

Oracle® Enterprise Manager

Administrator's Guide

Release 2.2

September 2000

Part No. A85248-01

ORACLE®

Copyright © 1996, 2000, Oracle Corporation. All rights reserved.

The Programs (which include both the software and documentation) contain proprietary information of Oracle Corporation; they are provided under a license agreement containing restrictions on use and disclosure and are also protected by copyright, patent, and other intellectual and industrial property laws. Reverse engineering, disassembly, or decompilation of the Programs is prohibited.

The information contained in this document is subject to change without notice. If you find any problems in the documentation, please report them to us in writing. Oracle Corporation does not warrant that this document is error free. Except as may be expressly permitted in your license agreement for these Programs, no part of these Programs may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the express written permission of Oracle Corporation.

If the Programs are delivered to the U.S. Government or anyone licensing or using the programs on behalf of the U.S. Government, the following notice is applicable:

Restricted Rights Notice Programs delivered subject to the DOD FAR Supplement are "commercial computer software" and use, duplication, and disclosure of the Programs, including documentation, shall be subject to the licensing restrictions set forth in the applicable Oracle license agreement. Otherwise, Programs delivered subject to the Federal Acquisition Regulations are "restricted computer software" and use, duplication, and disclosure of the Programs shall be subject to the restrictions in FAR 52.227-19, Commercial Computer Software - Restricted Rights (June, 1987). Oracle Corporation, 500 Oracle Parkway, Redwood City, CA 94065.

The Programs are not intended for use in any nuclear, aviation, mass transit, medical, or other inherently dangerous applications. It shall be the licensee's responsibility to take all appropriate fail-safe, backup, redundancy, and other measures to ensure the safe use of such applications if the Programs are used for such purposes, and Oracle Corporation disclaims liability for any damages caused by such use of the Programs.

Oracle® is a registered trademark, and Oracle7, Oracle8, Oracle8i, Oracle Expert, Oracle Trace, Net8, PL/SQL, SQL*, SQL*Net, and SQL*Plus are trademarks or registered trademarks of Oracle Corporation. All other company or product names mentioned are used for identification purposes only and may be trademarks of their respective owners. Windows, Windows NT, Visual C++, and OLE are trademarks of Microsoft Corporation. Netscape, Netscape Certificater Server, Netscape FastTrack Server, Netscape Navigator, Netscape ONE, SuiteSpot, and the Netscape N and Ship's Wheel logos are registered trademarks of Netscape Communications Corporation in the United States and other countries.

OraTcl - Copyright 1993 Tom Poindexter and US West Advanced Technologies, Inc. Permission to use, copy, modify, and distribute the software and its documentation for any purpose and without fee is hereby granted, provided that the copyright notice appear in all copies. Tom Poindexter and U S WEST make no representations about the suitability of this software for any purpose. It is provided as is without express or implied warranty. By use of this software the user agrees to indemnify and hold harmless Tom Poindexter and U S WEST from any claims or liability for loss arising out of such use.

Contents

Send Us Your Comments	xi
Preface.....	xiii
Part I Oracle Enterprise Manager Framework	
1 Console	
Enterprise Manager Console	1-2
Components.....	1-2
Navigator	1-2
Group	1-2
Jobs	1-3
Events	1-3
Console Menus	1-4
Context-Sensitive Menus.....	1-4
File Menu.....	1-5
View Menu	1-5
System Menu	1-5
Tools Menu.....	1-6
Database Applications	1-6
Service Management	1-6
Help Menu.....	1-7
Managing Enterprise Manager Administrators.....	1-8
Managing Administrator Accounts	1-9

Creating or Editing an Administrator Account.....	1-10
Reassigning Object Ownership.....	1-11
Administrator Preferences	1-11
General.....	1-12
Notification	1-12
Filters	1-13
Email	1-15
Paging	1-17
Paging Status Codes for Numeric Pages	1-18
Email/Paging Message Body Definition	1-19
Paging Server	1-20
Schedule.....	1-22
Permissions	1-23
Preferred Credentials	1-25
Setting Administrator Credentials	1-26
Saving Logon Information as a Preferred Credential	1-27
Saving the Contents of a List.....	1-27
Configuring and Starting the Paging Service.....	1-28
Setting Up Paging	1-29
Adding a Paging Server.....	1-30
Adding Paging Carrier.....	1-31
Specifying Paging Notification Preferences.....	1-32
Other Paging Server Operations	1-33
Removing a Paging Server	1-33
Viewing Information on Paging Server	1-33
Pinging a Paging Server	1-33
Querying Status of the Paging Service	1-34
Stopping the Paging Service	1-34
Removing a Paging Carrier	1-34
Editing a Paging Carrier	1-35
Viewing Information about a Paging Carrier	1-35
Testing a Paging Carrier	1-35
Creating Enterprise Manager Reports	1-35
Enterprise Report versus Database Configuration/Status Reports	1-36
Enterprise Report (General Systems)	1-36

Database Configuration/Status Report	1-36
Requirements	1-37
Launching the Report Wizard	1-37
Creating Enterprise Reports	1-37
Creating DBA Studio Reports	1-38

2 Navigator

Navigator Pane	2-2
Populating the Navigator Tree	2-2
Expanding Objects in the Navigator	2-2
Viewing Specific Tree Objects	2-4
Launching Tools	2-4
Navigator Menu	2-5
Discovering Services	2-7
Adding a Service	2-8
Refreshing a Service	2-9
Removing a Service	2-9
Pinging the Intelligent Agent	2-9
Determining Node Properties	2-10
Manipulating Objects in the Navigator	2-10
Administering Objects	2-10
Copying Navigator Objects	2-10
Apache Web Servers	2-11
Discovering Apache Web Servers	2-11
Determining the Status of Apache Web Server	2-11
Paging/Email Blackout	2-12
Specifying Total Paging/Email Blackout	2-12
Defining a Paging/Email Blackout	2-12
Making a Copy of an Existing Blackout Schedule	2-14
Turning Blackout Schedules On and Off	2-14
Deleting Paging/Email Blackout Periods	2-14
Viewing Blackout Periods	2-14
Removing a Node from the Navigator	2-15
Node Removal Failure	2-15

3 Groups

Group Pane	3-2
Group Menu	3-3
Managing Groups	3-4
Creating a Group.....	3-4
Group General Page	3-5
Group Permissions Page	3-6
Manipulating Group Views	3-7
Monitoring Status	3-7
Expanding Objects.....	3-8
Groups	3-8
Databases and Other Discovered Services	3-8
Launching Tools from a Group	3-8
Adding Objects to a Group	3-9
Deleting Objects from the Group Pane.....	3-9
Modifying a Group	3-10
Removing Groups.....	3-10
Example: Creating a Group	3-11

4 Jobs

Job Process	4-2
Job Tasks	4-2
Writing SQL*Plus Scripts	4-3
Job Credentials.....	4-4
Submitting Jobs	4-5
Cancelling Jobs.....	4-5
Job Pane	4-6
Active Job Pane	4-7
Context-sensitive Menu options	4-8
History Page.....	4-9
Job Menu	4-10
Job Library.....	4-11
Creating, Modifying, or Viewing a Job	4-12
Creating a New Job.....	4-12
Modifying a Saved Job	4-13

Viewing Job Details	4-14
General Page.....	4-14
Job Task Page.....	4-15
Job Parameters Page.....	4-17
Job Schedule Page	4-17
Job Permissions Page	4-18
Job Progress Page	4-19
Job Output Dialog Box	4-20
Example: Creating a Job.....	4-21
Oracle Job Tasks	4-23
Oracle Database Tasks	4-24
Enterprise Manager Wizard Database Tasks	4-24
Operating System or Node Tasks	4-27
Tcl Script Examples	4-29
Listener Tasks.....	4-30

