

SQL WORKLOAD ANALYSIS 1.6.X

I D E R A

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SQL Workload Analysis

IDERA SQL Workload Analysis provides a granular breakdown of SQL Server wait states with easy drill-down to isolate problems quickly. It delivers valuable real-time and historical data to help tune queries as well as actionable recommendations to improve performance.

The SQL Workload Analysis dashboard displays trending database activity and top utilizing SQL statements, logins, machines, and programs. This makes it easy for DBAs, developers, and system admins to identify problems and develop remedies across a number of situations. With it they can:

- Know immediately where databases are spending time.
- Quickly isolate slow SQL statements and drill down for actionable advice in as little as 1 click.
- Perform real-time analysis with continuous SQL sampling intervals as fast as 1 sec.
- Investigate historical query plan trends in SQL Server 2005 and newer systems.
- Utilize automatic recommendations to improve query performance.



Release Notes

IDERA SQL Workload Analysis provides a granular breakdown of SQL Server wait states with easy drill-down to isolate problems quickly. It delivers valuable real-time and historical data to help tune queries as well as actionable recommendations to improve performance. The SQL Workload Analysis dashboard displays trending database activity and top utilizing SQL statements, logins, machines, and programs. This makes it easy for DBAs, developers, and system admins to identify problems and develop remedies across a number of situations.

To get a quick glimpse into the features, fixed issues, and known issues in this release of SQL Workload Analysis, review the following sections of the Release Notes:

- [Key new features in this release.](#)
- [Fixed issues in this release.](#)
- [Known issues in this release.](#)

New Features

SQL Workload Analysis includes the following new features:

1.6.2 New Features

- SQL Workload Analysis 1.6.2 includes a new licensing library, which only affects products with expiring licenses.

Fixed Issues

1.6.2 Fixed Issues

- SQL Workload Analysis is no longer displaying errors when viewing execution plans.
- SQL Workload Analysis is no longer having issues when installed with non-default Dashboard locations



Previous features and fixed issues

1.6.1 New Features

- SQL Workload Analysis allows you to configure the storage location for the SQLWA database and the message queue files.
- New widget "Top SQL Stored Procedure" with drill-down capability.
- Launch SQL Diagnostic Manager in context to specific time-range from SQL Workload Analysis.

1.6.1 Fixed Issues

- SQL Workload Analysis is collecting information normally for its respective analysis.
- The “Login Failed. The login is from an untrusted domain and cannot be used with Windows authentication” message is no longer displaying when registering instances in SQL Workload Analysis.
- The error "Reason: ERROR: 22001: value too long for type character varying(40)) is no longer displaying when entering credentials during installation.

1.5 New features

- Integration with the IDERA Dashboard
- Unified installer for both products: IDERA Dashboard & SQL Workload Analysis
- Drill-down capability for top programs, top machines, and top logins
- Add new instances using existing list of registered instances in the IDERA Dashboard

1.5 Fixed Issues

- SWA no longer requires a server reboot, when from time to time, stops collecting data.



Known Issues

Known Issues for 1.6.1

Installation

Compatibility

SQL Workload Analysis is not supported in Windows Vista 32-bit machine.

Uninstallation

Exception shown when uninstalling

After uninstalling SQL Workload Analysis, the product is still shown under the managed products and an exception is seen when clicking SQLWA link after it was uninstalled.

Previous known issues

Known Issues for 1.5

IDERA Dashboard

Unsuccessful migration of SQL Workload Analysis

After installation, the IDERA Dashboard is unable to successfully migrate SQL Workload Analysis to a different (remote) installation of the IDERA Dashboard. The suggested workaround is to perform a new installation in the target server.



Monitored Instances

Error adjusting the column width of the Monitored Instances list

The handlers that are used to adjust the width of the columns can go off-screen after performing an adjustment. The suggested workaround is to refresh (F5) the web browser to reset the columns width to their default settings.

License Management

Error updating license key information after the trial license expires

SQL Workload Analysis is unable to register a new license key after the trial license has expired. The suggested workaround is to register new license key information before the trial period expires.



Welcome to SQL Workload Analysis

This wiki helps you understand IDERA SQL Workload Analysis characteristics and features.

Need help using SQL Workload Analysis? See the following topics:

- [SQL Workload Analysis FAQ](#)
- [Monitoring EMC storage using SQL Workload Analysis](#)

What is SQL Workload Analysis?

IDERA SQL Workload Analysis monitors SQL Server instances remotely (agent-less), from a dedicated framework machine. SWA has a web-based interface (IDERA Dashboard), which you can access from a web browser. [Click here](#) to learn more about the IDERA Dashboard.

How does SQL Workload Analysis help me?

SQL Workload Analysis enables DBAs to identify, isolate, and resolve tough performance issues with specific SQL transactions or workloads in just a few mouse clicks.

About IDERA

IDERA is a leading provider of application and server management solutions. We have a wide variety of performance management products for Microsoft SQL Server, and award-winning server backup solutions for both managed service providers and enterprise customers. IDERA products install in minutes and start solving server problems immediately, giving administrators more time, reduced overhead and expenses, and increased server performance and reliability. We are a Microsoft Gold Certified partner, headquartered in Houston, Texas, with offices in Asia Pacific, Australia, New Zealand, Europe, Africa, and Latin America. So we're everywhere your IT needs are.

IDERA products

Our tools are engineered to scale from managing a single server to enterprise deployments with thousands of servers. IDERA products combine ease of use with a design that installs in minutes, configures in hours, and deploys worldwide in days. To learn more about IDERA products, visit the IDERA Web site at www.idera.com.



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For a complete list of our partners, please visit our [IDERA website](#).

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Sales Email	sales@idera.com
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Website	www.idera.com

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 the IDERA Solutions Knowledge Base, available at the [IDERA Customer Support Portal](#).



Using Help

The IDERA wiki includes a comprehensive online Help system as well as additional resources that support you as you install and use IDERA products. You can also search multiple IDERA support solutions, available at [Customer Support Portal](#).

Additionally, IDERA helps you by providing:

- 24/7 technical support for critical issues.
- Availability to report cases and access a web-based customer portal for update status.
- Access to our [Knowledge Center](#) where you can find FAQs, How To's, Best Practices, and Webcasts.

This wiki includes the following Web browser minimum requirements:

- Internet Explorer 9.0
- Mozilla Firefox 4
- Google Chrome 6

You can access the IDERA Help system through the **Help** icon on the top right section of your window or by pressing F1 on the section where you need more information.

You can print a help topic from the wiki using the Print function in your browser.



Get Started

IDERA SQL Workload Analysis provides a granular breakdown of SQL Server wait states with easy drill-down to isolate problems quickly. It delivers valuable real-time and historical data to help tune queries as well as actionable recommendations to improve performance.

Use the following checklist to get started using SQL Workload Analysis.

✓	Follow these steps ...
	Run the Setup.exe file from the root folder of the installation kit to install the IDERA Dashboard and SQL Workload Analysis
	Log in the IDERA Dashboard.
	Add instances for monitoring.
	If you want to grant other users access to the IDERA Dashboard or SQL Workload Analysis, manage users in the Administration view.
	Get a complete overview of your environment in the SQL Workload Analysis dashboard.

Installation and deployment

You can install and deploy SQL Workload Analysis in any environment size. SQL Workload Analysis integrates seamlessly with the [IDERA Dashboard](#), a common technology framework designed to support multiple IDERA products.

- Learn about the [product components and architecture](#).
- Review the [hardware](#), [software](#), and [permissions](#) requirements.
- View [installation instructions](#) for the IDERA Dashboard and SQL Workload Analysis.

IDERA Dashboard product components and architecture

The IDERA Dashboard provides web and back end services, shared across multiple IDERA products. To learn more about what the IDERA Dashboard is and how it works, see [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 IDERA Dashboard and SQL Workload Analysis views and widgets that are displayed in the web console. The Web Application Service requires two ports:

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

Core Service

The Core Service is a C# (.NET 4.0 Framework) based Windows service that hosts dashboard and SQL Workload Analysis 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.

SQL Workload Analysis product components and architecture

SQL Workload Analysis consist of a light, unobtrusive architecture that easily runs in your SQL Server environment with minimal configuration. All components run outside and separate from SQL Server processes.

SQL Workload recommended server sizing guidelines

The following guidelines provide an estimation of the hardware resources required to deploy SQL Workload Analysis depending on the number of servers you want to monitor.



The requirements detailed in this page, also applied when setting up a VM for SQL Workload Analysis.



Installs under 15 monitored instances

Type	Requirement
CPU Cores	2 - 4
Memory	4 - 10 GB
Disk Space	Approximately 3 - 5 GB per monitored instance

Installs 15-45 monitored instances

Type	Requirement
CPU Cores	4 - 8
Memory	10 - 32 GB
Disk Space	Approximately 3 - 5 GB per monitored instance

Software requirements

IDERA Dashboard services requirements

You need to comply with the following requirements to install the IDERA Dashboard services:

Microsoft. NET Framework version	4.0 or later	<p>Make sure to install this software prior to the installation of the IDERA Dashboard.</p> <p>For more information about the .NET Framework, see the MSDN article .NET Framework Versions and Dependencies.</p>
----------------------------------	--------------	--



Operating System (32-bit and 64-bit)	<ul style="list-style-type: none"> • Windows Vista SP2+ • Windows 7 • Windows Server 2008 R2 • Windows 8 • Windows Server 2012 • Windows Server 2012 R2 • Windows 10 	
Other requirements	MDAC 2.8	

IDERA Dashboard repository requirements

The IDERA Dashboard supports any of the following versions for hosting its repositories:

SQL Server Express, Standard, or Enterprise Edition	<ul style="list-style-type: none"> • SQL Server 2005 • SQL Server 2008 • SQL Server 2008 R2 • SQL Server 2012 • SQL Server 2014 • SQL Server 2016
---	---

Monitored SQL Workload Analysis instances requirements

All SQL Server instances that you want to monitor should comply with the following requirements:

SQL Server Express, Standard or Enterprise Edition	<ul style="list-style-type: none"> • SQL Server 2005 • SQL Server 2008 • SQL Server 2008 R2 • SQL Server 2012 • SQL Server 2014 • SQL Server 2016
--	---



Web browser requirements

The IDERA Dashboard and SQL Workload Analysis' web consoles are compatible with the following browsers:

- Internet Explorer IE 9.x+
- Microsoft Edge
- Google Chrome
- Mozilla Firefox

Port requirements

- Web Application Service: **9290** (Standard HTTP port) and **9291** (SSL port)
- Core Service: **9292** (REST API port) and **9293** (.NET remoting port)
- Idera Framework: **20700** (Tomcat GUI port) and **20705** (ActiveMQ port)
- Idera PMDB: **20701** (PostgreSQL port)

Required accounts and permissions

SQL Workload Analysis uses the same types of authentication available in the SQL Server security model. When specifying account credentials for SQL Workload Analysis, 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 Workload Analysis 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 Workload Analysis. 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](#).

