

Examining the relationship between Precise for Oracle database objects

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About the Objects tab

It is important to understand the relationship between database objects and statements to make sound and well-founded tuning decisions.

The Objects tab is a comprehensive browser that lets you understand the relationships and associations between database schema objects. It also provides further understanding into the relationships between data dictionary components and the statements that access them. This information lets you identify the statements that will be affected by changes to a database object, and the schema relationship impacts that are associated with an object change. The Objects tab also lets you observe storage utilization, over time and at varying levels, such as double-space, table, index, and Oracle file.

While the Activity tab focuses on SQL tuning, the Object tab focuses on database object tuning. In many cases, you may want to tune a database object rather than a specific query or program. This is especially true if you did not personally write the application in question, as for example, in ERP and CRM applications, and cannot therefore change the text of any statement.

Object tuning is a powerful tool. Taking into consideration important aspects regarding objects can ensure maximum application performance. Precise for Oracle lets you examine your index structure by displaying the usage of each index. Storage layout can be optimized by analyzing the object storage configuration and metric information.

Because Precise for Oracle tracks changes in the database objects, the effect of schema changes on performance can be easily observed.

 This section provides a general description of how to use the Objects tab in your analysis of Oracle objects. For further information on a specific Oracle object, see Oracle's relevant documentation.

How the Objects tab is structured

The Objects tab consists of two different views: Explore Objects and Tune Objects.

The Explore Objects view displays information on a selected entity and its associated entities. The selected parent entity is always reflected in the Tab heading, which serves as a point of orientation. The highest-level entity you can view information for in the Objects tab is Instance. You can choose another instance from the Instance selector.

The Tune Objects view displays performance and usage information per table or index, based on new and existing data sources.

About the Explore Objects view

When you open the Objects tab from the Activity tab (and the selected entity is Statement, Table, Index, Oracle File or Storage Device) or the SQL tab (Table, Index or Column) you launch to the tab in context, and information on the entity you selected is displayed. In all other circumstances the settings from your last visit to the Objects tab are retained. This is similar to clicking the History button and returning to a previous tab.

Although a large number of entities can be displayed in the Objects tab, they nearly all share the same set of Main Area views and Associations.


About the Main area in the Explore Objects view

The Main area, in the Objects tab, shows comprehensive information on the selected entity. You can choose from several views to examine the entity from different angles. For example, you can focus exclusively on Instance Parameters, or Instance Parameters Changes.

The following table explains the standard views that are available for most entities in the Objects tab.

Table 1 Standard views in the Objects tab

View	Description
Overview	Usually the first view that is displayed. The Overview shows general properties of the entity that can be found in the Oracle data dictionary, such as DBA_OBJECTS, and DBA_TABLES, and also provides graphs that can assist you in analyzing changes in objects.
RAC Database	RAC allows multiple instances on different nodes to access a shared database on a cluster system. This allows multiple servers to share the load. The RAC Database view is only displayed for RAC instances.
Storage	This view displays current storage information for objects such as information on extents.

Changes	<p>The changes displayed by this view are represented differently depending on whether they occurred on the instance level or on the table or index level, as follows:</p> <ul style="list-style-type: none"> Precise for Oracle FocalPoint periodically scans for changes in the instance that have been made to components, initialization parameters, redo log parameters, rollback segments, tablespaces, datafiles, and schemas. This can be valuable information when you are trying to determine why performance degradation has occurred. These changes are captured by the Collect Instance Definitions process. The scan typically occurs once a week (this interval can be configured in AdminPoint; see the <i>Precise Administration Guide</i> for details). At least two snapshots must have been captured before Precise for Oracle can detect whether a change has occurred—the first to establish the baseline and the second to calculate the differences. Changes that occur on the table or instance level are captured in the same way as other changes but are represented in accordance with their equivalent DDL (for example, DROP INDEX or ALTER TABLE). These changes are captured by the Collect Schema Changes process. The scan typically occurs once a week (this interval can be configured in AdminPoint; see the <i>Precise Administration Guide</i> for details). This process is disabled by default. <div>  The information displayed in the Changes view is not the same as an audit trail. Precise for Oracle only tells you that the change occurred somewhere between the two snapshots and does not tell you who or what was responsible for the change. If a change is made and then restored to its original value before the next sample, it will not be detected. Similarly, if a number of consecutive changes of the same type are made to an object between samples, only the overall change will be recorded. </div>
Statistics	<p>This view displays statistics generated by the Oracle statistics collection mechanism (for example, distinct values for a column, or number of rows for a table). If you are using the COST or CHOOSE database optimizer modes, it is important that the statistics are accurate and up-to-date.</p>

About the Association area in the Explore Objects view

The Association area, in the Objects tab, provides corresponding information on the entities that are related to or can be associated with the selected entity (the entity displayed in the Tab heading). You can view information on one type of associated entity at a time, such as Statements or Tablespaces, by selecting an entity from the Association Controls list. The selection you make is reflected in the Association area only; the Main area remains unchanged. For some entities, tabs above the Association area enable you to view additional information. Clicking a tab changes the columns of the table displayed for the associated entities.

From the Association area, you can also drill down to another entity by clicking on a table row. A drill down affects the entire tab. When you drill down to another entity, the Tab heading reflects the new selection, the Main area displays information on the newly selected entity, and the Association area shows data on the entities that are associated with the selected entity.

For example, when you want to view information on a specific Tablespace, from the Association controls, click Tablespaces. The Association area changes to display tablespace-related information. Note that the Tab heading and the Main area remain unchanged. Click the row of the tablespace you want to view detailed information for. The Tab heading indicates the newly selected entity; the Main area displays an overview of the tablespace you drilled down to, and the Association area shows a list of Oracle files that belong to the tablespace and their properties.

The following table explains the standard tabs that are available for most entities in the Association area.

Table 2 Standard tabs in the Association area of the Objects tab

Tab	Description
dictionary	Displays Oracle data dictionary information that can be found in DBA_OBJECTS, DBA_TABLES, etc. This information is then generally displayed in the Overview in the Main area when the entity is selected.
Storage	Displays extent information similar to that found in DBA_SEGMENTS. This information is then generally displayed in the Storage view in the Main area when the entity is selected.
Statistics	Displays some statistics generated by Oracle statistics collection mechanism (for example, distinct values for a column, or number of rows for a table). If you are using the COST or CHOOSE database optimizer modes, it is important that the statistics are accurate and up-to-date. You may want to sort by the Last Analyzed On date or use the Filter dialog to search for entities whose Last Analyzed On date is before a certain date.
Usage	<p>Displays a breakdown of the different ways in which an object such as a table, index or column has been accessed within explain plans—for example the number of full table scans or index range scans. This information is only available for statements that have been explained. It can help you determine if your indexing strategy is working effectively. You may want to sort tables by the number of Full Scans or use the More feature to find tables that have been Accessed via Full Scan and have a large number of rows or blocks.</p> <p>The Access columns are specific to a type of object but they all share a References column. This represents the total of all individual usages, and provides an overall view of the usage of a particular object.</p>

See “About Objects tab entities” on page 95 and “About Precise for Oracle tabs” on page 21.

About the Tune Objects view

You can launch directly to the Tune Objects view of the Objects tab from the following tabs:

Table 3 Direct launch

Tab	Description
Dashboar rd	From the launch icon for object findings.
Activity	From the Association area, by clicking on the launch entity, or when clicking on the Objects workstation button when an Object entity is displayed in the Main area.
Objects	From the launch icon for an active object.
SQL	From the launch icon in the Objects tab, when tables and indexes are selected.

The Main area of the Tune Objects view displays information on the table you drilled down to and its indexes. You can also directly open a table by using the Open option.

Selecting a table to tune

You can select a table to tune by using the Open option. To open a table for tuning

1. On the Tune Objects tab in the Objects tab, click **Open**.
2. In the Open Table dialog box, in the Instance drop-down list, select the instance related to the table you want to tune.
3. In the Owner drop-down list, select the owner of the table you want to tune.
4. In the Table drop-down list, select the name of the table you want to tune.
5. Click **Ok**.

