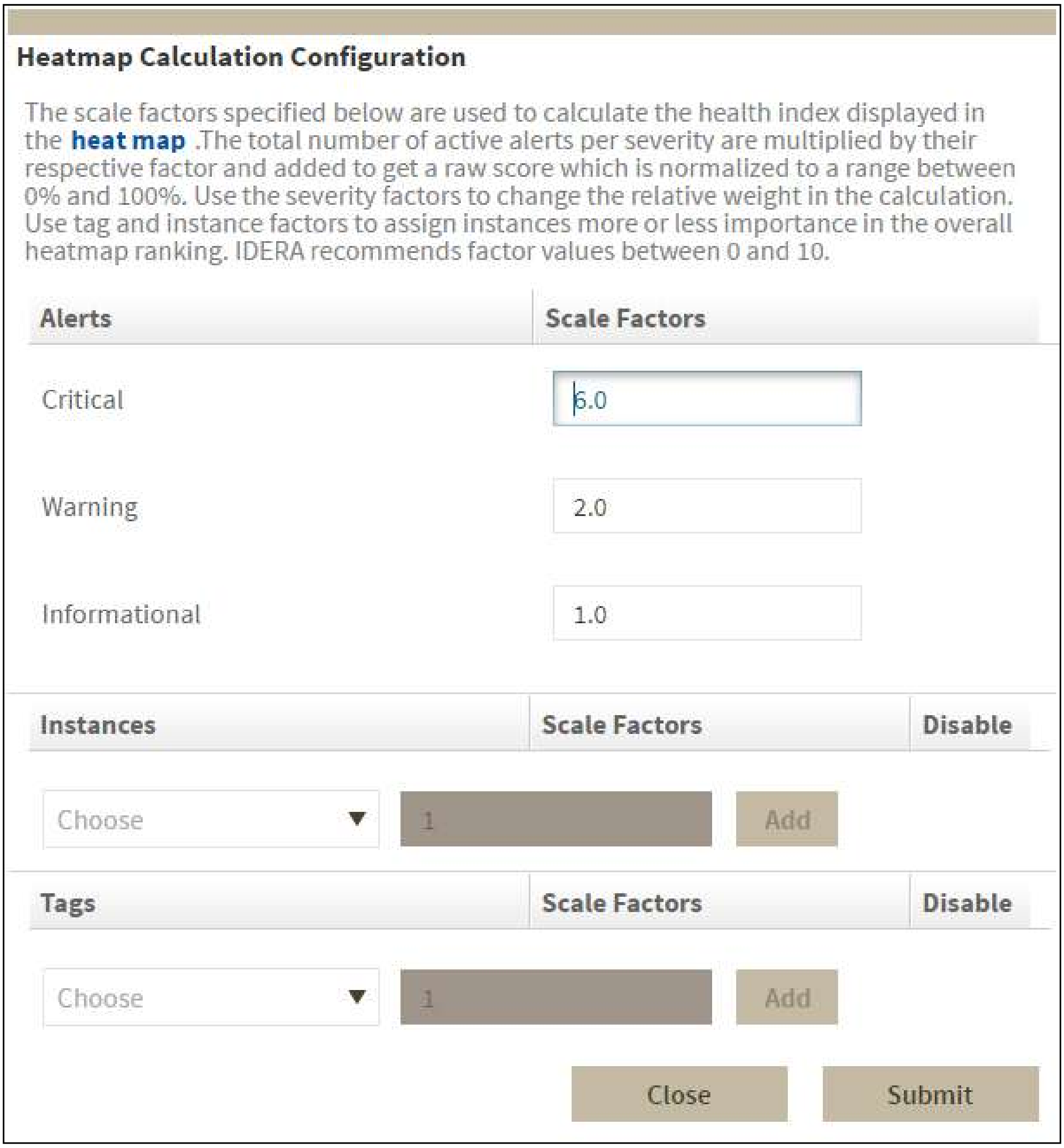
The health index is a percentage value that provides an estimate of the relative health of your monitored SQL Server. The health index is based on the following raw calculation:

Health Index Raw Calculation = Instance or Tag Scale Factor * (# Critical Alerts * Critical Scale Factor + # Warning Alerts * Warning Scale Factor + # Informational Alerts * Informational Scale Factor)

The raw score is normalized to a range between 100% and 0%. SQL Server is healthier the closer its health index is to 100%, and it is in critical state the closer its health index is to 0%. Use the severity factors to change the relative weight in the calculation. Use tag and instance factors to assign instances more or less importance in the overall heat map ranking.

To configure the Health Index Calculations:

1. Click the gear icon at the upper-right corner of the **All Instances** section to display the Heatmap Calculation Configuration dialog.



Heatmap Calculation Configuration

The scale factors specified below are used to calculate the health index displayed in the **heat map** .The total number of active alerts per severity are multiplied by their respective factor and added to get a raw score which is normalized to a range between 0% and 100%. Use the severity factors to change the relative weight in the calculation. Use tag and instance factors to assign instances more or less importance in the overall heatmap ranking. IDERA recommends factor values between 0 and 10.

Alerts	Scale Factors
Critical	6.0
Warning	2.0
Informational	1.0

Instances	Scale Factors	Disable
Choose ▼	1	Add

Tags	Scale Factors	Disable
Choose ▼	1	Add

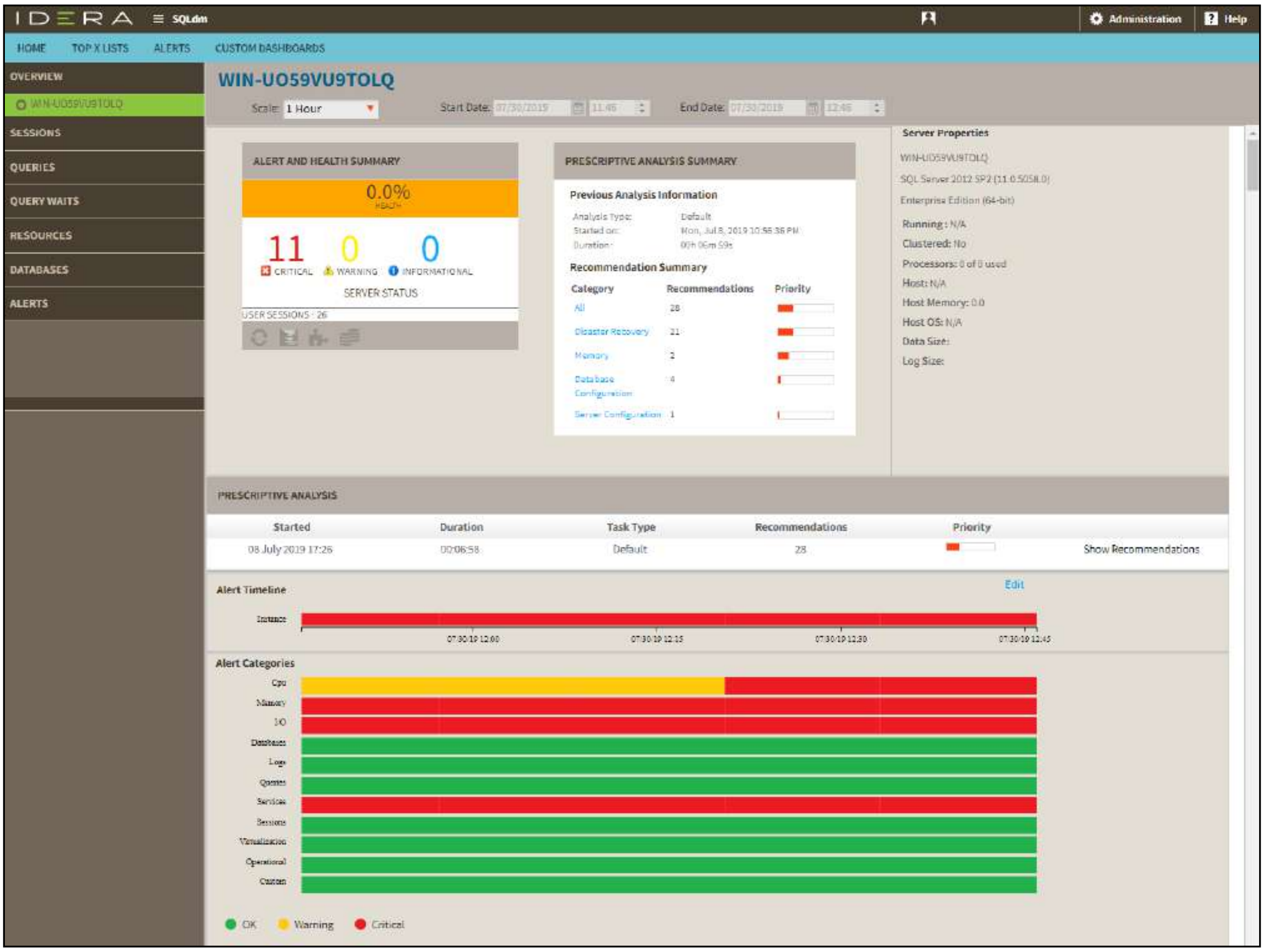
2. Type the values that you want in the respective Alert Scale Factor field. IDERA recommends factor values between zero and ten.
3. Choose an instance from the registered instances and click **Add** to apply a distinctive scale factor.
4. Choose a tag from the available tags and click **Add** to apply a distinctive scale factor.
5. Click **Submit**.

ⓘ The heatmap sub-view displays instances according to severity. The color of the square relates to the percentage of its health status and includes a range of colors not only restricted to green, yellow, and red.

Navigate a single instance through IDERA Dashboard

The single instance dashboard includes an overview section for the selected monitored SQL server and specific category views. SQL Diagnostic Manager users are able to obtain details on sessions, queries, resources, and databases. Click image to view full size.

> **SQL Workload Analysis**
>
> When the monitored instance it is registered in SQL Workload Analysis, the Launch SWA icon displays on the right side of the History Range Control. Click the Launch SWA icon to be redirected to SQL Workload Analysis.



WIN-UO59VU9TOLQ

Scale: 1 Hour   Start Date: 07/30/2019 11:46   End Date: 07/30/2019 12:46

Previous Analysis Information

Analysis Type: Default
Started on: Mon, Jul 8, 2019 10:56:36 PM
Duration: 00h 06m 59s

Recommendation Summary

Category	Recommendations	Priority
All	28	
Disaster Recovery	21	
Memory	2	
Database Configuration	4	
Server Configuration	1	

Server Properties

WIN-UO59VU9TOLQ
SQL Server 2012 SP2 (11.0.5058.0)
Enterprise Edition (64-bit)
Running : N/A
Clustered: No
Processors: 0 of 0 used
Host: N/A
Host Memory: 0.0
Host OS: N/A
Data Size:
Log Size:

PRESCRIPTIVE ANALYSIS

Started	Duration	Task Type	Recommendations	Priority	
08 July 2019 17:26	00:06:58	Default	28		Show Recommendations

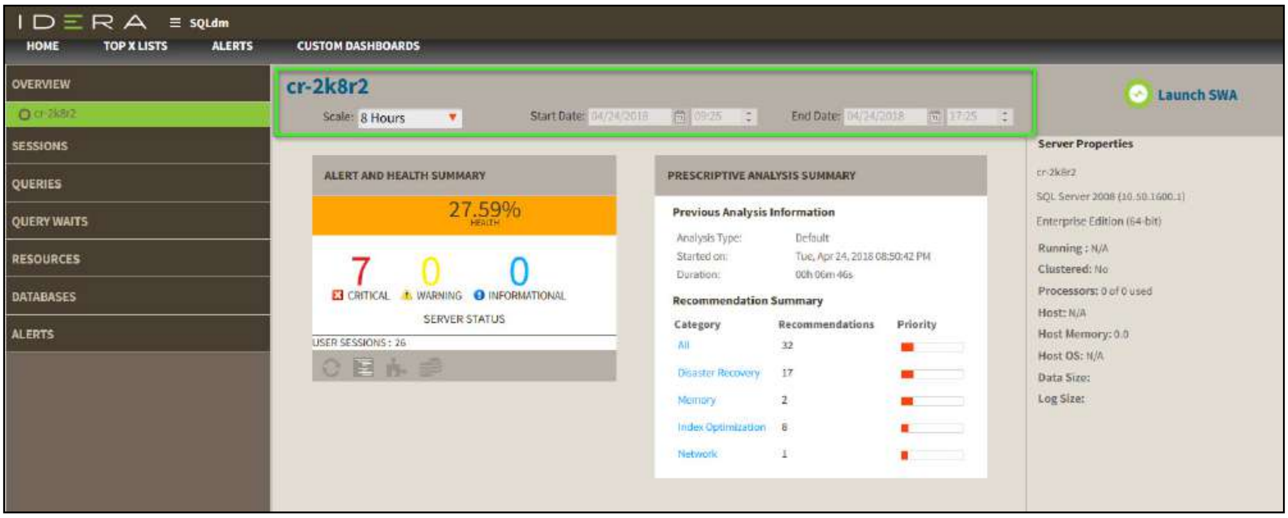
In the single instance dashboard, you can find the following sections:

- History Range Control
- Alert and Health Summary
- Prescriptive Analysis Summary
- Server properties
- Prescriptive Analysis

- Alert Timeline
- Alert Categories
- Charts

History Range Control

SQL Diagnostic Manager also includes a new History Range Control, located at the top of the Web Console and in the option History Browser in the Desktop Console, both can be modified and be designated a specific start time and date as well as a current snapshot.



cr-2k8r2

Scale: 8 Hours Start Date: 04/24/2018 09:25 End Date: 04/24/2018 17:25

ALERT AND HEALTH SUMMARY

27.59% HEALTH

7 CRITICAL 0 WARNING 0 INFORMATIONAL

SERVER STATUS

USER SESSIONS : 26

PRESCRIPTIVE ANALYSIS SUMMARY

Previous Analysis Information

Analysis Type: Default
Started on: Tue, Apr 24, 2018 08:50:42 PM
Duration: 00h 06m 46s

Recommendation Summary

Category	Recommendations	Priority
All	32	🟥
Disaster Recovery	17	🟥
Memory	2	🟥
Index Optimization	8	🟥
Network	1	🟥

Server Properties

cr-2k8r2
SQL Server 2008 (10.50.1600.1)
Enterprise Edition (64-bit)
Running : N/A
Clustered: No
Processors: 0 of 0 used
Host: N/A
Host Memory: 0.0
Host OS: N/A
Data Size:
Log Size:

Alert and Health Summary

In this section, you find the health index, the alert status, and the user sessions from SQL Diagnostic Manager. Also, includes shortcuts to filter data through Sessions, Queries, Resources, and Databases.

Prescriptive Analysis Summary

The prescriptive summary shows the previous analysis information and the resulting recommendations summary. You can click any category under Recommendation Summary to be redirected to the Analyze tab in the desktop console

Server Properties

In this section view the most important characteristics of your monitored SQL Server instance.

Instance Name

Displays the name of the monitored SQL Server instance or its friendly name assigned in the desktop console.

✓ Assign a friendly name to your instance that is meaningful to you and easy to identify.

SQL Version

Indicates the current SQL Server version including service pack and build information on this SQL Server instance.

SQL Edition

Indicates the current SQL Server edition, including Enterprise, Business Intelligence, or Standard, installed on this SQL Server instance.

Running since

Indicates the timestamp associated with the most recent restart of this SQL Server instance.

Clustered

Indicates whether this SQL Server instance is part of a cluster. If it is part of a cluster, SQL Diagnostic Manager displays the name of the active node.

Processors

Indicates the total number of processors associated with this SQL Server instance and how many of these processors are currently in use.

Host

Indicates the name of the server hosting this SQL Server instance.

Host Memory (GB)

Indicates the total amount of memory on the server hosting this SQL Server instance.

Host OS

Indicates the current operating system on the server hosting this SQL Server instance.

Data Size

Displays the data size of the server.

Log Size

Displays the log size of the server.

Prescriptive Analysis

The Prescriptive Analysis panel shows a summary of the performed Analyses, this panel shows the Date, the Duration, the Task Type, the number of recommendations, the Priority, and you can click the **Show Recommendations** to review the list of recommendations of each Analysis.

Alert Timeline

This graph shows a summary of the alert categories, CPU, Memory, I/O, Databases, Logs, Queries, Services, Sessions, Virtualization, Operational and Custom. This graph is color-coded depending on the status of the alerts inside each category.

Alert Categories

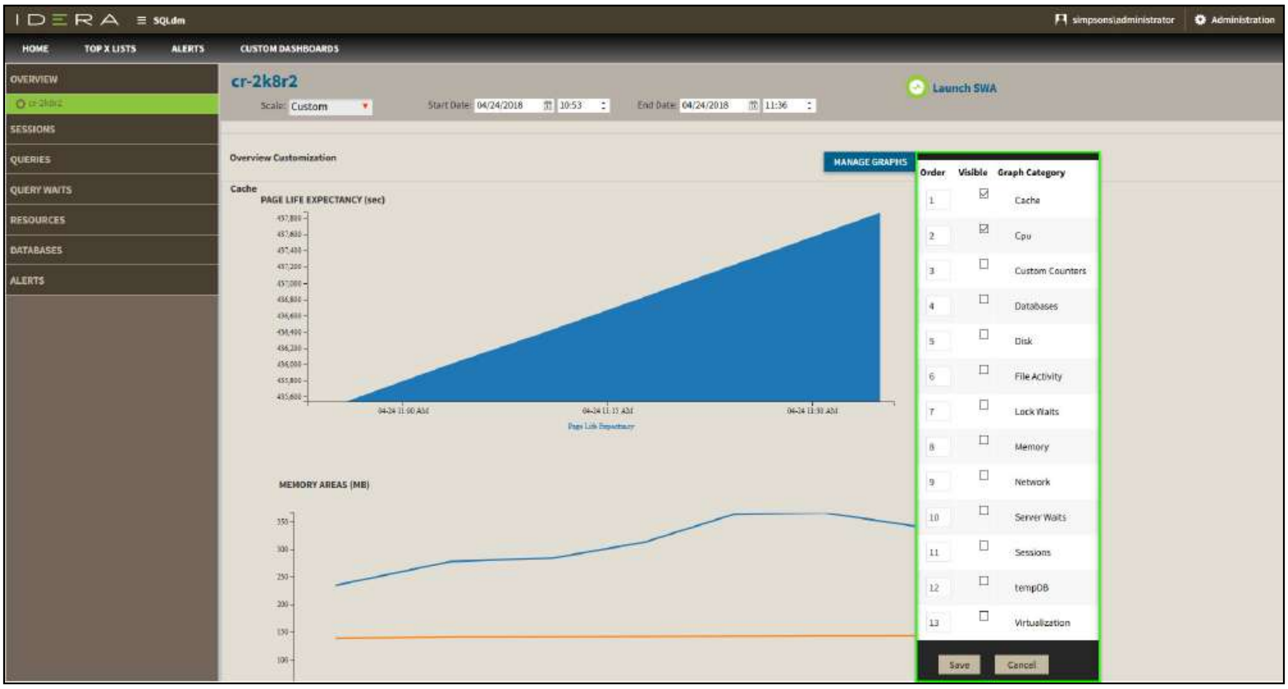
This alert timeline view allows you to easily identify the highest alert for your monitored SQL Server instance and the highest alert for a specific category.

Configure the Alert Category graph, following these steps:

- Click **Edit,** located next to the Alert Timeline graph.
- Check or uncheck the checkboxes located under the Visible column.
- Or, reorganize the Order column with the listed numbers preferred.
- Click **Save**.

Charts

The single instance dashboard includes the option **MANAGE GRAPHS**. This option allows you to choose the following graphs to be displayed in the overview single instance view:



cr-2k8r2

Scale: Custom   Start Date: 04/24/2018 10:53   End Date: 04/24/2018 11:36

Order	Visible	Graph Category
1	☑	Cache
2	☑	Cpu
3	□	Custom Counters
4	□	Databases
5	□	Disk
6	□	File Activity
7	□	Lock Waits
8	□	Memory
9	□	Network
10	□	Server Waits
11	□	Sessions
12	□	tempDB
13	□	Virtualization

Cache

The Cache chart tracks the database and procedure processes using a buffer pool of memory on your monitored SQL Server instance.

CPU

The CPU chart tracks the performance of the processor used by your monitored SQL Server.

Custom Counters

The Custom Counters chart displays the statistics for a selected custom counter on a monitored SQL Server instance.

Databases

The Databases chart tracks the performance of the databases on your monitored SQL Server.

Disk

The Disk chart tracks the performance of the disk used by your monitored SQL Server.

File Activity

The File Activity chart displays the top five database files with the highest relative activity since the last refresh.

Lock Waits

The Lock Waits chart tracks the total number waits caused when a task is waiting to acquire a lock on your monitored SQL Server.

Memory

The Memory chart tracks the usage and availability of memory on your monitored SQL Server computer.

Network

The Network chart tracks the performance of the network connection being used by your monitored SQL Server.

Server Waits

The Server Waits chart tracks the total number and time spent on waits affecting your monitored SQL Server.

Sessions

The Sessions chart tracks the performance of the active and blocked sessions running on your monitored SQL Server.

tempDB

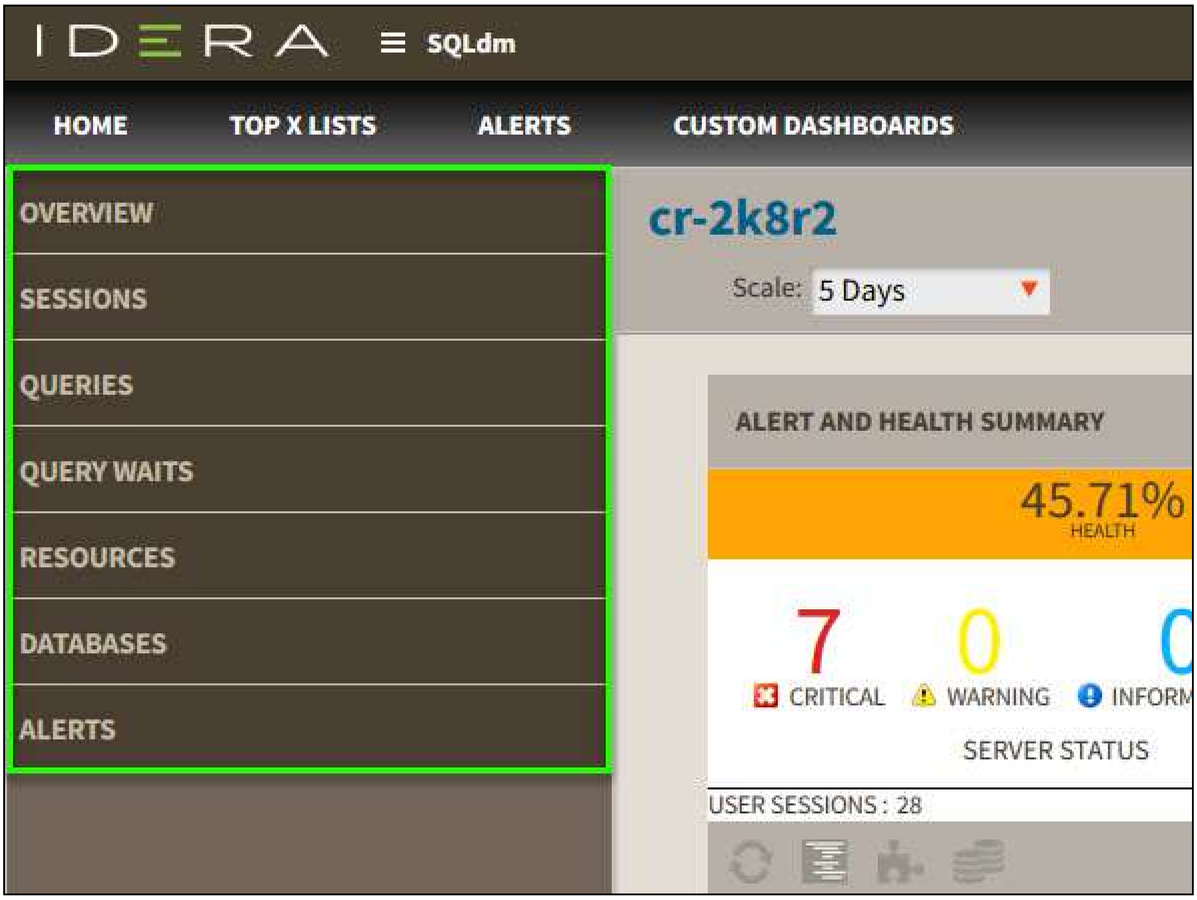
The Tempdb chart tracks the status of the tempdb database on your monitored SQL Server instance.

Virtualization

The Virtualization chart tracks the performance of your virtual machine or host, depending on the selection in the panel.

Category views

The single instance dashboard contains the Overview, Sessions, Queries, Query Waits, Resources, Databases, and Alerts tabs where you can see metrics and information on these category views.



From these tabs you can:

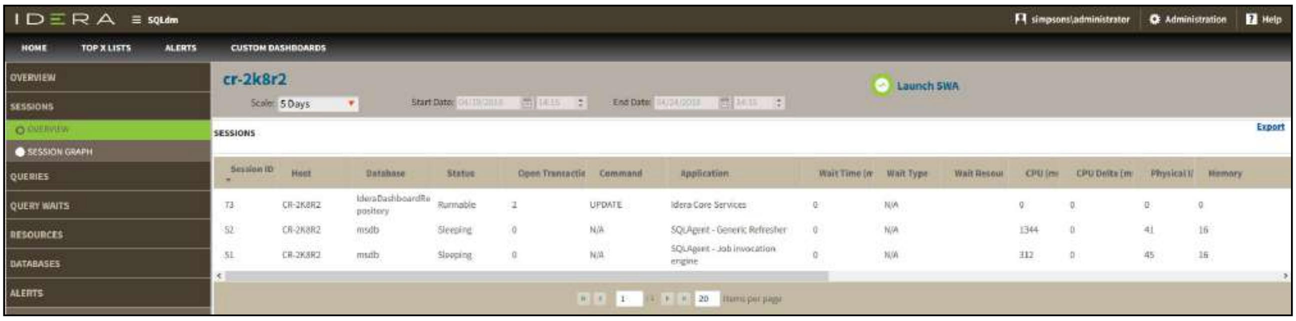
- View your SQL Server sessions information in IDERA Dashboard.
- View your SQL Server queries information.
- View your SQL Server query waits information.
- View your SQL Server resources information.
- View your SQL Server databases information.
- View your SQL Server alerts.

Access the single instance dashboard

SQL Diagnostic Manager provides several paths to access the single instance dashboard. The first access path is by clicking the appropriate monitored SQL Server instance in the list, thumbnail, or heatmap sub-views. The second access path is by clicking a specific instance from the Active Alerts panel, or the Most Critical Instances view in the main dashboard. It is also possible to access the single instance dashboard by clicking a specific instance or database in the Top servers by alert count, Top servers by response time, and Top databases by alerts widgets.

View your SQL Server sessions information in IDERA Dashboard

The Sessions tab of the single instance dashboard allows you to quickly view key diagnostic statistics for sessions on your SQL Server instance and contains the Overview and Session Graphs views. Click image to view the full size.



cr-2k8r2

Scale: 5 Days   Start Date: 04/19/2018 14:15   End Date: 04/24/2018 14:15

SESSIONS

Session ID	Host	Database	Status	Open Transactio	Command	Application	Wait Time (m	Wait Type	Wait Resou	CPU (m	CPU Delta (m	Physical I/	Memory
73	CR-2K8R2	IderaDashboardRepository	Runnable	2	UPDATE	Idera Core Services	0	N/A		0	0	0	0
52	CR-2K8R2	msdb	Sleeping	0	N/A	SQLAgent - Generic Refresher	0	N/A		1344	0	41	16
51	CR-2K8R2	msdb	Sleeping	0	N/A	SQLAgent - Job invocation engine	0	N/A		312	0	45	16

1   20 items per page

Overview

The **Sessions > Overview** tab contains the following information:

- Session ID
- Host
- Database
- Status
- Open transactions
- Command
- Application
- Wait time (ms)
- Wait type
- Wait resources
- CPU (ms)
- CPU Delta (ms)
- Physical I/O
- Memory
- Login time
- Last Batch
- Blocked by
- Blocking
- Blocking count
- Net address
- Net library
- Version store elapsed (sec)

Export

You can export session overview information in the following formats: PDF, XLS, or XML.

Session Graphs

The **Sessions > Sessions Graphs** tab contains the following charts (Click image to view full size):

Response Time (ms)

The Response Time chart displays the response time (in milliseconds) it takes a Select SQL statement to go to the SQL Server instance and back. This chart indicates the current speed and congestion of the network as well as the speed with which SQL Server processes small queries.

Session Activity

The Session Activity chart displays the number of concurrent connections to the monitored SQL Server instance over time. The total number of sessions includes the active, idle, and system sessions.

Blocked Sessions

The Blocked Sessions charts lists all the Blocked Sessions, Lead Blockers, and the Total Deadlocks for the selected SQL Server instance. This allows you to easily view blocks as they occur.

Access the Sessions tab

SQL Diagnostic Manager provides three paths to access the Sessions tab. The first access path is by clicking on the Response Time chart (ms) of the single instance dashboard, and you are directed to the **Sessions > Overview** tab. The second access path is by selecting the Sessions tab of the single instance dashboard. You can also click on an alert that belongs to the Sessions category in the Active alerts panel of the main dashboard.

View your SQL Server queries information in IDERA Dashboard

The Queries tab of the single instance dashboard lists each event that occurs in the Query Monitor and allows you to easily explore query data in multiple ways and get a handle of query performance in your environment.

The Queries tab provides a highly usable and customizable Main Query view along with two low-level views which you can navigate to for root cause analysis:

- Query Signature view
- Query Details view

The Main Query view consists of the following major components that allow you to customize your view:

- View selection and grouping
- Filtering
- Time
- Data view

Select the type of view that you want to be displayed

The View Selection of the Main Query view allows you to choose from a variety of views to explore query data. The following views are available:

- Duration (ms)
- CPU Time (ms)
- Reads
- Writes
- I/O (sum of reads and writes)
- Blocking Duration (ms)
- Wait Duration (ms)
- Deadlocks

ⓘ Duration (ms) is the default view of the Main Query view.

Use Group By to organize your view

Once you have selected a view, use the **Group By** option to choose from the following type of objects for query aggregation:

- Application
- Database
- User
- Client
- Query Signature

ⓘ Application is the grouping by default in the Main Query view.

Use Filtering to customize your view

Filter options in the Main Query view allow you to focus only on the information you want to be displayed. You can include or exclude specific applications, databases, users, SQL text, and more from the Query Monitor results through filters. The following filter options are available:

- Application

- Databases
- Users
- Clients
- SQL (Include SQL text matching or exclude SQL text matching)
- Advanced Filters

Select a time period to display query data

You can choose the time period to display in the Main Query view. This selection limits the queries to only those that run during the specified time period. You can select from a broad range of built-in time periods or specify start and end dates, and times for the period. The **Time** box includes the following options:

- Last 30 minutes
- Last 1 hour
- Last 4 hours
- Last 8 hours
- Last 24 Hours
- Last 7 days
- Last 30 days
- Custom

> By default only queries that start within the time period are shown. If you want to modify this behavior, the Advanced Filters option lets you include incomplete queries or overlapping queries. For more information, see Advanced filters of the main query view.

> To switch to a shorter time frame, click the larger time bucket. For example, clicking a month in a monthly graph modifies the time period to the selected month and grouping to days.

Analyze your query data

On the right-hand side of the overall view, query data is displayed based on your View, Group By, and filtering selections. The Data view is designed to provide good visualization of the selected data and enable you to drill down into problem areas. The Data view is composed of the following elements:

Header

Provides View, Group By, Period, and filter criteria information.

Graph

Chart area which displays the aggregated query results that meet the filtering criteria.

List

Displays data selected for the view in list form. There are several list options according to your **Group By** selection in the Main Query view.

The table below shows what options you have to drill down from the graph or list and get more specific information:

Click the...	Access the...
Application Name	Query Signature view

Click the...	Access the...
Database Name	Query Signature view
User	Query Signature view
Client	Query Signature view
Query Signature	Query Statement view

You can return to the higher level view by clicking ⌃ by the list name.

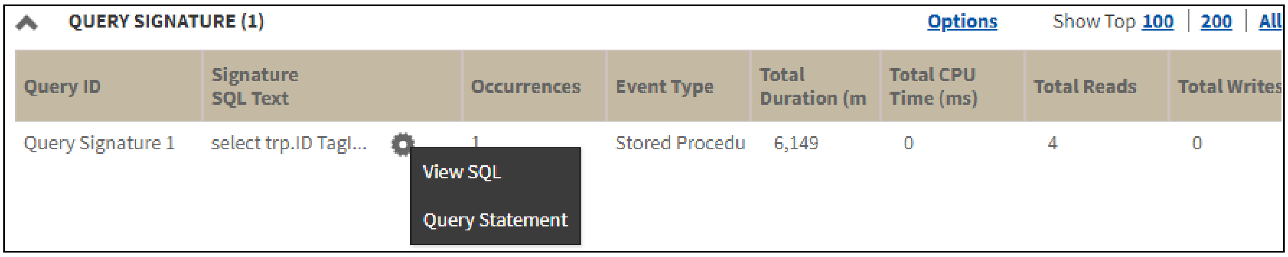
Access the Queries tab

SQL Diagnostic Manager provides two paths to access the Queries tab. The first access path is by selecting the Queries tab of the single instance dashboard. You can also click the query category icon of a specific instance in the thumbnail sub-view.

Advanced query signature view

SQL Diagnostic Manager provides the ability to view individual SQL Statements or to view Query Signatures. Query signatures are groupings of SQL Statements that match once their literals are stripped. A query signature broadly defines queries and trends with a less overwhelming amount of data and allows you to diagnose a query in a general sense.

Once you identify a potential problem signature, you can drill into individual queries that make up the signature as needed by clicking the ⚙ icon.

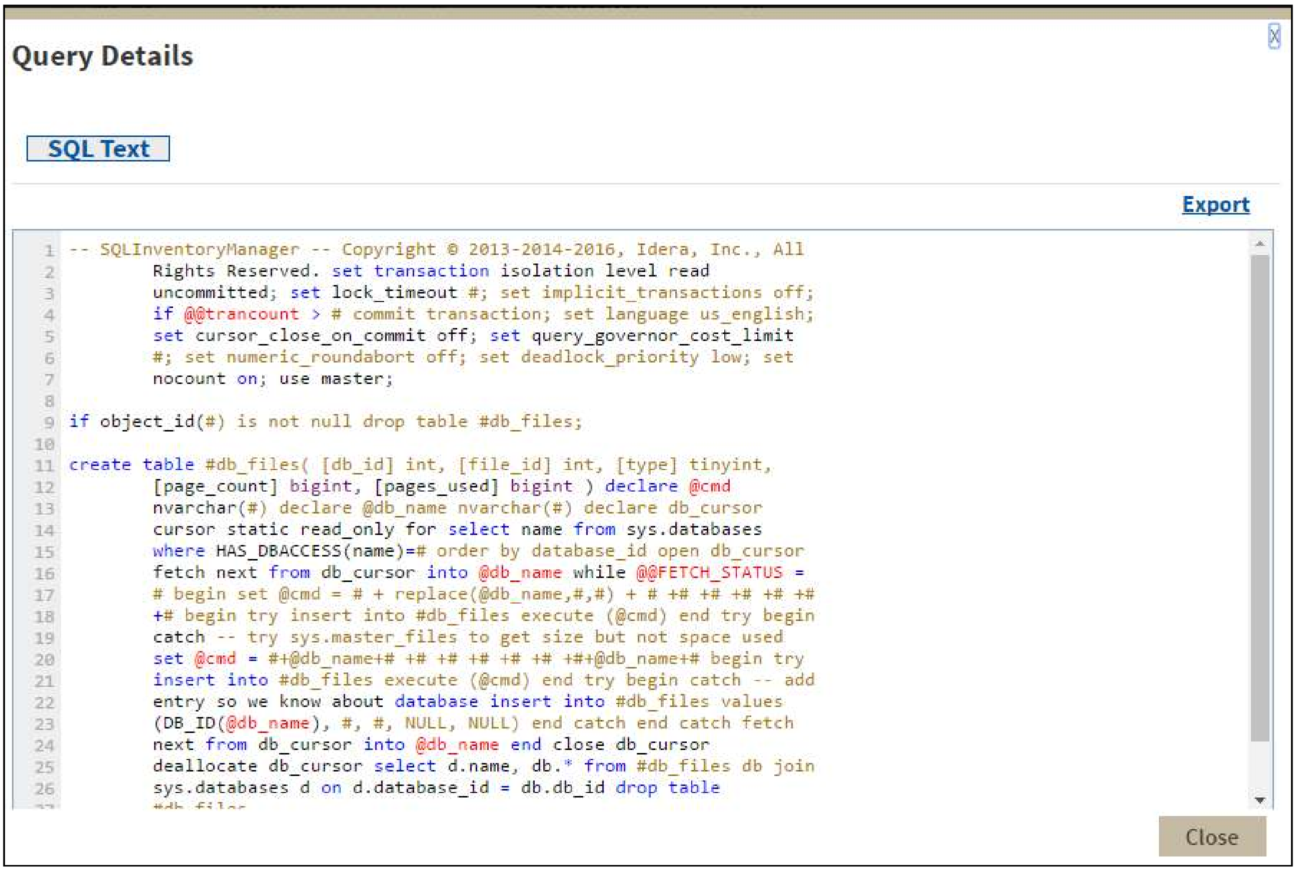


QUERY SIGNATURE (1) Options Show Top 100 | 200 | All

Query ID	Signature SQL Text	Occurrences	Event Type	Total Duration (m	Total CPU Time (ms)	Total Reads	Total Writes
Query Signature 1	select trp.ID Tagl... ⚙	1	Stored Procedu	6,149	0	4	0

Upon clicking the ⚙ icon, the following context menu displays:

- **View SQL**. Click this option to view the underlying SQL Text for the query execution plan. In this view, you can export and save SQL text for review



Query Details

```
-- SQLInventoryManager -- Copyright © 2013-2014-2016, Idera, Inc., All
        Rights Reserved. set transaction isolation level read
        uncommitted; set lock_timeout #; set implicit_transactions off;
        if @@trancount > # commit transaction; set language us_english;
        set cursor_close_on_commit off; set query_governor_cost_limit
        #; set numeric_roundabort off; set deadlock_priority low; set
        nocount on; use master;

if object_id(#) is not null drop table #db_files;

create table #db_files( [db_id] int, [file_id] int, [type] tinyint,
        [page_count] bigint, [pages_used] bigint ) declare @cmd
        nvarchar(#) declare @db_name nvarchar(#) declare db_cursor
        cursor static read_only for select name from sys.databases
        where HAS_DBACCESS(name)=# order by database_id open db_cursor
        fetch next from db_cursor into @db_name while @@FETCH_STATUS =
        # begin set @cmd = # + replace(@db_name,#,#) + # +# +# +# +# +#
        +# begin try insert into #db_files execute (@cmd) end try begin
        catch -- try sys.master_files to get size but not space used
        set @cmd = #+@db_name+# +# +# +# +# +# +#+@db_name+# begin try
        insert into #db_files execute (@cmd) end try begin catch -- add
        entry so we know about database insert into #db_files values
        (DB_ID(@db_name), #, #, NULL, NULL) end catch end catch fetch
        next from db_cursor into @db_name end close db_cursor
        deallocate db_cursor select d.name, db.* from #db_files db join
        sys.databases d on d.database_id = db.db_id drop table
        #db_files
```

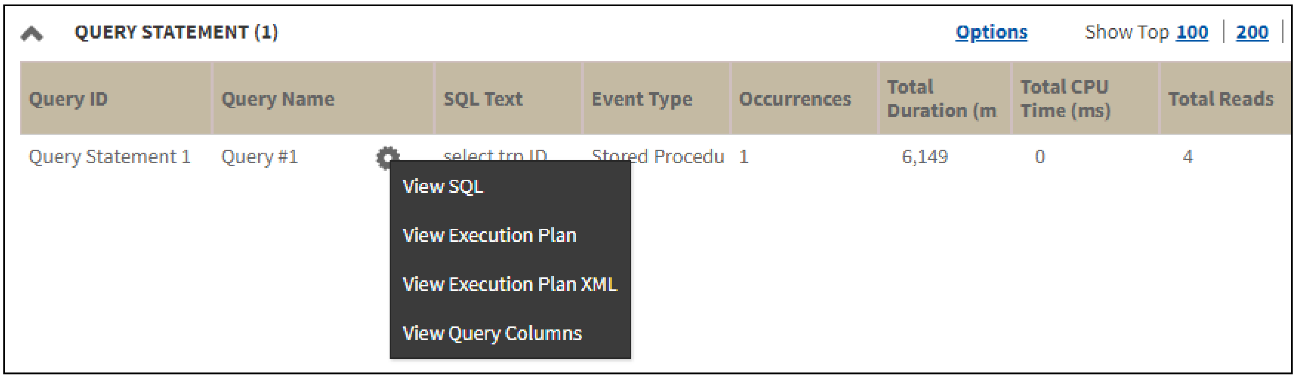
- **Query Statement**. Click this option to view query statements for the selected client.

For additional information on query signatures, see View the query monitor signature mode.

Advanced query statement view

SQL Diagnostic Manager provides you the ability to view individual SQL Statements or to view Query Signatures. Query statements are presented exactly as they are collected by the Query Monitor Trace. Query statements provide all the detail you may need to diagnose a specific problem with a query.

Once you identify a potential problem statement, you can drill into the Query Details view by clicking the ⚙ icon.



QUERY STATEMENT (1)

Options   Show Top 100 | 200 |

Query ID	Query Name	SQL Text	Event Type	Occurrences	Total Duration (m	Total CPU Time (ms)	Total Reads
Query Statement 1	Query #1 ⚙	select trp ID	Stored Procedu	1	6,149	0	4

Upon clicking the ⚙ icon, the following context menu displays:

- View SQL
- View Execution Plan
- View Execution Plan XML
- View Query Columns

Query Details view

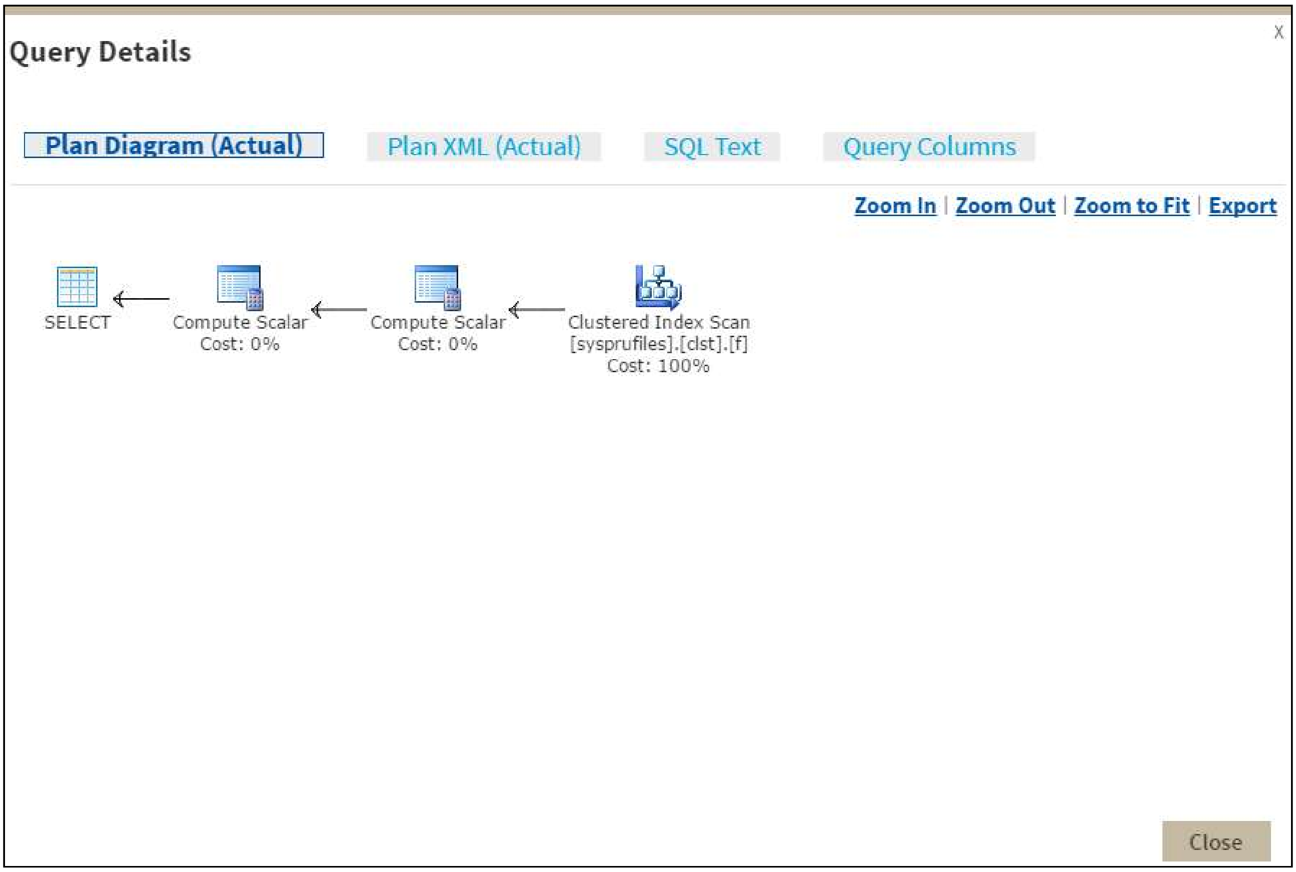
The Query Details view provides various views with detailed information on each query. The Query Details view is comprised of the following tabs:

- Plan Diagram
- Plan XML
- SQL Text
- Query Columns

⚠ The Plan Diagram and Plan XML views are only available for instances running SQL Server 2008+.

Plan Diagram

The Plan Diagram is a visual representation of the query execution plan (actual or estimated) available in XML format in SQL Server. The Plan Diagram displays a view of the tree of operations that make up a query. This tree shows individual operation nodes, pertaining graphical execution plan icon, along with basic information such as operator name and operation percentage of total cost. Click image to view full size.



In the Plan Diagram view you can perform the following actions:

- Select individual operators and view the set of properties for each operator.
- Increase the size of the image **(Zoom in)**.
- Reduce the image size **(Zoom out)**.
- Select a size for the view so that fits the current view size **(Zoom to fit)**.

- Export image of Plan Diagram.

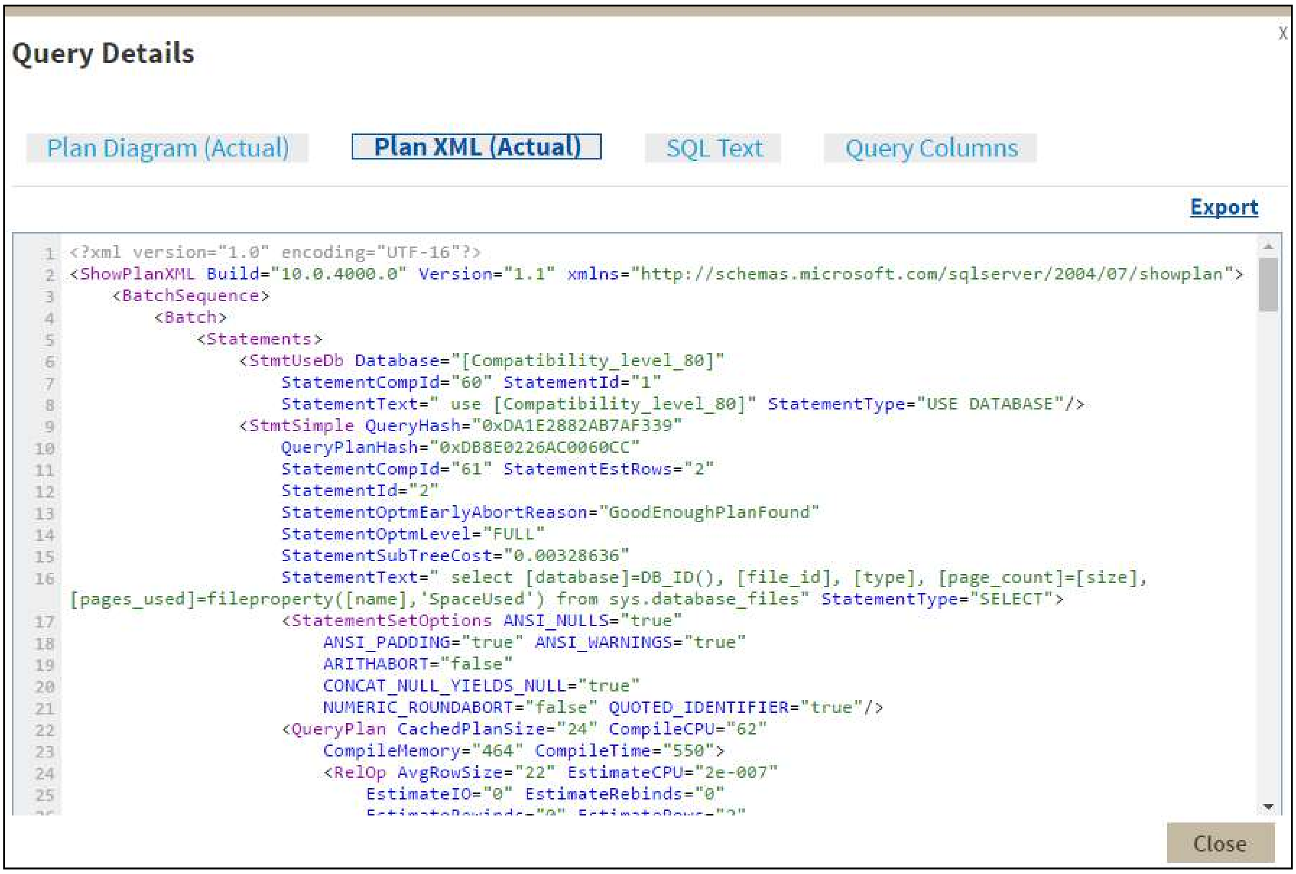
ⓘ The top three operators based on the percentage of total cost in a Plan Diagram are highlighted in yellow.

✓ **Estimated Query Plans**

SQL Diagnostic Manager displays information on whether the plan displayed is an estimated query plan or an actual one.

Plan XML

The Plan XML tab of the Query Details window displays the actual XML of the query execution plan. It has a syntax-highlighting (color-coded) XML viewer. Click image to view full size.



```
<?xml version="1.0" encoding="UTF-16"?>
<ShowPlanXML Build="10.0.4000.0" Version="1.1" xmlns="http://schemas.microsoft.com/sqlserver/2004/07/showplan">
    <BatchSequence>
        <Batch>
            <Statements>
                <StmtUseDb Database="[Compatibility_level_80]"
                    StatementCompId="60" StatementId="1"
                    StatementText=" use [Compatibility_level_80]" StatementType="USE DATABASE"/>
                <StmtSimple QueryHash="0xDA1E2882AB7AF339"
                    QueryPlanHash="0xDB8E0226AC0060CC"
                    StatementCompId="61" StatementEstRows="2"
                    StatementId="2"
                    StatementOptmEarlyAbortReason="GoodEnoughPlanFound"
                    StatementOptmLevel="FULL"
                    StatementSubTreeCost="0.00328636"
                    StatementText=" select [database]=DB_ID(), [file_id], [type], [page_count]=[size],
[pages_used]=fileproperty([name],'SpaceUsed') from sys.database_files" StatementType="SELECT">
                    <StatementSetOptions ANSI_NULLS="true"
                        ANSI_PADDING="true" ANSI_WARNINGS="true"
                        ARITHABORT="false"
                        CONCAT_NULL_YIELDS_NULL="true"
                        NUMERIC_ROUNDABORT="false" QUOTED_IDENTIFIER="true"/>
                    <QueryPlan CachedPlanSize="24" CompileCPU="62"
                        CompileMemory="464" CompileTime="550">
                        <RelOp AvgRowSize="22" EstimateCPU="2e-007"
                            EstimateIO="0" EstimateRebinds="0"
                            EstimateRewinds="0" EstimateRows="2"
```

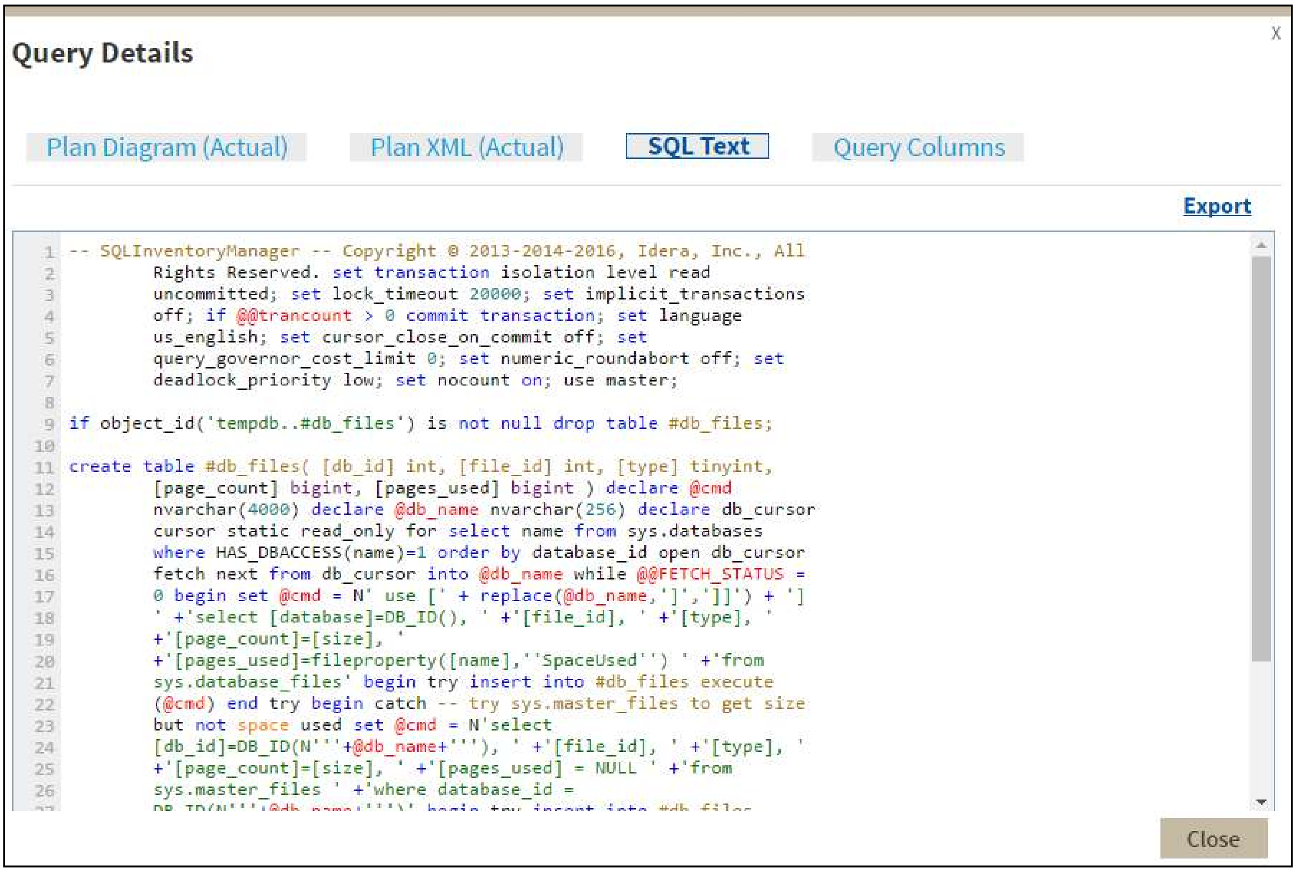
In the Plan XML view you can perform the following actions:

- Export and save XML file for review in other application such as SSMS or email query execution plan to other DBAs.

❗ Save the file with `.sqlplan` extension to view the graphical query plan in SSMS.

SQL Text

The SQL Text tab of the Query Details window shows the underlying SQL Text for the query execution plan.



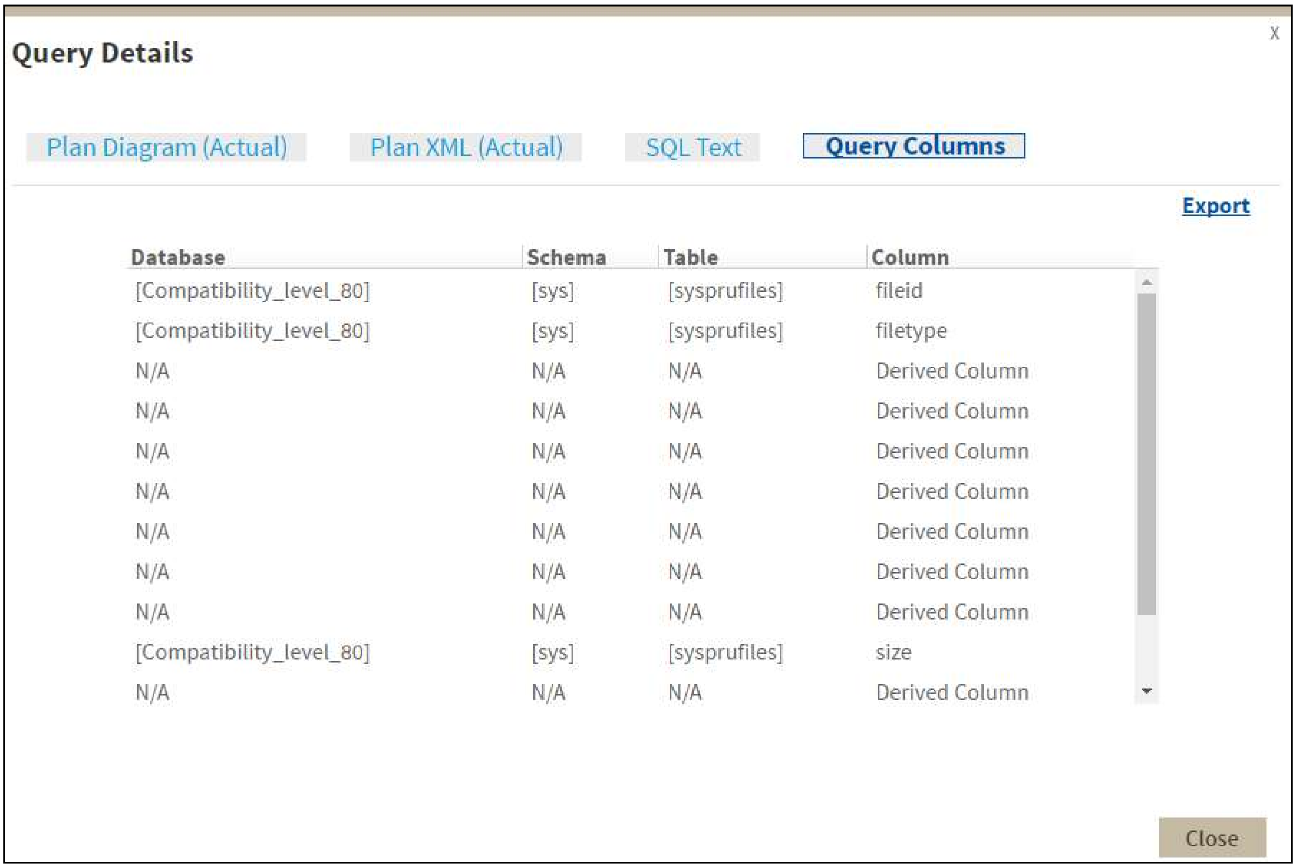
```
-- SQLInventoryManager -- Copyright © 2013-2014-2016, Idera, Inc., All
        Rights Reserved. set transaction isolation level read
        uncommitted; set lock_timeout 20000; set implicit_transactions
        off; if @@trancount > 0 commit transaction; set language
        us_english; set cursor_close_on_commit off; set
        query_governor_cost_limit 0; set numeric_roundabort off; set
        deadlock_priority low; set nocount on; use master;

if object_id('tempdb..#db_files') is not null drop table #db_files;

create table #db_files( [db_id] int, [file_id] int, [type] tinyint,
        [page_count] bigint, [pages_used] bigint ) declare @cmd
        nvarchar(4000) declare @db_name nvarchar(256) declare db_cursor
        cursor static read_only for select name from sys.databases
        where HAS_DBACCESS(name)=1 order by database_id open db_cursor
        fetch next from db_cursor into @db_name while @@FETCH_STATUS =
        0 begin set @cmd = N' use [' + replace(@db_name,']',']]') + ']
        ' +'select [database]=DB_ID(), ' +'[file_id], ' +'[type], '
        +'[page_count]=[size], '
        +'[pages_used]=fileproperty([name],''SpaceUsed'') ' +'from
        sys.database_files' begin try insert into #db_files execute
        (@cmd) end try begin catch -- try sys.master_files to get size
        but not space used set @cmd = N'select
        [db_id]=DB_ID(N'''+@db_name+'''), ' +'[file_id], ' +'[type], '
        +'[page_count]=[size], ' +'[pages_used] = NULL ' +'from
        sys.master_files ' +'where database_id =
```

In the SQL Text view you can perform the following actions:

- Export and save SQL text for review.
- Access the Plan Diagram, Plan XML, and Query Columns tabs.

Query Columns

The Query Columns tab of the Query Details window shows all the referenced columns for the query execution plan.



Database	Schema	Table	Column
[Compatibility_level_80]	[sys]	[sysprufiles]	fileid
[Compatibility_level_80]	[sys]	[sysprufiles]	filetype
N/A	N/A	N/A	Derived Column
N/A	N/A	N/A	Derived Column
N/A	N/A	N/A	Derived Column
N/A	N/A	N/A	Derived Column
N/A	N/A	N/A	Derived Column
N/A	N/A	N/A	Derived Column
N/A	N/A	N/A	Derived Column
[Compatibility_level_80]	[sys]	[sysprufiles]	size
N/A	N/A	N/A	Derived Column

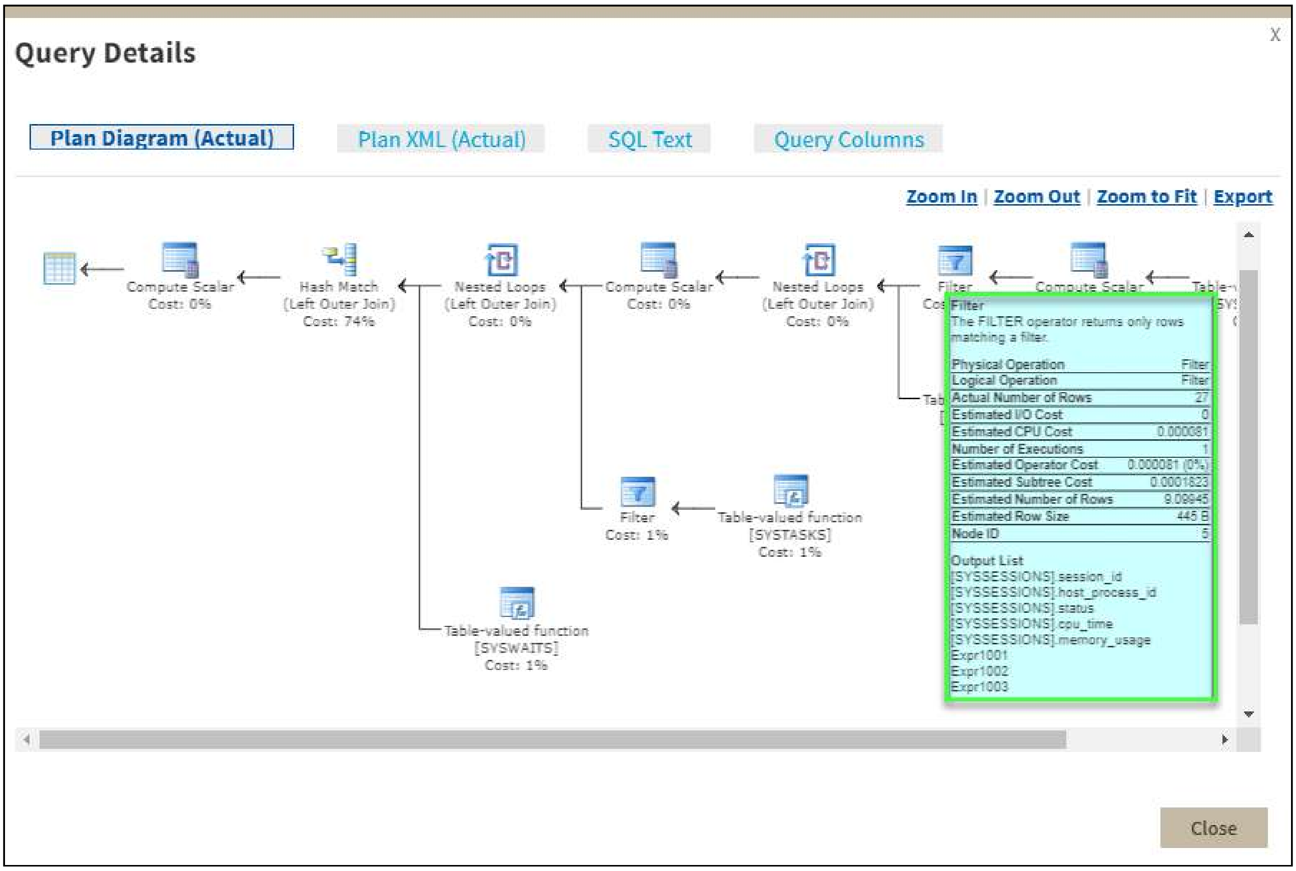
In the Query Columns view you can perform the following actions:

- Export and save information to a text file.

Plan diagram operator properties

In the Plan Diagram view, hover over an operator to view its full set of properties such as:

- Operator Type.
- Operator Description.
- List of Properties (varies according to operator type).
- Related Objects (varies according to operator type).



Filter

The FILTER operator returns only rows matching a filter.

Physical Operation	Filter
Logical Operation	Filter
Actual Number of Rows	27
Estimated I/O Cost	0
Estimated CPU Cost	0.000081
Number of Executions	1
Estimated Operator Cost	0.000081 (0%)
Estimated Subtree Cost	0.0001823
Estimated Number of Rows	9.09945
Estimated Row Size	445 B
Node ID	5

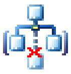
Output List
[SYSSESSIONS].session_id
[SYSSESSIONS].host_process_id
[SYSSESSIONS].status
[SYSSESSIONS].cpu_time
[SYSSESSIONS].memory_usage
Expr1001
Expr1002
Expr1003

Execution plan graph operators table

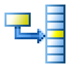
Operators describe how SQL Server executes a query or a Data Manipulation Language (DML) statement. The query optimizer uses operators to build a query plan to create the result specified in the query, or to perform the operation specified in the DML statement. The query plan is a tree consisting of physical operators.

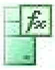
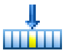
This is the table of descriptions to be used in the properties dialog showing the operator details in the execution plan graphical view.

Operator	**Graphical execution plan icon**	**Text**
Aggregate	None	The **Aggregate** operator is a physical or logical operator that computes a new value using the SQL Server functions MIN, MAX, SUM, COUNT or AVG.
Arithmetic Expression	$\frac{A}{(B+C)}$	The **Arithmetic Expression** operator computes a new value from existing values in a row. **Arithmetic Expression** is not used in SQL Server 2014.
Assert	▤	The **Assert** operator verifies a condition. The **Assert** operator is a physical operator.
Assign	A←B	The **Assign** operator assigns a value to a variable
Asnyc Concat	None	The **Asnyc Concat** operator is used in remote distributed queries to get output rows from remote child nodes to send to the parent node.
Bitmap	▦	The **Bitmap** operator is used to apply filtering to parallel query plans. **Bitmap** is a physical operator.
Bitmap Create	▦	The **Bitmap Create** operator is a logical operator that shows where bitmaps are built.
Bookmark Lookup	▦	The **Bookmark Lookup** operator uses a bookmark (row ID or clustering key) to look up the corresponding row in the table or clustered index. **Bookmark Lookup** is not used in SQL Server 2014. The **Key Lookup** operator also provides this functionality.

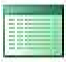
Branch Repartition	None	The **Branch Repartition** operator is a logical operator showing where iterators could be executed by parallel threads.
Broadcast	None	The **Broadcast** operator sends the set of input rows to multiple consumers.
Build Hash		The **Build Hash** operator indicates that a batch has table has been built.
Cache	None	The **Cache** operator is a logical operator that caches a single row of data. **Cache** is not used in SQL Server 2014.
Clustered Index Delete		The **Clustered Index Delete** operator deletes rows from a clustered index. **Clustered Index Delete** is a physical operator.
Clustered Index Insert		The **Clustered Index Insert** operator inserts rows into a clustered index. **Clustered Index Insert** is a physical operator.
Clustered Index Merge		The **Clustered Index Merge** operator merges a data stream and a clustered index. **Clustered Index Merge** is a physical operator.
Clustered Index Scan		The **Clustered Index Scan** operator scans a clustered index. It returns only rows matching the WHERE clause and sorts the results based on the ORDERED clause.
Clustered Index Seek		The **Clustered Index Seek** operator retrieves rows from a clustered index using the seeking ability of indexes.
Clustered Index Update		The **Clustered Index Update** operator updates rows in the clustered index. It only updates rows matching the WHERE clause.
Collapse		The **Collapse** operator merges separate operations into a single more efficient operation.

Columnstore Index Scan		The **Columnstore Index Scan** operator scans the columnstore index specified in the query execution plan argument.
Compute Scalar		The **Compute Scalar** operator returns a computer scalar value from an evaluated expression.
Concatenation		The **Concatenation** operator returns rows scanned from multiple inputs. This is used for statements like UNION ALL.
Constant Scan		The **Constant Scan** operator adds rows into a query.
Convert		The **Convert** operator converts one scalar type to another.
Cross Join	None	The **Cross Join** operator is a logical operator that joins each row from input with each row from another input.
catchall	C	The **catchall** operator is a placeholder icon when an operator does not match any other query operators.
Cursor	None	The **Cursor** operator describes the execution of a query or update that use cursor operations.
Declare	A→	The **Declare** operator allocates a local variable.
Delete		The **Delete** operator deletes rows from an object.
Deleted Scan		The **Deleted Scan** operator scans the deleted table within a trigger.
Distinct	None	The **Distinct** operator removes duplicate rows.
Distinct Sort	None	The **Distinct Sort** operator removes duplicate rows and sorts the resulting set of rows.

Distribute Streams		The **Distribute Streams** operator is used to break records from a single input to multiple output streams in a parallel query plan.
Dynamic		The **Dynamic** operator uses a cursor to see all changes made by others.
Eager Spool		The **Eager Spool** operator stores each row in the input to tempdb so that this cached data can be used if the operator is rewound.
Fetch Query		The **Fetch Query** operator returns rows from a fetch issued against a cursor.
Filter		The **Filter** operator returns only rows that match a filter expression.
Flow Distinct	None	The **Flow Distinct** operator removes duplicate rows but returns each row as it is processed.
Full Outer Join	None	The **Full Outer Join** operator is a logical operator that implements an OUTER JOIN. Results in all matching rows from two streams plus rows for each row in the streams that did not have matches.
Gather Streams		The **Gather Streams** operator is used to consume multiple input streams and combine them into a single output stream in parallel query plans.
Hash Match		The **Has Match** operator creates a hash table from the rows in the build input.
Inner Join	None	The **Inned Join** operator returns rows that satisfy the JOIN of the first (top) input with the second (bottom) input.
Insert		The **Insert** logical operator inserts input rows into the object specified in the Argument column.
Inserted Scan		The **Inserted Scan** operator scans the inserted table.

Intrinsic		The **Intrinsic** operator runs an internal Transact-SQL function.
Iterator		The **Iterator** operator is a placeholder icon used when no match is found for the iterator operation.
Key Lookup		The KEY LOOKUP operator signals a lookup using a bookmark on a table with a clustered index.
Keyset		The KEYSET operator uses a cursor that can only see updates and not inserts.
Language Element		The LANGUAGE ELEMENT operator is a placeholder icon when no matching language constructs can be found.
Lazy Spool		The LAZY SPOOL operator stores each row in the input to tempdb so that this cached data can be used if the operator is rewound. The rows are only copied to tempdb as they are processed.
Left Anti Semi Join	None	The LEFT ANTI SEMI JOIN operator returns rows from the first input where there is no match in the second input.
Left Outer Join	None	The LEFT OUTER JOIN operator returns rows from the first input that satisfy the join with the second input.
Left Semi Join	None	The LEFT SEMI JOIN operator returns rows from the first input that have a match with the second input.
Log Row Scan		The LOG ROW SCAN operator scans the transaction log.
Merge Interval		The MERGE INTERVAL operator merges multiple intervals to create a minimal set of non-overlapping intervals.
Merge Join		The MERGE JOIN operator performs one of the many possible join operations.

Nested Loops		The NESTED LOOPS operator perform the logical operations to satisfy many join operations that need a loop to search the inner table for rows in the outer table.
Nonclustered Index Delete		The NONCLUSTERED INDEX DELETE operator deleted rows from a non-clustered index.
Index Insert		The INDEX INSERT operator inserts rows into a non-clustered index.
Index Scan		The INDEX SCAN operator scans a non-clustered index. It returns only rows matching the WHERE clause
Index Seek		The INDEX SEEK operator retrieves rows from a non-clustered index using the seeking ability of indexes.
Index Spool		The INDEX SPOOL operator copies input rows to tempdb and builds a non-clustered index for these rows.
Nonclustered Index Update		The NONCLUSTERED INDEX UPDATE operator updates rows from its input in the non-clustered index.
Online Index Insert		The ONLINE INDEX INSERT operator is a physical operator indicating that an index create, alter or drop is performed online.
Parallelism	None	The PARALLELISM operator the logical operations of distribute, gather or repartition streams.
Parameter Table Scan		The PARAMETER TABLE SCAN operator scans a table that acts as a parameter of the query.
Partial Aggregate	None	The PARTIAL AGGREGATE operator is a logical operator that aggregates input rows to prevent writing to disk in parallel plans.
Population Query		The POPULATION QUERY operator populates a cursor's work table.

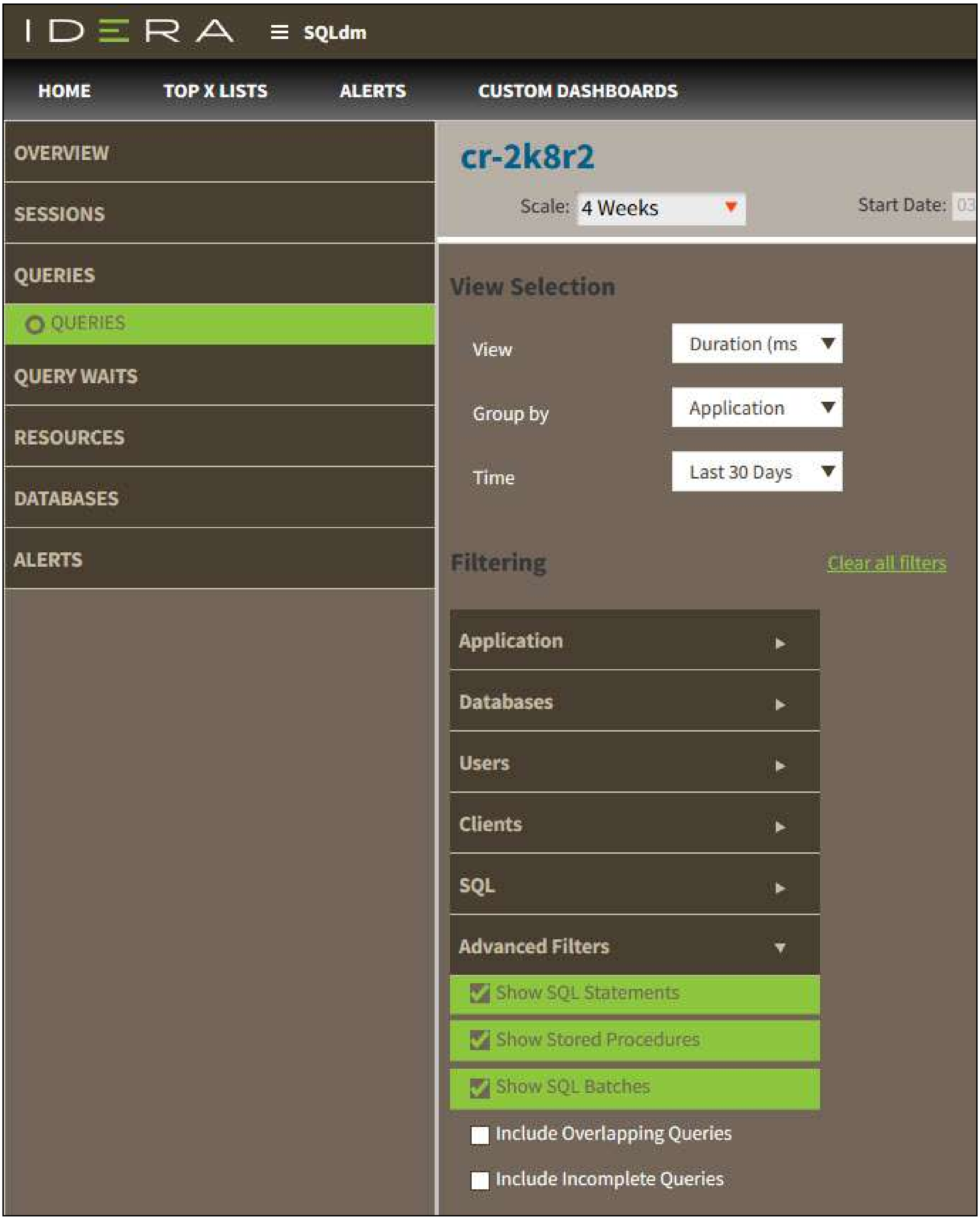
Refresh Query		The REFRESH QUERY operator fetches current data for rows.
Remote Delete		The REMOTE DELETE operator deletes rows from an remote object.
Remote Index Scan		The REMOTE INDEX SCAN operator scans a remote index.
Remote Index Seek		The REMOTE INDEX SEEK operator retrieves rows using a remote index.
Remote Insert		The REMOTE INSERT operator inserts rows into a remote object.
Remote Query		The REMOTE QUERY operator submits a query to a remote source.
Remote Scan		The REMOTE SCAN operator scans a remote object.
Remote Update		The REMOTE UPDATE operator updates a remote object.
Repartition Streams		The REPARTITION STREAMS operator creates multiple out streams from multiple input streams while applying a bitmap filter.
Result		The RESULT operator is the query plan return data.
RID Lookup		The RID LOOKUP operator is a bookmark lookup on a heap.
Right Anti Semi Join	None	The RIGHT ANTI SEMI JOIN operator returns rows from the second input where the is no match in the first input.
Right Outer Join	None	The RIGHT OUTER JOIN operator returns rows from the second input that satisfy the join with the first input.

Right Semi Join	None	The RIGHT SEMI JOIN operator returns rows from the second input that have a match with the first input.
Row Count Spool		The ROW COUNT SPOOL operator returns empty rows for each row in the input stream.
Segment		The SEGMENT operator uses the value of columns to divide the input set into segments.
Segment Repartition	None	The SEGMENT REPARTITION operator marks the boundaries of regions whose iterators can be run in parallel threads.
Sequence		The SEQUENCE operator executes each input in sequence.
Sequence Project		The SEQUENCE PROJECT operator adds columns to the input set, divides the input set into segments and outputs one segment at a time.
Snapshot		The SNAPSHOT operator creates a cursor that cant see changes by others.
Sort		The SORT operator sorts incoming rows.
Split		The SPLIT operator creates a delete and insert operation out of each update operation.
Spool		The SPOOL operator saves an intermediate query to tempdb.
Stream Aggregate		The STREAM AGGREGATE operator groups rows by columns and calculates aggregate expressions.
Switch		The SWITCH operator copies the appropriate input stream to the output stream by evaluating an expression.
Table Delete		The TABLE DELETE operator deletes rows from a table.

Table Insert		The TABLE INSERT operator inserts rows into a table.
Table Merge		The TABLE MERGE operator applies a merge data stream to a heap.
Table Scan		The TABLE SCAN operator retrieves rows from a table.
Table Spool		The TABLE SPOOL operator scans the input and places the rows into tempdb.
Table Update		The TABLE UPDATE operator updates rows in a table.
Table-valued Function	fx	The TABLE-VALUED FUNCTION operator evaluates a table-valued function and stores the resulting rows in tempdb.
Top		The TOP operator returns only the specified number of rows from the input.
Top N Sort	None	The TOP N SORT operator returns only the specified number of rows from the input and sorts them.
UDX		The UDX operator implements XQuery and XPath operations.
Union	None	The UNION operator combines multiple inputs and removes duplicates.
Update		The UPDATE operator updates a specified object from the rows in its input.
While		The WHILE operator represents a SQL while loop.
Window Spool		The WINDOW SPOOL operator expands the input rows into sets of rows that represent the window associated with the row.

Advanced filters of the Main Query view

Advanced filter options allow you to determine the precise Query Monitor data that is displayed. You can find the advanced filter options at the left side of the Main Query view. Click image to view full size.



cr-2k8r2

Scale: 4 Weeks

Start Date: 03

View Selection

View: Duration (ms

Group by: Application

Time: Last 30 Days

☑ Show SQL Statements

☑ Show Stored Procedures

☑ Show SQL Batches

□ Include Overlapping Queries

□ Include Incomplete Queries

The Advanced Filters include:

Show SQL Statements

Includes queries that are SQL Statements. This filter is enabled by default.

Show Stored Procedures

Includes queries that are Stored Procedure calls. This filter is enabled by default.

Show SQL Batches

Includes queries that are SQL batches. This filter is enabled by default.

Include Overlapping Queries

Includes queries whose total period of execution overlaps with the selected time period. This filter is disabled by default.

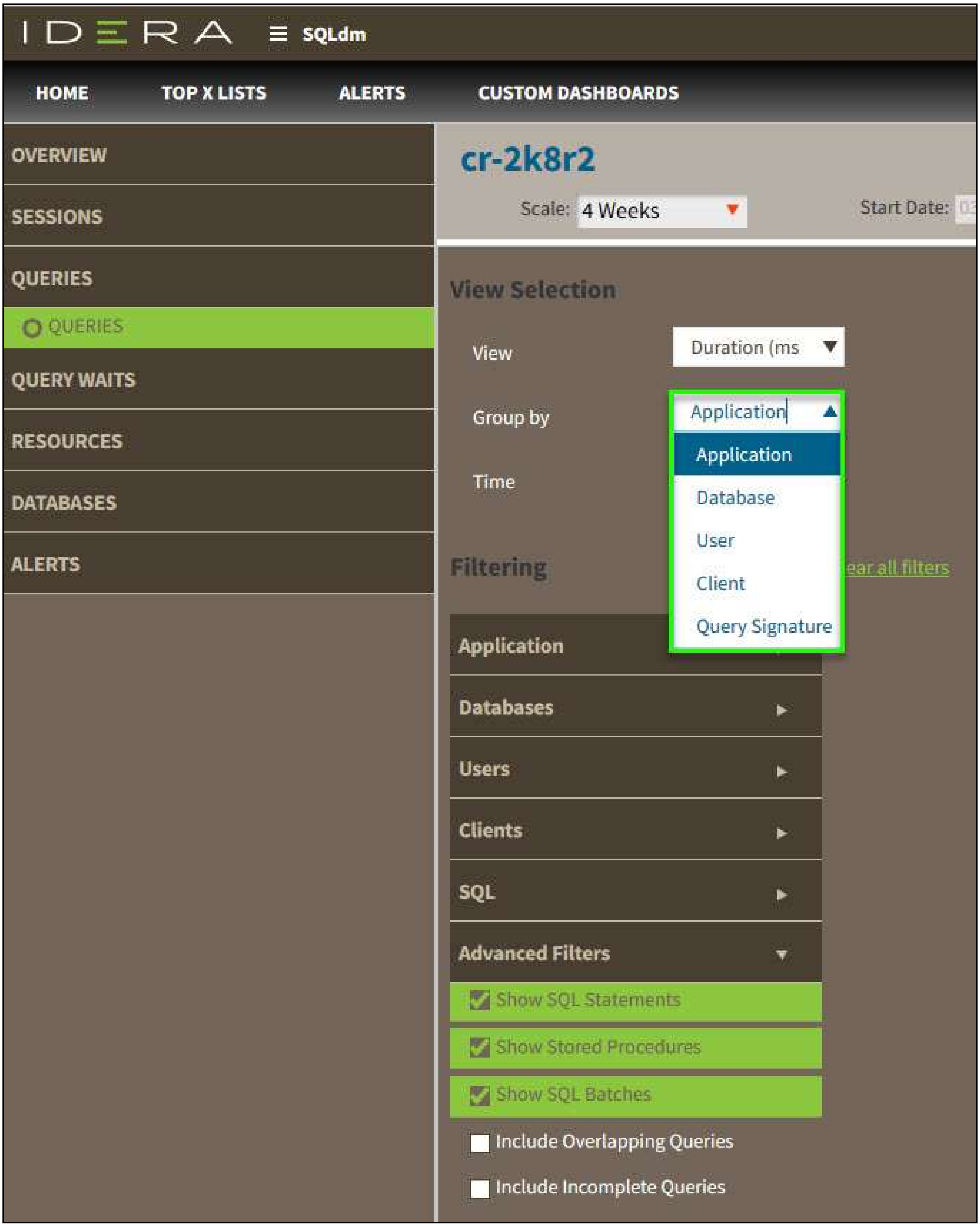
Include Incomplete Queries

Includes queries whose total period of execution exceeds the selected time period (i.e. query information is incomplete). This filter is disabled by default.

List view of the main query view

The list view displays all matching objects for the view selection and grouping in the Main Query view. The following list options are available:

- Application list
- Database list
- User list
- Client list
- Query Signature list



cr-2k8r2

Scale: 4 Weeks

View: Duration (ms

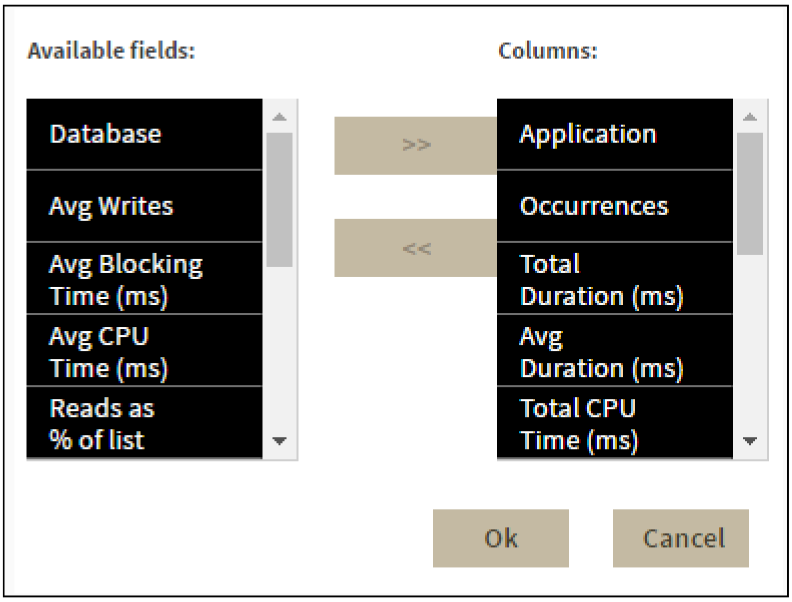
Group by: Application

Application list

The application list displays data that results from grouping by Application in the View Selection of the Main Query view. The application list provides you with the following information by default:

- Application
- Occurrences
- Total Duration (ms)
- Average Duration (ms)
- Total CPU Time (ms)
- Total Reads
- Total Writes
- Total I/O
- Total Wait Time (ms)
- Most Recent Completion
- Total Blocking Time (ms)
- Total Deadlocks

You can add or remove columns through the Column Chooser under **Options**.



- Database
- Average Writes
- Average Blocking Time (ms)
- Average CPU Time (ms)
- Reads as % of list
- Average I/O
- CPU as % of list
- Average Reads
- Average CPU Per Second
- Average Deadlocks
- Average Wait Time (ms)

✓ **Records**

You can display the top 100, 200, or all records by clicking the different **Show Top** options.

Explanation: CPU as % of List

In the Main Query view, after selecting the CPU Time (ms) by Application view. The CPU as % of list metric provides the CPU as a percentage of the values returned in the application list. For example, if you have three applications returned with a total CPU Time (ms) of 600, then the CPU as % of list metric for each is calculated as follows:

Application 1- CPU Time (ms): 100; (100/600) *100 = **16.7%** of total application CPU.

Application 2- CPU Time (ms): 200; (200/600) *100 = **33%** of total application CPU.

Application 3- CPU Time (ms): 300; (300/600) *100 = **50%** of total application CPU.

The CPU as % of list metric helps to pinpoint which application in your list has the highest CPU Time percentage (Application 3).

To drill down for additional query information, you can click the gear icon in the list and the following context menu displays:

- **Query Signature**. Click this option to view query signatures for the selected application.
- **Query Statement**. Click this option to view query statements for the selected application.

ⓘ To access the Query Signature view, you can also click the linkable application name (e.g. Microsoft SQL Server) in the application list.

Database list

The database list displays data that results from grouping by Database in the View Selection of the Main Query view. The database list provides you with the following information by default:

- Database
- Occurrences
- Total Duration (ms)
- Average Duration (ms)
- Total CPU Time (ms)
- Total Reads
- Total Writes
- Total I/O
- Average Wait Time (ms)
- Most Recent Completion
- Average Blocking Time (ms)
- Average Deadlocks

Additional columns are available through the Column Chooser under **Options**.

- Average Writes
- Total Blocking Time (ms)
- Average CPU Time (ms)
- Reads as % of list

- Total Wait Time (ms)
- Average I/O
- Total Deadlocks
- CPU as % of list
- Average Reads
- Average CPU Per Second
- Application

To drill down for additional query information, you can click the gear icon in the list and the following context menu displays:

- **Query Signature**. Click this option to view query signatures for the selected database.
- **Query Statement**. Click this option to view query statements for the selected database.

✓ **Records**

You can display the top 100, 200, or all records by clicking the different **Show Top** options.

ⓘ To access the Query Signature view, you can also click the linkable database name in the database list.

User list

The user list displays data that results from grouping by the user in the View Selection of the Main Query view. The user list provides you with the following information by default:

- Users
- Occurrences
- Total Duration (ms)
- Total CPU Time (ms)
- Total Reads
- Total Writes
- Average Wait Time (ms)
- Most Recent Completion
- Average Blocking Time (ms)
- Average Deadlocks

Additional columns are available through the Column Chooser under **Options**:

- Database
- Average Writes
- Total Blocking Time (ms)
- Average Duration (ms)
- Average CPU Time (ms)
- Reads as % of list
- Total Wait Time (ms)
- Average I/O Per Second
- Total Deadlocks
- CPU as % of list
- Average Reads
- Average CPU Per Second
- Application

To drill down for additional query information, you can click the gear icon in the list and the following context menu displays:

- **Query Signature**. Click this option to view query signatures for the selected user.
- **Query Statement**. Click this option to view query statements for the selected user.

✓ **Records**

You can display the top 100, 200 or all records by clicking the different **Show Top** options.

ⓘ To access the Query Signature view, you can also click the linkable username in the user list.

Client list

The client list is the data displayed after you selected **Group By** Clients in the View Selection of the Main Query view. The client list provides you with the following information by default:

- Clients
- Occurrences
- Total Duration (ms)
- Average Duration (ms)
- Total CPU Time (ms)
- Total Reads
- Total Writes
- Average Wait Time (ms)
- Most Recent Completion
- Average Blocking time (ms)
- Average Deadlocks

Additional columns are available through the Column Chooser under **Options**.

- Database
- Average Writes
- Total Blocking Time (ms)
- Average CPU Time (ms)
- Reads as % of list
- Total Wait Time (ms)
- Average I/O Per Second
- Total Deadlocks
- CPU as % of list
- Average Reads
- Average CPU Per Second
- Application

To drill down for additional query information, you can click the gear icon in the list and the following context menu displays:

- **Query Signature**. Click this option to view query signatures for the selected client.
- **Query Statement**. Click this option to view query statements for the selected client.

✓ **Records**

You can display the top 100, 200 or all records by clicking the different **Show Top** options.

ⓘ To access the Query Signature view, you can also click the linkable client name in the client list.

Query Signature list

The Query signature list is the data displayed after you selected **Group By** Query Signature in the View Selection of the Main Query view. The Query signature list provides you with the following information by default:

- Query ID
- Signature SQL Text
- Occurrences
- Event Type
- Total Duration (ms)
- Total CPU Time (ms)
- Total Reads
- Total Writes
- Average Wait Time (ms)
- Most Recent Completion
- Average Blocking Time (ms)
- Average Deadlocks
- Keep Detailed History Flag
- Aggregated

Additional columns are available through the Column Chooser under **Options**.

- Database
- Average Writes
- Total Blocking Time (ms)
- Average Duration (ms)
- Average CPU Time (ms)
- Reads as % of list
- Total Wait Time (ms)
- Average I/O Per Second
- Total Deadlocks
- CPU as % of list
- Average Reads
- Average CPU Per Second
- Application

To research for additional query details, you can perform the following actions from this list:

- View SQL
- Query Statement

⚠ You can display the top 100, 200, or all records by clicking the different **Show Top** options.

View your SQL Server query waits information in IDERA Dashboard

The Query waits tab of the single instance dashboard allows you to analyze waits over time (**Query Waits over Time**) and by duration (**Query Waits by Duration**), so that you can better determine where your biggest bottlenecks are occurring and what changes could potentially have the biggest performance boost on your SQL Server instance.

Query waits over time

The Query waits over time view provides a selectable time range for the stacked bar chart display of waits. This view comes with various dimensions for display that allow you to further investigate any performance issues:

- Waits
- Waits Category
- Statements
- Applications
- Databases
- Clients
- Sessions
- Users

> ✓ **Access the Query waits by duration view**
>
> You can navigate to the Query waits by duration view by double-clicking any bar in this view.

Query waits by duration

The Query waits by duration view displays a horizontal bar chart of query waits by duration of the wait. This view comes with various dimensions for display that allow you to further investigate any performance issues:

- Waits
- Waits Category
- Statements
- Applications
- Databases
- Clients
- Sessions
- Users

> ⓘ **Time range**
>
> In the Query waits by duration view, the horizontal bar chart is filtered by the selected time range in the Query waits over time view.

Access the query waits tab

To access the query waits enhanced views, click the monitored instance of your choice in the Home tab of the SQL Diagnostic Manager web console, and then select the Query Waits tab.

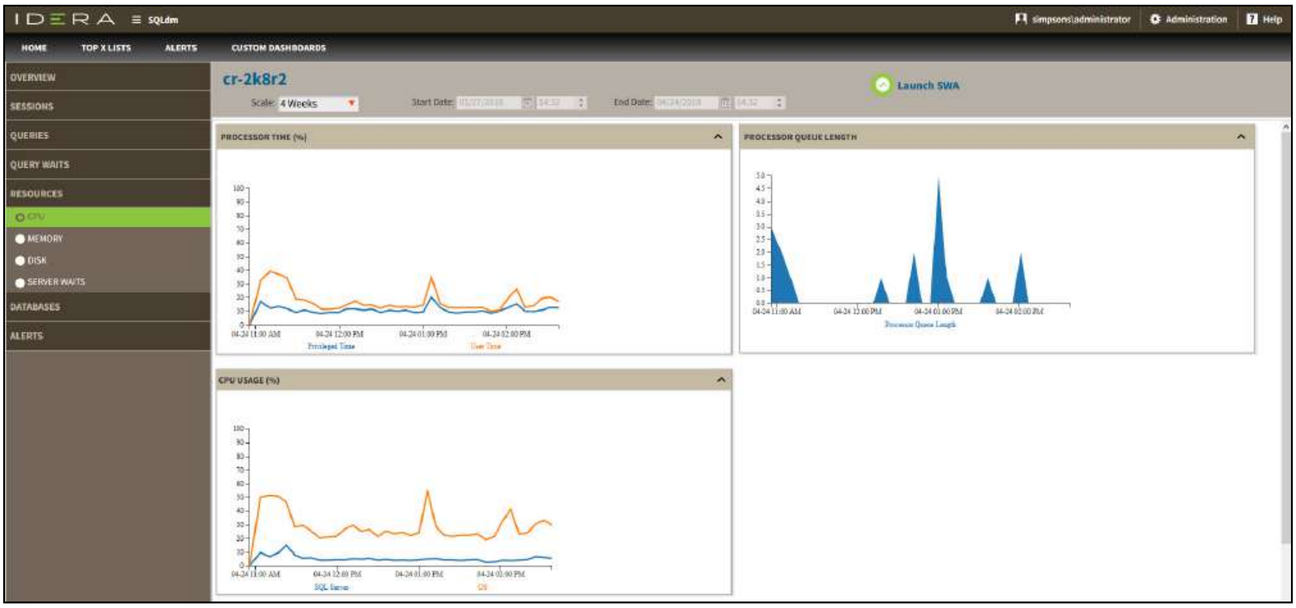
View your SQL Server resources information in IDERA Dashboard

The Resources tab of the single instance dashboard contains several views such as CPU, Memory, Disk, and Server Waits. The Resources tab allows you to monitor the system resources on the computer hosting the SQL Server instance as well as what is used by SQL Server.

Resource bottlenecks are often the cause of SQL Server performance problems. These bottlenecks can result from poor database application design or point to other system processes using valuable resources needed by SQL Server.

CPU view

The **Resources > CPU** tab contains several charts and a Top sessions by active CPU widget (Click image to view full size).



Charts

Processor Time (%)

The Processor Time chart displays the percentage of CPU time used by all processes on the computer hosting the SQL Server instance.

Processor Queue Length

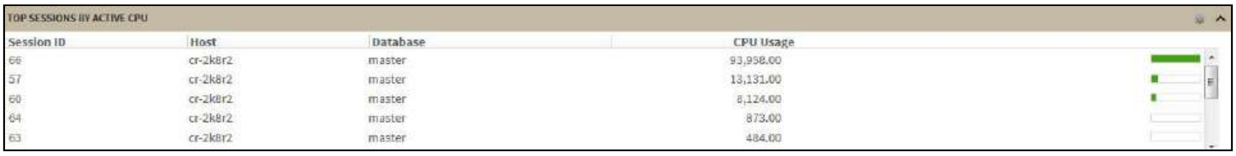
The Processor Queue Length chart displays the number of ready threads in the processor queue on the computer hosting the SQL Server instance.

CPU Usage (%)

The CPU Usage (%) chart displays the percentage of processing power in use on the computer that hosts the SQL Server instance over a period of time. You can select that information displays for the last 30 minutes, 1 hour, 4 hours, 8 hours, and 12 hours.

Top Sessions by Active CPU

This widget allows you to view the top sessions of a selected SQL Server instance per CPU usage. You can configure this widget to display additional entries by clicking the gear icon or you can expand/contract by clicking ^ .

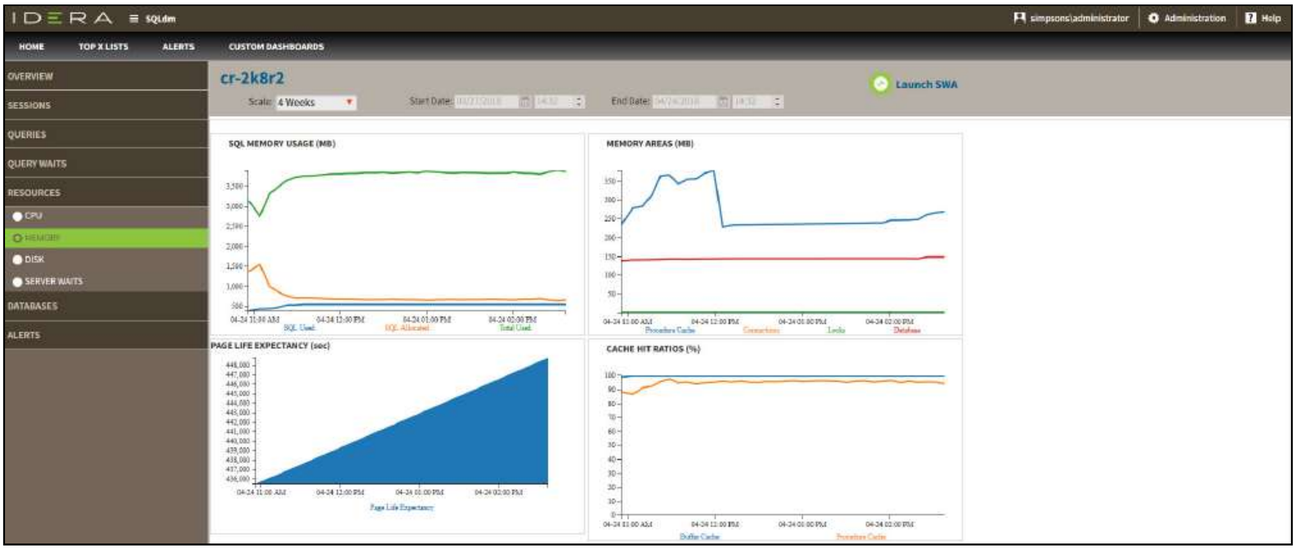


TOP SESSIONS BY ACTIVE CPU

Session ID	Host	Database	CPU Usage
66	cr-2k8r2	master	93,958.00
57	cr-2k8r2	master	13,131.00
60	cr-2k8r2	master	8,124.00
64	cr-2k8r2	master	873.00
63	cr-2k8r2	master	484.00

Memory view

The **Resources > Memory** tab contains the following charts (Click image to view full size).



cr-2k8r2

Scale: 4 Weeks

Charts

SQL Memory Usage (MB)

This chart displays the SQL memory usage (SQL Used) compared to what is allocated (SQL Allocated) and the total used (Total Used).

Memory Areas (MB)

This chart displays the memory usage of the Procedure Cache, Connections, Locks, and Database.

Page Life Expectancy (sec)

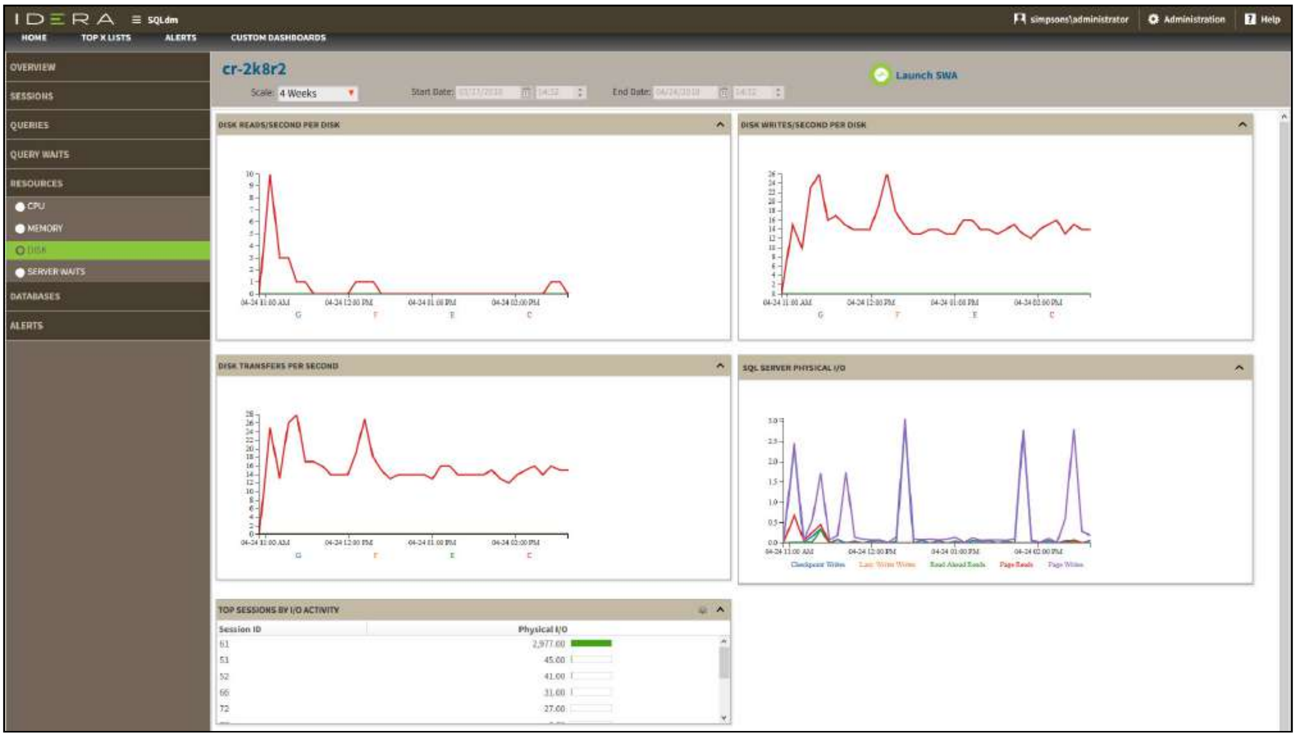
This chart provides the time in seconds that a page remains in the cache or buffer pool.

Cache Hit Ratios (%)

This chart displays the hit ratios of the Buffer and Procedure cache.

Disk view

The **Resources > Disk** tab contains several charts and the Top sessions by I/O activity widget (Click image to view full size).



Session ID	Physical I/O
61	2,977.00
51	45.00
52	41.00
66	31.00
72	27.00

Charts

Disk Reads/Second Per Disk

This chart displays the number of reads per disk per second during a sample interval. You can select intervals of 30 minutes, 1 hour, 4 hours, 8 hours, and 12 hours.

Disk Writes/Second Per Disk

This chart displays the number of writes per disk per second during a sample interval. You can select intervals of 30 minutes, 1 hour, 4 hours, 8 hours, and 12 hours.

Disk Transfers Per Second

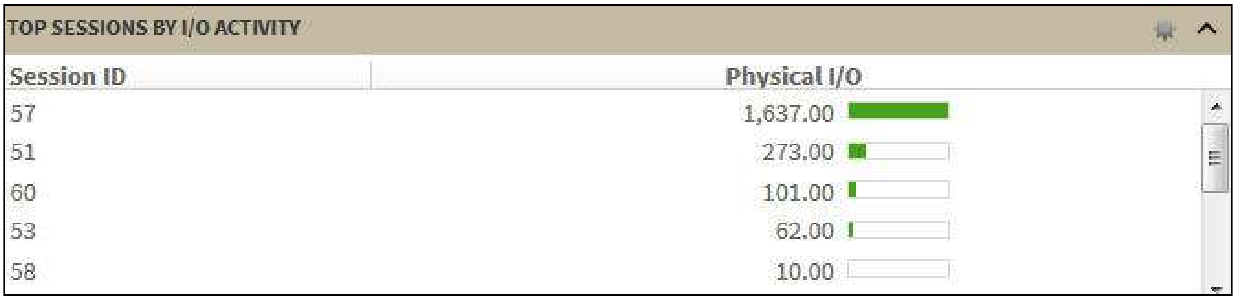
This chart displays the number of disk transfers per second during a sample interval. You can select intervals of 30 minutes, 1 hour, 4 hours, 8 hours, and 12 hours.

SQL Server Physical I/O

This chart displays the number of read and write requests sent to the physical disk the SQL Server instance resides in. Read and write requests are classified in Checkpoint Writers, Read-Ahead Reads, Page Writes, Lazy Writer Writes, and Page Reads.

Top Sessions by I/O Activity

This widget allows you to view the top sessions of a selected SQL Server instance per I/O Activity. You can configure this widget to display additional entries by clicking the gear icon or you can expand/contract by clicking ^ .

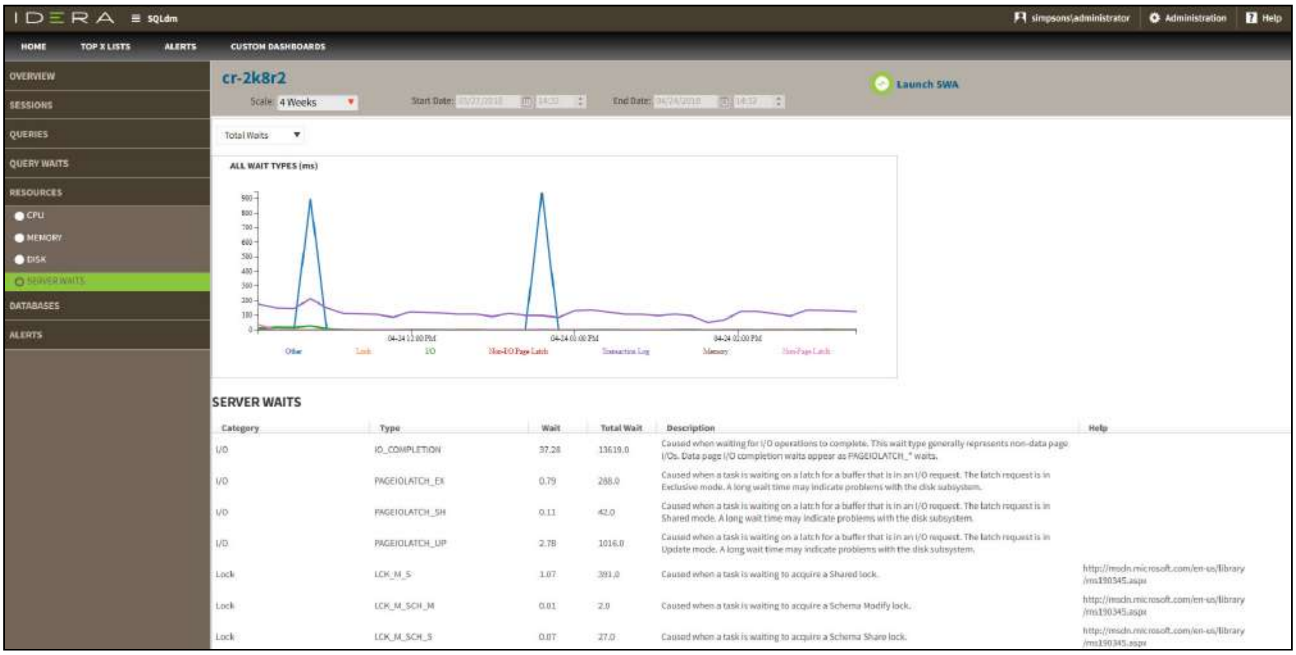


TOP SESSIONS BY I/O ACTIVITY

Session ID	Physical I/O
57	1,637.00
51	273.00
60	101.00
53	62.00
58	10.00

Server Waits view

The **Resources > Server Waits** tab contains a chart that display information on all waits occurring on your system and show the time different wait types occurred and the length of time (in milliseconds) it took for the waits to clear. Click image to view full size.



SERVER WAITS

Category	Type	Wait	Total Wait	Description	Help
I/O	IO_COMPLETION	37.28	13619.0	Caused when waiting for I/O operations to complete. This wait type generally represents non-data page I/Os. Data page I/O completion waits appear as PAGEIOLATCH_* waits.	
I/O	PAGEIOLATCH_EX	0.79	288.0	Caused when a task is waiting on a latch for a buffer that is in an I/O request. The latch request is in Exclusive mode. A long wait time may indicate problems with the disk subsystem.	
I/O	PAGEIOLATCH_SH	0.11	42.0	Caused when a task is waiting on a latch for a buffer that is in an I/O request. The latch request is in Shared mode. A long wait time may indicate problems with the disk subsystem.	
I/O	PAGEIOLATCH_UP	2.78	1016.0	Caused when a task is waiting on a latch for a buffer that is in an I/O request. The latch request is in Update mode. A long wait time may indicate problems with the disk subsystem.	
Lock	LCK_M_S	1.07	391.0	Caused when a task is waiting to acquire a Shared lock.	http://msdn.microsoft.com/en-us/library/ms190345.aspx
Lock	LCK_M_SCH_M	0.01	2.0	Caused when a task is waiting to acquire a Schema Modify lock.	http://msdn.microsoft.com/en-us/library/ms190345.aspx
Lock	LCK_M_SCH_S	0.07	27.0	Caused when a task is waiting to acquire a Schema Share lock.	http://msdn.microsoft.com/en-us/library/ms190345.aspx

Wait categories in the drop-down menu

Total Waits

Total waits include all the types of waits collected.

Signal Waits

Signal waits occur when a resource is now available (after a resource wait) and the task is waiting to run again.

Resource Waits

Resource waits occur when access to a resource is denied because the resource is in use or not available.

Server Waits panel

Below the charts, the Server Waits panel includes information on the wait category, wait type, length of time the wait took to clear, total wait time for all the collected wait types, and a definition of the wait type.

Available wait types

The SQL Diagnostic Manager web console displays information on the following wait types: I/O, Memory, Non-I/O Page Latch, Non-Page Latch, Transaction Log, and Other categories.

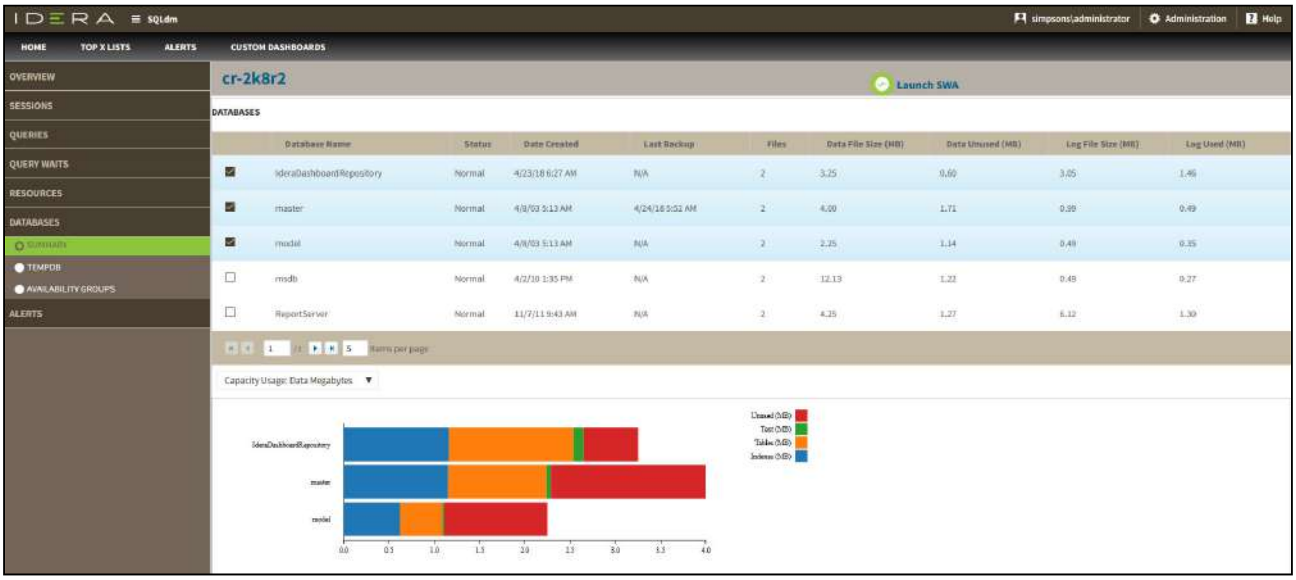
For additional information on Server Waits metrics, see Server Waits Panel.

Access the Resources tab

SQL Diagnostic Manager provides two paths to access the Resources tab. The first access path is by selecting the Resources tab of the single instance dashboard. You can also click the resources category icon of a specific instance in the thumbnail sub-view.

View your SQL Server databases information in IDERA Dashboard

The Databases tab of the single instance dashboard contains the Summary, Tempdb, and Availability Groups views. The Databases tab allows you to view the status of all the databases on the selected SQL Server instance, the tempdb database, and the availability groups.



	Database Name	Status	Date Created	Last Backup	Files	Data File Size (MB)	Data Unused (MB)	Log File Size (MB)	Log Used (MB)
☑	IderaDashboardRepository	Normal	4/23/18 6:27 AM	N/A	2	3.25	0.60	3.05	1.46
☑	master	Normal	4/8/03 5:13 AM	4/24/18 5:52 AM	2	4.00	1.71	0.99	0.49
☑	model	Normal	4/8/03 5:13 AM	N/A	2	2.25	1.14	0.49	0.35
□	msdb	Normal	4/2/10 1:35 PM	N/A	2	12.13	1.22	0.49	0.27
□	ReportServer	Normal	11/7/11 9:43 AM	N/A	2	4.25	1.27	6.12	1.30

Summary view

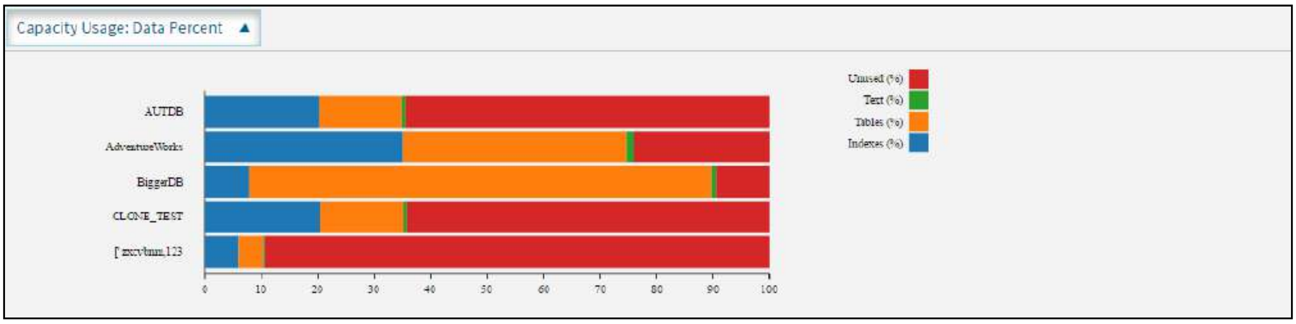
The **Databases > Summary** tab lists each database on the monitored SQL Server instance and provides a large variety of database statistics:

- Database name
- Status
- Date Created
- Last Backup
- Files
- Data File Size (MB)
- Data Unused (MB)
- Log File Size (MB)
- Log Used (MB)

> ✓ **Multi-database selection**
>
> Select multiple databases to display as horizontal stacked bar charts.

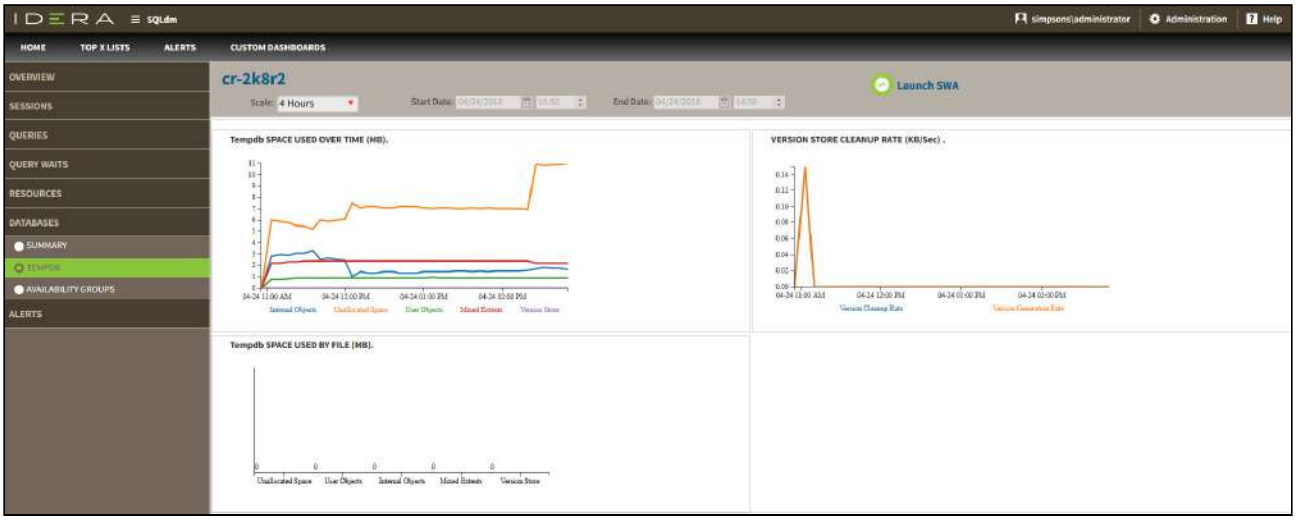
Capacity Usage chart

You can choose to view how data or log is used on your database. The Capacity Usage drop-down list allows you to choose data or log in megabytes or percentages. You can select one or more databases in the Databases panel to display in the Capacity Usage chart. This chart provides information on the text, tables, indexes space, as well as the unused space of your database.



Tempdb view

The **Databases > Tempdb** tab allows you to view the status of your tempdb database on the selected SQL Server instance. Click image to view full size.



The Tempdb view contains the following charts:

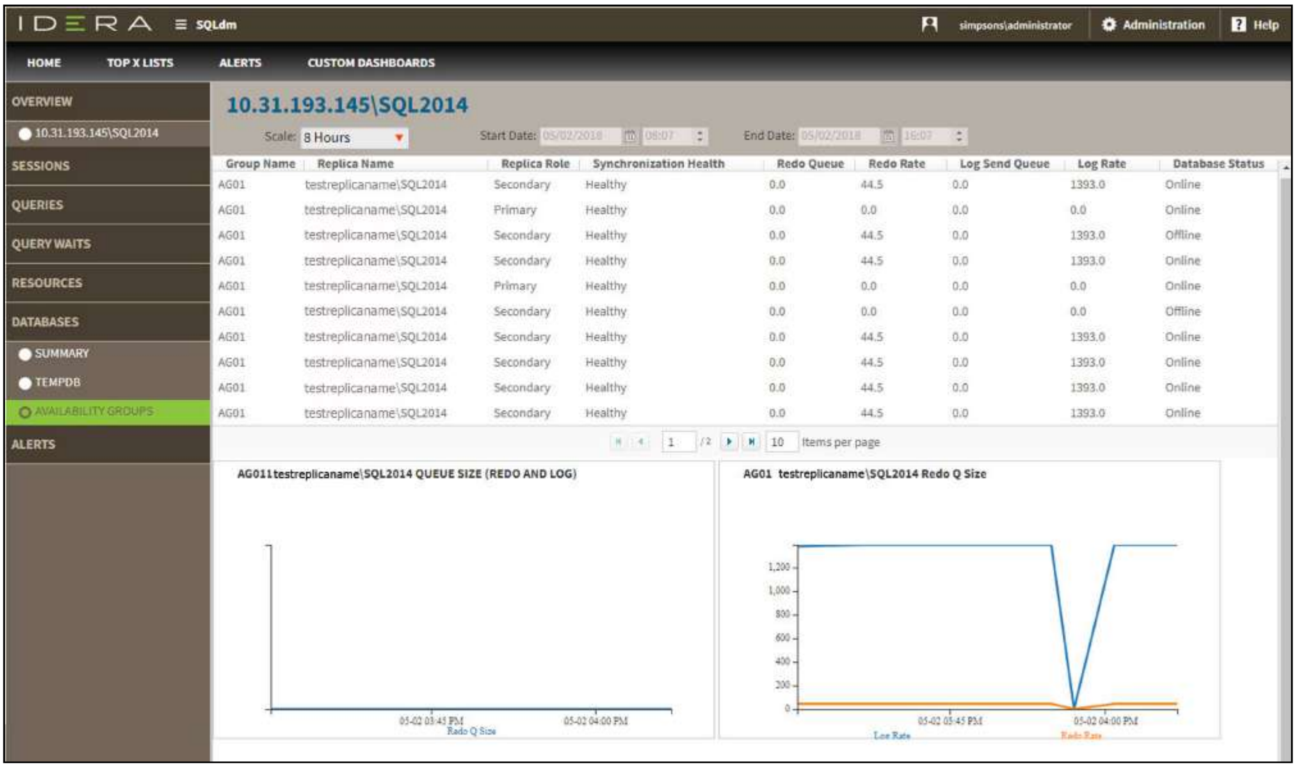
- Tempdb Space Used over Time (MB)
- Version Store Cleanup Rate (KB/Sec)
- Tempdb Space Used by File (MB)

For information on each chart, see Get the tempdb status summary.

Availability Groups

The **Databases > Availability Groups** tab allows you to view the status of your availability groups on the selected SQL Server instance. This tab lists the Availability Groups, with the following description:

- Group Name
- Replica Name
- Replica Role
- Synchronization Health
- Redo Queue
- Redo Rate
- Log Send Queue
- Log Rate
- Database Status



10.31.193.145\SQL2014

Scale: 8 Hours Start Date: 05/02/2018 08:07 End Date: 05/02/2018 16:07

Group Name	Replica Name	Replica Role	Synchronization Health	Redo Queue	Redo Rate	Log Send Queue	Log Rate	Database Status
AG01	testreplicaname\SQL2014	Secondary	Healthy	0.0	44.5	0.0	1393.0	Online
AG01	testreplicaname\SQL2014	Primary	Healthy	0.0	0.0	0.0	0.0	Online
AG01	testreplicaname\SQL2014	Secondary	Healthy	0.0	44.5	0.0	1393.0	Offline
AG01	testreplicaname\SQL2014	Secondary	Healthy	0.0	44.5	0.0	1393.0	Online
AG01	testreplicaname\SQL2014	Primary	Healthy	0.0	0.0	0.0	0.0	Online
AG01	testreplicaname\SQL2014	Secondary	Healthy	0.0	0.0	0.0	0.0	Offline
AG01	testreplicaname\SQL2014	Secondary	Healthy	0.0	44.5	0.0	1393.0	Online
AG01	testreplicaname\SQL2014	Secondary	Healthy	0.0	44.5	0.0	1393.0	Online
AG01	testreplicaname\SQL2014	Secondary	Healthy	0.0	44.5	0.0	1393.0	Online
AG01	testreplicaname\SQL2014	Secondary	Healthy	0.0	44.5	0.0	1393.0	Online

1 /2 10 Items per page

Access the Databases tab

The SQL Diagnostic Manager web console provides two paths to access the Databases tab. The first access path is by selecting the Databases tab of the single instance dashboard. You can also click the database category icon of a specific instance in the thumbnail view.

View your SQL Server alerts in IDERA Dashboard

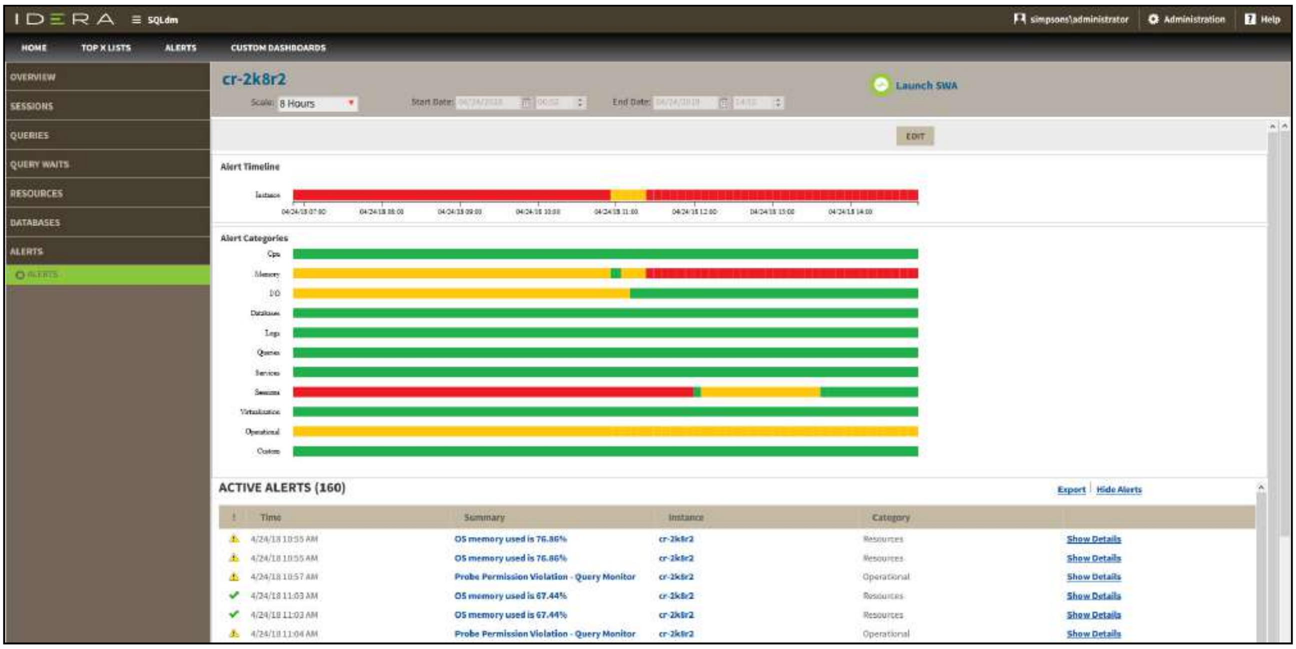
The Alerts tab of the single instance dashboard displays a color-coded alerts timeline view and an active alerts panel for the selected instance.

Color-coded alerts timeline view

The color-coded alerts timeline view allows you to easily identify the highest alert for your monitored SQL Server instance and the highest alert for a specific category. Each color in the alert timeline represents a different alert type. See the following table for more details:

Alert type	**Color**	**Meaning**
OK	**Green**	The alert is in an acceptable threshold.
Warning	**Yellow**	The alert reaches a Warning threshold.
Critical	**Red**	The alert reaches a Critical threshold.

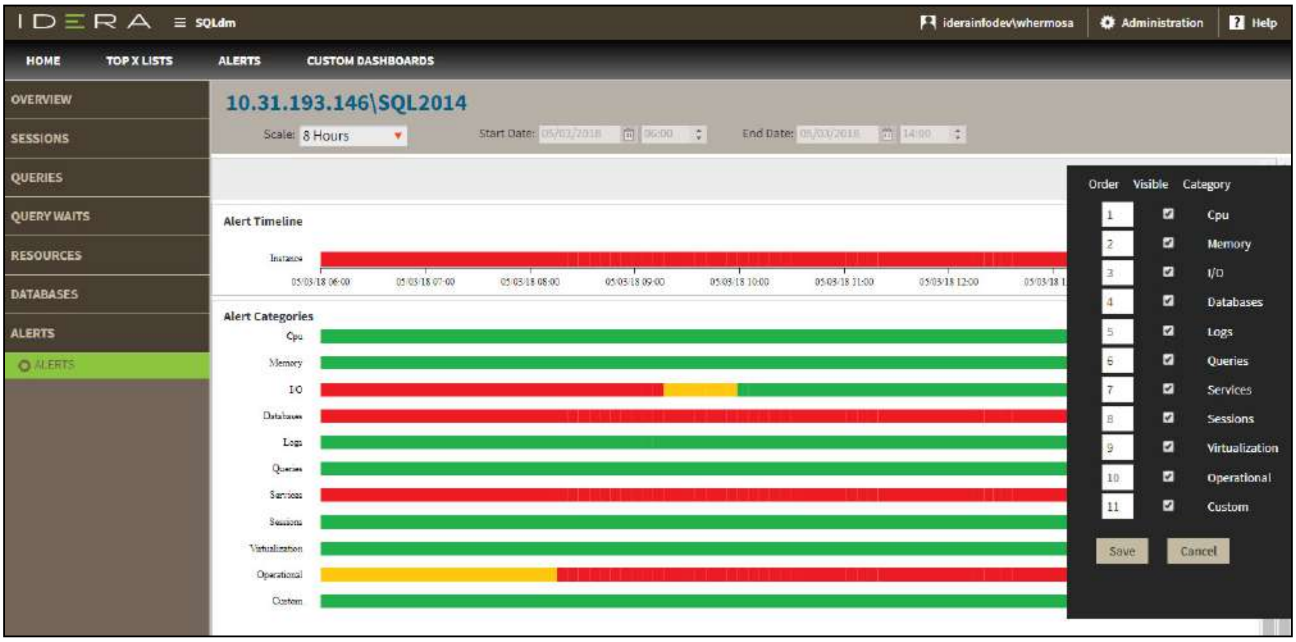
Filter your alert results in the Alerts tab by specifying a timeframe or by selecting default timeframes of 8 hours, 1 day, 5 days, or 4 weeks. Click image to display it in full-sized view.



ACTIVE ALERTS (160)

!	Time	Summary	Instance	Category	
⚠	4/24/18 10:55 AM	OS memory used is 76.86%	cr-2k8r2	Resources	Show Details
⚠	4/24/18 10:55 AM	OS memory used is 76.86%	cr-2k8r2	Resources	Show Details
⚠	4/24/18 10:57 AM	Probe Permission Violation - Query Monitor	cr-2k8r2	Operational	Show Details
✓	4/24/18 11:03 AM	OS memory used is 67.44%	cr-2k8r2	Resources	Show Details
✓	4/24/18 11:03 AM	OS memory used is 67.44%	cr-2k8r2	Resources	Show Details
⚠	4/24/18 11:04 AM	Probe Permission Violation - Query Monitor	cr-2k8r2	Operational	Show Details

You can also filter your alert results by alert category or categories' order. Click **Edit** to order and select the categories you want to display in the Alerts timeline view.



10.31.193.146\SQL2014

Scale: 8 Hours Start Date: 05/03/2018 06:00 End Date: 05/03/2018 14:00

Order	Visible	Category
1	☑	Cpu
2	☑	Memory
3	☑	I/O
4	☑	Databases
5	☑	Logs
6	☑	Queries
7	☑	Services
8	☑	Sessions
9	☑	Virtualization
10	☑	Operational
11	☑	Custom

Active alerts panel

The Alerts tab also lists all the active alerts of your monitored SQL Server instance over a period of time. The active alerts panel provides the following information:

Alert type

Shows alert type icon: ✓ for OK alerts, ⚠ for Warning alerts, and ✖ for Critical alerts.

Time

Indicates date and time of alert inception.

Summary

Displays alert description.

Instance

Displays the name of the monitored SQL Server instance.

Category

Indicates alert category.

Additional options

In the Active alerts panel of the single instance dashboard, you can select the following additional options:

Show alert details

View additional information on a specific active alert by clicking **Show Details**.

Export

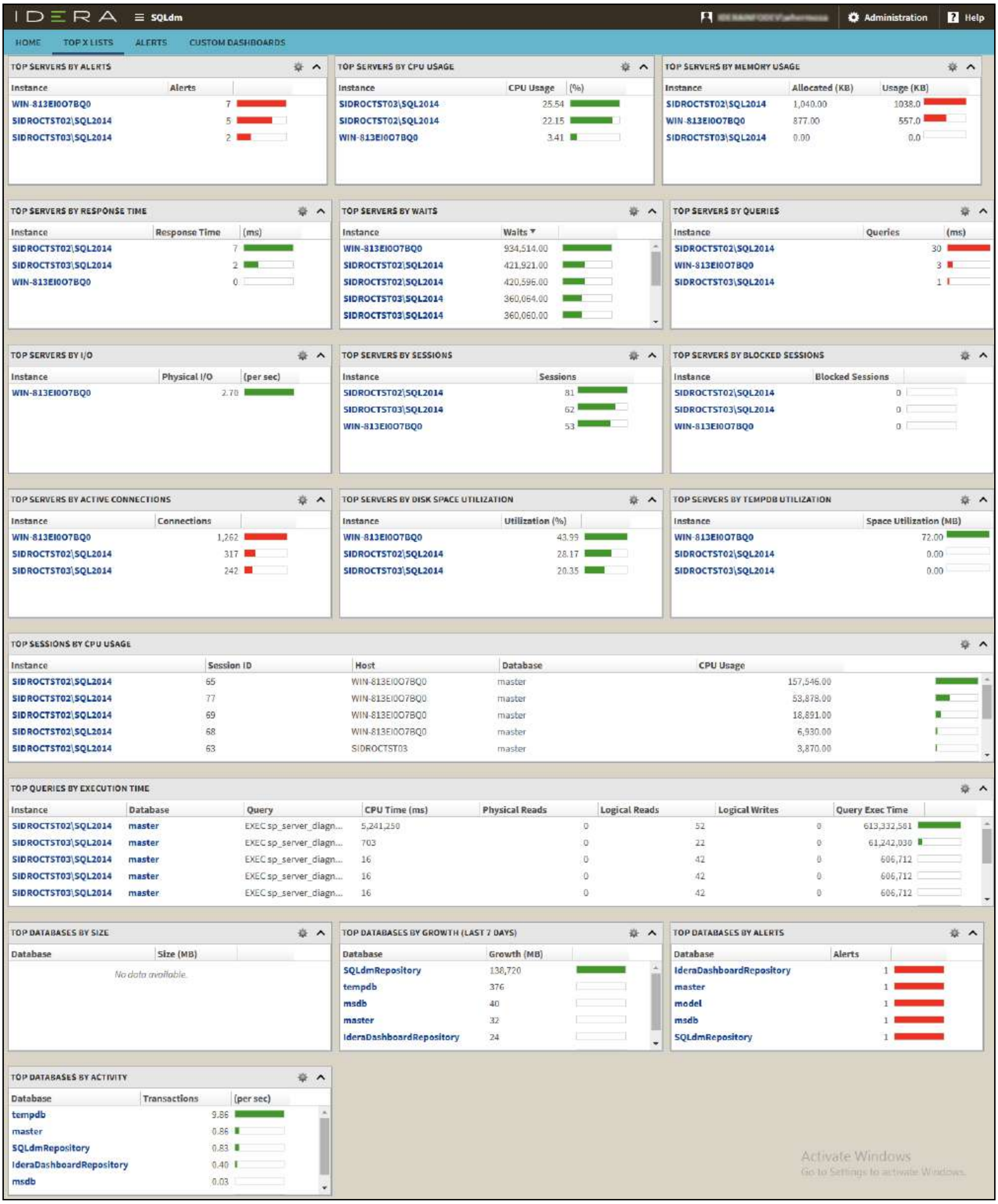
Export your alerts information in PDF, XLS, and XML.

Show/Hide Alerts

Choose to show or hide active alerts.

View your top values in IDERA Dashboard

The Top X Lists tab of the SQL Diagnostic Manager web console allows you to view the top values in descending order for selected metrics across the instances and databases in your SQL Server environment. Click the image to view full size.



TOP SERVERS BY ALERTS

Instance	Alerts
WIN-813EI0O7BQ0	7
SIDROCTST02\SQL2014	5
SIDROCTST03\SQL2014	2

TOP SERVERS BY CPU USAGE

Instance	CPU Usage	(%)
SIDROCTST03\SQL2014	25.54	
SIDROCTST02\SQL2014	22.15	
WIN-813EI0O7BQ0	3.41	

TOP SERVERS BY MEMORY USAGE

Instance	Allocated (KB)	Usage (KB)
SIDROCTST02\SQL2014	1,040.00	1038.0
WIN-813EI0O7BQ0	877.00	557.0
SIDROCTST03\SQL2014	0.00	0.0

TOP SERVERS BY RESPONSE TIME

Instance	Response Time	(ms)
SIDROCTST02\SQL2014	7	
SIDROCTST03\SQL2014	2	
WIN-813EI0O7BQ0	0	

TOP SERVERS BY WAITS

Instance	Waits ▾
WIN-813EI0O7BQ0	934,514.00
SIDROCTST02\SQL2014	421,921.00
SIDROCTST02\SQL2014	420,596.00
SIDROCTST03\SQL2014	360,064.00
SIDROCTST03\SQL2014	360,060.00

TOP SERVERS BY QUERIES

Instance	Queries	(ms)
SIDROCTST02\SQL2014	30	
WIN-813EI0O7BQ0	3	
SIDROCTST03\SQL2014	1	

TOP SERVERS BY I/O

Instance	Physical I/O	(per sec)
WIN-813EI0O7BQ0	2.70	

TOP SERVERS BY SESSIONS

Instance	Sessions
SIDROCTST02\SQL2014	81
SIDROCTST03\SQL2014	62
WIN-813EI0O7BQ0	53

TOP SERVERS BY BLOCKED SESSIONS

Instance	Blocked Sessions
SIDROCTST02\SQL2014	0
SIDROCTST03\SQL2014	0
WIN-813EI0O7BQ0	0

TOP SERVERS BY ACTIVE CONNECTIONS

Instance	Connections
WIN-813EI0O7BQ0	1,262
SIDROCTST02\SQL2014	317
SIDROCTST03\SQL2014	242

TOP SERVERS BY DISK SPACE UTILIZATION

Instance	Utilization (%)
WIN-813EI0O7BQ0	43.99
SIDROCTST02\SQL2014	28.17
SIDROCTST03\SQL2014	20.35

TOP SERVERS BY TEMPDB UTILIZATION

Instance	Space Utilization (MB)
WIN-813EI0O7BQ0	72.00
SIDROCTST02\SQL2014	0.00
SIDROCTST03\SQL2014	0.00

TOP SESSIONS BY CPU USAGE

Instance	Session ID	Host	Database	CPU Usage
SIDROCTST02\SQL2014	65	WIN-813EI0O7BQ0	master	157,546.00
SIDROCTST02\SQL2014	77	WIN-813EI0O7BQ0	master	53,878.00
SIDROCTST02\SQL2014	69	WIN-813EI0O7BQ0	master	18,891.00
SIDROCTST02\SQL2014	68	WIN-813EI0O7BQ0	master	6,930.00
SIDROCTST02\SQL2014	63	SIDROCTST03	master	3,870.00

TOP QUERIES BY EXECUTION TIME

Instance	Database	Query	CPU Time (ms)	Physical Reads	Logical Reads	Logical Writes	Query Exec Time
SIDROCTST02\SQL2014	master	EXEC sp_server_diagn...	5,241,250	0	52	0	613,332,581
SIDROCTST03\SQL2014	master	EXEC sp_server_diagn...	703	0	22	0	61,242,030
SIDROCTST03\SQL2014	master	EXEC sp_server_diagn...	16	0	42	0	606,712
SIDROCTST03\SQL2014	master	EXEC sp_server_diagn...	16	0	42	0	606,712
SIDROCTST03\SQL2014	master	EXEC sp_server_diagn...	16	0	42	0	606,712

TOP DATABASES BY SIZE

Database	Size (MB)

No data available.

TOP DATABASES BY GROWTH (LAST 7 DAYS)

Database	Growth (MB)
SQLdmRepository	138,720
tempdb	376
msdb	40
master	32
IderaDashboardRepository	24

TOP DATABASES BY ALERTS

Database	Alerts
IderaDashboardRepository	1
master	1
model	1
msdb	1
SQLdmRepository	1

TOP DATABASES BY ACTIVITY

Database	Transactions	(per sec)
tempdb	9.86	
master	0.86	
SQLdmRepository	0.83	
IderaDashboardRepository	0.40	
msdb	0.03	

The **Top X Lists dashboard** contains 18 widgets that help you assess quickly the health and performance of your SQL Server environment. You can expand widgets, drill down for details, and also configure them as follows:

Records

Choose to display a particular number of records with a maximum of 50. Access this option through the gear icon on the right of the widget.

On the **Top X Lists dashboard** you can find the following widgets:

Top servers by alerts

This widget allows you to view the instances with the highest number of alerts during the past seven days in your SQL Server environment. This widget displays the following information:

- Instance name
- Alerts

Clicking a specific server (instance name) in the widget allows you to navigate to the **Overview** tab of the single instance dashboard for that server.

Top servers by CPU usage

This widget allows you to view the instances with the highest percentage of CPU usage in your SQL Server environment. This widget displays the following information:

- Instance name
- CPU usage in percentage

Clicking a specific instance name in the widget allows you to navigate to the **Resources> CPU** tab of the single instance dashboard for that server.

Top servers by memory usage

This widget provides you with information on the top instances with the highest percentage of memory usage in comparison to their SQL Server allocated memory. This widget displays the following information:

- Instance name
- Allocated (KB)
- Usage (KB)

Clicking a specific server (instance name) in the widget allows you to navigate to the **Resources > Memory** tab of the single instance dashboard for that server.

Top Servers by response time

This widget provides you with information on the top response times in milliseconds for all instances in your environment. Keeping a tab of the top response times helps monitor congestion in a network and the performance of SQL Server.

This widget displays the following information:

- Instance name
- Response time in milliseconds

Clicking a specific server (instance name) in this widget allows you to navigate to the overview tab of the single instance dashboard for that server.

Top Servers by waits

This widget provides you with information on the top waits for all instances in their environment. This widget displays the following information:

- Instance name
- Waits

Clicking a specific server (instance name) in the widget allows you to navigate to the **Resources > Server Waits** tab of the single instance dashboard for that server.

Top servers by queries

This widget allows you to view the top instances with the highest number of queries in your SQL Server environment. Keeping a tab of this metric in your environment lets you prevent overloading your server.

This widget displays the following information:

- Instance name
- Queries (ms)

Clicking a specific server (instance name) in the widget allows you to navigate to the main dashboard.

Top servers by I/O

This widget provides you with information on the top 10 instances with the highest I/O load by SQL Physical I/O (reads and writes) in their SQL Server environment. Keeping tab of the I/O subsystem performance prevents increased timeouts and response times.

This widget displays the following information:

- Instance name
- Physical I/O (per sec)

Clicking on a specific server (instance name) in the widget allows you to navigate to the **Resources > Disk** tab of the single instance dashboard for that server.

Top servers by sessions

This widget allows you to view the top values of the total number of sessions by instance in your SQL Server environment. Keeping a tab of this metric in your environment lets you monitor the system load.

This widget displays the following information:

- Instance name
- Sessions

Clicking a specific server (instance name) in the widget allows you to navigate to the **Sessions > Summary** tab of the single instance dashboard for that server.

Top servers by blocked sessions

This widget allows you to view the top blocked sessions by instances in your SQL Server environment. This widget displays the following information:

- Instance name
- Blocked sessions

Clicking a specific server (instance name) in the widget allows you to navigate to the **Sessions > Overview** tab of the single instance dashboard for that server.

Top Servers by active connections

This widget provides you with information on the top number of most user connections by instance in a SQL Server environment. This widget helps you keep on top of the load on the system and monitor bottlenecks.

This widget displays the following information:

- Instance name
- Connections

Clicking a specific server (instance name) in the widget allows you to navigate to the **Sessions > Summary** tab of the single instance dashboard for that server.

Top servers by disk space utilization

This widget allows you to view the top instances with the highest percentage of disk space utilization in your SQL Server environment. Keeping a tab of this metric in your environment, lets you monitor available and used disk space so that there is enough space to be allocated to databases, databases backups, and any other types of files that you may want to store on the server.

This widget displays the following information:

- Instance name
- Utilization (%)

Clicking a specific database name in the widget allows you to navigate to the **Resources > Disk** tab of the single instance dashboard for that server.

Top servers by tempdb utilization

This widget allows you to view the top values of the instances with the most tempdb space utilization in your SQL Server environment. High tempdb utilization may lead to costly performance issues. This widget displays the following information:

- Instance name
- Space utilization (MB)

Clicking a specific server (instance name) in the widget allows you to navigate to the **Databases > Tempdb** tab of the single instance dashboard for that server.

Top sessions by CPU usage

This widget allows you to view the top values of sessions by CPU Usage in your SQL Server environment. This widget helps you monitor the system load on your SQL Server environment. This widget displays the following information:

- Instance name
- Session ID
- Host
- Status
- Database
- Session CPU Usage

Clicking a specific server (instance name) in the widget allows you to navigate to the **Sessions > Summary** tab of the single instance dashboard for that server.

Top queries by execution time

This widget allows you to view the top longest running queries in your SQL Server environment. Long running queries not only consume system resources that make the server and application run slowly, but they may also lead to table locking and data corruption.

This widget displays the following information:

- Instance name
- Database name
- Query name
- CPU time (ms)
- Physical Reads
- Logical Reads
- Logical Writes
- Query execution time (ms)

Clicking on any row in this widget allows you to navigate to the **Queries > Summary** tab of the single instance dashboard for that server.

> ✓ You can configure the Top queries by execution time widget by time frame and records to display. Click the gear icon to select a specific number of records, and choose to display the longest running queries for the **Last 24 hours** or **Last 7 days**. Note that the maximum amount of records the widget displays is 50.

Top databases by size

This widget provides you with information on the top databases by file size across your SQL Server environment. Note that values represent the actual amount of data used inside a database. This widget displays the following information:

- Database name
- Size (MB)

Clicking a specific database (database name) in the widget allows you to navigate to the main dashboard.

Top databases by growth (Last 7 days)

This widget allows you to view the top fastest growing databases by instance in your SQL Server environment. Keeping a tab of this metric in your environment, lets you predict how large databases may grow. This widget displays the following information:

- Database name
- Growth (MB)

Clicking a specific database name in the widget allows you to navigate to the main dashboard.

Top databases by alerts

This widget allows you to view the top instances with the highest number of database alerts in your SQL Server environment. This widget displays the following information:

- Database name
- Alerts

Clicking a specific database name in the widget allows you to navigate to the **Databases > Summary** tab of the single instance dashboard for that server's database.

Top databases by activity

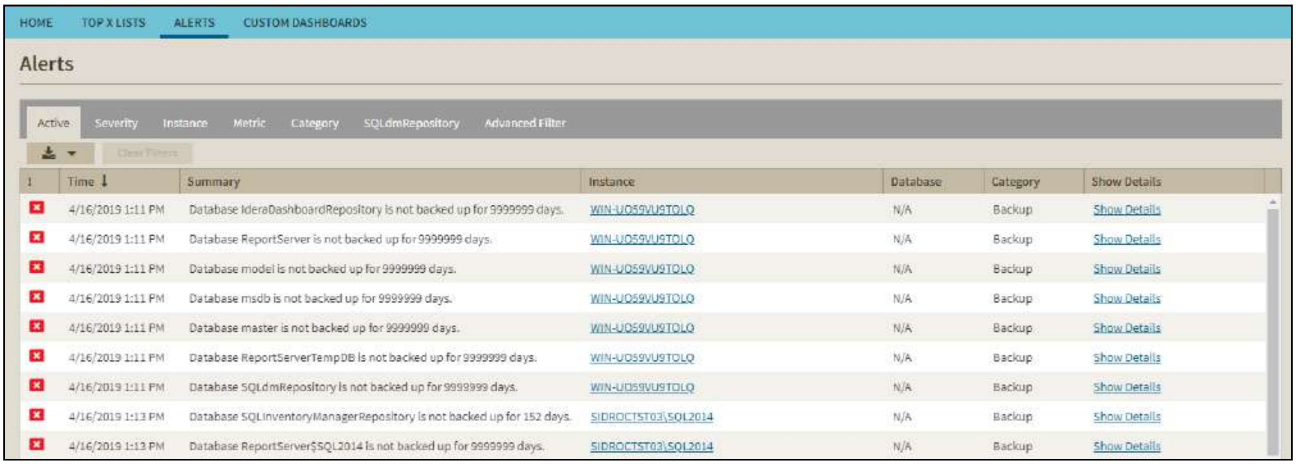
This widget provides you with information on the top databases by activity size across your SQL Server environment. This widget displays the following information:

- Database name
- Transactions (per sec)

Clicking a specific database name in the widget allows you to navigate to the **Databases > Summary** tab of the single instance dashboard for that database.

View all your alerts in IDERA Dashboard

SQL Diagnostic Manager includes an improved Dashboard. The Alerts tab of the SQL Diagnostic Manager web console allows you to view all alerts for all the servers in your environment.



!	Time ↓	Summary	Instance	Database	Category	Show Details
☒	4/16/2019 1:11 PM	Database IderaDashboardRepository is not backed up for 9999999 days.	WIN-UO59VU9TOLQ	N/A	Backup	Show Details
☒	4/16/2019 1:11 PM	Database ReportServer is not backed up for 9999999 days.	WIN-UO59VU9TOLQ	N/A	Backup	Show Details
☒	4/16/2019 1:11 PM	Database model is not backed up for 9999999 days.	WIN-UO59VU9TOLQ	N/A	Backup	Show Details
☒	4/16/2019 1:11 PM	Database msdb is not backed up for 9999999 days.	WIN-UO59VU9TOLQ	N/A	Backup	Show Details
☒	4/16/2019 1:11 PM	Database master is not backed up for 9999999 days.	WIN-UO59VU9TOLQ	N/A	Backup	Show Details
☒	4/16/2019 1:11 PM	Database ReportServerTempDB is not backed up for 9999999 days.	WIN-UO59VU9TOLQ	N/A	Backup	Show Details
☒	4/16/2019 1:11 PM	Database SQLdmRepository is not backed up for 9999999 days.	WIN-UO59VU9TOLQ	N/A	Backup	Show Details
☒	4/16/2019 1:13 PM	Database SQLInventoryManagerRepository is not backed up for 152 days.	SIDROCTST03\SQL2014	N/A	Backup	Show Details
☒	4/16/2019 1:13 PM	Database ReportServer$SQL2014 is not backed up for 9999999 days.	SIDROCTST03\SQL2014	N/A	Backup	Show Details

Organize your alerts

Your alerts are organized under the following columns:

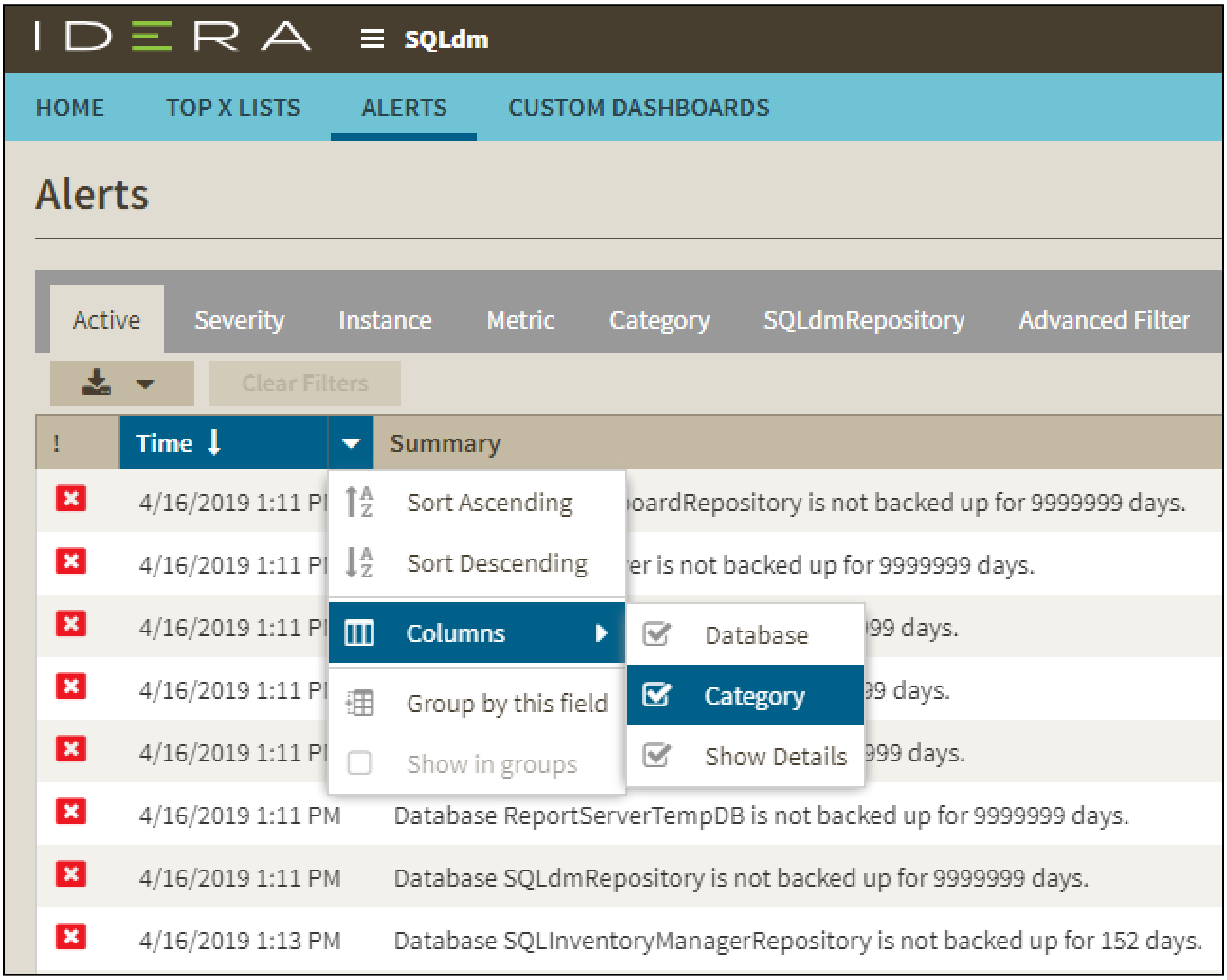
- **Active -** Organizes all your alerts that are currently active.
- **Severity -** Organizes all your alerts by their severity (Severity 8, Severity 4, and Severity 1).
- **Instance -** Organizes all your alerts by monitored SQL Server instance.
- **Metric -** Organizes all your alerts by each of the metrics affected.
- **Category -** Organizes all your alerts by their category.
- **SQLdmRepository -** Organizes all your alerts by SQL Diagnostic Manager Repository.
- Set your advanced filter in IDERA Dashboard

⚠ **Severity**

In the new Alert grid, **Severity** uses the following numerical values:

- Severity 8 = Critical
- Severity 4 = Warning
- Severity 1 = Informational

The Dashboard console has a new alert grid and custom filters that help you organize your alerts in your most convenient way. Click the ▼ icon located next to the column name to expand the drop-down menu. This menu allows you to sort your criteria by Sort Ascending or Sort Descending, you can remove or add the Database, Category, and Show Details columns, and group the information by fields.