Installation instructions

This procedure guides you through a typical install of SQL Workload Analysis integrated with the IDERA Dashboard.

- The SQL Workload Analysis installation kit provides users with a unified installer for both products: IDERA Dashboard and SQLWA.



- IDERA recommends running the unified installer. See [Install the IDERA Dashboard and SQL Workload Analysis](#) for detailed instructions.

i Installation prerequisites

- The user must have a local administrator account.
- Microsoft .NET Framework 4.0 or later must be installed prior to beginning installation.

Install the IDERA Dashboard & SQL Workload Analysis

This procedure guides you through the installation of the IDERA Dashboard and SQL Workload Analysis.

Start your IDERA SQL Workload Analysis installation

You can install the IDERA Dashboard and SQL Workload Analysis on any computer that meets or exceeds the product requirements.

To start installing the IDERA Dashboard and SQL Workload Analysis:

1. Log on with an administrator account to the computer on which you want to install SQL Workload Analysis.
2. Run Setup.exe in the root of the installation kit.
3. Click **Next** on the **Welcome** window of the setup program.
4. Review the license agreement. To accept this license agreement, click **I accept the terms and conditions of this License Agreement**, and then click **Next**.

Select Products to install

By default both products (IDERA Dashboard & SQL Workload Analysis) are selected to be installed. You can choose to install only the IDERA Dashboard or only SQL Workload Analysis.

Select a registration option to install your IDERA Dashboard

You can select to install or upgrade your IDERA Dashboard on your local machine or on a remote server. If you have previously installed the IDERA Dashboard, provide the URL and the administrator credentials. Then 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 install, we recommend using the default location for SQL WA and the IDERA Dashboard.

On the Display Name text box, type a unique name for your SQLWA instance. The display name helps you to distinguish different instances of the same product. Click **Next** to continue with the installation.

Select a Windows user account to use for the service account

SQL Workload Analysis uses the service account to communicate with the monitored SQL Server. The IDERA Dashboard uses this account to connect, discover, and gather configuration information from SQL Servers in your environment. The installer grants the "Log on as a Service" right to the account that you specify. You can also choose to use different Windows credentials for each of the products.

To specify a service account:

1. On the Service Account window, type appropriate credentials in the provided fields under which the services run.
2. Click **Next**. SQL Workload Analysis verifies the connection before continuing.

Select service ports to use for the IDERA Dashboard

The IDERA Dashboard uses ports **9094**, **9290**, **9291**, and **9292** for the web application and dashboard 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 dashboard services to use.
2. Verify that the Firewall allows TCP (Transmission Control Protocol) traffic through your specified ports.
3. Click **Next**.

Select a SQL Server instance to use for the IDERA Dashboard Repository database


The IDERA Dashboard Repository database is where the collected data, alert information, and alert configuration settings are stored.

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

1. On the Repository Database screen, specify the host SQL Server instance you want to use for the IDERA Dashboard Repository database.
2. Type the name for the IDERA Dashboard 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, the IDERA Dashboard 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.

4. Click **Next**.

IDERA SQLWA Database and Message Queue configuration

To change the storage paths for the Database File and the Message Queue, first uncheck the Default Location and enter the new storage paths.

Complete the install

The setup will grant the provided accounts access to SQL Workload Analysis and the IDERA Dashboard. The user that installs the IDERA Dashboard has access to this application by default as a Dashboard Administrator. You can choose whether you want other users to have access to the IDERA Dashboard 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**.
2. Click **Finish** to exit the IDERA Dashboard Setup Wizard.

To access the IDERA Dashboard and the SQL Workload Analysis web console, see [Log in the IDERA Dashboard and web console](#).

Uninstalling the IDERA Dashboard

If you wish to uninstall the IDERA Dashboard, make sure to unregister all products by clicking the **Manage Products** link of the Products widget in the Administration view. For additional information, see [Managing products in the IDERA Dashboard](#).

Log in to the IDERA Dashboard

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

1. Open your selected Browser. 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 **http://<localhost>:9290** or **http://<machinename>:9290**.
3. When the IDERA Dashboard web console launches on your browser, use your Windows user account **<domain\user>** with the respective password to log in to the product.


A screenshot of the IDERA login interface. At the top is the IDERA logo. Below it are two text input fields: the first is labeled 'Domain\Username Credentials' and the second is labeled 'Password'. Below these fields is a brown 'Log in' button. At the bottom of the form area, there is a link that says 'Log on using Windows Credentials'.



The SQL Workload Analysis Dashboard

The left column displays a list of the monitored instances, allowing you to identify their status using specific icons for each possible status. Below is a description of each status:

	Instance is active and there is data collected in the last 2 minutes
	Instance is inactive or unreachable
	Instance has been removed
	Unknown. No data collected in the last 2 minutes
	Stopped

You can launch the SQL Diagnostic Manager Web console for instances that are also registered in SQL Diagnostic Manager by clicking the icon .



All the information displayed in the SWA Home tab is measured in seconds.

You can select a time frame from the available options located in the top right corner of the screen.



The following time frames are available for SQL Workload Analysis to retrieve information:

- 15 minutes
- 1 hour
- 4 hours
- 1 day
- 5 days
- 4 weeks

 Click the  icon for help. This icon opens the SQL Workload Analysis wiki.

SQL Workload Analysis Dashboard

The SQL Workload Analysis Dashboard lists the top monitored instances. When you select one of the monitored instances, SQL WA displays the following information:

- [Total in DB Highlights](#)
- [Total in DB Trending](#)
- [Top Databases](#)



- [Page Faults/sec](#)
- [Top SQL Stored Procedures](#)
- [Top SQL Statements](#)
- [Top Logins](#)
- [Top Machines](#)
- [Top Programs](#)

Total in DB Highlights

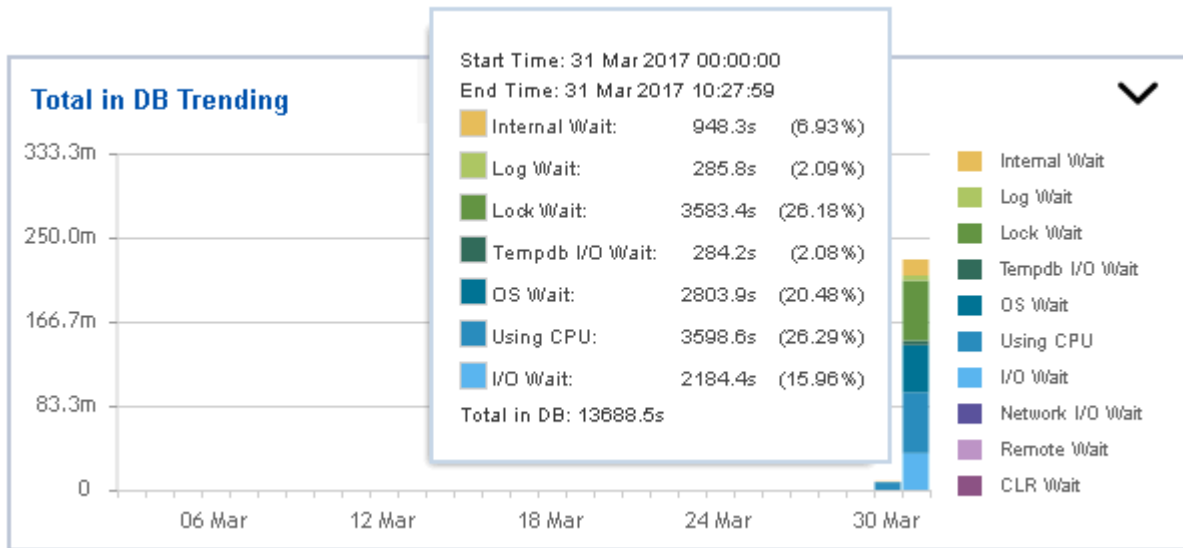
The Total in DB Highlights chart shows a general overview of the following metrics:

- **Internal Wait** - Analyze statements experiencing internal waits.
- **I/O Wait** - Analyze disks and storage devices experiencing high I/O waits.
- **Lock Wait** - Analyze current and historical locks.
- **Using CPU** - Analyze statements with high CPU consumption.
- **OS Wait** - Analyze statements experiencing OS waits.
- **Tempdb I/O Wait** - Analyze statements experiencing I/O waits on tempdb.
- **Network I/O Wait** - Analyze statements experiencing network waits.
- **Log Wait** - Analyze statements experiencing log waits.
- **Remote Wait** - Analyze statements experiencing waits for remote instances.

