Oracle® Enterprise Manager

Getting Started with the Oracle Standard Management Pack

Release 9.0.1

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Oracle Enterprise Manager Getting Started with the Oracle Standard Management Pack, Release 9.0.1

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Preface

This section describes the purpose and organization of this guide: *Getting Started with the Oracle Standard Management Pack.* Specifically, it covers the following topics:

- Purpose of This Guide

- Audience

- How This Guide Is Organized

- Conventions Used in This Guide

- Oracle Enterprise Manager Pack Information

- Related Publications

- Oracle Enterprise Manager Documentation

- Oracle Support

- Documentation Accessibility

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Purpose of This Guide

This guide provides an overview of the Oracle Standard Management Pack applications and their features. As the guide describes how to use the Oracle Standard Management Pack applications, it also introduces you to key concepts and terminology in the following products: Oracle Performance Manager, Oracle Index Tuning Wizard, Oracle Baseline Viewer, Oracle Change Manager, Oracle Create Baseline, Oracle Compare Database Objects, and Oracle TopSessions charts.

Audience

This guide is written for Oracle Standard Management Pack users who want to monitor and diagnose problems, tune high impact indexes, and track and compare changes in their Oracle environment.

How This Guide Is Organized

This guide is organized as follows:

Chapter 1, "Overview"

Provides a general description of the Oracle Standard Management Pack.

Chapter 2, "Post-Installation Configuration"

Describes how to configure Performance Manager and TopSessions.

Chapter 3, "Introduction to Oracle Performance Manager"

Provides an overview of the Oracle Performance Manager application and its features.

Chapter 4, "Introduction to Oracle Index Tuning Wizard"

Provides an overview of the Oracle Index Tuning wizard.

Chapter 5, "Overview of the Change Management Applications"

Provides an overview of the Baseline Viewer, Create Baseline, Compare Database Objects, and Change Manager applications and their features.

Chapter 6, "Using Change Manager"

Provides an overview of the Change Manager application.

Chapter 7, "Using Oracle TopSessions"

Provides an overview of the Oracle TopSessions application and its features.

Appendix A, "Troubleshooting Appendix"

Provides solutions to problems you may encounter while working with the Standard Management Pack.

Conventions Used in This Guide

The following table lists the conventions used in the guide.

Convention	Explanation
#	The default superuser prompt.
%	The default user prompt.
[Ctrl/C]	Press the Ctrl key while you simultaneously press another key (in this case, C).
italics	Italicized words indicate variables, such as a file or directory name.
$ORACLE_HOME	Represents the directory where you installed Oracle Enterprise Manager components and the Oracle Standard Management Pack applications. The directory name may be different on your system.
otrace*xx*	The *xx* represents the version of the database for which you are collecting data; for example, otrace73 for the Oracle Server release 7.3.

This guide also assumes that you are familiar with the operation of Microsoft Windows NT. Refer to the Windows documentation for your system, if necessary. In general, this guide shows the directory names as they are used in UNIX; on an NT system, delineate directory names with a backslash (\).

To reduce wordiness and redundancy, menu and submenu choices are joined by arrows. For example, Collection=>Create refers to the Create Collection choice in the Collection menu.

Oracle Enterprise Manager Pack Information

The Oracle Enterprise Manager product family includes the following packs: Oracle Change Management Pack, Oracle Diagnostics Pack, Oracle Standard Management Pack, Oracle Tuning Pack, Oracle Management Pack for SAP R/3, and Oracle Management Pack for Oracle Applications. Each pack is fully integrated into the Oracle Enterprise Manager Console framework.

Oracle Change Management Pack

- Includes Baseline Viewer, Change Manager, DB Alter, Create Baseline, Compare Database Objects, DB Propagate, DB Quick Change, Find Database Objects, and Plan Editor.

- Tracks metadata changes in databases.

- Eliminates errors and loss of data when upgrading databases to support new applications.

- Analyzes the impact and complex dependencies associated with application change and automatically performs database upgrades.

- Allows you to find the database objects that match a set of search criteria that you specify.

- Initiates change safely with easy-to-use wizards that teach the systematic steps necessary to upgrade.

Oracle Diagnostics Pack

- Includes Oracle Performance Manager, Oracle Capacity Planner, Oracle Trace Data Viewer, Oracle TopSessions charts, and Oracle Event Tests that are provided with the Oracle Diagnostics Pack.

- Monitors, diagnoses, and maintains the health of databases, operating systems, and applications. Both historical and real-time analysis are used to automatically avoid problems before they occur.

- Provides powerful capacity planning features that enable users to easily plan and track future system resource requirements.

Oracle Standard Management Pack

- Includes Baseline Viewer, Change Manager, Create Baseline, Compare Database Objects, Oracle Index Tuning Wizard, Oracle Performance Manager, and Oracle TopSessions charts.

- Monitors and diagnoses problems, tunes high impact indexes, and tracks and compares changes in your Oracle environment.

Oracle Tuning Pack

- Includes Oracle Auto-Analyze, Oracle SQL Analyze, Oracle Expert, Oracle Index Tuning Wizard, Oracle Tablespace Map, and Oracle Reorg Wizard.

- Optimizes system performance by identifying and tuning major database and application bottlenecks such as inefficient SQL, poor data structures, and improper use of system resources.

- Discovers tuning opportunities and automatically generates the analysis and required changes to tune the system. Inherent in the product are powerful teaching tools which train DBAs how to tune as they work.

- Helps increase the productivity of developers and DBAs.

Oracle Management Pack for SAP R/3

- Includes Oracle Performance Manager, Oracle Capacity Planner, and Oracle Event Tests that are specific to monitoring your SAP R/3 environment.

- Monitors, diagnoses, and maintains the health of a SAP R/3 system. Both historical and real-time analysis are used to automatically avoid problems before they occur.

- Provides powerful capacity planning features that enable users to easily plan and track future system resource requirements.

Oracle Management Pack for Oracle Applications

- Includes Oracle Performance Manager, Oracle Capacity Planner, Concurrent Processing Tuning Assistant, and Oracle Applications Event Tests.

- Enables you to monitor all aspects of your system, including databases and concurrent managers.

- Enables the monitoring, diagnosing, and capacity planning of the Oracle Applications environment.

Related Publications

For further details about the information provided in this manual, see the following manuals in the Oracle Server documentation set:

- *Oracle9i Database New Features*

- *Oracle9i Database Concepts*

- *Oracle9i Database Administrator's Guide*

- *Oracle9i Database Performance Guide and Reference*

- *Oracle9i Database Performance Methods*

Oracle Enterprise Manager Documentation

The *Getting Started with the Oracle Standard Management Pack* manual is one of several Oracle Enterprise Manager documents.

Oracle Enterprise Manager base documentation

- The *Oracle Enterprise Manager Readme* provides important notes regarding the online documentation, updates to the software, and other late-breaking information for Oracle Enterprise Manager and the Oracle Management Packs.

- The *Oracle Enterprise Manager Administrator's Guide* explains how to use Oracle Enterprise Manager, Oracle's systems management console, common services, and integrated platform tool.

- The *Oracle Enterprise Manager Concepts Guide* provides an overview of the Oracle Enterprise Manager.

- The *Oracle Enterprise Manager Configuration Guide* explains how to configure Oracle Enterprise Manager.

- The *Oracle Enterprise Manager Messages Manual* describes the Oracle Enterprise Manager error messages and methods for diagnosing the messages.

- The *Oracle Intelligent Agent User's Guide* provides configuration information and answers to crucial troubleshooting questions pertaining to the Oracle Intelligent Agent.

- The *Oracle Enterprise Manager Event Test Reference Manual* describes Oracle Event Tests which allow you to implement automatic problem detection and correction on concurrent managers, databases, listeners, nodes, and SAP R/3 systems.

Oracle Management Pack Installation Documentation

- The *Oracle 9i Installation Guide Release 9.0.1 for UNIX Systems* provides important information for installing the Oracle Enterprise Manager console and the management packs. This manual also contains information such as hardware and software requirements, installable components, and deinstallation procedures. The *Oracle 9i Installation Guide Release 9.0.1 for UNIX Systems* is located on the Oracle9i Online Generic Documentation CD-ROM, Release 1 (9.0.1) or you can get a free download from the Oracle Documentation Center at docs.oracle.com.

Oracle Change Management Pack documentation

- The *Getting Started with Oracle Change Management Pack* manual provides an overview of the concepts and features of the Oracle Change Management Pack applications.

Oracle Diagnostics Pack documentation

- The *Getting Started with the Oracle Diagnostics Pack* provides an overview of the concepts and features of Oracle Performance Manager, Oracle Capacity Planner, Oracle Data Viewer, and the Oracle TopSessions charts.

Oracle Tuning Pack documentation

- *Database Tuning with the Oracle Tuning Pack* provides an overview of the concepts and features of each of the applications included in the Oracle Tuning Pack. The applications include Oracle SQL Analyze, Oracle Expert, Oracle Index Tuning Wizard, Reorg Wizard, Tablespace Map, Outline Management, and the Outline Editor. A description of how these applications can work together to tune an Oracle database is also provided.

Oracle Management Pack for SAP/R3 Documentation

- *Oracle Management Pack for SAP R/3 Readme* provides important notes regarding Oracle Management Pack for SAP R/3 online documentation, updates to the software, and other late-breaking information.

- *Getting Started with Oracle Management Pack for SAP R/3* provides an overview of the concepts and features of Oracle Performance Manager and Oracle Capacity Planner. It also describes Oracle Event Tests that are provided with the Oracle Management Pack for SAP/R3.

- The *Oracle Management Pack for SAP R/3 Installation Guide* provides important information for installing the Oracle Management Pack for SAP R/3. This manual also contains information such as hardware and software requirements, installable components, and deinstallation procedures.

Oracle Management Pack for Oracle Applications Documentation

- *Getting Started with Oracle Management Pack for Oracle Applications* provides an overview of the concepts and features of Oracle Performance Manager, Oracle Capacity Planner, and Concurrent Processing Tuning Assistant. It also describes Oracle Applications Event Tests and Jobs that are specific to monitoring your Oracle Applications environment.

Oracle Support

The Oracle MetaLink site provides access to information that will aid you in using Oracle products such as: hot topics, product reference, installation assistance materials, white papers, problem/solution articles, and more . To use this site you

must be a licensed Oracle user with an active support service contract. Contact your Oracle sales representative for more information.

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How to Find Oracle Documentation Online

To download free release notes or installation documentation, please visit the Oracle Documentation Center at http://docs.oracle.com/.

Printed documentation is available for sale in the Oracle Store at http://oraclestore.oracle.com/.

1

Overview

The Oracle Standard Management Pack is an optional set of applications that provide advanced tools that allow you to monitor and diagnose problems, tune high impact indexes, and track and compare changes in your Oracle9*i* environment.

The Oracle Standard Management Pack includes the following applications:

- Oracle Performance Manager

  Applies real-time, graphical Oracle and host monitoring through an extensive array of customized performance charts.

- Oracle Index Tuning Wizard

  Pro actively optimizes the indexes in your database environment.

- Oracle Baseline Viewer

  Lets you display baselines created using Create Baseline.

- Oracle Change Manager

  Gives you direct or indirect access to change management operations.

- Oracle Create Baseline

  Captures definitions of schema objects.

- Oracle Compare Database Objects

  Allows you to easily compare schemas or databases.

- Oracle TopSessions Chart

  Provides focused, performance diagnostics for Oracle sessions.

The following sections provide an overview of these applications.

What's New in Oracle Standard Management Pack for Release 9*i*

The following list provides the new features and enhancements to release 9i of the Oracle Standard Management Pack.

- An enhanced real time diagnostics interface that builds on the new performance data organization and drilldowns for Performance Manager.

    - New organization of the Database Health overview diagnostics charts for easier performance assessment.

    - Integration of host operating system diagnostics data in the Database Health overview, providing a single monitoring point for databases and operating systems.

    - Drilldowns to diagnostics advice.

- Automated generation and web publication of Performance Manager charts. This allows the administrator to set up status and performance reports that are periodically updated for access from a web server by other database administrators and system managers. This supports all services covered by Performance Manager.

- New top activity diagnostics charts for finding and troubleshooting high impact sessions and SQL in Performance Manager.

    - New filtering capabilities providing complete flexibility in searching for high impact activity, such as high cost SQL by object or type.

    - New top details provide graphical performance data to help diagnose a problem session or SQL statement.

- Direct Connect Performance Manager that allows database monitoring without the Agent and OMS.

- Architectural enhancements for better performance and scalability for Change Manager. In this release there are performance improvements for Capture and Compare operations running against large schemas.

- Extended coverage for Instance parameters in tracking applications. Change Manager is extended to capture and compare Oracle instance parameters. You can compare instance parameters between any combination of databases and baselines. This is valuable in diagnosing performance problems.

- Browser-based implementation.

Oracle Performance Manager

Oracle Performance Manager provides a system for capturing, filtering, and presenting performance data for both the database and the host operating system. Oracle Performance Manager offers:

- Graphical, real-time monitoring

  With Oracle Performance Manager, database and host operating system performance statistics are captured in real-time mode and can be viewed in various tables and charts and in two- and three-dimensional presentations.

- Predefined charts

  Oracle Performance Manager provides a large collection of predefined charts and tables organized into performance monitoring groups, including database contention, I/O, load, memory use, instance metrics, parallel server performance, and host operating system resource usage.

- User-defined charts

  Oracle Performance Manager can be used to graphically display any data accessible through SQL or through the data collection framework. The application allows you to create customized charts from user-defined scripts which then can be added to the Oracle Performance Manager navigator tree for easy access.

- Customizable chart attributes and displays

  With Oracle Performance Manager, chart properties and attributes can be customized to change the type of the presentation. The type of chart can be changed to bar, hierarchical, strip, pie, or table.

- Chart drill down

  Allows charts to be linked to other charts to gather detailed information.

- Record and playback of charts

  A user can capture a chart's activity for analysis at a later date. Oracle Performance Manager allows charts to be recorded and played back at your convenience.

Oracle Index Tuning Wizard

The Oracle Index Tuning wizard quickly finds indexing problems that can slow down the performance of your Oracle8 database. You can use the Index Tuning

wizard to evaluate and optimize indexes for situations when, for example, SQL statement response time is slow.

The Index Tuning wizard considers your application type, for example, data warehousing, table, and SQL statements for tuning.

The Index Tuning wizard then implements the generated recommendations or saves the recommendations for later implementation. Each index recommendation generated contains detailed information on exactly what operation needs to be performed on the schema.

Oracle Change Manager

The Change Manager application is the change management central interface. In most cases, Change Manager gives you direct or indirect access to change management operations, such as creating baselines with Create Baseline and comparing database object definitions with Compare Database Objects.

Create Baseline

The Create Baseline application guides you through the process of capturing the definitions of a database (or a subset of a database) in a form useful to Compare Database Objects and other applications. Create Baseline lets you specify the set of database object definitions to capture, then captures those definitions in their current state.

Create Baseline can capture object definitions in both of the following forms:

- A baseline. The baseline stores definitions in a form that Create Baseline can use. (A baseline is an object that contains a set of database definitions captured at a certain time.)

- SQL DDL (optional). These SQL DDL statements can be used to create the definitions in a new database or as input to CASE tools that accept SQL DDL input.

The Baseline Viewer application lets you display baselines created using Create Baseline. Baseline Viewer also allows you to view a particular version of a baseline and to generate SQL statements for a baseline (if the statements were not generated already by Create Baseline when the baseline was created).

Compare Database Objects

The Compare Database Objects application guides you through the steps of selecting two sets of object definitions and then comparing them. The object definitions can be selected from current databases or they can be selected from baselines created earlier with Compare Database Objects. If differences are found when the two sets of object definitions are compared, the Comparison Viewer allows you to view the differences between the corresponding object definitions.

Oracle TopSessions

The Oracle TopSessions chart provides a focused view of database activity by database session. Oracle TopSessions extracts and analyzes sample dynamic Oracle performance data by session, automatically determining the top Oracle users based on a specific selection criteria, such as memory, CPU usage, or file I/O activity.

> **Note:** All the applications that make up the Oracle Standard Management Pack are members of other Oracle Enterprise Manager Packs. For this reason, you may find mention of other applications in the help, documentation, and user interfaces that make up the Oracle Standard Management Pack.

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Post-Installation Configuration

After you have installed the Standard Management Pack, configure the components listed in the following table:

Components	Where to Find the Information
Performance Manager	Setting Up Performance Manager on page 2-1
Data Viewer	Obtaining Trace Data for Use in Trace Data Viewer on page 2-4

Setting Up Performance Manager

The following setup tasks are required before you use Oracle Performance Manager:

- Configure the Oracle Intelligent Agent to collect data
- Optionally, enable disk statistics collection on Windows NT

The following setup tasks are required before you use Performance Manager:

- Convert any user-defined charts you created with earlier versions of Performance Manager
- If you plan to use Performance Manager in a Parallel Server environment, you may need to set up your server using Oracle-supplied SQL scripts.

The following sections describe each of these setup tasks in more detail.

Configuring Oracle Intelligent Agent to Collect Data

Performance Manager and Capacity Planner require the use of the Intelligent Agent data gathering service. For monitoring operating system data, the Oracle Intelligent Agent must be installed on the same node as the operating system you are

monitoring. For monitoring other target types, such as databases, the Oracle Intelligent Agent can run on the same node as the target you are monitoring, or it can run on a different node, depending upon your configuration.

Refer to the *Oracle Intelligent Agent User's Guide* for information on how to configure and start the Oracle Intelligent Agent.

Enabling Disk Statistics Collection on Windows NT

To collect disk statistics on Windows NT, enable them by typing:

```
diskperf  -Y
```

Disk statistics are enabled the next time the system is restarted. For more information about the DISKPERF tool, refer to the Microsoft Windows NT documentation.

> **Note:** Enabling disk statistics is not required. You can still monitor other operating system statistics with Performance Manager or Capacity Planner even if disk statistics are not enabled.