About the Main area in the Tune Objects view

The segment table, located in the upper left corner of the Main area of the Objects tab, displays information on the selected table and its corresponding indexes. Additional tabs (Details, Partitions, and Columns), located in the lower left corner, provide additional information on the selected table. You can view this information by clicking the + sign to expand the view.

The following table provides an explanation of the information displayed in the Segments table.

Table 4 Segments table

Column	Description
Segment icon	Icon indicating whether a segment is a table or an index.
Name	Displays the name of the segment.
In Oracle (Sum.)	Displays a breakdown of the total waits that contributed to the In Oracle time for the object.
Logical Reads	Summarizes the logical reads made on the object.
Physical I/Os	Summarizes the direct physical reads, direct physical writes, physical reads, and physical writes made on the object.
Statements	Displays the number of statements that accessed the table within the selected time frame.
Hit Ratio	Displays the cache hit ration of the selected object.
Index Columns	When the selected object is an index, displays the names of the index columns.

The Details area displays relevant data dictionary information for the selected index, table or segments. The Columns area shows information on the columns of the selected tables or index.

The following table describes the information displayed in the Dictionary and Columns areas.

Table 5 Information displayed in the Dictionary and Columns area

Selection	Dictionary	Columns
All Segments	Rows, Degree, Last analyzed on, Chained rows	Column, Type, Distinct values, Nullable, Position in partition
Tables	Rows, Degree, Pct free, Last analyzed on, Chained rows, Partitioned, Number of partitions, Partition type, Partition columns, Number of subpartitions, Subpartition type, Subpartition columns	Column, Type, Distinct values, Nullable, Position in partition
Indexes	Number of columns, Distinct keys, Leaf blocks, B-levels, Clustering factor, Columns Last analyzed on, Pct free, Partitioned, Locality, Partition type, Partition columns, Number of subpartitions, Subpartition type, Subpartition columns	Column, Type, Distinct values, Nullable, Position in index, Position in partition



You can launch with the selected row of the Segments table in context to the Active Objects association in the Explore Objects view by clicking the Dictionary links.

About the Details area in the Tune Objects view

The Details area, in the Objects tab, is divided into the following tabs:

- Highlights
- Overtime
- Statements
- Joins
- Partitions

About the Highlights tab

The Highlights tab shows the statement access type distribution for the segment, indicating how the segment was accessed. The Findings table displays information on problematic objects and provides links to the appropriate tabs where you can continue your analysis or tune the object. It displays the percentage of time the object spends in the Oracle database, with respect to the amount of time spent by all segments in the Oracle database.

When you click on a row in the Findings table, additional details on the selected finding are displayed in the Details area below the table.

If you want to continue your examination of a particular finding, click on the launch icon to launch to the appropriate tab with the selected finding in context.

About the Overtime tab

The Overtime tab shows the segment's I/O wait distribution, by read/writes, over time and the segment changes that took place during the selected time period.

The following table describes the information displayed in the Overtime tab.

Table 6 Overtime graphs

Graphs	Description
In Oracle	Displays In Oracle resource consumption over time, broken down into In Oracle wait states.
Changes	Shows at which point in time database block changes occurred, and the space allocated to the segment by the data dictionary, on the DB Block Changes axis. Additional points on the graph indicate whether or not Statistics (analyze operations performed on the segment) or Schema Changes (structural changes made to the object) occurred at that point in time. This information helps you identify the impacts of a statistics or schema change on a database object.
Physical I/O vs. Logical Reads	Summarizes physical I/O (includes physical reads direct, physical writes and physical writes direct) vs. logical reads on the selected segment, over time.

About the Statements tab

The Statements tab shows the statement access type distribution for the segment, indicating how the segment was accessed. Each table is populated according to the row you select in the table above it. The Statements table will show information on the accessing statements using the access type you selected in the Access Types table. The Columns table provides information on how columns are being used in the statement.

The following table describes the information displayed in the Statement tab.

Table 7 Statement table

Table	Description
Access Types	<p>The Access Types table shows the following information on the statement's access types:</p> <ul style="list-style-type: none">• Access Type. Describes which access type was used to access the specific object, segment or segments.• In Oracle (Sum.). Displays the amount of time spent by the selected object, segment or segments, of the specified access type, in the Oracle database.• Statements In Oracle. Displays the amount of time spent by the selected object, segment or segments, of the specified access type, in the Oracle database.• Statements. Number of explained statements accessing the segment with the specified access type <p>If you want to continue your examination of a particular access type, click on the launch icon to launch to the Activity tab with the selected access type in context.</p>

Statements	<p>The Statements table shows the following information on the statements using the access type you selected in the Access Types table:</p> <ul style="list-style-type: none"> • Text. Displays the beginning of the selected statement's text so that you can identify the statement. You can view more of the statement's text by placing the cursor over the text cell in the table and viewing the information displayed in the ToolTip. • In Oracle (Sum.). Displays the amount of time spent by the selected statement, of the specified access type, in the Oracle database. • Statements In Oracle. Displays the amount of time spent by the specific statement, of the specified access type, in the Oracle database. • Access Type. Displays how the statements accessed all segments, or the selected segment or object (access type). • Executions. Displays the number of times the statement was executed. • Duration (Avg.). Displays the average time spent by the statement in the Oracle database. • Statement. Displays the statement's calculated hash or user-defined name. • Programs. Displays the program that executed the statement. • Host Users. Displays the users that executed that statement. <p>If you want to continue your examination of a particular statement, click on the launch icon to launch to the Activity tab with the selected statement in context.</p>
Columns	<p>The Columns table shows the following information on the statement you selected in the Statements table:</p> <ul style="list-style-type: none"> • Column. Displays the name of the column used by the statement. • In Clause. Displays the number of times the column was accessed by SELECT, WHERE, ORDER, or UPDATE clauses. • Equal Operator. Displays the number of equal signs (=) used by the column. • Distinct Values. Displays the number of distinct values used by the column over the entire segment or object. • Position in Index. Displays the position of the column in the index or partition.

About the Joins tab

The Joins tab displays information on the tables (and their corresponding statements), that participate in joins with the selected table.



This tab is only displayed if a table is selected in the Segments table in the Main area.

The following table describes the information displayed in the Joins tab.

Table 8 Joins Tables

Table	Description
Tables	<p>The Tables table shows the following information on the tables that are joined with the selected segment, segments, or object:</p> <ul style="list-style-type: none"> • Name. Displays the name of the joined table. • Owner. Displays the owner of the joined table. • In Oracle. Displays the dispersion of the In Oracle time of the selected object or segment with respect to the table it is joined with. • Statements In Oracle. Displays the In Oracle time of all statements accessing both tables. • Explained Statements. Displays the number of statements that both the selected table and the current table participate in. <p>If you want to continue your examination of a particular join table, click on the launch icon to launch to the Tune Object view with the selected join table in context.</p>
Statements	<p>The Statements table shows the following information on the statements in which both the selected segment or object, and the selected table appear:</p> <ul style="list-style-type: none"> • Text. Displays the beginning of the selected statement's text so that you can identify the statement. You can view more of the statement's text by placing the cursor over the text cell in the table and viewing the information displayed in the ToolTip. • In Oracle. Displays the dispersion of the In Oracle time of the selected object or segment with respect to the table it is joined with. • Statements In Oracle. Displays a breakdown of the In Oracle time of all statements accessing both tables. • Columns. Displays the name of the column appearing in both tables. • Statement. Displays the statement's calculated hash or user-defined name. <p>If you want to continue your examination of a particular statement, click on the launch icon to launch to the Activity tab with the selected statement in context.</p>

About the Partitions tab

The Partitions tab displays partition details for the selected segment or object.



This tab is only displayed if the object or segment you selected in the Segments table is partitioned.

The following table describes the information displayed in the Partitions tab.