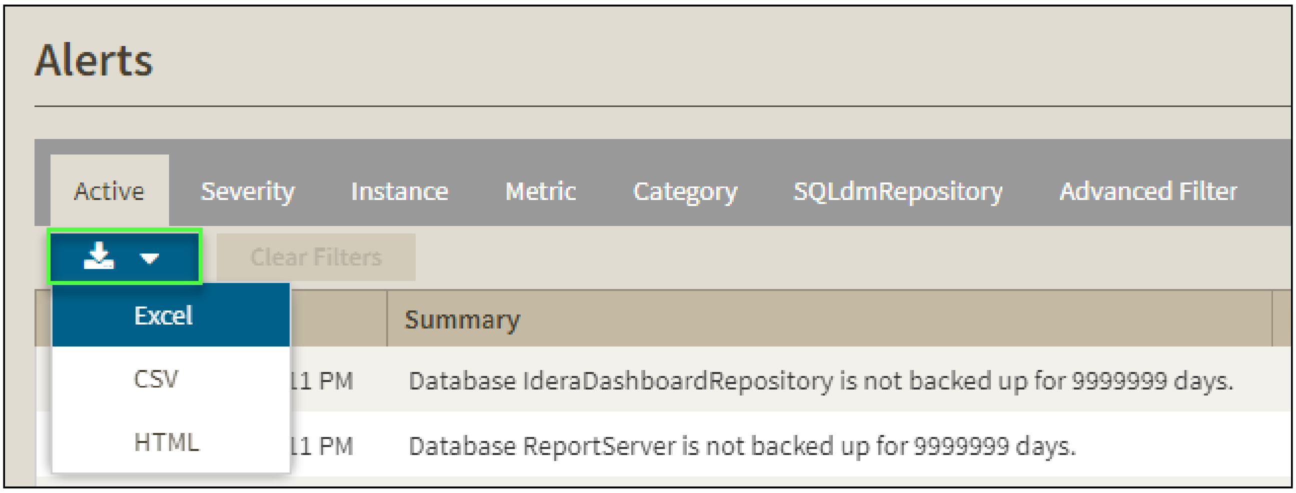


Alerts

!	Time	Summary
☒	4/16/2019 1:11 PI	oardRepository is not backed up for 9999999 days.
☒	4/16/2019 1:11 PI	er is not backed up for 9999999 days.
☒	4/16/2019 1:11 PI	99 days.
☒	4/16/2019 1:11 PI	99 days.
☒	4/16/2019 1:11 PI	999 days.
☒	4/16/2019 1:11 PM	Database ReportServerTempDB is not backed up for 9999999 days.
☒	4/16/2019 1:11 PM	Database SQLdmRepository is not backed up for 9999999 days.
☒	4/16/2019 1:13 PM	Database SQLInventoryManagerRepository is not backed up for 152 days.

Additional options

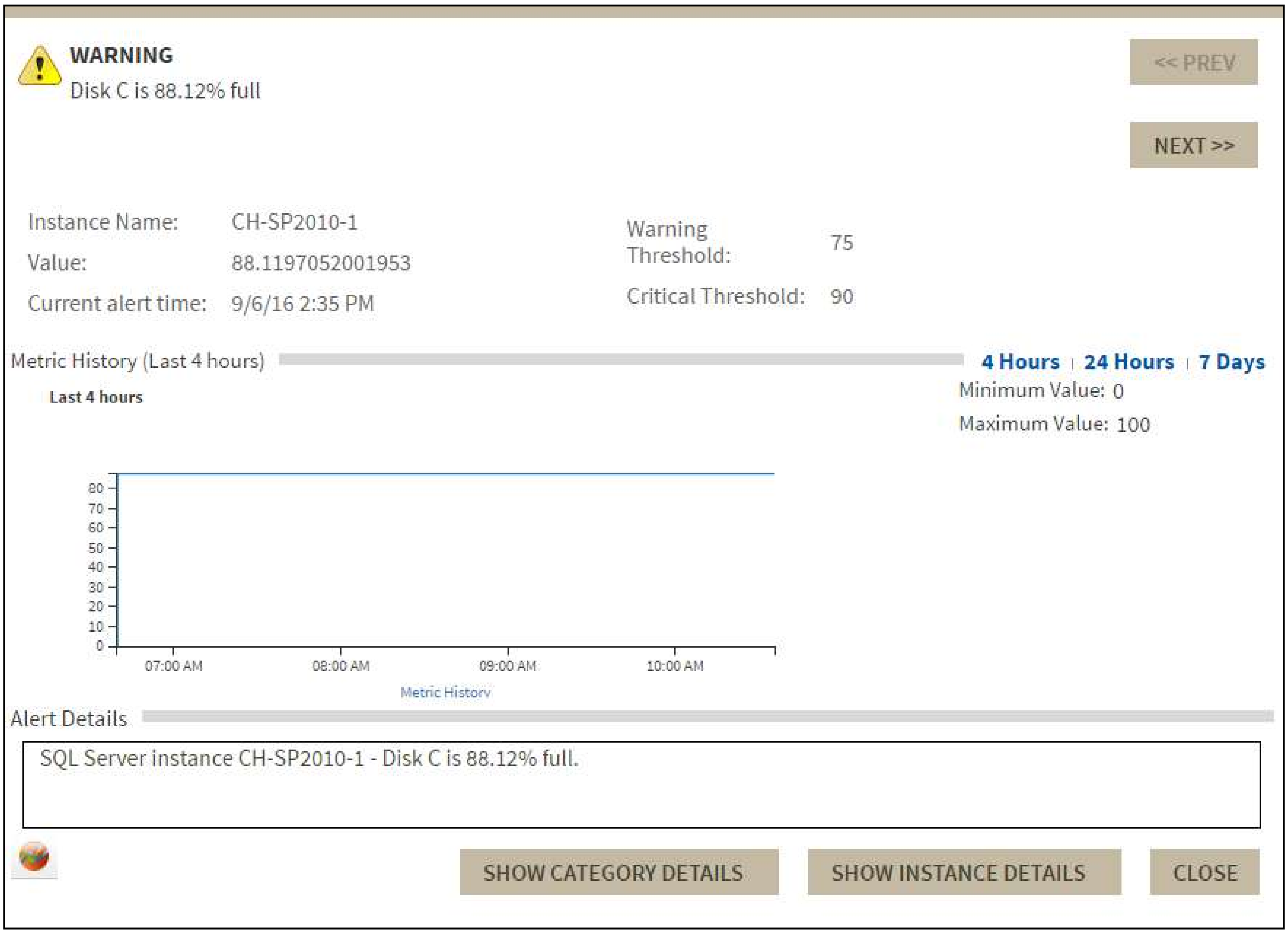
- Access the single instance dashboard by clicking the instance name in an alert row.
- Access the Alerts Detail screen by clicking **Show Details**.
- Export your alerts information in different formats: Excel, CSV, and HTML.



	Summary
11 PM	Database IderaDashboardRepository is not backed up for 9999999 days.
11 PM	Database ReportServer is not backed up for 9999999 days.

Check your alert details in IDERA Dashboard

The Alerts Detail screen in the IDERA Dashboard provides you with detailed statistics on your alerts.



WARNING

Disk C is 88.12% full

Instance Name:	CH-SP2010-1	Warning Threshold:	75
Value:	88.1197052001953	Critical Threshold:	90
Current alert time:	9/6/16 2:35 PM		

Metric History (Last 4 hours)

Minimum Value: 0

Maximum Value: 100

Alert Details

SQL Server instance CH-SP2010-1 - Disk C is 88.12% full.

On the Alerts Detail screen you can find the following information:

- Alert Name
- Instance Name
- Value
- Current alert time
- Warning Threshold
- Critical Threshold
- Alert Details

Additional button options

Category

Click the **SHOW CATEGORY DETAILS** button to access first the Overview tab of a single instance and then specific category views such as sessions, queries, query waits, resources, databases, and alerts.

Instance

Click the **SHOW INSTANCE DETAILS** button to access the single instance dashboard for a specific instance.

Close

Click the **CLOSE** button to exit the Alerts Detail screen.

Prev

Click the **PREV** button to view details for a previous alert.

Next

Click the **NEXT** button to view details for the next alert.

Metric history

View alert history for the past 4 hrs, 24 hrs or 7 Days.

Launch SQL Diagnostic Manager

Click the SQL Diagnostic Manager icon to launch the SQL Diagnostic Manager Console.

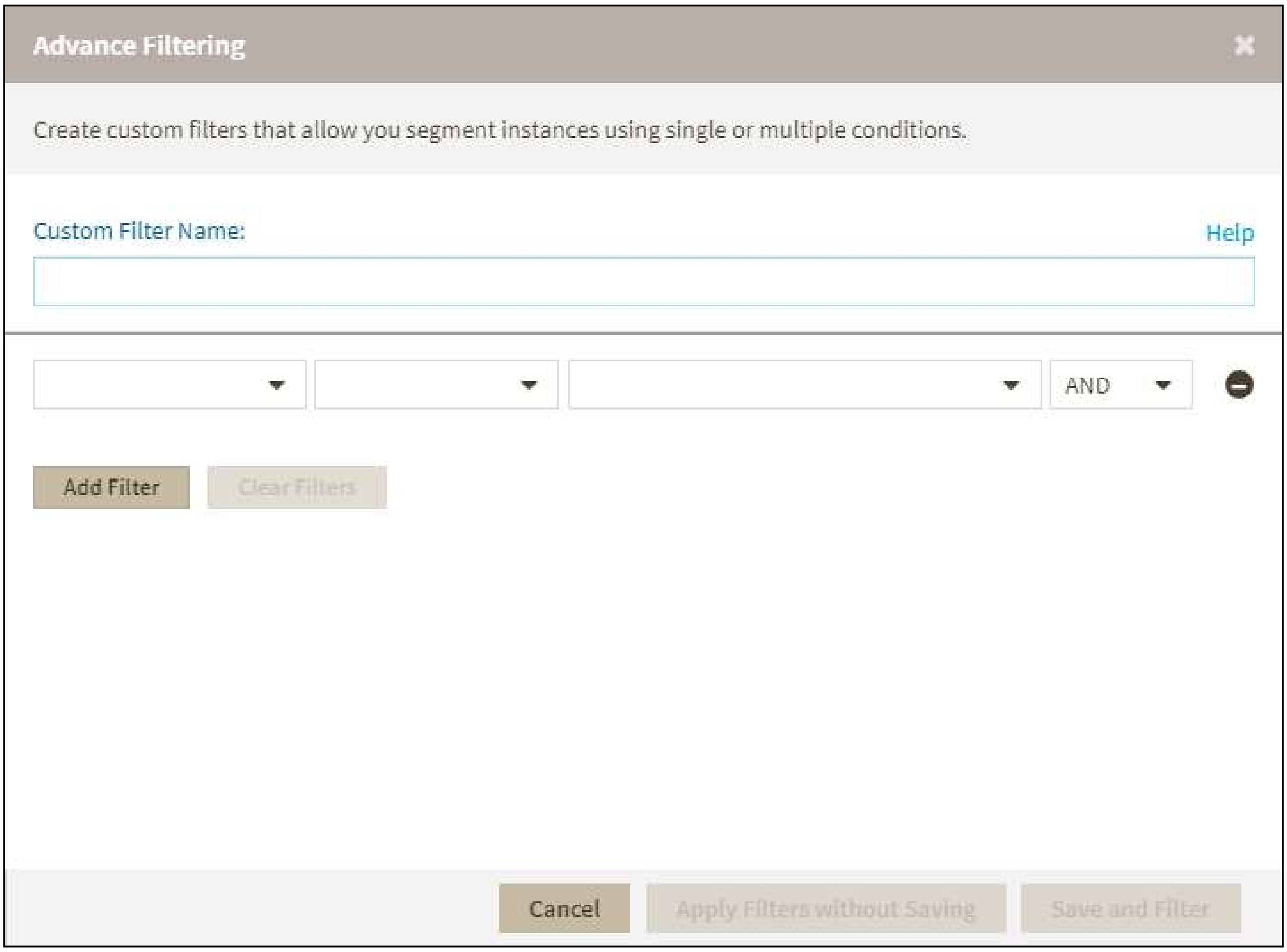
Access the Alerts Detail screen

SQL Diagnostic Manager provides several paths to access the Alerts Detail screen. The first access path is by clicking any row in the alerts roll up view of the Alerts tab. The second access path is by clicking over a category icon in the thumbnail sub-view that contains active alerts. It is also possible to access the Alerts Detail screen through the SQL Diagnostic Manager web console's home tab and the specific widgets it contains.

Set your advanced filter in IDERA Dashboard

Advanced filters allow you to create custom filters that help you segment instances using single or multiple conditions.

Advanced Filter dialog

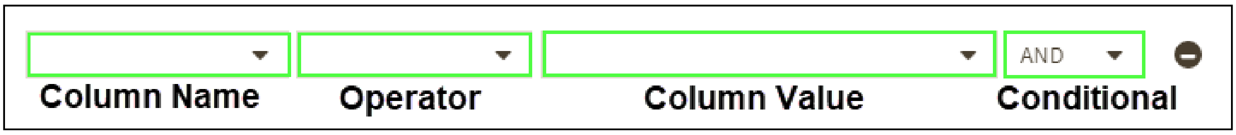


Advance Filtering

Create custom filters that allow you segment instances using single or multiple conditions.

- **Custom Filter Name -** Enter a name for your custom filter.

Use the following fields to create your custom filters. Custom filters on IDERA SQL Diagnostic Manager have the following structure:

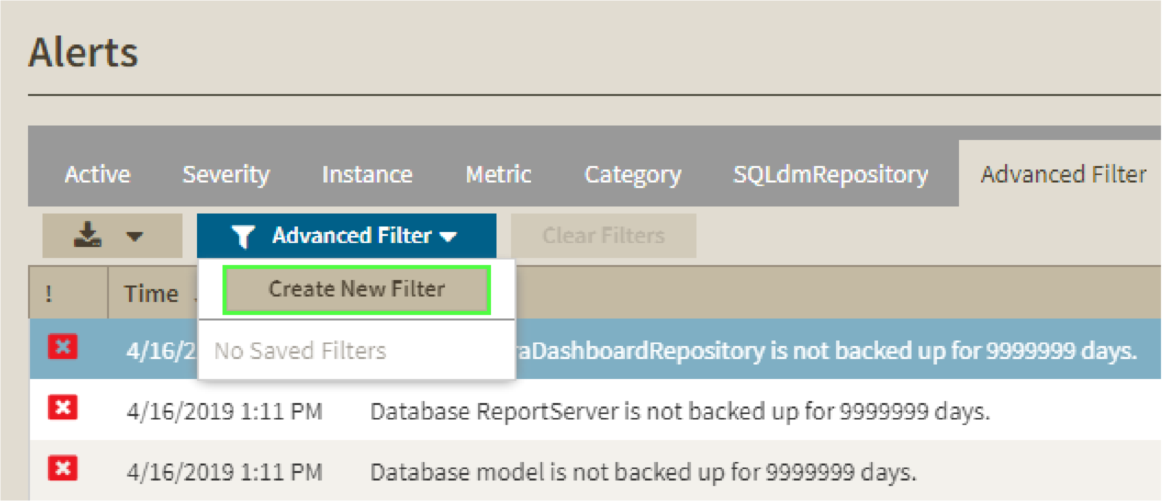


- **Add Filter -** Allows you to add an additional filter.
- **Clear Filters -** Clears the value of filter creation fields.
- **Cancel -** Cancels the creation of the filter.
- **Apply Filters without Saving -** Applies the current advanced filter without saving it.
- **Save and Filter -** Saves and applies the filter.

Creating an Advanced Filter

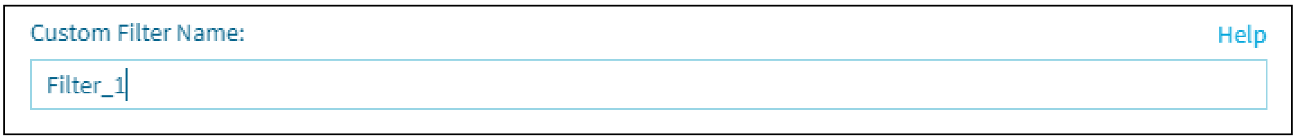
To create an advanced filter follow these instructions:

1. Go to the instance view where you want to create a filter.
2. Click **Advanced Filter** and select **Create Filter**.

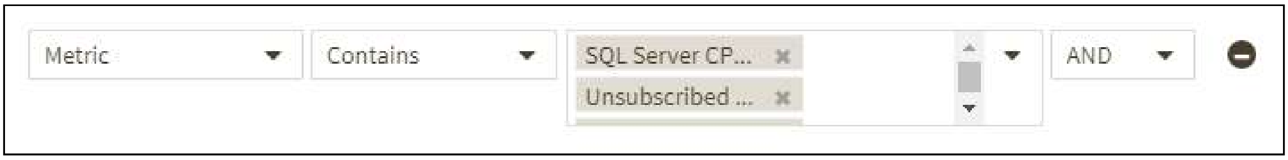


4/16/2 ... aDashboardRepository is not backed up for 9999999 days.
4/16/2019 1:11 PM Database ReportServer is not backed up for 9999999 days.
4/16/2019 1:11 PM Database model is not backed up for 9999999 days.

3. On the Advanced Filters dialog enter a name for your filter.

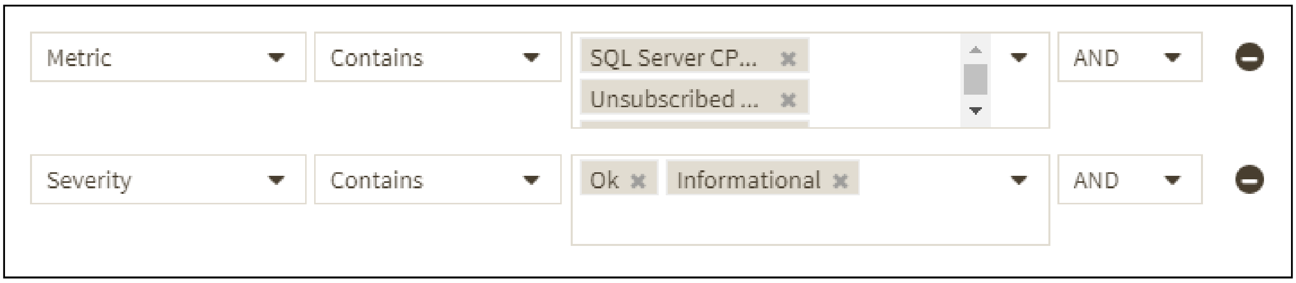

Custom Filter Name: Filter_1

4. Use the drop-down menus to select your desired criteria on the filter creation field.



5. Click **Save and Filter**.

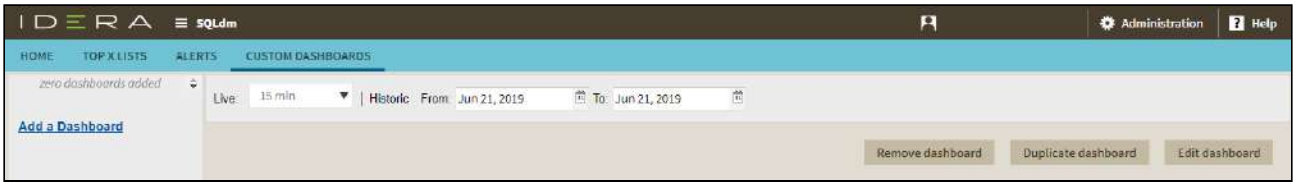
You can also use conditions to further refine your advanced filters. To add more filtering fields, click **Add Filter**.



To remove a filter field click ⊖ .

Create custom dashboards in IDERA Dashboard

The Custom Dashboards tab of the SQL Diagnostic Manager web console allows you to create and view custom dashboards. You can define and save multiple dashboard views to compare metrics across your monitored SQL Server instances.



Add a dashboard

To add a dashboard:

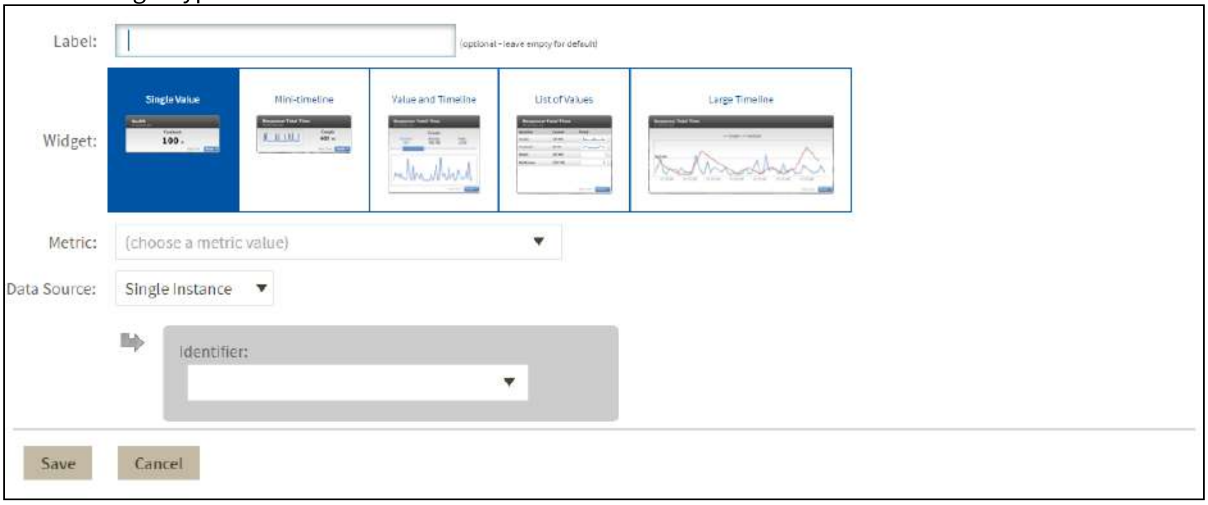
1. Click **Add a Dashboard** in the Custom Dashboards view.
2. Type a dashboard name on the Add a Dashboard window.
3. Select the Default check box, if you want to set this dashboard as the default one.
4. Click **Save.**

Add widgets to your dashboard

Customize your dashboard by adding widgets to display specific SQL Diagnostic Manager metrics. You can add a widget at a time.

To add a widget to your dashboard:

1. Click **Add a Widget** in the Edit Dashboard view.
2. Type a label for your widget in the corresponding box or leave it empty for default.
3. Select a widget type.



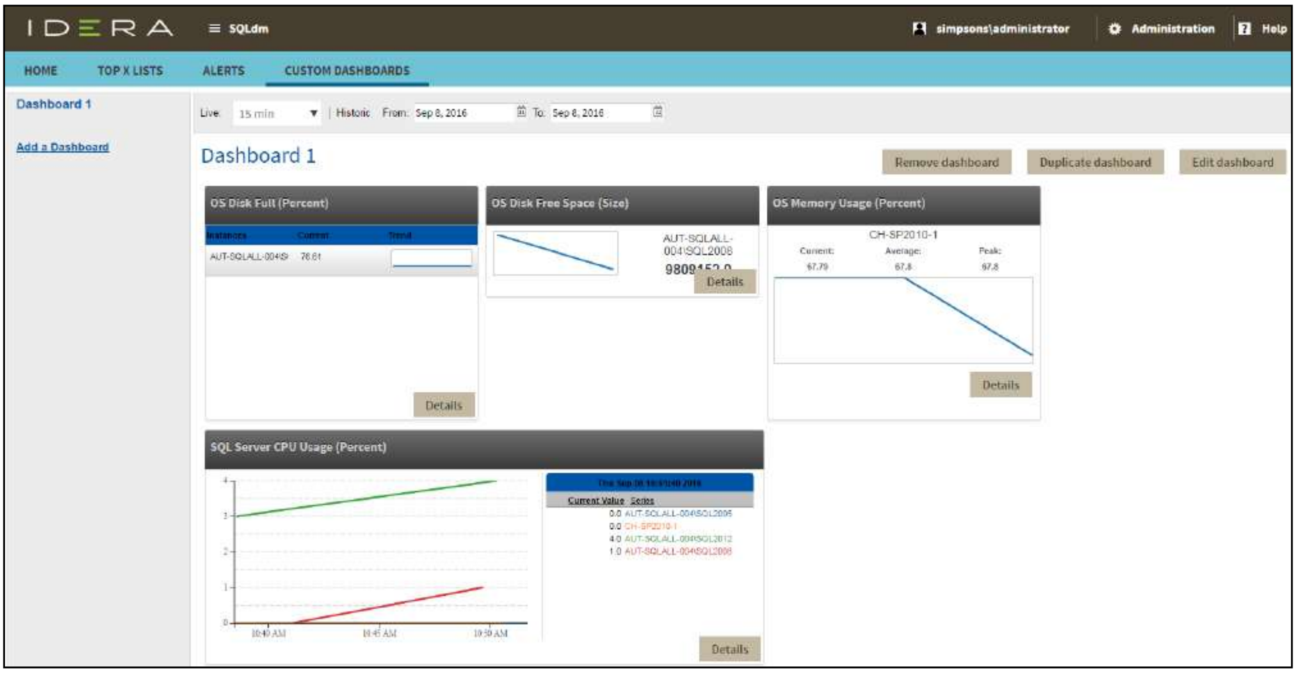
4. Choose a metric from the drop-down list.
5. Choose a data source from the drop-down list. Available options vary according to the type of widget selected and include:
   - Single Instance
   - Multiple Instance

  - Tag Name
  - All Instances
6. Choose an identifier or identifiers from the drop-down list. Note that if you select the All Instances data source option, it is not possible to assign an identifier.
7. Click **Save.**

Actions to perform in your Custom Dashboards View

The SQL Diagnostic Manager web console allows you to perform the following actions in your Custom Dashboards view:

- Filter your results by time frame
- Edit your dashboard
- Remove your dashboard
- Duplicate your dashboard



To display a widget in full size, click **Details**.

Filter results by time frame

Filter results in your dashboard by specific built-in periods from the Live list or by specific start and end dates in the historic timeframe option.

By default, the results of the timeframe is the current date.

Edit your dashboard

In the Edit Dashboard view, you can:

- Change your dashboard name.

- Set your dashboard as the default one by selecting the Default check box.
- Select or create a dashboard tag by typing a name in the Dashboard Tags box.
- Add a new widget, remove, or edit current widgets.
- Place and order widgets in your dashboard by dragging and dropping them.

To access the Edit Dashboard view, click **Edit Dashboard** in the Custom Dashboards view.

⚠ Click **Save** after making changes in the Edit Dashboard view.

Remove a dashboard

To remove a dashboard, click **Remove Dashboard** and then select **OK** on the Confirmation window.

Duplicate a dashboard

To duplicate a dashboard, click **Duplicate Dashboard.**

Custom dashboards widget types

The SQL Diagnostic Manager web console allows you to choose between the following predefined widget types for a customized dashboard view:

Single value

Shows the single value for a specific metric and instance.

Mini-timeline

Displays the timeline and value for a specific metric and instance.

Value and timeline

Displays the value and the baseline range for a specific metric and instance.

List of Values

Displays the current value and the trend for a specific metric and instance, multiple instances, or tags.

Large timeline

Displays the timeline and the current value for a specific metric and instance, multiple instances, or tags.

Monitor SQL Server Performance

SQL Diagnostic Manager allows you to analyze the performance of your monitored SQL Server instances through **My Views** and the **Dashboard** view.

See the general status of all your monitored SQL Server instances

The SQL Diagnostic Manager Today view allows you to view the status of all your monitored SQL Server instances, including a listing of all your active alerts.

Get the configuration properties of all your monitored SQL Server instances

The Server Configuration Properties view allows you to view the important configuration settings for all of your monitored SQL Server instances. While you manage these settings in different areas of SQL Diagnostic Manager, you can see a current list of all of your instances and their properties settings in one view.

Get an overview of a group of SQL Server instances

My Views allows you to monitor either specific groups of SQL Server instances or all groups. This overview includes monitors that allow you to view several important specifics, see a glance if there are any problems, and drill down to detailed metrics for each component on the SQL Server instance.

Get an overview of a specific SQL Server instance

The Dashboard view provides a graphical representation of the activity on your SQL Server instance. This dashboard allows you to diagnose inter-related issues, using quick links to see the associated details and review possible solutions to specific issues.

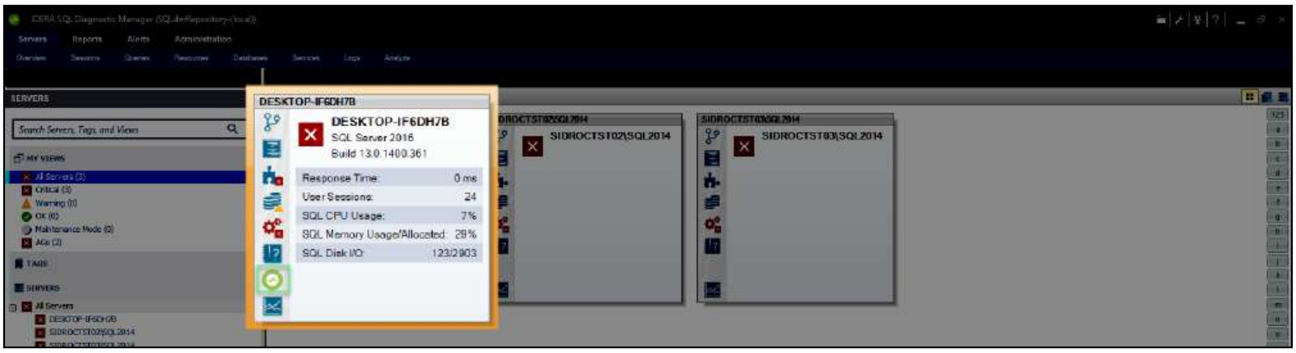
Launch SQL Workload Analysis

SQL Diagnostic Manager allows you to launch SQL Workload Analysis in context of your monitored server from the desktop console and the web console. SQL Workload Analysis dashboard displays trending database activity and top utilizing SQL statements, logins, machines, and programs. SWA provides a granular breakdown of the SQL Sever wait states with easy drill-down isolate problems quickly. View real-time and historical data to help tune queries and actionable recommendations to improve performance. For more information, see the SQL Workload Analysis Online Help.

Launch SQL Workload Analysis

In the desktop console, right-click the All Servers option under MY VIEWS, and select **Open** to get the Thumbnails view of all servers.

SQL Diagnostic Manager recognizes which servers are being monitored by SQL Workload analysis as well. The ● displays only under these servers thumbnails.

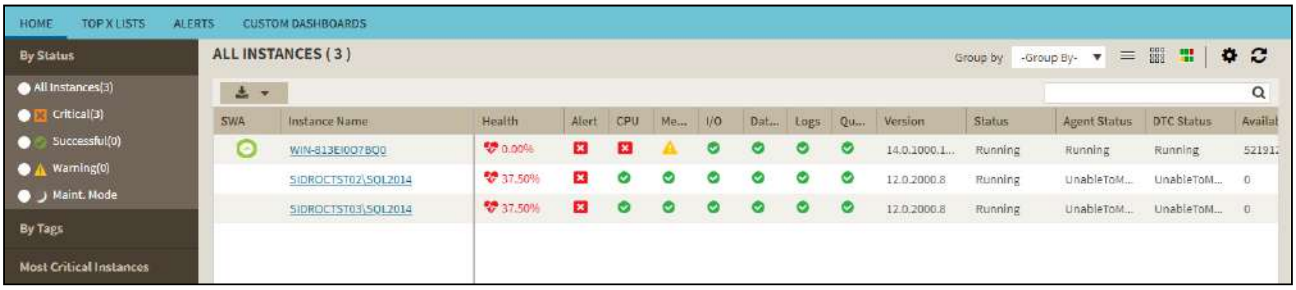


DESKTOP-IF6DH7B

DESKTOP-IF6DH7B
SQL Server 2016
Build 13.0.1400.361

Response Time:	0 ms
User Sessions:	24
SQL CPU Usage:	7%
SQL Memory Usage/Allocated:	29%
SQL Disk I/O:	123/2903

In the list view of the web console, the listed instances are well identified with the SWA icon when they are registered in SQL Workload Analysis.



ALL INSTANCES (3)

SWA	Instance Name	Health	Alert	CPU	Me...	I/O	Dat...	Logs	Qu...	Version	Status	Agent Status	DTC Status	Availat
●	WIN-813EI0O7BQ0	0.00%	☒	☒	⚠	✓	✓	✓	✓	14.0.1000.1...	Running	Running	Running	521912
	SIDROCTST02\SQL2014	37.50%	☒	✓	✓	✓	✓	✓	✓	12.0.2000.8	Running	UnableToM...	UnableToM...	0
	SIDROCTST03\SQL2014	37.50%	☒	✓	✓	✓	✓	✓	✓	12.0.2000.8	Running	UnableToM...	UnableToM...	0

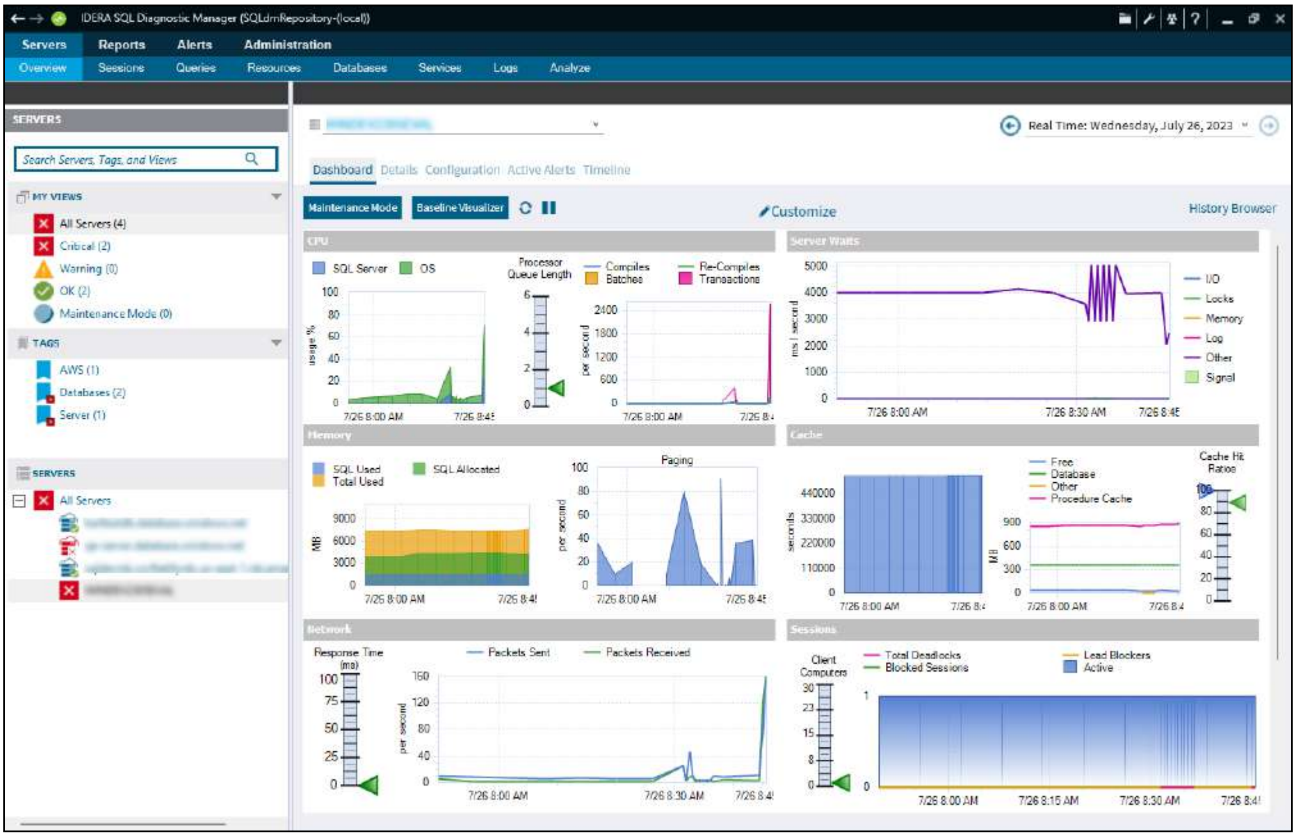
Monitor instances

The Overview tab contains the following views:

- Dashboard view where you can see an overview of the instance.
- Details view that lets you create charts with the specific data items you need.
- Configuration view that allows you to view the configuration information of your SQL Server.
- Active Alerts view where you can see all outstanding alerts for this instance.
- Timeline view where you can see a timeline of events as they occurred in this instance.

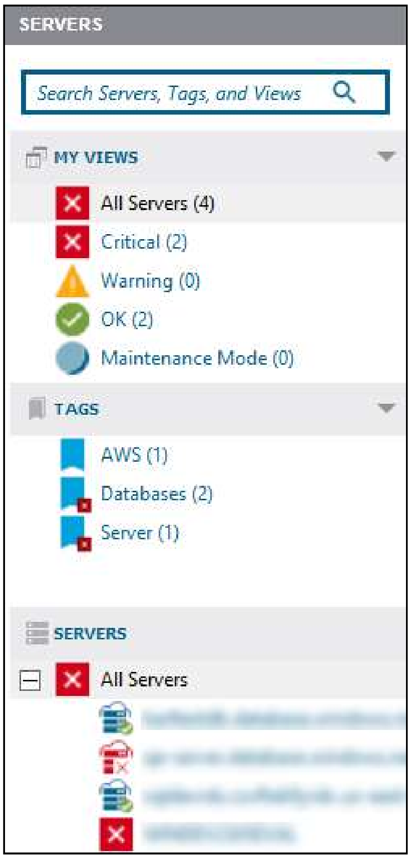
Access the Overview tab

Access the Overview tab by clicking the appropriate monitored SQL Server instance, this tab is the default view when you first click an instance.



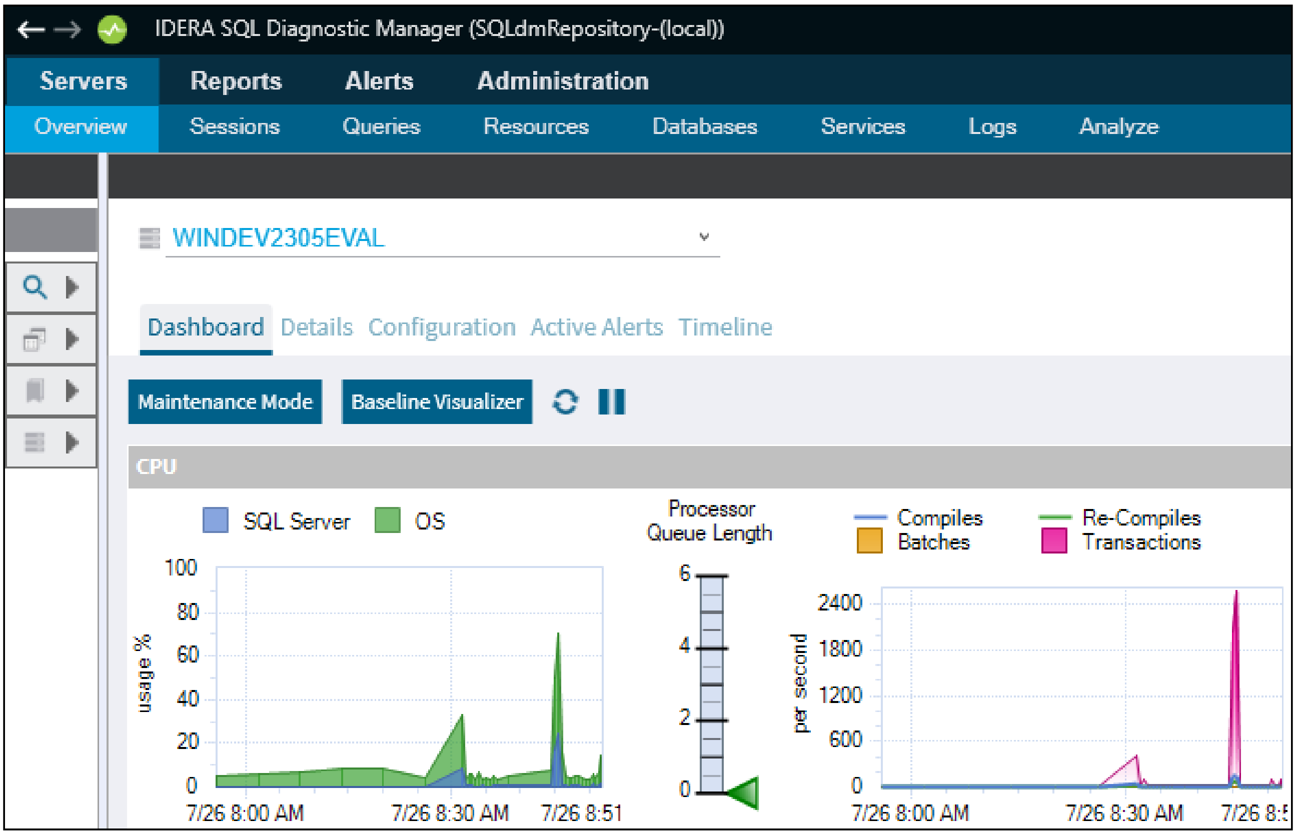
Navigate to your SQL Server instances

The SERVERS sidebar contains all the SQL Server instances that are monitored by SQL Diagnostic Manager, providing a general overview.

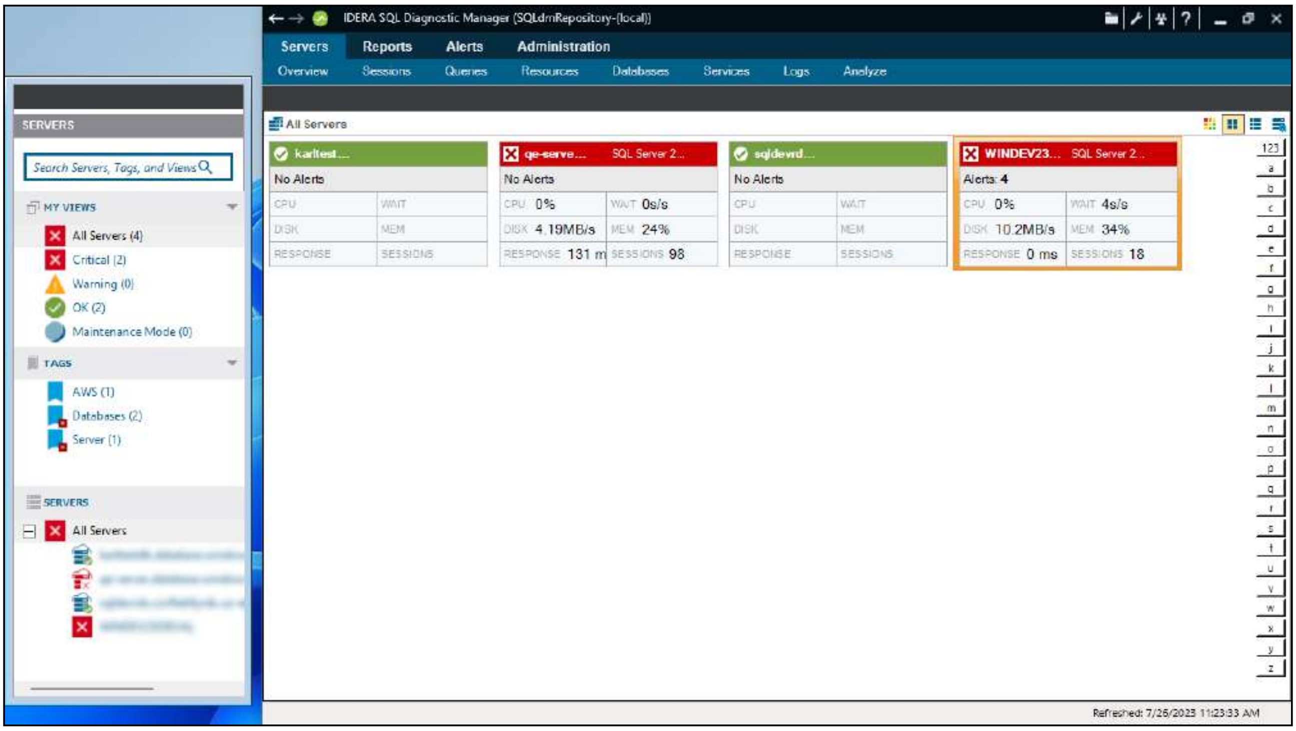


- The SERVERS panel includes a search bar that eases the search in environments with a large number of instances.
- Under MY VIEWS, select All Servers to see all your instances' thumbnails with fast information, and review more about the available views. Additionally, MY VIEWS displays status icons, when a SQL Server instance is associated with a Critical, Warning, OK, and Maintenance Mode metric icon, you can use your mouse cursor to hover over the server name to view the top three associated alerts, allowing you to prioritize your SQL Server instances and the work that you need to perform.
- The Servers sidebar displays tags, which are a way of labeling and organizing servers.
- Under Servers, you can find the list of the monitored servers by SQL Diagnostic Manager, click any of your servers' names to access the Overview screen of the selected server.

The Servers sidebar can be expanded or collapsed, allowing you to have a larger screen space.



Additionally, SQL Diagnostic Manager allows you to undock and move your panels as you prefer. Double-click the dark gray bar to undock the panel, move it wherever you prefer, and double-click to return to its original location:



karltest...	qe-serve... SQL Server 2...	sqldevrd...	WINDEV23... SQL Server 2...
No Alerts	No Alerts	No Alerts	Alerts: 4
CPU	CPU 0%	CPU	CPU 0%
WAIT	WAIT 0s/s	WAIT	WAIT 4s/s
DISK	DISK 4.19MB/s	DISK	DISK 10.2MB/s
MEM	MEM 24%	MEM	MEM 34%
RESPONSE	RESPONSE 131 m	RESPONSE	RESPONSE 0 ms
SESSIONS	SESSIONS 98	SESSIONS	SESSIONS 18

Refreshed: 7/26/2023 11:23:33 AM

Refresh your alerts

A full refresh of alerts excluding table fragmentation occurs in the following circumstances even if longer collection intervals are defined:

- When the collection service starts
- When the collection service receives a new workload, such as redirecting the Management Service to a new Repository
- When you add a SQL Server for collection
- When a SQL Server resumes from Maintenance Mode
- When a user selects Refresh Alerts

This refresh does not cause the collection of non-alertable data, nor cause the collection of anything that is disabled.

Overview tab features

When you select a SQL Server instance in the Servers sidebar, the Overview tab displays the following options:

Dashboard

> The Dashboard view is where you can see a graphical representation of the most important metrics for the selected SQL Server instance.

Details

> The Details view lets you view the values of each data item collected and create charts with the specific data items you need.

Configuration

> The Configuration view allows you to view and control the operational configuration of the monitored SQL Server instance.

Active Alerts

> The Active Alerts view allows you to view and control the active alerts as of the most recent data collection.

Timeline

> The Timeline view allows you to view all alerts and maintenance mode events as well as the first monitored event for the selected SQL Server instance.

Other Servers features

By right-clicking a SQL Server instance in the Servers sidebar you can perform the following actions:

Open

> Opens the Dashboard view for the selected monitored SQL Server instance.

Refresh Alerts

> Gathers the alert status and refreshes the tree view information for the selected monitored SQL Server instance.

Delete

Allows you to delete the SQL Server instance from your SQL Diagnostic Manager installation. When you select **Delete**, SQL Diagnostic Manager displays a message asking whether you want to retain the collected data for the SQL Server instance, and it also allows you to cancel out of the deletion process.

✓ You cannot retrieve collected data once it is deleted from the SQL Diagnostic Manager Repository. Use the Delete option with care.

Maintenance Mode

Allows you to take an individually monitored SQL Server instance offline for scheduled maintenance or other reasons.

Configure Baseline

Allows you to configure the performance baseline for the selected SQL Server instance.

Apply Alert Template

Allows you to select an existing alert template to apply to the selected SQL Server instance.

Configure Alerts

Allows you to specify the alert criteria for each collected metric on the selected SQL Server instance.

Snooze Alerts

Allows you to snooze all the alerts for the selected SQL Server instance instead of selecting the snooze feature for each alert individually.

Resume Alerts

Allows you to resume any alerts set to snooze on the selected SQL Server instance.

Properties

Allows you to view and edit the collection properties of your SQL Server instance.

Get the SQL Server performance overview

The Dashboard view contains a graphical representation of the activity on your SQL Server instance. This view not only displays the status of your SQL Server instance, but it allows you to diagnose where problems originate.

The Dashboard view is made up of panels, which include additional information for specific metrics in chart form. Hover your mouse cursor over an area within a chart on which you want to get actual statistics. Click a specific metric to drill down for more detailed information. By using the options in the menu available when you right-click over an area, you can configure alerts, view associated help topics and details, print, save the image, or export the dashboard to Microsoft Excel as a `.csv` file.

You can also customize your Dashboard view to show only those panels that are important to your monitored SQL Server instance. SQL Diagnostic Manager also allows you to save your customized view on a per-instance basis or use the same view for all of your instances. For more information about customizing your Dashboard view, see Customize your Dashboard view.

Access the Dashboard view

You can open the Dashboard view of the SQL Diagnostic Manager Overview tab by selecting the appropriate SQL Server instance, and then clicking **Overview > Dashboard**.

Dashboard view

The Dashboard view is organized with panels that display all the key metrics collected by SQL Diagnostic Manager by category.

The available data panels for the Dashboard view include:

Cache

The Cache panel tracks the database and procedure processes using a buffer pool of memory on your monitored SQL Server instance, and includes the following charts and gauges:

- Page Life Expectancy
- Areas
- Hit Ratios

CPU

The CPU panel includes key CPU metrics for your SQL Server instance and the computer that hosts the instance. The metrics displayed in CPU include the following charts and gauges:

- Usage
- Processor Queue Length
- Call Rates

Custom Counters

The Custom Counters panel tracks selected custom counters for your monitored SQL Server instance. You must have at least one custom counter to view data in this panel.

Databases

The Databases panel includes key metrics covering the health of the databases on your monitored SQL Server instance. The metrics displayed in Databases include the following charts and gauges:

- Transactions/sec
- Log Flushes/sec
- Reads/sec
- Writes/sec
- I/O Stall ms/sec

Disk

The Disk panel includes key metrics that monitor the health of the disk of your monitored SQL Server instance. The metrics displayed in Disk include the following charts and gauges:

- Latency
- Throughput
- SQL Server Physical I/O

File Activity

The File Activity panel includes the top five database files with the highest relative activity since the last refresh of your monitored SQL Server instance. You can select different metrics and display results for all files, or a single database, disk, or file. The available metrics include:

- Reads/sec
- Writes/sec
- Transfers/sec

Lock Waits

The Lock Waits panel tracks the total number waits caused when a task is waiting to acquire a lock on your monitored SQL Server.

Memory

The Memory panel includes key Memory metrics for your SQL Server instance and the computer that hosts the instance. The metrics displayed in Memory include the following charts:

- SQL Server Usage
- SQL Server Paging
- VM Memory Usage
- Host Memory Usage

Network

The Network panel tracks the performance of the network connection being used by your monitored SQL Server, and includes the following charts and gauge:

- SQL Server Throughput
- VM Network Usage Throughput
- Host Network Usage Throughput
- Response Time

Server Waits

The Server Waits panel tracks the total number and time spent on waits affecting your monitored SQL Server.

Sessions

The Sessions panel includes session-specific data items. The metrics displayed in Sessions include the following chart and gauge:

- Activity & Blocking
- Clients

Tempdb

The Tempdb panel tracks the status of the tempdb database on your monitored SQL Server instance, and includes the following charts and gauge:

- Tempdb Space Used
- Tempdb Contention
- Version Store Cleanup Rate

Virtualization

The Virtualization panel tracks the performance of the host server that manages your virtual machines and the VM on which the monitored SQL Server instance is running, and includes the following charts and gauges:

- Virtual Machine Memory Areas
- VM Host Memory Areas
- Virtual Machine Disk Usage
- VM Host Disk Usage
- CPU Ready

Understand the Dashboard colors

The following colors are associated with a status for each of the provided panels.

Gray

Indicates the status of the data is normal, or within the thresholds assigned to the metric.

Blue

Indicates the status of the data is at an informational level based on your settings.

Yellow

Indicates the status of the data is at a warning level, or outside the threshold of normal but not yet at the critical status.

Red

Indicates the status of the data is at a critical level and requires immediate action.

Blank metrics on the Dashboard

If a metric on the Dashboard has no value, or displays as blank, SQL Diagnostic Manager is not able to collect the corresponding counter. Causes of this situation include:

- The SQL Diagnostic Manager Console has not captured the metrics. It can take up to two refreshes for this capture to occur.

- OS metrics are disabled. SQL Diagnostic Manager requires direct WMI or OLE automation to collect data.
- If using OLE automation, those procedures are unavailable. SQL Diagnostic Manager is unable to locate required OLE automation stored procedures.
- If connecting to WMI directly, the WMI Service is not running. SQL Diagnostic Manager requires that the WMI service is running on the computer that hosts the SQL Server instance in order to collect OS metrics.
- The counters do not exist on this SQL Server instance.

You can enable OS metrics monitoring to track the performance of the computers on which your monitored SQL Server instances are hosted.

Refresh your Dashboard data

The Dashboard view is refreshed according to the time set in the **Server View Refresh** field on the Console Options window, which is accessible by clicking **Tools > Console Options**.

Understanding your chart data and refresh interval

SQL Diagnostic Manager charts provide data whether collected real-time or as part of a scheduled collection event. For additional information about how SQL Diagnostic Manager displays your chart data, see Charts.

Customize your Dashboard view

The Dashboard view is customizable per monitored SQL Server instance by selecting the panels that are important to view for that instance. You can customize your Dashboard view for the selected SQL Server instance or as the default for all SQL Server instances added to SQL Diagnostic Manager.

Using the Panel Gallery

When you install SQL Diagnostic Manager, a default Dashboard view is applied to all your SQL Server instances. The Panel Gallery allows you to alter your view so that you can monitor the most important metrics. To access the Panel Gallery, select your preferred SQL server instance from the Servers pane and then click **Customize**. Once in the Dashboard Designer, click a panel in the Panel Gallery for SQL Diagnostic Manager to display additional information about that panel.

Designing a Dashboard view

When you design a Dashboard view, select the metric panels that display the current status and the best information for your selected SQL Server instance. SQL Diagnostic Manager allows you to create multiple designs, you can create one design with panels specifically for SQL Server 2000 instances and another design for SQL Server 2005 instances. It allows you to create designs that show the most important panels to monitor when certain events trigger alerts.

SQL Diagnostic Manager allows you to choose from several different layouts of columns and rows for your dashboard design. You can then drag and drop panels from the Panel Gallery to the actual location in the layout where you want that panel to reside. You can also click, hold, and drag panels to re-arrange their location. When you drag a panel to another position and release the mouse button, the panel you moved switches locations with the existing panel. For example, your design includes the CPU panel in the upper left corner and the Sessions panel in the lower right corner. Click, hold, and drag the Sessions panel to the upper left corner, and then release. Note that the Sessions panel is in the upper left corner and the CPU panel is now in the lower right corner. For more information on available designs, see Design a dashboard view.

SQL Diagnostic Manager includes several options for you to use as your Dashboard view. You can also create a design using the available panels, and save the design for other people in your environment to use as their Dashboard view. For more information on available designs, see Select a dashboard design.

Saving a design

Once you are pleased with the selection and positioning of your panels, you can save your design. In the Dashboard Designer, click **Save**. SQL Diagnostic Manager allows you to name this design, which is then displayed in the Dashboard Gallery. For additional information about saving a dashboard design, see Save a dashboard design.

Understanding how you can apply a dashboard design

SQL Diagnostic Manager allows you to use a design for a single session of the SQL Diagnostic Manager Management Console, apply a design to a specific monitored SQL Server instance, or apply the layout to any other SQL Server instance including those you add later. You can use a custom Dashboard view in the following situations:

One-time use

SQL Diagnostic Manager allows you to view a custom layout of your Dashboard view for a single session of the SQL Diagnostic Manager Management Console. For example, an event in one of your instances triggered an alert. You want to watch the metric that includes statistics relating to this alert, so you access the Panel Gallery in the Dashboard Designer. Drag the panel displaying the alert-related statistics to the top-left corner of your layout, and then close the Dashboard Designer. SQL Diagnostic Manager displays a message that you made changes to the current design. Click **No** to use this design only until you close this session of the SQL Diagnostic Manager Management Console.

SQL Diagnostic Manager keeps that panel in the position of your Dashboard view until you close the SQL Diagnostic Manager Management Console session. Even after accessing other areas within SQL Diagnostic Manager, when you return to your Dashboard view, the same panel appears in the same location.

When you no longer want that panel foremost in your Dashboard view, simply close the SQL Diagnostic Manager Management Console knowing that the default Dashboard view for that instance appears the next time you access SQL Diagnostic Manager.

Set as the default design for one or more instances

While the default Dashboard view includes panels that are important to your monitored SQL Server instances, the panels may not be in the order in which you want or this design does not include all of the panels you want to view. If there are no existing designs you want to use, access the Panel Gallery to select and move the panels you want to the positions that most suit your needs.

When you are done with your design, click **Save** to make sure you can use this design again. Type a unique name for this design, verify that this SQL Server instance appears in the **Selected Servers** area. You can add any other SQL Server instances, select the name of the instance, and then click **Add >** to move the instance to the Selected Servers area. Once your list of selected instances is complete, click **OK**.

Each time you access the Dashboard view for this instance, SQL Diagnostic Manager displays the information using this design.

You can also select an existing dashboard design as the default for one or more monitored SQL Server instances. On the Server Overview tab, click **Customize** to open the Dashboard Designer, and click **Select a Dashboard**. Scroll through the available designs and select the one you want to use for the monitored instance. Click **Select** and each time you access the Dashboard view for this instance, SQL Diagnostic Manager displays the information in this design.

Set as the default design for all new or unassigned instances

SQL Diagnostic Manager allows you to select a design to use as the default for all new or unassigned monitored SQL Server instances so that you have a consistent format across all of your monitored SQL Server instances. When saving a dashboard design, check the **Use this dashboard as my default for new or unassigned servers** check box.

Available panels

- Cache panel
- CPU panel
- Custom Counters Panel
- Databases panel
- Disk panel
- File Activity panel
- Lock Waits panel
- Memory panel
- Network panel
- Server Waits panel
- Sessions panel
- Tempdb panel

- Virtualization panel

Design a Dashboard view

Throughout the day, your monitored SQL Server instances can go through several situations including triggered alerts requiring immediate attention. Some events result in multiple alerts, each needing you to keep a close eye on them as a resolution is put into place. To help you monitor your SQL Server instances, SQL Diagnostic Manager provides a default Dashboard view that includes commonly monitored metrics for the selected SQL Server instance.

You can improve the Dashboard view by customizing your view to include those panels most important to you. A customized Dashboard view can help you keep your monitored SQL Server instances from triggering alerts by providing you with real-time coverage of crucial metrics.

You can view your current Dashboard view by making the appropriate changes, and then closing the Panel Gallery pane for a full view of your design. Click **View Panel Gallery** to toggle the display of the Panel Gallery selection pane. You can also close the Panel Gallery by clicking the close icon in the upper right corner of the pane.

Identify which Dashboard panels you want to include

In the Panel Gallery, each panel includes a brief description and a link to access additional information about that panel. To view the description, click the panel for which you want to view details. SQL Diagnostic Manager also displays a sample graphic showing the kinds of charts and data available in the panel. Click **More info** in the description to access the help topic specifically for that panel.

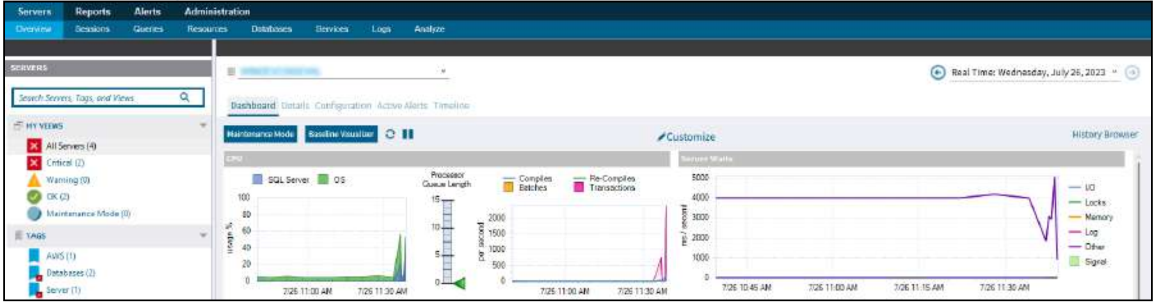
Note that you can use the same panel more than once in your Dashboard design. Because some panels in the Panel Gallery provide drop-down selections for you to select metrics or other filters, you can use the same panel more than once in your Dashboard. This feature is handy when using panels such as the Databases panel because it allows you to have one Databases panel displaying a selected metric and another Databases panel displaying a different metric. You can do the same with the Disk panel to view the same metrics for different disks at the same time.

Manage your Dashboard view

To change your current Dashboard view:

1. Select the appropriate SQL Server instance from the Servers sidebar.
2. Click **Customize**, and notice that you are now in the Customize Dashboard screen.
3. If you want to change the number of panels to display in your view, click **Select Layout**, and select the number of columns and rows.
4. Using a drag-and-drop method, move the panels you want to include from the Panel Gallery to the location within the view where you want that panel to reside. You can place the same panel more than once in your view. This feature is important on panels that allow you to select different metrics, such as the Databases panel which offers different measurements per second.
5. Click **Close Designer** once you select and move panels to where you want them to reside.
6. On the confirmation message, click **Yes** to use this design again or apply it to additional SQL Server instances, or click **No** to use this design for only this session of the SQL Diagnostic Manager Management Console. For additional information about saving a dashboard design, see Save a

dashboard design.



Select an existing dashboard design

SQL Diagnostic Manager includes a default Dashboard view and multiple designs with installation. If you want to change your view, you can select each panel specifically for a custom view or you can select from existing layouts that you or another user in your environment created. This feature allows you to share designs as templates that each user can use to save, and then apply to their monitored SQL Server instances.

Select an existing design for your Dashboard view

To use an existing design for your Dashboard view:

1. Select the appropriate SQL Server instance from the Servers pane.
2. Click **Customize**. Notice that you are now in the Dashboard tab. SQL Diagnostic Manager displays this tab when you use the Customize feature.
3. Click **Select a Dashboard**.
4. Scroll through the displayed designs until you find the one you want to use. Click the arrows to scroll through the available designs. Click **All Dashboards** to view designs other users in your environment created and made available for use. This feature allows you to "share" a design that you find effective.
   Click **Select** when you find the design you want to use. SQL Diagnostic Manager returns you to the Dashboard Designer using your selected design. You can then save this design to use for this SQL Server instance or click **Close Designer** to use this design only during this session of the SQL Diagnostic Manager Management Console. For additional information about saving a dashboard design, see Save a dashboard design.

Delete a Dashboard layout

If you created a layout that you no longer want anyone to use, you can delete that layout from your gallery. Simply click **Select a Dashboard**, scroll to the layout you want to delete, and then click **Delete**. You cannot delete any of the layouts supplied with your SQL Diagnostic Manager installation.

Save a dashboard design

There are two options when saving a design for your Dashboard view. Check **Use this dashboard as my default for new or unassigned servers** if you want SQL Diagnostic Manager to use this design for all new SQL Server instances and for existing instances that do not have a designated default Dashboard view.

To save a dashboard design:

1. In the Dashboard Designer, click **Save**.
2. Type the name you want for your new design. If you use the name of the existing design, SQL Diagnostic Manager displays a message alerting you to the existing design. You can then type a different name or use the same name, replacing the existing design with this new format.
3. Verify that the correct monitored SQL Server instance appears in the Selected Servers area. You can apply this design to additional instances by selecting the instance, and then clicking **Add >** to move the instance from **Available Servers** to **Selected Servers**.
4. Check **Use this dashboard as my default for new or unassigned servers,** if you want SQL Diagnostic Manager to use this design as the default Dashboard view for all of your new monitored SQL Server instances and any instance that does not currently have a designated default design.
5. Click **OK**.

Cache panel

The Cache panel tracks the database and procedure processes using a buffer pool of memory on your monitored SQL Server instance. Unexpected spikes in the buffer and procedure cache may alert you to check that you have enough memory for the current pool to function properly. Chronically high cache metrics may indicate the need for server maintenance, query tuning, or index updates to better handle the ongoing workload. For additional information, see Manage your procedure cache.

If the database cache size seems to be too small for optimal performance and there is very little available memory on the system, adding more memory to the system may increase performance. If there is a lot of available memory on the system and the database cache size is not growing beyond a certain point, the database cache size may be capped at an artificially low limit. Increasing this limit may increase performance.

Page Life Expectancy chart

The **Page Life Expectancy** chart provides the time in seconds that a page remains in the cache or buffer pool. The longer your page stays in the cache, the more likely the chance that SQL Server finds that data quickly without a read of physical media and minimize processing resource use. Use the Page Life Expectancy alert to warn you of issues.

Areas chart

The Areas chart displays the usage in megabytes of each type of cache in use.

Metric	Why it is important
Database	Indicates the amount of system memory (in MB) used by the database cache manager to hold commonly-used information from the database file(s) to prevent file operations.
Free	A low amount of free cache indicates a higher risk of performance issues.
Procedure Cache	Indicates the amount of space used to store query plans.
Other	Indicates the amount of space used by other processes.

Cache Hit Ratios gauge

The **Cache Hit Ratios** gauge displays the hit rates of the Buffer and Procedure cache in this SQL Server instance. Use the Procedure Cache Hit Ratio (Percent) alert to warn you of issues.

Available alerts

- Page Life Expectancy alert
- Procedure Cache Hit Ratio (Percent) alert

CPU panel

The CPU panel tracks the performance of the processor used by your monitored SQL Server. Unexpected spikes in CPU usage and call rates may warn you about the beginning of a serious performance issue. Chronically high CPU metrics may indicate the need for server maintenance, query tuning, or index updates to better handle the ongoing workload. For additional information, see how to get your CPU performance details.

Usage chart

The **CPU Usage** chart displays the percentage of processing power in use on the computer that hosts the SQL Server instance over a period of time. The CPU view on the Resources view allows you to track your CPU usage over a period of time, along with other key CPU statistics. For additional information about how SQL Diagnostic Manager works with virtual machines and collects metrics, see How SQL Diagnostic Manager works with a virtual environment.

Metric	Why it is important
SQL usage	A higher SQL usage can indicate that SQL Server is spending too much time processing queries.
Total usage	A high total CPU usage can indicate that this server does not have enough resources to adequately process its current workload.
VM usage	A high virtual machine usage can indicate that the processor power allocated to this VM is insufficient for its current workload.
Host usage	A high host server usage indicates the processing power on this host is insufficient to handle the workload of the currently active VMs.

Processor Queue Length gauge

The **CPU Processor Queue Length** gauge displays the current value of the processor queue length metric. Use this metric to determine how much work is waiting on this server. A high processor queue could indicate a blocking session or other performance issues.

Call Rates chart

The **CPU Call Rates** chart breaks down the processor workload into the number of batches, compilations, and transactions completed each second, giving you a detailed view of which activities are resource-intensive.

Metric	Why it is important
Batches/sec	A high throughput rate can indicate a higher risk of network, CPU, and resource issues as the SQL Server performance degrades.
Compiles/sec	A high number of compilations (greater than 100 per second) can indicate a high server workload or that there is more recompilation overhead than necessary.

Metric	Why it is important
Re-Compiles/sec	A high re-compilation rate can indicate excessive re-compilation overhead.
Transactions/sec	A high rate of transactions can indicate a higher risk of resource issues, such as blocks or locks, due to the heavier workload.

Differences in statistics

You may notice some difference in your statistics, such as your OS CPU usage being higher than your VM CPU usage. While the hypervisor manages resources efficiently, the demand for physical resources may be greater than what it has to provide. For example, a guest OS on a virtual machine submits a batch of work to a CPU for execution. However, all of the physical CPUs are committed to other work, so there is no physical CPU available on the host to process the work. In this situation, the VM has to wait for a CPU to become available to process its work. While it is waiting, the guest OS is unaware of the wait and assumes that it is simply taking longer for the CPU to process this batch of work, and the OS thinks it is using more CPU power than it is actually using.

Remember that SQL Diagnostic Manager uses the additional overhead of the hypervisor to calculate the VM metrics. In this situation, the hypervisor knows the VM is just waiting for a CPU, so it does not charge the VM for CPU processing power while it is waiting. The result is that the guest OS reports that it is using the additional processing power.

Available alerts

- Host CPU Usage (Percent) Alert
- OS Processor Time (Percent) Alert
- OS Processor Queue Length (Count) Alert
- SQL Server CPU Usage (Percent) Alert
- VM CPU Usage (Percent) Alert

Custom Counters panel

The Custom Counters panel displays the statistics for a selected custom counter on a monitored SQL Server instance. At least one custom counter must exist on the selected instance for this panel to display any data. Custom counters allow you to include more performance metrics than are provided by SQL Diagnostic Manager. For additional information about custom counters, see Use custom counters to track metrics.

Any alerts affecting the Custom Counters panel depend on the selected custom counter and alert threshold settings.

Databases panel

The Databases panel tracks the performance of the databases on your monitored SQL Server. Unexpected spikes in database usage may warn you about the beginning of a serious performance issue. This feature offers a number of different metric sets based on your preference, which allows you to view your database transactions, log flushes, reads, writes, or I/O stalls. For each metric set, you can view a list of your top 100 databases sorted by current usage of that metric, and a bar representing the relative size of the associated database. A trends chart displays the same data over a period of time for only your top five databases. For additional information, see Get the database status summary.

Transactions chart (per second)

The Transactions/sec chart displays the number of transactions per second occurring on the databases on your SQL Server instance.

Log flushes chart (per second)

The Log Flushes/sec chart displays the number of log flushes performed per second and usually matches the number of transactions per second. If you experience a disk bottleneck, review to see if your log flushes greatly outnumbers your transactions.

Reads chart (per second)

The **Reads/sec** chart displays the number of reads per second performed by the databases on your SQL Server instance.

Writes chart (per second)

The **Writes/sec** chart displays the number of writes per second performed by the databases on your SQL Server instance.

I/O stall chart (ms/sec)

The **I/O Stall ms/sec** chart displays the total time per second (in milliseconds) that the databases on your SQL Server instance were waiting on an I/O to complete. Chronically high I/O stall metrics may indicate a disk bottleneck.

Disk panel

The Disk panel tracks the performance of the disk used by your monitored SQL Server. Unexpected spikes in latency, throughput, or SQL Server IO may warn you about the beginning of a serious performance issue. Chronically high disk metrics can signify an insufficient IO subsystem, or excessive or inefficient IO activity on the server. Use the **Disk** view on the **Resources** tab to track several key disk statistics over a period of time. For additional information, see Get the disk performance details.

Latency chart

The **Disk Latency** chart plots the average time (in milliseconds) required to complete disk reads and writes, tracking the disk IO speed over time.

Metric	Why it is important
Average Disk ms/Read	Higher disk read times impact the ability of SQL queries to retrieve data from your databases.
Average Disk ms/Write	Higher disk write times impact the ability of SQL queries to update your databases, from simple text column modifications to dropping tables.

Throughput chart

The **Disk Throughput** chart plots the number of disk reads and writes over time.

Metric	Why it is important
Disk reads/sec	A high number of disk reads may indicate that the SQL Server is executing poorly-performing queries.
Disk writes/sec	A high number of disk writes may indicate that the SQL Server is running low on allocated memory.

SQL Server Physical I/O chart

The **SQL Server Physical I/O** chart breaks down the SQL Server throughput into its key component pieces, giving you a detailed view of how well SQL Server is processing your data requests and updates.

Metric	Why it is important
Checkpoint writes	A high number of checkpoint writes may indicate that pages are not written to disk quickly enough for optimal performance.
Lazy writer writes	A high number of lazy writer writes may indicate that the SQL Server is running low on allocated memory.

Metric	Why it is important
Page Reads	A high number of page reads may indicate that the SQL Server is executing inefficient queries or that you should optimize the database indexes.
Page Writes	A high number of page writes may indicate that the SQL Server is executing inefficient queries or that you should optimize the database indexes.
Read ahead reads	A high number of read-ahead reads may indicate that you should tune your query execution plan or that you should defragment the disk.

Available alerts

- Average Disk Milliseconds Per Read Alert
- Average Disk Milliseconds Per Write Alert
- Disk Reads (Per Second) Alert
- Disk Writes (Per Second) Alert

File Activity panel

The File Activity panel displays the top five database files with the highest relative activity since the last refresh. Available metrics allow you to view the top Reads/sec, Writes/sec, and Transfers/sec activity for all files or a selected database, disk, or file. Unexpected spikes in the amount of file activity may warn you of ineffective or excessive indexing or out-of-date statistics. For additional information, see View file activity.

I/O stall chart (ms/sec)

The **I/O Stall ms/sec** chart displays the total time per second (in milliseconds) that the SQL Server processes were waiting on an I/O to complete. Chronically high I/O stall metrics may indicate a disk bottleneck.

Reads chart (per second)

The **Reads/sec** chart displays the number of physical reads per second the disk sub-system is performing to bring SQL Server database pages into the data (buffer) cache. If the reads rate is excessive for a long period of time, consider taking action to avoid performance issues.

Reads KB chart (per second)

The **Reads KB/sec** chart displays the size of the physical reads per second the disk sub-system is performing to bring SQL Server database pages into the data (buffer) cache.

Total KB chart (per second)

The **Total KB/sec** chart displays the total size of activity per second across all databases on the monitored instance.

Writes chart (per second)

The **Writes/sec** chart displays the number of physical database writes per second the disk sub-system is performing. If the writes rate is excessive for a long period of time, consider taking action to avoid performance issues.

Writes KB chart (per second)

The **Writes KB/sec** chart displays the size of the physical database writes per second the disk sub-system is performing.

Transfers chart (per second)

The **Transfers/sec** chart displays the total number of transfers per second across all databases on the monitored instance. Transfers are the sum of reads and writes. A higher transfer rate indicates a higher risk of resource issues.

When the File Activity panel displays no data

There are circumstances under which the File Activity panel does not display any data. For example, when you lose connection to the Collection Service or SQL Diagnostic Manager Repository. Another reason is the lack of collection data points. On new instances, file activity collection occurs once per hour by default. By increasing the length of time shown on the desktop client views, you may be able to see more data points. You can modify the timeframe of data displayed in SQL Diagnostic Manager by clicking **Tools > Console Options** while in the File Activity view and changing the **Keep data for the last** and **Show data for the last** values.

You also can change the database collection interval and grooming options to help you see more data points. Use the **Collect and alert on database metrics** field in the General tab of the Monitored SQL Server Properties window to manage your database collection. For grooming options, use the **Groom Sessions, Queries, Deadlocks, Waits, and History Browser data older than** field in the Grooming Options window.

> ✓ Decreasing the collection interval and grooming your data less often can result in performance issues and require additional storage space in your Repository.

Activity for a new monitored SQL Server instance

The File Activity panel displays results based on activity since the last refresh. You must have two collections to create a point on the graph, three collections to create a line. By default, the database collection interval is set at one hour, which means that the File Activity panel does not show a point until an hour after adding the instance unless you perform a manual refresh. You can refresh and collect data by clicking the **Refresh** button in the SQL Diagnostic Manager Management Console menu bar.

Activity when using the History Browser

The History Browser allows you to view the state of your SQL Server instance at the time a snapshot occurs, which is every six minutes by default. When using the History Browser with the File Activity panel, note that data may appear in one snapshot but not in others because no file activity occurred during that interval. Remember that file activity data does not appear for the first two hours of monitoring a SQL Server instance because the metrics are based on the activity since the last database refresh.

Lock Waits panel

The Lock Waits panel tracks the total number waits caused when a task is waiting to acquire a lock on your monitored SQL Server. Unexpected spikes in the number of lock waits may warn you about the beginning of a serious performance issue. Chronically high lock wait numbers may indicate the need for server maintenance, query tuning, or index updates to better handle the ongoing workload. For additional information, see Analyze locked sessions.

Lock Waits chart

The Lock Waits chart displays the number of waits and the request type occurring.

Metric	**Why it is important**
Database	Indicates the time waiting for a database lock.
Extent	Indicates the time waiting for an extent lock.
File *SQL Server 2005 and above only*	Indicates the time waiting for a file lock.
HoBT *SQL Server 2005 and above only*	Indicates the time waiting for a Heap or BTree lock.
Key *SQL Server 2000 only*	Indicates the time waiting for a key lock.
Key/RID *SQL Server 2005 and above only*	Indicates the time waiting for a key or RID lock.
Metadata *SQL Server 2005 and above only*	Indicates the time waiting for a metadata lock.
Object *SQL Server 2005 and above only*	Indicates the time waiting for an object lock.
Page	Indicates the time waiting for a page lock.
RID *SQL Server 2000 only*	Indicates the time waiting for a relative identifier (RID) lock.
Table *SQL Server 2000 only*	Indicates the time waiting for a table lock.

Memory panel

The Memory panel tracks the usage and availability of memory on your monitored SQL Server computer. Unexpected spikes in memory usage can warn you about the beginning of a serious performance issue. Chronically high memory metrics may indicate the need for server maintenance, query tuning, or other diagnostics to better handle the ongoing workload. Use the **Memory** view on the **Resources** tab to track key memory statistics over a period of time. For additional information, see Get memory performance details.

SQL Server Usage chart

The **SQL Server Usage** chart compares the amount of memory allocated and used by SQL Server to the total memory consumed by a computer.

Metric	Why it is important
SQL allocated	Indicates how much available memory is allocated to SQL Server from the operating system (SQLOS). Compare this metric to how much memory is actually being used by SQL Server.
SQL used	Indicates how much memory is currently used by SQL Server from the total allocated (SQL allocated) to this application. A higher SQL memory percentage indicates that you may have poorly performing queries or a fragmented database.
Total used	Indicates how much physical memory is used by the operating system (SQL Server and other applications). A higher total memory percentage indicates that the overall workload of the SQL Server computer is too intensive for the available resources.

SQL Server Paging chart

The **SQL Server Paging** chart plots the number of swapped pages per second, over time, as calculated by the memory paging metric.

VM Memory Usage chart

The **VM Memory Usage** chart compares the amount of memory allocated and used by SQL Server to the total memory consumed by this virtual machine. For additional information about how SQL Diagnostic Manager works with virtual machines and collects metrics, see How SQL Diagnostic Manager works with a virtual environment.

Metric	Why it is important
Active	Indicates the amount of memory actively used by this virtual machine.
Ballooned	Indicates the amount of memory temporarily reclaimed by the host system for use in other areas. A higher ballooned value indicates that the host server is under memory pressure. Review your load balancing for the host server.

Metric	Why it is important
Consumed	Indicates the amount of memory consumed by this virtual machine. This value does not include shared memory or overhead memory for this VM.
Granted	Indicates the amount of physical memory granted by the host to this virtual machine.
Swapped	Indicates the amount of memory swapped to disk by the hypervisor.

Host Memory Usage chart

The **Host Memory Usage** chart compares the amount of memory allocated and used by SQL Server to the total memory consumed on this host server. For additional information about how SQL Diagnostic Manager works with virtual machines and collects metrics, see How SQL Diagnostic Manager works with a virtual environment.

Metric	Why it is important
Active	Indicates the amount of memory actively used by all of your VMs on this host server.
Ballooned	Indicates the amount of memory temporarily reclaimed by all of your VMs on the host system for use in other areas. A higher ballooned value indicates that the host server is under memory pressure. Review your load balancing for the host server.
Consumed	Indicates the amount of memory consumed by all of your VMs on this host server. This value does not include shared memory or overhead memory for these VMs.
Granted	Indicates the amount of physical memory granted by the host to all of your VMs.
Swapped	Indicates the amount of memory swapped to disk by the hypervisor.

Available alerts

- Host Memory Usage (Percent) Alert
- O/S Memory Usage (Percent) Alert
- O/S Paging Alert
- SQL Memory Usage (Percent) Alert
- VM Memory Usage (Percent)

Network panel

The Network panel tracks the performance of the network connection being used by your monitored SQL Server. Unexpected spikes in packet rates and response times may warn you about the beginning of a serious performance issue. Chronically high network metrics may indicate excessive network traffic or a high server workload, which may require you to move some monitored instances to other computers to free up network resources and balance the workload.

SQL Server Throughput chart

The **SQL Server Throughput** chart plots how many packets this SQL Server sends and receives over time.

Metric	Why it is important
Packets received/sec	A consistently high rate may indicate that the packet size is too small.
Packets sent/sec	A consistently high rate may indicate that the packet size is too small.

VM Network Usage Throughput chart

The **VM Network Usage Throughput** chart plots how much data this virtual machine transmits and receives in KB/second over time. For additional information about how SQL Diagnostic Manager works with virtual machines, see How SQL Diagnostic Manager works with a virtual environment.

Metric	Why it is important
Transmitted KB/sec	A consistently high rate may indicate that data throughput is saturated. Investigate load balancing your network traffic.
Received KB/sec	A consistently high rate may indicate that data throughput is saturated. Investigate load balancing your network traffic.

Host Network Usage Throughput chart

The **Host Network Usage Throughput** chart plots how much data this host server transmits and receives in KB/second over time. For additional information about how SQL Diagnostic Manager works with virtual machines, see How SQL Diagnostic Manager works with a virtual environment.

Metric	Why it is important
Transmitted KB/sec	A consistently high rate may indicate that data throughput is saturated. Investigate load balancing your network traffic.
Received KB/sec	A consistently high rate may indicate that data throughput is saturated. Investigate load balancing your network traffic.

Response Time gauge

The **Response Time** gauge displays the time (in milliseconds) SQL diagnostic manager currently needs to send a simple SQL command to the SQL Server instance, have it processed, and receive the returned result set. This value corresponds to the SQL Server Response Time metric.

Available alerts

- SQL Server Response Time Alert

Server Waits panel

The Server Waits panel tracks the total number and time spent on waits affecting your monitored SQL Server. Unexpected spikes in the number of server waits may warn you about the beginning of a serious performance issue. Chronically high server wait times may indicate the need for server maintenance, query tuning, or index updates to better handle the ongoing workload. For additional information, see View server waits.

✓ Server Waits chart data is not available for monitored servers using SQL Server 2000. For SQL Server 2000 users, SQL Diagnostic Manager monitors lock waits.

Server Waits chart

The Server Waits Chart displays the overall wait time for key areas on your monitored SQL Server instance.

Metric	Why it is important
I/O	Indicates the amount of input and output occurring on your SQL Server instance. A consistently high rate may indicate a higher risk of performance issues as the SQL Server processes wait for I/O to become available.
Locks	Indicates the wait time caused by locks on databases hosted by this SQL Server instance.
Log	Indicates the wait time related to database transaction logs.
Memory	Indicates all wait time related to memory operations.
Signal	Indicates that a SQL Server process is waiting for CPU time after the associated resources became available for processing.
Other	Indicates all lock waits not included in other categories and not excluded from monitoring.

Sessions panel

The Sessions panel tracks the performance of the active and blocked sessions running on your monitored SQL Server. Unexpected spikes in the number of concurrent blocked sessions may warn you about the beginning of a serious performance issue. Chronically high blocked and deadlocked sessions are a significant performance concern. For additional information, see Get sessions performance summary.

Activity & Blocking chart

The Activity and Blocking chart shows the total number of active sessions on your monitored SQL Server instance and any blocking or deadlocks that may occur between sessions.

Metric	Why it is important
Active	Indicates the number of active sessions on the SQL Server instance.
Blocked Sessions	Indicates the number of sessions on the SQL Server instance being blocked by other sessions holding requested locks.
Lead Blockers	Indicates sessions that block at least one session, which can then block other sessions.
Total Deadlocks	Indicates the total number of deadlocks on the SQL Server instance. A deadlock has no lead blocker and is circular in nature.

Client Computers gauge

The Client Computers gauge displays the total number of unique client computers connected to the SQL Server instance.

Available alerts

- Blocked Sessions Alert
- Client Computers Alert
- Total Deadlocks Alert

Tempdb panel

The Tempdb panel tracks the status of the tempdb database on your monitored SQL Server instance. Unexpected spikes in the use of tempdb usage and space may warn you to allocate additional space to prevent tempdb issues from causing a performance issue on your server. For additional information, see how to get the tempdb status summary.

✓ Problems with tempdb can cause an entire SQL Server instance to become inoperable.

Tempdb Space Used chart

The Tempdb Space Used chart provides different views of how your database is used over time based on the object type. Tempdb can fill up quickly when you are low on disk space and or have a low maximum size for database growth. In environments where read committed snapshot isolation is in use, long running transactions may also cause rapid growth in tempdb.

Metric	**Why it is important**
Internal	Indicates the amount of tempdb space used by internal objects.
Mixed	Indicates the amount of tempdb space used by mixed extents.
User	Indicates the amount of tempdb space used by user objects.
Version Store	Indicates the amount of tempdb space used by the version store.

Tempdb Contention chart

The Tempdb Contention chart provides the latch wait time for the allocation pages of your tempdb. These latch waits are associated with performance degradation for the related queries. Latch contention is usually an indication that you should create additional tempdb data files or if you already have multiple files, make adjustments so they are equally sized. For more information about tempdb contention, see Monitor your tempdb database.

Metric	**Why it is important**
GAM Page	Indicates the latch wait time for the global allocation map pages of tempdb.
PFS Page	Indicates the latch wait time for the page free space pages of tempdb.
SGAM Page	Indicates the latch wait time for the shared global allocation map pages of tempdb.

Version Store Cleanup Rate

The **Version Store Cleanup Rate** gauge displays the current version store cleanup rate and the version generation rate of the data rows necessary to support snapshot isolation. Maintaining a cleanup rate above or equal to the generation rate helps you avoid filling up tempdb. Note that long-running snapshot isolation transactions prevent cleanup of older entries in the tempdb version store, causing growth which can affect performance and cause tempdb to run out of space. When interpreting this gauge, note that version store cleanup occurs only once per minute while generation may be ongoing. For more information about tempdb version store, see Monitor your tempdb database.

Available alerts

- Tempdb Contention Alert
- Version Store Generation Ratio Alert
- Version Store Size Alert

Virtualization panel

The Virtualization panel tracks the performance of your virtual machine or host, depending on the selection in the panel. Unexpected spikes in virtual memory or disk usage may warn you about the beginning of a serious performance issue indicating the need for server maintenance to better handle the ongoing workload. For additional information about how SQL Diagnostic Manager works with virtual machines and collects metrics, see How SQL Diagnostic Manager works with a virtual environment.

✓ Note that you can customize your Dashboard view to include two Virtualization panels and add one for your virtual machine and the other for your host.

Virtual Memory Usage chart

The Virtual Memory Usage chart displays the amount of memory allocated and used by SQL Server to the total memory consumed on this VM or host server. The **Resources > Memory** view allows you to track your usage over a period of time, along with other key memory statistics. For additional information about how SQL Diagnostic Manager works with virtual machines and collects metrics, see How SQL Diagnostic Manager works with a virtual environment.

Metric	Why it is important
Active	Indicates the amount of active memory used by this virtual SQL Server instance.
Ballooned	Indicates the amount of ballooned memory on this virtual SQL Server instance. A spike in this value alerts you of the low memory status of the host.
Consumed	Indicates the amount of memory consumed by this virtual SQL Server instance.
Granted	Indicates the amount of memory granted to this virtual SQL Server instance.
Swapped	Indicates the amount of swapped memory on this virtual SQL Server instance. A spike in this value alerts you of the low memory status of the host.

CPU Ready Wait Time gauge

The CPU Ready Wait Time gauge displays the current gauge value of the vCPU Ready Time metric available on the Server Details view. Use this metric to determine the length of time that virtual CPU in your virtual machine is waiting on a physical CPU on your host to become available. A spike in this value may indicate over committed physical CPUs on the host server.

Virtual Disk Usage chart

The Virtual Disk Usage chart displays the amount of data read from and written to disk for the VM or host server during the sample interval. The **Resources > Disk** view allows you to track your usage over a period of time, along with other key disk statistics.

Metric	**Why it is important**
Disk Read	A high number of disk reads may indicate that the VM or host server is executing poorly-performing queries.
Disk Write	A high number of disk writes may indicate that the VM or host server is running low on allocated memory.

Available alerts

- Host Memory Swap Detected Alert
- VM CPU Ready Wait Time (ms) Alert
- VM Memory Swap Detected Alert
- VM Reclaimed/Ballooned Memory (KB) Alert

Get the SQL Server performance details

The Details view displays a list of properties for the selected SQL Server instance, a list of the collected metrics and their characteristics, and provides a chart for you to graphically display metrics selected from the displayed list. For each metric, SQL Diagnostic Manager displays the current value, value range for reference, alert status, metric category, thresholds for each alert, and whether the metric is a custom counter. To add a metric to the Details chart, check the check box in the chart column for the appropriate metric.

✓ All fields highlighted in the **State** column are associated with alerts. Right-click any of these metrics and select **Configure Alerts** to edit the associated thresholds.

Access the Details view

You can open the Details view of the SQL Diagnostic Manager Overview tab by selecting the appropriate SQL Server instance, and then clicking **Overview > Details** .

SQL Server instance properties area

The following properties are displayed for the selected monitored SQL Server instance.

Version

Indicates the current SQL Server version including service pack and build information on this SQL Server instance.

Edition

Indicates the current SQL Server edition, including Enterprise, Business Intelligence, or Standard, installed on this SQL Server instance.

Running

Indicates the timestamp associated with the most recent restart of this SQL Server instance.

Clustered

Indicates whether this SQL Server instance is part of a cluster. If it is part of a cluster, SQL Diagnostic Manager displays the name of the active node.

Processors

Indicates the total number of processors associated with this SQL Server instance and how many of these processors are currently in use.

Host

Indicates the name of the server hosting this SQL Server instance.

Host OS

Indicates the current operating system on the server hosting this SQL Server instance.

Host Memory

Indicates the total amount of memory on the server hosting this SQL Server instance.

Databases

Indicates the current number of databases on this SQL Server instance.

Data Size

Indicates the current size of the data on this SQL Server instance.

Log Size

Indicates the current size of the log files on this SQL Server instance.

VM Name

Indicates the name of the virtual machine on which this monitored SQL Server instance is running.

Virtualization Host Server

Indicates the name or IP address of the virtualization host server on which this virtual machine is running.

Host Memory

Indicates the total amount of memory on the host server on which this virtual machine is running.

Host Physical Processors

Indicates the total number of physical processors associated with the host server on which this virtual machine is running.

Host Logical Processors

Indicates the total number of logical processors associated with the host server on which this virtual machine is running. The number of logical processors is different from the number of physical processors only if the CPU on the host server supports Hyper-Threading.

Understanding your chart data and refresh interval

SQL Diagnostic Manager charts provide data whether collected real time or as part of a scheduled collection event. For additional information about how SQL Diagnostic Manager displays your chart data, see Charts.

Monitor SQL Server configuration settings

The Configuration view allows you to view the SQL Server configuration settings for the selected SQL Server instance. When diagnosing problems with SQL Server performance it is helpful to see how it is configured. In addition, SQL Diagnostic Manager offers the ability to edit some configuration settings, depending on the option selected.

Access the Configuration view

You can open the Configuration view of the SQL Diagnostic Manager Overview tab by selecting the appropriate SQL Server instance, and clicking **Overview > Configuration**.

To edit a configuration setting:

1. Select an option from the list.
2. Click the **Edit Value** hyperlink in the Details pane.
3. Enter the new value.
4. Click **OK**.

Edit your configuration value

The Edit Configuration Value window allows you to enter a new value for the selected SQL Server instance configuration option. Any change to the selected value does not take effect until you restart the selected SQL Server instance.

Access the Edit Configuration Value window

You can access the Edit Configuration Value window by selecting an option, and then click the **Edit Value** option located in the Details pane.

View active alerts for this instance

The Active Alerts view allows you to view a list of all the active alerts as of the last data collection. Click any alert in the list to view details at the bottom of the window.

Access the Active Alerts view

You can open the Active Alerts view of the SQL Diagnostic Manager Overview tab by selecting the appropriate SQL Server instance, and clicking **Overview > Active Alerts**.

Available actions

The Active Alerts view includes the 12-Hour Forecast option to display the likelihood an alert is generated at a given time during the day, broken down into two-hour segments. This information helps you know on which areas you should concentrate your focus to avoid problems within your SQL Server environment.

In addition to providing the ability to see all your active alerts in a single window, the Active Alerts view allows you to perform the following functions via the right-click context menu for each alert:

- Open the Real Time view for more information on the metric that caused the alert.
- Open the Historical view to review the history of the metric that caused the alert. The **Show Historical View** option is not available for all alerts.
- Open the Show Details view for more information on the metric that caused the alert. The **Show Details View** option is not available for all alerts.
- Open the SQL Diagnostic Manager online help to the topic for the selected alert.
- Clear the selected alert or clear all alerts of the selected type for this SQL Server instance. The **Clear Alert** and **Clear All Alerts of this Type for this Instance** options are not available for all alerts.
- Open the alert configuration for the metric.
- Snooze the alert for a set period of time.
- Collapse or expand all of the displayed alert groups. This option is available only when you use the **Group By Box** functionality.
- You can also print, export results to Microsoft Excel, and copy the alert information to your Clipboard for additional use.

Get a 12-hour forecast of alert activity

Using current and historical data, SQL Diagnostic Manager uses statistical analysis to estimate the likelihood that an event generates a particular alert. This forecasting lets you proactively focus on certain areas in your SQL Server environment and prevent problems from occurring.

SQL Diagnostic Manager begins building forecasting models once you receive three critical or warning alerts for a given metric.

The 12-hour Forecast is separated into two-hour segments. Each two-hour segment displays the chance of an alert occurrence. Click the associated percentage chance to see the alert forecast details. This window displays the alerts that may occur over the two-hour time segment.

12 Hour Forecast icons

Icon	Description
✓	**OK** - There is a low chance (less than 20%) that a warning or critical alert occurs in the two-hour time segment leading to the forecast time.
⚠	**Warning** - There is a moderate likelihood (less than 50%) that a critical alert occurs, or a high likelihood (50% or higher) that a warning alert occurs, in the two-hour time segment leading to the forecast time.
✖	**Critical** - There is a very high likelihood (50% or higher) that a critical alert occurs in the two-hour time segment leading to the forecast time.

Alert forecast details

The Alert Forecast Details window displays the Server, Alert Metric, the likelihood the alert occurs, and the type of alert expected in the two-hour window leading up to this forecast time. To sort the list, click any column heading.

Snooze alerts

You have the ability in SQL Diagnostic Manager to snooze or pause all alert generation for a specified period of time. For example, you can snooze a specific alert through the Active Alerts tab. Right-click the alert that you no longer want to view, and then select **Snooze Alert**.

If you want to pause multiple alerts at the same time, you can mass snooze alert generation. To mass snooze, right-click a specific instance, and select **Snooze Alerts**. This option is also accessible when right-clicking a specific tag, using certain server views, and when using the Tools menu.

This feature is important if you are working on known issues and you want to avoid unnecessary alert traffic.

✓ The **Resume Alerts** option allows you to resume any alerts set to snooze.

View past performance

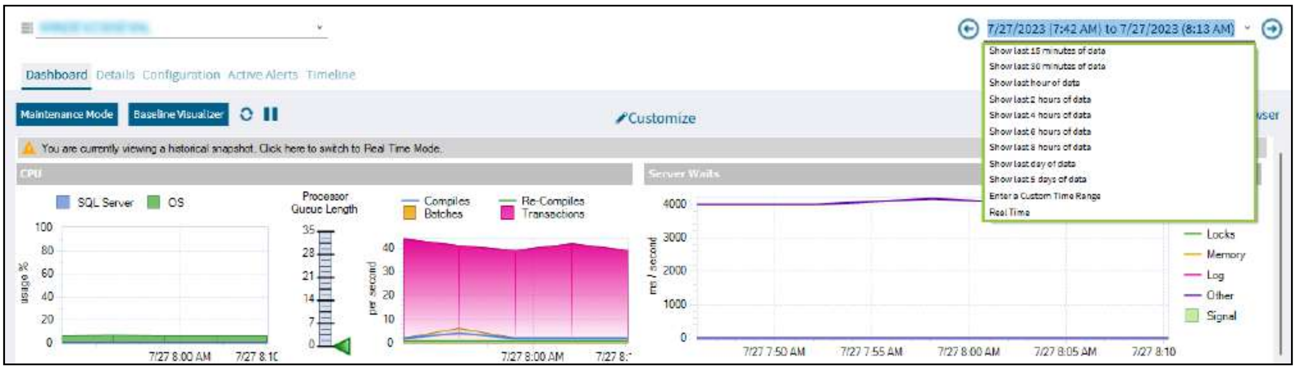
The History Browser is intended to provide information about the state of your SQL Server instance at the time a standard snapshot is taken. You can use this information to diagnose and resolve issues to keep the issue from happening again. The History Browser allows you to select a historical snapshot collected by the standard refresh and view the data that was collected using almost all the SQL Diagnostic Manager real-time views.

> ⓘ By default, Session details and inactive alerts are stored for 31 days while standard metric information is stored for 365 days. You can edit these options on the Grooming Options window.

Historical Snapshot drop-down

SQL Diagnostic Manager has a historical snapshot drop-down in the top-right corner, the drop-down allows you to retrieve faster historical and real-time data. The following options are available for data retrieval:

- Real Time
- Show last 15 minutes of data
- Show last 30 minutes of data
- Show last hour of data
- Show last 2 hours of data
- Show last 4 hours of data
- Shot last 6 hours of data
- Show last day of data
- Show last 5 days of data
- Enter a Custom Time Range



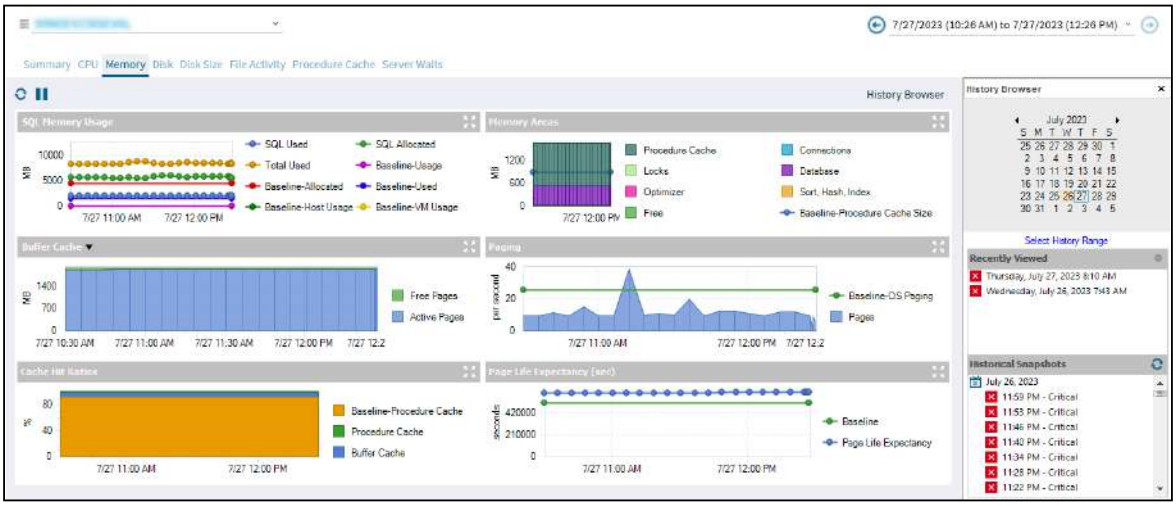
7/27/2023 (7:42 AM) to 7/27/2023 (8:13 AM)

You are currently viewing a historical snapshot. Click here to switch to Real Time Mode.

Select a specific snapshot in time in the History Browser

To select a specific snapshot:

1. Open the History Browser.
2. Select the date from the calendar. You can also select the time range to filter the number of snapshots displayed.
3. Select the corresponding snapshot from the Historical Snapshots list.



The icons next to each snapshot represent the highest level of alert thresholds violated. These icons can help you identify a specific snapshot. In addition, you can hover over snapshots in the list to see the most critical alerts associated with the snapshot.

The alert status listed by snapshots in the History Browser may not reflect the latest status due to delays in writing history to the repository. This status corrects eventually in the History Browser.

Alerts with associated views that support historical snapshots

On the Alerts view, some of the alerts allow you to retrieve the associated view when the alert is activated. To access this view, right-click the alert and click **Show Historical View** in the **Details** pane.

The following table displays a list of alerts that provide an associated view in SQL Diagnostic Manager.

Alert	Associated View
Average Disk Milliseconds Per Read	Resources
Average Disk Milliseconds Per Transfer	Resources
Average Disk Milliseconds Per Write	Resources
Blocked Sessions (Count)	Sessions
Blocking Session Wait Time (Seconds)	Sessions
Client Computers (Count)	Sessions

Alert	Associated View
Databases Read/Write Errors Occurred	Databases
Disk Reads Per Second	Resources
Disk Transfers Per Second	Resources
Disk Writes Per Second	Resources
Host CPU Usage (Percent)	Resources
Host Memory Usage (Percent)	Resources
Oldest Open Transactions (Minutes)	Sessions
OS Average Disk Queue Length (Count)	Resources
OS Average Disk Queue Length Per Disk (Count)	Resources
OS Disk Time (Percent)	Resources
OS Disk Time Per Disk (Percent)	Resources
OS Memory Usage (Percent)	Resources
OS Paging (Per Second)	Resources
OS Privileged Time (Percent)	Resources
OS Processor Queue Length (Count)	Resources
OS Processor Time (Percent)	Resources
Page Life Expectancy	Server
Session CPU Time (Seconds)	Sessions
SQL Server CPU Usage (Percent)	Resources

Alert	Associated View
SQL Server Memory Usage (Percent)	Resources
SQL Server Response Time (Milliseconds)	Sessions
Tempdb Contention (ms)	Databases
User Connections (Percent)	Sessions
VM CPU Usage (Percent)	Resources
VM Memory Usage (Percent)	Resources

Views that support historical snapshots

Users may notify you of SQL Server problems that have happened in the past. Using the History Browser, you can go back to a point in time and view the state of your system and also compare system states at different points in time.

The following views support historical snapshots:

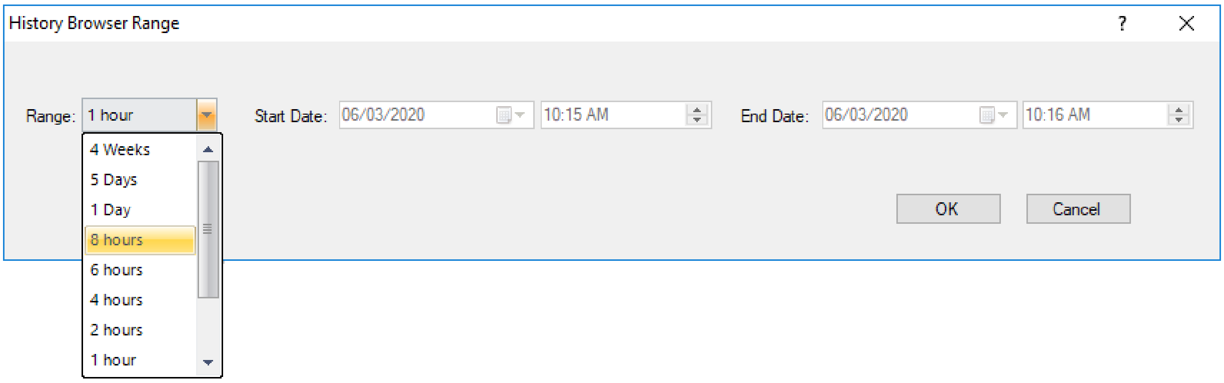
- Overview > Dashboard
- Overview > Details
- Overview > Active Alerts
- Sessions > Summary
- Sessions > Details
- Sessions > Locks
- Sessions > Blocking
- Queries > Signature Mode
- Queries > Statement Mode
- Queries > Query History
- Queries > Query Waits
- Resources > Summary
- Resources > CPU
- Resources > Memory
- Resources > Disk
- Resources > File Activity
- Resources > Server Waits
- Databases > Tempdb Summary
- Databases > Availability Group
- Analyze > History

History Browser Range

Find the History Browser Range access in the Web Console, in the History Browser of the Desktop Client console, and when you select 'Enter a Custom Time Range' from the Historical Snapshot drop-down.

Follow these steps to configure the History Browser Range:

1. In the desktop console, click **History Browser**.
2. Under the calendar select the option **Select History Range.**
3. The History Browser Range window opens.
4. Select the range from the drop down list scale, these options are the following: 4 Weeks, 5 Days, 1 Day, 8 hours, 6 Hours, 4 hours, 2 Hours, 1 hour, 30 minutes, 15 minutes, and Custom.
5. When selecting **Custom**, the user needs to select a Start Date/Time and End Date/Time.
6. Click **OK**.



History Browser Range

Range: 1 hour

Start Date: 06/03/2020 10:15 AM

End Date: 06/03/2020 10:16 AM

Pause alerts and decrease collection

Maintenance Mode allows you to temporarily stop alert generation and the collection of performance metrics for the selected SQL Server instances. Using Maintenance Mode on one instance does not prevent the collection of performance metrics and notifications for those instances that are not in Maintenance Mode.

⚠ If you open a SQL Diagnostic Manager dashboard for an instance that is in Maintenance Mode, real-time data collection will be attempted.

✓ It is possible to enable or disable maintenance mode on several SQL Server instances, see About Mass Maintenance Mode.

Uses for putting a SQL Server instance into Maintenance Mode

Enable Maintenance Mode before you begin any regularly scheduled maintenance or testing on a monitored SQL Server instance. You can also enable Maintenance Mode when you need to bring a SQL Server instance offline for unplanned diagnostics.

Be aware that the total number of monitored SQL Server instances allowed by your license includes monitored instances that are in Maintenance Mode.

Bring the SQL Server back online in SQL Diagnostic Manager

Disabling Maintenance Mode allows SQL Diagnostic Manager to resume performance statistics collection and alert generation for the selected SQL Server instance. Before you enable Maintenance Mode, make sure you complete all maintenance and testing on the target SQL Server instance.

If you have a SQL Server instance in Maintenance Mode and are ready to bring it back online in SQL Diagnostic Manager, click **Maintenance Mode** on the Server Overview tab.

Configure SQL Diagnostic Manager monitoring properties

The Monitored SQL Server Properties window allows you to edit the SQL Diagnostic Manager monitoring settings for the registered SQL Server instance. To access the Monitored SQL Server Properties window, right-click a SQL Server instance from the **Server** tree and select **Properties**.

The Monitored SQL Server Properties window includes the following tabs:

General

The General tab displays common properties such as the data collection interval, credentials, and encryption options.

Baseline Configuration

The Baseline Configuration option allows you to set the date range and time used to calculate a performance baseline for the monitored SQL Server instance.

Query Monitor

Allows you to enable or disable query monitoring, and set the options for Query Monitor.

Activity Monitor

Allows you to enable or disable monitoring of non-query activities, and set the options for Activity Monitor.

Replication

The Replication tab lets you disable replication statistics collection to conserve system resources.

Table Statistics

The Table Statistics tab allows you to select the time and days SQL Diagnostic Manager collects table statistics on your SQL Server instance. In addition, you can select the minimum size table needed for SQL Diagnostic Manager to rebuild the index.

Custom Counters

Allows you to link custom counters to the monitored SQL Server instance.

Maintenance Mode

The Maintenance Mode tab allows you to enter the maintenance schedule for your server. This allows you to turn off alerts and notifications for the time periods when you know the server is unavailable.

OS Metrics

The OS Metrics tab allows you to select how you want your operating system data collected, whether through OLE automation or direct WMI. You can also choose to not collect OS data.

Disk Drives

The Disk Drives tab allows SQL Diagnostic Manager to alert on disk drives and database space calculations for the monitored SQL Server instance.

Cluster Settings

The Cluster Settings lets SQL Diagnostic Manager trigger an alert whenever a cluster is running on a non-preferred node within a clustered environment.

Wait Monitoring

The Wait Monitoring allows you to collect and view wait statistics in the hopes of diagnosing any bottleneck on your system.

Virtualization

The Virtualization displays the name of the host server on which the selected monitored SQL Server instance is running.

Analysis Configuration

Allows you to schedule a prescriptive analysis of your monitored SQL Server instance. For more information, visit Configure prescriptive analysis options.

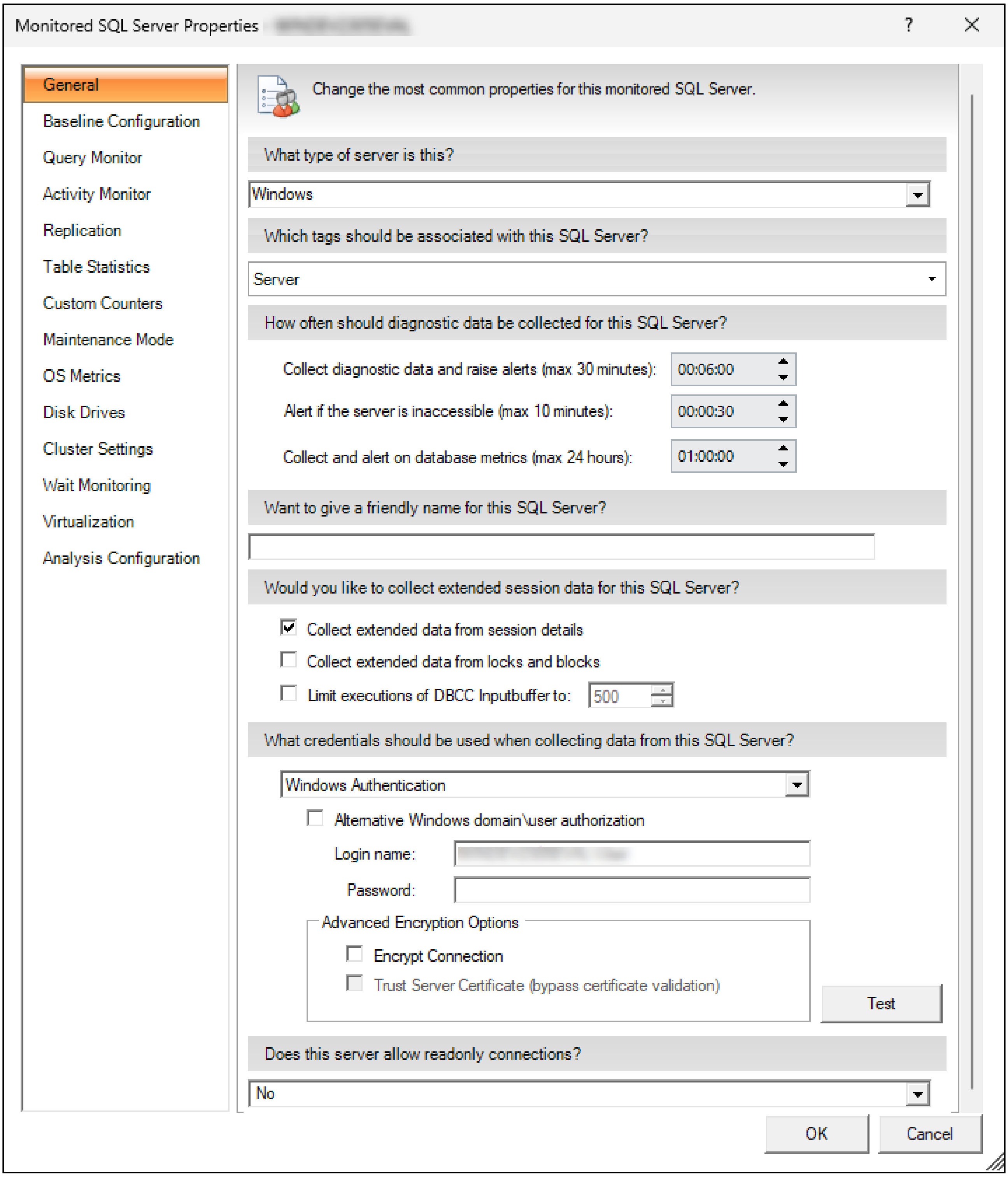
Set general server options

The General tab of SQL Diagnostic Manager allows you to edit the most common property settings such as:

- Select the type of server
- Associate tags with an instance
- Select a diagnostic data collection interval
- Assign a friendly name to your SQL Server instance
- Collect extended session data
- Assign data collection credentials
- Select encryption options
- Configure read-only connections

Access the General tab

You can access the General tab of the Monitor SQL Server Properties window by right-clicking the appropriate monitored SQL Server instance, and then selecting **Properties**.



Monitored SQL Server Properties [redacted]

Change the most common properties for this monitored SQL Server.

What type of server is this?

Windows

Which tags should be associated with this SQL Server?

Server

How often should diagnostic data be collected for this SQL Server?

Collect diagnostic data and raise alerts (max 30 minutes): 00:06:00

Alert if the server is inaccessible (max 10 minutes): 00:00:30

Collect and alert on database metrics (max 24 hours): 01:00:00

Want to give a friendly name for this SQL Server?

Would you like to collect extended session data for this SQL Server?

☑ Collect extended data from session details

☐ Collect extended data from locks and blocks

☐ Limit executions of DBCC Inputbuffer to: 500

What credentials should be used when collecting data from this SQL Server?

Windows Authentication

☐ Alternative Windows domain\user authorization

Login name: [redacted]

Password:

Advanced Encryption Options

☐ Encrypt Connection

☐ Trust Server Certificate (bypass certificate validation)

Does this server allow readonly connections?

No

Select the type of the monitored server

The drop-down menu allows you to identify the type of server you are monitoring, and select from the following options: Windows, Amazon RDS SQL Server (RDS SQL), Microsoft Azure SQL Database (AzureDB), or Linux.

Associate tags with an instance

The tag field allows you to select a tag to add your server to or add a new tag. Tags help you organize server instances into meaningful groups.

Select a diagnostic data collection interval

The data collection interval is the amount of time SQL Diagnostic Manager waits between each collection of data on the selected SQL Server instance. You can set a different interval for each of the following functions:

Collect diagnostic data and raise alerts (max 30 minutes)

The interval between times that the SQLDM Collection Service collects diagnostic data and raises the associated alerts. Lower values cause SQL Diagnostic Manager to raise alerts more quickly but also cause more frequent refreshes, which increases your monitoring overhead.

Alert if the server is inaccessible (max 10 minutes)

The server availability verification interval is the amount of time SQL Diagnostic Manager waits between verifying availability on the selected SQL Server instance. If the connection test collector does not complete within the time specified in the **Alert if the server is inaccessible (max 10 minutes)** field, the SQL Server instance is considered unresponsive. Setting this field to a very low value can result in false positive alerts.

Collect and alert on database metrics (max 24 hours)

The interval between times that the SQL Diagnostic Manager Collection Service collects database space-related data and raises the associated alerts. Lower values cause SQL Diagnostic Manager to raise alerts more quickly but also cause more frequent refreshes, which increases your monitoring overhead. In environments with a large number of databases whose sizes do not change rapidly, setting the database data collection to a long interval can greatly reduce the monitoring footprint.

By default, SQL Diagnostic Manager collects diagnostic data every six minutes and database data every 60 minutes. Consider the following factors before selecting your data collection interval:

Data collection purpose

If your goal with this data collection is to identify broad trends and alerts on critical downtime, then a longer refresh interval is appropriate. If you are closely monitoring your SQL Server instance for minute-by-minute changes, use a shorter duration.

Data collection frequency

When diagnosing specific problems or when working with a problematic SQL Server instance, a short interval lets you capture enough data to diagnose the issue. In most situations, the default interval provides sufficient data for your diagnostic needs. Note that SQL Server instances used only occasionally may require less monitoring attention.

Notification of existing or potential problems

Remember that a lower collection interval results in SQL Diagnostic Manager raising alerts more quickly, but also increases your monitoring overhead. This is true when any setting causes more frequent refreshes.

System resource impact

Although SQL Diagnostic Manager limits the amount of system resource impact when collecting data, short collection times on SQL Server instances with large amounts of data could potentially cause system performance degradation. Using the default interval should meet your data collection needs while limiting any system resource impacts.

Space needed for the SQL Diagnostic Manager Repository

A lower collection interval results in more frequent refreshes which are all stored in the SQL Diagnostic Manager Repository. Make sure you have enough available space to accommodate these lower settings.

Data spikes

SQL Diagnostic Manager averages most metrics over the timeframe between collections. More frequent data collection causes increased movement in averages because of short-duration events. For example, a 15-second CPU spike has a greater effect on a one-minute refresh than on a six-minute refresh. You can use alert smoothing to reduce the impact of data spikes on a per-alert basis.

Assign a friendly name to your SQL Server instance

SQL Diagnostic Manager allows you to assign a friendly name to your monitored SQL Server instance that is meaningful to you and easy to identify. SQL Diagnostic Manager displays the friendly name in the server tree of the desktop client and the web console.

Collect extended session data

The extended session collection data includes important session information, such as details, locks, and blocks. If this information is important to you, make sure the **Collect extended session data, including session details, locks, and blocks** check box is selected.

> ⓘ The extended session collection data gathers all the executing sessions, the idle sessions, and all the outstanding locks; regardless of their blocking status. This information includes tempdb usage data which is used to populate the session list in the tempdb view.

Limit the number of DBCC Inputbuffer executions

You can limit the number of executions performed by the DBCC Inputbuffer, which retrieves the actual input command for the Session Details view, among others. Note that on busy servers, decreasing the **Limit executions of DBCC Inputbuffer to** value can reduce monitoring impact.

Data collection credentials

SQL Diagnostic Manager uses the specified credentials to collect data from the monitored SQL Server instance. You can choose to use either Windows authentication or SQL Server authentication.

Windows authentication

Windows Authentication uses the security of the operating system to create a trusted connection only if the account matches a security account defined in SQL Server. This security account must have sufficient permissions on the monitored instance to collect data and OS metrics.

SQL Server authentication

Select this option to use the credentials of a specific SQL Server account.

ⓘ From SQL Diagnostic Manager 12.0, you can monitor across untrusted domains by selecting the **Alternative windows domain/user authorization**.

Select encryption options

SQL Diagnostic Manager allows you to designate encryption methods used to encrypt data between the Collection Service and the monitored SQL Server instance. You can choose to use SSL or SSL with a Trust Service Certificate.

Encrypt Connection (SSL)

This option sets a flag in the connection properties that are used when the collection service connects to a monitored server that specifies that SSL (Secure Sockets Layer) is used to encrypt the data between the collection service and the monitored SQL Server instance. For this option to work correctly, configure the monitored SQL Server instance to support encryption.

Trust Server Certificate (Bypass Certificate Validation)

This option is available only when the Encrypt Connection (SSL) is selected. This option allows you to skip the certificate validation when a SQL Server instance establishes a connection. If SSL on the monitored SQL Server instance is not configured to use a certificate that the collection service trusts, the connection is rejected unless the Trust Server Certificate option is selected.

Configure read-only connections

SQL Diagnostic Manager allows you to set up read-only connections for a specific instance.

Configure server baseline options

The Baseline Configuration tab of the Monitored SQL Server Properties window allows you to configure your server baseline options. SQL Diagnostic Manager calculates a baseline out of a pool of collected data based on the selected period and collection interval and is represented by mean, standard deviation, minimum, maximum, and count statistics.

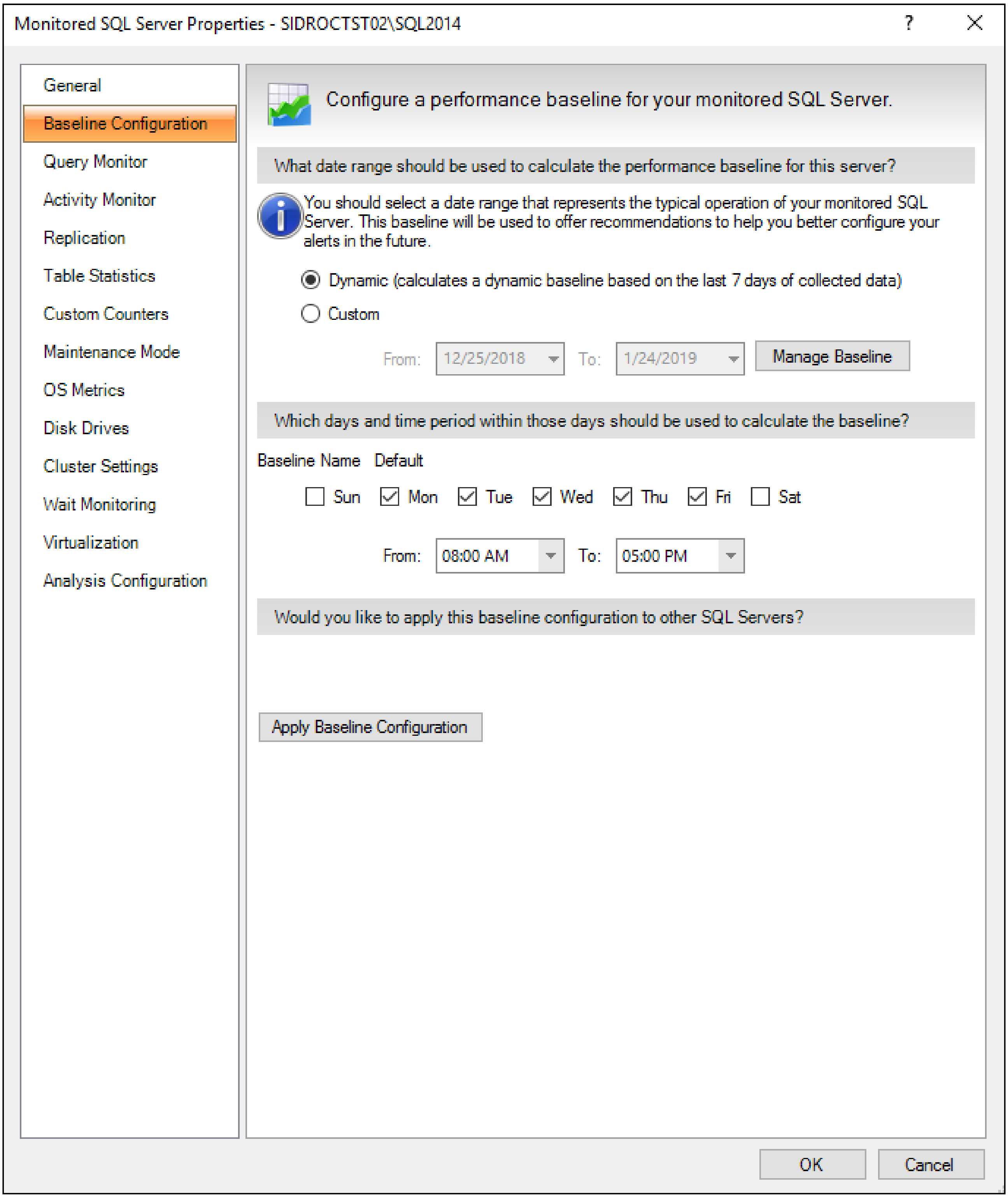
Some benefits of using this feature include:

- **Effective alert thresholds** - SQL Diagnostic Manager uses the baseline to provide alert recommendations which you can use to set effective alert thresholds.
- **Effective baseline periods** - Use the Baseline Visualizer to clearly visualize when to establish baseline periods.
- **Alerting and recommendations**
- **Multiple baselines** - Define and schedule multiple baselines per server.
- **Quick propagation of baselines** - Apply baselines to more than one instance.
- **Baseline display in metric graphs** - View relevant baseline in effect in various metric graphs of the Resources tab.

> ❗ User accounts with the View privilege can access the Baseline Configuration window, but cannot make any changes. User accounts with the Modify privilege can make changes to the baseline configuration of their monitored SQL Server instances.

Access the Baseline Configuration tab

You can access the Baseline Configuration tab of the Monitor SQL Server Properties window by right-clicking the appropriate monitored SQL Server instance, and then selecting **Baseline Configuration**.


Monitored SQL Server Properties - SIDROCTST02\SQL2014

Configure a performance baseline for your monitored SQL Server.

What date range should be used to calculate the performance baseline for this server?

You should select a date range that represents the typical operation of your monitored SQL Server. This baseline will be used to offer recommendations to help you better configure your alerts in the future.

● Dynamic (calculates a dynamic baseline based on the last 7 days of collected data)

○ Custom

From: 12/25/2018 To: 1/24/2019

Which days and time period within those days should be used to calculate the baseline?

Baseline Name Default

□ Sun ☑ Mon ☑ Tue ☑ Wed ☑ Thu ☑ Fri □ Sat

From: 08:00 AM To: 05:00 PM

Would you like to apply this baseline configuration to other SQL Servers?

Select a baseline period

The baseline period you specify should represent a typical operation of the monitored SQL Server instances to which this baseline applies.

Dynamic

Calculates a dynamic baseline based on a moving window of the past seven days of collected data.

Custom

Allows you to set a specific time range that does not change.

Select days and time periods

SQL Diagnostic Manager allows you to select the date range used to calculate the performance baseline for one or more selected SQL Server instances. The day and time period fields allow you to select the days and times on which to base your alert baseline calculations. These settings apply to both the Automatic and Custom baseline selections.

✓ When your SQL Server instances are not busy, clear the days and times to remove them from the calculation and provide a more realistic and accurate baseline.

Add multiple baselines

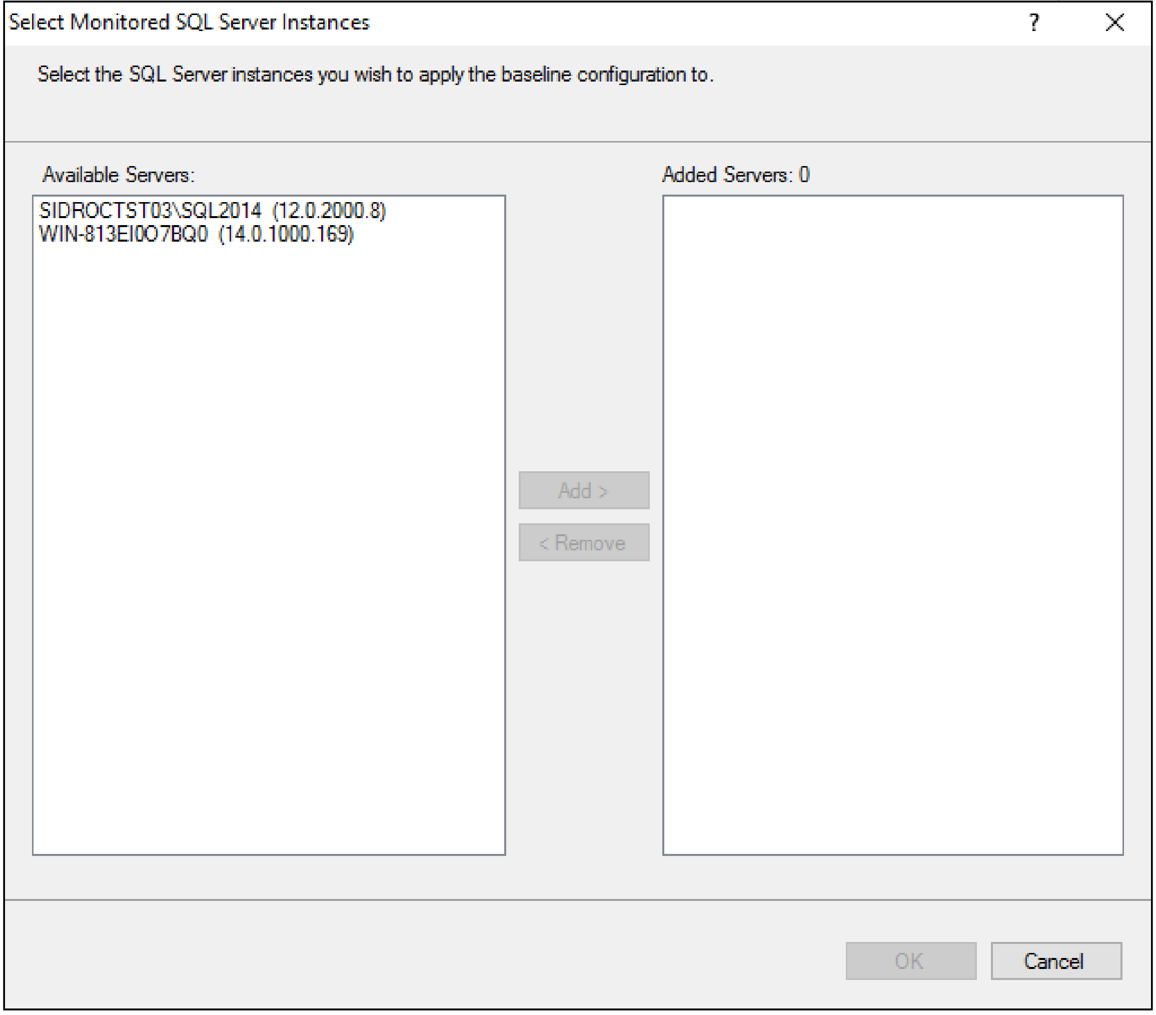
SQL Diagnostic Manager allows you to add and schedule multiple baseline periods in addition to the default one. Open the Add baseline window by clicking the **Manage Baseline** button. For more information, see Schedule multiple baselines.

Apply the baseline to more than one instance

You can apply the baseline configuration from a specific server to additional instances not included when you originally created the baseline configuration.

To add a baseline configuration to additional instances:

1. Click **Apply Baseline Configuration** to display the Select Monitored SQL Server Instances dialog.


Select Monitored SQL Server Instances
?
Select the SQL Server instances you wish to apply the baseline configuration to.
Available Servers:
Added Servers: 0
Add >
< Remove
OK
Cancel

SIDROCTST03\SQL2014 (12.0.2000.8)
WIN-813EI0O7BQ0 (14.0.1000.169)

2. Select the appropriate instances from the **Available Servers** list, and then click **Add >** to move them to the **Added Servers** list.
3. Click **OK** to confirm your selection and allow SQL Diagnostic Manager to apply this configuration to other instances.

✓ When verifying your baseline configuration changes for more than one instance in the Change Log view, note that instance property changes are logged only once. In comparison, baseline configuration changes are logged as many times as the number of instances affected by the change.

Metrics used in baseline calculations

SQL Diagnostic Manager uses the following metrics when calculating a baseline for a monitored SQL Server instance:

- Available Memory
- Batches Per Second
- Blocked Sessions
- Buffer Cache Hit Ratio
- Buffer Cache Size

- Checkpoint Writes Per Second
- Client Computers
- Data File Count
- Data File Space Allocated
- Data File Space Used
- Data File Space Used (Percent)
- Database Count
- Disk Queue Length
- Disk Time (Percent)
- Distribution Latency
- Host CPU Usage
- Host CPU Usage MHz
- Host Disk Device Latency
- Host Disk Kernel Latency
- Host Disk Queue Latency
- Host Disk Read
- Host Disk Total Latency
- Host Disk Usage
- Host Disk Write
- Host Memory Swap In Rate
- Host Memory Swap Out Rate
- Host Memory Active
- Host Memory Ballooned
- Host Memory Consumed
- Host Memory Granted
- Host Memory Usage
- Host Net Received
- Host Net Transmitted
- Host Net Usage
- Full Scans Per Second
- Lazy Writer Writes Per Second
- Lock Waits Per Second
- Log File Count
- Log File Space Allocated
- Log File Space Used
- Log File Space Used (Percent)
- Log Flushes Per Second
- Logins Per Second
- Oldest Open Transaction (Minutes)
- Open Transactions
- OS CPU Privileged Activity
- OS CPU User Time
- OS Memory Used (Percent)
- OS Total Processor Activity
- Packet Errors Per Second
- Packets Received Per Second
- Packets Sent Per Second
- Page Life Expectancy
- Page Lookups Per Second
- Page Reads Per Second
- Page Splits Per Second
- Page Writes Per Second

- Pages Per Second
- Physical Memory
- Procedure Cache Hit Ratio
- Procedure Cache Size
- Processor Queue Length
- Read Ahead Pages Per Second
- Replication Latency (Seconds)
- Replication Subscribed
- Response Time
- SQL Compilations Per Second
- SQL CPU Activity
- SQL Memory Allocated
- SQL Memory Used
- SQL Recompilations Per Second
- System Processes
- System Processes Consuming CPU
- Table Lock Escalations
- Tempdb GAM Wait Time Milliseconds
- Tempdb PFS Wait Time Milliseconds
- Tempdb SGAM Wait Time Milliseconds
- Tempdb Size
- Tempdb Size Percent
- Undistributed Transactions
- Unsubscribed Transactions
- Used Memory (Percent)
- User Connections (Percent)
- User Processes
- User Processes Consuming CPU
- Version Store Generation
- Version Store Size
- VM CPU Ready
- VM CPU Swap Wait
- VM CPU Usage
- VM CPU Usage MHz
- VM Disk Read
- VM Disk Usage
- VM Disk Write
- VM Memory Active
- VM Memory Ballooned
- VM Memory Consumed
- VM memory Granted
- VM Memory Swap In Wait
- VM Memory Swap Out Rate
- VM Memory Swapped
- VM Memory Usage
- VM Net Received
- VM Net Transmitted
- VM Net Usage
- Workfiles Created Per Second
- Worktables Created Per Second

Apply baseline to multiple instances

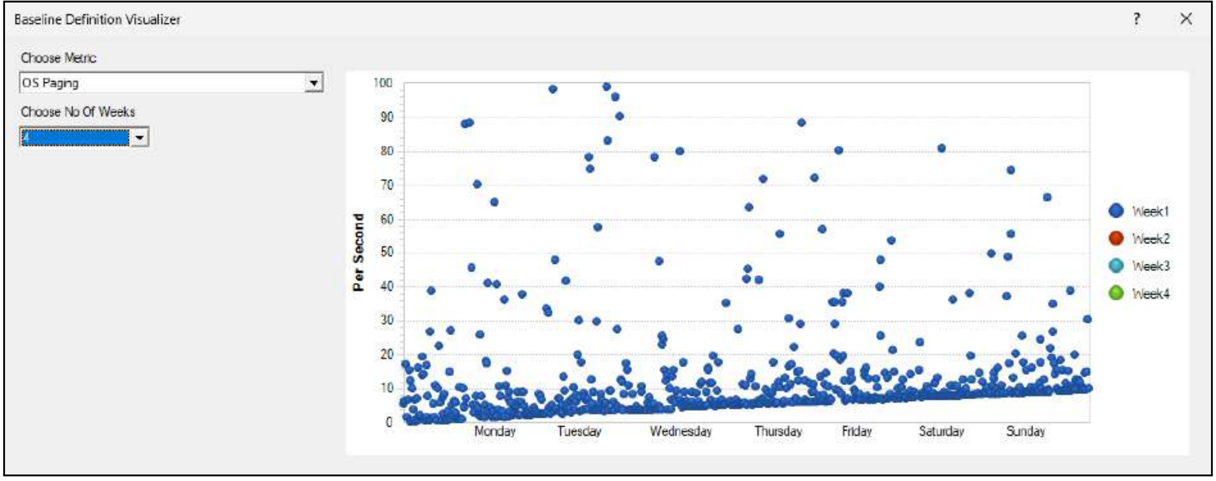
SQL Diagnostic Manager allows you to set a baseline configuration for a monitored SQL Server instance, and then apply that same baseline to other instances. Simply select the appropriate instances from the **Available Servers** list, and click **Add >** to move them to the **Added Servers** list. Click **OK**, and SQL Diagnostic Manager applies this configuration to the other instances.

Use the baseline visualizer

The Baseline Visualizer of SQL Diagnostic Manager provides better visualization of the performance of your monitored SQL Server instance.

To access the Baseline Visualizer:

1. Click **Baseline Visualizer** in the Overview tab of a specific SQL Server instance.



Baseline Definition Visualizer

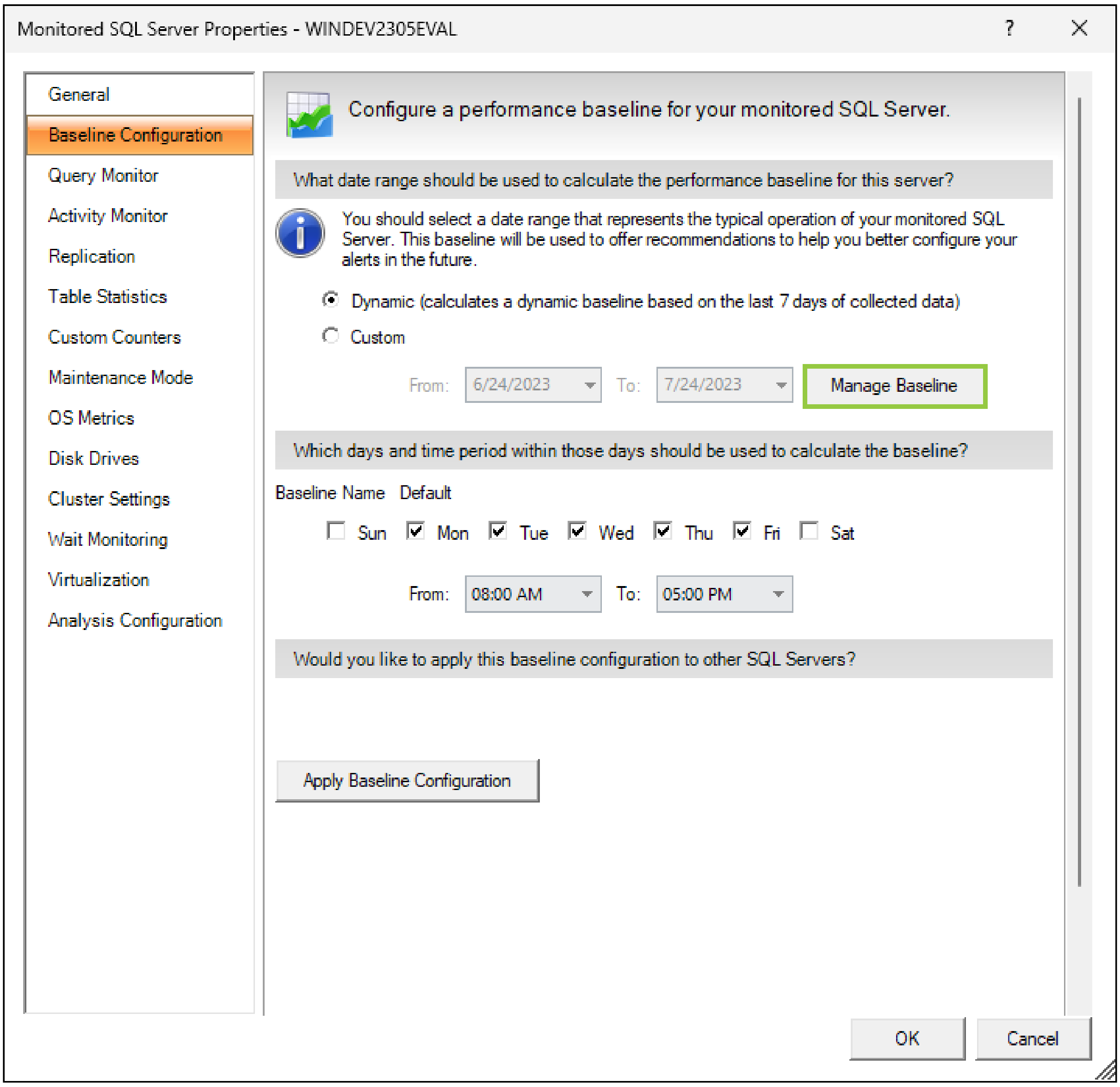
Choose Metric: OS Paging

Choose No Of Weeks

2. In the Baseline Definition Visualizer window, select a metric and the number of weeks you wish data to be returned for the baseline definition.

Schedule multiple baselines

SQL Diagnostic Manager allows you to define and schedule any number of baseline periods in addition to the default one.



Monitored SQL Server Properties - WINDEV2305EVAL

Configure a performance baseline for your monitored SQL Server.

What date range should be used to calculate the performance baseline for this server?

You should select a date range that represents the typical operation of your monitored SQL Server. This baseline will be used to offer recommendations to help you better configure your alerts in the future.

● Dynamic (calculates a dynamic baseline based on the last 7 days of collected data)

○ Custom

From: 6/24/2023 To: 7/24/2023

Which days and time period within those days should be used to calculate the baseline?

Baseline Name Default

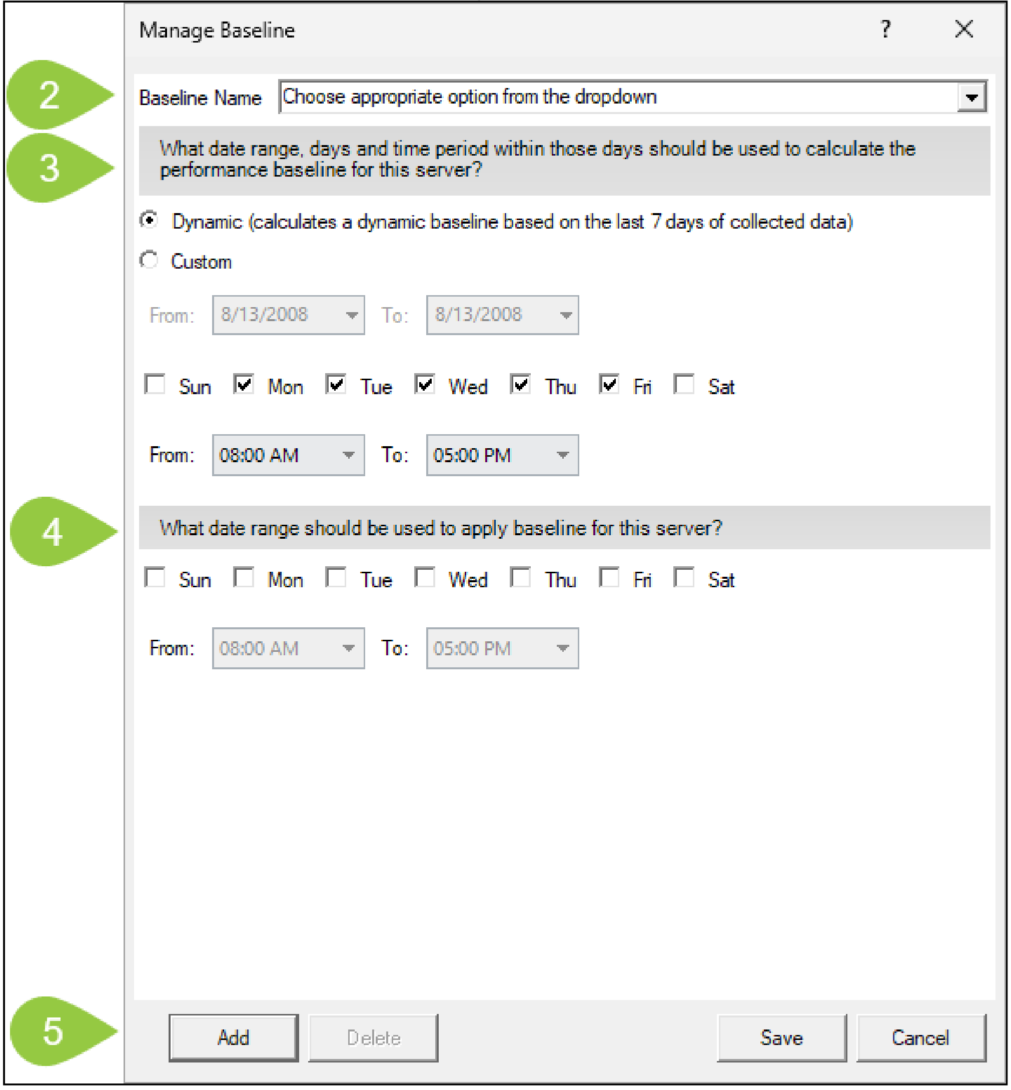
□ Sun ☑ Mon ☑ Tue ☑ Wed ☑ Thu ☑ Fri □ Sat

From: 08:00 AM To: 05:00 PM

Would you like to apply this baseline configuration to other SQL Servers?

To add a new baseline:

1. Click **Manage Baseline** to display the Manage Baseline window.



Baseline Name: Choose appropriate option from the dropdown

What date range, days and time period within those days should be used to calculate the performance baseline for this server?

● Dynamic (calculates a dynamic baseline based on the last 7 days of collected data)

○ Custom

From: 8/13/2008 To: 8/13/2008

□ Sun ☑ Mon ☑ Tue ☑ Wed ☑ Thu ☑ Fri □ Sat

From: 08:00 AM To: 05:00 PM

What date range should be used to apply baseline for this server?

□ Sun □ Mon □ Tue □ Wed □ Thu □ Fri □ Sat

From: 08:00 AM To: 05:00 PM

2. Type a name in the **Baseline Name** field.
3. Select Dynamic to use the default options or select Custom to set the date range, the days, and the period to calculate the baseline performance for the server.
4. Select the days and periods to schedule when to apply baseline to the server.
5. Click **Add** to save the created baseline, click **Edit** to edit the baseline, or click **Delete**.
6. Click **Save.**

✓ The baseline period you specify should represent a typical operation of the monitored SQL Server instances to which this baseline applies.

! SQL Diagnostic Manager allows only one baseline in effect at any time.

To edit a baseline:

1. Click **Manage Baseline** to display the Add baseline window.
2. Select the baseline you want to update from the **Baseline Name** list.
3. Modify days and time periods as desired.

4. Click **Save**.

⚠ When you schedule a new baseline, the changes are applied to the next day or when the baseline is refreshed (test this behavior when the feature is available).

Enable baseline thresholds

SQL Diagnostic Manager allows users to enable alerts when the following metrics are outside their established baseline thresholds:

- Availability Group Estimated Data Loss (Seconds)
- Availability Group Estimated Recovery Time (Seconds)
- Availability Group Log Send Queue Size (KB)
- Availability Group Redo Queue Size (KB)
- Availability Group Redo Rate (KB/sec)
- Availability Group Synchronization Performance (Seconds)
- SQL Server Data Used (Percent)
- SQL Server Log Used (Percent)
- OS Average Disk Queue Length (Count)
- OS Disk Time (Percent)
- OS Memory Usage (Percent)
- OS Paging (Per Second)
- OS Privileged Time (Percent)
- OS Processor Queue Length (Count)
- OS Processor Time (Percent)
- OS User Time (Percent)
- Page Life Expectancy
- Procedure Cache Hit Ratio
- SQL Server CPU Usage (Percent)
- SQL Server Memory Usage (Percent)
- Non-Distributed Transactions (Count)
- Unsubscribed Transactions (Count)
- Unsubscribed Transactions (Seconds)
- Blocked Sessions (Count)
- Client Computers (Count)
- Oldest Open Transaction (Minutes)
- SQL Server Response Time (Miliseconds)
- User Connections (Percent)
- VM CPU Usage (Percent)

Baseline display

SQL Diagnostic Manager allows users to view the baseline in effect in various metric graphs of the Resources tab.

View baseline in effect in the following graphs:

In the **Resources > CPU** view:

- CPU Usage
- Processor Queue Length
- Processor Time

In the **Resources > Memory** view:

- SQL Memory Usage
- Paging
- Cache Hit Ratios
- Page Life Expectancy (sec)

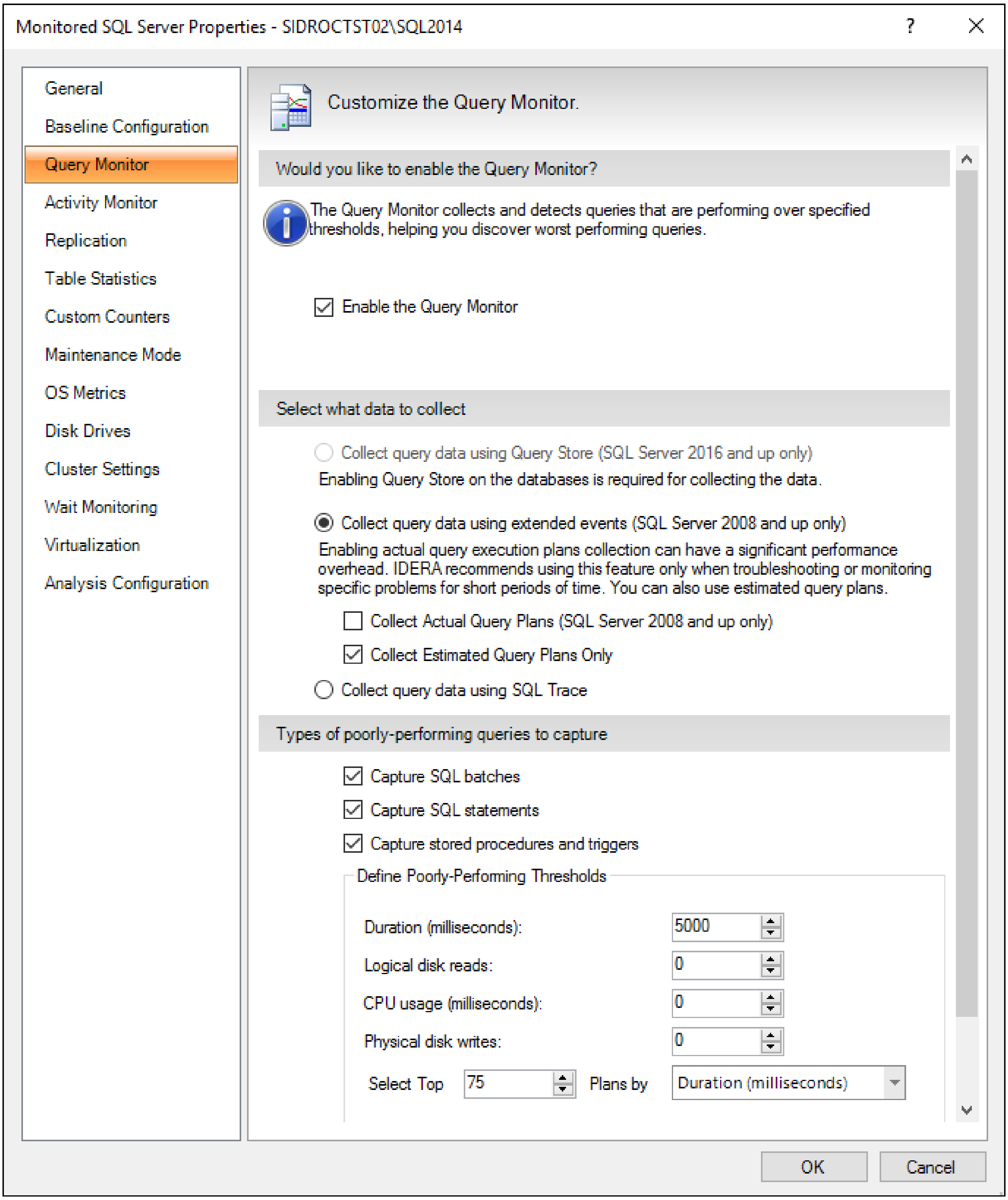
In the **Resources > Disk** view:

- Disk Busy Per Disk
- Average Disk Queue Length Total

Set query monitor options

The Query Monitor is a standard SQL Server trace that collects all the events that occur on your SQL Server instance over a period of time. You can enable this option if you experience query timeouts or other performance issues.

> ⓘ By default, the Query Monitor option is not enabled.



Customize the Query Monitor.

Would you like to enable the Query Monitor?

The Query Monitor collects and detects queries that are performing over specified thresholds, helping you discover worst performing queries.

☑ Enable the Query Monitor

Select what data to collect

○ Collect query data using Query Store (SQL Server 2016 and up only)

Enabling Query Store on the databases is required for collecting the data.

● Collect query data using extended events (SQL Server 2008 and up only)

Enabling actual query execution plans collection can have a significant performance overhead. IDERA recommends using this feature only when troubleshooting or monitoring specific problems for short periods of time. You can also use estimated query plans.

□ Collect Actual Query Plans (SQL Server 2008 and up only)

☑ Collect Estimated Query Plans Only

○ Collect query data using SQL Trace

Types of poorly-performing queries to capture

☑ Capture SQL batches

☑ Capture SQL statements

☑ Capture stored procedures and triggers

Define Poorly-Performing Thresholds

Duration (milliseconds):	5000
Logical disk reads:	0
CPU usage (milliseconds):	0
Physical disk writes:	0

Select Top 75 Plans by Duration (milliseconds)

The Query Monitor window allows you to enable or disable query monitoring using the **Enable the Query Monitor** check box. You can also select the settings that are used:

- Query data using Query Store

- Query data using extended events
- Capturing poorly-performing queries

Query data using Query Store

Collect query data using Query Store for instances running SQL Server 2016 or higher.