Converting User-Defined Charts From Previous Releases of Performance Manager

If you created user-defined charts using Performance Manager release 1.5.0 or earlier and want to use them with the current Performance Manager release, you must first convert them to release 1.6.0.

Performance Manager Release 1.6.0 user-defined charts are converted to the current release when you migrate your existing performance data to the Enterprise Manager Release 2.1 repository.

For more information, refer to the following sections.

> **Note:** Release 1.5.5 of Performance Manager did not include the functionality of user-defined charts.

Converting Performance Manager Release 1.5.0 User-Defined Charts

To convert user-defined charts created using Performance Manager Release 1.5.0 or earlier:

1. Run vmmmig.exe. This executable creates a text file named vtmusr.txt in the $ORACLE_HOME\SYSMAN\ADMIN directory. This text file contains data

about the user-defined charts created using Performance Manager release 1.5.0 or earlier. When you run vmmmig.exe, specify the user name, password, and service for the Enterprise Manager repository that contains the user-defined charts that you want to convert, for example:

```
vmmmig joseph/password@my_rep
```

Note that `my_rep` in the previous command line is the service name for the Enterprise Manager repository.

2. Run vmm2vtm.exe. This executable uses the data in the vtmusr.txt file to create user-defined charts in the repository that can be used with Performance Manager release 1.6.0. When you run vmm2vtm.exe, supply a user name, password, and target for the Enterprise Manager V2.x repository and the name of the target under which you want the user-defined charts stored for Performance Manager release 1.6.0, for example:

```
vmm2vtm.exe joseph/password@my_rep my_db
```

Note that my_rep in the previous command line is the target name of the Enterprise Manager V2.x repository and my_db is the name of the target service under which you want the user-defined charts stored. In other words, after the previous command is run, all the user-defined charts are converted and stored under the my_db service in the Performance Manager release 1.6.0 tree view.

If any error messages are generated when you run vmm2vtm.exe, edit the vtmusr.txt file based on the error messages. For example, the error messages may state that there is a problem with a chart or that a chart does not exist. Since the vtmusr.txt file contains a list of the charts, edit the file to remove any problematic charts.

Then, run vmm2vtm.exe again.

Converting Performance Manager Release 1.6.0 User-Defined Charts

If you created user-defined charts with Performance Manager Release 1.6.0, you can convert those charts for use with the current release of Performance Manager. User-defined charts created with Performance Manager 1.6.0 are converted when you create a new Enterprise Manager repository and migrate your existing performance data to the new repository.

For more information about creating a new Oracle Enterprise Manager repository and migrating your existing data, see the *Oracle Enterprise Manager Configuration Guide*.

Using Performance Manager in a Parallel Server Environment

To use Performance Manager in a Parallel Server environment, two database instances must be started, otherwise Performance Manager does not treat the server as a Parallel Server.

There are two scenarios for using Performance Manager in an Oracle Parallel Server environment, and different configuration steps are required for each scenario.

The two scenarios and their configuration steps are:

1. If you are using Performance Manager to monitor an Oracle7 Parallel Server environment, do the following:

   a. Ensure all instances are running.

   b. Run the ops_gdl.sql script. This generates an appropriate ops_dbl.sql file. The ops_dbl.sql file shipped with the product is only an example. The actual contents of ops_dbl.sql depend on your database name, instance names, and the number of instances which exist.

   c. Run the ops_mon.sql script, which runs ops_ctab.sql, ops_dbl.sql, ops_ pack.sql to create Performance Manager tables and views to fetch and display Oracle7 Parallel Server data in charts.

      Oracle7 does not have global V$ (GV$) tables; these files install a set of PL/SQL procedures, database links, and O$ tables that are used by Performance Manager in the absence of GV$ tables.

2. If you are using Performance Manager to monitor an Oracle8 Parallel Server environment, you do not need to run any of the Parallel Server scripts. For example, if you use any release of Oracle that has GV$ tables (namely Oracle release 8.0 and later), you do not need to run these scripts.

Obtaining Trace Data for Use in Trace Data Viewer

To obtain data to view, see the chapter, "Using Oracle Trace" in the *Oracle9i Database Performance Guide and Reference* for information about collecting Oracle Trace Data via the command line interface.

3

Introduction to Oracle Performance Manager

Oracle Performance Manager is an Oracle Enterprise Manager application that allows you to monitor the performance of the database and its related applications and operating systems in real time. It allows system and database administrators to monitor performance statistics for Oracle database servers, web servers, Oracle concurrent managers, operating systems, and other managed targets. Performance Manager also allows you to record statistics and play them back at a later time.

You can display these statistics in a number of formats including horizontal and vertical tables, strip charts, horizontal and vertical bar charts, and pie charts. You can also drill down for more detail on some predefined charts.

For most targets, Performance Manager integrates Event system thresholds with charts so that events and charts share common performance thresholds you can set from either monitoring point. This provides consistent monitoring of thresholds across Enterprise Manager and allows access to graphical and historical diagnostics information from the Event system. You can investigate event notifications by launching charts, historical data and diagnostic advice directly from the Event Viewer. Performance Manager charts incorporate event notification through chart threshold state indicators. Performance Manager threshold and event features are available for node and database data.

You can use activity diagnostic charts such as TopSessions for finding and troubleshooting high impact sessions. These charts provide graphical performance data to help you diagnose a problem session or SQL statement.

> **Note:** In releases prior to 9*i*, the Agent data gathering service (also known as the Oracle Data Gatherer) was used to collect data for presentation in real-time performance monitoring utilities and historical data. The Intelligent Agent and the data gathering service were separate services that were started and stopped independently of each other.
>
> With 9*i*, the data collection capabilities are integrated into the 9*i* Intelligent Agent. Therefore, there is no separate service that needs to be started. Furthermore, when you stop the 9*i* Intelligent Agent, the data gathering capabilities are disabled and not available.

Oracle Performance Manager uses the Intelligent Agent (Agent) to collect performance data. To monitor some types of data, you must install the Agent on the system (or systems) where you want to monitor data. See the *Oracle Intelligent Agent User's Guide* for information on managing the Agent on a system.

If you are using Oracle Performance Manager to monitor database performance, the Agent can be installed on another system. See "Accessing Performance Data Through an Intermediate Host" on page 3-3 for more information on accessing data through an Agent on another system.

The types of performance data that Oracle Performance Manager can monitor on a system depends on the products that are installed. Table 3–1 shows the types of data (or targets) that Oracle Performance Manager can monitor when various Oracle products are installed.

Table 3–1   Data that Performance Manager Can Monitor when Various Oracle Products Are Installed

Oracle Product	Oracle Concurrent Manager Data	Oracle Server Data	Operating System Data	SAP R/3 System Data	Microsoft SQL Server Data
Diagnostics Pack	No	Yes	Yes	No	Yes
Management Pack for Oracle Applications	Yes	No	Yes	No	No

Table 3–1   Data that Performance Manager Can Monitor when Various Oracle Products Are Installed (Cont.)

Oracle Product	Oracle Concurrent Manager Data	Oracle Server Data	Operating System Data	SAP R/3 System Data	Microsoft SQL Server Data
Management Pack for SAP R/3	No	No	Yes	Yes	No
Standard Management Pack (Oracle Standard Edition only)	No	Yes	Yes	No	Yes

If additional products from Oracle or other vendors are installed, Oracle Performance Manager may be able to monitor additional types of data not shown in Table 3–1.

Accessing Performance Data Through an Intermediate Host

Oracle Performance Manager relies on the Agent to monitor a target (such as a node, a database, or a concurrent manager). Usually, the collection of the data is done on the system where the target is located. However, for some types of targets Oracle Performance Manager can also monitor data on a system by using the Agent on another system (an intermediate host).

This intermediate host could be the client system where the Oracle Performance Manager is running, or any other system on the network on which the Agent is available.

There are three ways to set the location of the Agent. The method you use depends on how you connect to the target. Consider the following three scenarios:

■   You connect to a target that has been discovered using the Enterprise Manager console and you are running Oracle Performance Manager while connected to the Oracle Management Server.

Performance Manager attempts to connect to the Agent on the host where the target is located. If this connection fails or cannot be attempted because no preferred credentials have been set for the target, you can use the Connection Details dialog box to specify logon credentials for the target. This dialog box

also contains a field to specify the location of the Agent that will be used to collect performance data.

- You click the **Add Service** button in the toolbar panel and manually add the target to the navigator.

  Performance Manager displays a Logon dialog box. You can use the Connection Details dialog box to specify the location of the Agent that will be used to collect performance data.

- You select a target in the Performance Manager navigator tree and choose **Set Connection Details** from the **File** menu.

  Performance Manager displays the Logon dialog box for the selected target. Use the Connection Details dialog box to specify the location of the Agent that will be used to collect performance data.

Usage Scenarios for Oracle Performance Manager

Using Oracle Performance Manager, you can:

- Monitor one or more targets concurrently.
- View the monitored data in various chart formats, including strip (line), pie, bar, table, and hierarchical.
- Set the refresh rate for a chart's data.
- View multiple charts concurrently for each monitored target.
- View multiple charts in a single window.
- Drill down from one chart to another related chart. Drill down to diagnostic advice.
- Choose the collected data and data sources to display in a chart.
- View threshold state indicators that provide immediate visual notification of performance status for specific targets.
- Print a chart.
- Generate and publish an HTML report for a chart.
- Display context-sensitive help for a chart, if help is available for the chart.
- Play a recording of a chart, with fast-forward and pause features.
- Create and modify user-defined charts.

Starting Oracle Performance Manager

You can start Oracle Performance Manager from the Oracle Enterprise Manager console, from the UNIX command line, or from the Windows **Start** menu.

Starting Oracle Performance Manager from the Console

You can start Oracle Performance Manager from the Oracle Enterprise Manager console in any of the following ways:

- On the Oracle Enterprise Manager console, point to the **Standard Management Pack** drawer, then click **Performance Manager**.

- On the **Tools** menu of the Oracle Enterprise Manager console, point to **Standard Management Pack**, then click **Performance Manager**.

- Click the right mouse button on the **target** for which you want to start Performance Manager and then choose **Performance Manager** from the **Related Tools** menu item on the context menu.

> **Note:** When you start Oracle Performance Manager from the Oracle Enterprise Manager console, Oracle Performance Manager connects to the Oracle Management Server using the same credentials used to start the Oracle Enterprise Manager console.

Starting Oracle Performance Manager from the UNIX Command Line

To start Performance Manager from the UNIX command line, set default to the ORACLE_HOME/bin directory, then type the following command:

```
./oemapp pm
```

> **Note:** ORACLE_HOME represents the home directory in which the Standard Management Pack is installed.

When you start Performance Manager from the UNIX command line, you are given a choice of logging in to the Oracle Management Server and running Performance Manager in Enterprise mode or Standalone mode.

See "Running Performance Manager in Enterprise Mode" on page 3-6 and "Running Performance Manager in Standalone Mode" on page 3-7 for more information about running Performance Manager in Enterprise mode and Standalone mode.

Starting Oracle Performance Manager from the Start Menu in Windows NT

On the **Start** menu of Windows NT, follow the path: **Start**=>**Programs**=>**ORACLE_ HOME**=>**Standard Management Pack**=>**Performance Manager**.

> **Note:** ORACLE_HOME represents the home directory in which the Standard Management Pack is installed.

When you start Performance Manager from the **Start** menu, you are given a choice of logging in to the Oracle Management Server and running Performance Manager in Enterprise mode or Standalone mode.

Running Performance Manager in Enterprise Mode

To run Oracle Performance Manager in Enterprise mode:

1. Click **Login to the Oracle Management Server**.

2. Enter the appropriate connection information for your Oracle Management Server.

   To select an alternate Management Server, click the **Management Server** button next to the **Management Server** drop-down list. In the resulting dialog box, you can add another node that is running Oracle Management Server software. The Oracle Management Server and its associated repository must already exist.

   For information on the fields in the Management Servers dialog box, click **Help**.

3. Click **OK**.

> **Note:** If the repository was created using Enterprise Manager Release 2.1 or earlier, you must upgrade the repository or create a new repository. For more information, see the *Oracle Enterprise Manager Configuration Guide*.

When Performance Manager is running in Enterprise mode and the navigator is first displayed with a target type folder expanded, the targets of that type that were discovered in the Enterprise Manager console are displayed. When you expand a target, Performance Manager attempts to connect to the target. When the target is a database and preferred credentials for the database have been saved in the Oracle Enterprise repository, Performance Manager attempts to connect to the database

using those credentials. Otherwise, the Oracle Database Logon dialog box prompts you for the logon information.

Running Performance Manager in Standalone Mode

To run Oracle Performance Manager in standalone mode (not connected to the Oracle Enterprise Manager repository), click **Standalone, no repository connection**, then click **OK**.

When Performance Manager is running in Standalone mode Performance Manager displays any targets that were added to the console in Standalone mode. You can add nodes or databases to the collection view for the current standalone mode session only. Click on the Add Service toolbar button after selecting the folder for the desired target type.

> **Note:** Your recordings and user-defined charts will not be saved in Standalone mode. If you exit Performance Manager, you will not be able to play back any recordings or access these user-defined charts in future sessions. You will also not be able to save any chart settings or custom charts.

Using the Oracle Performance Manager Main Window

The primary component of the Oracle Performance Manager user interface is the main window (see Figure 3–1), which contains two panels. The navigator or tree panel appears on the left side of the main window and the property sheet panel appears on the right side. When you select an item in the navigator panel, the property sheet panel displays the properties of the selected item.

When you first start Oracle Performance Manager, the navigator panel displays the target type folders and the property sheet panel displays the Performance Manager welcome screen.

A vertical toolbar appears on the left side of the window and a menu bar appears across the top of the window. For more information about the buttons in the toolbar and the commands available from the Performance Manager menus, choose **Window** from the Performance Manager **Help** menu.

In the navigator panel, the **Network** folder contains a folder for each target type. For example, when you have the Standard Management Pack installed, the target types are Nodes, Databases, and SQL Servers. Not all target types may be available on all systems.

In addition to the **Network** folders, the **Recordings** folder contains any recordings of chart data that exist. For more information about the **Recordings** folder, see "Recording Chart Data" on page 3-21.

Figure 3–1 Oracle Performance Manager Main Window
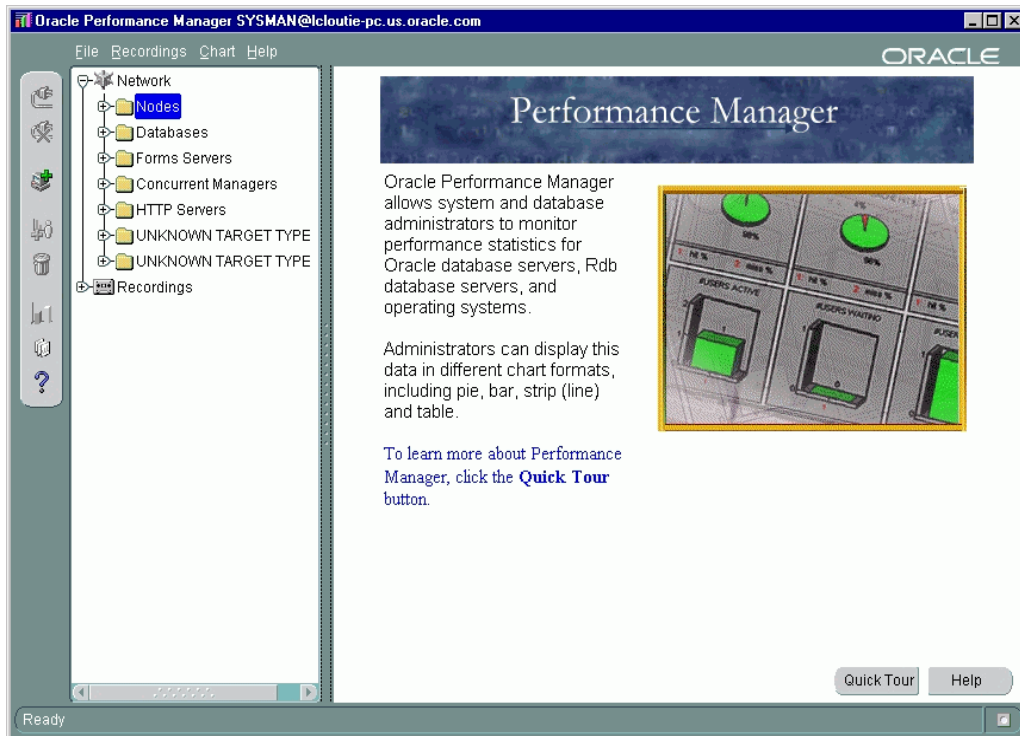
Connecting to a Discovered Target in Enterprise Mode

Expand a target type folder to view the corresponding targets previously discovered through the Oracle Enterprise Manager console.

To connect to a discovered target, select the target in the navigator tree and click **Connect to service** in the Performance Manager toolbar, or click the plus sign (+) next to the target in the navigator. You can also connect to the target by double clicking on it in the navigator tree . You may be prompted with a Logon dialog box if credentials are required to connect to the target. For information on the fields in the Logon dialog box, click **Help**.

Manually Connecting to a Target

You can manually add additional targets that have not been discovered using the Enterprise Manager console.

> **Note:** When you add a target manually to the navigator tree using the **Add Service** button, you are adding that target for the current session of Performance Manager only. You can begin collecting data for the target, but if you exit and restart Performance Manager, you will have to add the target again.

To add and connect to a target manually:

1. Select the folder for the target type you are adding.

2. Click **Add Service** in the Performance Manager toolbar panel.

Performance Manager displays a Logon dialog box.

3. Fill in the fields in the Logon dialog box and click **OK**.

For information on the fields in the Logon dialog box, click **Help**.

After you connect to a target, Performance Manager displays the classes of performance information you can monitor for the selected target. Expand a class to see the individual performance data charts available for the selected class.

Viewing Performance Manager Charts

You can display a chart using one of the following methods:

- Select the chart in the navigator, and click the **Show Chart** button on the toolbar.