Total in DB Trending

The Total in DB Trending graph displays information measured in seconds about Internal Wait, Log Wait, Lock Wait, Tempdb I/O Wait, OS Wait, Using CPU, I/O Wait, Network I/O Wait, Remote Wait, and CLR Wait. All Waits are color-coded and they are related to the Total in DB Highlights graph.

You can drill down into different time intervals, click and drag the rectangle over the graph.



Top Databases

The Top Databases lists the databases that have been more frequently used or accessed. The list includes numeric and graphic information about the time spent executing queries and updates on each of the databases in the list.

When you click one of the listed databases, SQL Workload Analysis redirects you to the Database page.

On the left side of the Database screen, you find the list of Databases registered in the monitored server followed by the Total in DB value. This list helps you to have a faster access to other databases.

Top Tables

The Top Table chart, lists the table names followed by the Wait Time, the number of Operations, the used Space, and the Database name to where they belong.

Click a table name to obtain detailed information and to drill down into the table page.



Page Faults/sec

SQL Workload Analysis displays the number of page faults per second as seen by the SQL Server process; as well as, the server machine instance corresponding to the specific monitored instance.

The Page Faults/sec graph shows a contrast between the SQL Server Page Faults/sec and the Server page Faults/sec, drill-down the graph for a detailed view of a specific time or a specific range of time.

Top SQL Stored Procedures or Batches

The Top SQL Stored Procedures table lists all the SQL Stored procedures, their Total in DB data, the number of Executions, and the Database name.

Click one of the listed SQL Stored Procedures or Batches to drill down to the Statement page filtered by the selected procedure or batch.

Top SQL Statements

Displays a list of the most frequently executed SQL statements, including queries, and updates that have been performed on a specific monitored instance and/or a specific database.

When you drill down into any of the Statements, SQL Workload Analysis redirects you to the statement page where you can find more detailed query information, these details help you to identify the heaviest operators per query and the percentage of the execution time of these operators.

The Top SQL Statements page displays the performance summary; which includes the Procedure/Batch information, any [Findings and Next Steps](#), the SQL Statement full text, the trends of the waits, the Top Accesses Objects, and the Top Machines.



Finding and next steps

The Findings and Next steps box describes each finding or action detected in the selected SQL Statement; such as the heaviest operators. It displays the severity under the Rank columns, and shows the Operator and Object name.

Findings and Next Steps ▼

Rank	Finding or Action
!	<p>Warnings Detected</p> <p>Warnings were detected in the SQL statement execution plan.</p> <p style="text-align: right;">▶ Examine Warnings</p>
!	<p>Heavy Operator Detected</p> <p>The operator is responsible for 19.8% of the actual SQL statement execution time.</p> <p>Operator: Clustered Index Seek Object: sysobjvalues.clst</p> <p style="text-align: right;">▶ Examine Operator</p>
!	<p>Heavy Operator Detected</p> <p>The operator is responsible for 19.8% of the actual SQL statement execution time.</p> <p>Operator: Clustered Index Seek Object: sysclsobjs.clst</p> <p style="text-align: right;">▶ Examine Operator</p>

[▶ View Execution Plan](#)

You can perform the following actions in the Findings and Next Steps box:

- Click **Examine** button to obtain detailed information on the selected Finding or Action.
- Click the **View Execution Plan** option to review the Execution Plan. In this option you can find a detailed information about specific components and the efficiency related to the findings. Also, it displays the SQL Statement Full Text.



Top Logins

Provides a list of logins executed in the monitored instances. This information identifies where the user was accessing the system from and other SQL statements. The list also defines the type of user, the total workload in the DB (measured in seconds), and the number of executions.

Click any of the listed Logins to obtain more information on the selected Login. SQL Workload Analysis redirects you to the Login page where it shows the top waits and their trends, the top databases, the top SQL statements, the top machines, and the top programs. On the left side of the screen, you find the list of Logins to help you a faster access to any other Login that you need.

Top Machines

Displays a list of machine instances that frequently connect to a specific monitored instance and/or a specific database. When you click any of the listed machines, SQL Workload Analysis redirects you to the Machines page.

Top Programs

Provides a list of client application programs that most frequently connect to a specific monitored instance and/or a specific database.

The Top Programs box shows the list of Programs and the Total in DB.

When you click any of the listed programs, SQL Workload Analysis redirects you to the Top Program page.

For a selected program, SQL Workload Analysis shows the top wait, the top databases, the top SQL Statements, the top logins, and the top machines.



Administering SQL Workload Analysis

The Administration tab of SQL Workload Analysis allows you to add new instances for monitoring, manage the registered instances, and manage the license information.

Register Instances for monitoring

In order to monitor an instance with SQL Workload Analysis, you need to register it with SQL Workload Analysis. This section helps you register one or more instances with SQL Workload Analysis.

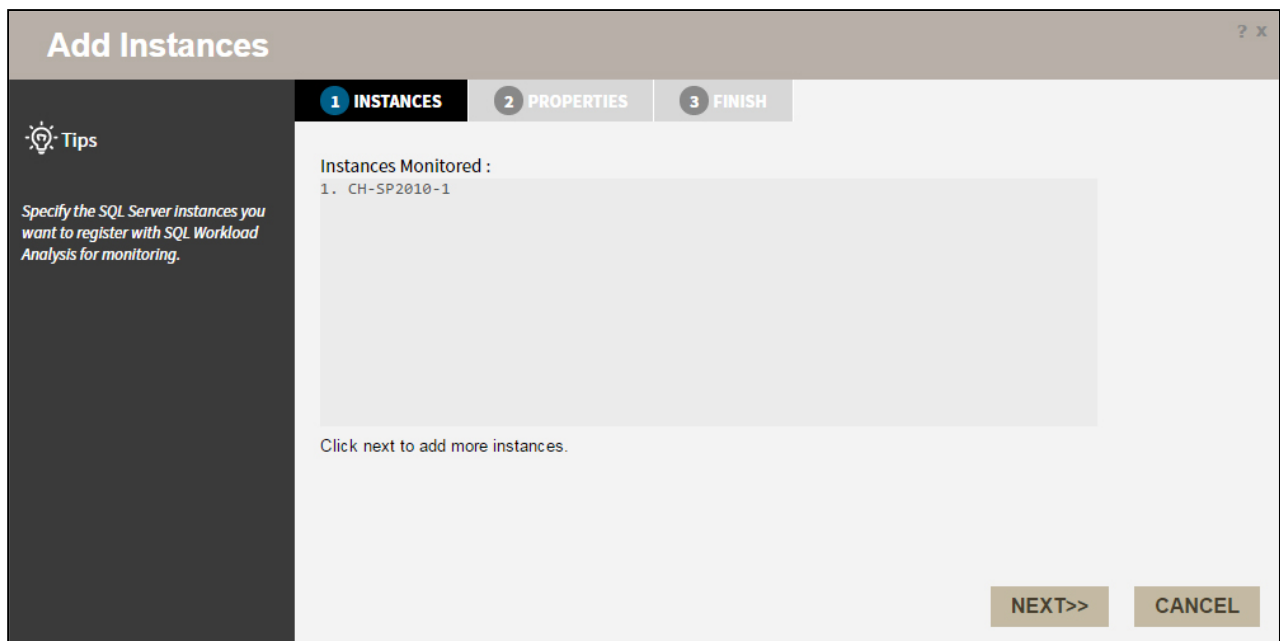
Access the Add Instance Wizard

You can access the **Add Instance** wizard from the **Add SQL Server Instance** option in the Administration tab.

To add an Instance follow these steps:

1. Instances

The **Instances** tab displays a list of the instances currently monitored by SQL Workload Analysis.





Click **NEXT** to add a new instance for monitoring.

2. Specify the Instance name and the connection credentials

Enter the **Instance name** or choose an instance from the list of instances already registered in the IDERA Dashboard. Choose if you want to use **SQL Server Authentication** or **Windows Authentication** from the **Account Type** list.

If you choose SQL Server Authentication, select **Enable OS Statistics Collection** to retrieve OS Statistics information, type the user name and password. If you choose to use **Windows Authentication**, type the respective user name, password, and domain name.

The screenshot shows a dialog box titled "Add Instances" with three tabs: 1 INSTANCES, 2 PROPERTIES (selected), and 3 FINISH. On the left, there is a "Tips" section with a lightbulb icon and the text: "Specify the SQL Server instances you want to register with SQL Workload Analysis for monitoring. Separate multiple instances with a semicolon." The main area is titled "SQL Connection Credentials" and contains the instruction "Specify the account to be used to gather instance information". Below this are several input fields: "Instance Name" (a dropdown menu showing "CH-SP2010-1"), "Account Type" (a dropdown menu showing "Windows Authentication"), "Windows User Name", "Windows Password", and "Domain Name or Server Name". At the bottom right, there are three buttons: "<<PREV", "NEXT>>", and "CANCEL".

✓ For more information on the minimum required permissions, see [Required accounts and permissions](#).

3. Finish

On this section, you can review your Instance Registration Details such as: Instance Name, Account Type, and User Name.



Add Instances

1 INSTANCES 2 PROPERTIES 3 FINISH

Tips
Specify the SQL Server Instances you want to register with SQL Workload Analysis for monitoring. Separate multiple Instances with a semicolon.