> ✓ SQL Diagnostic Manager does not change Query Store selections at this time. Try the IDERA Query Store Optimizer for more on Query Store improvements.

Query data using extended events

You can select to collect query data using Extended Events (Collect query data using extended events radio button) or SQL Trace (Collect query data using SQL Trace radio button). For instances running SQL Server 2008 or higher, the Query Monitor uses by default Extended Events. First introduced in SQL Server 2008, Extended Events provide a new mechanism to capture information about events inside the Database Engine and diagnose performance problems. This functionality is highly efficient and lightweight. For more information about using Extended Events, see the Microsoft document, Extended Events.

> ⚠ To capture query data for monitored pre-SQL Server 2008 instances, enable the SQL Trace collection option. Enabling this option can degrade performance on your SQL Server.

To collect query execution plans, click **Collect query data using extended events (SQL Server 2008 and up only)** in the Query Monitor window. By default, this option enables the collection of estimated query plans only. If you would like to collect actual query plans instead, select the **Collect Actual Query Plans (SQL Server 2008 and up only)** check box.

> ❗ Enabling actual query execution plans collection can have a significant performance overhead, so IDERA recommends using this feature only when troubleshooting or monitoring specific problems for short periods of time. You can also use estimated query plans.

Capturing poorly-performing queries

The types of poorly-performing queries to capture include:

- SQL batches
- SQL Statements
- Stored procedures and triggers

You can also define specific poorly-performing thresholds such as duration, logical disk reads, CPU usage, physical disk writes, and select up to 1000 plans defined by these thresholds.

Diagnosing specific performance issues

Select the events that help you best diagnose the specific issues occurring with query performance on your SQL Server instance. For example, you may want to monitor queries taking a long time to complete, requiring heavy CPU usage, and causing a large number of logical disk reads or physical disk writes, which indicates a memory issue.

SQL Diagnostic Manager uses tracing to locate and flag worst-performing T-SQL. SQL Diagnostic Manager cannot display binary data in a readable format. If you captured DTS packages, you may see unreadable characters in the Command field of the Tree View. Capturing DTS data may also adversely affect the performance of the SQL Server or Data Warehouse you are monitoring.

Access the Query Monitor tab

You can access the Query Monitor tab of the Monitored SQL Server Properties window by right-clicking the appropriate SQL Server instance, and then selecting **Properties**. Click **Query Monitor** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.

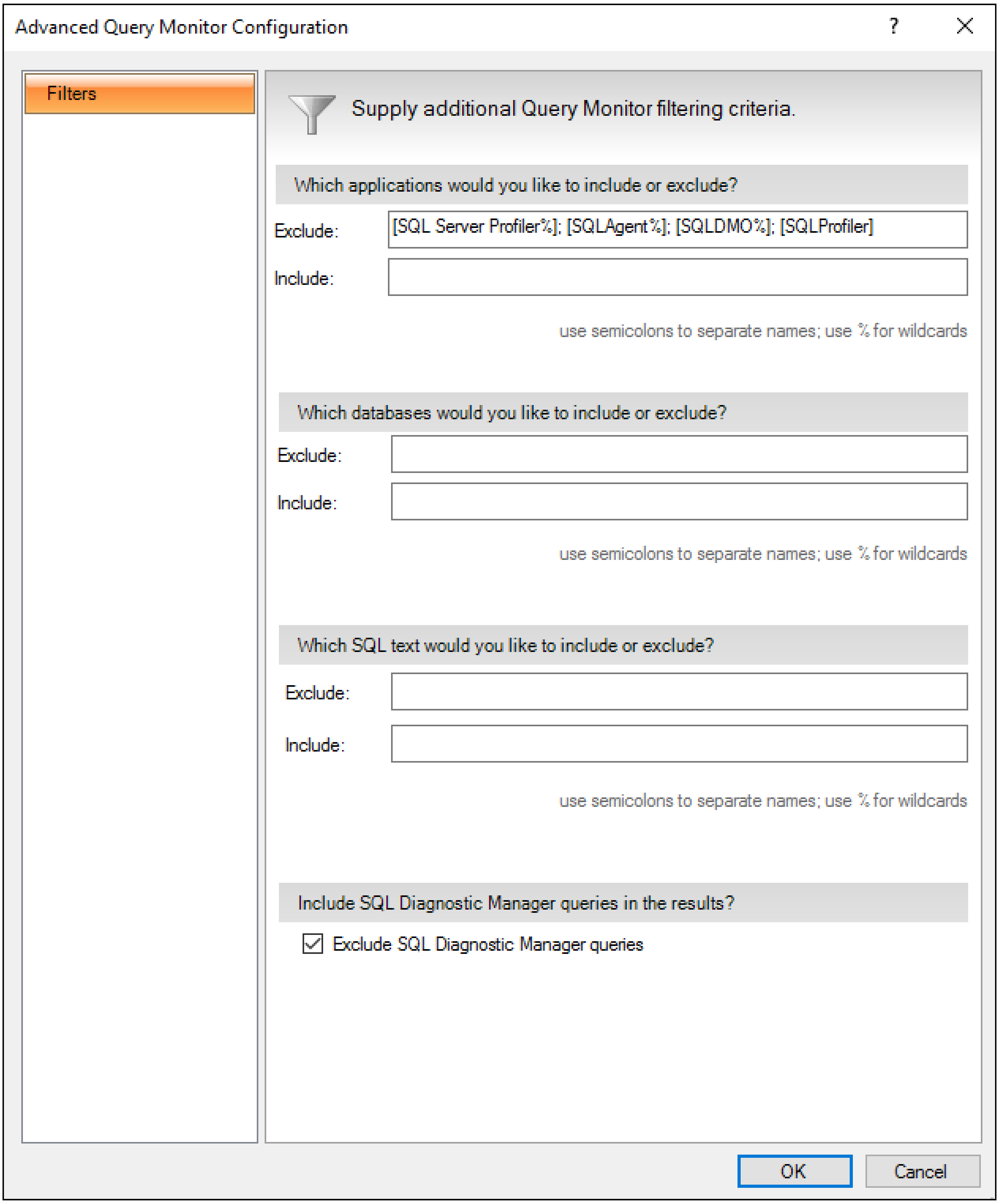
Configure advanced query monitor options

The Advanced Query Monitor Configuration window allows you to supply filtering criteria such as including or excluding specific applications, databases, and SQL text from the Query Monitor Trace collection. Filtering allows you to improve the results you see in the Query Monitor view and reduce the impact of the Query Monitor trace on your server.

> ⓘ You can also configure these options directly from the new advanced query views in the SQL Diagnostic Manager web console. See View your SQL Server queries information.

Access the Advanced Query Monitor Configuration window

You can access the Advanced Query Monitor Configuration window (click image to view full size) by right-clicking the appropriate monitored SQL Server instance and selecting **Properties**. Click **Query Monitor** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window, and then click **Advanced**.



Advanced Query Monitor Configuration

Supply additional Query Monitor filtering criteria.

Which applications would you like to include or exclude?

Exclude: [SQL Server Profiler%]; [SQLAgent%]; [SQLDMO%]; [SQLProfiler]

Include:

use semicolons to separate names; use % for wildcards

Which databases would you like to include or exclude?

Exclude:

Include:

use semicolons to separate names; use % for wildcards

Which SQL text would you like to include or exclude?

Exclude:

Include:

use semicolons to separate names; use % for wildcards

Include SQL Diagnostic Manager queries in the results?

☑ Exclude SQL Diagnostic Manager queries

When using Query Monitor filtering, take into account that Exclude takes precedence over Include.

Using Query Monitor exclusion filtering

Excluding data from your Query Monitor trace helps filter out information that is not important for the task at hand. SQL Diagnostic Manager allows you to filter specific applications, databases, or SQL text and also exclude the SQL Diagnostic Manager queries from the results. When adding multiple items to exclude, use a semi-colon **(;)** between items of the same type. You can also use a percent character **(%)** as a wildcard.

To exclude data from your Query Monitor trace while in the Queries view:

1. On the Queries view for the server you want to exclude data from, press the **Configure Query Monitor** button.
2. Click **Advanced**.
3. Enter your filter information in the **Exclude** fields, using **(;)** to separate items and **(%)** as a wildcard.
4. Click **OK**.

Using Query Monitor inclusion filtering

SQL Diagnostic Manager allow you to set Query Monitor inclusion filters. You can choose the applications, databases, and SQL text you want to include in the Query Monitor trace and SQL Diagnostic Manager stores only queries that match these inclusion filtering criteria. When adding multiple items to include, use a semi-colon **(;)** between items of the same type. You can also use a percent character **(%)** as a wildcard.

To include data in your Query Monitor trace while in the Queries view:

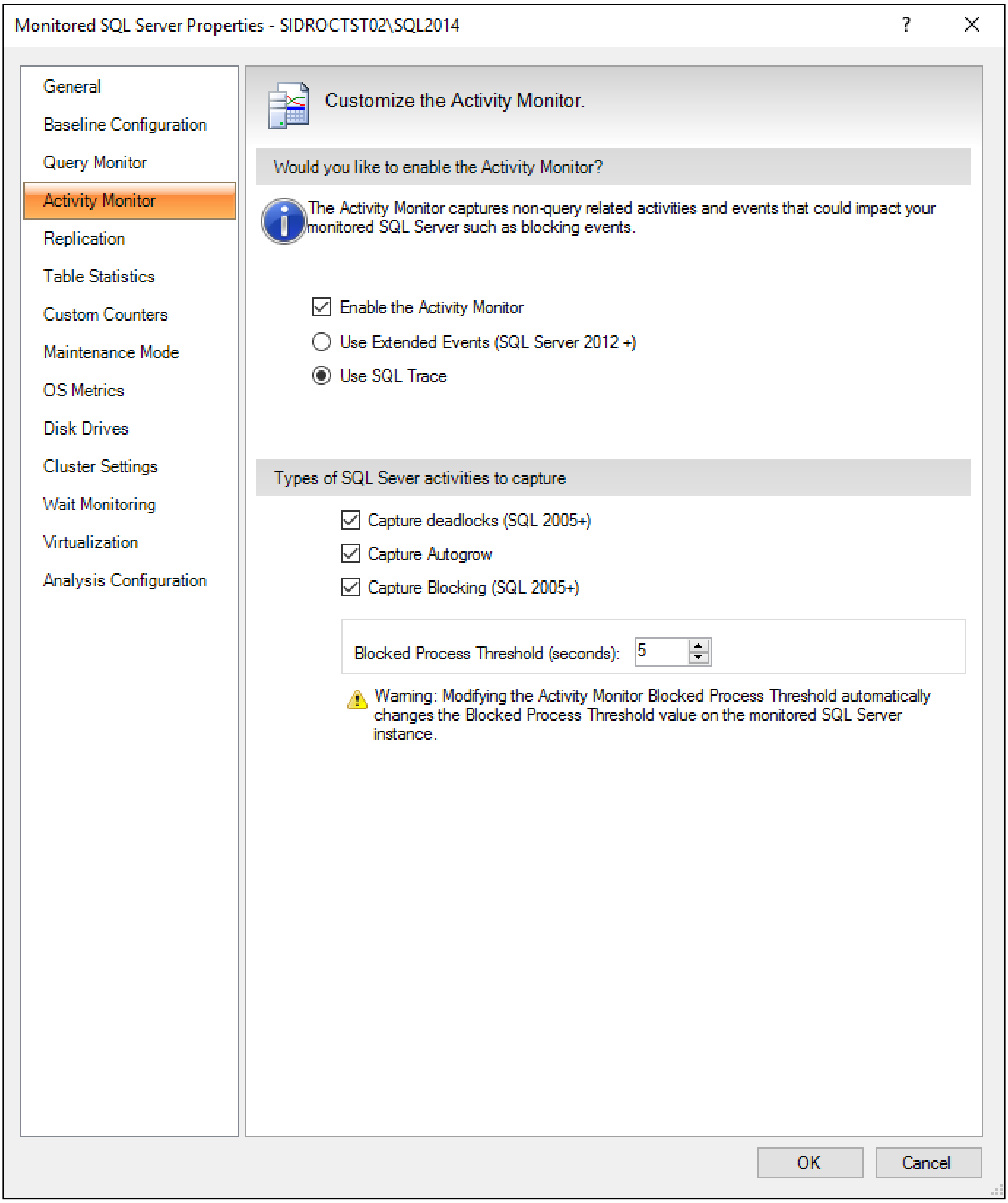
1. On the Queries view for the server you want to include data in, press the **Configure Query Monitor** button.
2. Click **Advanced**.
3. Enter your filter information in the **Include** fields, using **(;)** to separate items and **(%)** as a wildcard.
4. Click **OK**.

Set activity monitor options

The Activity Monitor window allows you to enable or disable monitoring of non-query activities. If you enable the Activity Monitor, you can select the settings that are used.

The types of non-query events to capture include:

- Capture Deadlocks (SQL 2005+)
- Capture Autogrow
- Capture Blocking (SQL 2005+)



Monitored SQL Server Properties - SIDROCTST02\SQL2014

Customize the Activity Monitor.

Would you like to enable the Activity Monitor?

The Activity Monitor captures non-query related activities and events that could impact your monitored SQL Server such as blocking events.

☑ Enable the Activity Monitor

○ Use Extended Events (SQL Server 2012 +)

● Use SQL Trace

Types of SQL Sever activities to capture

☑ Capture deadlocks (SQL 2005+)

☑ Capture Autogrow

☑ Capture Blocking (SQL 2005+)

Blocked Process Threshold (seconds): 5

Warning: Modifying the Activity Monitor Blocked Process Threshold automatically changes the Blocked Process Threshold value on the monitored SQL Server instance.

Non-query activities data collection

You can select to collect non-query activity data using Extended Events (Use Extended Events radio button) or SQL Trace (Use SQL Trace radio button). For instances running SQL Server 2012 or higher, the Activity Monitor uses by default Extended Events. First introduced in SQL Server 2008, Extended Events provide a new mechanism to capture information about events inside the Database Engine and diagnose performance problems. This functionality is highly efficient and lightweight. For more information about using Extended Events, see the Microsoft document, Extended Events.

> ⚠ To capture non-query activities for monitored pre-SQL Server 2008 instances, enable the SQL Trace collection option. Note that enabling this option can degrade performance on your SQL Server.

Capturing deadlocks

Capturing deadlock information allows the associated deadlock alert to provide details on deadlocked processes on the Alerts view. Deadlock monitoring is supported on monitored instances running SQL Server 2005 or greater and is dependent on the Activity Monitor. To access this information, check **Enable the Activity Monitor** and **Capture deadlocks (SQL 2005+)** in the Activity Monitor window. Details provided include:

- SPID
- Hostname
- Login Name
- Client Application
- Database
- Status
- Wait Time
- Wait Resource
- Transaction Count
- Input Buffer
- Lock Object
- Lock Mode
- Lock Owners
- Lock Waiters

Capturing autogrow events

Capturing autogrow information allows the associated autogrow alert to provide information about log and data growth on the Alerts view. To access this information, check **Enable the Activity Monitor** and **Capture Autogrow** in the Activity Monitor window.

Capturing blocking events

Capturing blocking information allows the associated blocked alert to provide details on blocking and blocked sessions on the Alerts view. Blocking monitoring is supported on monitored instances running SQL Server 2005 or greater and is dependent on Activity Monitor. To access this information, check **Enable the Activity Monitor** and **Capture Blocking (SQL 2005+)** in the Activity Monitor window. Key details provided for blocking and blocked sessions include:

Blocking process details:

- Session ID
- Hostname
- User Name
- Application

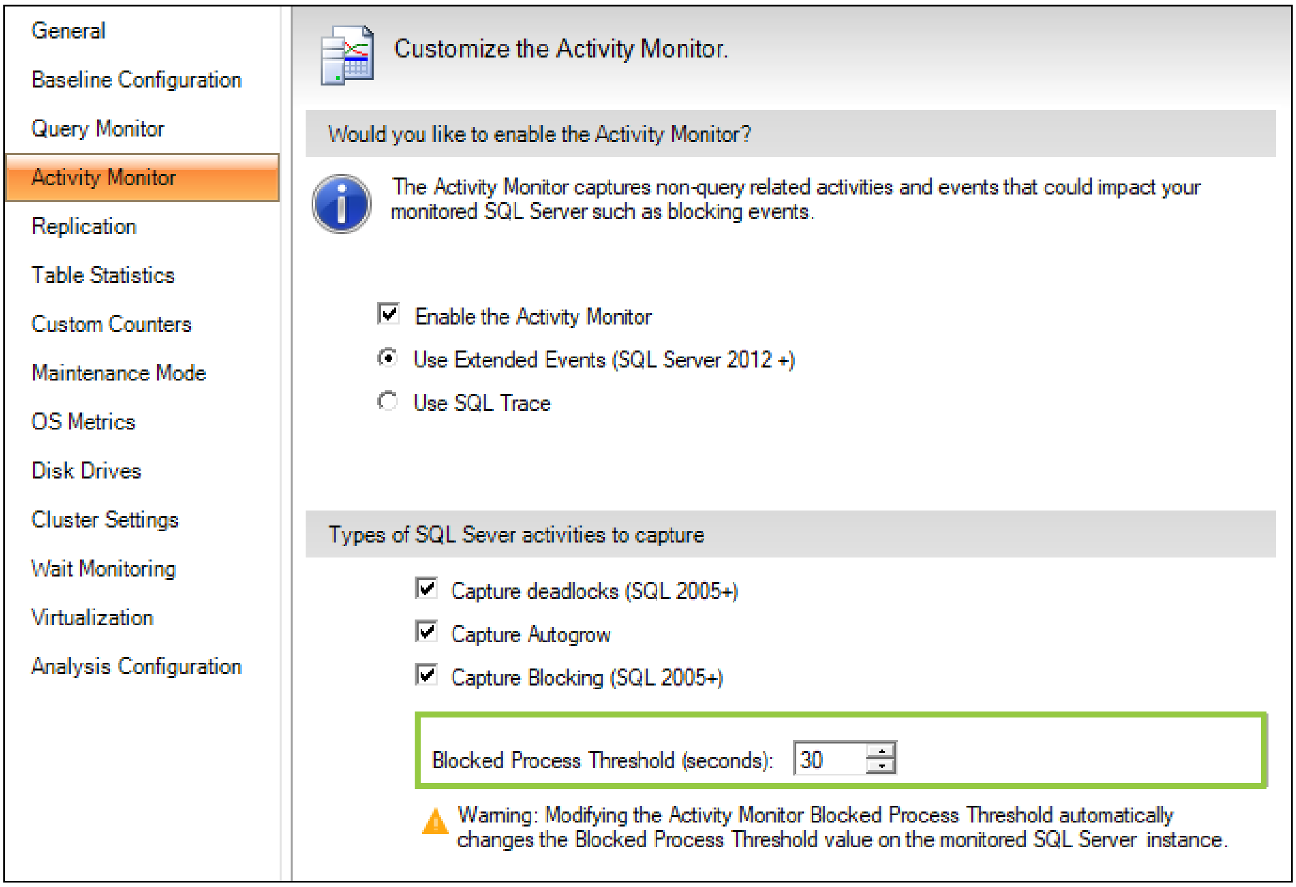
- Database
- Last Batch Started
- Transaction ID
- Open Transactions

Blocked process details:

- Session ID
- Hostname
- User Name
- Application
- Database
- Last Batch Started
- Transaction ID
- Open Transactions
- Wait Resource

Blocked process threshold

SQL Server 2005+ includes a new SQL Server Profiler event, the Blocked Process report. This event helps identify blocking issues and provides relevant information to solve these issues. In SQL Diagnostic Manager, you can take advantage of this feature by setting the blocked process threshold value according to your needs. To access the **Blocked Process Threshold** option, enable **Capture Blocking (SQL 2005+)** in the Activity Monitor window. Note that when this option is enabled, the blocked process threshold value is automatically set to 5 (seconds) but can be modified as desired.



Customize the Activity Monitor.

Would you like to enable the Activity Monitor?

The Activity Monitor captures non-query related activities and events that could impact your monitored SQL Server such as blocking events.

☑ Enable the Activity Monitor

● Use Extended Events (SQL Server 2012 +)

○ Use SQL Trace

Types of SQL Sever activities to capture

☑ Capture deadlocks (SQL 2005+)

☑ Capture Autogrow

☑ Capture Blocking (SQL 2005+)

Blocked Process Threshold (seconds): 30

Warning: Modifying the Activity Monitor Blocked Process Threshold automatically changes the Blocked Process Threshold value on the monitored SQL Server instance.

Since collecting information about blocked processes in an SQL server is resource-intensive, IDERA recommends setting the blocked process threshold value to at least 5 (seconds) or your deadlock monitor runs constantly. For more information on this topic, see the Microsoft document Increase or Disable Blocked Process Threshold.

> ✓ Modifying the Activity Monitor's blocked process threshold automatically changes the blocked process threshold value in your monitored SQL Server instance.

Access the Activity Monitor tab

You can access the Activity Monitor tab of the Monitored SQL Server Properties window by right-clicking the appropriate SQL Server instance and then selecting **Properties**. Click **Activity Monitor** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.

Disable replication statistics collection

The gathering of replication statistics can require a significant amount of system resources. The Replication tab of the Monitored SQL Server Properties window provides the option to disable the collection of replication statistics and conserve system resources.

Collecting replication statistics requires plenty of system resources, especially when your publisher or distribution queues contain a large number of items. You can easily enable this feature when you need replication statistics, and then disable it once you've collected enough data.

Access the Replication tab

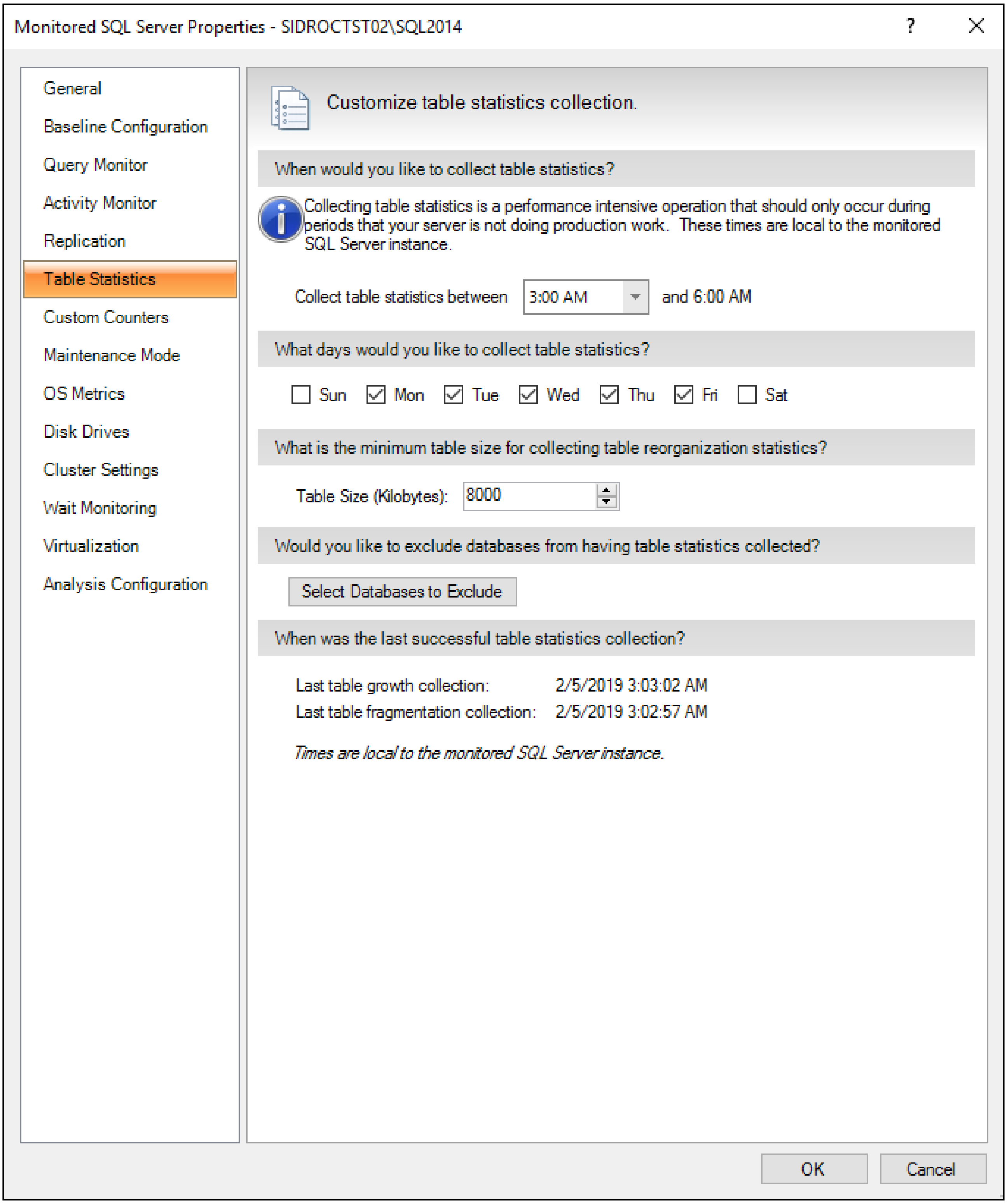
You can access the Replication tab of the Monitor SQL Server Properties window by right-clicking the appropriate monitored SQL Server instance, and then selecting **Properties**. Click **Replication** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.

Edit table statistics options

SQL Diagnostic Manager lets you collect statistics and perform trend analysis over time. Table Statistics allow you to designate the days and times SQL Diagnostic Manager collects table growth and reorganization statistics. Because statistics collection can negatively impact performance, SQL Diagnostic Manager allows you to designate an individual Table Statistics collection time for the SQL Server instances. Configure a time you know the instance is utilized less than normal.

In addition, you can limit the amount of performance impact by utilizing the following:

- Limit reorganization to databases over a set size, which eliminates the reorganization of small, rarely-used tables.
- Exclude non-essential databases from collection by clicking **Select Databases to Exclude** and selecting the appropriate databases.



Monitored SQL Server Properties - SIDROCTST02\SQL2014

Customize table statistics collection.

When would you like to collect table statistics?

Collecting table statistics is a performance intensive operation that should only occur during periods that your server is not doing production work. These times are local to the monitored SQL Server instance.

Collect table statistics between 3:00 AM and 6:00 AM

What days would you like to collect table statistics?

□ Sun ☑ Mon ☑ Tue ☑ Wed ☑ Thu ☑ Fri □ Sat

What is the minimum table size for collecting table reorganization statistics?

Table Size (Kilobytes): 8000

Would you like to exclude databases from having table statistics collected?

When was the last successful table statistics collection?

Last table growth collection: 2/5/2019 3:03:02 AM

Last table fragmentation collection: 2/5/2019 3:02:57 AM

Times are local to the monitored SQL Server instance.

Access the Table Statistics tab

You can access the Table Statistics tab of the Monitor SQL Server Properties window by right-clicking the appropriate monitored SQL Server instance and selecting **Properties.** Click **Table Statistics** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.

Schedule table statistics collection

Table Statistics collection is a resource-intensive process. Schedule your collection time for non-peak hours to reduce the possibility of your users experiencing decreased performance.

✓ The SQL Diagnostic Manager Collection Service may not include fragmentation data for a particular table for any of the following reasons:

- Table statistics collection has not occurred.
- The database hosting the table is excluded from collection.
- The table size does not meet the minimum size threshold.
- The database hosting the table is not accessible.
- The table is locked.

Select a database to exclude from table statistics collection

SQL Diagnostic Manager allows you to exclude non-essential databases from table growth statistics collection. Excluding a database from collection avoid clutter and unnecessary growth in your Repository. To exclude a database, select the appropriate database from the available list, and then click **OK**. You can exclude more than one database at a time.

Access this list of databases for exclusion

If you want to exclude one or more of your databases from table statistics collection, access the Server Properties dialog for that monitored SQL Server instance by right-clicking the instance and selecting **Properties**. Click the Table Statistics tab, and then click **Select Databases to Exclude**.

Link custom counters

The Custom Counters tab allows you to select the metrics you want to explicitly link to the selected SQL Server instance or a group of instances using tags. Note that SQL Diagnostic Manager displays a counter linked through a tag in gray text. You cannot remove this type of counter until you remove the tag from the instance.

Access the Custom Counters tab

You can access the Custom Counters tab of the Monitor SQL Server Properties window by right-clicking the appropriate monitored SQL Server instance, and then selecting **Properties**. Click **Custom Counters** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.

Linking a custom counter

To link a custom counter to a selected monitored SQL Server instance, access the Custom Counters tab for that instance. Select one or more counters in the **Available Counters** list, and then click **Add >** to move the counters to the **Linked Counters** list. Use Shift+click or Ctrl+click to select more than one counter. Click **Test** if you want to test the counters. After your test is complete, click **OK**.

Testing a linked custom counter

SQL Diagnostic Manager allows you to test the selected custom counters against your SQL Server instances. When linking the counter, click **Test**. Check the box for all custom counters you want to test, and then click **Test**. SQL Diagnostic Manager indicates that it is running the test, and displays additional information in the **Result** column when the test is complete. Click **Done** to exit the Test Custom Counters window. Be sure to click **OK** after testing the link or SQL Diagnostic Manager does not save your updates.

Schedule maintenance mode

Maintenance mode allows you to temporarily stop alert generation and performance metric collection for the time period that your SQL Server instance is offline. This pause allows you to perform necessary maintenance on a SQL Server without causing SQL Diagnostic Manager to send numerous misleading alerts.

Access the Maintenance Mode tab

You can access the Maintenance Mode function by right-clicking the appropriate monitored SQL Server instance, and then selecting Maintenance Mode. This will prompt three command options: Enable, Disable, and Schedule.

The ***Enable*** command puts the SQL Server instance into maintenance mode, stopping alert generation and collection of some performance metrics.

The ***Disable*** command allows SQL Diagnostic Manager to resume performance statistics collection and alert generation for the selected SQL Server instance.

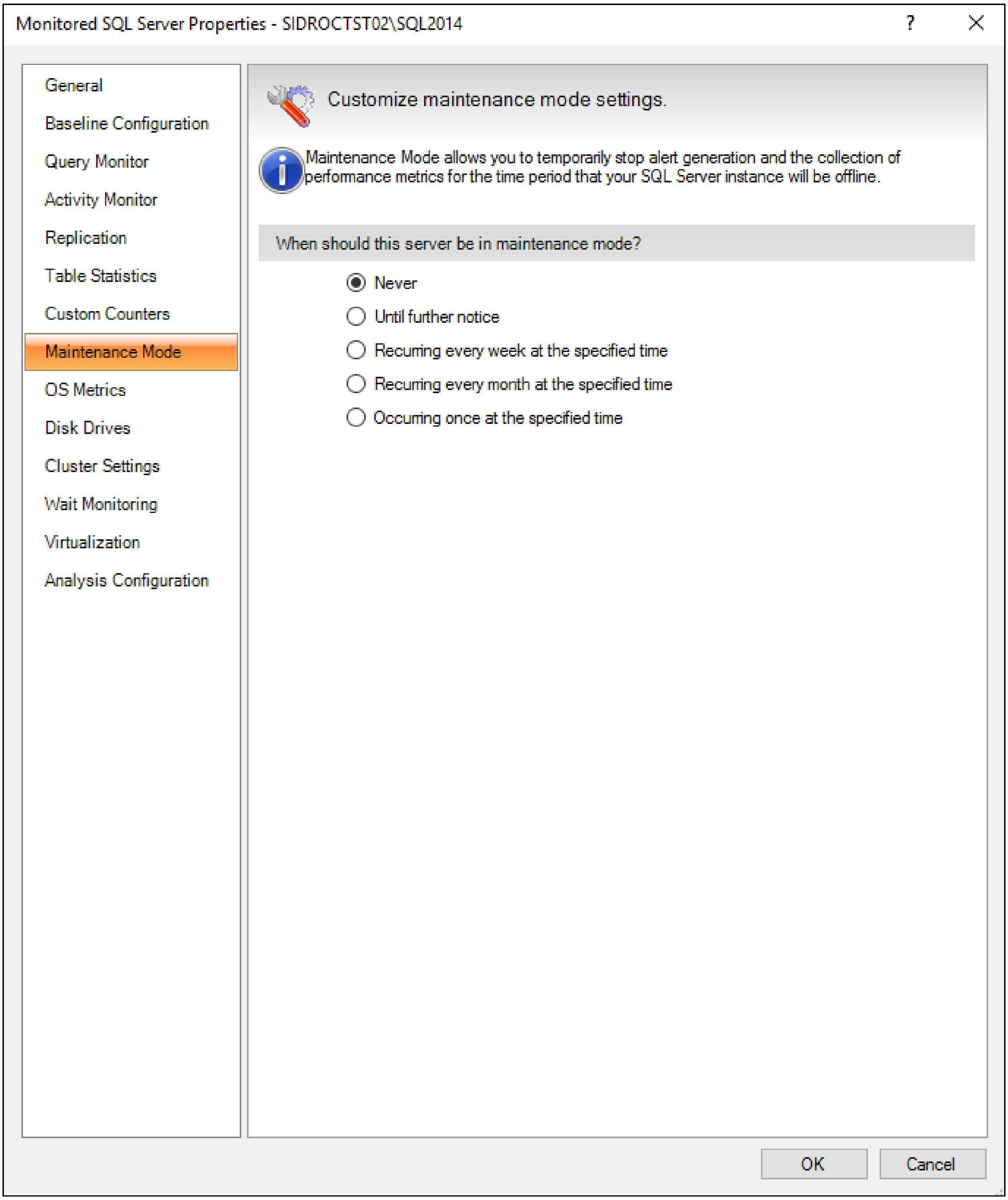
The ***Schedule...*** command prompts the monitored SQL Server Properties dialog, where under the Maintenance Mode tab it is possible to select a specific maintenance mode setting.

✓ A different way to access the Maintenance Mode function is by right-clicking the monitored SQL Server instance, and then selecting Properties. Click Maintenance Mode when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.

About mass maintenance mode

Users looking to apply maintenance mode modifications to a large number of servers at once can run the Maintenance Mode command by right-clicking on the following: Server Tree, a specific tag, a particular server view and Tools.

Available maintenance mode settings



Monitored SQL Server Properties - SIDROCTST02\SQL2014

Customize maintenance mode settings.

Maintenance Mode allows you to temporarily stop alert generation and the collection of performance metrics for the time period that your SQL Server instance will be offline.

When should this server be in maintenance mode?

- ● Never
- ○ Until further notice
- ○ Recurring every week at the specified time
- ○ Recurring every month at the specified time
- ○ Occurring once at the specified time

You can choose from the following options when setting a monitored SQL Server instance to maintenance mode:

Never

The server is never in maintenance mode and always generates alerts.

Until further notice

The server is in maintenance mode and does not generate alerts until this setting is changed.

Recurring every week at the specified time

Set the server to enter maintenance mode at regular intervals, for the day, time, and duration you select.

Recurring every month at the specified time

Set the server to enter maintenance mode at regular intervals, for the month, time, and duration you select.

Occurring once at the specified time

The server enters maintenance mode at a specified date and time, and leaves maintenance mode at a specified date and time.

Configure OS metrics monitoring

SQL Diagnostic Manager allows you to enable either OLE automation or direct Windows Management Interface (WMI) procedures for monitoring OS metrics.

⚠ If your SQL Server instance includes enabled Lightweight Pooling, SQL Diagnostic Manager cannot collect OS metrics information.

If SQL Diagnostic Manager cannot provide OS metrics, a message displays on the Dashboard and Services Summary views providing more information.

✓ When SQL Diagnostic Manager cannot collect OS Metrics due to the disabled collection, a bar displays a link to enable OS metric collection procedures for your SQL Server version.

CPU UsageSQL Diagnostic Manager collects metrics that track the performance of the computers that host your monitored SQL Server instances. These metrics are the following:

- Processor Queue Length
- Memory Paging
- Total Memory Usage
- SQL Server Memory Usage
- Disk Queue Length

OS Metrics tab

You can access the OS Metrics tab of the Monitor SQL Server Properties window by right-clicking the appropriate monitored SQL Server instance and selecting **Properties**. When SQL Diagnostic Manager displays the monitored SQL Server Properties window, click **OS Metrics** option from the left side tab options.

Once the right-side Properties window displays the OS Metrics configuration options, you find the following options of how the OS metrics are being collected:

- **Do not collect Operating System metrics:** OS metrics collection is not required in SQL Diagnostic Manager. However, if you disable this feature, SQL Diagnostic Manager ceases to collect OS metrics and does not raise any previously-associated alerts. You can easily re-enable OS metric collection at any time if you decide that you want to continue collecting these metrics.
- **Collect Operating System metrics using OLE automation:** Change your OS metrics collection to use OLE automation if you want OS and disk statistics, plus the auto discovery of mount points.

ⓘ **Advantages of using OLE automation**

The advantages of using OLE automation are the following:

1. You do not require any additional ports to be opened, since the standard SQL communication port is sufficient.
2. SQL Diagnostic Manager uses the SQL Server service account permissions to capture WMI metrics.
3. And, uses SQL Authentication.

⚠ When using OLE automation you must enable this option; also, OLE automation opens up possibilities for a sysadmin to run queries to reach outside SQL, although you must be a sysadmin to run these queries, it may not be the best option for some environments.

- **Collect Operating System metrics using direct WMI:** Select to collect your OS Metrics using WMI.

Advantages of using direct WMI

The advantages of using WMI are the following:

1. You do not require additional SQL Server configuration adjustments.
2. You do not require SQL Server to gather the performance data because the collection service reaches directly to WMI.

When using direct WMI you must have RPC port 135 opened for WMI request initiation access. You must have permissions configured on each SQL instance to allow for remote access to WMI, using a Windows account. Other high-end ports opened may be required in firewall to allow WMI to communicate. The following article explains how to set a fixed port for WMI: Setting Up a Fixed Port for WMI

- **Required permissions for direct WMI collection**

It is preferred that the WMI user is a local administrator on the monitored SQL Server instance. However, if you do not want to grant administrator access, use the following steps to configure remote WMI access in Microsoft Windows:

1. Add the user account to the Performance Log Users and distributed COM users groups.
2. Grant privileges to WMI.

You also may need to add the WMI user account to the following policies:

- Act as part of the operating system
- Log on as a batch job
- Log on as a service
- Replace a process level token

For more information about using a direct WMI connection, see the Microsoft document, Securing a Remote WMI Connection.

- **Configure WMI to run out-of-process**

Edit your specific registry settings to allow WMI to run out-of-process. To edit these registry settings, perform the following steps:

1. In the cd image of the SQL Diagnostic Manager install, open Scripts folder.
2. Copy the SQLdmoutofprocoleautomation.reg file onto each of your monitored SQL Server instances.
3. Run this file on each of your monitored SQL Server instances.

- **Configure WMI timeouts**

SQL Diagnostic Manager allows you to configure the WMI timeout value. In some environments, customers may experience WMI timeouts when their machine is too busy to respond in a timely manner. Although WMI timeouts should not be ignored and often point to an environmental issue, you can control this value when the behavior displayed is normal in your environment. The default WMI timeout value in SQL Diagnostic Manager is of 90 seconds to reduce the number of intermittent errors.

To configure the WMI timeout value:

1. Navigate to the SQL Diagnostic Manager install directory
2. Open SQLdmCollectionService.exe.Config
3. Modify the **<CollectionService>** node under the **<Services>** node
4. Add wmiQueryTimeOut="300" as a parameter to this node
5. Save and close file

6. Restart the collection service

   Sample configuration entry:

```
<Services>
<CollectionService instanceName="Default" servicePort="5167"
managementServiceAddress="Server" managementServicePort="5166"
heartbeatIntervalSeconds="180" wmiQueryTimeOut="300"/>
</Services>
```

Issues you may encounter before SQL Diagnostic Manager begins collecting OS Metrics:

The following issues require user action before SQL Diagnostic Manager can begin collecting OS metrics:

- **OLE Automation Procedures Disabled:** Select the **Collect Operating System data using OLE Automation** option to enable OLE Automation procedures.
- **OLE Automation Procedures Unavailable:** The stored procedures associated with OLE Automation are missing on the SQL Server instance. SQL Diagnostic Manager cannot capture OS metrics until these stored procedures are available on the SQL Server instance.
- **WMI Service Not Running:** The WMI Service on the monitored SQL Server instance may not be running. SQL Diagnostic Manager cannot collect OS metrics until this service is started.
- **Lightweight Pooling Enabled:** This is an advanced feature used in symmetric multiprocessing environments in SQL Server. SQL Diagnostic Manager cannot collect OS metrics until this option is disabled on your monitored SQL Server instances.

Customize disk statistics

Disk drive statistics collection provides the ability for SQL Diagnostic Manager to alert on disk drives and database space calculations. By default, SQL Diagnostic Manager attempts to auto-discover local disk drives on monitored instances. In some environments, the auto-discovered list may be incomplete or incorrect. The Customize disk drive statistics collection window allows you to turn off the auto-discover feature and manually add the drives for drive statistics collection.

✓ SQL Diagnostic Manager populates the disk drive list using operating system metrics from a WMI call even if your collection is configured to use OLE automation. SQL Diagnostic Manager requires you to enter credentials to connect directly to WMI. This functionality lets SQL Diagnostic Manager quickly discover mount points while the OLE automation does not provide such information.

Access the Disk Drives tab

You can access the Disk Drives tab of the Monitor SQL Server Properties window by right-clicking the appropriate monitored SQL Server instance, and then selecting **Properties**. Click **Disk Drives** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.

Incomplete disk drive list

SQL Diagnostic Manager automatically discovers local disk drives on your monitored instances. Sometimes this list is incomplete or contains drives that are not related to SQL Server. If you need to modify this list, clear the **Discover disk drives** check box, and then type the drive information including mount points, if necessary, into the **Available disk drives** field. Select the appropriate drive or drives and then click **Add** to move the drive information to the **Selected disk drives** box. Click **OK**.

Configure cluster settings

If you have a clustered environment, SQL Diagnostic Manager can trigger an alert whenever a cluster is running on a non-preferred node. The preferred cluster node is the "active" node in a cluster. By default, the preferred cluster node is the first node added when deploying SQL Diagnostic Manager in your clustered environment.

Access the Cluster Settings tab

You can access the Cluster Settings tab of the Monitor SQL Server Properties window by right-clicking the appropriate monitored SQL Server instance, and then selecting **Properties**. Click **Cluster Settings** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.

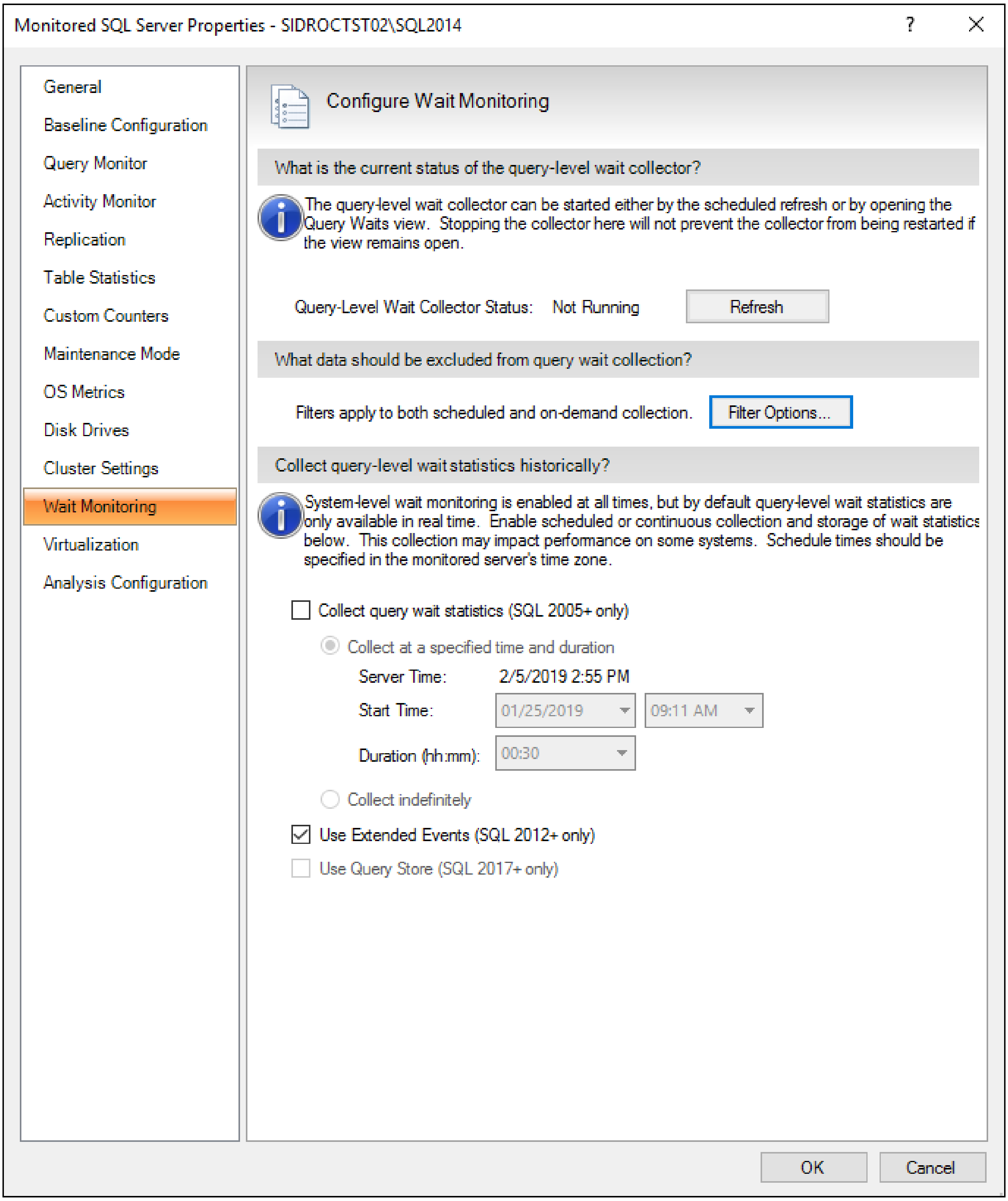
Configure wait monitoring

SQL Diagnostic Manager allows you to collect and view wait statistics on the selected SQL Server instance. Wait statistics offer one of the best means in diagnosing the reason a bottleneck is occurring on your system.

⚠ **Query Store**

Query Store is now an option for query plan collection and monitoring. Query Store must be enabled on the monitored instance, along with Query Monitor and Query Waits.

✓ SQL Diagnostic Manager does not change Query Store selections at this time. Try the IDERA SQL Query Store Optimizer for more on Query Store improvements


Monitored SQL Server Properties - SIDROCTST02\SQL2014
?
General
Baseline Configuration
Query Monitor
Activity Monitor
Replication
Table Statistics
Custom Counters
Maintenance Mode
OS Metrics
Disk Drives
Cluster Settings
Wait Monitoring
Virtualization
Analysis Configuration
Configure Wait Monitoring
What is the current status of the query-level wait collector?
Refresh
What data should be excluded from query wait collection?
Filter Options...
Collect query-level wait statistics historically?
OK
Cancel

The query-level wait collector can be started either by the scheduled refresh or by opening the Query Waits view. Stopping the collector here will not prevent the collector from being restarted if the view remains open.

Query-Level Wait Collector Status: Not Running

Filters apply to both scheduled and on-demand collection.

System-level wait monitoring is enabled at all times, but by default query-level wait statistics are only available in real time. Enable scheduled or continuous collection and storage of wait statistics below. This collection may impact performance on some systems. Schedule times should be specified in the monitored server's time zone.

□ Collect query wait statistics (SQL 2005+ only)

● Collect at a specified time and duration

Server Time: 2/5/2019 2:55 PM

Start Time: 01/25/2019 09:11 AM

Duration (hh:mm): 00:30

○ Collect indefinitely

☑ Use Extended Events (SQL 2012+ only)

□ Use Query Store (SQL 2017+ only)

The Wait Monitoring tab of the Monitored SQL Server Properties window allows you to configure how SQL Diagnostic Manager collects wait statistics.

- View, start, stop, and refresh the query-level wait collector.

- Collect query-level wait statistics historically and set the time to collect them.

> Overly complex filters of SQL Text using Extended Events can cause high loads on the monitored instance due to a known Microsoft defect.

When to use wait monitoring

Wait Monitoring helps you diagnose congestion or blocks on your system. You should enable Wait Monitoring for the time period required to diagnose specific issues you experience. When your diagnosis is complete, disable Wait Monitoring.

Access the Wait Monitoring tab

You can access the Wait Monitoring tab of the Monitor SQL Server Properties window by right-clicking the appropriate monitored SQL Server instance, and then selecting **Properties**. Click **Wait Monitoring** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.

Configure advanced query wait statistics options

The Advanced Query Wait Statistics Configuration window allows you to filter out applications, databases, SQL text from the Query Waits Statistics collection, and exclude specific SQL Diagnostic Manager queries as well as limit the number of rows to be collected at a time. Filtering allows you to improve the results you see in the Query Waits view and reduce the impact of the Query Wait trace on your server.

> Overly complex filters of SQL Text using Extended Events can cause high loads on the monitored instance due to a known Microsoft defect.

Access the Advanced Query Wait Statistics Configuration window

You can access the Advanced Query Wait Statistics Configuration window by right-clicking the appropriate monitored SQL Server instance, and then selecting **Properties**. Click **Wait Monitoring** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window, and then click **Filter Options**.

> ✓ When using Query Wait filtering, take into account that Exclude takes precedence over Include.

Using Query Wait filtering

Excluding data from your Query Waits Statistics collection helps filter out information that is not important for the task at hand. SQL Diagnostic Manager allows you to filter specific applications, databases, SQL text and also exclude the SQL Diagnostic Manager queries from the results or limit the number of rows to be collected at a time. When including multiple items to exclude, use a semi-colon **(;)** between items of the same type. You can also use a percent character **(%)** as a wildcard.

To exclude data from your Query Wait Statistics collection while in the Queries view:

1. On the Queries Waits view for the server you want to exclude data from, press the **Configure** button.
2. Click **Filter Options**.
3. Enter your filter information in the provided fields, using **(;)** to separate items and **(%)** as a wildcard.
4. Click **OK**.

Configure virtualization

The Virtualization tab of the Monitored SQL Server Properties window displays the name of the host server on which the selected monitored SQL Server instance is running. If this is not the correct host server, click **VM Configuration** to make the necessary changes to connect to the appropriate virtual machine.

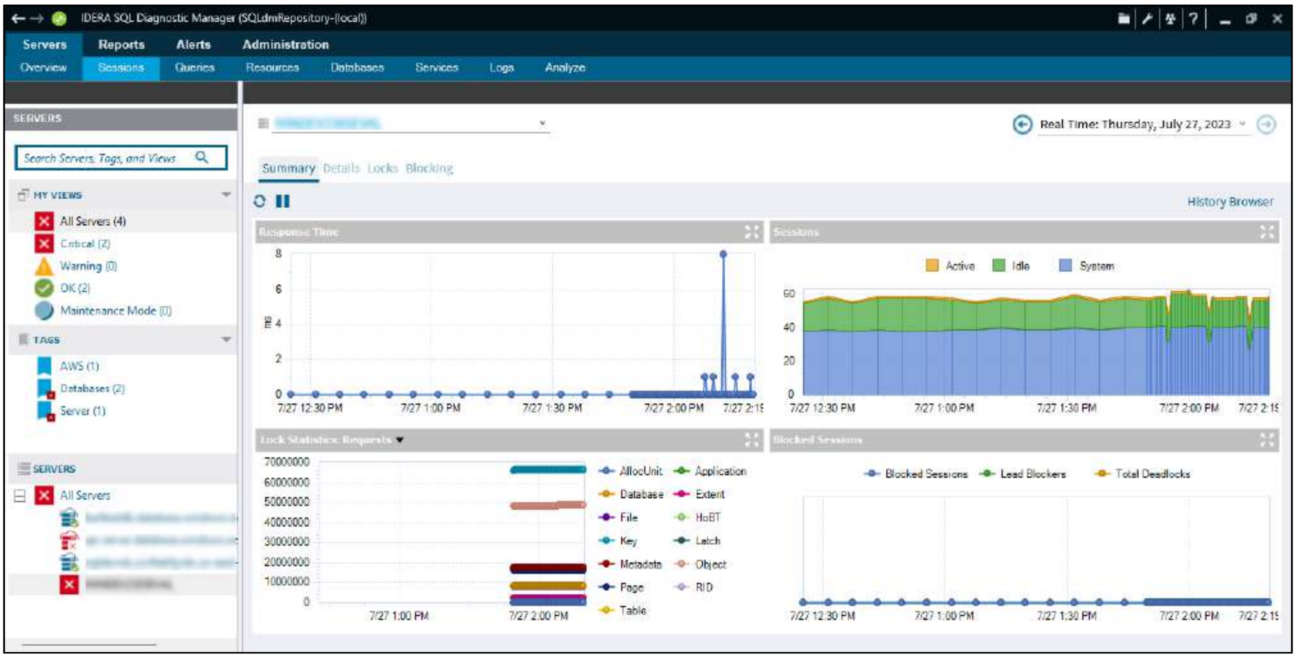
Access the Virtualization tab

You can access the Virtualization tab of the Monitor SQL Server Properties window by right-clicking the appropriate monitored SQL Server instance, and then selecting **Properties**. Click **Virtualization** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.

Monitor sessions

The Sessions tab contains the following views:

- **Summary:** You can view charts for each Sessions statistic, the following charts are displayed in the Summary tab:
  - Response Time
  - Sessions
  - Lock Statistics: Average Wait Time, Deadlocks, Requests, Timeouts, Waits, and Wait Time
  - Blocked Sessions
- **Details**: Allows you to create charts with the specific data items you need.
- **Locks:** Allows you to create charts based on each lock present on your SQL Server.
- **Blocking:** Allows you to create charts specific to all the Blocking sessions.



The Sessions tab provides the following options:

- The ability to diagnose performance bottlenecks caused by blocking or locked sessions.
- The ability to trace specific sessions to see why the session may be blocked or locked.
- The ability to kill sessions to improve system performance.

Access the Sessions tab

Access the Sessions tab by clicking the appropriate monitored SQL Server instance and clicking the Sessions tab.

Alerts associated with the Sessions tab

The following alerts are associated with the Sessions tab:

Blocked Sessions (Count)

The number of sessions blocked by other sessions holding requested locks.

Blocking Session Wait Time (Seconds)

The amount of time (in seconds) that a SQL Server session is blocking other sessions.

Client Computers (Count)

The number of unique client computers connected to the instance.

Deadlock

Refers to when two processes are waiting for a resource held by the other process.

Oldest Open Transaction (Minutes)

Displays the longest amount of time between a transaction using a Being Transaction statement and the corresponding Commit Transaction or Rollback Transaction statement, in minutes.

Query Monitor Events (Count)

The number of queries captured by Query Monitor on the monitored SQL Server instance during the last scheduled refresh.

Session CPU Time (Seconds)

Provides the CPU time (in seconds) used by SQL Server sessions.

SQL Server Response Time (Milliseconds)

Calculates the sum of the response time (in milliseconds) to send a batch of SQL statements to the server, process the query, and return the results to the SQL Diagnostic Manager Console.

User Connections (Percent)

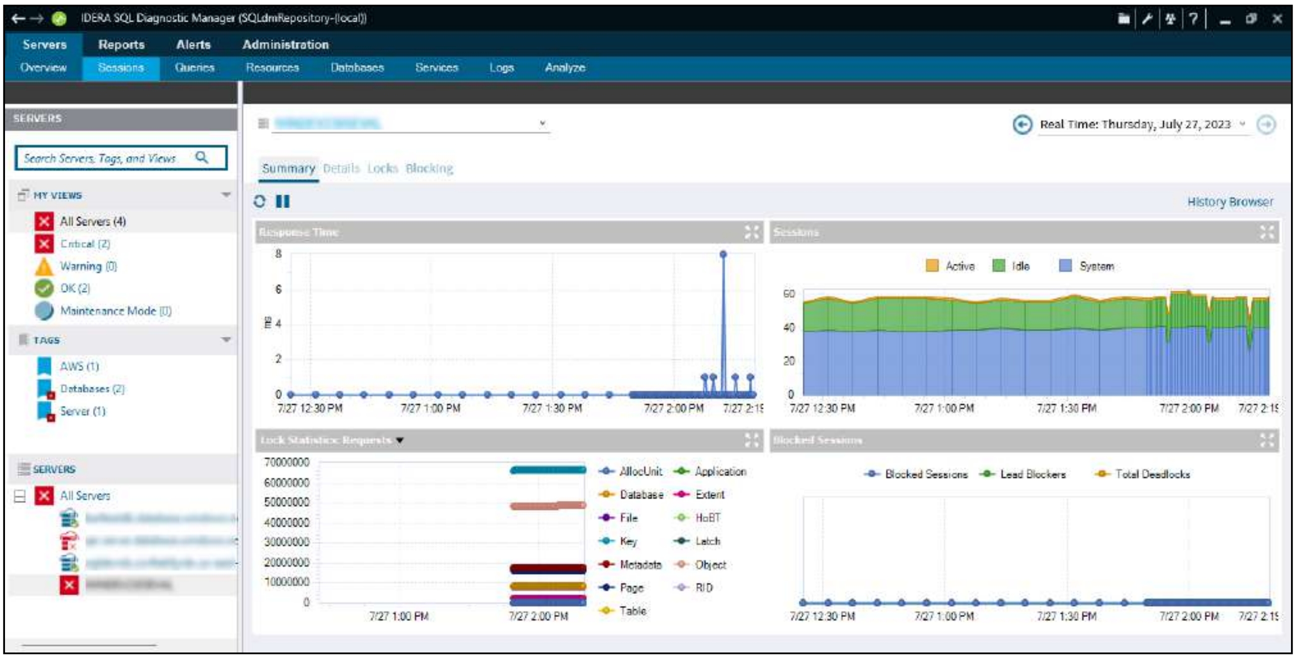
The percentage of user connections allowed that are currently used.

Get sessions performance summary

The Sessions Summary view displays real-time charts that allow you to quickly view key diagnostic statistics for sessions on your SQL Server instance. The Sessions Summary tab includes the Response Time, Sessions, Lock Statistics, and Blocked Sessions charts.

Access the Summary view

You can open the Summary view of the SQLDM Sessions tab by selecting the appropriate SQL Server instance and clicking **Sessions > Summary**.



- Response Time chart

The Response Time chart displays the response time (in milliseconds), you can see the specific time and response time of any data point in the chart by hovering your mouse over it. The Response Time chart indicates the current speed and congestion of the network as well as the speed with which the SQL Server processes small queries. Unusually high response times could indicate the need to upgrade server or network hardware.

- Sessions chart

The Sessions chart displays the number of concurrent connections to the monitored SQL Server instance over time. The total number of sessions includes the Active, Idle, and System sessions. Also, you can see the specific metric value for a given time by hovering your mouse over the chart.

- Lock Statistics chart

The Lock Statistics chart provides a breakdown of the various lock types taken by SQL Server in the last refresh. The Lock Statistics chart offers, by using the drop-down menu, charts that include information on the Average Wait Time, Deadlocks, Requests, Timeouts, Waits, and Wait Time. Also, you can see the specific time and statistic on any data point on the Lock Statistics for a given time by hovering your mouse over the chart.

- Blocked Sessions chart

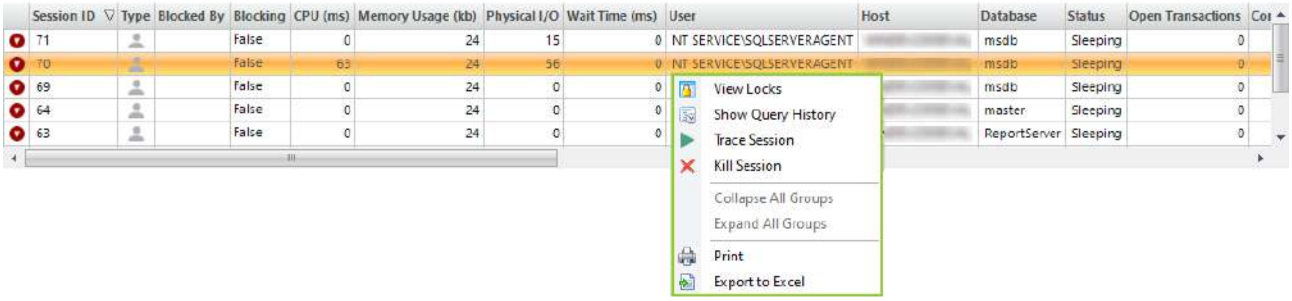
The Blocked Sessions charts list all the Blocked Sessions, Lead Blockers, and the Total Deadlocks, in real-time, for the selected SQL Server instance, allowing you to easily see blocks as they occur. Also, you can see the specific time and number of blocked sessions at a given time by hovering your mouse over the chart.

> Right-click any of the Summary Sessions graphs to enable the Toolbar option. This toolbar helps you set different configurations, like copying the graph to a clipboard, changing the type of graph, or the color palettes, and printing. Change the view of the graph to 3D/2D, rotate the view, rotate around the Y-axis, rotate around the X-axis, cluster the Z-axis, change the axis settings, and add point labels, a data grid, or a legend box. Also, you can access other graph Properties.

Get sessions performance details

The Sessions Details view provides an in-depth analysis of sessions running on your monitored SQL Server instance. You can view a wide range of information from performance details to open transactions and configured options or track process activity at the statement level. Individual sessions appear in the top portion of the window.

Right-click any session in the list to View Locks, Show Query History, Trace Session, Kill Session, Print the associated statistics, or Export statistics to Microsoft Excel.

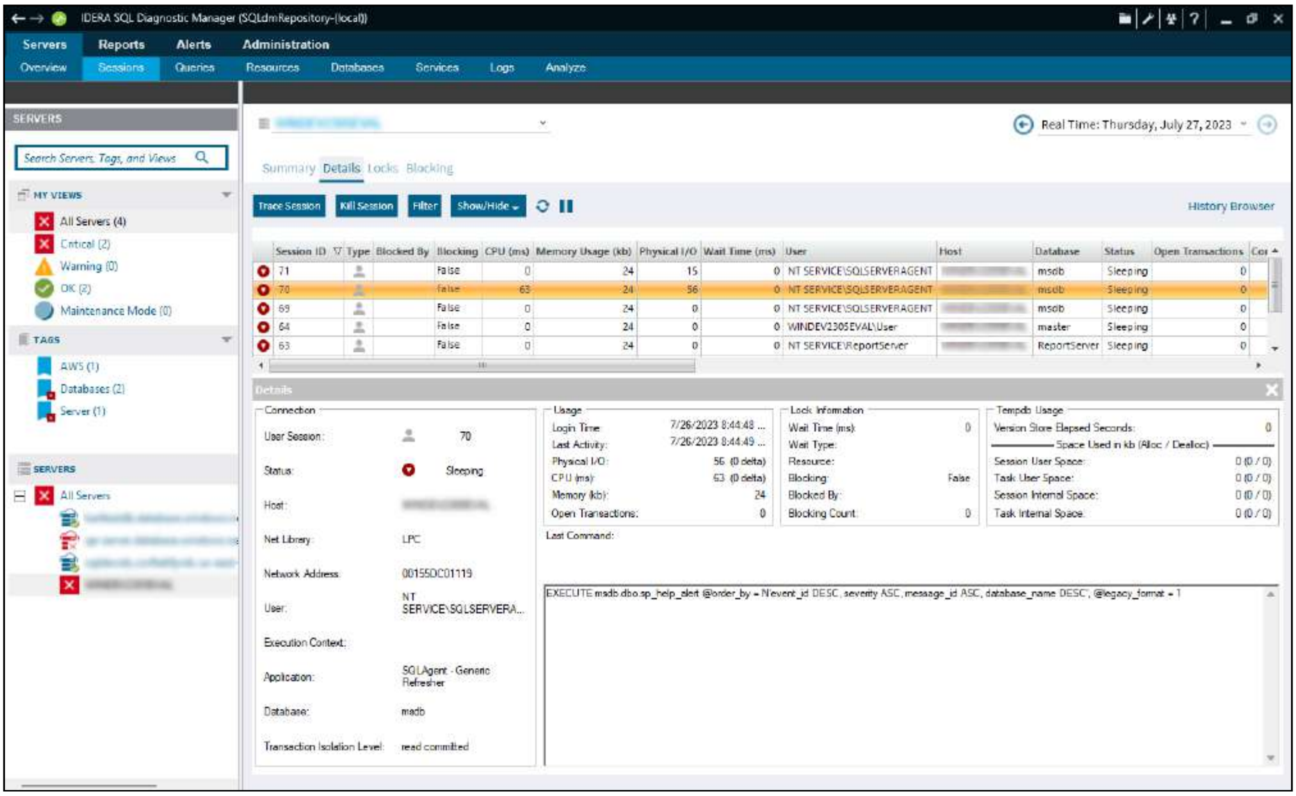


Session ID ▽	Type	Blocked By	Blocking	CPU (ms)	Memory Usage (kb)	Physical I/O	Wait Time (ms)	User	Host	Database	Status	Open Transactions	Coı
71			False	0	24	15	0	NT SERVICE\SQLSERVERAGENT	[redacted]	msdb	Sleeping	0	
70			False	63	24	56	0	NT SERVICE\SQLSERVERAGENT	[redacted]	msdb	Sleeping	0	
69			False	0	24	0	0		[redacted]	msdb	Sleeping	0	
64			False	0	24	0	0		[redacted]	master	Sleeping	0	
63			False	0	24	0	0		[redacted]	ReportServer	Sleeping	0	

When you select a session, SQL Diagnostic Manager displays the statistics for that session in the **Details** section at the bottom of the window. This section includes in-depth information regarding the session Connection, Usage, Lock, and Tempdb usage.

Access the Details view

To open the Details view of the SQL Diagnostic Manager Sessions select the appropriate SQL Server instance, and click **Sessions > Details**.



Session ID	Type	Blocked By	Blocking	CPU (ms)	Memory Usage (kb)	Physical I/O	Wait Time (ms)	User	Host	Database	Status	Open Transactions	Cor
71			False	0	24	15	0	NT SERVICE\SQLSERVERAGENT	[redacted]	msdb	Sleeping	0	
70			False	63	24	56	0	NT SERVICE\SQLSERVERAGENT	[redacted]	msdb	Sleeping	0	
69			False	0	24	0	0	NT SERVICE\SQLSERVERAGENT	[redacted]	msdb	Sleeping	0	
64			False	0	24	0	0	WINDEV2305EVAL\User	[redacted]	master	Sleeping	0	
63			False	0	24	0	0	NT SERVICE\ReportServer	[redacted]	ReportServer	Sleeping	0	

Details

Connection

User Session:	70
Status:	Sleeping
Host:	[redacted]
Net Library:	LPC
Network Address:	00155DC01119
User:	NT SERVICE\SQLSERVERA...
Execution Context:	
Application:	SQLAgent - Generic Refresher
Database:	msdb
Transaction Isolation Level:	read committed

Usage

Login Time:	7/26/2023 8:44:48 ...
Last Activity:	7/26/2023 8:44:49 ...
Physical I/O:	56 (0 delta)
CPU (ms):	63 (0 delta)
Memory (kb):	24
Open Transactions:	0

Lock Information

Wait Time (ms):	0
Wait Type:	
Resource:	
Blocking:	False
Blocked By:	
Blocking Count:	0

Tempdb Usage

Version Store Elapsed Seconds:	0
Space Used in kb (Alloc / Dealloc)	
Session User Space:	0 (0 / 0)
Task User Space:	0 (0 / 0)
Session Internal Space:	0 (0 / 0)
Task Internal Space:	0 (0 / 0)

Last Command:

```
EXECUTE msdb.dbo.sp_help_alert @order_by = N'event_id DESC, severity ASC, message_id ASC, database_name DESC', @legacy_format = 1
```

✓ Select the Filter button to select items shown on the view.

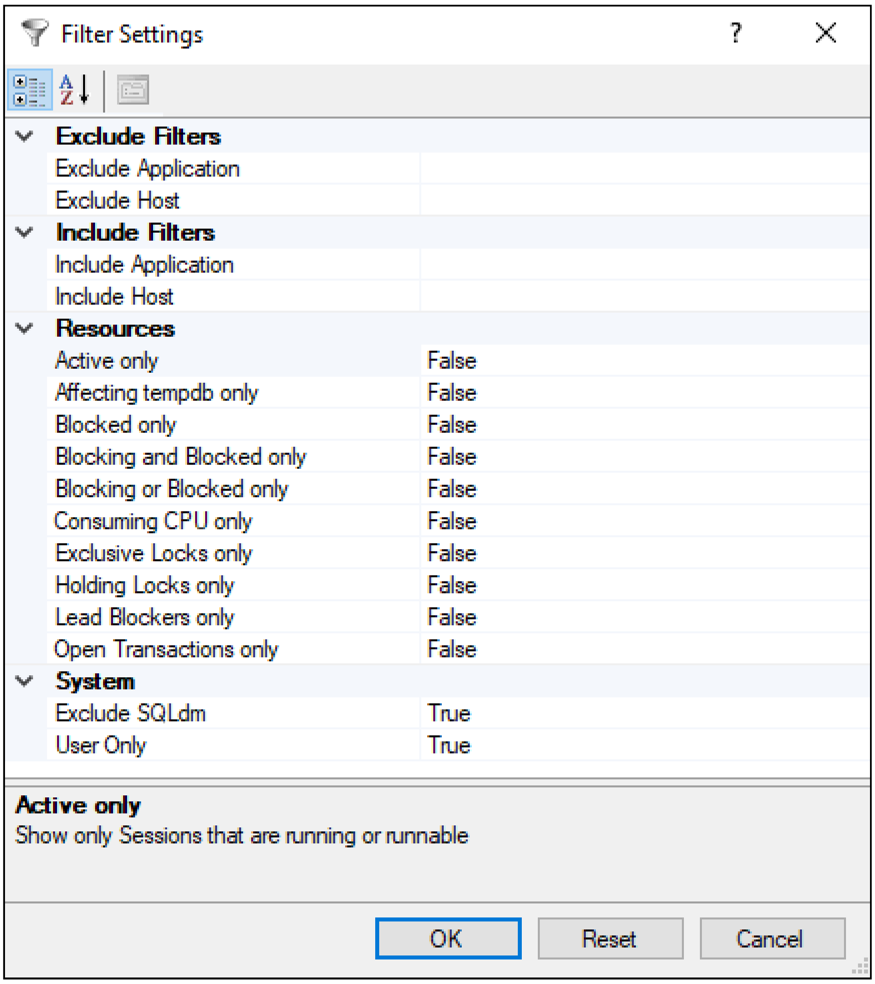
Filter views

On a number of views, SQL Diagnostic Manager includes filtering options ranging from ribbons allowing you to select items shown on the view, to a **Filter Settings** window that provides a variety of options to customize how SQL Diagnostic Manager presents your view.

Use the Filter options to customize your view

The Filter box contains the filtering options available for that view, meaning that the available options are not consistent across views because of the data displayed in each view. You can select the options you want displayed in the menu by using the Filter Settings window. Click the **Filter** icon in the ribbon to display the Filter Settings window.

Every Filter Settings window in SQL Diagnostic Manager provides specific options for the current view. These options can include true or false fields that allow you to decide whether to show a particular item, filtering fields where you can enter an item name or even use a wildcard (%), dates and time ranges, and interval periods:



Exclude Filters	
Exclude Application	
Exclude Host	
Include Filters	
Include Application	
Include Host	
Resources	
Active only	False
Affecting tempdb only	False
Blocked only	False
Blocking and Blocked only	False
Blocking or Blocked only	False
Consuming CPU only	False
Exclusive Locks only	False
Holding Locks only	False
Lead Blockers only	False
Open Transactions only	False
System	
Exclude SQLdm	True
User Only	True

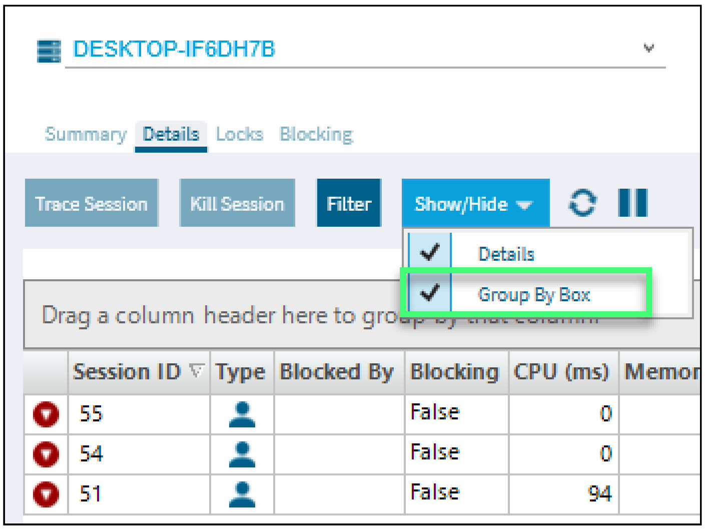
Active only
Show only Sessions that are running or runnable

- **Exclude Filters**
  - Exclude Application: Specify the Application you want to exclude in the filter, you can enter the application name or use the wildcard character.
  - Exclude Host: Specify the Host name you want to exclude in the filter or use the wildcard character.

- **Include Filters**
  - Include Application: Specify the Application you want to include in the filter, you can enter the application name or use the wildcard character.
  - Include Host: Specify the Host name you want to include in the filter or use the wildcard character.
- **Resources**
  - Active only: Select True or False to show only Sessions that are running.
  - Affecting tempdb only: Select True or False to show only Sessions that are affecting tempdb (2005+only)
  - Blocked only: Select True or False to show only Sessions that are blocked by other process.
  - Blocking and Blocked only: Select True or False to show only Sessions that are being blocked by other session and are blocking other sessions.
  - Blocking or Blocked only: Select True or False to show only Sessions that are being blocked by another session or are blocked other sessions.
  - Consuming CPU only: Select True or False to show only Sessions that are consuming CPU cycles.
  - Exclusive Locks only: Select True or False to show only Sessions that holding exclusive locks.
  - Holding Locks only: Select True or False to show only Sessions that are holding locks.
  - Lead Blockers only: Select True or False to show only Sessions that are leading a blocking chain.
  - Open Transactions only: Select True or False to show only Sessions that have open transactions.
- **System**
  - Exclude SQLdm: Select between True or False to exclude all Sessions associated with SQL Diagnostic Manager.
  - User Only: Select between True or False to show only User Sessions and exclude all the System sessions.

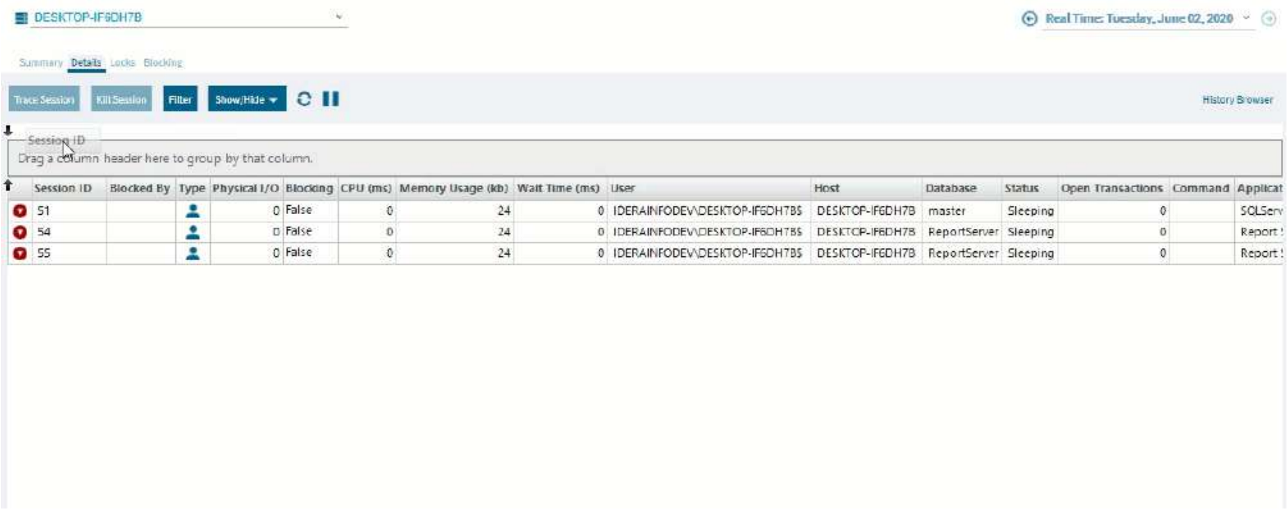
Use the Group By feature to organize your view

The Group By feature allows you to group the information shown in your views. To group your information by a column, check the **Group By Box** option, and then drag one or more column headings into the provided area as shown in the following image.



	Session ID	Type	Blocked By	Blocking	CPU (ms)	Memor
●	55	👤		False	0	
●	54	👤		False	0	
●	51	👤		False	94	

When you group data by multiple columns, be sure to select the headings in the hierarchy in which you want SQL Diagnostic Manager to display the results. After selecting the **Group By Box** check box, click, hold, and drag the first column heading (first order of grouping) into the grouping area. Next, click, hold, and drag the second column heading (second order of grouping) into the grouping area. Continue this process until you have the data hierarchy you want. Click the column headings to toggle sort order between ascending and descending.



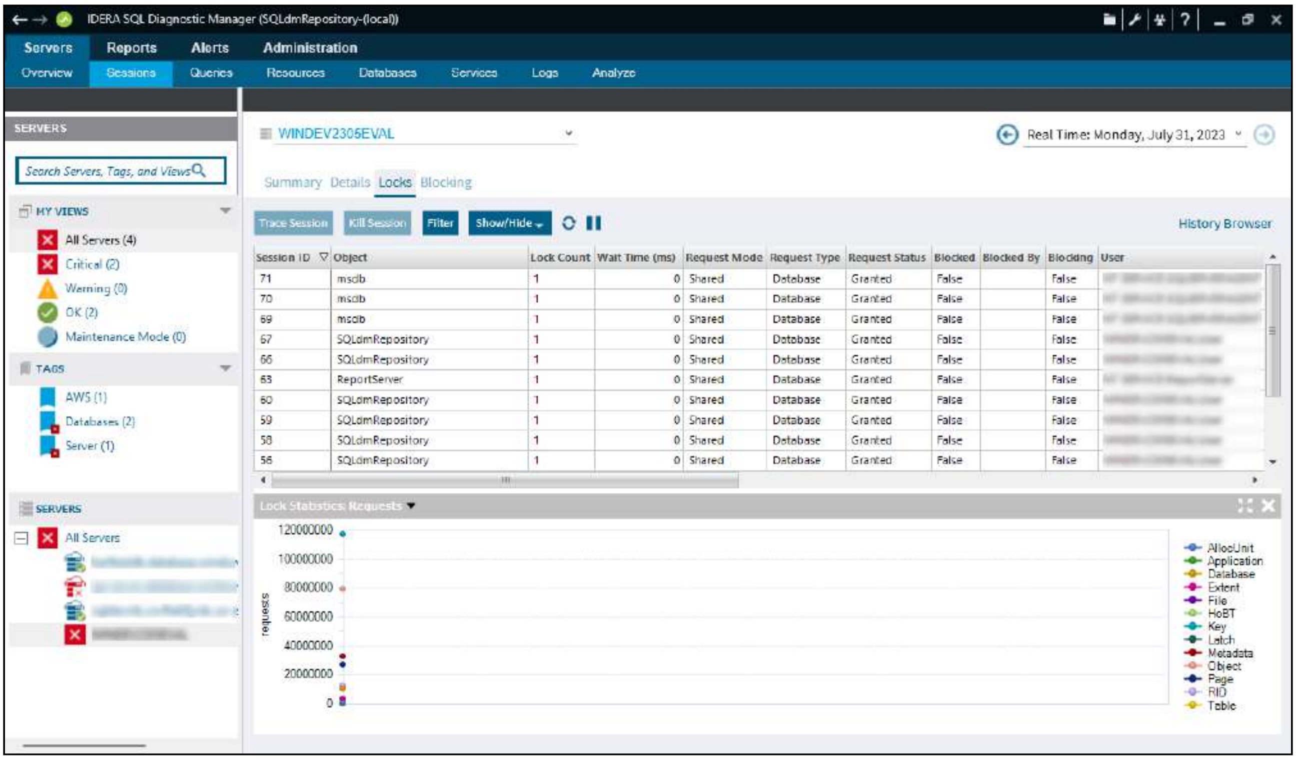
Drag a column header here to group by that column.

	Session ID	Blocked By	Type	Physical I/O	Blocking	CPU (ms)	Memory Usage (kb)	Wait Time (ms)	User	Host	Database	Status	Open Transactions	Command	Applicat
●	51		👤	0	False	0	24	0	IDERAINFODEV\DESKTOP-IF6DH7B$	DESKTOP-IF6DH7B	master	Sleeping	0		SQLServ
●	54		👤	0	False	0	24	0	IDERAINFODEV\DESKTOP-IF6DH7B$	DESKTOP-IF6DH7B	ReportServer	Sleeping	0		Report !
●	55		👤	0	False	0	24	0	IDERAINFODEV\DESKTOP-IF6DH7B$	DESKTOP-IF6DH7B	ReportServer	Sleeping	0		Report !

You can remove a column from the grouping area by performing a click, hold, and drag of the column back into the grid area or by right-clicking the heading, and selecting **Remove This Column**.

Analyze locked sessions

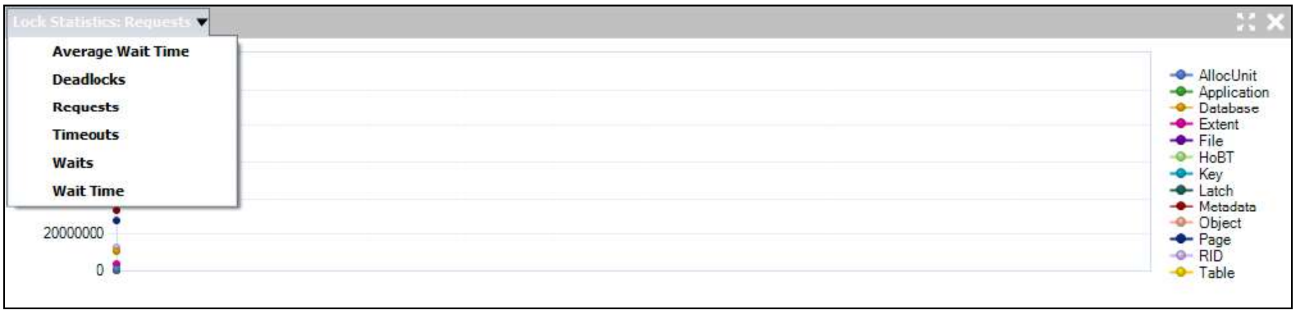
The Locked Sessions view shows which problem locks are causing data availability problems and unacceptable responses. Combining the information provided on the Problem Locks view (including the type of Lock) with the **Lock Statistics: Waits** chart on the Sessions Summary tab, you can pinpoint, correct, or reschedule automated applications that cause extensive row, table, or database locking.



Session ID	Object	Lock Count	Wait Time (ms)	Request Mode	Request Type	Request Status	Blocked	Blocked By	Blocking	User
71	msdb	1	0	Shared	Database	Granted	False		False	[redacted]
70	msdb	1	0	Shared	Database	Granted	False		False	[redacted]
69	msdb	1	0	Shared	Database	Granted	False		False	[redacted]
67	SQLdmRepository	1	0	Shared	Database	Granted	False		False	[redacted]
66	SQLdmRepository	1	0	Shared	Database	Granted	False		False	[redacted]
63	ReportServer	1	0	Shared	Database	Granted	False		False	[redacted]
60	SQLdmRepository	1	0	Shared	Database	Granted	False		False	[redacted]
59	SQLdmRepository	1	0	Shared	Database	Granted	False		False	[redacted]
58	SQLdmRepository	1	0	Shared	Database	Granted	False		False	[redacted]
56	SQLdmRepository	1	0	Shared	Database	Granted	False		False	[redacted]

Use the drop-down list in the chart title to select charts that include:

- Average Wait Time
- Deadlocks
- Requests
- Timeouts
- Waits
- Wait Time information



Right-click any of these charts and either print, save as an image, or export them to Microsoft Excel. In addition, you can select **Toolbar** for advanced customization options such as changing the chart color scheme and the type of chart shown.

Access the Locks view

You can open the Locks view of the SQL Diagnostic Manager Sessions tab by selecting the appropriate SQL Server **instance** and **clicking Sessions > Locks.**

Available SQL Server lock objects

The Lock Statistics chart includes the following objects:

AllocUnit

Represents a lock on an allocation unit.

Application

Represents a lock on an application-specific resource.

Database

Represents a lock on a database, including all objects in the database.

Extent

Represents a lock on a contiguous group of eight pages.

File

Represents a lock on a database file.

HoBT

(Heap or BTree) Represents a lock on a heap of data pages, or on the BTree structure of an index.

Key

Represents a lock on a row in an index.

Latch

Represents a lock on a latch.

Metadata

Represents a lock on a piece of catalog information, also called metadata.

Object

Represents a lock on an item such as a table, stored procedure, or view, including all data and indexes. The object represents anything that has an entry in sys.all_objects.

Page

Represents a lock on an 8 KB page in a database.

RID

(Row ID) Represents a lock on a single row in a heap.

Table

Represents a lock on a table.

Analyze blocked sessions

The Blocking view provides a blocking tree, along with the lead blockers, for the selected SQL Server instance. A lead blocker is a session that blocks at least one session, which can then block other sessions.

> ✓ You can use the History Browser to view past performance and go back to the point in time to view the sessions involved with the blocking alerts you receive.

Navigate through the blocking tree to find sessions that cause blocks, and then either trace sessions to find out what is causing the blocks or stop the session to have it removed. To trace a blocked session or lead blocker select it from the list and click **Trace Session**. To stop a blocked session, or lead blocker, select it from the list, and click **Kill Session**.

> ✓ Deadlocks have no lead blockers and are circular in nature. For this reason, SQL Diagnostic Manager does not display deadlocks in the Blocking Tree but does display instances of deadlocks in the Blocking Chart. In addition, SQL Diagnostic Manager does not count self-blocking sessions as blocked or blocking sessions.

Access the Blocking view

You can open the Blocking view of the SQL Diagnostic Manager Sessions tab by selecting the appropriate SQL Server instance, and then clicking **Sessions > Blocking**.

Trace Session

When you click **Trace Session**, the Session Trace window opens. The Session Trace provides session statistics and information including the following:

- Overview of the session, including the CPU Time, Row Count, Lock Wait Timeout, Physical Reads and Write metrics.
- Last Command executed.
- All the SQL Server statements.

Blocking chart

The Blocking chart displays the number of blocked sessions, lead blockers, and total deadlocks at a given point in time. The total deadlocks represent the total number of deadlocks that have occurred since the last time the pane was refreshed.

You can right-click the chart and either print, save as image, or export this data to Microsoft Excel. In addition, you can select **Toolbar** for advanced customization options, such as changing the chart color scheme and the type of chart shown.

Blocking Sessions Report

The Blocking Sessions Report (Block Reports) displays blocking and blocked sessions' information. To access the Blocking Sessions Report in the Alert view, select the Show Block Details option in the right-click context menu. You can also access the same information on the **Blocking View** by selecting a specific SQL Server instance, pointing to **Sessions**, and then selecting the **Blocking** ribbon.

Key information provided for blocking and blocked sessions includes:

Blocking Process Details:

- Session ID
- Host Name
- User Name
- Application
- Database
- Last Batch Started
- Transaction ID
- Open Transactions

Blocked Process Details:

- Session ID
- Host Name
- User Name
- Application
- Database
- Last Batch Started
- Transaction ID
- Open Transactions
- Wait Time (ms)
- Wait Resource

This feature allows you to export statistics in XML format.

✓ To retrieve the blocking sessions report for SQL Diagnostic Manager, select the "**Non-Query activities>Capture Blocking (SQL 2005+)**" check box in the **Activity Monitor** Tab.

Deadlock Sessions Report

The Deadlock Sessions Report (Deadlock Reports) displays deadlock sessions information. To access the Deadlock Sessions Report in the Alert view, select the **Show Block Details** option in the right-click context menu. You can also access the same information on the **Blocking View** by selecting a specific SQL Server instance, pointing to **Sessions**, and then selecting the **Blocking** ribbon.

Key information provided for deadlock sessions includes:

Deadlock Process Details:

- Session ID
- Status
- Host Name
- User Name
- Execution Context
- Application
- Database
- Last Batch Started
- Last Batch Completed
- Last Transaction Started
- Transaction ID
- Transaction Name
- Open Transactions
- Wait Time (ms)

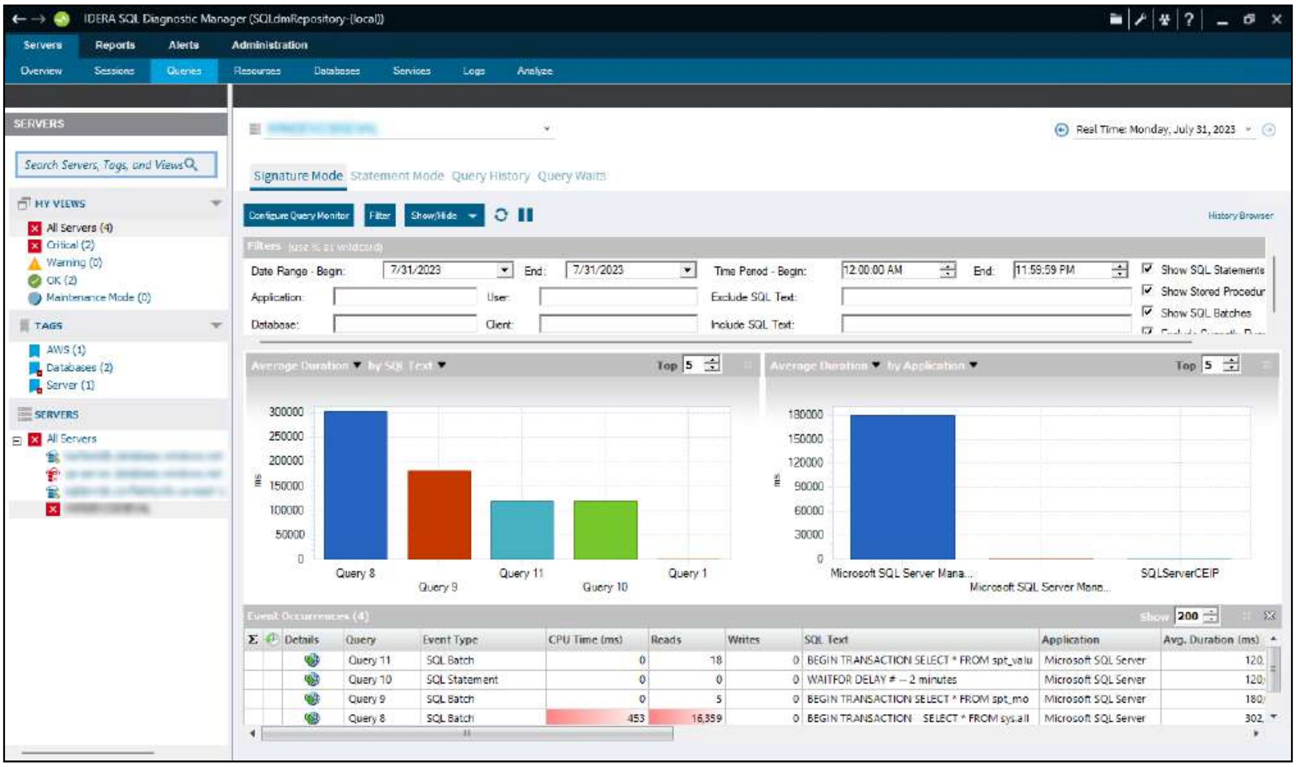
- Wait Type
- Wait Resource

This feature allows you to export statistics in XDL format.

> ✓ To retrieve the deadlock sessions report for SQL Diagnostic Manager, select the "**Non-Query activities>Capture deadlocks (SQL 2005+)**" check box in the **Activity Monitor** Tab.

Monitor query performance

Query Monitor is a useful SQL Server tool that allows you to log and analyze queries. Query Monitor allows you to establish criteria for the queries you wish to capture, and filter those results to analyze the queries returned. Use the Query Monitor when diagnosing poor query performance on your SQL Server instance. You should monitor queries if your SQL Server instance performance is poor, as a way to diagnose potential query issues.



Date Range - Begin: 7/31/2023 End: 7/31/2023 Time Period - Begin: 12:00:00 AM End: 11:59:59 PM

Application: User: Exclude SQL Text:

Database: Client: Include SQL Text:

☑ Show SQL Statements
☑ Show Stored Procedur
☑ Show SQL Batches

Σ		Details	Query	Event Type	CPU Time (ms)	Reads	Writes	SQL Text	Application	Avg. Duration (ms)
			Query 11	SQL Batch	0	18	0	BEGIN TRANSACTION SELECT * FROM spt_valu	Microsoft SQL Server	120.
			Query 10	SQL Statement	0	0	0	WAITFOR DELAY # -- 2 minutes	Microsoft SQL Server	120.
			Query 9	SQL Batch	0	5	0	BEGIN TRANSACTION SELECT * FROM spt_mo	Microsoft SQL Server	180.
			Query 8	SQL Batch	453	16,359	0	BEGIN TRANSACTION SELECT * FROM sys.all	Microsoft SQL Server	302.

To explore query data in multiple ways and get a handle on queries in your system, try our New advanced query views of the SQL Diagnostic Manager web console.

Access the Queries tab

Access the Queries tab by clicking the appropriate monitored SQL Server instance and then clicking the Queries tab.

Use the Queries tab

The Queries tab lists each event that occurs in the Query Monitor. For each event, among other details, SQL Diagnostic Manager lists the SQL text associated, start and end times, application, user information, and client computer associated with the event. Fields with SQL text hold 255 characters of text. To view the full SQL text, right-click the field and then select the appropriate option.
SQL Diagnostic Manager automatically assigns a name to each of your queries starting with Query 1. The name

provides context to your query when switching from Signature Mode, Statement Mode, Query History, and Query Waits views.

> ⓘ Query names are not persistent. They are different on different desktops and sessions on the same desktop.

The **Event Occurrences** chart at the bottom of the view displays the number of T-SQL statements, stored procedures, and SQL batches captured in the trace.

> ✓ Right-click any column heading to pick additional columns to display.

The Sigma (Σ) character indicates that the data in this row is at least partially composed of aggregated data. This means that the data is condensed into a day-length summary and some precision about the individual statements, client computers, and users is suppressed. Rows in this view with the Sigma character may include a mix of aggregated and non-aggregated data.

Understand the difference between Signature Mode and Statement Mode

Signature and Statement modes are two different ways to group and view your queries. You can toggle between each mode to see the differences.

Signature Mode (default Queries view)

All active queries are automatically reduced to the signatures (parameters are stripped) and grouped accordingly.

> ✓ You can also view signatures in the Advanced query signature view of the SQL Diagnostic Manager web console.

Statement Mode

All queries are presented exactly as the Query Monitor Trace collects them.

Use Filter Settings to customize your view

Use the Filters section of the Signature Mode, Statement Mode, and Query History views to pick the time range, what to include in the table, and even specific applications, client computers, databases, SQL text, and users to view.

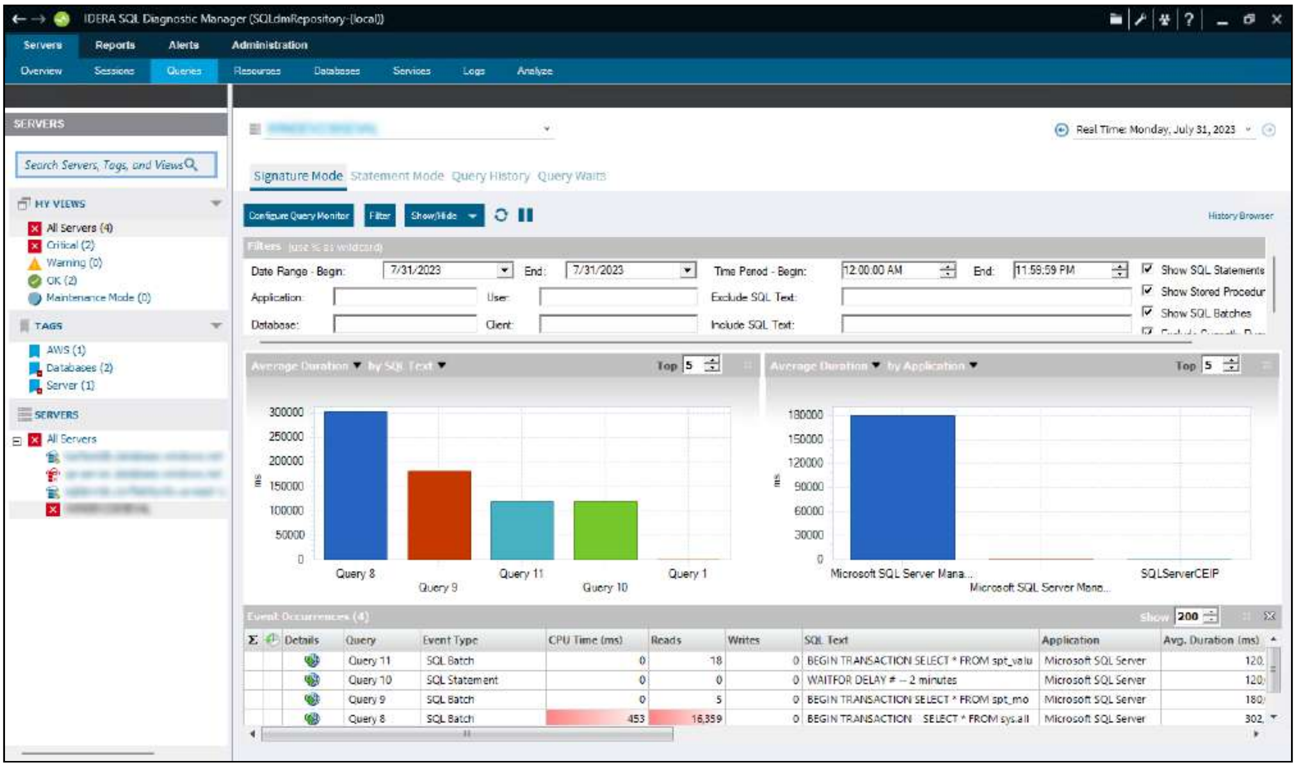
You can access advanced filters by clicking the **Filter** button. These options include the ability to filter out specific applications, databases, and SQL text from your query collection.

> ✓ The **Include incomplete queries** filter in the Signature Mode and Statement Mode views is disabled by default. If you would like to include data with null values in these views, select the **Include incomplete queries** check box in the Filters section.

> ✓ You can hide and unhide the Filter and List areas of the Query Monitor views in the ribbon.

View the query monitor signature mode

The Query Monitor Signature Mode view includes all active query information, automatically reduced to the signatures and grouped accordingly. Note that the parameters are stripped.



Date Range - Begin: 7/31/2023 End: 7/31/2023 Time Period - Begin: 12:00:00 AM End: 11:59:59 PM

Application: User: Exclude SQL Text:

Database: Client: Include SQL Text:

☑ Show SQL Statements
☑ Show Stored Procedur
☑ Show SQL Batches

Details	Query	Event Type	CPU Time (ms)	Reads	Writes	SQL Text	Application	Avg. Duration (ms)
	Query 11	SQL Batch	0	18	0	BEGIN TRANSACTION SELECT * FROM spt_valu	Microsoft SQL Server	120.
	Query 10	SQL Statement	0	0	0	WAITFOR DELAY # -- 2 minutes	Microsoft SQL Server	120,
	Query 9	SQL Batch	0	5	0	BEGIN TRANSACTION SELECT * FROM spt_mo	Microsoft SQL Server	180,
	Query 8	SQL Batch	453	16,359	0	BEGIN TRANSACTION SELECT * FROM sys.all	Microsoft SQL Server	302,

If you want to prevent certain queries from appearing on the Query Monitor views, click **Configure Query Monitor > Advanced** and enter the applications, databases, or SQL text you want to exclude from the Query Monitor collection. You can also configure these options directly in the SQL Diagnostic Manager web console.

The Query Monitor Signature Mode view is the place to start when investigating query performance. It broadly defines queries and trends with a less overwhelming amount of data and allows you to diagnose a query in a general sense. Once you identify a potential problem, you may want to view the statement mode view to see why a query is experiencing performance problems for a particular user, and then to the query history to see how the query performs over time and the associated trends.

The Signature Mode view is displayed as follows:

- **Filter -** Use Query filters to narrow the results to only those that most interest you. Do this by selecting the Date Range - Begin and End, the Application, User, Database, Client, and the SQL Text you want to include or exclude from your results.
- **Charts -** The primary focus of the Signature Mode view is in the charts. The cart type drop-down allows you to pick a chart type: Average CPU, Average Reads, Average Writes, Average Waits, Deadlocks, Blocking, CPU Per Second, and I/O Per Second. Also, you can choose to view the type of chart by the following categories: By SQL Text, By Application, or By Database.

- **Event Occurrences -** It lists each occurrence of the query and the associated statistics, such as the Event Type, CPU Time (ms), Reads, Writes, SQL Text, Application, Avg. Duration (ms), Database, Avg. CPU Time, Reads as % of List, Avg. Writes, CPU as % of List, Writes as % of List, Avg. I/O Per Sec, Avg. Wait Time (ms), Avg. CPU Per Sec, Avg. Reads, Occurrences, Most Recent Completion, Avg. Blocking Time (ms), and Avg. Deadlocks.

In the Event Occurrences, each listed query has the option to view the Query Details, click 🌐 to open the Query Details window (if the icon 🌐 is not colored, it means that there is no plan collected).

Sigma (Σ) character

The Sigma character indicates that the data in this row is at least partially composed of aggregated data. This means that the data is condensed into a day-length summary and some precision about the individual statements, client computers, and users is suppressed. Rows in this view with the Sigma character may include a mix of aggregated and non-aggregated data.

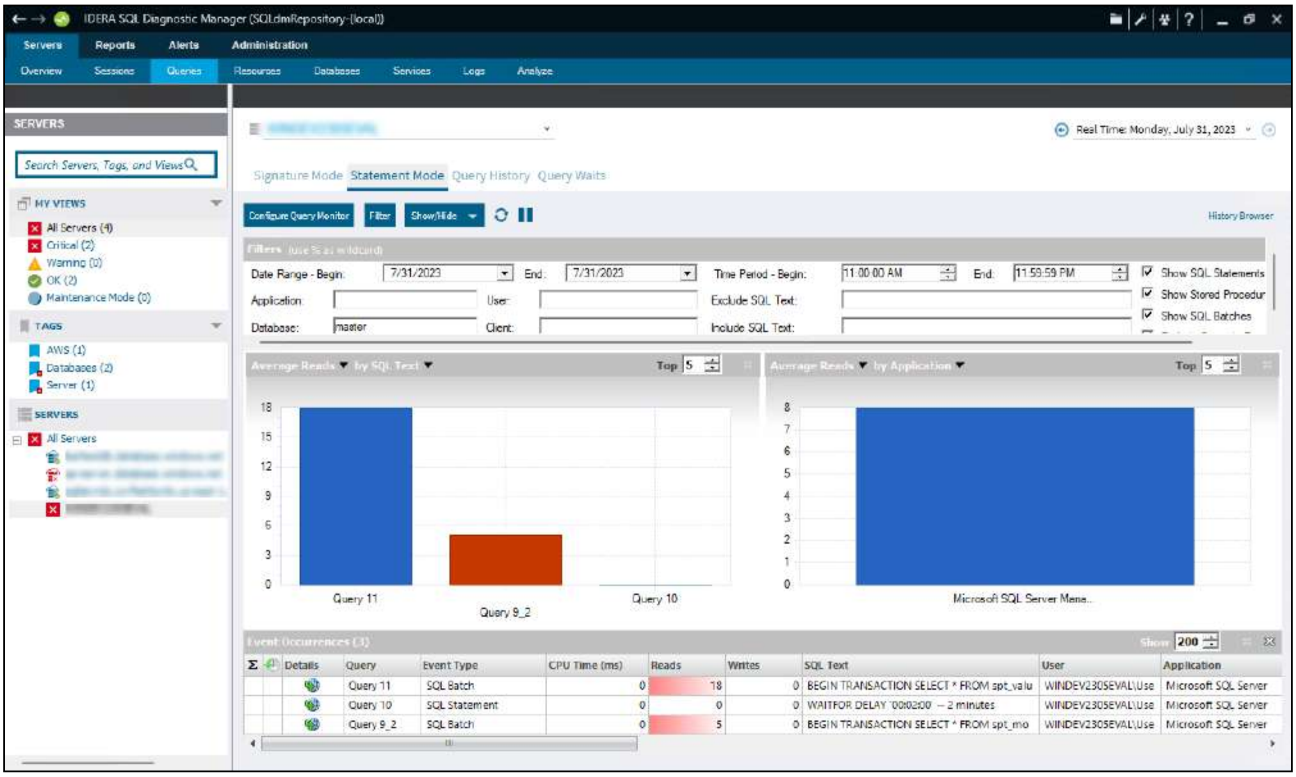
In the Signature Mode view, right-click any of the listed queries under the Event Occurrences list and click Show Query Text to open the SQL Text window (In this window run a Query Diagnosis and receive a list of performance recommendations).

Understanding cell colors

Red in the column indicates that the data in that row represents 20% or more of the total data displayed in the list, while yellow indicates that the data in the row represents 5% or more of the total data displayed in the list.

View the query monitor statement mode

The Statement Mode view includes queries that are presented exactly as they are collected by the Query Monitor Trace.



Date Range - Begin:	7/31/2023	End:	7/31/2023	Time Period - Begin:	11:00:00 AM	End:	11:59:59 PM	☑ Show SQL Statements
Application:		User:		Exclude SQL Text:				☑ Show Stored Procedur
Database:	master	Client:		Include SQL Text:				☑ Show SQL Batches

Σ		Details	Query	Event Type	CPU Time (ms)	Reads	Writes	SQL Text	User	Application
			Query 11	SQL Batch	0	18	0	BEGIN TRANSACTION SELECT * FROM spt_valu	WINDEV2305EVAL\Use	Microsoft SQL Server
			Query 10	SQL Statement	0	0	0	WAITFOR DELAY '00:02:00' -- 2 minutes	WINDEV2305EVAL\Use	Microsoft SQL Server
			Query 9_2	SQL Batch	0	5	0	BEGIN TRANSACTION SELECT * FROM spt_mo	WINDEV2305EVAL\Use	Microsoft SQL Server

If queries appear on the Query Monitor views that you never want to appear, click **Configure Query Monitor > Advanced** and enter the applications, databases, or SQL text you want to exclude from the Query Monitor collection.

The Statement Mode view is where you go to drill down into a specific execution of a particular query. Whereas the signature mode view provides a filtered look at your queries, the Statement Mode view provides all the details you may need to diagnose a specific problem with a query. Once you find the problem query, History mode allows you to track the query over time and view trends.

The Statement Mode view is displayed as follows:

- **Filter -** Use Query filters to narrow the results to only those that most interest you. Do this by selecting the Date Range - Being and End, Application, User, Database, Client, and the SQL Text you want to include or exclude from your results.
- **Charts -** The primary focus of the Statement Mode view is in the charts. The charts type drop-down allows you to pick a chart type to display: Average Duration, Average CPU, Average Reads, Average Writes, Average Waits, Deadlocks, Blocking, CPU Per Second, and I/O Per Second. Also, you can choose to view the type of charts by the following categories: By SQL Text, By Application, By Database, By User, and By Client.
- **Event Occurrences -** It lists each occurrence of the query and associated statistics, such as the Event Type, CPU Time (ms), Reads, Writes, SQL Text, User, Application, Duration (ms), Database, Avg. CPU Time (ms),

Avg. Writes, Avg. I/O per sec, Wait Time (ms), Avg. CPU Per Sec, Avg. Reads, Start Time, End Time, Blocking Time (ms), Deadlocks, Client, and Speed.

In the Event Occurrences, each listed query has the option to view the Query Details, click 🌐 to open the Query Details window (if the icon 🌐 is not colored, it means that there is no plan collected).

Sigma (Σ) character

The Sigma character indicates that the data in this row is at least partially composed of aggregated data. This means that the data is condensed into a day-length summary and some precision about the individual statements, client computers, and users is suppressed. Rows in this view with the Sigma character may include a mix of aggregated and non-aggregated data.

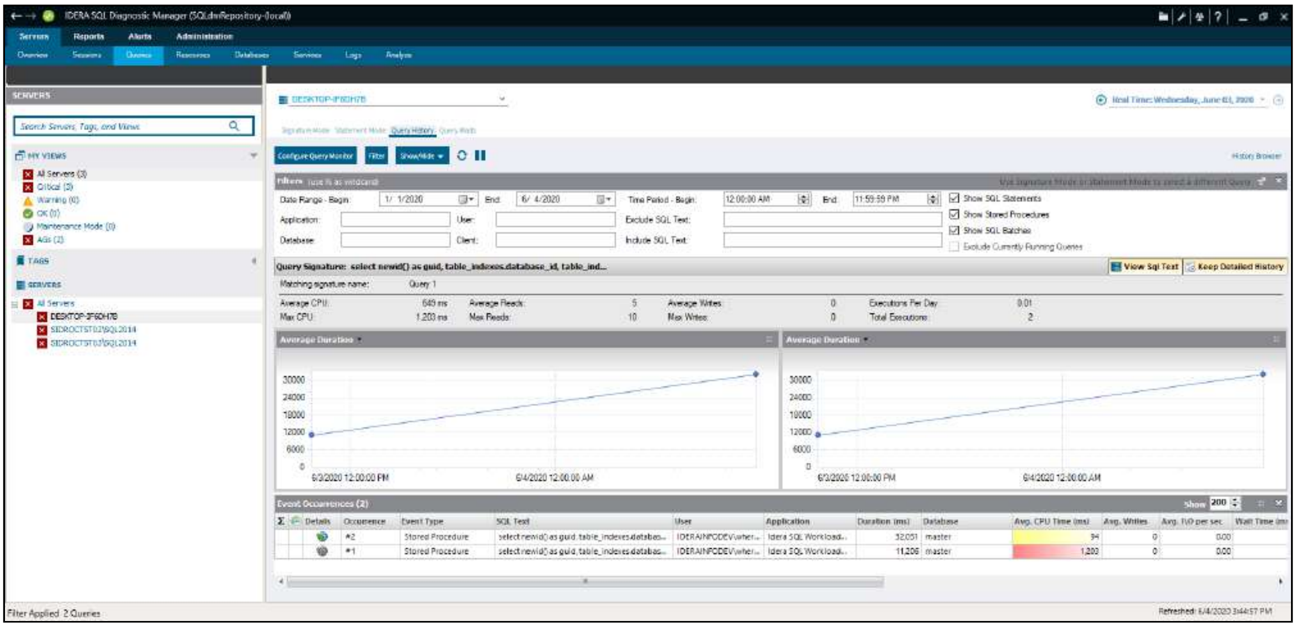
In the Signature Mode view, right-click any of the listed queries under the Event Occurrences list and click Show Query Text to open the SQL Text window (In this window run a Query Diagnosis and receive a list of performance recommendations).

Understanding cell colors

Red in the column indicates that the data in that row represents 20% or more of the total data displayed in the list, while yellow indicates that the data in the row represents 5% or more of the total data displayed in the list.

View the query history

Query History allows you to track the performance of a query over time. To access the Query History view, select the query you want to see on the query statement mode or signature mode view in the graph. You can also access the Query History view by right-clicking a session on the Session Details view or a Statement on the Query Waits view and selecting Show Query History.



Filters (use % as wildcard)

Use Signature Mode or Statement Mode to select a different Query

Date Range - Begin: 1/ 1/2020 End: 6/ 4/2020 Time Period - Begin: 12:00:00 AM End: 11:59:59 PM

Application: User: Exclude SQL Text:

Database: Client: Include SQL Text:

☑ Show SQL Statements
☑ Show Stored Procedures
☑ Show SQL Batches
□ Exclude Currently Running Queries

Query Signature: select newid() as guid, table_indexes.database_id, table_ind...

Matching signature name: Query 1

Average CPU:	649 ms	Average Reads:	5	Average Writes:	0	Executions Per Day:	0.01
Max CPU:	1,203 ms	Max Reads:	10	Max Writes:	0	Total Executions:	2

Event Occurrences (2) Show 200

Details	Occurence	Event Type	SQL Text	User	Application	Duration (ms)	Database	Avg. CPU Time (ms)	Avg. Writes	Avg. I/O per sec	Wait Time (ms)
	#2	Stored Procedure	select newid() as guid, table_indexes.databas...	IDERAINFODEV\wher...	Idera SQL Workload...	32,051	master	94	0	0.00	
	#1	Stored Procedure	select newid() as guid, table_indexes.databas...	IDERAINFODEV\wher...	Idera SQL Workload...	11,206	master	1,203	0	0.00	

Filter Applied 2 Queries

Refreshed: 6/4/2020 3:44:57 PM

Access the Query History view

You can open the Query History view of the SQL Diagnostic Manager Queries tab by selecting the appropriate SQL Server instance and clicking **Queries > Query History**.

View Query History

1. Use the drop-down menu on each chart to view the history of each of the metrics associated with the query: Average Duration, Average CPU, Average Reads, Average Writes, Average Waits, Deadlocks, Blocking, CPU Per Second, and I/O Second.
2. Click **View SQL Text** to see the associated query text.
3. Click **Aggregate History** to keep an aggregated history for the selected query.

Use Query filters to narrow the results to only those that most interest you. Do this by selecting the date and time range, the application, user, database, workstation, and even the SQL text you want to include or exclude from your results.

Event Occurrences is a list of each occurrence of the query and the associated statistics, such as the duration, CPU time, reads, writes, and associated SQL text. Click the Maximize window icon to view a larger version of this list.

If Query Monitor is disabled but Activity Monitor is enabled, SQL statements appearing in the Event Occurrences grid come from the Blocking Session collector. The collector only populates the following fields: Occurrence, SQL text, Event Type, and Deadlocks.

Sigma (Σ) character

The Sigma character indicates that the data in this row is at least partially composed of aggregated data. This means that the data is condensed into a day-length summary and some precision about the individual statements, client computers, and users is suppressed. Rows in this view with the Sigma character may include a mix of aggregated and non-aggregated data.

Understanding cell colors

Red in the column indicates that the data in that row represents 20% or more of the total data displayed in the list, while yellow indicates that the data in the row represents 5% or more of the total data displayed in the list.

View query waits

The Query Waits view displays the queries on your SQL Server instance with the longest wait times. By default, the chart at the bottom of the view displays the query waits over time and allows you to further investigate based on Statements, Applications, Databases, Clients, Sessions, and Users.

By analyzing these waits you can better determine where your biggest bottlenecks are occurring and what changes could potentially have the biggest performance boost on your SQL Server instance.

You can select to view query waits as the waits appear over time or by duration of the wait, color coded by query. The chart includes each of the following wait type categories: Backup, I/O, Lock, Memory, Non-I/O Page Latch, Non-Page Latch, Transaction Log, and Other.

Access the Query Waits view

To pen the Query Waits view of the SQL Diagnostic Manager Queries tab, select the appropriate SQL Server instance, select **Queries**, and click **Query Waits**.

Query Details

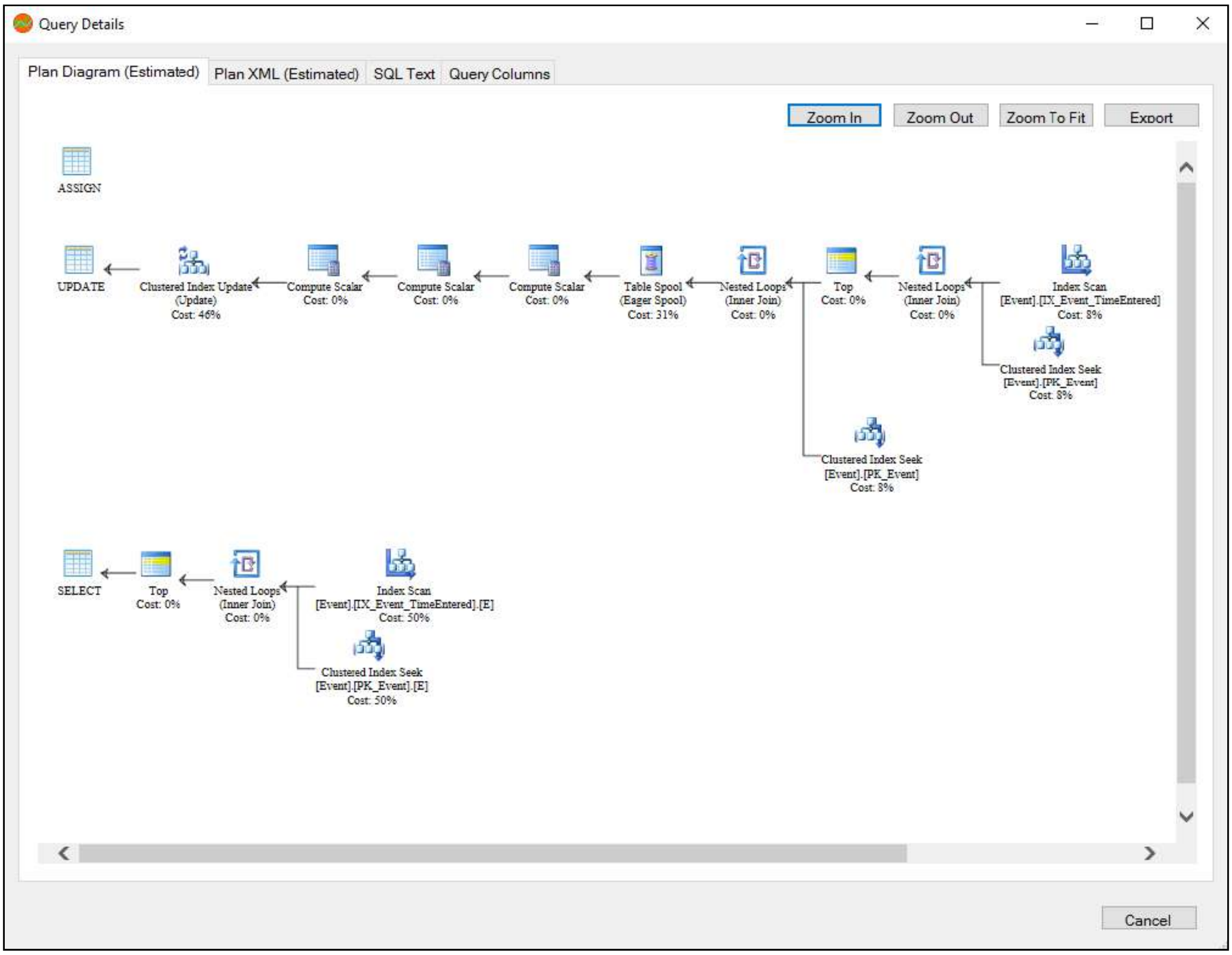
The Query Details window provides various views with detailed information on each query. The Query Details view is comprised of the following tabs:

- Plan Diagram
- Plan XML
- SQL Text
- Query Columns

The Plan Diagram and Plan XML views are only available for instances running SQL Server 2008+.

Plan Diagram

The Plan Diagram (estimated) is a visual representation of the query execution plan (actual or estimated) available in XML format in SQL Server. The Plan Diagram displays a view of the tree of operations that make up a query. This tree shows individual operation nodes, pertaining graphical execution plan icon, along with basic information such as operator name and operation percentage of total cost.


Query Details
Plan Diagram (Estimated)
Plan XML (Estimated)
SQL Text
Query Columns
Zoom In
Zoom Out
Zoom To Fit
Export
ASSIGN
UPDATE
Clustered Index Update (Update) Cost: 46%
Compute Scalar Cost: 0%
Compute Scalar Cost: 0%
Compute Scalar Cost: 0%
Table Spool (Eager Spool) Cost: 31%
Nested Loops (Inner Join) Cost: 0%
Top Cost: 0%
Nested Loops (Inner Join) Cost: 0%
Index Scan [Event].[IX_Event_TimeEntered] Cost: 8%
Clustered Index Seek [Event].[PK_Event] Cost: 8%
Clustered Index Seek [Event].[PK_Event] Cost: 8%
SELECT
Top Cost: 0%
Nested Loops (Inner Join) Cost: 0%
Index Scan [Event].[IX_Event_TimeEntered].[E] Cost: 50%
Clustered Index Seek [Event].[PK_Event].[E] Cost: 50%
Cancel

In the Plan Diagram view you can perform the following actions:

- Select individual operators and view the set of properties for each operator.
- Increase the size of the image (**Zoom in**).
- Reduce the image size (**Zoom out**).
- Select a size for the view so that fits the current view size (**Zoom to fit**).
- Export image of Plan Diagram.

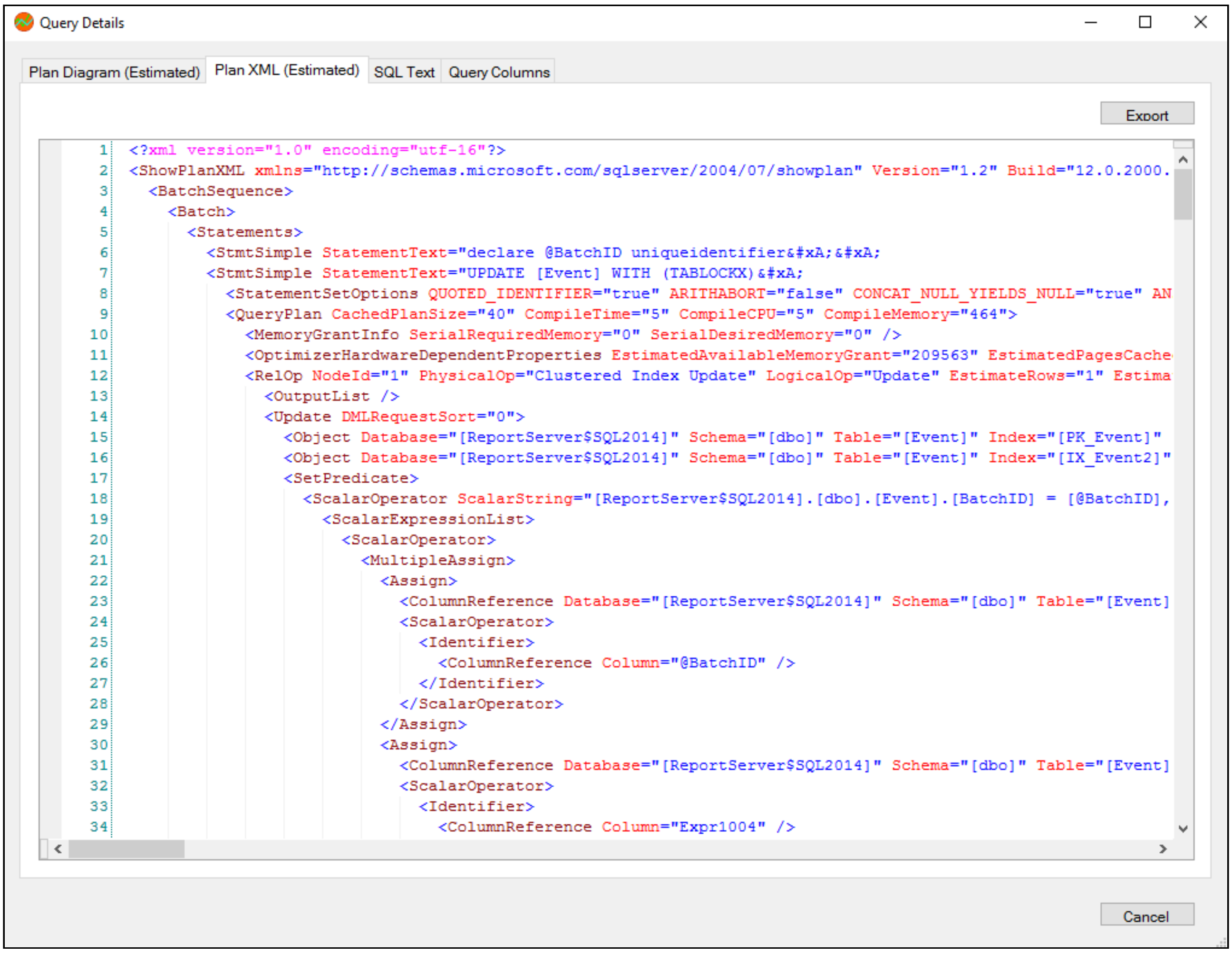
ⓘ The top three operator based on the percentage of total cost in a Plan Diagram are highlighted in yellow.

✓ **Estimated Query Plans**

SQL Diagnostic Manager displays information on whether the plan displayed is an estimated query plan or an actual one.

Plan XML

The Plan XML of the Query Details window displays the actual XML of the query execution plan. It has a syntax-highlighting (color-coded) XML viewer.



```
<?xml version="1.0" encoding="utf-16"?>
<ShowPlanXML xmlns="http://schemas.microsoft.com/sqlserver/2004/07/showplan" Version="1.2" Build="12.0.2000.
  <BatchSequence>
    <Batch>
      <Statements>
        <StmtSimple StatementText="declare @BatchID uniqueidentifier&#xA;&#xA;
        <StmtSimple StatementText="UPDATE [Event] WITH (TABLOCKX)&#xA;
          <StatementSetOptions QUOTED_IDENTIFIER="true" ARITHABORT="false" CONCAT_NULL_YIELDS_NULL="true" AN
          <QueryPlan CachedPlanSize="40" CompileTime="5" CompileCPU="5" CompileMemory="464">
            <MemoryGrantInfo SerialRequiredMemory="0" SerialDesiredMemory="0" />
            <OptimizerHardwareDependentProperties EstimatedAvailableMemoryGrant="209563" EstimatedPagesCache
            <RelOp NodeId="1" PhysicalOp="Clustered Index Update" LogicalOp="Update" EstimateRows="1" Estima
              <OutputList />
              <Update DMLRequestSort="0">
                <Object Database="[ReportServer$SQL2014]" Schema="[dbo]" Table="[Event]" Index="[PK_Event]"
                <Object Database="[ReportServer$SQL2014]" Schema="[dbo]" Table="[Event]" Index="[IX_Event2]"
                <SetPredicate>
                  <ScalarOperator ScalarString="[ReportServer$SQL2014].[dbo].[Event].[BatchID] = [@BatchID],
                    <ScalarExpressionList>
                      <ScalarOperator>
                        <MultipleAssign>
                          <Assign>
                            <ColumnReference Database="[ReportServer$SQL2014]" Schema="[dbo]" Table="[Event]
                            <ScalarOperator>
                              <Identifier>
                                <ColumnReference Column="@BatchID" />
                              </Identifier>
                            </ScalarOperator>
                          </Assign>
                          <Assign>
                            <ColumnReference Database="[ReportServer$SQL2014]" Schema="[dbo]" Table="[Event]
                            <ScalarOperator>
                              <Identifier>
                                <ColumnReference Column="Expr1004" />
```

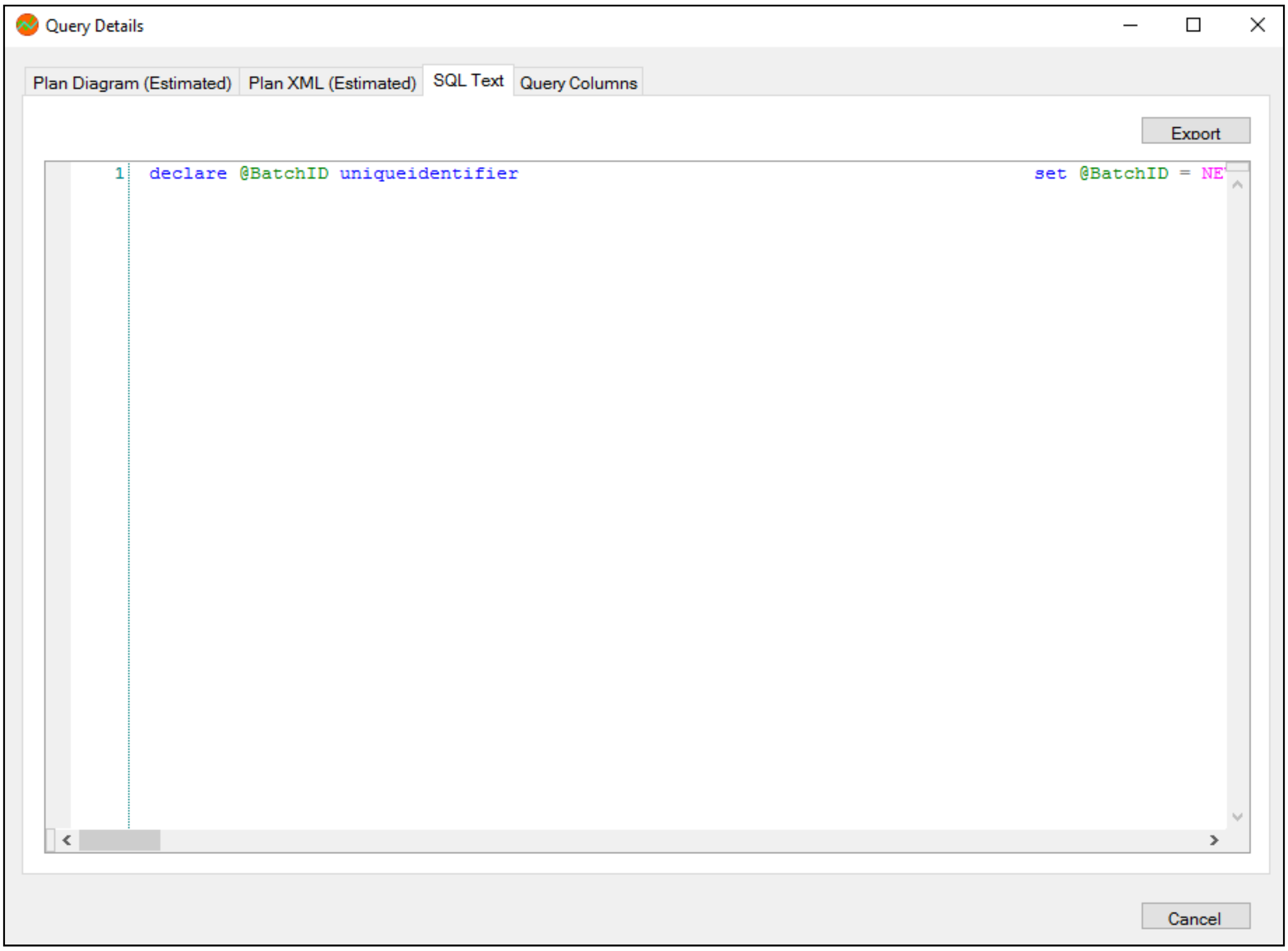
In the Plan XML view you can perform the following actions:

- Export and save XML file for review in other application such as SSMS or email query execution plan to other DBAs.

Save the file with **.sqlplan** extension to view the graphical query plan in SSMS.

SQL Text

The SQL Text tab of the Query Details window shows the underlying SQL Text for the query execution plan.



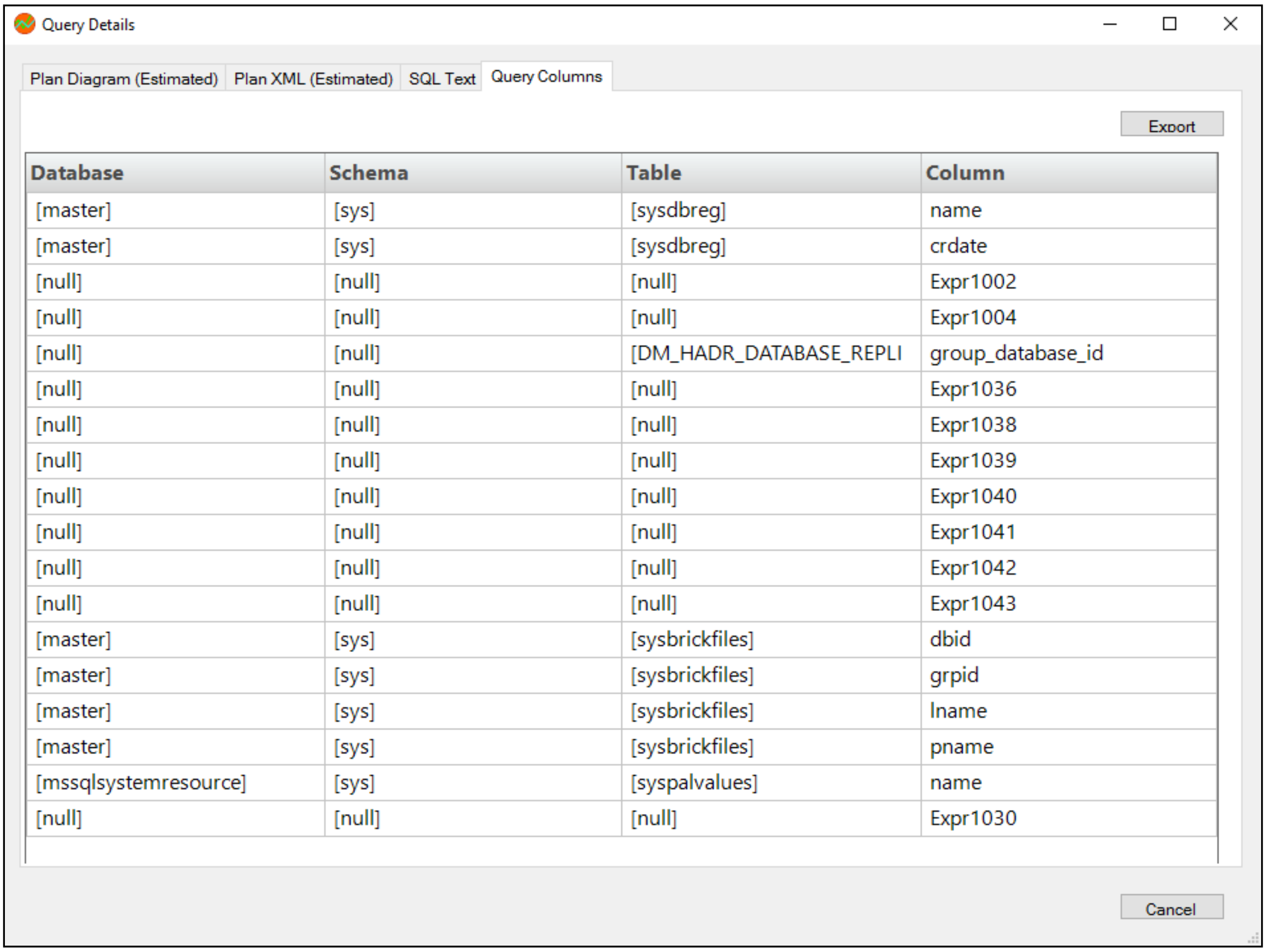
```
declare @BatchID uniqueidentifier                                       set @BatchID = NE
```

In the SQL Text view you can perform the following actions:

- Export and save SQL Text for review.
- Access the Plan Diagram, Plan XML, and Query Columns tabs.

Query Columns

The Query Columns tab of the Query Details window shows all the referenced columns for the query execution plan.



Database	Schema	Table	Column
[master]	[sys]	[sysdbreg]	name
[master]	[sys]	[sysdbreg]	crdate
[null]	[null]	[null]	Expr1002
[null]	[null]	[null]	Expr1004
[null]	[null]	[DM_HADR_DATABASE_REPLI	group_database_id
[null]	[null]	[null]	Expr1036
[null]	[null]	[null]	Expr1038
[null]	[null]	[null]	Expr1039
[null]	[null]	[null]	Expr1040
[null]	[null]	[null]	Expr1041
[null]	[null]	[null]	Expr1042
[null]	[null]	[null]	Expr1043
[master]	[sys]	[sysbrickfiles]	dbid
[master]	[sys]	[sysbrickfiles]	grpid
[master]	[sys]	[sysbrickfiles]	lname
[master]	[sys]	[sysbrickfiles]	pname
[mssqlsystemresource]	[sys]	[syspalvalues]	name
[null]	[null]	[null]	Expr1030

In the Query Columns view you can perform the following actions:

- Export and Save information to a text file.

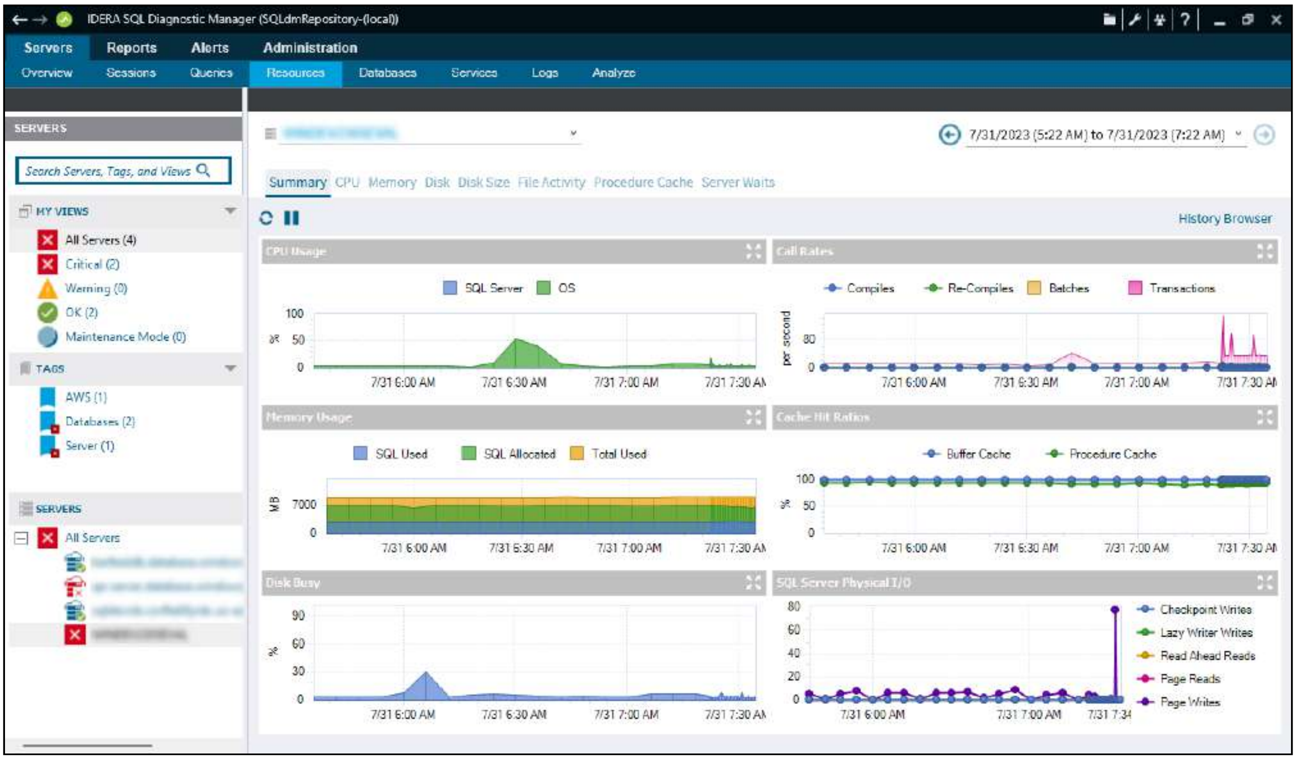
Monitor resources

The Resources tab allows you to monitor the system resources on the computer hosting the SQL Server instance as well as what is used by SQL Server.

Resource bottlenecks are often the cause of SQL Server performance problems. These bottlenecks can result from poor database application design or point to other system processes using valuable resources needed by SQL Server.

Access the Resources tab

Access this tab by clicking the appropriate monitored SQL Diagnostic Manager and selecting the Resources tab.



Alerts associated with the Resources tab

The following alerts are associated with the Resources tab:

Disk Reads / Seconds Per Disk

The number of disk reads per second, per disk.

Disk Transfers / Seconds Per Disk

The number of disk transfers per second, per disk.

Disk Writes / Seconds Per Disk

The number of disk writes per second, per disk .

OS Average Disk Queue Length

The average number of both read and write requests queued for all the disks on the computer hosting the SQL Server instance.

OS Disk Time (Percent)

Indicates the percentage of elapsed time that all the disks were busy servicing read and write requests on the SQL Server computer.

OS Memory Usage (Percent)

Indicates the percentage of total memory used on the SQL Server computer.

OS Paging (Per Second)

Indicates the page fault rate for all processes on the SQL Server computer.

OS Privileged Time (Percent)

Indicates the percentage of CPU time used by all processes on the computer hosting the SQL Server instance, executed in Privileged mode.

OS Processor Queue Length

Is the number of ready threads in the processor queue on the computer hosting the SQL Server instance.

OS Processor Time (Percent)

Indicates the percentage of CPU time used by all processes on the computer hosting the SQL Server instance.

OS User Time (Percent)

Indicates the percentage of CPU time spent by all processes, on the computer hosting the SQL Server instance, executing in User mode.

Page Life Expectancy

The number of seconds a page stays in the buffer pool without references.

Procedure Cache Hit Ratio (Percent)

The ratio of procedure cache hits to procedure cache lookups. This indicates when an execution plan is reused from memory as opposed to compiled from disk.

SQL Server CPU Usage (Percent)

Indicates the percentage of the total CPU used by the SQL Server instance.

SQL Server Memory Usage (Percent)

Indicates the percentage of total memory used by SQL Server.

Get the resource performance summary

The Resources Summary tab displays real-time charts that allow you to quickly view key diagnostic statistics for monitoring the resources for the selected SQL Server instance and computer on which it resides. The Resources Summary tab is especially useful in determining resource bottlenecks. For more details, click any of the charts to navigate to the associated tab.

Access the Resources Summary view

You can open the Summary view of the SQL Diagnostic Manager Resources tab, select the appropriate SQL Server instance, select **Resources**, and click **Summary.**

Use the CPU Usage chart

The CPU Usage chart helps you determine the amount of strain your SQL Server instance is putting upon the CPU. This is an important factor in analyzing poorly-performing SQL Server instances. Click this chart to open the CPU, which contains more charts and information on your CPU resources.

> ✓ SQL Server is the primary process consuming CPU on the computer hosting your instance. If this is the case and the total CPU usage is consistently higher than 80 percent, the computer requires your attention. High usage may indicate the need to upgrade your CPU or add more processors.

Use the Call Rates chart

The Call Rates chart helps you determine why you have high CPU usage. The Call Rates chart displays the following metric statistics:

Batches

Displays the rate at which SQL Server issues SQL Statement batches.

Compiles

Displays the rate at which SQL Server compiles SQL Statements into the Procedure Cache.

Re-Compiles

Displays the rate at which SQL Server recompiles stored SQL Statements into the Procedure Cache.

> ✓ If the number of re-compiles is consistently higher than 10, or the number of compiles is high, you may need to tune your queries. Consider running the Query Monitor as a way of diagnosing query performance issues. You can enable the Query Monitor on the Query Monitor tab of the Monitored SQL Server Properties window.

Transactions

Displays the number of SQL Statement transactions affecting the Procedure Cache.

Use the Memory Usage chart

The Memory Usage chart allows you to analyze the way in which your SQL Server instance uses memory. The chart provides the amount of memory allocated to SQL Server, the memory currently used by SQL Server, and the total amount used on the host computer.

> ✓ If the SQL Used metric is consistently high compared to the amount of physical memory on the computer where the SQL Server instance resides, it may indicate that you need more physical memory.

Use the Cache Hit Ratios chart

The Cache Hit Ratios chart allows you to view how often a request is serviced by the buffer and procedure cache.

> ✓ An acceptable Buffer Cache and Procedure Cache percentage is 90 percent or higher. If this number is consistently lower, analyze your memory settings and add more memory if necessary.

Use the Disk Busy chart

Use the Disk Busy chart to analyze bottlenecks in your file system.

> ✓ If your Disk Busy is consistently over 90 percent you may need to use a faster disk drive, move files to an additional disk or server, or add disks to a RAID array to improve your SQL Server performance.

Use the SQL Server Physical I/O chart

The SQL Server Physical I/O chart allows you to view the number of pages read from, and written to, the physical disk.

The SQL Server Physical I/O chart displays the following reads and writes:

Checkpoint Writes

Save time during recovery by creating a point at which all dirty pages are guaranteed written to disk.

Lazy Writer Writes

Create more available buffers for the system by clearing all unnecessary buffers.

Page Reads

Are disk writes where the requesting session must wait for the disk write operation to finish.

Page Writes

Are disks writes where the requesting session must wait for certain operations to finish.

> ✓ If the number of reads and writes approaches the limits of the I/O capacity of the computer the SQL Server instance resides, consider reducing the values by tuning your application or database, increasing the I/O capacity of your hardware, or adding memory.

Read Ahead Reads

Are part of a process in which SQL Server predicts what pages a session requires next and writes them to memory in advance.

Understanding your chart data and refresh interval

SQL Diagnostic Manager charts provide data whether collected real-time or as part of a scheduled collection event. For additional information about how SQL Diagnostic Manager displays your chart data, see Charts.

Get CPU performance details

The CPU tab displays key CPU statistics that are updated according to your refresh interval. These statistics can help you determine the cause to any performance bottlenecks that are occurring on your SQL Server instance.

Access the CPU view

To open the CPU view of the SQL Diagnostic Manager Resources tab, select the appropriate SQL Server instance, select Resources, and click **CPU**.

CPU tab charts

The following charts are available in the CPU tab:

CPU Usage

> Displays the percentage of a CPU consumed by your SQL Server, virtual machine, and host server. On multi-processor computers, CPU time used by SQL Server is derived from the processors available for use by SQL Server.

Processor Queue Length

> Displays the number of threads in queue for processor time on the computer that hosts the monitored SQL Server instance.

Processor Time

> Displays the percentage of elapsed time that is used by processor executing code in privileged mode.

Call Rates

> Displays the rate of SQL Server batch statements, SQL compiles into procedure cache, and SQL Server recompiles of statements stored in the procedure cache.

Understanding your chart data and refresh interval

SQL Diagnostic Manager charts provide data whether collected real-time or as part of a scheduled collection event. For additional information about how SQL Diagnostic Manager displays your chart data, see Charts.

Get memory performance details

The Memory tab displays the dynamic memory currently in use by SQL Server as well as how that memory satisfies the requirements of SQL Server components. For example, you can see what percentage of the total allocated memory is currently used by the procedure cache. You can control the amount of memory SQL Server uses by either setting a fixed memory value or setting minimum and maximum memory usage values.

Static structures, like procedure headers, use the amount of memory derived from subtracting the sum of the graphed sections displayed on the Memory tab from the total allocated memory, also provided on the Memory tab.

Access the Memory view

To open the Memory view of the SQL Diagnostic Manager Resources tab, select the appropriate SQL Server instance, click **Resources**, and select **Memory**.

Memory tab charts

The following charts are available on the Memory tab:

SQL Server Memory Usage

Displays the SQL Memory Usage by what is used by SQL Server compared to what is allocated and the total used.

VM/Host Memory Usage

Displays the memory usage by your virtual machine and host as a percentage of total memory available.

Paging

Displays the memory pages per second.

SQL Server Memory Areas

Displays the memory usage of the Procedure Cache, Connections, Locks, Database, Optimizer, Sort, Hash, and Index.

VM Memory Areas

Displays the amount of memory allocated to and used by SQL Server to the total memory consumed on this virtual machine.

Host Memory Areas

Displays the amount of memory allocated to and used by SQL Server to the total memory consumed on this host server.

Cache Hit Ratios

Displays the hit ratios of the Buffer and Procedure cache.

Buffer Cache

Displays the buffer cache used by Free and Active pages.

Procedure Cache

Provides the amount of allocated memory used by dynamic and static stored procedures. Included in this value is the memory used by server side cursors and plans. From the total memory allocated to SQL Server, the pinned tables, open objects, connections, locks, and free buffer values are subtracted. The remainder is divided between procedure and data cache.

Page Life Expectancy (sec)

Provides the time in seconds that a page remains in the cache or buffer pool.

Understanding your chart data and refresh interval

SQL Diagnostic Manager charts provide data whether collected real-time or as part of a scheduled collection event. For additional information about how SQL Diagnostic Manager displays your chart data, see Charts.

Get disk performance details

The Disk tab allows you to view key statistics on the way your disks are used on the computer hosting your SQL Server instance. This allows you to analyze your disk performance for any performance bottlenecks that may be occurring.

Disk information is displayed in four charts that display the drives the computer on which the SQL Server instance is located. You can pick which four charts you view by selecting from the drop-down list at the top of each chart. You can select from the following charts:

✓ You must have OS metrics enabled to show the information in the charts on the Disks tab.

Access the Disk view

To open the Disk view of the SQL Diagnostic Manager Resources tab, select the appropriate SQL Server instance, click **Resources**, and select **Disk**.

Disk tab details

Disk Busy Total

Displays the percentage of time during the sample interval that the disk was not idle for all the disks(combined) on the server that the SQL Server instance resides.

Disk Busy Per Disk

Displays the percentage of time during the sample interval that each disk was not idle.

Average Disk Queue Length Total

Displays the average length of the disk queue during the sample interval for all disks (combined) on the server that the SQL Server instance resides.

Average Disk Queue Length Per Disk

Displays the average length of the disk queue during the sample interval for all disks (individual) on the server that the SQL Server instance resides.

SQL Server Physical I/O

Displays the number of read and write requests sent to the physical disk the SQL Server instance resides.

SQL Server Physical I/O Errors

Displays the number of errors sent from the physical disk the SQL Server instance resides.

Disk Reads/Second Per Disk

Displays the number of reads per disk per second during the sample interval.

Disk Transfers/Second Per Disk

Displays the number of transfers per disk per second during the sample interval.

Disk Writes/Second Per Disk

> Displays the number of writes per disk per second during the sample interval.

Average Disk ms/Read Per Disk

> Displays the average length of time (in milliseconds) for a disk to read during the sample interval.

Average Disk ms/Transfer Per Disk

> Displays the average length of time (in milliseconds) for a disk transfer during the sample interval.

Average Disk ms/Write Per Disk

> Displays the average length of time (in milliseconds) for a disk write during the sample interval.

VM Disk Usage

> Displays the amount of data read from and written to disk in KB per second for this virtual machine during the sample interval. For additional information about how SQL Diagnostic Manager works with virtual machines and collects metrics, see How SQL Diagnostic Manager works with a virtual environment.

Host Disk Usage

> Displays the amount of data read from and written to disk in KB per second for the host server during the sample interval. For additional information about how SQL Diagnostic Manager works with virtual machines and collects metrics, see How SQL Diagnostic Manager works with a virtual environment.

Understanding your chart data and refresh interval

SQL Diagnostic Manager charts provide data whether collected in real-time or as part of a scheduled collection event. For additional information about how SQL Diagnostic Manager displays your chart data, see Charts.

Get disk size details

The Disk Size tab allows you to view key statistics on the way your disks are used on the computer hosting your SQL Server instance. This allows you to analyze your disk performance for any performance bottlenecks that may be occurring.

✓ You must have OS metrics enabled to show the information in the charts on the Disks tab.

Access the Disk Size view

You can open the Disk Size view by selecting the appropriate SQL Server instance, and then clicking **Disk Size** in the **Views** group of the **Resources** tab. Click image to view full size.

Disk Size tab details include:

- Drive Name
- Total Size (MB)
- Used (MB)
- Free Disk (MB)
- SQL Data Used (MB)
- SQL Data Free (MB)
- SQL Log (MB)
- Other Files (MB)

Current Disk Usage chart

The Disk size tab includes a chart that displays the current disk usage. The drop-down list allows you to choose to view the data in megabytes or percentages.

Understanding your chart data and refresh interval

SQL Diagnostic Manager charts provide data whether collected real-time or as part of a scheduled collection event. For additional information about how SQL Diagnostic Manager displays your chart data, see Charts.

✓ You can print, export to Excel, or save the Current Disk Usage chart image.

View file activity

The SQL Diagnostic Manager File Activity allows you to view the relative activity of your database files, on a file-by-file basis. Each database file is listed in a column that represents the disk or mount point on which the files reside. At the top of each column the overall Reads, Writes, and Transfers per second are listed. Click an individual file to expand it and view a graph and the activity data specific to that file.

For each database file, the following information is provided:

Reads and Writes Per Second

The numbers listed are the average number of reads and write operations per second over the period between collections. Collection times are configured on the Server Properties window.

Activity lights

Read (green) and Write (blue) lights flash with activity.

Activity graph

A bar graph under the file name displays the recent trend of reads and writes per second. This graph expands when you double-click the file. The expanded Activity graph displays the activity trend for the amount of time specified on the Console Options window (🔧 **> Console Options**).

Activity data

The arrows and the associated data represent the amount of data activity occurring on the file and whether the amount of activity is rising or falling relative to the previous data point.

> Right-click a disk column to Expand/Collapse all files for a database, Expand/Collapse all files on a disk, Navigate to Disk view, or Navigate to the Disk Files view.

Access the File Activity view

To open the File Activity view of the SQLDM Resources tab, select the appropriate SQL Server instance, click **Resources**, and select **File Activity**.

Database Files + Remaining Disk Files

Database Files + Remaining Disk Files chart depicts the activity of all the non-SQL database files and files not included in the File Activity window.

Use the filter to display vital database activity

The filters at the top of the File Activity window allow you to limit the amount of data to that data which is most important to you.

> For an accurate filter, use the percent (%) wildcard character in the **File Path Like** or **File Name Like** field if you do not include the entire name.

Filter Drive

Use the **Drive** drop-down to select the drives to display on the File Activity window. You can also enter a file path in the **File Path Like** field to select a subset of drives. This field accepts the percent (%) wildcard character.

Filter Database

Use the **Database** drop-down to select the databases to display on the File Activity window. You can also enter a file name in the **File Name Like** field to select a subset of databases. This field accepts the percent (%) wildcard character.

File Type

Check the boxes of the file types to display on the File Activity window.

Sort By

Select to sort by **Database Name**, **File Name**, **Reads Per Second**, or **Writes Per Second**.

Sort Direction

Further, sort your data by selecting **Ascending** or **Descending** order.

Manage your procedure cache

The Procedure Cache view allows you to view each item cached, the size, and the SQL text associated. Graphs below the cache listing provide you with a breakdown of the key Procedure Cache statistics that can help you analyze performance bottlenecks on your SQL Server instance.

The **Usage** column displays the number of times the associated cache object is used since inception. The **References** column displays the number of other cache objects referencing the associated cache object, with "1" as the base.

Access the Procedure Cache view

You can open the Procedure Cache view of the SQL Diagnostic Manager Resources tab by selecting the appropriate SQL Server instance, and then clicking **Resources > Procedure Cache**.