- Select the chart in the navigator, and choose **Show Chart** from the **Chart** menu.

- Select the chart in the navigator, which displays the chart's property sheet. To start the chart with the selected property sheet options, click **Show Chart** on the property sheet.

- Select a chart class, then select the chart in the **Predefined Displays** list and click **Show Chart**.

- Select the chart in the navigator and click the right mouse button. From the context menu, click **Show Chart**.

Performance Manager displays each chart or chart group in its own window, which is separate from the main window. This window is called the Chart Display window. For more information, see "Using the Chart Display Window" on page 3-12.

Monitoring Multiple Targets Concurrently

You can view charts from multiple targets concurrently by connecting to the targets from the navigator tree and displaying charts.

Viewing Chart Groups

Some types of data include a chart group, which is two or more charts that are displayed within a single Chart Display window. You display a chart group the same way as you view any other chart (see "Viewing Performance Manager Charts" on page 3-9).

You can display a special chart group that contains the Overview Charts for a selected target:

1. Select a target in the Performance Manager navigator.

2. Click the **Show Overview Charts** button in the toolbar panel.

    Performance Manager displays a chart group containing some key statistics most likely of interest to database administrators monitoring the selected target.

Charts in a chart group are displayed within a single window. You perform actions, such as setting options and displaying drilldown charts, on one chart at a time within a chart group. The currently selected chart within a chart group window is identified by a highlighted title or a black box. For example, the **Memory Faults** chart is the currently selected chart in Figure 3–2.

Figure 3–2 Identifying the Selected Chart In a Chart Group
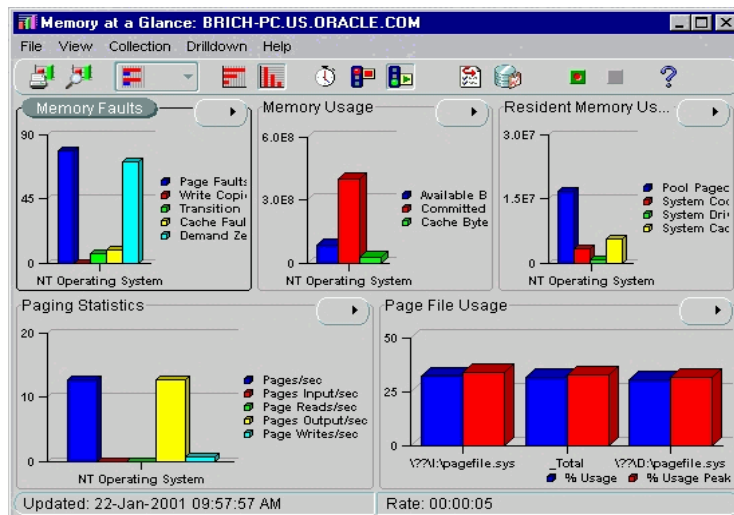
Besides viewing the Overview Charts for a selected target, you can also view a chart group provided with a data class. For example, you can select the **Memory** data class for a Windows NT node and display the **Memory at a Glance** chart group. Not all data classes provide chart groups, however.

Selecting Collected Data and Data Sources

For some charts, the chart's property sheet allows you to select the collected data to display and the data sources for which the collected data should be displayed.

The collected data are the statistics that can be monitored and displayed in the chart. The data sources are the items from which Oracle Performance Manager is able to collect the data. For example, the data source of disk statistics may be disk1 or disk2, and the data source of file statistics may be file1 or file2.

By clicking in the column next to the name of the collected data or the name of the data source in the chart property sheet, you can specify whether or not to monitor that collected data or data source and display it in the chart.

When a green check mark appears in the column, Oracle Performance Manager will display that collected data or data source in the chart. If you click in the column again, the check mark goes away, which indicates that Oracle Performance Manager will not display that collected data or data source. You can toggle back and forth between monitoring and not monitoring all the collected data or data sources by

clicking in the column head. If the check mark is gray, it means Oracle Performance Manager will display the collected data or data source, and you are unable to change the selection of this data.

If the chart definition contains default data source or collected data attributes, then those items are preselected in the chart's property sheet.

Using the Chart Display Window

When you display a chart, Oracle Performance Manager opens the Chart Display window. The window contains its own toolbar and menu bar. For information about the Chart Display window, choose **Window** from the Chart Display window **Help** menu.

Selecting a Chart Format

To change the format of the chart, click on the **Chart Format button** in the Chart Display window toolbar and select the format in which you want to display the chart from the list that displays.

For example, suppose a chart initially displays as a bar chart. To see the data as a pie chart, choose **Pie Chart** from the list that displays when you click on the Chart Format button in the toolbar. You can also display a chart in one of the additional formats:

- Bar (vertical or horizontal orientation)

- Strip (or line chart)

- Table (vertical or horizontal orientation)

- Hierarchical

You can also choose a chart format from the View menu in the Chart display window or right mouse click on a chart and select a chart type from the context menu. For more information about the buttons on the Chart Display window toolbar, see the Oracle Performance Manager online help.

> **Note:** Depending upon the type of chart you are displaying, one or more of the chart formats may not be available.

Setting the Chart Refresh Rate

By default, most charts are set to refresh every fifteen seconds but vary based on the chart. That means that Performance Manager collects the data every fifteen seconds and then immediately refreshes (or redisplays) the chart using the new data.

To change the refresh rate for the current chart:

1. Click the **Refresh Rate** button in the Chart Display window toolbar.

Performance Manager displays the Refresh Rate dialog box.

2. Use the fields on the dialog box to set a new refresh rate for the current chart.

3. Click **OK** to close the dialog box and display the chart using the new refresh rate.

You can also choose Refresh Rate from the **Collection menu** to change the refresh rate.

Pausing and Restarting a Chart

By default, Performance Manager continues to collect performance data and update the current chart using the current refresh rate.

To pause a chart so it stops redisplaying based on the refresh rate, click the **Pause Chart** button in the Chart Display toolbar.

To restart the chart, click the **Resume Chart** button in the Chart Display toolbar.

Selecting Chart Options

After you display a chart in the Chart Display window, you can still modify the collected data and data sources for the chart. For more information about selecting the collected data and data sources before you display a chart, see "Selecting Collected Data and Data Sources" on page 3-11.

To set the chart options:

1. Click the **Options** button in the Chart Display toolbar.

Performance Manager displays the Options dialog box.

2. Use the Options dialog box to add or remove data items from the chart.

For more information on selecting data sources and selecting collected data, click **Help**.

You can also access the Options dialog box by choosing Options from the Collection menu.

Oracle Performance Manager also allows you to select filters to limit the data collected for a chart. However, not all charts provide filters. For charts that allow you to filter the chart data, you can select a limit to the number of data sources that are displayed. For example, if the data sources are the processes on an operating system, you can modify the chart to display only 10 processes, rather than all the processes.

For example, to select a limit to the number of data sources that are displayed for the **Pagefaults Per Session** chart, do the following:

> **Note:** The **Pagefaults Per Session** chart in the **Process** class is available only when you are monitoring a Windows NT node. For a UNIX node, select the **Process Info** chart in the **Process Data** class as an example of a chart you can filter.

1. Highlight the **Pagefaults Per Session** chart in the navigator tree of the Performance Manager main window.

    You can locate the chart by traversing the tree as follows:
    Network=>**Nodes**=><Name of Node>=>**Process**=>**Pagefaults Per Process**.

2. Click the **Options** tab in the Property Sheet panel.

3. Enter **10** in the **Maximum Number of Data Sources to Display** field.

    The 10 data sources will be sorted by Page Faults per second, as shown in the **Sort the data by** drop-down list.

    > **Note:** The number of options available on the Options tab will vary, depending upon the chart you are modifying. Some charts offer more or fewer options than the Pagefaults Per Process chart discussed here.

4. Click **Show Chart**.

    Performance Manager displays the chart, but includes a maximum of 10 data sources.

You can later change this setting after the chart is displayed:

1. In the Chart Display window for the Pagefaults Per Process chart, click the **Options** button in the toolbar.

2. In the **Options** tab, set the **Maximum Number of Data Sources to Display** back to 7.

3. Click **OK**.

These options can be useful for finding the top resource users. In the case where processes are the data sources and the data collected is memory usage and CPU usage, you can ask the Agent to limit the number of data sources to 10, and to sort by memory usage. Your chart would then show the 10 processes using the most memory. If you were to sort by CPU usage, you would get the 10 processes using the most CPU instead.

Some charts can also give different views of the data. If that feature is available, you will also be able to select a view of the data. An example of a data view may be the current rate per second or current rate per transaction for each piece of data collected in the chart.

Chart-Specific Commands

Some types of charts have their own unique commands. For example, you can select the **Kill Session** command when you are viewing the Lock Manager charts for Oracle database targets, or **Turn SQL Trace On** if you are viewing a Top Sessions chart.

To see if a chart-specific command is available for a chart:

■   Click the right mouse button on an item name in the chart legend or a data item in the chart and click **Drilldown** on the context menu.

■   Click the **Drilldown** menu on the Chart Display window menu bar.

Drilling Down from One Chart to Another

Some charts have drill-down charts associated with them. To see if any drill-down charts are available for the current chart, do one of the following:

■   Click the right mouse button on an item name in the chart legend or a data item in the chart and click **Drilldown** on the context menu.

■   Click the **Drilldown** menu on the Chart Display window menu bar.

■   Click on the **Chart Status button**.

In all cases, Performance Manager displays any drill-down charts associated with that chart item as menu options on the **Drilldown** menu. If a list of drill-down chart names is not displayed, no drill-down charts are associated with that item.

> **Note:** If you have trouble selecting a particular data item when you try to drill down for related data, pause the chart or reduce the refresh rate. For more information, see "Pausing and Restarting a Chart" on page 3-13.

Using the Chart Status Button

You can use the Chart Status button located in the upper right corner of a chart to perform one of several tasks. When you click on the button, menu items appear based on the context of the chart as seen in Figure 3–3.

Figure 3–3   Chart Status Button
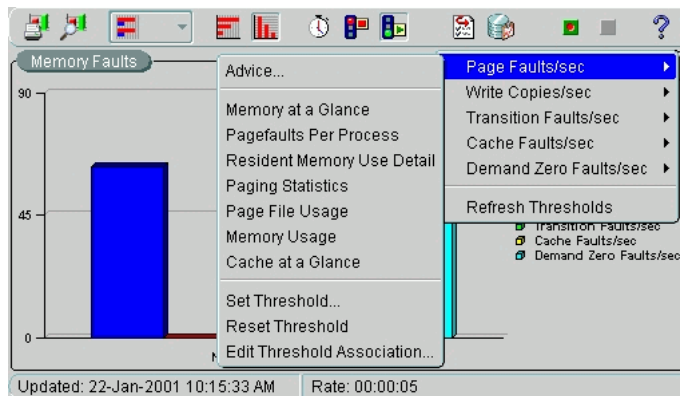
- View the threshold status of chart metric(s)

  The Chart Status button displays the current status of thresholds for metrics in the chart. If an indicator flag is present, at least one of the metrics on the chart has thresholds defined. The most severe threshold displays on the button. A green flag indicates that no metrics have crossed a threshold, a yellow flag indicates that at least one metric has crossed a warning threshold, and a red flag indicates that at least one metric has crossed a critical threshold. When you press the Chart Status button, you can view the status of individual metrics within the chart. If several metrics have crossed warning or critical thresholds,

the menu items are sorted according to the severity, with the indicators for the most severe items on top and the less severe on the bottom.

■ Display advice on a data item

When you choose Advice from the Chart Status button, Performance Manager displays an information window that provides information about the currently selected data item along with guidelines for solving existing problems, or suggestions about other charts to view for further diagnosis, as seen in Figure 3–4.

Figure 3–4 Viewing Advice from the Chart Status Button
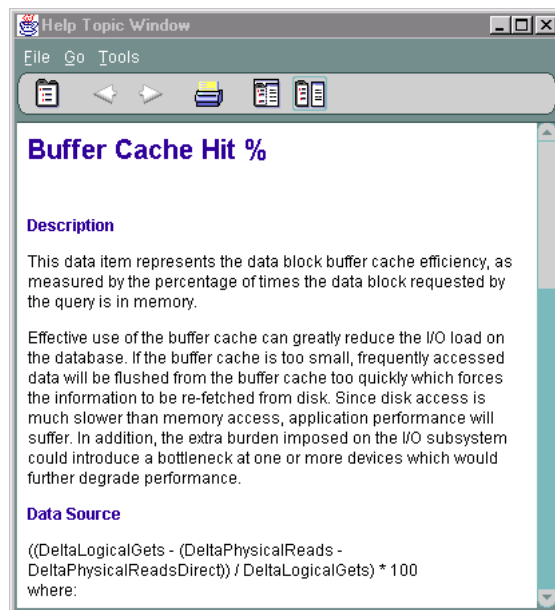
> **Note:** In addition to accessing help topics for individual metrics and events through the Advice function, you can view the full documentation set for all types of metrics and events independently through your web browser. For more information see "Viewing Metric and Event Documentation Through a Browser" on page 3-37.

- Drill down to a chart

  After you select a data item, you can choose to drill down to one of the charts displayed in the list or invoke tools like SQL Analyze.

- Set or reset thresholds for a chart or an event

  You can set chart-only thresholds for a data item or you can reset the chart-only threshold to its default value. You can choose to set or edit the threshold for the value in the chart only, or you can edit or register an event threshold for the data item. For more information, see "Registering Events in Performance Manager" on page 3-31.

- Edit a threshold association

  You can edit a threshold association for a metric by selecting Edit Threshold Association from the Chart Status button and choosing an event from the dialog box that appears. For more information, see "Editing Threshold Associations" on page 3-35.

- Refresh thresholds

  To view Event System changes made while a Performance Manager chart is visible, choose Refresh Thresholds from the Chart Status button menu on the Performance Manager chart. For more information, see "Refreshing Thresholds" on page 3-34.

Displaying Alternate Chart Orientations

You can display bar charts and tables with either a horizontal or vertical orientation.

To change the orientation of the bar chart or table, click the button associated with the orientation that you want.

Sorting Data in a Table Chart

When a chart is displaying data in table format, the sort order of the column data can be changed by clicking the column headers in the table. The first click on a column header sorts the data in ascending order, and a second click sorts the data in descending order.

Changing the sort order in the chart table does not affect the data's sort order on the server. To change the sort order of the data on the server, use the **Options** page. For more information, see "Selecting Chart Options" on page 3-13.

Saving Your Changes to a Chart

If you are working in repository mode and you make modifications to a chart (for example, if you change the format, orientation, or sorting order of a chart), you can save your changes in one of two ways:

- Click **Save** on the Chart Display **File** menu.

  Performance Manager saves your changes using the same name as the original chart. When you display the chart again, your changes will appear in the Chart Display window.

  To later remove your changes and display the predefined chart using its original settings, click **Remove Chart** on the **Chart** menu.

  > **Note:** You can remove the changes you saved to a predefined chart, but you cannot delete the original predefined chart.

- Click **Save As** on the Chart Display **File** menu.

  Performance Manager displays the Save Custom Chart dialog box. Use this dialog box to enter a name for the custom chart and to indicate whether you want to create a similar chart for other targets of the same type. For information about the fields on the Save Custom Chart dialog box, click **Help**.

  Click **OK** in the Save Custom Chart dialog box to save the custom chart using the name you provided. Performance Manager saves the chart in the Custom Charts folder for the selected target.

  To delete a custom chart from the Custom Charts folder, select the chart and click **Remove Chart** on the **Chart** menu.

> **Note:** You can delete custom charts, but you cannot delete predefined charts.

Obtaining Help for a Class, Chart, or Data Item

To get help on a class or chart:

1. Select the class or chart in the main window navigator.

2. From the **Help** menu, choose **Selected Item**.

   If help is available for the selected chart, Performance Manager displays a message box or a help topic window describing the chart data.

To get help on a data item:

1. Select a chart.

2. In the Property Sheet panel, select a data item and choose **Selected Item** from the **Help** menu.

> **Note:** Help is not available for all objects.

Printing a Chart

To print a chart, click the **Print Screen** button on the Display Chart window toolbar.

The size of the chart on the screen determines the size of the chart in the chart printout. For example, when you print a chart that is 5 inches high and 7 inches wide on your screen, the chart will be 5 inches high and 7 inches wide in the printout.

Generating a Report for a Chart

To generate an HTML report for a chart:

1. Click the **Report Chart** button while the chart is displayed.

   Performance Manager displays a dialog box that tells you the name of the HTML file used to display the report and where the file will be saved.

2. Make a note of the file name and location.

3. Click **Yes** to preview the chart in your Web browser, or click **No** if you do not want to preview the report.

You can view the report later using a Web browser, or—if you have experience with Web publishing tools and techniques—you can share the report with your co-workers by publishing the HTML file and its associated graphic files on a Web server.

Recording Chart Data

Oracle Performance Manager allows you to record the data being monitored in a chart. After a recording is complete, you can play it back. During playback, you can pause and fast forward the recording, if you wish.

Chart recordings are saved under the **Recordings** folder and on the Recordings tab of the right pane of the Performance Manager main window when a recorded chart is selected. The Recordings tab is added to a chart's property sheet after you record the chart.

You can manage chart recordings in the **Recordings** folder without connecting to the target from which a chart was recorded. If you are already connected to a target, you can see a chart's recordings by selecting the **Recordings** tab in that chart's Detail property sheet.

Starting a Recording

You start a recording by performing one of the following steps:

- With a chart highlighted in the navigator tree of the Performance Manager main window, click **Record Chart** on the chart's property sheet.

- With a chart displayed in the Chart Display window, click **Start Recording** in the Chart Display window toolbar.

- With a chart displayed in the Chart Display window, click **File**=>**Recording**=>**Start Recording**.

Oracle Performance Manager displays the Recording Parameters dialog box. For more information on the fields in the Recording Parameters dialog box, click **Help**.

Stopping a Recording

To stop recording a chart, do one of the following:

- To stop recording the current chart, click the **Stop Recording** button in the Chart Display window toolbar.