Instance Name: CH-SP2010
Account Type : Windows Authentication
OS User Name : Administrator
SQL User Name :

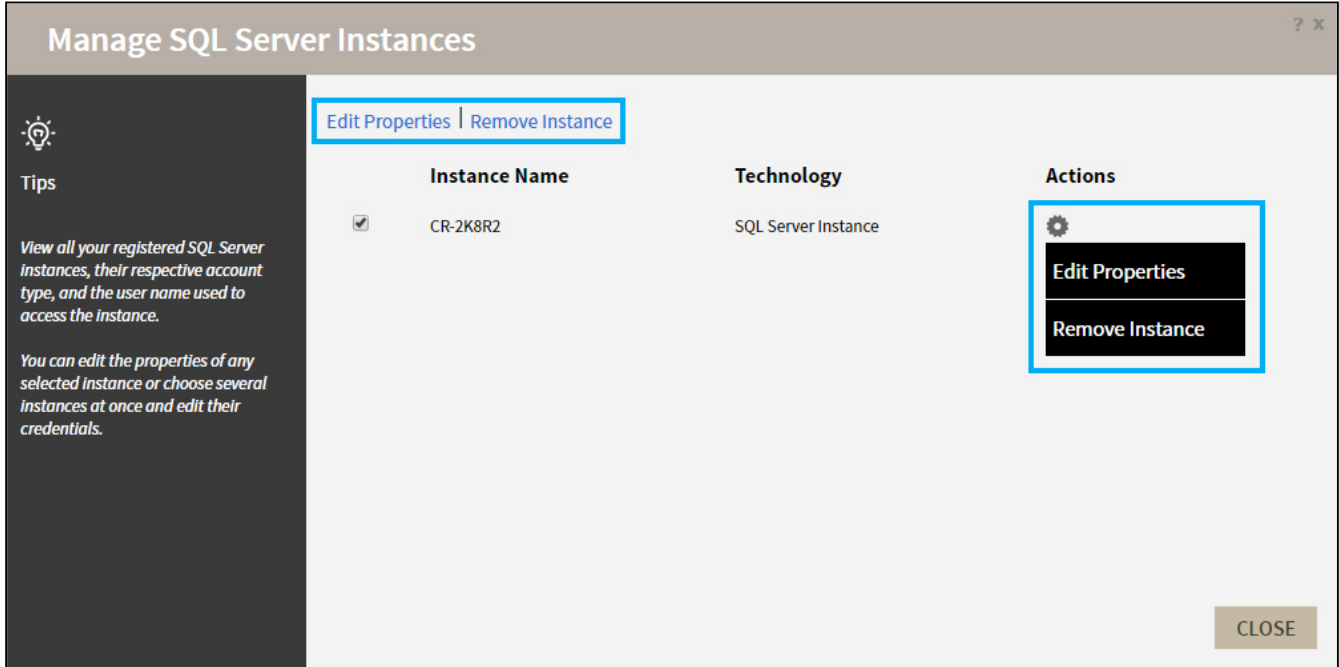
<<PREV FINISH CANCEL

To change registration details you can click **PREV** to go back to previous screens until you find the one you need to modify.

After you review your registration details click **FINISH**.

Manage registered Instances

You can manage the instances registered and monitored by SQL Workload Analysis from the **Manage SQL Server Instances** option in the **Administration** tab.




The options available are:

Edit Properties

Allows you to modify the account credentials of a registered instance.

Remove Instance

Allows you to remove an instance from the list of instances monitored by SQL Workload Analysis.

To perform an action, select the instance and click the action you want to perform from the options above the list. You can also click the  icon to select the action.

Manage License

You can view and modify the License information by clicking the **Manage License** option in the **Administration** tab.



Manage License ? x

Current License

Type:	Trial License
Status:	OK
Expiration Date:	2017-02-23 07:38:55.0
Total Licensed Servers:	1
Monitored Servers:	1
Key:	No key applied

New License

[Click here to buy more SQL Workload Analysis licenses](#)

APPLY

CLOSE

Modify the License key by typing a New License Key or go to the IDERA online store to purchase a new License.

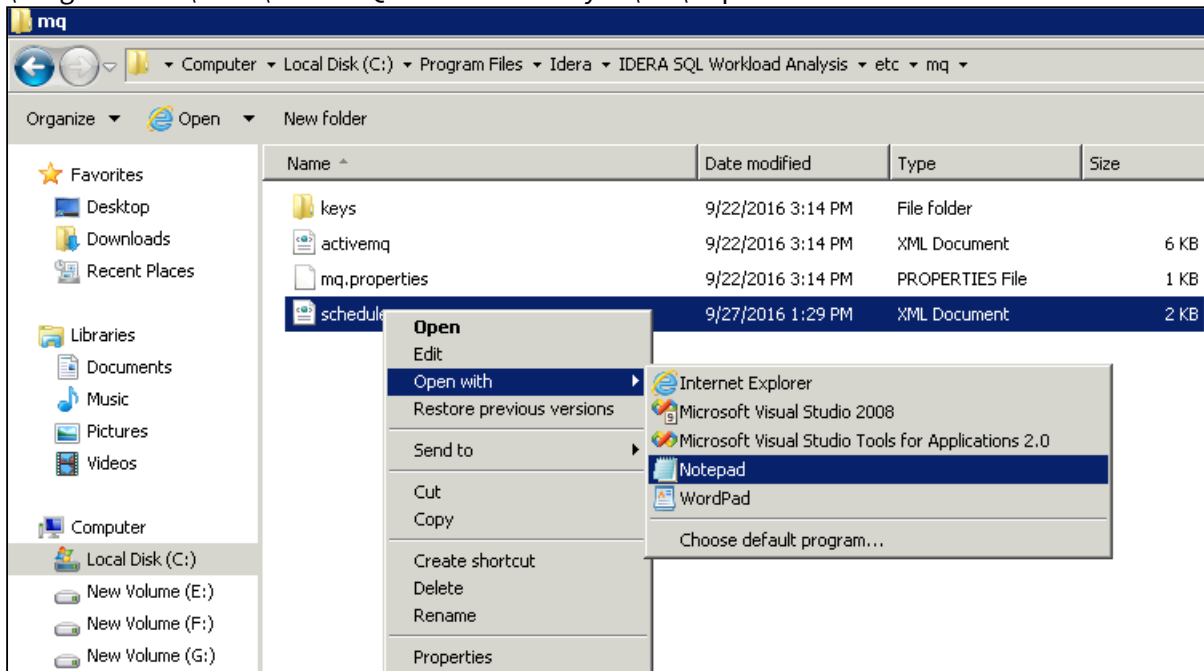
Set your SQL Workload Analysis grooming schedule

Grooming is the process of deleting metrics stored in the repository that are older than a given date and time. This process is important because it optimizes the performance of processes such as data collection.

In SQL Workload Analysis you can set your grooming schedule by following these steps:



1. Open the **schedule** file in a text editor such as Notepad, this file is located in the following path: C:\Program Files\Idera\IDERA SQL Workload Analysis\etc\mq



2. Search for the line that specifies the purge schedule in a standard cron format and edit the time value in a 24-hour format. For example, if you want to set your grooming for 8:00 PM of the 14th day of the month, the cron should be set at: **0 20 14 * *** in a standard cron format. Check the images below.



Default grooming time

By default, the grooming schedule time is set at 10:00 AM on the 1st day of the month.



```

schedule - Notepad
File Edit Format View Help
<beans xmlns="http://www.springframework.org/schema/beans"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:task="http://www.springframework.org/schema/task"
  xsi:schemaLocation="http://www.springframework.org/schema/beans
http://www.springframework.org/schema/beans/spring-beans.xsd
http://www.springframework.org/schema/task
http://www.springframework.org/schema/task/spring-task-3.0.xsd">
  <task:scheduler id="taskscheduler" pool-size="10" />

  <task:scheduled-tasks scheduler="taskscheduler">
    <task:scheduled ref="summaryDbTask" method="run"
      cron="0 3 * * * ?" />
  </task:scheduled-tasks>
  <bean id="summaryDbTask" class="com.precise.standard.infra.db.jobs.scheduledTask">
    <property name="type" value="summary"/>
  </bean>

  <task:scheduled-tasks scheduler="taskscheduler">
    <task:scheduled ref="purgeDbTask" method="run"
      cron="0 10 1 * * ?" />
  </task:scheduled-tasks>
  <bean id="purgeDbTask" class="com.precise.standard.infra.db.jobs.scheduledTask">
    <property name="type" value="purge"/>
  </bean>

  <task:scheduled-tasks scheduler="taskscheduler">
    <task:scheduled ref="clusterDbTask" method="run"
      cron="0 10 5 * * ?" />
  </task:scheduled-tasks>
  <bean id="clusterDbTask" class="com.precise.standard.infra.db.jobs.scheduledTask">
    <property name="type" value="cluster"/>
  </bean>
</beans>

```

```

schedule - Notepad
File Edit Format View Help
<beans xmlns="http://www.springframework.org/schema/beans"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:task="http://www.springframework.org/schema/task"
  xsi:schemaLocation="http://www.springframework.org/schema/beans
http://www.springframework.org/schema/beans/spring-beans.xsd
http://www.springframework.org/schema/task
http://www.springframework.org/schema/task/spring-task-3.0.xsd">
  <task:scheduler id="taskscheduler" pool-size="10" />

  <task:scheduled-tasks scheduler="taskscheduler">
    <task:scheduled ref="summaryDbTask" method="run"
      cron="0 3 * * * ?" />
  </task:scheduled-tasks>
  <bean id="summaryDbTask" class="com.precise.standard.infra.db.jobs.scheduledTask">
    <property name="type" value="summary"/>
  </bean>

  <task:scheduled-tasks scheduler="taskscheduler">
    <task:scheduled ref="purgeDbTask" method="run"
      cron="0 20 14 * * ?" />
  </task:scheduled-tasks>
  <bean id="purgeDbTask" class="com.precise.standard.infra.db.jobs.scheduledTask">
    <property name="type" value="purge"/>
  </bean>

  <task:scheduled-tasks scheduler="taskscheduler">
    <task:scheduled ref="clusterDbTask" method="run"
      cron="0 10 5 * * ?" />
  </task:scheduled-tasks>
  <bean id="clusterDbTask" class="com.precise.standard.infra.db.jobs.scheduledTask">
    <property name="type" value="cluster"/>
  </bean>
</beans>

```

- Restart the SQL Workload Analysis services (IDERA Collector Service and IDERA Framework service).