5 Events

What's New in Events	5-2
Event System Overview	5-4
Using Events.....	5-4
Creating Events	5-5
Registering Events	5-6
Event Occurrences.....	5-7
Event Notifications	5-7
Notifying Administrators	5-8
Interpreting Events	5-8
Correcting Problems.....	5-10
Event Categories and Types	5-10
Fault Management Event Tests	5-11
Space Management Event Tests.....	5-11
Resource Management Event Tests.....	5-12
Performance Management Event Tests.....	5-12
Unsolicited Event Tests.....	5-12
Registering Interest in an Unsolicited Event	5-12
Setting the Parameters Property Sheet for Unsolicited Events	5-13

Raising an Unsolicited Event Test	5-14
Raising Unsolicited Events Via Enterprise Manager Jobs	5-15
Unsolicited Event Caveats	5-21
Event Pane	5-21
Alerts Page.....	5-22
Viewing Alerts	5-23
History Page.....	5-23
Registered Page	5-23
Event Menu	5-24
Context-Sensitive Menus.....	5-25
Event Library Dialog	5-26
Editing an Event	5-26
Oracle Event Tests	5-26
Event Viewer	5-27
General.....	5-27
Log	5-28
Notification Details.....	5-28
Creating, Modifying, and Registering an Event	5-29
Modifying a Registered Event	5-30
Event General Page.....	5-31
Event Tests Page.....	5-33
Event Parameters Page	5-34
Parameters	5-35
Event Permissions Page.....	5-35
Event Progress Page	5-37
Example: Creating and Registering an Event	5-37
Administrator Event Notification	5-40
Oracle Event Tests	5-40
Database Fault Management Event Tests.....	5-41
Node Fault Management Events.....	5-41
Listener Fault Management Events	5-42
Data Gatherer Fault Management Events.....	5-42
Numeric Pager Job/Event Ids	5-42
General Event System Troubleshooting Procedures	5-43
Obtaining Enterprise Manager Repository Status	5-43

Event System Features and Requirements	5-43
--	------

Part II The Database Administration Tools

6 DBA Management Pack

DBA Studio	7-2
Common Features of DBA Management Pack Functionality	7-3
Tree Views and Property Sheets.....	7-3
Multi-Column Lists	7-3
Database Version Awareness	7-3
Database Reports	7-3
Logging of Database Changes.....	7-3
Showing Object DDL	7-3
Show SQL	7-4
Show Dependencies.....	7-4
Right-Mouse Commands.....	7-4
Font Settings.....	7-4
Advanced Mode.....	7-4
DBA Management Pack Functionality and Wizards	7-5
Instance Management.....	7-6
Database Operations	7-7
Stored Configurations	7-8
Sessions	7-8
In-Doubt Transactions	7-9
Resource Consumer Groups	7-9
Resource Plans	7-9
Resource Plan Schedule	7-9
Schema Management.....	7-10
Tree List by Schema	7-11
Editing an Object	7-12
Creating Objects	7-12
Security Management.....	7-13
User Operations	7-14
Role Operations	7-15
Profile Operations	7-15

Storage Management	7-16
Controlfile Operations	7-17
Tablespace Operations	7-18
Datafile Operations	7-18
Rollback Segment Operations	7-18
Redo Log Group Operations	7-18
Archive Log Operations	7-18
Replication Management	7-18
JServer Management	7-19
Cache Management	7-19
SQL*Plus Worksheet.....	7-20
Wizards	7-20

A Enterprise Manager Event Handler

How the Event Handler Works	A-2
How to Set Up the Event Handler	A-3
Defining Event Filters	A-4
Filter Syntax.....	A-4
The Event Logger Templates.....	A-5
The Command Executor Templates	A-8
Starting up and Running the Event Handler.....	A-10
Stopping the Event Handler	A-12
Troubleshooting Tips.....	A-12
Tracing	A-14
Sample Filters and Templates:.....	A-15
Filters:	A-15
Templates	A-15
Known Issues	A-16
Differences between Solaris and Windows NT	A-17

B Keyboard Shortcuts

Index

Send Us Your Comments

Oracle Enterprise Manager Administrator's Guide, Release 2.2

Part No. A85248-01

Oracle Corporation welcomes your comments and suggestions on the quality and usefulness of this document. Your input is an important part of the information used for revision.

- Did you find any errors?
- Is the information clearly presented?
- Do you need more information? If so, where?
- Are the examples correct? Do you need more examples?
- What features did you like most?

If you find any errors or have any other suggestions for improvement, please indicate the document title and part number, and the chapter, section, and page number (if available). You can send comments to us in the following ways:

- FAX: (650) 506-7200 Attn: Oracle System Management Products
- Postal service:
Oracle Corporation
Oracle System Management Products Documentation Manager
500 Oracle Parkway, 50p5
Redwood Shores, CA 94065
USA

If you would like a reply, please give your name, address, telephone number, and (optionally) electronic mail address.

If you have problems with the software, please contact your local Oracle Support Services.

Preface

This chapter describes the purpose and organization of this guide. The following information is discussed:

- Purpose of this Guide
- Audience
- How this Guide Is Organized
- How to Use This Guide
- Conventions Used in This Guide
- Product Documentation
- Related Publications

Purpose of this Guide

This guide describes Oracle® Enterprise Manager, Release 2.2: Oracle's system management Console, common services, and integrated platform graphical tools. Oracle Enterprise Manager is bundled with the DBA Management Pack, which is an integrated set of standard database administration applications to help automate and simplify the common daily tasks of administrators. These supplemental applications focus on specific areas of database administration, helping administrators with their daily and routine tasks of managing databases and other services and keeping them operational.

From the client interface, the Oracle Enterprise Manager Console, you can do the following:

- Centrally administer, diagnose, and tune multiple databases
- Manage non-database Oracle products and services
- Effectively monitor and respond to the health of your Oracle family of products and third-party services 24 hours a day
- Schedule jobs on multiple nodes at varying time intervals
- Monitor networked services for events
- Customize your display by organizing databases and other services into logical administrative groups

While using Enterprise Manager products, you should refer to the online help for specific information on the displayed dialog box, menu, or window. You can display the online help by pressing F1 or selecting a Help button if present.

For an overview of the Oracle Enterprise Manager system, see the *Oracle Enterprise Manager Concepts Guide*.

Audience

This guide is written for those who wish to use Oracle Enterprise Manager to perform system administration tasks.

This guide assumes you are familiar with the administrative tasks you wish to perform. If you are not, refer to the Oracle server documentation set. The Oracle server documentation set contains specific and thorough descriptions of the database administration tasks you can perform with Enterprise Manager applications. In addition, the Oracle server documentation set provides recommendations on how to administer your database optimally. If you have not yet read the introductory chapters of the Oracle server administrator's guide, we recommend that you do so. These chapters describe the specific responsibilities of a database administrator.

You should also be familiar with the operation of your specific Microsoft Windows or UNIX system. See the documentation for your Windows or UNIX system, if necessary.

How this Guide Is Organized

This guide is divided into chapters, as described below.

Part I: *Oracle Enterprise Manager Framework*

Chapter 1, "Console"

This chapter describes the Enterprise Manager Console, its basic configuration and functions, as well as system administrative functions such as paging, email, and managing administrators.

Chapter 2, "Navigator"

This chapter explains the Navigator component of the Enterprise Manager Console, associated menus, and managing object within the Navigator such as discovering services, managing web servers, and generating reports.

Chapter 3, "Groups"

This chapter explains the Group component of the Enterprise Manager Console and how using Groups can simplify administering a your enterprise.

Chapter 4, "Jobs"

This chapter explains how to use the Job Scheduling component of Enterprise Manager to automate administrative tasks.