- To stop all recordings at one time, choose **Stop All Recordings** from the Performance Manager main window **Recordings** menu.

- To stop a recording from the **Recordings** folder, expand the **Recordings** folder in the Performance Manager main window and navigate to the chart. Select the chart and click **Stop Recording** on the chart's property sheet.

- With a chart displayed in the Chart Display window, click **File**=>**Recording**=>**Stop Recording**.

Playing a Recording

> **Note:** Before you can play a recording, you must stop the recording. For more information, see "Stopping a Recording" on page 3-21.

To play a recording, do the following in the Performance Manager main window:

1. Navigate to the **Recordings** folder.

2. Select the chart you want to play in the navigator tree.

3. In the corresponding property sheet, select the recording from the list of recordings for the selected chart, and click **Play Recording** (or on the **Recordings** menu click **Play Recording**).

4. In the Chart Display window toolbar, click **Start Playback**.

   The **Stop Playback**, **Pause Playback**, and **Fast Forward** buttons become available in the playback window (Figure 3–5). When the playback is complete, the **Reset Playback** button becomes available.

Figure 3–5   Chart Playback Buttons in the Chart Display Window

Removing a Recording

To remove a recording:

1. Navigate to the **Recordings** folder or the Recordings tab on the chart's Detail page.

2. Select the recording you want to remove.

3. From the **Recordings** menu, click **Remove Recording**.

Creating a User-Defined Chart

In addition to predefined charts, you can define your own charts for database targets based on user-defined scripts. By defining your own charts, you can take a snapshot of data at any given interval. After successful evaluation of the script, you can define the operations to be performed on the data.

> **Note:** The Performance Manager online help includes an example of creating a user-defined chart. Search for **Example** in the online help index.

To define a new chart:

1. Expand the **Databases** folder in the navigator tree.

2. Expand the database for which you want to define a user-defined chart.

3. Select the **User-Defined Charts** folder.

4. Click **Create User-Defined Chart** in the toolbar.

    The resulting New Chart property sheet includes the SQL Script Command page and the Data Items page.

5. On the SQL Script Command page, enter a SQL script that will be used to gather statistics for the chart you are defining.

6. Click **Evaluate**.

    Performance Manager evaluates the SQL script. If the script is valid, Performance Manager displays the Data Items page.

7. Use the Data Items page to customize how the resulting data from the script entered on the SQL Script Command page will be displayed in chart form.

You can remove columns and change the names of the columns. You can also define new columns with data calculated from existing columns. For more information, see "Modifying the Data Items for a User-Defined Chart" on page 3-24.

Modifying an Existing User-Defined Chart

To modify an existing chart you perform the same steps as outlined in "Creating a User-Defined Chart" on page 3-23. The only exception is that the chart label is already defined.

Note: To add or modify data items to user-defined charts, you must use the Agent release 8.1.6. or later.

To modify an existing chart:

1. Expand the **Databases** folder in the navigator tree.

2. Expand the database for which you want to modify a user-defined chart.

3. Select the **User-Defined Charts** folder.

4. Click the name of the chart you want to modify.

   On the SQL Script Command page, you can modify the script used to gather statistics for the chart. On the Data Items page, you can remove, add, or modify the data items associated with the chart. For more information, see "Modifying the Data Items for a User-Defined Chart" on page 3-24.

Modifying the Data Items for a User-Defined Chart

When you select a user-defined chart and then display the Data Items page, you can modify the data items for the chart as follows:

- Select a data item and click **Set Data Source**.

  A key icon appears next to the data item you designate as the data source. The data source is the object about which Performance Manager is able to collect the data. You must designate one of the data items as the source for the user-defined chart. To designate a data item as the data source, highlight the data item you want as the data source and click this button. By default, the first data item is set as the data source.

- Select a data item and click **Remove**.

  Performance Manager removes the data item from the Data Items page.

- Select a data item and click **Modify** or click **Add** to add a new data item to the user-defined chart.

  > **Note:** To add or modify data items to user-defined charts, you must use the Agent release 8.1.6 or later.

Performance Manager displays the Add/Modify Chart Columns dialog box. For more information about this dialog, click **Help**. The Oracle Performance Manager Help provides details on the functions and operations available. The Help also provides an example of creating a user-defined chart.

Copying a User-Defined Chart

You can copy user-defined charts from one target to another or within the same serve by using the Create Like option. To copy a user-defined chart:

1. In the navigator tree, select the user-defined chart you want to copy.

2. From the **Charts** menu, click **User-Defined Charts**=>**Create Like**.

   Performance Manager displays the Create Like User-Defined Chart dialog box.

3. Type a label for the new chart in the **Chart Label** field.

   Note that chart labels must be unique within a target.

4. In the **Service** drop-down list, select the target service for the new chart.

5. Click **OK**.

In the Create Like User-Defined Chart dialog box, you can choose the SQL Script Command or Data Items page to view the attributes of the chart you are copying. However, you cannot change the values of the attributes. Once the chart has been copied, you can select the new chart in the navigator tree and make any desired adjustments.

Converting Old Performance Manager User-Defined Charts

If you created user-defined charts using Oracle Performance release 1.5.0 or earlier (the Windows versions of Oracle Performance Manager), you can convert these

user-defined charts so that they can be used with Oracle Performance Manager release 2.1. See "Converting User-Defined Charts From Previous Releases of Performance Manager" on page 2-2 for information on how to perform the conversion.

Chart Display Window Menu Shortcut Keys

Table 3–2 lists the Chart Display Window menu and submenu items along with their corresponding shortcut keys.

Table 3–2   Chart Display Window Shortcut Keys

Task	Shortcut Key
Print Screen . . .	Control+P
Report Chart. . .	Control+R
Start Recording	Control+K
Stop Recording	Control+J
Start Playback	Control+Q
Stop Playback	Control+Y
Pause Playback	Control+W
Fast Forward	Control+F
Reset Playback	Control+B
Save	Control+S
Save As	Control+A
Close	Alt+F4
Pause/Resume Chart	Control+Q
Refresh Rate . . .	Control+E
Options	Control+O
Historical Data	Control+D
Using Help	Control+Shift+U
Help on Item	Control+Shift+H
Contents	Control+H
Search . . .	Control+Shift+S

Table 3–2   Chart Display Window Shortcut Keys

Task	Shortcut Key
Window	F1

Working With Events and Thresholds in Performance Manager

You can create and edit threshold values from both the Oracle Enterprise Manager console and Performance Manager.

> **Note:**   The Performance Manager threshold and event features described in this section are available only for node and database data.

From Performance Manager, you can create and edit a Chart-only threshold, create and register an event, reset a Chart-only threshold, or edit a registered event. From the Enterprise Manager console, you can create, edit or deregister an Enterprise Manager event but you cannot edit or view Chart-only thresholds.

You can set thresholds on data items by using event tests or by setting a threshold for a data item in a chart (Chart-only threshold) using the Set Chart-only Threshold dialog box seen in Figure 3–6. When you monitor a chart that contains a data item that supports a threshold established for an event, you can edit the parameters for that event by choosing **Set Threshold** from the **Chart Status** button.

When you create events from Performance Manager, the event is initialized with the context defined by the Performance Manager chart. You can only modify the event tests in an event if the event was registered using the Oracle 9*i* Agent.

If a data item supports the concept of an event, the chart displays a visible indicator (a flag) based on thresholds stored in the repository for that data item. If the data item does not support the concept of an event, you cannot establish a chart-only threshold for the data item. Every metric-based event test can have a warning and a critical threshold value. The flag indicators on a chart specify whether a threshold value has crossed a warning or critical threshold. The flag that appears on the Chart Status button in a chart displays the most serious state of any contained metric thresholds, and the metrics that appear when you click on the **Chart Status** button are sorted with the most serious indicators displayed first in the list.

Figure 3–6   S*et Chart-only Threshold dialog box*
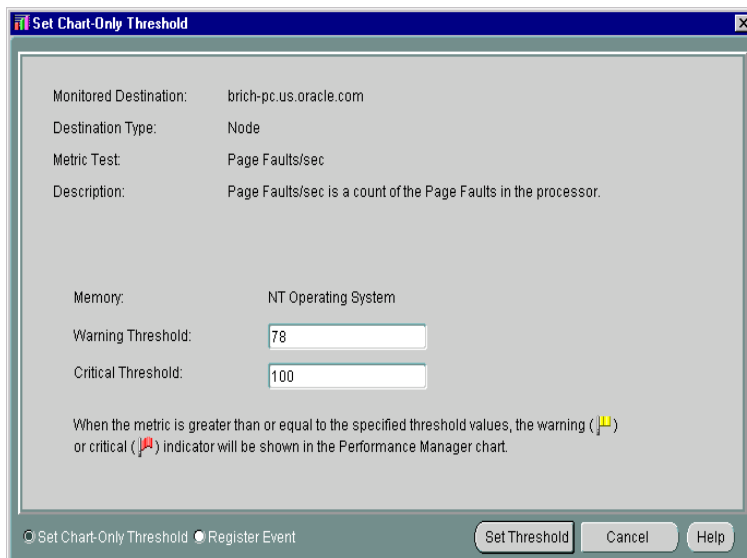
Threshold values may be derived from one of three sources:

- A default value for some metrics that is added to the repository at the time of product installation.

- Chart-only thresholds, which are warning and critical threshold values for a specific metric, target, target type and instance.

- An event test derived threshold, which can be shared among administrators depending on the access rights of the user and the event containing the event test. When you set a threshold on a data item associated with an existing event, the thresholds displayed in that chart correspond to the thresholds set for the event test.

The threshold types listed above apply to metrics in a specific order of precedence:

- If you have Event System access and access to an event containing a metric, the threshold values for the metric are defined by the Event Test and override any Chart-only or default threshold values.

- If you have established a Chart-only threshold for a metric, the threshold values you establish are valid and supersede any default values that may exist.

- If neither of the previous two scenarios exist and a default threshold is defined in the repository for the metric, the default value defines the warning and critical thresholds for this metric, regardless of target or data source.

Threshold values are stored in the Oracle Management Server respository and are updated whenever the user sets or edits a Chart-only threshold or when Event registration changes occur. Chart-only thresholds are removed from the repository when you invoke Reset Threshold or when the Administrator is removed from the system. If you create a Chart-only threshold that is later overridden by the registration of an event, the Chart-only threshold remains in the repository. If the association between the metric and the event is later broken, the Chart-only threshold is restored.

To set or edit thresholds in Performance Manger:

1. Click the **Chart Status** button in the upper right corner of the chart below the menu bar.

2. Select the data item for which you want to set a threshold and then choose **Set Thresholds** from the context menu.

   If there is more than one data source displayed in a chart when you select Set Thresholds, Performance Manager displays the Select Data Source dialog box where you must choose a single data source for which to set a threshold. When you create or edit a chart-only threshold or create a new event, you must choose a single data source before setting thresholds.

3. To set or modify a Chart-Only threshold, select **Set Chart-Only Threshold** at the bottom of the window. To register an event, select **Register Event**.

   > **Note:** If you do not have permission to access the Enterprise Manager Event System, the option of registering an event from the dialog box is not present.

4. To set or modify a Chart-Only threshold, add or modify the values in the **Warning Threshold** and **Critical Threshold** fields. If default warning or critical threshold values are defined for the metric, the input fields will contain these values.

   To register or modify an event, select **Register Event** and then complete the fields in the General, Test, Parameters, Schedule, Access and Fixit Jobs pages of the event property sheet. If you are using a pre-9*i* Agent and you modify an

event that has been registered, those changes are not used by the registered event.

Triggered Events and Thresholds

Events and thresholds often poll at different intervals. For example, events may be polled at intervals of minutes or even hours, while thresholds may be sampled in seconds. The result is that you could see a metric cross a threshold in a chart but not be notified of an event simultaneously. If the problem were caused by a spike, the threshold may be crossed in the chart with a sampling occurrence measured in seconds, but not trigger an event because the metric is sampled in minutes or hours, meaning the event is never triggered at all.

Additionally, events can include the concept of occurrences. Occurrences prevent notification for erratic or one-time instances of a threshold being crossed. If an event has a number of occurrences associated with a test, you may see the threshold crossed in a chart but never see the corresponding event triggered.

Events Registered for Multiple Targets

If you attempt to modify a threshold that has an associated event test registered for multiple targets, a warning displays indicating that the change you make will affect the event test for multiple targets and that if you want to use different thresholds for each target, you must create separate events. If you continue with the change, the existing event is deregistered for all targets and re-registered for all targets with the new threshold.

Metrics with Multiple Events and Different Thresholds

When you display a chart for a data item for which there are multiple event tests, a message is displayed indicating that there are multiple tests for the same metric. To show a threshold for the chart, you must select which event test to associate with the metric. If you then modify the associated event test or the metric in the chart, the thresholds are synchronized. Other tests of the metric are not affected by changes to the threshold in a chart.

If another user de-registers the associated event test and then you display a chart with that metric, a warning displays indicating that the previously associated event test no longer exists. If only a single event test remains for the metric, the message indicates that the remaining event is now associated with the metric. If more than one event remains, the message indicates that you must select a new event to associate with the metric.

If you add a new event test for a metric where a single chart-only threshold already exists, the thresholds associated with the previous test will not be used during monitoring.

Event Permissions

If you display a chart for which you have read-only permission for the corresponding event, you cannot modify the thresholds for that chart. You receive a read-only view of the event indicating that if you wish to change the thresholds associated with the data item, you must be granted appropriate access to the event system.

> **Note:** Super-users who set up permissions on an event should consider the effect on non-privileged administrators who will be unable to modify the thresholds.

Registering Events in Performance Manager

You can register events from within Performance Manager through the Chart Status button on a chart containing the data item for which you want to register an event.

Registering events through Performance Manager is procedurally identical to registering events through the Enterprise Manager console.

To create or edit events in Performance Manager:

1. Click on the **Chart Status button** in the upper right corner of the chart.

2. Select the data item and then choose **Set Threshold** from the context menu.

   If there is more than one data source displayed in a chart when you select Set Threshold, Performance Manager displays the Select Data Source dialog box where you must choose a single data source for which to set a threshold. When you create or edit a Chart-only threshold or create a new event, you must choose a single data source before setting thresholds.

3. Select **Register Event** at the bottom of the dialog box.

4. Complete or modify the fields in the General, Test, Parameters, and Permissions pages of the property sheet to create a new event. If you are using a pre-9*i* Agent and you modify an event that has been registered, those changes are not used by the registered event.

When you use a pre-9*i* Agent, the property sheet for creating a new event is similar to the property sheet for modifying an event. Some fields are editable while others are not. If you are using a 9*i* Agent, you can modify many more fields.

You can use several predefined event tests that have been installed with Oracle Enterprise Manager.

About Oracle 9*i* and Pre-9*i* Agents

If you attempt to register a 9*i* event with a pre-9*i* Agent, you will receive an error message indicating that you cannot register the event. You can use only a 9*i* Agent to register 9*i* events.

If there exists both a 9*i* and pre-9*i* version of the same event, then the Oracle Management Server will determine which to use depending on the Agent version. For example, if there is a 9*i* Agent, the Agent will request registration using the 9*i* version of the event. If the Agent is pre-9*i*, then it will use the pre-9*i* version.

If you have migrated from a pre-9*i* Agent, then an existing event will not automatically use the 9*i* counterpart. To use the 9*i* test and access thresholds in the repository, you must deregister the pre-9*i* event and register the 9*i* event using the 9*i* Agent.

Viewing Thresholds

If a Performance Manager chart is displaying metrics that have multiple data sources, you can display the View Thresholds dialog box to view all threshold indicators. The View Thresholds dialog box is accessible from the **Chart Status** button.

The View Thresholds dialog box displays the current threshold status of each data item and its corresponding data source. You can view the status for each metric/data source pair using flags to indicate whether the value of the data item has passed its warning or critical threshold. If a data item has no threshold set, the column containing that data item is left blank.

When you display the View Thresholds dialog box, the current data item and threshold values are captured in a dataset and the status of each threshold is displayed in the table. A timestamp of the dataset appears in the bottom left corner of the View Thresholds dialog box.

If you change a threshold value for a data item while the View Thresholds dialog box remains open, the new threshold value is compared against the dataset created at the time you displayed the dialog box, not against the current value of the data

item in real time. To refresh the statuses in the View Threshold dialog box, close and redisplay it.

You can add or change threshold values by clicking the **Chart Status** button on the View Thresholds dialog box and choosing **Set Threshold** from the context menu.

To view thresholds:

1. Click the **Chart Status** button for the chart containing the data item for which you want information and select **View thresholds** from the context menu.

   The View Thresholds dialog box appears, displaying the status of any thresholds set for each of the data items and data sources in the chart. The status for a threshold is indicated by the flag that appears in the column for the data item and data source.

   - A **green flag** indicates the value for the data item has not crossed a threshold.

   - A **yellow flag** indicates the value for the data item is at or has passed the warning threshold.

   - A **red flag** indicates the value for the data item is at or has passed the critical threshold.

   If no threshold is set for a data item, the status for that metric is left blank.

   The threshold statuses that appear in the View Thresholds dialog box are derived from dataset values gathered at the time you display the View Thresholds dialog box. The date and time of the dataset appears at the bottom of the dialog box. The View Thresholds dialog box is not updated when the Performance Manager chart is refreshed.

   From the View Thresholds dialog box, you can set thresholds or reset and edit associations for a specific cell if thresholds are set.

You can set or edit a threshold for a metric from the View Thresholds dialog box by clicking the **Chart Status** button and selecting **Set Thresholds** from the context menu. For more information about setting thresholds, see "Working With Events and Thresholds in Performance Manager" on page 3-27.

> **Note:** If you add or change the value of a threshold for a data item, the status flag for the data item on the currently displayed View Thresholds dialog box is updated based on the values stored in the dataset at the time the View Thresholds dialog box was displayed. To update all the status flags in the current chart, close the View Thresholds dialog box and redisplay it.