Table 9 Partitions table

Column	Description
Partition	Displays the name of the segment partition.
Deleted	Indicates whether or not the partition was deleted.
In Oracle (Sum.)	Displays a breakdown of the total waits that contributed to the In Oracle time for the selected partition.
Logical Reads	Summarizes the logical reads made on the selected partition.
Physical I/Os	Summarizes the direct physical reads, direct physical writes, physical reads, and physical writes made on the selected partition.
Segment	Displays the name of the segment owning the partition.
Blocks	Displays the segment size in blocks.
Tablespace	Displays the name of the tablespace in which the partition resides.
Buffer Pool	Displays the name of the buffer pool in which the partition resides.

If you want to continue your examination of a particular partition, click on the launch icon to launch to the Activity tab with the selected partition in context.

About Objects tab entities

The Objects tab displays information on many different entities. This section provides an overview of all these entities, their meaning, and their views.

In the Objects tab, you can examine the following entities:

- Instance entity
- Oracle File entity
- Tablespace entity
- Table entity
- Index and unused index entities
- Column entity
- Statement entity
- PL/SQL entity
- Object entity
- View entity
- Attribute entity
- Cluster entity
- Constraint entity
- Index Partition and Index Sub-Partition entities
- Index-type entity
- LOB entity
- Materialized View entity
- Method entity
- Rollback entity
- Sequence entity
- Synonym entity
- Table Partition and Table Sub-Partition entities
- Trigger entity
- User entity
- User-defined type entity

Some entities are related to storage devices and are only available if you install the EMC Symmetrix and Clariion or HP SureStore versions of Precise for Storage. The Objects tab lets you see details for all the storage arrays connected to the server where the currently selected instance is running. You can then drill down inside an array and see details of its components. The performance counters are available for all devices and not just for those devices used by the selected instance. This gives you a view of the overall performance of the arrays and lets you identify less busy devices that you can move your Oracle files to.

The following entities are only available if you have installed Precise for Storage:

- EMC Units
- Disk director entity
- Port entity
- Hyper entity
- HP Storage Device entity

For more information on the supported platforms, see the *Precise Installation Guide*.

About the Instance entity

The Instance entity, in the Objects tab, shows object-related information on the instance level. The following views are available:

- Overview
- Init parameters
- Database options

- Database option changes
- Parameter changes
- Redo log changes
- Rollback segment changes
- Tablespace and datafile changes
- Schema changes

It is possible to associate from an instance to Active Objects and to the Users and Tablespaces defined in the instance, and to the Oracle Files that make up the instance. You can display additional entities by using the More... option.

About the overview of instance-related objects

The Overview displays general instance information and an overtime graph that illustrates the time (Sum.) that the instance spent In Oracle during the selected time period.

The following table describes the general information displayed in this view.

Table 10 Instance Overview

Column	Description
Version	Displays which version of Oracle software is being used.
Parallel	Indicates whether the instance is part of an OPS or RAC cluster.
Status	Displays the status of the instance.
Database Status	Displays the status of the entire database, in relation to the cluster.
Archiver Status	Displays the status of the database log archiver.
Up Time	Displays how long the database has been up.

Additionally Logical Reads and Space Allocation graphs are shown.

About init parameters for an instance

The Init Parameters view displays all Oracle initialization or INIT.ORA parameters.

The following table describes the table shown in this view.

Table 11 Init Parameters view

Column	Description
Parameter	Displays the Parameter Name.
Values	Displays the Current Value.
Is Default	Indicates whether the value displayed is the default value.
Is Session Modifiable	Indicates whether this parameter can be changed to take effect according to session.
Is System Modifiable	Indicates whether this parameter can be changed to take effect across the entire instance.
Is Modified	Indicates whether the parameter has been modified after instance startup.
Is Adjusted	Indicates whether Oracle adjusted the input value to a more suitable value.
Description	Provides a description of the parameter.

About database options

The Database Options view displays the available database options. The following table describes the table shown in this view.

Table 12 Database Options view

Column	Description
Option	Displays the name of the database option.
Is Enabled	Displays a True or False value indicating whether or not the option is enabled.

About examining changes to database options

The Database Options Changes view displays the changes made to database options during the selected time period. The following table describes the table shown in this view.

Table 13 Database Options Changes view

Column	Description
Timestamp	Displays the date the change took place.
Component	Displays the name of the item changed.
Old Value	Displays the old value of the component.
New Value	Displays the new value of the component.

About parameter changes

The Parameter Changes view displays the changes to the database initialization parameters during the selected time period.

The following table describes the table shown in this view.

Table 14 Parameter Changes view

Column	Description
Timestamp	Displays the date the change took place.
Parameter	Displays the name of the item changed.
Old Value	Displays the old value of the parameter.
New Value	Displays the new value of the parameter.

About changes to the redo logs

The Redo Log Changes view displays the changes to the redo logs during the selected time period. The following table describes the table shown in this view.

Table 15 Redo Log Changes view

Column	Description
Timestamp	Displays the date the change took place.
Redo Log	Displays the name of the redo log that was changed.
Change Type	Displays the type of change that took place.
Field	Displays the type of change that took place—created, deleted or field changed.
Old Value	Displays the old value of the parameter.
New Value	Displays the new value of the parameter.

About changes to rollback segments

The Rollback Segment Changes view displays the changes to rollback segments during the selected time period. The following table describes the table shown in this view.

Table 16 Rollback Segment Changes view

Column	Description
Timestamp	Displays the date the change took place.
Owner	Displays the Oracle user that owns the rollback segment.
Rollback Segment	Displays the name of the rollback segment that was changed.
Change Type	Displays the type of change that took place.
Field	Displays the type of change that took place—created, deleted or field changed.

Old Value	Displays the old value of the parameter.
New Value	Displays the new value of the parameter.

About changes to tablespaces and datafiles

The Tablespace and Datafile Changes view displays the changes to tablespaces and datafiles during the selected time period.

The following table describes the table shown in this view.

Table 17 Tablespace and Datafile Changes view

Column	Description
Timestamp	Displays the date the change took place.
<blank>	Datafile or Tablespace.
Name	The name of the datafile or tablespace that was changed.
Change Type	Indicates the type of change that took place—created, deleted or field changed.
Field	Displays which item was changed.
Old Value	Displays the old value of the parameter.
New Value	Displays the new value of the parameter.

About schema changes

The Schema Changes view displays the changes made to schema objects, such as tables and indexes, during the selected time period, but expressed as DDL. For example: DROP INDEX or ALTER TABLE

The following table describes the table shown in this view.

Table 18 Schema Changes view

Column	Description
Timestamp	Displays the date the change took place.
Change Type	Provides a description of the change, for example, Create TABLE CUSTOMER.

About the Oracle File entity

The Oracle File entity is comprised of information about datafiles and temporary files. This information lets you find objects that reside on the Oracle file and the statements that access these objects. You can view the I/O statistics of the Oracle file to understand the I/O read and write time and the number of physical I/Os. The Oracle File entity displays general details, I/O activity, and storage information for the selected file.

The following views are available:

- Overview
- RAC Database
- Dictionary
- Storage

About the overview of an Oracle file

The Overview, in the Objects tab, displays general Oracle file information and several overtime graphs. The following table describes how the general information is structured.

Table 19 Structure of general information for an Oracle file

Item	Description
File Name	Displays the name of the Oracle file.
Folder	Displays the Operating System folder where the file is located.
Created on	Displays the date the file was created.
Status	Displays the status of the file—Online, Offline, Recover, System.

Tablespace	Displays the name of the Tablespace supported by the Oracle file.
File Type	Indicates whether the file is a datafile, or a temp file.

The following table describes the overtime graphs for an Oracle file.

Table 20 Overtime graphs for an Oracle file

Graph	Description
Physical I/O Operations	Illustrates the physical reads and physical writes over time.
Physical Read Time (Avg.)	Illustrates the average read times.
I/O Waits (Sum.)	Illustrates the numbers of I/O waits according to wait state.
Physical Write Time (Avg.)	Illustrates the average write times.

About the RAC Database of an Oracle file

The RAC Database view, in the Objects tab, compares the file activity of the entire RAC database to the file activity of the selected RAC instance. This view shows aggregated wait states, and load balancing and indicates whether only the specific instance is effected by an event, or whether the entire database is effected by the event.