Chapter 5, "Events"

This chapter explains how to use the Event Management component of Enterprise Manager to monitor managed nodes and services.

Part II: *The Database Administration Tools*

Chapter 6, "DBA Management Pack"

This chapter introduces the DBA Management Pack, which is an integrated set of standard database administration applications to help automate and simplify the common daily tasks of administrators. It also describes the user interface elements used in the database administration applications.

How to Use This Guide

The *Oracle Enterprise Manager Administrator's Guide* has been designed to be used closely with the Oracle Server documentation set. While this guide describes how to use Enterprise Manager to perform database administration tasks, the Oracle Server

documentation set describes the reasons for and the implications of performing these tasks. Consequently, you should refer to the Oracle Server documentation set while using Enterprise Manager to perform your administrative tasks.

For an overview of the Enterprise Manager system, see the *Oracle Enterprise Manager Concepts Guide*. After reading this manual, you may choose to proceed directly to those chapters that are relevant to the tasks you plan to perform using Enterprise Manager.

Before using the database administration applications, you should read Chapter 6, "DBA Management Pack". This chapter provides an overview of the organization and user interface elements of the applications.

While using the Enterprise Manager products, you should refer to the online help for specific information on the displayed dialog box, menu, or window. You can display the online help by pressing F1 or selecting a Help button if present.

Conventions Used in This Guide

The following sections explain the conventions used in this guide.

Examples

This guide contains code examples. Note that the text of examples appears in a different font than the text of the guide. This is an example of a SELECT statement:

```
SELECT * FROM emp
```

Examples in this guide follow these case conventions:

- Keywords, such as CREATE and NUMBER, appear in uppercase. Keywords have special meanings. When you specify them, they can be in uppercase or lowercase, but they must be used exactly as they appear in the code example.
- Names of database objects and their parts, such as emp and empno, appear in lowercase. However, in the text of this guide, names of database objects and their parts appear in uppercase.
- Parameters act as place holders in examples. They appear in lowercase. Parameters are usually names of schema objects, Oracle datatypes, or expressions. When you see a parameter in a syntax diagram, you should substitute an object or expression of the appropriate type. Note that parameter names appear in italics in the text of this guide.

Command Syntax

- *Italics* is used for variables, such as *oem_tool*
- | denotes alternative choices
- {*param1* | *param2* | ... } signifies that one of the parameters in {} must be used
- [] identifies optional parameters

Special Text

Special text is provided to alert you to particular information within the body of this guide and within other manuals.

Note: This indicates important information related to Enterprise Manager.

Additional Information: Where necessary, this refers you to your operating system-specific Oracle documentation for additional information.

Attention: This highlights information that is important when performing the described task.

Suggestion: This signifies suggestions and practical hints that can be helpful when using Enterprise Manager.

Warning: This indicates information that you should be aware of before you perform the action described in the current section.

Product Documentation

The Oracle Enterprise Manager product documentation includes the following:

- The *Oracle Enterprise Manager Readme* provides important notes regarding the updates to the software, documentation, and late-breaking news.
- The *Oracle Enterprise Manager Configuration Guide* provides information about configuring Oracle Enterprise Manager components.
- The *Oracle Enterprise Manager Concepts Guide* provides an overview of the Enterprise Manager system.
- The *Oracle Enterprise Manager Administrator's Guide* describes the components and features of the Oracle Enterprise Manager system.
- 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 information on configuring and troubleshooting the Intelligent Agent.

The guides are available on the CD in HTML and Adobe Acrobat (PDF) formats for viewing with a web browser. In addition to the Enterprise Manager documentation, extensive online help is provided for Oracle Enterprise Manager components.

Related Publications

The *Oracle Enterprise Manager Administrator's Guide* refers to important information in related publications. Depending on the version of the Oracle database, you would refer to the Oracle7 or Oracle8i documentation. The related books referred to in this guide are listed below:

- For general information about the Oracle8i and how it works, see *Getting to Know Oracle8i* and *Oracle8i Concepts*.
- For information about administering Oracle8i, see the *Oracle8i Administrator's Guide*.
- For information on Oracle's SQL commands and functions, see the *Oracle8i SQL Reference*.
- For information about Oracle messages and codes, refer to *Oracle8i Error Messages*.
- For information about the Oracle networking system, see your network-specific documentation.
- For information about the Oracle8i for other platforms, see your platform-specific documentation.
- For information on Oracle Parallel Server, refer to the *Oracle8i Parallel Server Setup and Configuration Guide*, which provides essential information for preparing Oracle8i for use with Oracle Parallel Server and Oracle Enterprise Manager. The "Introducing Oracle Parallel Server" chapter provides a conceptual and component overview of Oracle Parallel Server. This information will help you prepare and plan your Oracle Parallel Server installation and configuration in an Oracle8i environment.

Oracle Corporation also publishes several files that are available on your distribution media. These files are usually named README, RELNOTE, BUGHST, and RESTRICT and have extensions such as .WRI, .DOC, and .TXT. Read these files to learn about changes to the software or documentation that has not been described in the guides. The exact names and locations of the files mentioned above may vary, depending on your operating system.

Part I

Oracle Enterprise Manager Framework

- Chapter 1, "Console"
- Chapter 2, "Navigator"
- Chapter 3, "Groups"
- Chapter 4, "Jobs"
- Chapter 5, "Events"

This chapter introduces the Oracle Enterprise Manager Console and provides an overview of its components. The following topics are included in this chapter:

- Enterprise Manager Console
- Console Menus
- Managing Enterprise Manager Administrators
- Configuring and Starting the Paging Service
- Creating Enterprise Manager Reports

Enterprise Manager Console

The Console is the primary interface used for all Oracle Enterprise Manager operations. It provides menus, toolbars, and the framework to access Oracle tools and utilities available through other vendors. The graphical configuration of the Console and the tools available are determined by the optional products installed and user preferences. See Figure 1–1, "Console Window" for an illustration of a Console screen.

Components

The Console includes viewing panes for the Navigator, Group, Jobs, and Events systems.

Navigator

The Navigator displays a hierarchical list of all the services in a network, providing a direct view of services such as databases, groups, listeners, and nodes, plus the objects that they contain. The Navigator shows all the network services with their relationships to other objects.

Through the Navigator, you can also launch administration tools for managing objects such as database users and tablespaces. You can also perform many administration tasks in the Navigator, such as creating, editing, or dropping tablespaces. See Chapter 2, "Navigator" for information.

Group

The Group system allows you to organize managed services into logical groups that you can then manage collectively with a graphical display. With the Group system, you can create, save, modify, and view groups. To create a group of services, drag and drop objects from the Navigator into the Group view. See Chapter 3, "Groups" for information.

Jobs

Jobs are standard tasks, such as executing a SQL script or backing up a database, that can be automated through Oracle Enterprise Manager. The Job system allows you to manage and schedule jobs and remote operations for the services of your network. Jobs can be scheduled at various times, such as daily or weekly, and at single or multiple destinations. See Chapter 4, "Jobs" for more information.

Events

The Event system allows you to monitor and display the status of events—such as a loss of service—occurring on the managed services in your network system. See Chapter 5, "Events" for more information.

Figure 1–1 Console Window



Console Menus

The Console menu bar provides access to the following menus:

Figure 1–2 Console Menu Bar



The File, View, System, Tools, and Help menus are described in this section.

- See "Navigator Menu" on page 2-5 for information about the Navigator menu.
- See "Group Menu" on page 3-3 for information about the Group menu.
- See "Job Menu" on page 4-10 for information about the Job menu.
- See "Event Menu" on page 5-24 for information about the Event menu.