Procedure Cache tab charts

The following charts are available on the Procedure Cache tab:

Cache Size by Object Type

Displays the amount of the procedure cache used by various objects including:

- Adhoc Query
- Check Constraint
- Default Constraint
- Extended Procedure
- Prepared Statement
- Replication Procedure
- Rule
- Stored Procedure
- System Table
- Trigger
- User Table
- View

Object Types

Use the drop-down button to select either Hit Ratio, Object Count, or Use Rate.

- Hit Ratio offers a chart of the cache hit ratios of the individual object types in memory through the last 25 refreshes. For example, you can view the hit ratio of the extended procedure object.
- Object Count displays the number of objects using the procedure cache.
- Use Rate displays the rate at which each of the object types is used in the procedure cache.

View server waits

The Server Waits view allows you to see all of the waits affecting server performance. By correlating the areas of the SQL Server instance that are waiting with other statistics, it is possible to narrow down possible causes of the waits. All waits occurring on your system are displayed in a graph that shows the time the wait happened and the length of time it took for the wait to clear. You can filter the graph by the wait type to view how a particular wait is affecting your server. Below the graph, SQL Diagnostic Manager displays a table that includes the wait category, wait type, length of time the wait took to clear, total wait time for all the collected wait types, and a definition of the wait type.

Server waits are always collected. History mode for this view is available.

Access the Server Waits view

You can open the Server Waits view of the SQL Diagnostic Manager Resources tab by selecting the appropriate SQL Server instance, and clicking **Resources > Server Waits**.

Available wait types

You can filter the view by Backup, I/O, Lock, Memory, Non-I/O Page Latch, Non-Page Latch, Transaction Log, and Other.

Available wait categories

You can select from the following wait categories:

Total Waits

Total waits include all the types of waits collected.

Signal Waits

Signal waits occur when a resource is now available (after a resource wait) and the task is waiting to run again.

Resource Waits

Resource waits occur when access to a resource is denied because the resource is in use or not available.

Monitor databases

SQL Diagnostic Manager allows you to monitor your database backups, restores, table sizes, table row counts, configurable options, and replication status. SQL Diagnostic Manager provides a graphical analysis of the used, unused, and index disk space of the database. You can also view the size and structure of database tables. SQL Diagnostic Manager provides a list of data size, text or image size, index page size, and the number of table rows, making reorganization and index creation decisions easy.

The following concepts are important to understand when using the Databases tab:

Percentage of Database/Log Full

The **%Data Full** and **%Log Full** columns on the Database Summary and Database Files views refer to the current space used as a percentage of the potential maximum available space. The larger the number the closer you are to running out of space. These columns can have associated alert thresholds.

Potential Maximum Available Space

The **Data Potential Growth** and **Log Potential Growth** columns on the Database Summary and Database Files views refer to the currently allocated space plus the available expansion space.

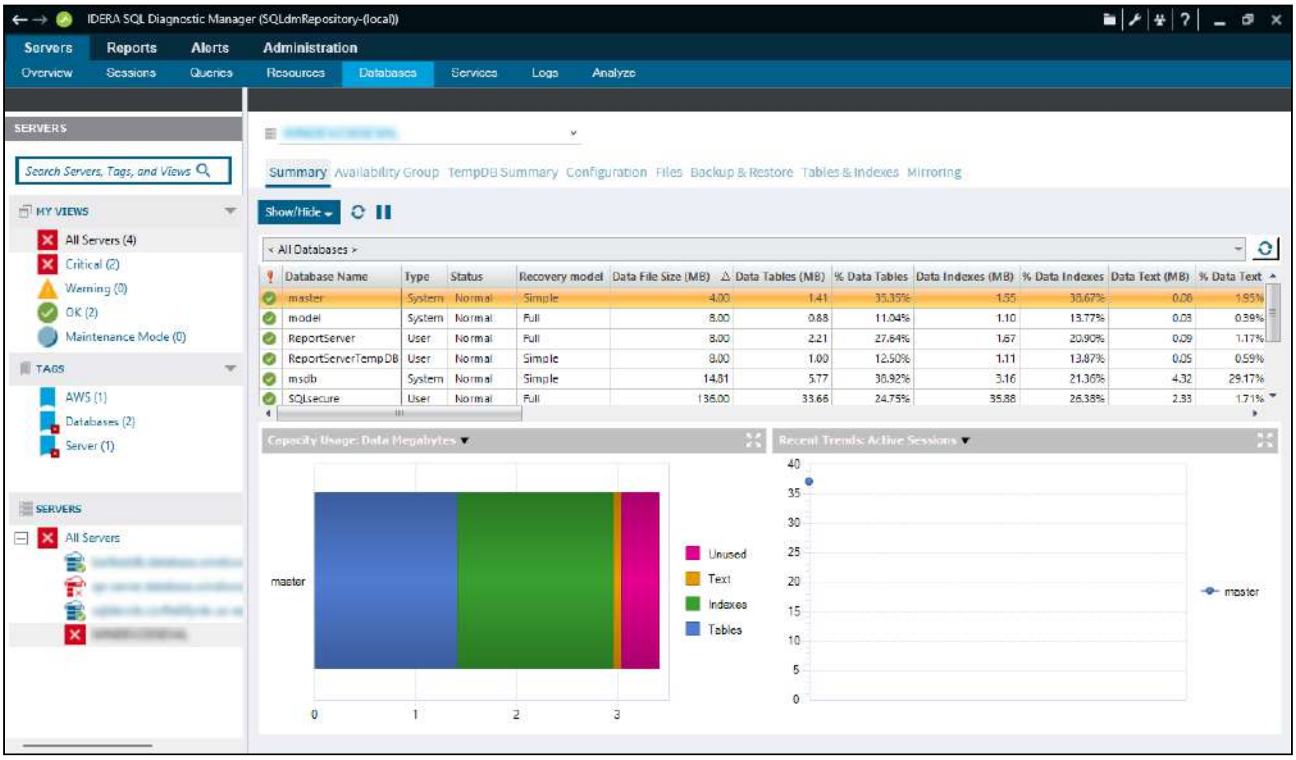
Available Expansion Space

Available Expansion Space refers to the available disk space that files can grow into as determined by the growth settings for the files, the location of the files, and the free space on those disks.

Multiple database files as well as files from other databases can potentially compete for space on the same disk. For example, if the data and log files for several databases are on the same disk and the data file of one database expands, the available expansion space for all database files on the disk is immediately reduced.

Access the Databases tab

Access this view by clicking the appropriate server and selecting the Databases tab.



Database Name	Type	Status	Recovery model	Data File Size (MB)	Data Tables (MB)	% Data Tables	Data Indexes (MB)	% Data Indexes	Data Text (MB)	% Data Text
master	System	Normal	Simple	4.00	1.41	35.35%	1.55	38.67%	0.08	1.95%
model	System	Normal	Full	8.00	0.88	11.04%	1.10	13.77%	0.03	0.39%
ReportServer	User	Normal	Full	8.00	2.21	27.64%	1.67	20.90%	0.09	1.17%
ReportServerTempDB	User	Normal	Simple	8.00	1.00	12.50%	1.11	13.87%	0.05	0.59%
msdb	System	Normal	Simple	14.81	5.77	38.92%	3.16	21.36%	4.32	29.17%
SQLsecure	User	Normal	Full	136.00	33.66	24.75%	35.88	26.38%	2.33	1.71%

Alerts associated with the Databases tab

The following alerts are associated with the Databases tab:

Database Full (Percent)

Percentage of the allowable disk space for the database currently used by the sum of data, text, and index. Allowable disk space for the database is calculated by considering the currently allocated space, auto-growth settings, and available disk space.

Database Read/Write Error Occurred

Failure to read from or write to the hard disk.

Database Status

Multiple types of Database Status alerts exist.

Index Row hits (Percent)

The number of rows hit that part of a clustered index or an entire non-clustered index returns, indicating index effectiveness.

Log Full (Percent)

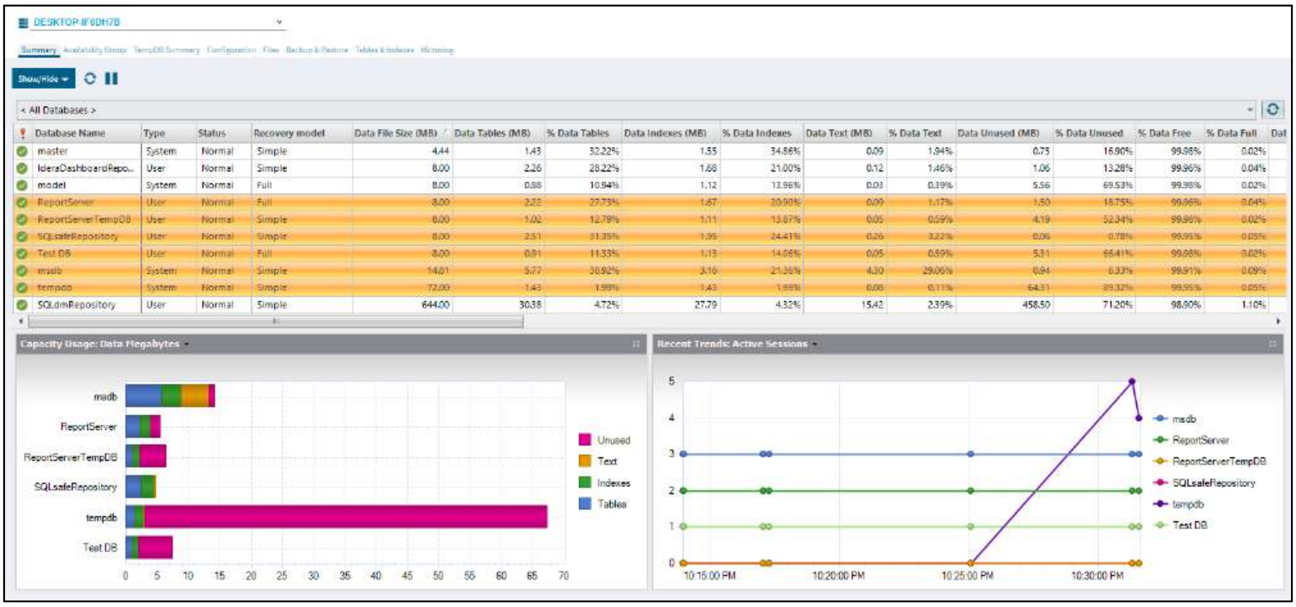
Percentage of the allowable disk space for the database currently used by the transaction log. Allowable disk space for the database is calculated by taking the currently allocated space, auto-growth settings, and available disk space.

Table Fragmentation (Percent)

Percentage of pages that are fragmented in each table in the database.

Get the database status summary

The Database Summary tab allows you to view the status of all the databases on the selected SQL Server instance. Along with the database status table, the Summary tab includes charts that provide options for viewing the capacity usage and recent trends of your databases. You can select multiple databases in the list using click+Shift and click+Ctrl to compare several databases.



!	Database Name	Type	Status	Recovery model	Data File Size (MB)	Data Tables (MB)	% Data Tables	Data Indexes (MB)	% Data Indexes	Data Text (MB)	% Data Text	Data Unused (MB)	% Data Unused	% Data Free	% Data Full	Dat
✓	master	System	Normal	Simple	4.44	1.43	32.22%	1.55	34.86%	0.09	1.94%	0.75	16.90%	99.98%	0.02%	
✓	IderaDashboardRepo...	User	Normal	Simple	8.00	2.26	28.22%	1.68	21.00%	0.12	1.46%	1.06	13.28%	99.96%	0.04%	
✓	model	System	Normal	Full	8.00	0.88	10.94%	1.12	13.96%	0.03	0.39%	5.56	69.53%	99.98%	0.02%	
✓	ReportServer	User	Normal	Full	8.00	2.22	27.73%	1.67	20.90%	0.09	1.17%	1.50	18.75%	99.96%	0.04%	
✓	ReportServerTempDB	User	Normal	Simple	8.00	1.02	12.79%	1.11	13.87%	0.05	0.59%	4.19	52.34%	99.98%	0.02%	
✓	SQLsafeRepository	User	Normal	Simple	8.00	2.51	31.35%	1.95	24.41%	0.26	3.22%	0.06	0.78%	99.95%	0.05%	
✓	Test DB	User	Normal	Full	8.00	0.91	11.33%	1.13	14.06%	0.05	0.59%	5.31	66.41%	99.98%	0.02%	
✓	msdb	System	Normal	Simple	14.01	5.77	38.92%	3.16	21.36%	4.30	29.06%	0.94	6.33%	99.91%	0.09%	
✓	tempdb	System	Normal	Simple	72.00	1.43	1.99%	1.43	1.99%	0.06	0.11%	64.31	89.32%	99.95%	0.05%	
✓	SQLdmRepository	User	Normal	Simple	644.00	30.38	4.72%	27.79	4.32%	15.42	2.39%	458.50	71.20%	98.90%	1.10%	

✓ The status column can help you quickly identify databases that have associated alerts and need your Attention.

The Database Summary tab lists each database on the monitored SQL Server instance. The Database Summary tab displays a large variety of database statistics and is an important way to get an overview of the health of your databases. This information gives you a good indication as to how the data is configured in your database, such as comparing the volume of your table data compared to your indexes, or the size of your log files.

Access the Database Summary view

You can open the Summary view of the SQL Diagnostic Manager Databases tab, select the appropriate SQL Server instance, click **Databases**, and select **Summary** .

Database Summary tab charts

The Database Summary tab includes charts that display capacity usage and recent trends information for your database.

Capacity Usage

You can choose to view how data or the log is used on your database. The drop-down list allows you to choose to view the data or log in megabytes or percentages. For more information, click inside the chart to open the Database Files tab.

Recent Trends

You can choose to view how your database or group of databases are used currently by selecting either active sessions, transactions per second, data size, log size, or log flushes from the drop-down list.

Monitor AlwaysOn Availability Groups

The AlwaysOn Availability Groups view allows you to monitor availability groups, availability databases, and availability replicas.

> ✓ If you have configured the AlwaysOn Availability Groups feature on your SQL 2012 Server, SQL Diagnostic Manager automatically recognizes the availability databases and starts to monitor them.

AlwaysOn Availability Groups are part of an integrated solution, introduced in SQL Server 2012 with the goal of achieving the highest level of data availability and disaster recovery for organizations. Availability Groups grant DBAs the ability to automatically or manually failover a group of databases as a single unit with support for up to four secondary replicas. For additional information on availability groups, see the Microsoft document, Overview of AlwaysOn Availability Groups (SQL Server).

Access the AlwaysOn Availability Groups view

To open the AlwaysOn Availability Groups view click the appropriate monitored SQL Server instance, select **Databases**, and click **Availability Group**.

Database AlwaysOn Availability Groups statistics

In this view, you can see the health of all your availability groups, availability databases and monitored availability replicas.The database table provides the following information for each availability group (as seen in the view by default):

Database Name

Displays the name of the availability database.

Group Name

Displays the name of the availability group for which the connected server instance hosts a replica.

Replica Name

Displays the name of the server instance that hosts the availability replica.

Failover Mode

Displays the failover mode for which the availability replica is configured. The possible failover modes are automatic or manual.

Availability Mode

Describes if data synchronization will use either the synchronous-commit or asynchronous-commit availability mode.

Replica Role

Indicates the current role of the availability replica. Possible values are primary or secondary.

Synchronization Health

> Displays database synchronization state in the availability group. Possible values include: not healthy, partially healthy, and healthy.

Redo Queue Size (KB)

> Displays the amount of log records from log files in KB that need redoing in the secondary replica to complete synchronization.

Redo Rate (KB/s)

> Rate in KB per second at which log records are redone in the secondary database to complete synchronization.

Log Send Queue Size (KB)

> Amount of log records in KB needed to ship to the secondary replica to complete synchronization.

Log Send Rate (KB/s)

> Indicates the rate in KB per second at which log records are being sent to the secondary replica to complete synchronization.

Listener DNS Name

> The network name of the availability group listener.

Listener IP Address

> The IP address reserved for the availability group listener. If the nodes of your Windows cluster are on different subnets you will need an IP address for each of those subnets.

Failover Readiness

> Indicates whether the secondary database is synchronized with the corresponding primary database. Possible values include: True (the database is marked as synchronized and is ready for a failover) and False (the database is not synchronized and not ready for a failover).

Synchronization Database Status

> Indicates whether the availability database is currently synchronized with the primary replica. Possible synchronization states are: not synchronizing, synchronizing, synchronized, reverting, and initializing.

Database Status

> Description of the database state of the availability replica. Possible values include: online, restoring, recovering, recovery_pending, suspect, emergency, and offline.

Suspended Status

> An AlwaysOn availability database is suspended. Possible values are true or false.

Last Hardened Time

> Indicates the time when the log-block identifier was received for the last hardened LSN on the secondary replica.

Operational Status

Indicates the current operational state of the secondary replica. Possible state values include: pending failover, pending, online, offline, failed, failed no quorum, and NULL.

Connection Status

Indicates whether a secondary replica is currently connected to the primary replica. Possible values include: connected and disconnected.

Synchronization Performance (s)

Indicates the time in seconds it takes to synchronize between the primary and secondary replicas.

Estimated Data Loss (s)

Indicates the time difference in seconds of the last transaction log record in the primary replica and secondary replica. If the primary replica fails, all transaction log records within the time window will be lost.

Estimated Recovery Time (s)

Indicates the time in seconds it takes to redo the catch-up time. The catch-up time is the time it will take for the secondary replica to catch up with the primary replica.

Additional columns available through the **Column Chooser**:

Database ID

Identifier of the database, unique within an instance of SQL Server.

FileStream Send Rate (KB/s)

Indicates the rate of the FileStream in KB per second at which transactions are being sent to the secondary replicas.

Group ID

Unique identifier (GUID) of the availability group.

Last Connect Error#

Number of the last connection error.

Last Connect Error Description

Description of the last connection error.

Last Connect Error Time

Timestamp of the last connection error.

Listener Port

The TPC port used by the availability group listener.

Replica ID

Identifier of the availability replica within the availability group.

✓ You can hide and unhide additional columns in the Availability Groups table by right clicking on any header in the grid and selecting a column from the **Column Chooser** dialog.

Availability Groups charts

The AlwaysOn Availability Groups view includes charts that display the queue size and transfer rates of different availability groups.

Queue Size chart

Provides users with graphical details about queues in the AlwaysOn Availability Groups feature. This chart is a stacked bar chart for the "Log Send Queue Size" and "Redo Queue Size."

Transfer Rates chart

Provides users with graphical details about data transfer rates for redo and logs. This chart is a line chart for the "Log Send Rate" and "Redo Rate."

Availability Groups alerts

To view a list of all available alerts, see Metric alerts.

Understand the view colors

The AlwaysOn Availability Groups view uses a color-based alert system. The following colors are associated with a status and action within SQL Diagnostic Manager:

Color	Alert Status	Action
Green	OK	Acceptable threshold where SQL Diagnostic Manager does not generate an alert.
Blue	Informational	Informational threshold where SQL Diagnostic Manager generates an informational alert.
Yellow	Warning	Warning threshold where SQL Diagnostic Manager generates a warning alert.
Red	Critical	Critical threshold where SQL Diagnostic Manager generates a critical alert.

Get the tempdb status summary

The Tempdb Summary tab allows you to view the status of your tempdb database on the selected SQL Server instance. These charts include options for viewing your current capacity usage and recent trends of your files over time. These statistics appear in the Database Statistics report.

The Tempdb Summary tab displays a list of sessions currently using tempdb along with their cumulative usage and tempdb space. These statistics help you get an overview of the health of your tempdb database and gives you a good indication whether you have enough space allocated or whether tempdb issues are causing a performance problem on your server.

Access the Tempdb Summary view

You can open the Tempdb Summary view of the SQL Diagnostic Manager Databases tab, select the appropriate SQL Server instance, click **Databases**, and click Tempdb **Summary**.

Tempdb Summary tab charts

The Tempdb Summary tab includes charts that display capacity usage and recent trend information for your tempdb database.

Toggle between the Version Store Cleanup and Tempdb Contention charts by using the drop-down list available to the right of the chart title.

Tempdb Space Used by File

> You can choose to view how each file is using space on your tempdb database, displayed in megabytes.

Tempdb Space Used Over Time

> You can choose to view how your database is used over time based on object type by comparing charts that offer metrics for the Space Used and Space Allocated.

Version Store Cleanup Rate

> The tempdb database version store collects data rows necessary to support snapshot isolation. This chart helps you see the current cleanup rate to avoid filling up tempdb.

Tempdb Contention

> The Tempdb Contention chart displays latch wait time (in milliseconds) for the allocation pages of tempdb. The three tracked allocation page types are:
>
> - Page free space (PFS)
> - Global allocation map (GAM)
> - Shared global allocation map (SGAM)

Latch contention of this sort is usually an indication that you should create more tempdb data files. In some situations, using Trace Flag 1118 may also alleviate tempdb contention.

Monitor your tempdb database

SQL Diagnostic Manager allows you to monitor your tempdb database with a number of charts and alerts to help you avoid costly performance issues caused by a full tempdb. The tempdb system database is a workspace used to hold temporary user objects, results created through queries and sorts, and other objects created by the SQL Server Database Engine. Because of the large amount of data stored in tempdb, users can run out of disk space, which causes the entire server and all of its databases to become unresponsive. SQL Diagnostic Manager seeks to resolve some of these issues by providing a monitoring solution that features a series of tempdb-specific charts, views, and alerts.

The tempdb system database, along with the Master, Model, and MSDB databases, is provided by default with SQL Server and is a shared resource available to all users connected to a single SQL Server instance. Each time you start SQL Server, it re-creates tempdb based on the Model database. Tempdb can fill up quickly when you are low on disk space or have a low maximum size for database growth. Certain workloads may cause excessive space usage or create contention in tempdb, which can affect performance on the entire server.

✓ Tempdb monitoring is supported on SQL Server 2005 and above servers only.

Tempdb version store

The tempdb version store collects the data necessary to support row versioning. Each time a data value changes, a new version of the row is created and stored for as long as the oldest active transaction needs to access it. Once the row version is no longer needed it is removed from tempdb by a cleanup job which runs once per minute. As a result, long-running transactions prevent cleanup of older entries into the tempdb version store, causing growth which can affect performance and cause tempdb to run out of space.

Tempdb contention

Tempdb resource contention or waits is usually the result of heavy use on too few tempdb files and occurs when the system attempts to allocate pages. The tempdb contention chart displays latch wait time (in milliseconds) for the allocation pages of tempdb. The three tracked allocation page types are:

- Page free space (PFS)
- Global allocation map (GAM)
- Shared global allocation map (SGAM)

Latch contention of this sort is usually an indication that you should create more tempdb data files. In some situations, using Trace Flag 1118 may also alleviate tempdb contention.

Available alerts

Tempdb includes the following specific alerts:

- Data File Autogrow
- Log File Autogrow
- Longest Running Version Store Transaction (Minutes)
- Session Tempdb Space Usage (MB)
- Tempdb Contention (ms)
- Version Store Generation Ratio
- Version Store Size (MB)

Monitor database configuration settings

The Database Configuration view allows you to view the configuration settings of the databases on the selected SQL Server instance. This view contains a single grid that includes the configuration settings for all databases on the selected SQL Server instance.

✓ The columns displayed on the Database Configuration view differ between SQL Server 2005 and SQL Server 2008 instances.

You can use the Database Configuration view to analyze configuration differences between databases or databases with incorrect configuration settings.

✓ If you experience database issues, the Database Configuration view can help you determine if the problem is caused by configuration errors.

Access the Configuration view

To open the Configuration view of the SQL Diagnostic Manager Databases tab, select the appropriate SQL Server instance, click **Databases,** and select **Configuration**.

Null values in the Collation and Version columns

If the database is not started and AUTO_CLOSE is set to ON, these columns are set to null until the database is started.

View database status

SQL Diagnostic Manager allows multiple simultaneous status indicators for each individual database, very similar to what you see in Microsoft SQL Server Management Studio. You can see the status of a database in the Servers tree by expanding the associated Server tree. The status displayed matches what is shown in Microsoft SQL Server Management Studio in all cases where Management Studio displays a status.

Database alerts and statuses

The following alerts and statuses are associated with Database status:

Default Status Level	Alert/Status	Description
OK	Normal	Everything is okay and the database is operating normally.
OK	Standby	The database is in standby mode.
OK	Read Only	The database is in read-only mode.
OK	Single User	The database is in single-user mode.
OK	Restore Mirror	Restoring the database mirror.
OK	Undetermined	No information is available one this database.
OK	Cleanly Shut Down	The database is shut down and needs no recovery.
OK	DBO Use Only	The database is in a dbo-use mode (restricted_user).
Warning	Restoring	Restoring the database.
Warning	Recovering	Recovering the database.
Warning	Recovery Pending	The database recovery is not yet begun.
Warning	Offline	The database is offline.
Critical	Suspect	The database integrity is suspect.

Default Status Level	Alert/Status	Description
Critical	Emergency Mode	The database is in emergency mode.
Critical	Inaccessible	The SQLdm Monitoring Service is unable to open the database. A serious issue such as a disk failure can cause an inaccessible database.

Change the default alert status level

Alerting is based on the most critical status associated with a database at the time of collection.

> ✓ Note that for certain metrics, using the informational alert means that you no longer receive a warning or critical alert for events generated by that metric. Please review the situation before setting up an informational alert.

To change the default alert status level:

1. Right-click any server in the Servers tree.
2. Select **Configure Alerts**.
3. Select **Database Status** from the list of alerts.
4. Double-click any of the values on the **Configuration** tab.
5. Edit each alert to associate it with the desired alert status level.

Analyze database files

The Files view allows you to see the file statistics for each of your databases on the selected SQL Server instance. Database capacity and growth are common causes of SQL Server performance bottlenecks.

✓ Database growth statistics are collected every scheduled refresh.

The Files view is an important tool that displays how much disk space you have available to your databases, how much disk space they are using, and the percentage of space used by databases and logs. Database capacity and growth are common causes of SQL Server performance bottlenecks.

For Example: If the % Data Full on a database is over a threshold, it could mean that either the file doesn't have the file auto-growth setting turned on, is about to reach the maximum allowable size, or that the disk the database is on is about to run out of space.

Another common use of the Files view is to identify the fragmentation percentage on an index. Once identified, you can click **Rebuild Indexes** to reduce the fragmentation on the selected index.

Access the Files view

To open the Files view of the SQL Diagnostic Manager Databases tab, select the appropriate SQL Server instance, click **Databases**, and select **Files**.

Get file statistics

Select any database in the list to display the associated file statistics in the Data Files tab of the Files view. Click any file in the list to populate the information displayed in the File Usage chart.

Select the drop-down box above the chart to choose a chart type:

- Current Megabytes
- Current Percent
- Potential Megabytes
- Potential Percent

✓ You can select multiple databases as well as multiple files to compare file statistics.

Access the Data Files tab

To open the Data Files tab of the SQL Diagnostic Manager Databases Files view, select the appropriate SQL Server instance, click **Databases**, and select **Files**. The Data Files tab is the default view.

Get file group information

The File Groups tab of the Files view displays the selected database. Click a group on the File Groups tab to populate the **File Group Usage** chart. Select the drop-down list above the chart to choose a chart type:

- Current Megabytes
- Current Percent
- Potential Megabytes
- Potential Percent

> ✓ Select multiple databases and multiple file groups to compare how they are used. This can help you quickly spot issues with your file usage.

Access the File Groups tab

To open the File Groups tab of the SQL Diagnostic Manager Databases Files view, select the appropriate SQL Server instance, click **Databases**, select **Files,** and then click the **File Groups** tab.

View transaction log information

The Transaction Logs tab of the Files view allows you to view the transaction log files for the selected databases. Select the drop-down list above the chart to choose from the following chart types :

- Current Megabytes
- Current Percent
- Potential Megabytes
- Potential Percent

✓ Log files in high transaction rate environments can occupy multiple disks. The Transaction Logs tab allows you to easily monitor these configurations.

Access the Transaction Logs tab

To open the Transaction Logs tab of the SQL Diagnostic Manager Databases Files view, select the appropriate SQL Server instance, click **Databases**, select **Files**, and then click the **Transaction Logs** tab.

Get disk information

The Disks tab of the Files view provides a graphical representation of your current disk usage. Select the drop-down list above the chart to choose from the following chart types:

- Megabytes
- Percent

✓ You must have OS metrics enabled to show the information in the charts on the Disks tab.

Access the Disks tab

To open the Disks tab of the SQL Diagnostic Manager Databases Files view, select the appropriate SQL Server instance, click **Databases**, select **Files**, and click the **Disks** tab.

Analyze backups and restores

The Backups & Restores tab allows you to view the backup and restore history of each database on the selected SQL Server instance. You can view the backup and restore history of a database or a group of databases. The history displays in the Backup/Restore History section of the tab. The Backup/Restore section shows the date and time of the backup or restore, the user that initiated it, and the size and path of the backup or restore file.

The Backups and Restores view is a useful way to view the last successful backup, the recovery model used, and the backup history for each of the databases on the SQL Server instance. To see your backup and restore history, click one or multiple databases to populate the Backup and Restore History table.

✓ The default filter setting shows a 31-day history. For less frequently run jobs such as quarterly or annual backups, it may be necessary to increase the **Days To Show** setting in the Filters window.

Access the Backups & Restores view

To open the Backups & Restores view of the SQL Diagnostic Manager Databases tab, select the appropriate SQL Server instance, click **Databases**, and select **Backups & Restores**.

Analyze tables and indexes

The Tables & Indexes tab allows you to view statistics for all the tables and indexes on a particular database. To see all the tables and indexes for a database, use the database drop-down list to select your database.

Along with displaying statistics, the Tables & Indexes tab includes the ability to update your statistics and rebuild your indexes on the selected table. These options are available by right-clicking a table and selecting the appropriate option from the context menu. To perform these actions on multiple tables, use the buttons on the ribbon.

✓ Table growth statistics are collected on the schedule configured on the Table Statistics tab of the Monitored SQL Server Properties window. This includes the table fragmentation and size statistics.

The Tables and Indexes view provides a good way to view the overall health of your tables. In addition, the Tables and Indexes view allows you to rebuild the index for any of your tables that have a high fragmentation percentage.

✓ The Rebuild Indexes function is enabled for User tables. System tables cannot have indexes rebuilt.

Access the Tables & Indexes view

To open the Tables & Indexes view of the SQL Diagnostic Manager Databases tab, select the appropriate SQL Server instance, click **Databases**, and select **Tables & Indexes**.

Use the Table Details section

The Table Details section of the Table and Indexes view allows you to view various details on the selected table. To update the statistics for your tables, click **Update Statistics** at the top of the view. The following tables are available in the Table Details section:

Size

Displays the size of the data, text, and indexes associated with the selected table.

Dependencies

Lists other database objects that the selected table contains references to and other database objects that reference the selected table. In addition to the object name, the type of object and action associated is listed.

Indexes

Lists the associated indexes and index information for the selected table.

Index Statistics

Lists the number of columns, average length, average row hits, and row hits percentage for each column in an index associated with the selected table. It also lists the data distribution data values and occurrences of each value.

Table Size Details chart

The Table Size Details chart displays the size of each component in a table. To view the Table Size Details chart, select a table from the list and click the Size tab in the Table Details section.

Analyze table dependencies

The Table Dependencies tab displays the objects the selected table references and is referenced by, the type of dependency, and the action of the dependency. This allows you to quickly see how the table is utilized and how it is affected by and affects other tables and objects.

Indexes tab

The Indexes tab displays all indexes defined for the selected table and an overview of each index.

Analyze index statistics

The Tables and Indexes view allows you to see general table and index statistics for the database selected. You can also rebuild indexes for highly fragmented tables and update your statistics, which are displayed in the chart and tables in the Table Details section of the view. For more information, see the Microsoft document, Tables and Indexes.

⚠ The Collection Service may not gather fragmentation data for a particular table because:

- Table statistics collection has not occurred
- The database hosting the table was excluded from collection
- The table size does not meet the minimum size threshold
- The database hosting the table is not accessible
- The table is locked

Update table statistics

The Update Statistics option on the Tables and Indexes view of the Databases tab allows you to update your Table Statistics information. When you click **Update Statistics** from the SQL Diagnostic Manager Console, the Select Tables window opens and allows you to choose the tables to update.

Rebuild indexes

The Rebuild Indexes option on the Tables and Indexes view allows you to select tables to rebuild. Rebuilding your tables allows you to decrease the amount of fragmentation on a table. High table fragmentation can lead to overall performance bottlenecks on your SQL Server instance.

When you click **Rebuild Indexes** from the SQL Diagnostic Manager Console, the **Select Tables** window opens and allows you to choose the table indexes to rebuild.

> ✓ If you are rebuilding indexes on a very large table the rebuild process could take several minutes to complete. While the rebuild is in process, the table is locked and users are unable to access it.

Once the indexes are rebuilt, the **% Fragmentation (Current)** column displays showing you the results.

> ✓ If you are rebuilding a very large index, the SQL Diagnostic Manager Console checks for the rebuild status for 90 seconds. If the rebuild is not complete after 90 seconds, the **% Fragmentation (Current)** column does not display the new value until the next table statistics collection occurs.

Monitor database mirroring

The Database Mirroring view allows you to monitor the mirrored databases set up on monitored SQL Server instances. You can view the mirrored databases by clicking **Mirroring** on the Databases tab.

> ✓ If you have enabled database mirroring on your SQL Server, the SQL Diagnostic Manager Database Mirror Monitoring view is enabled by Default.

Database mirroring is a process available in SQL Server 2005 and 2008 that moves database transactions from one SQL Server database to another SQL Server database on a different instance of SQL Server.

Database mirroring allows you to configure a duplicate of your important databases for availability and redundancy.

Access the Mirroring view

You can open the Mirroring view of the SQL Diagnostic Manager Databases tab by selecting the appropriate SQL Server instance, and clicking **Databases > Mirroring**.

Database mirroring statistics

In this view, you can see all the mirrored databases on all the monitored SQL Server instances, their current status, and history. The database table provides the following information:

Database Name

The name of the database.

Server Instance

The SQL Server instance hosting the mirrored database.

Current Role

Describes whether the database is the principal or the mirrored database.

Partner Instance

The name of the SQL Server instance that is the mirror partner.

Mirroring State

The status of the database mirror, color-coded based on the configured alert level.

Witness Connection

The status of the connection, color-coded based on the configured alert level.

Operational State

Describes whether the database mirroring session is operating in a preferred configuration based on how the user established which SQL Server instance hosts the principal and which SQL Server instance hosts the mirrored database.

Operating Mode (Hidden)

Shows the current operating mode: High availability with automatic fail-over (has a witness, synchronous); High availability without automatic fail-over (no witness, synchronous); High performance (no witness, asynchronous).

Available details for a specific session

Select a session, and then click the Status tab to view the following details. You can also view historical information for a selected session using the History tab. This information includes the history of the metrics over time for both the local and remote partner.

Unsent log (in kilobytes)

Size of the log waiting in the send queue on the principal, displayed in kilobytes.

Oldest unsent transaction (dd.hh:mm)

Date and time of the oldest unsent transaction in the send queue on the principal.

Time to send log (estimated)

Estimated number of minutes required by the principal to send the log waiting in the send queue to the mirror based on the current send rate. Note that this rate is affected by the rate of incoming transactions.

Send rate (in kilobytes per second)

Rate at which the principal is sending transactions to the mirror, displayed in kilobytes per second.

Rate of new transactions (in kilobytes per second)

Rate at which transactions are added to the unsent queue on the principal.

Unrestored log (in kilobytes)

Size of the log waiting in the redo queue on the mirror, in kilobytes.

Time to restore log (estimated)

Estimated number of minutes required to apply the log in the redo queue to the mirror database.

Current restore rate (in kilobytes per second)

Rate at which transactions in the redo queue are applied to the mirror database, in kilobytes per second.

Mirror commit overhead

Size of the log waiting in the redo queue on the mirror, in kilobytes. This delay is due to mirror operations and is the first indication that the traffic exceeds the capabilities of the hardware.

Time to send and restore all current log (estimated)

Estimated number of minutes required to process all outstanding transactions on both the principal and mirror.

Operating mode

Displays one of the following operating modes for the current database mirroring session: High availability with automatic fail-over (has a witness, synchronous), High availability without automatic fail-over (no witness, synchronous), or High performance (no witness, asynchronous).

Witness Address

Network address of the witness SQL Server instance.

Mirror Address

Network address of the mirror SQL Server instance.

Principal Address

Network address of the principal SQL Server instance.

Available actions in the Database Mirror Monitoring view

Each row of the mirrored databases table provides a menu of actions you can perform:

Failover

Select **Fail over to partner** to fail over the principal role between the two partner databases in the mirroring session.

The duration of a mirroring failover operation varies according to the amount of log in the redo queue on the mirror. All transactions in the redo queue must roll forward before the mirror can assume the role of Principal. After the failover is initiated, the Principal changes to PENDING_FAILOVER while the mirror synchronizes. Once complete, there is a brief period where user connections are terminated and while roles are switching the mirroring status is undetermined. If a refresh occurs at this time, your mirrored database does not show in the Mirrored Databases grid. This lasts for a moment and your next refresh reflects the switched roles.

Suspend or Resume Monitoring

Use **Suspend\resume session** to pause all mirroring operations. While mirroring is paused in "High Availability" mode, all transactions opened against the principal are queued for transmission to the mirror partner once the session resumes.

Set mirror relationship as "Failed over" or "Normal"

Select **Mark session as "failed over"** or **Mark session as "normal" operational status** to define the status of a mirror relationship. Once you have set a preferred operational state, SQL Diagnostic Manager alerts you if the configuration differs from your selection.

Clear the role preference for this mirroring session

Use **Clear preferred role for this session** to clear the preferred role for the session and stop receiving alerts for differences between the current configuration and the Normal status.

Available alerts for mirrored databases

You can configure the following alerts for mirrored databases .

Mirror Commit Overhead

Average delay (in milliseconds) on the principal server instance for each transaction due to database mirroring.

Mirrored Server Role Change

A change in role occurred on a mirrored database on the monitored server.

Mirroring Oldest Unsent Transactions

The age of the oldest unsent transaction in minutes on the principal. This is only meaningful on the principal server instance.

Mirroring Preferred Configuration

A change occurred in terms of the preferred operational status.

Mirror Status

Status of the mirrored database such as synchronized, suspended or disconnected.

Mirroring Unrestored Log

Size of the redo queue on the mirror in kilobytes. The redo queue is the size in kilobytes of the outstanding transactions on the mirror that are not yet applied.

Mirroring Unsent Log

Size of the unsent log in the send queue on the principal in kilobytes.

Mirroring Witness Connection

If a witness is configured, this alert displays whether the witness is connected.

Monitor services

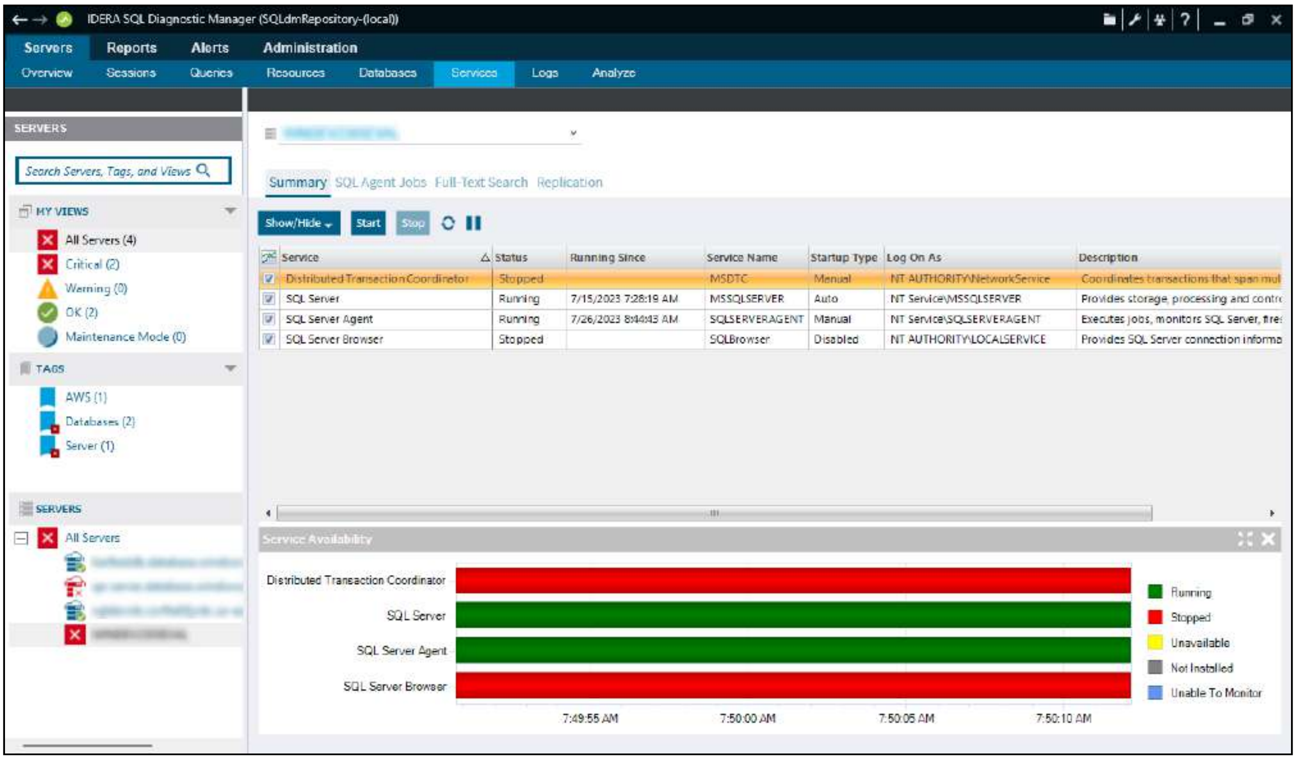
The Services tab allows you to view the status and manage your SQL Server services including the following services:

- SQL Server Agent
- SQL Server Browser
- Full-Text Search (Note that SQL Server 2008 no longer has a separate full-text search service. If the monitored instance is SQL Server 2008, the full-text search does not appear on the grid or graph.)
- DTC (Distributed Transaction Coordinator service)
- Replication services

> ✓ The Start and Stop service actions are not supported for virtual SQL Server instances or instances located on a Windows cluster node. To start or stop a service on a virtual SQL Server 2008 instance, use the Microsoft Failover Cluster Management tool. For SQL Server 2005 or earlier, use the Microsoft Cluster Administrator tool to manage services.

Access the Services tab

Access this tab by selecting the appropriate monitored server and clicking the Services tab.



	Service	Status	Running Since	Service Name	Startup Type	Log On As	Description
☑	Distributed Transaction Coordinator	Stopped		MSDTC	Manual	NT AUTHORITY\NetworkService	Coordinates transactions that span mul
☑	SQL Server	Running	7/15/2023 7:28:19 AM	MSSQLSERVER	Auto	NT Service\MSSQLSERVER	Provides storage, processing and contr
☑	SQL Server Agent	Running	7/26/2023 8:44:43 AM	SQLSERVERAGENT	Manual	NT Service\SQLSERVERAGENT	Executes jobs, monitors SQL Server, fire
☑	SQL Server Browser	Stopped		SQLBrowser	Disabled	NT AUTHORITY\LOCALSERVICE	Provides SQL Server connection informa

Alerts associated with the Services tab

The following alerts are associated with the Services tab:

Cluster Active Node

The active node of the cluster is non-preferred. You can configure the preferred node under **Server Properties > Cluster Settings**.

Cluster Failover

There is a change in the active node. This alert remains active for the amount of time specified in the advanced settings for that alert.

Distribution Latency (Seconds)

Time in seconds that a replication transaction is held at the Publisher and waiting for a Distributor.

DTC Status

Displays the status of the Distributed Transaction Coordinator service.

Full-Text Search Status

Displays the status of the Full-Text Search service.

Last Full-Text Catalog Update (Hours)

The number of hours beyond which the Full-Text Catalog statistics data is considered outdated.

Latent replication transaction (Count)

The number of transactions not written to the Distribution database.

SQL Server Agent Job Completion

Provides the status of the Agent Job Completion metric. Values for this alert include **Succeeded**, **Retry**, **Canceled**, **Failed**, and **Unknown**.

SQL Server Agent Job Failure

Indicates that a scheduled job processed by the SQL Server Agent service ended abnormally.

SQL Server Agent Long Running Job (Minutes)

Provides the maximum number of minutes used to complete a scheduled SQL Server Agent job.

SQL Server Agent Long Running Job (Percentage)

Indicates the percentage of time a scheduled job is using over what it normally uses to complete the job.

SQL Server Agent Status

Displays the status of the SQL Server Agent service.

SQL Server Active Directory Helper Service Status

Displays the status of the SQL Server Active Directory Helper service.

SQL Server Browser Service Status

Displays the status of the SQL Server Browser service.

SQL Server Status

Displays the status of the SQL Server service.

Unsubscribed Transactions (Count)

The number of non-subscribed transactions written to the Distribution database.

Unsubscribed Transactions (Seconds)

The number of seconds a transaction written to the database waits before subscription.

Get an overview of your services performance

The Services Summary tab includes the status of your Services. You can start and stop your Distributed Transaction Coordinator (DTC), or Full-Text Search by selecting the appropriate button.

> ✓ SQL Server 2008 and above no longer have a separate full-text search service. If the monitored instance is SQL Server 2008 or above, the full text search does not show on the grid or graph.

The Service Availability chart displays the DTC, Full-Text Search, SQL Server, SQL Server Browser, and SQL Server Agent status.

> ✓ An Unavailable status in the chart is caused by a pending status change such as starting, stopping, pausing, and continuing.

Access the Services Summary view

To open the Summary view of the SQL Diagnostic Manager Services tab, select the appropriate SQL Server instance, click **Services**, and select **Summary**.

Monitor SQL Agent jobs

The SQL Agent Jobs view allows you to view all your SQL Agent Jobs for the selected SQL Server instance. You can view the Job History of SQL Agent Jobs in the Job History list and Job Steps by clicking the **+** button next to the **Job Name**.

> ✓ SQL Server 2005 users may notice that SQL Diagnostic Manager does not display the Job History for the listed SQL Agent jobs. These issues is the result of a SQL Server 2005 security setting. You can override this security setting by using the following statement on the target server:
>
> ```
> sp_configure 'agent XPs',1
> reconfigure with overrid
> ```

Access the SQL Agent Jobs view

To open the SQL Agent Jobs view of the SQL Diagnostic Manager Services tab. select the appropriate SQL Server instance, click **Services**, and **SQL Agent Jobs**.

Last Run Outcome colors

The Last Run Outcome column of the SQL Agent Jobs page is color coded to quickly alert you of issues needing your attention. The colors used in this column depend on the use of the SQL Agent Job Completion metric in the Alert Configuration dialog.

If this metric is enabled, the Last Run Outcome column is colored based on the correlation of the outcome of the job or job step and the state that outcome corresponds to in the SQL Agent Job Completion metric. If this metric is not enabled, then SQL Diagnostic Manager displays results in red if the outcome is Failed or Canceled, and green if the outcome is Succeeded. All other outcome states remain the default color.

To customize the Last Run Outcome settings for your SQL Agent jobs:

1. Right-click a SQL Server instance in the Servers tree.
2. Select **Configure Alerts**.
3. Select the **SQL Server Agent Job Completion** metric.
4. Click the **Edit** button.
5. Make the necessary changes to customize your alert states.
6. Click **OK**.

View message information about a specific job

Use the Job History list to see more information about a specific job. You can review the full message by right-clicking the appropriate job name, and then selecting **View Message**. A copy feature allows you to cut and paste the message detail into another format for additional use.

Monitor full text searches

Use the Full-Text Search to monitor and diagnose problems with the SQL Server Full-Text Search service. The view is composed of a single list that displays information about each Full-Text catalog maintained on a monitored SQL Server. You can view Catalog details by selecting a Full-Text Catalog from the list.

The Full-Text Search view lists all the full-text search catalogs that are hosted on the SQL Server instance as well as their statuses. You can also start or stop the Full-Text Search service, optimize or rebuild the catalogs.

For each catalog listed, the database, status, size, and last population date is listed. In addition, selecting any catalog from the list populates the **Catalog Details** section. This section includes information on the tables, rows, columns, catalogs, language, and column data types included in the Full-Text search.

Access the Full-Text Search view

To open the Full-Text Search view of the SQL Diagnostic Manager Services tab, select the appropriate SQL Server instance, click **Services**, and select **Full-Text Search**.

Optimize or Rebuild my Full-Text Catalog

Optimize

When you select the **Optimize** button, SQL Server optimizes the space utilization of the catalog and improve query performance as well as the accuracy of relevance rankings of search results.

Rebuild

When you select the **Rebuild** button, SQL Server repopulates the full-text search index.

Analyze replication information

The Replication view allows you to analyze data replication details for the selected SQL Server instance. Included are the topology and key metrics that detail the current state of active subscribed and non-subscribed transactions on all SQL Server instances related to replication on the monitored SQL Server. For more information about replication, see the Microsoft document, SQL Server Replication.

> ⚠ Collecting replication statistics can have a performance impact on the monitored SQL Server instance.

Using the Replication view

The following elements in the Replication view help you make sure that proper replication is occurring and that your data is distributed to the correct subscribers.

Replication Trends

The Replication Trends view on the Services tab, displays information about the following metrics:

- The **Non-Distributed Count** graph tracks the number of replication transactions published by the Publisher but not received by the Distributor.
- The **Non-Distributed Time** graph tracks the time in seconds that a replication transaction has been holding at the Publisher and waiting to be received by a Distributor.
- The **Non-Subscribed Coun**t graph tracks the number of replication transactions received by the Distributor and not received by a Subscriber.
- The **Non-Subscribed Time** graph tracks the time in seconds that a replication transaction has been holding at the Distributor and waiting to be received by a Subscriber.

Replication Topology

The Replication topology grid displays all replication sessions in which the selected server is participating, whether it is a publisher, distributor, or subscriber. For merge and snapshot replication, SQL Diagnostic Manager must monitor the distributor. For transactional replication, we recommend that you monitor the distributor, publisher, and subscriber for a complete set of metrics. Note that SQL Diagnostic Manager displays a subset of data for each monitored participant. Right-click a row or session to navigate to the participant for more information.

Detailed Overview

The Detailed Overview tab provides an overview of transactional replication specific to the publisher, distributor, and subscriber. In addition, SQL Diagnostic Manager also displays an overview of the selected merge replication session gathered from the distributor.

> ✓ Times displayed in the subscriber grid are local to the subscriber.

Non-Subscribed Queue

The Non-Subscribed Queue tab contains the Entry Date, Subscription Database, Wait Time, and Command contained in the queue of active non-subscribed commands. Once a command exceeds the retention period, SQL Diagnostic Manager switches the command to inactive and no longer displays the detail.

Access the Replication view

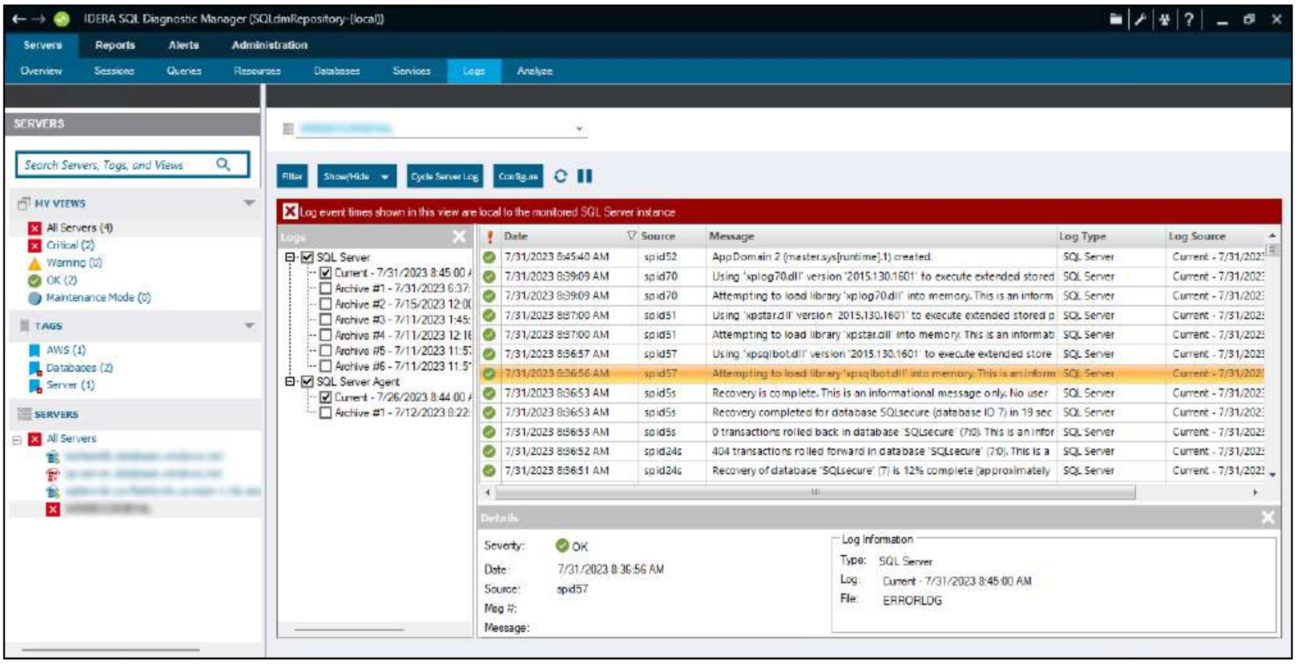
To open the Replication view of the SQL Diagnostic Manager Services tab, select the appropriate SQL Server instance, select **Services**, and click **Replication**.

Monitor logs

The Logs tab allows you to view SQL Server-related logs. Use these logs to diagnose SQL Server problems where a history of events is necessary to form context. The current log is selected by default but you can select archived or even multiple archived logs to view or search. Filter and Search options allow you to locate the areas of the logs that are most important.

Access the Logs tab

Access this tab by clicking the appropriate monitored server and selecting **Servers>Logs**.


IDERA SQL Diagnostic Manager (SQLdmRepository-(local))
Servers
Reports
Alerts
Administration
Overview
Sessions
Queries
Resources
Databases
Services
Logs
Analyze
SERVERS
Search Servers, Tags, and Views
MY VIEWS
All Servers (4)
Critical (2)
Warning (0)
OK (2)
Maintenance Mode (0)
TAGS
AWS (1)
Databases (2)
Server (1)
SERVERS
All Servers
[redacted]
[redacted]
[redacted]
[redacted]
Filter
Show/Hide
Cycle Server Log
Configure
Log event times shown in this view are local to the monitored SQL Server instance.
Logs
☑ SQL Server
☑ Current - 7/31/2023 8:45:00 A
□ Archive #1 - 7/31/2023 6:37:
□ Archive #2 - 7/15/2023 12:0(
□ Archive #3 - 7/11/2023 1:45:
□ Archive #4 - 7/11/2023 12:1(
□ Archive #5 - 7/11/2023 11:57
□ Archive #6 - 7/11/2023 11:5
☑ SQL Server Agent
☑ Current - 7/26/2023 8:44:00 A
□ Archive #1 - 7/12/2023 8:22:
Details

!	Date	Source	Message	Log Type	Log Source
✓	7/31/2023 8:45:40 AM	spid52	AppDomain 2 (master.sys[runtime].1) created.	SQL Server	Current - 7/31/202:
✓	7/31/2023 8:39:09 AM	spid70	Using 'xplog70.dll' version '2015.130.1601' to execute extended stored	SQL Server	Current - 7/31/202:
✓	7/31/2023 8:39:09 AM	spid70	Attempting to load library 'xplog70.dll' into memory. This is an inform	SQL Server	Current - 7/31/202:
✓	7/31/2023 8:37:00 AM	spid51	Using 'xpstar.dll' version '2015.130.1601' to execute extended stored p	SQL Server	Current - 7/31/202:
✓	7/31/2023 8:37:00 AM	spid51	Attempting to load library 'xpstar.dll' into memory. This is an informati	SQL Server	Current - 7/31/202:
✓	7/31/2023 8:36:57 AM	spid57	Using 'xpsqlbot.dll' version '2015.130.1601' to execute extended store	SQL Server	Current - 7/31/202:
✓	7/31/2023 8:36:56 AM	spid57	Attempting to load library 'xpsqlbot.dll' into memory. This is an inform	SQL Server	Current - 7/31/202:
✓	7/31/2023 8:36:53 AM	spid5s	Recovery is complete. This is an informational message only. No user	SQL Server	Current - 7/31/202:
✓	7/31/2023 8:36:53 AM	spid5s	Recovery completed for database SQLsecure (database ID 7) in 19 sec	SQL Server	Current - 7/31/202:
✓	7/31/2023 8:36:53 AM	spid5s	0 transactions rolled back in database 'SQLsecure' (7:0). This is an infor	SQL Server	Current - 7/31/202:
✓	7/31/2023 8:36:52 AM	spid24s	404 transactions rolled forward in database 'SQLsecure' (7:0). This is a	SQL Server	Current - 7/31/202:
✓	7/31/2023 8:36:51 AM	spid24s	Recovery of database 'SQLsecure' (7) is 12% complete (approximately	SQL Server	Current - 7/31/202:

Severity: ✓ OK
Date: 7/31/2023 8:36:56 AM
Source: spid57
Msg #:
Message:

Log Information
Type: SQL Server
Log: Current - 7/31/2023 8:45:00 AM
File: ERRORLOG

Available actions

Actions

Click **Cycle Server Log** to archive the information in the most recent log and start a new log.

Click **Configure** to determine the number of SQL Server logs retained by SQL Server.

Details section

The Details section provides more information about the selected event.

Filter

The Filter options allow you to return specific data. Note that these selections work only once you enable log alerts.

Logs tab

The Logs tab allows you to look at all the events taking place on your SQL Server instance. Each event, when selected, contains detailed information in the Details section of the tab which allows you to diagnose specific issues that occur.

The archive number is the file number associated with the log in SQL Server while the date is the last modified date of the file on disk. If the archive numbers seem out of order, check the error log.

For Example: If one of your SQL Server instances restarts, the event log can tell you the time of the restart. This helps you diagnose issues that occur on your SQL Server instances.

Filter SQL Server events

The Filter Settings window allows you to select:

- The time range to filter events, such as **Date Range-Begin** and **Date Range-End**.
- The source of the log entry, such as the session ID number.
- The message severity, such as **OK**, **Warning**, or **Critical.**

If the alert is disabled, all messages are informational.

Access the Filter Settings window

To open the Filter Settings window from the SQL Diagnostic Manager Logs tab, select the appropriate SQL Server instance, click **Logs**, and select **Filter**.

Settings Server Log filters

To Filter the Server Log:

1. Click the **Filter** button on the Logs tab.
2. Verify that SQL Diagnostic Manager displays the correct **Source**.
3. Make the necessary changes in the **Message Severity** area.
4. Type a **Date Range-Begin** and **Date Range-End** in the **Period** section of the Filter Settings window.
5. Click **OK**.

Search for SQL Server events

The **Find** window, accessed by clicking **Search**, allows you search for text in the event messages.

To search for text in your Server logs:

1. Click **Search** on the Logs tab.
2. Enter the search term in the **Find what** field.
3. Select the field you want to search (**Message**, **Msg #**, or **Source**) from the **Look in** drop-down list.
4. Select your **Find** options.
5. Click **Find Next**.
6. Keep clicking **Find Next** to scroll through the matches to locate the specific event.

Cycle the SQL Server log

Click the **Cycle Server Log** button to archive what is in the most recent (current) log and start a new log.

To cycle the Server Logs:

1. Click **Cycle Server Log**.
2. Select the log types you want to cycle (SQL Server or SQL Server Agent).
3. Click **OK** to cycle the logs.

Configure logs

The Configure Logs window allows you to determine the number of SQL Server Logs retained by SQL Server. You can access this window by clicking **Configure** on the Logs tab.

Check the **Unlimited** check box to retain all **Event Logs** or enter the number to keep only a number of the most current logs. SQL Diagnostic Manager deletes older logs.

> ✓ The number indicated on the Configure Server Logs window changes the number of SQL Server Logs stored by SQL Server, but not the number of SQL Server Agent logs stored.

Analyze your SQL Server instance

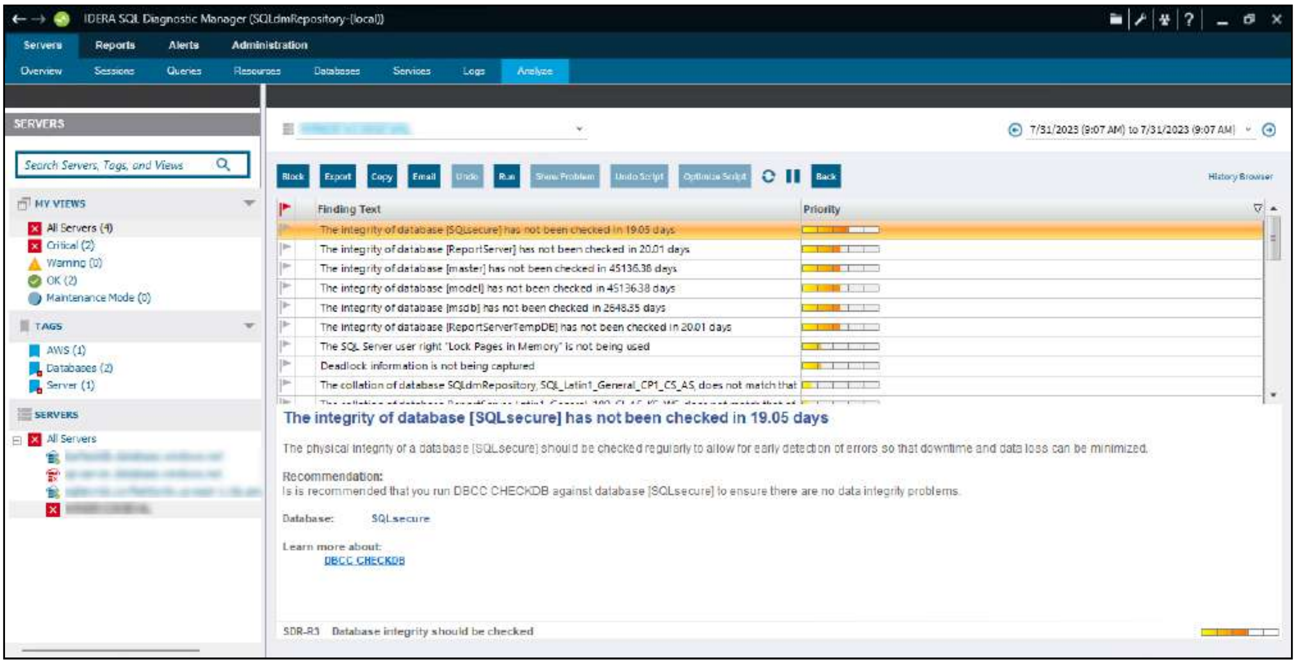
In SQL Diagnostic Manager you can run a prescriptive analysis on a specific SQL Server instance to identify and resolve SQL Server performance problems. The analysis engine scans your SQL Server configuration for potential problems and the health of your databases, resulting in a useful set of recommendations for improving performance.

The prescriptive analysis targets some of the most common areas of SQL Server performance problems, such as queries, server configuration, security, database objects, memory, and more. It is easy to work with the interface, which makes this feature accessible to a broad range of users such as the less experienced DBA or the developer in need of testing database performance.

> ⓘ SQL Diagnostic Manager now includes new recommendations for Azure and Amazon RDS instances.

Access the Analyze tab

Access this tab by clicking the appropriate monitored server and selecting the Analyze tab.



Finding Text	Priority
The integrity of database [SQLsecure] has not been checked in 19.05 days	
The integrity of database [ReportServer] has not been checked in 20.01 days	
The integrity of database [master] has not been checked in 45136.38 days	
The integrity of database [model] has not been checked in 45136.38 days	
The integrity of database [msdb] has not been checked in 2648.35 days	
The integrity of database [ReportServerTempDB] has not been checked in 20.01 days	
The SQL Server user right "Lock Pages in Memory" is not being used	
Deadlock information is not being captured	
The collation of database SQLdmRepository, SQL_Latin1_General_CP1_CS_AS, does not match that	

The integrity of database [SQLsecure] has not been checked in 19.05 days

The physical integrity of a database [SQLsecure] should be checked regularly to allow for early detection of errors so that downtime and data loss can be minimized.

Recommendation:
Is is recommended that you run DBCC CHECKDB against database [SQLsecure] to ensure there are no data integrity problems.

Database: SQLsecure

Learn more about:
DBCC CHECKDB

SDR-R3 Database integrity should be checked

In the **Analyze** tab, you can:

- Run a prescriptive analysis on your SQL Server on-demand of your SQL Server instance.
- Fine-tune your analysis.
- Identify a problem and optimize scripts.
- View your prescriptive analysis results.

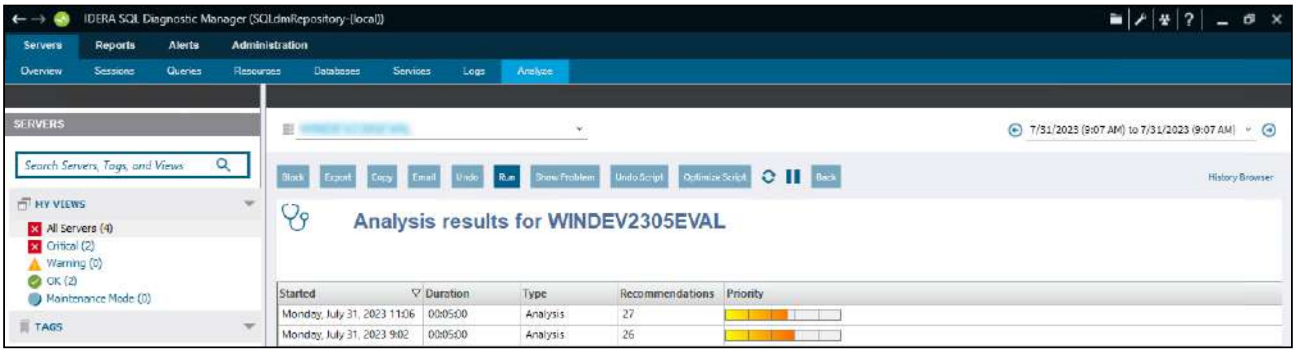
> ⓘ The prescriptive analysis uses the best method to collect query data according to the SQL Server version. If your monitored server is SQL Server 2008 or a later version, Extended Events is used in place of SQL Trace.

✓ If you do not wish to run a full analysis of your SQL Server, you can diagnose individual queries. For more information, see Diagnose queries.

Run a prescriptive analysis on your SQL Server

When configuring your analysis, you can select any combination of performance categories to focus the analysis. Each category contains a set of performance metrics and their related recommendations. By picking a category, you are identifying which SQL Server areas concern you most.

Based on the chosen categories, SQL Diagnostic Manager polls your target SQL Server instance to gather the appropriate metrics and determine which recommendations match the current performance issues.



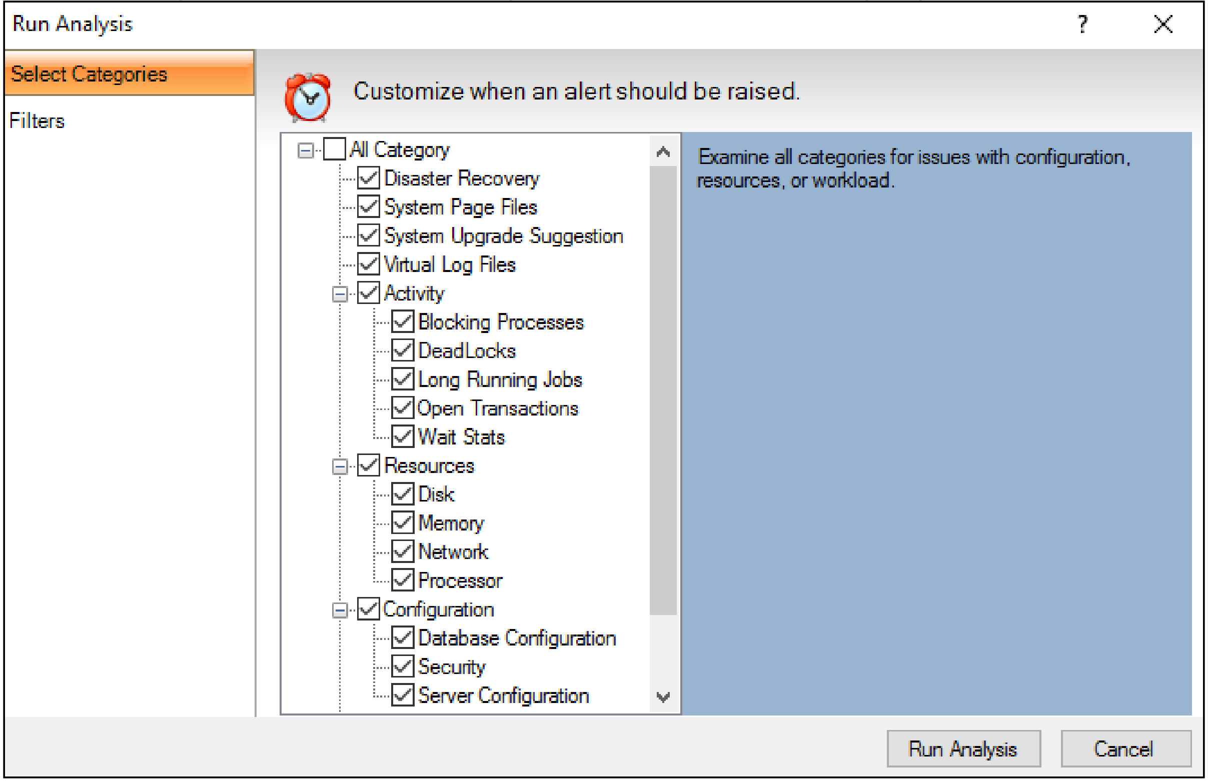
Analysis results for WINDEV2305EVAL

Started	Duration	Type	Recommendations	Priority
Monday, July 31, 2023 11:06	00:05:00	Analysis	27	
Monday, July 31, 2023 9:02	00:05:00	Analysis	26	

To run an analysis:

1. Click **Run Analysis** in the Analyze tab.
2. When the Run Analysis window opens, you can select all the categories depending on what you want to include in your analysis. In the Filters tab, you can include specific applications (% wildcard), limit your

analysis to a single database, and set how long SQLDM should spend collecting diagnostic data.



Customize when an alert should be raised.

- ☐ All Category
  - ☑ Disaster Recovery
  - ☑ System Page Files
  - ☑ System Upgrade Suggestion
  - ☑ Virtual Log Files
  - ☑ Activity
    - ☑ Blocking Processes
    - ☑ DeadLocks
    - ☑ Long Running Jobs
    - ☑ Open Transactions
    - ☑ Wait Stats
  - ☑ Resources
    - ☑ Disk
    - ☑ Memory
    - ☑ Network
    - ☑ Processor
  - ☑ Configuration
    - ☑ Database Configuration
    - ☑ Security
    - ☑ Server Configuration

Examine all categories for issues with configuration, resources, or workload.

3. Once you are finished with the Analysis configuration, click **Run Analysis** to start with the Analysis, or click **Cancel** if you want to cancel the Analysis.
4. When the analysis is complete, SQL Diagnostic Manager lists all the performed analysis results by date.
5. Double-click any of the Analyses to review the priority-ranked list of recommendations.

> SQLDM lists recommendations by priority. The priority of a recommendation is determined by the performance gain you receive from making the suggested change, and how relevant are the parameters you specified when configuring the analysis.

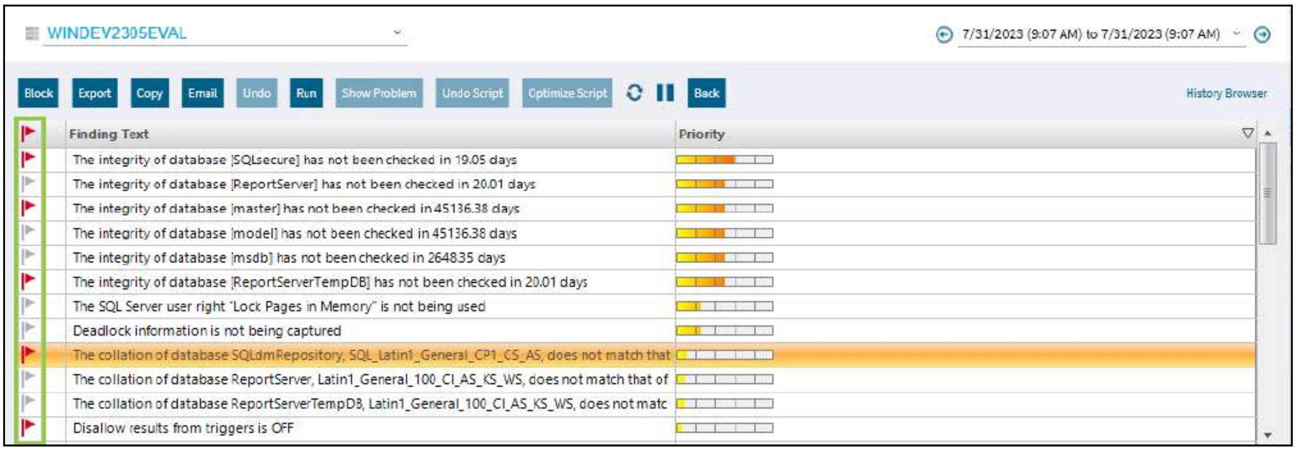
6. Select a recommendation to have detailed information.

> You can set up the Analysis categories, Analysis options, Scheduling, and other Advanced Settings in the Monitored SQL Server Properties window:
> 1. Right-click the appropriate SQL Server instance from the **Servers** tree and select **Properties**.
> 2. Select **Analysis Configuration** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window. For more information, review Configure your prescriptive analysis options.
> 3. Click **OK**.

Flag a Recommendation

Flagging a recommendation allows you to mark it for follow-up action. Use flags to identify recommendations that require further investigation or that you want to optimize at a later time. When you flag a recommendation, this flagged state is saved to the analysis file, allowing you to easily find the recommendation later.

To flag recommendations, click the **Flag** icon next to the recommendation you want to flag.



Finding Text	Priority
The integrity of database [SQLsecure] has not been checked in 19.05 days	
The integrity of database [ReportServer] has not been checked in 20.01 days	
The integrity of database [master] has not been checked in 45136.38 days	
The integrity of database [model] has not been checked in 45136.38 days	
The integrity of database [msdb] has not been checked in 264835 days	
The integrity of database [ReportServerTempDB] has not been checked in 20.01 days	
The SQL Server user right "Lock Pages in Memory" is not being used	
Deadlock information is not being captured	
The collation of database SQLdmRepository, SQL_Latin1_General_CP1_CS_AS, does not match that	
The collation of database ReportServer, Latin1_General_100_CI_AS_KS_WS, does not match that of	
The collation of database ReportServerTempDB, Latin1_General_100_CI_AS_KS_WS, does not matc	
Disallow results from triggers is OFF	

Scripts

Optimize Script

Some recommendation has the Optimize Script option enabled. The Optimize Now window displays the script that was used to enact the recommended change. Review the script, to either Run it or Cancel to return to the recommendation you were viewing.

When you run the Optimize Script, displays next to the optimized recommendation.

You can also copy the script to a Notepad or any other text editor to examine the code and research other options further before making the change.

Undo Script

The **Undo Optimization** window displays the script that is used to enact the recommended change. Review the script and either click the **Run** button to initiate the undo or click **Cancel** to return to the recommendation you were viewing. The undo script can be copied to the clipboard and used at a later time.

Executing the undo script on a recommendation that is not already optimized can harm your SQL Server environment. Before executing the undo script, be sure that the corresponding optimization is performed.

Show Problem

The **Show Problem** button launches the SQL Viewer window with the SQL text associated with the recommendation highlighted.

Additional actions

Block

Block a particular recommendation or recommendations to fine-tune your analysis.

Export

Export your recommendations in `.xls` file format.

Copy

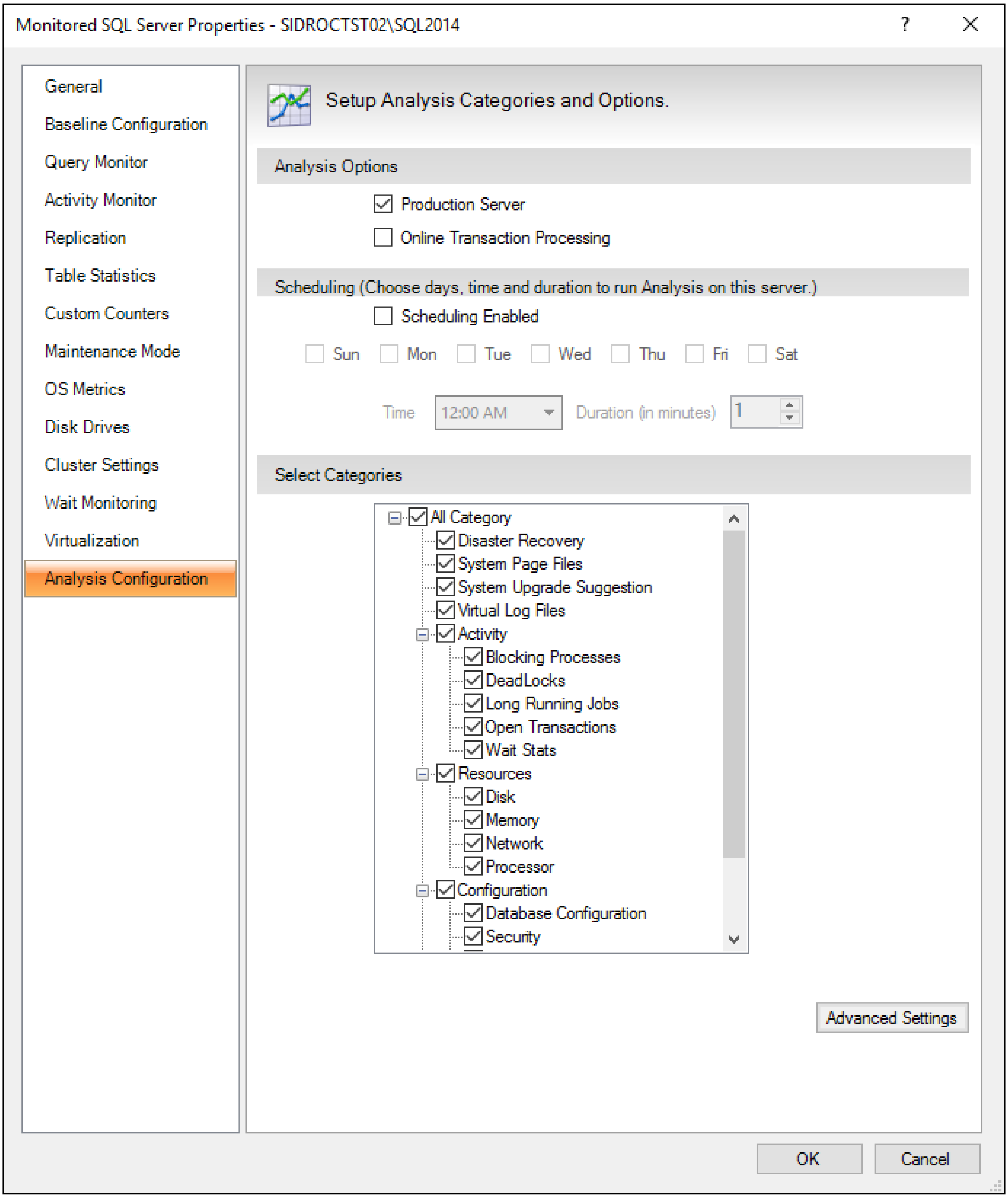
Copy your recommendations to the clipboard so that you can view the text in a text editor.

Email

Email your analysis results with recommendations.

Configure prescriptive analysis options

In the Analysis Configuration tab of the Monitored SQL Server Properties window you can schedule a prescriptive analysis of your SQL Server instance and configure your analysis options.



Monitored SQL Server Properties - SIDROCTST02\SQL2014

Setup Analysis Categories and Options.

Analysis Options

☑ Production Server

□ Online Transaction Processing

Scheduling (Choose days, time and duration to run Analysis on this server.)

□ Scheduling Enabled

□ Sun □ Mon □ Tue □ Wed □ Thu □ Fri □ Sat

Time 12:00 AM Duration (in minutes) 1

Select Categories

- ☑ All Category
  - ☑ Disaster Recovery
  - ☑ System Page Files
  - ☑ System Upgrade Suggestion
  - ☑ Virtual Log Files
  - ☑ Activity
    - ☑ Blocking Processes
    - ☑ DeadLocks
    - ☑ Long Running Jobs
    - ☑ Open Transactions
    - ☑ Wait Stats
  - ☑ Resources
    - ☑ Disk
    - ☑ Memory
    - ☑ Network
    - ☑ Processor
  - ☑ Configuration
    - ☑ Database Configuration
    - ☑ Security

Access the Analysis Configuration tab

To can access the Analysis Configuration tab of the Monitor SQL Server Properties window, right-click the appropriate monitored SQL Server instance, select **Properties**, and click **Analysis Configuration**.

Specify analysis options

SQL Diagnostic Manager provides two analysis options: Production server or Online Transaction Processing (OLTP).

- Check **Production Server**, if your instance is being used as a production server.
- Check **Online Transaction Processing** (OLTP), if your instance has OLTP enabled.

Schedule an analysis

SQL Diagnostic Manager allows you to schedule the days and time for *regular prescriptive analysis* and/or specify the duration of a *workload analysis* on your SQL Server instance. Scheduled analyses are an important way to track the health of your SQL Server environment. For more information on this feature, see Schedule analysis.

Select categories

When configuring your analysis, you can select any combination of performance categories to focus the analysis. Each category contains a set of performance metrics and their related recommendations. By picking a category, you are identifying which SQL Server areas concern you most. For additional information on the different categories, see Performance categories.

> ⓘ The more categories you pick, the longer the analysis needs to run to ensure all relevant data has been collected and thoroughly analyzed.

Using advanced analysis configuration options

You can choose to block recommendations and databases from the analysis, as well as apply additional filters using the options available on the Server Settings window. To access this window, click the Advanced Settings button on the Analysis Configuration tab.

Performance categories

On the Select categories section, you can select one or more of the following performance categories for use in the detailed analysis:

General

Disaster Recovery, System Page File, System Upgrade Suggestion, and Virtual Log Files.

⚠ The System Page Files, System Upgrade Suggestion, and Virtual Log Files performance categories are not available in SQL Diagnostic Manager 10.0.

Activity

Blocking Processes

Detects any processes that are blocking other processes.

Deadlocks

Detects any deadlocks on the SQL Server instance.

Long Running Jobs

Identifies any long-running jobs.

Open Transactions

Identifies any long-running open transactions and determines whether the associated T-SQL code needs corrections to improve performance.

Wait Stats

Identifies any waits that are affecting SQL Server performance.

Resources

Disk

Detects whether disk settings and associated problems are affecting SQL Server performance.

Memory

Examines the server memory settings and determines whether they affect performance.

Network

Detects network problems or configuration settings that affect SQL Server performance.

Processor

Detects processor problems and associated configuration settings.

Configuration

Database Configuration

Identifies which database configuration settings improve SQL Server performance.

Security

Identifies non-optimal security settings on the SQL Server instance.

Server Configuration

Detects server configuration settings that can decrease the performance of your SQL Server instance.

Workload

Index Optimization

Determines whether index settings or problems with the indexes themselves are negatively affecting SQL Server performance.

Query Optimization

Detects query problems that negatively affect your SQL Server performance.

> ⓘ The Index Optimization and Query Optimization categories return heavy recommendations if you run a workload analysis and they return light recommendations if you run a regular analysis.

Index and Query Optimization performance categories

The Index Optimization and Query Optimization categories return light recommendations if you run a regular analysis and they return heavy recommendations if you run a workload analysis.

Lightweight recommendations

Index Optimization

ID	Recommendation
SDR-I1	Auto Stats Recommendation
SDR-I10	Index Underutilized Recommendation
SDR-I16	Index Unused Recommendation
SDR-I17	Index Page Latch Contention Recommendation
SDR-I2	Fragmented Index Recommendation
SDR-I21	Overlapping Index Recommendation
SDR-I22	Non-Clustered Matching Clustered Index Recommendation
SDR-I23	Non-Incremental Column Stat On Partitioned Table
SDR-I24	High Modifications Since Last Stat Update
SDR-I25	Hash Index Few Buckets
SDR-I26	Hash Index Large Duplicate Key
SDR-I27	Scanned Hash Index
SDR-I28	Hash Index Too Many Buckets
SDR-I29	Rarely Used Index On In-Memory Table
SDR-I3	Out Of Date Stats Recommendation
SDR-I30	Column Store Index Missing On Large Tables

ID	Recommendation
SDR-I31	Filtered Column Not In Key Of FilteredIndex
SDR-I5	Disabled Index Recommendation
SDR-I6	Duplicate Index Recommendation
SDR-I7	Hypothetical Index Recommendation
SDR-I8	Partial Duplicate Index Recommendation
SDR-I9	Index Lock Contention Recommendation

Query Optimization

ID	Recommendation
SDR-Q3	SQL Module Option Recommendation
SDR-Q37	Flag 4199 Low Compatible
SDR-Q38	Flag 4199 All Db Compatible
SDR-Q39	Query Store Disabled
SDR-Q40	Query Store Out Of Space
SDR-Q41	Query Store Almost Full
SDR-Q42	Plan Guides Used Over Query Store
SDR-Q43	Frequently Executed Procedure With High CPU Time
SDR-Q44	New Cardinality Estimator Not Being Used
SDR-Q46	Top 10 Queries With Longest Average Execution Time
SDR-Q47	Top10 Queries Consuming Most IO

ID	Recommendation
SDR-Q48	Queries With Double Increase In Execution Time
SDR-Q49	Top10 Queries Having Longer Duration In Last Hour
SDR-Q50	Queries With Four Different Plan In Two Days

Heavy weight recommendations

Index Optimization

ID	Recommendation
SDR-I4	Missing Index Recommendation
SDR-I19	No Column Stats Recommendation

Query Optimization

ID	Recommendation
SDR-Q11	TSql Recommendation With Table (Unfiltered Delete)
SDR-Q13	TSql Hint Recommendation (Hint Abuse)
SDR-Q16	TSql Recommendation (Left Expression In Where Clause)
SDR-Q17	TSql Recommendation (Like Use Not Needed)
SDR-Q18	TSql Nested Min Max Recommendation (Nested Min Max)
SDR-Q19	No Join Predicate Recommendation
SDR-Q2	TSql Cursor Recommendation (Fast Forward Cursor)
SDR-Q20	TSql Recommendation With Column (Not In Used On Nullable Column)
SDR-Q22	TSql Recommendation (Select Star Abuse)
SDR-Q24	TSql Recommendation (Function In Where Clause)

ID	Recommendation
SDR-Q26	TSql Recommendation (Union Set Abuse)
SDR-Q28	TSql Recommendation (Top Vs Row Count)
SDR-Q29	TSql Recommendation (Ansi Top Equivalent)
SDR-Q34	TSql Recommendation (Naked Insert)
SDR-Q35	User Defined Function In Predicate Recommendation
SDR-Q35	Intrinsic Function In Predicate Recommendation
SDR-Q35	Implicit Conversion In Predicate Recommendation
SDR-Q6	Cached Plan Misuse Recommendation
SDR-Q8	TSql Recommendation (Two Expression Coalesce)

Schedule analysis

SQL Diagnostic Manager allows you to schedule the days and time for a *regular prescriptive analysis* on your SQL Server instance. Scheduled analyses are an important way to track the health of your SQL Server environment. To get the most out of this feature, IDERA recommends that you schedule the analysis to run during busy periods or during times your SQL Server users are experiencing problems.

To schedule an analysis:

1. Right-click the appropriate monitored SQL Server instance and select **Properties > Analysis Configuration**.
2. On the Setup Analysis Categories and Options window, under the Scheduling section, click the **Scheduling Enabled** check box.
3. Select the days and time you want the analysis to start. For best results, select a time when the SQL Server instance is busy.

   > ⚠ The specified days and time only apply to prescriptive analysis. Workload analysis is not impacted by this feature.

4. Specify the total **Duration** (in minutes) that you want SQL Diagnostic Manager to take collecting and analyzing data from this server.

   > ⚠ The specified duration only applies to workload analysis. Prescriptive analysis is not be impacted by this feature.

5. Click **OK**.

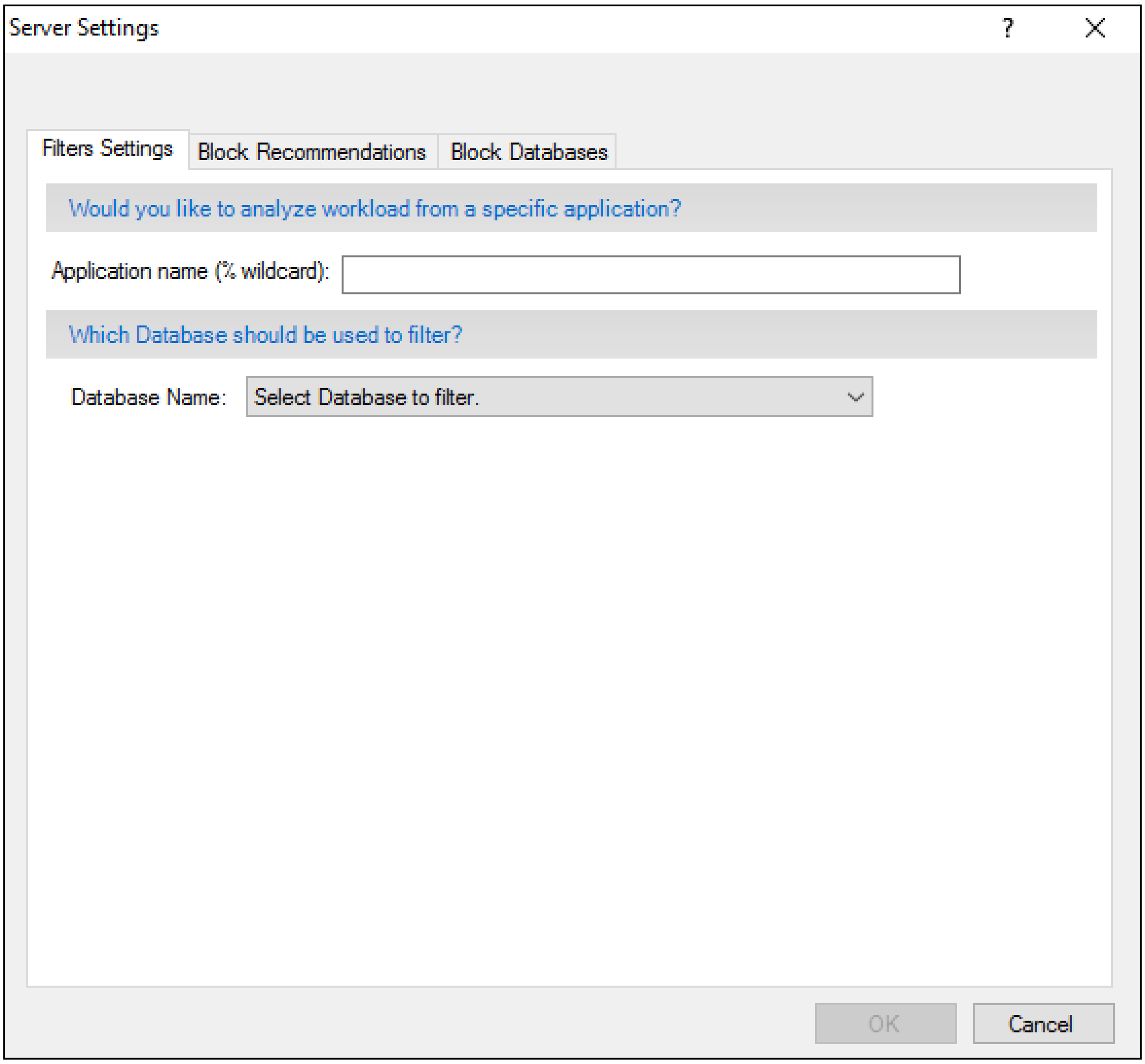
To cancel an analysis:

1. Right-click the appropriate monitored SQL Server instance and select **Properties > Analysis Configuration**.
2. On the Setup Analysis Categories and Options window, under the Scheduling section, clear the **Scheduling Enabled** check box.

Fine-tune your analysis

SQL Diagnostic Manager provides several options to fine-tune your prescriptive analysis results. You can apply filters that allow you to focus on a specific application or database. You can also reduce analysis "noise" by blocking recommendations and databases for changes that you do not plan to make in your environment.

Apply filters



Would you like to analyze workload from a specific application?

Application name (% wildcard):

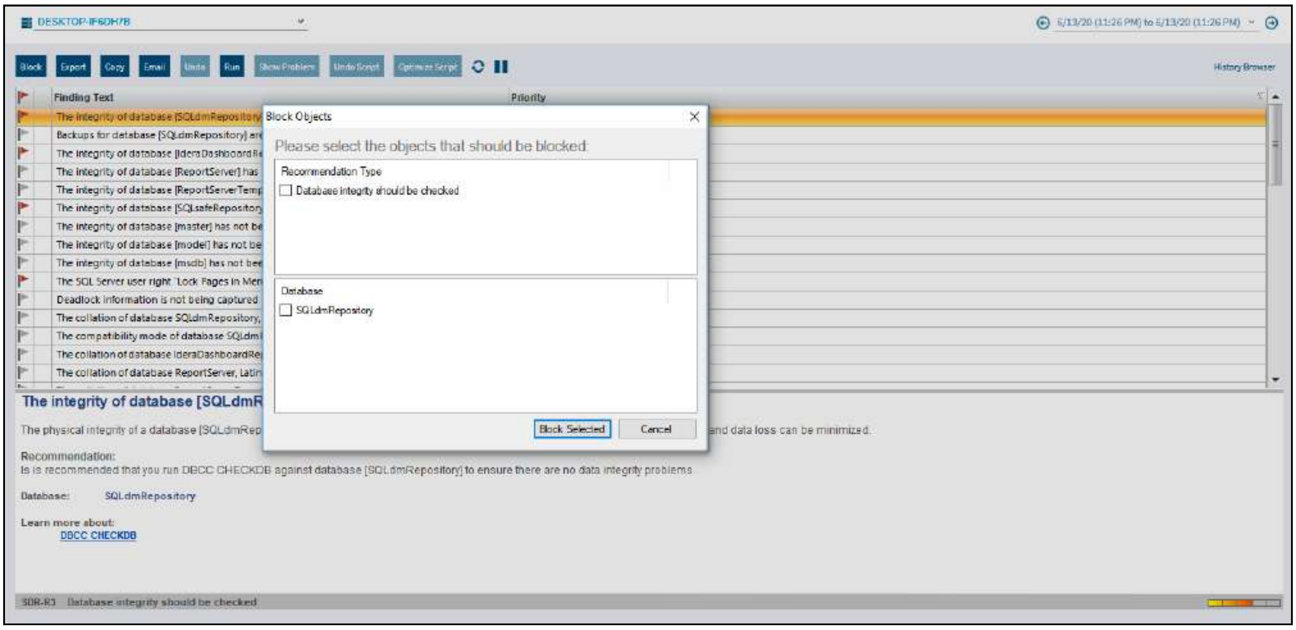
Which Database should be used to filter?

Database Name: Select Database to filter.

To apply filters in your analysis results:

1. Right-click the appropriate SQL Server instance from the **Servers** sidebar and select **Properties**.
2. Select **Analysis Configuration** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.
3. Click **Advanced Settings** to access the Server Settings window.
4. Select the Filter Settings tab.
5. Enter the filter information in the provided fields, using **(%)** as a wildcard.
6. Click **OK**.

Block your recommendations



The integrity of database [SQLdmRepository
Backups for database [SQLdmRepository] are
The integrity of database [IderaDashboardRe
The integrity of database [ReportServer] has
The integrity of database [ReportServerTemp
The integrity of database [SQLsafeRepository
The integrity of database [master] has not be
The integrity of database [model] has not be
The integrity of database [msdb] has not bee
The SQL Server user right "Lock Pages in Men
Deadlock information is not being captured
The collation of database SQLdmRepository,
The compatibility mode of database SQLdm
The collation of database IderaDashboardRe
The collation of database ReportServer, Latin

Please select the objects that should be blocked:

Recommendation Type
□ Database integrity should be checked

Database
□ SQLdmRepository

The integrity of database [SQLdmR

The physical integrity of a database [SQLdmRep … and data loss can be minimized.

Recommendation:
Is is recommended that you run DBCC CHECKDB against database [SQLdmRepository] to ensure there are no data integrity problems

Database: SQLdmRepository

Learn more about:
DBCC CHECKDB

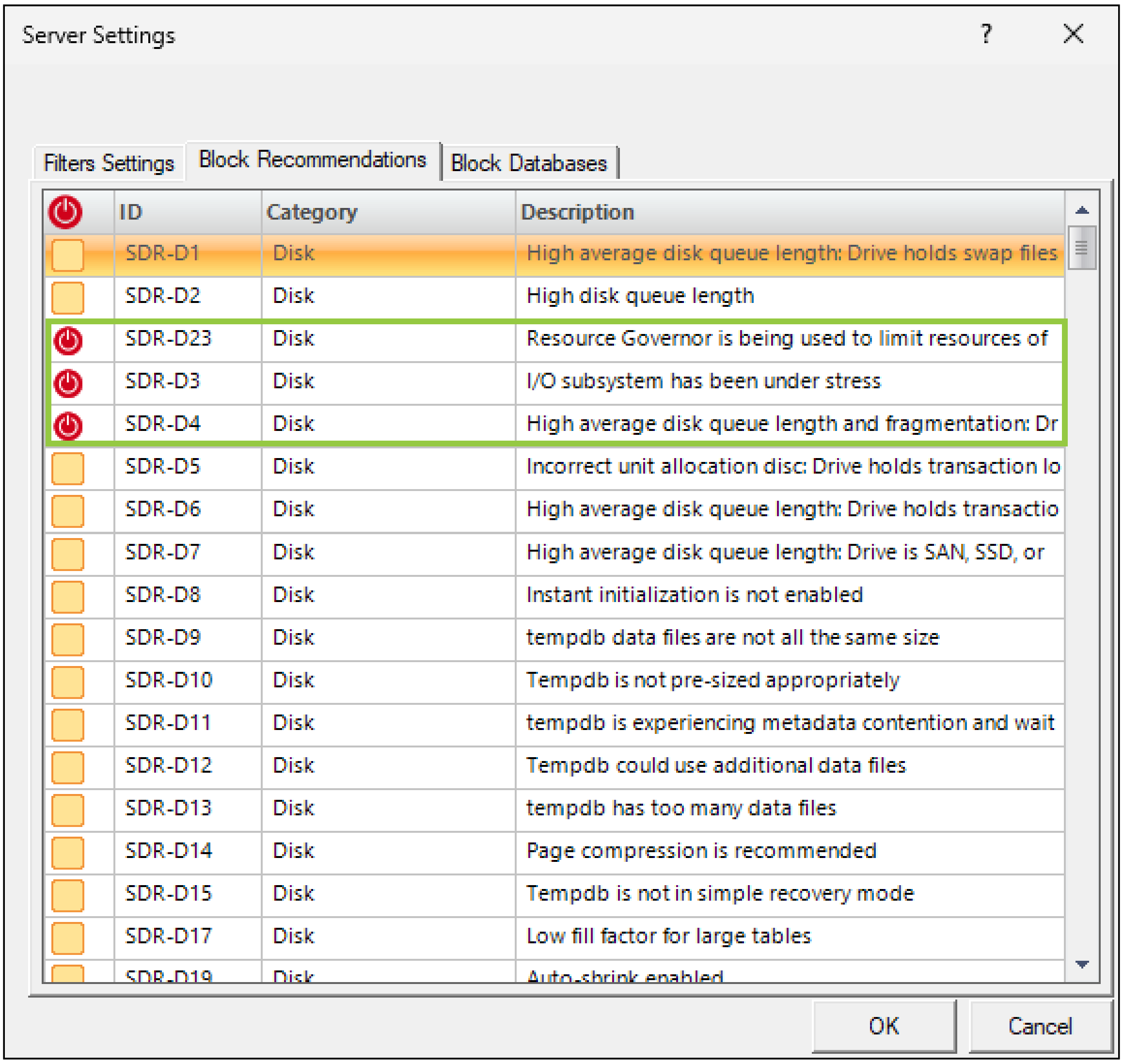
SDR-R3 Database integrity should be checked

To block recommendations from appearing in your analysis:

1. Select one or more recommendations returned from the analysis.
2. Click **Block** in the **Actions** group of the Analyze tab and the Block Objects screen displays.
3. Select the recommendation check box or boxes under Recommendation type.
4. Click **Block Selected**.

To block recommendations from the Server Settings window:

1. Right-click the appropriate SQL Server instance from the **Servers** sidebar and select **Properties**.
2. Select **Analysis Configuration** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.
3. Click **Advanced Settings** to access the Server Settings window.
4. Select the Block Recommendations tab.
5. Select the **Block** checkbox next to each of the recommendations you want to block from future analyses.
6. Click **OK**.



⏻	ID	Category	Description
□	SDR-D1	Disk	High average disk queue length: Drive holds swap files
□	SDR-D2	Disk	High disk queue length
⏻	SDR-D23	Disk	Resource Governor is being used to limit resources of
⏻	SDR-D3	Disk	I/O subsystem has been under stress
⏻	SDR-D4	Disk	High average disk queue length and fragmentation: Dr
□	SDR-D5	Disk	Incorrect unit allocation disc: Drive holds transaction lo
□	SDR-D6	Disk	High average disk queue length: Drive holds transactio
□	SDR-D7	Disk	High average disk queue length: Drive is SAN, SSD, or
□	SDR-D8	Disk	Instant initialization is not enabled
□	SDR-D9	Disk	tempdb data files are not all the same size
□	SDR-D10	Disk	Tempdb is not pre-sized appropriately
□	SDR-D11	Disk	tempdb is experiencing metadata contention and wait
□	SDR-D12	Disk	Tempdb could use additional data files
□	SDR-D13	Disk	tempdb has too many data files
□	SDR-D14	Disk	Page compression is recommended
□	SDR-D15	Disk	Tempdb is not in simple recovery mode
□	SDR-D17	Disk	Low fill factor for large tables
□	SDR-D19	Disk	Auto-shrink enabled

ⓘ Blocking a recommendation removes it from all future analysis results for this registered instance.

Block databases

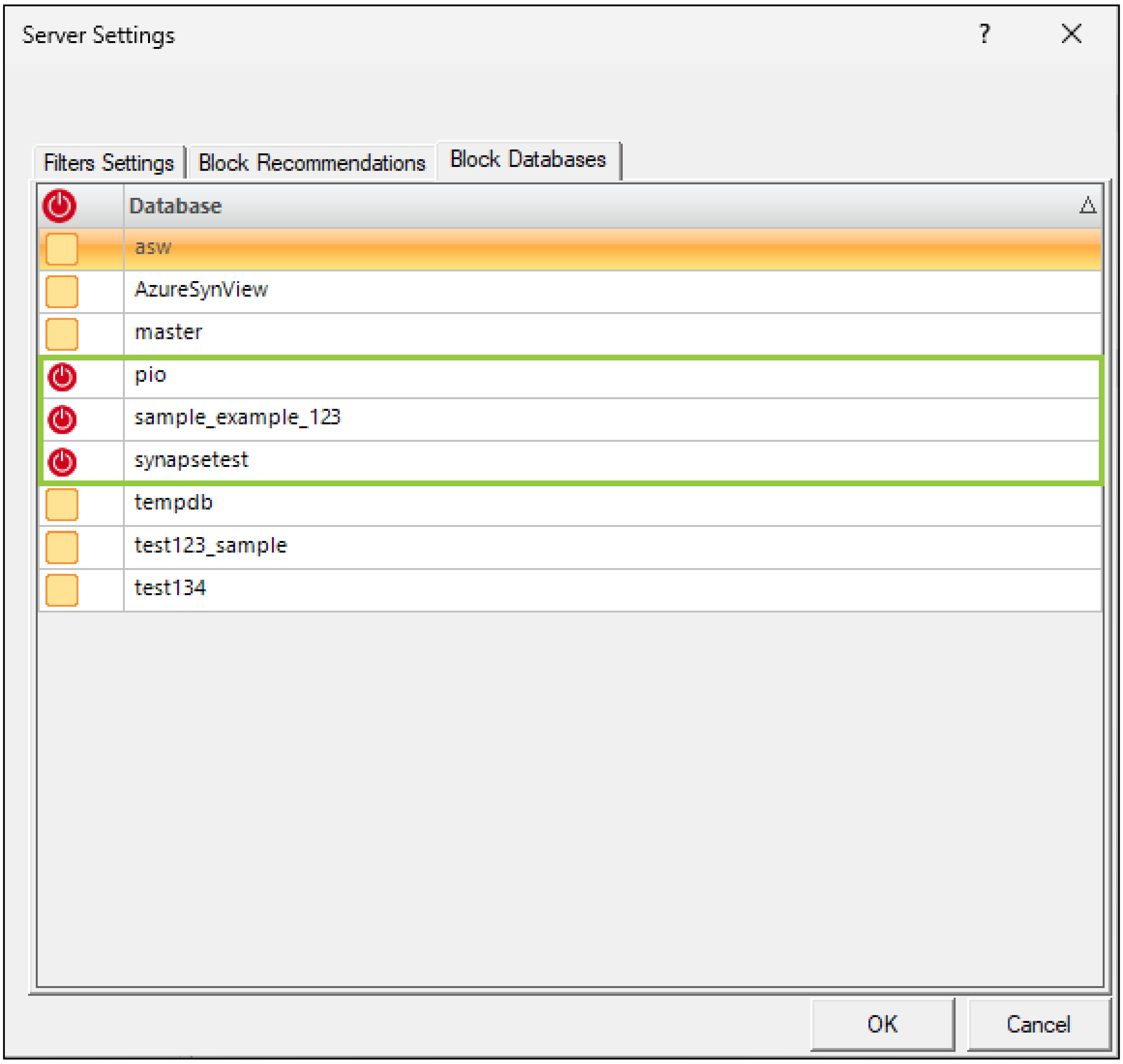
To block databases from appearing in your analysis:

1. Access the Block Objects screen by selecting one or more recommendations and clicking **Actions > Block** in the Analyze tab.
2. Select the database check box or boxes under Database.
3. Click **Block Selected**.

To block databases from the Server Settings window:

1. Right-click the appropriate SQL Server instance from the **Servers** sidebar and select **Properties**.
2. Select **Analysis Configuration** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.
3. Click **Advanced Settings** to access the Server Settings window.

4. Select the Block Databases tab.
5. Select the **Block** check box next to each of the databases you want to block from future analyses.
6. Click **OK**.



⏻	Database
□	asw
□	AzureSynView
□	master
⏻	pio
⏻	sample_example_123
⏻	synapsetest
□	tempdb
□	test123_sample
□	test134

ⓘ Blocking a database removes it from all future analysis results for this registered instance.

Unblock your recommendations or databases

To unblock recommendations or databases to include them in your analysis:

1. Right-click the appropriate SQL Server instance from the **Servers** sidebar and select **Properties**.
2. Select **Analysis Configuration** when SQL Diagnostic Manager displays the Monitored SQL Server Properties window.
3. Click **Advanced Settings** to access the Server Settings window.
4. Select the Block Recommendations tab or the Block Databases tab of the Server Settings window.
5. Scroll down the list of blocked recommendations or databases and find the recommendation or database you want to unblock.

6. Clear the **Block** box next to the appropriate recommendation or the **Block** box next to the appropriate database.
7. Click **OK**.

Identify a problem and optimize scripts

On the Analyze tab, in the Scripts group, you can identify a problem and optimize performance:

Show Problem

The **Show Problem** button launches the SQL Viewer window with the SQL text associated with the recommendation highlighted. Click **Copy** to copy the SQL text to the clipboard so you can view the text in a text editor or in SQL Server Management Services.

Optimize Script

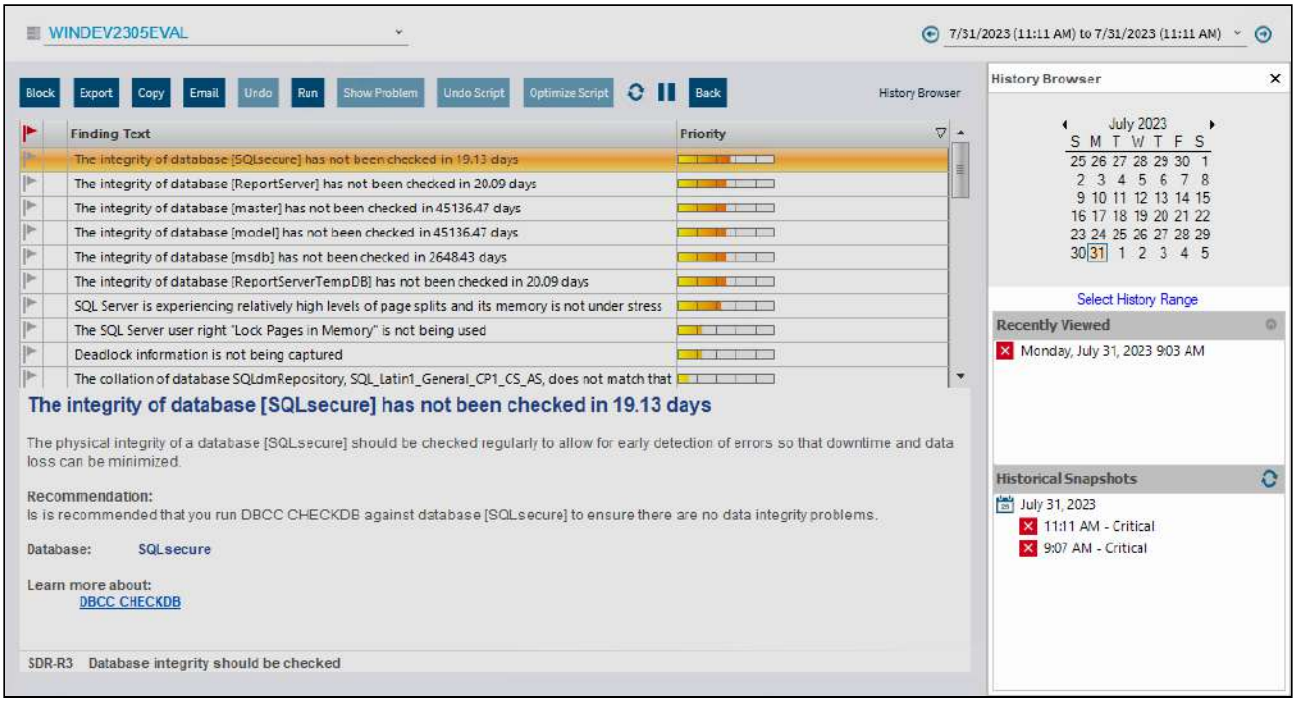
The **Optimize Script** window displays the script that is used to enact the recommended change. Review the script, and then either click the **Run** button to initiate the optimization or click **Cancel** to return to the recommendation you were viewing. You can also copy the script to Notepad or another text editor to examine the code and research other options further before making the change.

Undo Script

The **Undo Script** window displays the script that is used to enact the recommended change. Review the script, and then either click the **Run** button to initiate the undo or click **Cancel** to return to the recommendation you were viewing. The undo script can be copied to clipboard and used at a later time.

View your prescriptive analysis results

On the Analyze tab, in the History group, you can access the results of every analysis stored by SQL Diagnostic Manager for your monitored SQL Server instance.



Finding Text	Priority
The integrity of database [SQLsecure] has not been checked in 19.13 days	
The integrity of database [ReportServer] has not been checked in 20.09 days	
The integrity of database [master] has not been checked in 45136.47 days	
The integrity of database [model] has not been checked in 45136.47 days	
The integrity of database [msdb] has not been checked in 2648.43 days	
The integrity of database [ReportServerTempDB] has not been checked in 20.09 days	
SQL Server is experiencing relatively high levels of page splits and its memory is not under stress	
The SQL Server user right "Lock Pages in Memory" is not being used	
Deadlock information is not being captured	
The collation of database SQLdmRepository, SQL_Latin1_General_CP1_CS_AS, does not match that	

The integrity of database [SQLsecure] has not been checked in 19.13 days

The physical integrity of a database [SQLsecure] should be checked regularly to allow for early detection of errors so that downtime and data loss can be minimized.

Recommendation:
Is is recommended that you run DBCC CHECKDB against database [SQLsecure] to ensure there are no data integrity problems.

Database: SQLsecure

Learn more about:
DBCC CHECKDB

SDR-R3 Database integrity should be checked

History Browser

July 2023

S	M	T	W	T	F	S
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5

Select History Range

Recently Viewed
Monday, July 31, 2023 9:03 AM

Historical Snapshots
July 31, 2023
11:11 AM - Critical
9:07 AM - Critical

Analyses are ordered by start time per the local computer running the SQL Diagnostic Manager console and include:

- Timestamp when the analysis started.
- Total number of recommendations found.
- Highest priority recommendation associated with the analysis.

To select a specific analysis:

1. Open the History Browser.
2. Select the date from the calendar.
3. Select the corresponding analysis from the Historical Snapshots list.

Additional actions

Previous Analysis

Browse the previous analysis result of your SQL Server instance.

Next Analysis

Browse to the next analysis result of your SQL Server instance.

To return to Real-Time mode, click **Run Analysis** on the Analyze tab.

Diagnose queries

Access query diagnosis from any SQL Diagnostic Manager view that contains a SQL query such as the Query Statement Mode, Signature Mode, or the alert views. Query diagnosis helps you save time by analyzing the queries you care about without having to wait for a full analysis to complete.

When SQL Diagnostic Manager diagnoses a query, you receive performance recommendations.

To a query diagnosis:

1. Right-click any selected SQL query and select **Show Query Text**.
2. In the SQL Text dialog, click **Diagnose** to start your query diagnosis.
3. In the Analyze tab a priority-ranked list of recommendations displays.

View the Timeline for this instance

The Timeline view provides a chronological chart of events that affect your monitored SQL Server instance. The view details the point in time for this monitored SQL Server instance when an alert occurred, including custom counter alerts.

SQL Diagnostic Manager displays as many alerts as can fit in the window and uses color codes based on the alert type as shown in the key below the menu. While a single Timeline point can represent more than one alert, the point itself appears in the color of the most critical alert for that time.

Use the filters to pinpoint the information you want to view. If the displayed timeframe is not exactly what you want to view, select another period from the **Filter** drop-down list. Notice that the measurement at the bottom of the window changes from hours to days if you switch from a daily option to one over a period of days. Select **Pick a Day** to select a specific day using the calendar.

You can also use the time frame slider at the bottom of the view to zoom in or out by dragging the start and end bars to the desired position. Click the left or right arrows to move your set range to another period in the timeline. SQL Diagnostic Manager retains the range size, but changes the results based on the dates within the range.

SQL Diagnostic Manager displays alerts on the Timeline in your local time even if the monitored SQL Server instance where the event occurred is located in a different time zone.

Access the Timeline view

You can open the Timeline view of the SQL Diagnostic Manager Overview tab by selecting the appropriate SQL Server instance, and clicking **Overview > Timeline**.

Access more alert detail from the Timeline

View the total number of alerts at a specific time

When you hover your cursor over a point in the timeline, SQL Diagnostic Manager displays the number of alerts for the time displayed in the timestamp.

Zoom in for more detail

Your alert configuration may cause the Timeline view to appear cluttered in the default settings. Occasionally, a timeline point appears without an attached alert flag to let you know about the associated alert. If you experience these issues, use the time frame slider at the bottom of the view to zoom in for a clearer picture of a set of alerts.

View alerts

While the Timeline provides your alerts in chronological format, you may want to view more detail about a single alert while using this view. To access the Alerts view from the Timeline, simply right-click the alert and select **View Alerts**. SQL Diagnostic Manager displays the view you receive when you click the Alerts pane for a monitored SQL Server instance.

DBaaS custom dashboard

In the desktop console you can create a custom dashboard with metric panels that are supported in SQL Diagnostic Manager.

Upgrade DMSO Servers from Existing DM Installation

SQL Diagnostic Manager now supports upgrades from any existing DM Installation including the following versions:

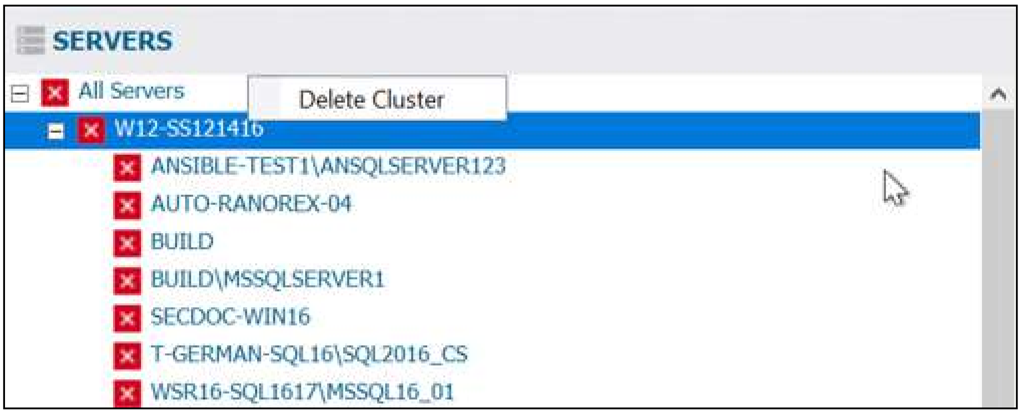
- SQL Diagnostic Manager 11.1.x
- SQL Diagnostic Manager 11.0.x
- SQL Diagnostic Manager 10.6.x

> ⓘ Upgrades include the option to add a new index repository and register each Diagnostic Manager Installation.

Deletion of Diagnostic Manager Installations from Index Repository

SQL Diagnostic Manager now allows you to easily delete a Diagnostic Manager Installation by right-clicking on it in the tree view.

> Before any deletion, a warning will be displayed.

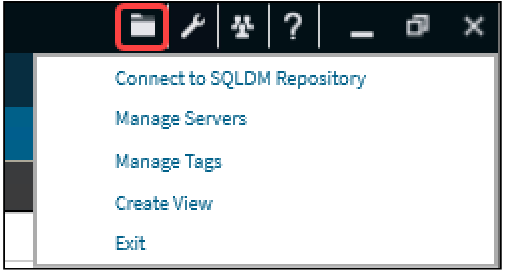


> ⚠ Consider that a DM Installation deletion implies deleting the DM installation and its instances from the index repository.

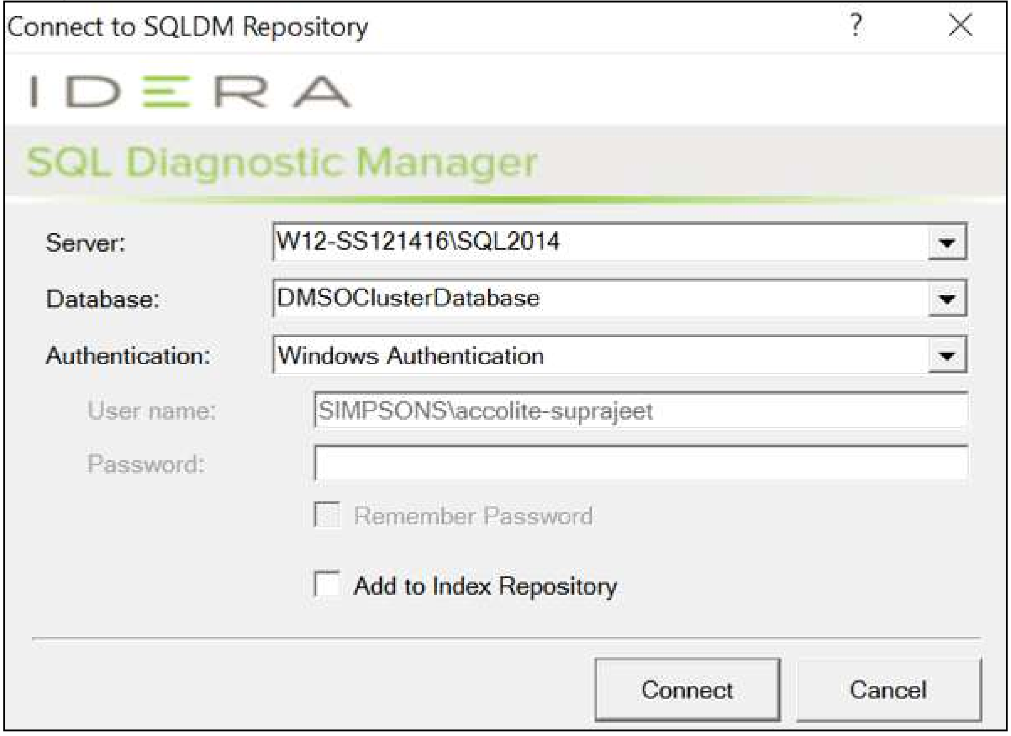
Add a DM Installation to an Index Repository

You can add a DM installation to the index repository from the Diagnostic Manager Windows Console. To do so, follow the next steps while connected to the Index Repository:

1. Select the **Connect to SQL DM Repository** option from the Files menu.



2. From the drop-down list, choose the Server where the DM installation will be added.
3. Configure your Repository with the Database and the Authentication type.



Connect to SQLDM Repository

Server: W12-SS121416\SQL2014

Database: DMSOClusterDatabase

Authentication: Windows Authentication

User name: SIMPSONS\accolite-suprajeet

Password:

□ Remember Password

□ Add to Index Repository

4. Select the **Add to Index Repository** option and click Connect.

ⓘ When you select the **Add to Index Repository** option dialog box similar to “Connect to SQLDM Repository” provides credentials to add the designated SQLDM Repository to the Index Repository and display the associated instances in the tree.

Add and Remove Instances

SQL Diagnostic Manager allows you to easily add and remove DMSO Instances from your Installations. You can add or remove Instances to the DMSO Management through:

- User Interface.
- PowerShell Cmdlet.

User Interface

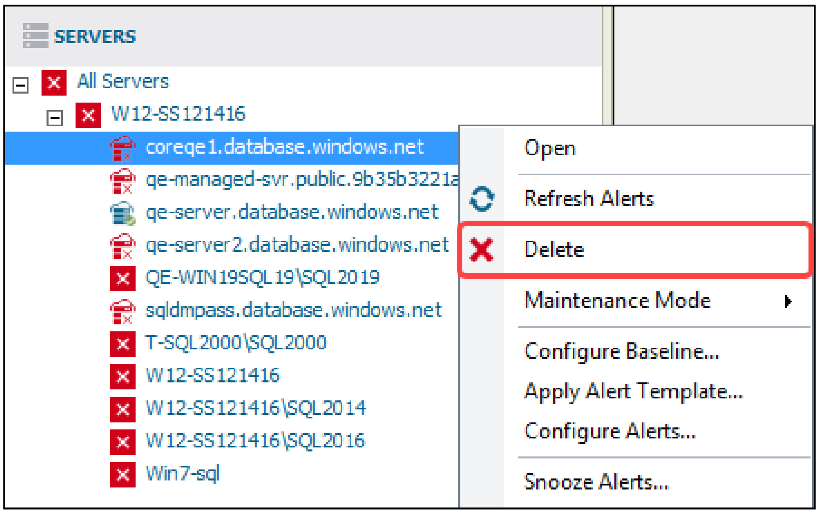
Add a DMSO Instance through the User Interface using the Add Servers Wizard, you can find it

- By selecting the **Manage Servers** under the Files menu
- By right-clicking the DMSO Cluster and selecting **Manage Servers...**

Configure your instance as it was a normal instance.

> ⚠ To determine which repository is used, you may need to allow the current value of the **ActiveRepositoryConnection** property
> in the **DesktopClient.Properites.Settings** class.

Also, you can remove monitored instances through the user Tree View by right-clicking the DMSO Instance to remove and selecting the **Delete** option.



PowerShell Cmdlet

Add a DMSO Instance through PowerShell Cmdlet, check the example below :

```
New-SQLdmMonitoredInstance -Path Instance1 -Cluster MgmtCluster
-WindowsAuthentication -tags production,finance
```

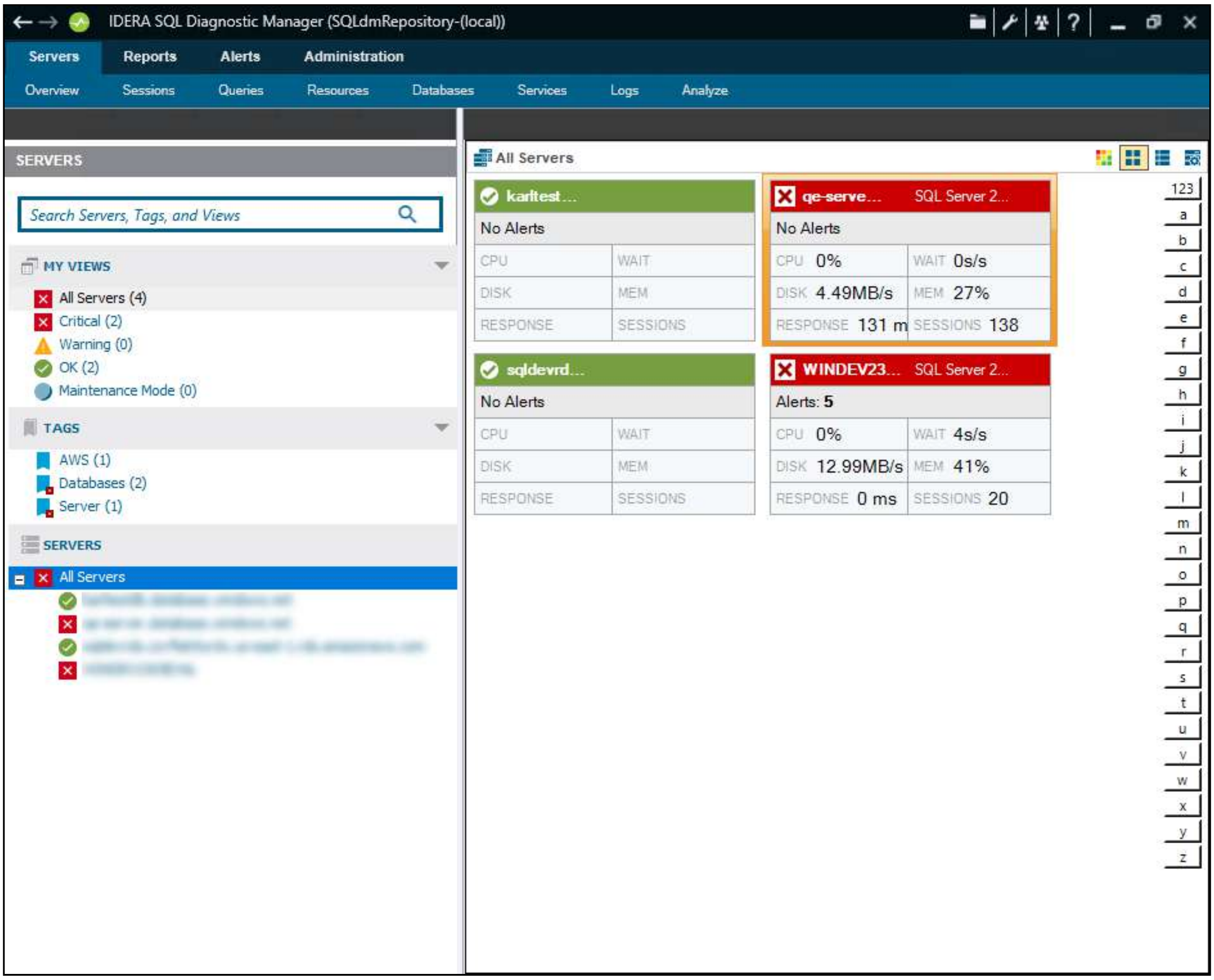
Finally, you can add a DMSO Instance through PowerShell Cmdlet:

```
Remove-SQLdmMonitoredInstance -Path \Instances\ServerA
```

Amazon RDS Monitoring

SQL Diagnostic Manager fully supports Amazon RDS Databases in SQL Server Standard or Enterprise Edition. Within the Amazon coverage, SQL Diagnostic Manager has a complete and custom navigation pane for Amazon RDS monitoring.

The Amazon RDS servers are identified by a cloud icon which helps users to recognize them easily.



karltest...
No Alerts
CPU | WAIT
DISK | MEM
RESPONSE | SESSIONS

qe-serve... SQL Server 2...
No Alerts
CPU 0% | WAIT 0s/s
DISK 4.49MB/s | MEM 27%
RESPONSE 131 m | SESSIONS 138

sqldevrd...
No Alerts
CPU | WAIT
DISK | MEM
RESPONSE | SESSIONS

WINDEV23... SQL Server 2...
Alerts: 5
CPU 0% | WAIT 4s/s
DISK 12.99MB/s | MEM 41%
RESPONSE 0 ms | SESSIONS 20

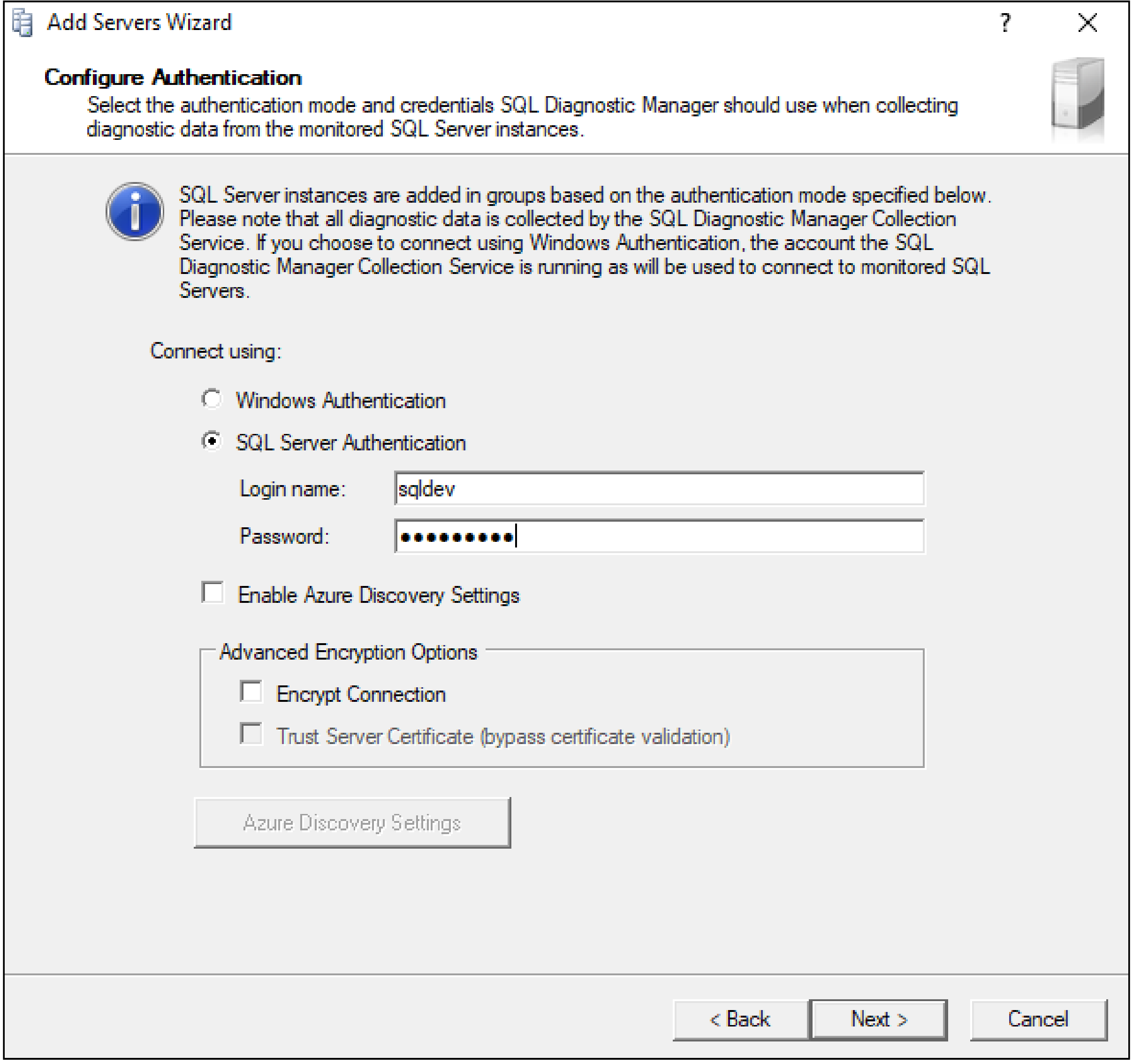
The server navigation includes the following tabs when monitoring Amazon RDS servers:

- Overview
- Sessions
- Queries
- Resources
- Databases
- Analyze
- Services
- Logs
- Analyze

Amazon RDS Discovery

SQL Diagnostic Manager Discovery finds all the Servers associated with your Amazon Profile credentials, which allows you to easily add your Amazon RDS servers.

1. Right-click **All Servers** located on the SERVERS side screen
2. Select **Manage Servers** adding a new server
3. Under the Manager Server window, select the **Add** option
4. In the Welcome Add Servers Wizard, click **next**.
5. Select SQL Server Authentication and enter your credentials.



Add Servers Wizard

Configure Authentication

Select the authentication mode and credentials SQL Diagnostic Manager should use when collecting diagnostic data from the monitored SQL Server instances.

SQL Server instances are added in groups based on the authentication mode specified below. Please note that all diagnostic data is collected by the SQL Diagnostic Manager Collection Service. If you choose to connect using Windows Authentication, the account the SQL Diagnostic Manager Collection Service is running as will be used to connect to monitored SQL Servers.

Connect using:

○ Windows Authentication

● SQL Server Authentication

Login name: sqldev

Password: ●●●●●●●●●●

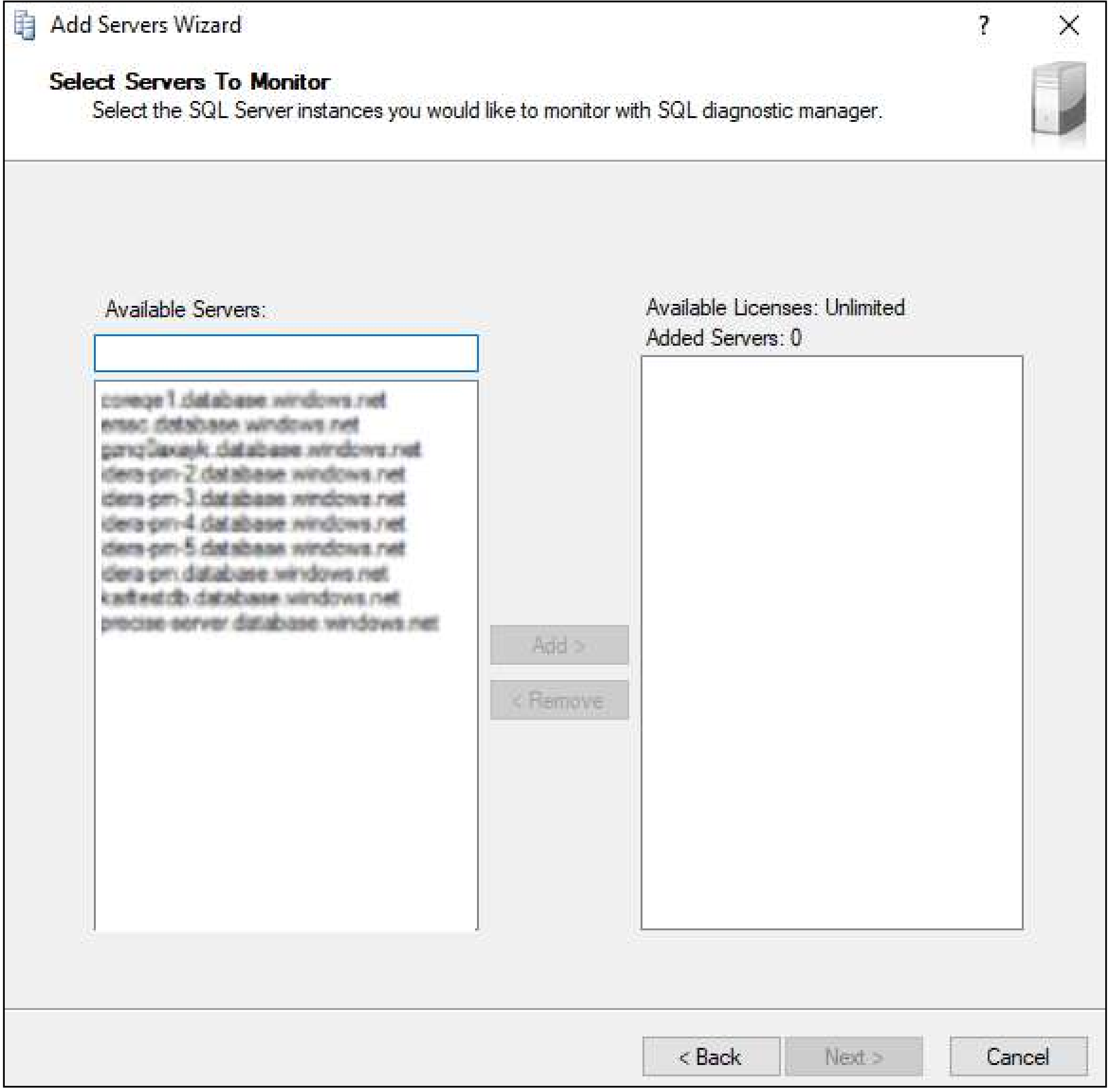
□ Enable Azure Discovery Settings

Advanced Encryption Options

□ Encrypt Connection

□ Trust Server Certificate (bypass certificate validation)

6. Click **Next.** The result of your research should be all the servers found, check the image below. Select the servers you want to add, click **Add>** to move them to the Added Servers, and click **Next**.



Add Servers Wizard

Select Servers To Monitor

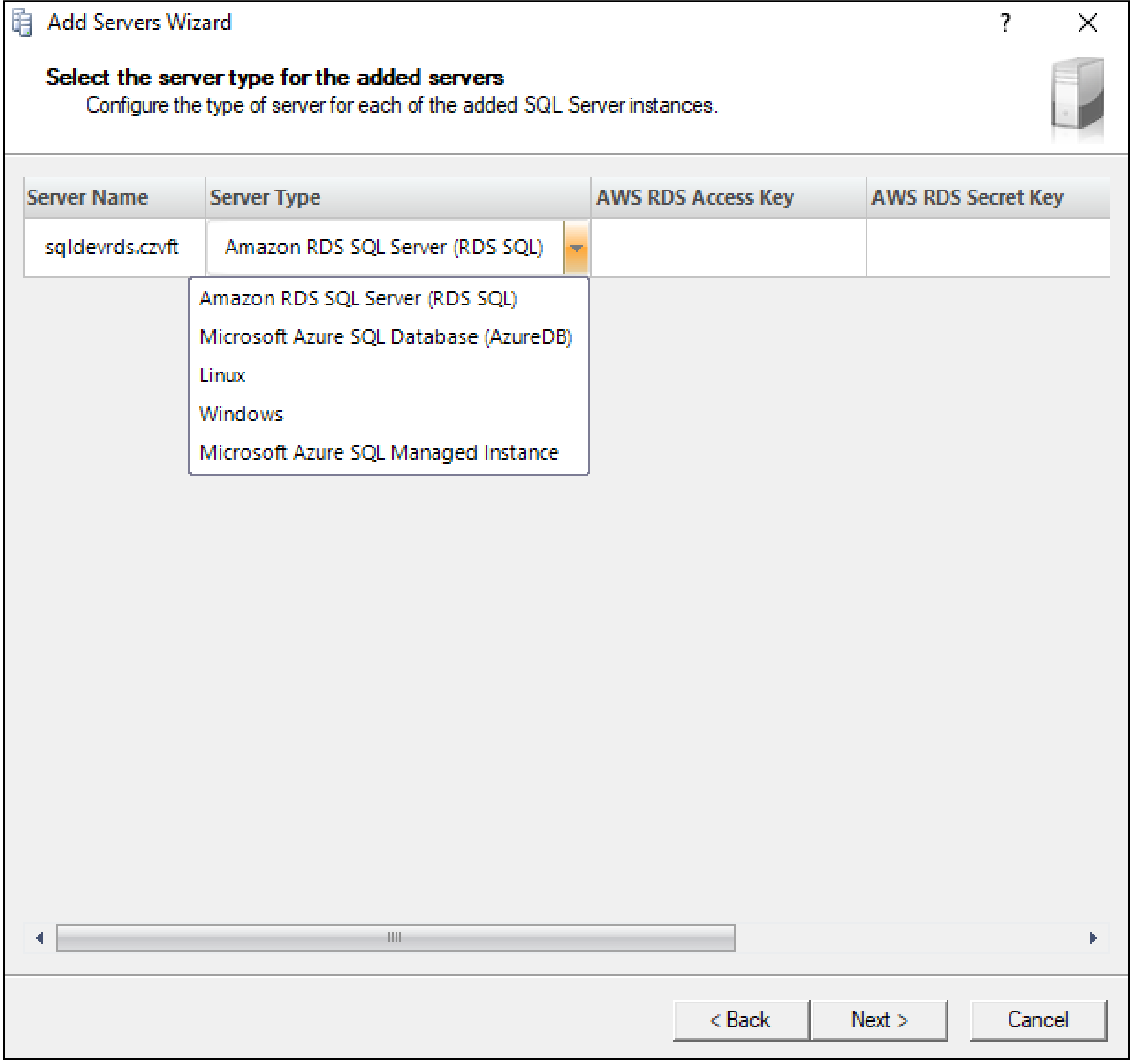
Select the SQL Server instances you would like to monitor with SQL diagnostic manager.

Available Servers:

corege1.database.windows.net
ersac.database.windows.net
gsnq3axajk.database.windows.net
idera-pm-2.database.windows.net
idera-pm-3.database.windows.net
idera-pm-4.database.windows.net
idera-pm-5.database.windows.net
idera-pm.database.windows.net
kaftestdb.database.windows.net
precise-server.database.windows.net

Available Licenses: Unlimited
Added Servers: 0

7. Select the Amazon RDS SQL Server (RDS SQL) Server Type and click **Next**.



Add Servers Wizard

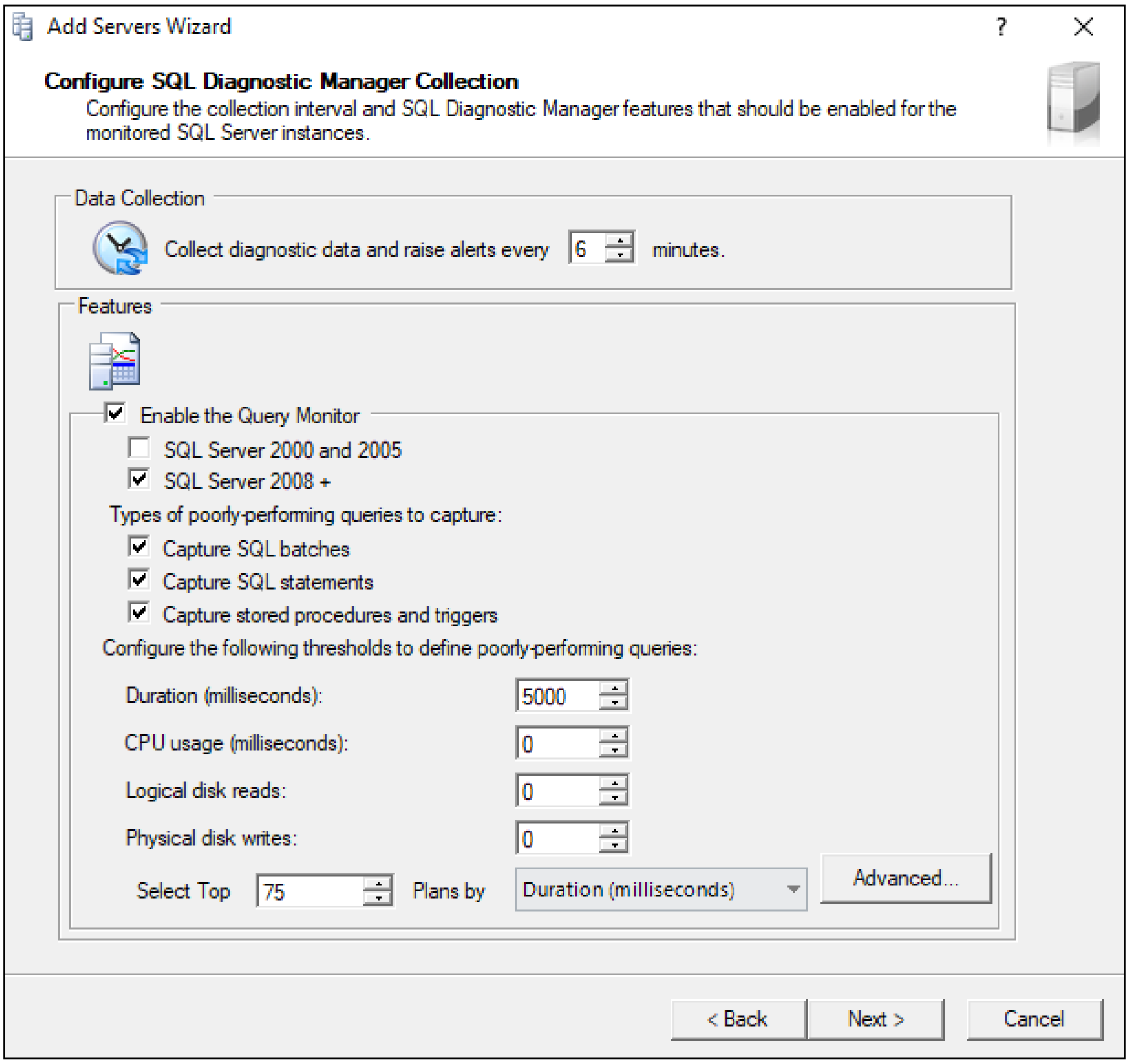
Select the server type for the added servers

Configure the type of server for each of the added SQL Server instances.

Server Name	Server Type	AWS RDS Access Key	AWS RDS Secret Key
sqldevrds.czvft	Amazon RDS SQL Server (RDS SQL)		

Amazon RDS SQL Server (RDS SQL)
Microsoft Azure SQL Database (AzureDB)
Linux
Windows
Microsoft Azure SQL Managed Instance
< Back
Next >
Cancel

8. Configure the collection internal and SQLDM features in the Configure SQL Diagnostic Manager Collection, and click **Next**.



Add Servers Wizard

Configure SQL Diagnostic Manager Collection

Configure the collection interval and SQL Diagnostic Manager features that should be enabled for the monitored SQL Server instances.

Data Collection

Collect diagnostic data and raise alerts every 6 minutes.

Features

☑ Enable the Query Monitor

☐ SQL Server 2000 and 2005

☑ SQL Server 2008 +

Types of poorly-performing queries to capture:

☑ Capture SQL batches

☑ Capture SQL statements

☑ Capture stored procedures and triggers

Configure the following thresholds to define poorly-performing queries:

Duration (milliseconds): 5000

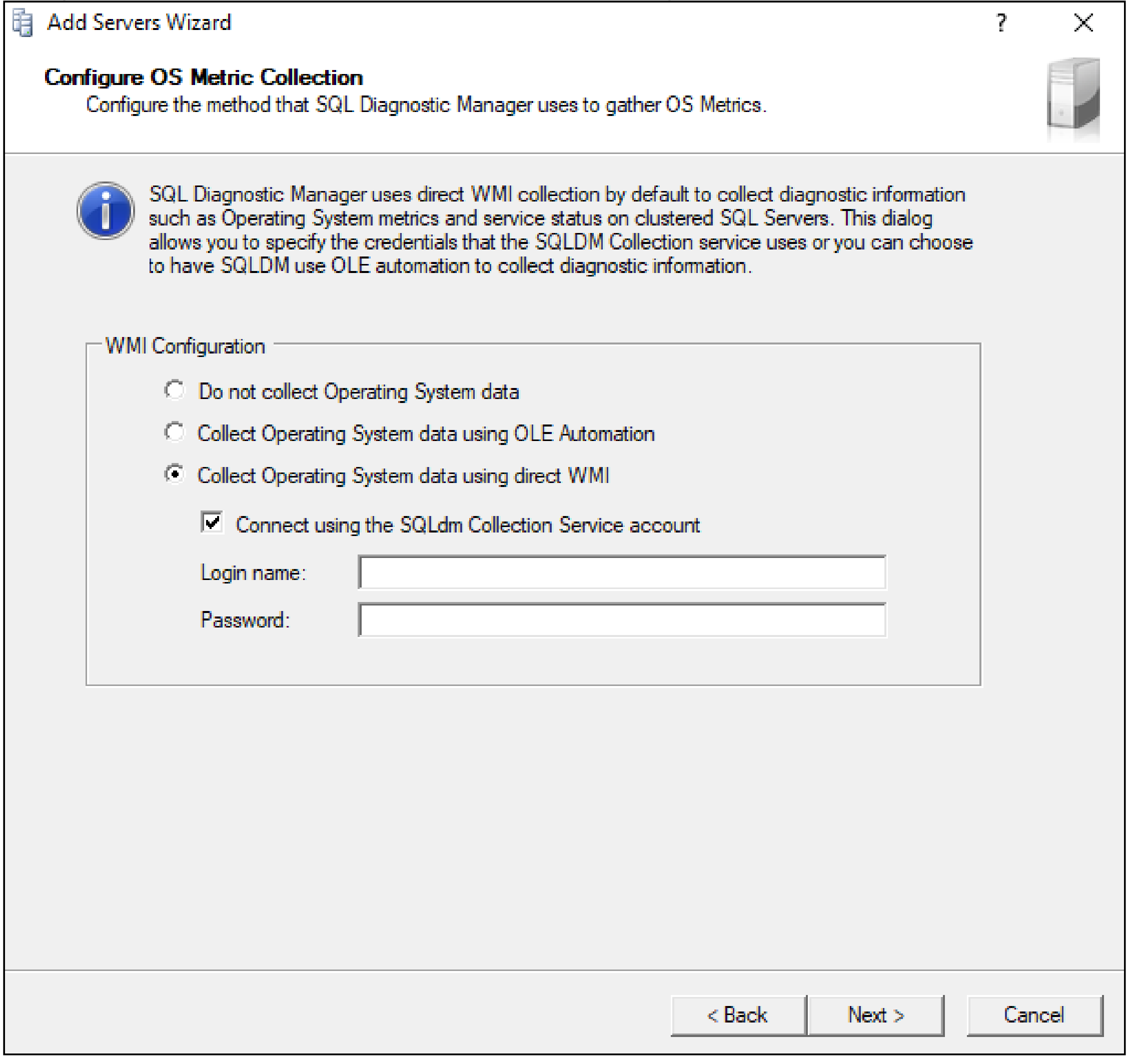
CPU usage (milliseconds): 0

Logical disk reads: 0

Physical disk writes: 0

Select Top 75 Plans by Duration (milliseconds)

9. Configure OS Metric Collection offers you different VMI configurations, choose one, and click **Next**.



Add Servers Wizard

Configure OS Metric Collection

Configure the method that SQL Diagnostic Manager uses to gather OS Metrics.

SQL Diagnostic Manager uses direct WMI collection by default to collect diagnostic information such as Operating System metrics and service status on clustered SQL Servers. This dialog allows you to specify the credentials that the SQLDM Collection service uses or you can choose to have SQLDM use OLE automation to collect diagnostic information.

WMI Configuration

○ Do not collect Operating System data

○ Collect Operating System data using OLE Automation

● Collect Operating System data using direct WMI

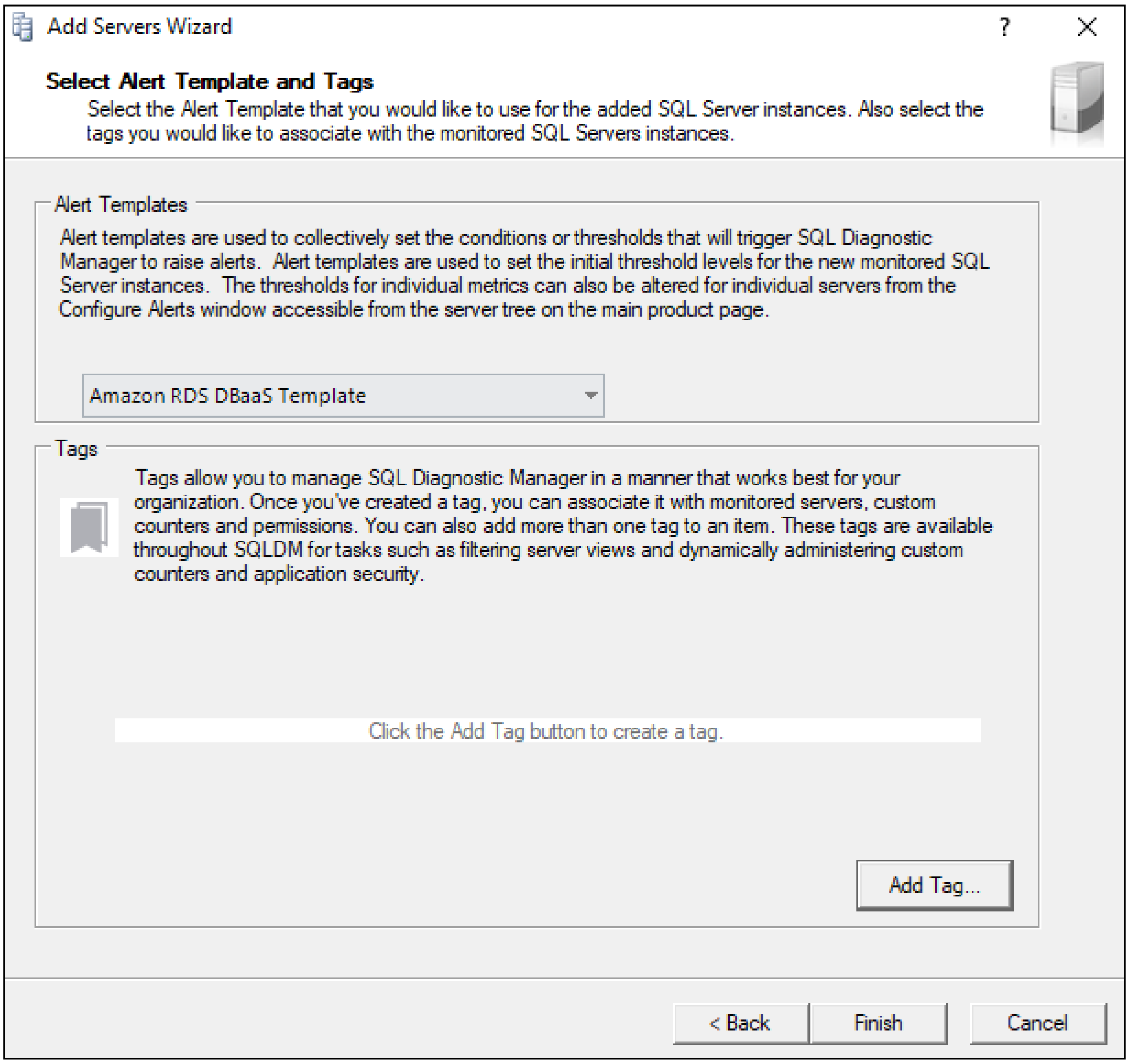
☑ Connect using the SQLdm Collection Service account

Login name:

Password:

10. Finally, SQL Diagnostic Manager offers you Alert Templates and Tags for better Server management. By default, the Amazon RDS DBaaS Template is selected, set the alert template and tag of your preference, and

click **Finish**.