Storage

This option helps you to change the storage location of SQL Workload Analysis database and message queue files for proper distribution. To change the location, follow these instructions below:



1. Click **Relocate Database/ Message Queue Files**.

Relocate Database/Message Queue Files

Data File Storage: C:\Program Files\Idera\IDERA SQL Wo **BROWSE**

Message Queue Storage: C:\Program Files\Idera\IDERA SQL Wo **BROWSE**

CANCEL **SAVE**

2. Click **BROWSE**, to select a new location for the Data File Storage.
3. Click **BROWSE**, to select a new location for the Message Queue Storage.
4. Once you finish editing the new locations, click **SAVE**. If you do not want to save the changes, click **CANCEL**.

After saving your changes, a Warning message shows up asking if you want to proceed or cancel.

Warning

Moving the files could take a significant amount of time and impacts data collection. Do you wish to proceed?

CANCEL **YES**

5. Once SQLWA finished to move the files to the new locations, a message shows up confirming the results of the operation. Click **OK**.



Result

Files have been moved successfully. Please restart your collector service(s) and Framework service.

OK



Customize SQL Workload Analysis layout

SQL Workload Analysis allows users to customize the widgets that are shown in the main SQL Workload Analysis Dashboard.

You can customize the layout by moving (drag and drop) each panel. Modify the view of you dashboard by relevance in the most convenient location.

i You can customize all the views that you find in SQL Workload Analysis.

The screenshot displays the SQL Workload Analysis dashboard for instance CR-2K8R2. The interface includes a navigation bar with 'HOME' and 'ADMINISTRATION' tabs, and a user profile for 'simpsons\administrator'. The main content area is divided into several sections:

- Monitored Instances:** A table showing the instance 'CR-2K8R2' with a total in DB of 11.0s.
- Total in DB Highlights:** A table listing wait types: Log Wait (6.0s), Internal Wait (3.0s), and I/O Wait (2.0s).
- Total in DB Trending:** A bar chart showing performance trends from Sunday 23:00 to Thursday 11:00.
- Top Databases:** A table showing 'msdb' (7.0s) and 'IDERADashboardRepository' (4.0s).
- Top SQL Stored Procedures or Batches:** A table listing SQL statements such as 'Text (N/A), Command (EXECUTE)', 'sp_safagent_log_jobhistory', and 'UPDATE [msdb].[dbo].[sysjobschedule...]'.

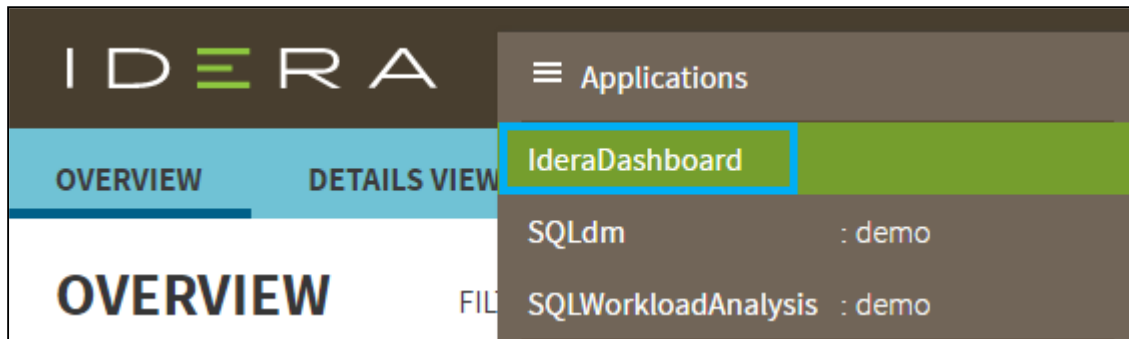


The IDERA Dashboard

What is 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 in a consolidated view while providing users the means to drill into individual product dashboards for details.

To access the IDERA Dashboard, select **IDERA Dashboard** from the drop-down menu, next to the IDERA logo.






The IDERA Dashboard is comprised of the following tabs:

- Overview
- Details view
- Alerts view
- Administration




What actions can be performed in the Overview tab of the IDERA Dashboard?

In the IDERA Dashboard users can glance at their registered products overall status through the **Overview** tab. This tab contains product widgets of all the products registered with the IDERA Dashboard. By default, the **Overview** tab displays the **Overall Status** widget.

From the **Overall Status** widget, you can perform the following actions:

- Click  to access the **Alerts** tab of SQL Workload Analysis.
- Click  to access the SQL Workload Analysis and its **Side by Side Server Performance** window.
- Click  to access the SQL Workload Analysis Dashboard.






✔ Click  to expand or collapse a widget. You can also view a widget in full size by clicking  or remove it by clicking .

✔ **Customize the Overview tab**

You can customize this view in the **Customize DBA Dashboard** option of the **Administration** tab. [Click here](#) to learn more.

What actions can be performed in the Details view of the IDERA Dashboard?

In the IDERA Dashboard users can select specific metrics to display in the **Details** view tab. This tab contains product widgets of all the products registered with the IDERA Dashboard.

✔ Click  to expand or collapse a widget. You can also view a widget in full size by clicking  or remove it by clicking .

✔ **Customize the Details view tab**

You can customize this view in the **Customize DBA Dashboard** option of the **Administration** tab. [Click here](#) to learn more.

What actions can be performed in the Alerts view of the IDERA Dashboard?

In the IDERA Dashboard users can access information on all registered products current alerts and filter them based on:

- Product
- Category
- Severity
- Metric
- Tag



What actions can be performed in the Administration view of the IDERA Dashboard?

In the IDERA Dashboard, all products show a common **Administration** tab, granted the logged-in user has administrator privileges. Selecting this tab, displays the Administration view which hosts a range of sections for performing administration-related actions.

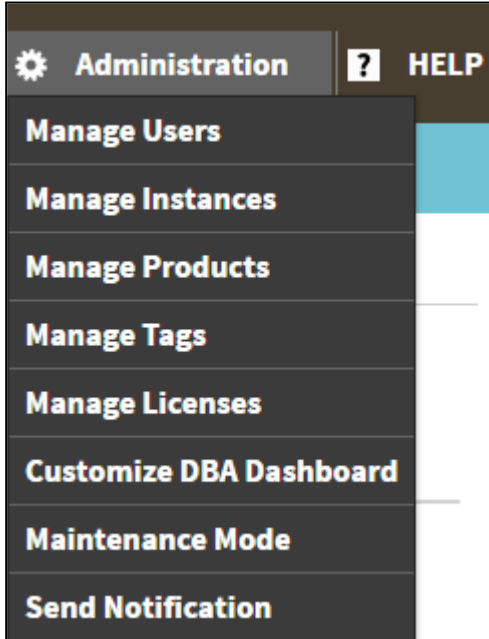
OVERVIEW	DETAILS VIEW	ALERTS	ADMINISTRATION
ADMINISTRATION			
Users Give users permission to use the Idera Dashboard. Create, edit and delete users with the Manage Users action. Manage Users		Configure Navigation Order Customize the order of the products on the navigation tab. Customize Main Navigation Tab Order	
Instances The Idera Dashboard tracks SQL Server instances discovered and managed by Idera products. Use Manage Instances to view and manage this list. Manage Instances		Configure Dashboard Views Customize the objects that display on the Dashboard Views. Customize DBA Dashboard	
Products The Idera Dashboard hosts products that register with the dashboard. Typically this is handled at the time the product is installed or uninstalled. The Manage Products option lets you view and manage the list of registered products. Manage Products		Send Notification to All Users Add a warning message to notify all users about product upgrades. Send Notification	
Tags Tags can help you organize your managed instances and databases. Tags created and updated in Idera Dashboard can be made available and used in other Idera SQL products. Create, import, view, edit and delete tags and their associated instances and databases using the Manage Tags action. Manage Tags		Licensing View license statuses for your Idera SQL products using the Manage Licenses action. Manage Licenses	

The **Administration** view of the IDERA Dashboard provides a central set of services related to specific actions such as:

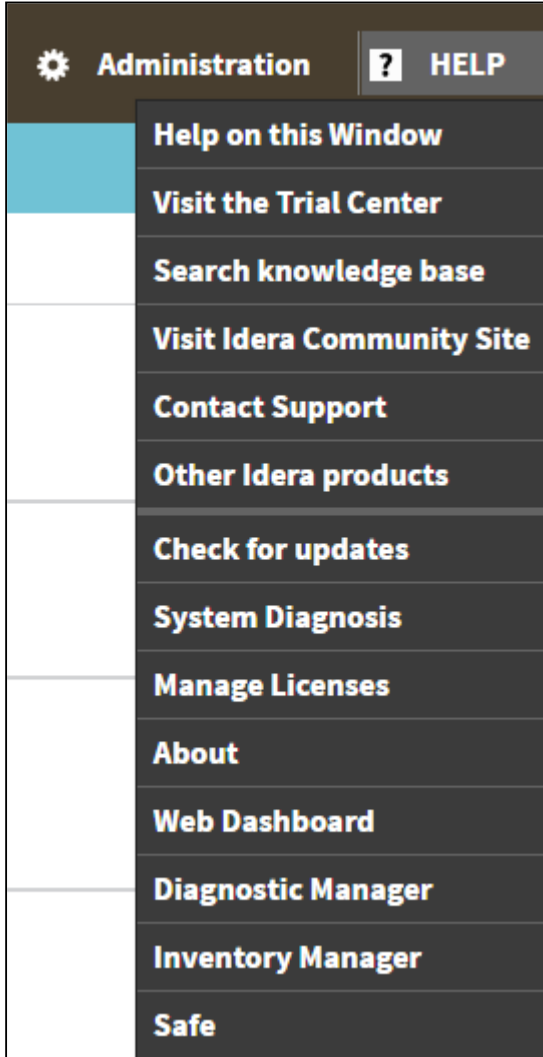
- [Managing users](#)
- [Managing Products](#)
- [Managing Instances](#)
- [Customizing Navigation Order](#)
- [Dashboard Views](#)
- [Managing Tags](#)
- [Notifications to all users](#)
- [Managing Licenses](#)

For more information on each service and what configuration settings are available, visit each respective section.