When using the Console menus, note that:

- Some menus include other menus. For example, when you select the Database Applications from the Tools menu, a sub-menu containing several options displays.
- Menu options vary depending on the objects selected or the active window in the Console. The Tools menu items vary depending on the components that have been installed.

Context-Sensitive Menus

You can click the right mouse button on objects in some windows of the Console to display a context-sensitive, or short-cut, menu. This menu usually contains a subset of the options that are available through a menu in the main menu bar. For example, if you click the right mouse button on a group in the Navigator pane, a menu appears with the menu options from the Group menu.

Note: See "Discovering Services" on page 2-7 for information on context-sensitive menu options in the Navigator.

File Menu

The File menu items allow you to exit the system.

View Menu

The View menu customizes the Console layout, allowing you to show or hide toolbars or windows. You can also use the window palette located in the upper-left corner of the Console to access the View menu options. At least one window must be visible in the Console.

Show/Hide Navigator Pane

Hides or shows the Navigator pane.

Show/Hide Job Pane

Hides or shows the Job Scheduling pane.

Show/Hide Event Pane

Hides or shows the Event Management pane.

Show/Hide Group Pane

Hides or shows the Group pane.

Show/Hide Toolbar

Hides or shows the Oracle Enterprise Manager toolbar.

System Menu

The System menu provides options to set up administrator and system configurations.

Preferences...

Displays the Edit Administrator Preferences property sheet, which allows the current administrator to change preferences, including permissions and login credentials. See "Administrator Preferences" on page 1-11 for more information.

Manage Administrators

Displays the Administrator Manager Accounts property sheet for adding, modifying, and removing administrators. This option is only available to Super Administrators. See "Managing Enterprise Manager Administrators" on page 1-8 for more information.

Configure SMTP Gateway

The System menu contains the Configure SMTP Gateway option. Use the Configure SMTP Gateway option to specify the SMTP gateway that is used for the SMTP E-mail system. E-mail notification will not function correctly until the SMTP gateway is set properly. This menu option is only available to super administrators.

Add Services to tnsnames.ora

Updates the local network configuration file (tnsnames.ora) with discovered services information. You should run this after a Discovery operation so that any Value-Added Applications, such as Oracle Parallel Server Manager or Replication Manager, can access the discovered services.

Font Settings

Changes the font settings for the Console and DBA Studio.

Font settings in pop-up menus will not change even if you have specified to change the font settings.

Generate Enterprise Report

Allows you to create an HTML-based Enterprise Report containing information such as event alerts, scheduled jobs, groups, and discovered services for all managed nodes in your enterprise. For more information, see "Creating Enterprise Manager Reports" on page 1-35.

Tools Menu

The Tools menu allows you to execute database applications and other utilities that have been installed on your system. The menu options in the Tools menu depend on your installed Oracle Enterprise Manager configuration.

Database Applications

This menu option lists the database administration functions that you can execute from the Console. Examples include schema, instance, and security management.

Service Management

This menu option lists integrated applications such as the Oracle Application Server Manager.

Other optional applications may also be available from this menu.

Help Menu

From the Help menu, you can access the Enterprise Manager online help system. You can also access Enterprise Manager's Quick Tours. Enterprise Manager comes with a variety of Quick Tours, each providing a comprehensive overview for Enterprise Manager and specific integrated applications. Enterprise Manager version information is also available.

Managing Enterprise Manager Administrators

Enterprise Manager, Release 2.2 is a multi-administrator system: every person who is administering systems using Enterprise Manager has his or her own administrator account which he or she uses to log into the Console or stand-alone application.

The installation of Enterprise Manager creates a single super administrator named `sysman`. The super administrator `sysman` creates administrators using the Manage Administrators item in the System menu. In addition to an administrator name and password, each account can be tagged as a "Super Administrator" account or an account to which the administrator has access to only jobs and/or events.

Differences between the two types of accounts are as follows:

- **Super Administrators** automatically have full privileges for all objects in the system. Most Super Administrators also have a separate account for daily operations but use their Super Administrator account for special operations only available to Super Administrators, such as starting and stopping the Management Server, creating new Enterprise Manager Administrators, configuring paging servers, or checking other administrator's schedules. Using the `sysman` account for daily administration work is not recommended. The Super Administrator account is similar to root on UNIX or Administrator on Windows NT and is a user which cannot be deleted or renamed. It is a user that can perform any task and therefore should be used only for setting up the environment. After the necessary DBA accounts are created, the Super Administrator account 'SYSMAN' should not be used anymore.
- **Regular Administrators** can have full access to all other Console operations but they will only see or be able to modify those jobs, events, or groups to which they have access.

Typically, all administrators share a single Enterprise Manager, Release 2.2 repository, which allows administrators to share information. Although you can set up multiple repositories, administrators using different repositories will not have access to each other's information; there is no sharing of data between repositories. Administrative data stored in the repository is filtered based on administrator permissions.

Preferred Credentials must be set up for each administrator account. When an administrator connects through the Navigator or stand-alone application, the preferred credentials used are those defined explicitly for that administrator.

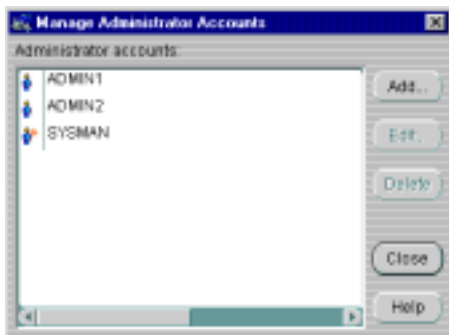
Managing Administrator Accounts

Enterprise Manager administrators are created, edited, and deleted with the Manage Administrators option of the Console System menu. The Manage Administrators option displays the Manage Administrator Accounts dialog (Figure 1-3, "Manage Administrator Accounts"). The Manage Administrators option is only available to Super Administrators. Super Administrators have full privileges for all objects and can create, edit, and delete other administrators. The Super Administrator sets up the administrator name and initial password and determines whether an administrator is a Super Administrator or regular administrator. The Super Administrator also determines whether the administrator has access to the job and event systems.

In this dialog, you can:

- Click the Add button in the Manage Administrator Accounts dialog to display the Create Administrator Account dialog. The Administrator Account dialog allows you to add a new administrator. See "Creating or Editing an Administrator Account" below for more information.
- Select the Delete button to delete an administrator. If the administrator is the owner of any objects, you need to reassign object ownership otherwise the objects are deleted with the administrator. See "Reassigning Object Ownership" on page 1-11 for more information.

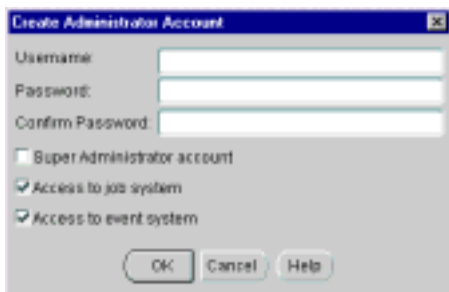
Figure 1–3 *Manage Administrator Accounts*



Creating or Editing an Administrator Account

In the Manage Administrators dialog, enter a unique administrator name and password for the Enterprise Manager administrator. Note that the administrator name is not the same as a database username.

Figure 1–4 *Create Administrator Account*



Check the access available to the administrator:

Super Administrator

Allows the administrator to add other administrators, as well as access to all created objects, e.g., jobs, events, and groups.

Access to Job System

Allows the administrator access to the Job system, but does not automatically give access privileges for specific jobs.

Access to Event System

Allows the administrator access to the Event system.