Add Servers Wizard

Select Alert Template and Tags

Select the Alert Template that you would like to use for the added SQL Server instances. Also select the tags you would like to associate with the monitored SQL Servers instances.

Alert Templates

Alert templates are used to collectively set the conditions or thresholds that will trigger SQL Diagnostic Manager to raise alerts. Alert templates are used to set the initial threshold levels for the new monitored SQL Server instances. The thresholds for individual metrics can also be altered for individual servers from the Configure Alerts window accessible from the server tree on the main product page.

Amazon RDS DBaaS Template

Tags

Tags allow you to manage SQL Diagnostic Manager in a manner that works best for your organization. Once you've created a tag, you can associate it with monitored servers, custom counters and permissions. You can also add more than one tag to an item. These tags are available throughout SQLDM for tasks such as filtering server views and dynamically administering custom counters and application security.

Click the Add Tag button to create a tag.

For more information about Alert Templates and Tags, visit Select an alert template and tags and Configure alert templates.

Amazon RDS Overview

The Amazon RDS Overview tab includes the following five screens:

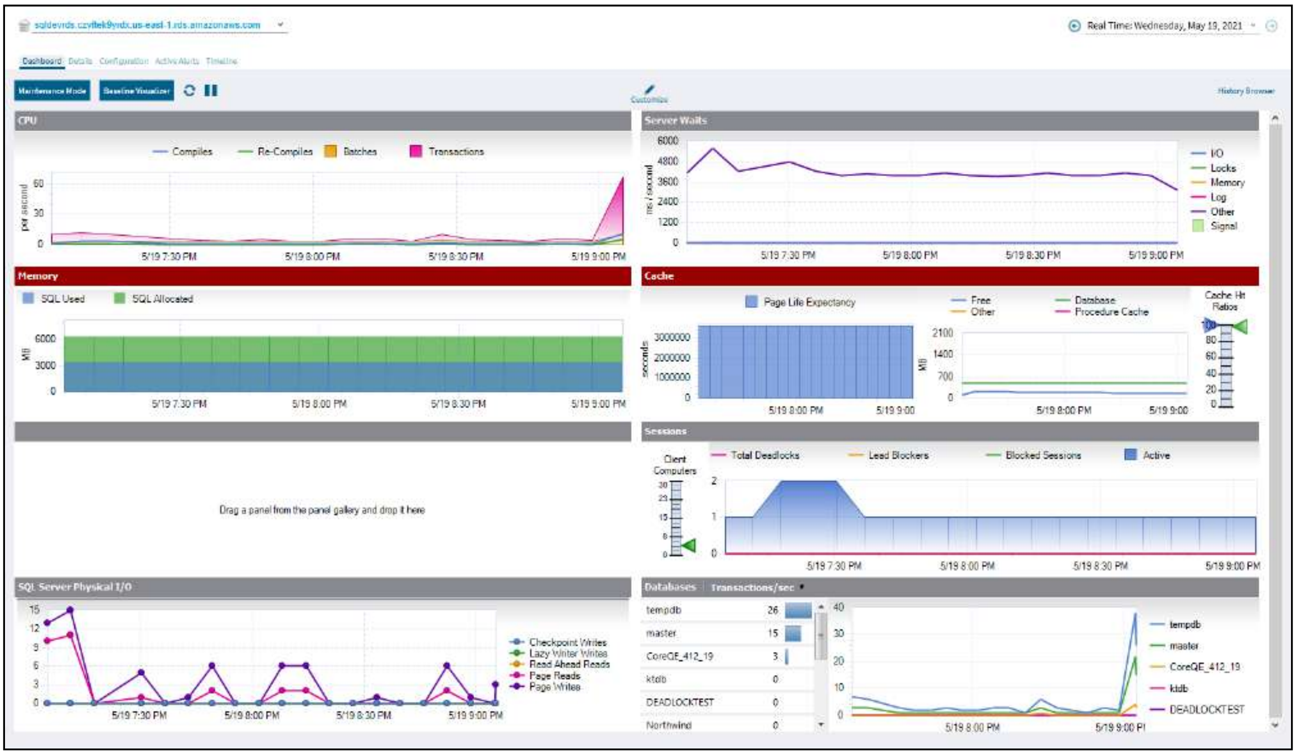
- Dashboard
- Details
- Configuration
- Active Alerts
- Timeline

Dashboard

The Dashboard view shows you an overview of the instance. The overview tab displays the following graphs, by default:

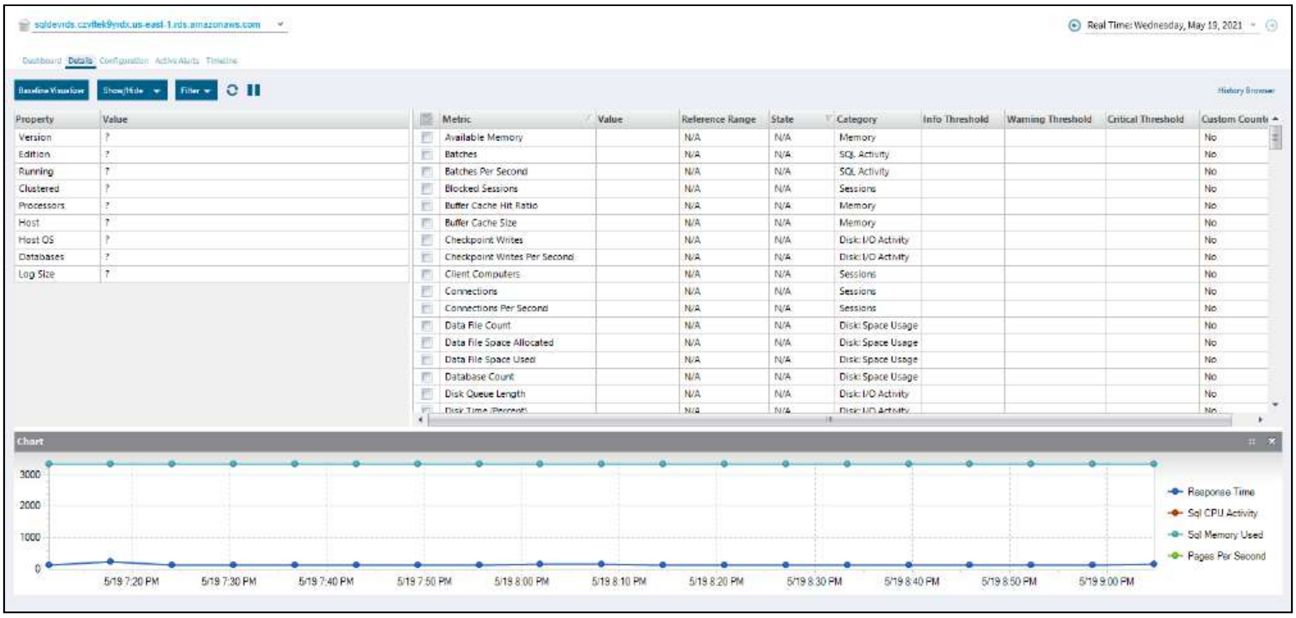
- CPU
- Server Waits
- Memory
- Cache
- Network
- Sessions
- SQL Server Physical I/O
- Databases

You can add or edit the layout of your Dashboard by clicking Customize. In the Customize Dashboard screen, click View Panel Gallery, and drag the panels from the right side to your Dashboard screen on the left.



Details

The Details screen shows the properties of the monitored Amazon RDS server, including the Version, Edition, Host OS, Databases, and Log Size. On the right screen, you can review the metrics list, check any metric to add it in the chart located at the bottom of the screen.

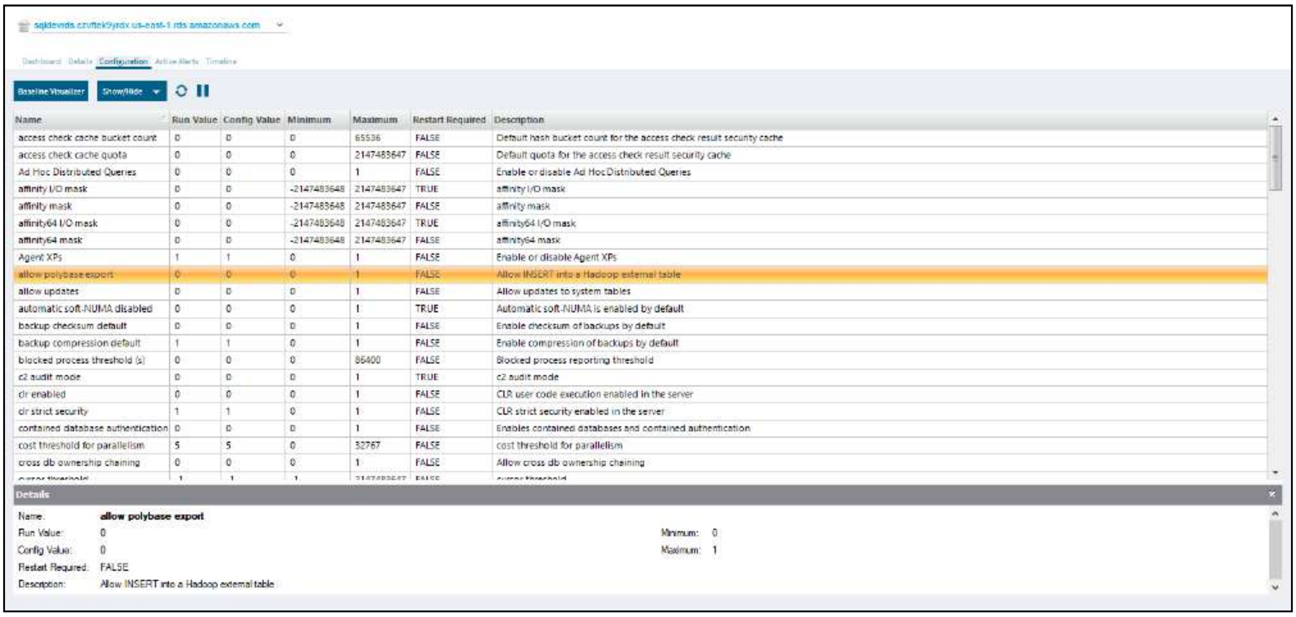


Property	Value
Version	?
Edition	?
Running	?
Clustered	?
Processors	?
Host	?
Host OS	?
Databases	?
Log Size	?

	Metric	Value	Reference Range	State	Category	Info Threshold	Warning Threshold	Critical Threshold	Custom Counte
□	Available Memory		N/A	N/A	Memory				No
□	Batches		N/A	N/A	SQL Activity				No
□	Batches Per Second		N/A	N/A	SQL Activity				No
□	Blocked Sessions		N/A	N/A	Sessions				No
□	Buffer Cache Hit Ratio		N/A	N/A	Memory				No
□	Buffer Cache Size		N/A	N/A	Memory				No
□	Checkpoint Writes		N/A	N/A	Disk: I/O Activity				No
□	Checkpoint Writes Per Second		N/A	N/A	Disk: I/O Activity				No
□	Client Computers		N/A	N/A	Sessions				No
□	Connections		N/A	N/A	Sessions				No
□	Connections Per Second		N/A	N/A	Sessions				No
□	Data File Count		N/A	N/A	Disk: Space Usage				No
□	Data File Space Allocated		N/A	N/A	Disk: Space Usage				No
□	Data File Space Used		N/A	N/A	Disk: Space Usage				No
□	Database Count		N/A	N/A	Disk: Space Usage				No
□	Disk Queue Length		N/A	N/A	Disk: I/O Activity				No
□	Disk Time (Percent)		N/A	N/A	Disk: I/O Activity				No

Configuration

The Configuration view allows you to view the SQL Server configuration settings for the selected Amazon RDS instance. When diagnosing problems with SQL Server performance, it is helpful to see how it is configured. In addition, SQL Diagnostic Manager offers the ability to edit some configuration settings, depending on the option selected.



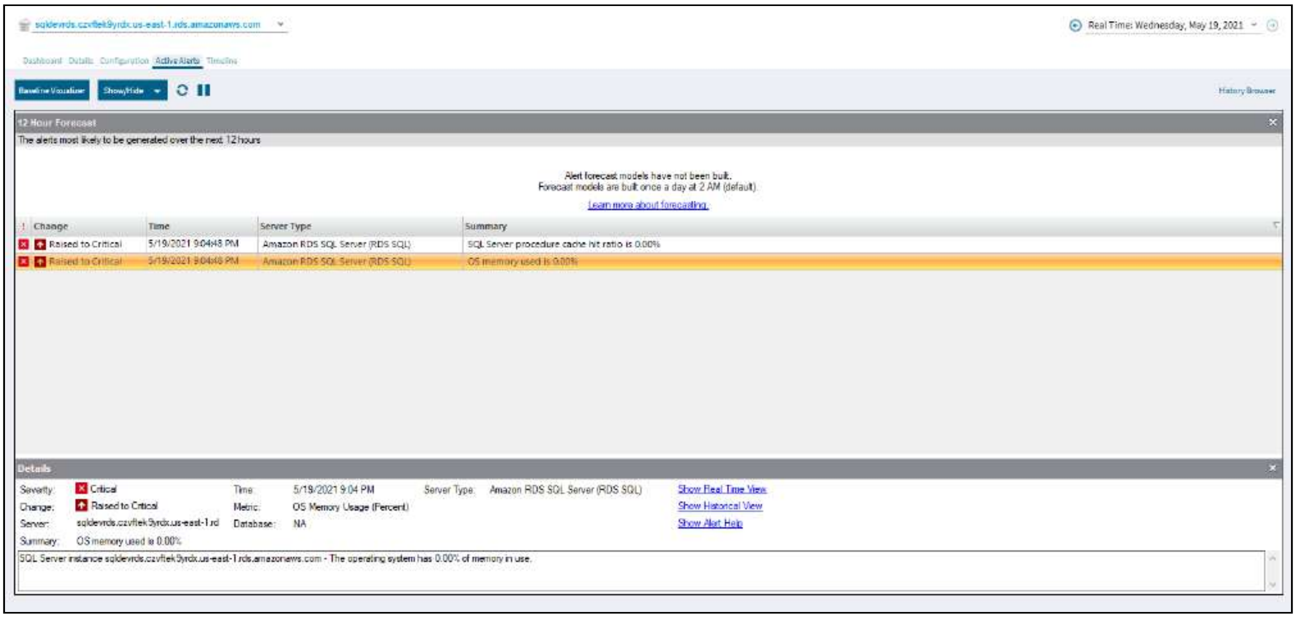
Name	Run Value	Config Value	Minimum	Maximum	Restart Required	Description
access check cache bucket count	0	0	0	65536	FALSE	Default hash bucket count for the access check result security cache
access check cache quota	0	0	0	2147483647	FALSE	Default quota for the access check result security cache
Ad Hoc Distributed Queries	0	0	0	1	FALSE	Enable or disable Ad Hoc Distributed Queries
affinity I/O mask	0	0	-2147483648	2147483647	TRUE	affinity I/O mask
affinity mask	0	0	-2147483648	2147483647	FALSE	affinity mask
affinity64 I/O mask	0	0	-2147483648	2147483647	TRUE	affinity64 I/O mask
affinity64 mask	0	0	-2147483648	2147483647	FALSE	affinity64 mask
Agent XPs	1	1	0	1	FALSE	Enable or disable Agent XPs
allow polybase export	0	0	0	1	FALSE	Allow INSERT into a Hadoop external table
allow updates	0	0	0	1	FALSE	Allow updates to system tables
automatic soft-NUMA disabled	0	0	0	1	TRUE	Automatic soft-NUMA is enabled by default
backup checksum default	0	0	0	1	FALSE	Enable checksum of backups by default
backup compression default	1	1	0	1	FALSE	Enable compression of backups by default
blocked process threshold (s)	0	0	0	86400	FALSE	Blocked process reporting threshold
c2 audit mode	0	0	0	1	TRUE	c2 audit mode
clr enabled	0	0	0	1	FALSE	CLR user code execution enabled in the server
clr strict security	1	1	0	1	FALSE	CLR strict security enabled in the server
contained database authentication	0	0	0	1	FALSE	Enables contained databases and contained authentication
cost threshold for parallelism	5	5	0	32767	FALSE	cost threshold for parallelism
cross db ownership chaining	0	0	0	1	FALSE	Allow cross db ownership chaining
cursor threshold	-1	-1	-1	2147483647	FALSE	cursor threshold

Name: **allow polybase export**
Run Value: 0
Config Value: 0
Restart Required: FALSE
Description: Allow INSERT into a Hadoop external table

Minimum: 0
Maximum: 1

Active Alerts

The Active Alerts view allows you to check a list of all the active alerts as of the last data collection. Click any alert in the list to view details at the bottom of the window.



12 Hour Forecast

The alerts most likely to be generated over the next 12 hours

Alert forecast models have not been built.
Forecast models are built once a day at 2 AM (default).
Learn more about forecasting.

!	Change	Time	Server Type	Summary
☒	Raised to Critical	5/19/2021 9:04:48 PM	Amazon RDS SQL Server (RDS SQL)	SQL Server procedure cache hit ratio is 0.00%
☒	Raised to Critical	5/19/2021 9:04:48 PM	Amazon RDS SQL Server (RDS SQL)	OS memory used is 0.00%

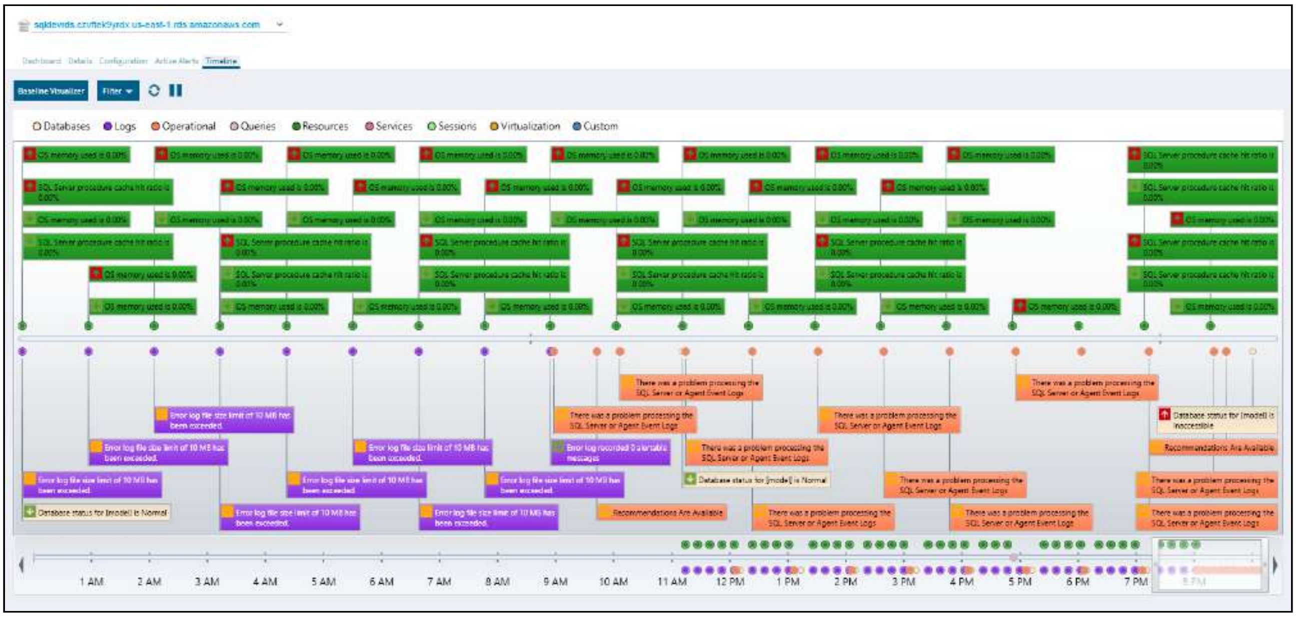
Details

Severity: ☒ Critical
Change: Raised to Critical
Server: sqldevrds.czvftek9yrdx.us-east-1.rd
Summary: OS memory used is 0.00%
Time: 5/19/2021 9:04 PM
Metric: OS Memory Usage (Percent)
Database: NA
Server Type: Amazon RDS SQL Server (RDS SQL)
Show Real Time View
Show Historical View
Show Alert Help

SQL Server instance sqldevrds.czvftek9yrdx.us-east-1.rds.amazonaws.com - The operating system has 0.00% of memory in use.

Timeline

The Timeline view provides a chronological chart of events that affect your monitored SQL Server instance. The view details the point in time for this monitored SQL Server instance when an alert occurred, including custom counter alerts.



OS memory used is 0.00%

SQL Server procedure cache hit ratio is 0.00%

Error log file size limit of 10 MB has been exceeded.

There was a problem processing the SQL Server or Agent Event Logs

Error log recorded 0 alertable messages

Database status for [model] is Normal

Database status for [model] is Inaccessible

Recommendations Are Available

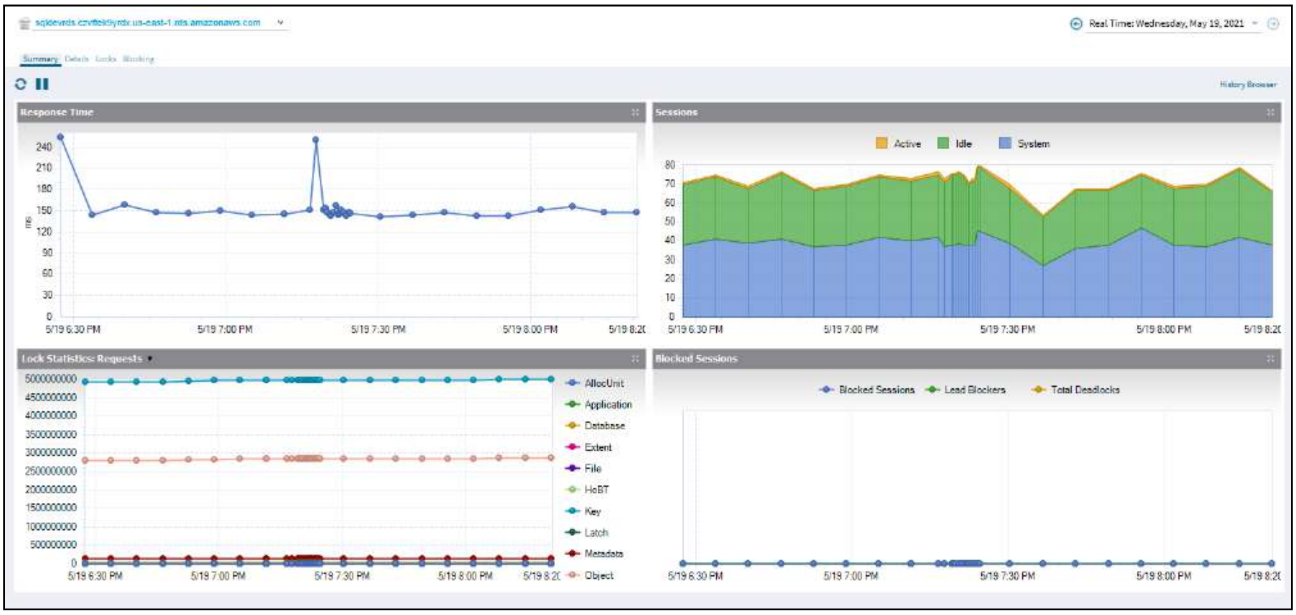
Amazon RDS Sessions

The Sessions tab includes the Summary, Details, Locks, and Blocking screens.

Summary

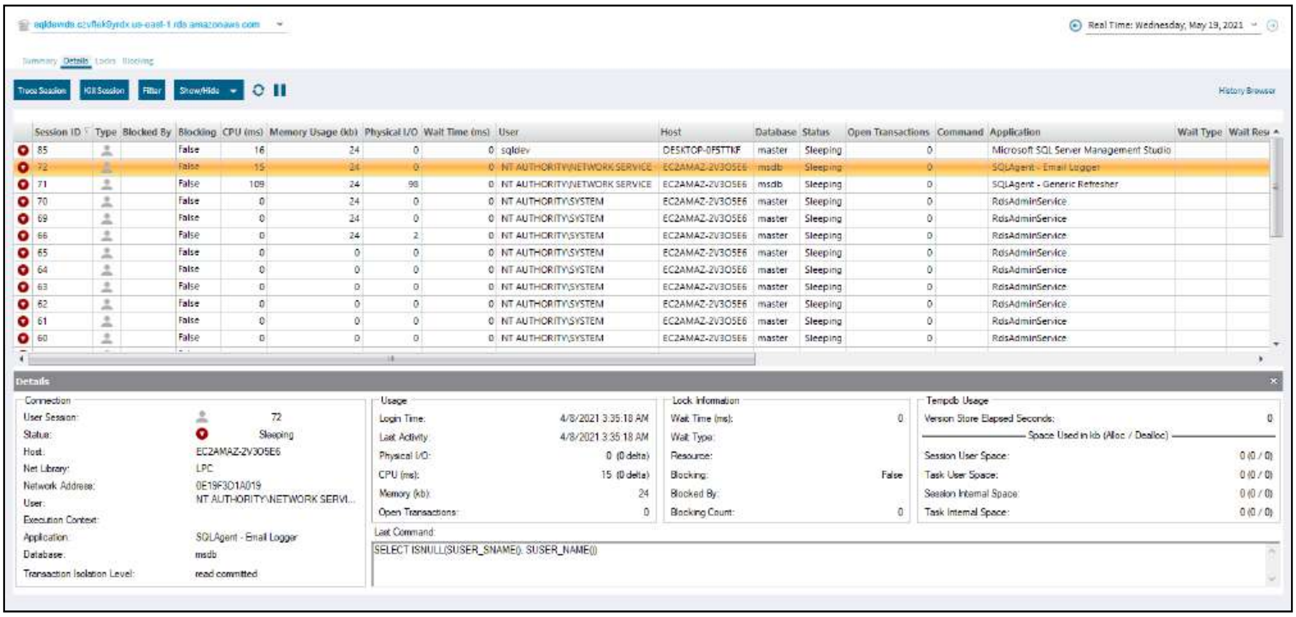
The Sessions Summary shows real-time charts for your monitored Amazon RDS server, the following charts are displayed in this view:

- Response Time
- Sessions
- Blocked Sessions
- Max Session Percent
- Lock Statistic



Details

The Sessions Details view provides an in-depth analysis of sessions running on your monitored Amazon RDS server.



Session ID	Type	Blocked By	Blocking	CPU (ms)	Memory Usage (kb)	Physical I/O	Wait Time (ms)	User	Host	Database	Status	Open Transactions	Command	Application	Wait Type	Wait Res
85			False	16	24	0	0	sqldev	DESKTOP-0F5TTKF	master	Sleeping	0		Microsoft SQL Server Management Studio		
72			False	15	24	0	0	NT AUTHORITY\NETWORK SERVICE	EC2AMAZ-2V3O5E6	msdb	Sleeping	0		SQLAgent - Email Logger		
71			False	109	24	98	0	NT AUTHORITY\NETWORK SERVICE	EC2AMAZ-2V3O5E6	msdb	Sleeping	0		SQLAgent - Generic Refresher		
70			False	0	24	0	0	NT AUTHORITY\SYSTEM	EC2AMAZ-2V3O5E6	master	Sleeping	0		RdsAdminService		
69			False	0	24	0	0	NT AUTHORITY\SYSTEM	EC2AMAZ-2V3O5E6	master	Sleeping	0		RdsAdminService		
66			False	0	24	2	0	NT AUTHORITY\SYSTEM	EC2AMAZ-2V3O5E6	master	Sleeping	0		RdsAdminService		
65			False	0	0	0	0	NT AUTHORITY\SYSTEM	EC2AMAZ-2V3O5E6	master	Sleeping	0		RdsAdminService		
64			False	0	0	0	0	NT AUTHORITY\SYSTEM	EC2AMAZ-2V3O5E6	master	Sleeping	0		RdsAdminService		
63			False	0	0	0	0	NT AUTHORITY\SYSTEM	EC2AMAZ-2V3O5E6	master	Sleeping	0		RdsAdminService		
62			False	0	0	0	0	NT AUTHORITY\SYSTEM	EC2AMAZ-2V3O5E6	master	Sleeping	0		RdsAdminService		
61			False	0	0	0	0	NT AUTHORITY\SYSTEM	EC2AMAZ-2V3O5E6	master	Sleeping	0		RdsAdminService		
60			False	0	0	0	0	NT AUTHORITY\SYSTEM	EC2AMAZ-2V3O5E6	master	Sleeping	0		RdsAdminService		

Connection

User Session:	72
Status:	Sleeping
Host:	EC2AMAZ-2V3O5E6
Net Library:	LPC
Network Address:	0E19F3D1A019
User:	NT AUTHORITY\NETWORK SERVI...
Execution Context:	
Application:	SQLAgent - Email Logger
Database:	msdb
Transaction Isolation Level:	read committed

Usage

Login Time:	4/8/2021 3:35:18 AM
Last Activity:	4/8/2021 3:35:18 AM
Physical I/O:	0 (0 delta)
CPU (ms):	15 (0 delta)
Memory (kb):	24
Open Transactions:	0

Lock Information

Wait Time (ms):	0
Wait Type:	
Resource:	
Blocking:	False
Blocked By:	
Blocking Count:	0

Tempdb Usage

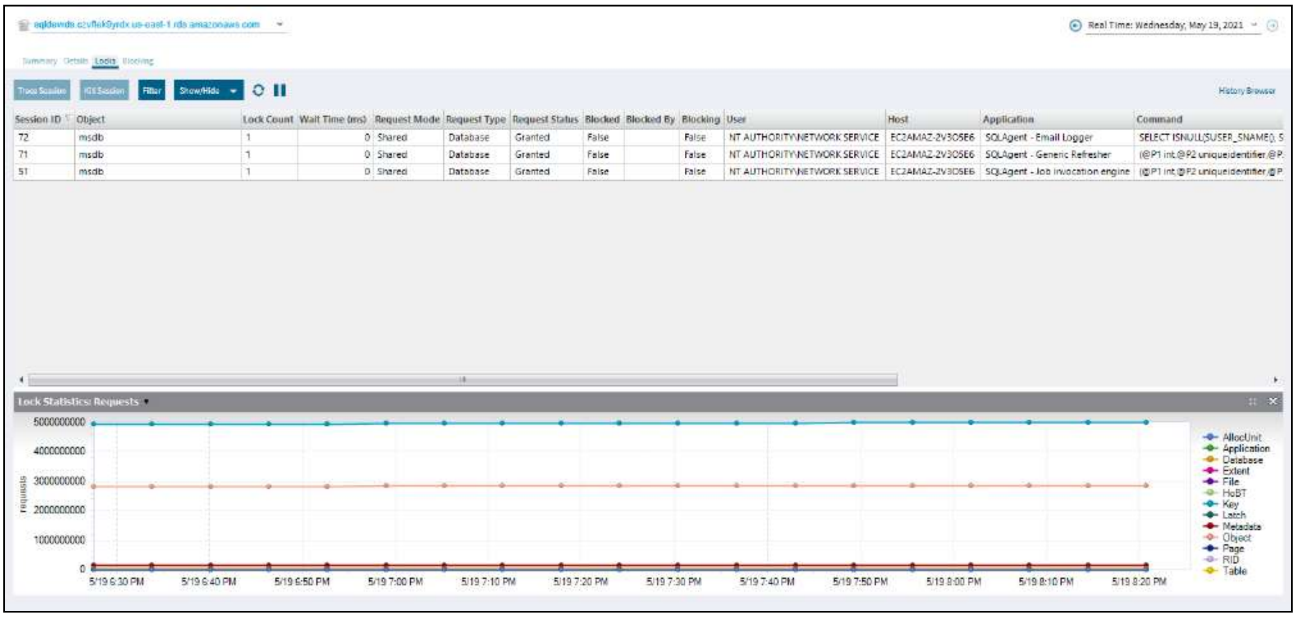
Version Store Elapsed Seconds:	0
Space Used in kb (Alloc / Dealloc)	
Session User Space:	0 (0 / 0)
Task User Space:	0 (0 / 0)
Session Internal Space:	0 (0 / 0)
Task Internal Space:	0 (0 / 0)

Last Command:

```
SELECT ISNULL(SUSER_SNAME(), SUSER_NAME())
```

Locks

On the Locked Sessions view, you can see which locks are causing data availability problems and unacceptable responses. At the bottom of the screen, the Lock Statistics chart has the same function as a non-cloud monitored server.



Session ID	Object	Lock Count	Wait Time (ms)	Request Mode	Request Type	Request Status	Blocked	Blocked By	Blocking	User	Host	Application	Command
72	msdb	1	0	Shared	Database	Granted	False		False	NT AUTHORITY\NETWORK SERVICE	EC2AMAZ-2V3O5E6	SQLAgent - Email Logger	SELECT ISNULL(SUSER_SNAME(), S
71	msdb	1	0	Shared	Database	Granted	False		False	NT AUTHORITY\NETWORK SERVICE	EC2AMAZ-2V3O5E6	SQLAgent - Generic Refresher	(@P1 int,@P2 uniqueidentifier,@P
51	msdb	1	0	Shared	Database	Granted	False		False	NT AUTHORITY\NETWORK SERVICE	EC2AMAZ-2V3O5E6	SQLAgent - Job invocation engine	(@P1 int,@P2 uniqueidentifier,@P

Blocking

The Blocking view provides a blocking tree, along with Block Reports, Deadlock Reports information. At the bottom of the screen, the Block Sessions chart represents the Blocked Sessions, Lead Blockers, and Total Deadlocks information.

Amazon RDS Queries

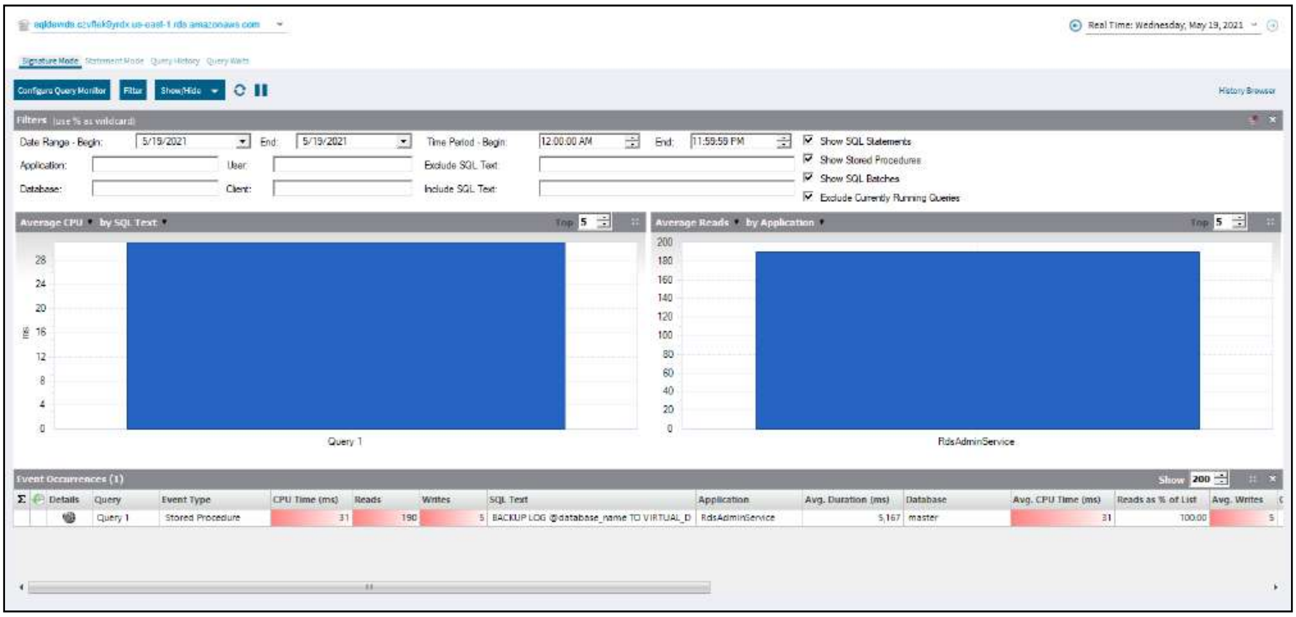
Amazon RDS Query Monitor is a useful SQL Server tool that allows you to log and analyze queries. Query Monitor allows you to establish criteria for the queries to analyze the queries returned by:

- Discovering the worst performing queries.
- Visualizing complex SQL Queries.
- Pinpointing root causes.
- Generating recommendations to improve the performance of SQL databases and queries.

The Sessions tab includes the Signature Mode, Statement Mode, Query History, and Query Waits.

Signature Mode

The Query Monitor Signature Mode view includes all active query information, automatically reduced to the signatures grouped accordingly.



Date Range - Begin: 5/19/2021 End: 5/19/2021 Time Period - Begin: 12:00:00 AM End: 11:59:59 PM

Application: User: Exclude SQL Text:

Database: Client: Include SQL Text:

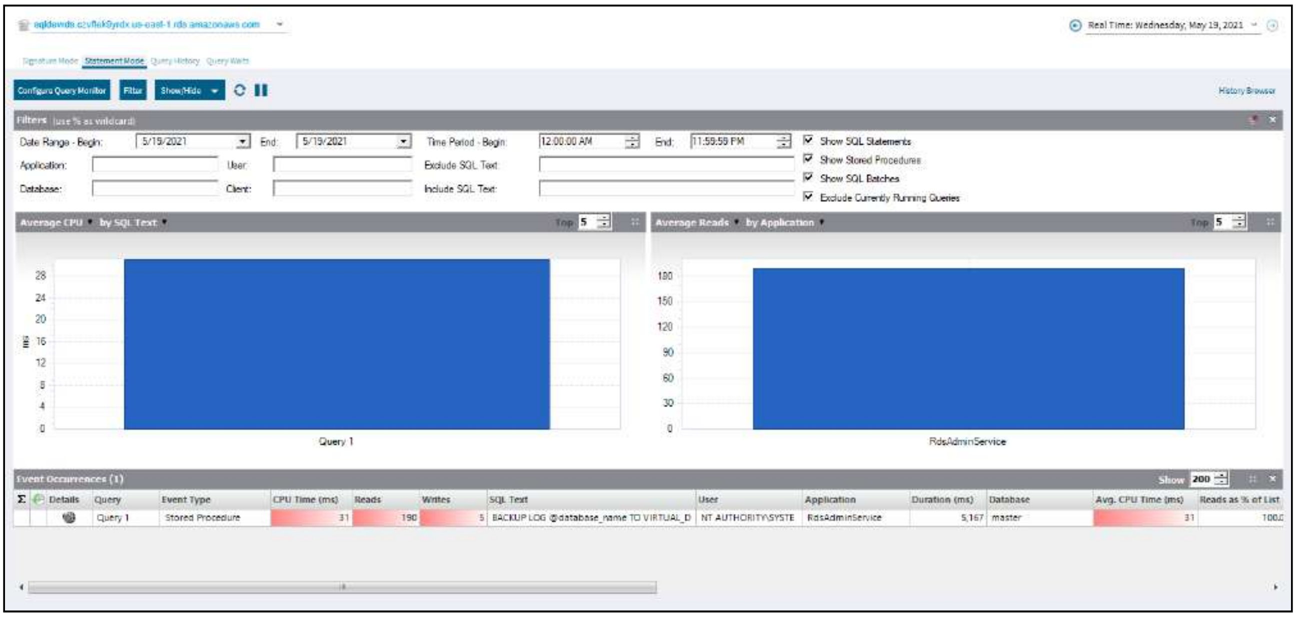
☑ Show SQL Statements
☑ Show Stored Procedures
☑ Show SQL Batches
☑ Exclude Currently Running Queries

Top 5 · Top 5 · Show 200

Σ	Details	Query	Event Type	CPU Time (ms)	Reads	Writes	SQL Text	Application	Avg. Duration (ms)	Database	Avg. CPU Time (ms)	Reads as % of List	Avg. Writes
		Query 1	Stored Procedure	31	190	5	BACKUP LOG @database_name TO VIRTUAL_D	RdsAdminService	5,167	master	31	100.00	5

Statement Mode

The Statement Mode view is where you go to drill down into a specific execution of a particular query. It provides all the detail you may need to diagnose a specific problem with a query.



Date Range - Begin: 5/19/2021 End: 5/19/2021 Time Period - Begin: 12:00:00 AM End: 11:59:59 PM

Application: User: Exclude SQL Text:

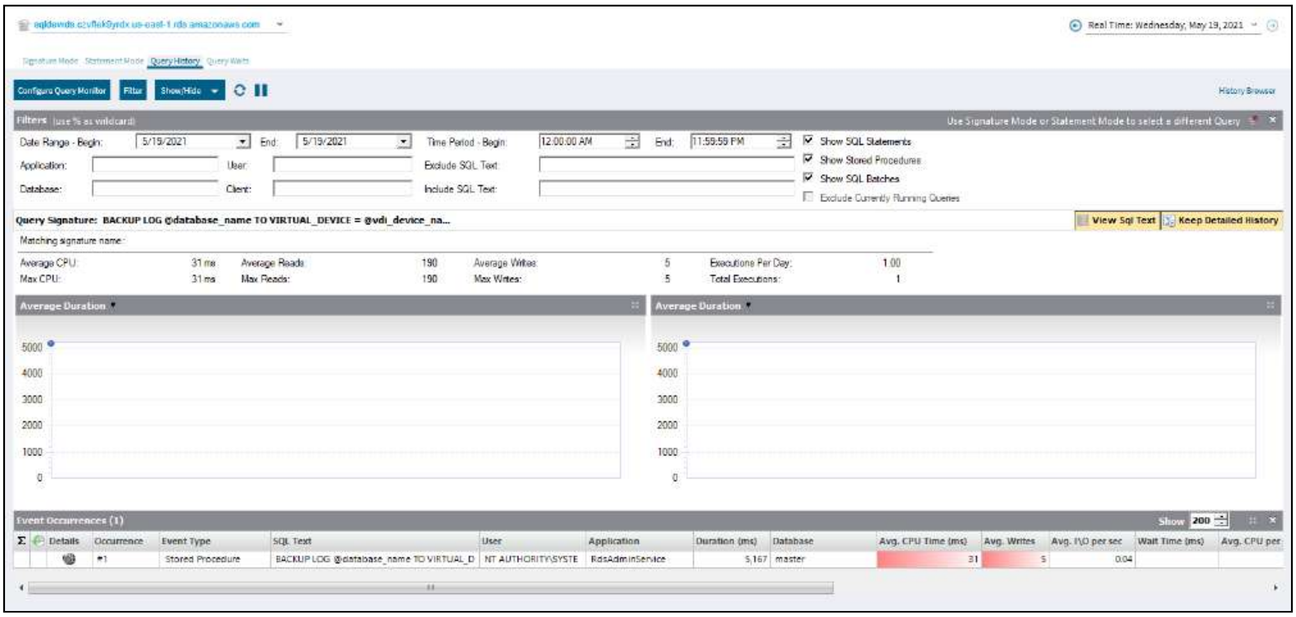
Database: Client: Include SQL Text:

☑ Show SQL Statements
☑ Show Stored Procedures
☑ Show SQL Batches
☑ Exclude Currently Running Queries

Σ	Details	Query	Event Type	CPU Time (ms)	Reads	Writes	SQL Text	User	Application	Duration (ms)	Database	Avg. CPU Time (ms)	Reads as % of List
		Query 1	Stored Procedure	31	190	5	BACKUP LOG @database_name TO VIRTUAL_D	NT AUTHORITY\SYSTE	RdsAdminService	5,167	master	31	100.0

Query History

Query History allows you to track the performance of a query over time.



Date Range - Begin: 5/19/2021 End: 5/19/2021 Time Period - Begin: 12:00:00 AM End: 11:59:59 PM

Application: User: Exclude SQL Text:

Database: Client: Include SQL Text:

☑ Show SQL Statements
☑ Show Stored Procedures
☑ Show SQL Batches
□ Exclude Currently Running Queries

Query Signature: BACKUP LOG @database_name TO VIRTUAL_DEVICE = @vdi_device_na...

Matching signature name:

Average CPU:	31 ms	Average Reads:	190	Average Writes:	5	Executions Per Day:	1.00
Max CPU:	31 ms	Max Reads:	190	Max Writes:	5	Total Executions:	1

Σ	Details	Occurrence	Event Type	SQL Text	User	Application	Duration (ms)	Database	Avg. CPU Time (ms)	Avg. Writes	Avg. I\O per sec	Wait Time (ms)	Avg. CPU per
		#1	Stored Procedure	BACKUP LOG @database_name TO VIRTUAL_D	NT AUTHORITY\SYSTE	RdsAdminService	5,167	master	31	5	0.04		

Query Waits

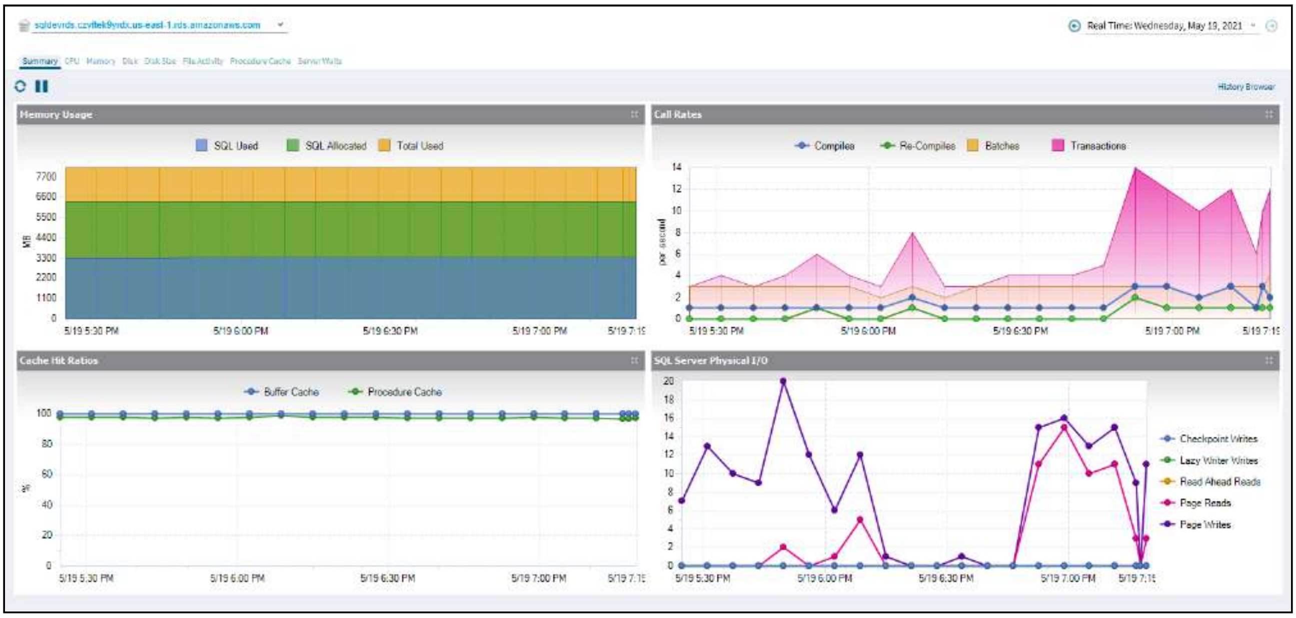
The Query Waits view displays the queries on your SQL Server instance with the longest wait times. By default, the chart at the bottom of the view displays the query waits over time and allows you to further investigate based on Statements, Applications, Databases, Clients, Sessions, and Users.

Amazon RDS Resources

The Resources tab allows you to monitor the system resources on the server hosting the Amazon RDS instance.

Summary

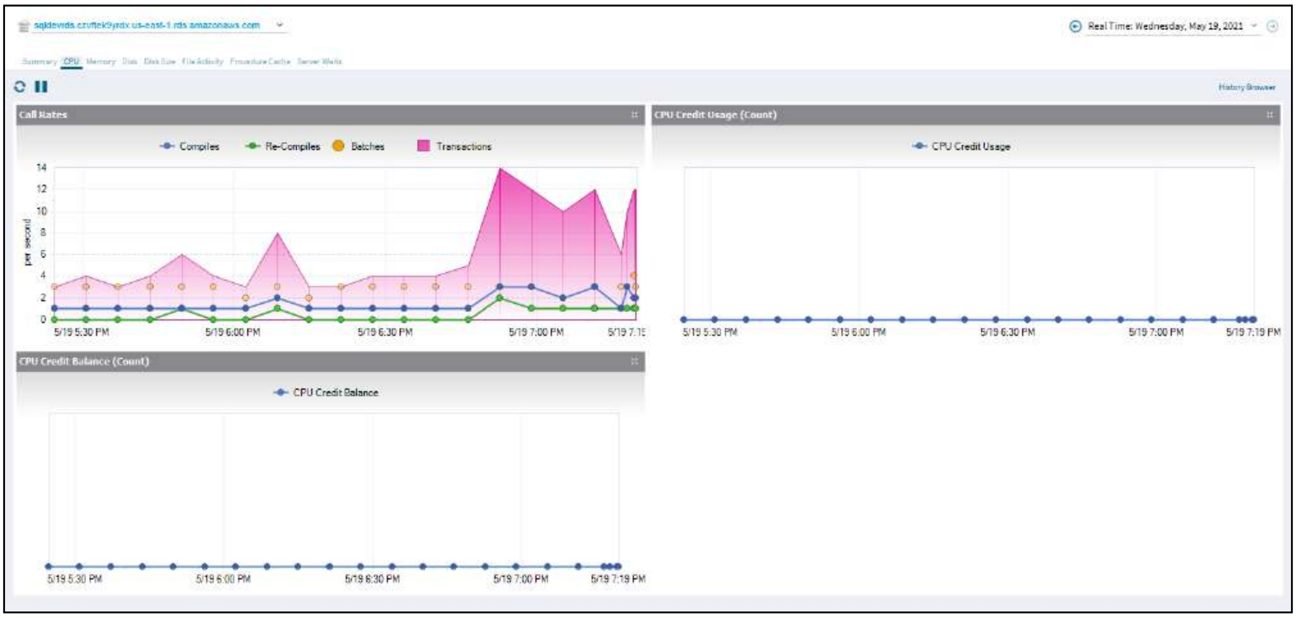
The Resources Summary tab displays real-time charts allowing you to quickly identify key diagnostic statistics for monitoring the resources for the selected Amazon RDS instance.



CPU

The Call Rates chart displays the rate of batch statements, the compiles into procedure cache, then recompile of statements stored in the procedure cache.

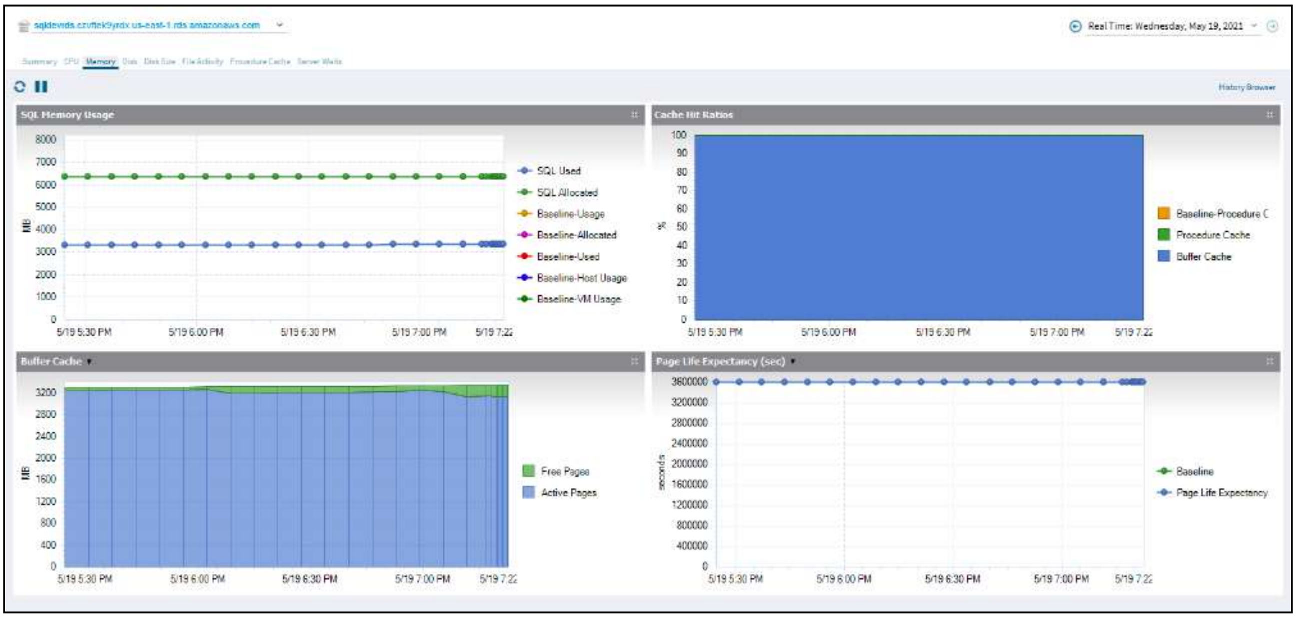
In addition, the Max Worker Percent chart shows the percentage of worker threads used on the database, relative to the maximum available for the service tier.



Memory

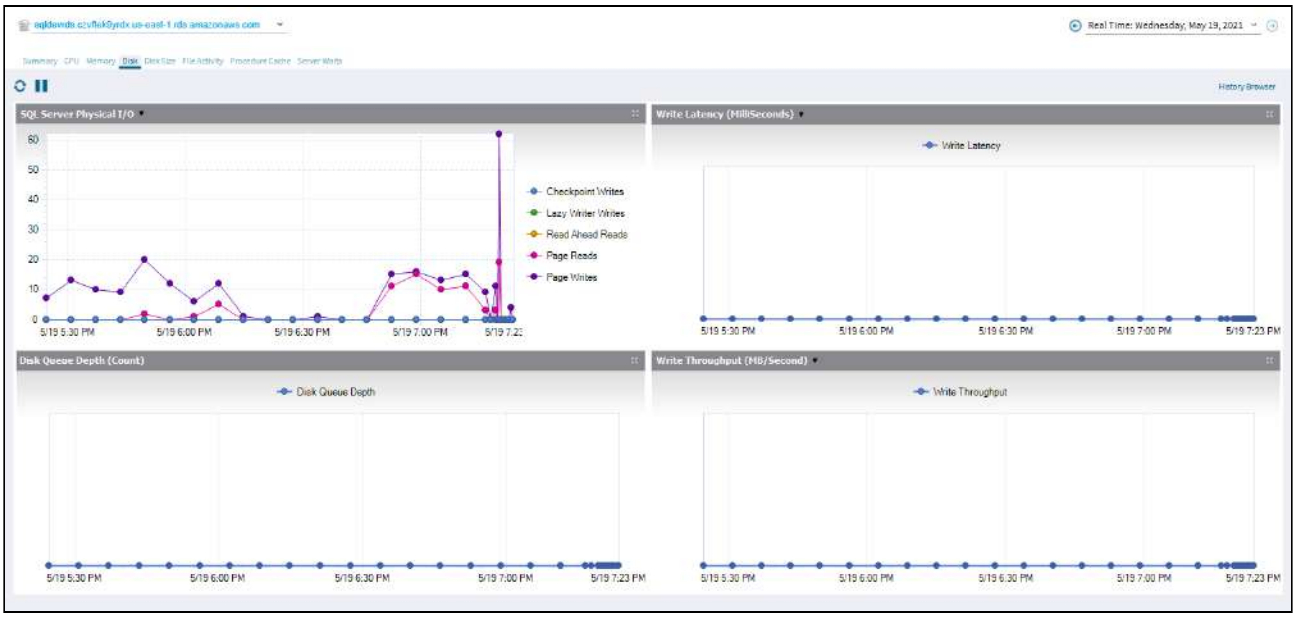
The following charts are available on the Memory tab:

- SQL Memory Usage - Displays the SQL Memory Usage by what is used by SQL Server compared to what is allocated and the total used.
- Paging - Displays the memory pages per second.
- Memory Areas - Displays the memory usage of the Procedure Cache, Connections, Locks, Database, Optimizer, Sort, Hash, and Index.
- Cache Hit Ratios - Displays the hit ratios of the Buffer and Procedure cache.
- Buffer Cache - Displays the buffer cache used by Free and Active pages.
- Page Life Expectancy (sec) - Provides the time in seconds that a page remains in the cache or buffer pool.
- Database Average Memory Usage Percent - Displays the percentage of memory used for the database, relative to the maximum available for the service tier.



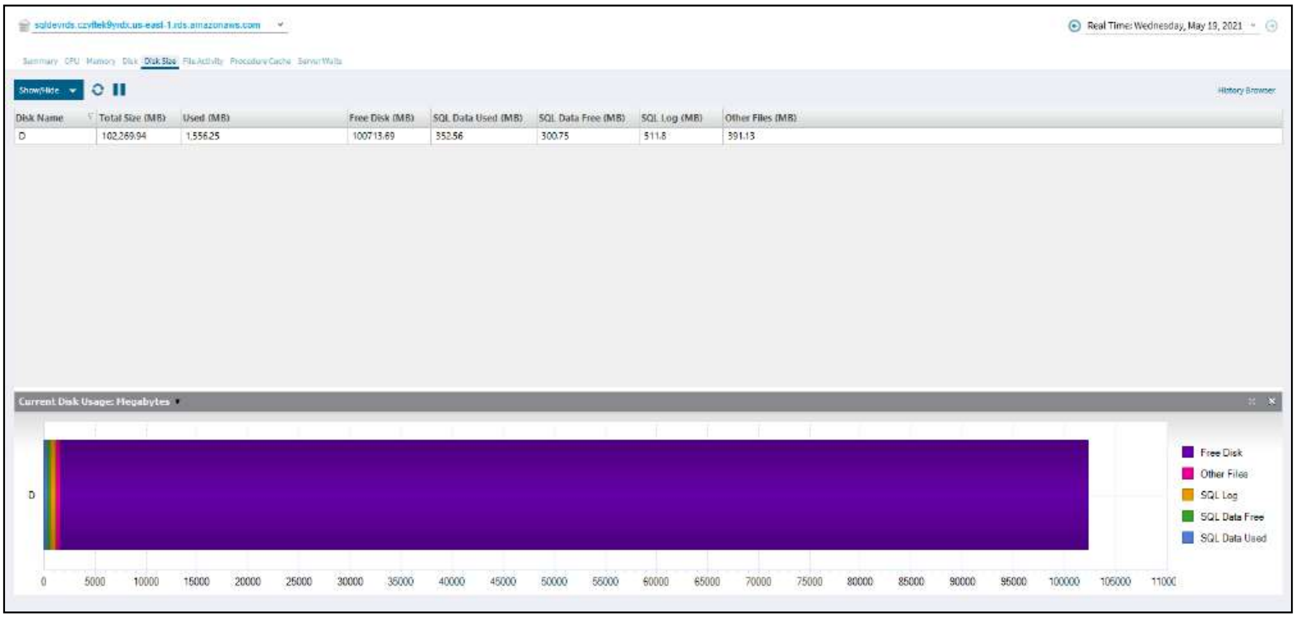
Disk

The Disk tab shows the key statistics on the way your disks are used on your Amazon RDS server.



Disk Size

The Disk Size tab allows you to view key statistics on the way your disks are used on the computer hosting your Amazon RDS instance. This allows you to analyze your disk performance for any performance bottlenecks that may be occurring.



Disk Name	Total Size (MB)	Used (MB)	Free Disk (MB)	SQL Data Used (MB)	SQL Data Free (MB)	SQL Log (MB)	Other Files (MB)
D	102,269.94	1,556.25	100713.69	352.56	300.75	511.8	391.13

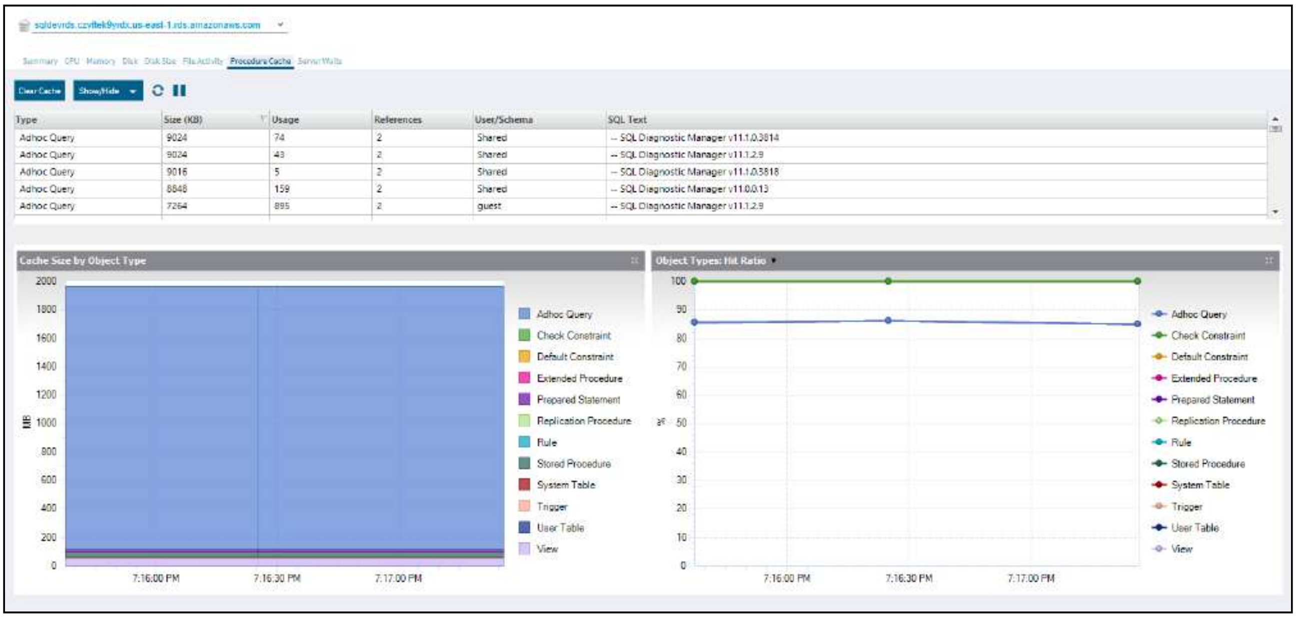
File Activity

The SQL Diagnostic Manager File Activity allows you to view your database files' relative activity on a file-by-file basis.

Each database file is listed in a column that represents the disk or mount point on which the files reside. At the top of each column the overall Reads, Writes, and Transfers per second are listed. Click an individual file to expand it to view its graph and activity data.

Procedure Cache

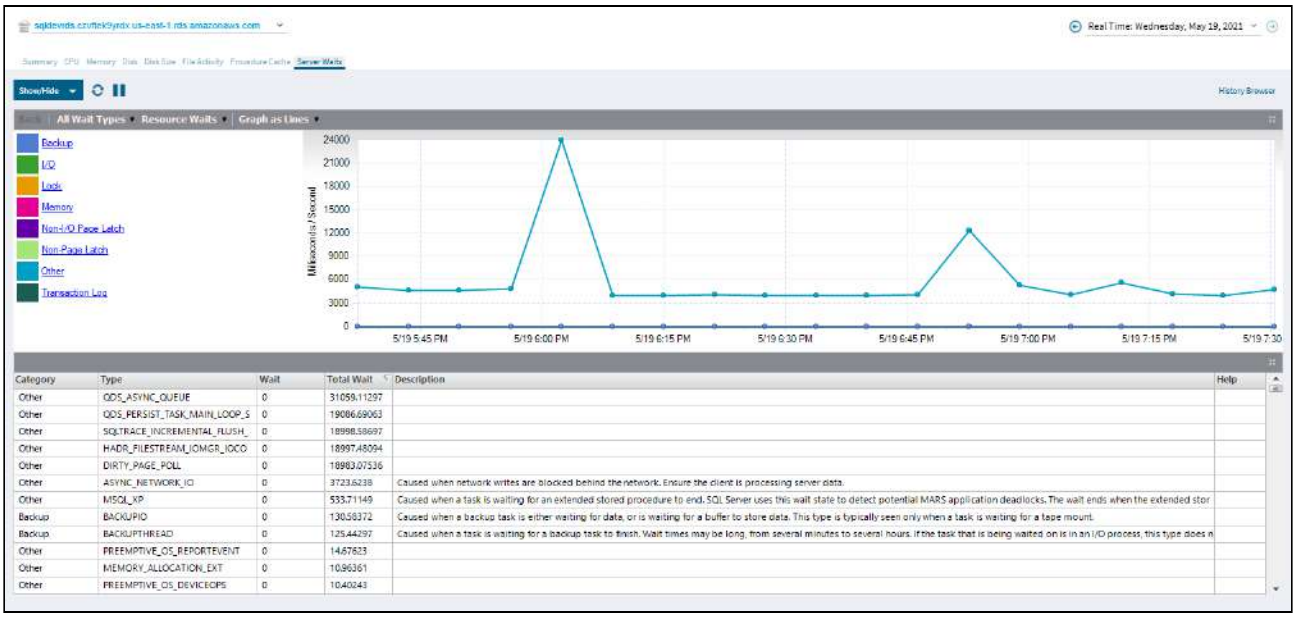
The SQL Diagnostic Manager File Activity allows you to view your database files' relative activity on a file-by-file basis. Each database file is listed in a column that represents the disk or mount point on which the files reside. At the top of each column the overall Reads, Writes, and Transfers per second are listed. Click an individual file to expand it and view a graph and the activity data specific to that file.


sqldevrds.czvltek9yrdx.us-east-1.rds.amazonaws.com
Summary CPU Memory Disk Disk Size File Activity Procedure Cache Server Waits
Clear Cache
Show/Hide

Type	Size (KB)	Usage	References	User/Schema	SQL Text
Adhoc Query	9024	74	2	Shared	-- SQL Diagnostic Manager v11.1.0.3814
Adhoc Query	9024	43	2	Shared	-- SQL Diagnostic Manager v11.1.2.9
Adhoc Query	9016	5	2	Shared	-- SQL Diagnostic Manager v11.1.0.3818
Adhoc Query	8848	159	2	Shared	-- SQL Diagnostic Manager v11.0.0.13
Adhoc Query	7264	895	2	guest	-- SQL Diagnostic Manager v11.1.2.9

Server Waits

The Server Waits view allows you to see all of the waits affecting Amazon RDS server performance.



Category	Type	Wait	Total Wait	Description	Help
Other	QDS_ASYNC_QUEUE	0	31059.11297		
Other	QDS_PERSIST_TASK_MAIN_LOOP_S	0	19086.69063		
Other	SQLTRACE_INCREMENTAL_FLUSH_	0	18998.58697		
Other	HADR_FILESTREAM_IOMGR_IOCO	0	18997.48094		
Other	DIRTY_PAGE_POLL	0	18983.07536		
Other	ASYNC_NETWORK_IO	0	3723.6238	Caused when network writes are blocked behind the network. Ensure the client is processing server data.	
Other	MSQL_XP	0	533.71149	Caused when a task is waiting for an extended stored procedure to end. SQL Server uses this wait state to detect potential MARS application deadlocks. The wait ends when the extended stor	
Backup	BACKUPIO	0	130.58372	Caused when a backup task is either waiting for data, or is waiting for a buffer to store data. This type is typically seen only when a task is waiting for a tape mount.	
Backup	BACKUPTHREAD	0	125.44297	Caused when a task is waiting for a backup task to finish. Wait times may be long, from several minutes to several hours. If the task that is being waited on is in an I/O process, this type does n	
Other	PREEMPTIVE_OS_REPORTEVENT	0	14.67623		
Other	MEMORY_ALLOCATION_EXT	0	10.96361		
Other	PREEMPTIVE_OS_DEVICEOPS	0	10.40243		

Amazon RDS Databases

SQL Diagnostic Manager provides a graphical analysis of the used, unused, and index disk space of the database.

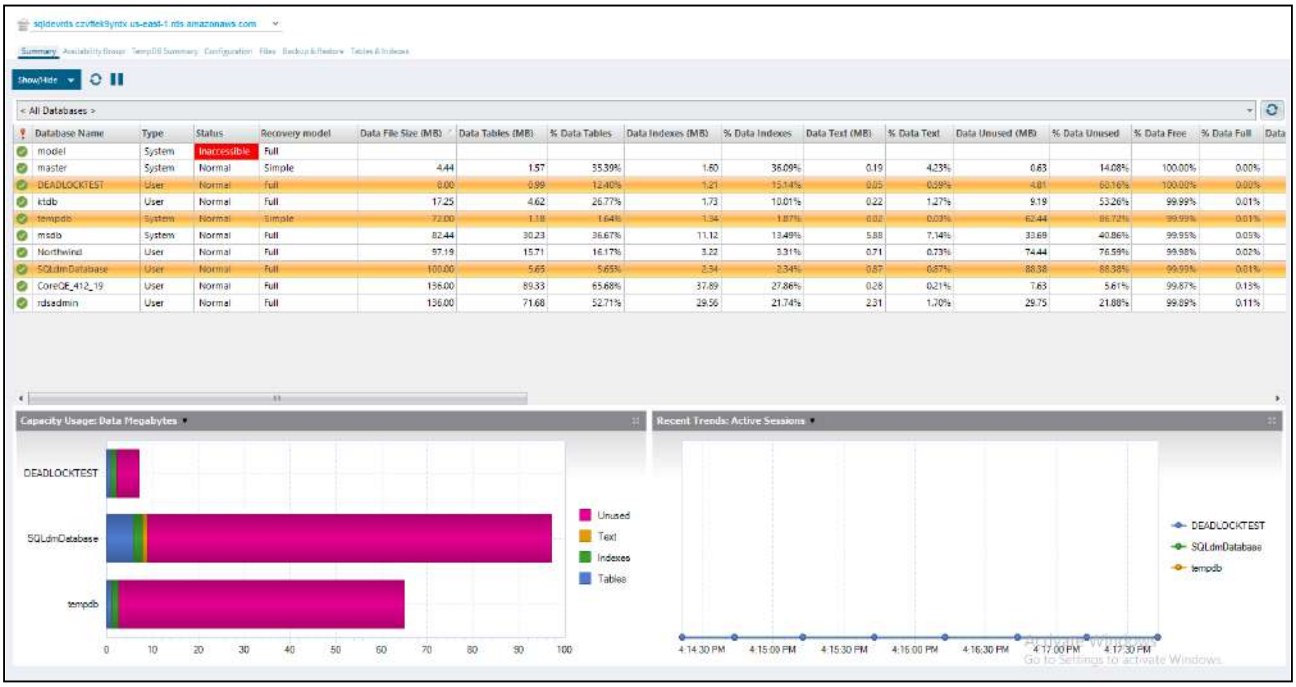
Amazon RDS Databases allows you to view the size and structure of database tables. Also, it provides a list of data size, text or image size, index page size, and the number of table rows, making reorganization and index creation decisions easier.

Summary

The Database Summary view allows you to view the status of all the databases on the selected Amazon RDS server.

The following graphs are displayed at the bottom of the screen:

- **Capacity Usage** - Select how to view the data or the log is used on your database. The drop-down list allows you to choose to view the data or log in megabytes or percentages.
- **Recent Trends** - Select it to view how your database or group of databases are used currently by selecting either active sessions, transactions per second, data size, log size, or log flushes from the drop-down list.



	Database Name	Type	Status	Recovery model	Data File Size (MB)	Data Tables (MB)	% Data Tables	Data Indexes (MB)	% Data Indexes	Data Text (MB)	% Data Text	Data Unused (MB)	% Data Unused	% Data Free	% Data Full	Data
✓	model	System	Inaccessible	Full												
✓	master	System	Normal	Simple	4.44	1.57	35.39%	1.60	36.09%	0.19	4.23%	0.63	14.08%	100.00%	0.00%	
✓	DEADLOCKTEST	User	Normal	Full	8.00	0.99	12.40%	1.21	15.14%	0.05	0.59%	4.81	60.16%	100.00%	0.00%	
✓	ktdb	User	Normal	Full	17.25	4.62	26.77%	1.73	10.01%	0.22	1.27%	9.19	53.26%	99.99%	0.01%	
✓	tempdb	System	Normal	Simple	72.00	1.18	1.64%	1.34	1.87%	0.02	0.03%	62.44	86.72%	99.99%	0.01%	
✓	msdb	System	Normal	Full	82.44	30.23	36.67%	11.12	13.49%	5.88	7.14%	33.69	40.86%	99.95%	0.05%	
✓	Northwind	User	Normal	Full	97.19	15.71	16.17%	3.22	3.31%	0.71	0.73%	74.44	76.59%	99.98%	0.02%	
✓	SQLdmDatabase	User	Normal	Full	100.00	5.65	5.65%	2.34	2.34%	0.87	0.87%	88.38	88.38%	99.99%	0.01%	
✓	CoreQE_412_19	User	Normal	Full	136.00	89.33	65.68%	37.89	27.86%	0.28	0.21%	7.63	5.61%	99.87%	0.13%	
✓	rdsadmin	User	Normal	Full	136.00	71.68	52.71%	29.56	21.74%	2.31	1.70%	29.75	21.88%	99.89%	0.11%	

Availability Group

The Availability Group view allows you to monitor availability groups, availability databases, and availability replicas on the selected Amazon RDS server.

The following graphs are displayed at the bottom of the screen:

- **Queue Size Chart** - Provides users with graphical details about queues in the AlwaysOn Availability Groups feature. This chart is a stacked bar chart for the "Log Send Queue Size" and "Redo Queue Size."
- **Transfer Rates Chart** - Provides users with graphical details about data transfer rates for redo and logs. This chart is a line chart for the "Log Send Rate" and "Redo Rate."

TempDBSummary

The Tempdb Summary tab allows you to view the status of your TempDB database on the selected Amazon RDS instance.

The Tempdb Summary view displays a list of sessions currently using tempdb along with their cumulative usage and tempdb space. These statistics help you get an overview of the health of your tempdb database and give you a good indication of whether you have enough space allocated or whether tempdb issues are causing a performance problem on your server.

The following graphs are displayed at the top of the view:

- **Tempdb Space Used by File** - You can choose to view how each file is using space on your tempdb database, displayed in megabytes.
- **Tempdb Space Used Over Time** - You can choose to view how your database is used over time based on object type by comparing charts that offer metrics for the Space Used and Space Allocated.
- **Version Store Cleanup Rate** - The tempdb database version store collects data rows necessary to support snapshot isolation. This chart helps you see the current cleanup rate to avoid filling up tempdb.

Configuration

The Database Configuration view allows you to review the configuration settings of the databases on the selected Amazon RDS instance. This view contains a single grid that includes the configuration settings for all databases on the selected SQL Server instance.

Files

The Files view allows you to see the file statistics for each of your databases on the selected Amazon RDS instance.

This tool is important because it displays how much disk space you have available to your databases, how much disk space they are using, and the percentage of space used by databases and logs.

Backup & Restore

The Backups & Restores view allows you to view the History backup and restore of each database on the selected Amazon RDS instance. Also, it is a useful way to view the last successful backup, the recovery model used, and the backup history for each of the databases on the Amazon RDS instance.

Tables & Indexes

The Tables & Indexes tab allows you to view statistics for all the tables and indexes on a particular database. To see all the tables and indexes for a database, use the database drop-down list to select your database.

Amazon RDS Services

The Services tab allows you to view the status and manage your SQL Server services such as:

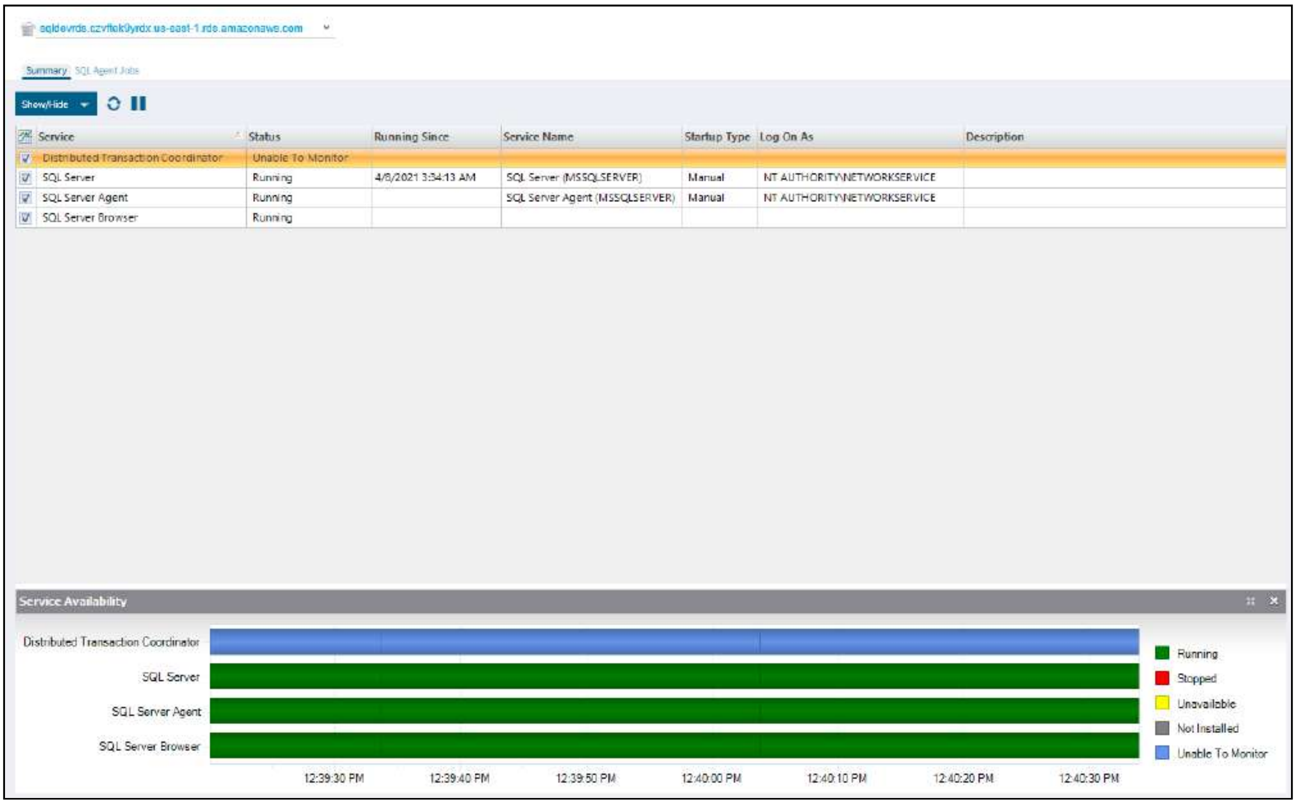
- DTC (Distributed Transaction Coordinator service)
- SQL Server
- SQL Server Agent
- SQL Server Browser

The **Start** and **Stop** service actions are not supported for virtual SQL Server instances or instances located on a Windows cluster node. To start or stop a service on a virtual SQL Server 2008 instance, use the Microsoft Failover Cluster Management tool. For SQL Server 2005 or earlier, use the Microsoft Cluster Administrator tool to manage services.

Summary

The Services Summary screen includes the status of your Services.

The Service Availability chart displays the DTC, SQL Server, SQL Server Browser, and SQL Server Agent status.

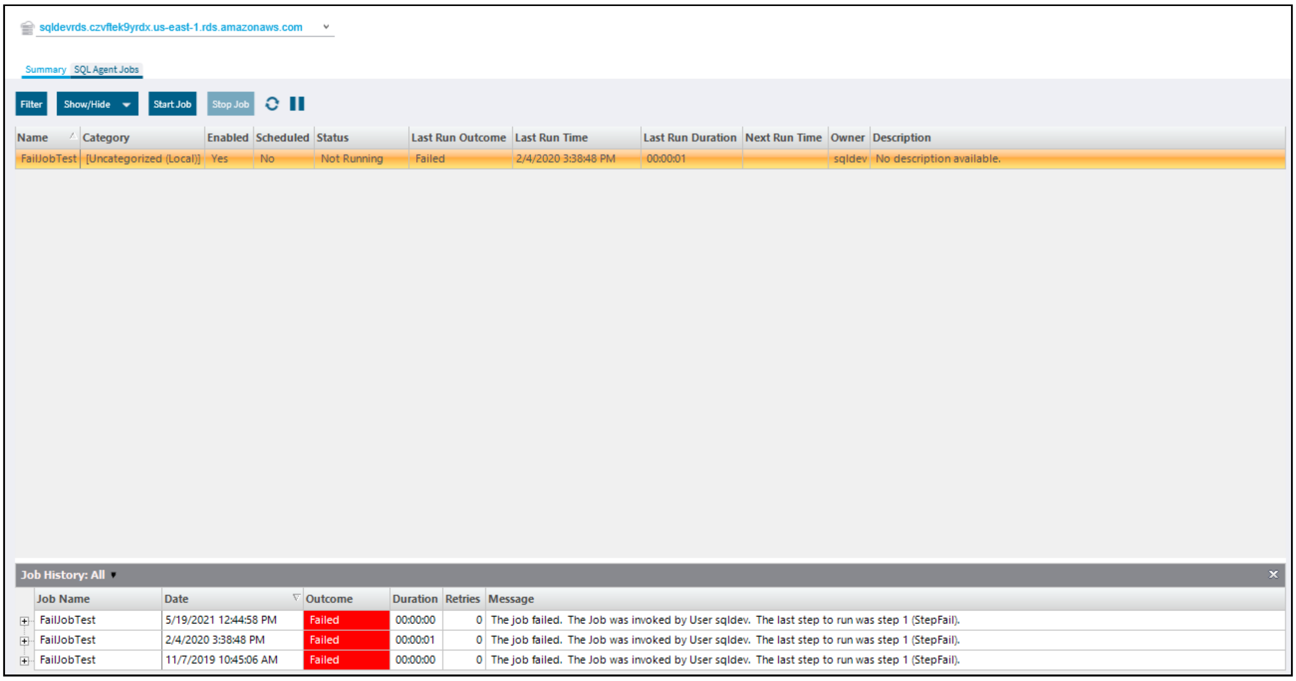


☑	Service	Status	Running Since	Service Name	Startup Type	Log On As	Description
☑	Distributed Transaction Coordinator	Unable To Monitor					
☑	SQL Server	Running	4/8/2021 3:34:13 AM	SQL Server (MSSQLSERVER)	Manual	NT AUTHORITY\NETWORKSERVICE	
☑	SQL Server Agent	Running		SQL Server Agent (MSSQLSERVER)	Manual	NT AUTHORITY\NETWORKSERVICE	
☑	SQL Server Browser	Running					

An Unavailable status in the chart is caused by a pending status change such as starting, stopping, pausing, and continuing.

SQL Agent Jobs

The SQL Agent Jobs view allows you to view all your SQL Agent Jobs for the selected Amazon RDS instance. You can view the Job History of SQL Agent Jobs in the Job History list and Job Steps by clicking the + button next to the **Job Name**.



Name	Category	Enabled	Scheduled	Status	Last Run Outcome	Last Run Time	Last Run Duration	Next Run Time	Owner	Description
FailJobTest	[Uncategorized (Local)]	Yes	No	Not Running	Failed	2/4/2020 3:38:48 PM	00:00:01		sqldev	No description available.

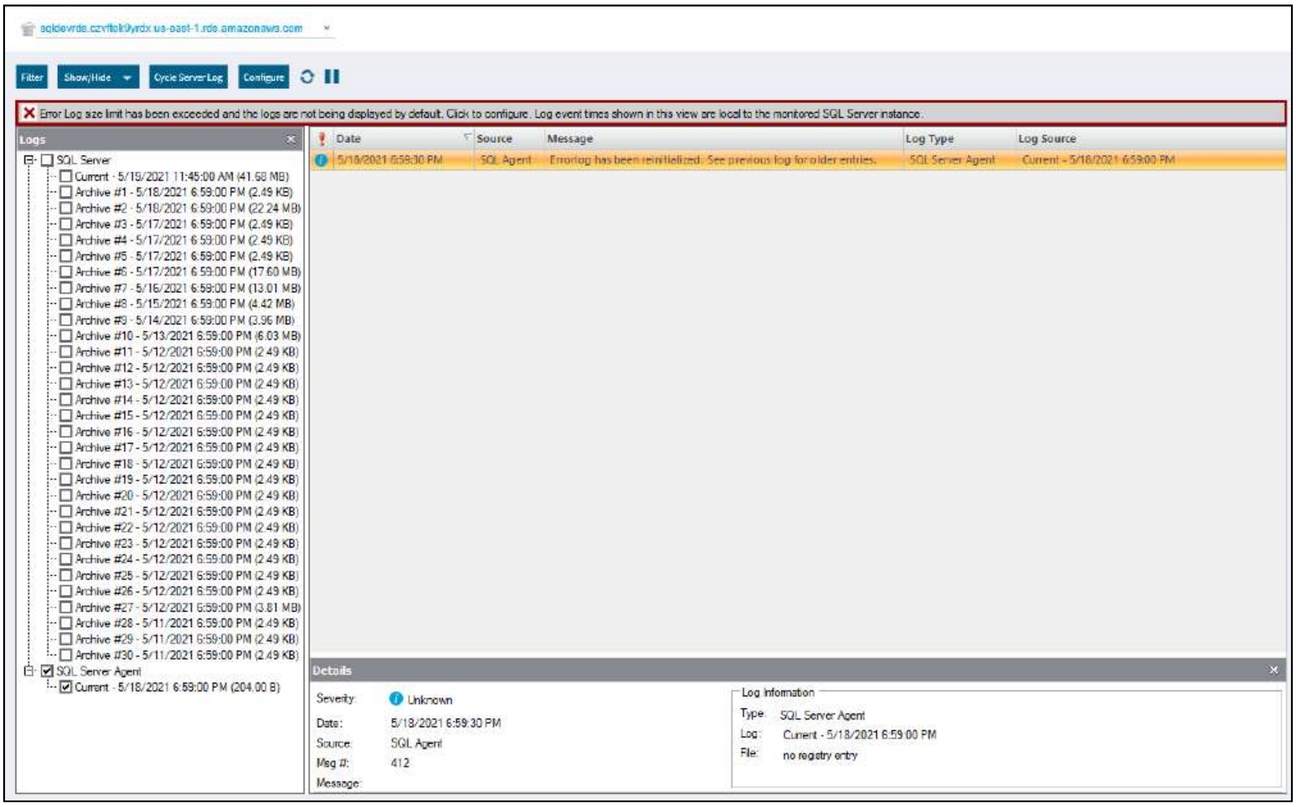
Job History: All

Job Name	Date	Outcome	Duration	Retries	Message
FailJobTest	5/19/2021 12:44:58 PM	Failed	00:00:00	0	The job failed. The Job was invoked by User sqldev. The last step to run was step 1 (StepFail).
FailJobTest	2/4/2020 3:38:48 PM	Failed	00:00:01	0	The job failed. The Job was invoked by User sqldev. The last step to run was step 1 (StepFail).
FailJobTest	11/7/2019 10:45:06 AM	Failed	00:00:00	0	The job failed. The Job was invoked by User sqldev. The last step to run was step 1 (StepFail).

Amazon RDS Logs

The Logs tab allows you to view SQL Server-related logs.

Use these logs to diagnose SQL Server problems where a history of events is necessary to form context. The current log is selected by default, but you can select archived or even multiple archived logs to view or search. Filter and Search options allow you to locate the areas of the logs that are most important.



Error Log size limit has been exceeded and the logs are not being displayed by default. Click to configure. Log event times shown in this view are local to the monitored SQL Server instance.

Logs

- □ SQL Server
  - □ Current - 5/15/2021 11:45:00 AM (41.68 MB)
  - □ Archive #1 - 5/18/2021 6:59:00 PM (2.49 KB)
  - □ Archive #2 - 5/18/2021 6:59:00 PM (22.24 MB)
  - □ Archive #3 - 5/17/2021 6:59:00 PM (2.49 KB)
  - □ Archive #4 - 5/17/2021 6:59:00 PM (2.49 KB)
  - □ Archive #5 - 5/17/2021 6:59:00 PM (2.49 KB)
  - □ Archive #6 - 5/17/2021 6:59:00 PM (17.60 MB)
  - □ Archive #7 - 5/16/2021 6:59:00 PM (13.01 MB)
  - □ Archive #8 - 5/15/2021 6:59:00 PM (4.42 MB)
  - □ Archive #9 - 5/14/2021 6:59:00 PM (3.96 MB)
  - □ Archive #10 - 5/13/2021 6:59:00 PM (6.03 MB)
  - □ Archive #11 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #12 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #13 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #14 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #15 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #16 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #17 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #18 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #19 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #20 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #21 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #22 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #23 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #24 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #25 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #26 - 5/12/2021 6:59:00 PM (2.49 KB)
  - □ Archive #27 - 5/12/2021 6:59:00 PM (3.81 MB)
  - □ Archive #28 - 5/11/2021 6:59:00 PM (2.49 KB)
  - □ Archive #29 - 5/11/2021 6:59:00 PM (2.49 KB)
  - □ Archive #30 - 5/11/2021 6:59:00 PM (2.49 KB)
- ☑ SQL Server Agent
  - ☑ Current - 5/18/2021 6:59:00 PM (204.00 B)

!	Date	Source	Message	Log Type	Log Source
●	5/18/2021 6:59:30 PM	SQL Agent	Errorlog has been reinitialized. See previous log for older entries.	SQL Server Agent	Current - 5/18/2021 6:59:00 PM

Details

Severity: Unknown
Date: 5/18/2021 6:59:30 PM
Source: SQL Agent
Msg #: 412
Message:

Log Information
Type: SQL Server Agent
Log: Curent - 5/18/2021 6:59:00 PM
File: no registry entry

Amazon RDS Analysis

The Analyze tab runs prescriptive analyses on Amazon RDS servers to identify and resolve SQL Server performance problems. The analysis engine scans your SQL Server configuration for potential issues and the health of your databases, resulting in a useful set of recommendations for improving performance for your monitored Amazon RDS servers.

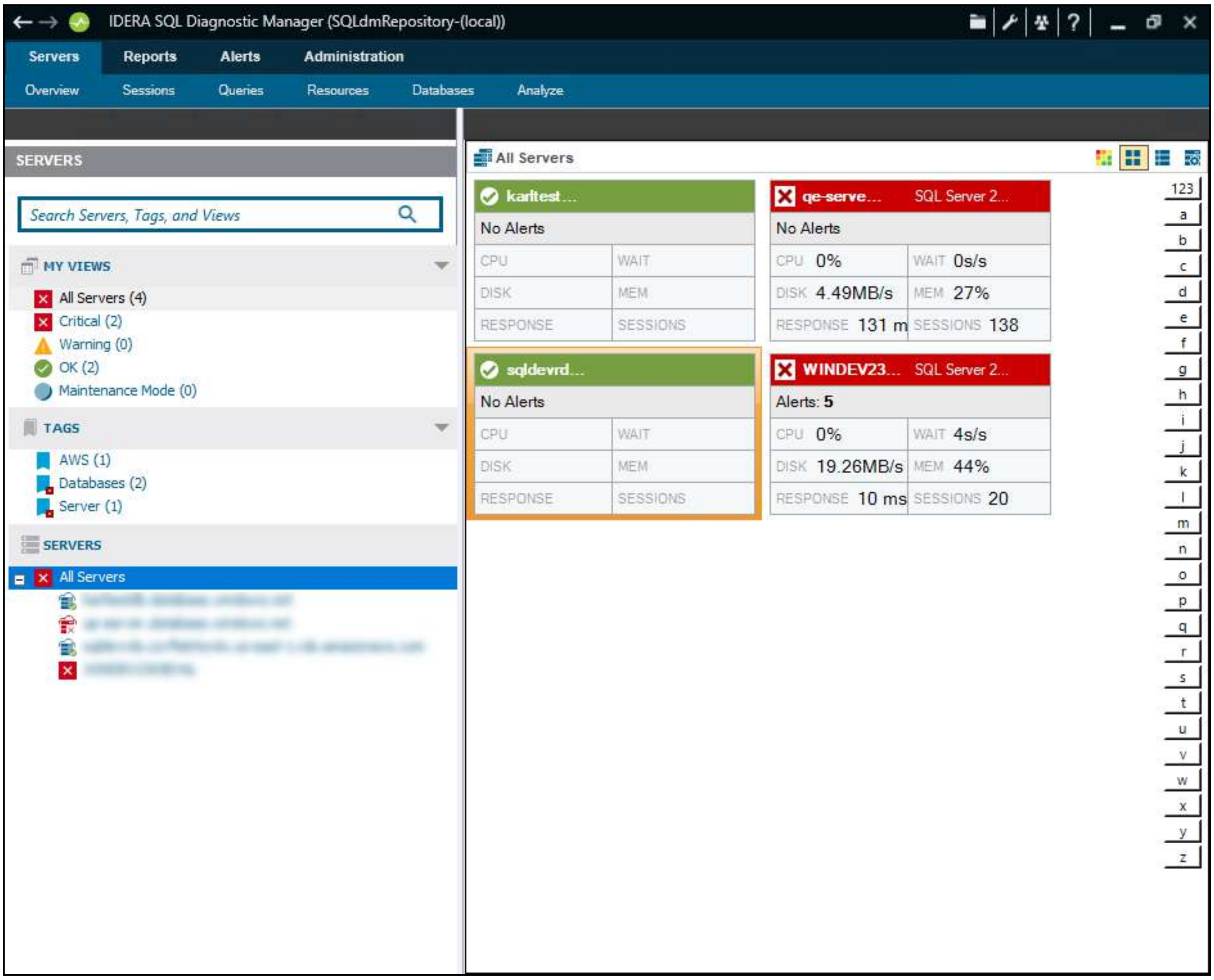
SQL Diagnostic Manager includes compatible recommendations for your monitored Amazon RDS servers. Follow the same steps of a windows server analysis for an Amazon RDS server, Run a prescriptive analysis on your SQL Server.

Azure SQL Monitoring

SQL Diagnostic Manager fully supports Azure SQL Databases and Azure Managed Instances. It includes support for the following Azure SQL Deployment options:

- Azure SQL Single database
- Azure SQL Elastic Pools
- Azure SQL Managed Instance

Within the Azure coverage, SQL Diagnostic Manager has a complete and custom navigation pane for Azure SQL monitoring. The Azure SQL and RDS servers are identified by a cloud icon which helps users to recognize them easily.



The server navigation includes the following tabs when monitoring Azure SQL servers:

- Overview
- Sessions
- Queries
- Resources
- Databases

- Analyze

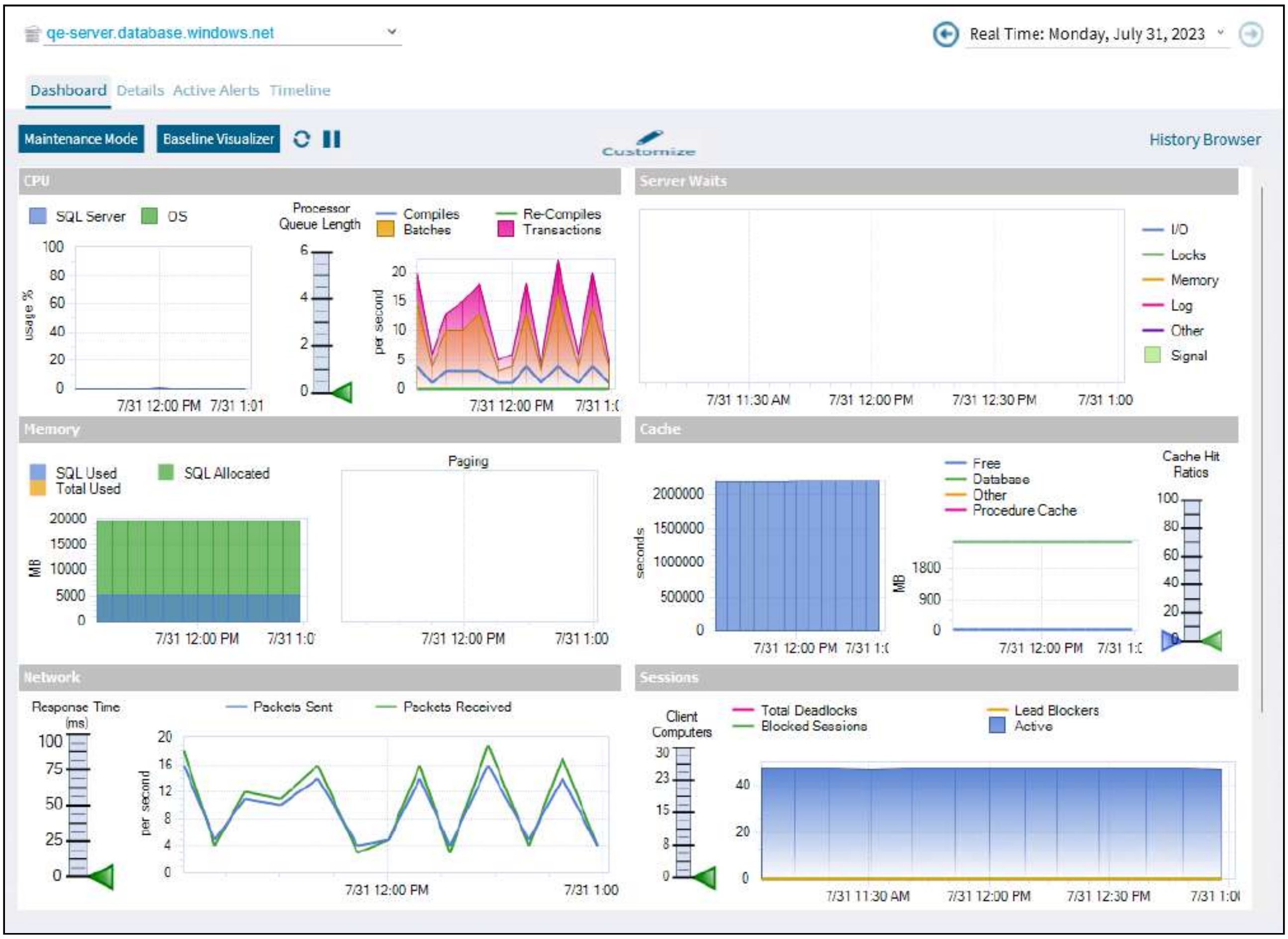
Azure Overview

Dashboard

The Dashboard view shows you an overview of the instance. The overview tab displays the following graphs, by default:

- CPU
- Server Waits
- Memory
- Cache
- Network
- Sessions
- SQL Server Physical I/O
- Databases

You can add or edit the layout of your Dashboard by clicking Customize. In the Customize Dashboard screen, click View Panel Gallery, and drag the panels from the right side to your Dashboard screen on the left.



Details

The Details screen shows the properties of the monitored Azure SQL server, including the Version, Edition, Host OS, Databases, and Log Size. On the right screen, you can review the metrics list, and check any metric to add it in the chart located at the bottom of the screen.

Active Alerts

The Active Alerts view allows you to check a list of all the active alerts as of the last data collection. Click any alert in the list to view details at the bottom of the window.

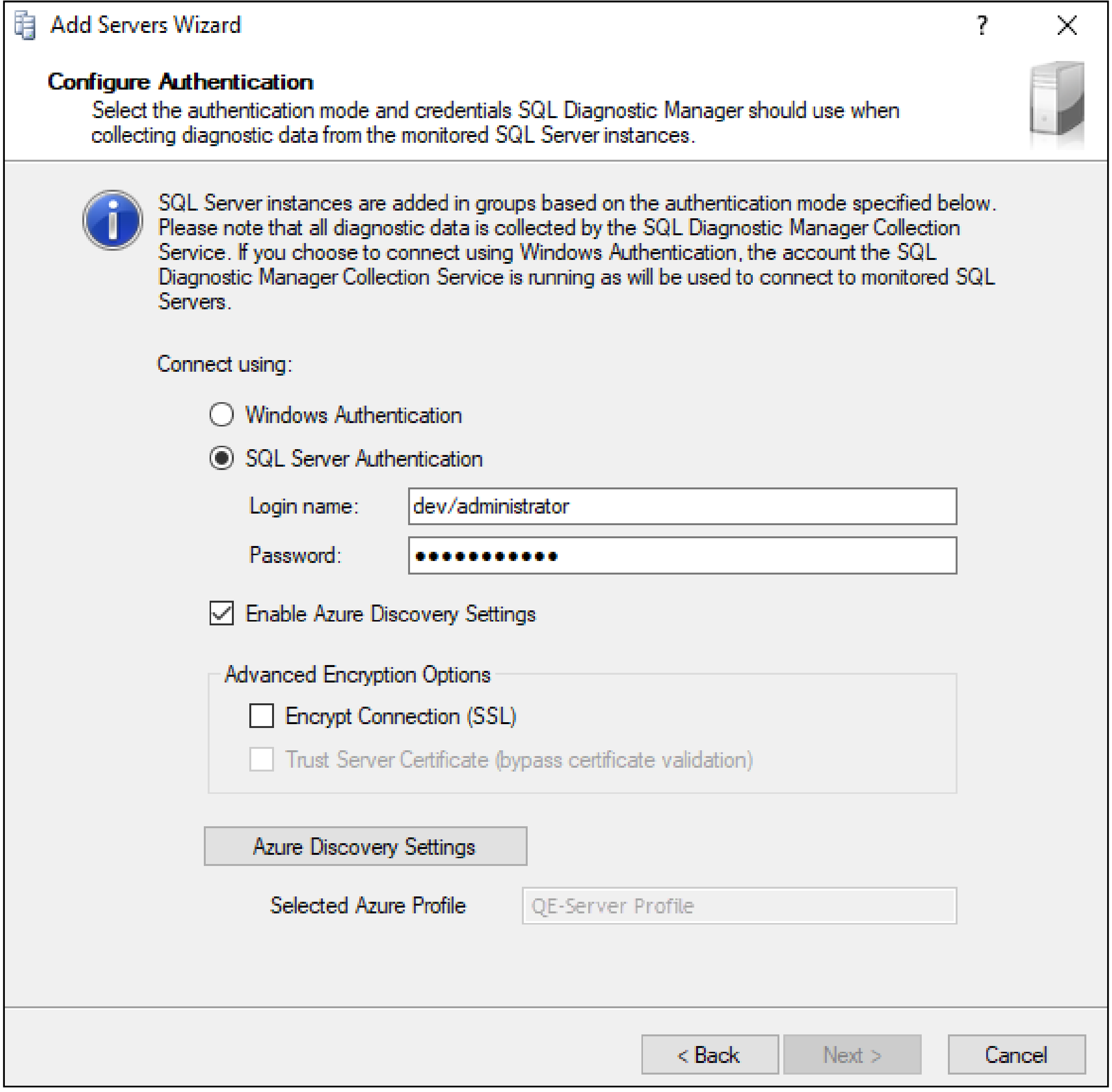
Timeline

The Timeline view provides a chronological chart of events that affect your monitored SQL Server instance. The view details the point in time for this monitored SQL Server instance when an alert occurred, including custom counter alerts.

Azure Discovery

SQL Diagnostic Manager discovers all the Servers associated with your Azure Profile credentials, which allows you to easily add your Azure SQL servers.

1. Right-click All Servers located on the SERVERS side screen
2. Select **Manage Servers** adding a new server
3. Under the Manager Server window, select the **Add** option
4. In the Welcome Add Servers Wizard, click **next**.
5. Select SQL Server Authentication and enter your credentials.
6. Select the **Enable Azure Discovery Settings** checkbox.



Add Servers Wizard

Configure Authentication

Select the authentication mode and credentials SQL Diagnostic Manager should use when collecting diagnostic data from the monitored SQL Server instances.

SQL Server instances are added in groups based on the authentication mode specified below. Please note that all diagnostic data is collected by the SQL Diagnostic Manager Collection Service. If you choose to connect using Windows Authentication, the account the SQL Diagnostic Manager Collection Service is running as will be used to connect to monitored SQL Servers.

Connect using:

○ Windows Authentication

● SQL Server Authentication

Login name: dev/administrator

Password: ●●●●●●●●●●●

☑ Enable Azure Discovery Settings

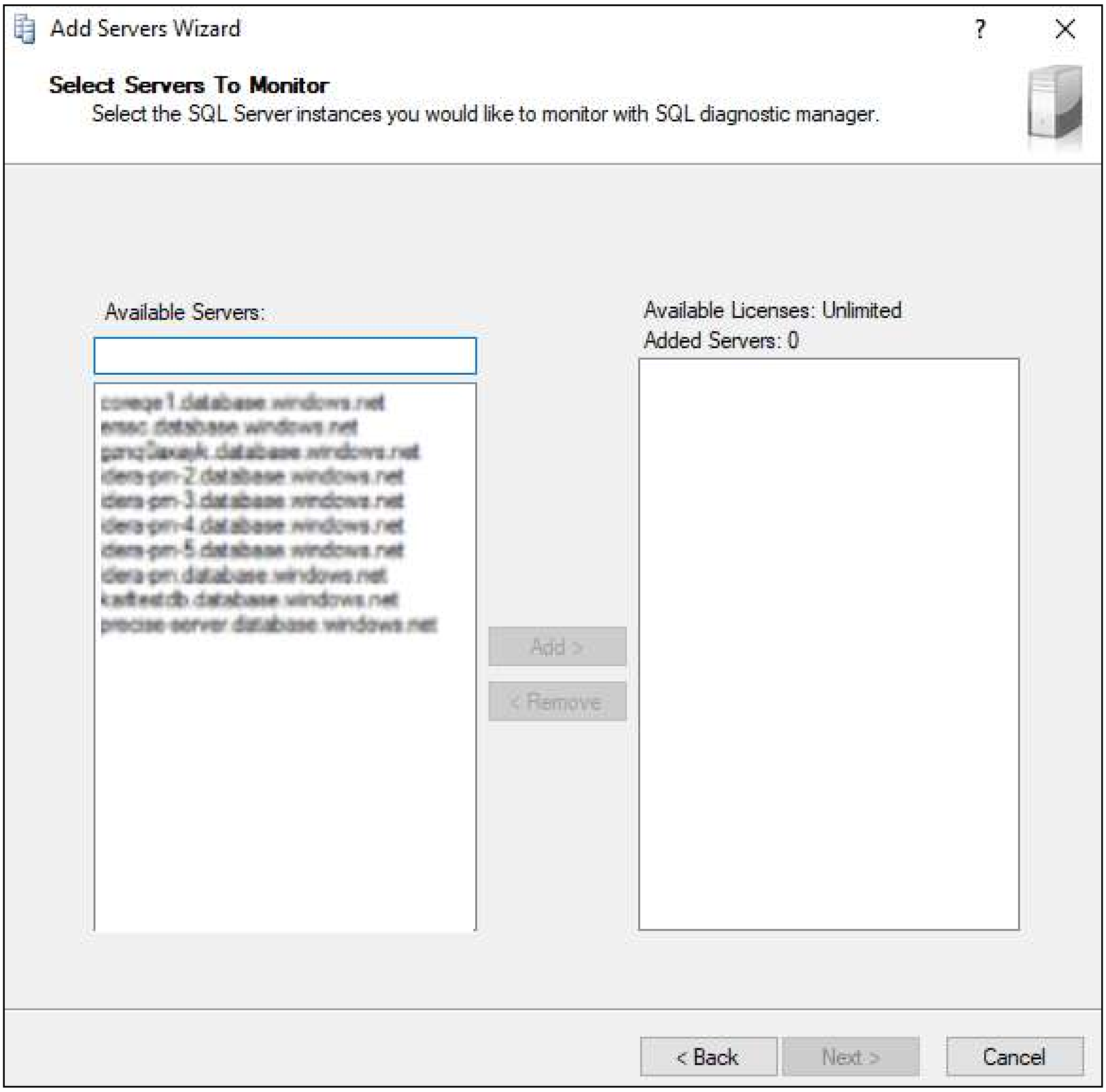
Advanced Encryption Options

□ Encrypt Connection (SSL)

□ Trust Server Certificate (bypass certificate validation)

Selected Azure Profile: QE-Server Profile

7. Click the **Azure Discovery Settings** button. When the Azure Application Configuration opens, enter your credentials, select the Azure profile from the drop-down list, and click **OK**.
8. The Azure profile selected displays in the Selected Azure Profile textbox, and click **Next**.
9. The result of your research should be all the servers related to your Azure Profile, check the image below. Select the servers you want to add, click **Add>** to move them to the Added Servers, and click **Next**.



Add Servers Wizard

Select Servers To Monitor

Select the SQL Server instances you would like to monitor with SQL diagnostic manager.

Available Servers:

coreqe1.database.windows.net
ersac.database.windows.net
garq3axajk.database.windows.net
idera-pm-2.database.windows.net
idera-pm-3.database.windows.net
idera-pm-4.database.windows.net
idera-pm-5.database.windows.net
idera-pm.database.windows.net
kaftestdb.database.windows.net
precise-server.database.windows.net

Available Licenses: Unlimited

Added Servers: 0

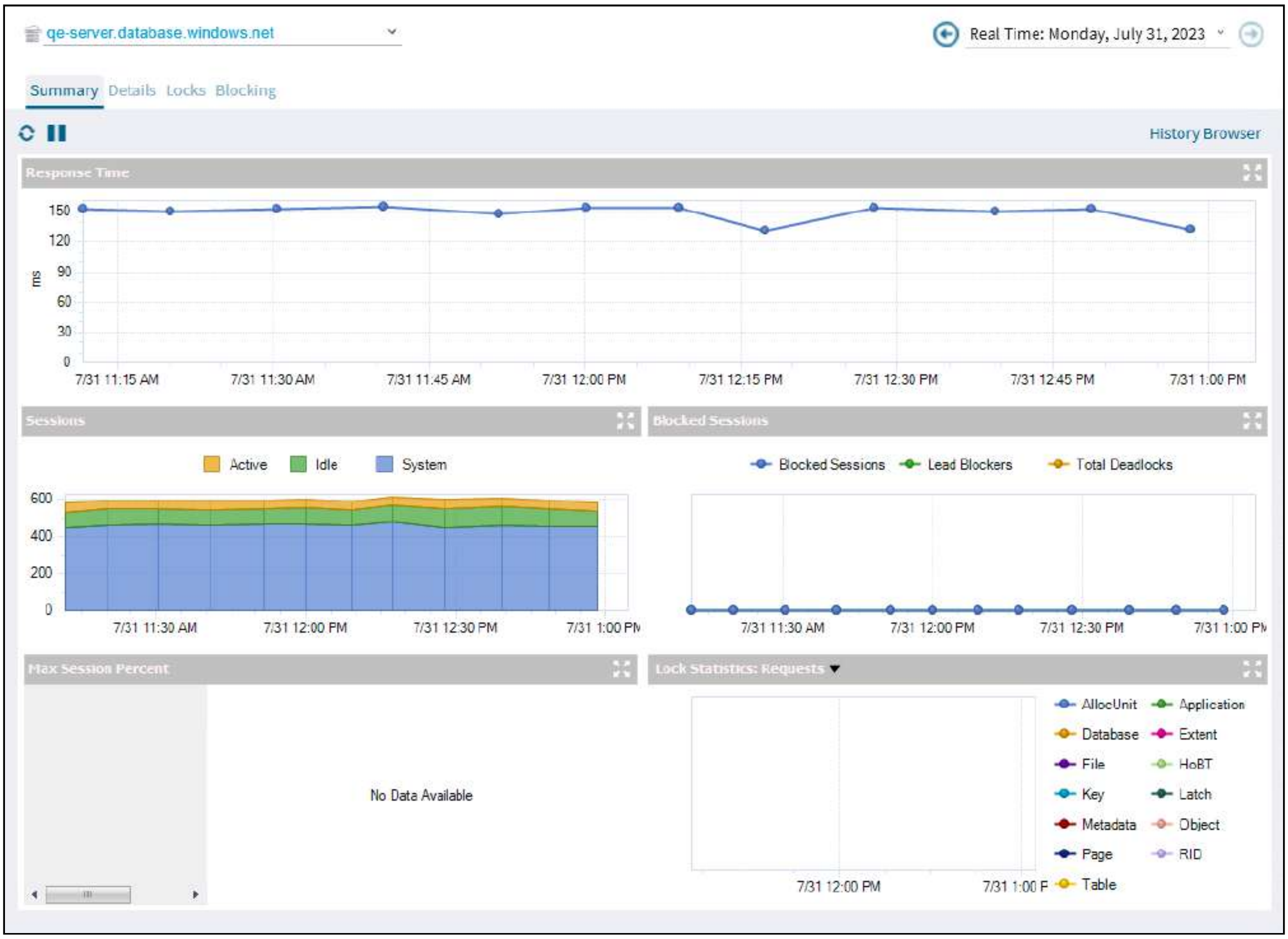
Azure Sessions

The Sessions tab includes the Summary, Details, Locks, and Blocking screens.

Summary

The Sessions Summary shows real-time charts for your monitored Azure SQL server, the following charts are displayed in this view:

- Response Time
- Sessions
- Blocked Sessions
- Max Session Percent
- Lock Statistic



Details

The Sessions Details view provides an in-depth analysis of sessions running on your monitored Azure SQL server.

Locks

On the Locked Sessions view, you can see which locks are causing data availability problems and unacceptable responses. At the bottom of the screen, the Lock Statistics chart has the same function as a non-cloud monitored server.

Blocking

The Blocking view provides a blocking tree, along with Block Reports, and Deadlock Reports information. At the bottom of the screen, the Block Sessions chart represents the Blocked Sessions, Lead Blockers, and Total Deadlocks information.

Azure Queries

Azure SQL Query Monitor is a useful SQL Server tool that allows you to log and analyze queries. Query Monitor allows you to establish queries' criteria to analyze the queries returned by:

- Discovering the worst performing queries.
- Visualizing complex SQL Queries.
- Pinpointing root causes.
- Generating recommendations to improve the performance of SQL databases and queries.

Use the Query Monitor when diagnosing poor query performance on your SQL Server instance. You should monitor queries if your SQL Server instance performance is poor, as a way to diagnose potential query issues.

The Sessions tab includes the Signature Mode, Statement Mode, Query History, and Query Waits.

Signature Mode

The Query Monitor Signature Mode view includes all active query information automatically reduced to the signatures grouped accordingly.

Statement Mode

The Statement Mode view is where you go to drill down into a specific execution of a particular query. It provides all the detail you may need to diagnose a specific problem with a query.

Query History

Query History allows you to track the performance of a query over time.

Query Waits

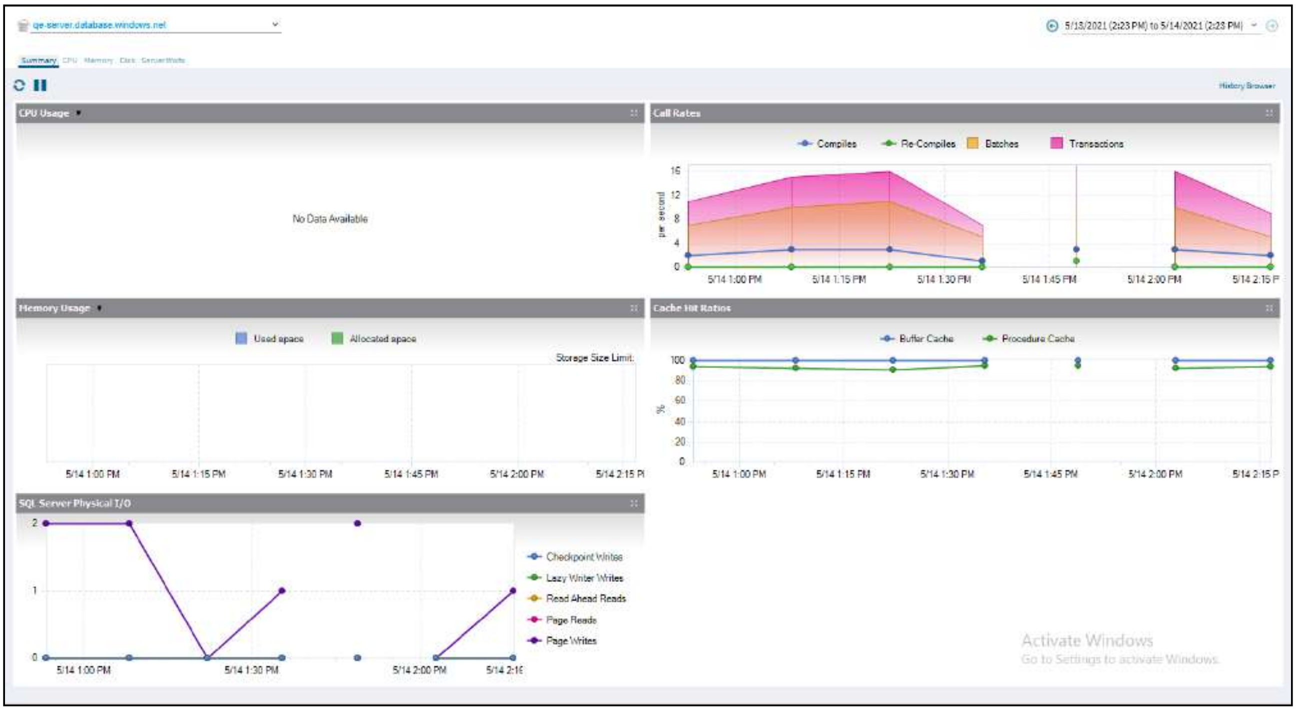
The Query Waits view displays the queries on your SQL Server instance with the longest wait times. By default, the chart at the bottom of the view displays the query waits over time and allows you to further investigate based on Statements, Applications, Databases, Clients, Sessions, and Users.

Azure Resources

The Resources tab allows you to monitor the system resources on the server hosting the Azure SQL instance.

Summary

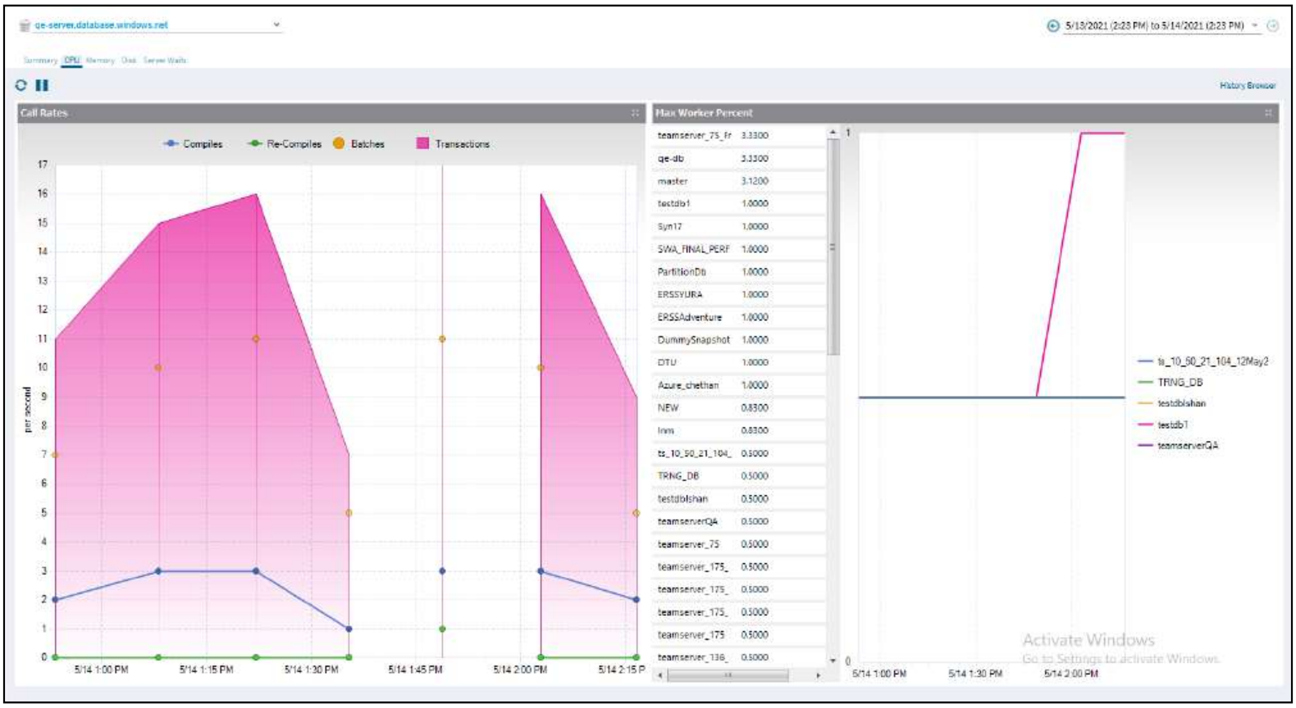
The Resources Summary tab displays real-time charts allowing you to quickly identify key diagnostic statistics for monitoring the resources for the selected Azure SQL instance.



CPU

The Call Rates chart displays the rate of batch statements, the compiles into procedure cache, then recompile of statements stored in the procedure cache.

In addition, the Max Worker Percent chart shows the percentage of worker threads used on the database, relative to the maximum available for the service tier.

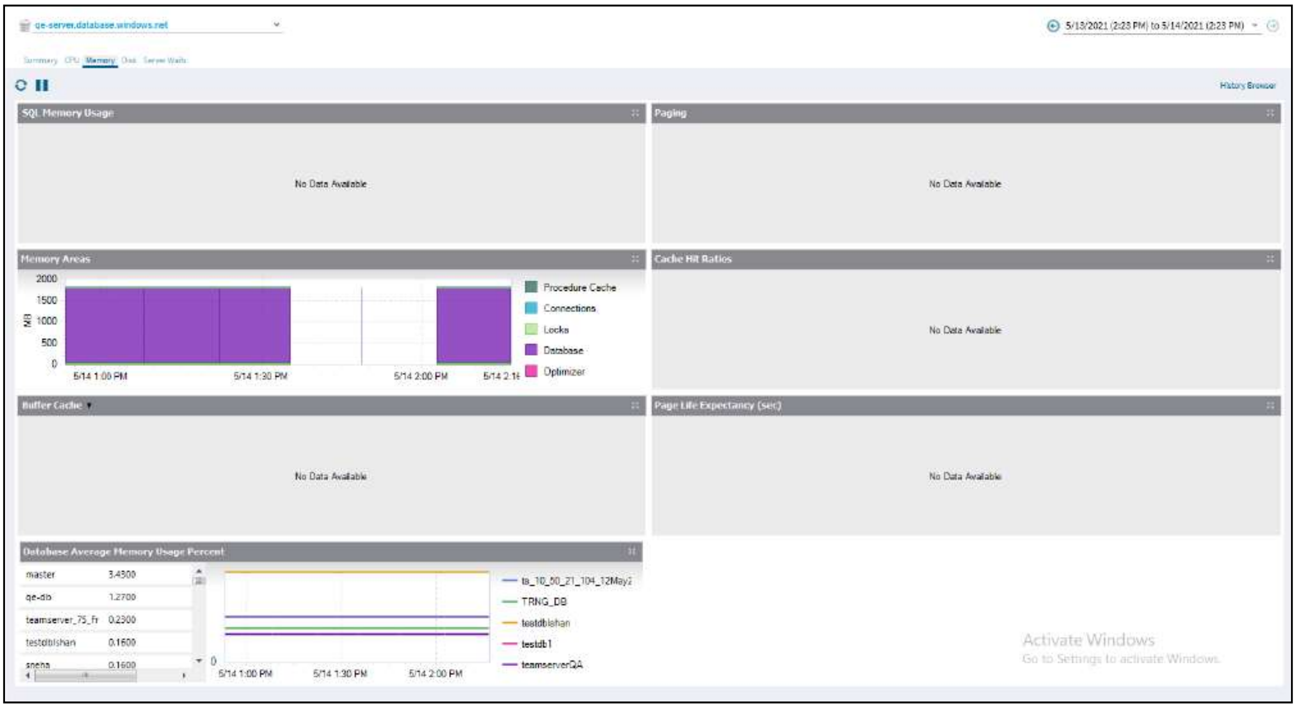


teamserver_75_Fr	3.3300
qe-db	3.3300
master	3.1200
testdb1	1.0000
Syn17	1.0000
SWA_FINAL_PERF	1.0000
PartitionDb	1.0000
ERSSYURA	1.0000
ERSSAdventure	1.0000
DummySnapshot	1.0000
DTU	1.0000
Azure_chethan	1.0000
NEW	0.8300
lnm	0.8300
ts_10_50_21_104_	0.5000
TRNG_DB	0.5000
testdbIshan	0.5000
teamserverQA	0.5000
teamserver_75	0.5000
teamserver_175_	0.5000
teamserver_175_	0.5000
teamserver_175_	0.5000
teamserver_175	0.5000
teamserver_136_	0.5000

Memory

The following charts are available on the Memory tab:

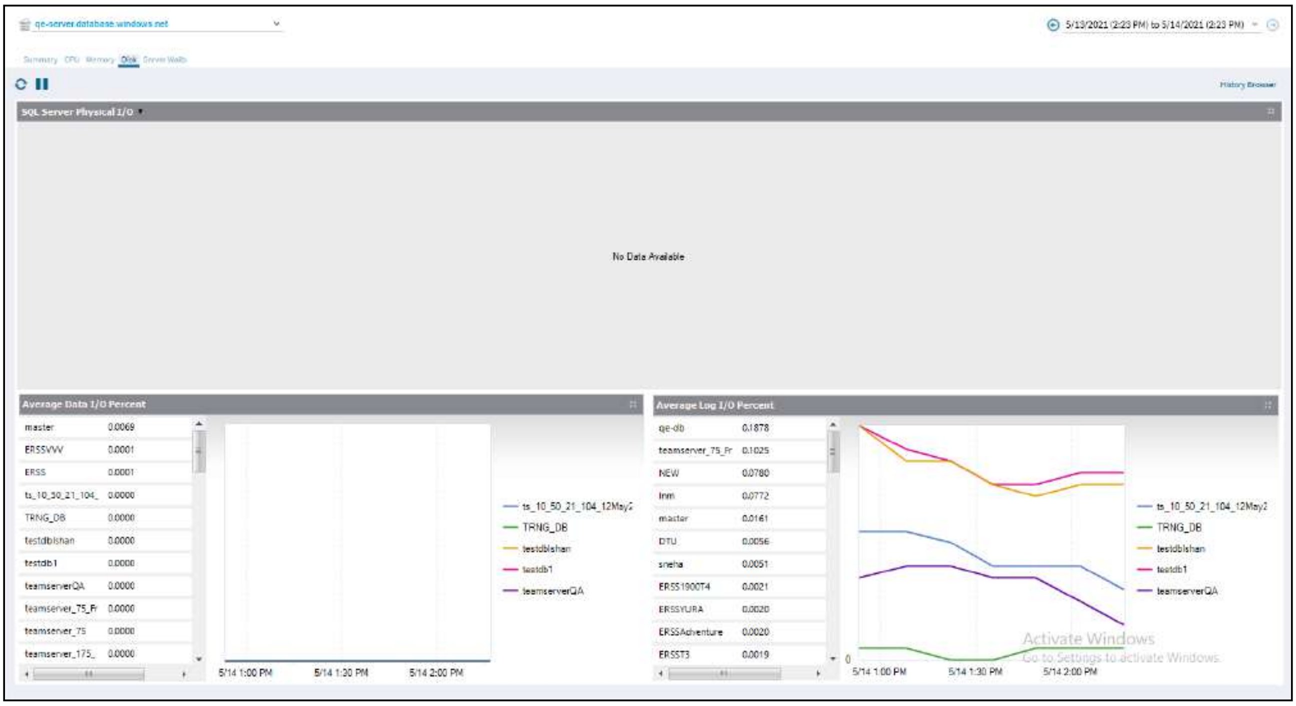
- SQL Memory Usage - Displays the SQL Memory Usage by what is used by SQL Server compared to what is allocated and the total used.
- Paging - Displays the memory pages per second.
- Memory Areas - Displays the memory usage of the Procedure Cache, Connections, Locks, Database, Optimizer, Sort, Hash, and Index.
- Cache Hit Ratios - Displays the hit ratios of the Buffer and Procedure cache.
- Buffer Cache - Displays the buffer cache used by Free and Active pages.
- Page Life Expectancy (sec) - Provides the time in seconds that a page remains in the cache or buffer pool.
- Database Average Memory Usage Percent - Displays the percentage of memory used for the database, relative to the maximum available for the service tier.



master	3.4300
qe-db	1.2700
teamserver_75_Fr	0.2300
testdblshan	0.1600
sneha	0.1600

Disk

The Disk tab shows the key statistics on the way your disks are used on your Azure SQL server.



Average Data I/O Percent

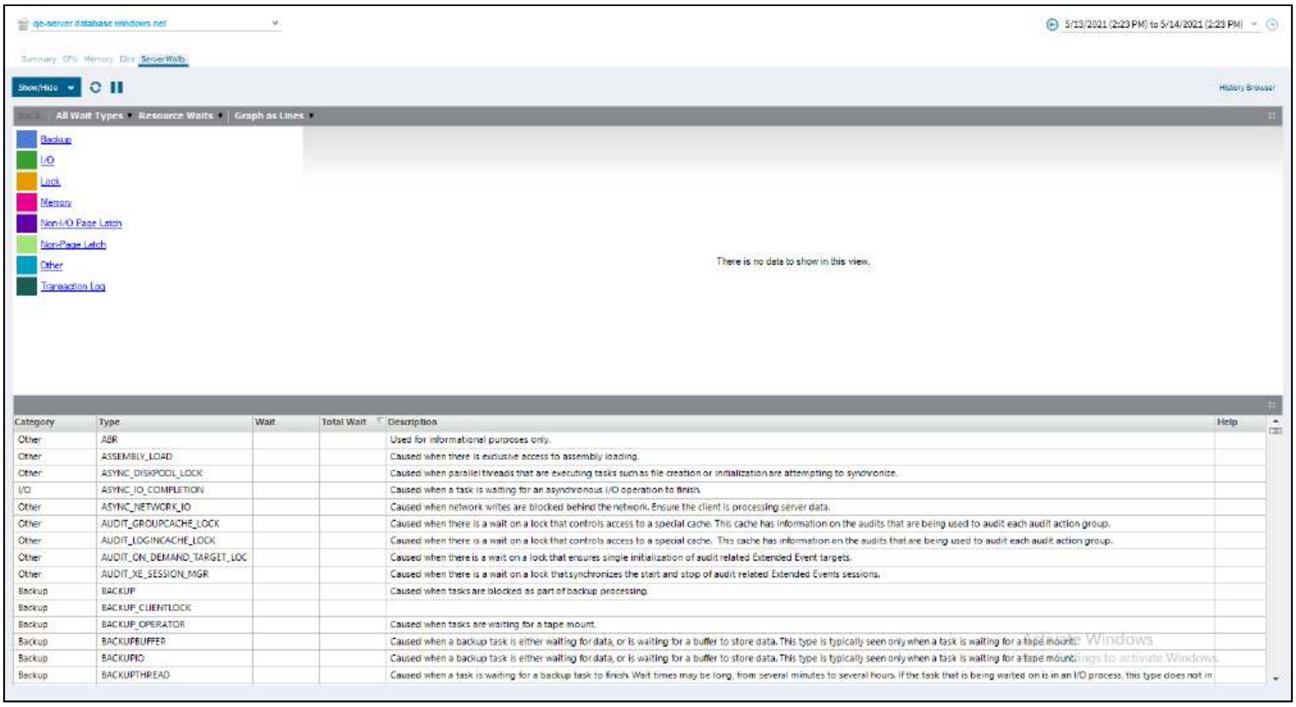
master	0.0069
ERSSVVV	0.0001
ERSS	0.0001
ts_10_50_21_104_	0.0000
TRNG_DB	0.0000
testdblshan	0.0000
testdb1	0.0000
teamserverQA	0.0000
teamserver_75_Fr	0.0000
teamserver_75	0.0000
teamserver_175_	0.0000

Average Log I/O Percent

qe-db	0.1878
teamserver_75_Fr	0.1025
NEW	0.0780
lnm	0.0772
master	0.0161
DTU	0.0056
sneha	0.0051
ERSS1900T4	0.0021
ERSSYURA	0.0020
ERSSAdventure	0.0020
ERSST3	0.0019

Server Waits

The Server Waits view allows you to see all of the waits affecting Azure SQL server performance.



There is no data to show in this view.

Category	Type	Wait	Total Wait	Description	Help
Other	ABR			Used for informational purposes only.	
Other	ASSEMBLY_LOAD			Caused when there is exclusive access to assembly loading.	
Other	ASYNC_DISKPOOL_LOCK			Caused when parallel threads that are executing tasks such as file creation or initialization are attempting to synchronize.	
I/O	ASYNC_IO_COMPLETION			Caused when a task is waiting for an asynchronous I/O operation to finish.	
Other	ASYNC_NETWORK_IO			Caused when network writes are blocked behind the network. Ensure the client is processing server data.	
Other	AUDIT_GROUPCACHE_LOCK			Caused when there is a wait on a lock that controls access to a special cache. This cache has information on the audits that are being used to audit each audit action group.	
Other	AUDIT_LOGINCACHE_LOCK			Caused when there is a wait on a lock that controls access to a special cache. This cache has information on the audits that are being used to audit each audit action group.	
Other	AUDIT_ON_DEMAND_TARGET_LOC			Caused when there is a wait on a lock that ensures single initialization of audit related Extended Event targets.	
Other	AUDIT_XE_SESSION_MGR			Caused when there is a wait on a lock that synchronizes the start and stop of audit related Extended Events sessions.	
Backup	BACKUP			Caused when tasks are blocked as part of backup processing.	
Backup	BACKUP_CLIENTLOCK				
Backup	BACKUP_OPERATOR			Caused when tasks are waiting for a tape mount.	
Backup	BACKUPBUFFER			Caused when a backup task is either waiting for data, or is waiting for a buffer to store data. This type is typically seen only when a task is waiting for a tape mount.	
Backup	BACKUPIO			Caused when a backup task is either waiting for data, or is waiting for a buffer to store data. This type is typically seen only when a task is waiting for a tape mount.	
Backup	BACKUPTHREAD			Caused when a task is waiting for a backup task to finish. Wait times may be long, from several minutes to several hours. If the task that is being waited on is in an I/O process, this type does not in	

Azure Databases

SQL Diagnostic Manager provides a graphical analysis of the used, unused, and index disk space of the database. You can also view the size and structure of database tables, this screen provides a list of data size, text or image size, index page size, and the number of table rows, making reorganization and index creation decisions easy.

Summary

The Database Summary view allows you to view the status of all the databases on the selected Azure SQL server.

The following graphs are displayed at the bottom of the screen:

- **Capacity Usage** - Select how to view the data or the log is used on your database. The drop-down list allows you to choose to view the data or log in megabytes or percentages.
- **Recent Trends** - Select how to view how your database or group of databases are used currently by selecting either active sessions, transactions per second, data size, log size, or log flushes from the drop-down list.

Configuration

The Database Configuration view allows you to review the configuration settings of the databases on the selected Azure SQL instance. This view contains a single grid that includes the configuration settings for all databases on the selected SQL Server instance.

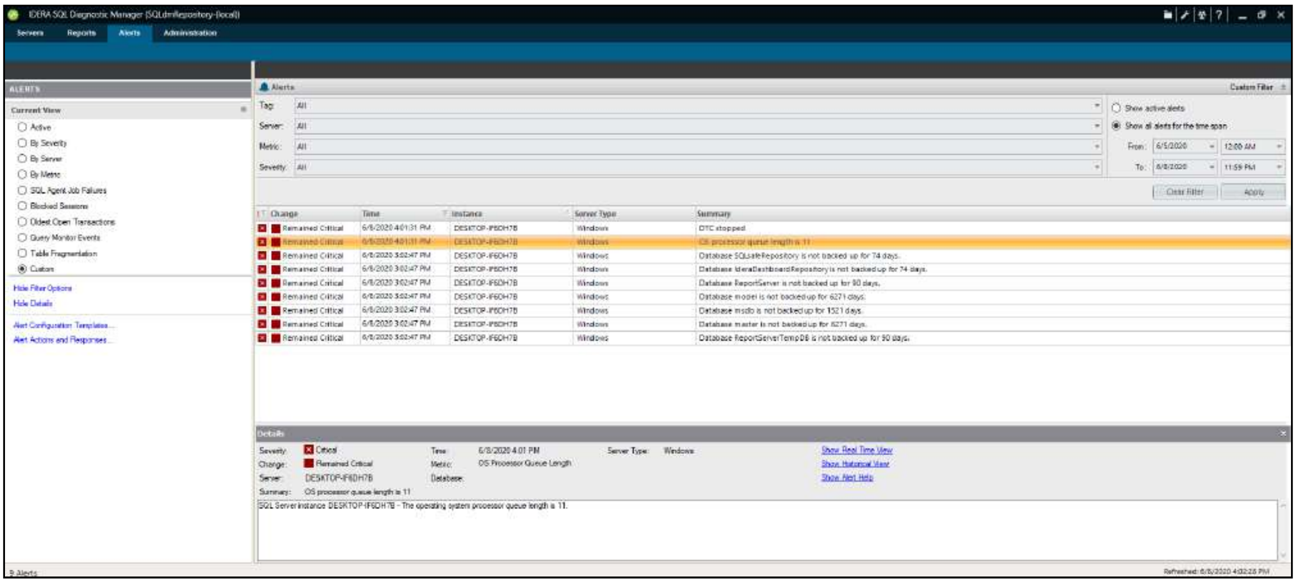
Azure Analysis

The Analyze tab runs prescriptive analyses on Azure SQL servers to identify and resolve SQL Server performance problems. The analysis engine scans your SQL Server configuration for potential problems and the health of your databases, resulting in a useful set of recommendations for improving performance for your monitored Azure SQL servers.

SQL Diagnostic Manager includes compatible recommendations for your monitored Azure SQL instances. Follow the same steps of a windows server analysis for an Azure SQL server, Run a prescriptive analysis on your SQL Server.

Organize alerts

Access the Alerts view from the SQLDM desktop console by clicking the **Alerts** tab.



Tag: All
Server: All
Metric: All
Severity: All
From: 6/5/2020 12:00 AM
To: 6/8/2020 11:59 PM

Change	Time	Instance	Server Type	Summary
Remained Critical	6/8/2020 4:01:31 PM	DESKTOP-IF6DH7B	Windows	DTC stopped
Remained Critical	6/8/2020 4:01:31 PM	DESKTOP-IF6DH7B	Windows	OS processor queue length is 11
Remained Critical	6/8/2020 3:02:47 PM	DESKTOP-IF6DH7B	Windows	Database SQLsafeRepository is not backed up for 74 days.
Remained Critical	6/8/2020 3:02:47 PM	DESKTOP-IF6DH7B	Windows	Database IderaDashboardRepository is not backed up for 74 days.
Remained Critical	6/8/2020 3:02:47 PM	DESKTOP-IF6DH7B	Windows	Database ReportServer is not backed up for 90 days.
Remained Critical	6/8/2020 3:02:47 PM	DESKTOP-IF6DH7B	Windows	Database model is not backed up for 6271 days.
Remained Critical	6/8/2020 3:02:47 PM	DESKTOP-IF6DH7B	Windows	Database msdb is not backed up for 1521 days.
Remained Critical	6/8/2020 3:02:47 PM	DESKTOP-IF6DH7B	Windows	Database master is not backed up for 6271 days.
Remained Critical	6/8/2020 3:02:47 PM	DESKTOP-IF6DH7B	Windows	Database ReportServerTempDB is not backed up for 90 days.

Severity: Critical
Change: Remained Critical
Server: DESKTOP-IF6DH7B
Summary: OS processor queue length is 11
Time: 6/8/2020 4:01 PM
Metric: OS Processor Queue Length
Database:
Server Type: Windows

SQL Server instance DESKTOP-IF6DH7B - The operating system processor queue length is 11.

Refreshed: 6/8/2020 4:02:28 PM

Organize your alerts by Active Alerts

The Alerts tab allows you to view all the alerts for all of the monitored servers. Under the Alerts screen you can review all the active alerts; additionally, you can filter them by selecting an specific time frame.

Tag, Server, Metric, and Severity are the main custom filters you can configure under the Alerts screen, use **Apply** to retrieve the alerts under the configuration you choose or use **Clear Filter** to remove all the configured filter options.

The **Change** column is a useful way to see the agent history of a metric. This column tracks every status change occurring between OK, informational, warning, and critical states.

Organize your alerts by the Current View

You can organize your alerts by selecting one of the following views from the Current View section of the Navigation Pane:

Active

Organizes all your alerts that are currently active.

By Severity

Organizes all your alerts by their severity.

By Server

Organizes all your alerts by monitored SQL Server instance.

By Metric

Organizes all your alerts by each of the metrics affected.

Agent Job Failures

Lists all the alerts caused by Agent Job failures.

Blocked Processes

Lists all the alerts caused by blocked processes.

Oldest Open Transactions

Lists the oldest open transactions that have alerts associated with them.

Query Monitor

Lists all the alerts associated with the Query Monitor.

Table Reorganization

Lists all the alerts associated with table reorganization.

Custom

Allows you to configure the view to show what is most important to you.

Organize your alerts using the Filter Options

SQL Diagnostic Manager allows you to organize your alerts using the available filter options. Click the **Show Filter Options/Hide Filter Options** toggle in the Navigation Pane to open the Alerts filter. Filter options such as the specific view, SQL Server instance, metric, severity, and time range associated with the alert help pinpoint to data you want to view.

ⓘ Additionally, you can access the Alert Configuration Templates and the Alert Actions and Responses configuration options.

Alert on SQL Server Metrics

SQL Diagnostic Manager allows you to configure alerts to inform and warn you about approaching issues with your SQL Server instances. You can view these alerts using the SQL Diagnostic Manager Console.

When an alert threshold is reached, SQL Diagnostic Manager can:

- Send an email notification
- Pop up an alert message in your Windows taskbar
- Write an event to the Windows Event log
- Generate an event on the Timeline
- Create a new To Do item

To Do feature

Beginning with SQL Diagnostic Manager 7.0, the To Do feature is available only to users who had To Do activated in an earlier 6.x version. This version of SQL Diagnostic Manager does not support this feature for new users.

In response to a set threshold entering the error level, SQL Diagnostic Manager can perform one or more of the following actions:

- Send an email notification
- Write an event to the Windows Event log
- Generate an event on the Timeline
- Create a new To Do item

Once you correct the situation triggering the alert, SQL Diagnostic Manager alerts you again if the situation recurs.

On each SQL Diagnostic Manager view, columns containing associated alerts are highlighted with their current status color. You can right-click many of these columns and select **Configure Alert** to change the associated thresholds.

Database- or disk-level alerts

SQL Diagnostic Manager includes some alerts that allow you to set them at a database or disk level, meaning that you can set different alert thresholds for each database or disk within a monitored SQL Server instance.

Alert templates

SQL Diagnostic Manager allows you to configure generic alert settings as a template that you can apply to servers and groups of servers in your organization. Click **Tools > Alert Configuration Templates** and complete the required fields to configure an alert template.

Informational alerts

Informational alerts allow you to set a threshold that, when generated, triggers a status that does not affect the overall status of the server within SQL Diagnostic Manager. You can use informational alerts to notify an administrator of the state of a particular metric for a server or trigger secondary processes that could take action to prevent issue escalation.

⚠ Note that for certain metrics, using the informational alert means that you no longer receive a warning or critical alert for events generated by that metric. Please review the situation before setting up an informational alert.

Configure alerts

The Alert Configuration window allows you to set up alerts for specific SQL Server instances. To open the Alert Configuration window with a SQL Server instance selected, right-click the instance, and then select **Configure Alerts**. You can set the acceptable thresholds using the following alert types:

Alert Type	Color	Meaning
OK	**Green**	Acceptable threshold where SQL Diagnostic Manager does not generate an alert.
Informational	**Blue**	Informational threshold where SQL Diagnostic Manager generates an informational alert.
Warning	**Yellow**	Warning threshold where SQL Diagnostic Manager generates a warning alert.
Critical	**Red**	Critical threshold where SQL Diagnostic Manager generates a critical alert.

In addition to setting the thresholds for specific alerts, you can customize your alerts by adding comments to each alert. Comments allow you to include instructions to users when a level reaches a particular threshold or to provide additional information about the alert. You can also customize the levels at which SQL Diagnostic Manager provides alert notifications by changing the informational, warning, and critical values either on the Configuration tab of the Alert Configuration window or, for the database- and disk-level alerts, on the Database Threshold Configuration window available by selecting the database or disk and clicking **Edit**.

You can also base your alerts on the past performance of the metrics collected by SQL Diagnostic Manager. This is a powerful and effective way to make sure that the alerts you receive are outside of your typical metric ranges.

✓ For each alert metric, you can enter the specific criteria by double-clicking the values on the Configuration tab.

To configure an alert:

1. Right-click a SQL Server instance in the Servers sidebar.
2. Select **Configure Alerts**.
3. Select the metric you want to edit from the list in the **Alert Configuration** window.
4. ***If the metric features a per-database or per-disk alert***, on the Configuration tab of the Alert Configuration window, click **Add**. Use the drop-down list to select the database or disk to which you want to apply these settings. ***If the metric applies at the instance level***, continue with the next step.
5. Check the boxes next to **Informational**, **Warning**, and **Critical** to include alerts for these states.
6. Change the alert thresholds by moving the arrows to the appropriate levels or by double-clicking the value and typing a new threshold level.
7. ***If the metric features a per-database or per-disk alert***, click **Advanced** to apply any advanced settings, such as alert suppression or autogrow settings. Click **OK**. ***If the metric applies at the instance level***, continue with the next step.
8. Select the **Comments** tab and enter the information you want to display in the alert message for this metric.

9. Click **Apply**.
10. ***If you want to replicate these edits to other SQL Server instance SQL Diagnostic Manager is monitoring, tags, or templates***, click **Yes**.
11. Click **OK** to accept your changes.

> Note that when you modify an alertable metric in the Alert Configuration window, the **Create Template** button is disabled. Once you apply the modification, this command button is enabled again.

Alert refresh

A full refresh of alerts excluding table fragmentation occurs in the following circumstances even if longer collection intervals are defined:

- When the collection service starts
- When the collection service receives a new workload, such as redirecting the Management Service to a new Repository
- When you add a SQL Server for collection
- When a SQL Server resumes from Maintenance Mode
- When a user selects Refresh Alerts

This refresh does not cause collection of non-alertable data, nor cause collection of anything that is disabled.

Table Fragmentation alert thresholds

SQL Diagnostic Manager updates Table Fragmentation alerts with new threshold information only when new data is generated during the table statistics collection interval. It is preferred that you set your table statistics collection interval to occur when your server is not performing any production tasks.

Because this data collection occurs at most once per day and you can configure it to run as infrequently as once per week, you may experience a significant delay before new alerts are generated with your new alert threshold. You can configure your wait monitoring using the Monitored SQL Server Properties window.

Apply different alert thresholds to multiple databases or disks

Some of the available alerts allow you to apply them independently to multiple databases or disks on your monitored SQL Server instance. When you click the alert to modify the thresholds, notice that a list of your databases or disks appears with the associated thresholds as they are currently set. Click **Edit** to make your changes. The Database Threshold Configuration dialog lets you specify the database, and then select the thresholds for that database only. The Disk Threshold Configuration dialog provides the same functionality, only disks replace the databases.

Alert templates

SQL Diagnostic Manager allows you to configure generic alert settings as a template that you can apply to servers and groups of servers in your organization. Click 🔧 **> Alert Configuration Templates** and complete the required fields to configure an alert template.

Informational alerts

Informational alerts allow you to set a threshold that when generated triggers a status that does not affect the overall status of the server within SQL Diagnostic Manager. You can use informational alerts to notify an administrator of the state of a particular metric for a server or trigger secondary processes that could take action to prevent issue escalation.

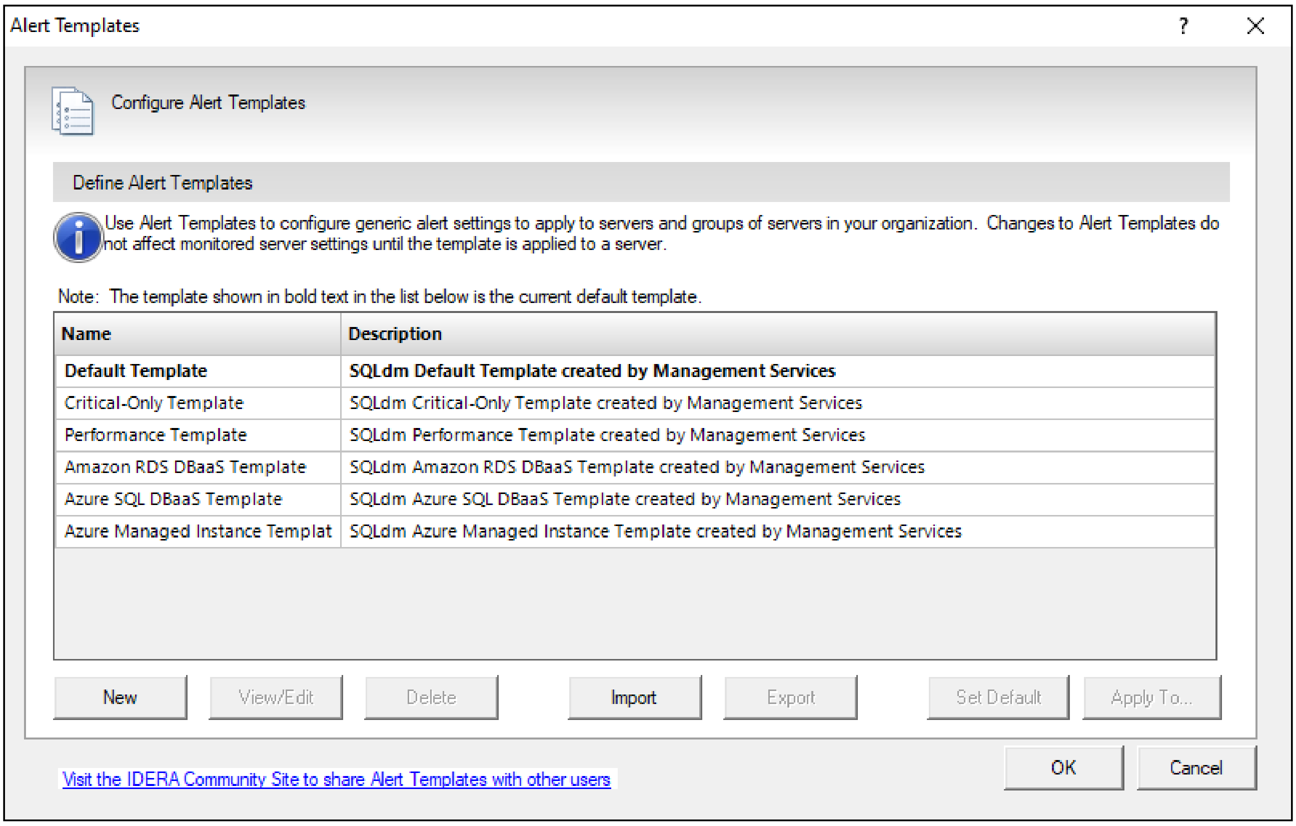
⚠ Note that for certain metrics, using the informational alert means that you no longer receive a warning or critical alert for events generated by that metric. Please review the situation before setting up an informational alert.

Configure alert templates

The Alert Templates window allows you to configure generic alert settings that you can apply to servers and groups of servers in your organization. An event that causes a metric to no longer meet a condition or to exceed a threshold signals SQL Diagnostic Manager to raise an alert. The Alert Templates save you time and help you to avoid mistakes by simplifying alert configuration across your environment.

SQL Diagnostic Manager has the following five Alert Templates that can be used to configure generic alert settings to apply to your monitored servers:

- Default Template
- Critical-Only Template
- Performance Template
- Amazon RDS DBaaS Template
- Azure SQL DBaaS Template
- Azure Managed Instance Template


Alert Templates

Configure Alert Templates

Define Alert Templates

Use Alert Templates to configure generic alert settings to apply to servers and groups of servers in your organization. Changes to Alert Templates do not affect monitored server settings until the template is applied to a server.

Note: The template shown in bold text in the list below is the current default template.

Name	Description
Default Template	**SQLdm Default Template created by Management Services**
Critical-Only Template	SQLdm Critical-Only Template created by Management Services
Performance Template	SQLdm Performance Template created by Management Services
Amazon RDS DBaaS Template	SQLdm Amazon RDS DBaaS Template created by Management Services
Azure SQL DBaaS Template	SQLdm Azure SQL DBaaS Template created by Management Services
Azure Managed Instance Templat	SQLdm Azure Managed Instance Template created by Management Services

New
View/Edit
Delete
Import
Export
Set Default
Apply To...
Visit the IDERA Community Site to share Alert Templates with other users
OK
Cancel

Applying an alert template to a monitored server overwrites all existing alert configurations. You can make any custom changes to the alert configuration once the template is applied. If you make a change to a template that is applied to a server, you must also reapply the template to that server using the **Apply To** button.

Servers are not permanently attached to an applied alert template. SQL Diagnostic Manager does not propagate to the monitored server any changes made to the template unless explicitly applied.

A template allows you to apply the same alert configurations to more than one SQL Server instance. It helps you avoid simple mistakes such as transposing characters or leaving out metric details that could occur when you manually configure each server. Alert templates also help you roll out changes by making the updates in a single location and then rolling out the changes across your environment. If you are more interested in ad hoc alert configuration, remember that you can use a template to return a server to default settings if you make any changes that you later want to revert.

Access the Alert Templates window

You can open the Alert Templates window from the SQL Diagnostic Manager Console menu bar by selecting 🔧 **> Alert Configuration Templates**.

Create a new alert template

Create a new alert template or edit the existing Default Template to suit your needs when alerting on your monitored SQL Server instances.

To create a new alert template:

1. Select 🔧 and click **Alert Configuration Templates**.
2. Click **New**.
3. Type a unique name and description.
4. ***If you want to create a new template based on an existing template***, select the name of the existing template from the **Copy from** list.
5. ***If you want to use this new template as your default template***, check **Default Template**.
6. When you click **OK**, the **"Would you like to apply this template to existing SQL Server instances?"** message prompts. Click **Yes** to confirm or click **No** if you do not want to apply this template.
    a. If you click **Yes**, the Select Servers or Tags opens. Select Tags or Select Servers to which the alert template should be applied.