The following table describes the information displayed on Oracle files in the RAC Database view.

Table 21 Information displayed on Oracle files in the RAC Database view

Item	Description
Database	Displays the logical name of the RAC database.
DB Name	Displays the Oracle database name.
DB ID	Displays the Oracle database ID.
Instance Number	Displays the number of the instance in the RAC database.
Instances	Displays the number of instances that share the same RAC database with the selected instance.
Overtime graphs	<p>Displays the following overtime graphs that compare the Oracle file activity of the entire database to the Oracle file activity of the selected instance, over the selected time period:</p> <ul style="list-style-type: none"> • Database physical I/O operations • Average database I/O waits • Average database physical read time • Average database physical write time

About the dictionary of an Oracle file

The Dictionary view, in the Objects tab, displays the general properties of the Oracle File. The following table describes how the information in the Dictionary view is structured.

Table 22 Structure of information in the Dictionary view

Item	Description
File	Displays the full path of the Oracle file.
Name	Displays the name of the Oracle file.
Folder	Displays the Operating System folder where the file is located.
Tablespace	Displays the name of the Tablespace supported by the Oracle file.
File ID	Displays the Oracle ID for the file.
File Type	Indicates whether the file is a datafile or temp file.
Status	Displays the status of the file—Online, Offline, Recover, System.
Autoextension	Indicates whether the file can be autoextended.

Created on	Displays the date the file was created.
Accessibility	Indicates whether or not the file can be written to: Read Write, or Read Only.

About storage information related to an Oracle file

The Storage view, in the Objects tab, displays storage information related to the Oracle File. The following table describes how the information in the Storage view is structured.

Table 23 Structure of information in the Storage view

Item	Description
File Size	Displays the current size of the file.
Blocks	Displays the number of blocks in the file.
Block Size	Displays the block size of the file.
Autoextension	Indicates whether or not the file can autoextended.
Max. File Size	Displays the maximum size the file can be extended to.
Max. Blocks	Displays the maximum number of blocks the file can be extended to.
Increment by	Displays the size allocated for further extension when auto-extending.

Associating an Oracle file with other entities

You can associate an Oracle file in the Main area of the Objects tab with the following entities in the Association area:

- Tables and Indexes that are stored in the file.
- Statements that are run against those tables and indexes in the file.
- Tablespaces that the file belongs to.
- Storage devices that the file is mounted on. This option is only available if Precise for Storage is installed. You can display additional entities by using the More... option.

The information in the Association area table is displayed on the following tabs:

- **Dictionary tab.** Displays general properties of the Oracle File.
- **Storage tab.** Display storage information related to the Oracle File.
- **Physical I/O tab.** Displays a table of total I/O activity against the Oracle File, over the selected time period. On this tab, the table contains the following columns:
 - **File.** The name of the Oracle file.
 - **Physical I/O Operations.** A bar graph that shows the number of physical reads and writes.
 - **Physical Reads.** The total number of physical reads executed during the selected time period. **Physical Writes** The total number of physical writes executed during the selected time period.
 - **Avg. Read REQ time (Msec.).** The average number of physical reads per minute, executed during the selected time period.
 - **Avg. Write REQ time (Msec.).** The average number of physical writes per minute executed during the selected time period.
 - **File ID.** ID of the file.

About the Tablespace entity

The Tablespace entity displays general details, I/O activity and storage information for the selected Tablespace. The following views are available:

- Overview
- RAC Database
- Dictionary
- Storage

About the overview of a tablespace

The Overview, in the Objects tab, displays general tablespace information and a stacked overtime graph that illustrates the physical reads and physical writes to the tablespace.

The following table describes how the general information is structured.

Table 24 Structure of general information for a tablespace

Item	Description
Status	Displays the status of the tablespace—online, or offline.

Datafiles	Displays the number of datafiles supporting the tablespace.
Contents	Indicates whether the tablespace is Temporary or Permanent.
Logging	Indicates whether the Tablespace has logging enabled.
Extent Management	Indicates whether the tablespace is locally managed or dictionary managed.
Allocation Type	Specifies how Oracle manages extents within the Tablespace. Values are System or Uniform.
Plugged in	Indicates whether a transportable tablespace is available.
Block Size	Displays the underlying block size of the tablespace.

Additionally a Physical I/O Operations graph is shown.

About the RAC Database of a tablespace

The RAC Database view, in the Objects tab, compares the tablespace activity of the entire RAC database to the tablespace activity of the selected RAC instance. This view shows aggregated wait states, and load balancing and indicates whether only the specific instance is effected by an event, or whether the entire database is effected by the event.

The following table describes the information displayed on tablespaces in the RAC Database view.

Table 25 Information displayed in the RAC Database view for tablespaces

Item	Description
Database	Displays the logical name of the RAC database.
DB Name	Displays the Oracle database name.
DB ID	Displays the Oracle DATABASE ID.
Instance Number	Displays the number of the instance in the RAC database.
Instances	Displays the number of instances that share the same RAC database with the selected instance.
Overtime Graphs	Displays Database physical I/O operations in the overtime graph. The graph compares the tablespace activity of the entire database to the tablespace activity of the selected instance, over the selected time period.

About the dictionary of a tablespace

The Dictionary view, in the Objects tab, displays the general properties of the tablespace. The following table describes how the information in the Dictionary view is structured.

Table 26 Structure of information in the Dictionary view

Item	Description
Name	Displays the name of the tablespace.
Datafiles	Displays the number of datafiles supporting the tablespace.
Status	Displays the status of the tablespace—online, or offline.
Contents	Indicates whether the tablespace is Temporary or Permanent.
Logging	Indicates whether the tablespace has logging enabled.
Extent Management	Indicates whether the tablespace is managed locally or by dictionary.
Allocation Type	Specifies how Oracle manages extents within the Tablespace. Values are System, or Uniform.
Plugged in	Indicates whether a transportable tablespace is available.

About storage information related to a tablespace

The Storage view, in the Objects tab, displays storage information related to the tablespace, including used and free space, and extent information.

The following table describes how the information in the Storage view is structured.

Table 27 Structure of information in the Storage view

Item	Description
Datafiles	Displays the number of datafiles supporting the tablespace.
Total Space	Displays the total space available in the tablespace.
Used Space	Displays the amount of used space in the tablespace.
Free Space	Displays the amount of free space in the tablespace.
Free Extents	Displays the number of free extents in the tablespace.
Largest Free Extent	Displays the size of the largest free extent in the tablespace.
Initial Extent	Displays the default size allocated to the first extent when creating a table in the tablespace.
Next Extent	Displays the default size allocated to subsequent extents when creating a table in the tablespace.
Pct. Increase	Displays the default percentage increase in size on each subsequent extent allocation.
Min. Extent Size	Displays the smallest extent size Oracle may use.
Min. Extents	Displays the minimum default number of extents allowed for tables within the tablespace.
Max. Extents	Displays the maximum default number of extents allowed for tables within the tablespace.

Associating a tablespace with other entities

You can associate a tablespace in the Main area of the Objects tab with the following entities in the Association area:

- Oracle Files that are used for storage
- Statements that have accessed the Tablespace
- Tables and Indexes in the tablespace

You can display additional entities by using the More... option.

The information in the Association area table is displayed on the following tabs:

- **Dictionary tab.** Displays general properties of the Tablespace.
- **Storage tab.** Displays storage information related to the tablespace, including used and free space, and extent information.
- **Physical I/O tab.** Displays a table of total I/O activity against the tablespace, over the selected time period. On this tab, the table contains the following columns:
 - **File.** The name of the file.
 - **Physical I/O Operations.** A bar graph showing the number of physical reads and writes.
 - **Avg. Read REQ Time (Msec.).** Average read request time in milliseconds.
 - **Avg. Write REQ Time (Msec.).** Average write request time in milliseconds.

About the Table entity

The Table entity, in the Objects tab, displays general details, storage information, statistical information, and change-related information for the selected table.