Resetting Thresholds

You can reset Chart-only thresholds through the **Chart Status** button on a chart. If you reset a Chart-only threshold for a data item, the current threshold is deleted and is reset to its default value. If the data item has no default value, the threshold is simply deleted and no value is assigned as a threshold.

If you select Reset Threshold for a data item with an assigned event, a message box displays stating that you must deregister or edit the event from within the Enterprise Manager console.

To reset a threshold:

1. From the chart, click on the **Chart Status button** and select the metric and data source for which you want to reset a threshold.

2. From the context menu, choose **Reset Threshold**. When you select Reset Threshold, the current data item is reset to its default value. If the data item has no default threshold value, the threshold is eliminated.

   A confirmation dialog box appears, verifying that you are about to reset the threshold for the current metric. Click the **OK** button to confirm.

   If no threshold exists for the metric, an error dialog box displays informing you that the threshold cannot be reset because no threshold exists for the metric.

If you attempt to reset a threshold associated with a registered event, an error message dialog box displays. You cannot deregister an event from within Performance Manager because the event associated with a metric may have several other targets and tests. You can instead edit the event from within Performance Manager by choosing Set Threshold (for 9*i* targets) to remove or modify the event.

Refreshing Thresholds

A chart may not reflect an event that is registered while the related chart is open because the information for the metric in the chart related to the event has not been read from the repository. A chart does not automatically reflect the effect of event

system changes. When you select Refresh Thresholds from the Chart Status button, Performance Manager updates the chart with the new data from the threshold repository and updates the chart threshold indicators.

When Event Registration or Permission changes effect the threshold respository, Performance Manager users are notified of these changes in a dialog box when the threshold data for the metric is next read from the repository. The following actions are conveyed to the Performance Manager user when a chart is opened, thresholds are refreshed for a chart, or thresholds are edited:

- An event test associated with a metric has been deregistered.

- A Chart-only threshold is overridden by the registration of an event test by another user.

- An event test associated with a metric has failed registration.

- Access to an event containing an event test associated with a metric has been removed.

- An event test associated with an event has been removed from the event or the instance has been modified.

- An event test associated with a metric has failed event modification.

To refresh thresholds, choose **Refresh Thresholds** from the **Chart Status** button on the Performance Manager chart.

Editing Threshold Associations

There may be circumstances when a user has permission to view several events that contain the same event test. When viewing a chart, you must decide which event will be associated with the metric in the chart. You can invoke Edit Threshold Association to change this association.

The **Edit Threshold Association** menu item has no application for data items with less than two events assigned to it. If you select **Edit Threshold Association** in such a case, a message box appears informing you that the threshold association cannot be changed because a threshold association for the metric does not exist or there is only one registered event test.

You cannot change the association for Chart-only thresholds because each user has his own pool of Chart-only thresholds and duplicates are not supported.

To edit threshold associations:

1. Click the Chart Status button in the current chart and select the metric for which you want to edit the threshold association, and then choose Edit Threshold Association from the context menu.

2. When applicable, select the data source from the Select Data Source dialog box and click OK.

3. Select the event threshold you want to assign to the data item in the list that appears in the Associate Metric with Event Test dialog box.

4. Click the **OK** button at the bottom of the Associate Metric with Event Test dialog box.

> **Note:** If you attempt to set a threshold association when the metric is not associated with an event test or you only have permission to view one registered event test for the specified target and data source, an error dialog box appears informing you that the association cannot be changed.

To edit threshold associations:

1. Click the **Chart Status** button in the current chart and select the metric for which you want to edit the threshold association and then choose **Edit Threshold Association** from the context menu.

2. When applicable, select the data source from the Select Data Source dialog box and click OK.

3. Select the event threshold you want to assign to the data item in the list that appears in the Associate Metric with Event Test dialog box.

4. Click on the **OK** button at the bottom of the Associate Metric with Event Test dialog box.

Running Performance Manager in a Browser

You can run Oracle Performance Manager in a browser and use a significant subset of the features of the full product, including basic monitoring features and event integration. Browser support includes basic monitoring features and event integration if you are using a version 9*i* Agent (or later).

The following features are available when running Performance Manager in a browser:

- Show database chart

- Show node chart

- Drilldowns

- Help

- Quick Tour

- Print Screen from charts

- Report Chart from charts

- Pause/Resume charts

- Set Refresh Rate

- Set Options

- Setting Chart-only thresholds

- Event Registration

The following features are not available while running Performance Manager in a browser:

- Recordings

- Historical collection drilldowns

- Custom Charts

- Saved chart attributes

- User-defined charts

- Direct Connect

- Standalone mode

- SQL Analyze

- Threshold status

Viewing Metric and Event Documentation Through a Browser

You can view specific information about metrics, events, charts and classes in Performance Manager through the Advice function on the Chart Status button and through other contextual functions within the Oracle Enterprise Manager application. However, you can view the full set of documentation for all the

following types of metrics and events independently through your web browser without having to access the Oracle Enterprise Manager application. The documentation available through your browser provides a comprehensive Table of Contents, an index keyword search, and a full text search function.

- Oracle Database

- Windows NT

- IBM AIX

- Sun Solaris

- HP-UX

- Compaq Tru64

- SAP R/3 System

- Oracle Applications system

For each of these types of metrics and events, the following information is provided.

For Metrics:

- Classes

- Charts

- Data Items

   - Description

   - Source

   - User Action

- Event Tests

   - Description

   - Source

   - Parameters

   - Output

   - Frequency

   - User Action

To access each documentation set, open the appropriate file below in a web browser:

- Oracle Database -- ORACLE_HOME/doc/EM/Webhelp/dba/dba.htm

- Windows NT -- ORACLE_HOME/doc/EM/Webhelp/nt_os/NT_OS.htm

- IBM AIX -- ORACLE_HOME/doc/EM/Webhelp/aix/AIX.htm

- Sun Solaris -- ORACLE_HOME/doc/EM/Webhelp/sol/SOL.htm

- HP-UX -- ORACLE_HOME/doc/EM/Webhelp/hpux/HPUX.htm

- Compaq Tru64 -- ORACLE_HOME/doc/EM/Webhelp/dec/DEC.htm

- SAP R/3 -- ORACLE_HOME/doc/EM/Webhelp/sap/sap.htm

- Oracle Applications System -- ORACLE_ HOME/doc/EM/Webhelp/oafnd/OAFND.htm

4

Introduction to Oracle Index Tuning Wizard

The Oracle Index Tuning wizard is a software application that identifies tables with inefficient indexes and makes recommendations which will improve access to those tables.

The Index Tuning wizard:

- Identifies tables in need of index changes
- Presents its findings in reports
- Implements the recommendations for you

The Index Tuning wizard is intended for use with the Oracle cost-based optimizer. The recommendations made by the Index Tuning wizard will optimize index usage for the Oracle cost-based optimizer. Therefore, you should not use the Index Tuning wizard for those schemas where rule-based optimization is used.

This chapter describes when to use the Index Tuning wizard, how to access the Index Tuning wizard, and the Index Tuning wizard interface.

When to Use the Index Tuning Wizard

You can use the Index Tuning wizard to proactively maintain optimal indexes for your database. You should run the Index Tuning wizard regularly to evaluate whether index changes should be made to improve SQL query performance. The Index Tuning wizard may recommend adding new indexes, changing existing indexes, or changing the type of an index.

You should also use the Index Tuning wizard when one of the following situations occurs:

- A user has reported unacceptable response times for a query

- New applications have been added to the database environment
- Existing application SQL has been modified
- The database server has been upgraded to a new version
- Table sizes within the database have increased substantially

Any of these factors may impact the indexing decisions for the database.

Accessing the Index Tuning Wizard

You can access the Index Tuning wizard in the following ways:

- From the Oracle Enterprise Manager Tuning Pack tool drawer
- Through the Oracle Expert application

  If you have the Oracle Expert application installed, you can launch the Index Tuning wizard from the Oracle Expert Tools menu.

  > **Note:** In either case, you must first select a database in the navigator tree before launching the Index Tuning wizard.

The Index Tuning wizard makes two database connections:

1. The Index Tuning wizard connects to its repository to store and analyze data required for index tuning.
2. The Index Tuning wizard uses the database credentials defined in Oracle Enterprise Manager console to connect to the target database for index tuning.

Index Tuning Wizard Interface

When you first access the Index Tuning wizard, you are greeted with a Welcome screen that provides some of the advantages of using the Index Tuning wizard.

You will be lead through the following screens:

- Application Type
- Schema Selection
- Index Recommendations
- Analysis Report and Script

■ Finish

Each of these screens is described in the following sections.

Application Type

On this screen, you choose the type of application that is primarily being used for the target database being tuned: Online Transaction Processing (OLTP), data warehousing, or multipurpose.

Schema Selection

On this screen, you have the opportunity to select the schemas you wish to evaluate. The **Any Schema** option tells the Index Tuning Wizard to select any schema which has a table referenced by one of the worst performing SQL statements. Select this option if you want an overview of the database's overall performance problems.

The purpose of the **Selected Schemas** option is to hide recommendations for schemas that you are not responsible for tuning or you do not wish to tune at the current time. Select this option if you only want recommendations for schemas you control. The schemas you select may or may not be the worst performers so you may or may not get tuning recommendations for all of the selected schemas.

When you first use the Index Tuning wizard, it is best to let the wizard select any schema so you will see an overall view of the problem areas. You can then focus on specific areas of the database for which you have control.

Index Recommendations

From this screen you can:

■ Have the Index Tuning wizard generate the index recommendations, that is, collect and analyze the data to provide the index recommendations.

■ Choose the index recommendations to be implemented.

The Index Tuning wizard provides a work-in-progress dialog box.

You can stop the generation at any time. The Index Tuning wizard deletes all the created files in preparation for the next generation.

Once the recommendations are generated, use this screen to choose the index recommendations you want to implement. The Details button provides additional

information about each recommendation. To activate the Details button, select a recommendation.

Analysis Report and Script

The Analysis Report and Script page displays the Analysis Report and Script tabs to view all of the recommendations for a tuning session, as well as the rationale for those recommendations.

> **Note:**   The Analysis report for a tuning session is available only after the Index Tuning Wizard has analyzed the collected data.

During an analysis, the Index Tuning Wizard sifts through the collected data, uses its rules to generate tuning recommendations, then stores the information for the Analysis report in the repository. The Analysis report information stays in the repository until another analysis is performed for the tuning session.

The Script tab displays the SQL script needed to implement the recommendations that you selected on the Index Recommendations page. You can view the SQL *before* choosing to implement the recommended changes.

You can print and save the report and script from this page.

Finish

This screen allows you to implement and save the index tuning recommendations. The possibilities are:

- Implement the selected recommendations immediately

- Save the recommendations as an implementation script (Provides you with another opportunity to save the analysis report and script if you have not already done so.)

- Save the recommendations to an Oracle Expert Tuning Session (Standard Management Pack users must have the Oracle Tuning Pack installed for this option to work.)

When you click Finish, the recommendations will be saved and/or implemented according to the choices made.

5

Overview of the Change Management Applications

The change management applications provided by the Oracle Standard Management Pack are a group of integrated applications used to track changes to database object definitions. The change management applications are components of Oracle Enterprise Manager.

The change management applications provided by the Oracle Standard Management Pack are:

- Create Baseline
- Compare Database Objects
- Change Manager

This chapter provides an overview of change management applications, concepts, and features.

The following section describes new features for this release of the change management applications.

New Features for the Change Management Applications

The following list describes the major new features for this version of the change management applications:

- Instance parameters can be included in baselines

    The Create Baseline and Compare Database Objects applications support Oracle instance parameters in this release.

You can use Create Baseline to create a baseline that includes definitions and instance parameter settings for a database, or you can create a baseline that contains only the instance parameters for a database.

You can use Compare Database Objects to compare a database's current instance parameter settings to the database's instance parameter settings that were captured in a previous baseline. Or, you can compare two different baselines taken at different points in time that include a database's instance parameter settings.

Comparing instance parameters differences for a database can help you monitor changes in the database's configuration, which may enable you to diagnose performance problems.

- Change management applications can be run standalone (without a connection to the Oracle Management Server)

In previous releases, change management applications could only be run after connecting to an Oracle Management Server. With this release, you can run change management applications standalone (without a connection to the Oracle Management Server). See "Running Change Manager Connected to an Oracle Management Server or Standalone" on page 6-1 for more information.

To run Change Management Pack applications standalone, you must have a standalone repository. See the *Oracle Enterprise Manager Configuration Guide* for information on the steps to perform before creating a standalone repository.

- Change management applications run in a web browser

In this release, you can run change management applications from a web browser. To do this, you start the Oracle Enterprise Manager Console in a browser, then choose **Tools**->**Change Management Pack**->**Change Manager** to start Change Manager in the browser. Other change management applications that you start from Change Manager also run in the browser.

The majority of the change management application features are available from a browser. However, you cannot perform import and export operations from the Change Manager application when it is running in a browser.

For information on running the Oracle Enterprise Manager Console in a web browser, see the *Oracle Enterprise Manager Configuration Guide*.

Database Objects Supported by the Change Management Applications

The types of database object definitions that the change management applications supports are:

- Cluster
- Database link
- Function
- Index
- Materialized view
- Materialized view log
- Package
- Package body
- Procedure
- Profile
- Refresh group
- Role
- Rollback segment
- Sequence
- Synonym
- Table
- Tablespace
- Trigger and instead-of trigger
- User
- View

The change management applications currently do not support the following features of the database objects in the previous list:

- Object-oriented features:
  - Tables and snapshot logs that refer to user-defined data types.
  - Object tables

- Nested tables

- Object views

■ Snapshots that are not read-only

For a more complete list that describes the level of support the change management applications offer for specific database objects and attributes, see the section on currently unsupported database features and attributes in the Change Management Pack section of the *Oracle Enterprise Manager Readme*.

Understanding Change Management Objects

The following types of objects are created only by change management applications and are used to track changes to other object definitions:

■ Baselines

A baseline is a group of database object definitions captured by the Create Baseline application at a particular point in time. Each baseline has the name of its baseline specification and a version number. A baseline is stored in a format that can be used by multiple change management applications.

A baseline specification is used to generate baselines. A baseline specification includes a baseline name, source database, scope specification, and owner. The baseline name can be changed after the baseline specification is created, but the source database, scope specification, and owner cannot. The scope specification for a baseline is a set of criteria that an object must meet to be included in the baseline generated from the baseline specification. The scope specification describes the types of database object definitions to be included in the baseline, the schemas in which to look for those object definitions, and the names of those object definitions. See "Overview of Create Baseline" on page 5-6 for more information about baselines.

■ Comparisons

A comparison identifies the differences found by the in two sets of database object definitions that you have specified in the Compare Database Objects application. Each comparison has the name of its comparison specification and a version number. Comparison results are displayed in the Comparison Viewer.

A comparison specification is used to generate comparisons. A comparison specification is defined by its name, source database, scope specification, and owner. The name can be changed after the comparison specification is created, but the source database, scope specification, and owner cannot. The scope

specification for a comparison is a set of criteria that the set of objects to be compared must meet to be included in a comparison generated from the comparison specification. The scope specification describes the types of database object definitions to be included in the comparison, the schemas in which to look for those object definitions, and the names of those object definitions. See "Overview of Compare Database Objects" on page 5-8 for more information about comparisons.

Change Management Applications

The Change Manager application is the central interface for the change management applications. Change Manager provides direct or indirect access to all change management features. For example, Change Manager provides direct access to the change management history features. It provides indirect access to the other change management applications, which can be started from Change Manager. See "Starting Change Manager" on page 6-3 for more information on starting Change Manager and "Starting Change Management Applications from Change Manager" on page 6-5 for more information on starting other applications from Change Manager.

With change management applications, you can track changes by:

- Capturing the current definitions of a set of database objects in a baseline.

- Creating new versions of a baseline at regular intervals to track changes in that set of database objects over time.

- Comparing a set of object definitions in one schema, database, or baseline to another set of definitions (in a schema, database, or baseline). A comparison identifies differences between two sets of definitions.

- Creating new versions of a comparison at regular intervals to determine the differences between the two sets of definitions over time.

The applications and their functions are:

– Create Baseline

Captures one or more definitions from one database.

– Compare Database Objects

Compares a set of object definitions in one schema, database, or baseline to another set of definitions (in a schema, database, or baseline).

The following sections provide additional overview information on the change management applications.

Overview of Change Manager

The Change Manager application is the central interface for the change management applications. Change Manager gives you direct or indirect access to change management operations.

Using Change Manager, you can view change management objects (baselines and comparisons), as well as check on the status of current tasks. You can also view history information that tells you which change management operations were performed by what users at what time.

You can also use Change Manager to start the other change management applications.

Figure 5–1 shows the functional capabilities of Change Manager.

Figure 5–1   Functional Capabilities of Change Manager

```
┌─────────────────┐      ┌──────────────────────────────┐
│                 │      │  direct or indirect access to all │
│  Provides ...   │ ───► │  change management features      │
│                 │      │                              │
└─────────────────┘      └──────────────────────────────┘
```
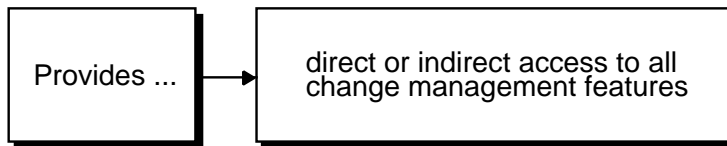
NU-3705A-AI

See Chapter 6, "Using Change Manager" on page 6-1 for more information on using Change Manager. The chapter includes information on starting Change Manager, starting other applications from Change Manager, and on the features that are accessible from the Change Manager application.

Overview of Create Baseline

The Create Baseline application guides you step-by-step through the process of capturing a database (or a subset of a database) in a form that is readable by other change management applications. Create Baseline lets you specify the set of database object definitions to capture, captures those definitions in their current state at the time of the capture operation, and displays the baseline in the Baseline Viewer.