> ⓘ You can edit the configuration of your new alert template. In the Add Alert Template window, click **Edit configuration** to change thresholds and other metric parameters, for more information review Configure your alert settings.

Change an existing template

SQL Diagnostic Manager allows you to make changes to an existing alert template. Select the template from the list, and then click **View/Edit**. If necessary, you can delete any existing template except for the Default Template. To delete a template, select the template you want to delete, and then click **Delete**.

Import an existing template

SQL Diagnostic Manager allows you to import an existing alert template from the IDERA community site. Click **Import** and select an alert template.

Export an existing template

SQL Diagnostic Manager allows you to export an existing alert template. Select the template from the list, and then click **Export**. You can use the default location or specify a different path to save the export file.

Apply template changes to a tag or server

Once you create a new template or make changes to an existing template, you should apply the updates to your tags or servers. Select the template from the list, click **Apply To**, select a tag or servers to which you want to apply the alert template, and then click **OK**.

Note that if the template you are making changes to is already associated with a tag or server, these changes are not automatically applied when you change the template. You must use the **Apply To** button and select the appropriate tag or servers.

Set a template to use as the default

You can set an existing template as the default for SQL Diagnostic Manager to apply to all new servers added without specifying an alert template. To designate a template as the default, click the template in the list, click **Set Default**, and then click **OK**. If there is only one template in your list, SQL Diagnostic Manager uses this template as the default.

Apply alert templates to individual databases or disks within an instance

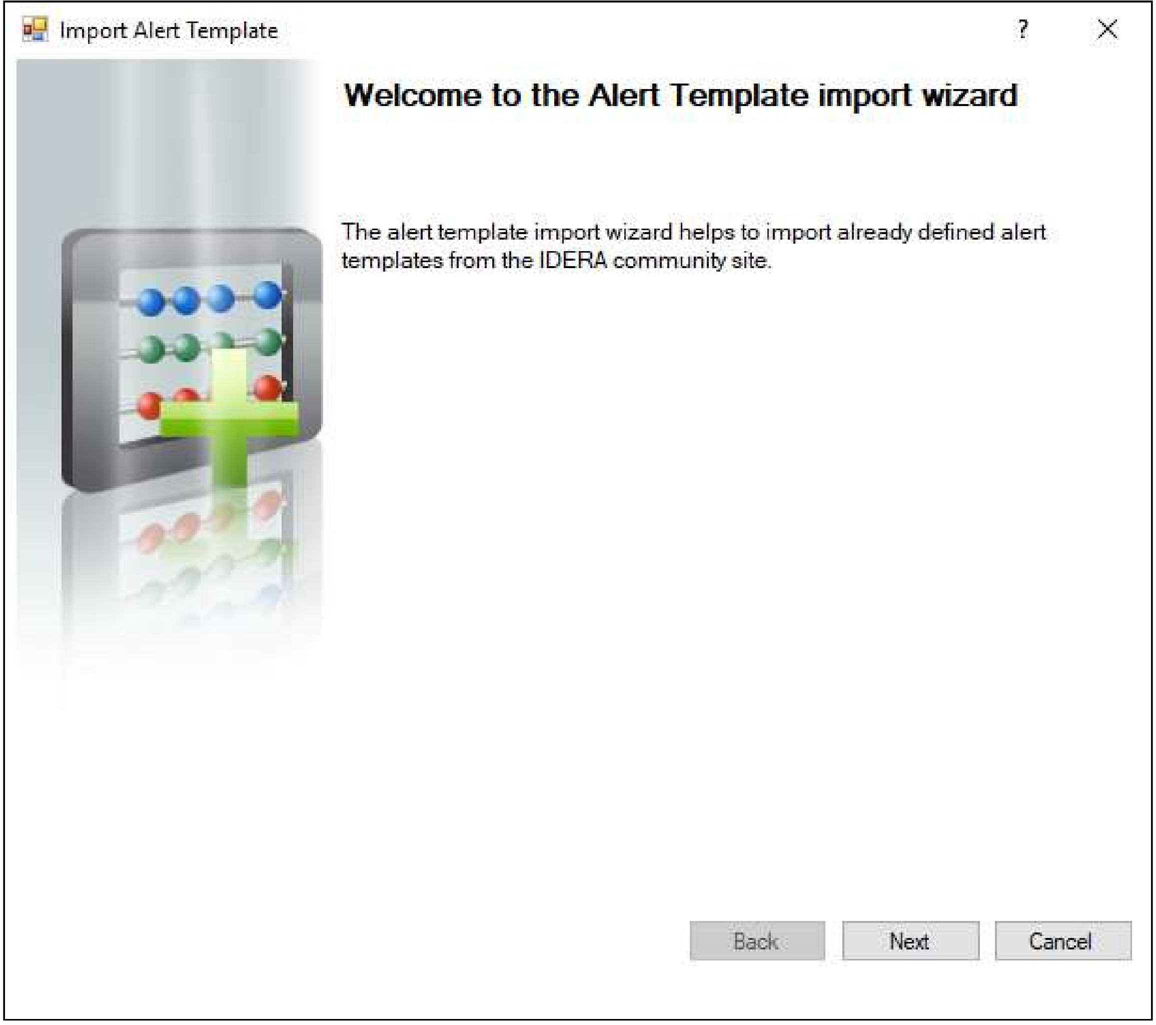
SQL Diagnostic Manager includes the ability to apply some alert thresholds on a per-database or per-disk basis within an instance. When you create an alert template and include one of these alerts, you cannot select which database or disk to apply the alert to because that is unknown in a template. For that reason, these alerts apply to all databases and disks within the instance to which it is applied.

Import an existing template

The Alert Templates window allows you to configure generic alert settings that you can apply to servers and groups of servers in your organization. Alert templates save you time and help you to avoid mistakes by simplifying alert configuration across your environment. SQL Diagnostic Manager allows you to import an existing alert template from the IDERA community site to suit your needs when alerting on your monitored SQL Server instances.

To import an alert template:

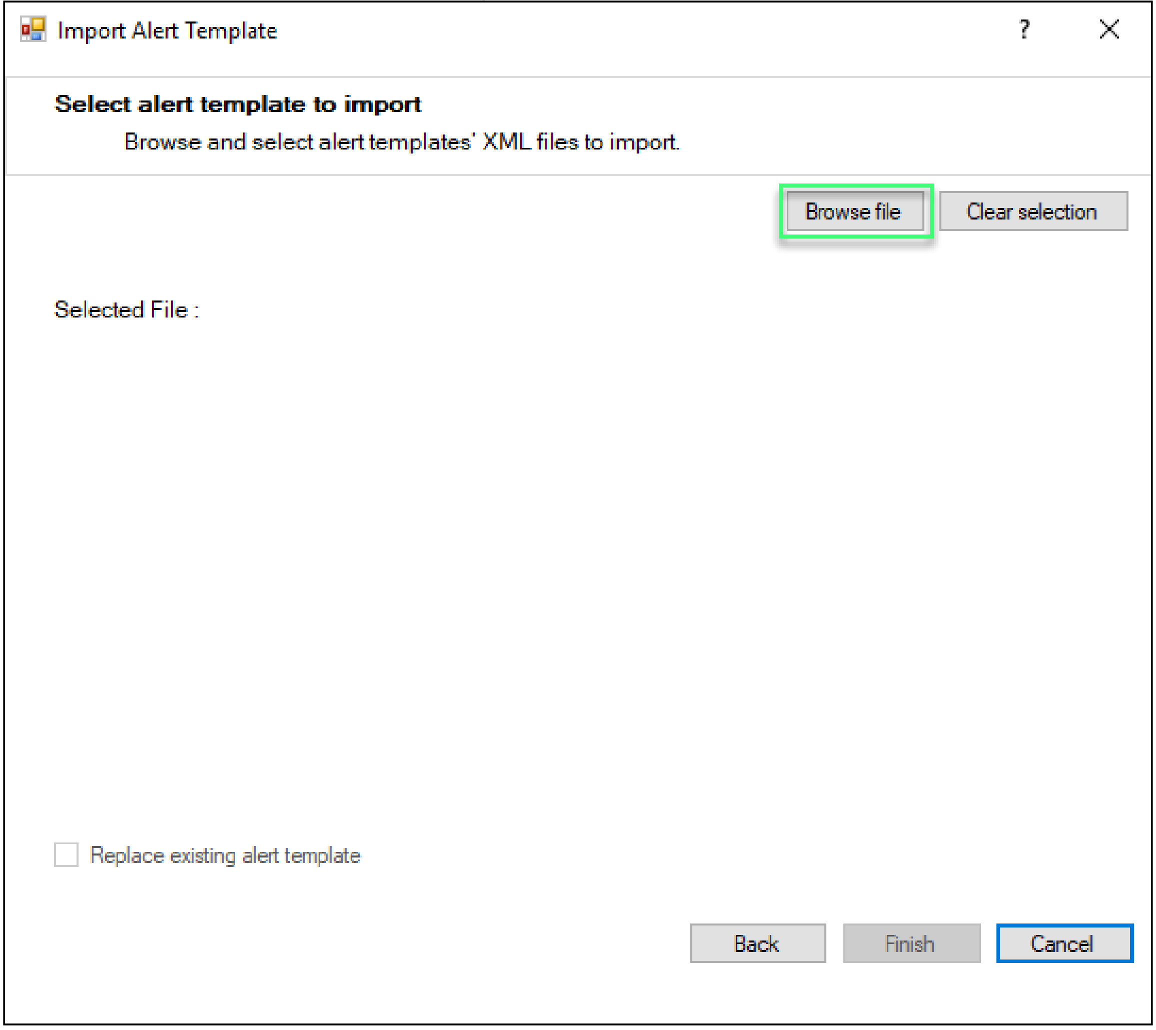
1. Click select **Alert Configuration Templates,** and click **Import**.
2. On the **Welcome to the Alert Template Import Wizard page**, click **Next** to proceed.



The alert template import wizard helps to import already defined alert templates from the IDERA community site.

You can also access the Alert Template import wizard by clicking **Administration > Import/ Export** from the navigation pane and selecting Alert Template in the import column.

3. On the **Select alert template to import** page, browse for alert templates' XML files to import.



Select alert template to import

Browse and select alert templates' XML files to import.

Selected File :

□ Replace existing alert template

4. If the imported alert template is valid, click **Finish** to complete the import process and exit the wizard.
5. If you imported an alert template already in use (same name). You can click **Clear selection** and browse for a new alert template file. Alternatively, if you wish to replace your current alert template with the imported one, select the **Replace existing alert template** check box.
6. If you imported an invalid alert template. You can click **Clear selection** and browse for a new alert template file.
7. Click **Finish** to complete import process or **Back** to modify any settings.

Export an alert template

For instructions on exporting an alert template, see Export an existing template.

Export an existing template

The Alert Templates window allows you to configure generic alert settings that you can apply to servers and groups of servers in your organization. Alert templates save you time and help you to avoid mistakes by simplifying alert configuration across your environment. SQL Diagnostic Manager allows you to export and share an existing alert template in the IDERA community site to suit your needs when alerting on your monitored SQL Server instances.

To export an alert template:

1. Select 🔧 **> Alert Configuration Templates**.
2. Select the template from the list and click **Export**.
3. In the **Save As** dialog box, indicate in which folder and under what name to save the alert template XML file.
4. In the "Selected Alert Template Exported Successfully" notification, click **OK**.

To export all your alert templates at once:

1. Select **Administration > Import/Export** and click **Alert Template** in the export column.
2. In the **Browse For Folder** dialog box, indicate in which folder you want to save the alert templates XML files.
3. Click **OK** in the "Alert templates exported successfully" notification.

Import an alert template

For instructions on importing an alert template, see Import an existing template.

Configure alert template settings

The Alert Template Configuration window allows you to set up the alerts templates for multiple or all SQL Server instances.

> ⚠ Be sure to review a list of the default alert IDs, their descriptions, and associated events before configuring your alerts.

You can set the acceptable thresholds using the following alert types:

Alert Type	Color	Meaning
OK	**Green**	Acceptable threshold where SQL Diagnostic Manager does not generate an alert.
Informational	**Blue**	Informational threshold where SQL Diagnostic Manager generates an informational alert.
Warning	**Yellow**	Warning threshold where SQL Diagnostic Manager generates a warning alert.
Critical	**Red**	Critical threshold where SQL Diagnostic Manager generates a critical alert.

In addition to setting the thresholds for specific alerts, you can customize your alerts by adding comments to each alert, and customize the alert rank based on the users environment and preferences . Comments allow you to include instructions to users when a level reaches a particular threshold or to provide additional information about the alert. You can also customize the levels at which SQL Diagnostic Manager provides alert notifications by changing the informational, warning, and critical values either on the Configuration tab of the Alert Configuration window or, for database- and disk-level alerts, on the Database Threshold Configuration window available by selecting the database or disk.

Also, you can base your alerts on the past performance of the metrics collected by SQL Diagnostic Manager. This is a powerful and effective way to make sure that the alerts you receive are outside of your typical metric ranges.

> ✓ For each alert metric, you can enter the specific criteria by double-clicking the values on the Configuration tab.

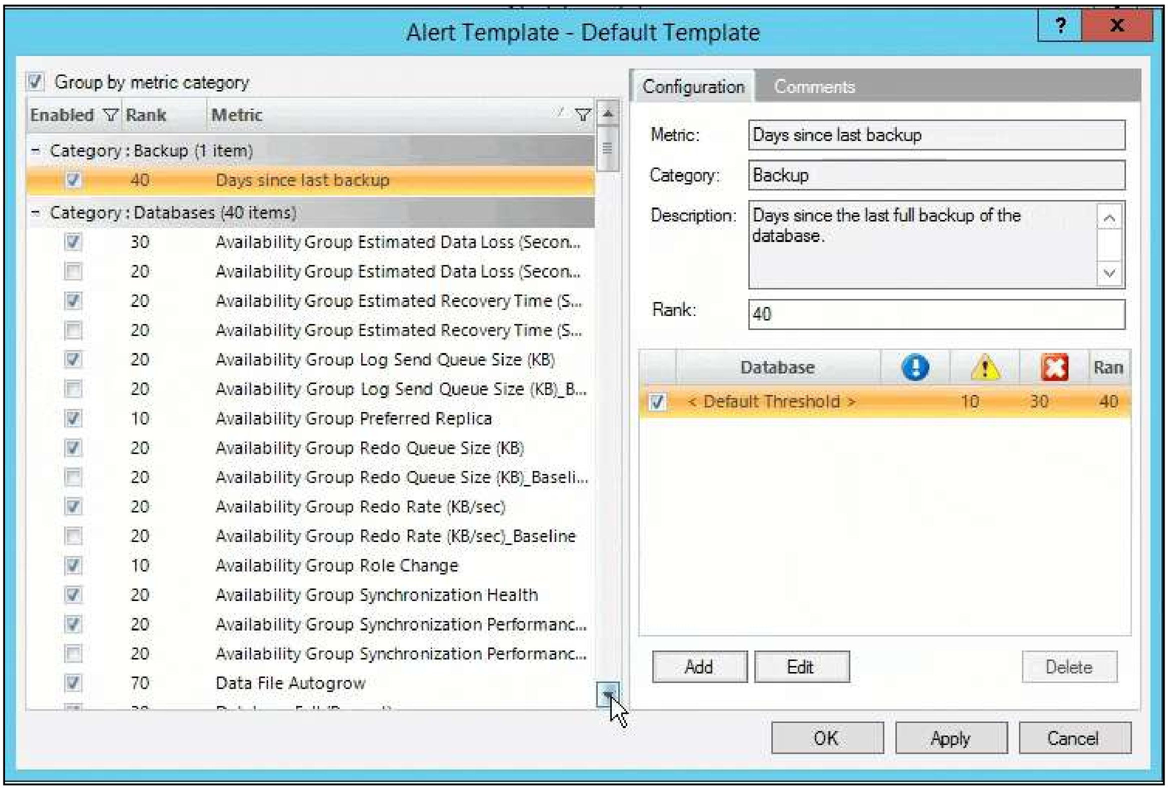
You can add or import custom metrics to your alert configuration by using the Add Custom Counter wizard or the Import Custom Counter Wizard on the Administration window. This dialog allows you to use custom counters to track metrics that SQL Diagnostic Manager begins to monitor. You can select metrics in PerfMon, SQL Server, and even metrics monitored via custom T-SQL script.

To configure the settings for an alert template:

1. Select the metric you want to edit from the list in the Alert Template Configuration window.
2. Check the boxes next to **Informational**, **Warning**, and **Critical** to include alerts for these states.
3. Change the alert thresholds by moving the arrows to the appropriate levels or by double-clicking the value and typing a new threshold level.
4. Select the **Comments** tab and enter information you want displayed in the alert message for this metric.
5. Edit the Rank value if needed.

The Rank value is a global setting, editing this value affects all instances, and not just one template.

6. Click **Apply**.
7. Click **OK** to accept your changes.



☑ Group by metric category

Enabled	Rank	Metric
Category : Backup (1 item)		
☑	40	Days since last backup
Category : Databases (40 items)		
☑	30	Availability Group Estimated Data Loss (Secon...
□	20	Availability Group Estimated Data Loss (Secon...
☑	20	Availability Group Estimated Recovery Time (S...
□	20	Availability Group Estimated Recovery Time (S...
☑	20	Availability Group Log Send Queue Size (KB)
□	20	Availability Group Log Send Queue Size (KB)_B...
☑	10	Availability Group Preferred Replica
☑	20	Availability Group Redo Queue Size (KB)
□	20	Availability Group Redo Queue Size (KB)_Baseli...
☑	20	Availability Group Redo Rate (KB/sec)
□	20	Availability Group Redo Rate (KB/sec)_Baseline
☑	10	Availability Group Role Change
☑	20	Availability Group Synchronization Health
☑	20	Availability Group Synchronization Performanc...
□	20	Availability Group Synchronization Performanc...
☑	70	Data File Autogrow

Metric: Days since last backup

Category: Backup

Description: Days since the last full backup of the database.

Rank: 40

	Database	ℹ	⚠	✖	Ran
☑	< Default Threshold >		10	30	40

Use alert templates in individual databases or disks within an instance

SQL Diagnostic Manager includes the ability to apply some alert thresholds on a per-database or per-disk basis within an instance. When you create an alert template and include one of these alerts, you cannot select which database or disk to apply the alert to because that is unknown in a template. For that reason, these alerts apply to all databases and disks within the instance to which it is applied. For additional information, see Configure database thresholds or Configure disk thresholds.

About informational alerts

Informational alerts allow you to set a threshold that, when generated, triggers a status that does not affect the overall status of the server within SQL Diagnostic Manager. You can use informational alerts to notify an administrator of the state of a particular metric for a server or trigger secondary processes that could take action to prevent issue escalation.

Note that for certain metrics, using the informational alert means that you no longer receive a warning or critical alert for events generated by that metric. Please review the situation before setting up an informational alert.

Configure database thresholds

The Database Threshold Configuration dialog allows you to set alert thresholds for selected databases on your SQL Server instance. Not all alerts are available for database-specific application. The following alerts include database-specific settings:

- Database Full (Percent)
- Database Full (Size)
- Log Full (Percent)
- Log Full (Size)

Use the **Advanced** button to set how and when alerts are raised by limiting the number of alerts and notifications generated.

To add a database for specific alert configuration:

1. Right-click a SQL Server instance in the Servers sidebar.
2. Select **Configure Alerts**.
3. Select the database-specific metric you want to edit from the list in the **Alert Configuration** window.
4. On the Configuration tab, click **Add**.
5. Select the database from the available drop-down list.
6. Make the appropriate changes to your alert configuration for this database, and then click **OK**. SQL Diagnostic Manager now displays that database in the list on the Configuration tab.
7. Click **OK** to accept your changes.

To edit the alert threshold configuration for a database:

1. Right-click a SQL Server instance in the Servers sidebar.
2. Select **Configure Alerts**.
3. Select the database-specific metric you want to edit from the list in the **Alert Configuration** window.
4. On the Configuration tab, click the database you want to configure, and then click **Edit**.
5. Change the alert thresholds by moving the arrows to the appropriate levels or by double-clicking the value and typing a new threshold level, and then click **OK**.
6. Click **Apply**.
7. ***If you want SQL Diagnostic Manager to replicate your edits to other monitored SQL Server instances, tags, or templates,*** click **Yes**.
8. In the Select Modification Targets dialog, select the templates, tags, or instances you want to include, and then click **OK**.
9. Click **OK** to accept your changes.

To delete the alert threshold configuration for a database:

1. Right-click a SQL Server instance in the Servers sidebar.
2. Select **Configure Alerts**.
3. Select the metric from which you want to remove the specific database from the list in the **Alert Configuration** window.
4. On the Configuration tab, click the database you want to delete, and then click **Delete**.
5. Click **Yes** in the confirmation window.
6. Click **Apply**.
7. ***If you want to delete the same database from any other SQL Server instances, tags, or templates***, click **Yes.**
8. In the Select Modification Targets dialog, select the templates, tags, or instances you want to apply the same modification, and then click **OK**.
9. Click **OK** to accept your changes.

Configure disk thresholds

The Disk Threshold Configuration dialog allows you to set alert thresholds for selected disks on your SQL Server instance. Not all alerts are available for applying disk-specific thresholds. The following alerts include disk-specific settings:

- OS Disk Free Space (Size)
- OS Disk Full (Percent)

Use the **Advanced** button to set how and when alerts are raised by limiting the number of alerts and notifications generated.

To add a disk for specific alert configuration:

1. Right-click a SQL Server instance in the Servers sidebar.
2. Select **Configure Alerts**.
3. Select the disk-specific metric you want to edit from the list in the **Alert Configuration** window.
4. On the Configuration tab, click **Add**.
5. Select the disk from the available drop-down list.
6. Make the appropriate changes to your alert configuration for this disk, and then click **OK**. SQL Diagnostic Manager now displays that disk in the list on the Configuration tab.
7. Click **OK** to accept your changes.

To edit the alert threshold configuration for a disk:

1. Right-click a SQL Server instance in the Servers sidebar.
2. Select **Configure Alerts**.
3. Select the disk-specific metric you want to edit from the list in the **Alert Configuration** window.
4. On the Configuration tab, click the disk you want to configure, and then click **Edit**.
5. Change the alert thresholds by moving the arrows to the appropriate levels or by double-clicking the value and typing a new threshold level, and then click **OK**.
6. Click **Apply**.
7. ***If you want SQL Diagnostic Manager to replicate your edits to every monitored SQL Server instance***, click **Yes**, select the instances you want to include, and then click **OK**.
8. Click **OK** to accept your changes.

To delete the alert threshold configuration for a disk:

1. Right-click a SQL Server instance in the Servers sidebar.
2. Select **Configure Alerts**.
3. Select the metric from which you want to remove the specific disk from the list in the **Alert Configuration** window.
4. On the Configuration tab, click the disk you want to delete, and then click **Delete**.
5. Click **Yes** in the confirmation window.
6. Click **Apply**.
7. ***If you want to delete the same disk from any other SQL Server instance SQL Diagnostic Manager is monitoring***, click **Yes**, select the instances you want to include, and then click **OK**.
8. Click **OK** to accept your changes.

Set advanced alert options

The Advanced Alert Settings window allows you to control how and when alerts are raised by limiting the number of alerts and notifications that are generated.

Alert Duration

Alert duration allows you to select the total time an alert is raised for an event.

Alert Suppression

Alert suppression allows you to select the amount of time SQL Diagnostic Manager waits before alerting on a metric that has exceeded threshold limits.

Alert Filters

Alert filters allows you to select:

- Filter out alerts:
  - Minimum Version Store Size that should be reach before an alert is raised.
  - Minimum Version Store Generation Rate at which an alert should be generated.
- Disk drive exclusions to exclude one or more disk drives from triggering an alert
- Text and regular expressions to exclude certain words and expressions from triggering an alert

Autogrow Settings

Autogrow settings allows you to select whether you want SQL Diagnostic Manager to take auto growth into account when calculating the remaining space available.

Database Exclusions

Database exclusions allows you to select the databases you want to exclude from database alerts.

Job Exclusions

Job exclusions allows you to select both the jobs and job categories you want to exclude from job alerts.

Sessions Exclusions

Sessions exclusions allows you to select the applications, host servers, and users you want to exclude from job alerts.

Custom Counters

Custom counters allows you to select whether SQL Diagnostic Manager generates an alert when a custom counter is not collected.

Configure a custom response when an alert is generated by SQL Diagnostic Manager

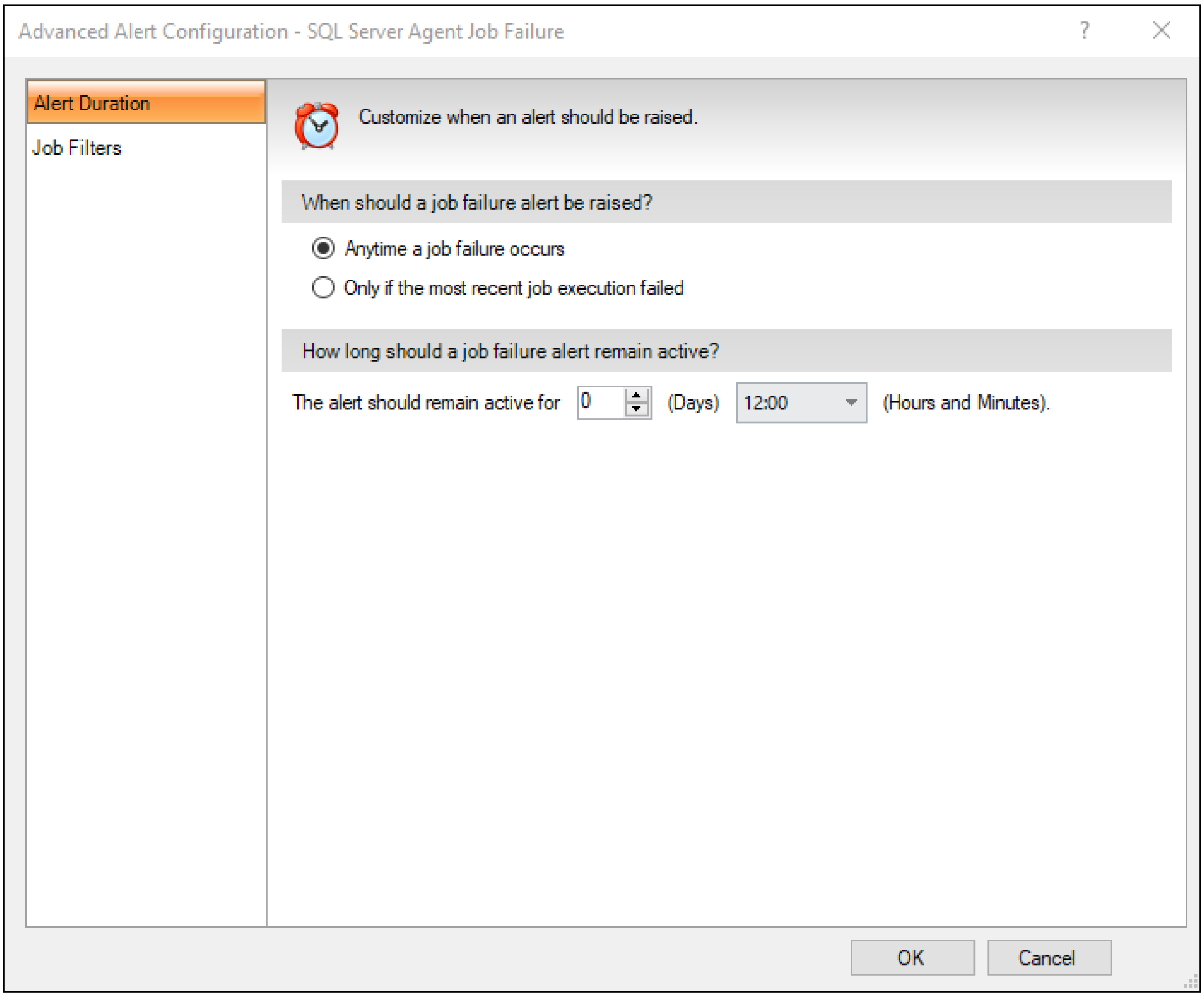
SQL Diagnostic Manager allows you to configure when and how alert responses are generated. You can select from the following alert responses (providers):

- Send an email to a person or group of people
- Log an event in the Windows Event Log
- Enable the Query Monitor
- Execute a program or utility
- Send an event to your Network Management tool
- Execute a SQL Agent Job
- Execute a Script
- Create a To Do (Note that beginning with SQL Diagnostic Manager 7.0, the To Do feature is available only to users who had To Do activated in an earlier 6.x version. This version of SQL Diagnostic Manager does not support this feature for new users.)

To configure a custom response when an alert is generated, select 🔧 **> Alert Actions and Responses** from the console toolbar.

Configure alert duration

SQL Diagnostic Manager allows you to determine the total time an alert is raised for an event occurring on a specified SQL Server instance. The Alert Duration tab of the Advanced Alert Configuration window provides a page for you to enter the duration of the alert in hours and minutes. For the SQL Server Agent Job Failure metric, you can specify whether you want SQL Diagnostic Manager to trigger the alert each time any job fails or to raise an alert only upon the failure of the most recently-executed job.



Customize when an alert should be raised.

When should a job failure alert be raised?

● Anytime a job failure occurs

○ Only if the most recent job execution failed

How long should a job failure alert remain active?

The alert should remain active for 0 (Days) 12:00 (Hours and Minutes).

The metrics that allow for specifying alert duration include the following:

- SQL Server Agent Job Completion
- SQL Server Agent Job Failure
- SQL Server Agent Long Running Job (Minutes)
- SQL Server Agent Long Running Job (Percent)

To use ad hoc Alert Configuration to enter how long a job alert remains active:

1. In the Navigation page, click **Servers**.
2. Right-click the appropriate SQL server instance, and then select **Configure Alerts**.

3. Select the metric for which you want to configure an alert.
4. Click **Advanced**.
5. Click **Alert Duration**.
6. Type or use the selection window to enter the alert duration in hours and minutes.
7. Click **OK**.
8. To accept these changes, click **OK**.

To use Alert Configuration templates to enter how long a job alert remains active:

1. Click 🔧 **> Alert Configuration Templates**.
2. Click **New** or select an existing template, and click **View/Edit**.
3. ***If you clicked*** **New**, type a name, and click **Edit Configuration**.
4. ***If you clicked*** **View/Edit**, click **Edit Configuration**.
5. Select the metric for which you want to configure an alert.
6. Click **Advanced**.
7. Click **Alert Duration**.
8. ***If you selected the SQL Server Agent Job Completion, SQL Server Agent Long Running Job (Minutes), or SQL Server Agent Long Running Job (Percent) metric***, continue with the next step. ***If you selected the SQL Server Agent Job Failure metric***, select **Anytime a job failure occurs** to trigger an alert each time a job failure occurs or select **Only if the most recent job execution failed** if you want to raise an alert only when the most recently-executed job fails.
9. Type or use the selection window to enter the alert duration in hours and minutes.
10. Click **OK**.

Configure alert suppression

In certain environments, it is acceptable for some metrics to exceed the configured alert thresholds for very short periods of time, for example one refresh. Typically these exceptions last less than a minute. If you are monitoring many SQL Server instances or if the amount of data collected is very high, this could produce a significant number of alerts. The Advanced Alert Configuration window allows you to limit the number of these alerts that are generated by letting you input the number of minutes a threshold violation occurs before an alert is raised, reducing the amount of alert "noise" you receive.

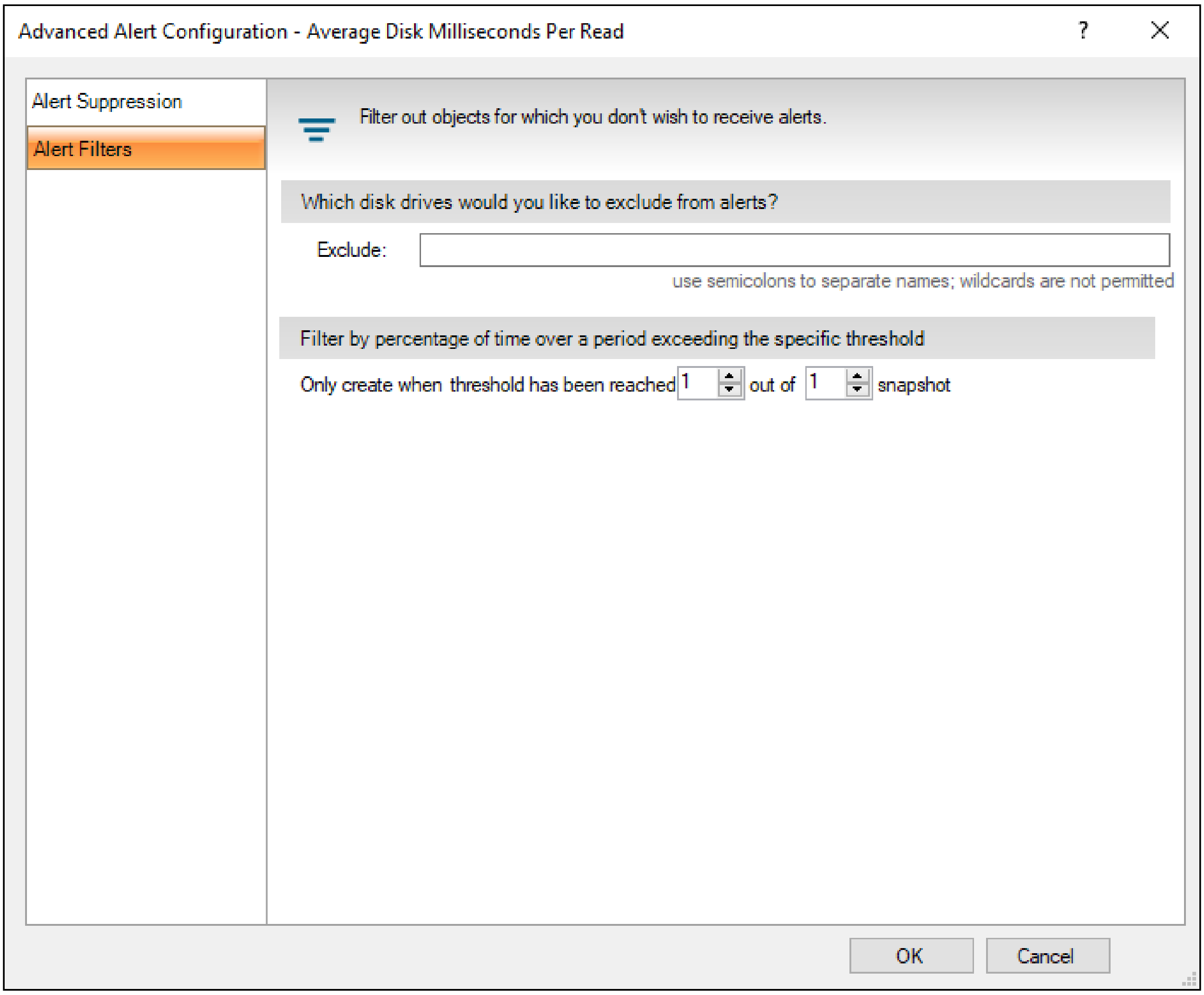
The amount of time you enter here depends on how critical the metric is in your environment and the amount of time SQL Diagnostic Manager waits between refreshes. If you enter a time less than that of the refresh, the second consecutive refresh where the alert is outside the acceptable threshold range prompts the alert.

The following table displays the length of time SQL Diagnostic Manager waits before an alert is raised when the scheduled refresh occurs every six minutes and various values are entered:

Time entered on the Advanced Alert Configuration window	Alert is generated
1-5 minutes	Second Refresh occurs six minutes after the first encounter of the problem
6-11 minutes	Third Refresh occurs 18 minutes after the first encounter of the problem
12-17 minutes	Fourth Refresh occurs 24 minutes after the first encounter of the problem

Configure alert filters - disk drive exclusions

By default, certain metrics include all drives within a specific SQL Server instance when monitoring for events that can trigger an alert. The Alert Filters tab of the Advanced Alert Configuration window allows you to select one of more disk drives to exclude from alerting on the selected metric.



Advanced Alert Configuration - Average Disk Milliseconds Per Read

Filter out objects for which you don't wish to receive alerts.

Which disk drives would you like to exclude from alerts?

Exclude:

use semicolons to separate names; wildcards are not permitted

Filter by percentage of time over a period exceeding the specific threshold

Only create when threshold has been reached 1 out of 1 snapshot

The alerts that allow for disk drive exclusions include the following:

- Average Disk Milliseconds Per Read
- Average Disk Milliseconds Per Transfer
- Average Disk Milliseconds Per Write
- Disk Reads Per Second
- Disk Transfers Per Second
- Disk Writes Per Second
- OS Average Disk Queue Length Per Disk (Count)
- OS Disk Free Space (Size)
- OS Disk Full (Percent)
- OS Disk Time Per Disk (Percent)

To use ad hoc Alert Configuration to exclude disk drives from an alert:

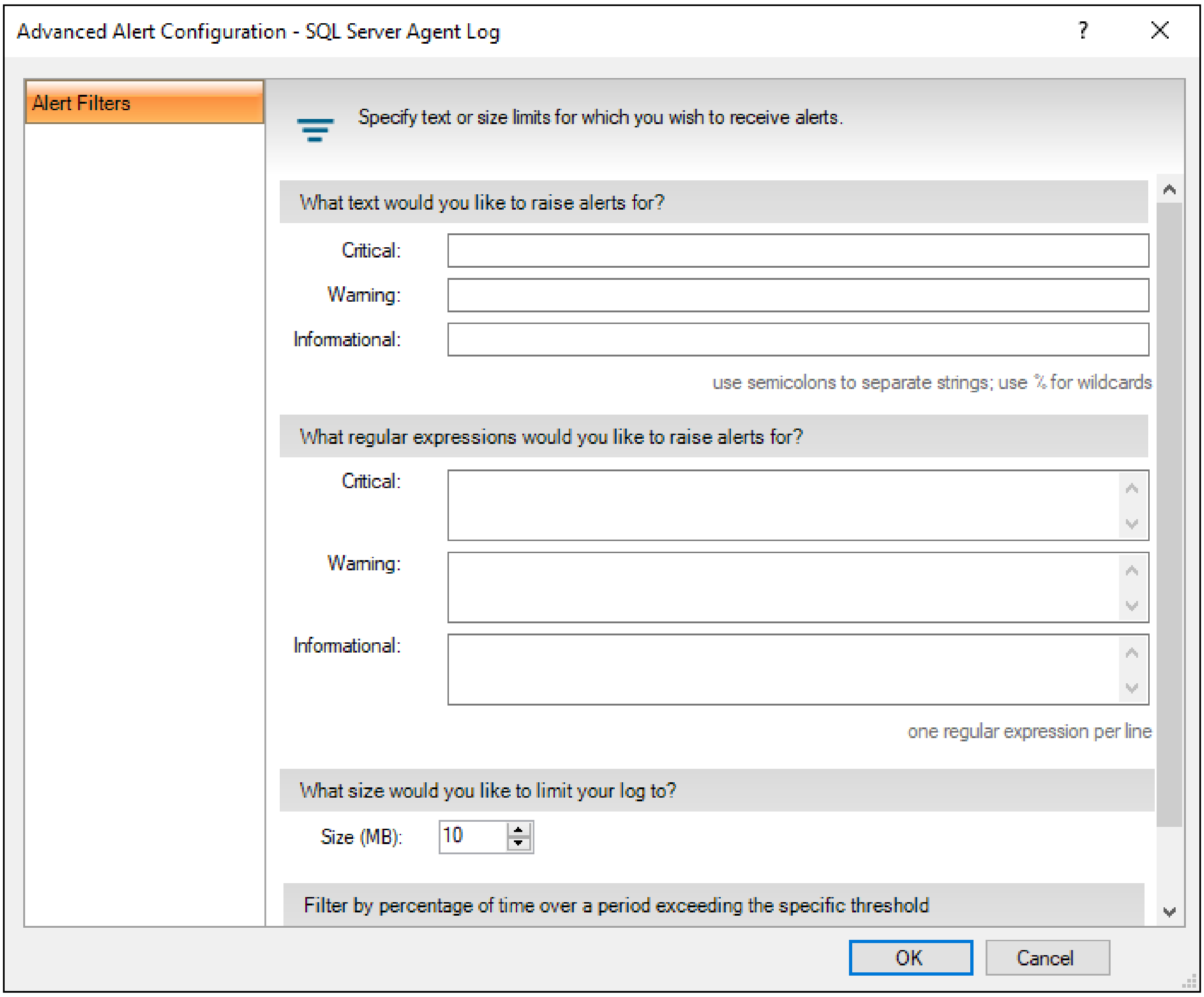
1. Right-click the appropriate SQL server instance, and select **Configure Alerts**.
2. Select the metric for which you want to configure an alert.
3. Select the appropriate disk, **Edit**, and click **Advanced**.
4. Click the Alert Filters tab.
5. Type one or more disk drives to exclude from alerts.
6. Click **OK**.

To use Alert Configuration Templates to exclude disk drives from an alert:

1. Click 🔧 and select **Alert Configuration Templates**.
2. Click **New** or select an existing template, and then click **View/Edit**. When you click **New**, type a name, and click **Edit Configuration**.
3. Click **View/Edit** , click **Edit Configuration**.
4. Select the metric for which you want to configure an alert.
5. Select the appropriate disk, **Edit** , and click **Advanced**.
6. Click the Alert Filters tab.
7. Type the name of the disk drives you want to exclude from alerts. Use semicolons to separate names and do not use wildcard characters.
8. Click **OK**.

Configure text and expression alerts

SQL Server Agent Log and SQL Server Error Log metrics allow users to trigger an alert based on certain text or regular expressions. SQL Diagnostic Manager provides different levels of alerts so you can select whether you want to generate a critical, warning, or informational alert based on your entered data. You can also limit the size of your logs to decrease your response time and avoid using additional space on your server.


Advanced Alert Configuration - SQL Server Agent Log

Alert Filters

Specify text or size limits for which you wish to receive alerts.

What text would you like to raise alerts for?

Critical:

Warning:

Informational:

use semicolons to separate strings; use % for wildcards

What regular expressions would you like to raise alerts for?

Critical:

Warning:

Informational:

one regular expression per line

What size would you like to limit your log to?

Size (MB): 10

Filter by percentage of time over a period exceeding the specific threshold

To use ad hoc Alert Configuration to enter text or a regular expression to trigger an alert:

1. Right-click the appropriate SQL Server instance, and select **Configure Alerts**.
2. Select the metric for which you want to configure an alert.
3. Click **Advanced**.
4. Under ***What text would you like to raise alerts for?*** Type the text in the appropriate field. Use semicolons to separate names and a percent (%) character as a wildcard.
5. Under ***What regular expressions would you like to raise alerts for?*** Type the expression in the appropriate field. Type only one regular expression per line.
6. Click **OK**.

To use Alert Configuration Templates to enter text or a regular expression to trigger an alert:

1. Click 🔧 and select **Alert Configuration Templates**.
2. Click **New** or select an existing template, and then click **View/Edit**.
3. ***If you clicked* New** , type a name, and then click **Edit Configuration**.
4. ***If you clicked* View/Edit** , click **Edit Configuration**.
5. Select the metric for which you want to configure an alert.
6. Click **Advanced**.
7. Under ***What text would you like to raise alerts for?*** Type the text in the appropriate field. Use semicolons to separate names and a percent (%) character as a wildcard.
8. Under ***What regular expressions would you like to raise alerts for?*** Type the expression in the appropriate field. Type only one regular expression per line.
9. Click **OK**.

Limit the size of a log that SQL Diagnostic Manager reads

In an attempt to improve response time and avoid using unnecessary space on your server, you can designate the maximum size of your SQL Server Agent log and your SQL Server Error log that SQL Diagnostic Manager reads. When a log reaches the size limit set in the Alert Configuration, it triggers an alert. SQL Diagnostic Manager does not display in the Logs view any data from error or agent logs in excess of the size limit. A quick solution to decrease the size of your file is to click Cycle Server Log to archive the information in the most recent log and start a new log. You can also cycle the log using SSMS.

> Before cycling your log, it is important to note that if you have a limit set, then the log file deleted is the oldest log file stored. If you want to keep that log file, copy the file elsewhere before cycling the log.

> SQL Server 2000 users also must restart the SQL Server Agent Service after cycling the SQL Server Agent log. The only way to cycle the agent log on SQL Server is to cycle the agent service. This process results in a new log.

To adjust the log size limit that SQL Diagnostic Manager reads:

1. View the Alert Configuration for your monitored SQL Server instance.
2. Select either the **SQL Server Agent Log** or the **SQL Server Error Log** alert, and click **Advanced**.
3. In the Alert Filters tab, adjust the **Size (MB)** field based on what you want for your log size limit.
4. Click **OK**, and then click **Apply**.
5. Click **OK** in the confirmation message if you want to apply your change to any other SQL Server instances, or click **No.**

Configure size remaining

SQL Server can automatically expand a database or log when necessary based on a set of parameters. The Autogrow Settings tab of the Advanced Alert Configuration window allows you to specify whether you want to take this autogrowth into account when calculating the remaining space available.

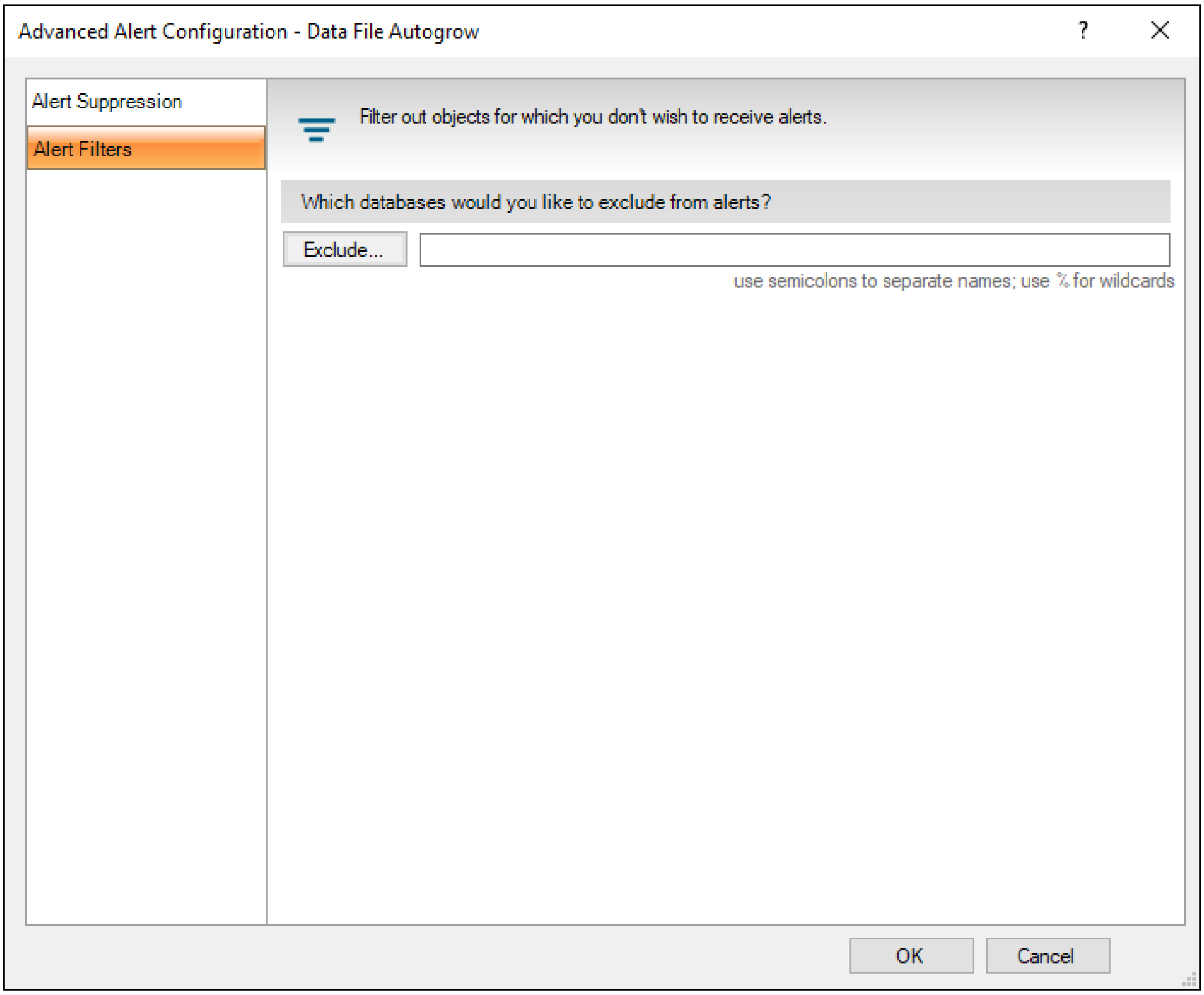
SQL Diagnostic Manager allows you to select whether to trigger an alert based on the current database or log used size divided by the maximum possible size. Click **Yes, alert on the current used size divided by the maximum possible size** on the Autogrow Settings page to set the alert to include auto grow or click **No, alert on the current used size divided by the current file size** if you do not want to take SQL Server auto-growth into consideration.

Understanding the downside of Auto-grow

You can avoid unnecessary long reads and poor response time from SQL Server by minimizing the number of autogrow events occurring in your environment. Each time an auto-growth event occurs, SQL Server holds up database processing while looking for disk space for the additional data. Usually this new space is not adjacent to the existing space and causes physical disk fragmentation. As more and more auto-growth events occur, the more the disk becomes fragmented, leading to longer periods while SQL Server reads the databases.

Configure alert filters - database exclusions

The Alert Filters tab of the Advanced Alert Configuration window allows you to select databases to exclude from alerting on the selected metric. You can limit the amount of alert noise generated for very small databases, which tend to report a high fragmentation rate, or databases that are in single user mode and are usually in use.



Advanced Alert Configuration - Data File Autogrow

Filter out objects for which you don't wish to receive alerts.

Which databases would you like to exclude from alerts?

use semicolons to separate names; use % for wildcards

The alerts that allow for database exclusions include the following:

- Data File Autogrow
- Database Full (Percent)
- Database Full (Size)
- Database Status
- Days since last backup
- Filegroup Space Full (Percent)
- Filegroup Space Full (Size)
- Log File Autogrow
- Log Full (Percent)
- Log Full (Size)

- Table Fragmentation (Percent)

Access the Alert Filters tab of the Alert Configuration window

1. Right-click the SQL Server instance you want to manage and then select **Configure Alerts**.
2. Select the alert you want to configure.
3. ***If the alert is database-specific*** , select the appropriate database, click **Edit**, and select **Advanced.** If the alert is not database-specific, click **Advanced**.
4. Click the Alert Filters tab.

Exclude a database from an alert

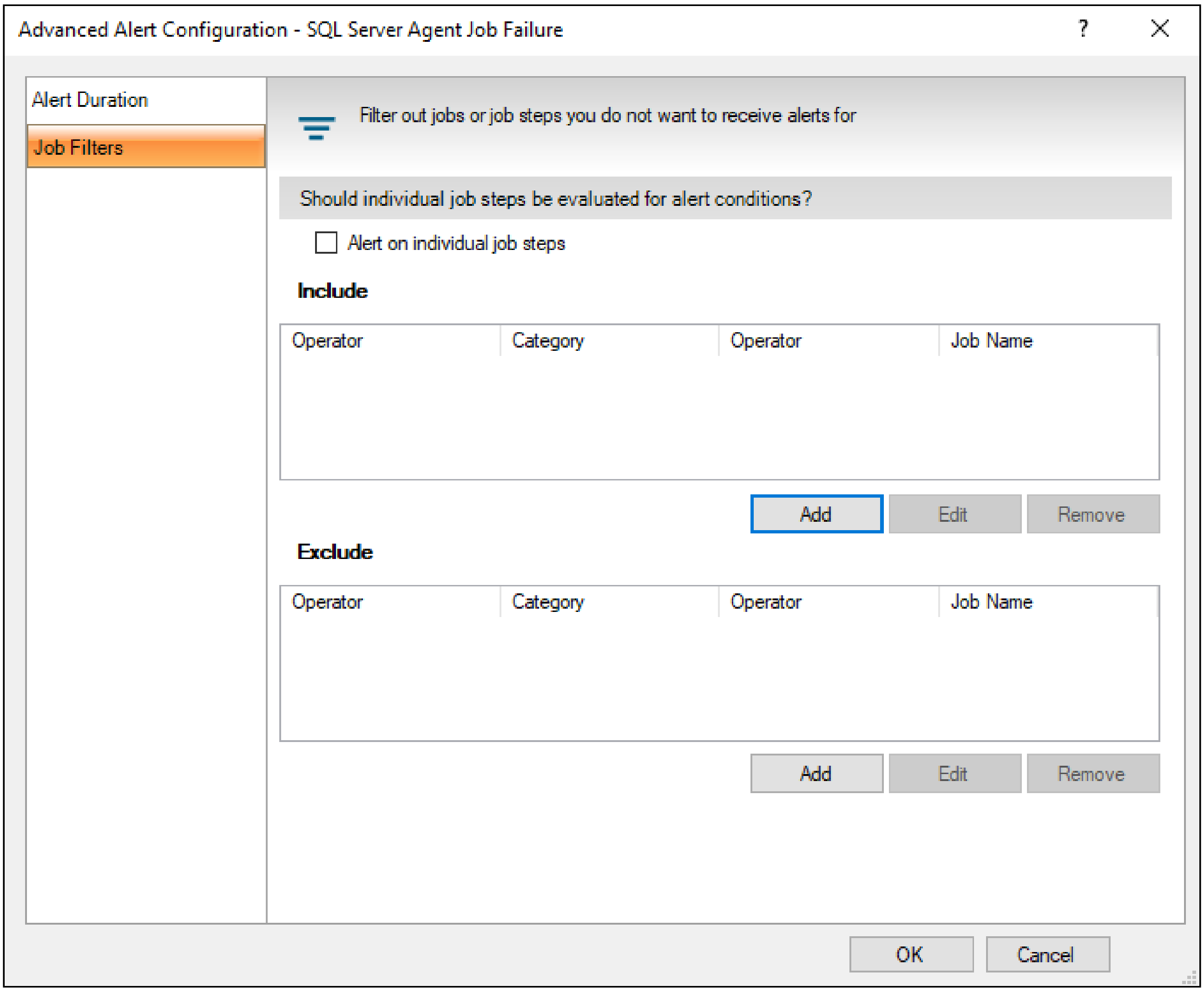
You can select one or more databases to exclude from alerting on the selected metric.

1. Access the Alert Filters tab using the previous steps.
2. Click **Exclude**.
3. Select one or more databases from the list and click **Exclude**.
4. Click **OK**.
5. To accept these changes, click **OK**.

Configure job exclusions

The Alert Filters tab of the Advanced Alert Configuration window allows you to select jobs or job categories to include or exclude from alerting for the specified metric. Filtering allows you to limit the amount of alert noise generated for SQL Server Agent Jobs or Job categories that, for example, are known to run for a long time.

By default, SQL Diagnostic Manager alerts on all Jobs. If you check the **Alert on individual job steps** box, all job steps generate alerts. Using the Include filter limits job alerts to only those SQL Server Agent Job steps that apply to the filter. The Exclude filter limits the job alerts to every SQL Server Agent Job step except for those included in the Exclude filter.


Advanced Alert Configuration - SQL Server Agent Job Failure

Filter out jobs or job steps you do not want to receive alerts for

Should individual job steps be evaluated for alert conditions?

□ Alert on individual job steps

The metrics that allow for SQL Server Agent Job exclusions include the following:

- SQL Server Agent Job Completion
- SQL Server Agent Job Failure
- SQL Server Agent Long Running Job (Minutes)
- SQL Server Agent Long Running Job (Percent)

To filter SQL Server Agent Job alerts:

1. Open the Alert Configuration window and select the alert you want to configure.
2. Click **Advanced**.
3. Select the **Job Filters** tab.
4. Check the **Alert on individual job steps** box if you would like an alert for each step in each job.
5. Click the **Add** button under the Include or Exclude filters.
6. Enter the **Job Name** or **Job Categories** to include or exclude and click **OK**. Use the percent symbol (%) as a wildcard.
7. Click **OK** to apply your changes.

You can set thresholds for the SQL Server Agent Long Running Job (Minutes) and SQL Server Agent Long Running Job (Percent) metrics on your SQL Server instance.

To add a job for specific alert configuration:

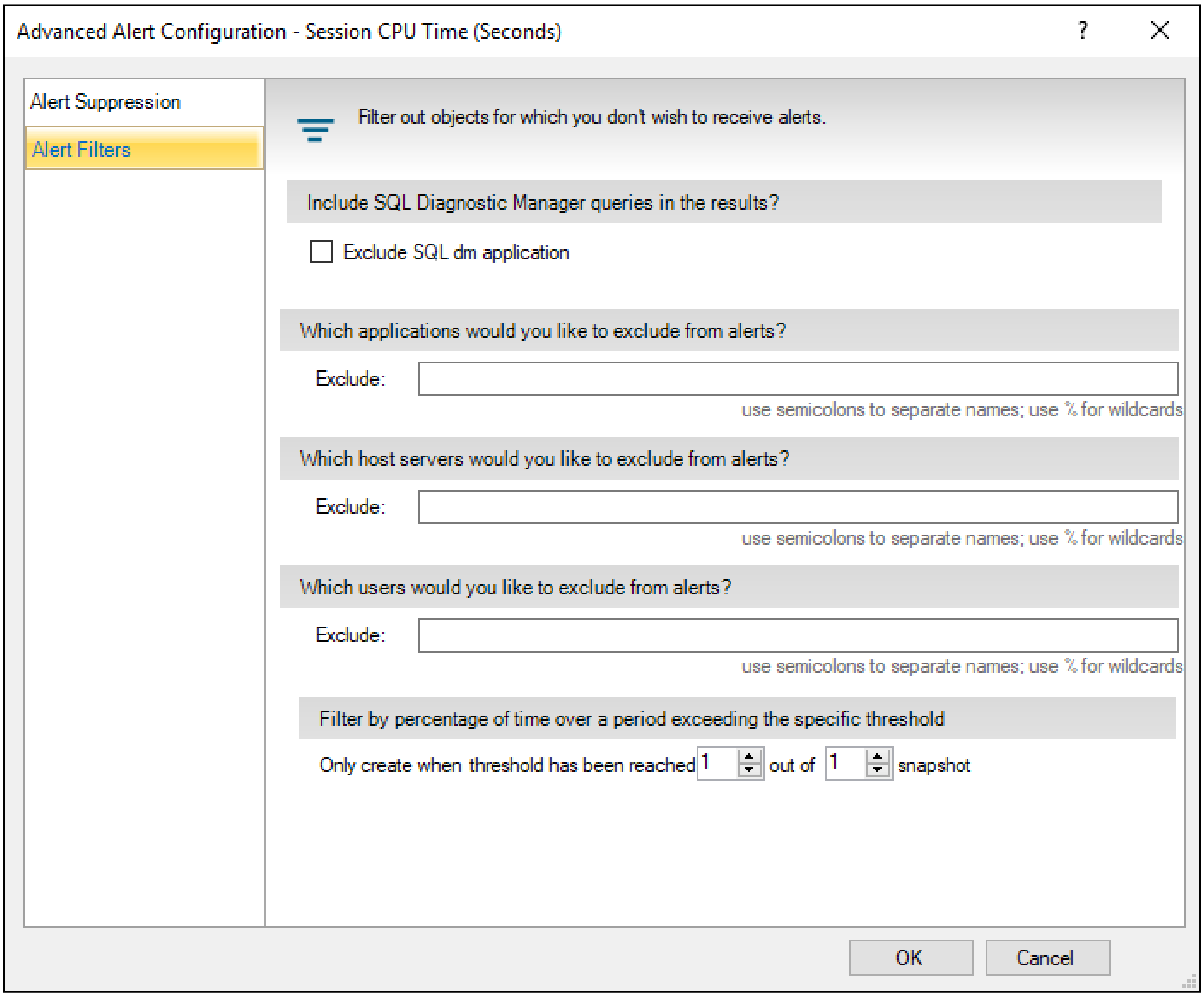
1. Right-click a SQL Server instance in the Servers sidebar.
2. Select **Configure Alerts**.
3. Select the job-specific metric you want to edit from the list in the Alert Configuration window.
4. On the Configuration tab, click **Add**.
5. Specify or select the job name.
6. Make the appropriate changes to your alert configuration for this job, and click **OK.** SQL Diagnostic Manager now displays the job in the list on the Configuration tab.

Follow these steps to edit the alert threshold configuration for a job:

1. Right-click a SQL Server instance in the Servers sidebar.
2. Select **Configure Alerts**.
3. Select the job-specific metric you want to edit from the list in the Alert Configuration window.
4. On the Configuration tab, select the job you want to configure, and click **Edit**.
5. Change the alerts thresholds by moving the arrows to the appropriate level or by entering new values of the threshold level on the Job Threshold Configuration window.
6. Click **OK**.

Configure session exclusions

The Advanced Alert Configuration window allows you to exclude applications, host servers, and users from the selected alert. You can limit the amount of alert noise generated by known applications, power users, or even a whole list of power users, such as a development team, that commonly exceed your alert thresholds.



Advanced Alert Configuration - Session CPU Time (Seconds)

Alert Suppression
Alert Filters

Filter out objects for which you don't wish to receive alerts.

Include SQL Diagnostic Manager queries in the results?

□ Exclude SQL dm application

Which applications would you like to exclude from alerts?

Exclude:

use semicolons to separate names; use % for wildcards

Which host servers would you like to exclude from alerts?

Exclude:

use semicolons to separate names; use % for wildcards

Which users would you like to exclude from alerts?

Exclude:

use semicolons to separate names; use % for wildcards

Filter by percentage of time over a period exceeding the specific threshold

Only create when threshold has been reached 1 out of 1 snapshot

The metrics that allow for session exclusions include the following:

- Blocking Session Wait Time (Seconds)
- Oldest Open Transaction (Minutes)
- Session CPU Time (Seconds)

To configure session exclusions:

1. Open the Alert Configuration window and select the alert you want to configure.
2. Click **Advanced**.
3. Enter the applications, host servers, and users you want to exclude from the alert using % for wildcards and semicolons to separate application names.
4. Click **OK** to save your configuration.

Configure custom counter suppression

The Advanced Alert Configuration window allows you to select whether you want an alert created when SQL Diagnostic Manager cannot collect a custom counter. Preventing an alert when you cannot collect the custom counter eliminates any potential noise the alert could generate.

> ✓ If a custom counter collection fails, it is included in a critical summary alert that lists all the custom counters that it could not collect.

Add or edit job filter

The Add Job Filter or Edit Job Filter window allows you to create or edit a filter to determine when you want a SQL Server Agent job condition to raise an alert.

Access the add or edit job filters

To access the Add Job Filter or Edit Job Filter window:

1. Right-click a SQL Server instance in the Servers tree.
2. Select **Configure Alerts**.
3. Select one of the following alerts:

- SQL Server Agent Job Completion
- SQL Server Agent Job Failure
- SQL Server Agent Long Running Job (Minutes)
- SQL Server Agent Long Running Job (Percent)

- Click **Advanced**, and select **Job Filters**.
- Click **Add** or **Edit** in either the Include or Exclude list.

Use the Job Filters tab

The Job Filters tab allows you to include or exclude a job by job category, name, or step name if you check **Alert on individual job steps**.

To add a job filter:

1. Select **Like** or **Equals** in the Operator drop-down window for either the Job Category, Job Name, or Step Name field.
2. Enter the value to filter the job for in the Value field or click the **Browse** button to browse for the object you want to filter.

   ✓ Use the percent symbol (%) as a Wildcard.

3. Click **OK**.

   ⚠ The Browse button is only available when adding or editing job step filters for a single SQL Server instance.

Alert value configuration

The Value Configuration window allows you to select whether you receive an alert for a particular event based on the selected level for that event. For example, if you select the Critical alert level for **Offline** for Database Status, you receive a Critical Level alert if the Database is ever offline. The alerts are available as shown in the following image.

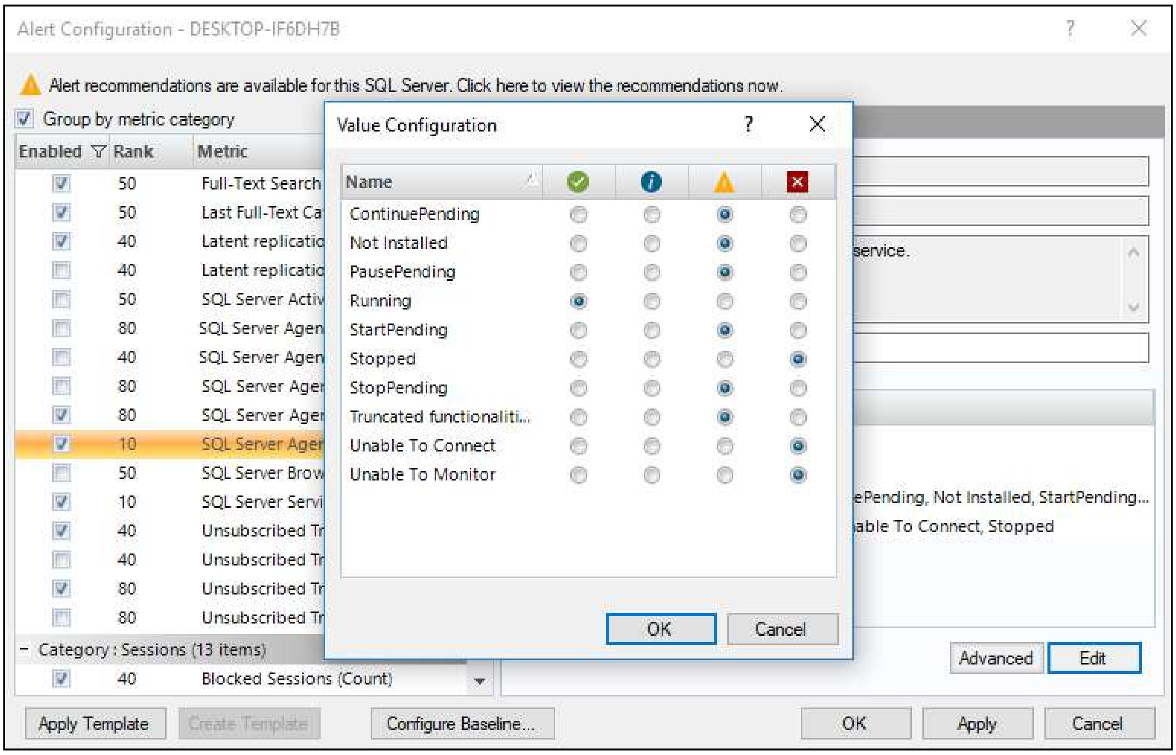
Alert Level	**Description**
✓	The selected metric is in an OK state.
❗	The selected metric is in an Informational state.
⚠	The selected metric is in a Warning state.
✖	The selected metric is in a Critical state.

Access the Value Configuration window

SQL Diagnostic Manager displays the Value Configuration window when you attempt to edit values for certain metrics.

To access the Value Configuration window:

1. Right-click a monitored SQL Server instance, and then select **Configure Alerts**.
2. In the Alert configuration window, select one of the following metrics:
   - Database Status
   - Mirroring Status
   - OS Metrics Collection Status
   - DTC Status
   - Full-Text Search Status
   - SQL Server Agent Status
   - SQL Server Status
   - SQL Server Agent Job Completion
   - Host Power State
   - VM Power State
3. Click **Edit**.



Alert Configuration - DESKTOP-IF6DH7B

Alert recommendations are available for this SQL Server. Click here to view the recommendations now.

☑ Group by metric category

Enabled	Rank	Metric
☑	50	Full-Text Search
☑	50	Last Full-Text Ca
☑	40	Latent replicatio
□	40	Latent replicatio
□	50	SQL Server Activ
□	80	SQL Server Agen
□	40	SQL Server Agen
□	80	SQL Server Ager
☑	80	SQL Server Ager
☑	10	SQL Server Ager
□	50	SQL Server Brow
☑	10	SQL Server Servi
☑	40	Unsubscribed Tr
□	40	Unsubscribed Tr
☑	80	Unsubscribed Tr
□	80	Unsubscribed Tr
− Category : Sessions (13 items)		
☑	40	Blocked Sessions (Count)

Value Configuration

Name	✓	i	⚠	✕
ContinuePending	○	○	●	○
Not Installed	○	○	●	○
PausePending	○	○	●	○
Running	●	○	○	○
StartPending	○	○	●	○
Stopped	○	○	○	●
StopPending	○	○	●	○
Truncated functionaliti...	○	○	●	○
Unable To Connect	○	○	○	●
Unable To Monitor	○	○	○	●

service.

ePending, Not Installed, StartPending...

able To Connect, Stopped

About informational alerts

Informational alerts allow you to set a threshold that, when generated, triggers a status that does not affect the overall status of the server within SQL Diagnostic Manager. You can use informational alerts to notify an administrator of the state of a particular metric for a server or trigger secondary processes that could take action to prevent issue escalation.

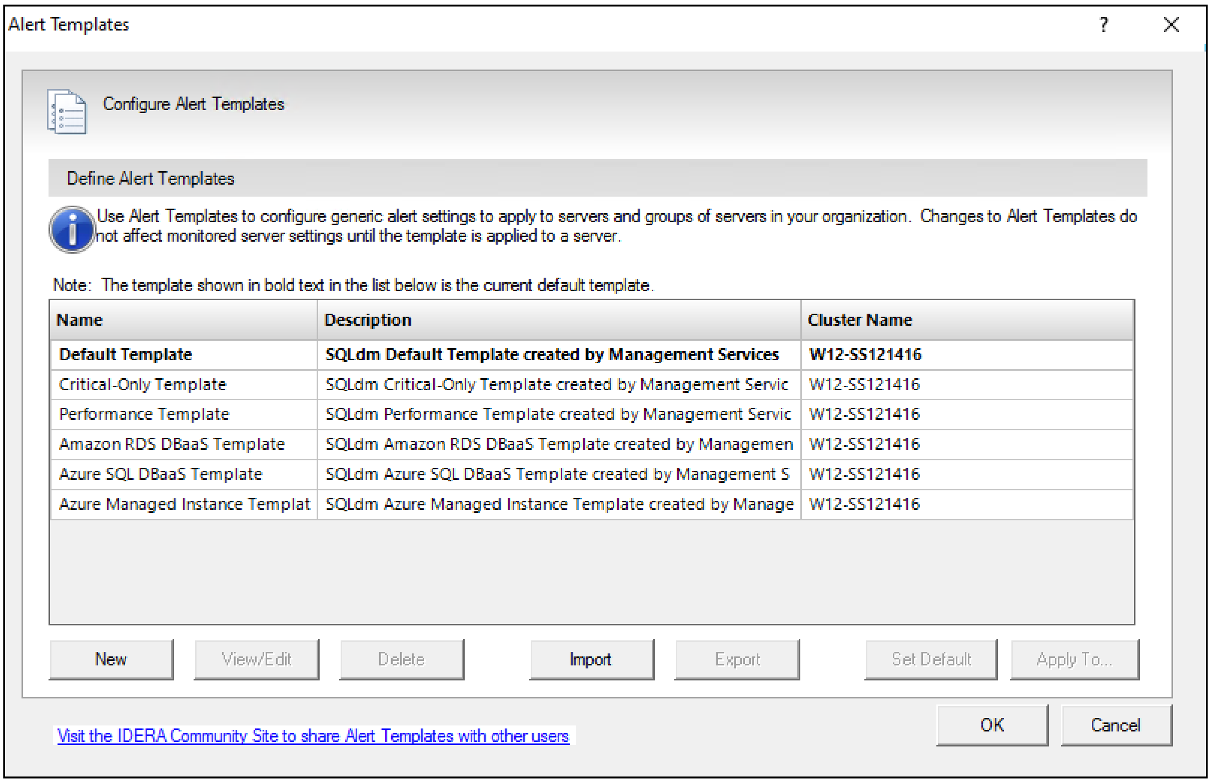
⚠ Note that for certain metrics, using the informational alert means that you no longer receive a warning or critical alert for events generated by that metric. Please review the situation before setting up an informational alert.

Configure alerts for important cluster events

The Alert Templates window allows you to configure generic alert settings that you can apply to servers and groups of servers in your organization. An event that causes a metric to no longer meet a condition or to exceed a threshold signals the SQL Diagnostic Manager to raise an alert. The Alert Templates save you time and help you to avoid mistakes by simplifying alert configuration across your environment.

SQL Diagnostic Manager has the following five Alert Templates that can be used to configure generic alert settings to apply to your monitored servers:

- Default Template
- Critical-Only Template
- Performance Template
- Amazon RDS DBaaS Template
- Azure SQL DBaaS Template
- Azure Managed Instance Template



Use Alert Templates to configure generic alert settings to apply to servers and groups of servers in your organization. Changes to Alert Templates do not affect monitored server settings until the template is applied to a server.

Note: The template shown in bold text in the list below is the current default template.

Name	Description	Cluster Name
Default Template	**SQLdm Default Template created by Management Services**	**W12-SS121416**
Critical-Only Template	SQLdm Critical-Only Template created by Management Servic	W12-SS121416
Performance Template	SQLdm Performance Template created by Management Servic	W12-SS121416
Amazon RDS DBaaS Template	SQLdm Amazon RDS DBaaS Template created by Managemen	W12-SS121416
Azure SQL DBaaS Template	SQLdm Azure SQL DBaaS Template created by Management S	W12-SS121416
Azure Managed Instance Templat	SQLdm Azure Managed Instance Template created by Manage	W12-SS121416

New
View/Edit
Delete
Import
Export
Set Default
Apply To...
Visit the IDERA Community Site to share Alert Templates with other users
OK
Cancel

Applying an alert template to a monitored server overwrites all existing alert configurations. You can make any custom changes to the alert configuration once the template is applied. If you make a change to a template that is applied to a server, you must also reapply the template to that server using the **Apply To** button.

> Servers are not permanently attached to an applied alert template. SQL Diagnostic Manager does not propagate to the monitored server any changes made to the template unless explicitly applied.

A template allows you to apply the same alert configurations to more than one SQL Server instance. It helps you avoid simple mistakes such as transposing characters or leaving out metric details that could occur when you manually configure each server. Alert templates also help you roll out changes by making the updates in a single location and then rolling out the changes across your environment. If you are more interested in ad hoc alert configuration, remember that you can use a template to return a server to default settings if you make any changes that you later want to revert.

Access the Alert Templates window

You can open the Alert Templates window from the SQL Diagnostic Manager Console menu bar by selecting ⚙ **> Alert Configuration Templates**.

Create a new alert template

Create a new alert template or edit the existing Default Template to suit your needs when alerting on your monitored SQL Server instances.

To create a new alert template:

1. Select ⚙ and click **Alert Configuration Templates**.
2. Click **New**.
3. Type a unique name and description.
4. ***If you want to create a new template based on an existing template*** , select the name of the existing template from the **Copy from** list.
5. ***If you want to use this new template as your default template*** , check **Default Template**.
6. When you click **OK**, the **"Would you like to apply this template to existing SQL Server instances?"** message prompts. Click **Yes** to confirm or click **No** if you do not want to apply this template.
    a. If you click **Yes**, the Select Servers or Tags opens. Select Tags or Select Servers to which the alert template should be applied.

> ⓘ You can edit the configuration of your new alert template. In the Add Alert Template window, click **Edit configuration** to change thresholds and other metric parameters, for more information review Configure your alert settings.

Change an existing template

SQL Diagnostic Manager allows you to make changes to an existing alert template. Select the template from the list, and then click **View/Edit**. If necessary, you can delete any existing template except for the Default Template. To delete a template, select the template you want to delete, and then click **Delete**.

Import an existing template

SQL Diagnostic Manager allows you to import an existing alert template from the IDERA community site. Click **Import** and select an alert template.

Export an existing template

SQL Diagnostic Manager allows you to export an existing alert template. Select the template from the list, and then click **Export**. You can use the default location or specify a different path to save the export file.

Apply template changes to a tag or server

Once you create a new template or make changes to an existing template, you should apply the updates to your tags or servers. Select the template from the list, click **Apply To**, select a tag or servers to which you want to apply the alert template, and then click **OK**.

Note that if the template you are making changes to is already associated with a tag or server, these changes are not automatically applied when you change the template. You must use the **Apply To** button and select the appropriate tag or servers.

Set a template to use as the default

You can set an existing template as the default for SQL Diagnostic Manager to apply to all new servers added without specifying an alert template. To designate a template as the default, click the template in the list, click **Set Default**, and then click **OK**. If there is only one template in your list, SQL Diagnostic Manager uses this template as the default.

Apply alert templates to individual databases or disks within an instance

SQL Diagnostic Manager includes the ability to apply some alert thresholds on a per-database or per-disk basis within an instance. When you create an alert template and include one of these alerts, you cannot select which database or disk to apply the alert to because that is unknown in a template. For that reason, these alerts apply to all databases and disks within the instance to which it is applied.

Configure how SQL Diagnostic Manager responds to alerts

The Alert Actions and Responses window allows you add, modify, import/export, and configure alert responses. You can:

- Configure your email (SMTP) settings to send out alert notifications using the email server available on your network.
- Configure your network management (SNMP) settings to set up a network management alert response.

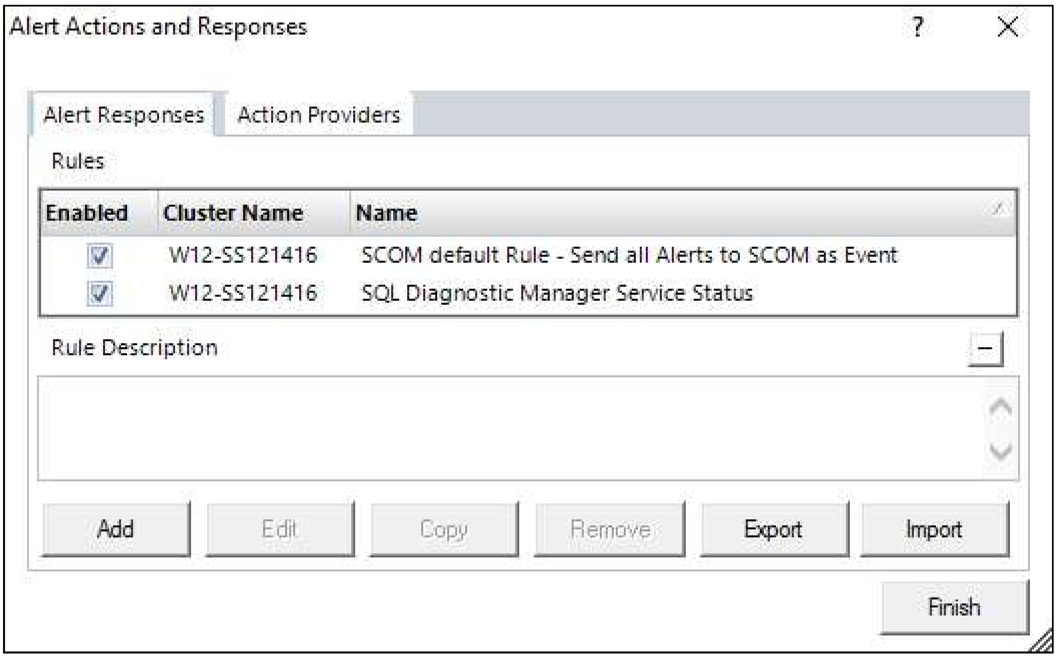
> When you first add your SQL Server instance to SQL Diagnostic Manager, you should begin setting up your alert thresholds, and then set up your alert action rules and providers to specify who receives related notifications.

Access the Alert Actions and Responses window

You can open the Alert Actions and Responses window from the SQL Diagnostic Manager Console menu by selecting 🔧 **> Alert Actions and Responses**.

Available Alert Responses tab actions

You can enable or disable an action provider by checking/clearing the box in the *Enabled* column.



Enabled	Cluster Name	Name
☑	W12-SS121416	SCOM default Rule - Send all Alerts to SCOM as Event
☑	W12-SS121416	SQL Diagnostic Manager Service Status

> SQL Diagnostic Manager provides two rules enabled by default. You can disable, edit, copy, or remove them.

Add

Click **Add** to create a new alert response.

Edit

Click **Edit** to make modifications to an existing alert response.

Copy

Click **Copy** to make a duplicate of an existing alert response. The copy function can save time when you want to change just one setting on a particular rule.

Remove

Click **Remove** to delete the selected alert response.

Export

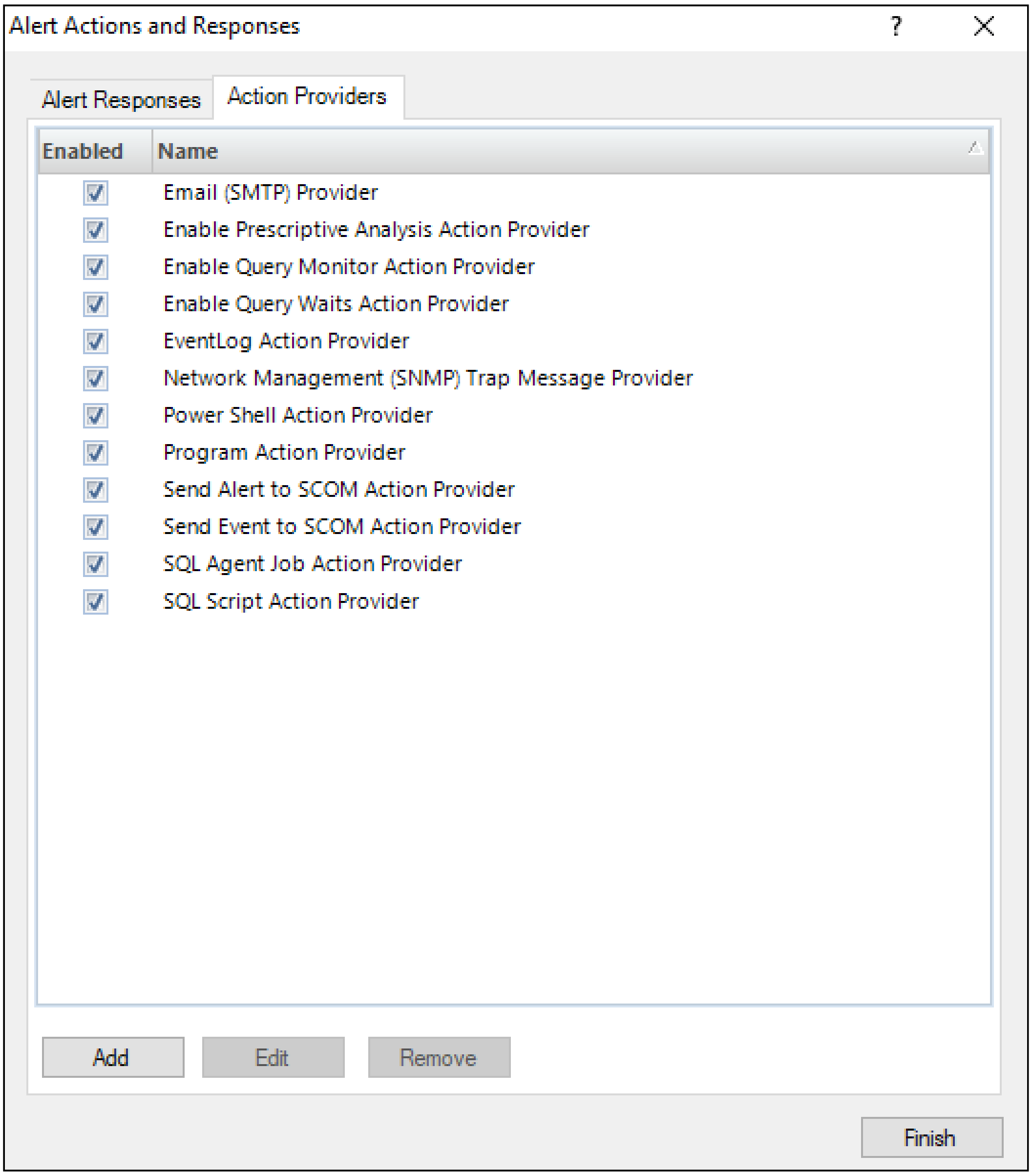
Click **Export** to export an alert response XML file.

Import

Click **Import** to import an alert response XML file.

Available Action Providers tab actions

You can enable or disable an action provider by checking/clearing the box in the *Enabled* column.


Alert Actions and Responses

Enabled	Name
☑	Email (SMTP) Provider
☑	Enable Prescriptive Analysis Action Provider
☑	Enable Query Monitor Action Provider
☑	Enable Query Waits Action Provider
☑	EventLog Action Provider
☑	Network Management (SNMP) Trap Message Provider
☑	Power Shell Action Provider
☑	Program Action Provider
☑	Send Alert to SCOM Action Provider
☑	Send Event to SCOM Action Provider
☑	SQL Agent Job Action Provider
☑	SQL Script Action Provider

Add

Click **Add** to open the Alert Communications Wizard and create a new SMTP or SNMP action provider.

Edit

Click **Edit** to edit an SMTP or SNMP action provider.

Remove

Click **Remove** to delete an SMTP or SNMP action provider.

Configure automated responses to alerts

Use the **Alert Response** window to create or modify your new alert response rule.

Access the Alert Response window

1. Select **> Alert Actions and Responses**.

Add a new rule

1. Click **Add** on the **Alert Responses** tab of the Alert Actions and Responses dialog box.
2. Enter a **Name** for the rule.
3. Check the boxes for the conditions and destinations for the rule.
4. Click **Enable** to activate the associated action. Note that all actions are disabled by default.
5. If you enabled an action, provide any required information for the selected action.
6. Click **Add** to select additional actions to perform in response to the alert. This feature allows you to add multiple instances of certain actions.
7. Click the hyperlink text to select specific conditions for the rule.
8. Click **OK** when finished.

Available conditions

By default, alert response rules are not limited to specific SQL Server instances, metrics, severity levels, and times. You can use conditions to tailor the triggers of your alert responses. The following conditions help you manage alert response rules.

Where the SQL Server Instance is in *specified list*

> Trigger a response when the listed SQL Server instance is included in the displayed list. Click **specified list**, and then select one or more instances to include in the alert response trigger. Click **Select all** to include all of the displayed instances.

Where SQL Server Instance has a tag in *specified list*

> Trigger a response when the listed SQL Server instance contains a tag in the displayed list. Click **specified list**, and then select one or more tags to include in the alert response trigger. Click **Select all** to include all of the displayed tags.

Where the metric is in the *specified list*

> Trigger a response if the metric is included in the displayed list. Click **metric**, and then select one or more metrics to include in the alert response trigger. Click **Select all** to include all of the displayed metrics.

Where all metrics are in the *specified list*

> Trigger a response only if multiple metrics in the specified list reach the specified threshold(s). Click **metric**, and then select metrics to include in the alert response trigger. Click **Select all** to include all of the displayed metrics.

Where metric severity has changed

> Trigger a response when the metric severity changes regardless of level. Click the displayed severity level, and then select one or more severity levels to include in the alert response trigger.

Where refresh occurred during a *specific time frame*

Trigger a response if the refresh occurred during the displayed time frame. Click **during this time**, and then select the time and date range to set the alert response trigger time frame.

Available action providers

Action providers allow you to select actions that you want to occur as part of the alert response. By default, all actions are disabled. To enable an action, click **Enable** next to the appropriate action. The following actions help you manage alert response rules:

- Email (SMTP) Provider
- EventLog Action Provider
- Network Management Protocol (SNMP) Trap Message Provider
- PowerShell Action Provider
- Prescriptive Analyzer Action Provider
- Program Action Provider
- Query Monitor Action Provider
- Query Waits Action Provider
- SCOM Alert Action Provider
- SCOM Event Action Provider
- ServiceNow Action Provider
- SQL Agent Job Action Provider
- SQL Script Action Provider

Email (SMTP) Provider

When the criteria for the new alert rule is met, SQL Diagnostic Manager sends an alert email message to the SMTP server, which then forwards the message to the specified email address. Configure your email settings and network manager settings to receive these alert email messages.

EventLog Action Provider

When the criteria for the new alert rule is met, an entry to the EventLog is created.

Network Management Protocol (SNMP) Trap Message Provider

When the criteria for the new alert rule is met, SQL Diagnostic Manager sends an SNMP Trap message to the network management console based on the configuration of your email settings and network management settings.

PowerShell Action Provider

When the criteria for the new alert rule is met, you can specify a PowerShell script to run in response to the alert.

To run a PowerShell script as an alert response:

1. Enable the PowerShell Action provider and the PowerShell Action dialog displays.
2. Enter a description for the PowerShell command in the Description field.
3. Either type in the PowerShell command you want to run when the alert criteria is met, or paste in the PowerShell command from another application.
4. Click **Test** to verify your PowerShell command.
5. Click **OK**.

Prescriptive Analyzer Action Provider

When the criteria for the new alert rule is met, it triggers the Prescriptive Analyzer to run a prescriptive analysis on a specific server based on selected performance categories.

To enable the prescriptive analyzer as an alert response:

1. Enable the Prescriptive Analyzer provider and the Prescriptive Analysis Settings window displays.
2. Select the performance categories of your choice.
3. Click **OK**.

Program Action Provider

When the criteria for the new alert rule is met, you can specify a program for the SQLdm Management Service to run in response to the alert.

To start a program as an alert response:

1. Enable the **Program Action** provider and the Program Action dialog displays.
2. Enter a description for the **Program** action.
3. Enter the full path to the program you want to launch as an alert response. Use the **More Options** drop-down menu to select from common runtime arguments.

   > ✓ You can run executable (.exe) files only through the Program Action Provider. If you need to run a batch (.bat) file, use `cmd /c run.bat.`

4. Enter the full path of the directory in which you want the program to run.

   > ✓ The **Start in** field is useful when you want a different directory for where an action begins and where the program resides.

5. Click **Test** to make sure that the SQLdm Management Service can run the program.
6. Click **OK.**

Query Monitor Action Provider

When the criteria for the new alert rule is met, it triggers the Query Monitor to start so that you can collect more information.

To enable query monitor as an alert response:

1. Enable the Query Monitor provider and the Query Monitor Settings dialog displays.
2. Select either **Enable query monitor** to enable the query monitor until it is manually disabled or **Enable query monitor for a limited time**.
3. Click **OK**.

Query Waits Action Provider

When the criteria for the new alert rule is met, it triggers the Query Waits to start so that you can collect more information.

To enable query waits as an alert response:

1. Enable the Query Waits provider and the Query Waits Settings dialog displays.
2. Select either **Enable query waits** to enable the query monitor until it is manually disabled or **Enable query waits for a limited time** and configure the duration.
3. Click **OK**.

SCOM Alert Action Provider

When the criteria for the new alert rule is met, SQL Diagnostic Manager sends an alert to SCOM.

To create SCOM alert response:

1. Send **to SCOM as Alert** option.
2. Select the metrics you want to be sent to SCOM as alerts. You can also select all available metrics.
3. Click **OK**.

SCOM Event Action Provider

When the criteria for the new alert rule is met, SQL Diagnostic Manager sends an event to SCOM.

To create SCOM alert response:

1. Send **to SCOM as Event** option.
2. Select the metrics you want to be sent to SCOM as alerts. You can also select all available metrics.
3. Click **OK**.

ServiceNow Action Provider

When the criteria for the new alert rule is met, SQL Diagnostic Manager sends an alert to ServiceNow.

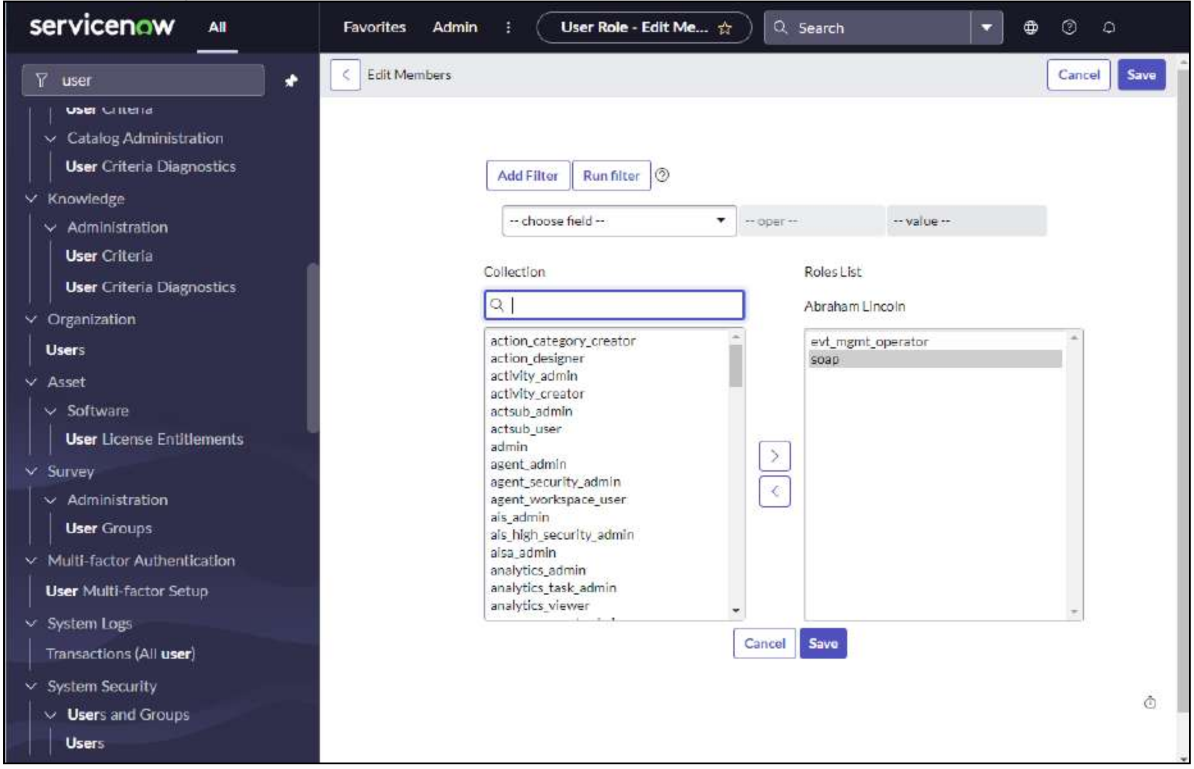
To enable ServiceNow as an event:

1. Enable **Send ServiceNow as Event** option.
2. Provide the following information regarding the ServiceNow configuration:
    a. Provider Name. By default, ServicerNow Action Provider
    b. URL. For now, use the following link: https://instancename.service-now.com
    c. Upload As. Select **Event** from the drop-down list.
    d. User Information
        - Username.
        - Password.
        - Alert Source. By default, SQL Diagnostic Manager.
3. Click **OK**.

To enable ServiceNow as an alert:

1. Enable **Send ServiceNow as Alert** option.
2. Provide the following information regarding the ServiceNow configuration:
    a. Provider Name. By default, ServicerNow Action Provider
    b. URL. For now, use the following link: https://instancename.service-now.com
    c. Upload As. Select **Alert** from the drop-down list.
    d. Table Name. Type the desired table name in the text field.
    e. User Information
        - Username.
        - Password.
        - Alert Source. By default, SQL Diagnostic Manager.
3. Click **OK**.

ⓘ Keep in mind that you should have an **evt_mgmt_operator** and **soap** user role for basic authentication for ServiceNow integration.



Roles List

Abraham Lincoln

evt_mgmt_operator
soap

ⓘ Consider that the Provider Name and the Alert Source are descriptive fields. You can leave them with default values or edit them to your preference.

SQL Agent Job Action Provider

When the criteria for the new alert rule is met, you can specify a SQL Agent Job to run in response to the alert.

To start a SQL Agent Job as an alert response:

1. Enable the SQL Agent Job Action provider and the SQL Agent Job Action dialog displays.
2. Select the SQL Server instance from the **Server** drop-down list or select **%(Instance)** to run the SQL Agent Job on the server that caused the alert.
3. Click **Browse** next to the **Job Name** field.
4. On the Select Job window, select the SQL Server instance the SQL Agent Job is located on and click **Load**.
5. Select the SQL Agent job from the list and click **OK**.
6. If you want to select a particular Job Step to run, click the **Browse** button in the Job Step window
   a. In the Select Job Step window click **Load**.
   b. Select the Job step from the list and click **OK**.
   c. Click **Test** to verify your configuration.
   d. Click **OK.**

SQL Script Action Provider

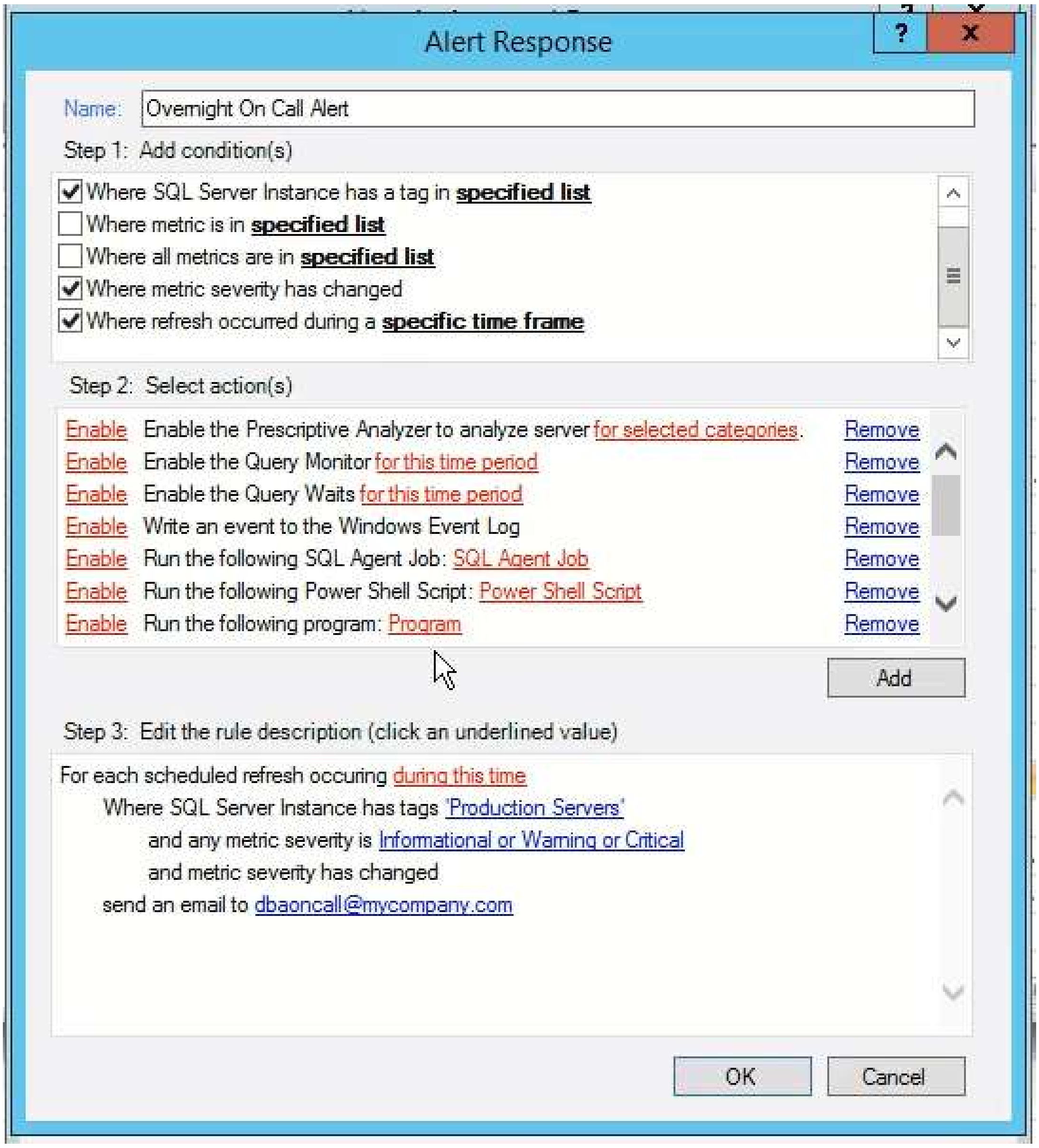
When the criteria for the new alert rule is met, you can specify a SQL Server script to run in response to the alert.

To run a SQL Script Action Provider as an alert response:

1. Enable the SQL Script Action provider and the SQL Script Action dialog displays.
2. Enter a description for the SQL Script Action in the Description field.
3. Click **Browse** to select the SQL Server instance or leave it at the default of **%(Instance)** to run the SQL Script on the server that caused the alert.
4. Either type in the T-SQL you want to run when the alert criteria is met, or paste in the T-SQL from another application.
5. Click **Test** to verify your SQL script.
6. Click **OK**.

Change the condition value

You can edit the rule description by clicking the underlined value from the **Step 3** section. SQL Diagnostic Manager displays a list of currently defined items for you to select as the new value. Make the necessary updates, and then click **OK**.



Alert Response

Name: Overnight On Call Alert

Step 1: Add condition(s)

☑ Where SQL Server Instance has a tag in **specified list**
□ Where metric is in **specified list**
□ Where all metrics are in **specified list**
☑ Where metric severity has changed
☑ Where refresh occurred during a **specific time frame**

Step 2: Select action(s)

Enable	Enable the Prescriptive Analyzer to analyze server for selected categories.	Remove
Enable	Enable the Query Monitor for this time period	Remove
Enable	Enable the Query Waits for this time period	Remove
Enable	Write an event to the Windows Event Log	Remove
Enable	Run the following SQL Agent Job: SQL Agent Job	Remove
Enable	Run the following Power Shell Script: Power Shell Script	Remove
Enable	Run the following program: Program	Remove

Step 3: Edit the rule description (click an underlined value)

For each scheduled refresh occuring during this time
Where SQL Server Instance has tags 'Production Servers'
and any metric severity is Informational or Warning or Critical
and metric severity has changed
send an email to dbaoncall@mycompany.com

Add action provider

The Add Action Provider dialog box allows you to select additional action providers to use for your alert response. The list displays the action providers that support simultaneous responses. The following choices are available:

Email (SMTP) Provider

When the criteria for the new alert rule is met, SQL Diagnostic Manager sends an alert email message to the SMTP server, which then forwards the message to the specified email address. SQL Diagnostic Manager allows you to configure your email settings and configure your network management settings to properly route alert messages.

PowerShell Action Provider

Execute a PowerShell command when the criteria of your Alert Response rule is met.

Program Action Provider

Start a program when the criteria of your Alert Response rule is met.

SQL Agent Job Action Provider

Execute a SQL Agent job when the criteria of your Alert Response rule is met.

SQL Script Action Provider

Execute a SQL Script when the criteria of your Alert Response rule is met.

Alert Communications wizard

The Alert Communications wizard allows you to set up and configure SMTP (email) and SNMP (network management) providers for your alerts. Click **Next** to continue to the **Choose Provider Type** window of the wizard.

Access the Alert Communication wizard

1. Select **> Alert Actions and Responses** from the SQL Diagnostic Manager toolbar menu.
2. Select the Action Providers tab and click **Add**.

Choose provider type

The Choose Provider Type window of the Alert Communication wizard allows you to choose which type of provider you want to create. Select either Simple Mail Transfer Protocol (SMTP) or Simple Network Management Protocol (SNMP) from the Provider Type drop-down, give the Provider a name and click **Next** to configure your provider.

Simple Mail Transfer Protocol (SMTP)

> This provider allows you to send an email to one or multiple email addresses whenever alerts are generated.

Simple Network Management Protocol (SNMP)

> This provider allows you to send an event to your Network Management system whenever alerts are generated.

Access the Choose Provider Type window

1. Select 🔧 **> Alert Actions and Responses** from the SQLDM toolbar menu.
2. Select the Action Providers tab and click **Add**.
3. Click **Next** on the Welcome to the Alert Communications wizard window.

Configure email settings

The Alert Communications wizard allows you to configure email settings for sending out alert notifications using the email server available on your network.

Configure your email settings

To configure your email settings:

1. Click **Alerts** in the Navigation pane, and select **Alert Actions and Responses**.
2. Click the Action Providers tab.
3. Click **Add**.
4. On the Welcome page of the Alert Communications wizard, click **Next**.
5. Select the **Simple Mail Transfer Protocol (SMTP)** provider type, type a unique name, and then click **Next**.
6. Type the SMTP address, port number, and the number of seconds to wait before a timeout occurs.
7. ***If the Server requires authentication***, check **Server requires authentication**, and then type the appropriate login information for the email server.
8. Type the **Name** and **E-mail** address you want to appear in the **From** field in alert notifications.
9. To verify the connection to the SMTP server, click **Test**. Type the email address to send the test email, and then click **OK**.
10. Verify that the correct recipient received the test email message, and then click **OK**. ***If the test is unsuccessful***, review your settings.
11. Click **Finish**.

Configure network management settings

The Alert Communications wizard allows you to set up Simple Network Management Protocol (SNMP) for sending out alert events to your Network Management system on the SNMP Configuration window.

SQL Diagnostic Manager includes a MIB that you can use in your Network Management System to format the events that are sent by SQL Diagnostic Manager.

The MIB file is located in the root directory of your SQL Diagnostic Manager installation and is named IDERA MIB.

> SQL Diagnostic Manager supports SNMPv1 and SNMPv2.

Access the Alert Communications wizard SNMP Configuration window

1. Select 🔧 **> Alert Actions and Responses** from the SQL Diagnostic Manager toolbar menu.
2. Select the Action Providers tab and click **Add**.
3. Click **Next** on the Welcome to the Alert Communications wizard window.
4. Select **Simple Network Management Protocol (SNMP)** from the **Provider Type** drop-down.
5. Enter a name for your provider.
6. Click **Next**.

Set up your SNMP communication

1. Enter the SNMP address, port number, and the community name that you want to use.
2. Click **OK**.

   > It is best to specify a computer name for the address, especially in a DHCP environment. If the manager has a static address, enter the IPv4 formatted address instead.

3. Click Test to verify the connection to the SNMP enabled management console.
4. Verify that the test event arrived and click **OK** if the test is successful.
5. Click **Finish**.

Understanding the IDERA MIB

A MIB is a standardized file that defines the data that is sent to the Network Management Console in the SNMP Trap events generated by SQL Diagnostic Manager.

SNMP traps enable an agent to spontaneously inform the management station of significant events by way of an unsolicited SNMP message. Traps are suitable when there is a large number of devices and each device has a large number of objects.

Note that in order for a management system to interpret a trap sent to it by an agent, it needs to have the MIB for that trap loaded.

The MIB file (Idera.MIB) defines the following data:

Name	OID	Syntax	Description
Alert Summary	.1.3.6.1.4.1.24117.1.2.1	DisplayString	Summary text of the alert
Alert Text	.1.3.6.1.4.1.24117.1.2.2	DisplayString	Full text description of the alert
Metric	.1.3.6.1.4.1.24117.1.2.3	DisplayString	SQLdm metric that triggered the alert
Severity	.1.3.6.1.4.1.24117.1.2.4	DisplayString	Severity of the alert
Instance	.1.3.6.1.4.1.24117.1.2.5	DisplayString	The SQL server instance that triggered the alert
Database	.1.3.6.1.4.1.24117.1.2.6	DisplayString	If applicable to the alert, the database that triggered the alert
Table	.1.3.6.1.4.1.24117.1.2.7	DisplayString	If applicable to the alert, the table that triggered the alert
Timestamp	.1.3.6.1.4.1.24117.1.2.8	DisplayString	The date and time that the alert was detected
Value	.1.3.6.1.4.1.24117.1.2.9	DisplayString	The value detected for the specific metric
Description	.1.3.6.1.4.1.24117.1.2.10	DisplayString	Description of metric
Comments	.1.3.6.1.4.1.24117.1.2.11	DisplayString	User specified comments pertaining to the metric

Create alert response bundles

SQL Diagnostic Manager allows you to create alert response bundles for related alerts. The alert response bundle contains individual alert information for several alerts, summarized and delivered through only one message.

To create an alert response bundle:

1. Click 🔧 **>Alert Actions and Responses** in the menu bar.
2. Click **Add** on the Alert Responses tab of the Alert Actions and Responses dialog box.
3. Enter a **Name** for the rule.
4. Check the **Where all the metrics are in the specified list box** condition.
5. Enable the **Send an email to recipient** action.
6. Click **metric** in the Edit the rule description field, and select related metrics to include in the alert response trigger.
7. Click the hyperlink text to select specific conditions for the rule.
8. Click **OK** to finish.

Alerts compatible with the alert response bundles feature

Jobs

- SQL Server Agent Long Running Job (Minutes)
- SQL Server Agent Long Running Job (Percent)
- SQL Server Agent Job Completion
- SQL Server Agent Job Failure
- SQL Server Agent Log

Blocking and Deadlocks

- Blocked Sessions
- Blocked Sessions Wait Time (Seconds)
- Deadlock

Size Databases

- Data File Autogrow
- Database Full (Percent)
- Database Full (Size)

Size Disks

- OS Average Disk Queue Length (Count)
- OS Average Disk Queue Length Per Disk (Count)
- OS Disk Free Space (Size)
- OS Disk Full (Percent)
- OS Disk Time (Percent)
- OS Disk Time Per Disk (Percent)

Error Log

- SQL Server Error Log

Availability Group Databases

- Availability Group Estimated Data Loss (Seconds)

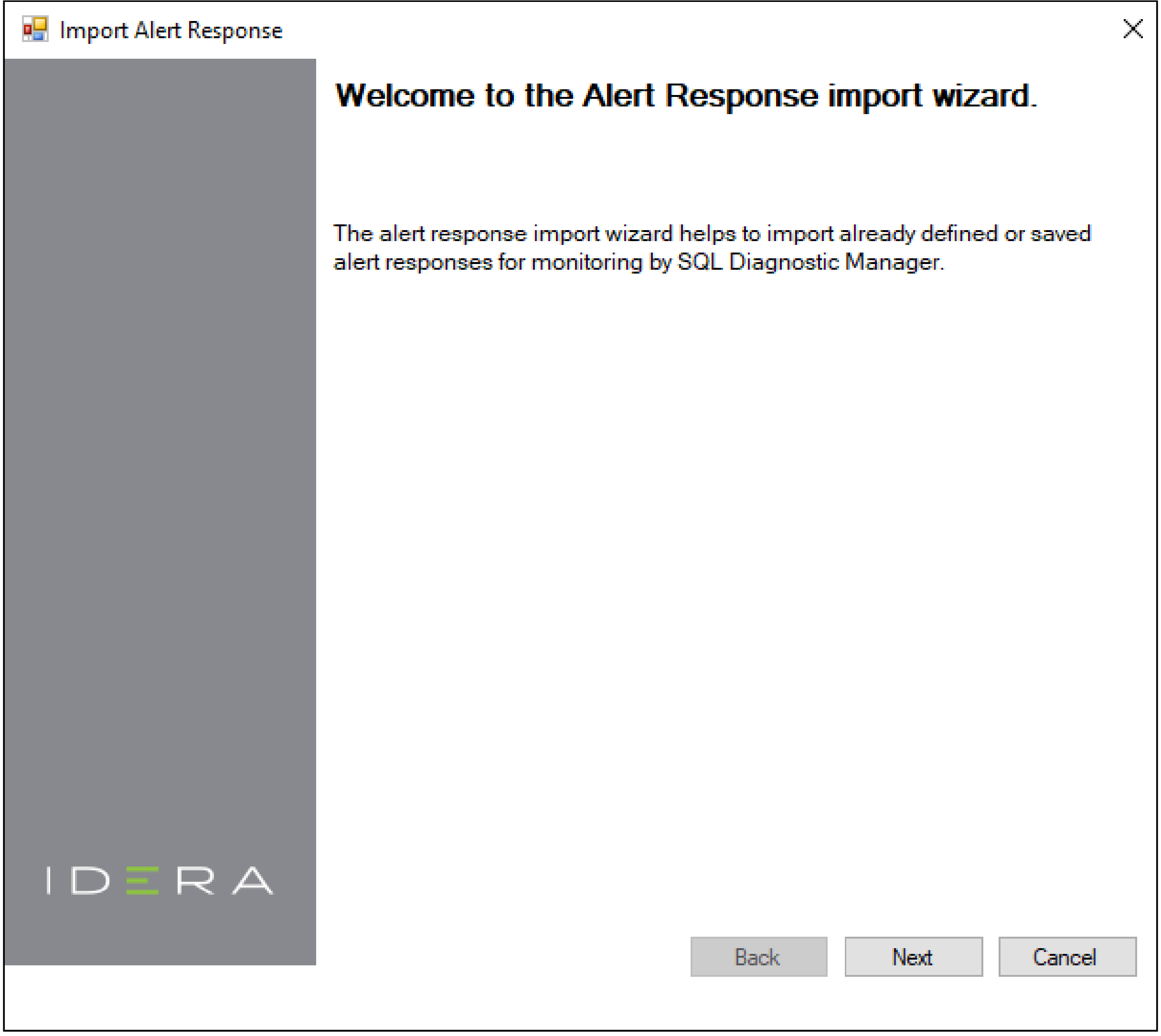
- Availability Group Estimated Recovery time (Seconds)
- Availability Group Log Send Queue Size (KB)
- Availability Group Preferred Replica
- Availability Group Redo Queue Size (KB)
- Availability Group Redo Rate (KB/sec)
- Availability Group Role Change
- Availability Group Synchronization Health
- Availability Group Synchronization Performance (Seconds)

Import an alert response

The Alert Response import wizard allows you to import existing alert response actions.

To import an alert response:

1. Open the Alert Actions and Responses window by selecting 🔧 **> Alert Actions and Responses** from the SQL Diagnostic Manager console menu and clicking **Import**.
2. On the **Welcome to the Alert Response import wizard** page, click **Next**.



Welcome to the Alert Response import wizard.

The alert response import wizard helps to import already defined or saved alert responses for monitoring by SQL Diagnostic Manager.

> ✓ You can also access this feature by clicking **Administration>Import/Export** from the navigation pane and then selecting **Alert Response** in the import column.

3. On the **Select Alert Responses to import** page, browse for notification rules' XML files to import.
4. On the **Summary of imported Alert Response** page, you can verify that the selected alert response files were imported correctly. If there are any errors you can view details by clicking **View Validation Errors**.
5. If the imported alert response is valid, click **Finish** to complete the import process and exit the Alert Response import wizard.

✓ **Export an alert response**

For instructions on exporting an alert response, see Export an alert response.

Export an alert response

SQL Diagnostic Manager allows you to export existing alert response actions.

To export an alert response:

1. Open the Alert Actions and responses window by selecting 🔧 **> Alert Actions and Responses** from the SQL Diagnostic Manager console menu. Select the notification rules that you want to export and click **Export**.

> To export all your alert responses at once, click **Administration > Import/Export** from the navigation pane and select **Alert Response** in the export column.

2. In the **Browse for Folder** dialog box, indicate in which folder you want to save the alert response XML files.

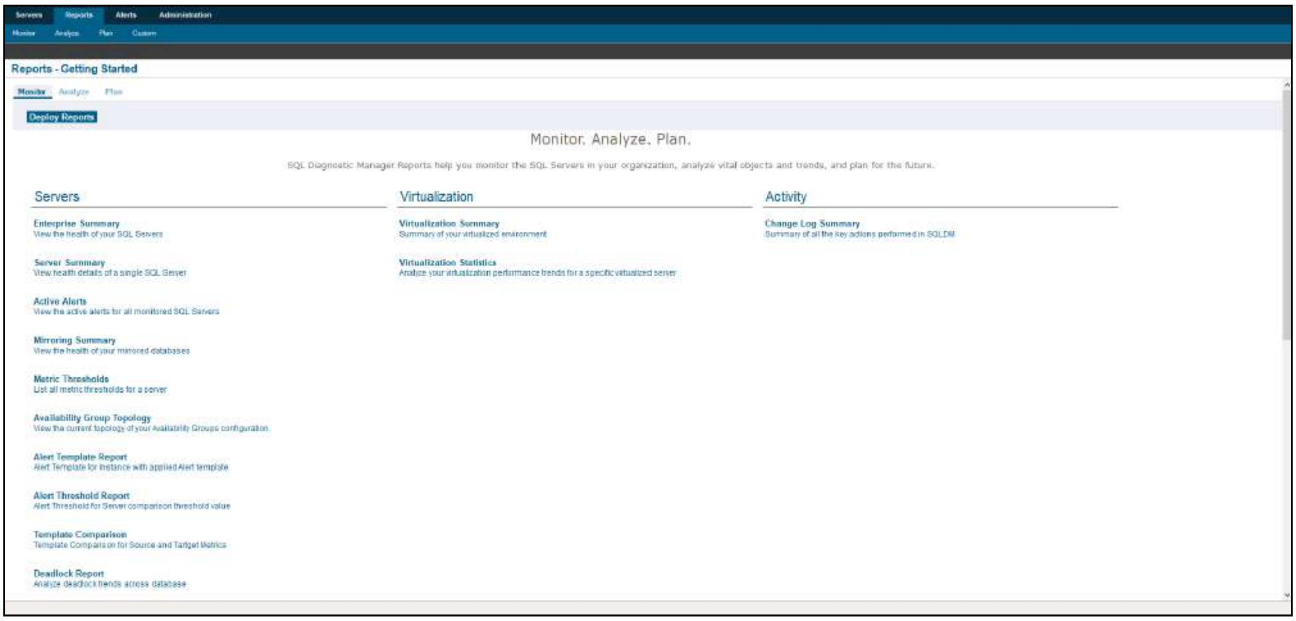
3. Click **OK** in the "Alert response exported to selected directory" notification.

> **Import an alert response**
>
> For instructions on importing an alert response, see Import an alert response.

Report on SQL Server Performance

The Reports view lets you create reports that allow you to analyze current and historical performance and statistical data. SQL Diagnostic Manager provides three types of comprehensive reports: Monitor, Analyze, Plan, and Custom.

Reports look best when printed in letter-size format.



Reports - Getting Started

Monitor. Analyze. Plan.

SQL Diagnostic Manager Reports help you monitor the SQL Servers in your organization, analyze vital objects and trends, and plan for the future.

Servers

Enterprise Summary
View the health of your SQL Servers

Server Summary
View health details of a single SQL Server

Active Alerts
View the active alerts for all monitored SQL Servers

Mirroring Summary
View the health of your mirrored databases

Metric Thresholds
List all metric thresholds for a server

Availability Group Topology
View the current topology of your Availability Groups configuration

Alert Template Report
Alert Template for Instance with applied Alert template

Alert Threshold Report
Alert Threshold for Server comparison threshold value

Template Comparison
Template Comparison for Source and Target Metrics

Deadlock Report
Analyze deadlock trends across database

Virtualization

Virtualization Summary
Summary of your virtualized environment

Virtualization Statistics
Analyze your virtualization performance trends for a specific virtualized server

Activity

Change Log Summary
Summary of all the key actions performed in SQLDM

Customize reports

After you run a report, you can use the **Report Toolbar** to select the page setup, page width, and print layout to customize your report.

Click **Show Filters** to open the Filter area of the Reports view. Each report has several filter options, such as which SQL Server instances to display, the period of time to report on, and the time intervals to show in the charts.

Deploy reports to Microsoft Reporting Server

You can use the SQLDM Reports Deployment wizard to deploy specified reports to the Microsoft Reporting Server.

Report filters

Every report in SQL Diagnostic Manager contains filters to allow you to select the information that you want included in your reports. If you want to return to the default filters after making some choices, click **Reset Filters** at the top of the report. Use the **Show Filters/Hide Filters** toggle depending on your preference.

The following list includes all of the filters available, though each report contains different options.

Case Insensitive

Check whether you want SQL Diagnostic Manager to ignore query case for the report results.

Chart Type

Select the type of chart you want to convey your report results.

Compare Server

Optional. Select a SQL Server instance and period of time to compare statistics with your main selected Server and Period.

Compare with same server

Check whether you want to compare the same monitored SQL Server instance using a different metric or period.

Database, Database Name

Select or type the name of one or more databases on which you want to report.

Forecast Type, Forecast Units

Select the type of forecast and number of units to use for projecting future growth trends based on your expected growth rate and sample size.

Drive Name

Select the drive within the monitored SQL Server instance on which you want to report.

End Hour

Select or type the end time of the range from which you want to report trends. SQL Diagnostic Manager includes trends through to the most recent collection time.

Include Batches/SQL Statements/Stored Procedures/System Databases

Check whether you want to include batches, SQL statements, stored procedures, or system databases in your report results.

Metric

Select the metric you want to include in your report.

Min. Duration

Select or type the minimum duration of the queries to display in your report.

Min. CPU/Executions/Reads/Writes

Select or type the minimum number or size of CPU, executions, reads, or writes for the queries you want to display in your report.

Min. Bytes Read/Bytes Written/Data Size/Growth/Transactions

Select or type the minimum number or size of bytes read or written per second, data size, growth, or transactions for the databases you want to display in your report.

Number of Applications

Select or type the number of database applications that you want included in your report.

Number of Databases/Servers

Select or type the number of databases or monitored SQL Server instances you want included in your report.

Number of Queries

Select or type the number of queries that you want returned in the report results.

Action

Select an action type on which you want to report.

Repository User

Select a repository user by whom you want to filter your report.

Workstation

Select a workstation on which you want to report.

Workstation User

Select a workstation user account used to access the workstation on which you want to report.

Period

Select the time range on which you want to report. Choose Custom Range to select the sample months, days, hours, or minutes on which you want to report. The sample choices depend on the type of report selected.

Range

Displays the period of time selected for your report.

Sample

Select the period of time between data points on the graphs that appear in your report. This selection also represents the most current information as of that particular point.

Search Item and Search Value

Select up to four different items and their values to search for in your server inventory, and then type the value you want to search to find. Use a percent (%) character as a wildcard when specifying a Search Value.

Server

Select the monitored SQL Server instance or instances on which you want to report.

Show Problems Only

Check whether you want to include only problems in your report results.

Signature Mode

Check whether you want to group similar queries in your report results.

Start Time, Start Hour

Select or type the start time for the range from which you want to report trends. SQL Diagnostic Manager includes trends through to the most recent collection time.

Tag

Select a sample group for the report based on the tags that you assigned to those monitored SQL Server instances.

Monitor reports

Monitor reports give you overview information for your monitored SQL Server instances and the virtual machines on which the monitored SQL Server instances are running. In addition, oversee overall activity in your SQL Diagnostic Manager environment through the Activity Monitor Reports.

Access the Reports view

SQL Diagnostic Manager provides two paths to access the Reports view. The first access path is by clicking **Reports** in the Navigation pane. The second access path is by clicking **Go > Reports**. The second path is the only option if you hide your Navigation pane in the SQLDM Console.

Server Monitor Reports

Enterprise Summary

Use the Enterprise Summary report to view the health of your SQL Servers.

Server Summary

Use the Server Summary report to view the health of a single SQL Server.

Active Alerts

Use the Active Alerts report to identify the currently active alerts for all monitored SQL Servers.

Mirroring Summary

Use the Mirroring Summary report to view the health of your mirrored databases.

Metric Thresholds

Use the Metric Thresholds report to view all metric thresholds for a SQL Server instance.

Availability Group Topology

Use the Availability Group Topology report to view the current topology of an AlwaysOn Availability Groups configuration.

Deadlock Report

The Deadlock Report lets you analyze deadlocks on your SQL Server instance. By analyzing you can better determine where deadlocks are occurring and what changes can have the greatest performance impact.

Alert Template Report

The Alert Template Report displays the list of instances with Alert Template assigned per instance.

Alert Threshold Report

The Alert Threshold Report displays all the metrics thresholds of the selected server.

Template Comparison

The Template Comparison report displays all the metrics thresholds differences between the Source and the Target Template.

Virtualization Monitor Reports

Virtualization Summary

Use the Virtualization Summary report to view a summary of your virtualized environment.

Virtualization Statistics

Use the Virtualization Statistics report to view an analysis of your virtualization performance trends for a virtualized machine.

Activity Monitor Reports

Change Log Summary

Use the Change Log Summary report to view a list of all actions and configuration changes performed in your SQL Diagnostic Manager environment over a specified period of time.

Server monitor reports

Server monitor reports provide an overview of your monitored SQL Server instances.

Server Monitor Reports

Enterprise Summary

Use the Enterprise Summary report to view the health of your SQL Servers.

Server Summary

Use the Server Summary report to view the health of a single SQL Server.

Active Alerts

Use the Active Alerts report to identify the currently active alerts for all monitored SQL Servers.

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Use the Mirroring Summary report to view the health of your mirrored databases.

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Use the Metric Thresholds report to view all metric thresholds for a SQL Server instance.

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Use the Availability Group Topology report to view the current topology of an AlwaysOn Availability Groups configuration.

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The Deadlock Report lets you analyze deadlocks on your SQL Server instance. By analyzing you can better determine where deadlocks are occurring and what changes can have the greatest performance impact.

Alert Template Report

The Alert Template Report displays the list of instances with Alert Template assigned per instance.

Alert Threshold Report

The Alert Threshold Report displays all the metrics thresholds of the selected server.

Template Comparison

The Template Comparison Report displays all the metrics thresholds differences between the Source and the Target Template.

Enterprise Summary

The Enterprise Summary report provides an overview of the health and performance of all SQL Server instances monitored by SQL Diagnostic Manager. Click the appropriate instance and SQL Diagnostic Manager displays the Server Summary report.

When to run this report

You can run the Enterprise Summary report to view a quick overview of the health and performance of all monitored instances. This report allows you to see the status of all your SQL Server instances at a glance.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Enterprise Summary report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL diagnostic manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL diagnostic manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the console and reports represent? - Solution #00002237

Server Summary

The Server Summary report provides a detailed overview of the health and performance of a specific SQL Server, such as SQL Server status, and File Use. This report displays graphs of the following metrics: **Response Time**, **SQL Server CPU Activity**, **OS Memory Usage**, and **Disk Busy**. Also, it provides the databases information of the selected server: **Database Name**, **Creation Date**, **Data + Log Size (MB)**, and **Status**.

When to run this report

You should run the Server Summary report to view the detailed performance and health information of a single SQL Server.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Server Summary report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
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- What does the 'Memory Usage' metric in the console and reports represent? - Solution #00002237

Active Alerts

The Active Alerts report lists all outstanding, active alerts that SQL Diagnostic Manager has raised against your SQL Server instances. Select a Server or a Tag from the drop-down lists to run the Active Alerts Report. This report lists all the Alerts, the Status, the Description, and the Details of all active alerts.

When to run this report

You should run the Active Alerts report to view all alerts currently active on your monitored instances. You can sort the alerts by severity level, so you can focus on the most critical alerts first.

How SQL Diagnostic Manager calculates metric values on this report

The values on the Active Alerts report correlate with the related SQL Server metric.

Mirroring Summary

The Mirroring Summary report allows you to view the current mirroring sessions across all or selected tags or servers.

The data for this report comes from SQL Server system views for database mirroring. The SQL Diagnostic Manager alert thresholds are used to highlight existing issues as defined by your configured alert settings.

When to run this report

You should run the Mirroring Summary report to view a quick overview of the health of your mirrored databases.

How SQL Diagnostic Manager calculates metric values on this report

The values on the Mirroring Summary report correlate with the related SQL Server metric.

Metric Thresholds

The Metric Thresholds report provides a list of metric thresholds for a monitored SQL Server instance. To successfully monitor OS metrics, enable WMI or OLE automation on the monitored instance.

In the Metric Thresholds report results, the table displays the Metric name, the Threshold Instance, and the threshold values (Informational, Warning, and Critical).

When to run this report

You should run the Metric Thresholds report to review your current Informational, Warning, and Critical threshold settings for the selected SQL Server instance. This report also lists whether a metric is enabled, helping you decide what action is necessary for you to get the most out of SQL Diagnostic Manager.

How SQL Diagnostic Manager calculates metric values on this report

The values on the Metric Thresholds report correlate with the related SQL Server metric.

Availability Group Topology

The Availability Group Topology report allows users to view the current topology of an AlwaysOn availability group's configuration. The report displays all of the availability groups on the server, replicas that participate in the group, and the databases within the group.

You can filter results by availability group only. The report lists detailed information for availability replicas and corresponding databases.

Availability replica table

Provides information on availability Replica, Roles assigned, Failover mode, Availability Modes selected, and the Secondary Connection Mode.

Availability databases table

Provides information on the Database, Failover readiness, and Synchronization State of the availability databases contained within the selected availability replica.

When to run this report

You should run the Availability Group Topology report to keep track of modifications made to your current AlwaysOn availability groups and avoid any potential setbacks to your high-availability and disaster recovery strategies.

Deadlock Report

The Deadlock report lets you analyze deadlocks on your SQL Server instance. The report filters the data by Instance Name, followed by **Application Name**, **Database Name**, **SQL Statement**, **Collection Date**, **XDL Data**, **Deadlock ID**, **Login Name**, and **Host Name**.

This report lists all the deadlock occurrences historically and in detail.

When to run this report

By analyzing the deadlocks, you can better determine where deadlocks are occurring and analyze the changes can have the greatest performance impact.

Alert Template Report

The Alert Template report lists the last applied template in the selected servers, or selected Tag.

To run this report simply, select a tag, or a server from the drop-down list, and click **Run Report**.

Alert Threshold Report

The Alert Threshold Report lists which thresholds have changed from the last applied template.

To run this report simply, select a server from the drop-down list, and click **Run Report**.

Template Comparison

The template comparison report displays all the metric thresholds differences for a selected Source and a Target template.

To run this report simply, select a Source Template from the drop-down list, chose a Target Template, and click **Run Report**.

Virtualization monitor reports

Virtualization monitor reports provide overview information for the virtual machines on which your monitored SQL Server instances are running. Reports are compatible with Hyper-V or VMWare VMs. Click the links below for more information.

Virtualization Monitor Reports

Virtualization Summary

Use the Virtualization Summary report to view a summary of your virtualized environment.

Virtualization Statistics

Use the Virtualization Statistics report to view an analysis of your virtualization performance trends for a virtualized machine.

Virtualization Summary

The Virtualization Summary report provides an overview of the health and performance of the virtualized environment for the selected SQL Server instance. This report includes information about the VM as well as configuration of the host server. Click the appropriate instance and SQL Diagnostic Manager displays the Virtualization Summary report.

When to run this report

You can run the Virtualization Summary report to view a quick overview of the health and performance of the virtualized environment for your selected monitored instance. Run this report when you want a quick glance at the VM information for this instance.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Virtualization Summary report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055

Virtualization Statistics

The Virtualization Statistics report provides an analysis of your virtualization performance trends for a virtualized machine monitored by SQL Diagnostic Manager. Select the appropriate instance and SQL Diagnostic Manager displays the Virtualization Statistics report using your selected chart type.

When to run this report

You can run the Virtualization Statistics report when you are concerned about a virtualized machine and its performance. This report allows you to see the CPU, memory, disk, and network performance metrics for the selected VM and period of time.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Virtualization Statistics report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055

Activity monitor reports

Activity monitor reports provide overview information on all actions and configuration changes performed in SQL Diagnostic Manager. Click the link below for more information.

Activity Monitor Reports

Change Log Summary

Use the Change Log Summary report to view a summary of key actions performed in your SQL Diagnostic Manager environment.

Change Log Summary

The Change Log Summary report lets you view a list of all actions and configuration changes performed in your SQL Diagnostic Manager environment over a specified period of time and through various filter options. The report contains detailed information, Date, Action, Object Name, Workstation, Repository User, and Change Summary. For Example, users are able to view all changes performed by a specific repository user, by expanding Details.

When to run this report

You should run the Change Log Summary report to audit overall activity in your SQL Diagnostic Manager environment. This report allows you to analyze key changes that might hinder your performance or represent a risk.

Analysis reports

Analysis reports provide information that allows you to analyze the current effectiveness of your SQL Servers. Click the links below for more information.

Access the Reports view

SQL Diagnostic Manager provides two paths to access the Reports view. The first access path is by clicking **Reports** in the Navigation pane. The second access path is by clicking **Go > Reports**. The second path is the only option if you hide your Navigation pane in the SQL Diagnostic Manager Console.

Server Analysis Reports

Top Servers

Use the Top Servers report to identify your worst performing SQL Servers.

Server Uptime

Use the Server Uptime report to review the uptime and downtime of your monitored SQL Server.

Server Statistics

Use the Server Statistics report to analyze and compare performance trends across two SQL Servers.

Server Inventory

Use the Server Inventory report to find SQL Servers that share the same properties.

Query Overview

Use the Query Overview report to identify your worst performing queries.

Top Queries

Use the Top Queries re port to find queries that are performing poorly or executing too frequently.

Alert History

Use the Alert History report to analyze the alert history for a SQL Server.

Baseline Statistics

Use the Baseline Statistics report to review and compare metric and baseline values across two SQL Server instances.

Query Wait Statistics

Use the Query Wait Statistics report to analyze different wait type categories on your SQL Server instance.

Database Analysis Reports

Top Databases

Use the Top Databases report to identify your worst performing databases.

Database Statistics

Use the Database Statistics r eport to analyze and compare performance trends across two databases.

Top Database Applications

Use the Top Database Applications report to find database applications that consume system resources.

Mirroring History

Use the Mirroring History report to analyze the event history for a mirrored database.

Top Tables by Growth

Use the Top Tables by Growth report to identify the fastest growing tables.

Top Tables by Fragmentation

Use the Top Tables by Fragmentation report to identify the most fragmented tables.

Tempdb Statistics

Use the Tempdb Statistics report to analyze performance statistics for your tempdb database.

Transaction Log Statistics

Use the Transaction Log Statistics report to analyze the use of your log files.

Availability Group Statistics

Use the Availability Group Statistics report to view the historical health of your availability groups, availability replicas, and availability databases.

Resource Analysis Reports

Session Statistics

Use the Session Statistics report to track key session and network performance metrics over time.

Detailed Session Report

The Detailed Session report provides detailed session information on your selected SQL Server instance.

CPU Statistics

Use the CPU Statistics report to track key CPU performance metrics.

Disk Details

Use the Disk Details report to track key disk metrics.

Disk Space Usage

Use the Disk Space Usage report to obtain an overview of the available disk space across your SQL Server environment.

Disk Space History

Use the Disk Space History report to view the history of activity for a specific disk.

Disk Statistics

Use the Disk Statistics report to track key disk performance metrics.

Replication Statistics

Use the Replication Statistics report to track key replication performance metrics.

Memory Statistics

Use the Memory Statistics report to track key memory performance metrics.

Server analysis reports

Server analysis reports provide information that allows you to analyze the current effectiveness of your SQL Servers. Click the links below for more information.

Server Analysis Reports

Top Servers

Use the Top Servers report to identify your worst performing SQL Servers.

Server Uptime

Use the Server Uptime report to review the uptime and downtime of your monitored SQL Server.

Server Statistics

Use the Server Statistics report to analyze and compare performance trends across two SQL Servers.

Server Inventory

Use the Server Inventory report to find SQL Servers that share the same properties.

Query Overview

Use the Query Overview report to identify your worst performing queries.

Top Queries

Use the Top Queries report to find queries that are performing poorly or executing too frequently.

Alert History

Use the Alert History report to analyze the alert history for a SQL Server.

Baseline Statistics

Use the Baseline Statistics report to review and compare metric and baseline values across two SQL Server instances.

Query Wait Statistics

Use the Query Wait Statistics report to analyze the different query waits in a SQL Server.

Top Servers

The Top Servers report identifies your worst performing SQL Server instances based on the number of active alerts for the current monitored instances, response time, CPU usage, memory usage, and disk usage.

You can further filter your monitored instances by wait time with waits that exceed a defined **Wait Threshold** in milliseconds. This report displays the values of the following metrics: **Top Servers by Active Alerts**, **Top Servers by Response Time**, **Top Servers by CPU Usage**, **Top Servers by Memory Usage**, **Top Servers by Disk Usage**, and **Top Servers by Wait**.

> ⚠ A value of N/A indicates that the Collection service failed to collect data due to disabled OS metrics or a non-responsive WMI server. You must enable OS metrics monitoring to receive results.

When to run this report

Run the Top Servers report daily to keep ahead of critical issues that can cause an unavailable instance. Use this report to compile a list of instances that need immediate attention.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Top Servers report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL diagnostic manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL diagnostic manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the Console and Reports represent? - Solution #00002237

Server Statistics

The Server Statistics report lets you analyze and compare performance trends across two SQL Server instances.

You can select a Chart Type from the following drop-down list to be displayed in the report: **Response Time**, **% CPU Usage**, **Memory Usage (GB)**, and **% Disk Busy**. The Master Metrics table shows the comparison of the selected instances for all the mentioned metrics over a specified period of time.

When to run this report

You should run the Server Statistics report when you want to trend key performance metrics over time for one or two specific instances, in response to a known problem or a routine health check. For example, if the same third party application uses two different databases but only one database has reported issues, then comparing their key performance metrics can help you diagnose the issue.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Server Statistics report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

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Server Inventory

The Server Inventory report lets you compile a list of SQL Server instances that share up to seven different properties: **Server Name**, **Server Version**, **OS Version**, **Number of Processors**, **Physical Memory**, and **Clustered**.

✓ You can use % as a wildcard in the **Search Value** field.

When to run this report

Run the Server Inventory report when you need to identify which monitored instances require software or hardware upgrades, or simply want to know how many instances of a SQL Server version are deployed.

Deleted SQL Server instances

When you choose to delete a SQL Server instance, SQL Diagnostic Manager displays the confirmation message, "Would you like to retain the data collected for the selected instance?" When you click **Yes** , SQL Diagnostic Manager retains data for the instance and includes it in some reports, such as the Server Inventory report.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Server Inventory report correlate with the related SQL Server metric.
You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055

Query Overview

The Query Overview report identifies the worst performing queries run on a specific SQL Server instance over time, including the call volume of each query. This report requires that you enabled Query Monitoring in the SQL Diagnostic Manager Console and have collected sufficient query data for the specified time period. This report displays the values of the Stored Procedures, SQL Statements, Batches, and the Query Overview.

When to run this report

You should run the Query Overview report when you want to determine whether SQL Server queries run through Microsoft SQL Server tools or third-party applications are impacting the performance of your monitored instances. This report can help you further diagnose a known performance issue or proactively identify queries whose resource consumption may cause issues in the future.

How SQL Diagnostic Manager calculates metric values on this report

The values on the Query Overview report correlate with the related SQL Server metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055

Top Queries

The Top Queries report lets you compile a list of queries based on call frequency, duration of execution, CPU usage, and the number of reads and writes performed on the databases hosted by the specified SQL Server instance. You can define minimum thresholds for each of these performance metrics and then see which queries match or exceed the selected values. This report requires that you enabled Query Monitoring in the SQL Diagnostic Manager Console and have collected sufficient query data for the specified time period.

When viewing results, note that you can click the SQL statement to view the Query Statistics report, which provides details on an individual SQL statement or signature as collected by the Query Monitor.

This report displays the Statements by **Top Queries By Frequency**, **Top Query by Avg. Duration**, **Top Queries By CPU**, **Top Queries By Reads**, and **Top Queries By Writes.**

When to run this report

You should run the Top Queries report on a routine basis, such as every week, to proactively identify potential performance issues that may be caused by queries. You can also use this report to track historic performance trends and determine the relationship between query usage and your database performance.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Top Queries report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

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- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the Console and Reports represent? - Solution #00002237

Query Statistics

The Query Statistics report lets you view details for an individual SQL statement or signature as collected by the Query Monitor. This report requires that you enabled Query Monitoring in the SQL Diagnostic Manager Console and have collected sufficient query data for the specified time period.

When to run this report

You should run the Query Statistics report to analyze an individual SQL statement or signature for a monitored instance.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Query Statistics report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- What does the 'Memory Usage' metric in the console and reports represent? - Solution #00002237

Alert History

The Alert History report lets you review the alerts that SQL Diagnostic Manager has raised for the selected SQL Server instance over a specified period of time. You can also review alerts, the time, status and the description of each one of them.

When to run this report

You should run the Alert History report when you want to analyze the historical health of the SQL Server by identifying and tracking critical values for key performance metrics. Each raised alert represents a point in time when a metric reached or exceeded the specified threshold.

By default, SQL Diagnostic Manager alerts on many performance-related SQL Server metrics. You can also configure alerts and create custom counters to track specific performance data.

How SQL Diagnostic Manager calculates metric values on this report

The values on the Alert History report correlate with the related SQL Server metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055

Baseline Statistics

The Baseline Statistics report lets you analyze and compare baselines within a single SQL Server instance and across two instances. When viewing baseline statistics for a monitored SQL Server instance, you can compare the baseline metric values at two different times or two different metrics at the same time. Include another instance and you can compare baselines values occurring at the same time or different times.

When to run this report

You should run the Baseline Statistics report when you want to view trends in the average value of a metric for a SQL Server instance and how this value changes over time to help you in capacity planning. This report also provides insight into the utilization of your different instances by comparing the baselines over time.

Report selections change based on the selected Period

The Baseline Statistics report **Period** indicates the date range for which you want to see results. If you select **Today** or **Custom Range**, SQL Diagnostic Manager displays additional fields that allow you to filter results by the start and end hours.

> ✓ If you select **Custom Range** as the **Period**, and the start and end dates are both for the same day, SQL Diagnostic Manager calculates the selection the same as if you select **Today** as the **Period**.

How SQL Diagnostic Manager calculates metric values on this report

The baseline values are the most recent calculations for the selected period. Note that the **Metric Value** is an average of all data for the selected metric. For example, if you select **Hours** from the **Sample** drop-down list, the Baselines Statistics report grid includes 24 rows for a single day, one row for each hour from 00:00 to 23:00. Each row displays a metric value which is the average of the selected metric for that hour, such as 05:00 to 05:59:59, and the baseline values which are calculated for the entire 24-hour day. As a result, SQL Diagnostic Manager displays 24 rows of different metric values but equal baseline values.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055

Query Wait Statistics

The Query Wait Statistics report lets you analyze different wait type categories on your SQL Server instance. By analyzing these waits you can better determine where your biggest bottlenecks are occurring and what changes could have the greatest performance impact. You can select from various wait type categories such as **Backup**, **Excluded**, **I/O**, **Lock**, **Memory**, **Non-I/O Page Latch**, **Non-Page Latch**, **Transaction Log**, and **Other**.

This report requires that you enabled Query Monitoring in the SQL Diagnostic Manager Console and have collected sufficient query data for the specified time period.

When to run this report

You should run the Query Wait Statistics report on a routine basis, such as every week, to proactively identify potential performance issues that may be caused by queries.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Query Wait Statistics report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the Console and Reports represent? - Solution #00002237

Server Uptime

The Server Uptime report lets you review the uptime and the downtime of a server that SQL Diagnostic Manager raises for the selected SQL Server instance over a specified period of time.

To run the Server Uptime report, follow these steps:

1. Select the instance you want to review from the Server drop-down menu.
2. Specified a Period of time (Today, Last 7 Days, Last 30 Days, Last 365 Days, and Custom Range).

   > ⚠ When you select Custom Range, the Select Custom Range windows open to specify the Period of Time of your preference. The date range is limited for which data was collected for your monitored servers.

3. Click **Run Report**.

Database analysis reports

Database analysis reports provide information on databases that allows you to analyze the current effectiveness of your SQL Servers. Click the links below for more information.

Database Analysis Reports

Top Databases

Use the Top Databases report to identify your worst performing databases.

Database Statistics

Use the Database Statistics report to analyze and compare performance trends across two databases.

Top Database Applications

Use the Top Database Applications report to find database applications that consume system resources.

Mirroring History

Use the Mirroring History report to analyze the event history for a mirrored database.

Top Tables by Growth

Use the Top Tables by Growth report to identify the fastest growing tables.

Top Tables by Fragmentation

Use the Top Tables by Fragmentation report to identify the most fragmented tables.

Tempdb Statistics

Use the Tempdb Statistics report to analyze performance statistics for your tempdb database.

Transaction Log Statistics

Use the Transaction Log Statistics report to analyze the use of your log files.

Availability Group Statistics

Use the Availability Group Statistics report to view the historical health of availability groups, availability replicas, and availability databases.

Top Databases

The Top Databases report identifies your worst performing SQL Server databases based on the size of the database, the growth rate of the database, and the number of reads, writes, and transactions per second performed on the database.

You can further filter your monitored databases by wait time with waits that exceed a defined **Wait Threshold** in milliseconds. Use this report to compile a list of databases that used most often or have the heaviest loads, these databases are shown in different tables: **Top Databases By Data Size**, **Top Databases By Data Growth**, **Top Databases By Reads Per Second**, **Top Databases By Writes Per Second**, and **Top Databases By Transactions Per Second**.

✓ You can use % as a wildcard in the **Search Value** field.

When to run this report

You should run the Top Databases report on a routine basis, such as once a week. This report helps you:

- Plan for upcoming maintenance
- Identify issues that may impact third-party application performance even though the host SQL Server instance remains healthy
- Compare database performance across your enterprise

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Top Databases report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the Console and Reports represent? - Solution #00002237

Database Statistics

The Database Statistics report lets you analyze and compare performance trends, such as the percentage of growth, across two SQL Server databases. You can also compare performance metrics at different points in time for the same database. You can select a metric from the drop-down Chart Type list to be displayed in a chart on your report: **Data File Size MB**, **Log File Size MB**, **Data Growth %**, **Reads Per Second**, **Writes Per Second**, and **Transactions Per Second**.

When to run this report

You should run the Database Statistics report when attempting to understand performance differences or troubleshooting database issues.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Database Statistics report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the Console and Reports represent? - Solution #00002237

Top Database Applications

The Top Database Applications report lets you find the applications that are consuming the highest amount of your system resources, this report displays the value for **Top Applications By CPU**, **Top Applications By Reads**, and **Top Applications By Writes**. You can define minimum thresholds for each of these performance metrics and then see which applications match or exceed the selected values. This report requires that you enabled Query Monitoring in the SQL Diagnostic Manager Console and have collected sufficient query data for the specified time period.

✓ You can use % as a wildcard in the **Search Value** field.

When to run this report

You should run the Top Database Applications report on a routine basis, such as every week, to proactively identify potential performance issues that may be caused by third-party applications. You can also use this report to track historical performance trends and determine the relationship between third-party application usage and your database performance.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Top Database Applications report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055

Mirroring History

The Mirroring History report lets you view the status of select mirroring metrics at the time of each SQL Diagnostic Manager scheduled refresh for the specified period.

You can filter the results by Time, Tag, Server, Database, and also check to view only problems as defined in your alerts. Fields showing metrics corresponding to alerts are color-coded according to the alert.

When to run this report

You should run the Mirroring History report when you want to analyze the historical health of your mirrored SQL Server databases by identifying and tracking critical values for key performance metrics. Each red or yellow value in the report grid corresponds to a raised alert. These visual warnings represent points in time when the metric reached or exceeded the specified alert threshold.

By default, SQL Diagnostic Manager alerts on many performance-related SQL Server metrics. You can also configure alerts and create custom counters to track specific performance data.

Transaction Log Statistics

The Transaction Log Statistics report provides data about the database transaction log size and activity on a per-database basis. You can display your results in hours or days, depending on the sample range selected. Note that SQL Diagnostic Manager displays the Cache Reads and Flushes chart types as data per second.

Select a metric from the Chart Type drop-down list to be displayed in this report: **Cache Hit Ratio**, **Cache Reads**, **File Size**, **Flush Waits**, **Flushes**, and **Kilobytes Flushed**.

When to run this report

You should run the Transaction Log Statistics report when attempting to troubleshoot performance problems related to transaction logs.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Transaction Log Statistics report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the Console and Reports represent? - Solution #00002237

Top Tables by Growth

The Top Tables by Growth report identifies the fastest growing tables in a database. You can select a specific database to analyze or evaluate all databases on a specific SQL Server instance. You can also choose a growth metric and its minimum threshold to see which tables match or exceed the selected value. This report displays the fastest growing tables **by Size Growth %**, **by Row Growth%**, **by Number of Rows**, **by Total Size, by Data Size**, **by Text Size**, and **by Index Size**.

When to run this report

You should run the Top Tables by Growth report on a routine basis, depending on how heavily your company uses the host SQL Server instance. Use this report to see how rapidly (or slowly) tables are growing over time. ***If database capacity on a given instance becomes limited***, run this report to see a list of tables that are the top contributors and decide whether you want to move them to another database.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Top Tables by Growth report correlate with the related SQL Server metric.

However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the Console and Reports represent? - Solution #00002237

Top Tables by Fragmentation

The Top Tables by Fragmentation report identifies the most fragmented tables in a database, select a specific database to analyze or evaluate all databases on a specific SQL Server instance. You can also choose a fragmentation metric and its minimum threshold to see which tables match or exceed the selected value. Also, this report display the **Top Tables by Logical Fragmentation** and **Top Tables by Data Size**.

When to run this report

You should run the Top Tables by Fragmentation report on a routine basis, depending on how mission-critical or sensitive the data is and how heavily your company uses the host database. Use this report to identify the tables that you want to optimize for improved performance.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Top Tables by Fragmentation report correlate with the related SQL Server metric.

However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055

Tempdb Statistics

The Tempdb Statistics report lets you view space utilization and data throughput statistics over time for your Tempdb database. You can focus on a single chart type, such as data file growth, and track its value increase over a specified period of time. This report allows you to obtain statistics through different metrics or chart types: **Data File Size MB**, **Data File Growth**, **Reads Per Second**, **Writes Per Second**, **Transactions Per Second**, **User Objects MB**, **Internal Objects MB**, **Version Store MB**, and **Mixed Extents MB**.

> ⚠ The Tempdb Statistics report is available for users with monitored SQL Server instances on SQL Server 2005 or later.

When to run this report

You should run the Tempdb Statistics report to view different space utilization and data throughput statistics currently occurring on your monitored SQL Server instances.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Tempdb Statistics report are averages of data from the system DMV sys.dm_db_file_space_usage on the monitored SQL Server.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055

Availability Group Statistics

The Availability Group Statistics report allows users to view the health of their availability groups, availability replicas, and availability databases over a specific time range.

You can filter results by tag, availability group, period, sample, server, and chart type. The report compiles crucial health metrics that include the **Redo Rate (KB/sec)**, **Redo Queue Size (KB**), **Log Send Rate (KB/sec**), and **Log Send Queue Size (KB**).

The Availability Group Statistics report also provides DBAs with a graphical representation of a selected metric and a statistics table with weighted averages for relevant metrics.

For individual details on availability databases per replica, click the expandable command button.

> ✓ Access the Availability Group Topology report by clicking a specific group link while viewing the Availability Group Statistics report.

When to run this report

You should run the Availability Group Statistics report when you want to analyze the historical health of your availability groups and corresponding components. This report helps you to ensure the highest level of availability by identifying and tracking critical health metrics.

Resource analysis reports

Resource analysis reports provide information that focuses on key performance metrics of your SQL Servers. Click the links below for more information.

Resource Analysis Reports

Session Statistics

Use the Session Statistics report to track key session and network performance metrics over time.

Detailed Session Report

The Detailed Session report provides detailed session information on your selected SQL Server instance.

CPU Statistics

Use the CPU Statistics report to track key CPU performance metrics.

Disk Details

Use the Disk Details report to track key disk metrics.

Disk Space Usage

Use the Disk Space Usage report to view disk space information, you can filter the information by selecting one or more disks of your environment.

Disk Space History

Use the Disk Space History report to view disk activity history across your environment.

Disk Statistics

Use the Disk Statistics report to track key disk performance metrics.

Replication Statistics

Use the Replication Statistics report to track key replication performance metrics.

Memory Statistics

Use the Memory Statistics report to track key memory performance metrics.

Session Statistics

The Session Statistics report lets you view trends for sessions and network connectivity, such as transactions per minute, on a monitored SQL Server instance over a specified period of time. Check **Show Tabular Data** to display results in a single tabular or grid format and check **Show Baseline** to include baseline data points in the Session Statistics report. For additional information about baseline configuration, see Configure server baseline options.

The Session Statistics report displays the following graphs: **User Processes and Computers**, **Logins per Minute**, **Network Packets per Minute**, **Transactions per Minute**, and **Oldest Open Transaction (minutes).**

When to run this report

You should run the Session Statistics report to analyze the sessions and network connectivity for a monitored instance. High logins or transactions per minute may indicate a need for increased resources.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Session Statistics report correlate with the related SQL Server metric.

However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the console and reports represent? - Solution #00002237

Detailed Session Report

The Detailed Session report provides detailed session information of your SQL Server instance. This report trigger the list of **Session IDs**, **User Name**, **Host Name**, **Application**, **Login Time**, and the **Last Activity** time.

When to run this report

You should run the Detailed Session report to analyze the sessions for a monitored instance.

CPU Statistics

The CPU Statistics report lets you view trends for CPU usage on a monitored SQL Server instance over a specified period of time. Check **Show Tabular Data** to display results in a single tabular or grid format and check **Show Baseline** to include baseline data points in the CPU Statistics report. For additional information about baseline configuration, see Configure server baseline options.

The CPU Statistics reports displays the following graphs: **CPU Usage (%)**, **Processor Queue Length**, **SQL Compilations**, **SQL Recompilations**, **Locks Waits per Minute**, and **Table Lock Escalations**,

When to run this report

You should run the CPU Statistics report to analyze contributors to CPU usage for a monitored instance.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the CPU Statistics report correlate with the related SQL Server metric.

However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the console and reports represent? - Solution #00002237

Memory Statistics

The Memory Statistics report lets you view trends for memory usage on a monitored SQL Server instance over a specified period of time. To successfully monitor OS metrics, make sure that you enable WMI or OLE automation on the monitored instance. Check **Show Tabular Data** to display results in a single tabular or grid format.

Check **Show Baseline** to include baseline data points in the Memory Statistics report. For additional information about baseline configuration, see Configure server baseline options.

When to run this report

You should run the Memory Statistics report to analyze the memory needs of a monitored instance. This can help you identify problems with current usage or to plan for future increases in memory.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Memory Statistics report correlate with the related SQL Server metric.

However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the console and reports represent? - Solution #00002237

Disk Details

The Disk Details report lets you view key disk metrics of a monitored SQL Server instance and specific disk drive over a specified period of time. To successfully monitor OS metrics, make sure that WMI/OLE automation is enabled on the monitored instance. Check **Show Tabular Data** to display results in a single tabular or grid format.

This report generates the following graphs: **Disk Time Per Read (MS)**, **Disk Time Per Transfer (MS)**, **Disk Time Per Write (MS)**, **Disk Reads Per Second**, **Disk Transfers Per Second**, and **Disk Writes Per Second.**

When to run this report

You should run the Disk Details report to analyze the six key metrics for disk speed, such as disk time per read or disk reads per second.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Disk Details report correlate with the related SQL Server metric.

However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How to customize existing reports used with Reporting Services? - Solution #00000307

✓ Customize your report and use the Chart filter to include either the average or maximum disk details.

Disk Statistics

The Disk Statistics report lets you view trends for the disk activity of a monitored SQL Server instance over a specified period of time. To successfully monitor OS metrics, make sure that you enable WMI or OLE automation on the monitored instance. Check **Show Tabular Data** to display results in a single tabular or grid format and check **Show Baseline** to include baseline data points in the Disk Statistics report. For additional information about baseline configuration, see Configure server baseline options.