The following views are available:

- Overview
- RAC Database
- Dictionary
- Storage
- Statistics
- Changes

About the overview of a table

The Overview, in the Objects tab, displays general table information and several overtime graphs. The following table describes how the general information is structured.

Table 28 Structure of general information for a table

Item	Description
Created on	Displays the date the table was created.
Status	Displays the status of the table—whether it is valid or invalid.
Partitioned	Indicates whether the table is partitioned.

Nested	Indicates whether the table is nested.
Temporary	Indicates whether the table is temporary or permanent.
Index Organized	Indicates whether the table is Index Organized.
Cluster	Indicates whether the table is part of a cluster.
Tablespace	Displays the tablespace in which the table is created.
Logging	Indicates whether updates to the table are logged.
Cache	Indicates whether the table is cached in the buffer cache.
Rows	Displays the number of rows in the table.
Last Analyzed on	Displays the date on which the table was last analyzed.

The following table describes the overtime graphs for a table.

Table 29 Overtime graphs for an table

Graph	Description
In Oracle (Sum.)	Displays the relevant In Oracle wait states.
Changes	Displays the changes made over time where each point on the overtime graph represents a separate statistics or schema change.
Blocks	Displays the number of blocks allocated, split, empty or used.
Rows	Displays the number of rows in the table.

The changes, blocks and rows data is dependent on the Collect Schema Changes process. Precise for Oracle reports statistical changes when this process is run.

About the RAC Database of a Table

The RAC Database view, in the Objects tab, compares the table activity of the entire RAC database to the table activity of the selected RAC instance. This view shows aggregated wait states, and load balancing and indicates whether only the specific instance is effected by an event, or whether the entire database is effected by the event.

The following table describes the information displayed on tables in the RAC Database view.

Table 30 Information displayed on tables in the RAC Database view

Item	Description
Database	Displays the logical name of the RAC database.
DB Name	Displays the Oracle database name.
DB ID	Displays the Oracle database ID.
Instance Number	Displays the number of the instance in the RAC database.
Instances	Displays the number of instances that share the same RAC database with the selected instance.
Overtime graphs	Displays the following overtime graph that compares the table activity of the entire database to the table activity of the selected instance, over the selected time period: <ul style="list-style-type: none"> In Oracle (Sum.)

About the dictionary of a Table

The Dictionary view, in the Objects tab, displays the general properties of the table. The following table describes how the information in the Dictionary view is structured.

Table 31 Structure of information in the Dictionary view

Item	Description
Created on	Displays the date the table was created.

Last Modified on	Displays the date on which the table was last modified.
Status	Displays the status of the table—whether it is valid, or invalid.
Cache	Indicates whether the table is cached in the buffer cache.
Degree	Specifies the degree of parallelism to be used when performing full table scans using parallel query.
Partitioned	Indicates whether the table is partitioned.
Nested	Indicates whether the table is nested.
Temporary	Indicates whether the table is temporary or permanent.
Index Organized	Indicates whether the table is Index Organized.
cluster	Indicates whether the table is clustered.
Logging	Contains “Yes” if logging is enabled for all operations or “NO” if minimal logging is enabled whenever applicable. For more information, see Oracle’s documentation.



If the selected table is partitioned, some of these fields will not be displayed in Precise for Oracle, but they will be displayed in the table partition itself.

About storage information related to a table

The Storage view, in the Objects tab, displays storage information related to the table, including used and free space, and extent information.

The following table describes how the information in the Storage view is structured.

Table 32 Structure of information in the Storage view

Item	Description
Table	Name of the table.
Owner	Owner of the table.
Tablespace	Displays the tablespace where the table is located.
Segment Blocks	Displays the number of segment blocks in the table.
Extents	Displays the number of extents in the table.
Initial Extent	Displays the size allocated to the first extent when the table was created.
Next Extent	Displays the size allocated when the table size is not sufficient.
Pct. Increase	Displays the default percentage increase in size on each subsequent extent allocation.
Pct. Used	Displays the percentage of used space in each data block.
Pct. Free	Displays the percentage of space reserved in each data block for updates.
Min. Extents	Displays the minimum number of extents allowed.
Max. Extents	Displays the maximum number of extents allowed.
Init. Trans.	Displays the initial number of transaction slots in each block.
Max. Trans.	Displays the maximum number of transaction slots in each block.
Free Lists	Displays the number of free lists.
Type	Displays Type of the object.
Table #	Displays table id as shown in Oracle dictionary.



If the selected table is partitioned, some of these fields are not displayed in Precise for Oracle, but they will be displayed in the table partition itself.

About the statistics of a table

The Statistics view, in the Objects tab, displays statistics on the table. This information is generated by the Oracle statistics collection mechanism.

The following table describes how the information in the Statistics view is structured.

Table 33 Structure of information in the Statistics view

Item	Description
Rows	Indicates the number of rows.
Chained Rows	Indicates the number of chained rows.
Row Length (Avg.)	Indicates the average row length.
Recent Growth	Indicates the growth of the table (in blocks) since the previous statistics collection and from the Collect Schema Changes process.
Last Analyzed on	Displays the date of the last analysis.
Empty Blocks	Displays the number of empty blocks.
Non-empty Blocks	Displays the number of non-empty blocks.
Free space per Block (Avg.)	Displays the average amount of free space per block.

About table-related changes

The Changes view, in the Objects tab, displays details of the changes that were made to the table and the indexes defined on the table.

The following table describes how the information in the Changes view is structured.

Table 34 Structure of information in the Changes view

Column	Description
Timestamp	Displays the date the change took place.
Change Type	Displays a description of the change. For example: EMPLOYEE.DENSITY modified from 0.00201 to 0.00203.

Associating a table with other entities

You can associate a table in the Main area of the Objects tab with the following entities in the Association area:

- Columns that make up the table
- Indexes that are related to the table
- Statements that access the table
- Table partitions
- Table subpartitions

You can display additional entities by using the More... option.

The information in the Association area table is displayed on the following tabs:

- **Dictionary tab.** Displays data dictionary information for the selected table.
- **Storage tab.** Displays storage information for the selected table.
- **Statistics tab.** Displays the statistics for the table, generated by the Oracle statistics collection mechanism

About the Index and Unused Index entities

The Index entity, in the Objects tab, displays general details, storage information, Oracle statistics information, and change-related information for the selected index or unused index.

An index is unused if it has not been referenced in an explain plan. Until some statements have been explained using Precise for Oracle, all indexes are, by definition, unused. For this reason, it is important that all functions within an application are exercised before you search for unused indexes. Statements are automatically explained by Precise for Oracle FocalPoint once a day (by default), so there may be a lag before a statement is explained following its execution.

The following views are available:

- Overview
- RAC Database
- Dictionary
- Storage
- Statistics

- Changes

About the overview of an index

The Overview, in the Objects tab, displays general index information and several overtime graphs. The following table describes how the general information is structured.

Table 35 Structure of general information for an index

Item	Description
Create d on	Displays the creation date of the index.
Status	Displays the status of the index—indicates whether it is valid, or invalid.
Type	Displays the type of index—Normal or Bitmap.
Unique	Indicates whether the key values are unique.
Partiti oned	Indicates whether the index is partitioned.
Table	Displays the name of the table that the selected index is referring to.
Owner	Displays the Oracle user that owns the index.
Distinc t Keys	Displays the number of distinct values in the index.
Cluste ring Factor	Displays the clustering factor of the index. The clustering factor is an important factor in determining how efficiently an index range scan will retrieve data from the table. It measures the degree to which the data in the index and its table are in the same order or, put another way, the probability that the next row to be fetched from the table is in the same block as the current row. It can vary between the number of blocks in the table (the best case because they are in the same order) and the number of rows in the table (the worst case because they are completely out of sync). The clustering factor tends to become worse over time as data is inserted and deleted. Note that the clustering factor makes no difference for a unique index lookup.
Leaf Blocks	Displays the number of blocks at the lowest index level.
B- Levels	Displays the number of levels above the leaf blocks in the index (indicates the depth of the index).
Last Analyz ed on	Displays the date when the index was last analyzed.

The following table describes the overtime graphs for a table.