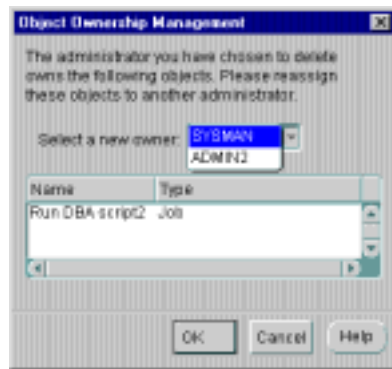
After an administrator has been created, the administrator can log in to the Enterprise Manager Console and set up administrator preferences.

If you select the Edit button, you will get the Preferences window, as described in "Administrator Preferences" on page 1-11. You can then edit the preferences for the selected administrator.

Reassigning Object Ownership

If you delete an administrator who owns any object, the Object Ownership Management dialog appears. See Figure 1-5, "Object Ownership Management". The dialog allows you to reassign the objects to another Enterprise Manager administrator. If you do not reassign the objects, the objects are deleted.

Figure 1-5 Object Ownership Management



Administrator Preferences

The Edit Administrator Preferences property sheet is displayed with the Preferences option of the System menu. This property sheet allows you to configure the preferences for an Enterprise Manager administrator. The pages in the property sheet are:

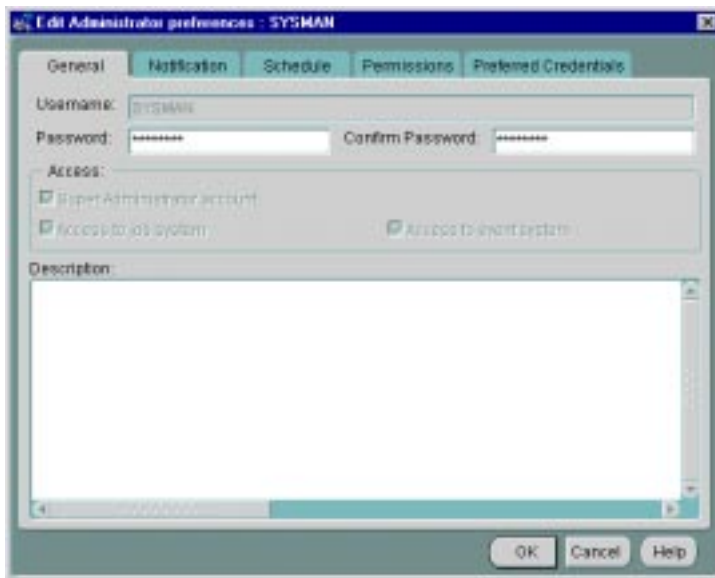
- General
- Notification
- Schedule

- Permissions
- Preferred Credentials

General

The General Preferences page allows a Super Administrator to change an administrator's password and access privileges.

Figure 1–6 Administrator General Preferences



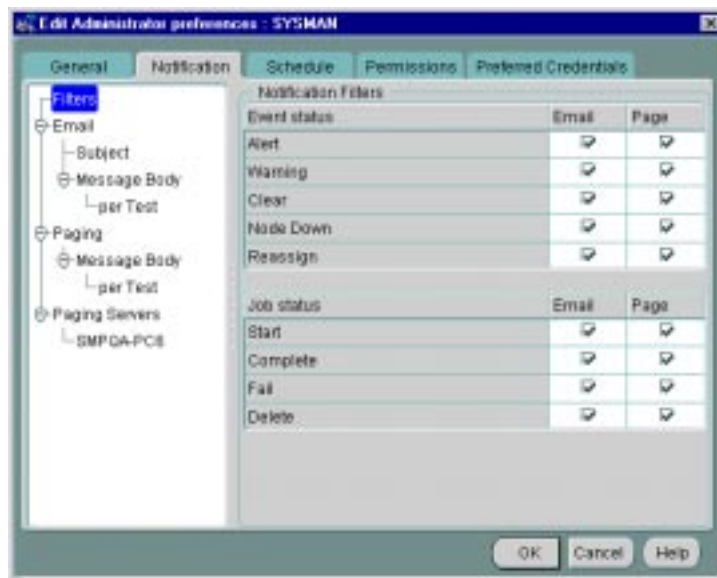
Notification

The Notification page allows you to set up paging and email notification methods for the administrator. This page consists of a hierarchical tree list and a right-side modal area that changes according to the object selected in the navigator. The tree list consists of four top-level objects:

- Filters (Selected by default)
- Email
- Paging
- Paging Servers

Note: If you plan to use the Enterprise Manager Paging Server for notification, you need to configure the paging and modem settings for your system before you set up administrators. To configure the modem for the system, access the Modems option in the Control Panel. Before using mail, specify the SMTP Gateway for Email with the Configure SMTP Gateway option of the Console System menu.

Figure 1–7 Administrator Notification Preferences



Filters

Notification filters allow each administrator to specify when to send an email notification as opposed to a page notification as a result of a job or event status change.

- Event Notification Filter:** The Event Notification Filter allows you to filter email/pages sent to an administrator according to the event's level of severity. Filtering is set at the user level by checking or unchecking the Email/Page options on this property sheet page. You can select any combination of the following levels of event severity. For example, you can set filtering so that an

administrator is notified via email if there is a warning and notified via the paging system if there is an alert. Selecting all levels of severity provides no filtering.

- *Alert*
- *Warning*
- *Clear*
- *Node Down*
- *Reassign*

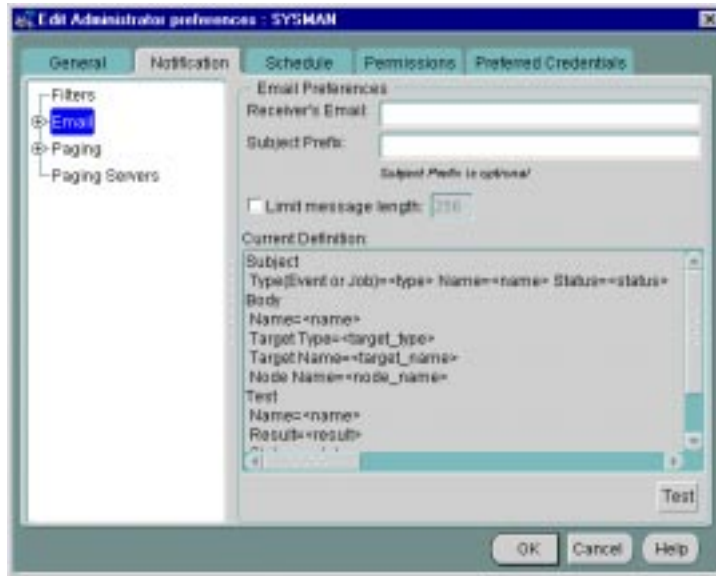
Job Notification Filter The Job Notification Filter allows you to filter email/pages sent to an administrator according to job status. As with the Event Notification Filter, filtering is set at the user level by checking or unchecking the desired option. Selecting all job statuses provides no filtering.

- *Start*
- *Complete*
- *Fail*
- *Delete (Job removed)*

Email

This page allows you to specify notification parameters for email.

Figure 1–8 Administrator Notification Preferences: Email



- **Receiver's Email:** Enter the email address of the administrator to whom the mail is being sent.
- **Subject Prefix:** Enter an optional prefix that is appended to the E-mail subject. That allows administrators to quickly identify messages from Enterprise Manager in their mail.
- **Limit message length:** Allows you to specify the maximum message body length of an E-mail notification. By default, this length is unlimited.
- **Current Definition:** Displays the current settings for format and content of E-mail notifications. To set or change the default parameters, expand the Email object in the tree list. You can select format and content options for the Subject line and Message Body. You can further expand the Message Body object to specify options at the Per Event Test level.
- **Test:** Click the Test button to check the validity of E-mail configuration. A message displays to inform you of the status of the test email.