This report generates the following graphs: **IO Activity %**, **Work Files Per Minute**, **Tempdb Size (MB)**, **Page Reads Per Second**, **Page Writes Per Second**, **Page Splits Per Minute**, **Page Lookups Per Minute**, **% Disk Busy**, and **Disk Queue Length**.

When to run this report

You should run the Disk Statistics report to analyze the disk activity such as work files per minute or page read/ writes per second.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Disk Statistics report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the console and reports represent? - Solution #00002237

Replication Statistics

The Replication Statistics report lets you view trends for the replicated transactions on a monitored SQL Server instance over a specified period of time. Check **Show Tabular Data** to display results in a single tabular or grid format and check **Show Baseline** to include baseline data points in the Replication Statistics report. For additional information about baseline configuration, see Configure server baseline options.

This report generates the following graphs: **Replication Statistics** and **Maximum Subscription Latency**.

When to run this report

You should run the Replication Statistics report to analyze the efficiency of replication between databases.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Replication Statistics report correlate with the related SQL Server metric.

However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the console and reports represent? - Solution #00002237

Disk Space Usage

The Disk Space Usage report provides an overview of the available disk space, this information can be filter by selecting one or more disks of your SQL Server environment. To access this report, click **Reports** in the Navigation pane, then in the Analyze menu select **Resources > Disk Space Usage**.

Select one of the following metrics from the Chart Type drop-down menu to be displayed in the report: **SQL Data Used MB**, **SQL Data Free MB**, **SQL Log File MB**, **Non-SQL Disk Usage MB**, **Free Disk Space in MB**, **Disk Reads Per Sec,** and **Disk Writes Per Sec**.

When to run this report

You can run the Disk Space Usage report to understand where you have the most and the least disk space available in your environment.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Disk Space Usage report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the console and reports represent? - Solution #00002237

✓ **Deploy report to Microsoft Reporting Server**

You can use the SQLdm Reports Deployment wizard to deploy the Disk Space Usage report to the Microsoft Reporting Server.

Disk Space History

The Disk Space History report provides the history of activity for a specific disk. To access this report, click **Reports** in the Navigation pane, then select **Resources > Disk Space History** in the Analyze menu.

When to run this report

You can run the Disk Space History report to locate a new database by analyzing available disk space and level of activity.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Disk Space History report correlate with the related SQL Server metric. However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the console and reports represent? - Solution #00002237

✓ **Deploy report to Microsoft Reporting Server**

You can use the SQLdm Reports Deployment wizard to deploy the Disk Space History report to the Microsoft Reporting Server.

Plan reports

Planning reports allow you to plan for future needs based on current trends.

Access the Reports view

SQL Diagnostic Manager provides two paths to access the Reports view. The first access path is by clicking **Reports** in the Navigation pane. The second access path is by clicking **Go > Reports**. The second path is the only option if you hide your Navigation pane in the SQL Diagnostic Manager Console.

Available reports

Disk Space Usage Forecast

Use the Disk Space Usage Forecast report to forecast disk space needs based on average historical growth rates.

Database Growth Forecast

Use the Database Growth Forecast report to forecast future database growth based on historical trends.

Table Growth Forecast

Use the Table Growth Forecast report to forecast future table growth based on historical trends.

Disk Space Usage Forecast

The Disk Space Usage Forecast report lets you predict how much disk space you need in the future based on current and historical growth rate trends. For more accurate forecasting, select the largest possible period of historical data and the shortest possible projection into the future.

> ✓ The Disk Space Usage Forecast report does not display the maximum capacity of the disk. You can use this report to estimate how much space you need, but it does not indicate when existing space runs out.

When to run this report

Run the Disk Space Usage Forecast report to help anticipate your needs and plan for future acquisition of disk space.

Available forecast types

You can choose Linear or Exponential (Aggressive) forecasting types when you run this report.

Linear forecasting follows the trend of the available data and extends the forecast out in a straight line by the number of forecast units.

Exponential forecasting tends to exaggerate the trend that exists in the data. This allows you to more easily see if your data (disk space usage) is trending toward or away from a critical threshold. If the rate of growth is not constant, the exponential forecast type gives a more accurate forecast of future growth.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Disk Space Usage Forecast report correlate with the related SQL Server metric.

However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the console and reports represent? - Solution #00002237

Database Growth Forecast

The Database Growth Forecast report lets you predict how large selected databases may grow based on current and historical growth rate trends. For more accurate forecasting, select the largest possible period of historical data and the shortest possible projection into the future.

When to run this report

You should run the Database Growth Forecast report to help anticipate your needs and plan for future database expansion.

Available forecast types

You can choose Linear or Exponential (Aggressive) forecasting types when you run this report.

Linear forecasting follows the trend of the available data and extends the forecast out in a straight line by the number of forecast units.

Exponential forecasting tends to exaggerate the trend that exists in the data. This allows you to more easily see if your data (database growth) is trending toward or away from a critical threshold. If the rate of growth is not constant, the exponential forecast type gives a more accurate forecast of future growth.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Database Growth Forecast report correlate with the related SQL Server metric.

However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
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- What does the 'Memory Usage' metric in the console and reports represent? - Solution #00002237

Table Growth Forecast

The Table Growth Forecast report lets you predict how large selected tables may grow based on current and historical growth rate trends. For more accurate forecasting, select the largest possible period of historical data and the shortest possible projection into the future.

When to run this report

You should run the Table Growth Forecast report to help anticipate your needs and plan for future creation of additional tables.

Available forecast types

You can choose Linear or Exponential (Aggressive) forecasting types when you run this report.

Linear forecasting follows the trend of the available data and extends the forecast out in a straight line by the number of forecast units.

Exponential forecasting tends to exaggerate the trend that exists in the data. This allows you to more easily see if your data (table growth) is trending toward or away from a critical threshold. If the rate of growth is not constant, the exponential forecast type gives a more accurate forecast of future growth.

How SQL Diagnostic Manager calculates metric values on this report

Most values on the Table Growth Forecast report correlate with the related SQL Server metric.

However, some metric values represent averages over time. Likewise, a few metric values are based on performance algorithms that use multiple statistics to calculate a more accurate metric.

You can access our Customer Support Portal for more information about the algorithm used to calculate a specific metric.

- How is the Worst Performing and Most Frequent Queries information gathered? - Solution #00000412
- How does SQL Diagnostic Manager gather statistics from monitored SQL Servers? - Solution #00000055
- How does SQL Diagnostic Manager calculate the reorganization percentage for database tables? - Solution #00000301
- What does the 'Memory Usage' metric in the console and reports represent? - Solution #00002237

Deploy SQL Diagnostic Manager reports to Reporting Services

In addition to the included reports, SQL Diagnostic Manager also allows you to generate reports using Microsoft Reporting Services. Microsoft Reporting Services allows you to build powerful, custom reports to deploy for a comprehensive auditing solution.

Access the Reports Deployment wizard

SQL Diagnostic Manager provides two paths to access the Reports Deployment wizard where you can select reports to deploy to a Microsoft Reporting Services Server. The first path is by clicking **Deploy them now** at the bottom of the **Reports > Getting Started** view. The second path is by first selecting a specific report in the **Reports > Getting Started** view, and then clicking the **Deploy Report** option from the Navigation Pane.

In order to use this feature, you must have access to a server with Microsoft Reporting Services. For more information about Reporting Services, see the Microsoft document, Reporting Services Reports.

⚠ In the case of interlinked reports such as the Availability Group Statistics and Topology reports, users need to make sure to first deploy both reports from SQL Diagnostic Manager or Microsoft Reporting Services displays an error message.

Select reports to deploy

SQL Diagnostic Manager includes built-in reports that are specially designed to generate commonly-requested metrics reports using the SQL Server data collected in the repository.

Select reports

In the Reports Deployment wizard check the box for each report you want to deploy to a Microsoft Reporting Services Server, then click **Next**.

Available Reports

You can generate reports from the following report categories:

Server Monitoring Reports

Report Name	**Description**
Enterprise Summary	View the health of your SQL Servers.
Server Summary	View the health details of a single SQL Server.
Active Alerts	View the active alerts for all monitored SQL Servers.
Mirroring Summary	View the health of your mirrored databases.
Metric Thresholds	View all metric thresholds for a server.
Availability Group Topology	View the current topology of your availability groups configuration.
Deadlock	View the deadlock trends across SQL Server database.

Virtualization Monitoring Reports

Report Name	**Description**
Virtualization Summary	View a summary of your virtualized environment.
Virtualization Statistics	Analyze the performance trends of your virtual machines.

Activity Monitoring Reports

Report Name	Description
Change Log Summary	View a summary of all key actions performed in your SQLdm configuration.

Server Analysis Reports

Report Name	Description
Top Servers	Identify your worst performing SQL Servers.
Server Statistics	Analyze and compare performance trends across two SQL Servers.
Server Inventory	Find SQL Servers that share the same properties.
Query Overview	Identify your worst performing queries.
Top Queries	Find queries that are performing poorly or executing frequently.
Alert History	Analyze the alert history for your SQL Servers.
Baseline Statistics	Analyze and compare performance baselines across two SQL Server instances.
Query Wait Statistics	Analyze different wait type categories on your SQL Server instance.

Database Analysis Reports

Report Name	Description
Top Databases	Identify your worst performing databases.
Database Statistics	Analyze and compare performance trends across two databases.
Top Database Applications	Find database applications that consume system resources.
Mirroring History	Analyze the event history for a mirrored database.

Report Name	Description
Top Tables by Growth	Identify the fastest growing tables.
Top Tables by Fragmentation	Identify the most fragmented tables.
Tempdb Statistics	Analyze the performance trends of your tempdb database.
Transaction Log Statistics	Analyze the database transaction log.
Availability Group Statistics	View the historical health of your availability groups, availability replicas, and availability databases. Plus view additional information through the Availability Group Database Statistics sub-report.

Resource Analysis Reports

Report Name	Description
Session Statistics	Track key session and network performance metrics over time.
CPU Statistics	Track key CPU performance metrics.
Disk Details	Track key disk metrics for server.
Disk Statistics	Track key disk performance metrics.
Replication Statistics	Track key replication performance metrics.
Memory Statistics	Track key memory performance metrics.
Disk Space Usage	Track the most recent snapshot of available disk space.
Disk Space History	Track the history of activity for your disk.

Plan Reports

Report Name	Description
Disk Space Usage	Predicts how much disk space may be needed in the future based on current and historical growth rate trends

Report Name	Description
Database Growth	Predicts how large selected databases may grow based on current and historical growth rate trends.
Table Growth	Predicts how large selected tables may grow based on current and historical growth rate trends.

Specify a reporting services server and data source

In order to successfully deploy the reports, you must specify a Microsoft Reporting Services Server and a data source for the report.

Type the name of the report server or select it from the drop-down list, and then click **Next**.

⚠ You must type the full URL address of the Microsoft Reporting Services Server. For example, http://<ReportingServer>/reportserver.

Configure report email notifications

Enter the email address where you would like SQL Diagnostic Manager to send the report notification, and then click **Next**. For more information on configuring report servers for email delivery, see the Microsoft document, E-Mail Delivery in Reporting Services.

View the report deployment summary

Review that all the Reporting Services settings are correct and click **Finish** to apply your changes. If you want to make any changes to the settings displayed, click the **Back** button to go back and make your changes.

Custom reports

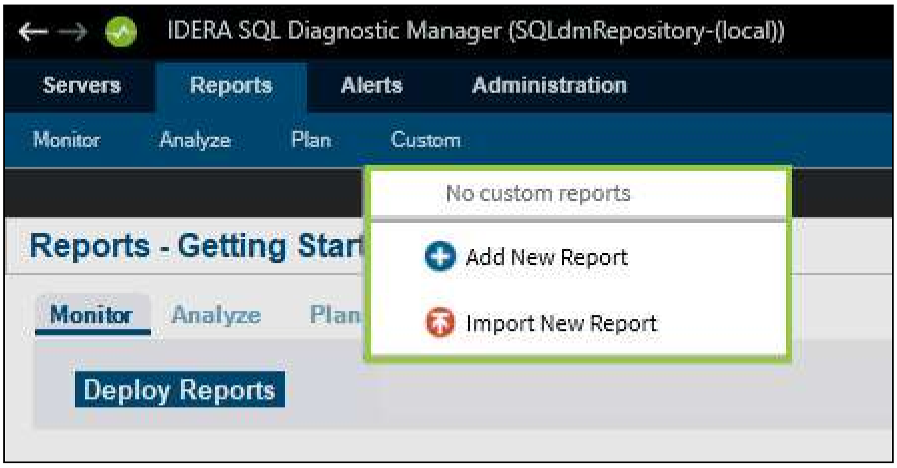
The Custom Reports view allows you to create, import, or export reports on any counter collected by SQL Diagnostic Manager and on any of your custom counters. You can create custom reports to view graphs of the counters followed by a grid containing all of the counters graphed over the entered time frame.

Import and export custom reports

You can also import or share custom reports in the IDERA community site.

Access Custom Reports

Once in the Reports view, click **Custom** in the Navigation pane.



Add New Report

Create your custom report.

Import or Export an existing report

You can import or export an existing custom report to the IDERA community site.

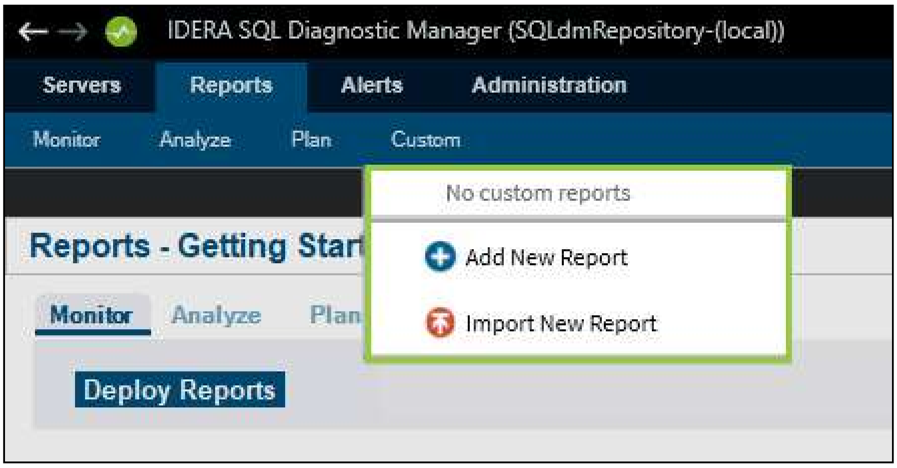
Create a custom report

The Custom Reports wizard allows you to create or edit a custom report. Custom Reports can include any metric collected by SQL Diagnostic Manager. This wizard allows you to choose the counters you want to include in your report, order the way the metrics appear, and specify the aggregation method used on each of your metrics.

To open the Custom Reports wizard, click the **Add New Report** option in the drop-down list under the Reports tab.

Add or edit a custom report

On the Custom drop-down list, you can select whether you want to create a new report or edit an existing report.

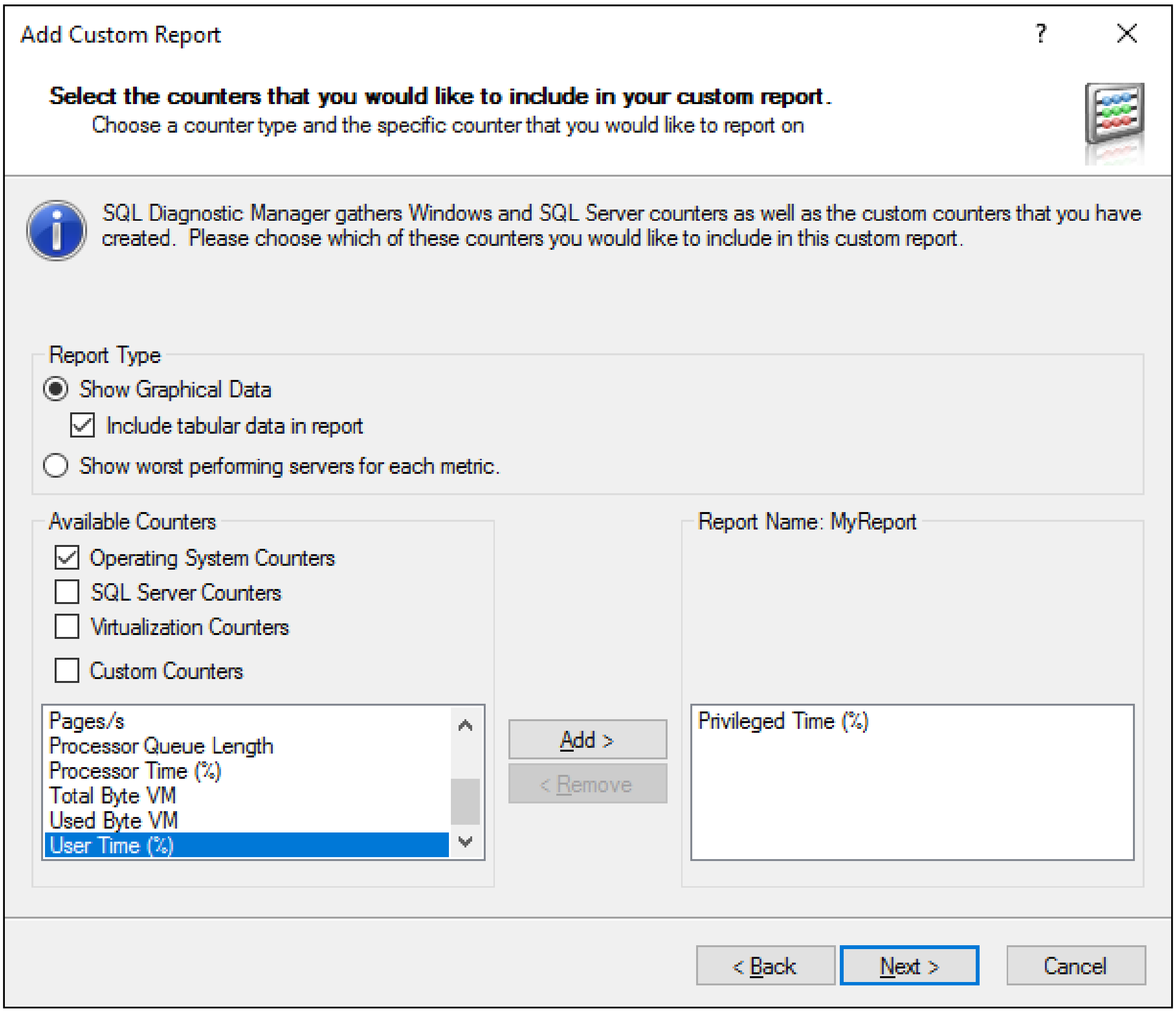


Create a new Report

To create a new report, follow the steps below.

1. Select **Add New Report** from the drop-down list.
2. When the Custom Report Wizard window opens, click **Next**, type a name for the report, and click **Next**.

3. Select the custom counters you want to include in your report from the Available Counters list, and click **Next**.



Add Custom Report

Select the counters that you would like to include in your custom report.

Choose a counter type and the specific counter that you would like to report on

SQL Diagnostic Manager gathers Windows and SQL Server counters as well as the custom counters that you have created. Please choose which of these counters you would like to include in this custom report.

Report Type

● Show Graphical Data

☑ Include tabular data in report

○ Show worst perfoming servers for each metric.

Available Counters

☑ Operating System Counters

□ SQL Server Counters

□ Virtualization Counters

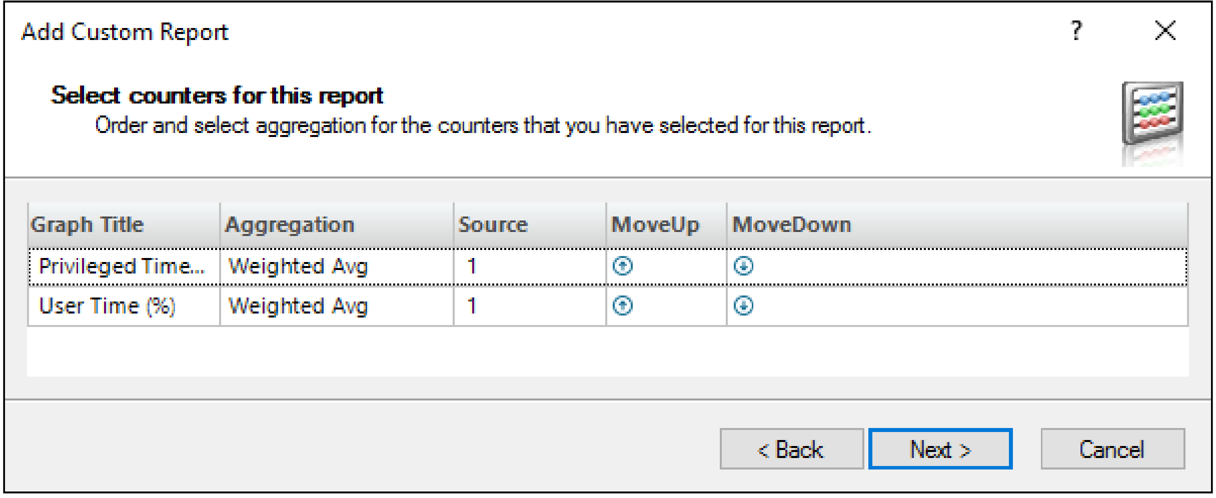
□ Custom Counters

Pages/s
Processor Queue Length
Processor Time (%)
Total Byte VM
Used Byte VM
User Time (%)

Report Name: MyReport

Privileged Time (%)

4. Configure the order of your custom counter according to your preference. Click **Next** when you are done.



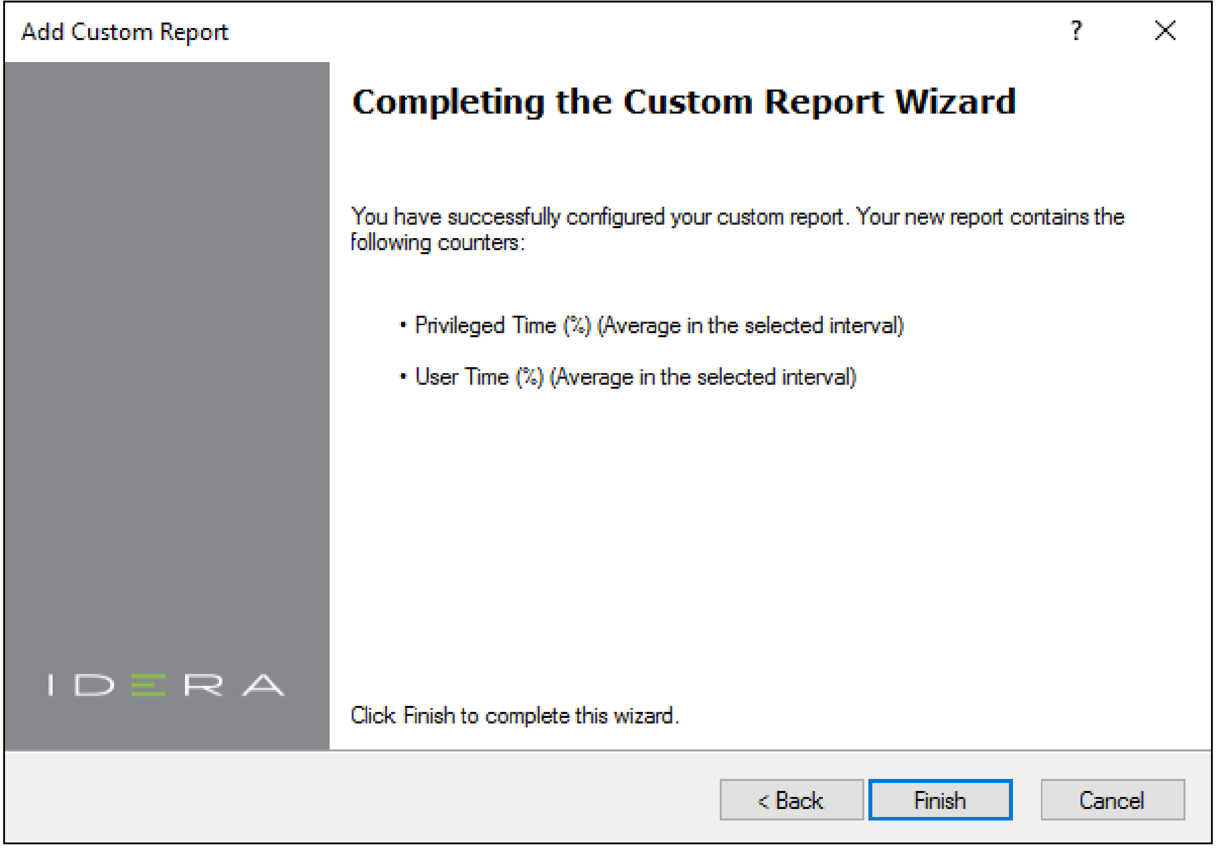
Add Custom Report

Select counters for this report

Order and select aggregation for the counters that you have selected for this report.

Graph Title	Aggregation	Source	MoveUp	MoveDown
Privileged Time...	Weighted Avg	1	⊕	⊕
User Time (%)	Weighted Avg	1	⊕	⊕

5. Check your custom counters summary and click **Finish** .



Completing the Custom Report Wizard

You have successfully configured your custom report. Your new report contains the following counters:

- Privileged Time (%) (Average in the selected interval)
- User Time (%) (Average in the selected interval)

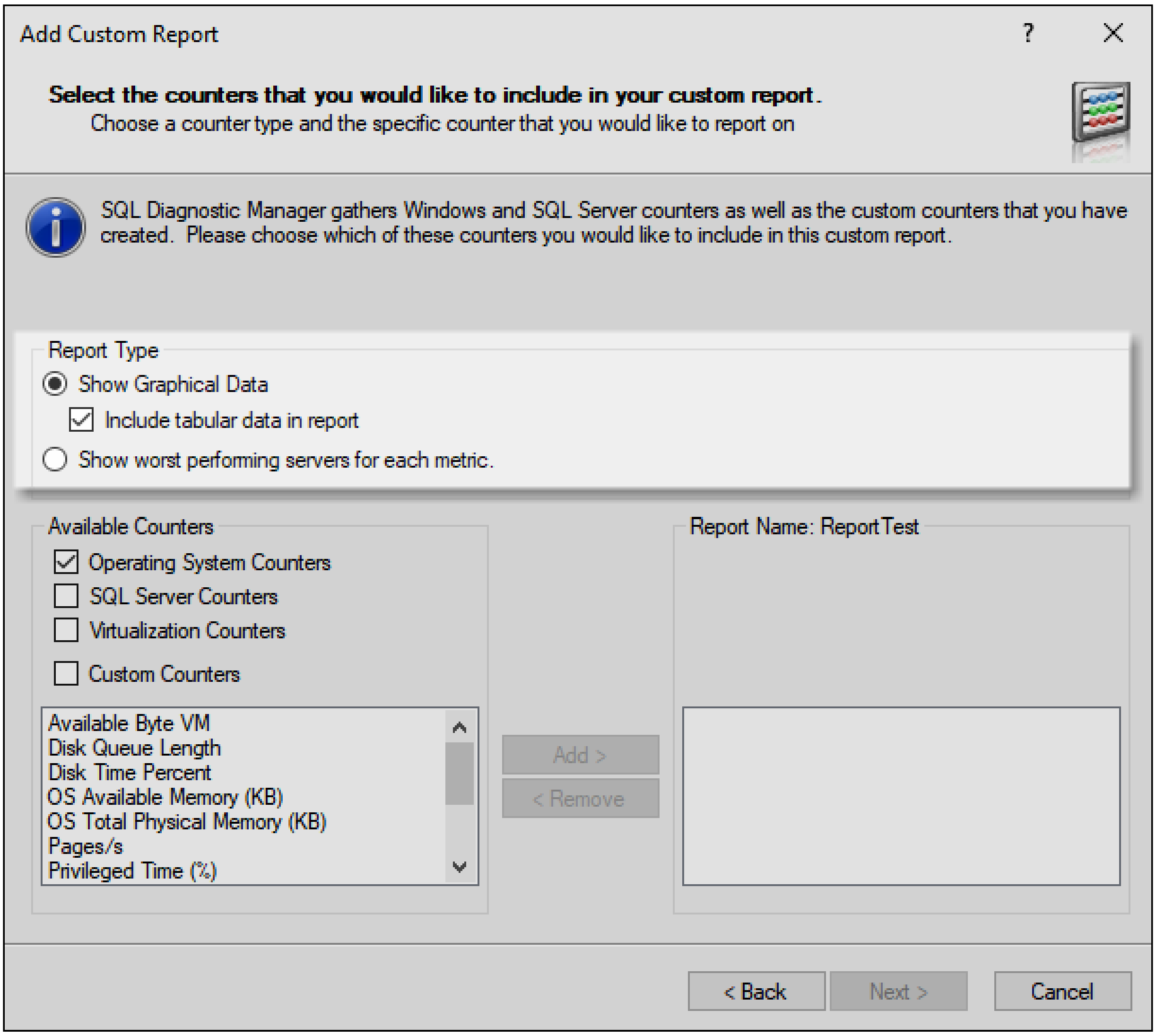
Click Finish to complete this wizard.

Edit a report

To edit an existing report, select the custom report from the Custom drop-down list. When the report opens, select **Edit** from the Custom drop-down list and edit your report.

Select report type

SQL Diagnostic Manager allows you to choose the type of custom report you want to create. You can select the show graphical data report or theshow worst-performing servers for each metric report.



Add Custom Report

Select the counters that you would like to include in your custom report.
Choose a counter type and the specific counter that you would like to report on

SQL Diagnostic Manager gathers Windows and SQL Server counters as well as the custom counters that you have created. Please choose which of these counters you would like to include in this custom report.

Report Type
- ● Show Graphical Data
  - ☑ Include tabular data in report
- ○ Show worst performing servers for each metric.

Available Counters
- ☑ Operating System Counters
- □ SQL Server Counters
- □ Virtualization Counters
- □ Custom Counters

Available Byte VM
Disk Queue Length
Disk Time Percent
OS Available Memory (KB)
OS Total Physical Memory (KB)
Pages/s
Privileged Time (%)

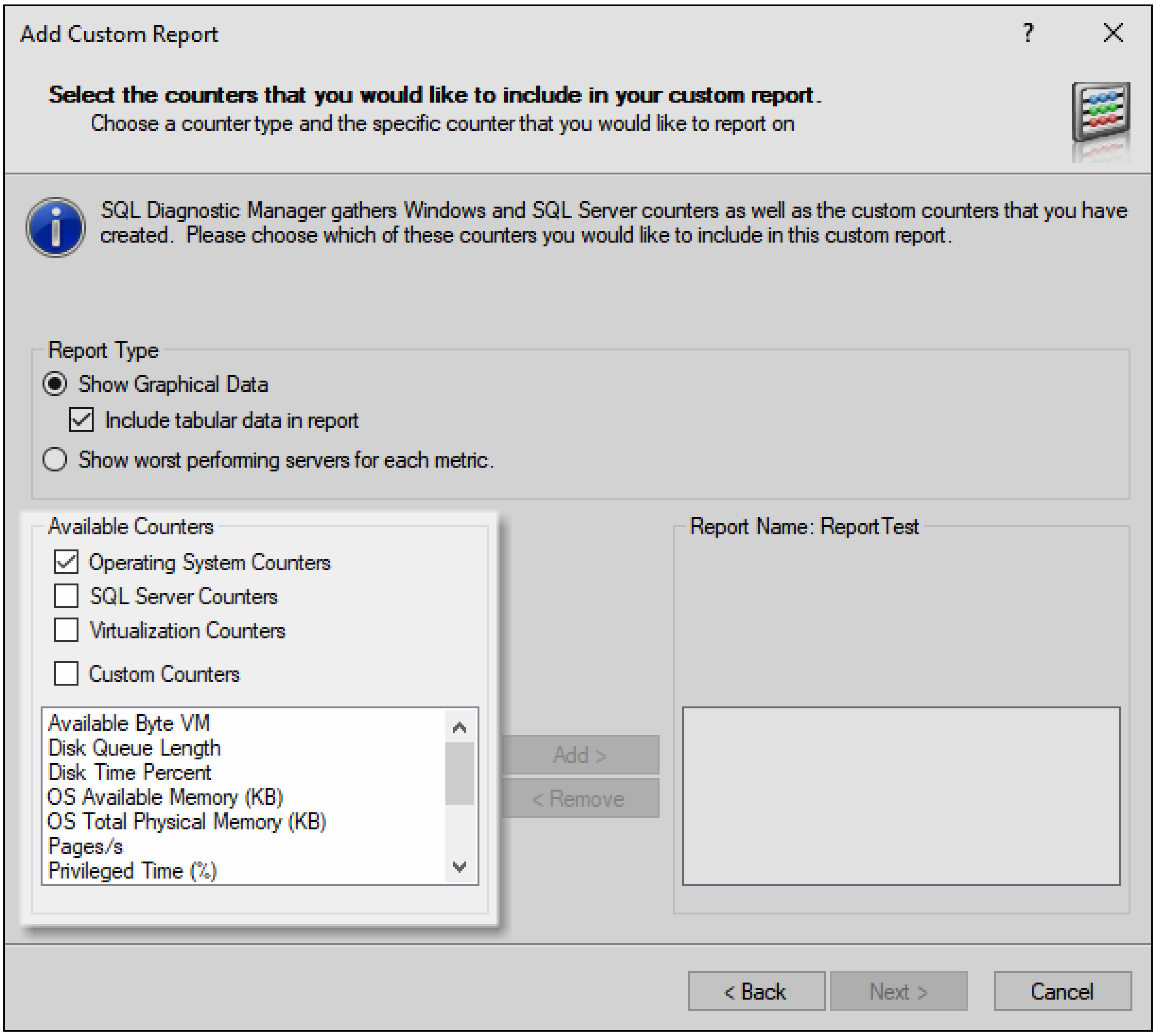
Report Name: ReportTest

If you want SQL Diagnostic Manager to display tabular data, select the **Include tabular data in the report** check box.

> ✓ Enable the **Include tabular data in the report** check box by clicking the **Show Graphical Data** radio button.

Select counter type and counters

The Select Counters window allows you to choose the counters you want to include in your report. You can select up to 10 counters from all of the counters that SQL Diagnostic Manager currently collects.



Add Custom Report

Select the counters that you would like to include in your custom report.

Choose a counter type and the specific counter that you would like to report on

SQL Diagnostic Manager gathers Windows and SQL Server counters as well as the custom counters that you have created. Please choose which of these counters you would like to include in this custom report.

Report Type

● Show Graphical Data

☑ Include tabular data in report

○ Show worst performing servers for each metric.

Available Counters

☑ Operating System Counters

□ SQL Server Counters

□ Virtualization Counters

□ Custom Counters

Available Byte VM
Disk Queue Length
Disk Time Percent
OS Available Memory (KB)
OS Total Physical Memory (KB)
Pages/s
Privileged Time (%)

Report Name: ReportTest

To select the counters you want to include in your custom report:

1. Check the box next to the type of counters you want to include with your report to view an alphabetical list of counters. You can select counters from the following groups:
    a. Operating System Counters
    b. SQL Server Counters
    c. Virtualization Counters for both Hyper-V and VMware server virtualization platforms
    d. Custom Counters
3. Select one or more counters from the Available Counters list and click **Add** to include it in your report.
4. Click **Next**.

Top Servers custom report

The Top Servers custom report lists your worst performing monitored SQL Server instances for each selected metric. The Top Servers custom report allows you to filter information by tag, time period, and number of servers.

When to run this report

Run the Top Servers custom report to quickly identify your monitored SQL Server instances that need immediate attention.

Select counter order

Update the counter order for this report to specify where you want SQL Diagnostic Manager to display the counters included in your custom report and how to aggregate metrics.

SQL Diagnostic Manager offers the following options to change the aggregation for each metric included in your report.

Maximum

Displays the maximum value for the metric since the last collection.

Average

Displays the average per second value since the last collection.

Per Minute

Displays the average per minute value since the last collection.

To rearrange or change the metric aggregation for your counters:

1. ***If you want to rearrange a counter in your report***, click the up or down arrow next to the counter you want to move.
2. ***If you want to change the aggregation for a metric in your report***, select the appropriate **Aggregation** method.
3. Click **Next**.
4. Complete the Custom Report wizard by clicking **Finish**.

Import a custom report

The Custom Reports Import Wizard allows you to import already defined custom reports from the IDERA Community Site. Custom reports can include any metric collected by SQL Diagnostic Manager.

> ❗ The Custom Reports Import and Export functionality applies only to reports created within SQL Diagnostic Manager. Also, you can export or import these reports only within SQL Diagnostic Manager environments.

To import a custom report:

1. Open the Custom Reports Import Wizard by selecting the **Import** button from the Custom reports drop-down list.

   > ✓ You can also access the Custom Report import wizard by clicking **Administration > Import/Export** from the navigation pane and selecting **Custom Report** in the import column.

2. On the **Welcome to the Custom Reports Import** page, click **Next**.
3. On the **Select custom reports to import** page, browse for custom reports' XML files to import.
4. If the report name is already in use but you wish to complete the import process, click **Replace existing report**.
5. If the imported custom report is valid. Click **Finish** to complete the import process and exit the Custom Reports Import Wizard.

   > ✓ **Export a custom report**
   >
   > For instructions on exporting a custom report, see Export a custom report.

Export a custom report

The Custom Reports Export Wizard allows you to export and share already created custom reports in the IDERA community site. Custom Reports can include any metric collected by SQL Diagnostic Manager.

> The Custom Reports Import and Export functionality applies only to reports created within SQL Diagnostic Manager. Also you can export or import these reports only within SQL Diagnostic Manager environments.

To export a custom report:

1. Select **Reports** in the navigation pane.
2. Once in the Reports view, click **Custom** in the Navigation pane.
3. Select the custom report you wish to export from the list and click **Export** in the Custom Report Options. Click image to view full size.
4. In the **Save As** dialog box, indicate in which folder you want to save the custom report XML file.
5. In the "Selected custom report exported successfully" notification, click **OK**.

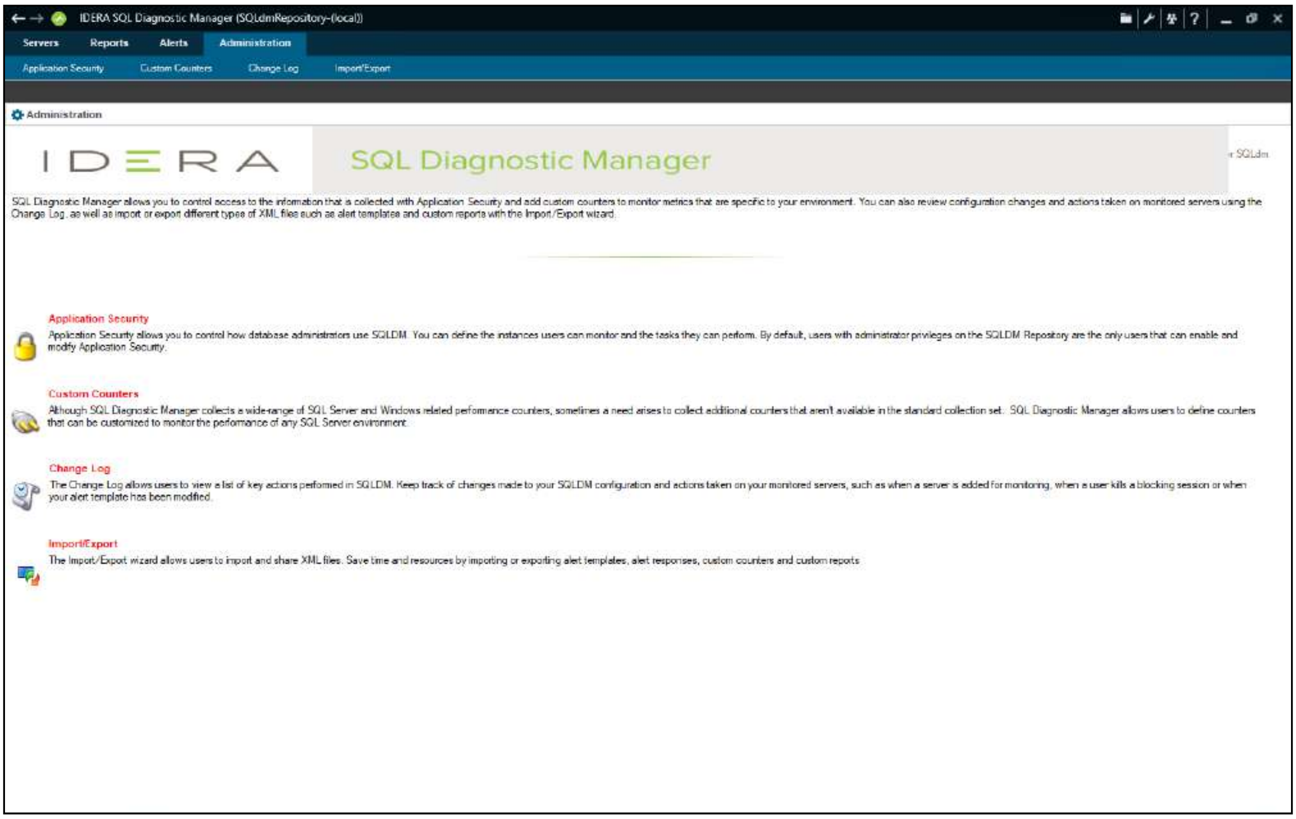
> **Import a custom report**
>
> For instructions on importing a custom report, see Import a custom report.

To export all your custom reports:

1. Select **Administration > Import/Export** and click **Custom Report** in the export column.
2. In the **Browse For Folder** dialog box, indicate in which folder you want to save the custom reports XML files.
3. Once you receive the notification "Custom reports exported successfully to selected directory", click **OK**.

Manage SQL Diagnostic Manager

The Administration view of SQL Diagnostic Manager allows you to control access to all the information that SQL Diagnostic Manager collects, letting you designate the servers and databases that each of your SQL Diagnostic Manager users can view or edit. In addition to controlling access, you can also add or import custom counters to monitor in SQL Diagnostic Manager and even keep track of key actions performed in your SQL Diagnostic Manager environment.



SQL Diagnostic Manager allows you to control access to the information that is collected with Application Security and add custom counters to monitor metrics that are specific to your environment. You can also review configuration changes and actions taken on monitored servers using the Change Log, as well as import or export different types of XML files such as alert templates and custom reports with the Import/Export wizard.

Application Security

Application Security allows you to control how database administrators use SQLDM. You can define the instances users can monitor and the tasks they can perform. By default, users with administrator privileges on the SQLDM Repository are the only users that can enable and modify Application Security.

Custom Counters

Although SQL Diagnostic Manager collects a wide-range of SQL Server and Windows related performance counters, sometimes a need arises to collect additional counters that aren't available in the standard collection set. SQL Diagnostic Manager allows users to define counters that can be customized to monitor the performance of any SQL Server environment.

Change Log

The Change Log allows users to view a list of key actions performed in SQLDM. Keep track of changes made to your SQLDM configuration and actions taken on your monitored servers, such as when a server is added for monitoring, when a user kills a blocking session or when your alert template has been modified.

Import/Export

The Import/Export wizard allows users to import and share XML files. Save time and resources by importing or exporting alert templates, alert responses, custom counters and custom reports.

Use application security to manage SQL Diagnostic Manager

In many SQL Server production environments, there are several different types of users, such as DBAs, Operators, Help Desk Users, Administrators, and Auditors to name a few. Within each of these groups, there may be several sub-groups of responsibility, such as a DBA that manages a certain set of high-security databases that other DBAs do not. SQL Diagnostic Manager allows you to designate the access both individual users and groups of users have within SQL Diagnostic Manager.

⚠ When Application Security is enabled, the only users who have access to SQL Diagnostic Manager are those who belong to the sysadmin role on the SQL Diagnostic Manager Repository. All other users must be added to SQL Diagnostic Manager.

Enable Application Security

Once you enable Application Security, you must add User Permissions for each user you want to give SQL Diagnostic Manager access. Based on the assigned permissions, each user can only access a subset of monitored SQL Server instances. These security settings are enforced in the SQL Diagnostic Manager Console.

Note that users who belong to the sysadmin role on the SQL Diagnostic Manager Repository always have Administrator powers.

Available actions on the Application Security window

The Application Security window lists each login name and the type of access the login has to SQL Diagnostic Manager. The following actions are available on the Application Security window:

Disable/Enable Application Security

You can toggle Application Security on and off using the associated icon. Disabling Application Security gives all SQL Diagnostic Manager users full access to SQL Diagnostic Manager.

Add SQL Diagnostic Manager Permissions

You can open the Add SQL Diagnostic Manager Permissions wizard by clicking the **Add** button on the Application Security window. This wizard allows you to add SQL Server Logins, Windows Users, and Group accounts and assign them SQL Diagnostic Manager view, modify, and administration privileges.

Edit Login Permissions

Once you add SQL Diagnostic Manager Permissions, the Edit Login Permissions window allows you to edit login permissions.

Delete Login Permissions

Click the **Delete** button to remove the previously added login from SQL Diagnostic Manager.

Enable/Disable Permissions

You can toggle non-system, SQL Diagnostic Manager login permissions by checking and clearing the associated box in the **Enabled** column.

Export SQL Diagnostic Manager Permission Settings to Excel

You can export all your SQL Diagnostic Manager Permission settings to Microsoft Excel by right-clicking any user in on the Application Security window and selecting **Export to Excel**.

Add users to SQL Diagnostic Manager

The Add Permission wizard allows you to give SQL Diagnostic Manager access to a specified login in your environment. By default, all users belonging to the sysadmin role on the SQL Diagnostic Manager Repository have SQL Diagnostic Manager Administrator privileges and all other users are denied access to any of the monitoring and diagnostic views in SQL Diagnostic Manager.

⚠ Logins belonging to the sysadmin role on the SQL Diagnostic Manager Repository have SQL Diagnostic Manager Administrator privileges and you cannot edit or delete these accounts.

Each login account can have multiple permissions associated with it. For example, if you want User A to have the ability to view all your SQL Server instances but modify only one of them, you can create two permissions. Include View permissions in the first login to allow the login to view all your SQL Server instances, and enable Modify permissions for the specified SQL Server instance in the second login.

✓ If a SQL login is entered and it does not already exist, a new login account is created on the SQL Diagnostic Manager Repository SQL Server instance.

To create a SQLDM login account:

1. Click **Administration > Application Security**.
2. Click the **Add** button on the Application Security window.
3. Click **Next** on the Add Permission wizard Welcome window.
4. Type either the Windows account or SQL login used to connect to the SQL Diagnostic Manager Repository.
5. Select the **Authentication** type and click **Next**.
6. Select the type of SQL Server instance permissions to grant to the specified account and click **Next**.
7. Select the tags or SQL Server instances to apply the permissions to and click **Add** to move them to the Selected Servers column and click **Next** (this option is only available for View and Modify permissions only).
8. Review your changes on the Summary window and click **Finish** to add the SQL Diagnostic Manager login.

Specify user

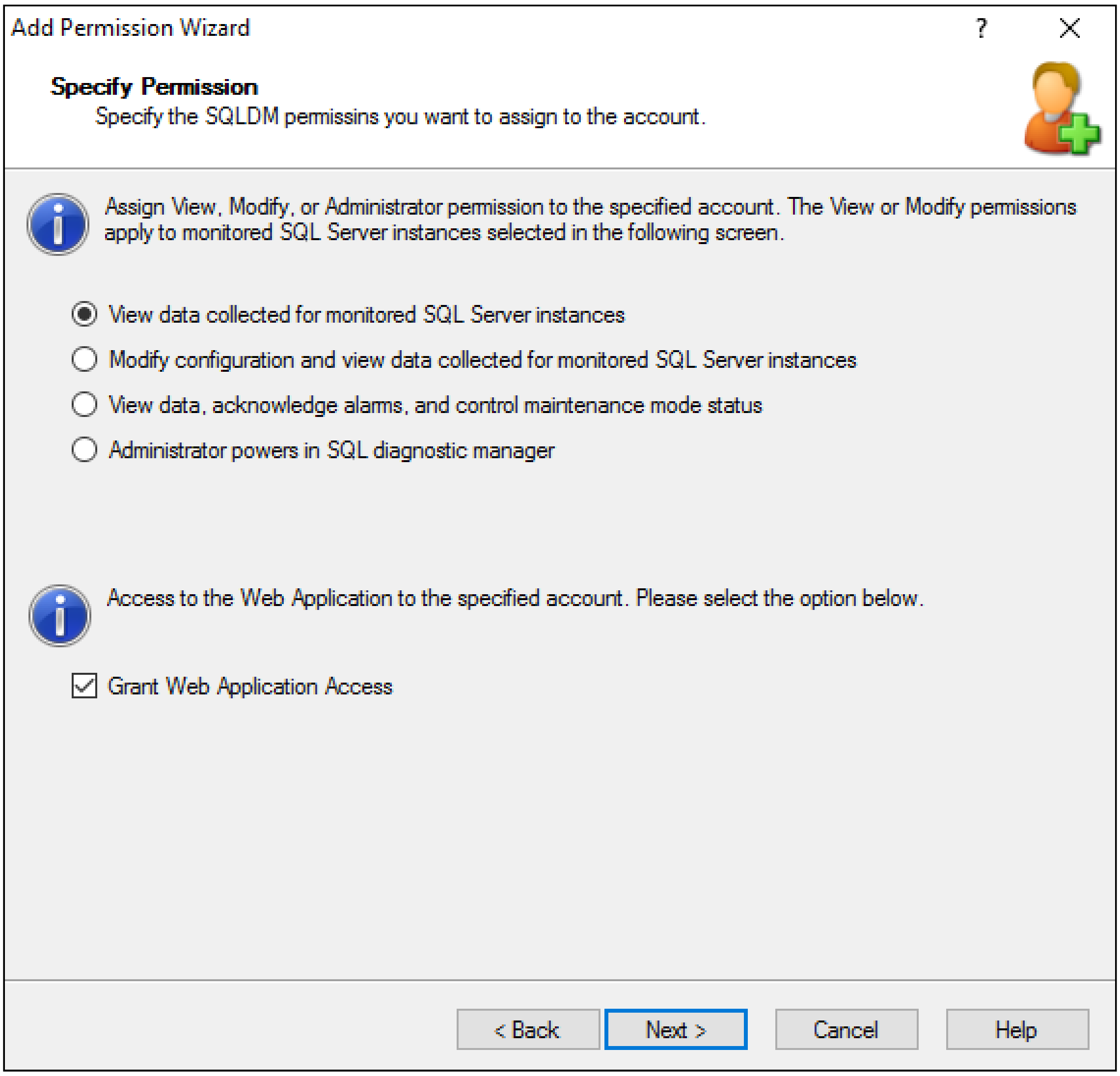
The Specify User window allows you to enter the login name and authentication type. Enter either the Windows account name or the SQL login used to connect to the SQLDM Repository. If the SQL login entered does not exist, one is created on the SQLDM Repository Server.

> ⚠ If the Windows account entered is not a valid Windows account, an error appears when you exit the Add Permission wizard and the SQLDM login is not created.

Specify permissions

In this window you can specify the SQLDM permissions you want to assign to the login. You can apply the following permissions to the specified account:

- View data collected for monitored SQL Server instances
- Modify configuration and view data collected for monitored SQL Server instances
- View data, acknowledge alarms, and control maintenance mode status
- Administrator powers in SQL Diagnostic Manager



Specify Permission
Specify the SQLDM permissins you want to assign to the account.

Assign View, Modify, or Administrator permission to the specified account. The View or Modify permissions apply to monitored SQL Server instances selected in the following screen.

● View data collected for monitored SQL Server instances
○ Modify configuration and view data collected for monitored SQL Server instances
○ View data, acknowledge alarms, and control maintenance mode status
○ Administrator powers in SQL diagnostic manager

Access to the Web Application to the specified account. Please select the option below.

☑ Grant Web Application Access

ⓘ Give access to the Web Application to the specified account, by selecting the Grant Web Application Access option.

View Permissions

Logins with View permissions can view the data collected for the assigned SQL Server instances except where noted in the following table.

SQLDM Area	Cannot do the following
File Menu	Manage servers
Tools Menu	Configure default alerts
	Edit notification rules or providers
	Edit grooming options
Help Menu	Manage licenses
Servers pane	Delete servers
	Enter or exit Maintenance Mode
	Configure alerts, but can view alert settings
	Edit SQL Server properties, but can view properties
Today Page > Active Alerts	Configure alerts, but can view alerts
Today Page > Common Tasks	Manage servers
Mini-Monitors grid	Delete mini-monitors
	Edit properties, but can view properties
Server Overview > Dashboard	Enter or exit Maintenance Mode
	Configure alerts, but can view alert settings
Server Overview > Details	Configure alerts, but can view alert settings
Server Overview > Configuration	Edit value
Session > Details	Trace or kill a session

SQLDM Area	Cannot do the following
Session > Locks	Trace or kill a session
Session > Blocking	Trace or kill a session
Queries/Non-query activities	Configure Query/Activity Monitor properties, but can view properties
Resources > Procedure Cache	Clear cache
Databases > Tables and Indexes	Update statistics or rebuild indexes
Services > Summary	Start or stop services
Services > SQL Agent Jobs	Start or stop job
Logs	Cycle server log
	Configure
Alerts pane	Configure default alerts
	Edit notification rules and providers
Alerts > Grid	Configure alerts, but can view alerts
	Clear alerts
	Clear alerts of this type for this instance
Administration pane	Access or view Administration

Modify Permissions

Logins with Modify permissions can edit basic settings for the data collected for assigned SQL Server instances except where noted in the following table.

SQLDM Area	Cannot do the following
File Menu	Manage servers

SQLDM Area	Cannot do the following
Tools Menu	Edit alert configuration
	Edit notification rules or providers
	Edit grooming options
Help Menu	Manage licenses
Alerts pane	Configure default alerts
	Edit notification rules or providers
Administration pane	Access or view Administration

Administration Permissions

Logins with Administration permissions can access all monitored SQL Server instances and modify all settings including grooming options, notification rules, and providers, manage SQL Diagnostic Manager licenses, manage application security including the ability to add custom counters, and has the ability to add and remove SQL Server instances in SQL Diagnostic Manager.

✓ You cannot edit or delete logins belonging to the sysadmin role on the SQL Diagnostic Manager Repository as they have SQL Diagnostic Manager Administrator privileges.

ⓘ The SQLDM Console displays a message when a user with View or Modify permissions attempts to perform an action that requires Administrator (sysadmin) permissions.

Assign instances to user

The Select SQL Server window allows you to select the SQL Server instances to apply the permissions you set on the Specify User Permissions window. Select Server tags from the Tags drop-down list or choose New tag from the list. Select the SQL Server Instances you want the login to have permissions on and click **Add** button to move them to the Selected Servers column. Click **Next** to continue.

View the Add Permission summary

Review that all the Add Permission settings are correct and click **Finish** to apply your changes. If you want to make any changes to the settings displayed, click the **Back** button to go back and make your changes.

Edit user permissions

The Edit Permissions window allows you to change the permissions for the specified login.

⚠ Logins belonging to the sysadmin role on the SQLDM Repository have SQLDM Administrator privileges and you cannot edit or delete the login.

To Enable/Disable Login Permissions

You can toggle non-system, SQLDM login permissions by checking and clearing the associated check box in the **Enabled** column.

Edit Permissions

Select the appropriate permission level for the login. You can select **View**, **Modify**, or **Administrator** permissions.

Enter Comments

The **Comments** field allows you to enter additional information about the login. This information appears in the **Comment** column on the Application Security window.

Edit assigned instances

The Assigned Servers window allows you to change the SQL Server instances on which the login has permissions. To tag a server instance, select Server tags from the Tags drop-down list or add a new tag by choosing New tag from the list. Select the SQL Server instances on which you want the login to have permissions and click **Add** button to move them to the **Selected Servers** column. Click **Next** to continue.

Use the Change Log to review changes in your SQL Diagnostic Manager configuration

Granted the number and different types of users in SQL Server production environments, keeping track of changes to your SQL Diagnostic Manager configuration is critical. Through the Change Log you can view a list of key actions performed in your SQL Diagnostic Manager environment, such as when a server is added for monitoring, an alert configuration or grooming configuration is changed. The Change Log view gives thorough and instant information on modifications.

The Change Log view is available by default in SQL Diagnostic Manager version 8.0 and higher versions.

Access the Change Log view

To open the Change Log view, click **Administration > Change Log** from the navigation pane.

Change Log Window Properties

This window allows you to view details about an individual event in the Change Log. You can view the following information:

- Date and time of action
- Type of action
- Object on which the action occurred
- Workstation and workstation user
- Repository user who executed the action
- Description of action

Available actions

Scroll through activities

To scroll from one action to the next, use the up and down arrows.

Copy, export and print action details

To copy action details to another application, export contents to Microsoft Excel or even print, right-click on selected row. This action prompts the aforementioned commands.

Getting more information

You might be interested in obtaining further details about the actions performed in SQL Diagnostic Manager and their possible impacts. The details pane contains in depth action information and automatically displays when a row in the table is highlighted. The split bar is adjustable to your needs.

Filters

Allows you to filter the listed activities by time span, for example, last 30 days or even arrange a custom range.

Enable Groups

Allows you to group actions by a specific header column, such as the workstation from which an action was executed or the date an action occurred. To enable groups, click Group By Box. You can as well expand all groups or collapse all groups.

Available columns

Date

Provides date and time when action occurred.

Action

Provides information on the type of action that occurred.

Object Name

Provides the name of the object on which the action was executed.

Workstation

Provides the name of the workstation from which an action was executed.

Workstation User

Provides the name of the user, logged in a specific workstation, from which an action was executed.

Repository User

Provides the name of the user who applied the change. The format displayed, when using Windows authentication, is DomainName\LogonName.

Change Summary

Provides a brief description of action.

Use the SQL Diagnostic Manager import/export wizard

SQL Diagnostic Manager provides a centralized import/export wizard that allows you to import and share existing XML files. Save time and resources by importing or exporting alert templates, alert responses, custom reports, and custom counters files.

ⓘ The import/export wizard is available by default in SQL Diagnostic Manager 10.0 and higher versions.

Access the import/export wizard

To open the import/export wizard, click **Administration > Import/Export** at the navigation pane.

Available options in the import/export wizard

Alert Template

Click **Alert Template** in the appropriate column to import or export an alert template.

Alert Response

Select **Alert Response** in the appropriate column to import or export an alert response.

Custom Report

Click **Custom Report** in the appropriate column to import or export a custom report.

Custom Counters

Select **Custom Counter** in the appropriate column to import or export a custom counter.

Use PowerShell to automate SQL Diagnostic Manager functions

SQL Diagnostic Manager PowerShell integration allows you to make mass changes to your SQL Diagnostic Manager configuration across multiple SQL Server instances in a few lines of text, saving you time. For more information about it click the following link: SQL Diagnostic Manager PowerShell integration.

About PowerShell

Microsoft® Windows® PowerShell is a task-based command-line shell and scripting language designed especially for system administration. Built on the .NET Framework, Microsoft® Windows® PowerShell helps IT professionals and power users control and automate the administration of the Windows operating system and applications that run on Windows.

Windows PowerShell furnishes an operating environment for commands that include cmdlets, functions, filters, scripts, aliases, and executables (applications). The main command type used in this environment is the cmdlet, with certain cmdlets made available only through Windows PowerShell providers that allow access to stored data.

Windows PowerShell operates within a hosting application (the default is `powershell.exe`) that exposes a command line to the user, and uses a host interface to communicate with the commands invoked by the command line. You can use a console application, Windows application, or a Web application as the hosting application. In most cases, the hosting application uses its Main function to interact with the Windows PowerShell runtime through the internal host interface; however, a hosting application can optionally support its own custom host by implementing the PSHost class along with one or more related user interface classes. Together, these classes allow direct communication between the application and Windows PowerShell commands.

For more information about Windows PowerShell, see SQL Server Books Online.

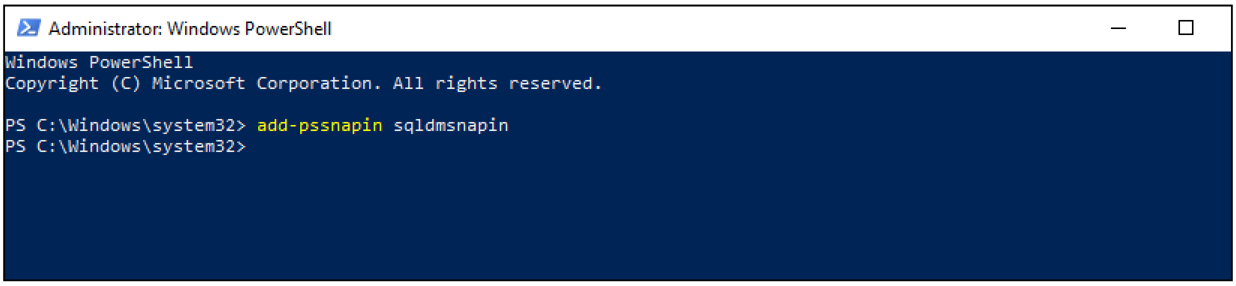
Install the SQL Diagnostic Manager provider for PowerShell

The SQLDM Provider is installed automatically with SQL Diagnostic Manager. To use SQL Diagnostic Manager snapin, you have to enable the provider and register the SQLDM drive.

PowerShell 3.0 or higher is required to use the PowerShell snap-in.

To enable the provider, type the following within PowerShell:

```
add-pssnapin sqldmsnapin
```

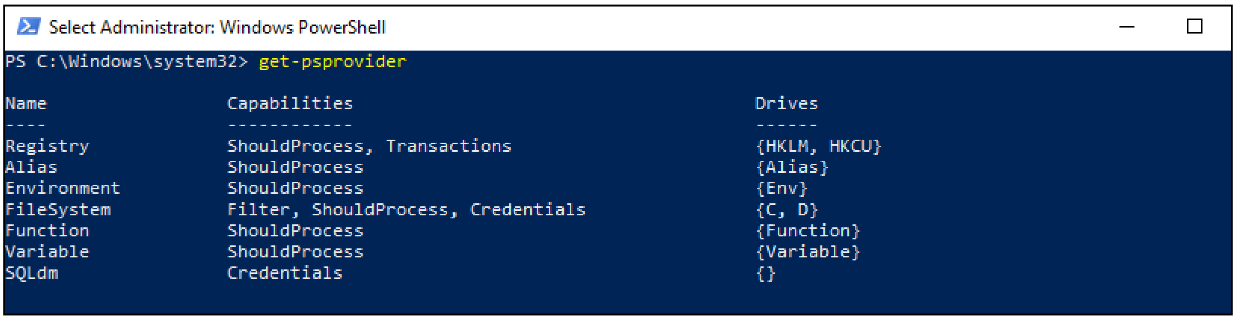


```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

PS C:\Windows\system32> add-pssnapin sqldmsnapin
PS C:\Windows\system32>
```

To verify your snapin is registered:

```
get-psprovider
```



```
PS C:\Windows\system32> get-psprovider

Name                 Capabilities                                      Drives
----                 ------------                                      ------
Registry             ShouldProcess, Transactions                       {HKLM, HKCU}
Alias                ShouldProcess                                     {Alias}
Environment          ShouldProcess                                     {Env}
FileSystem           Filter, ShouldProcess, Credentials                {C, D}
Function             ShouldProcess                                     {Function}
Variable             ShouldProcess                                     {Variable}
SQLdm                Credentials                                       {}
```

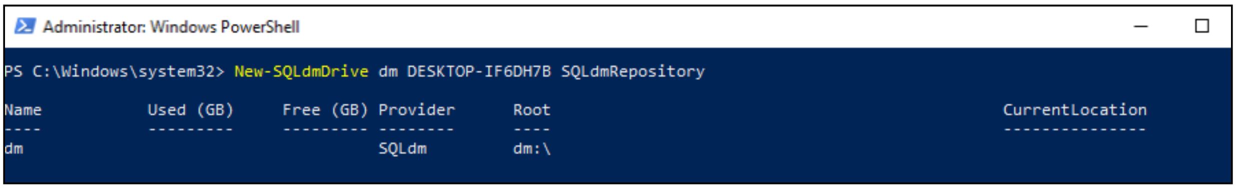
To register the SQLdm drive, type the following within PowerShell:

```
        New-SQLdmDrive dm [Server] [Repository]
```

For example:

```
New-SQLdmDrive dm PUL-FF-W2K8X64S\SQL2012_BI SQLdmRepository
```

Creates a new SQL Diagnostic Manager drive called 'dm' that is connected to the `SQLdmRepository` database on the `PUL-FF-W2K8X64S\SQL2012_BI` SQL Server using Windows Authentication.



```
PS C:\Windows\system32> New-SQLdmDrive dm DESKTOP-IF6DH7B SQLdmRepository

Name           Used (GB)     Free (GB) Provider      Root                                               CurrentLocation
----           ---------     --------- --------      ----                                               ---------------
dm                                     SQLdm         dm:\
```

PowerShell help

To receive general help, type the following within PowerShell:

```
get-help
```

To display a list of cmdlets for the SQL Diagnostic Manager snapin:

```
get-help sqldm
```

Applications available to use with PowerShell

There are several applications that allow you to use PowerShell and enhance its functionality.

PowerShell Plus is a powerful interactive scripting environment designed to help administrators and developers learn and master Windows PowerShell. Unlike most of the basic script editors on the market today, PowerShell Plus features a powerful interactive console, an advanced script editor and a comprehensive learning center. PowerShell Plus is built on the backbone of PowerShellIDE, the first PowerShell application to offer a very rich graphical user interface.

Interactive PowerShell Console

The PowerShellPlus Console allows you to work interactively with PowerShell from a feature-rich Windows UI. This integration makes working with PowerShell faster and easier to use than ever before.

Advanced Script Editor

The advanced debugger and script editor lets you build and test complex PowerShell scripts, try one line PowerShell commands from an embedded console window, and sign your script with a security certificate, all from a single workspace.

Comprehensive Learning Center

The Comprehensive Learning Center helps you experience PowerShell by example. Short tutorials guide you through basic concepts at your own pace. The Comprehensive Learning Center also includes dynamically created help topics from currently installed PowerShell CmdLets.

PowerShell Cmdlets for SQL Diagnostic Manager

The following cmdlets help you automate the administration of your SQL Diagnostic Manager deployments in different environments:

- Local environments
- Cluster environments

> ⚠ To use SQL Diagnostic Manager snapin, you have to enable the provider and register the SQLDM drive.

PowerShell Cmdlets in local environments

The examples provided below provide a small sample of the parameters that are available with each cmdlet. The get-help cmdlet can be used to obtain more information regarding each cmdlet including all of the available parameters.

For example, the following command can be used to get more information on the **Set-SQLdmMonitoredInstance** cmdlet:

```
get-help Set-SQLdmMonitoredInstance
```

or

```
get-help Set-SQLdmMonitoredInstance -detailed
```

The list of cmdlets and their descriptions for the local environment can be found below:

Cmdlet Name	Description	Examples

`Escape-SQLdmName`	Allows you to specify server names containing special characters such as |\?/<>[]:*	`Escape-SQLdmName Server\Instance`
		- Escapes the instance name Server\Instance.
		`Escape-SQLdmName Server\Instance1,Server\Instance2`
		- Escapes the array of instance names.
		`Escape-SQLdmName Server\Instance | Escape-SQLdmName -undo`
		- Escapes the instance name Server\Instance and then undo the operation.
		`Set-SQLdmMonitoredInstance (Escape-SQLName Server\Instance1) -WindowsAuthentication`
		- Escapes the instance name for a Windows user.

`Get-SQLServers`	Retrieves a list of SQL Servers on the network	`Get-SQLServers`
		- Returns a list of all known SQL Servers.
		`Get-SQLServers -localonly`
		- Returns a list of SQL Servers running on the local machine.

Cmdlet Name	Description	Examples

`Grant-SQLdmPermissions`	Grants SQL Diagnostic Manager permissions on a server	`Grant-SQLdmPermission -Path dm:\appsecurity\AUser\AServer -Permission View`
		- Grants View permissions to instance 'AServer' to user 'AUser'.
		`Grant-SQLdmPermission -Path("dm:\appsecurity\" + (Escape-SQLdmName -Name MyDomain\AUser)) -Name AServer -Permission Modify`
		- Grants Modify permissions to instance 'AServer' to Windows user 'MyDomain\AUser'.
		`Grant-SQLdmPermission -Path dm:\appsecurity\AUser -Tag Prod -Permission Modify`
		- Grants a user permissions to instances tagged as Prod.

Cmdlet Name	Description	Examples

`New-SQLdmAlertTemplate`	Associates a template to a monitored instance or a tag	`New-SQLdmAlertTemplate`
		- Enter the following parameters when using this command: TemplateName, DataSource, and RepositoryName or Tag. For example:
		New-SQLdmAlertTemplate
		`PS dm:\> New-SQLdmAlertTemplate -DataSource DESKTOP-IF6DHB -RepositoryName SQLdmRepository -RepositoryInstances DESKTOP -IF6DHB -TemplateName "Default Template"`

Cmdlet Name	Description	Examples

`New-SQLdmDrive`	Creates a drive for connecting to the SQLdm Repository	`New-SQLdmDrive dm MYSQLDMSERVER SQLdmRepository`
		- Creates a new SQL Diagnostic Manager drive called 'dm' that is connected to the SQLdmRepository database on the MYSQLDMSERVER SQL Server using Windows Authentication.
		`New-SQLdmDrive dm MYSQLDMSERVER SQLdmRepository -Credential sa`
		- Creates a new SQL Diagnostic Manager drive called 'dm' that is connected to the SQLdmRepository database on the MYSQLDMSERVER SQL Server using SQL Authentication. Note that Powershell will prompt for the password.

Cmdlet Name	Description	Examples

`New-SQLdmMonitoredInstance`	Adds a SQL Server Instance to monitor in SQL Diagnostic Manager	`New-SQLdmMonitoredInstance -Path Instance1 -WindowsAuthentication -tags production,finance,critical`
		- Adds a new instance named Instance1 to SQL Diagnostic Manager.
		`New-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServerA\Instance1) -Credential sa`
		- Adds a new instance named ServerA\Instance1 to SQL Diagnostic Manager.

`New-SQLdmUser`	Creates a new SQL Diagnostic Manager user	`New-SQLdmUser -Path fred -SQLLogin -Password xxxx -Comment "Fred is an admin"`
		- Creates a new user called fredthat uses SQL Authentication . Note that if the password is not specified, PowerShell will prompt for the password.
		`New-SQLdmUser (Escape-SQLdmName -Name mydomain\fred) -WindowsUser`
		- Creates a new user called mydomain\fred that uses Windows Authentication.

Cmdlet Name	Description	Examples

`Remove-SQLdmMonitoredInstance`	Removes a SQL Server Instance from SQL Diagnostic Manager monitoring	`Remove-SQLdmMonitoredInstance -Path \Instances\ServerA`
		- Removes the instance named ServerA from SQL Diagnostic Manager.
		`Remove-SQLdmMonitoredInstance (Escape-SQLdmName -Name ServerA\Instance1) -retaindata`
		- Removes the instance named ServerA from SQL Diagnostic Manager but retains its data for reporting.

`Remove-SQLdmUser`	Removes an existing SQL Diagnostic Manager user	`Remove-SQLdmUser -Path / AppSecurity/fred`
		- Removes user fredfrom SQL Diagnostic Manager.
		`Remove-SQLdmUser (Escape-SQLdmName -Name MyDomain\AUser)`
		- Removes Windows user MyDomain\AUser from SQL Diagnostic Manager.

Cmdlet Name	Description	Examples

`Revoke-SQLdmPermission`	Revokes SQL Diagnostic Manager permissions on a server	`Revoke-SQLdmPermission -Path \AppSecurity\fred\ServerA`
		- Revokes user fred's permissions to instance ServerA.
		`Revoke-Permission -Path /AppSecurity/fred -Name ServerA`
		- Revokes user fred's permissions to instance ServerA.
		`Revoke-Permission -Path /AppSecurity/fred -Tag Prod`
		- Revokes user fred's permissions to instances tagged as Prod.
		`Revoke-SQLdmPermission -Path ("dm:\AppSecurity\" + (Escape-SQLdmName -Name MyDomain\UserA)) -Name (Escape-SQLdmName -Name ServerA\Instance1)`
		- Revokes Windows user MyDomain\UserA permission to ServerA\Instance1.

Cmdlet Name	Description	Examples

`Set-SQLdmAppSecurity`	Enables or disables Application Security for SQL Diagnostic Manager	`Set-SQLdmAppSecurity \AppSecurity -Enabled`
		- Enables SQL Diagnostic Manager Application Security.
		`Set-SQLdmAppSecurity \AppSecurity -Disabled`
		- DisablesSQL Diagnostic Manager Application Security.

`Set-SQLdmLogging`	Sets the logging level of the SQL Diagnostic Manager provider	❗ Use `Set-SQLdmLogging` for debugging purposes only. This cmdlet should be used at the request of IDERA Technical Support.

Cmdlet Name	Description	Examples

`Set-SQLdmMonitoredInstance`	Configures options on your SQL Server Instance	`Set-SQLdmMonitoredInstance -Path Instance1,Instance2,Instance3 -Credential sa`
		- Updates the credentials used for Instance1,Instance2, and Instance3 to use SQL Authentication and sets a new login and password. Note that PowerShell will prompt for the password.
		`Set-SQLdmMonitoredInstance (Escape-SQLdmName -Name ServerA\Instance1) -WindowsAuthentication`
		- Updates the credentials used for ServerA\Instance1 to use Windows Authentication.

Cmdlet Name	Description	Examples

`Set-SQLdmUser`	Set the properties of an existing SQL Diagnostic Manager user	`Set-SQLdmUser -path \AppSecurity\bozo -Disabled -Comment "Bozo is disabled."`
		- Disables the Set SQL Diagnostic Manager user bozo.
		`Set-SQLdmUser fred -Enabled -Administrator`
		- Enables SQL Diagnostic Manager user fred and gives him administrator rights.
		`Set-SQLdmUser (Escape-SQLdmName -Name mydomain\fred) -Disabled`
		- Disables the SQL Diagnostic Manager user mydomain\fred.

PowerShell Cmdlets in DMSO environments

Cmdlet Name	Description	Examples

`New-SQLdmMonitoredInstance`	Adds a SQL Server Instance to monitor in DMSO	`New-SQLdmMonitoredInstance -Path Instance1 -Cluster cluster1 -WindowsAuthentication`
		- Adds a new instance named Instance1 to the SQL DMSO environment.
		`New-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServerA\Instance1) -Cluster cluster1 -Credential sa`
		- Adds a new instance named ServerA\Instance1 to SQL DMSO environment.

`Remove-SQLdmMonitoredInstance`	Removes a SQL Server Instance from SQL DMSO environments monitoring
	⚠ This cmdlet is the same for clusters and local environments.
		`Remove-SQLdmMonitoredInstance -Path \Instances\ServerA`
		- Removes the instance named ServerA from SQL DMSO environment.
		`Remove-SQLdmMonitoredInstance (Escape-SQLdmName -Name ServerA\Instance1) -retaindata`
		- Removes the instance named ServerA from SQL Diagnostic Manager but retains its data for reporting.

Customize your Monitored SQL Server properties within PowerShell

SQL Diagnostic Manager allows you to customize your monitored SQL Server properties within PowerShell.

With PowerShell you can:

- Edit general settings
- Edit query monitor settings
- Edit query waits settings
- Edit activity monitor settings
- Add alternate Windows users
- Exclude applications, databases, and SQL statements within PowerShell
- Disable replication collection settings
- Customize table statistics collection
- Customize maintenance mode settings

⚠ To use SQL Diagnostic Manager snap-in, you have to enable the provider and register the SQLDM drive.

Edit general settings

Edit the general settings of your monitored SQL Server with the following PowerShell commands:

Cmdlet Name	Description	Examples
`-FriendlyServerName`	Sets friendly name to an instance.	`SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name ServeA\Instance1) -FriendlyServerName stringName`
`-FriendlyServerName Blank`	Clears the friendly name previously assigned to an instance.	`SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name ServeA\Instance1) -FriendlyServerNameBlank`
`-InputBufferLimiter`	Defines an Input Buffer Limiter value.	`SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name ServeA\Instance1) -InputBufferLimiter 100`
`-InputBufferLimiter Enable`	Enables the Input Buffer Limiter.	`SetSQLdmMonitoredInstance Path (EscapeSQLdmName -Name ServeA\Instance1) -InputBufferLimiterEnable`

Cmdlet Name	Description	Examples
`-InputBufferLimiter Disable`	Disables the Input Buffer Limiter.	`SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name ServeA\Instance1) -InputBufferLimiterDisable`
`-addtag`	Associates tags to a server. Note that any tags that are specified have to already exist.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1) -addtag NewTag,Tag2`
`-removetag`	Disassociates tags from a server. Note that any tags that are specified have to already exist.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -removetag NewTag,Tag2`
`-ScheduledCollectionIntervalMinutes`	Specifies how often (in minutes) scheduled data collection takes place.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -ScheduledCollectionIntervalMinutes 10`
`-DatabaseStatisticsIntervalMinutes`	Specifies how often (in minutes) database statistics collection takes place.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 )-DatabaseStatisticsIntervalMinutes 120`

Cmdlet Name	Description	Examples

`-ExtendedSessionDataCollection`	Enables or disables extended data collection.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -ExtendedSessionDataCollection 1`
		- Enables extended data collection.
		`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -ExtendedSessionDataCollection 0`
		- Disables extended data collection.

`-Credential`	Sets SQL Authentication credentials.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -Credential sa`
		- Uses SQL authentication. Note that PowerShell will prompt for the password.
		`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -WindowsAuthentication`
		- Uses the credentials of the SQLDM Collection Service to connect to the monitored instance when collecting statistics.

Cmdlet Name	Description	Examples

`-EncryptConnection`	Enables or disables encrypt connection.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -EncryptConnection 1`
		- Enables encrypt connection.
		`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -EncryptConnection 0`
		- Disables encrypt connection.

`-TrustServerCertificates`	Enables or disables trust server certificates.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -TrustServerCertificates 1`
		- Enables trust server certificates.Note that when specified with the EncryptConnection parameter, SQL Server will not validate the certificates sent from the client but the data will still be encrypted.
		`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -TrustServerCertificates 0`
		- Disables trust server certificates.

Edit query monitor settings

Customize the query monitor settings of your monitor SQL Server with the following PowerShell commands:

Cmdlet Name	Description	Examples
-QMEnableTraceMonitoring	Enables "Collect Query Data using SQL Trace".	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name ServeA\Instance1) -QMEnableTraceMonitoring
-QMEnableExtendedEvents	Enables "Collect Query Data using Extended Events".	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name ServeA\Instance1) -QMEnableExtendedEvents
-QMEnableCollectQueryPlan	Enables "Collect actual Query Plans".	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name ServeA\Instance1) -QMEnableCollectQueryPlan
-QMDisableCollectQueryPlan	Disables "Collect actual Query Plans".	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name ServeA\Instance1) -QMDisableCollectQueryPlan
-QMEnableCollectEstimatedQueryPlan	Enables “Collect Estimated Query Plans”.	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name ServeA\Instance1) -QMEnableCollectEstimatedQueryPlan
-QMDisableCollectEstimatedQueryPlan	Disables “Collect Estimated Query Plans”.	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name ServeA\Instance1) -QMDisableCollectEstimatedQueryPlan
-QMEnabled	Enables query monitoring.	Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1) -QMEnabled

Cmdlet Name	Description	Examples
`-QMDisabled`	Disables query monitoring.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -QMDisabled`
`-QMCaptureBatches`	Captures SQL batches.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -QMEnabled -QMCaptureBatches 1`
`-QMCaptureStatements`	Captures SQL statements.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -QMEnabled -QMCaptureStatements 1`
`-QMCaptureProcs`	Captures stored procedure and triggers.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -QMEnabled -QMCaptureProcs 1`
`-QMQueryDuration`	Sets up threshold Duration (in milliseconds).	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -QMQueryDuration 20000`

Cmdlet Name	Description	Examples
`-QMLogicalDiskReads`	Sets up threshold Logical disk reads.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -QMLogicalDiskReads 20`
`-QMCpuUsage`	Sets up threshold CPU Usage (in milliseconds).	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -QMCpuUsage 500`
`-QMPhysicalDiskWrites`	Sets up threshold Physical disk writes.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -QMPhysicalDiskWrites 20`

Edit query waits settings

Customize the query waits settings of your monitor SQL Server with the following PowerShell commands:

Cmdlet Name	Description	Examples
-QWExtendedEnable	Enables "Use Extended Events (SQL Server 2012 +)".	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name INSTANCE_NAME) -QWExtendedEnable
-QWExtendedDisable	Disables "Use Extended Events (SQL Server 2012 +)".	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name INSTANCE_NAME) -QWExtendedDisable
-QWStatisticsDisable	Disables "Collect query wait statistics (SQL 2005+ only)".	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name INSTANCE_NAME) -QWStatisticsDisable

Cmdlet Name	Description	Examples
-QWStatisticsDuration	Enables "Collect query wait statistics at a specified time and duration".	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name INSTANCE_NAME) -QWStatisticsStartDate"yyyy-mm-dd-hh:mm" -QWStatisticsDuration mm:ss
-QWStatisticsCollectIndefinite	Enables "Collect query wait statistics with Collect indefinitely option".	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name INSTANCE_NAME) -QWStatisticsCollectIndefinite

Edit activity monitor settings

Customize the activity monitor settings of your monitor SQL Server with the following PowerShell commands:

Cmdlet Name	Description	Examples
-NQAEnableSQLTrace	Enables “Use SQL trace”.	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name SRISHTIPUROHIT\SQLEXPRESS) -NQAEnableSQLTrace
-NQAEnableExtendedEvent	Enables “Use extended event (SQL 2012+)”.	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name SRISHTIPUROHIT\SQLEXPRESS) -NQAEnableExtendedEvent
-NQADisableAutoGrow	Disables “Capture Autogrow”.	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name SRISHTIPUROHIT\SQLEXPRESS) -NQADisableAutoGrow
-NQAEnableAutoGrow	Enables “Capture Autogrow”.	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name SRISHTIPUROHIT\SQLEXPRESS) -NQAEnableAutoGrow
-NQAEnableCaptureBlocking	Enables “Capture Blocking”.	SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name SRISHTIPUROHIT\SQLEXPRESS) -NQAEnableCaptureBlocking

Cmdlet Name	Description	Examples
`-NQADisableCaptureBlocking`	Disable “Capture Blocking”.	`SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name SRISHTIPUROHIT\SQLEXPRESS) -NQADisableCaptureBlocking`
`-NQACaptureBlocking`	Sets “blocking process threshold".	`SetSQLdmMonitoredInstance -Path (EscapeSQLdmName -Name SRISHTIPUROHIT\SQLEXPRESS) -NQACaptureBlocking 100`

Add alternate Windows users

Add alternate Windows users with the following cmdlet in different environments.

Cmdlet Name	Description	Examples

`-WindowsAlternateAuthentication`	Add alternate Windows users.	`New-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name Instance1) ` **`-WindowsAlternateAuthentication`** ` Domain1\User1`
		- Adds the instance named Instance1 with a valid Windows user named User1.
		`New-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name Instance1) ` **`-Cluster`** ` Cluster1 ` **`-WindowsAlternateAuthentication`** ` domain1\User1`
		- Adds the instance named Instance1 with a valid Windows user named User1 in a DMSO environment.

Exclude applications, databases, and SQL statements within PowerShell

Exclude applications, databases, and SQL statements with the following PowerShell commands:

Cmdlet Name	Description	Examples
`-QMExcludedApps`	Excludes applications from the query monitor.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -QMExcludedApps excludedApp1, excludedApp2, excludedApp3`
`-QMExcludedDatabases`	Excludes databases from the query monitor.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -QMExcludedDatabases DB1,DB2,DB3`
`-QMExcludedSql`	Excludes SQL statements from the query monitor.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -QMExcludedSql "Select 1","Select * from Table where ID=5"`

Disable replication collection

Disable replication statistics collection with the following PowerShell command:

Cmdlet Name	Description	Example
`-ReplicationStatisticsDataCollection`	Disables replication statistics collection.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -ReplicationStatisticsDataCollection 0` • Disables replication statistics collection for server named ServerA\Instance1.

Customize table statistics collection

Customize table statistics collection with the following PowerShell commands:

Cmdlet Name	Description	Example
`-QTStartTime`	Specifies the time of day for quiet time collection to occur.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -QTStartTime 02:30:00 -QTDays Monday,Tuesday -QTReorgMinTableSizeK 200 -QTExcludedDatabases Test`
`-QTDays`	Specifies the days of the week to perform quiet time collection.	
`-QTReorgMinTableSizeK`	Specifies the quiet time minimum table size (in kilobytes) to collect reorganization statistics.	
`-QTExcludedDatabases`	Specifies the list of databases to exclude from quite time data collection.	

Customize maintenance mode settings

Customize maintenance mode settings with the following PowerShell commands:

Cmdlet Name	Description	Examples
`-MMNever`	Sets maintenance mode to *Never*. Note that SQL Diagnostic Manager will collect data according to its normal scheduled collection interval.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -MMNever`
`-MMAlways`	Sets maintenance mode to *Until further notice*. Schedule collection will not occur.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -MMAlways`

Cmdlet Name	Description	Examples
`-MMRecurring`	Sets maintenance mode to *Recurring every week at the specified time*.	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -MMRecurring -MModeDays Monday,Wednesday,Friday -MModeStartTime 01:35:00 -MModeDuration 01:00`
`-MModeDays`	Specifies the days of the week recurring maintenance mode will be effective.	
`-MModeStartTime`	Specifies the start time for recurring maintenance mode.	
`-MModeDuration`	Specifies the length of time for recurring maintenance mode.	
`-MMOnce`	Sets maintenance mode to *Occurring once at the specified time.*	`Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name ServeA\Instance1 ) -MMOnce -MModeStartDate "2013-03-25 15:00" -MModeEndDate "2013-03-25 15:30"`
`-MModeStartDate`	Specifies the start date and time for one-time maintenance mode.	
`-MModeEndDate`	Specifies the end date and time for one-time maintenance mode.	

Example: Editing several properties at once within PowerShell

PowerShell allows you to set up several properties in one command-line. On the PowerShell window, use Set-SQLdmMonitoredInstance followed by the corresponding cmdlets of the properties you want to edit. For example, consider the properties listed below:

- Enable Query Monitoring
- Capture Batches
- No capture procedures
- Set Query duration at 200 (ms)
- Set Logical disk reads at 20
- Set CPU usage at 100
- Set Physical disk writes at 10
- Exclude Application: MyExcludedApp
- Exclude Databases: DB1, DB2, and DB3

You can customize these settings with the following PowerShell command-line:

```
Set-SQLdmMonitoredInstance -Path (Escape-SQLdmName -Name QA- Name
Server\Instance) -QMEnabled -QMCaptureBatches 1 -QMCaptureProc 0
-QMQueryDuration 200
-QMLogicalDiskReads 20 -QMCpuUsage 100 -QMPhysicalDiskWrites 10
-QMExcludedApps MyExcludedApp -QMExcludedDatabases DB1,DB2,DB3
```

Manage your SQL Diagnostic Manager license

SQL Diagnostic Manager requires a license key. This key allows you to access all SQL Diagnostic Manager features.

Though you can immediately begin using SQL Diagnostic Manager with the included evaluation key, consider updating the evaluation license as soon as possible. A registered license key allows you to unlock the evaluation time and registered instance limits so you can begin using SQL Diagnostic Manager to the fullest extent.

SQL Diagnostic Manager provides an intuitive interface for license key management. You can view the status of your license keys and add licenses to monitor additional instances. Each license allows you to monitor a predetermined number of SQL Server instances.

When you reach your license limit, SQL Diagnostic Manager does not let you add new instances. When your trial period expires, SQL Diagnostic Manager ceases to run.

To open the License Keys window, select ? **> Manage Licenses** from the Toolbar menu.

> ⚠ If you change the SQL Diagnostic Manager Repository to a different instance, make sure to request a new license key from IDERA Sales as this scenario is not supported.

Use the trial license

SQL Diagnostic Manager includes a limited-time trial account with every installation. Note that IDERA provides separate trial and production installers.
As the end of the trial period nears, SQL Diagnostic Manager warns you each time you start the console that your trial period is ending. At the end of this trial period, if the license is not upgraded, SQL Diagnostic Manager stops functioning.

SQL Diagnostic Manager limits the number of monitored SQL Server instances to 15 when using a trial license.

Upgrade your trial license to a full license

1. Contact IDERA Sales to upgrade your SQL Diagnostic Manager trial license.
2. Click ? and select **Manage Licenses**.
3. Enter the new license key in the **New Key** section and click **Enter**. When prompted to type or copy to replace the current key, click **Yes** to continue.

⚠ If after upgrading to a full license you desire to move your SQL Diagnostic Manager Repository to another instance, make sure to request a new license key from IDERA Sales as this scenario is not supported.

Add a new license

If you would like to monitor additional SQL Server instances beyond the limits of your existing license, contact IDERA Sales to purchase additional licenses.

Once you receive a new license, open the License Keys window, click ?, select **Manage Licenses**, type your license key in the available space, and click **Enter**. Your new license lists the number of additional SQL Server instances that you can monitor by SQL Diagnostic Manager. Each new license you add to SQL Diagnostic Manager adds to the total number of SQL Server instances that you can monitor.

To get a new license, contact your IDERA Sales representative.

Generate a new license key

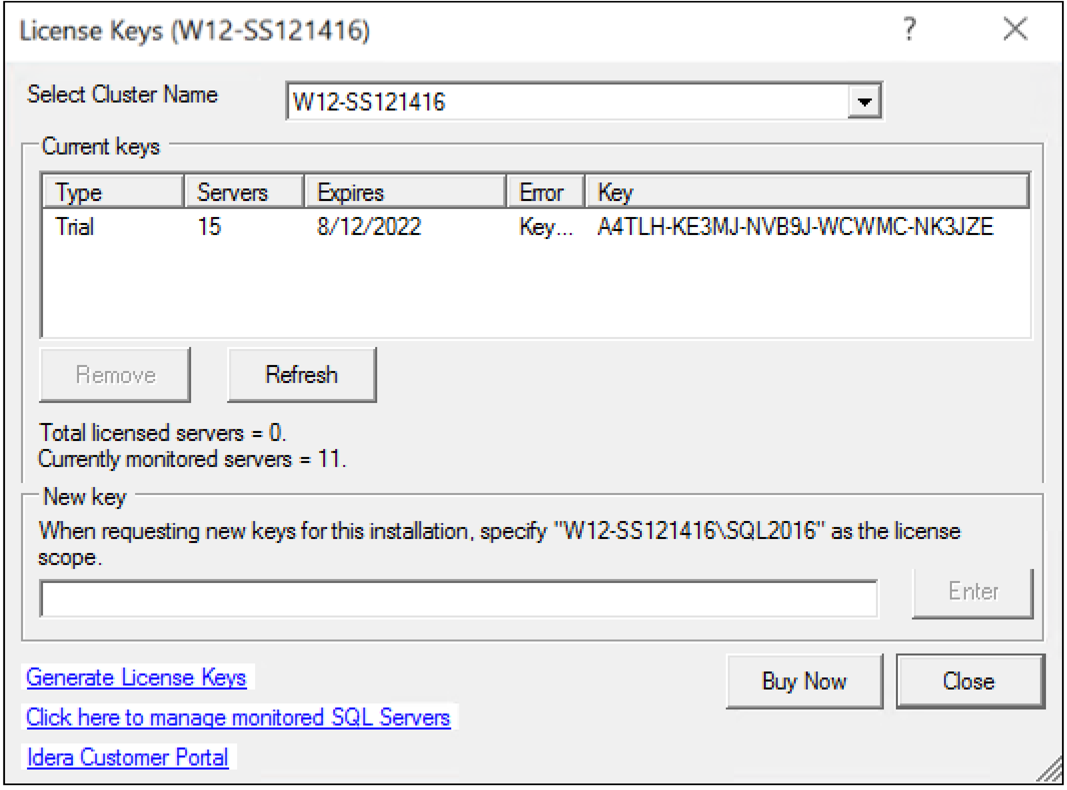
SQL Diagnostic Manager provides a new self-service licensing model that allows you to generate new license keys by logging in to the IDERA Customer Portal or by using the license manager utility.

> ⚠ To upgrade to SQL Diagnostic Manager 9.0 or higher versions, a new license key is required.

Log in the IDERA Customer portal and generate a new license key

To generate a new license key:

1. Open the License Keys window, click ?, select **Manage Licenses** from the Toolbar menu, and click **Generate License Keys**.



License Keys (W12-SS121416)

Select Cluster Name: W12-SS121416

Current keys

Type	Servers	Expires	Error	Key
Trial	15	8/12/2022	Key...	A4TLH-KE3MJ-NVB9J-WCWMC-NK3JZE

Total licensed servers = 0.
Currently monitored servers = 11.

New key

When requesting new keys for this installation, specify "W12-SS121416\SQL2016" as the license scope.

2. On the Manage Licenses window, click **View Licenses.**
3. On the Login to the IDERA Customer Portal window, type your email address in the corresponding space.
4. Enter your password in the appropriate space.
5. Click **Log in** and follow the instructions in the IDERA Customer Portal.

Use the license manager utility and generate a new license

To generate a new license key:

1. Open the License Keys window, click ?, select **Manage Licenses** from the Toolbar menu, and click **Generate License Keys.**
2. On the Manage Licenses window, click the Edit icon ( ).

3. On the Enter credentials to connect window, type your username in the appropriate space.
4. Enter your password in the corresponding space.
5. Select the authentication method by clicking the **Windows** button or the **SQL** button.
6. Click **Log in** and follow the instructions.

Manage your SQL Server instances

The Manage Servers window (🗔 **> Manage Servers**) allows you to see all the SQL Server instances monitored by SQL Diagnostic Manager. You can:

- Add new SQL Server instances to SQL Diagnostic Manager
- Edit the SQL Diagnostic Manager configuration for a particular SQL Server instance
- Remove a SQL Server instance from SQL Diagnostic Manager
- Access the VM Configuration window to associate your monitored virtual SQL Server instances to a host machine
- Apply an existing alert template to a server or group of servers
- Test the connection status of your SQL Server instances

Edit your Management Service configuration

The SQLDM Management Service Configuration wizard allows you to change how the SQLDM Management Service interacts with the SQL Diagnostic Manager Repository.

You can edit the SQLDM Management Service settings whenever you change the location of your SQL Diagnostic Manager Repository or if you want to change the account or authentication method the SQLDM Management Service uses to connect to the SQL Diagnostic Manager Repository.

Access the Management Service Configuration wizard

You can access the SQLDM Management Service Configuration wizard by running the `SQLdmManagementServiceConsole.exe` file in your root SQL Diagnostic Manager directory.

To use the SQLdm Management Service Configuration wizard:

1. Run `SQLdmManagementServiceConsole.exe` in your root SQL Diagnostic Manager directory.
2. Click **Next** on the Welcome window.
3. Enter your Repository information.
4. Enter the Authentication method that you want the SQLdm Management Service to use to write configuration and collected statistics to the SQL Diagnostic Manager Repository.
5. Click **Test** to verify the connection.
6. Click **Next**.
7. Verify the changes are correct.
8. Click **Finish** to apply the changes.

Select a SQL Server instance for the Management Service

The SQLDM Management Service Configuration wizard allows you to select the SQL Server instance for the SQLDM Management Service to connect with the SQLDM Repository. Select the appropriate SQL Server instance from the lists of available local and network instances, and then click **OK**.

Select a database for the Management Service

The SQLDM Management Service Configuration wizard allows you to select the database for the SQLDM Management Service to connect with the SQLDM Repository. Select the appropriate database from the list of available databases, and then click **OK**.

Monitored metrics

SQL Diagnostic Manager collects a number of SQL Server and operating system performance metrics to help you monitor, alert, and report on your system health. SQL Diagnostic Manager includes a number of metrics for your use, such as:

- Batches Received (Per Second)
- Blocked Sessions (Count)
- Buffer Cache Hit Ratio (Percent)
- Client Computers
- SQL Compilations (Per Second)
- Data Used (Percent)
- Database Status
- Disk Queue Length
- Disk Time (Percent)
- I/O Waits
- Lock Waits
- Log Flushes
- Log Space Used (Percent)
- Memory Page Faults (Per Second)
- Memory Paging
- Memory Waits
- Other Waits
- Packets Received (Per Second)
- Packets Sent and Received
- Packets Sent (Per Second)
- Page Reads (Per Second)
- Page Writes (Per Second)
- Percent of SQL Server Data Space Used
- Percent of SQL Server Log Space Used
- Physical Page Reads and Writes
- Processor Queue Length
- Re-compiles Per Second
- Signal Waits
- SQL Server Batches Received
- SQL Server CPU Usage
- SQL Server Log Space Used (Percent)
- SQL Server Memory Usage
- SQL Server Response Time
- Total Memory Usage
- Transaction Log Waits
- Transactions (Per Second)
- Wait type category - Backup
- Wait type category - I/O Page Latch
- Wait type category - Lock
- Wait type category - Memory
- Wait type category - Non-I/O Page Latch
- Wait type category - Non-Page Latch
- Wait type category - Other
- Wait type category - Transaction Log

Batches Received (Per Second)

The Batches Received (Per Second) metric counts the total number of batch requests that the SQL Server computer receives per second. This rate is a measurement of throughput on the processor.

This metric uses the counter `Batch requests/sec` from the SQL Server `SQL Statistics` counter object. On SQL Server 2000 instances, this counter is available through `sysperfinfo`. On SQL Server 2005 or later instances, this counter is available through `sys.dm_os_performance_counters`.

To track this metric, use the CPU Call Rates chart in the CPU dashboard of the Server Overview tab.

While this counter has no good or bad value, each of these T-SQL batches must be:

1. Transmitted to the server using the network.
2. Parsed by SQL Server to check syntax.
3. Have an execution plan compiled.
4. Executed according to the execution plan.
5. Have the results transmitted back to the client computer or website.

Reduce the number and impact of T-SQL batches

In this situation, you should reduce the number of T-SQL batches and the impact of each as much as possible by:

- Reducing the size and complexity of the T-SQL by creating a stored procedure containing the commands you want to execute and then simply calling it in the T-SQL batch. This approach reduces the size and complexity of the T-SQL batch, which means less network traffic and less CPU time consumed producing a complex execution plan.
- Once you move most of the T-SQL code into stored procedures, consider grouping as many of those calling T-SQL commands into a single network batch, if possible. Also, consider redesigning the application to call only those stored procedures you need to complete an application function all from within one batch rather than sending each EXECUTE statement to execute separately in its own batch. This strategy reduces network queues dramatically as better use is made of the default 4 KB network packet size.

Blocked Sessions (Count)

The Blocked Sessions (Count) metric counts the number of sessions on the SQL Server instance blocked by other sessions holding requested locks.

By default, a blocked session waits forever for a lock. You can change this behavior by adding `SET LOCKTIMEOUT 60000` to the top of the first T-SQL batch after you make a connection.

Buffer Cache Hit Ratio (Percent)

The Buffer Cache Hit Ratio (Percent) metric calculates the percentage of data pages SQL Server found in memory without reading the data from the disk subsystem. This value is measured by reading the 'buffer cache hit ratio' from `sysperfinfo`. The higher this value is the more efficiently the system is running.

Reduce the percentage of memory used by SQL Server

Once SQL Server is up for at least 30 minutes, use the following solutions if values lower than 85% regularly occur:

- Add more physical memory (RAM) to the computer.
- If your site makes use of extended stored procedures that are infrequently called, then after calling them, issue a `DBCC DLLNAME (FREE)`. Once an extended stored procedure is called, it remains in memory until SQL Server is shut down even if it is never again called, which then wastes available memory. A `DBCC dllname (FREE)` releases that memory for use by both the procedure cache and Data Pages, which has a significant positive effect on both the Procedure Cache Hit Ratio and the Buffer Cache Hit Ratio. Execute `sp_helpextendedproc` to view the extended stored procedures currently loaded in memory by SQL Server.
- Allowing SQL Server to consume more of the available memory, making sure that OS Paging does not increase.
- Limit SQL Server computers to performing only SQL Server work. Stop any unnecessary programs, such as allowing the computer to act as either a primary or backup domain controller.
- If the computer is running multiple instances of SQL Server, then consider placing each instance on a separate physical computer.

Client Computers

The Client Computers metric calculates the number of distinct connected network adapters currently using the SQL Server instance. This value is measured by getting the count of processes from distinct computers in `sysprocesses` table.

SQL Compilations (Per Second)

This metric calculates the number of SQL compilations per second, including statement-level re-compilations.

This metric uses the counter `SQL Compilations/sec` from the SQL Server `SQL Statistics` counter object. On SQL Server 2000 instances, this counter is available through `sysperfinfo`. On SQL Server 2005 or later instances, this counter is available through `sys.dm_os_performance_counters`.

A high number of compilations (greater than 100 per second) can indicate a high server workload or that there is more recompilation overhead than necessary. Too many compilations can impact a server's performance.

Data Used (Percent)

The Data Used (Percent) metric calculates the size of all data files used as a percent of the added allocated size of all data files.

In a typical medium-to-large-scale OLTP environment with a data file size of over 50 GB, this value slowly increases over time in a linear fashion with the population of any available history tables.

Reduce the percentage of data used

If your site experiences a sudden sharp increase in this value of over 10% in an hour, investigate the issue to fully understand the underlying causes which often lead to poor performance. Possible causes include:

- A large number of rows were inserted into a table. If so, then make sure that the table is not fragmented due to this operation. To verify, run `DBCC SHOWCONTIG`.
- An index with very poor cardinality (uniqueness) was added to a large table. Indexes with poor cardinality often exceed the size of the underlying table itself and in almost all cases are not used by any SQL Server query.
- A large number of rows were incorrectly changed by performing an insert of a new row followed by a delete of the old row. Although the net effect of the change is essentially the same number of rows; the database would have grown significantly in size and require you to issue a `DBCC SHRINKDATABASE`. It is likely that the table is also fragmented because the inserts were done before the deletes so run `DBCC SHOWCONTIG`. Always delete the old rows out of a table first before inserting the new rows; otherwise the tables are fragmented more quickly, databases increase in size, and the performance of the transactions is degraded due to the large number of page splits the table had to undergo.

Database Status

The Database Status metric indicates the operational status of the database, such as Normal, Offline, or Suspect. You can select the database status for which you want to receive alerts.

Disk Queue Length

The Disk Queue Length metric counts the average number of system requests that are waiting for disk access on the computer hosting the SQL Server instance. The Disk view on the Resources tab allows you to track your Disk Queue Length, along with other key disk statistics, over a period of time on the computer hosting your SQL Server instance.

Reasons why this metric has no value

SQL Diagnostic Manager is unable to collect the corresponding counter due to one of the following reasons:

- It usually takes two refreshes to begin populating the Disk Queue metric, which occurs within a few seconds.
- OS Metrics collection is disabled or not working properly. You must enable OS Metrics collection for SQLdm to collect hardware performance metrics.
- Lightweight Pooling is enabled. SQL Diagnostic Manager cannot collect OS metrics if Lightweight Pooling is enabled on the SQL Server instance.
- The counter does not exist on this SQL Server instance.

Disk Time (Percent)

The Disk Time (Percent) metric calculates the percentage of elapsed time during which all the disks were busy servicing read and write requests on the SQL Server computer. This counter is measured by subtracting the Disk Idle Time percent from 100. The WMI object `Win32_PerfRawData_PerfDisk_PhysicalDisk` property `PercentIdleTime` is measured to get Disk Idle Time percent.

Reduce disk time

If this metric value regularly exceeds 75%, consider the following solutions:

- Check OS Paging to make sure that paging from/to the swap file is not causing these IOs.
- Distribute the data and logs over more disks.
- Replace disks with faster disks.
- Add more memory if the main cause is Disk Reads.
- Switch from a RAID 5 to RAID 10 solution if Disk Writes make up more than 20% of total disk access.
- Move non-SQL Server applications to another computer.
- If the computer is running multiple instances of SQL Server, consider placing each instance on a separate computer.

I_O Waits

The I/O Waits metric calculates the length of time that SQL Server processes had to wait for I/O to become available. This rate is a measurement of throughput on the SQL Server computer processor, as determined by the SQL Server workload.

Lock Waits

The Lock Waits metric calculates the length of time that SQL Server processes had to wait for a resource lock to resolve. This rate is a measurement of throughput on the SQL Server computer processor, as determined by the SQL Server workload.

Log Flushes (Per Second)

The Log Flushes (Per Second) metric reads `LOG FLUSHES/SEC` from `sysperfinfo`. Each time data changes, the changes write to the log cache, which resides in memory. Under certain conditions, this log cache is flushed to disk. These situations include:

- A commit or roll back of an explicit or implicit transaction.
- A CHECKPOINT statement execution.
- SQL Server issues an automatic checkpoint.
- The Log Cache is full and needs emptying.

Reduce log flushes

On an OLTP system that runs relatively small transactions (on average, less than 40 rows added, changed, or deleted per transaction), the number of Log Flushes should not exceed SQL Batches by more than 40% during periods of high activity. If you exceed this percentage, then one of the following abnormal conditions exists:

- T-SQL batches sent for execution contain a number of individual data manipulation statements (inserts, deletes, or updates) not enclosed within a transaction.
- Large batch jobs which update significant amounts of data are run during the day.
- Deadlocks or Lock Timeouts are causing a number of transactions to roll back or execute a ROLLBACK TRANSACTION statement.
- Your Recovery Interval parameter is too low. Raise this parameter to 10-15 minutes.
- An explicit CHECKPOINT statement is executed within some transactions.
- If you need to delete the entire contents of a table, use the TRUNCATE TABLE statement instead of DELETE as it produces less log flushes.

If you implement the previously-mentioned measures and the Log Flushes still greatly exceed 140% of SQL Batches, then consider:

- Switching your RAID array from a RAID 5 to a RAID 10 solution. Each write IO results in two writes using RAID 10 vs. 4 for RAID 5 (100% more efficient with writes).
- As long as the RAID controller has some form of battery backup, then switch its cache mode from Write-through to Write-back, as this setting increases the system's ability to handle write IOs by an order of magnitude.
- Adding more cache memory to the RAID controller.

Memory Page Faults (Per Second)

This metric calculates the page fault rate for all processes on the SQL Server computer. The `WMI object Win32_PerfRawData_PerfOS_Memory` property `PagesPersec` is measured to get this value. For optimal performance, the page fault rate should either be either 0 or very low.

Reduce memory page faults

Use the following solutions to reduce the page fault rate if it rises above 100 for a period of time longer than a momentary spike:

- Decrease the memory being used by stopping unnecessary programs such as the Print Spooler from running on the dedicated SQL Server computer. You should also eliminate activities such as the server acting as a PDC or BDC and (as a last resort) reducing the amount of memory SQL Server may consume.
- Add more physical memory on the computer.
- If the computer is running multiple instances of SQL Server, then consider moving each instance to a separate physical computer.

Memory Paging

The Memory Paging metric counts the number of pages being swapped in and out of memory per second. The **Memory** view on the **Resources** tab allows you to track paging and other key memory statistics over a period of time.

Reasons why this metric has no value

SQL Diagnostic Manager is unable to collect the corresponding counter due to one of the following reasons:

- It usually takes two refreshes to begin populating the Memory Paging metric, which occurs within a few seconds.
- OS Metrics collection is disabled or not working properly. You must enable OS Metrics collection for SQLdm to collect hardware performance metrics.
- Lightweight Pooling is enabled. SQL Diagnostic Manager cannot collect OS metrics if Lightweight Pooling is enabled on the SQL Server instance.
- The counter does not exist on this SQL Server instance.

Memory Waits

This metric calculates the length of time that SQL Server processes had to wait for SQL Server memory to become available. This rate is a measurement of throughput on the SQL Server computer processor, as determined by the SQL Server workload.

Other Waits

This metric includes any additional waits occurring on this SQL Server outside of the following wait categories:

- I/O
- Locks
- Memory
- Signal

Waits are a measurement of throughput on the SQL Server computer processor, as determined by the SQL Server workload. To get more details about monitored wait statistics, see the Server Waits view, and review the Microsoft Best Practice Article SQL Server Waits and Queues.

Packets Received (Per Second)

This metric is calculated as a rate between two refreshes of the value of the system statistical function `@@pack_received`. If this value is consistently high, consider changing the packet size.

Packets Sent and Received

This metric counts the number of packets being sent and received, per second, on your SQL Server instance.

Packets Sent (Per Second)

This metric is calculated as a rate between two refreshes of the value of the system statistical function `@@pack_sent`. If this value is consistently high, consider changing the packet size.

Page Reads (Per Second)

This metric counts the number of physical reads the disk sub-system performs to bring SQL Server database pages into the data (buffer) cache. For the first few minutes after you start or restart SQL Server, almost any request for data is retrieved from disk. As the data cache fills, these requests are reduced. This value is measured by reading `'PAGE READS/SEC'` from `sysperfinfo`.

Currently, even the fastest disks can support a maximum sustained rate of around only 85 random IOs per second. To determine if your IO subsystem is "flooded," perform the following calculation:

On RAID 10: `((Page reads + read ahead pages + ((page writes + checkpoint pages + lazy writes + log flushes) X 2)) / number of disk spindles in RAID array)` must be < 65.

Reduce page reads

If the page reads rate exceeds 65 for more than five seconds every 20 minutes, then consider these solutions:

- Add more physical memory (RAM) to the computer.
- If your site makes use of extended stored procedures that are not called very often, then after calling them, issue a `DBCC DLLNAME (FREE)`. Once an extended stored procedure is called, it remains in memory until SQL Server is shut down even if it is never called again. This is tremendously wasteful in terms of available memory and a `DBCC DLLNAME (FREE)` releases that memory for use by both the procedure cache as well as the Data Pages which have a significant positive effect on both the Procedure Cache Hit Ratio as well as the Buffer Cache Hit Ratio. In order to view the extended stored procedures currently loaded in memory by SQL Server, execute `SP_HELPEXTENDEDPROC`.
- Allow SQL Server to consume more of the available memory (making sure that OS Paging does not increase).
- If you are running large, batch-style reporting queries on the OLTP server, then large numbers of data pages are flushed from cache causing much additional IO overhead. In this situation, set up a separate SQL Server Reports computer to service all but the smallest reports. You can feed this Reports Server via backups and Log Shipping from the OLTP server.
- Stop unnecessary programs (such as the Print Spooler or activities such as the database server acting as either a BDC or PDC) from running.
- If the computer is running multiple instances of SQL Server, then consider placing each instance on a separate physical computer.

Page Writes (Per Second)

This metric counts the number of physical database writes the disk sub-system performs. This value is measured by reading `PAGE READS/SEC` from `sysperfinfo`.

Currently, even the fastest disks can support a maximum sustained rate of around only 85 random IOs per second. To determine if your IO subsystem is "flooded," perform the following calculation:

- On RAID 5: `((Page reads + read ahead pages + ((page writes + checkpoint pages + lazy writes + log flushes) X 4)) / number of disk spindles in RAID array)` must be < 65.
- On RAID 10: `((Page reads + read ahead pages + ((page writes + checkpoint pages + lazy writes + log flushes) X 2)) / number of disk spindles in RAID array)` must be < 65.

Reduce page writes

If the page writes rate exceeds 65 for more than five seconds every 20 minutes, then consider the following:

- Add more physical memory (RAM) to the computer.
- If your site makes use of extended stored procedures that are not called very often, then after calling them, issue a `DBCC DLLNAME (FREE)`. Once an extended stored procedure is called, it remains in memory until SQL Server is shut down even if it is never called again! This is tremendously wasteful in terms of available memory and a `DBCC DLLNAME (FREE)` releases that memory for use by both the procedure cache as well as the Data Pages which has a significant positive effect on both the Procedure Cache Hit Ratio as well as the Buffer Cache Hit Ratio. In order to view the extended stored procedures currently loaded in memory by SQL Server, execute `SP_HELPEXTENDEDPROC`.
- Allow SQL Server to consume more of the available memory (making sure that OS Paging does not increase).
- If you are running large, batch-style reporting queries on the OLTP server, then large numbers of data pages are flushed from cache causing much additional IO overhead. In this situation, set up a separate SQL Server Reports computer to service all but the smallest reports. You can feed this Reports Server via backups and Log Shipping from the OLTP server.
- Stop unnecessary programs (such as the Print Spooler or activities such as the database server acting as either a BDC or PDC) from running.
- If the computer is running multiple instances of SQL Server, then consider placing each instance on a separate physical computer.

Percent of SQL Server Data Space Used

This metric calculates the percentage of the allocated disk space for databases that is being used by the SQL Server instance. The total size allocated to the databases is the sum of unused space, data space, and index space. Data space includes leaf level clustered index pages, since these pages are the data pages. Index space excludes the leaf pages of clustered indexes. The Files view on the Databases tab allows you to view detailed data file information including the data size and the percentage of allocated file size being used on each of your databases.

Percent of SQL Server Log Space Used

This metric calculates the percentage of the allocated space for logs that is currently being used. The Files view on the Databases tab allows you to view detailed log information including the log size and the percentage of allocated file size being used on each of your databases.

Physical Page Reads and Writes

This metric counts the number of physical page reads and writes to disk from the SQL Server instance.

Processor Queue Length

This metric counts the number of ready threads in the processor queue on the computer that hosts the SQL Server instance. The WMI `object Win32_PerfRawData_PerfOS_System` property `ProcessorQueueLength` is measured to get processor queue length count.

Re-compiles (Per Second)

The Re-compiles (Per Second) metric calculates the rate of re-compiles on your monitored instance, using the counter `SQL Re-Compilations/sec` from the SQL Server `SQL Statistics` counter object.

On SQL Server 2000 instances, this counter is available through `sysperfinfo` and represents the rate of batch re-compilations per second.

On SQL Server 2005 or later instances, this counter is available through `sys.dm_os_performance_counters` and represents the rate of statement-level re-compilations per second.

Typically, this metric value is low. A high re-compilation rate may be a sign of excessive re-compilation overhead. Causes of re-compiles include various events including schema changes, statistics updates, and explicit calls to `WITH RECOMPILE`. Excessive re-compilation impacts you server performance.

Signal waits

This metric calculates the length of time that SQL Server processes had to wait for CPU time after the associated resources became available for processing. This rate is a measurement of throughput on the SQL Server computer processor, as determined by the SQL Server workload.

SQL Server Batches Received (Per Second)

The SQL Server Batches Received (Per Second) metric counts the number of T-SQL batches that SQL Server receives for execution every second. This value is measured by reading 'batch requests/sec' from `sysperfinfo`. While this counter has no good or bad value, each of these T-SQL batches must:

1. Be transmitted to the server using the network.
2. Be parsed by SQL Server to check syntax.
3. Include a compiled execution plan.
4. Include an executed execution plan.
5. Transmit the results back to the client computer or Web.

You must minimize the number and reduce the impact of these T-SQL batches as much as possible by:

- Reducing the size and complexity of the T-SQL by creating a stored procedure containing the commands you want executed, and then simply calling it in the T-SQL batch. This action reduces the size and complexity of the T-SQL batch, resulting in less network traffic and CPU time consumed producing a complex execution plan.
- Grouping as many calling T-SQL commands into a single network batch after you move most of the T-SQL code into stored procedures. Redesign the application to call whatever stored procedures you need to complete an application function all from within one batch rather than sending each EXECUTE statement to execute separately in its own batch. This action dramatically reduces network queues as you make better use of the default network packet size of 4 KB.

SQL Server CPU Usage (Percent)

The SQL Server CPU Usage (Percent) metric calculates the percentage of CPU time used by the SQL Server instance. This value is calculated by the percentage of time in a query spent by the I/O, idle, and CPU times on the computer that hosts the SQL Server instance.

To track this metric, use the CPU Usage chart in the CPU dashboard of the Server Overview tab.

Lower SQL Server CPU usage

If this value regularly exceeds 75%, consider taking the following actions:

- Reduce the number of SQL re-compilations, as they are CPU intensive. There are many reasons that an object such as a stored procedure is recompiled. You can remove most of these reasons by careful coding.
- Make sure that all T-SQL statements (whether in a Stored Procedure, Trigger, or Ad Hoc statement) that reference objects fully qualify the object referenced.

For example: `SELECT * FROM Northwind.dbo Employees` is a fully-qualified object reference whereas `SELECT * FROM Employees` is a poorly-qualified object. You can reuse the execution plans of fully-qualified objects "as is," whereas plans where you either cannot reuse the not fully-qualified objects or, if they are reused, then they are subject to a highly restrictive `COMPILE` lock while SQL Server determines if all of the objects referenced in the T-SQL code have the same owners as the execution plan currently in cache. Both of these situations consume a significant amount of CPU time.

Log Space Used (Percent)

The Log Space Used (Percent) metric calculates the added size all log files used as a percent of summed allocated size of all data files.

A transaction log continues to grow until its inactive portion is truncated. Transaction log truncation occurs because either:

- the BACKUP LOG statement successfully concluded, or
- if the database is using the Simple Recovery Model, then a CHECKPOINT T-SQL statement executes or SQL Server performed an internal automatic CHECKPOINT. SQL Server performs this action if the log reaches 70% full or when SQL Server determines the length of time to recover from the log, in the event of a failure, exceeds the Recovery Interval option.

Only the inactive portion of the log is ever removed. The inactive portion of the log is the portion of the log up to but not including the start date/time of the oldest open transaction. No matter which method is used to truncate the log, if there is a perpetually open transaction then the log continues to grow in size until it consumes all available disk space.

Reduce the percentage of the log used

If your transaction log size continues to grow despite issuing BACKUP LOG or CHECKPOINT statements, check for a rogue transaction. Begin your research by sorting the Last Batch column on the SQL Processes grid into ascending mode such that the processes containing the oldest batches appear first. Scroll down the list until you find the first user process with a non-zero number of transactions in its Trans column, and then kill this process. Once this is done, perform a CHECKPOINT or BACKUP LOG to reduce the Log File Used Size.

SQL Server Memory Usage

This metric calculates the percentage total memory being used on the computer hosting the selected instance by SQL Server. The Memory view on the Resources tab allows you to track the SQL Server memory usage, along with other key memory statistics, on the computer hosting your SQL Server instance.

SQL Server Response Time (ms)

This metric calculates the time (in milliseconds) that SQL Diagnostic Manager currently needs to send a simple SQL command to the SQL Server instance, have it processed, and receive the returned result set.

Typically, this value should average below 2000 ms for a well tuned network and server. Average values in excess of 2000 ms indicate either an excessively busy network segment or a stressed SQL Server.

Total Memory Usage

This metric calculates the percentage of physical memory and virtual memory Windows is using. The Memory view on the Resources tab allows you to track the Total Memory usage along with other key memory statistics on the computer hosting your SQL Server instance.

Transaction Log Waits

This metric calculates the length of time that SQL Server processes had to wait for the transaction log to become available. This rate is a measurement of throughput on the SQL Server computer processor, as determined by the SQL Server workload.

Transactions (Per Second)

This metric calculates the total number of transactions per second across all databases on the monitored instance.

This metric uses the counter `Transactions/sec` from the SQL Server Databases counter object and `_Total` instance. On SQL Server 2000 instances, this counter is available through `sysperfinfo`. On SQL Server 2005 or later instances, this counter is available through `sys.dm_os_performance_counters`.

This rate is a measurement of throughput on the processor, as determined by the SQL Server workload. Although this rate measures activity within a transaction, and a higher transaction rate indicates a higher risk of resource issues, it does not account for all activity on the SQL Server computer.

Wait type category - Backup

The Backup wait type category includes all the waits that are associated with bottlenecks caused during a backup process, including the following:

- BACKUP
- BACKUP_CLIENTLOCK
- BACKUP_OPERATOR
- BACKUPBUFFER
- BACKUPIO
- BACKUPTHREAD
- DISKIO_SUSPEND

Wait type category - I/O Page Latch

The I/O Page Latch wait type category includes all the waits that are associated with non-I/O page latch bottlenecks, including the following:

- ASYNC_IO_COMPLETION
- IO_COMPLETION
- PAGEIOLATCH_DT
- PAGEIOLATCH_EX
- PAGEIOLATCH_KP
- PAGEIOLATCH_NL
- PAGEIOLATCH_SH
- PAGEIOLATCH_UP

Wait type category - Lock

The Lock wait type category includes all the waits that are caused when a task is waiting to acquire a lock, including the following:

- LCK_M_BU
- LCK_M_IS
- LCK_M_IU
- LCK_M_IX
- LCK_M_RIn_NL
- LCK_M_RIn_S
- LCK_M_RIn_U
- LCK_M_RIn_X
- LCK_M_RS_S
- LCK_M_RS_U
- LCK_M_RX_S
- LCK_M_RX_U
- LCK_M_RX_X
- LCK_M_S
- LCK_M_SCH_M
- LCK_M_SCH_S
- LCK_M_SIU
- LCK_M_SIX
- LCK_M_U
- LCK_M_UIX
- LCK_M_X
- XACTLOCKINFO

Wait type category - Memory

The Memory wait type category includes all the waits that are associated with memory bottlenecks, including the following:

- CMEMTHREAD
- RESOURCE_SEMAPHORE
- RESOURCE_SEMAPHORE_MUTEX
- RESOURCE_SEMAPHORE_QUERY_COMPILE
- RESOURCE_SEMAPHORE_SMALL_QUERY
- SOS_RESERVEDMEMBLOCKLIST

Wait type category - Non-I/O Page Latch

The Non-I/O Page Latch wait type category includes all the waits that are associated with non-I/O page latch bottlenecks, including the following:

- PAGELATCH_DT
- PAGELATCH_EX
- PAGELATCH_KP
- PAGELATCH_NL
- PAGELATCH_SH
- PAGELATCH_UP

Wait type category - Non-Page Latch

The Non-Page Latch wait type category includes all the waits that are caused when a task is waiting for a latch that is not related to paging, including the following:

- LATCH_DT
- LATCH_EX
- LATCH_KP
- LATCH_NL
- LATCH_SH
- LATCH_UP
- TRAN_MARKLATCH_DT
- TRAN_MARKLATCH_EX
- TRAN_MARKLATCH_KP
- TRAN_MARKLATCH_NL
- TRAN_MARKLATCH_SH
- TRAN_MARKLATCH_UP

Wait type category - Other

This wait type category includes all the waits that do not belong to the Memory, I/O, Lock, Transaction Log, Non-I/O Page Latch, Non-Page Latch, or Backup categories.

The following waits are associated with the Other category:

- ABR
- ASSEMBLY_LOAD
- ASYNC_DISKPOOL_LOCK
- ASYNC_NETWORK_IO
- AUDIT_GROUPCACHE_LOCK
- AUDIT_LOGINCACHE_LOCK
- AUDIT_ON_DEMAND_TARGET_LOCK
- AUDIT_XE_SESSION_MGR
- BROKER_CONNECTION_TASK
- BROKER_ENDPOINT_STATE_TASK
- BROKER_INIT
- BROKER_MASTERSTART
- BROKER_REGISTERALLENDPOINTS
- BROKER_SERVICE
- BROKER_SHUTDOWN
- BROKER_XMIT_SHUTDOWN
- BROKER_XMIT_START
- BROKER_XMIT_TABLE
- BUILTIN_HASHKEY_MUTEX
- CHECK_PRINT_RECORD
- CLEAR_DB
- CLR_AUTO_EVENT
- CLR_CRST
- CLR_JOIN
- CLR_MANUAL_EVENT
- CLR_MEMORY_SPY
- CLR_MONITOR
- CLR_RWLOCK_READER
- CLR_RWLOCK_WRITER
- CLR_TASK_START
- CLRHOST_STATE_ACCESS
- COMMIT_TABLE
- CURSOR
- CURSOR_ASYNC
- CXPACKET
- CXROWSET_SYNC
- DAC_INIT
- DBMIRROR_DBM_EVENT
- DBMIRROR_DBM_MUTEX
- DBMIRROR_SEND
- DBMIRROR_WORKER_QUEUE
- DBMIRRORING_CMD
- DBTABLE
- DEADLOCK_ENUM_MUTEX
- DEADLOCK_TASK_SEARCH

- DEBUG
- DIRTY_PAGE_POLL
- DISABLE_VERSIONING
- DISPATCHER_QUEUE_SEMAPHORE
- DLL_LOADING_MUTEX
- DROPTEMP
- DTC
- DTC_ABORT_REQUEST
- DTC_RESOLVE
- DTC_STATE
- DTC_TMDOWN_REQUEST
- DTC_WAITFOR_OUTCOME
- DUMP_LOG_COORDINATOR
- DUMP_LOG_COORDINATOR_QUEUE
- DUMPTRIGGER
- EC
- EE_PMOLOCK
- EE_SPECPROC_MAP_INIT
- ENABLE_VERSIONING
- ERROR_REPORTING_MANAGER
- EXCHANGE
- EXECSYNC
- EXECUTION_PIPE_EVENT_INTERNAL
- FAILPOINT
- FCB_REPLICA_READ
- FCB_REPLICA_START
- FCB_REPLICA_WRITE
- FS_FC_RWLOCK
- FS_GARBAGE_COLLECTOR_SHUTDOWN
- FS_HEADER_RWLOCK
- FS_LOGTRUNC_RWLOCK
- FSA_FORCE_OWN_XACT
- FSAGENT
- FSTR_CONFIG_MUTEX
- FSTR_CONFIG_RWLOCK
- FT_COMPROWSET_RWLOCK
- FT_IFTS_RWLOCK
- FT_IFTSISM_MUTEX
- FT_MASTER_MERGE
- FT_METADATA_MUTEX
- FT_RESTART_CRAWL
- FT_RESUME_CRAWL
- FULLTEXT GATHERER
- GUARDIAN
- HADR_FILESTREAM_IOMGR_IO COMPLETION
- HTTP_ENDPOINT_COLLCREATE
- HTTP_ENUMERATION
- HTTP_START
- IMP_IMPORT_MUTEX
- IMPPROV_IOWAIT
- INDEX_USAGE_STATS_MUTEX
- INTERNAL_TESTING

- IO_AUDIT_MUTEX
- IO_RETRY
- IOAFF_RANGE_QUEUE
- KTM_ENLISTMENT
- KTM_RECOVERY_MANAGER
- KTM_RECOVERY_RESOLUTION
- LOGGENERATION
- LOGMGR_FLUSH
- LOGMGR_RESERVE_APPEND
- LOWFAIL_MEMMGR_QUEUE
- METADATA_LAZYCACHE_RWLOCK
- MIRROR_SEND_MESSAGE
- MSQL_DQ
- MSQL_SYNC_PIPE
- MSQL_XACT_MGR_MUTEX
- MSQL_XACT_MUTEX
- MSQL_XP
- MSSEARCH
- NET_WAITFOR_PACKET
- NODE_CACHE_MUTEX
- OLEDB
- PARALLEL_BACKUP_QUEUE
- PARALLEL_REDO_WORKER_SYNC
- PARALLEL_REDO_WORKER_WAIT_WORK
- PERFORMANCE_COUNTERS_RWLOCK
- PLACEHOLDER1
- PLACEHOLDER2
- PREEMTIVE_ABR
- PREEMPTIVE_AUDIT_ACCESS_EVENTLOG
- PREEMPTIVE_AUDIT_ACCESS_SECLOG
- PREEMPTIVE_CLOSEBACKUPMEDIA
- PREEMPTIVE_CLOSEBACKUPTAPE
- PREEMPTIVE_CLOSEBACKUPVDIDEVICE
- PREEMPTIVE_CLUSAPI_CLUSTERRESOURCECONTROL
- PREEMPTIVE_COM_COCREATEINSTANCE
- PREEMPTIVE_COM_COGETCLASSOBJECT
- PREEMPTIVE_COM_CREATEACCESSOR
- PREEMPTIVE_COM_DELETEROWS
- PREEMPTIVE_COM_GETCOMMANDTEXT
- PREEMPTIVE_COM_GETDATA
- PREEMPTIVE_COM_GETNEXTROWS
- PREEMPTIVE_COM_GETRESULTS
- PREEMPTIVE_COM_GETROWSBYBOOKMARK
- PREEMPTIVE_COM_LBFLUSH
- PREEMPTIVE_COM_LBLOCKREGION
- PREEMPTIVE_COM_LBREADAT
- PREEMPTIVE_COM_LBSETSIZE
- PREEMPTIVE_COM_LBSTAT
- PREEMPTIVE_COM_LBUNLOCKREGION
- PREEMPTIVE_COM_LBREADAT
- PREEMPTIVE_COM_LBSTAT
- PREEMPTIVE_COM_LBUNLOCKREGION

- PREEMPTIVE_COM_LBWRITEAT
- PREEMPTIVE_COM_QUERYINTERFACE
- PREEMPTIVE_COM_RELEASE
- PREEMPTIVE_COM_RELEASEACCESSOR
- PREEMPTIVE_COM_RELEASEROWS
- PREEMPTIVE_COM_RELEASESESSION
- PREEMPTIVE_COM_RESTARTPOSITION
- PREEMPTIVE_COM_SEQSTRMREAD
- PREEMPTIVE_COM_SESSTRMREADANDWRITE
- PREEMPTIVE_COM_SETDATAFAILURE
- PREEMPTIVE_COM_SETPARAMETERINFO
- PREEMPTIVE_COM_SETPARAMETERPROPERTIES
- PREEMPTIVE_COM_STRMLOCKREGION
- PREEMPTIVE_COM_STRMSEEKANDREAD
- PREEMPTIVE_COM_STRMSEEKANDWRITE
- PREEMPTIVE_COM_SRTMSETSIZE
- PREEMPTIVE_COM_SRTMSTAT
- PREEMPTIVE_COM_STRMUNLOCKREGION
- PREEMPTIVE_CONSOLEWRITE
- PREEMPTIVE_CREATEPARAM
- PREEMPTIVE_DEBUG
- PREEMPTIVE_DFADDLINK
- PREEMPTIVE_DFSLINKEXISTCHECK
- PREEMPTIVE_DFSLINKHEALTHCHECK
- PREEMPTIVE_DFSREMOVELINK
- PREEMPTIVE_DFSREMOVEROOT
- PREEMPTIVE_DFSROOTFOLDERCHECK
- PREEMPTIVE_DFSROOTINIT
- PREEMPTIVE_DFSROOTSHARECHECK
- PREEMPTIVE_DTV_ABORT
- PREEMPTIVE_DTC_ABORTREQUESTDONE
- PREEMPTIVE_DTC_BEGINTRANSACTION
- PREEMPTIVE_DTC_COMMITREQUESTDONE
- PREEMPTIVE_DTC_ENLIST
- PREEMPTIVE_DTC_PREPAREREQUESTDONE
- PREEMPTIVE_FILESIZEGET
- PREEMPTIVE_FSAOLEDB_ABORTTRANSACTION
- PREEMPTIVE_FSAOLEDB_COMMITTRANSACTION
- PREEMPTIVE_FSRECOVER_UNCONDITIONALUNDO
- PREEMPTIVE_GETRMINFO
- PREEMPTIVE_LOCKMONITOR
- PREEMPTIVE_MSS_RELEASE
- PREEMPTIVE_ODBCOPS
- PREEMPTIVE_OLE_UNINIT
- PREEMPTIVE_OLEDB_ABORTORCOMMITTRAN
- PREEMPTIVE_OLEDB_ABORTTRAN
- PREEMPTIVE_OLEDB_GETDATASOURCE
- PREEMPTIVE_OLEDB_GETLITERALINFO
- PREEMPTIVE_OLEDB_GETPROPERTIES
- PREEMPTIVE_OLEDB_GETPROPERTYINFO
- PREEMPTIVE_OLEDB_GETSCHEMALOCK
- PREEMPTIVE_OLEDB_JOINTRANSACTION

- PREEMPTIVE_OLEDB_RELEASE
- PREEMPTIVE_OLEDB_SETPROPERTIES
- PREEMPTIVE_OLEDBBOPS
- PREEMPTIVE_OS_ACCEPTSECURITYCONTEXT
- PREEMPTIVE_OS_ACQUIRECREDENTIALSHANDLE
- PREEMPTIVE_OS_AUTHENTICATIONOPS
- PREEMPTIVE_OS_AUTHORIZATIONOPS
- PREEMPTIVE_OS_AUTHZGETINFORMATIONFROMCONTEXT
- PREEMPTIVE_OS_AUTHZINITIALIZECONTEXTFROMSID
- PREEMPTIVE_OS_AUTHZINITIALIZERESOURCEMANAGER
- PREEMPTIVE_OS_BACKUPREAD
- PREEMPTIVE_OS_CLOSEHANDLE
- PREEMPTIVE_OS_CLUSTEROPS
- PREEMPTIVE_OSCOMOPS
- PREEMPTIVE_OS_COMPLETEAUTHTOKEN
- PREEMPTIVE_OS_COPYFILE
- PREEMPTIVE_OS_CREATEDIRECTORY
- PREEMPTIVE_OS_CREATEFILE
- PREEMPTIVE_OS_CRYPTACQUIRECONTEXT
- PREEMPTIVE_OS_CRYPTIMPORTKEY
- PREEMPTIVE_OS_CRYPTOPS
- PREEMPTIVE_OS_DECRYPTMESSAGE
- PREEMPTIVE_OS_DELETEFILE
- PREEMPTIVE_OS_DELETESECURITYCONTEXT
- PREEMPTIVE_OS_DEVICEOPS
- PREEMPTIVE_OS_DIRSVC_NETWORKOPS
- PREEMPTIVE_OS_DISCONNECTNAMEDPIPE
- PREEMPTIVE_OS_DOMAINSERVICEOPS
- PREEMPTIVE_OS_DSGETDCNAME
- PREEMPTIVE_OS_DTCOPS
- PREEMPTIVE_OS_ENCRYPTMESSAGE
- PREEMPTIVE_OS_FILEOPS
- PREEMPTIVE_OS_FINDFILE
- PREEMPTIVE_OS_FLUSHFILEBUFFERS
- PREEMPTIVE_OS_FORMATMESSAGE
- PREEMPTIVE_OS_FREECREDENTIALSHANDLE
- PREEMPTIVE_OS_FREELIBRARY
- PREEMPTIVE_OS_GENERICOPS
- PREEMPTIVE_OS_GETADDRINFO
- PREEMPTIVE_OS_COMPRESSEDFILESIZE
- PREEMPTIVE_OS_GETDISKFREESPACE
- PREEMPTIVE_OS_GETDILEATTRIBUTES
- PREEMPTIVE_OS_GETFILESIZE
- PREEMPTIVE_OS_GETLONGPATHNAME
- PREEMPTIVE_OS_GETPROCADDRESS
- PREEMPTIVE_OS_GETVOLUMENAMEFORBOLUMEMOUNTPOINT
- PREEMPTIVE_OS_GETVOLUMEPATHNAME
- PREEMPTIVE_OS_INITIALIZESECUTIRYCONTEXT
- PREEMPTIVE_OS_LIBRARYOPS
- PREEMPTIVE_OS_LOGONUSER
- PREEMPTIVE_OS_LOOKUPACCOUNTSID
- PREEMPTIVE_OS_MESSAGEQUEUEOPS

- PREEMPTIVE_OS_MOVEFILE
- PREEMPTIVE_OS_NETGROUPGETUSERS
- PREEMPTIVE_OS_NETLOCALGROUPGETMEMBERS
- PREEMPTIVE_OS_NETUSERGETGROUPS
- PREEMPTIVE_OS_NETUSETGETLOCALGROUPS
- PREEMPTIVE_OS_NETUSERMODALSGET
- PREEMPTIVE_OS_NETVALIDATEPASSWORDPOLICY
- PREEMPTIVE_OS_NETVALIDATEPASSWORDPOLICYFREE
- PREEMPTIVE_OS_OPENDIRECTORY
- PREEMPTIVE_OS_PIPEOPS
- PREEMPTIVE_OS_PROCESSOPS
- PREEMPTIVE_OS_QUERYCONTEXTATTRIBUTES
- PREEMPTIVE_OS_QUERYREGISTRY
- PREEMPTIVE_OS_QUERYSECURITYCONTEXTTOKEN
- PREEMPTIVE_OS_REMOREDIRECTORY
- PREEMPTIVE_OS_REPORTEVENT
- PREEMPTIVE_OS_REVERTTOSELF
- PREEMPTIVE_OS_RSFXDEVICEOPS
- PREEMPTIVE_OS_SECURITYOPS
- PREEMPTIVE_OS_SERVICEOPS
- PREEMPTIVE_OS_SETENDOFFILE
- PREEMPTIVE_OS_SETFILEPOINTER
- PREEMPTIVE_OS_SETFILEVALIDDATA
- PREEMPTIVE_OS_SETNAMEDSECURITYINFO
- PREEMPTIVE_OS_SQLCROPS
- PREEMPTIVE_OS_SQMLAUNCH
- PREEMPTIVE_OS_VERIFYSIGNATURE
- PREEMPTIVE_OS_VERIFYTRUST
- PREEMPTIVE_OS_VSSOPS
- PREEMPTIVE_OS_WAITFORSINGLEOBJECT
- PREEMPTIVE_OS_WINSOCKOPS
- PREEMPTIVE_OS_WRITEFILE
- PREEMPTIVE_OS_WRITEFILEGATHER
- PREEMPTIVE_OS_WSASETLATERROR
- PREEMPTIVE_REENLIST
- PREEMPTIVE_RESIZELOG
- PREEMPTIVE_ROLLFORWARDREDO
- PREEMPTIVE_ROLLFORWARDUNDO
- PREEMPTIVE_SB_STOPENDPOINT
- PREEMPTIVE_SERVER_STARTUP
- PREEMPTIVE_SETRMINFO
- PREEMPTIVE_SHAREDMEM_GETDATA
- PREEMPTIVE_SNIOPEN
- PREEMPTIVE_SOSHOST
- PREEMPTIVE_SOSTESTING
- PREEMPTIVE_STARTRM
- PREEMPTIVE_STREAMFCB_CHECKPOINT
- PREEMPTIVE_STREAMFCB_RECOVER
- PREEMPTIVE_STREEDRIVER
- PREEMPTIVE_TESTING
- PREEMPTIVE_TRANSIMPORT
- PREEMPTIVE_UNMARSHAKPROPAGATIONTOKEN

- PREEMPTIVE_VSS_CREATESNAPSHOT
- PREEMPTIVE_VSS_CREATEVOLUMESNAPSHOT
- PREEMPTIVE_XE_CALLBACKEXECUTE
- PREEMPTIVE_XE_DISPATCHER
- PREEMPTIVE_XE_DENGINEINIT
- PREEMPTIVE_XE_GETTARGETSTATE
- PREEMPTIVE_XESESSIONCOMMIT
- PREEMPTIVE_TARGETFINALIZE
- PREEMPTIVE_XE_TARGETINIT
- PREEMPTIVE_XE_TIMERRUN
- PREEMPTIVE_XETESTING
- PRINT_ROLLBACK_PROGRESS
- PWAIT_ALL_COMPONENTS_INITIALIZED
- QDS_ASYNC_PERSIST_TASK_START
- QDS_PERSIST_TASK_MAIN_LOOP_SLEEP
- QDS_SHUTDOWN_QURUR
- QDS_TASK_START
- QNMANAGER_ACQUIRE
- QPJOB_KILL
- QPJOB_WAITFOR_ABORT
- QRY_MEM_GRANT_INFO_MUTEX
- QUERY_ERRHDL_SERVICE_DONE
- QUERY_EXECUTION_INDEX_SORT_EVENT_OPEN
- QUERY_NOTIFICATION_MGR_MUTEX
- QUERY_NOTIFICATION_SUBSCRIPTION_MUTEX
- QUERY_NOTIFICATION_TABLE_MGR_MUTEX
- QUERY_NOTIFICATION_UNITTEST_MUTEX
- QUERY_OPTIMIZER_PRINT_MUTEX
- QUERY_TRACEOUT
- QUERY_WAIT_ERRHDL_SERVICE
- RECOVER_CHANGEDB
- REPL_CACHE_ACCESS
- REPL_HISTORYCACHE_ACCESS
- REPL_SCHEMA_ACCESS
- REPL_TRANHASHTABLE_ACCESS
- REPLICA_WRITES
- REQUEST_DISPENSER_PAUSE
- RESERVED_MEMORY_ALLOCATION_EXT
- RESMGR_THROTTLED
- RFS_MSGPUMP
- RFS_NOTIFYTHREAD
- RFS_STARTUP
- RG_RECONFIG
- SEC_DROP_TEMP_KEY
- SECURITY_CRYPTO_CONTEXT_MUTEX
- SECURITY_MUTEX
- SEQUENTIAL_GUID
- SERVER_IDLE_CHECK
- SHUTDOWN
- SLEEP_BPOOL_FLUSH
- SLEEP_DBSTARTUP
- SLEEP_DCOMSTARTUP

- SLEEP_MASTERDBREADY
- SLEEP_MSDBSTARTUP
- SLEEP_TEMPDBSTARTUP
- SNI_CRITICAL_SECTION
- SNI_HTTP_ACCEPT
- SNI_HTTP_WAITFOR_0_DISCON
- SNI_LISTENER_ACCESS
- SNI_TASK_COMPLETION
- SOAP_READ
- SOAP_WRITE
- SOS_CALLBACK_REMOVAL
- SOS_DISPATCHER_MUTEX
- SOS_LOCALALLOCATORLIST
- SOS_MEMORY_USAGE_ADJUSTMENT
- SOS_OBJECT_STORE_DESTROY_MUTEX
- SOS_PHYS_PAGE_CACHE
- SOS_PROCESS_AFFINITY_MUTEX
- SOS_SCHEDULER_YIELD
- SOS_SMALL_PAGE_ALLOC
- SOS_STACKSTORE_INIT_MUTEX
- SOS_SYNC_TASK_ENQUEUE_EVENT
- SOS_VIRTUALMEMORY_LOW
- SOSHOST_EVENT
- SOSHOST_INTERNAL
- SOSHOST_MUTEX
- SOSHOST_RWLOCK
- SOSHOST_SEMAPHORE
- SOSHOST_SLEEP
- SOSHOST_TRACELOCK
- SOSHOST_WAITFORDONE
- SQLCLR_APPDOMAIN
- SQLCLR_ASSEMBLY
- SQLCLR_DEADLOCK_DETECTION
- SQLCLR_QUANTUM_PUNISHMENT
- SQLSORT_NORMMUTEX
- SQLSORT_SORTMUTEX
- SQLTRACE_FILE_BUFFER
- SQLTRACE_FILE_READ_IO_COMPLETION
- SQLTRACE_FILE_WRITE_IO_COMPLETION
- SQLTRACE_INCREMENTAL_FLUSH_SLEEP
- SQLTRACE_LOCK
- SQLTRACE_SHUTDOWN
- SQLTRACE_WAIT_ENTRIES
- SRVPROC_SHUTDOWN
- TEMPOBJ
- THREADPOOL
- TIMEPRIV_TIMEPERIOD
- TRACE_EVTNOTIF
- TRACEWRITE
- TRANSACTION_MUTEX
- UTIL_PAGE_ALLOC
- VIA_ACCEPT

- VIEW_DEFINITION_MUTEX
- WAIT_FOR_RESULTS
- WAIT_XTP_HOST_WAIT
- WAITFOR_TASKSHUTDOWN
- WAITSTAT_MUTEX
- WCC
- WORKTBL_DROP
- WRITE_COMPLETION
- XACT_OWN_TRANSACTION
- XACT_RECLAIM_SESSION
- XACTWORKSPACE_MUTEX
- XE_BUFFERMGR_ALLPROCESSED_EVENT
- XE_BUFFERMGR_FREEBUF_EVENT
- XE_DISPATCHER_CONFIG_SESSION_LIST
- XE_DISPATCHER_JOIN
- XE_MODULEMGR_SYNC
- XE_OLS_LOCK
- XE_PACKAGE_LOCK_BACKOFF
- XE_SERVICES_EVENTMANUAL
- XE_SERVICES_MUTEX
- XE_SERVICES_RWLOCK
- XE_SESSION_CREATE_SYNC
- XE_SESSION_FLUSH
- XE_SESSION_SYNC
- XE_STM_CREATE
- XE_TIMER_MUTEX
- XE_TIMER_TASK_DONE

CXPACKET wait type actions

SQL Server waits provide information about what the database engine is waiting on while extracting queries on a monitored server. While there are many different wait types, CXPACKET waits are a commonly misinterpreted data measurement and require additional clarification.

CXPACKET waits often result when parallelized query threads have an unequal workload, causing a block on the entire query until the longest-running thread is complete. Note that the trigger for the CXPACKET wait occurs not with parallelism, but with the distribution of work on the individual threads.

While you can decrease the number of CXPACKET waits by reducing the MAXDOP on the monitored server, this is often not a recommended course of action as it may cause the wait to disappear and the underlying query to take longer to execute. For example, this issue may result from large parallel table scans, which you can verify using other wait types on the server, such as PAGIOLATCH_XX. This may also result from out-of-date statistics that cause a bad query plan and the unequal workload among threads.

Before adjusting MAXDOP, review your indexes and statistics for accuracy and make sure there are no other underlying issues. If you choose to adjust MAXDOP, recommended settings include 4, 2, or 1. For a NUMA system, use the number of cores available in a single NUMA node. You may want to make these updates on the single query instead of the entire instance to avoid any additional problems.

LOGMGR_RESERVE_APPEND

Occurs when a task is waiting to see whether log truncation frees up log space to enable the task to write a new log record. Consider increasing the size of the log file(s) for the affected database to reduce this wait.

SOS_STACKSTORE_INIT_MUTEX

This wait type occurs during the synchronization of internal store initialization. Look for systems of high blocking or contention problems with many of the workers and if detected, consider increasing the max working threads if you do not use the default setting of 0.

THREADPOOL

Look for symptoms of high blocking or contention problems with workers if the wait count and times are high. Consider increasing the max worker thread only if the default setting is anything but zero.

Occurs when a task is waiting to be run on. This can indicate that the maximum worker setting is too low, or that batch executions are taking unusually long, thus reducing the number of workers available to satisfy other batches.

Wait type category - Transaction Log

The Transaction Log wait type category includes all the waits that are associated with transaction log bottlenecks, including the following:

- LOGBUFFER
- LOGMGR
- WRITELOG

LOGBUFFER

This wait type is typically encountered whenever there is an I/O bottleneck. Look for WRITERLOG waiters and if found the overall problem is an I/O bottleneck on the storage system associated with the transaction log.

Metric alerts

SQL Diagnostic Manager offers numerous alerts to successfully monitor and warn you about your SQL Server instances and availability groups. Proper configuration is key to making sure you receive alerts only on those metrics that actually fall outside the typical performance of your environment. SQL Diagnostic Manager includes the following metric alerts for your use:

The alerts are listed by default as Rank and categories. The default Ranks are classified as follows:

- Rank 10 = Service High
- Rank 20 = Resource High
- Rank 30 = Database High
- Rank 40 = Process High
- Rank 50 = Service Low
- Rank 60 = Resource Low
- Rank 70 = Database Low
- Rank 80 = Process Low
- Rank 90 =Other

Category: Amazon RDS

Metric	Rank
CPU Credit balance High	100
CPU Credit balance Low	100
CPU Credit Usage	100
Disk Queue Depth	100
Read Latency High	100
Read Latency Low	100
Read Throughput	100
Swap Usage	100
Write Latency High	100
Write Latency Low	100
Write Throughput	100

Category: Azure DB

Metric	Rank
Average Data IO Percent High	100
Average Data IO Percent Low	100
Average Log Write Percent High	100
Average Log Write Percent Low	100
Database Average Memory Usage Percent High	100
Database Average Memory Usage Percent Low	100
In-Memory Storage Usage Percent High	100
In-Memory Storage Usage Percent Low	100
Max Session Percent High	100
Max Session Percent Low	100
Max Worker Percent High	100
Max Worker Percent Low	100
Service Tier Changes	100

Category: Backup

Metric	Rank
Days since last backup	40

Category: Databases

Metric	Rank
Availability Group Estimated Data Loss (Seconds)	20
Availability Group Estimated Recovery time (Seconds)	20
Availability Group Log Send Queue Size (KB)	20
Availability Group Preferred Replica	10
Availability Group Redo Queue Size (KB)	20
Availability Group Redo Rate (KB/sec)	20
Availability Group Role Change	10
Availability Group Synchronization Health	20
Availability Group Synchronization Performance (Seconds)	20
Data File Autogrow	70
Database Full (Percent)	30
Database Full (Size)	30
Database Read/Write Error Occurred	30
Database Status	30
Filegroup Space Full (Percent)	30
Filegroup Space Full (Size)	30
Index Row Hits (Percent)	70
Log File Autogrow	70

Metric	Rank
Log Full (Percent)	30
Log Full (Size)	30
Longest Running Version Store Transaction (Minutes)	30
Mirror Commit Overhead (Milliseconds)	30
Mirrored Server Role Change	30
Mirroring Oldest Unsent Transactions	30
Mirroring Preferred Configuration	30
Mirroring Status	30
Mirroring Unrestored Log (KB)	30
Mirroring Unsent Log (KB)	30
Mirroring Witness Connection	30
Session Tempdb Space Usage (MB)	80
Table Fragmentation (Percent)	70
Tempdb Contention (ms)	20
Version Store Generation Ratio	30
Version Store Size (MB)	30

Category: Logs

Metric	Rank
SQL Server Agent Log	40

Metric	Rank
SQL Server Error Log	40

Category: Operational

Metric	Rank
CLR Enabled	90
OLE Automation Disabled	90
OS Metrics Collection Status	90
SQL Server Agent XPs Disabled	50
SQL Server Data Used (Percent)	30
SQL Server Log Used (Percent)	30
SQLdm Repository Grooming Timed Out	90
WMI Service Unavailable	50

Category: Queries

Metric	Rank
Query Monitor Events (Counts)	80

Category: Resources

Metric	Rank
Average Disk Milliseconds Per Read	20
Average Disk Milliseconds Per Transfer	20
Average Disk Milliseconds Per Write	20

Metric	Rank
Disk Reads Per Second	60
Disk Transfers Per Second	60
Disk Writes Per Second	60
OS Average Disk Queue Length (Count)	20
OS Average Disk Queue Length Per Disk (Count)	60
OS Disk Free Space (Size)	20
OS Disk Full (Percent)	20
OS Disk Time (Percent)	60
OS Disk Time Per Disk (Percent)	60
OS Memory Usage (Percent)	20
OS Paging (Per Second)	60
OS Privileged Time (Percent)	60
OS Processor Queue Length (Count)	20
OS Processor Time (Percent)	20
OS User Time (Percent)	60
Page Life Expectancy	60
Procedure Cache Hit Ratio	20
SQL Server CPU Usage (Percent)	20
SQL Server Memory Usage (Percent)	20

Category: Services

Metric	Rank
Cluster Active Node	10
Cluster Failover	10
Distribution Latency (Seconds)	40
DTC Status	10
Full-Text Search Status	50
Last Full-Text Catalog Update (Hours)	50
Latent replication transaction (Count)	40
SQL Server Active Directory Helper Service Status	50
SQL Server Agent Job Completion	80
SQL Server Agent Job Failure	40
SQL Server Agent Long Running Job (Minutes)	80
SQL Server Agent Long Running Job (Percent)	80
SQL Server Agent Status	10
SQL Server Browser Service Status	50
SQL Server Status	10
Unsubscribed Transactions (Count)	40
Unsubscribed Transactions (Seconds)	80

Category: Sessions

Metric	Rank
Blocked Sessions	40
Blocked Sessions Wait Time (Seconds)	40
Client Computers (Count)	60
Deadlock	80
Oldest Open Transaction (Minutes)	40
Session CPU Time (Seconds)	80
SQL Server Response Time (Milliseconds)	40
User Connections (Percent)	20

Category: Virtualization

Metric	Rank
Host CPU Usage (Percent)	20
Host Memory Swap Detected	20
Host Memory Usage (Percent)	20
Host Power State	20
VM CPU Ready Wait Time (ms)	20
VM CPU Usage (Percent)	20
VM Host Server Change	20
VM Memory Swap Delay Detected	20

Metric	Rank
VM Memory Usage (Percent)	20
VM Power State	20
VM Reclaimed/Ballooned Memory (KB)	20
VM Resource Configuration Change	20
VM Resource Limits Detected	20

Availability Group Estimated Data Loss (Seconds) alert

The Availability Group Estimated Data Loss (Seconds) alert tracks the time period in seconds that data is not synchronized to the secondary replica. This value reflects the time difference of the last commit between the primary and secondary replicas. Alert includes affected databases.

For more information on configuring alerts and setting thresholds, see Configure alerts.

✓ **Enable baseline thresholds**

To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

✓ **Create an alert response bundle**

Create an alert response bundle with the Availability Group Estimated Data Loss (Seconds) alert and related alerts. For additional information, see Create alert response bundles.

Availability Group Estimated Recovery time (Seconds) alert

The Availability Group Estimated Recovery time (Seconds) alert provides the required time in seconds that the secondary replica needs to catch up with the primary replica. Alert includes affected databases.

For more information on configuring alerts and setting thresholds, see Configure alerts.

✓ **Enable baseline thresholds**

To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

✓ **Create an alert response bundle**

Create an alert response bundle with the Availability Group Estimated Recovery time (Seconds) alert and related alerts. For additional information, see Create alert response bundles.

Availability Group Log Send Queue Size (KB) alert

The Availability Group Log Send Queue Size (KB) alert indicates the amount of log records in KB needed to ship to the secondary replica to complete synchronization. Alert includes affected databases.

For more information on configuring alerts and setting thresholds, see Configure alerts .

✓ **Enable baseline thresholds**

To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

✓ **Create an alert response bundle**

Create an alert response bundle with the Availability Group Log Send Queue Size (KB) alert and related alerts. For additional information, see Create alert response bundles.

Availability Group Preferred Replica alert

The Availability Group Preferred Replica alert triggers when the preferred replica defined for a database changes to a different replica in a set period of time.

For more information on configuring alerts and setting thresholds, see Configure alerts.

✓ Create an alert response bundle with the Availability Group Preferred Replica alert and related alerts. For additional information, see Create alert response bundles.

Availability Group Redo Queue Size (KB) alert

The Availability Group Redo Queue Size (KB) alert indicates the amount of log records from log files in KB that need redoing in the secondary replica to complete synchronization. Alert includes affected databases.

For more information on configuring alerts and setting thresholds, see Configure alerts.

✓ **Enable baseline thresholds**

To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

✓ **Create an alert response bundle**

Create an alert response bundle with the Availability Group Redo Queue Size (KB) alert and related alerts. For additional information, see Create alert response bundles.

Availability Group Redo Rate (KB\sec) alert

The Availability Group Redo Rate (KB\sec) alert provides the rate in KB per second at which log records are redone in the secondary database to complete synchronization. Alert includes affected databases.

For more information on configuring alerts and setting thresholds, see Configure alerts.

✓ **Enable baseline thresholds**

To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

✓ **Create an alert response bundle**

Create an alert response bundle with the Availability Group Redo Rate (KB\sec) alert and related alerts. For additional information, see Create alert response bundles.