You can also access these options from the **ADMIN** drop-down on the top right corner of the UI.



Click the **HELP** drop-down on the top right corner to access a list of useful support options, tools, information, and products.



Managing users in the IDERA Dashboard

The **Manage Users** option allows users to grant access to other team members or groups and manage their roles. Users with administrative privileges are divided in:

- Dashboard administrators - capability to manage access to Dashboard functions as well as individual products' functions.
- Product administrators - capability to grant access to individual products for which they have administrative rights.



To add new users, edit their details (name, subscription, or email address), or remove them, select **Manage Users** in the Administration view. In the **Manage Users** window you can perform the following actions:

Add a user / group

In the IDERA Dashboard access is granted to Windows users or groups. To add users follow these steps:

MANAGE USERS

[Add User / Group](#)

Enabled	Display name	Account	Type
		simpsons\administrator	USER

User/Group Details

Account name: *
Windows user account in form "domain\accountname".

Display name:

Account Type: User Group

Do not timeout the browser session for this account.

Product: * Role: *

1. Click the **Add User / Group** option and the User/Group Details panel displays.
2. Type the Account name of the user you want to grant access to. You should enter a Windows user name in the following format: **<domain\user>**.
3. Enter a Display name.
4. Select User or Group in the Account Type field.
5. Select the **Do not timeout the browser session for this account** check box to stay logged in.
6. In the **Product** field, you can select to add a user to the IDERA Dashboard.
7. In the **Role** field, you can assign a user the Dashboard Administrator or Dashboard guest role if you select the IDERA Dashboard in the **Product** field. If you select an IDERA product in the **Product** field, you can assign a user the Product Administrator, Product user, or Product guest role.
8. Click **SAVE**.

✔ Provide the new user with the following URL: **http://<ServerName>:9290** or **http://<localhost>:9290** to access the IDERA Dashboard.



Edit a user/group

This option allows you to edit the account name and display name, disable the account, and add new permissions. To edit a user or group follow these steps:

1. Select one user / group from the list of users.
2. Change the necessary settings.
3. Click **SAVE**.

Delete a user / group from the IDERA Dashboard

To remove a user or group, select the User / group from the list and click the **DELETE** button. A confirmation dialog displays; click **YES** to remove or **NO** to cancel.

Managing products 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**.

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.

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 :

Dashboard Administrator :

Username :

Password :

Fill in the requested information and click **Migrate**.

Register a Product

The IDERA CWF 3.0 allows you to Register a Product. Click **Register a Product** to display the configuration settings.

Type all the requested information and click **Register**.

Managing Instances in the IDERA Dashboard

The IDERA Dashboard tracks SQL Server instances, discovered and managed by different IDERA products. The Instances widget of the Administration view, allows users to view and manage registered instances.

To view coverage or remove registered instances that no longer exist in your SQL Server environment, select **Manage Instances** in the Administration view, and the Managed Instances window displays.



MANAGE INSTANCES

SEARCH: Options Clear filters

Instance	MSSQL Version	Discovered	Last Seen	Status
<input checked="" type="radio"/> AUT-SQLBI-118	10.50.1600	May 05, 2016 10:33 ...	May 05, 2016 10:33 ...	Managed
<input type="radio"/> CH-SP2010-1	10.50.2550	May 05, 2016 10:33 ...	May 05, 2016 10:33 ...	Managed
<input type="radio"/> CR-2K8R2	10.50.1600	May 05, 2016 10:33 ...	May 05, 2016 10:33 ...	Managed

Instance Details

Instance Name: AUT-SQLBI-118
MSSQL Version: 10.50.1600
Tags:
Discovered: May 05, 2016 10:33 AM
Last Seen: May 05, 2016 10:33 AM

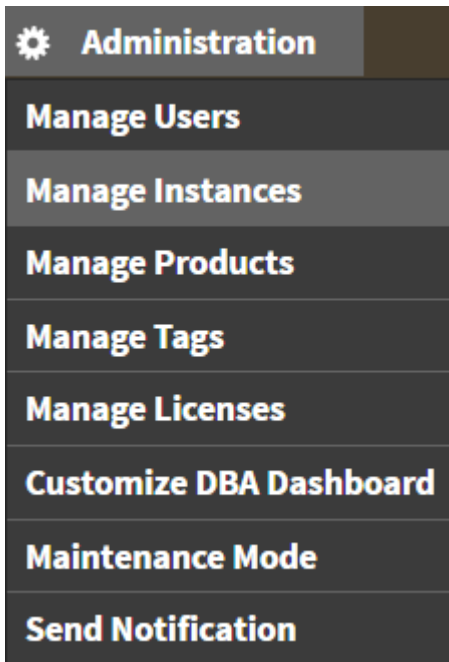
Product	Version	Status	Available Licenses
SQLdm(infodev)	10.1.0.0	Managed <input type="text" value="▼"/>	0

Save Discard changes

Select an instance to view its details and modify its Status.

Click **OPTIONS** to access the filtering options.

You can also access the Manage Instances option from the **ADMIN** drop-down on the top right corner of the UI.



Permissions for Managing Instances

- **Dashboard Administrator** - can add, edit, and remove instances from a product for all products.




- **Dashboard Guest** - can have a read-only view the instances summary and detail sections for all products.
- **Product Administrator** - can add, edit, and remove instances from the specific product.
- **Product Guest** - can have a read-only view of instance summary and detail sections for the specific product.
- **Product User** - can add, edit instances summary, and detail sections for the specific product. View of instances summary or details sections should be restricted to the specific product.

Configure navigation order in the IDERA Dashboard

The **Configure Navigation Order** option of the Administration view allows you to modify the order in which the navigation tab displays the IDERA products.

Click the **Customize Main Navigation Tab Order** option and a dialog displays.

Drag and drop products to the desired order and click **Save**.

You can also modify the order of the products from the **Products** drop-down menu. Click  **Customize** to enable the drag and drop feature. Select a product and release it in the desired position.

Click **Save** when you are done.

Configure the IDERA Dashboard view

The **Configure Dashboard Views** option allows users to customize which product widgets are shown in the Overview and Details view tabs of the IDERA Dashboard.

Click the **Customize DBA Dashboard** option in the **Administration** tab to display the Customize DBA Dashboard configuration panel.

In the Customize DBA Dashboard dialog you can try the following:

- Select to hide or show the DBA Dashboard to all users or to users with permissions in two or more products.
- Select the View you want to modify (Overview or Details View).
- Add or remove columns from the selected View.
- Specify the column widths.
- Add product widgets.
- Remove widgets.
- Re-arrange widgets (drag and drop).

Additionally, you can:



- Modify specific settings for each widget, such as its default state (Expanded or Collapsed).
- Assign another widget to a previously placed widget.

Managing Tags

Tags can help you organize your managed instances and databases. Tags created and updated in the IDERA Dashboard can be made available and used in other IDERA SQL products. This feature allows you to import, view, edit, and delete tags and their associated instances and databases.

Click **Manage Tags** in the **Administration** tab to display the configuration window.

MANAGE TAGS

SEARCH: [Options](#) [Delete](#)

[Add Tag](#)

Tag	Type	Conflict
<i>No Results Found</i>		

Manage Tags

◀ Select the row of a tag in table to view details.

[Delete tag](#) [Save](#) [Discard changes](#)

Click **Add Tag** to display the configuration panel to add a tag to a certain instance or database or select an existing entry from the list to edit its settings.



MANAGE TAGS

SEARCH: Options Delete

Add Tag

Tag	Type	Conflict
No Results Found		

Manage Tags

Tag:

Instances:

Instance	Product
No Results Found	

[Add instance](#)

Databases:

Instance	Database	Product
No Results Found		

▼

Delete tag
Save
Discard changes

Sending notifications

The IDERA Core Web Framework 3.0 allows you to send notifications over Email to all registered users in the IDERA Dashboard.

Click **Send notification** in the **Administration** tab to open a text field to enter the message you want to send.

Send Notification to All Users


Add a warning message to notify all users about product upgrades.

Specify message to inform users

Send

Click **Send** to send the notification message.



 The Notifications feature requires you to previously configure SMTP settings. Email notifications can only be sent to users with a registered Email address.

Manage Licenses

SQL Workload Analysis does not display license information in this view. You can access your SQL Workload Analysis license information from the **Manage Licenses** option in the Administration tab of SQL WA. [Click here](#) for more information.



Frequently asked questions

Where is SQL Workload Analysis installed? Should I install anything on the database machine?

SQL Workload Analysis monitors SQL Server instances remotely (agent-less), from a dedicated framework machine. SQL Workload Analysis has a web-based interface that you can use, via a browser, from any machine that can access the framework machine.

How is SQL Workload Analysis different from the Precise for SQL Server Enterprise edition?

It is based on the same collection technology, but there's a completely new UI, and it is designed from the bottoms up to be extremely easy to install and to use. SQL Workload Analysis is focused on SQL Server performance tuning, stemming from 20 years' R&D and DB tuning experience - all packaged in a user-friendly and effortlessly-deployed application. Precise for SQL Server Enterprise Edition complements SQL tuning with full-blown enterprise functionality including alerts, reports, up-stream application context, and network monitoring.

How can I pause monitoring an instance?

When adding monitoring for an instance, a dedicated Windows Service is created on the framework machine. Stopping/starting this Service will stop/start the monitoring for that instance.

I see a performance peak in one of the graphs. How do I zoom in to investigate it further?