Create Baseline can capture object definitions in both of the following forms:

- A baseline. The baseline stores definitions in a form that other change management applications can use. A baseline is created during every capture operation.

- A SQL DDL script. The script contains the SQL statements that correspond to the captured definitions. You can use the script to save a textual version of the definitions or as input to CASE tools that accept SQL DDL input. You can also use individual SQL statements from the script to create definitions in a new database. You have the option of whether or not to create a SQL DDL script. To save time during a capture operation, you can defer the creation of the SQL DDL script.

Figure 5–2 shows the functional capabilities of Create Baseline.

Figure 5–2   Functional Capabilities of Create Baseline

Captures ...   one or more definitions ...   from one database
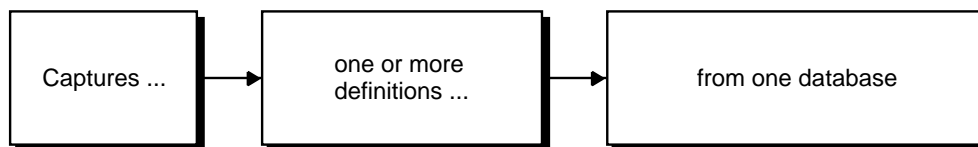
NU-3699A-AI

You can start Create Baseline from Change Manager. See "Starting Change Management Applications from Change Manager" on page 6-5 for information on starting Create Baseline from Change Manager.

The Baseline Viewer displays baselines created with Create Baseline. You can also use Baseline Viewer to generate a SQL DDL script for the baseline if you did not generate one when the baseline was captured. See "Starting Change Management Applications from Change Manager" on page 6-5 for information on starting Baseline Viewer from Change Manager.

To generate a report that includes information about the objects in a baseline, view the baseline in Baseline Viewer, click the Database Objects folder, and choose **File**->**List Report**. The online help contains more information about the specifics of using Baseline Viewer.

Capturing a Baseline from the Oracle Enterprise Manager Console

When you have Oracle Standard Management Pack installed, you can also perform a capture operation from the Oracle Enterprise Manager Console by following these steps:

1. Select a database, type, or schema folder in the Oracle Enterprise Manager navigator.

2. Click the right mouse button.

3. On the context menu, choose **Standard Management**->**Capture Database Objects**.

Create Baseline is started to capture a baseline for the selected database, then after the capture operation is completed, the Baseline Viewer is started to allow you to view the baseline.

The online help contains more information about the specifics of using Create Baseline.

Overview of Compare Database Objects

The Compare Database Objects application guides you step-by-step through the process of selecting two sets of object definitions for a comparison. The object definitions can be selected from current database definitions or they can be selected from baselines created earlier with Create Baseline. Differences that are found between the two sets of object definitions are displayed in the Comparison Viewer.

The result of comparing two sets of object definitions using Compare Database Objects is called a comparison. You can view a comparison, name it, and save it using the Comparison Viewer.

Figure 5–3 shows the functional capabilities of Compare Database Objects.

Figure 5–3   Functional Capabilities of Compare Database Objects
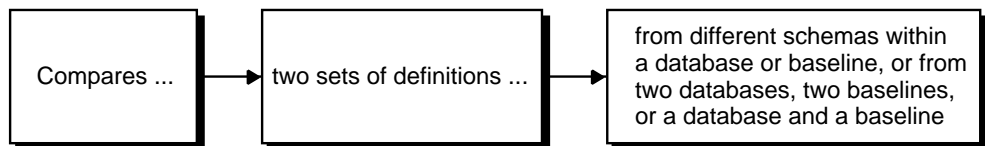
NU-3700A-AI

You can start Compare Database Objects from Change Manager. See "Starting Change Management Applications from Change Manager" on page 6-5 for information on starting Change Database Objects from Change Manager.

You can also generate a report about the results of a comparison by choosing **File**->**Report** in Comparison Viewer. The report includes:

- A description of what you compared.

- The comparison options you selected.

- A summary of the comparison results.

- The comparison tree and comparison details (optional).

Performing a Comparison from the Oracle Enterprise Manager Console

When you have the Oracle Standard Management Pack installed, you can also perform a comparison operation from the Oracle Enterprise Manager Console by following these steps:

1. Select a database, type, or schema folder in the Oracle Enterprise Manager navigator.

2. Click the right mouse button.

3. On the context menu, choose **Standard Management**->**Compare Database Objects**.

Compare Database Objects is used to specify the two sets of database object definitions to include in a comparison, and the Comparison Viewer is used to display the results of the comparison.

The online help contains more information about the specifics of using Compare Database Objects and Comparison Viewer.

Sample Uses for the Change Management Applications

This section provides some sample uses for change management applications in an application development environment.

Create Baseline Specifications

At the beginning of a new development cycle, use Create Baseline to create one or more baseline specifications that identify the database and schema object definitions used in your application.

Create Baseline Versions at Key Points

You can use a baseline specification to create a baseline that captures the database and schema object definitions used in your application at the start of the development cycle. Then, at regular intervals (such as daily or weekly) and at development milestones (such as beta freeze), create a new version of the baseline that captures the definitions at that point in time. These baseline versions provide a record of the definitions throughout the development cycle.

Generate Reports for Definitions in Baselines

Baseline Viewer allows you to view baselines and to generate a report that describes the definitions captured in the baseline.

Generate SQL Statements for Baseline Definitions

You can also use Baseline Viewer to generate the SQL data definition statements for each of the definitions in the baseline, and save these SQL statements to a file. The statements could then be used in a script to reproduce the definitions at some point in the future.

Create Comparison Specifications

Use Compare Database Objects to create comparison specifications that identify two sets of database definitions that you want to compare. The two sets of database definitions to be compared can be from two baselines, two databases, or a database and a baseline. Among the differences that comparisons can identify are text differences in objects such as procedures, packages, or views, and differences in instance parameters.

Create Comparison Versions to Track Definition Changes Over Time

You can use comparison specifications to create multiple versions of a comparison. You can use comparison versions to track changes to two sets of definitions over time.

For example, you can use a comparison specification to create a comparison that identifies the differences between the definitions in the original baseline for your application and those same definitions in your current database. Each time you create a new version of this comparison using the comparison specification, that comparison version identifies the differences between the original definitions at the start of the development cycle and those same definitions at the current time.

You could also use another comparison specification to create a comparison that compares definitions from your most recent (latest) baseline with those same

definitions in the previous (2nd latest) baseline. Each time you create a new version of this comparison using the comparison specification, that comparison version identifies the differences in the definitions since the previous baseline.

Generate Reports for Differences Identified in Comparisons

When viewing a comparison in the Comparison Viewer, you can choose **File**->**List** to generate a report that describes the differences between the two sets of definitions included in the comparison.

Use History Features to Track Definition Changes

You can use Change Manager's history features to see when baselines were captured and comparisons were performed. Change Manager's history features also record which administrator performed these tasks and the status of each task (for example, whether a capture operation succeeded or failed). You can print a report that includes this history information. See "Viewing History Entries for Tasks" on page 6-8 for more information on using Change Manager's history features.

The change applications and Plan Editor use many of the same components to create change plans, scripts, impact reports, and execution logs. Therefore, after you have used a components in one of the applications, you will know how to use it in another.

Using Help

Online help is provided for all of the Oracle Change Management Pack applications. Note that the Oracle Standard Management Pack includes only the Change Manager, Baseline Viewer, DB Capture, and DB Diff applications, and provides read-only access to database object definitions. Also, you cannot create change plans with Oracle Standard Management Pack. You can display the Contents page of the Oracle Change Management Pack help system, or you can display a help topic for your current context in an application.

Displaying the Contents Page for Help

Depending on the application that you are using, you can display the Contents page for the Oracle Change Management Pack online help by using one of the following methods:

- Press F1. If the Contents page for the help system does not display, click the Navigator button on the Help Topic Window toolbar.

- Click the ? on the application toolbar. This applies to Change Manager, Baseline Viewer, and Comparison Viewer only.

- Choose **Help**->**Contents**. This applies to Change Manager, Baseline Viewer, and Comparison Viewer only.

Use the help system's Contents page or Help Search page to locate help topics of interest. To access the Help Search page, choose **Tools**->**Search** on the Help Navigator window.

Displaying a Help Topic for Your Current Context in an Application

You can display context-sensitive help in several ways, depending on your context in an application.

- If a Help button exists, click it.

- If a Help button does not exist, click the object that you are interested in, then press F1.

- Some wizard pages for the change management applications also display property pages. To access help for the wizard page, click the Help button at the bottom left corner of the page. To access help for a property page, click a field in the property page, then click the Help button beneath the property page. If a Help button does not exist beneath the property page, click a field in the property page, then press F1.

Finding a Particular Type of Help Topic

In addition to providing context-sensitive help, the Oracle Change Management Pack help system contains conceptual topics, task topics, and a glossary. To locate each type of topic:

- Help topics whose titles begin with words such as "About," "Introduction," or "Overview" are conceptual topics. These topics usually provide overview information about change management applications or conceptual information that you should be aware of before performing a particular task. They do not provide step-by-step instructions for accomplishing a task. The Conceptual Topics book on the help system's Contents page includes all of the conceptual topics in the Oracle Change Management Pack help system.

- Help topics whose title begin with the word "To" are task topics. These topics provide step-by-step instructions for accomplishing a task. They do not provide conceptual information that you should be aware of before performing the task.

The Task Topics book on the help system's Contents page includes all of the task topics in the Oracle Change Management Pack help system.

■   The Oracle Change Management Pack glossary is available by accessing the Glossary book on the help system's Contents page.

6

Using Change Manager

The Change Manager application is the change management central interface. Change Manager gives you direct or indirect access to all of the change management operations (in cases where Change Manager cannot directly perform an operation, such as capturing or comparing object definitions, Change Manager starts the application that performs that operation).

Running Change Manager Connected to an Oracle Management Server or Standalone

You can run Change Manager connected to an Oracle Management Server or not connected to an Oracle Management Server. When you run Change Manager without connecting to an Oracle Management Server, you are running Change Manager standalone.

When you run Change Manager connected to an Oracle Management Server:

- Change Manager provides access to all the change management objects owned by all users in the Oracle Management Server repository. Objects are ordered by owner in the Change Manager navigator tree.

- Each user has read and write access to the objects that he or she owns, and has read-only access to objects owned by other users.

- Other change management applications started from Change Manager also run connected to the Oracle Management Server.

- You can submit change plan scripts as jobs using the Oracle Enterprise Manager job system.

When you run Change Manager standalone:

- Change Manager provides access to the change management objects in your standalone repository. Because the standalone repository contains only objects that you created, the Change Manager navigator tree displays only your change management objects.

- You have full access to your objects, but no access to any other objects.

- Other change management applications started from Change Manager also run standalone.

- You cannot submit change plan scripts as jobs using the Oracle Enterprise Manager job system, but you can execute scripts interactively.

Creating a Standalone Repository for Change Management Applications

A standalone repository is required to store Change Management Packchange management objects created during a standalone change management session. Read and follow the steps to perform before creating a standalone repository in the *Oracle Enterprise Manager Configuration Guide*.

The next time you start Change Manager standalone, a repository login dialog box prompts you for the Username, Password, and Service credentials of the user that owns the schema to be used for your standalone repository. When you provide the credentials for that user, the standalone repository tables needed by the change management applications will be created for you in that user's schema.

Changing Your Standalone Change Management Repository

At some point after creating a standalone repository for change management objects created during your change management sessions, you might decide that you want to use a different standalone repository.

To start using a different standalone repository, you must:

1. Make sure that you have followed the steps in the *Oracle Enterprise Manager Configuration Guide* that are a prerequisite for creating the new standalone repository.

2. In the ORACLE_HOME/sysman/config/ClientConfig.properties file (where ORACLE_HOME is the directory in which Oracle Enterprise Manager is installed), delete the lines that contain the following parameters:

   - OEM.REPOSITORY.USER

   - OEM.REPOSITORY.PASSWORD

■ OEM.REPOSITORY.DATABASE

Removing these lines from ClientConfig.properties removes information about the current standalone repository that is being used for standalone change management objects.

3. The next time you start Change Manager standalone, you are prompted for repository credentials for your standalone repository. Specify the Username, Password, and Service credentials of the user that owns the schema to be used for your standalone repository. The Username, Password, and Service information that you specify for the new standalone repository is stored in the ClientConfig.properties file.

Change Manager uses the information in the ClientConfig.properties file to determine the standalone repository in which to store information from your change management session.

Starting Change Manager

You can start the Change Manager application in any of the following ways:

■ From the Oracle Enterprise Manager Console, use any of these methods:

– Select a database in the navigator panel, click the right mouse button, point to the **Related Tools** menu option, then click **Change Manager**.

– On the **Tools** menu, point to **Standard Management Pack**, then click **Change Manager**.

– Click the Standard Management Pack drawer, then click the Change Manager icon.

When Change Manager is started from the Console using any of these methods, the mode in which the Console is running (connected to the Oracle Management Server or standalone) determines the mode in which Change Manager will run.

■ On UNIX or in a DOS window on an NT machine, set default to the ORACLE_HOME/bin directory (where ORACLE_HOME is the directory in which Oracle Enterprise Manager is installed), then enter the following in lowercase characters at the command line prompt:

```
oemapp ocm
```

When you start Change Manager using this method, you are prompted whether you want to run Change Manager connected to the Oracle Management Server or standalone.

- On the Windows **Start** menu, point to **Programs**, then to the Oracle Home where Oracle Enterprise Manager is installed, then to **Standard Management Pack**, then click **Change Manager**.

  When you start Change Manager using this method, you are prompted whether you want to run Change Manager connected to the Oracle Management Server or standalone.

See "Starting Change Management Applications from Change Manager" on page 6-5 for more information on starting the other change management applications from Change Manager.

Using the Change Manager Main Window

The Change Manager main window has a navigator tree on the left and a detail view on the right.

When Change Manager is running connected to an Oracle Management Server, the navigator tree displays the following change management objects, organized by owner:

- baselines
- comparisons

The tree contains the Baselines and Comparisons folders, even if objects of these types have not been created yet.

If Change Manager is running standalone, the tree displays only the change management objects belonging to the owner of the standalone repository being used.

If the Change Manager navigator tree contains no objects, this means that no baselines or comparisons have been created in the repository. When you create these objects, they appear in the Change Manager tree.

When you select a change management object or object folder and click the right mouse button, a context menu is displayed that lists the operations that can be performed in the current context. If you select an object that you do not own, some of the operations on the context menu are unavailable (for example, you cannot remove or modify an object that you do not own, because you have read-only access

to objects owned by other users). On the context menu, choose any available operation that you are interested in performing.

When the Change Manager Users folder (the root of the Change Manager tree) is selected, the detail view to the right of the Change Manager tree provides information about change management applications and the operations that they can perform. Click on an application's icon in the detail view to learn more about the operations that the application can perform.

When other folders or objects are selected in the Change Manager tree, the detail view provides related information about the selected folder or object.

> **Note:**   Change Manager provides right mouse button support for some operations.
>
> After you select an object in the Change Manager navigator, click the right mouse button to display a menu of options. Any menu options that are not appropriate for the given object are unavailable from the menu.

Starting Change Management Applications from Change Manager

You start the other change management applications and viewers from Change Manager, as follows:

- Create Baseline

  Choose **Object**->**Create Baseline**.

- Compare Database Objects

  Choose **Object**->**Compare Database Objects**.

- Baseline Viewer

  Expand the Change Manager folder, user folder, and Baselines folder in the Change Manager tree, select a baseline, then choose **Object**->**View Baseline**.

- Comparison Viewer

  Expand the Change Manager folder, user folder, and Comparisons folder in the Change Manager tree, select a comparison, then choose **Object**->**View Comparison**.

You can also start a change management application by clicking the Change Manager toolbar icon for that application.

When you start a change management application from Change Manager, the mode in which Change Manager is running (connected to the Oracle Management Server or standalone) determines the mode in which the other change management application will run.

Working with Baselines

Table 6–1 describes how to use Change Manager to perform different types of baseline operations.

Table 6–1   Performing Baseline Operations

Operation	Steps for Performing the Operation
Create a new baseline	Choose **Object**->**Create Baseline** and follow the steps in the Create Baseline application.
View a baseline	Select the baseline in the tree, then choose **Object**->**View Baseline**.
Delete a baseline	Select the baseline in the tree, then choose **Object**->**Remove**. This deletes all the versions of the baseline.
Export a baseline to a file	Choose **Tools**->**Export Plans/Baselines/Comparisons**, then specify the baseline to export and the name of the export file.
Import a baseline from a file	Choose **Tools**->**Import Plans/Baselines/Comparisons**, then specify the name of the export file and the baseline to import.
Create a new version of a baseline	Select the baseline in the tree, then choose **Object**->**Recapture**.
View a previous version of a baseline	Select the baseline in the tree, then choose **Object**->**Show Versions**. In the Versions dialog box, click the version you want to view, then click **View**.
Delete a previous version of a baseline	Select the baseline in the tree, then choose **Object**->**Show Versions**. In the Versions dialog box, click the version you want to delete, then click **Remove**.
View history entries for baseline tasks	Choose **View**->**Show History**. In the History dialog box, view history entries for completed baseline tasks on the History page.

For more information on working with baselines, see:

- "Viewing History Entries for Tasks" on page 6-8 for more information on viewing history entries for baseline tasks.

- "Working With a Particular Version of a Baseline or Comparison" on page 6-9 for more information on working with particular versions of baselines.

- "Exporting and Importing Baselines and Comparisons" on page 6-9 for more information on exporting and importing baselines.

Working with Comparisons

Table 6–2 describes how to use Change Manager to perform different types of comparison operations.