Email Subject This page allows you to select the content and format of the email subject line. By default, Type, Name, and Status are selected. You use the left/right arrows to move items back and forth between the Available and Selected lists.

Once an item has been selected, you can control the order in which the item appears by selecting it in the list and using the up/down arrows (located to the immediate right of the Selected list) to reposition the item within the list.

Note: The following information also applies to inserting content into the Email/Paging message body.

- **Available:** Lists available content.
- **Selected:** Lists currently selected content and the order in which the content should be displayed.
- **Use Abbreviated Format:** For Type (Job or Event), Status, and Target Type, you can select the Use Abbreviated Format option. When selected abbreviations are used in the Subject line. The following abbreviations are used by the system:

Service Type

- DB for Database
- LSR for Listener
- N for Node

Status

- ST for Started
- CO for Completed
- F for Failed
- D for Deleted
- W for Warning
- A for Alert
- C for Cleared
- NU for Node Unreachable
- R for Reassign

Timestamp Format

This option is available if Timestamp is chosen from the Selected list. You use the pull-down menu to select one of the pre-defined formats.

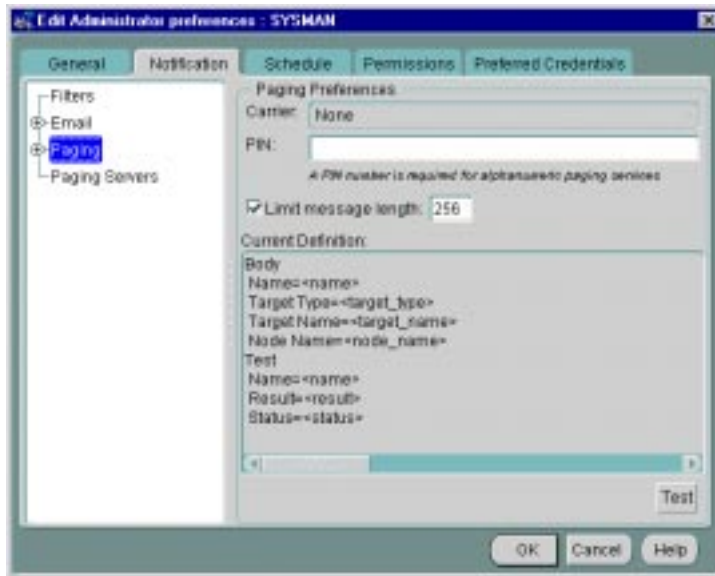
Do not include titles

When selected, classification titles such as Status, Service Name, and Timestamp are omitted from the message.

Paging

This page allows you to specify notification parameters for paging.

Figure 1–9 Administrator Notification Preferences: Paging



- **Carrier:** After a paging server is specified by a super administrator and the name of the paging carrier service and the corresponding paging carriers have been configured, select the name of the paging carrier service from the pull-down list.
- **PIN:** Enter the PIN for your paging carrier. This entry is only required for alphanumeric pagers.

- **Limit message length:** Allows you to specify the maximum message length of paging notifications. By default, this length is set to 256 characters.
- **Current Definition:** Displays the current settings for format and content of paging notifications. To set or change these parameters, expand the Paging object in the tree list. You can select format and content options for the Message Body. You can further expand the Message Body object to specify options at the Per Event Test level.
- **Test:** Click the Test button to check the validity of the paging configuration. For alphanumeric pagers, enter the PIN number. For numeric pagers 700, is sent.
Click on the Send button to send a test page to the specified pager. A message informs you of the status of the test page.
If the test fails, check the log file. If tracing is enabled for paging, you can also view the paging trace log file in the ORACLE_HOME\sysman\log directory on the machine which has the paging server.

Paging Status Codes for Numeric Pages

Numeric pages need to be interpreted as follows:

For job notifications, you will receive a 3 digit number which indicates the job status.

For event notifications you will receive the status code.

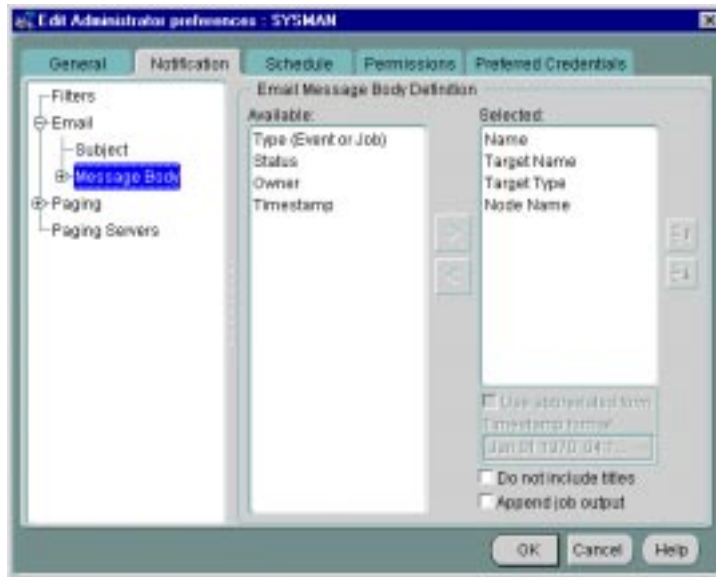
The event status and job status codes are listed as follows:

- 100 = Job Started
- 200 = Job Completed
- 300 = Job Failed
- 400 = Job Deleted
- 500 = Event Cleared
- 600 = Event Warning
- 700 = Event Alert
- 800 = Event Node Down
- 900 = Event Unknown
- 1000 = Event Assignee Changed

Email/Paging Message Body Definition

This page allows you to select the content and format for the body of the email or page message. By default, Name, and Status are selected. You use the left/right arrows to move items back and forth between the Available and Selected lists.

Figure 1-10 Administrator Notification Preferences: Email/Paging Body



Expanding the Message Body object in the navigator and selecting per Test allows you to use a subset of the following option settings on a per Test basis. See "Email Subject" on page 1-16 for more information on manipulating message content.

- **Available:** Lists available content.
- **Selected:** Lists currently selected content.
- **Use Abbreviated Format:** For Type (Job or Event), Status, and Service Type, you can select the Use Abbreviated Format option. When selected abbreviations are used in the Subject line. The following abbreviations are used by the system:

Service Type

- DB for Database
- LSR for Listener
- N for Node

Status

- ST for Started
- CO for Completed
- F for Failed
- D for Deleted
- W for Warning
- A for Alert
- C for Cleared
- NU for Node Unreachable
- R for Reassign

Timestamp Format

This option is available if Timestamp is chosen from the Selected list. You use the pull-down menu to select one of the pre-defined formats.

Do not include titles

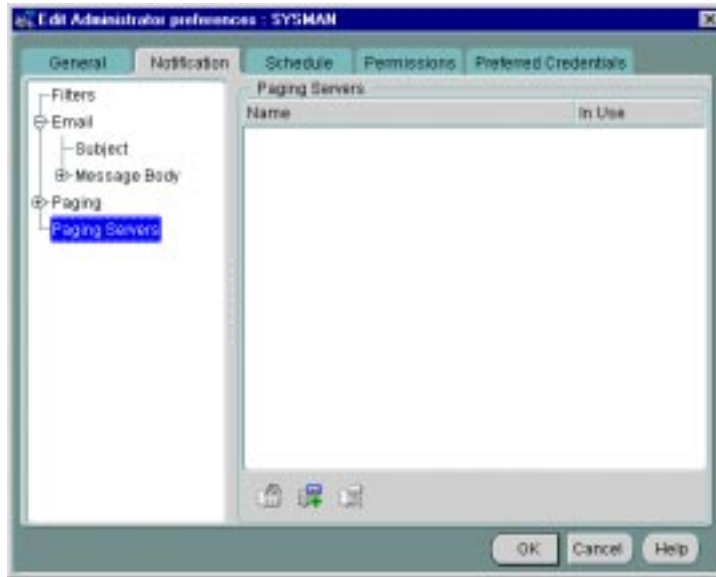
When selected, classification titles such as Status, Service Name, and Timestamp are omitted from the message.