SQL Workload Analysis has an easy zoom functionality. Simply drag your mouse with the left button click over the graph, drawing a rectangle to define the area you want to zoom in on. SQL Workload Analysis will zoom in quickly on this area. Note: zoom is enabled in all graphs besides in "Current" pane. Graphs displaying current information always show last 30 minutes of data in maximal granularity.

Data has stopped being collected. How do I troubleshoot this?

Troubleshoot data collection pauses with the following: Check whether the Windows Service of the collector is up and running. If it is stopped, restart it. Check whether the monitored instance's credentials were changed. If this is



the case, SQL Workload Analysis will not be able to connect to the monitored instance until the new credentials are provided. Rerun Setup.exe from the installation root folder to update credentials.

How to monitor in failover cluster configuration?

Install the SQL Workload Analysis framework on a dedicated server outside of the cluster. During setup, specify the logical (cluster) instance name as the SQL Server instance to be monitored. In case of failover, the collector will identify the failover in a second, and within moments will resume monitoring automatically without any manual intervention.

How do I upgrade from trial to standard version to continue monitoring beyond the trial's period?

Visit the [IDERA Online Store](#) to purchase a license.

How can I control the time frame of the displayed data?

SQL Workload Analysis provides simple shortcuts for setting desired time frame (e.g. last 8 hours) – these shortcuts are displayed on the top right part of the screen. Besides the shortcuts you can always zoom in from any graph (except for "Current" pane that always shows last 30 minutes).

What does "Total in DB" measure?

"Total in DB" is the total amount of time spent by the application/s inside the database over the selected time period. This measurement allows you to quickly identify the activities with the most significant contribution to DB resources usage. This time is divided into productive "Using CPU" time and non-productive waits for resources. This breakdown is clearly displayed along with the absolute time measurements.

What is the refresh rate of the SQL Workload Analysis views?

The main dashboard portlets are refreshed every 15 minutes. The "Current" pane's portlets are refreshed every minute. The rest of the screens are not automatically refreshed since they are designed for investigating performance bottlenecks and should not be refreshed without user's intention.



What are the units I see next to the time displays (including in the Y axis of the graphs)?

The units are: μ s – microsecond, ms – millisecond, s – second, m – minute, h – hour, d – day, w – week.

For some SQL statements, why don't I see summary values regarding physical reads, logical reads, etc.?

These values are not accessible whenever a statement is not kept in the SQL Server's procedure cache.

What are the "Top Accessed Objects" I see for a SQL statement?

Accessed objects are the tables and the indexes the statement is utilizing during its execution. This display allows you to understand object bottlenecks even without analyzing the execution plan.

How should I work with the Locking Sessions (Blockers) portlet to analyze locking situations?

The sessions appearing on the top of the hierarchy are the blocker sessions. They are also colored in red. To release the lock you may need to consider killing these blocker sessions. The number that you can see after the program's name is the client process ID, which should help you in locating the blocker. The sessions appearing beneath the blocker sessions are the locked sessions. Each locked session can in its turn cause additional sessions to become locked – these locked sessions will appear further down in the hierarchy. When looking at the locked session this column presents the locked statement. When looking at the blocker session this column presents the last statement that was executed by the session. Many times it will represent the locking statement.

The main dashboard shows only top databases/statements. How can I see more in the list?

Drill down through the links provided inside the lists to get to the designated page showing much longer lists and the important details for each item.



What does the "Table Cardinality" column mean in the statement's execution plan's display?

This column shows the number of rows in the access table. It may appear when the Operator name is: Table scan, Index seek, or Clustered index seek. Table cardinality should be used in conjunction with the value of Returned row column. Returned rows shows how many rows were returned after applying all the filter predicates for the selected operation. It allows calculating filtering ratio and assessing the potential of using an index. Let's assume: Operation name is Table scan, Table cardinality is 1000000, and Returned rows is 50. It means that SQL Server sequentially scans a 1000000-row table while only 50 rows were qualified after applying relevant filter predicates. Normally an index may help when the filter ratio (Returned rows / Table cardinality) is less than 1%. You may view filter predicates applied by an Operation by hovering on the Operation and then clicking the More properties link in the presented tool tip.

Locks trending graph shows lock types including "MD" prefix – what is it?

"MD" stands for METADATA. It means that the locked object is not user data such as table row or index key. The locked object is some dictionary object that describes user objects. In most cases METADATA locks are caused by DDL (create, alter, drop) rather than DML (insert, update, delete) statements. "MD Partition Lock" means that the partition function of a partitioned table is locked. It may happen when adding / removing partitions. During that time, any application trying to access that partitioned table will be locked. "MD Statistics Lock" means that the lock is due to trying to gather statistics on user objects and update the statistics in system tables. Updating stats in system tables may lock the optimizer when trying to generate an execution plan for queries that access objects on which statistics were gathered. "MD Other Lock" stands for any other METADATA lock (not one of the two mentioned above). The full list of METADATA sub types reported by SQL Server is documented as part of column `resource_subtype` of table `sys.dm_tran_locks`.

How can I extend SQL Workload Analysis' visibility into EMC storage?

SQL Workload Analysis provides deep visibility past the database and into the EMC storage array, including the ability to detect contention on physical disks or virtual pools. In order to enable this extended visibility, some EMC software needs to be installed on the SQL Workload Analysis server as well as the database hosts. Please consult the following document for the full details of how to extend SQL Workload Analysis' visibility into EMC Storage: [SQL Workload Analysis – Installing and Verifying EMC Solution Enabler](#).

Why do certain statements show zero execution counts?

IDERA SQL Workload Analysis computes the top SQL statements in terms of time spent in the database from one source of such data in the system tables of SQL Server and correlates this with the execution count of that statement from another source (i.e another set of system tables in the SQL Server). Because of sampling rates,



sampling errors, and the transient nature of the latter source, the correlation is sometimes not possible for certain statements with very few executions in any given time frame.



Monitoring EMC storage using SQL Workload Analysis

This section describes how to extend SQL Workload Analysis to monitor EMC storage used by SQL Server. As part of this, it describes what EMC software needs to be installed and how it should be configured.

Planning for EMC Solution Enabler installation

Which servers require Solutions Enabler installation?

EMC Solutions Enabler must be installed on the server on which the SQL Workload Analysis framework is installed. In addition, it must be installed on any server that hosts an instance of SQL Server to be monitored.

For example, if the SQL Workload Analysis framework is installed on Server A, and it is being used to monitor SQL Server instances residing on Server B and Server C, then Solutions Enabler needs to be installed on Server A, Server B, and Server C.

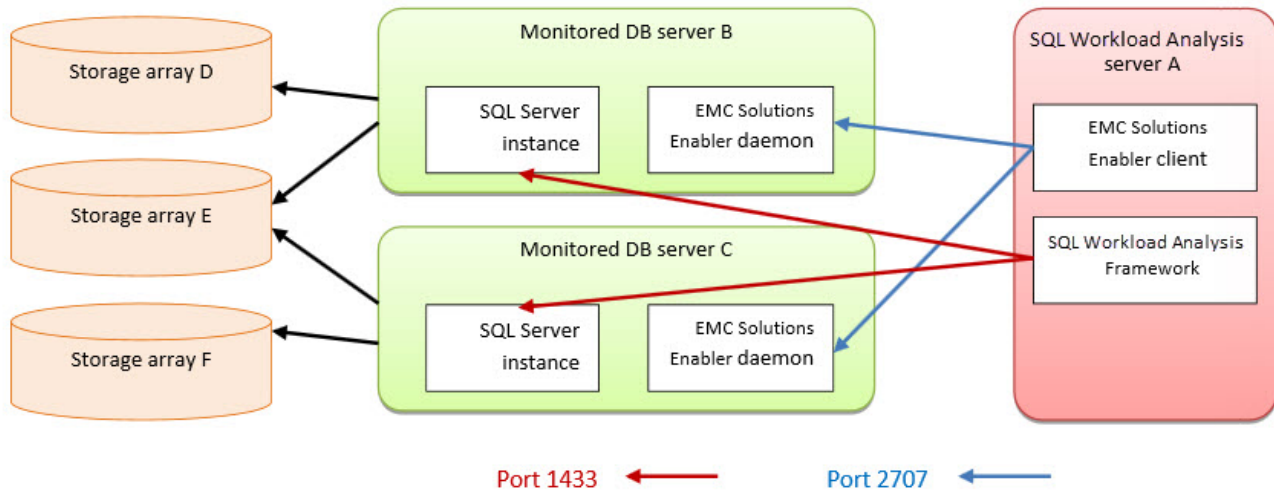
Network and security requirements

EMC Solutions Enabler client (running on SQL Workload Analysis server) should be able to send commands to Solutions Enabler daemon installed on each DB server. By default, Solutions Enabler daemon listens on port 2707. Port 2707 on each DB server must be open in the firewall for requests from the SQL Workload Analysis server.

Solutions Enabler ACL-based security is supported. If ACL is configured, the only authorization needed is BASE.



Installation diagram



About obtaining Solutions Enabler

EMC Solutions Enabler can be obtained from EMC. The EMC source for the Solutions Enabler is the EMC Extranet site – PowerLink: https://support.emc.com/downloads/2071_Solutions-Enabler.

Note

You will need an account (login and password) to access this site, which is provided by EMC.

Note

Be sure to download the correct version of the Solutions Enabler for your platform. If you are using a 32-bit platform, download the x86 version. If you are using a 64-bit platform, download the x64 version.

Note

SQL Workload Analysis supports Solutions Enabler 7.2 and above. It is highly recommended to use the highest version available (currently, Solutions Enabler 7.5).



Virtualization considerations

SQL Workload Analysis supports any configuration supported by EMC Solutions Enabler.

Typically, hypervisors abstract the physical layers from the virtual machines. Thus, special handling is required, otherwise EMC Solutions Enabler, running on a virtual machine, will not be able to interact with the Storage array.