Table 6–2   Performing Comparison Operations

Operation	Steps for Performing the Operation
Create a new comparison	Choose **Object**->**Compare Database Objects** and follow the steps in the Compare Database Objects application.
View a comparison	Select the comparison in the tree, then choose **Object**->**View Comparison**.
Delete a comparison	Select the comparison in the tree, then choose **Object**->**Remove**. This deletes all the versions of the comparison.
Export a comparison to a file	Choose **Tools**->**Export Plans/Baselines/Comparisons**, then specify the comparison to export and the name of the export file.
Import a comparison from a file	Choose **Tools**->**Import Plans/Baselines/Comparisons**, then specify the name of the export file and the comparison to import.
Create a new version of a comparison	Select the comparison in the tree, then choose **Object**->**Repeat Comparison**.
View a previous version of a comparison	Select the comparison in the tree, then choose **Object**->**Show Versions**. In the Versions dialog box, click the version you want to view, then click **View**.
Delete a previous version of a comparison	Select the comparison in the tree, then choose **Object**->**Show Versions**. In the Versions dialog box, click the version you want to delete, then click **Remove**.
View history entries for comparison tasks	Choose **View**->**Show History**. In the History dialog box, view history entries for completed comparison tasks on the History page.

For more information on working with comparisons, see:

- "Viewing History Entries for Tasks" on page 6-8 for more information on viewing history entries for comparison tasks.

- "Working With a Particular Version of a Baseline or Comparison" on page 6-9 for more information on working with particular versions of comparisons.

- "Exporting and Importing Baselines and Comparisons" on page 6-9 for more information on exporting and importing comparisons.

Viewing History Entries for Tasks

You can view history entries that show the status of the following change management tasks:

- Capturing baselines

- Performing comparisons

By viewing the history entries for completed tasks, you can determine when each change management task was performed and its completion status.

To view the history entries for tasks in the current change management repository, on the Change Manager **View** menu, choose the **Show History** option, which displays the History dialog box. The History dialog box allows you to view completed tasks.

Viewing Completed Tasks

Click the History tab of the History dialog box to view completed tasks.

The history entries on the History page of the History dialog box enable you to track the change management tasks that have been completed. Each row on the History page is a history entry for one completed task. The status for a particular history entry tells you whether the task completed successfully or not.

On the History page, you can perform the operations shown in Table 6–3:

Table 6–3   Operations That Can be Performed on Completed Tasks

Operation	Steps to Perform the Operation
Remove a task	Select a task and click **Remove**.
Update the History page display	Click the **Refresh** button. Any new completed tasks are displayed.

Table 6–3   Operations That Can be Performed on Completed Tasks (Cont.)

Operation	Steps to Perform the Operation
View a task	Select a task and click **GoTo**. The appropriate change management application window is opened in the correct context for viewing the task.
Save history entries to a file	Click the **Save List** button. The Save List dialog box lets you save some or all of the task history entries in a file. You have the option of viewing and printing the information to be included in the file before saving the file.
Sort history entries	Click a column heading on the History page. The first time you click a heading, the history entries are sorted in ascending order, using the values in that column. If you click again on the same heading, the history entries are sorted in descending order, using the values in that column.

Working With a Particular Version of a Baseline or Comparison

After you create a baseline specification, you can use the specification to generate multiple baselines over time. Similarly, after you create a comparison specification, you can use it to generate multiple comparisons over time.

By default, when you select a baseline or comparison in Change Manager, any operations you perform are carried out on the latest version of that object. In some cases, however, you may want to view or remove an earlier version of the object. To do so, after you select the object in Change Manager, on the **Object** menu, click **Show Versions**. This displays the Versions dialog box. In the Versions dialog box, select the version of the object that you are interested in, then click **View** to view the selected version of the object in the appropriate change management window or click **Remove** to remove the selected version of the object from the Oracle Enterprise Manager repository.

> **Note:**   When you remove a version of a baseline or comparison, the version numbers for the remaining versions of that object remain the same.

Exporting and Importing Baselines and Comparisons

You can export and import baselines and comparisons using Change Manager. After you export one or more of these objects to a file, you can then import the

objects into another repository, which copies the objects from one repository to another.

To export baselines or comparisons:

1. In Change Manager, choose **Tools**->**Export Plans/Baselines/Comparisons**.

2. In the Export Plans/Baselines/Comparisons dialog box, select the object or objects to export, then click **Export**.

3. In the Export Plans/Baselines/Comparisons to which file? dialog box, select a file into which the selected objects will be exported, then click **Save**.

To import baselines or comparisons:

1. In Change Manager, choose **Tools**->**Import Plans/Baselines/Comparisons**.

2. In the Import Plans/Baselines/Comparisons from which file? dialog box, identify the file that contains the object or objects that you want to import, then click **Open**.

3. In the Import Plans/Baselines/Comparisons dialog box, select the object or objects that you want to import, then click **Import**. If the import utility discovers that any of the objects being imported has the same name as an existing object in the current repository, you will be prompted to either rename the object being imported or to cancel the import operation for that object.

7

Using Oracle TopSessions

This chapter discusses the following Oracle TopSessions topics:

- Overview of Oracle TopSessions
- Before You Use the Oracle TopSessions Chart
- Displaying the TopSessions Chart
- Overview of Session Activity
- Viewing Details About a Given Session
- Customizing the Session Information You Display

Overview of Oracle TopSessions

You can use Performance Manager to assist you in identifying performance bottlenecks within your system and database environment. The TopSessions chart displays database sessions that are contributing most heavily to database activity. You can display various details for these sessions, including the SQL statements, and resource usage.

You can obtain an overview of session activity by displaying the top sessions sorted by a statistic of your choosing. For any given session you can then drill down for more detail, or if you choose, you can terminate the session using the Kill Session option.

The TopSessions chart provides a methodology for identifying and correcting certain database performance problems. For example, when sudden file I/O load is detected, you can first identify the sessions contributing most to the problem and then isolate the executing SQL statements in user applications for those sessions. You can then analyze the SQL explain plans for those SQL statements to determine how best to resolve the problem.

Once populated with data, the TopSessions chart includes a multi-column list of summary information for each session connected to the database instance or for each of the top n sessions as measured by the selected sort statistic.

You can also access the TopSessions chart from the Enterprise Manager console by selecting TopSessions from the Diagnostics Pack tool drawer. You can access information about individual sessions via drill downs from this chart.

The TopSessions chart displays the sessions sorted by the statistic specified on the Options tab of the TopSessions property sheet. By using the Set Options button in the toolbar the chart can be customized to show only the items of interest and the sort criteria can be changed. You can specify the number of sessions to display on the Options tab as well. See "Customizing the Session Information You Display" on page 7-15 for more information about customizing the TopSessions display.

You can re-sort the sessions by clicking on the statistic column you want to use as the sort criterion. Clicking on the column header toggles the sort order in descending or ascending order. This changes only the display sort order and has no effect on the top "n" sorting/reduction done by selecting the sort item in the Options page.

The File, View, Collection, Tools and Help menus are the same as those in the chart window for Performance Manager. The Drilldown menu is customized to reflect some of the tasks specific to TopSessions.

Before You Use the Oracle TopSessions Chart

Before you can use the TopSessions chart on pre-Oracle 9*i* databases, you must first run a SQL script that defines the OEM_MONITOR role which contains all the privileges required to use the Diagnostics Pack products. Granting the OEM_MONITOR role is the best way to ensure that a user has the correct privileges to use the TopSessions functions. The OEM_MONITOR role has been granted more privileges in the 9*i* version that help to provide better functionality and performance.

For 9*i* databases, the SQL script, **catsnmp.sql**, is run by default as part of the 9*i* database creation process. For all versions of the database prior to 9i, you must manually run a SQL script to define the OEM_MONITOR role and create the necessary views.

For versions 8.1.5, 8.1.6, and 8.1.7 of the database, you must run the script **catsnmp_8i.sql**. For versions 8.0.5 and 8.0.6 of the database, you must run the script **catsnmp_80.sql**. For version 7.3.4 of the database, you must run script

catsnmp_734.sql. The selected script must be executed by a user with SYS privileges.

The sql files are located in the Oracle home of the Oracle Enterprise Manager installation, $ORACLE_HOME/SYSMAN/ADMIN. You must run the appropriate version of the SQL script manually on all pre-9*i* databases.

The OEM_MONITOR role must be granted to any user wishing to use the Oracle Diagnostics Pack. Performance Manager does not require any of these new views in order to run, but if you attach to a database that does not have the views, or your process does not have the required privileges, or the OEM_MONITOR role does not exist, then an informational message displays.

Displaying the TopSessions Chart

You can display the TopSessions chart from the Oracle Enterprise Manager console, from the **Start** menu, or from within Performance Manager.

Displaying the TopSessions Chart from the Console

You can display the TopSessions chart from the Oracle Enterprise Manager console in any of the following ways:

- On the Oracle Enterprise Manager console, point to the **Standard Management Pack** drawer, then click **TopSessions**.

- On the **Tools** menu of the Oracle Enterprise Manager console, point to **Standard Management Pack**, then click **TopSessions**.

- Click the right mouse button on the **target node** for which you want to display the TopSessions chart and then choose **TopSessions** from the **Related Tools** menu item on the context menu.

Starting TopSessions from the Start Menu

On the **Start** menu, follow the path: **Start**=>**Programs**=> **ORACLE** - **$Oracle _Home**=>**Standard Management Pack**=>**TopSessions**.

> **Note:** ORACLE_HOME represents the home directory in which the Standard Management Pack is installed.

When you launch TopSessions from the Start menu, a database logon dialog box appears. By default, you are connected to the database via Direct Connect, allowing the application to run in Standalone mode. You can change the connection details from the logon dialog to connect to an OMS if you choose.

Displaying TopSessions in Performance Manager

You can display the TopSessions chart from within Performance Manager by following these steps:

1. Point to the database for which you want to display TopSessions in the Performance Manager navigator and then choose **TopSessions** from the list of available charts.

    The Data Tab appears in the right-side pane.

2. Choose the data sources from the list that appears in the top panel of the Data Tab.

3. Select the collection types you want to display from the list at the bottom panel of the Data Tab.

4. To filter the sessions you want to display, click on the Session Filtering Tab. Filtering allows you to reduce the number of sessions returned by specifying criteria that a session must meet in order to be considered part of the sample set. For more information about the Session Filtering function, see "Session Filtering Options Page" on page 7-17.

5. To limit the number of data sources and to set the sort order for the chart, click on the Options Tab.

6. To display the TopSessions chart, click on the Show Chart button at the bottom of the panel.

7. To record the chart activity, click on the Record Chart button at the bottom of the panel to bring up the Recording Parameters dialog box.

By default, the top *n* sessions in the main display are sorted by the session logical reads statistic. If you want to change the sort statistic and/or the statistic filter, choose Options on the Session menu. This displays the Options property sheet, on which you can customize the session information displayed in the main display. See "Customizing the Session Information You Display" on page 7-15 for more information about using the Options property sheet.

Figure 7–1 shows the Oracle TopSessions chart.

Figure 7–1 Oracle TopSessions Chart
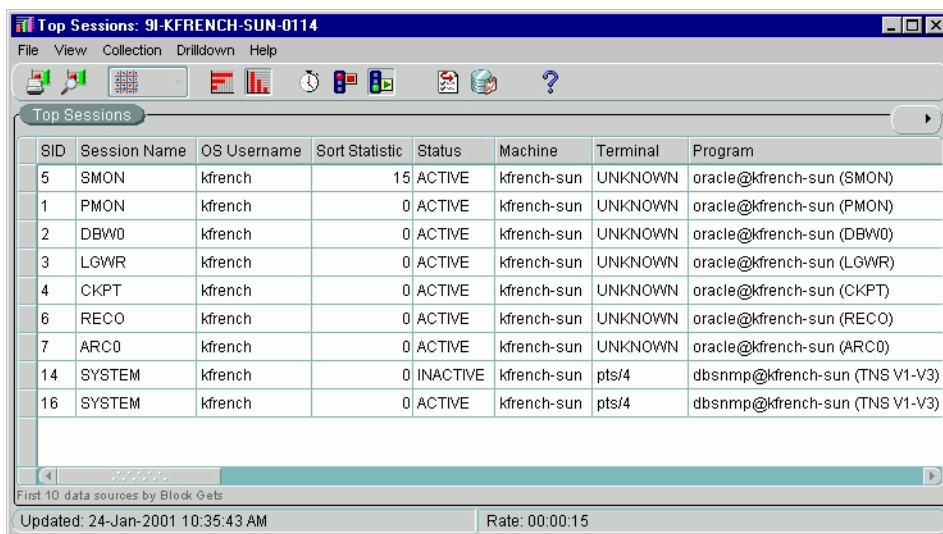
As Figure 7–1 shows, the Oracle TopSessions chart includes the following components:

- Menu bar
- Toolbar

The following sections describe each of these components.

Oracle TopSessions Menu Bar

The menu bar of the Oracle TopSessions chart includes the following pull-down menus:

- File
- View
- Collection
- Drilldown
- Help

File Menu

The File menu on the Charts display window has the following options:

- Print Screen

  Prints the displayed TopSessions chart.

- Report Chart

  Generates a report for the TopSessions chart. When you click the Report Chart button, Performance Manager creates a TopSessions chart report in HTML format and saves it for you. You can also preview the report by displaying it in your Web browser.

- Close

  Closes the displayed TopSessions chart.

View Menu

The View menu on the Charts display window has the following options:

- Table

  Changes the current display to a table chart. Table charts present text information, or a large number of instances, in a format that is easy to review.

- Horizontal Orientation

  Changes the chart orientation to horizontal.

- Vertical Orientation

  Changes the chart orientation to vertical.

Collection Menu

The Collection menu on the Charts display window has the following options:

- Pause Chart/Resume Chart

  Allows you to stop or resume collections for the chart displayed in the chart window.

- Refresh Rate

  This option lets you set the amount of elapsed time between data samples. The maximum interval is one day and the minimum is one second.

  Choose one or all of the following:

- Hours - maximum is 23 hours

- Minutes - maximum is 59 minutes

- Seconds - maximum is 59 seconds

- Options

  Displays the Options property sheet, from which you can specify the sorting criterion, the refresh mechanism, and the number of entries for statistics displayed in the Oracle TopSessions main window.

Drilldown Menu

The Drilldown menu shows the same items available from the Performance Manager chart window as well as available drilldowns for the selected sessions. The drilldowns available depend on the tools available on your system. If you choose Session Details from the Drilldown menu when no session is selected in the TopSessions chart, Performance Manager displays the Select Data Source dialog box where you can select from a list of data sources. After you choose the data sources, the Session Details window appears.

The Drilldown menu in the TopSessions chart also includes items specific to TopSessions. You can end a user session that you select on the TopSessions chart by choosing Kill Session from the Drilldown menu. When you kill a session, the session is removed from the chart. If a Session Detail window is open when you kill its session, the Session Detail window stops refreshing and reports an error.

> **Note:**   If the Tuning Pack is installed, Current SQL and Explain Plan appear on the Drilldown menu.

The Drilldown menu on the TopSessions chart has the following options:

- Historical Data

  Displays the Oracle Capacity Planner Database Logon dialog box. Supply the user name, password, and target information as needed. Once you have logged into Capacity Planner, you can display historical data for this chart or start collecting historical data.

- Session Details

  Displays the Session Details window for the session selected from the Oracle TopSessions chart. This menu item is disabled when no session in the Oracle TopSessions main display has been selected.

- Current SQL

- Open Cursors for this Session

- Timed Statistics

- List of Drill-Down Charts

  List of chart statistics for which you can view additional information (charts).

- Kill Session

  You can kill a session from the Top Sessions chart. This tool requires the Intelligent Agent release 8.0.6 or higher.

- Turn SQL Trace On

- Turn SQL Trace Off

- Tune SQL Statement

  Highlight an item in a Top Sessions chart and choose the Tune SQL statement menu option. If the Tuning Pack is installed, this action activates the SQL Analyze application.

Help Menu

The Help menu items allow you to obtain help on Oracle TopSessions chart items or property sheets.

Toolbar

The toolbar of the Oracle TopSessions chart contains icons representing certain Oracle TopSessions menu items, including the following:

Print Screen

Prints the displayed chart.

Report Chart

Generates a report for the displayed chart. When you click the Report Chart button, a chart report in HTML format is automatically created and saved for you. Performance Manager allows you to preview the report by displaying it on your screen.

Chart Type

Changes the current display to the chart type you select from the drop-down list. You can select a bar chart, pie chart, strip chart, or table chart. Bar charts show discrete measurements at the current time. Pie charts show the relationship or proportions of parts to a whole. Strip charts show trends or changes in data over a period of time. When you first display a Strip chart, you will notice the addition over time of tics at the bottom of the chart. Each point represents a polling event. Table charts present text information, or a large number of instances, in a format that is easy to review.

Horizontal Orientation

Changes the chart orientation to horizontal.

Vertical Orientation

Changes the chart orientation to vertical.

Refresh Rate

Allows you to set the time between collections. The time can be set in hours, minutes, and seconds.

Pause Chart

Allows you to stop the collection for a chart displayed in the chart window.

Resume Chart

Allows you restart the collection of a chart displayed in the chart window.

Options

Allows you to choose the data sources, data, sort criteria, and number of rows to display for the collection.

Historical Data

Displays the Oracle Capacity Planner Database Logon dialog box. Supply the user name, password, and service information as needed. Once you have logged into Capacity Planner, you can display historical data for this chart or start collecting historical data.

Start Recording

Starts recording the current TopSessions Chart.

Stop Recording

Stops recording the current TopSessions Chart.

Help on Chart

Displays help about the TopSessions chart.

Overview of Session Activity

Once populated with data, the Oracle TopSessions chart includes a multi-column list of summary information for each session connected to the database instance, or for each of the top *n* sessions, as measured by the selected sort statistic listed in Table 7–1.

Table 7–1   TopSessions Sort Statistics

Sort Statistic	Description
Recursive CPU	Amount of CPU used for parsing row cache statements such as lookups in the data dictionary, executing triggers, and PL/SQL.
Parse CPU	Amount of CPU time spent parsing SQL statements. The Parse CPU filter represents the percentage of CPU time spent parsing SQL statements. Parse time CPU can be a strong indication that an application has not been well tuned. High parse time CPU usually indicates that the application may be spending too much time opening and closing cursors or is not using bind variables.
Total CPU Time	Total elapsed time (in seconds) spent parsing, executing, and fetching during a session.
Execute Time	Total elapsed time (in seconds) for all calls (user and recursive) associated with a distinct session.
Rollback Count	Total number of times users manually issue the ROLLBACK statement or an error occurs during a user's transactions during the sample period.