Append job output

When selected job output is appended to the end of the notification. For instances where job output is large, you may want to specify a limit to the message length. If the job output pushes the notification length past the specified limit, then the job output will be truncated, not the message itself.

Paging Server

This page lists all available paging servers currently recognized by Enterprise Manager.

Figure 1–11 Administrator Notification Preferences: Paging Server

The multi-column list consists of two columns: The name of the paging server and whether the paging server is currently being used. Below the list are three icons that allow you to perform the following operations:

- Ping a paging server to see if it can be contacted.
- Add a new paging server to the list.
- Remove a server from the list.

Except for the Add Paging Server icon, the icons are grayed out unless a specific paging server is selected from the list. For information on how to add a paging server, see "Setting Up Paging" on page 1-29 and "Adding a Paging Server" on page 1-30.

Schedule

Use this property sheet page to indicate when you want to be paged and/or e-mailed. Determine the day, hour, and the method of notification. You will receive notifications only on the objects you have permission to access.

Figure 1–12 Administrator Notification Schedule



An administrator can be notified by email, paging, or both email and paging. Paging is recommended for urgent jobs, events, or critical systems.

To determine notifications:

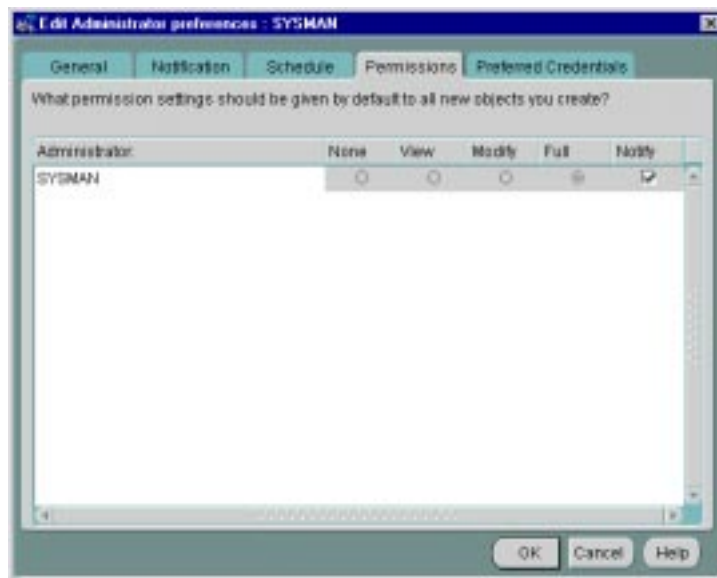
1. Select None, Pager, Email, or Email and Pager at the bottom of the dialog.
2. Click in the appropriate day/hour to set the notification method for that time period.
3. Repeat steps 1 and 2 for each notification method.

If you want to set the same notification an entire day or an hour of the day, click on the heading for that row or column. For example, if you want to set up paging notification for Saturday, click on the Sat heading after you have selected Pager at the bottom of the screen. You can also drag the cursor to "paint" across multiple cells.

Permissions

Use this property sheet page to determine the default permissions you want to assign to other administrators for the objects you create. This allows other Enterprise Manager administrators to share objects, such as events and jobs, that you have created. If you work on a team, this page lets you assign access privileges to all the members of the team at one time. When an object is created by an administrator, that administrator is the owner and automatically has full permissions. The owner's permissions cannot be modified.

Figure 1–13 Administrator Default Permissions



Access-control permissions apply to event, group, and job objects. When these objects are created, the default permissions are assigned to other Enterprise Manager administrators according to the selections in this page. These initial permissions can be overridden with the Permissions page of the object's property sheet.

For more information, see the following sections:

- "Group Permissions Page" on page 3-6
- "Job Permissions Page" on page 4-18
- "Event Permissions Page" on page 5-35

Note: Changing your default permissions does not retroactively change permissions on existing objects.

The levels of permission that you can assign to an Enterprise Manager administrator are:

None

This permission does not allow the administrator to view this object anywhere.

View

This permission allows the administrator to view the object, inspect object properties, view job/event status and outputs, and receive notifications if the object is an event.

Modify

This permission allows the administrator to edit the object's properties except those reserved for Full permission.

Full

This permission allows the administrator to delete the object, modify permissions for other administrators, and change the ownership of the object.

Notify

This permission allows the administrator to receive enhanced notifications on the objects. Notify permission cannot be assigned if the administrator's permission level is set to None.

Preferred Credentials

The Administrator Preferred Credentials property sheet page displays a list of services in the network, along with the service type and the administrator name for accessing the service. The property sheet page is accessed with the Administrator Preferences option of the System menu. Each row in the list of the property sheet includes:

- Service Name
- Service Type (such as database, listener, or node)
- Credentials (Check mark indicating you have already specified connection information. The check mark is either grey (credential set in a previous session) or green (credential set in the current session).)

You can click on a column heading to sort on that column. See Figure 1-14, "Administrator Preferred Credentials" for an illustration of the property sheet.

Note: Individual instances of an Oracle Parallel Server are listed. Oracle recommends that all instances of a Parallel server use the same preferred credentials as the Oracle Parallel Server.

Also, the Intelligent Agent authenticates the user name and password for all jobs and many events that it runs. These credentials are used when you access a network service in the Navigator or Group, and when running jobs and registering events. If you do not set the preferred credentials correctly, jobs and events may fail. See "Job Credentials" on page 4-4 and "Registering Events" on page 5-6 for more information.

Important: Changes to the Preferred Credentials will not be automatically propagated to previously registered jobs and events. In order to update these jobs and events with the new preferred credentials, you must de-register and subsequently re-register the jobs and events.

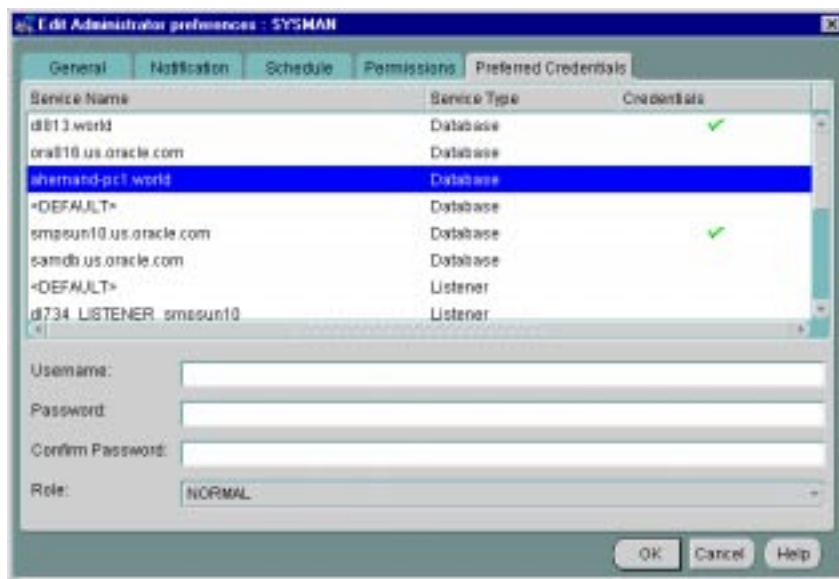
Oracle recommends that if some services of a particular type require the same credentials, use the <DEFAULT> credentials selection for that service type to have those credentials used by all services of that type.