Table 36 Overtime graphs for a table

Graph	Description
In Oracle (Sum.)	Displays the relevant In Oracle wait states.
Changes	Displays the number of changes that took place.
Distinct Keys	Displays the number of distinct keys in the index.
Clustering Factor	Displays the clustering factor of the index.

The changes, distinct keys, and clustering factor data is dependent on the Collect Schema Changes process. Precise for Oracle reports statistical changes when this process is run.

About the RAC Database of an index

The RAC Database view, in the Objects tab, compares the index activity of the entire RAC database to the index activity of the selected RAC instance. This view shows aggregated wait states, and load balancing and indicates whether only the specific instance is effected by an event, or whether the entire database is effected by the event.

The following table describes the information displayed on indexes in the RAC Database view.

Table 37 Information displayed on indexes in the RAC Database view

Item	Description
Database	Displays the logical name of the RAC database.
DB Name	Displays the Oracle database name.
DB ID	Displays the Oracle database ID.
Instance Number	Displays the number of the instance in the RAC database.
Instances	Displays the number of instances that share the same RAC database with the selected instance.
Overtime Graphs	Displays the In Oracle (Sum.) overtime graph. The graph compares the index or unused index activity of the entire database, to the index or unused index activity of the selected instance, over the selected time period.

About the dictionary of an index

The Dictionary view, in the Objects tab, displays the general properties of the index. The following table describes how the information in the Dictionary view is structured.

Table 38 Structure of information in the Dictionary view

Item	Description
Created on	Displays the creation date of the index.
Last Modified on	Displays the date on which the index was last modified.
Status	Displays the status of the index (valid or invalid).
Table	Displays the name of the table that the selected index is referring to.
Owner	Displays the Oracle user that owns the index.
Type	Displays the type of index—Normal, Bitmap.
Unique	Indicates whether the key values are unique.
Partitioned	Indicates whether the index is partitioned.
Compression	Indicates whether the index has been defined with the <code>COMPRESSES</code> attribute.
Logging	Indicates whether updates to the index are logged.
Columns	Displays the number of columns in the index.



If the selected index or unused index is partitioned, some of these fields will not be displayed in Precise for Oracle, but they will be displayed in the index partition itself.

About storage information related to an index

The Storage view, in the Objects tab, displays storage information related to the index. The following table describes how the information in the Storage view is structured.

Table 39 Structure of information in the Storage view

Item	Description
Tablespace	Displays the Tablespace in which the index is located.
Blocks	Displays the number of blocks in the index.
Extents	Displays the number of extents in the index.
Initial Extent	Displays the size allocated to the first extent when the index was created.
Logging	Indicates whether updates to the index are logged.
Compression	Indicates whether the index has been defined with the <code>COMPRESSES</code> attribute.
Table	Displays the name of the table that the selected index is referring to.
Owner	Displays the Oracle user that owns the index.



If the selected index or unused index is partitioned, some of these fields will not be displayed, but they will be displayed in the index partition itself.

About the statistics of an index

The Statistics view, in the Objects tab, displays statistics that are related to the index and generated by the Oracle statistics collection mechanism.

The following table describes how the information in the Statistics view is structured.

Table 40 Structure of information in the Statistics view

Item	Description
Distinct Keys	Displays the number of distinct values in the index.
Clustering Factor	Displays the clustering factor of the index. The clustering factor is an important factor in determining how efficiently an index range scan will retrieve data from the table. It measures the degree to which the data in the index and its table are in the same order or, put another way, the probability that the next row to be fetched from the table is in the same block as the current row. It can vary between the number of blocks in the table (the best case because they are in the same order) and the number of rows in the table (the worst case because they are completely out of sync). The clustering factor tends to become worse over time as data is inserted and deleted. Note that the clustering factor makes no difference for a unique index lookup.
Leaf Blocks	Displays the number of blocks at the lowest index level.
Leaf Blocks per Key	Displays the average number of leaf blocks in which each distinct key value appears. There must be at least one leaf block for a unique key.
Data Blocks per Key	Displays the average number of data blocks in which each distinct key value appears. There must be at least one leaf block for a unique key.
B-levels	Displays the number of levels above the leaf blocks in the index (indicates the depth of the index).
Last Analyzed on	Displays the date when the index was last analyzed.

About changes to indexes

The Changes view, in the Objects tab, displays details of the changes made to the index. The following table describes how the information in the Storage view is structured.

Table 41 Structure of the information in the Changes view

Column	Description
Timestamp	Displays the date of the change.
Change Type	Displays a description of the change. For example, EMP_DEPT_FK.DISTINCT_KEYS modified from 25 to 30.

Associating an index with other entities

You can associate an index in the Main area of the Objects tab with the following entities in the Association area:

- Columns in the index
- Tables that are indexed
- Statements that make use of the index (only if the index is used. By definition, no statements are associated with an unused index.)
- Index partitions and subpartitions

You can display additional entities by using the More... option.

The information in the Association area is displayed on the following tabs:

- Columns tab.** Displays information about the columns that make up the index.
 - Name.** Displays the name of the index.
 - Owner.** Displays the Oracle user that owns the index.

- **Columns.** Displays the number of columns that make up the index.
- **Column List.** Displays the names of the columns that make up the index.
- **Dictionary tab.** Displays data dictionary information for the selected index, similar to that described in the Main area.
- **Storage tab.** Displays storage information for the selected index, similar to that described in the Main area.
- **Statistics tab.** Displays statistics related to the index, as generated by the Oracle statistics collection mechanism.
 - **Index.** Displays the name of the index.
 - **Owner.** Displays the Oracle user that owns the index.
 - **Distinct keys.** Displays the number of distinct values in the index.
 - **Clustering Factor.** Displays the clustering factor of the index. The clustering factor is an important factor in determining how efficiently an index range scan will retrieve data from the table. It measures the degree to which the data in the index and its table are in the same order or, put another way, the probability that the next row to be fetched from the table is in the same block as the current row. It can vary between the number of blocks in the table (the best case because they are in the same order) and the number of rows in the table (the worst case because they are completely out of sync). The clustering factor tends to become worse over time as data is inserted and deleted. Note that the clustering factor makes no difference for a unique index lookup.
 - **Leaf Blocks.** Displays the number of blocks at the lowest index level.
 - **Leaf Blocks per Key.** Displays the average number of leaf blocks in which each distinct key value appears. There must be at least one leaf block for a unique key.
 - **Data Blocks per Key.** Displays the average number of data blocks in which each distinct key value appears. There must be at least one leaf block for a unique key.
 - **B-Levels.** Displays the number of levels above the leaf blocks in the index (indicates the depth of the index).
 - **Last Analyzed on.** Displays the date when the index was last analyzed.

About the Column entity

The Column entity, in the Objects tab, displays general details and Oracle analysis statistics for the selected column. The following views are available:

- Overview
- Statistics
- Buckets

About the overview of a column

The Overview, in the Objects tab, displays general column information and three overtime graphs that show the variation in the number of distinct values, the number of nulls, and the density. Density is the proportion of selective values divided by the number of distinct selective values. For uniformly distributed data, this equates to one over the number of distinct values.

The data is dependent on the Collect Schema Changes process. Precise for Oracle reports statistics changes when this process is run.

The following table describes how the general information is structured.

Table 42 Structure of general information for a column

Item	Description
Table	Displays the name of the table to which the column belongs.
Owner	Displays the Oracle-owning user.
Position	Displays the numeric position of the column within the table.
Predefined Type	Indicates whether the column is a predefined data type.
Type	Displays the data type of the column.
Length	Displays the length of the column.
Nullable	Indicates whether the column is allowed to hold null values.
Default Value	Displays a default value for the column, if any.

Additionally the Distinct Values, Null Values, and Density graphs are shown.

About the statistics of a column

The Statistics view, in the Objects tab, displays statistics related to the column and generated by the Oracle statistics collection mechanism.

The following table describes how the information in the Statistics view is structured.

Table 43 Structure of information in the Statistics view

Item	Description
Value (Min.)	Displays the lowest value for the column.