Microsoft Hyper-V exposes attached EMC devices using pass-through or VHD configuration. If the monitored SQL Server instance runs on a Microsoft Hyper-V guest server, only pass-through devices are supported.

VMware virtualization is fully supported by EMC Solutions Enabler, both for pass-through and VHD configuration.

Installing Solutions Enabler

This section contains a brief walk through for Solutions enabler deployment, for the purpose of monitoring by SQL Workload Analysis. for the full procedure and options of Solutions Enabler deployment, see also the *Solutions enabler Installation Guide* document, which can be found in the document set on the EMC web site.

Note

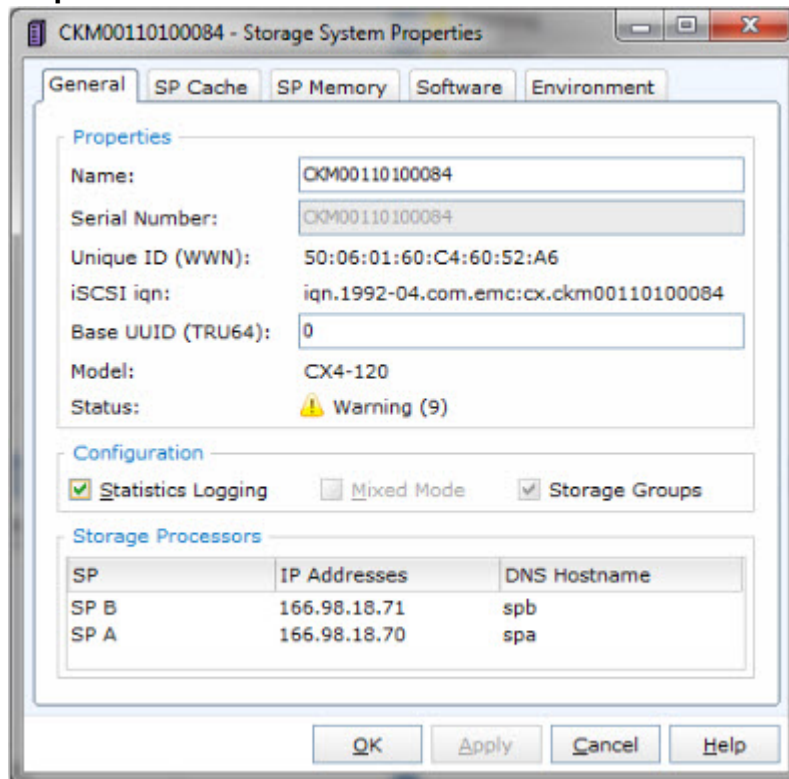
A user with the administrator role is needed to complete the following procedure.

On the SQL Workload Analysis server

1. Install Solutions Enabler.
 - a. Select the destination folder.
 - b. Select the **Setup Type** (use: **Complete**)
 - c. On the **Services List**, leave the default settings for the Stordeamon Services.
 - d. Click **Next**.
 - e. Click **Install**.
2. **If your SQL Server instance stores its data on CLARiiON or VNX storage arrays, Statistics Logging** should be enabled. The following procedure should be done per storage array:
 - a. Open Navisphere GUI or Unisphere web GUI. Typically, this will require a user with Storage Administrator rights and the URL of the Navisphere software.



- b. Right-click on the APM storage System (or on CLARiiON unit ID in Unisphere GUI) and select **Properties**.



- c. On the General tab, select **Statistics Logging**.
 - d. Click **Apply**.
 - e. Click **OK**.
 - f. Click **File > Save** and **Exit**.
3. Initialize Solutions Enabler (building the symapi\db\symapi_db.bin file).
 - a. Open a Windows command prompt.
 - b. Navigate to the directory in which the EMC Solutions Enabler is installed.
 - c. Execute: `SYMCLI\BIN\symcfg.exe discover -all`
The "No devices were found" message is expected and does not indicate an error.

On each monitored server

1. Install Solutions Enabler.
 - a. Select the destination folder.
 - b. Select the **Setup Type** (use: **Complete**)
 - c. On the **Service List**, use the defaults and also check the **SYMAPI daemon** checkbox.



- d. Click **Next**.
 - e. Click **Install**.
2. **If your SQL Server instance stores its data on CLARiiON or VNX storage arrays**, the monitored server should be authorized using a SYMCLI command as follows:
 - a. Make sure you have the array's Storage Processors (SP) hostname or IP address, and the array's administrator username and password.
 - b. Open the command prompt.
 - c. Navigate to the directory in which EMC Solutions Enabler is installed.
 - d. Execute: `SYMCLI\BIN\symcfg.exe authorization add -host {VNX-SP} -username {VNX Administrator} -password {VNX Administrator Password}`
 3. **If your SQL Server instance stores its data on Symmetrix (DMX or VMAX) storage arrays**, gatekeeper devices must be installed.
 - a. Gatekeeper device is a small device (less than 3 MB) used by Solutions Enabler to improve the communication with the storage array. The assistance of a storage administrator is required.
 - b. To verify which storage units and devices are attached to a monitored server, execute: `SYMCLI\BIN\syminq.exe`
The following table shows an example of the command's output.

Device		Product			Device	
Name	Type	Vendor	ID	Rev	Ser Num	Cap (KB)
\\.\PHYSICALDRIVE0		SEAGATE	ST15150W	HP12	02994239	4194157
\\.\PHYSICALDRIVE1		EMC	SYMMETRIX	5265	93052361	4224000
\\.\PHYSICALDRIVE2		EMC	SYMMETRIX	5265	93052461	4224000
\\.\PHYSICALDRIVE3		EMC	SYMMETRIX	5265	93052561	4224000
\\.\PHYSICALDRIVE4	GK	EMC	SYMMETRIX	5265	93050161	2880
\\.\PHYSICALDRIVE5	GK	EMC	SYMMETRIX	5265	93051161	2880

- c. Gatekeeper devices are marked with **GK** in the **Type** column. The two most left digits (**93** in this example) are the suffix of unit ID.
 - d. If gatekeeper devices are missing, ask the storage administrator to define them. To verify, execute `SYMCLI\BIN\syminq.exe` and check its output once again.
4. **If the monitored SQL Server instance runs on a VMware guest server**, the monitored server should be authorized using a SYMCLI command as follows:



- a. Make sure you have the ESX server hostname or IP address, and the ESX server's administrator username and password.
 - b. Open a command prompt.
 - c. Navigate to the directory in which EMC Solutions Enabler is installed.
 - d. Execute: `SYMCLI\BIN\symcfg.exe authorization add -host {ESX server} -username {ESX server Administrator} -password {ESX server Administrator Password} -vmware`
5. **If the monitored SQL Server instance runs on a Microsoft Hyper-V guest server**, the monitored server should be authorized using a SYMCLI command as follows:

Note

Only pass-through devices are supported. Devices configured as VHD are not supported.

- a. Make sure you have the Hyper-V hostname or IP address, and Hyper-V's administrator username and password.
 - b. Open a command prompt.
 - c. Navigate to the directory in which EMC Solutions Enabler is installed.
 - d. Execute: `SYMCLI\BIN\symcli.exe authorization add -host {Hyper-V hostname} -username {Hyper-V Administrator} -password {Hyper-V Administrator Password} -hyperv`
6. Initialize Solutions Enabler (building the `symapi\db\symapi_db.bin` file).
- a. Open a Windows command prompt.
 - b. Change to the directory in which the EMC Solutions Enabler is installed.
 - c. Execute the discover command:
`SYMCLI\BIN\symcfg.exe discover -all`
 This time, "No devices were found" message should be considered an error. If no devices were found, retry carefully steps 1 to 6. If still not found, open a support case using the IDERA community portal.
 - d. **If your SQL Server instance stores its data on Symmetrix (DMX or VMAX) storage arrays**, execute `SYMCLI\BIN\symcfg.exe list`
 Its output should list all attached Symmetrix storage units. Each of the units that are actually used to store SQL Server DB files should be marked as local in the **Attachment** column. See example:

Symmetrix	Attachment	Model	Version
000190103692	Remote	DMX3-24	5773



000190765393	Local	VMAX-1	5875
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- e. **If your SQL Server instance stores its data on VNX or CLARiiON storage arrays**, execute `SYMCLI\BIN\symcfg.exe list -clariion`. Its output should list all attached VNX and CLARiiON storage units.

Verifying Solutions Enabler's Deployment and Configuration

The last verification step should be done on each monitored server. It should be verified regardless of the storage array series (SYMMETRIX or CLARiiON).

To manually verify that Solutions Enabler was successfully deployed and configured:

1. Select a database file that is stored on an EMC storage array (file size must be > 0).
2. Open a Windows command prompt.
3. Navigate to the directory in which the EMC Solutions Enabler is installed.
4. Execute: `SYMCLI\BIN\symrslv.exe file <full path and name of the selected DB file>`
5. The output should contain a table with the following column titles: Size, Array, Dev, Offset, PPdevName, Offset, and Attr. Array and Dev should present EMC unit and EMC device. If "N/A" is presented instead, then EMC Solutions Enabler failed to map the file. In this case, open a support case using the IDERA community portal.

Finalizing SQL Workload Analysis Storage configuration

To finalize SQL Workload Analysis configuration:

1. Login to the server on which SQL Workload Analyzer is installed.
2. Navigate to SQL Workload Analyzer installation folder.
3. Execute: `setup.exe`.
 - a. Select an SQL Server instance and click the **Configure** button.
 - b. Click **Next** button until getting to the EMC Storage tab.
 - c. Check the **Enable EMC storage visibility** checkbox.
 - d. Click the **Next** button.
4. You should start seeing EMC storage statistics in SQL Workload Analyzer GUI in 45 minutes.