Availability Group Role Change alert

The Availability Group Role Change alert indicates when the primary role changes to a secondary replica. Alert includes affected databases for the entire availability group.

For more information on configuring alerts and setting thresholds, see Configure alerts.

✓ Create an alert response bundle with the Availability Group Role Change alert and related alerts. For additional information, see Create alert response bundles.

Availability Group Synchronization Health alert

The Availability Group Synchronization Health alert provides the database synchronization state in the availability group. Possible values include: not healthy, partially healthy, and healthy.

For more information on configuring alerts and setting thresholds, see Configure alerts.

✓ Create an alert response bundle with the Availability Group Synchronization Health alert and related alerts. For additional information, see Create alert response bundles.

Availability Group Synchronization Performance (Seconds) alert

The Availability Group Synchronization Performance (Seconds) alert indicates the time required in seconds to complete synchronization between the primary and secondary replicas.

For more information on configuring alerts and setting thresholds, see Configure alerts.

✓ **Enable baseline thresholds**

To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

✓ **Create an alert response bundle**

Create an alert response bundle with the Availability Group Synchronization Performance (Seconds) alert and related alerts. For additional information, see Create alert response bundles.

Average Data IO Percent High

This metric is the high percentage of Data IO being used to the current service tier of the database. High values may indicate that the service tier needs to be raised.

Average Data IO Percent Low

The average Data IO Percent Low metric is the percentage of Data IO being used relative to the current service tier of the database. Consistent low values indicate that the service tier selected may be more than the average Log Write Percent High what is required for the database.

Average Disk Milliseconds Per Read alert

The Average Disk Milliseconds Per Read alert provides the average time (in milliseconds) that a read operation uses data from the disk.

Average Disk Milliseconds Per Transfer alert

The Average Disk Milliseconds Per Transfer alert provides the average time (in milliseconds) used by a disk transfer operation.

Average Disk Milliseconds Per Write alert

The Average Disk Milliseconds Per Write alert provides the average time (in milliseconds) used by an operation writing data to the disk.

Average Log Write Percent High

The Average Log Write Percent High metric is the percentage of log write activity being used relative to the current service tier of the database. High values may indicate that the service tier needs to be raised.

Average Log Write Percent Low

The Average Log Write Percent Low metric alert is the percentage of log write activity being used relative to the current service tier of the database. Consistent low values indicate that the service tier selected may be more than what is required for the database.

Blocked Sessions (Count) alert

The Blocked Sessions (Count) alert provides the number of sessions on the SQL Server instance blocked by other sessions holding requested locks. For this alert to display, enable monitoring of non-query activities with capturing of blocking events.

By default, blocked sessions wait for a lock wait forever, which is not optimum behavior. You can change this default behavior by making a connection, and then adding `SET LOCKTIMEOUT 60000` to the top of the first T-SQL batch.

Reduce the number of blocked sessions

If you experience more than one blocked session on an average day, your site may experience one of the following issues:

- T-SQL batches submitted containing a `BEGIN TRANSACTION` statement with no corresponding `COMMIT TRANSACTION` statement. You must correct the T-SQL.
- T-SQL batches submitted containing a `BEGIN TRANSACTION` statement but where the `COMMIT TRANSACTION` statement is in a following T-SQL batch that is only executed once the end-user confirms the transaction. You must correct the T-SQL.
- The site includes some long-running transactions processing at peak times.

When your transactions run longer than they should and clash, consider drastically reducing the time that a lock is held by:

- Doing as much work as possible (for example, SELECT statements that may be needed) before the transaction performs its first update, delete, or insert.
- Group all UPDATES, DELETES, and INSERTS as closely as possible together within a transaction with as few selects as possible separating them.
- Commit the transaction as soon as possible after the last DML statement.
- Once the transaction has begun do not have any stops for user input. Gather all user inputs before the transaction starts.
- Avoid the use of server side cursors during a transaction as they slow execution considerably.
- If a stored procedure and/or trigger are invoked inside a transaction minimize or eliminate the number of SQL re-compilations made to that object. See the SQL Re-compilations counter for ways to dramatically reduce recompiles.
- Increase the speed of transaction throughput such that it becomes less likely that one transaction waits for the preceding one by:
  - Adding more disks to your RAID solution.
  - Replacing your disks with faster disks.
  - Switching your RAID array from a RAID 5 to a RAID 10 solution as each write IO results in two writes using RAID 10 vs. four for RAID 5 (100% more efficient with writes).
  - So long as the RAID controller has some form of battery backup, then switch its cache mode from Write-through to Write-back as this increases the system's ability to handle write IOs by an order of magnitude.
  - Adding more cache memory to the RAID controller.
  - Adding more RAM to the server.
  - Adding another CPU to a SMP computer.
  - Upgrading the CPU, memory and motherboard with faster models.
  - Minimize the number of Context Switches by turning on Use NT Fibers in SQL Server.

- Switch the Boost SQL Server Priority on.

✓ **Enable baseline thresholds**

To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

✓ **Create an alert response bundle**

Create an alert response bundle with the Blocked Sessions (Count) alert and related alerts. For additional information, see Create alert response bundles.

Blocking Session Wait Time (Seconds) alert

The Blocking Session Wait Time (Seconds) alert provides the time in seconds that a SQL Server session blocks other sessions.

By default, locked sessions waiting for a lock wait forever, which is not optimum behavior from an end-user point of view. You can change this default behavior by adding `SET LOCKTIMEOUT 60000` to the top of the first T-SQL batch after making a connection.

The Active Alerts view provides additional information on the Blocking Session Wait Time (Seconds) alert. To access this information, refer to the right-click context menu after having organized your alert view by metric. This menu grants access to real-time alert information, historical view, block details, and online help specific to the alert.

> ✓ To access similar information on the Blocking view, select a specific SQL Server instance, point to Sessions, and then select the Blocking ribbon.

Blocking Sessions Report

The Blocking Sessions Report displays blocking and blocked sessions' information. To access the Blocking Sessions Report in the Alert view, select the **Show Block Details** option in the right-click context menu.

Key information provided for blocking and blocked sessions includes:

Blocking Process Details:

- Session ID
- Hostname
- User Name
- Application
- Database
- Last Batch Started
- Transaction ID
- Open Transactions

Blocked Process Details:

- Session ID
- Hostname
- User Name
- Application
- Database
- Last Batch Started
- Transaction ID
- Open Transactions
- Wait Time (ms)
- Wait Resource

> ✓ To retrieve the blocking sessions report for SQL Diagnostic Manager, select the "**Non-Query activities>Capture Blocking (SQL 2005+)**" check box in the Activity Monitor Tab.

Reduce blocked sessions wait time

If you experience more than one blocked session on an average day, your site may experience one of the following issues:

- T-SQL batches submitted containing a `BEGIN TRANSACTION` statement with no corresponding `COMMIT TRANSACTION` statement. You must correct the T-SQL.
- T-SQL batches submitted containing a `BEGIN TRANSACTION` statement but where the `COMMIT TRANSACTION` statement is in a following T-SQL batch that is only executed once the end-user confirms the transaction. You must correct the T-SQL.
- The site includes some long-running transactions processing at peak times.

Where your transactions run longer than they should and clash, consider drastically reducing the time that a lock is held by:

- Performing as much work as possible before the transaction performs its first update, delete, or insert. For example, add any necessary SELECT statements.
- Grouping all UPDATES, DELETES, and INSERTS as closely as possible within a transaction with as few SELECTS as possible separating them.
- Committing the transaction as soon as possible after the final DML statement.
- Avoid any stops for user input once the transaction begins. Be sure to gather all user inputs before the transaction starts.
- Avoid the use of server-side cursors during a transaction as they slow execution considerably.
- Minimizing or eliminating the number of SQL re-compilations made to the object if a stored procedure and/or trigger is invoked inside a transaction. See the SQL RE-compilations counter for steps to dramatically reduce recompiles.
- Increasing the speed of transaction throughput such that it becomes less likely that one transaction waits for the preceding transaction. You can improve transaction throughput speed by:
  - Add more disks to your RAID solution.
  - Replacing your disks with faster disks.
  - Switching your RAID array from a RAID 5 to a RAID 10 solution. Note that each write IO results in two writes using RAID 10 vs. four for RAID 5 (100% more efficient with writes).
  - Switching the RAID controller cache mode from Write-through to Write-back so long as the RAID controller has some form of battery backup. This change increases the system's ability to handle write IOs by an order of magnitude.
  - Adding more cache memory to the RAID controller.
  - Adding more RAM to the server.
  - Adding another CPU to the SMP computer.
  - Upgrading the CPU, memory, and motherboard with faster models.
  - Minimizing the number of Context Switches by turning on Use NT Fibers in SQL Server.
  - Switching on the Boost SQL Server Priority.

✓ **Create an alert response bundle**

Create an alert response bundle with the Blocking Session Wait Time (Seconds) alert and related alerts. For additional information, see Create alert response bundles.

Client Computers (Count) alert

The Client Computers (Count) alert provides the number of unique client computers connected to the SQL Server instance. SQL Diagnostic Manager measures this value by getting the count of processes from distinct computers in `sysprocesses` table.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

CLR Enabled alert

The CLR Enabled alert indicates that the Common Language Runtime (CLR) configuration option is enabled for the SQL Server instance. You can run managed code in the .NET Framework. Use the Server Configuration view to reconfigure this option on SQL Server 2005 instances.

Cluster Active Node alert

The Cluster Active Node alert indicates that the active node of the cluster is non-preferred. The active cluster node changes when a failover event occurs. If the original preferred node is offline for an extended period of time, you can change the preferred node setting by right-clicking the instance in the **Servers** tree and selecting **Properties > Cluster Settings**. By default, the preferred node is first node encountered when monitoring began.

Cluster Failover alert

The Cluster Failover alert indicates a change in the active node. This alert remains active for the amount of time specified in the alert's advanced settings.

To edit these settings, right-click the server in the Servers tree and select Configure Alerts. Click the **Advanced** button on the Cluster Failover Alert and edit the time.

Prevent cluster failover alerts when you have a scheduled failover

You can temporarily put the server into maintenance mode by right-clicking the server in the Servers tree and selecting Maintenance mode. When the scheduled failover is over, right-click the instance in the **Servers** tree and select **Disable Maintenance Mode**.

CPU Credit Balance

The CPU Credit Balance metric is relevant to RDS databases in a T2 level instance. The more vCPUs available to the instance, the higher the number of credits per hour should be. If the balance of the credits is consistently high then the instance may be too large for the workload it is supporting. CPU credit balance is collected only at 5-minute invervals.

CPU Credit Usage

The CPU Credit Usage is relevant to RDS databases running in a T2 level instance. The more vCPUs available to the instance, more credits per hour should accumulate.

Database Average Memory Usage Percent High

The Database Average Memory Usage Percent High metric is the percentage of memory used for the database, relative to the maximum available for the service tier. High values indicate that there may not be enough memory available to support the peak workload.

Database Average Memory Usage Percent Low

The Database Average Memory Usage Percent metric is the percentage of memory used for the database, relative to the maximum available for the service tier. Consistently low values indicate that the service tier may be more than what is required for the workload.

Database Full (Percent) alert

The Database Full (Percent) alert provides the percentage of the allowable disk space for the database currently used by the sum of data, text, and indexes. Allowable disk space for the database is calculated by taking into account the current allocated space, SQL Diagnostic Manager auto-growth settings, and available disk space. If this value exceeds 80%, consider replacing disks with bigger disks.

This alert is raised based on the database metrics collection interval specified in Server Properties. For more information, see Set general server options.

Calculate the database full percentage using the autogrow settings

When setting the thresholds for your Database Full (Percent) alert, click **Advanced > Autogrow Settings** and SQL Diagnostic Manager provides a choice for you to calculate your displayed percentage. Select **Yes, alert on the current used size divided by the maximum possible size** to take possible autogrow into consideration when calculating the database full percentage. Select **No, alert on the current used size divided by the current file size** to calculate the database full percentage based only on the current size of the database disk file.

✓ Create an alert response bundle with the Database Full (Percent) alert and related alerts. For additional information, see Create alert response bundles.

Database Full (Size) alert

The Database Full (Size) alert provides the amount of disk space, in megabytes, currently used by the database as the sum of data, text, and indexes. This value represents the actual amount of used data within the database file and does not represent the size of the database file itself.

SQL Diagnostic Manager raises this alert based on the database metrics collection interval specified in Server Properties. For more information, see Set general server options.

✓ Create an alert response bundle with the Database Full (Size) alert and related alerts. For additional information, see Create alert response bundles.

Database Read/Write Error Occurred alert

The Database Read/Write Error Occurred alert indicates that an I/O error occurred while attempting to read from or write to a database file. If this error persists consider the following solutions:

- Replace the disks.
- File may be corrupted, see if you can restore from a backup.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

Database Status alert

The Database Status alert indicates that the Database Status metric reached an alert status. This status results when the database:

- Is inaccessible
- Has an issue with loading, crashed while loading, has not recovered, in recovery, suspect, or in emergency mode
- Contains databases sizes in the error threshold
- Contains logs with sizes in the error threshold
- Contains tables with reorganization needs in the error threshold
- Is transitioning, loading, being check pointed, set as DBO use only, or in single-user mode

This alert is raised based on the diagnostic data and database metrics collection intervals specified in Server Properties. For more information, see Set general server options.

Reduce the number of database status issues

Navigate to the **Summary** view on the **Database** tab of the SQLDM Console. Look for databases that have a critical or warning status and review what the issue is (the problem is highlighted either in yellow or red). You may need to rebuild an index, increase allocated file size, or turn on the auto-growth feature for your database or logs.

Data File Autogrow alert

The Data File Autogrow alert indicates that a data file autogrow occurred on the specified database. For this alert to display, enable monitoring of non-query activities with capturing of autogrow events. Note that you can avoid unnecessarily long reads and poor response time from SQL Server by minimizing the number of autogrow events occurring in your environment.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

To learn more about how autogrow works and related best-practices, see Microsoft Support Article 315512, "Considerations for the 'autogrow' and 'autoshrink' settings in SQL Server."

✓ Create an alert response bundle with the Data File Autogrow alert and related alerts. For additional information, see Create alert response bundles.

Days since last backup alerts

The Days since last backup alerts indicate the number of days that databases (per-database or at the instance level) have not been backed up.

To see more information about these alerts applied to Availability Groups, check Days since last backup for availability groups

Days since last backup at the instance-level

The Days since last backup alert applies to any database at the instance level.

⚠ The Days since last backup alert is enabled by default.

To configure thresholds and employ alert filters such as excluding specific databases, follow these steps:

To configure an instance-level alert:

1. Right-click a SQL Server instance in the Servers tree.
2. Select **Configure Alerts**.
3. Select the Days since last backup metric in the **Alert Configuration** window.
4. Click **Edit to** modify default threshold (number of days).
5. Check the boxes next to **Informational**, **Warning**, and **Critical** to include alerts for these states.
6. Change the alert thresholds by moving the arrows to the appropriate levels or by double-clicking the value and typing a new threshold level.
7. Click **Advanced** to apply advanced settings such as alert suppression or alert filters (excluding a database from alerts or/and Availability Group Collection).
8. Click **OK** to accept your changes.

ⓘ The configuration of the "Days since last backup" alert now has the option to include or exclude Read-Only databases.

Days since last backup per-database

The Days since last backup alert applies to a specific database in your monitored SQL Server instance. This alert is disabled by default.

To configure thresholds and employ alert filters such as excluding specific databases, follow these steps:

To configure a per-database alert:

1. Right-click a SQL Server instance in the Servers tree.
2. Select **Configure Alerts**.
3. Select the Days since last backup metric in the **Alert Configuration** window.
4. ***If the metric features a per-database*** , on the Configuration tab of the Alert Configuration window, click **Add**. Use the drop-down list to select the database to which you want to apply these settings.
5. Check the boxes next to **Informational**, **Warning**, and **Critical** to include alerts for these states.
6. Change the alert thresholds by moving the arrows to the appropriate levels or by double-clicking the value and typing a new threshold level.
7. Click **Advanced** to apply alert suppression.
8. Click **OK** to accept your changes.

Days since last backup for availability groups

The Advanced Alert Configuration for this metric includes the following options for Availability Group Collection Options:

- Primary
- Secondary
- Default
- Both

And under the Replica Collections Options

- Monitored Only
- All

Here are some scenarios applied to Availability Groups:

- **When primary and (any or all) other secondary servers are being monitored**: Primary server displays the last backup date alert by checking all other secondary servers for the latest backup date of that database. If the latest backup date across that Availability Groups justifies the alert, it displays. The secondary monitored databases also display the same alert, as the latest backup date for an Availability Group across all replicas will be the same.
- **When only primary replica of a database is being monitored**: In this scenario the alert displays after SQLDM checks the latest backup date across all replicas and if that date justifies the displayed alert.
- **When some secondary replica is being monitored but no primary replica**: In this scenario the alert displays after SQLDM checks the latest backup date across all replicas and if that date justifies the displayed alert.

⚠ **Limitations**

- The assumption is that the connection credentials of all the replicas are the same. At this point SQLDM stores connection credentials only of the monitored servers. If a secondary replica is not monitored, the connection credentials are unknown. This setting can not be included in the properties as a number of secondary replicas because is not limited and also its db specific.
- A replica may have the latest backup date, but it is possible that the sync is broken between replicas, in which case the db would have been backed up but the some data would not be there. In this case, the alert may not come if the last back update does not justify an alert.

Deadlock alert

The Deadlock alert indicates that a deadlock occurred on the monitored server. For this alert to display, enable monitoring of non-query activities with capturing of deadlock events.

Deadlocks occur when a process or several processes attempt to access a resource that the other holds a lock on. Neither task can complete because both processes are attempting to lock the same resource.

SQL Server chooses one or more deadlock to terminate so that processing can continue.

Resolve deadlocks

When a Deadlock Alert occurs, check the Alerts view in SQL Diagnostic Manager and select a deadlock alert. The SPID, Hostname, Login Name, Client Application, and Database are listed.

For more information, select **Show Deadlock Details**. This information helps with diagnosing the problem application and includes the option to export deadlock data to view in SQL Server Management Studio or SQL Server Profiler.

✓ Create an alert response bundle with the Deadlock alert and related alerts. For additional information, see Create alert response bundles.

Disk Queue Depth

Disk Queue Depth is a measure of how many outstanding requests are waiting to be handled by the storage system.

Disk Reads Per Second alert

The Disk Reads Per Second alert provides the rate of read operations on the disk. A high number of disk reads may indicate that SQL server is executing poorly performing queries. Note that this alert is disk specific.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. Note that you need to enable this alert first in the Alert Configuration window to rise.

✓ The Disk throughput chart provides a graphical analysis of the number of disk reads and writes over time.

Disk Transfers Per Second alert

Comprised of both Disk Reads/sec and Disk Writes/sec, the Disk Transfers Per Second alert provides the rate of transfer operations on the disk and helps to determine if a drive does not have enough supporting disks. Note that this alert is disk specific.

A large increase in disk transfers per second may signal a change in workload or a developing I/O or memory pressure issue.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. Note that you need to enable this alert first in the Alert Configuration window to rise.

✓ For additional information on the Disk Transfers/sec counter, see Monitoring Disk Usage.

Disk Writes Per Second alert

-The Disk Writes Per Second alert provides the rate of write operations on the disk. Note that this alert is disk-specific.

A high number of disk writes per second may indicate that the SQL Server is running low on allocated memory due to large amounts of data being written. It may also point to a situation of memory pressure that occurs when data is not able to remain in cache and has to be flushed to disk frequently.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. Note that you need to enable this alert first in the Alert Configuration window to rise.

✓ The Disk throughput chart provides a graphical analysis of the number of disk reads and writes over time.

Distribution Latency (Seconds) alert

The Distribution Latency (Seconds) alert tracks the amount of time, in seconds, that a replication transaction is at the Publisher waiting for a Distributor to receive it, and has exceeded the warning threshold.

Causes of high distribution latency

The most common cause of high distribution latency is when a transaction has a large amount of commands. Once the transaction is complete, distribution latency decreases.

The **Replication** view on the **Services** tab displays a graph with the non-distributed count and the non-distributed time. Graphs that trend upward may indicate a problem that needs resolution.

Reduce distribution latency

You can reduce distribution latency by:

- Reducing traffic on the publisher
- Limiting non-replication related work by the publisher
- Increasing the network bandwidth available to the publisher

DTC Status alert

The DTC Status alert provides the status of the Distributed Transaction Coordinator service.

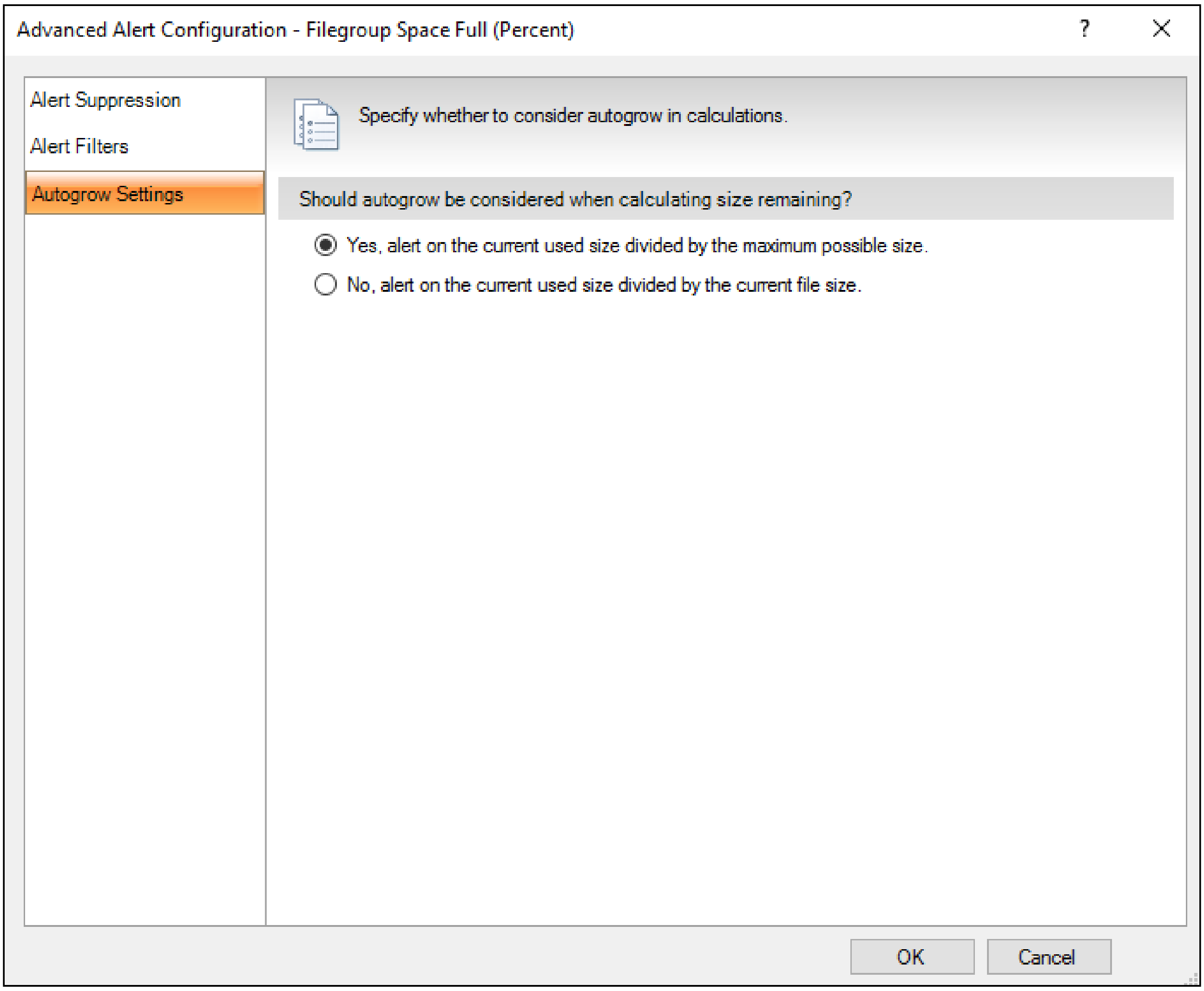
Filegroup Space Full (Percent) alert

The Filegroup Space Full (Percent) alert provides the percentage of the allowable filegroup space for the database currently used by all files within the filegroup. Allowable disk space for the database is calculated by taking into account the current allocated space, SQLdm auto-growth settings, and available disk space.

This alert is raised based on the database metrics collection interval specified in Server Properties. For more information, see Set general server options.

Calculate the filegroup space full percentage using the autogrow settings

When setting the thresholds for your Filegroup Space Full (Percent) alert, click **Advanced > Autogrow Settings** (see image below) and SQL Diagnostic Manager provides a choice for you to calculate your displayed percentage. Select **Yes, alert on the current used size divided by the maximum possible size** to take possible autogrowth into consideration when calculating the filegroup space full percentage. Select **No, alert on the current used size divided by the current file size** to calculate the filegroup space full percentage based only on the current size of the database disk file.



Advanced Alert Configuration - Filegroup Space Full (Percent)

Specify whether to consider autogrow in calculations.

Should autogrow be considered when calculating size remaining?

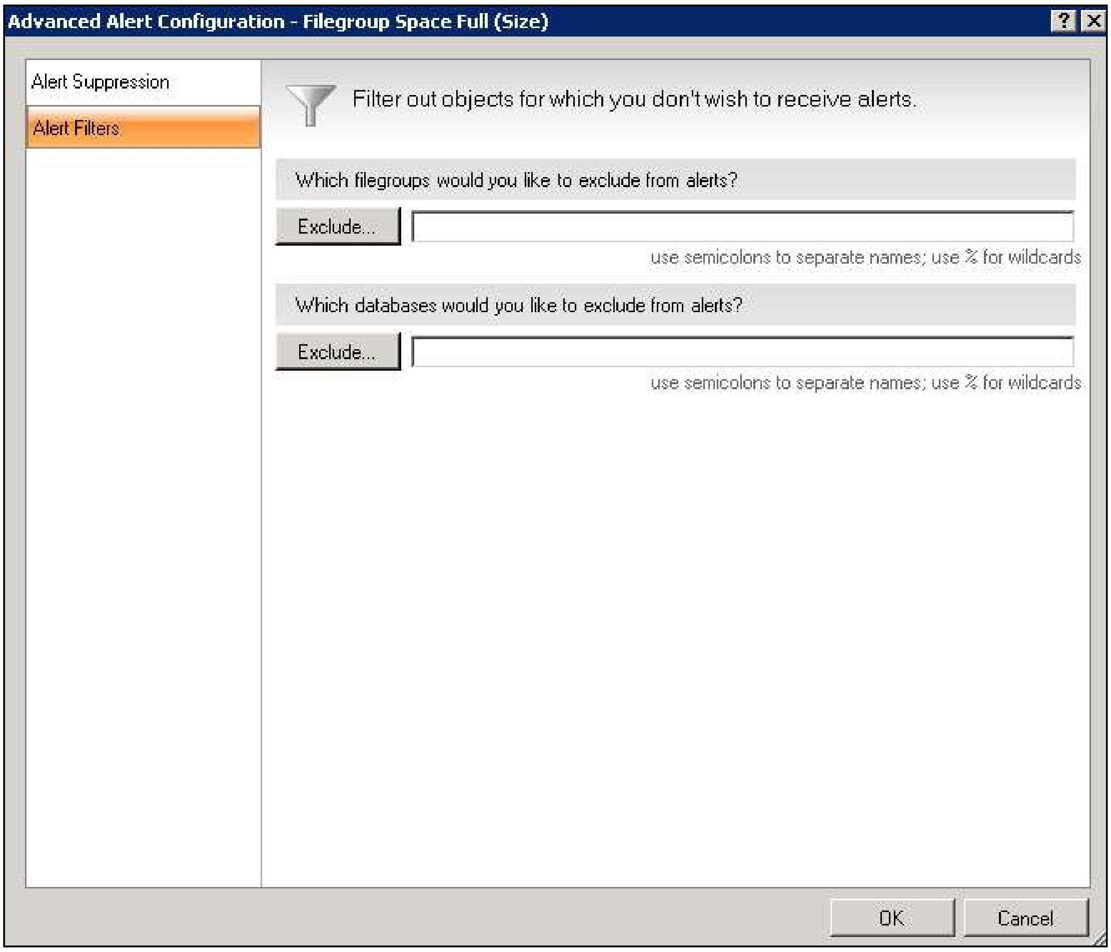
● Yes, alert on the current used size divided by the maximum possible size.

○ No, alert on the current used size divided by the current file size.

Filegroup Space Full (Size) alert

The Filegroup Space Full (Size) alert provides the amount of disk space, in megabytes, currently used by the database as the sum of all the files within the filegroup.

SQL Diagnostic Manager raises this alert based on the database metrics collection interval specified in Server Properties. You can also use advanced alert options such as filters to exclude specific filegroups or databases from alerting results.


Advanced Alert Configuration - Filegroup Space Full (Size)
?
Alert Suppression
Alert Filters
Filter out objects for which you don't wish to receive alerts.
Which filegroups would you like to exclude from alerts?
Exclude...
use semicolons to separate names; use % for wildcards
Which databases would you like to exclude from alerts?
Exclude...
use semicolons to separate names; use % for wildcards
OK
Cancel

You can access advanced filters by clicking **Advanced > Alert Filters** when setting the thresholds for your Filegroup Space Full (Size) alert.

The Filegroup Space Full (Size) alert is disabled by default.

Full-Text Search Status alert

The Full-Text Search Status alert provides the status of the Full-Text Search service.

Host CPU Usage (Percent) alert

The Host CPU Usage (Percent) alert indicates an unusually high amount of CPU usage by the VMWare or Hyper-V host server hosting the virtual machine on which the monitored SQL Server instance resides. The percentage of host server processor usage is listed under the control. A high host server percentage could indicate a large number of active client sessions. This alert is enabled by default and is available only on instances hosted on virtual machines enabled for VM monitoring.

Reduce your host CPU usage

Consistently high host server processor usage could indicate the need to:

- Reduce the number of SQL re-compilations as they are CPU intensive. There are many reasons that an object such as a stored procedure is recompiled and you can remove most of these reasons by careful coding.
- Make sure that all T-SQL statements (whether in a stored procedure, trigger or ad hoc statement) that reference objects fully qualify the object referenced.

For example: `SELECT * FROM Northwind.dbo Employees` is a fully-qualified object reference whereas `SELECT * FROM Employees` is a poorly-qualified object. You can reuse the execution plans of fully-qualified objects "as is," whereas plans where you either cannot reuse the not fully-qualified objects or, if they are reused, then they are subject to a highly restrictive `COMPILE` lock while SQL Server determines if all of the objects referenced in the T-SQL code have the same owners as the execution plan currently in cache. Both of these situations consume a significant amount of CPU time.

Host Memory Swap Detected alert

The Host Memory Swap Detected alert indicates that memory is swapped to disk for the host server hosting the virtual machine on which the monitored SQL Server resides. This may be an indication of memory pressure on the host. This alert is disabled by default and is only relevant to instances hosted on VMWare vCenter which have been enabled for VM monitoring in the SQLdm VM Configuration window.

Host Memory Usage (Percent) alert

The Host Memory Usage (Percent) alert provides the percent of available memory used by the host server hosting the virtual machine on which the monitored SQL Server resides. This alert is enabled by default and is available only on instances hosted on virtual machines enabled for VM monitoring.

Reduce your host memory usage

If this value is regularly over 80%, SQL Server needs more memory or needs to use the memory it has more efficiently. Consider implementing one or more of the following solutions:

- If your site makes use of extended stored procedures that are infrequently called, then after calling them, issue a `DBCC DLLNAME (FREE)`. Once an extended stored procedure is called, it remains in memory until SQL Server is shut down even if it is never again called, which then wastes available memory. A DBCC `dllname (FREE)` releases that memory for use by both the procedure cache and Data Pages, which has a significant positive effect on both the Procedure Cache Hit Ratio and the Buffer Cache Hit Ratio. Execute `sp_helpextendedproc` to view the extended stored procedures currently loaded in memory by SQL Server.
- As each SQL Server lock requires 96 bytes of memory, the granting of lock space is done at the expense of Data Pages and Procedure Cache Pages. To maintain proper system performance and throughput, keep the number of locks to a minimum by:

- Wherever possible, using the `(NOLOCK)` optimizer hint or `SET TRANSACTION ISOLATION LEVEL READ UNCOMMITTED` on select statements as this neither issues any shared locks on the data it reads nor honors any exclusive locks set by other transactions.
- When updating all rows in a table with more than 50 rows, using the `TABLOCKX` table hint. This table hint prevents SQL Server from initially taking exclusive row locks, granting many of these locks, and then escalating them to an exclusive table lock.
- When deleting all rows in any table, using the TRUNCATE TABLE statement instead of the DELETE statement as fewer locks and other system resources are consumed in the process.
- Reducing the time that a lock is held by:
  - Performing as much work as possible before the transaction performs its first update, delete, or insert. For example, add any necessary SELECT statements.
  - Grouping all UPDATES, DELETES, and INSERTS as closely as possible within a transaction with as few SELECTS as possible separating them.
  - Committing the transaction as soon as possible after the final DML statement.
  - Avoiding any stops for user input once the transaction begins. Be sure to gather all user inputs before the transaction starts.
  - Allowing SQL Server to consume more of the available memory, making sure that OS Paging does not increase.

- Add more physical memory (RAM) to the computer.
- If the computer is running multiple instances of SQL Server, then consider placing each instance on a separate physical computer.
- If the computer is running other memory-intensive applications, such as IIS or Exchange, then consider moving each instance to a separate physical computer.
- Limit SQL Server computers to performing only SQL Server work. Stop any unnecessary programs, such as allowing the computer to act as either a primary or backup domain controller.

Host Power State alert

The Host Power State alert provides the power state of the host as reported by the vCenter or Hyper-V host servers. This alert is enabled by default and is available only on instances hosted on virtual machines that are enabled for VM monitoring.

Index Row Hits (Percent) alert

The Index Row Hits (Percent) alert provides the percentage of the density of an index as used by the SQL Query Optimizer to determine index effectiveness. A high density indicates the existence of many duplicates and an inefficient index. A low density indicates high selectivity and an effective index.

This alert is raised based on the database metrics collection interval specified in Server Properties.

⚠ This alert is for visual indicators in the **Desktop Client only**. SQL Diagnostic Manager does not send notifications when this alert is triggered.

In-Memory Storage Usage Percent High

This metric is the percentage of storage used for in-memory transactions within the database, relative to the maximum available for the service tier. High values indicate that there may not be enough storage available to support the peak workload.

In-Memory Storage Usage Percent Low

The In-Memory Storage Usage Percent Low is the percentage of storage used for in-memory transactions within the database, relative to the maximum available for the service tier. Consistently low values indicate that the service tier may be more than what is required for the workload.

Last Full-Text Catalog Update (Hours) alert

The Last Full-Text Catalog Update (Hours) alert provides the time, in hours, since the last Full-Text Catalog update was performed and beyond which the statistics data is considered outdated.

Since full-text indexes are contained in full-text catalogs, when you create new content or change existing content in a catalog, you must regenerate the full-text index. This, along with inefficient indexes can impact your monitored SQL Server performance.

SQL Diagnostic Manager allows users to optimize full-text catalogs, for details see Monitor Your Full-Text Searches.

Note that this alert is raised based on the diagnostic data collection interval specified in Server Properties.

⚠ This alert is for visual indicators in the **Desktop Client only**. SQL Diagnostic Manager does not send notifications when this alert is triggered.

Latent replication transaction (Count)

The Latent replication transaction (Count) alert provides the number of replication transactions published by the Publisher but not received by the Distributor.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

Log File Autogrow alert

The Log File Autogrow alert indicates that a log file autogrow occurred on the specified database. For this alert to display, enable monitoring of non-query activities with capturing of autogrow events. Note that you can avoid unnecessarily long reads and poor response time from SQL Server by minimizing the number of Autogrow events occurring in your environment.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

To learn more about how autogrow works and related best-practices, see Microsoft Support Article 315512, "Considerations for the 'autogrow' and 'autoshrink' settings in SQL Server".

Log Full (Percent) alert

The Log Full (Percent) alert provides the percentage of the allowable disk space for the database currently used by the transaction log. Allowable disk space for the database is calculated by taking into account the current allocated space, auto-growth settings, and available disk space. If this value exceeds 80%, consider replacing disks with bigger disks.

This alert is raised based on the database metrics collection interval specified in Server Properties. For more information, see Set general server options.

Calculate the log full percentage using the autogrow settings

When setting the thresholds for your Log Full (Percent) alert, click **Advanced > Autogrow Settings** and SQL Diagnostic Manager provides a choice for you to calculate your displayed percentage. Select **Yes, alert on the current used size divided by the maximum possible size** to take possible autogrowth into consideration when calculating the log full percentage. Select **No, alert on the current used size divided by the current file size** to calculate the log full percentage based only on the current size of the database disk file.

Log Full (Size) alert

The Log Full (Size) alert provides the amount of disk space, in megabytes, currently used by the transaction log for the database. This value represents the actual amount of data within the log and does not represent the size of the database log file itself.

This alert is raised based on the database metrics collection interval specified in Server Properties. For more information, see Set general server options.

Longest Running Version Store Transaction (Minutes) alert

The Longest Running Version Store Transaction (Minutes) alert provides the time in minutes that the longest version store transaction is open and preventing version store cleanup. This alert occurs only on instances running SQL Server 2005 or above.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

Maintenance Mode Enabled alert

The Maintenance Mode Enabled alert indicates that the SQLDM Maintenance Mode is enabled. Maintenance Mode allows you to temporarily stop alert generation and the collection of performance metrics for the time period that this SQL Server instance is offline. You cannot configure this alert.

Max Session Percent High

The Max Session Percent High metric is the percentage of user sessions on the database, relative to the maximum available for the service tier. High values indicate that there may not be enough sessions available to support the users or processes.

Max Session Percent Low

The Max Session Percent Low metric is the percentage of user sessions on the database, relative to the maximum available for the service tier. Consistent low values indicate that the service tier may be more than what is required for the number of connections.

Max Worker Percent High

The Max Worker Percent High metric is the percentage of worker threads used on the database, relative to the maximum available for the service tier.

Max Worker Percent Low

The Max Worker Percent Low metric is the percentage of worker threads used on the database, relative to the maximum available for the service tier. Consistent low values indicate that the service tier may be more than what is required for the workload.

Mirror Commit Overhead (Milliseconds) alert

The Mirror Commit Overhead (Milliseconds) alert indicates that the commit overhead (in MS) of the mirrored database reached or exceeded an alert threshold. Specifies the number of milliseconds of average delay per transaction that are tolerated before a warning is generated on the principal server. This delay is the amount of overhead incurred while the principal server instance waits for the mirror server instance to write the transaction's log record into the redo queue. This value is relevant only in high-safety mode.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

For more information about mirror commit overhead, see the Microsoft document, Use Warning Thresholds and Alerts on Mirroring Performance Metrics (SQL Server).

Mirrored Server Role Change alert

The Mirrored Server Role Change alert indicates when the role of a mirrored database changes.

When you configure this alert, you can set the time at which the alert resets. Reset this alert when the role of the mirrored database has no impact.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

Mirroring Oldest Unsent Transactions (Minutes) alert

The Mirroring Oldest Unsent Transactions (Minutes) alert provides the age of unsent transactions queued on the processor and reached an alert threshold.

This alert specifies the number of minutes worth of transactions that can accumulate in the send queue before a warning is generated on the principal server instance. This warning helps measure the potential for data loss in terms of time and is especially relevant for high-performance mode. However, the warning is also relevant for high-safety mode when mirroring is paused or suspended because the partners become disconnected.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

For more information about oldest unsent transactions, see the Microsoft document, Use Warning Thresholds and Alerts on Mirroring Performance Metrics (SQL Server).

Mirroring Preferred Configuration alert

The Mirroring Preferred Configuration alert indicates that a database mirror partner took on a non-preferred role. This event means the roles in the mirroring relationship do not conform to the roles specified as Normal. This alert does not reset over time and remains until you restore the roles or you change the Normal state. You can restore the roles or modify the Normal definition in the **Mirroring** view of the Databases tab.

SQL Diagnostic Manager triggers this alert based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

Mirroring Status alert

The Mirroring Status alert provides the status of the mirrored database based on the current databases status other than OK. By default, the values Synchronizing and Synchronized equal an OK state. A Suspended database triggers a Warning alert, and a Disconnected or Pending Failover database status triggers the Critical alert.

You can change the status for the mirrored databases in the **Mirroring** view of the **Databases** tab.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

Mirroring Unrestored Log (KB) alert

The Mirroring Unrestored Log (KB) alert indicates that the amount of unrestored logs (in KB) queued on the mirrored database reached or exceeded an alert threshold.

This warning helps measure failover time. Failover time consists mainly of the time that the mirror server requires to roll forward any log remaining in its redo queue, plus a short additional time.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

For more information about unrestored logs, see the Microsoft document, Use Warning Thresholds and Alerts on Mirroring Performance Metrics (SQL Server).

Mirroring Unsent Log (KB) alert

The Mirroring Unsent Log (KB) alert indicates that the amount of unsent logs (in KB) queued on the mirrored database reached or exceeded an alert threshold.

This alert specifies how many kilobytes (KB) of unsent logs generate a warning on the principal server instance. This warning helps measure the potential for data loss in terms of KB and is especially relevant for high-performance mode. However, the warning is also relevant for high-safety mode when mirroring is paused or suspended because the partners become disconnected.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

For more information about unsent logs, see the Microsoft document,Use Warning Thresholds and Alerts on Mirroring Performance Metrics (SQL Server).

Mirroring Witness Connection alert

The Mirroring Witness Connection alert indicates that the connection to the mirror is lost.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

Oldest Open Transaction (Minutes) alert

The Oldest Open Transaction (Minutes) alert provides the time (in minutes) that the longest running transaction in the database has used since issuing the `BEGIN TRANSACTION` statement.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

OLE Automation Disabled alert

The OLE Automation Disabled alert indicates that the OLE automation configuration option is disabled in SQL Server 2005 or the procedures are dropped in SQL Server 2000 for the SQL Server instance. SQL Diagnostic Manager does not collect data such as OS metrics and service details using OLE automation. Use the OS Metrics tab of the server Properties dialog to reconfigure this option. For additional information about OS metrics collection, see Configure OS metrics monitoring.

OS Average Disk Queue Length (Count) alert

The OS Average Disk Queue Length (Count) alert provides the average number of both read and write requests queued for all the disks on the SQL Server computer.

Reduce queue length

If this queue often remains above six per physical disk for more than 10 seconds at a time, then your disk subsystem is overloaded. In this case consider the following:

- Check OS Paging to make sure that paging from/to the swap file is not causing these IOs.
- Replacing disks with faster disks.
- Add more disks to you RAID array.
- Switch your RAID array from RAID 5 to RAID 10 solution as each write IO results in two writes using RAID 10 vs. 4 for RAID 5.
- Move other applications to another computer.
- So long as the RAID controller has some form of battery backup then switch its cache mode from Write-through to Write-back as this increases the system ability to handle write IOs by an order of magnitude.
- If the computer is running multiple instances of SQL Server, then consider placing each instance on a separate physical computer.

✓ **Enable baseline thresholds**

To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

✓ **Create an alert response bundle**

Create an alert response bundle with the OS Average Disk Queue Length (Count) alert and related alerts. For additional information, see Create alert response bundles.

OS Average Disk Queue Length Per Disk (Count) alert

The OS Average Disk Queue Length Per Disk (Count) alert provides the average number of both read and write requests queued for each disk on the SQL Server computer.

Reduce queue length

If this queue often remains above six per physical disk for more than 10 seconds at a time then your disk subsystem is overloaded. In this case, consider the following:

- Check OS Paging to make sure that paging from/to the swap file is not causing these IOs.
- Replacing disks with faster disks.
- Add more disks to you RAID array.
- Switch your RAID array from RAID 5 to RAID 10 solution as each write IO results in two writes using RAID 10 vs. 4 for RAID 5.
- Move other applications to another computer.
- So long as the RAID controller has some form of battery backup then switch its cache mode from Write-through to Write-back as this increases the system ability to handle write IOs by an order of magnitude.
- If the computer is running multiple instances of SQL Server, then consider placing each instance on a separate physical computer.

✓ Create an alert response bundle with the OS Average Disk Queue Length Per Disk (Count) alert and related alerts. For additional information, see Create alert response bundles.

OS Disk Free Space (Size) alert

The OS Disk Free Space (Size) alert provides the amount of available disk space, in megabytes, on the SQL Server computer. This alert triggers separately for each disk on a server.

✓ Create an alert response bundle with the OS Disk Free Space (Size) alert and related alerts. For additional information, see Create alert response bundles.

OS Disk Full (Percent) alert

The OS Disk Full (Percent) alert provides the percentage of space used on a logical disk on the SQL Server computer. This alert is triggered separately for each disk on a server.

✓ You can access the Disk Size view of the Resources tab by double-clicking the OS Disk Full (Percent) alert in the Alerts view.

✓ **Create an alert response bundle**

Create an alert response bundle with the OS Disk Full (Percent) alert and related alerts. For additional information, see Create alert response bundles.

OS Disk Time (Percent) alert

The OS Disk Time (Percent) alert provides the percentage of elapsed time that all disks are busy servicing read and write requests on the SQL Server computer.

Reduce OS processor time

If this value regularly exceeds 75%, you should take action such as:

- Reduce the number of SQL re-compilations since they are CPU intensive. There are many reasons that an object such as a stored procedure is recompiled and you can remove most of these reasons by careful coding. See the SQL Re-compilations counter for ways to dramatically reduce recompiles.
- Make sure that all T-SQL statements (whether in a stored procedure, trigger, or ad hoc statement) that reference objects fully qualify the object referenced. For example: `SELECT * FROM Northwind.dbo Employees` is a fully-qualified object reference whereas `SELECT * FROM Employees` is a poorly-qualified object. You can reuse the execution plans of fully-qualified objects "as is," whereas plans where you either cannot reuse the not fully-qualified objects or, if they are reused, then they are subject to a highly restrictive `COMPILE` lock while SQL Server determines if all of the objects referenced in the T-SQL code have the same owners as the execution plan currently in cache. Both of these situations consume a significant amount of CPU time.
- Stop unnecessary programs (such as the Print Spooler or activities such as the database server acting as either a BDC or PDC) from running.

✓ **Enable baseline thresholds**

To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

✓ **Create an alert reponse bundle**

Create an alert response bundle with the OS Disk Time (Percent) alert and related alerts. For additional information, see Create alert response bundles.

OS Disk Time Per Disk (Percent) alert

The OS Disk Time Per Disk (Percent) alert provides the percentage of elapsed time that an individual disk is busy servicing read and write requests on the SQL Server computer. This alert triggers separately for each disk on a server.

Reduce OS processor time

If this value regularly exceeds 75%, you should take action such as:

- Reduce the number of SQL re-compilations since they are CPU intensive. There are many reasons that an object such as a stored procedure is recompiled and you can remove most of these reasons by careful coding. See the SQL Re-compilations counter for ways to dramatically reduce recompiles.
- Make sure that all T-SQL statements (whether in a stored procedure, trigger, or ad hoc statement) that reference objects fully qualify the object referenced. For example: `SELECT * FROM Northwind.dbo Employees` is a fully-qualified object reference whereas `SELECT * FROM Employees` is a poorly-qualified object. You can reuse the execution plans of fully-qualified objects "as is," whereas plans where you either cannot reuse the not fully-qualified objects or, if they are reused, then they are subject to a highly restrictive `COMPILE` lock while SQL Server determines if all of the objects referenced in the T-SQL code have the same owners as the execution plan currently in cache. Both of these situations consume a significant amount of CPU time.
- Stop unnecessary programs (such as the Print Spooler or activities such as the database server acting as either a BDC or PDC) from running.

✓ Create an alert response bundle with the OS Disk Time Per Disk (Percent) alert and related alerts. For additional information, see Create alert response bundles.

OS Memory Usage (Percent) alert

The OS Memory Usage (Percent) alert provides the percentage of physical and virtual memory. Consistently high Total Memory Usage could indicate either:

- A memory leak in a program in use.
- A need to increase the amount of total memory.

The Memory view on the Resources tab allows you to track the Total Memory usage along with other key memory statistics on the computer hosting your SQL Server instance.

Reduce OS memory usage

A high percentage of Total Memory Usage indicates a memory bottleneck. To investigate this issue, open the Memory view on the Resources tab to view how memory is utilized on your SQL Server instance. You may need to allocate more memory to SQL Server to increase your SQL Server performance, or limit the usage of other applications on the computer hosting your SQL Server instance.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

OS Metrics Collection Status alert

The OS Metrics Collection Status alert provides the status of SQL diagnostic manager OS Metrics Collection.

OS Paging (Per Second) alert

The OS Paging (Per Second) alert indicates that a memory threshold meets or exceeds the setting, due to one of the following causes:

- The OS Memory Paging is high
- The OS Memory Usage is high
- The SQL Server Memory Usage is high

Consistently high memory usage could cause system performance problems because of heavy disk usage and CPU load.

Reduce memory paging

A high number of memory paging indicates a memory bottleneck. You should open the **Memory** view on the **Resources** tab to see how memory is being utilized on your SQL Server instance. You may need to allocate more memory to SQL Server to increase your SQL Server performance.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

OS Privileged Time (Percent) alert

The OS Privileged Time (Percent) alert provides the percentage of CPU time spent by all processes executing in privileged mode on the SQL Server computer.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

OS Processor Queue Length (Count) alert

The OS Processor Queue Length (Count) alert indicates that the number of threads waiting on the processor reached an alert threshold. A consistently high processor queue length can indicate processor congestion. If your system has multiple processors, you may need to increase your alert thresholds.

Reduce your OS processor queue length

If the Processor Queue Length is often high, consider making one of the following changes:

- Upgrade to faster CPU(s).
- Reduce the number of SQL re-compilations as they are CPU intensive. There are many reasons that an object such as a stored procedure is recompiled, and you can remove most of these reasons by careful coding. See the SQL re-compilations counter for ways to dramatically reduce recompiles.
- Stop unnecessary programs from running (such as the Print Spooler or activities such as the database server acting as either a BDC or PDC).

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

OS Processor Time (Percent) alert

The OS Processor Time (Percent) alert provides the percentage of CPU time used by all processes on the computer hosting your SQL Server instance. The WMI object `Win32_PerfRawData_PerfOS_Processor` property `PercentProcessorTime` is measured to get percent processor time.

Reduce OS processor time

If this value regularly exceeds 75%, you should take action such as:

- Reduce the number of SQL re-compilations since they are CPU intensive. There are many reasons that an object such as a stored procedure is recompiled and you can remove most of these reasons by careful coding. See the SQL Re-compilations counter for ways to dramatically reduce recompiles.
- Make sure that all T-SQL statements (whether in a stored procedure, trigger, or ad hoc statement) that reference objects fully qualify the object referenced. For example: `SELECT * FROM Northwind.dbo Employees` is a fully-qualified object reference whereas `SELECT * FROM Employees` is a poorly-qualified object. You can reuse the execution plans of fully-qualified objects "as is," whereas plans where you either cannot reuse the not fully-qualified objects or, if they are reused, then they are subject to a highly restrictive `COMPILE` lock while SQL Server determines if all of the objects referenced in the T-SQL code have the same owners as the execution plan currently in cache. Both of these situations consume a significant amount of CPU time.
- Stop unnecessary programs (such as the Print Spooler or activities such as the database server acting as either a BDC or PDC) from running.

Reasons why the CPU Usage metric has no value

SQL Diagnostic Manager is unable to collect the corresponding counter due to one of the following reasons:

- It usually takes two refreshes to begin populating the CPU Usage metric, which occurs within a few seconds.
- OS Metrics collection is disabled or not working properly. You must enable OS Metrics collection for SQL Diagnostic Manager to collect hardware performance metrics.
- Lightweight Pooling is enabled. SQL Diagnostic Manager cannot collect OS metrics if Lightweight Pooling is enabled on the SQL Server instance.
- Alerts are disabled. SQL Diagnostic Manager displays an alert status when at least one of the three alerts is enabled.
- The counter does not exist on this SQL Server instance.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

OS User Time (Percent) alert

The OS User Time (Percent) alert provides the percentage of CPU time spent by all processes executing in user mode on the SQL Server computer.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

Page Life Expectancy alert

The Page Life Expectancy alert is triggered when the number of seconds a page stays in the buffer pool without references is below the warning level. A decrease in page life expectancy can indicate an increase in the physical I/O requirements for a user database. The rate decrease could likely indicate that the memory taken away from the buffer pool is forcing database pages to exit the buffer pool prematurely.

Diagnose problems with your SQL Server instance

Microsoft recommends a minimum target for page life expectancy of 300 seconds. This means that any given page in memory is kept in the buffer for five minutes before the buffer flushes the page to disk. A page life expectancy value of less than 300 seconds is indicative of either a memory problem or inefficient query plans.

✓ To enable alerting when this metric is outside its established baseline, select the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

Procedure Cache Hit Ratio (Percent) alert

The Procedure Cache Hit Ratio (Percent) alert provides the ratio of procedure cache hits to procedure cache lookups.This value indicates the reuse of an execution plan from memory as opposed to a compilation from disk.

Manage your Procedure Cache Hit Ratio

If you regularly encounter values below 80% once SQL Server is actively running for at least 30 minutes, then consider one of the following remedies:

- Make sure that all T-SQL statements (whether in a stored procedure, trigger or ad hoc statement) that reference objects fully qualify the object referenced. For example: `SELECT * FROM Northwind.dbo Employees` is a fully-qualified object reference whereas `SELECT * FROM Employees` is a poorly-qualified object. You can reuse the execution plans of fully-qualified objects "as is," whereas plans where you either cannot reuse the not fully-qualified objects or, if they are reused, then they are subject to a highly restrictive `COMPILE` lock while SQL Server determines if all of the objects referenced in the T-SQL code have the same owners as the execution plan currently in cache. Both of these situations consume a significant amount of CPU time.
- Add more physical memory (RAM) to the computer.
- If your site makes use of extended stored procedures that are not called very often, then after calling them, issue a `DBCC DLLNAME (FREE)` . Once an extended stored procedure is called, it remains in memory until SQL Server is shut down even if it is never called again! This is tremendously wasteful in terms of available memory and a `DBCC DLLNAME (FREE)` releases that memory for use by both the procedure cache as well as the Data Pages which has a significant positive effect on both the Procedure Cache Hit Ratio, as well as the Buffer Cache Hit Ratio. In order to view the extended stored procedures currently loaded in memory by SQL Server, execute `SP_HELPEXTENDEDPROC` .
- Allow SQL Server to consume more of the available memory (making sure that OS Paging does not increase).
- Stop unnecessary programs (such as the Print Spooler or activities such as the database server acting as either a BDC or PDC) from running.
- If the computer is running multiple instances of SQL Server, consider placing each instance on a separate physical computer.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

Query Monitor Events (Count) alert

The Query Monitor Events (Count) alert provides the number of queries captured by the Query Monitor on the SQL Server instance during the last scheduled refresh. A warning is generated if a query matches the criteria specified for a poorly performing query.

Read Latency High

The Read Latency metric is the measure of how long it takes for the SQL Server instance to complete a read from storage.

Read Throughput

The Read Throughput metric is the measure of how many MB/sec is being read from storage.

Service Tier Changes

The Service Tier Changes metric indicated whether the service level for a database has been changed in the time period being checked.

Session CPU Time (Seconds) alert

The Session CPU Time (Seconds) alert provides the CPU Time (in seconds) used by the SQL Server session since the last scheduled refresh.

Session Tempdb Space Usage (MB) alert

The Session Tempdb Space Usage (MB) alert provides the amount of tempdb space being used by a running session. This alert occurs only on instances running SQL Server 2005 or above.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

SQLdm Repository Grooming Timed Out alert

The ‘SQLdm Repository Grooming Timed Out’ alert is triggered when the grooming process of your SQLDM Repository has reached the time out period (180 minutes).

The time out period is typically exceeded when the repository database becomes very large in size. Running a complete reindex of the database should help improve the performance of the grooming process and prevent SQL DM from raising this alert.

> To review your grooming settings, go to **Tools** > **Grooming Options**.

SQLDM Service Status alert

The SQLDM Service Status alert provides the status of the SQLDM Manager Service. The possible statuses include **Running**, **Stopped**, or **Unknown**. You cannot configure this alert.

SQL Server Active Directory Helper Service Status alert

This alert provides the status of the SQL Server Active Directory Helper service.

SQL Server Agent Job Completion alert

The SQL Server Agent Job Completion alert provides the status of the Agent Job Completion metric. Values for this alert include **Succeeded**, **Retry**, **Canceled**, **Failed**, and **Unknown**.

✓ Create an alert response bundle with the SQL Server Agent Job Completion alert and related alerts. For additional information, see Create alert response bundles.

SQL Server Agent Job Failure alert

The SQL Server Agent Job Failure alert indicates that the scheduled SQL Server Agent job ended with a Failed status.

✓ Create an alert response bundle with the SQL Server Agent Job Failure alert and related alerts. For additional information, see Create alert response bundles.

SQL Server Agent Log alert

The SQL Server Agent Log alert indicates that specific text appeared in the SQL Server Agent error log. You can customize which text triggers this alert by using the Alert Filters tab on the Advanced Alert Configuration window.

The default settings are:

- 2 - Warning
- 1 - Critical

Use a size limit on your SQL Server Agent log

SQL Diagnostic Manager allows you to limit the size of your SQL Server Agent log to help improve response time and avoid using unnecessary space on your server. For additional information and steps on setting this limit, see Configure text and expression alerts.

✓ Create an alert response bundle with the SQL Server Agent log alert and related alerts. For additional information, see Create alert response bundles.

SQL Server Agent Long Running Job (Minutes) alert

The SQL Server Agent Long Running Job (Minutes) alert provides the maximum number of minutes used to complete a scheduled SQL Server Agent job.

✓ Create an alert response bundle with the SQL Server Agent Long Running Job (Minutes) alert and related alerts. For additional information, see Create alert response bundles.

SQL Server Agent Long Running Job (Percent) alert

The SQL Server Agent Long Running Job (Percent) alert provides the percentage of time that a scheduled SQL Server Agent job uses over the average successful completion time for this job in the current job history.

✓ Create an alert response bundle with the SQL Server Agent Long Running Job (Percent) alert and related alerts. For additional information, see Create alert response bundles.

SQL Server Agent Status alert

The SQL Server Agent Status alert provides the status of the SQL Server Agent Service.

SQL Server Agent XPs Disabled alert

The SQL Server Agent XPs Disabled alert indicates that the Agent XPs configuration option is disabled in SQL Server 2005 or later versions. The alert may also signal that procedures are dropped in SQL Server 2000 for the SQL Server instance. Note that SQL Diagnostic Manager does not collect SQL Agent job details.

Agent XPs are disabled when SQL Server Agent is stopped. You can re-enable Agent XPs through the Server Configuration view and allow viewing of agent job histories even when the agent is not running.

SQL Server Browser Service Status alert

This alert provides the status of the SQL Server Browser service.

SQL Server CPU Usage (Percent) alert

The SQL Server CPU Usage (Percent) alert indicates an unusually high amount of CPU usage by SQL Server. The percentage of SQL Server processor usage is listed under the control. A high SQL Server percentage could indicate a large number of active client sessions.

Reduce your SQL Server CPU usage

Consistently high SQL Server processor usage could indicate the need to:

- Reduce the number of SQL re-compilations as they are CPU intensive. There are many reasons that an object such as a stored procedure is recompiled and you can remove most of these reasons by careful coding.
- Make sure that all T-SQL statements (whether in a stored procedure, trigger or ad hoc statement) that reference objects fully qualify the object referenced.

For example: `SELECT * FROM Northwind.dbo Employees` is a fully-qualified object reference whereas `SELECT * FROM Employees` is a poorly-qualified object. You can reuse the execution plans of fully-qualified objects "as is," whereas plans where you either cannot reuse the not fully-qualified objects or, if they are reused, then they are subject to a highly restrictive `COMPILE` lock while SQL Server determines if all of the objects referenced in the T-SQL code have the same owners as the execution plan currently in cache. Both of these situations consume a significant amount of CPU time.

> To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

SQL Server Data Used (Percent) alert

The SQL Server Data Used (Percent) alert indicates that you have a high percentage of allocated database space in use.

This alert is raised based on the database metrics collection interval specified in Server Properties. For more information, see Set general server options.

Reduce your SQL Server database space used

- You may need to increase the amount of space allocated to databases, add disks to the computer hosting the instance, or move databases to another host computer.
- If you have autogrowth turned off, this alert indicates that you need to either allocate more space for databases or add more disk space.
- If you have autogrowth turned on and this alert is triggered often, you may need to adjust your autogrowth settings to a higher percentage to improve performance. Constant growth adjustments can degrade performance.
- For SQL Server 2000 users, SQLdm may incorrectly report the file size. This issue occurs when certain columns in the `sysindexes` table become inaccurate and provide SQL Diagnostic Manager with incorrect information regarding the number of rows and table size. To correct this problem, use the following T-SQL syntax:

  ```
  DBCC UPDATEUSAGE ('database_name' ) GO
  ```

  We recommend that you execute this command during non-peak hours as it is server intensive.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

SQL Server Error Log alert

The SQL Server Error Log alert indicates that specific text appeared in the SQL Server log. You can customize which text triggers the alert.

The default settings are:

- 11 - Warning
- 18 - Critical

Use a size limit on your SQL Server Error log

SQL Diagnostic Manager allows you to limit the size of your SQL Server Error log to help improve response time and avoid using unnecessary space on your server. For additional information and steps on setting this limit, see Configure text and expression alerts.

✓ Create an alert response bundle with the SQL Server Error Log alert and related alerts. For additional information, see Create alert response bundles.

SQL Server Log Used (Percent) alert

The SQL Server Log Used (Percent) alert provides the percentage of allocated disk space used by logs on the SQL Server instance reached an alert threshold. Once the log space is completely filled, all updates to the event log fail.

This alert is raised based on the database metrics collection interval specified in Server Properties. For more information, see Set general server options.

Reduce your SQL Server log space used

- You can allocate more disk space to the event log, turn on the auto-growth feature for your SQL Server log, or add additional disk space to the computer hosting your SQL Server instance.
- If autogrowth is turned off for your logs, this alert may indicate the need to either increase the allocated space for logs and/or add disk space to your SQL Server environment.
- If autogrowth is turned on and you are seeing this alert often, you may need to adjust your autogrowth settings to a higher percentage to improve degraded performance resulting from constant growth adjustments.
- In certain cases, SQL Diagnostic Manager may incorrectly report the file size. This issue occurs when certain columns in the 'sysindexes' table in SQL Server 2000 become inaccurate and provide SQL Diagnostic Manager with incorrect information regarding the number of rows and table size.
- Use the following T-SQL syntax to correct this issue:

```
DBCC UPDATEUSAGE ('database_name' ) GO
```

We recommend that you execute this command during non-peak hours as it is server intensive.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

SQL Server Memory Usage (Percent) alert

The SQL Server Memory Usage (Percent) alert provides the total server memory (Total Server Memory per `sysperfinfo`) as a percent of total physical memory from WMI.

Reduce the percentage of memory used by SQL Server

If this value is regularly over 80%, SQL Server needs more memory or needs to use the memory it has more efficiently. Consider implementing one or more of the following solutions:

- If your site makes use of extended stored procedures that are infrequently called, then after calling them, issue a `DBCC DLLNAME (FREE)`. Once an extended stored procedure is called, it remains in memory until SQL Server is shut down even if it is never again called, which then wastes available memory. A `DBCC dllname (FREE)` releases that memory for use by both the procedure cache and Data Pages, which has a significant positive effect on both the Procedure Cache Hit Ratio and the Buffer Cache Hit Ratio. Execute `sp_helpextendedproc` to view the extended stored procedures currently loaded in memory by SQL Server.
- As each SQL Server lock requires 96 bytes of memory, the granting of lock space is done at the expense of Data Pages and Procedure Cache Pages. To maintain proper system performance and throughput, keep the number of locks to a minimum by:
  - Wherever possible, using the `(NOLOCK)` optimizer hint or `SET TRANSACTION ISOLATION LEVEL READ UNCOMMITTED` on select statements as this neither issues any shared locks on the data it reads nor honors any exclusive locks set by other transactions.
  - When updating all rows in a table with more than 50 rows, using the `TABLOCKX` table hint. This table hint prevents SQL Server from initially taking exclusive row locks, granting many of these locks, and then escalating them to an exclusive table lock.
  - When deleting all rows in any table, using the TRUNCATE TABLE statement instead of the DELETE statement as fewer locks and other system resources are consumed in the process.
  - Reducing the time that a lock is held by:
    - Performing as much work as possible before the transaction performs its first update, delete, or insert. For example, add any necessary SELECT statements.
    - Grouping all UPDATES, DELETES, and INSERTS as closely as possible within a transaction with as few SELECTS as possible separating them.
    - Committing the transaction as soon as possible after the final DML statement.
    - Avoiding any stops for user input once the transaction begins. Be sure to gather all user inputs before the transaction starts.
    - Allowing SQL Server to consume more of the available memory, making sure that OS Paging does not increase.
- Add more physical memory (RAM) to the computer.
- If the computer is running multiple instances of SQL Server, then consider placing each instance on a separate physical computer.
- If the computer is running other memory-intensive applications, such as IIS or Exchange, then consider moving each instance to a separate physical computer.
- Limit SQL Server computers to performing only SQL Server work. Stop any unnecessary programs, such as allowing the computer to act as either a primary or backup domain controller.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

SQL Server Response Time (Milliseconds) alert

The SQL Server Response Time (Millisecond) alert provides the time (in milliseconds) SQL Diagnostic Manager currently needs to send a simple SQL command to the SQL Server instance, have it processed, and receive the returned result set.

High response times generally occur when sessions are blocked or when either there is heavy network traffic or network problems or when either the computer the SQL Diagnostic Manager Repository or the computer the SQL Diagnostic Manager Console is hosted on is running slow due to various problems.

Typically, this value should average below 2000 ms for a well tuned network and server. Average values in excess of 2000 ms indicate either an excessively busy network segment or a stressed SQL Server.

Reduce your SQL Server response time

A common cause to high response times is when sessions are being blocked. To fix this problem, go to the **Sessions** tab and select the **Blocking** view to see if any sessions are blocking. You can then select the session and click either **Trace Session** to see what queries the session is creating and to see what is causing the block, or **Kill Session** to stop it.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

SQL Server Service

The SQL Server Status alert provides the status of the SQL Server service.

Swap Usage

The Swap Usage metric is used when there is not enough available memory to fulfill a request.

Table Fragmentation (Percent) alert

The Table Fragmentation (Percent) alert provides the percentage of fragmented pages in a table. It is the scan density from `dbcc showcontig` on a clustered index of a table. If the table does not have a clustered index, table fragmentation is not collected. If this value exceeds 80%, consider the following remedies:

- Drop and re-create the clustered index.
- Reorder the leaf-level pages of the index in a logical order.
- Rebuild the index online.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

Tempdb Contention (ms) alert

The Tempdb Contention (ms) alert provides the latch wait time (in milliseconds) for tempdb allocation maps. The three tracked allocation page types are:

- Page free space (PFS)
- Global allocation map (GAM)
- Shared global allocation map (SGAM)

Latch contention of this sort is usually an indication that you need to create more tempdb data files. In some situation, using Trace Flag 1118 may also alleviate tempdb contention. This alert occurs only on instances running SQL Server 2005 or above.

Unsubscribed Transactions (Count) alert

The Unsubscribed Transactions (Count) alert provides the number of replication transactions received by the Distributor but not received by a Subscriber.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

Unsubscribed Transactions (Seconds) alert

The Unsubscribed Transactions (Seconds) alert provides the time (in seconds) that a replication transaction is holding at the Distributor and waiting for a Subscriber to receive it.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

User Connections (Percent) alert

The User Connections (Percent) alert provides the percentage of currently-used user connections allowed by the SQL Server instance. A high percentage indicates a load on the SQL Server. Note that the higher this value, the more SQL Server reserves for connections.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

Version Store Generation Ratio alert

The Version Store Generation Ratio alert provides the percentage by which the tempdb version store generation rate exceeds the cleanup rate. This alert is disabled by default and occurs only on instances running SQL Server 2005 or above.

> ⚠ You can raise this alert only when at least one minute elapses between alert refreshes as version store cleanup occurs once per minute.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

Version Store Size (MB) alert

The Version Store Size (MB) alert provides the size of the tempdb version store in megabytes. This alert is disabled by default and occurs only on instances running SQL Server 2005 or above.

This alert is raised based on the diagnostic data collection interval specified in Server Properties. For more information, see Set general server options.

VM CPU Ready Wait Time (ms) alert

The VM CPU Ready Wait Time (MS) alert provides the time (in milliseconds) that a virtual CPU is waiting for a physical CPU to become available for processing for the virtual machine on which the monitored SQL Server resides. A spike in this value may indicate CPU pressure on the host server. This alert is enabled by default and is only relevant to instances hosted on VMWare vCenter virtual machines enabled for VM monitoring in the SQLDM VM Configuration window.

VM CPU Usage (Percent) alert

The VM CPU Usage (Percent) alert provides the percentage of available virtual CPU time used by the virtual machine hosting the monitored SQL Server. This may differ from the processor utilization percentage reported by the guest OS. The percentage of processor usage is listed under the control. A high percentage could indicate a large number of active client sessions. This alert is disabled by default and is available only on instances hosted on virtual machines that are enabled for VM monitoring.

Reduce the percentage of available virtual CPU time used by your VM

Consistently high SQL Server processor usage could indicate the need to:

- Reduce the number of SQL re-compilations as they are CPU intensive. There are many reasons that an object such as a stored procedure is recompiled and you can remove most of these reasons by careful coding.
- Make sure that all T-SQL statements (whether in a stored procedure, trigger or ad hoc statement) that reference objects fully qualify the object referenced.

For example: `SELECT * FROM Northwind.dbo Employees` is a fully-qualified object reference whereas `SELECT * FROM Employees` is a poorly-qualified object. You can reuse the execution plans of fully-qualified objects "as is," whereas plans where you either cannot reuse the not fully-qualified objects or, if they are reused, then they are subject to a highly restrictive `COMPILE` lock while SQL Server determines if all of the objects referenced in the T-SQL code have the same owners as the execution plan currently in cache. Both of these situations consume a significant amount of CPU time.

✓ To enable alerting when this metric is outside its established baseline, click the **Baseline Thresholds Enabled (as percentage of baseline)** check box in the Alert Configuration window.

VM Host Server Change alert

The VM Host Server Change alert indicates that the virtual machine hosting the monitored SQL Server instance moved to a different host. This alert is disabled by default and is only relevant to instances hosted on VMWare vCenter which have been enabled for VM monitoring in the SQLDM VM Configuration window.

VM Memory Swap Delay Detected alert

The VM Memory Swap Delay Detected alert indicates that the memory being swapped to disk is causing a performance delay on the virtual machine on which the monitored SQL Server instance is running. This alert is enabled by default and is available only on instances hosted on virtual machines that are enabled for VM monitoring.

VM Memory Usage (Percent) alert

The VM Memory Usage (Percent) alert provides the percentage of available memory used by the virtual machine hosting the monitored SQL Server. This result may vary from the memory usage percentage reported by the guest operating system. This alert is disabled by default and is available only on instances hosted on virtual machines that are enabled for VM monitoring.

Reduce the percentage of memory used by SQL Server

If this value is regularly over 80%, SQL Server needs more memory or needs to use the memory it has more efficiently. Consider implementing one or more of the following solutions:

- If your site makes use of extended stored procedures that are infrequently called, then after calling them, issue a `DBCC DLLNAME (FREE)`. Once an extended stored procedure is called, it remains in memory until SQL Server is shut down even if it is never again called, which then wastes available memory. A `DBCC dllname (FREE)` releases that memory for use by both the procedure cache and Data Pages, which has a significant positive effect on both the Procedure Cache Hit Ratio and the Buffer Cache Hit Ratio. Execute `sp_helpextendedproc` to view the extended stored procedures currently loaded in memory by SQL Server.
- As each SQL Server lock requires 96 bytes of memory, the granting of lock space is done at the expense of Data Pages and Procedure Cache Pages. To maintain proper system performance and throughput, keep the number of locks to a minimum by:
  - Wherever possible, using the `(NOLOCK)` optimizer hint or `SET TRANSACTION ISOLATION LEVEL READ UNCOMMITTED` on select statements as this neither issues any shared locks on the data it reads nor honors any exclusive locks set by other transactions.
  - When updating all rows in a table with more than 50 rows, using the `TABLOCKX` table hint. This table hint prevents SQL Server from initially taking exclusive row locks, granting many of these locks, and then escalating them to an exclusive table lock.
  - When deleting all rows in any table, using the TRUNCATE TABLE statement instead of the DELETE statement as fewer locks and other system resources are consumed in the process.
  - Reducing the time that a lock is held by:
    - Performing as much work as possible before the transaction performs its first update, delete, or insert. For example, add any necessary SELECT statements.
    - Grouping all UPDATES, DELETES, and INSERTS as closely as possible within a transaction with as few SELECTS as possible separating them.
    - Committing the transaction as soon as possible after the final DML statement.
    - Avoiding any stops for user input once the transaction begins. Be sure to gather all user inputs before the transaction starts.
    - Allowing SQL Server to consume more of the available memory, making sure that OS Paging does not increase.
- Add more physical memory (RAM) to the computer.
- If the computer is running multiple instances of SQL Server, then consider placing each instance on a separate physical computer.
- If the computer is running other memory-intensive applications, such as IIS or Exchange, then consider moving each instance to a separate physical computer.
- Limit SQL Server computers to performing only SQL Server work. Stop any unnecessary programs, such as allowing the computer to act as either a primary or backup domain controller.

VM Power State alert

The VM Power State alert provides the power state of the VM as reported by the vCenter or Hyper-V host servers. This alert is enabled by default and is available only on instances hosted on virtual machines that are enabled for VM monitoring.

VM Reclaimed/Ballooned Memory (KB) alert

The VM Reclaimed/Ballooned Memory (KB) alert provides the amount of memory that is reclaimed by the host server and is no longer available to the virtual machine on which the SQL Server instance is running. This may be a sign of memory pressure on the host. This alert is enabled by default and is only relevant to instances hosted on VMWare vCenter virtual machines enabled for VM monitoring in the SQLdm VM Configuration window.

Reduce the percentage of memory used by SQL Server

If this value is regularly over 80%, SQL Server needs more memory or needs to use the memory it has more efficiently. Consider implementing one or more of the following solutions:

- If your site makes use of extended stored procedures that are infrequently called, then after calling them, issue a `DBCC DLLNAME (FREE)`. Once an extended stored procedure is called, it remains in memory until SQL Server is shut down even if it is never again called, which then wastes available memory. A `DBCC dllname (FREE)` releases that memory for use by both the procedure cache and Data Pages, which has a significant positive effect on both the Procedure Cache Hit Ratio and the Buffer Cache Hit Ratio. Execute `sp_helpextendedproc` to view the extended stored procedures currently loaded in memory by SQL Server.
- As each SQL Server lock requires 96 bytes of memory, the granting of lock space is done at the expense of Data Pages and Procedure Cache Pages. To maintain proper system performance and throughput, keep the number of locks to a minimum by:
  - Wherever possible, using the `(NOLOCK)` optimizer hint or `SET TRANSACTION ISOLATION LEVEL READ UNCOMMITTED` on select statements as this neither issues any shared locks on the data it reads nor honors any exclusive locks set by other transactions.
  - When updating all rows in a table with more than 50 rows, using the `TABLOCKX` table hint. This table hint prevents SQL Server from initially taking exclusive row locks, granting many of these locks, and then escalating them to an exclusive table lock.
  - When deleting all rows in any table, using the TRUNCATE TABLE statement instead of the DELETE statement as fewer locks and other system resources are consumed in the process.
  - Reducing the time that a lock is held by:
    - Performing as much work as possible before the transaction performs its first update, delete, or insert. For example, add any necessary SELECT statements.
    - Grouping all UPDATES, DELETES, and INSERTS as closely as possible within a transaction with as few SELECTS as possible separating them.
    - Committing the transaction as soon as possible after the final DML statement.
    - Avoiding any stops for user input once the transaction begins. Be sure to gather all user inputs before the transaction starts.
    - Allowing SQL Server to consume more of the available memory, making sure that OS Paging does not increase.
- Add more physical memory (RAM) to the computer.
- If the computer is running multiple instances of SQL Server, then consider placing each instance on a separate physical computer.
- If the computer is running other memory-intensive applications, such as IIS or Exchange, then consider moving each instance to a separate physical computer.
- Limit SQL Server computers to performing only SQL Server work. Stop any unnecessary programs, such as allowing the computer to act as either a primary or backup domain controller.

VM Resource Configuration Change alert

The VM Resource Configuration Change alert indicates that a resource configuration change occurred for the virtual machine hosting the monitored SQL Server instance. This alert is enabled by default and is available only on instances hosted on virtual machines that are enabled for VM monitoring.

VM Resource Limits Detected alert

The VM Resource Limits Detected alert indicates that CPU or memory resource limits are set for the virtual machine hosting the monitored SQL Server instance. Resource limits are set by the VM administrator on the total amount of resources that a VM is allowed to consume. This alert is disabled by default and is available only on instances hosted on virtual machines that are enabled for VM monitoring.

WMI Service Unavailable alert

The WMI Service Unavailable alert indicates that the WMI service is unavailable on the SQL Server computer. SQL Diagnostic Manager does not collect OS metrics.

Write Latency High

Write Latency is the measure of how long it takes for the SQL Server instance to complete a write to storage.

Write Latency Low

Write latency is the measure of how long it takes for the SQL Server instance to complete a read from storage. High average write latency indicates that the storage system is not performing well or is overwhelmed.

Write Throughput

Write Throughput is a measure of how many MB/sec is being write to storage.

Advanced solutions

SQL Diagnostic Manager includes functionality aimed at the more advanced user who wants to manage these features without contacting IDERA Support for assistance. Please do not attempt to perform these actions if you are unsure of what you are doing or why you would want to take such steps. These advanced topics include the following actions:

- Migrate or recover your installation
- Deploy SQL Diagnostic Manager in a clustered environment
- Understand default alert IDs
- Troubleshoot WMI connectivity issues
- Integrate SQL Diagnostic Manager with SCOM
- Certificate Issues

Migrate or Recover Your Installation

Establishing a migration or disaster recovery strategy for your SQL Diagnostic Manager Repository and Services allows you to preserve historical data and existing configuration settings. You can also continue monitoring your SQL Server environment to meet your auditing requirements.

> ⚠ SQL Diagnostic Manager Application security is not maintained when your SQL Diagnostic Manager installation is migrated to a new server.

This process helps you execute a migration or disaster recovery strategy that addresses one of the following situations:

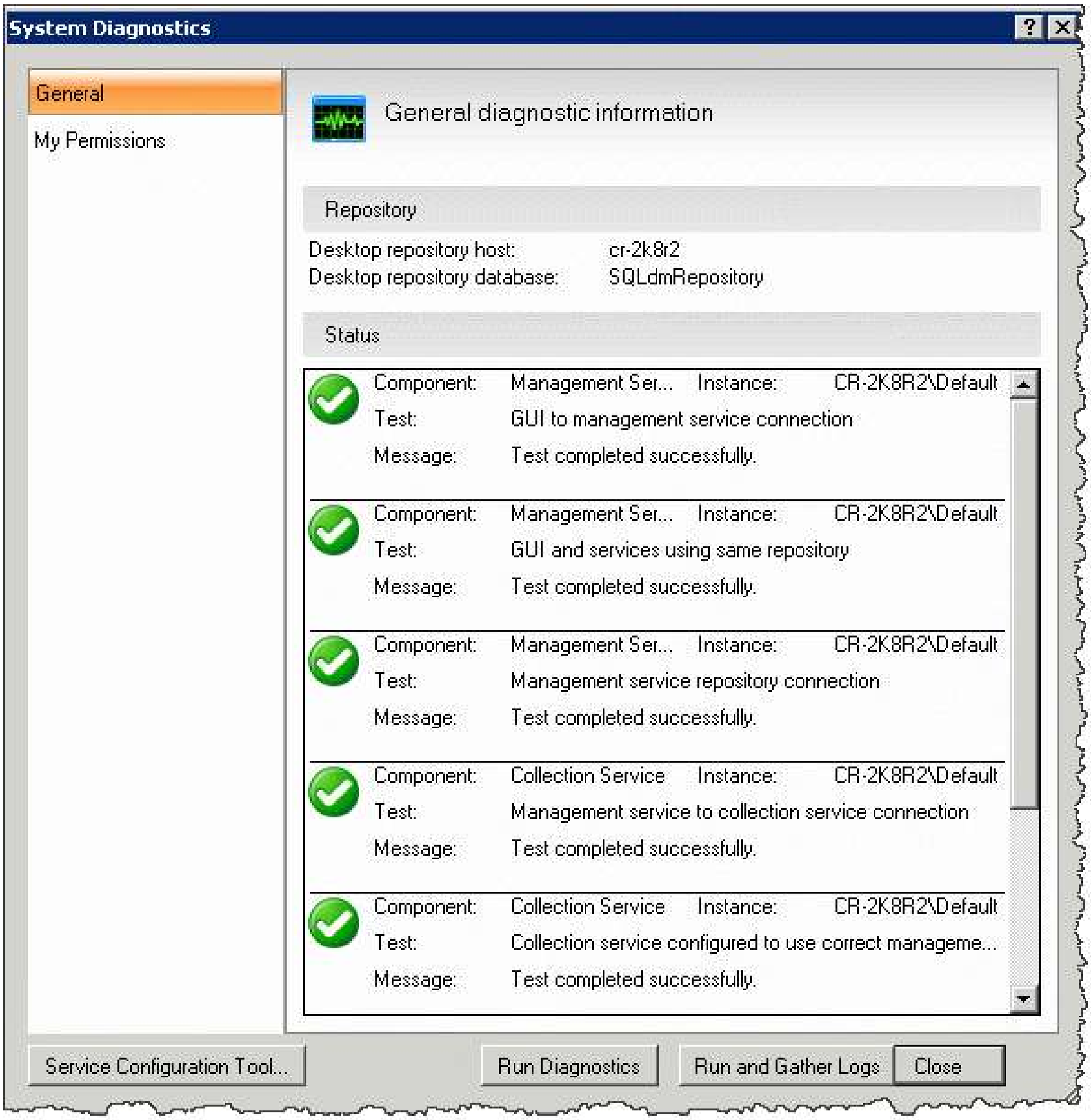
- The computer hosting SQL Diagnostic Manager requires maintenance, such as new hardware or a software upgrade (Microsoft Windows or SQL Server Service Pack)
- The computer hosting SQL Diagnostic Manager becomes permanently unavailable
- You decommission and replace the computer hosting SQL Diagnostic Manager

Refer to the following when migrating your SQL Diagnostic Manager installation:

- Choosing to migrate or recover SQL Diagnostic Manager
- Creating your migration or recovery plan
- Recovering your SQL Diagnostic Manager installation
- Migrating your complete SQL Diagnostic Manager installation
- Migrating the SQL Diagnostic Manager Repository only
- Migrating the SQL Diagnostic Manager services only

System diagnostics

The System Diagnostics window allows you to test the connections between the SQL Diagnostic Manager services and other SQL Diagnostic Manager components, as well as collect service and desktop client logs. This connection test is designed to assist you when the location of SQL Diagnostic Manager components changes due to a migration.



Desktop repository host: cr-2k8r2
Desktop repository database: SQLdmRepository

Component: Management Ser... Instance: CR-2K8R2\Default
Test: GUI to management service connection
Message: Test completed successfully.

Component: Management Ser... Instance: CR-2K8R2\Default
Test: GUI and services using same repository
Message: Test completed successfully.

Component: Management Ser... Instance: CR-2K8R2\Default
Test: Management service repository connection
Message: Test completed successfully.

Component: Collection Service Instance: CR-2K8R2\Default
Test: Management service to collection service connection
Message: Test completed successfully.

Component: Collection Service Instance: CR-2K8R2\Default
Test: Collection service configured to use correct manageme...
Message: Test completed successfully.

You can perform the following tests using system diagnostics:

Management Service Tests

- GUI to management service connection
- GUI and SQL Diagnostic Manager services using the same repository
- Management service repository connection

Collection Service Tests

- Management service to collection service connection
- Connection service configured to use correct management service
- Collection service can connect to management service
- Collection service heartbeat status

One-click System Diagnostics button:

You can run system diagnostics plus collect service and desktop client logs by clicking on **the Run and Gather Logs** button. This feature also saves the status of each collected log in a text file.

> ⚠ In a SQL Diagnostic Manager distributed environment, the **Run and Gather Logs** command, gathers only local logs. To collect all product logs, run this option from the machine where your SQL Diagnostic Manager services are installed.

Access the System Diagnostics window:

To open the System Diagnostics window, select **Help > System diagnostics** from the Toolbar menu.

> ⚠ In a console-only installation the **Service Configuration Tool** button is not available since the SQLdm Management Service Configuration Wizard is installed in the machine where all the SQL Diagnostic Manager services reside.

Choose to migrate or recover SQL Diagnostic Manager

When choosing whether a migration or disaster recovery strategy is best for your environment, consider if you want to permanently move the SQL Diagnostic Manager Repository or Services to another computer.

You can also choose to have the Repository and Console components located on computers that belong to different domains. This deployment option is advantageous during disaster recovery, especially if the only available computer is in another domain. Verify that a two-way trust exists between the target domains to support full communication between the Repository and consoles.

Goal	**Action**
Replace the SQL Diagnostic Manager Repository or Services computer	Migration
Repair the original Repository or Services computer	Recovery

In both cases, first backup and then restore the Repository database.

Create your migration or recovery plan

Once you decide whether a SQL Diagnostic Manager Migration or Recovery is best for your environment, create a plan so that when the time comes, you are prepared and get SQL Diagnostic Manager up and running as quickly as possible.

Creating a Migration Plan

A migration plan details moving the SQL Diagnostic Manager Repository and Services to another SQL Server instance, thereby replacing the original components. You can use a migration plan to respond to an immediate maintenance need. Use the procedures and guidelines in this document to implement or modify your migration plan.

Creating a Recovery Plan

A disaster recovery plan details the steps to remedy unexpected outages to make sure you can continue monitoring SQL Server activity and performance metrics. This document addresses disaster recovery best-practices for establishing a new Repository.

When you implement SQL Diagnostic Manager in your production SQL Server environment, consider preparing a disaster recovery plan to minimize audit data loss should the SQL Diagnostic Manager Repository become unavailable. Use the procedures and guidelines covered in this document to implement or modify your disaster recovery plan.

Understanding the Repository Database

The SQL Diagnostic Manager Repository consists of a SQL Server database named, by default, SQLdmRepository. This database contains the following information:

- Performance metrics and statistics collected from your monitored SQL Server instances
- Configuration settings such as the connection information for the SQL Diagnostic Manager services and alert notification rules
- Alert messages

By default, the Repository database uses the simple recovery model. When this setting is enabled, SQL Server does not maintain the transaction logs for the database. Likewise, any existing transaction logs are not included in backup data. If your corporate policies require transaction log backups, consider changing the recovery model to full so that transaction logs are maintained and archived.

Understanding SQL Diagnostic Manager services

SQL Diagnostic Manager has two centralized services, the Management Service and the Collection Service. These two services reside on the same computer.
The Management Service performs the following primary functions:

- Provides real-time data to the SQL Diagnostic Manager Console
- Receives historical data from the Collection Service for storage in the Repository
- Raises alerts and sends alert notifications

The Collection Service performs on-demand and scheduled collection from the monitored SQL Server instances.

Recovery and Migration Best Practices

Verify the Configuration of the Target SQL Server

When identifying the new SQL Server instance that you want to host the Repository and Services, make sure this instance meets or exceeds the product requirements as well as these specific requirements.

- You can dedicate the target instance to hosting the SQL Diagnostic Manager only
- The target instance runs the same version of SQL Server software that is currently running on the existing SQL Diagnostic Manager computer

Back up the Repository Database

Use a tool such as IDERA SQL Safe to perform a full backup of the Repository database. If you changed the default recovery model to full, make sure your backup includes all transaction logs.

Identify how often to backup the Repository database

The frequency at which you backup the Repository database depends on the following factors:

- How often your alert settings change
- How often your SQL Server environment changes as you add new servers and databases or remove older servers and database
- How much performance data you collect in a given time period
- How much risk you are willing to incur

The backup frequency should reflect your maintenance needs and allow you to meet future monitoring requirements.

Schedule routine backups of the Repository database

After you identify the appropriate backup frequency for your monitoring needs, use a tool such as IDERA SQL Safe to schedule routine backups of the Repository database. If you changed the default recovery model to full, make sure your backup includes all transaction logs.

Review disaster recovery guidelines

Make sure your recovery strategy includes plans to reinstate the original computer once it is repaired. Consider the following guidelines:

- To minimize data loss, plan to back up the Repository database on the temporary Repository computer immediately before reinstating the original computer.
- Use the procedures in this Technical Solution to reinstate the Repository on the original computer and configure the Management Service.
- To verify all components were reinstated correctly, test your implementation.
- Uninstall the components you previously implemented on the temporary computer.

Migrate your SQL Diagnostic Manager installation

The procedures in this section detail the migration steps for moving both the SQL Diagnostic Manager Repository and the Services to a new computer. Follow each section in order for a successful migration.

> ⚠ SQL Diagnostic Manager Application security is not maintained when your SQL Diagnostic Manager installation is migrated to a new server. For more information, see Use application security to manage SQL Diagnostic Manager.

Get a New SQL Diagnostic Manager License Key

Because you are migrating the Repository database to a different SQL Server instance, SQL Diagnostic Manager requires a new license key. You can easily request a new license key by sending an email to: licensing@idera.com.

To complete the request, make sure you have the name of the SQL Server instance where you plan to install the SQL Diagnostic Manager Repository database.

Restore the SQL Diagnostic Manager Repository on the Target Computer

For best results, use the following guidelines migrate your SQL Diagnostic Manager Repository to the target computer:

- Perform a full restore
- Schedule the restore during off-hours, or times when you expect the least collection activity

To restore the Repository database:

1. Use SQL Server Enterprise Manager or Management Studio to close any open connections to the Repository database.
2. Use SQL Server Enterprise Manager or Management Studio to take the Repository database offline. If you cannot take the Repository database offline, stop the Collection Service.
3. Use a tool such as IDERA SQL Safe to restore the Repository database on the target server using the appropriate backup archive file.

Disable or Uninstall the SQL Diagnostic Manager Services on the Current Computer

SQL Diagnostic Manager services must be uninstalled to avoid conflict with the restored SQL Diagnostic Manager Repository. For best results, use the following procedure:

If you do not want to keep the SQL Diagnostic Manager console on the current computer, perform the following steps:

1. Select **Start > Control Panel > Uninstall a Program** on your current computer.
2. Uninstall SQL Diagnostic Manager completely.

If you want to keep the SQL Diagnostic Manager Console on the current computer, perform the following steps:

1. Select **Start > Administrative Tools > Services** on the current computer.
2. Scroll down and right-click SQLDM Collection Service in the list, and select **Properties**.
3. In the Startup Type drop-down list, select **Disabled**.
4. Click **OK**.
5. Scroll down and right click SQLDM Management Services in the list, and select **Properties**.
6. In the Startup Type drop-down list, select **Disabled**.

7. Click **OK**.

Perform a Full SQL Diagnostic Manager Install on the New Computer

A full install of SQL Diagnostic Manager installs the new SQL Diagnostic Manager services, link them to the restored SQL Diagnostic Manager Repository, and install the SQL Diagnostic Manager Console. For best results, use the following procedure for installing SQL Diagnostic Manager:

1. Log on with an administrator account to the computer on which you want to install the SQL Diagnostic Manager services.
2. Run `Setup.exe` in the root of the installation kit.
3. Click **SQL diagnostic manager** on the **Quick Start** window.
4. On the **Welcome** window of the setup program, click **Next**.
5. Review and accept the license agreement by clicking I accept the terms in the license agreement, and then click **Next**.
6. Accept the default folder for your SQL Diagnostic Manager installation, or click **Change** to specify a different folder, and then click **Next**.
7. Select your setup type and then click **Next**.
8. Browse and select the SQL Server instance your SQL Diagnostic Manager Repository was restored to and click **Next**.
9. Enter your service account credentials and click **Next**.
10. Click **Install** to begin installing SQL Diagnostic Manager with the options you have selected.

Verify that the Migration was Successful

The SQL Diagnostic Manager Console includes a system diagnostics test that allows you to test the connections of all the SQL Diagnostic Manager components.

1. Open the SQL Diagnostic Manager Console.
2. Enter your new SQL Diagnostic Manager license key.
3. Add the SQL Server instances you want to monitor.
4. Open the System Diagnostics utility by selecting **Help > System Diagnostics**.
5. Click **Test**.
6. Verify that all the tests are successful.

Recovering your SQL Diagnostic Manager installation

In the event that your existing SQL Diagnostic Manager Repository is no longer available, you can recover your SQL Diagnostic Manager installation back to the last point a backup occurred.

Recovering the SQL Diagnostic Manager Repository

To recover lost or damaged data, restore the SQL Diagnostic Manager Repository database using the following guidelines:

- Perform a full restore
- Schedule the restore during off-hours, or times when you expect the least collection activity

To restore the Repository database:

1. Use SQL Server Enterprise Manager or Management Studio to close any open connections to the Repository database.
2. Use SQL Server Enterprise Manager or Management Studio to take the Repository database offline. If you cannot take the Repository database offline, stop the Collection Service.
3. Use a tool such as IDERA SQL Safe to restore the Repository database using the appropriate backup archive file.
4. On the computer hosting the SQL Diagnostic Manager services, restart the SQLDM Collection and Management services.
5. On all existing SQL Diagnostic Manager consoles, reconnect to the SQL Diagnostic Manager Repository by selecting **File >Connect to SQLDM Repository**.

Recovering the SQL Diagnostic Manager services

To install the SQL Diagnostic Manager services:

1. Log on with an administrator account to the computer on which you want to install the SQL Diagnostic Manager services.
2. Run `Setup.exe` in the root of the installation kit.
3. Click **SQL diagnostic manager** on the **Quick Start** window.
4. On the **Welcome** window of the setup program, click **Next**.
5. Review and accept the license agreement by clicking **I accept the terms in the license agreement**, and then click **Next**.
6. Accept the default folder for your SQL Diagnostic Manager installation, or click **Change** to specify a different folder, and then click **Next**.
7. Select the **Custom Install** setup type, and then click **Next**.
8. Select **SQLDM Services** (also select the **Desktop Client** if you want to run it on the same computer), and then click **Next**.
9. Specify which SQL Server instance is hosting the Repository database, verify that the displayed database name is correct, and then click **Next**.
10. Specify the account credentials that you want the SQL Diagnostic Manager services to use to connect to the SQL Diagnostic Manager Repository and the monitored SQL Server instances, and then click **Next**. This account must belong to the sysadmin role on the SQL Diagnostic Manager Repository database and each instance you plan to monitor.
11. Click **Install** to begin your installation.
12. Click **Finish** to exit the setup program.

Migrate the SQL Diagnostic Manager Repository

The procedures in this section detail the migration steps for moving the SQL Diagnostic Manager Repository to a new computer while leaving the SQL Diagnostic Manager services. Follow each section in order for a successful migration.

Get a New SQL Diagnostic Manager License Key

Because you are migrating the Repository database to a different SQL Server instance, SQL Diagnostic Manager requires a new license key. You can easily request a new license key by sending an email to: licensing@idera.com.

To complete the request, you need the name of the SQL Server instance where you plan to install the SQL Diagnostic Manager Repository database.

Restore the SQL Diagnostic Manager Repository on the Target Computer

To recover lost or damaged data, restore the Repository database. For best results, use the following guidelines:

- Perform a full restore
- Schedule the restore during off-hours, or times when you expect the least collection activity

To restore the Repository database:

1. Use SQL Server Enterprise Manager or Management Studio to close any open connections to the Repository database.
2. Use SQL Server Enterprise Manager or Management Studio to take the Repository database offline. If you cannot take the Repository database offline, stop the Collection Service.
3. Use a tool such as IDERA SQL Safe to restore the Repository database using the appropriate backup archive file.

Configure the Management Service

Configure the Management Service so that it can communicate with the new Repository.

To configure the SQLDM Management Service:

1. Start the Management Service Configuration wizard by selecting **Start > All Programs > IDERA > IDERA SQL Diagnostic Manager > Tools > Management Service Configuration Wizard** on the computer that hosts the SQL Diagnostic Manager services.
2. Read the Welcome window, and then click **Next**.
3. Verify that the following settings are correct, and then click **Next**.
   - The name of the SQL Server instance hosting the Repository database
   - The name of the Repository database
   - The type of authentication the Management Service should use to connect to the Repository database
4. Click **Test** to validate your settings.
5. Click **Finish** to exit the wizard.

Configure the SQLDM Desktop Client

Any previously deployed SQLDM Desktop Client has to be reconfigured to connect to the new Repository.

To reconfigure the SQLDM Desktop Client:

1. Launch the SQLDM Desktop Client by selecting **Start > All Programs > IDERA > IDERA SQL Diagnostic Manager > SQL Diagnostic Manager**.
2. Click **File > Connect to SQLDM Repository**
3. Verify that the following settings are correct, and then click **Next**.
   - The name of the SQL Server instance hosting the Repository database
   - The name of the Repository database
   - The type of authentication the Management Service should use to connect to the Repository database
4. Click **Connect** to save the changes.
5. Upon connecting to the Repository database, SQL Diagnostic Manager will generate a prompt indicating that a valid license does not exist. Click **Manage Licenses.**
6. In the **New Key** section, enter the new license key that was generated for the migration and click **Enter.**
7. Once the key has been added successfully, click the **Close** button.

Verify that the Migration was Successful

The SQL Diagnostic Manager Console includes a system diagnostics test that allows you to test the connections of all the SQL Diagnostic Manager components.

1. Open the SQL Diagnostic Manager console.
2. Enter your new SQL Diagnostic Manager license key.
3. Add the SQL Server instances you want to monitor.
4. Open the System Diagnostics utility by selecting **Help > System Diagnostics**.
5. Click **Test**.
6. Verify that all the tests are successful.

Migrate the SQL Diagnostic Manager services

The procedures in this section detail the migration steps for moving the SQL Diagnostic Manager services to a new computer while leaving the SQL Diagnostic Manager Repository. Follow each section in order for a successful migration.

Uninstall SQL Diagnostic Manager on the Original Computer

Uninstalling SQL Diagnostic Manager on the original computer via Add or Remove Programs, removes all the SQLDM components from the original computer except for the SQL Diagnostic Manager Repository. For best results, use the following procedure for uninstalling SQL Diagnostic Manager on the original computer:

1. Select **Start > Control Panel > Add or Remove Programs**.
2. Scroll down to SQL Diagnostic Manager and select **Remove**.
3. Click **Yes** to the prompt asking if you want to completely remove SQL Diagnostic Manager.

Perform a Full SQL Diagnostic Manager Install on the New Computer

A full install of SQL Diagnostic Manager installs the new SQL Diagnostic Manager services, link them to the restored SQL Diagnostic Manager Repository, and install the SQL Diagnostic Manager Console. For best results, use the following procedure for installing SQL Diagnostic Manager:

1. Log on with an administrator account to the computer on which you want to install the SQL Diagnostic Manager services.
2. Run `Setup.exe` in the root of the installation kit.
3. Click **SQL Diagnostic Manager** on the **Quick Start** window.
4. On the **Welcome** window of the setup program, click **Next**.
5. Review and accept the license agreement by clicking I accept the terms in the license agreement, and then click **Next**.
6. Accept the default folder for your SQL Diagnostic Manager installation, or click **Change** to specify a different folder, and then click **Next**.
7. Select your setup type and then click **Next**.
8. Browse and select the SQL Server instance on the original computer that contains your SQL Diagnostic Manager Repository, and click **Next**.
9. Enter your service account credentials and click **Next**.
10. Click **Install** to begin installing SQL Diagnostic Manager with the options you have selected.

Verify that the Migration was successful

The SQL Diagnostic Manager Console includes a system diagnostics test that allows you to test the connections of all the SQL Diagnostic Manager components.

1. Open the SQL Diagnostic Manager Console.
2. Enter your new SQL Diagnostic Manager license key.
3. Add the SQL Server instances you want to monitor.
4. Open the System Diagnostics utility by selecting **Help > System Diagnostics**.
5. Click **Test**.
6. Verify that all the tests are successful.

Deploy SQL Diagnostic Manager in a clustered environment

SQL Diagnostic Manager allows you to monitor your clustered SQL Server environment. See the following topics for installation and configuration instructions for Windows Server 2003, Windows Server 2008, Windows Server 2012, and later environments.

- Installing in a Windows Server 2003 Clustered Environment
- Installing in a Windows Server 2008 Clustered Environment
- Installing in a Windows Server 2012+ Clustered Environment
- Configure alerts for important cluster events

Windows Server 2003 clustered environment

The following instructions guide you through the installation of SQL Diagnostic Manager in a Windows Server 2003 based clustered environment.

Things to consider before you install SQL Diagnostic Manager in a clustered environment

- Create a separate cluster resource group to host SQLDM services. A separate group allows the SQLDM services to fail without causing other resources in the group to failover
- Before you create this separate cluster resource group, gather a dedicated IP, NetBIOS name, and a dedicated disk for the cluster resource group
- SQLdm Collection, SQLdm Management, SQLdm Predictive Analytics, and SQLdm Rest services can run as generic services on your newly-created cluster resource group

Install SQL Diagnostic Manager on a node

SQL Diagnostic Manager must be installed on each node within the cluster and configure the services as its described in the following page, Install SQL Diagnostic Manager on a node.

Configure the Cluster Resource Group

Cluster Resource Group settings must be modified to allow SQL Diagnostic Manager to recognize the cluster nodes.

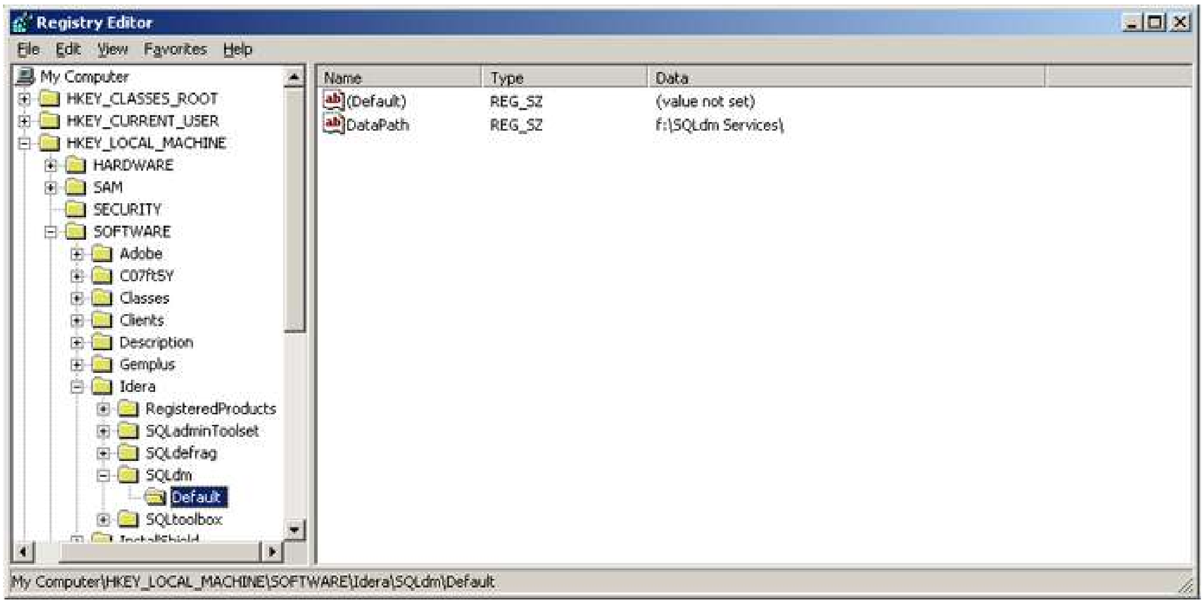
To configure the Cluster Resource Group:

1. In the Cluster Administrator tool, create the Cluster Resource Group:
   - Select **File > New > Group** and give the group and description
   - Add the nodes and click **Finish**
2. In the Cluster Administrator tool, add a disk to the Cluster Resource Group:
   - Right-click the group you just created, select **New > Resource** and give it a name and description
   - For the Resource Type, select **Physical Disk**
   - Select the SQLdm group
   - Click **Next** until you get to the last window and click **Finish**
3. In the Cluster Administrator tool, add an IP address for the Cluster Resource Group:
   - Right-click the group and select **New > Resource** and give it a name and description
   - Select the Resource type **IP Address**
   - Enter the IP address that you acquired for your new Cluster Resource Group
   - Click **Finish**
4. In the Cluster Administrator tool, add the Network Name resource to the Cluster Resource Group:
   - Right-click the group and **New > Resource** and give it a name
   - Select the Resource type **Network Name**
   - Add the dependency for the IP address resource
   - Specify the name and click **Finish**
5. Select a **Disk** that is in a Cluster Resource Group and create a folder on that disk used to hold local data for the services
6. On the primary node, use Registry Editor to create a new key named **Default** under *HKEY_LOCAL_MACHINE\SOFTWARE\Idera\SQLdm\*
7. Create a new String Value named **DataPath**.
8. Select a **Cluster Resource Group** in which you want to define the SQLdm resources
9. Create an IP Address resource for the SQLDM Services. If there is already an existing Network Name in the Cluster Resource Group, then you can skip this step
   - Create an Network Name resource that maps to the IP Address

- Create the Network Name resource and add the IP Address as a dependency

10. Create a Generic Service resource for the SQLdm Management Service
    - Add the **Disk** for the shared data as a dependency
    - Add the **Network Name** as a dependency
    - Specify SQLdmManagementService$Default as the name of the service to start
11. After the service is added, right-click it and select **Properties**
    - Select the Parameters tab and check the **Use network name for computer name** box
    - Select the Registry Replication tab and add *SOFTWARE\Idera\SQLdm\Default*
    - Click **OK**
12. Create a Generic Service resource for the SQLDM Collection Service
    - Add the **Disk** for the shared data as a dependency
    - Add the **Network Name** as a dependency
    - Specify SQLdmCollectionService$Default as the name of the service to start
13. After the service is added, right-click it and select **Properties**
    - Select the Parameters tab and check the **Use network name for computer name** box
    - Select the Registry Replication tab and add *SOFTWARE\Idera\SQLdm\Default*
    - Click **OK**
14. Create a Generic Service resource for the SQLdm Predictive Analytics Service
    - Add the **Disk** for the shared data as a dependency
    - Add the **Network Name** as a dependency
    - Specify SQLdmPredictiveAnalyticsService$Default as the name of the service to start
15. After the service is added, right-click it and select **Properties**
    - Select the Parameters tab and check the **Use network name for computer name** box
    - Select the Registry Replication tab and add *SOFTWARE\Idera\SQLdm\Default*
    - Click **OK**
16. Create a Generic Service resource for the SQLdm Rest Service
    - Add the **Disk** for the shared data as a dependency
    - Add the **Network Name** as a dependency
    - Specify SQLdmRestService$Default as the name of the service to start
17. After the service is added, right-click it and select **Properties**
    - Select the Parameters tab and check the **Use network name for computer name** box
    - Select the Registry Replication tab and add *SOFTWARE\Idera\SQLdm\Default*
    - Click **OK**
18. In Windows Services, bring the SQLDM Management service resource online
19. In Windows Services, bring the SQLDM Collection service resource online
20. In Windows Services, bring the SQLDM Predictive Analytics service resource online

21. In Windows Services, bring the SQLDM Rest service resource online



Name	Type	Data
(Default)	REG_SZ	(value not set)
DataPath	REG_SZ	f:\SQLdm Services\

My Computer\HKEY_LOCAL_MACHINE\SOFTWARE\Idera\SQLdm\Default

Complete the Cluster Configuration in SQL Diagnostic Manager

1. Use the Management Service Configuration wizard to force the services to re-register
2. Start the SQLDM Desktop Client and select SQLDM Repository. If the SQLDM Repository is clustered make sure to use the virtual server name for the SQL Server hosting the SQLDM Repository
3. Verify that your configuration displays correctly in the SQLDM Desktop Client

Windows Server 2008 clustered environment

The following instructions guide you through the installation of SQL Diagnostic Manager in a Windows Server 2008 based clustered environment.

Things to consider before you install SQL Diagnostic Manager in a clustered environment

- Create a separate cluster resource group to host SQLDM services. A separate group allows the SQLDM services to fail without causing other resources in the group to failover.
- Before you create this separate cluster resource group, gather a dedicated IP, NetBIOS name, and a dedicated disk for the cluster resource group.
- SQLdm Collection, SQLdm Management, SQLdm Predictive Analytics, and SQLdm Rest services can run as generic services on your newly-created cluster resource group.

Install SQLDM Services on Cluster Nodes

SQL Diagnostic Manager must be installed on each node within the cluster and configure the services as its described in the following page, Install SQL Diagnostic Manager on a node.

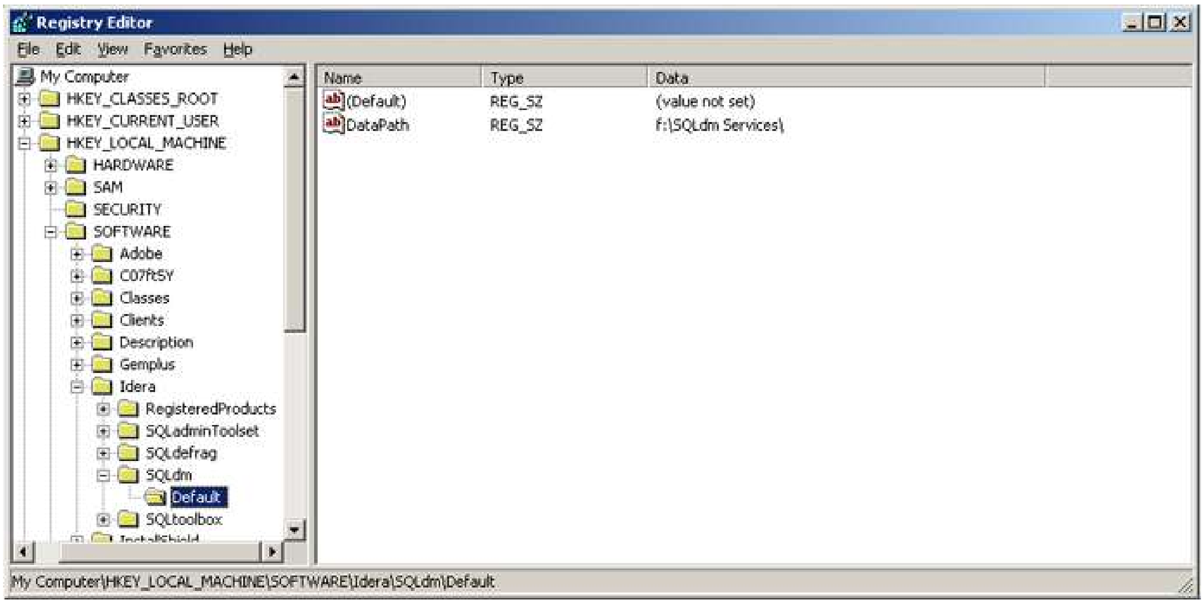
Configure the Cluster Resource Group

Cluster Resource Group settings must be modified to allow SQL Diagnostic Manager to recognize the cluster nodes.

To configure the Cluster Resource Group:

1. Select a disk that is configured in the Cluster Resource Group and create a folder on that disk that you want to use to hold local data for the services
2. On the primary node, edit the registry and add a new key named Default to the key *\SOFTWARE\Idera\SQLdm*. In this key add a string value called ***DataPath***. Set its value to the full path to the data directory created in step 1 (as shown in the image at the end of the steps)
3. In the Failover Cluster Management tool, right-click on **Services and Applications** and select **Configure a Service or Application**
   - Provide a name for the service
   - Select **Generic Service**
   - Select the SQLdm Management Service
   - Enter the network name and IP address for the services
   - Select the clustered storage that hosts the path defined in step 1
   - Skip the Registry Replication
   - Verify the settings and click **Next** to complete the wizard
   - Repeat step 3 for the remaining SQLdm services.
4. In **Services and Applications**, click the newly created service name in the Other Resources section and then on the SQLdm Management service and take it offline
5. Select the SQLdm Management Service from the list of resources
6. Select **Next** and **Finish** to exit the wizard
7. In **Services and Applications**, right-click on the newly created service and then on the **SQLdm Management Service** and select Properties
   - On the General tab, select **Use Network Name for computer name**
   - On the Dependencies tab, add the name of service and disk, and then click **Apply**
   - On the Registry Replication tab, if blank, add *SOFTWARE\Idera\SQLdm\Default\*
8. In **Services and Applications**, right-click the newly created service and select **Add a Resource and Generic Service**
9. Select the SQLdm Collection Service from the list of resources

10. Select **Next** and **Finish** to exit the wizard
11. In **Services and Applications**, right-click on the newly created service and then on the **SQLdm Collection Service** and select **Properties**
    - On the General tab, select **Use Network Name for computer name**
    - On the Dependencies tab, add name of service and disk, and then click **Apply**
    - On the Registry Replication tab, add *SOFTWARE\Idera\SQLdm\Default\*
12. In **Services and Applications**, right-click the newly created service and select **Add a Resource and Generic Service**
13. Select the SQLdm Predictive Analytics service from the list of resources
14. Select **Next** and then **Finish** to exit the wizard
15. In **Services and Applications**, click the newly-created service and then on the **SQLdm Predictive Analytics service** and select **Properties**
    - On the General tab, select **Use Network Name for computer name**
    - On the Dependencies tab, add the name of the service and disk, and then click **Apply**
    - On the Registry Replication tab, if blank, add *SOFTWARE\Idera\SQLdm\Default\*
16. In **Services and Applications**, right-click the newly created service and select **Add a Resource and Generic Service** .
17. Select the SQLdm Rest service from the list of resources
18. Select **Next** and then **Finish** to exit the wizard
19. In **Services and Applications**, click the newly-created service and then on the **SQLdm Rest service** and select **Properties**
    - On the General tab, select **Use Network Name** for computer name
    - On the Dependencies tab, add the name of the service and disk, and then click **Apply**
    - On the Registry Replication tab, if blank, add *SOFTWARE\Idera\SQLdm\Default\*
20. In Windows Services, bring the SQLdm Management service resource online
21. In Windows Services, bring the SQLdm Collection service resource online
22. In Windows Services, bring the SQLdm Predictive Analytics service resource online
23. In Windows Services, bring the SQLdm Rest service resource online
24. On the active node on which you installed the SQLdm services, use the Management Service Configuration wizard (**Start > All Programs > IDERA> SQL Diagnostic Manager > Tools > Management Service Configuration Wizard**) to force the services to re-register
25. Test the configuration from the Management Service Configuration wizard before finishing the wizard



Name	Type	Data
(Default)	REG_SZ	(value not set)
DataPath	REG_SZ	f:\SQLdm Services\

My Computer\HKEY_LOCAL_MACHINE\SOFTWARE\Idera\SQLdm\Default

Complete the Cluster Configuration in SQL Diagnostic Manager

Start the SQLDM Desktop Client and select SQLDM Repository. If the SQLDM Repository is clustered make sure to use the virtual server name for the SQL Server hosting the SQLDM Repository.

Windows Server 2012+ clustered environment

The following instructions guide you through the installation of SQL Diagnostic Manager in a Windows Server 2012 and later based clustered environment.

Things to consider before you install SQL Diagnostic Manager in a clustered environment

- Create a separate cluster resource group to host SQLDM services. A separate group allows the SQLDM services to fail without causing other resources in the group to failover
- To create a cluster resource group you need to gather a dedicated IP, NetBIOS name, and a dedicated disk
- SQLdm Collection, SQLdm Management, SQLdm Rest Service, and Predictive Analytics services can run as generic services on your newly-created cluster resource group

Next, follow the steps described in the links below to complete the installation of SQL Diagnostic Manager on a Windows Server 2012+ clustered environment:

1. Install SQL Diagnostic Manager on a node
2. Register the SQL Diagnostic Manager services as a Clustered Resource
3. Reconfigure the SQL Diagnostic Manager Services and Repository Database
4. Install the IDERA Dashboard and Register the SQL Diagnostic Manager with the IDERA Dashboard

Install SQL Diagnostic Manager on a node

SQL Diagnostic Manager must be installed on each node within the cluster. Perform the following steps on each node:

1. On a node of the cluster, download the SQL Diagnostic Manager installation kit ZIP file
2. Extract and run the executable file. Once, the extraction of the files completes, the IDERA SQL Diagnostic Manager Quick Start window displays
3. Click the **Install SQL Diagnostic Manager** link
4. On the Welcome to the SQL Diagnostic Manager Setup, click **Next**
5. Review the license agreement. To accept this agreement, check the box I accept the terms and conditions of this License Agreement and click **Next**
6. On the Customize your SQLdm setup screen, select both SQLDM Console and SQLDM Services and Repository options, and click **Next**
7. On the Registration with IDERA Dashboard screen, select the **Proceed without registration** option, and click **Next**
8. On the Service Account, enter your credentials that are used by the SQLDM services, and click **Next**
9. Select the destination directory on the Choose a destination folder screen. Click **Next**
10. Click **Install**, to start the installation of SQL Diagnostic Manager on the node
11. When the installation is completed, uncheck the Launch Idera SQL Diagnostic Manager selection, and click **Finish**
12. Open Windows Services
13. Locate and stop the following services:
    a. **SQLdm Collection Service**
    b. **SQLdm Management Service**
    c. **SQLdm Predictive Analytics Service**
    d. **SQLdm Rest Service**
14. Update the properties for all the mentioned services above, to Manual startup type
15. Repeat the steps above for the remaining nodes of the cluster

Once you completed the SQL Diagnostic Manager installation for all the cluster nodes, continue with your the configuration of the Cluster Resource group according to your Windows Server version:

- Windows Server 2003 clustered environment: Configure the Cluster Resource Group
- Windows Server 2008 clustered environment: Configure the Cluster Resource Group
- Windows Server 2012+ clustered environment: Register the SQL Diagnostic Manager Services as a Clustered Resource.

Register SQL Diagnostic Manager services as a Clustered Resource

Registering SQL Diagnostic Manager services with Microsoft Failover Cluster Manager allows the Microsoft Cluster Service to manage the services in failover situations. The following configuration ensures the high availability of the services during a failover.

Below, you can find two sets of instructions to register the SQL Diagnostic Manager services as a clustered resource:

- Creating a new role for SQL Diagnostic Manager services
- Adding the SQL Diagnostic Manager services to an existing role

Creating a new role for SQL Diagnostic Manager services

This set of instructions helps you to configure SQL Diagnostic Manager services in its own cluster using a Cluster Disk or Cluster Network shared folders. This option requires an available disk on the cluster to store the temporary files used by the SQLDM services.

> ⚠ For cluster disks, the available disk on the cluster can be any visible disk to all nodes in the cluster; including a network disk reachable via the UNC path.

1. Launch **Failover Cluster Manager** on a node of the cluster.

   > ⓘ For more information on how to launch the Failover Cluster Manager, check Installing the Failover Cluster Feature and Tools in Windows Server 2012

2. Right-click on **Role** and select **Create Empty Role**.
3. Right-click on **New Role** and select **Properties**.
4. Specify a new name for the role and click **OK**.
5. Right-click on the **Role**, select **Add Resource**, and click **Client Access Point**.
6. When the New Resource Wizard opens, type a unique network name and an IP address, and click **Next**.
7. Click **Next** on the Confirmation screen.
8. Click **Finish** on the Summary screen.
9. Create a SQLdm DataPath:
   a. For a Cluster Disk:
      i. Right-click on the **Role** and select **Add Storage**.
      ii. Select a disk, and click **OK**.
      iii. In File Explorer, create a folder to be used by SQLDM services on the disk that was added.
      Eg. *P:\SQLdmDataPath*
   b. For Cluster Network shared folder:
      i. On your network shared folder create a folder for SQLdm and ensure it has writing access to this ***DataPath***.
      Eg. *\\Server\SharedFolder\SQLdmDataPath*
10. Open Registry Editor and navigate to *HKEY_LOCAL_MACHINE\SOFTWARE\Idera\SQLdm*
11. Right-click the SQLdm key, select **New**, click **Key**, and enter ***Default*** for the name.
12. Right-click the Default key, select **New**, click **String Value**, and enter ***DataPath*** for the name.
13. Double-click on the recently created ***DataPath*** string value and enter the path to the folder that was created for SQLDM services, click **OK**.
14. Go back to Failover Cluster Manager.
15. Right-click on the **role**, select **Add Resource**, and click **Generic Service.**
16. On the Select Service screen, select the **SQLdm Collection Service**, and click **Next.**
17. Click **Next** on the Confirmation screen.
18. Click **Finish** on the Summary screen.

19. Repeat steps 17-20 for the remaining SQLDM services: SQLdm Management Service, SQLdm Predictive Analytics Service, and SQLdm Rest Service.
20. Right-click on one of the added SQLDM services and select **Properties**.
21. Go to the **Dependencies** tab and add the following resources:
    a. Name
    b. IP Address
    c. Disk

    > ⓘ You can skip adding the Disk resource only if a shared folder was used.

22. Click **Apply** and go to the **General** tab.
23. Check the box Use the network name for the computer name, and click **Apply**.
24. Go to the Registry Replication tab, click **Add**, enter *SOFTWARE\Idera\SQLdm\Default,* and click **OK**.

    > There is a bug in Windows 2012 where the Registry Replication tab is not available. If the tab is unavailable, use the Add-ClusterCheckpoint PowerShell cmdlet to add the necessary setting.
    > EXAMPLE: Add-ClusterCheckpoint -ResourceName "SQLdmCollectionService`$Default" -RegistryCheckpoint "SOFTWARE\Idera\SQLdm\Default" -Cluster "SQLdmServices"

25. Click **Apply**, and then click **OK**
26. Repeat steps 17-27 for the remaining SQLDM services: SQLdm Management Service, SQLdm Predictive Analytics Service, and SQLdm Rest Service
27. Right-click on each SQLDM service and select **Bring Online**

Adding the SQL Diagnostic Manager services to an existing role

The following set of instructions helps you to add the SQL Diagnostic Manager services to an existing role:

1. In File Explorer, create a folder to be used by SQLDM services on a disk that has been added as a cluster resource.
2. Open Registry Editor and navigate to *HKEY_LOCAL_MACHINE\SOFTWARE\Idera\SQLdm*
3. Right-click the SQLdm key, select **New**, click **Key**, and enter ***Default*** for the name
4. Right-click the Defaultkey, select **new**, click **String Value**, and enter ***DataPath*** for the name
5. Double-click the string value and enter the path to the folder that was created for SQLDM services, click **OK**
6. Launch **Failover Cluster Manager** on a node of the cluster. For more information on how to launch the Failover Cluster Manager, check Installing the Failover Cluster Feature and Tools in Windows Server 2012
7. Right-click on an existing role, select **Add Resource**, and click **Generic Service**
8. On the Select Service screen, select **SQLdmCollection Service**, and click **Next**
9. Click Next on the Confirmation screen
10. Click Finish on the Summary screen
11. Repeat steps 7-10 for the remaining SQLDM services: SQLdm Management Service, SQLdm Predictive Analytics Service, and SQLdm Rest Service
12. Right-click on one of the added SQLDM services, and select **Properties**
13. Go to the **Dependencies** tab and add the following resources:
    a. Name
    b. IP Address
    c. Disk
14. Click **Apply** and go to the **General** tab
15. Check the box of Use network name for the computer name, and click **Apply**.
16. Go to the Registry Replication tab, click **Add**, enter *SOFTWARE\Idera\SQLdm\Default,* and click **OK**

> There is a bug in Windows 2012 where the Registry Replication tab is not available. If the tab is unavailable, use the Add-ClusterCheckpoint PowerShell cmdlet to add the necessary setting. EXAMPLE: Add-ClusterCheckpoint -ResourceName "SQLdmCollectionService`$Default" -RegistryCheckpoint "SOFTWARE\Idera\SQLdm\Default" -Cluster "SQLdmServices"

17. Click **Apply**, and then click **OK**
18. Repeat steps 12-17 for the remaining SQLDM services: SQLdm Management Service, SQLdm Predictive Analytics Service, and SQLdm Rest Service
19. Right-click on each SQLDM service and select **Bring Online**

When you finish registering the SQL Diagnostic Manager services as Clustered Resources, you need to Reconfigure the SQLDM Services and Repository Database.

Register SQL Diagnostic Manager with the IDERA Dashboard

IDERA Dashboard does not currently support clustered environments. Given this limitation, IDERA Dashboard must be installed on a stand-alone server. The following details how to install and register SQL Diagnostic Manager in the IDERA Dashboard, allowing users to access the product using a web browser:

Install the IDERA Dashboard on a stand-alone server

1. Log onto a stand-alone server using an administrator account
2. Download the SQL Diagnostic Manager installation kit ZIP file
3. Extract and run the executable file. Once the extraction has completed, click the **Install the SQL Diagnostic Manager** link located in the IDERA SQL Diagnostic Manager Quick Start window
4. When the Welcome to the SQL Diagnostic Manager Setup wizard screen displays, click **Next**
5. Review the License Agreement. To accept this license agreement, click **I accept the terms and conditions of this License Agreement**, and then click **Next**
6. On the Customize your SQLdm setup page, only select the IDERA Dashboard option, and click **Next**
7. Enter the credentials that you need to run the IDERA Dashboard services, and click **Next**
8. When the Service Ports screen displays, accept the defaults ports by clicking **Next**
9. Specify the SQL Server instance to host the repository database for the IDERA Dashboard, and click **Next**
10. Click **Install**, to start the installation of the IDERA Dashboard
11. Once the installation is finished, click the **Finish** button
12. Close the IDERA SQL Diagnostic Manager Quick Start window

Register SQL Diagnostic Manager with IDERA Dashboard

1. Log into the IDERA Dashboard using a Dashboard administrator account

   > ✓ The URL used to access the IDERA Dashboard is constructed from the name of the machine on which the IDERA Dashboard was installed and the port specified for the Idera Dashboard Web Application Service.
   > For example, if the IDERA Dashboard was installed on a machine named MYSERVER and the Idera Dashboard Web Application Service used the default port of 9290, then the URL to access the IDERA Dashboard would be the following: *http://MYSERVER:9290*

2. Go to Administration, and select **Manage Products**
3. Click the **Register a Product** link
4. When the Add a Product to IDERA Dashboard window displays, fill out the required fields to register SQL Diagnostic Manager:
   a. Product: SQLDM
   b. Display name: A unique name of your choice
   c. Host: The network name that is configured as a dependency for the SQLDM services (e.g. SQLdmServices)
   d. Port: 5170
   e. Username and Password: Enter the credentials of a Dashboard administrator account.
5. Click **Register**
6. Click **Yes** to confirm the registration of the product
7. Log into the IDERA Dashboard again to confirm the product has been registered

Default alert IDs

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
0	101	Resources	SQL Server CPU Usage (Percent)	Percentage of CPU Time used by the SQL Server instance out of the total on the SQL Server computer.
1	202	Sessions	User Connections (Percent)	Percentage of the user connections allowed by the currently used SQL Server instances.
4	708	Services	Non-distributed Transactions (Count)	Number of replication transactions published by the Publisher but not received by the Distributor.
5	809	Services	Unsubscribed Transactions (Count)	Number of replication transactions received by the Distributor but not received by a Subscriber.
6	910	Queries	Oldest Open Transaction (Minutes)	Time in minutes that the longest running transaction in the database used since issuing the `BEGIN TRANSACTION` statement.
7	1011	Databases	Table Fragmentation (Percent)	Percentage of pages in the table that are fragmented.
8	1112	Databases	Database Full (Percent)	Percentage of the allowable disk space for the database currently used by the sum of data, text, and indexes. Allowable disk space for the database is calculated by taking into account the current allocated space, auto-growth settings, and available disk space.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
9	1213	Databases	Log Full (Percent)	Percentage of the allowable disk space for the database currently used by the transaction log. Allowable disk space for the database is calculated by taking into account the current allocated space, auto-growth settings and available disk space.
10	1314 - Running 1315 - Stopped 1316 - Other	Services	SQL Server Agent Status	Status of the SQL Server Agent service.
11	1417	Databases	Database Read/Write Error Occurred	An I/O error occurred while attempting to read from or write to a database file.
12	1518 - Running 1519 - Stopped 1520 - Paused 1521 - Not Admin 1522 Not Accessible 1523 - Other	Services	SQL Server Status	Status of the SQL Server service.
13	1624	Resources	SQL Server Memory Usage (Percent)	Percentage of memory used by the SQL Server instance out of the total memory on the SQL Server computer.
14	1725	Databases	Database Status	Operational status of the database, such as Normal, Offline, or Suspect.
17	2028	Services	Unsubscribed Transactions (Seconds)	Time in seconds that a replication transaction is holding at the Distributor and waiting for a Subscriber to receive it. This alert is for visual indicators in the Desktop Client only. No notifications are sent.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
18	2129 - Running 2130 - Stopped 2131 - Other	Services	DTC Status	Status of the Distributed Transaction Coordinator service.
19	2232 - Running 2233 - Other	Services	Full-Text Search Status	Status of the Full-Text Search service.
20	N/A	Databases	Index Row hits (Percent)	Percentage of density of an index as used by the SQL Query Optimizer to determine index effectiveness. A high density indicates many duplicates and an inefficient index while a low density indicates high selectivity and an effective index. This alert is for visual indicators in the Desktop Client only. No notifications are sent.
21	N/A	Services	Last Full-Text Catalog Update (Hours)	Time (in hours) since the last Full-Text Catalog update was performed and beyond which the statistics data is considered outdated. This alert is for visual indicators in the Desktop Client only. No notifications are sent.
22	2534	Sessions	SQL Server Response Time (Milliseconds)	Time (in milliseconds) SQL diagnostic manager currently needs to send a simple SQL command to the SQL Server instance, have it processed, and receive the returned result set.
23	4010 - Available 4011 - Other 4012 - Disabled 4013 - Unavailable	Operational	OS Metrics Collection Status	Status of SQL diagnostic manager OS Metrics Collection.
24	4020	Resources	OS Used Memory (Percent)	Percentage of total memory used on the SQL Server computer.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
25	4030	Resources	OS Paging (Per Second)	Page fault rate for all processes on the SQL Server computer.
26	4040	Resources	OS Processor Time (Percent)	Percentage of CPU time used by all processes on the SQL Server computer.
27	4050	Resources	OS Privileged Time (Percent)	Percentage of CPU time spent by all processes executing in privileged mode on the SQL Server computer.
28	4060	Resources	OS User Time (Percent)	Percentage of CPU time spent by all processes executing in user mode on the SQL Server computer.
29	4070	Resources	OS Processor Queue Length (Count)	Number of ready threads in the processor queue on the SQL Server Computer.
30	4080	Resources	OS Disk Time (Percent)	Percentage of elapsed time that all the disks were busy servicing read and write requests on the SQL Server computer.
31	4090	Resources	OS Average Disk Queue Length (Count)	Average number of both read and write requests queued for all the disks on the SQL Server computer.
32	2737	Sessions	Session CPU Time (Seconds)	CPU Time in seconds used by the SQL Server session since the last scheduled refresh.
33	2838	Sessions	Session CPU Time (Seconds)	Time in seconds that the SQL Server session is blocking other sessions.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
34	2940	Services	SQL Server Agent Long Running Job	Percentage of time a scheduled SQL Server Agent job is taking over the average successful completion time for this job in the current job history.
35	3039	Services	SQL Server Agent Job Failure	The scheduled SQL Server Agent job ended with a Failed status.
48	4001 - Enabled 4002 - Disabled	Operational	Maintenance Mode Enabled	Maintenance Mode is enabled for the SQL Server instance. SQL diagnostic manager does not collect scheduled data or process alerts.
49	4200	Operational	CLR Enabled	The Common Language Runtime (CLR) configuration option is enabled for the SQL Server instance. You can run managed code in the .NET Framework.
50	4210	Operational	OLE Automation Disabled	The OLE Automation Procedures configuration option is disabled (2005) or the procedures were dropped (2000) for the SQL Server instance. SQL diagnostic manager does not use OLE automation to collect data such as OS metrics and service details.
51	4220	Queries	Query Monitor Events (Count)	The number of queries captured by the Query Monitor on the SQL Server instance during the last scheduled refresh.
52	4230	Operational	SQL diagnostic manager Collection Service Status	Status of the SQL diagnostic manager Collection Service.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
53	4240	Operational	SQL Server Agent XPs Disabled	The Agent XPs configuration option is disabled (2005) or the procedures were dropped (2000) for the SQL Server instance. SQL diagnostic manager does not collect SQL Agent job details.
54	4250	Operational	WMI Service Unavailable	The WMI service is unavailable on the SQL Server computer. SQL diagnostic manager does not collect OS metrics.
57	4310	Sessions	Client Computers (Count)	Number of unique client computers connected to the SQL Server instance.
58	4320	Sessions	Blocked Sessions (Count)	Number of sessions on the SQL Server instance blocked by other sessions holding requested locks.
59	4330	Operational	SQL Server Data Used (Percent)	Percentage of allocated data space used across all data files on the SQL Server instance.
60	4340	Operational	SQL Server Log Used (Percent)	Percentage of allocated log space used across all log files on the SQL Server instance.
62	4110	Resources	OS Disk Time Per Disk (Percent)	Percentage of elapsed time that an individual disk was busy servicing read and write requests on the SQL Server computer. This event alerts separately for each disk on a server.
63	4120	Resources	OS Average Disk Queue Length Per Disk (Count)	Average number of both read and write requests queued for an individual disk on the SQL Server computer. This event alerts separately for each disk on a server.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
64	4100	Resources	OS Disk Full (Percent)	Percentage of space used on a logical disk on the SQL Server computer. This event alerts separately for each disk on a server.
65	2940	Services	SQL Server Agent Long Running Job (Minutes)	Maximum number of minutes a scheduled SQL Server Agent job should take to complete.
66	4400	Logs	SQL Server Error Log	The number of error log events requiring attention based on either message severity or specified text.
67	4410	Logs	SQL Server Agent Log	The number of agent log events requiring attention based on either message severity or specified text. When configuring this alert, use the indicator or grid to specify which log message severity corresponds to warning or critical. Use the advanced options to specify additional filters.
68	5105	Databases	Mirroring Unsent Log (KB)	Size of the unsent log in the send queue on the principal in kilobytes.
69	5106	Databases	Mirroring Unrestored Log (KB)	Size of the redo queue on the mirror in kilobytes.
70	5107	Databases	Mirroring Oldest Unsent Transaction (Minutes)	The age of the oldest unsent transaction in minutes on the principal. This is only meaningful on the principal server instance.
71	5108	Databases	Mirror Commit Overhead (Milliseconds)	Average delay (in milliseconds) on the principal server instance for each transaction because of database mirroring.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
72	5109	Databases	Mirroring Status	Status of the mirrored database such as synchronized suspended or disconnected.
73	5110	Databases	Mirroring Preferred Configuration	This operational configuration of this mirroring session changed.
74	5111	Databases	Mirrored Server Role Change	A mirrored database role changed.
75	5112	Databases	Mirroring Witness Connection	The mirroring witness is not connected.
76	4130	Resources	Page Life Expectancy	The number of seconds a page stays in the buffer pool without references.
77	4500	Services	Cluster Failover	A cluster failover has occurred.
78	4510	Services	Cluster Active Node	The active node of the cluster is a non-preferred node. The preferred node may be configured under Server Properties>Cluster Settings.
79	5120	Services	Distribution Latency (Seconds)	Time in seconds that a replication transaction has been holding at the Publisher and waiting to be received by a Distributor.
80	2840	Sessions	Deadlock	A deadlock occurred on the monitored server. Note that the Activity Monitor >Capture deadlocks (SQL 2005+) check box must be enabled for this alert to function.
81	4140	Resources	Procedure Cache Hit Ratio	The percentage of procedure cache hits to cache lookups.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
82	4150	Resources	Average Disk Milliseconds Per Read	Average time in milliseconds of a read operation of data from the disk. This is a per-disk metric.
83	4160	Resources	Average Disk Milliseconds Per Transfer	Average time in milliseconds of a disk transfer operation. This is a per-disk metric.
84	4170	Resources	Average Disk Milliseconds Per Write	Average time in milliseconds of a write operation of data to the disk. This is a per-disk metric.
85	4180	Resources	Disk Reads Per Second	Rate of read operations on the disk. This is a per-disk metric.
86	4185	Resources	Disk Transfers Per Second	Rate of transfer operations on the disk. This is a per-disk metric.
87	4190	Resources	Disk Writes Per Second	Rate of write operations on the disk. This is a per-disk metric.
88	3140	Services	SQL Server Agent Job Completion	The SQL Server Agent job/step has completed.
89	5130	Databases	Version Store Generation Ratio	Amount in percent by which the tempdb version store generation rate exceeds the cleanup rate.This alert is only raised on instances running SQL Server 2005 or above.
90	5131	Databases	Version Store Size (MB)	Size in megabytes of the tempdb version. This alert is only raised on instances running SQL Server 2005 or above.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
91	5135	Databases	Longest Running Version Store Transaction (Minutes)	Time in minutes that the longest version store transaction has been opened and preventing version store cleanup. This alert may only be raised on instances running SQL Server 2005 or above.
92	5136	Databases	Session Tempdb Space Usage (MB)	Amount of tempdb space being used by a running session. This alert is only raised on instances running SQL Server 2005 or above.
93	5132	Databases	Tempdb Contention (ms)	Current wait time for tempdb allocation maps (GAM SGAM and PFS) in milliseconds. This alert is only raised on instances running SQL Server 2005 or above.
94	1115	Databases	Log File Autogrow	Log file autogrow occurred on the specified database. Enable the "Activity Monitor>Capture Autogrow check box for this alert to function.
95	1116	Databases	Data File Autogrow	Data file autogrow occurred on the specified database. Enable the Activity Monitor>Capture Autogrow check box for this alert to function.
96	5200	Virtualization	VM Resource Configuration Change	A resource configuration change occurred for the virtual machine hosting the monitored SQL Server instance. This alert is enabled by default and is only relevant to instances hosted on VMWare vCenter virtual machines enabled for VM monitoring in the SQLdm VM Configuration window.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
97	5201	Virtualization	VM Host Server Change	The virtual machine hosting the monitored SQL Server instance moved to a different host. This alert is disabled by default and is only relevant to instances hosted on VMWare vCenter which have been enabled for VM monitoring in the SQLdm VM Configuration window.
98	5202	Virtualization	VM CPU Usage (Percent)	The percentage of available virtual CPU time used by the virtual machine hosting the monitored SQL Server. This may differ from the processor utilization percentage reported by the guest OS. A high percentage may indicate a large number of active client sessions.This alert is disabled by default and is only relevant to instances hosted on virtual machines enabled for VM monitoring in the SQLdm VM Configuration window.
99	5250	Virtualization	Host CPU Usage (Percent)	The percentage of available CPU time used by the host server hosting the virtual machine on which the monitored SQL Server is currently running. This alert is enabled by default and is only relevant to instances hosted on virtual machines enabled for VM monitoring in the SQLdm VM Configuration window.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
100	5203	Virtualization	VM Memory Usage (Percent)	The percentage of available memory used by the virtual machine hosting the monitored SQL Server. This may differ from the memory usage percentage reported by the guest OS. This alert is disabled by default and is only relevant to instances hosted on virtual machines enabled for VM monitoring in the SQLdm VM Configuration window.
101	5251	Virtualization	Host Memory Usage (Percent)	The percentage of available memory used by the host server hosting the virtual machine on which the monitored SQL Server is currently running. This alert is enabled by default and is only relevant to instances hosted on virtual machines enabled for VM monitoring in the SQLdm VM Configuration window.
102	5204	Virtualization	VM CPU Ready Wait Time	The time in milliseconds that a virtual CPU has been waiting for a physical CPU to become available for processing for the virtual machine on which the monitored SQL Server is currently running. A spike in this value may indicate CPU pressure on the host server. This alert is enabled by default and is only relevant to instances hosted on VMWare vCenter virtual machines enabled for VM monitoring in the SQLdm VM Configuration window.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
103	5205	Virtualization	VM Reclaimed/ Ballooned Memory (KB)	The amount of memory that has been reclaimed by host and is no longer available to the virtual machine on which the monitored SQL Server instance is running. A spike in this value may be a sign of memory pressure on the host. This alert is enabled by default and is only relevant to instances hosted on VMWare vCenter virtual machines enabled for VM monitoring in the SQLdm VM Configuration window.
104	5206	Virtualization	VM Memory Swap Delay Detected	Memory being swapped to disk is causing a performance delay on the virtual machine on which the monitored SQL Server instance is running. This is triggered if the Memory Swap In Rate (KB/s) or CPU Swap Rate (ms) counters are non-zero. This alert is enabled by default and is only relevant to instances hosted on VMWare vCenter virtual machines enabled for VM monitoring in the SQLdm VM Configuration window.
105	5252	Virtualization	Host Memory Swap Detected	Memory is being swapped to disk for the host server hosting the virtual machine on which the monitored SQL Server is currently running. This may be an indication of memory pressure on the host. This alert is disabled by default and is only relevant to instances hosted on VMWare vCenter which have been enabled for VM monitoring in the SQLdm VM Configuration window.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
106	5207	Virtualization	VM Resource Limits Detected	Either CPU or memory resource limits are set for the virtual machine hosting the monitored SQL Server instance. Resource limits are soft limits set by the VM Administrator on the total amount of resources that a VM is allowed to consume. This alert is disabled by default and is only relevant to instances hosted on VMWare vCenter virtual machines enabled for VM monitoring in the SQLdm VM Configuration window.
107	5208	Virtualization	VM Power State	This is the state of the VM as reported by the vCenter or Hyper-V host servers. This alert is enabled by default and is only relevant to instances hosted on virtual machines enabled for VM monitoring in the SQLdm VM Configuration window.
108	5253	Virtualization	Host Power State	This is the state of the host as reported by the vCenter or Hyper-V host servers. This alert is enabled by default and is only relevant to instances hosted on virtual machines enabled for VM monitoring in the SQLdm VM Configuration window.
109	1113	Databases	Database Full (Size)	The amount of disk space (in MB) currently used by the database as the sum of data text and indexes. This value is the actual amount of used data within the database file not the size of the database file itself.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
110	1214	Databases	Log Full (Size)	The amount of disk space (in MB) currently used by the transaction log for this database. This value is the actual amount of data within the log not the size of the database log file itself.
111	4101	Resources	OS Disk Free Space (Size)	Amount of space (in MB) available on a logical disk on the SQL Server computer.
116	5301	Databases	Availability Group Role Change	Primary role changed to a secondary replica. Alert includes affected database(s) for the entire availability group.
117	5302	Databases	Availability Group Estimated Data Loss (Seconds)	The time period in seconds that data is not synchronized to the secondary replica. Value reflects the time difference of the last commit between the primary and secondary replicas. Alert includes affected database(s).
118	5303	Databases	Availability Group Synchronization Health	Reflects database synchronization state in the availability group. Possible values include: not healthy partially healthy and healthy.
119	5304	Databases	Availability Group Estimated Recovery Time (Seconds)	The required time in seconds that the secondary replica needs to catch up with the primary replica. Alert includes affected database(s).
120	5305	Databases	Availability Group Synchronization Performance (Seconds)	The time required in seconds to complete synchronization between the primary and secondary replicas.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
121	5306	Databases	Availability Group Log Send Queue Size (KB)	Amount of log records in KB needed to ship to the secondary replica to complete synchronization. Alert includes affected database(s).
122	5307	Databases	Availability Group Redo Queue Size (KB)	Amount of log records from log files in KB that need redoing in the secondary replica to complete synchronization. Alert includes affected database(s).
123	5308	Databases	Availability Group Redo Rate (KB/s)	Rate in KB per second at which log records are redone in the secondary database to complete synchronization. Alert includes affected database(s).
124	5320	Databases	Availability Group Preferred Replica	Alert is raised when the database is no longer on the preferred replica.
125	5324	Operational	SQLdm Repository Grooming Timed Out	Grooming timed out on your SQL Server Repository. SQL diagnostic manager no longer deletes stored metrics in the SQLdm Repository at the set schedule. To review your grooming settings access Tools > Grooming Options.
126	5328	Databases	Filegroup Space Full (Percent)	TBD
127	5330	Databases	Filegroup Space Full (Size)	TBD
128	5332	Services	SQL Server Browser Service Status	Status of the SQL Server Browser service.
129	5342	Services	SQL Server Active Directory Helper Service Status	Status of the SQL Server Active Directory Helper service.

Repository ID	Windows Event ID	Category	Metric Name	Metric Description
130	1115	Backup	Days since last backup	Days since the database has not been backed up.

Troubleshoot WMI connectivity issues

In order to use WMI, the user account under which the Collection Service runs must have administrator permissions on the remote server. The most frequently encountered problems with WMI relate to RPC traffic failing to get through to the remote computer. Another issue involves DCOM/WMI permissions.

The following link provide additional information about how to troubleshoot WMI connectivity issues:

- Securing a remote WMI connection

Using WbemTest (Windows Management Instrumentation Tester)

You can use the WbemTest tool to connect to a server and issue WMI queries. Download this tool from Microsoft TechNet to help you test and troubleshoot WMI issues.

To use WbemTest:

1. Run `wbemtest.exe`.
2. Click **Connect**.
3. In the **NameSpace text** box, enter **\\server\root\cimv2** where the server is the name of the server to which you want to connect.
4. Provide Username and Password.
5. Click **Connect**.
6. Click **Query**.
7. Enter **select** * from win32_process.
8. Click **Apply**.

If WbemTest connects to the remote server and issues the query using WMI, you should see a query result with output. In this case, WMI to the required server is working and no further action is needed. For more information on the Windows Management Instrumentation Tester, refer to the Microsoft document,Windows Management Instrumentation Tester overview.

If you receive an error message, use the following processes to help identify and resolve the issue.

Error: The RPC Server Is Unavailable

This error usually indicates that the RPC traffic is not getting to the remote server, or there is no RPC listener on the remote server.

To troubleshoot this RPC error:

1. Make sure that the Remote Procedure Call (RPC) service is running on the remote server.
2. Verify that there is a TCP listener on the remote server by running the netstat -nao command and verifying that there is the following entry: `TCP 0.0.0.0:135 0.0.0.0:0 LISTENING 1304`
3. In the Tools subdirectory, run `rpcping /s <servername> /t ncacn_ip_tcp` where `<servername>` is the name of the remote server. This command verifies that RPC can communicate with the remote server and output similar to:
   `Completed 1 calls in 15 ms`
   `66 T/S or 15.000 ms/T`
4. Make sure that local or internal network firewalls do not block traffic by either disabling the firewall or configuring the Windows firewall to allow incoming RPC traffic.

5. Try to use the remote server IP address instead of the server name. If the IP address works, you may have a DNS issue.
6. If the remote server resides in a different domain, the two domains may not trust each other, or the user account does not have administrator permissions on the remote server/domain.
7. If both computers are in the same domain, and the user account has administrator permissions, try rejoining both computers to the domain.

Error: Access Denied

This error can indicate permission issues.

To troubleshoot this access error:

1. If the remote computer is running Windows XP, make sure it is not set to Force Guest. This setting forces impersonation of any connection as Guest.
   a. Open the Local Security Policy console from Administrative Tools.
   b. Browse to **Security Settings > Local Policies > Security Options** .
   c. Double-click Network Access: Sharing And Security Model For LocalAccounts.
   d. Change the settings from `Guest Only` to Classic.
2. Make sure DCOM is enabled on the remote server:
   a. Run `DcomCnfg` on the remote server.
   b. Click **Component Services**.
   c. Expand **Computers**.
   d. Right click **My Computer** and select **Properties**.
   e. Click the **Default Properties** tab.
   f. Make sure **Enable Distributed COM** on this computer is checked.
3. Verify the configuration of the correct DCOM remote launch and activation permissions:
   a. Run `DcomCnfg` on the remote server.
   b. Click **Component Services**.
   c. Expand **Computers**.
   d. Right click **My Computer** and select **Properties**.
   e. Click the **Com Security** tab.
   f. Under **Launch and Activation Permissions**, click **Edit Limits**.
   g. In the Launch Permissions dialog box, make sure your user account or group is listed in the Groups or user names list. If your user account or group is not listed, click **Add** and add it to the list.
   h. In the Launch Permission dialog box, select your user account or group in the Group or user names list. In the Allow column under Permissions for User, select **Remote Launch** and **Remote Activation**, and then click **OK**.
4. Make sure the correct DCOM remote access permissions are configured:
   a. Run `DcomCnfg` on the remote server.
   b. Click **Component Services**.
   c. Expand **Computers**.
   d. Right click **My Computer** and select **Properties**.
   e. Click the **Com Security** tab.
   f. Under **Access Permissions** , click **Edit Limits**.
   g. In the Access Permission dialog box, select `ANONYMOUS LOGON` name in the Group or user names list. In the Allow column under Permissions for User, select **Remote Access**, and then click **OK**.
5. Make sure the correct WMI namespace permissions are configured.
   a. On the target machine, run `wmimgmt.msc` .
   b. Right-click **WMI Control**, and then select **Properties**.

c. In the Security tab, select the CIMV2 namespace, and then click **Security**.
d. Locate the appropriate account, and then check **Remote Enable** in the Permissions list.

Integrate SQL Diagnostic Manager with SCOM

The IDERA SQLDM Management Pack (SQLDM MP) integrates and extends the Microsoft System Center Operations Manager (SCOM) monitoring capabilities by providing database administrators and IT operators with additional insight into the availability and performance of their SQL Server interfaces, all from one console.

SQLDM MP includes automatic discovery of SQLDM installations and of the SQL Server instances managed from those installations. Once discovered, SQLDM MP propagates the current status, health, and events of monitored instances up to SCOM.

SQLDM uses Alert Actions and Responses to control which alerts are escalated to SCOM and whether they go into SCOM as an Event or an Alert. For additional information, go to SCOM Event Action or SCOM Alert Action.

For additional information about SQLDM Management Pack, click Product Documentation, select the SQL Diagnostic Manager version you need, and click View. A dialog box opens with documentation options for SQL Diagnostic Manager plug-ins, click System Center Management Pack option, and download the SQLDM MP file.

⚠ Note that the IDERA SQLDM Management Pack for integration with SCOM is designed for System Center Operations Manager 2007 R2 and above.

Understanding the SQLDM Management Pack health model

The SQLDM Management Pack reports the health of each SQL Server instance monitored by SQL Diagnostic Manager, as well as the server health of SQL Diagnostic Manager itself. The following main characteristics help define the SQL Diagnostic Manager health model:

SQLDM Server

The health of SQL Diagnostic Manager is tracked by monitoring the state of three underlying services, using the following three service monitors:

- Collection Service Monitor
- Management Service Monitor
- Predictive Service Monitor

The automatically discovered Object ID for the SQLDM Service is Idera.SQLDM.Service.

SQLDM Instance

The health of each SQL server instance being monitored by SQL Diagnostic Manager is rolled up by reflecting the Alerts counts opened for that instance within SQL Diagnostic Manager.

If a SQL server instance currently has one or more Critical alerts open, then the Health of that instance is recorded as Critical. If one or more Warning alerts are open, but no Critical alerts show, then the health of the instance is recorded as Warning.

In Health Explorer the Diagnostic Manager Alert status which drove a specific Health state change is recorded and displayed in the State Change Events tab.

The automatically discovered Object ID for a SQL Instance is Idera.SQLDM.SqlInstance.

Install and configure the SQLDM Management Pack for SCOM

Before importing the SQLDM Management Pack for SCOM, you must import the relevant Microsoft Windows management packs for your current operating system. For example, if SQL Diagnostic Manager is installed on Windows Server 2008 R2, then you must install the management pack for that OS before continuing.

You can find the SQLDM MP (Idera.SQLDM.mp) in the root of the installation kit.

Configuring your installation to support SCOM

The SQLDM Management Pack requires that the SCOM agent has at least read access to the SQLDM Repository. Grant this access before installing the SQLDM MP and enabling discovery of any SQL Diagnostic Manager installed instances.

SQLDM MP also requires that a SCOM agent (version 2007 or above) be installed locally on each server where an instance of SQL Diagnostic Manager is present. If an agent is not already installed, then use the Discovery Wizard in the SCOM Console to push the agent installation.

Importing the SQLDM Management Pack for SCOM

The SQLDM Management Pack import process loads into the SCOM database the SQLDM MP settings, classes, and rules necessary for monitoring SQL Diagnostic Manager. The import replicates the relevant rules and objects to all systems where SQL Diagnostic Manager is installed.

The following steps help you import the SQLDM Management Pack when it is downloaded to a hard drive local to the SCOM Console. For more information about other methods of importing the Management Pack, see How to Import a Management Pack in Operations Manager 2007.

To import the SQLDM Management Pack:

1. Open the Operations Console for Operations Manager, and then click the Administration button.
2. In the Actions pane or from Actions → Actions menu option, click Import Management Packs.
3. Click **Add**, and then click **Add from disk**.
4. In the Online Catalog Connection dialog, click **No**. **If you did not preload the required OS Management Packs and you have a current Internet connection**, click **Yes**.
5. Browse for and then select the IDERA SQL Diagnostic Manager Management Pack.
6. Click **Install**. Discovery of SQL Diagnostic Manager servers and monitored SQL Server instances begins automatically as the Management Pack is deployed to the relevant agents across the network.

View SQL Diagnostic Manager details in SCOM

With the SQLDM Management Pack, all the key monitors employed by SQL DBAs are now fully visible to System Center Operations Manager operators, synchronizing IT operations and DBA functions and identifying situations that could impact SQL Server availability and performance.

The following table lists the SQL Diagnostic Manager views available within SCOM:

View Name	Description
SQL DM Server Health	This Health view lists all discovered SQL Diagnostic Manager servers in the environment. The health state of each instance is displayed, together with information about the specific SQL Server instance.
SQL Instance Alerts	Displays a list of current Alerts generated when a specific SQL Server instance monitored by SQL Diagnostic Manager has entered an unhealthy state.
SQL Instance Events	This view offers a list of all Alert transitions recorded by SQL Diagnostic Manager for each SQL Server instance which is being monitored. This view provides a complete history of the status of all monitored SQL Server instances.
SQL Instance Health	The Health view displays the current health state of each SQL Server instance monitored by a SQL Diagnostic Manager server.
Dashboard	This view combines the SQL DM Server Health, SQL Instance Health and the SQL Server instance events views into a single pane.

To access the SQL Diagnostic Manager views available in SCOM:

1. In the Monitoring pane of the System Center Operations Manager Console, locate the IDERA SQLDM folder.
2. Expand the tree view by clicking + sign next to **SQLDM**.