Value (Max.)	Displays the highest value for the column.
Distinct values	Displays the number of different values.
Null values	Displays the number of nulls.
Density	Displays the proportion of selective values divided by the number of distinct selective values. For uniformly distributed data this equates to one over the number of distinct values.
Time	Displays the date of the analyses.
Sample Size	Displays the number of rows sampled.
Length (Avg.)	Displays the average length of the column.

About the buckets of a column

The Buckets view, in the Objects tab, displays the distribution of column data in the Oracle statistics that were gathered. This information is typically generated for indexed columns with skewed data by running a statistics collection.

The following table describes how the information in the Buckets view is structured.

Table 44 Structure of information in the Buckets view

Column	Description
Bucket	The divisions of the Oracle statistics histograms.
Bucket Limit	The data value at the upper limit of each bucket.

Associating a column with other entities

You can associate a column in the Main area of the Objects tab with the following entities in the Association area:

- Statements that refer to the column
- Tables that the column belongs to
- Constraints that the column is involved in
- Indexes that the column belongs to

You can display additional entities by using the More... option.

The information in the Association area table is displayed on the following tabs:

- **Dictionary tab.** Displays data dictionary properties of the column similar to those displayed in the Main area overview.
- **Statistics tab.** Displays statistics on the column, as generated by the Oracle statistics collection mechanism.
- **Usage tab.** Displays information on how the column has been accessed within explain plans.
 - **Column.** Displays the name of the column.
 - **References.** Displays the total of the counts displayed in the columns that followed, viewed as a numeric figure or bar chart.
 - **As Indexable.** Displays the number of times a column could have been used as part of an index.
 - **In Select.** Displays the number of times a column appeared in a Select clause.
 - **In Where.** Displays the number of times a column appeared in a Where clause.
 - **In Update.** Displays the number of times a column appeared in an Update clause.
 - **In Join.** Displays the number of times a column appeared in a Join predicate.
 - **In Aggregate.** Displays the number of times a column appeared in an Aggregate function.
 - **In Distinct.** Displays the number of times a column appeared in a Distinct clause.
 - **In Order.** Displays the number of times a column appeared in a Sort by clause.
 - **In Group.** Displays the number of times a column appeared in Group by clause.
 - **Position.** Displays the numeric position of the column within the entities.

About the Statement entity

The Statement entity, in the Objects tab, displays activity information, In Oracle performance, the text of the statement, and the storage location for the selected statement.

The following views are available:

- In Oracle
- Overall activity
- Text
- Workshop

About In Oracle information for a statement

The In Oracle view, in the Objects tab, displays an overtime graph of the In Oracle wait states. See “Wait States” on page 35.

About the overall activity of a statement

The Overall Activity view, in the Objects tab, displays a graph that illustrates the statement’s overall activity over the selected time period. See “Wait States” on page 35.

About the text of a statement

The Text view, in the Objects tab, displays the full SQL text of the selected statement.

About information on the cabinet or folder related to a statement

The Workshop view, in the Objects tab, displays details on the cabinet or folder where the statement or PL/SQL is saved and on how it will be explained.

In general, if you prefer that a statement be referenced by a user-defined name in all tabs, rather than by a numeric identifier, you can save it to a particular cabinet or folder and assign a name to it. If required, you can also edit it later or add a tuning comment. See “Editing the properties of a statement” on page 31 and “About Precise for Oracle tabs” on page 21.

The following table describes how the information in the Workshop view is structured.

Table 45 Structure of information in the Workshop view

Item	Description
Explained on	Displays the date on the which the statement was last explained.
Optimizer Mode	Displays the Oracle optimizer mode.
Cost	Displays the optimizer cost.
Parsing User	Displays the Oracle user that the explain plan is generated for.
Cabinet	Displays the cabinet where the statement is stored.
Folder	Displays the folder within the cabinet where the statement is stored.
Origin	Indicates where the statement originated from, for example, automatically collected.
Saved on	Displays the date statement was saved.
Comment	Displays a textual comment associated with the statement.

About associating a statement with other entities

You can associate a statement in the Main area of the Objects tab with the following entities in the Association area:

- Tables
- Indexes
- Views

You can display additional entities by using the More... option.

The information in the Association area table is displayed on the following tabs:

- **General tab.** Displays the statement name and a portion of the SQL. You can also click on the tuning icon to launch the SQL tab to further your analysis.
- **Workshop tab.** Displays similar information to the information displayed in the Workshop view in the Main area. It is possible to associate from a Statement to the Tables, Indexes, and Views that it accesses.

About the PL/SQL entity

The PL/SQL entity, in the Objects tab, displays general details and the text of the selected PL/SQL. The following views are available:

- Overview
- Text

About the overview of a PL/SQL

The Overview, in the Objects tab, displays general information on the selected PL/SQL. The following table describes how the general information is structured.

Table 46 Structure of general information for a PL/SQL

Item	Description
Name	Displays the name of the PL/SQL.
Owner	Displays the Oracle user to which the PL/SQL belongs.
Type	Displays the type of PL/SQL. Possible values are: <ul style="list-style-type: none">• Procedure• Function• Package• Package Body
Created on	Displays the date on which the PL/SQL was created.
Last Modified on	Displays the date on which the PL/SQL was last updated.
Status	Displays the status of the PL/SQL (valid or invalid).

About the text of a PL/SQL

The Text view, in the Objects tab, displays the full text of the selected PL/SQL.

Associating a PL/SQL with other entities

You can associate a PL/SQL in the Main area of the Objects tab with the following entities in the Association area:

- Objects referenced in the text
- Views referenced in the text
- Tables referenced in the text

You can display additional entities by using the More... option.

About the View entity

The View entity, in the Objects tab, displays general details and the text for the selected view. The following views are available:

- Overview
- Text

About the overview of a view

The Overview, in the Objects tab, displays general information on the selected view.

The following table describes how the general information is structured.

Table 47 Structure of general information for a view

Item	Description
Name	Displays the name of the view.
Owner	Displays the Oracle user to which the view belongs.
Created on	Displays the date on which the view was created.
Last Modified on	Displays the date on which the view was last updated.
Type	View
Status	Displays the status of the view—whether it is valid or invalid.
Object ID	Displays the unique Oracle object ID for the view.

About the text of a view

The Text view, in the Objects tab, displays the full text of the selected view.

Associating a view with other entities

You can associate a view in the Main area of the Objects tab with the following entities in the Association area:

- Statements that access the view
- Columns that the view includes

You can display additional entities by using the More... option.

About the Attribute entity

The Attribute entity, in the Objects tab, displays general information (Overview) that is retrieved from the data dictionary.

Associating an attribute with other entities

You can associate an attribute, in the Objects tab, with the following entities:

- User-defined type of attribute
- User-defined type containing attribute

You can display additional entities by using the More... option.

About the Cluster entity

The Cluster entity, in the Objects tab, displays information from the data dictionary (Overview and Storage view) and lists the schema changes that have been made to the cluster during the selected time period (Schema Changes view).

Associating a cluster with other entities

You can associate a cluster in the Objects tab with the following entities:

- Tables
- Columns
- Indexes

You can display additional entities by using the More... option.

The information in the Association area table is displayed on the following tabs:

- **Dictionary tab.** Displays data dictionary information for the associated clusters, such as status, cache, creation date and when they were last modified.
- **Storage tab.** Display storage information related to the associated clusters, such as tablespace, initial extent and next extent, and percent increased, used and free.

About the Constraint entity

The Constraint entity, in the Objects tab, displays general information that is retrieved from the data dictionary.

Associating a constraint with other entities

You can associate a constraint with the following entities:

- Columns
- Tables
- Views
- Constraints

You can display additional entities by using the More... option.

About the Index Partition and Index Sub-Partition entities

When an index partition (or index sub-partition) is displayed in the Main area of the Objects tab, the Overview and the Storage view are available. Both views display information from the data dictionary.

Associating an index partition or sub-partition with other entities

You can associate an index partition or sub-partition in the Main area of the Objects tab with the following entities in the Association area:

- Columns in the index (sub-)partition
- Index that owns the index (sub-)partition

- Columns in the partition key.