Table 7–1 TopSessions Sort Statistics

Sort Statistic	Description
Commit Count	Total number of user commits performed during the sample period. When a user commits a transaction, the redo generated that reflects the changes made to database blocks must be written to disk. Commits often represent the closest thing to a user transaction rate.
SPID	Server Process Identifier is a unique value given to each database server process. You must specify an exact id number for the filter to work.
Logical Reads (%)	Percentage of total buffer gets that were attributed to this session during the sample period. Default is 10%.
Physical Reads (%)	Percentage of database blocks read from disk. Also known as "disk reads." Default is 10%.
Logon Time	Time of logon by this session (filter includes sessions that started before a user-defined date and time). To set the date and time, double click on a piece of the timestamp and use the up/down arrows to increase or decrease the value. The default timestamp is the current date and time.
UGA Memory	Total amount of memory used by the User Global Areas for a session.
Parse Elapsed Time	Total elapsed time (in seconds) for all parses associated with a distinct session.
Action	The name of the action being performed by the application module that first executed this statement. This name can be optionally set by using DMBS_APPLICATION_INFO.SET_ACTION.
Module	The name of the application module that first executed this statement. This name can be optionally set by using DMBS_APPLICATION_INFO.SET_MODULE.
Program	The name of the client program. (Useful when the program name is known and is distinct from other programs.)
Terminal	The operating system terminal name (useful for character mode applications).
Machine	The operating system machine name.

Table 7–1   TopSessions Sort Statistics

Sort Statistic	Description
OS Username	The name of the operating system client user. (Useful in a two tier architecture when the database client process does not live on a middle tier machine but initiated by the user on his desktop, or initiated on a UNIX machine. For desktop initiated processes, the Windows registry key USERNAME must be set to the username.)
Session Name	Either the Oracle username of the current session or if the session is owned by an Oracle background process, the name of the background process.
Total Parses	Total number of parse calls (hard and soft). A parse occurs when a SQL statement is mapped to a cursor during a session.
Hard Parses	Hard parses happen when the server parses a query and cannot find an exact match for the query in the library cache. Hard parses can be avoided by sharing SQL statements efficiently. The use of bind variables instead of literals in queries is one method to increase sharing.
Sort Rows	Total number of rows sorted.
Memory Sorts	Number of sorts with no disk writes. Sorts in memory are sorts that could be performed completely within the sort buffer in memory without using the temporary tablespace segments.
Disk Sorts	Sorts on disk are sorts too large to be performed entirely in the sort area, requiring I/O to temporary segments on disk.
Constant Changes	The number of times a database block has applied rollback entries to perform a consistent read on the block.
Block Changes	The number of times changes were made to blocks in the SGA as part of an update or delete. These are changes that are generating redo log entries and hence will be permanent changes to the database if the transaction is committed.
Phys Reads	This data item represents the number of data blocks read from disk during this sample period. When a user performs a SQL query, Oracle will try to retrieve the data from the database buffer cache (memory) first, then go to disk if it is not in memory already. Reading data blocks from disk is much more expensive than reading the data blocks from memory. The goal with Oracle should always be to maximize memory utilization.
Constant Gets	Total number of requests for information on constants in the data dictionary cache.

Table 7–1   TopSessions Sort Statistics

Sort Statistic	Description
Block Gets	Total number of requests for information on blocks in the data dictionary cache in CURRENT mode. When Oracle processes a user request for data it checks to see if the database blocks containing the requested data are in the memory (the database buffer cache) first. If so, Oracle checks to see if the data in those blocks is "up to date". If they are, Oracle will fulfill the request using the data blocks in memory. If they aren't in memory, Oracle will retrieve them from disk. This is less efficient, but necessary. If Oracle was able to retrieve the blocks from memory without having to apply rollback data for consistency, each block retrieved will log a db block get.

Using the Right Mouse Button on the Main Display

In the Oracle TopSessions chart, you can click on a username with the right mouse button and then select one of the menu items that appears in the context menu. The list contains the Print Screen, Report Chart, and Help on Chart menu items, and then lists the View, Collection, and Drilldown menus from which you can then select related items from the flyout menus.

Sorting the Order of Entries in the Chart

By default, the value of the sort statistic determines the order of session entries in the Oracle TopSessions chart. However, you can use any field in the list to sort the order of displayed session entries by clicking on any column header in the list.

Using the Chart Status Button

Use the Chart Status button in the upper right corner of the TopSessions chart to access many of the same options available from the Drilldown menu. You can display Advice about the current chart, view the Session Details page, kill the current session, and turn SQL Trace on or off. The contents of the menu that displays when you press the Chart Status button is subject to the context of the chart.

Viewing Details About a Given Session

To obtain more information about a given session, you can drill down by right mouse clicking on a session in the Oracle TopSessions chart. Click on the Drilldown

menu item and choose Session Details. Optionally, you can select a session and then choose Session Details from the Drilldown menu on the menu bar.

A Session Details window for that session appears as seen in Figure 7–2.

Figure 7–2   TopSessions Details Window
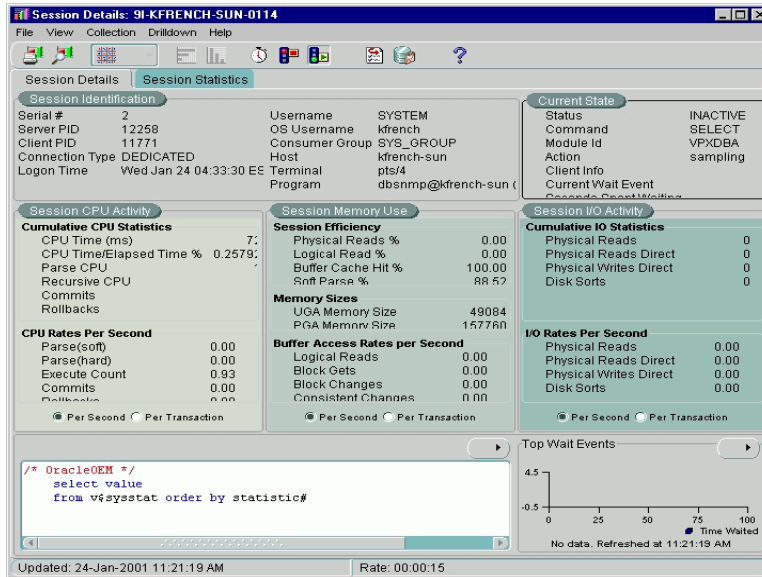
Session Details Page

The Session Details page presents a tabular view of a sessions details and includes the following sections:

- Session Identification Information
- Current State
- Session CPU Activity
- Session Memory Use
- Session I/O Activity
- Current SQL
- Top Wait Events

Session Details Statistics Page

The Statistics page of the Session Details window provides a large number of performance statistics for the selected session. The particular statistics this page displays can vary, depending on the Oracle server instance.

Figure 7–3   Session Statistics Page

For information about the statistics that can be displayed for a session, see the *Oracle Server Reference*. For information on how to make use of these statistics, see *Oracle Server Tuning*.

Customizing the Session Information You Display

To customize how session information is displayed in the Oracle TopSessions chart, choose Options from the Collection menu or click on the Options button on the toolbar. The Options property sheet that appears includes the following pages:

- Data
- Session Filtering

■   Options

To select one of these pages, click on the appropriate tab title near the top of the Options property sheet.

Data Options Page

When TopSessions is selected from the Oracle Performance Manager navigator tree, the Data Tab appears in the right-hand pane. The Data Tab presents information about the selected TopSessions collection such as the Data Sources and the collection types of the selected data. You can personalize the Data Tab view by selecting or deselecting the collected data items.

Figure 7–4   TopSessions Data Options Page
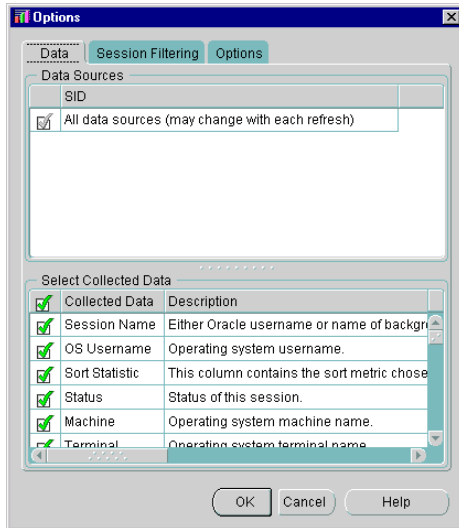
Data Sources

The "All data sources" option is selected by default.

Select Collected Data

You can specify which data items should appear in the chart by selecting or deselecting the items in this list. By default, a check mark appears in the "Collected Data" row, all data items will automatically appear in the chart.

Session Filtering Options Page

By default, a TopSessions collection will show any session that is currently active or any session that has executed a SQL statement since the last sample. These sessions are selected based on a default set of pre-defined filters. If you prefer, you can also customize the TopSessions collection by defining your own set of TopSessions filters. The TopSessions Filtering tab allows you to specify your own set of filters.

Figure 7–5 TopSessions Session Filtering Page
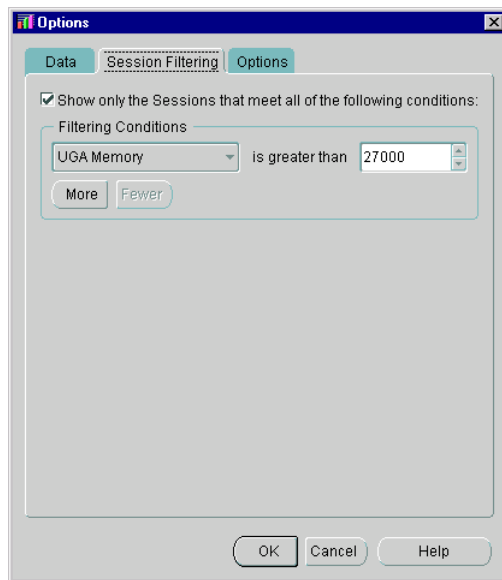
To enable the filtering options, check the box labeled: **Show only the statements that meet all of the following conditions**. Select a filtering condition and value, then click the **More** button to add additional filters. You can eliminate filters by pressing the **Fewer** button.

Creating a Customized TopSessions Collection

Before you create your own set of TopSessions filters, it is important to note the following filtering restrictions:

- You can only include one value per filter.
- Adding additional filters may negate previously defined filters.

For a complete list of filtering conditions and their descriptions, see Table 7–1, "TopSessions Sort Statistics" on page 7-10.

Options Page

The Options tab provides two display options. These options should be set prior to showing the TopSessions chart. You can also change the options after starting the chart to reduce the number of sessions to a smaller sample set based upon some abnormality you see in the default chart.

Figure 7–6   TopSessions Options Page
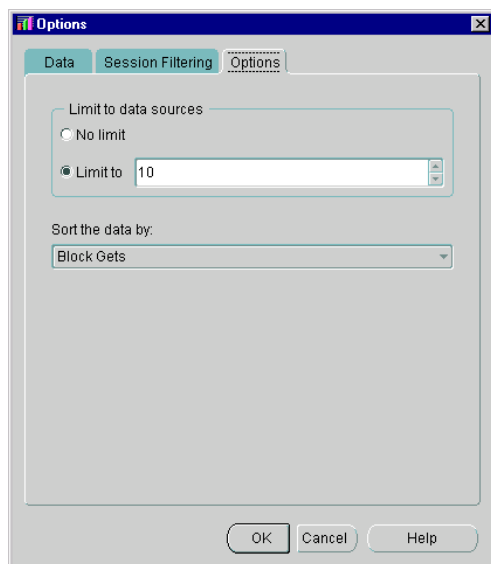
- Limit to data sources:

  No limit--The TopSessions chart will display all of the statements that meet the filtering criteria(n).

  Limit to--By default the TopSessions chart will only display the top 25 statements that meet the filtering criteria(n). You can, however, view more or fewer statements by adjusting this number.

- Sort the data by:

This option allows you to specify a sorting parameter. When the chart is displayed, the data items will be organized by the sorting parameter you have specified. The chart is sorted by disk reads by default.

A

Troubleshooting Appendix

This appendix describes different ways of troubleshooting problems that may occur when you are using change management applications.

You may decide to contact an Oracle Worldwide Customer Support representative regarding a problem with the change management applications. If so, you may be asked to use one of the approaches described in this appendix to obtain information that will help the representative determine the source of the problem.

Using Environment Variables When Running Change Manager from the Command Line

You can set environment variables in the MS-DOS or UNIX command line before you run the Change Manager application from the command line. The following environment variables may provide information that is useful for troubleshooting and debugging change management application problems:

■ set ORACLE_OEM_JAVAMX=-mx<number>m

The default is -mx128m. This environment variable specifies the maximum amount of virtual memory to be used by the Java Virtual Machine (in megabytes). This memory is not used unless needed. If the amount is exceeded, execution will be terminated. This environment variable can be used to increase the amount of memory for large script generations and other purposes.

■ set ORACLE_OEM_CLIENTTRACE=true

This environment variable, which is for Windows NT only, displays troubleshooting information in an MS-DOS window. Before you set this environment variable, the OCM_TRACE.ENABLED property in the ORACLE_HOME/sysman/config/ClientConfig.properties file (described in Table A–1 on page A-2) must be set to true, otherwise troubleshooting information is not

displayed in the MS-DOS window. Note that ORACLE_HOME is the directory in which Oracle Enterprise Manager is installed.

- set ORACLE_OEM_JAVARUNTIME=<directory where bin/java.exe is located>

  You can specify this environment variable if you have a Java development environment. This environment variable can be useful when the system is hanging and you want to get a thread dump.

Enabling Tracing and Debugging for Change Management Applications

You can turn on tracing and debugging facilities for the change management applications to help troubleshoot problems.

You can enter different properties in the ClientConfig.properties file in the ORACLE_HOME/sysman/config directory for Oracle Enterprise Manager to obtain more tracing and debugging information about change management applications. Table A–1 displays the properties and a description of each property.

By default, the trace files for change management applications are written to the ORACLE_HOME/sysman/log directory for Oracle Enterprise Manager.

Note: The OCM_TRACE.ENABLED property in the ClientConfig.properties file must be set to true for the other properties whose names begin with OCM_TRACE in the ClientConfig.properties file to be meaningful.

Table A–1   Using ClientConfig.properties to Enable Tracing and Debugging

Property and Settings	Description
OCM_TRACE.ENABLED={true|false}	If true, enables output of informational and problem trace messages.
OCM_TRACE_FILE.ENABLED={true|false}	If true, enables output of trace information to a file. The setting of the OCM_TRACE_VERSIONING.ENABLED property determines the name of the trace file.

Table A–1   Using ClientConfig.properties to Enable Tracing and Debugging (Cont.)

Property and Settings	Description
OCM_TRACE_VERSIONING.ENABLED={true | false}	The OCM_TRACE_ FILE.ENABLED property must be true for the OCM_ TRACE_ VERSIONING.ENABLED property to be meaningful.
	If the OCM_TRACE_ VERSIONING.ENABLED property is true, a new version of the trace file is created for each run of the application. The file has a name in the format Oracle Change Manager_ nnnnnn.log, where nnnnnn represents a series of numbers.
	If a change management application is running in more than one session on your machine, examine the timestamp of each trace file to determine the trace file that is associated with each session. The trace file with the earliest timestamp is the trace file for the session that started first, and so on.
	If the OCM_TRACE_ VERSIONING.ENABLED property is false or not used, the trace file has the name Oracle Change Manager.log, and the file is overwritten for each run of the application.

Table A–1   Using ClientConfig.properties to Enable Tracing and Debugging (Cont.)

Property and Settings	Description
OCM_TRACE_DEBUG.ENABLED={true | false}	If the OCM_TRACE_ DEBUG.ENABLED property is true, general debugging information (such as property values) is output to the trace file while Change Manager runs.
OCM_TRACE_DEBUG_VERBOSE.ENABLED={true | false}	If the OCM_TRACE_ DEBUG_ VERBOSE.ENABLED property is true, more detailed debugging information, including class names and line numbers, is output to the trace file while Change Manager runs.

Table A–1   Using ClientConfig.properties to Enable Tracing and Debugging (Cont.)

Property and Settings	Description
VDB_DEBUG={true | false}	If the VDB_DEBUG property is true, database calls are output to the trace file.
	This property is not specific to change management applications. It can be used with other Oracle Enterprise Manager applications.
	Use this property in the ClientConfig.properties file to capture database calls in the trace file when you are running Change Manager standalone.
	Use this property in the omsconfig.properties file in the $ORACLE_HOME/sysman/config directory to capture database calls in the trace file when you are running Change Manager connected to an Oracle Management Server.
	Use this property in both the ClientConfig.properties file and the omsconfig.properties file if you want to capture database calls in the trace file regardless of how you are running Change Manager.

Table A–1   Using ClientConfig.properties to Enable Tracing and Debugging (Cont.)

Property and Settings	Description
VDB_VERBOSE_DEBUG={true | false}	If the VDB_VERBOSE_ DEBUG property is true, more detailed information about database calls, including SQL statement issued and return values, is output to the trace file.
	This property is not specific to change management applications. It can be used with other Oracle Enterprise Manager applications.
	Use this property in the ClientConfig.properties file to capture database calls in the trace file when you are running Change Manager standalone.
	Use this property in the omsconfig.properties file in the $ORACLE_ HOME/sysman/config directory to capture database calls in the trace file when you are running Change Manager connected to an Oracle Management Server.
	Use this property in both the ClientConfig.properties file and the omsconfig.properties file if you want to capture database calls in the trace file regardless of how you are running Change Manager.

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