You can display additional entities by using the More... option.

The information in the Association area table is displayed on the following tabs:

- **Dictionary tab.** Displays information from the data dictionary.
- **Storage tab.** Displays information from the data dictionary.
- **Statistics tab.** Displays Oracle analysis statistics.

About the Indextype entity

When an indextype is displayed in the Main area of the Objects tab, the Overview provides general information from the data dictionary.

About associating an indextype with other entities

You can associate an indextype in the Main area of the Objects tab with User Defined Types and PL/SQLs. You can display additional entities by using the More... option.

About the LOB entity

When an LOB is displayed in the Main area of the Objects tab, the Overview provides general information from the data dictionary.

About associating an LOB with other entities

You can associate an LOB in the Main area of the Objects tab with the table that it belongs to. You can display additional entities by using the More... option.

The information in the Association area is displayed on the Dictionary and Storage tabs. Both display information from the data dictionary.

About the Materialized View entity

When a materialized view is displayed in the Main area of the Objects tab, it shows general information from the data dictionary (Overview) and the definition of the materialized view (Text view).

Associating a materialized view with other entities

You can associate a materialized view in the Main area of the Objects tab with its related tables, views, and nested materialized views. You can display additional entities by using the More... option.

The information in the Association area is displayed on the Dictionary tab, which shows information from the data dictionary, and the Text tab, which shows the view's definition.

About the Method entity

When a method is displayed in the Main area of the Objects tab, it shows general information from the data dictionary (Overview) and the definition of the method (Text view).

Associating a method with other entities

You can associate a method in the Main area of the Objects tab with its return type, that is, a user-defined type. You can display additional entities by using the More... option.

About the Rollback entity

When a rollback is displayed in the Main area of the Objects tab, the following views are available:

- **Overview.** Displaying information from the data dictionary.
- **Statistics.** Displays information relating to the Oracle analysis statistics.
- **Rollback Wait Graph.** Displays a graphical view of the rollback wait activity. You cannot drill down from an imported statement to other entities.

When the rollback is selected in the Association area, information is displayed on the following tabs:

- **Details.** Displays the same information as the Overview in the Main area.
- **Statistics.** Displays Oracle analysis statistics; lists only rollback segments with an online status.

You can display additional entities by using the More... option.

About the Sequence entity

When a sequence is displayed in the Main area of the Objects tab, the Overview provides general information from the data dictionary.

Associating a sequence with other entities

You can associate a sequence in the Main area of the Objects tab with PL/SQLs or other objects that use it, for example triggers and synonyms. You can display additional entities by using the More... option.

About the Synonym entity

When a synonym is displayed in the Main area of the Objects tab, the Overview displays general information from the data dictionary.

When a synonym is displayed in the Association area, it displays data dictionary information.

Associating a synonym with other entities

You can associate a synonym in the Main area of the Objects tab with its referenced object. You can display additional entities by using the More... option.

About the Table Partition and Table Sub-Partition entities

When a table partition or sub-partition is displayed in the Main area of the Objects tab, the Overview and the Storage view are available. Both views display information from the data dictionary.

When a table partition or table sub-partition is displayed in the Association area, information is displayed on the following tabs:

- **Dictionary.** Displays data dictionary information.
- **Storage.** Displays data dictionary information.
- **Statistics.** Displays Oracle analysis statistics.

You can associate an table partition or sub-partition in the Main area with the following entities in the Association area:

- Columns in the table (sub-)partition
- Columns in the partition key
- Table that spans the table (sub-)partition

You can display additional entities by using the More... option.

About the Trigger entity

When a trigger is displayed in the Main area of the Objects tab, the following views are available:

- **Overview.** Displays information from the data dictionary.
- **Text.** Displays the trigger definition.
- **SchemaChanges.** Displays changes that have been made to the trigger during the selected time period.

When a trigger is displayed in the Association area, it displays data dictionary information.

Associating a trigger with other entities

You can associate a trigger in the Main area of the Objects tab with the table or view that the trigger is defined for. You can display additional entities by using the More... option.

About the User entity

When a user is displayed in the Main area of the Objects tab, the Overview displays general information from the data dictionary.

When a user is displayed in the Association area, it displays data dictionary information.

Associating a user with other entities

You can associate a user in the Main area of the Objects tab with the tables, indexes, or views owned by the user, or with the statements that the user has executed. You can display additional entities by using the More... option.

About the User-Defined Type entity

When a user-defined type is displayed in the Main area of the Objects tab, the following views are available:

- **Overview.** Displays information from the data dictionary.
- **Text.** Displays a definition of the user defined type.

When a user-defined type is displayed in the Association area, it displays data dictionary information.

Associating a user-defined type with other entities

You can associate a user-defined type in the Main area of the Objects tab with attributes of that type, its own attributes and methods, and the objects where it is declared. You can display additional entities by using the More... option.

About the EMC Unit entity

This entity is only available, on the Objects tab, if you have installed Precise for Database & Storage. For more information on the supported platforms, see the *Precise Installation Guide*. For more information on the Storage Device entity, see "Storage Device entities" on page 123.

An EMC Unit is the highest level Symmetrix or Clariion entity and comprises the entire storage array. It contains devices, front-end directors, back-end directors and remote-directors. A unit may store data for many servers and applications. The EMC Unit entity displays configuration details and performance counters for units connected to the server that the currently selected instance is running on.

To determine if a unit is used by the selected instance, check the `Used by Instance` check box in the Association area. For more information on counters that are related to the current instance, drill down to the device level in either the Objects or Activity tabs.

The following views are available:

- Overview
- Performance
- Load
- Throughput

About the overview of an EMC unit

The Overview, in the Objects tab, displays general information on the Symmetrix unit, such as ID, model, and number of physical disks.

About the performance of an EMC unit

The Performance view, in the Objects tab, displays two overtime graphs that illustrate the following information:

- The number of sequential reads and the total number of read and write requests during the selected time period.
- The read, write, and overall cache hit ratios over the same time period.

About the load of an EMC unit

The Load view, in the Objects tab, displays an overtime graph that illustrates the megabytes of data read and written during the selected time period.

About the throughput of an EMC unit

The Throughput view, in the Objects tab, displays an overtime graph that illustrates the I/O rate (requests per second) and the throughput (megabytes per second) over the selected time period.

Associating an EMC unit with other entities

You can associate an EMC unit in the Main area of the Objects tab with the disk directors, front end directors, remote directors, and devices configured for the unit. You can display additional entities by using the More... option.

How the Objects tab can help you identify performance problems

The Objects tab helps you understand the relationship between database objects and statements. You can identify a performance problem by doing one or more of the following:

- [Examining INIT.ORA parameters](#)
- [About examining schema changes and tablespaces](#)

Examining INIT.ORA parameters

INIT.ORA parameters can help you when tuning a statement, object or instance in the Objects tab. To examine INIT.ORA parameters

1. In the Time Frame list, choose the period of time you want to analyze.
2. In the Instance list, choose the instance you want to view.
3. In the Main area, observe the Init Parameters view.

About examining schema changes and tablespaces

You can observe information on the schema changes in the Objects tab, by selecting an instance and the Schema Changes view.

To examine schema changes and tablespaces

1. In the Time Frame list, choose the period of time you want to analyze.
2. In the Instance list, choose the instance you want to analyze.
3. On the View controls in the Main area, click **Schema Changes** to open a view for that instance.
4. Now take a look at the Tablespaces entities, to understand how objects grow over time and what effect their growth has on performance. For example, the Objects tab shows storage information on tablespaces in Instance ora920, including the used and free space. Clicking a tablespace reveals details of an individual tablespace.

In another example, we analyze the number of reads and writes to a tablespace storing indexes. Here the number of physical write operations is much higher than the physical reads, probably as a result of heavy insert or update activity. This may indicate that the performance of insert or update statements is suffering because of the requirement to maintain the indexes.

For example, the number of physical reads from all the tables in tablespace XDB has increased over time. This is probably due to index range scans or full table scans that need to return more rows.