For example, if Administrator_1 has a username and password of foo/bar on all the databases that he manages, the administrator needs to enter foo/bar as his credentials in the <DEFAULT> database entry. All database administration tasks will use these <DEFAULT> credentials.

Furthermore, if the administrator has just one database which requires different credentials from foo/bar, he can enter different credentials for that database by selecting that specific database.

For NT users, you must set the preferred credentials for the node (where the NT Intelligent Agent resides) to be the same as the user that is set up to "Logon as a batch job."

Figure 1-14 Administrator Preferred Credentials



Setting Administrator Credentials

Select any row to update the credential fields for the object identified in the row.

Username

Enter the username. This field is required if a password needs to be entered.

Password

Enter the password associated with the username.

Confirm Password

Confirm the password.

Role (Database only)

Select the role from the pull-down list. You need to login with the SYSDBA or SYSOPER role to start up or shut down a database.

Changes to the credentials are recorded when you move to another line. When you are finished, save all your updates by clicking the OK button at the bottom of the property sheet.

Saving Logon Information as a Preferred Credential

Another convenient way to specify Preferred Credentials for discovered services is to select the Save as Preferred Credential option when manually connecting to a service from the Console or integrated application. For example, you attempt to access a newly discovered database from the Console Navigator. Enterprise Manager displays the Connect Information dialog so that you can log in to the database. You type in the requisite information and check the Save as Preferred Credential option. Click OK to log on to the database and save the logon information as a Preferred Credential for this service.

Saving the Contents of a List

Save list allows you to extract information from a multi-column list (such as the Job or Event History panes) and save it in a variety of formats (text, HTML, or Comma-Separated-Values). For example, you can select one or more entries in the Event History pane. By selecting the Report Event History from the Events Menu, you can save the list information (Event, Target, Target Type, Severity, Date/Time, Assigned To, Owner) to an HTML file. The dialog consists of the following elements:

File Name

The name and directory to which you want to save the file information.

Browse

Displays the File Save to dialog. Choose the desire location and file name.

Format

Select HTML (table), Text row, or comma-separated-values (used by spreadsheets or other applications).

View

Active only when HTML is selected as the file format, allows you to view the generated HTML table through the default browser for your system.

Rows

- All (total number) rows – Export all rows in the multi-column list.
- Selected (number of rows selected) rows – Export only selected rows in the multi-column list.

Configuring and Starting the Paging Service

If you want to be notified via paging in Oracle Enterprise Manager, you must explicitly install the Oracle Enterprise Manager Paging Server. This paging service is not installed as part of the base Oracle Enterprise Manager installation; it is installed through a Custom installation type. Refer to the installation guide provided with the database release for more details.

Note: The Paging Server is only available on Windows NT or Windows 2000, but the ability to configure it is available on both Unix and Windows platforms.

Only one paging service installation is required if you wish to utilize paging for notification purposes within Oracle Enterprise Manager.

The paging service supports either numeric or alphanumeric pagers and utilizes the following paging service protocols (for alphanumeric pagers only).

- TAP (Telocator Alphanumeric Protocol)
- GSM (Global System for Mobile Communications)
- FLEXTD

To use alphanumeric paging, you need a phone number to call for the modem at the paging service provider and the pin number for your pager. Contact your paging service provider for the phone number to call. It is the number for the modem for sending pages.

Your paging provider may also have a feature for sending email to your pager. If you have that feature, you can configure an administrator's preferences for

notification to use email, and specify your pager as the email receiver. This method will also work with many providers for sending notification to a cell phone.

Configuration of the paging service is not automatic. Follow the steps below to configure paging.

Setting Up Paging

On the machine from which you want to run the paging service, follow these instructions:

1. Install a modem.

Note: You must have a modem installed on the Windows NT or Windows 2000 machine that you are running the paging service.

2. Specify modem settings.
 - a. Go to Start > Settings > Control Panel > Modems.
 - b. Specify how your calls are dialed by clicking Dialing Properties from the Modems Properties page and then setting the following parameters:
 - * From what area code you are dialing
 - * From what country you are dialing
 - * How you access an outside line. If you are not required to dial a number to access an outside line, leave this field blank.
 - c. Set the Maximum Speed parameter by clicking Properties from the Modems Properties page. Oracle recommends setting this parameter to 9600K Baud; however, you should find the baud rate setting optimal for your system.

Note: A baud rate higher than 9600 may result in the loss of data with the paging service carrier. The baud rate of 9600 for your modem is only a recommendation. You must find the baud rate setting which is optimal for your system.

3. Install the Oracle Enterprise Manager Paging Server. Refer to the installation guide provided with the database release for information.
4. Start the Paging Service.
 - a. Go to Start > Settings > Control Panel > Services.
 - b. Select the Oracle<ORACLE_HOME_NAME>PagingService and click Start.

You can also start the paging service by typing the following at a command prompt

```
oemctrl start paging
```

Adding a Paging Server

Note: Only Super Administrators can add a paging server; this functionality is not available to regular administrators.

1. From the Enterprise Manager Console, select Preferences from the System menu. The Edit Administrator preferences property sheet appears. Click the Notification tab to access the Notification page.
2. From the Notification page, highlight Paging Servers from the tree list.
3. Right-click Paging Servers to obtain the pop-up menu and choose the Add item or click the Add Server icon on the detail view to the right.
4. When the Add Paging Server dialog appears, enter the name of the machine on which the paging server runs. For example, pjlee-pc.
5. Press the OK button.

If the Console is unable to find the paging server with the given hostname, an error appears, saying "VD-4362: Could not add paging server, as paging server <hostname> could not be reached."

If the paging server is found, a new paging server object is added under the "Paging Server" object in the tree list. The new paging server will have no paging carrier. You must add at least one paging carrier in order for paging to function.

Adding Paging Carrier

Note: Only Super Administrators can add a new paging carrier; the functionality is not available to regular administrators.

1. From the Notification page, highlight Paging Carriers from the tree list.
2. Right-click Paging Carriers to obtain the pop-up menu and choose the Add Carrier item or click the Add Carrier icon on the detail view to the right.
3. When the Add New Paging Carrier dialog appears, fill in the fields. Once defined, you can view the paging carriers by expanding the appropriate paging server and carrier objects in the tree list.
 - **Name**

Paging carrier name. Field accepts alphanumeric characters and underscores.
 - **Type**

Type of paging carrier. Enterprise Manager supports alphanumeric or numeric.
 - **Protocol**

TAP, FLEXTD, or GSM. Protocol selection is only available if the carrier type is Alphanumeric.
 - **Connection Properties**
 - * **Country Code:** The country code used to dial the pager if the call is international.
 - * **Area Code:** Area code used the by country in which the pager is located.
 - * **Number:** Local dialing number of the pager.
 - * **Suffix:** Permits identification of voice messages from a paging carrier and allows the person being paged to choose from several options when using a touch tone phone. For example, commas can be used as pauses. The Suffix field accepts the following characters: integers, commas, pound sign, and the star (asterisk).

Note: This option is only available if the paging carrier type is set to Numeric.

- Dialing Properties
 - * Timeout (in seconds): Maximum dialing time allowed for a successful page.
 - * Delay (in seconds): Time delay before dialing.
4. Press the OK button.

Specifying Paging Notification Preferences

While the Super Administrator configured the paging server and its carrier(s), all administrators who want page notifications must specify their own notification preferences by following the steps below:

1. Log on to the Console.
 - a. Go to System > Preferences > Notification. Then highlight Paging on the tree list to view Paging Preferences on the detail view to the right.
 - b. Select a paging service carrier from the drop down list.
 - c. Enter the Pin number for your alphanumeric pager. If you have a numeric pager, leave this field blank.
 - d. Test the paging notification by clicking the Test button.
2. Set your notification schedule. If you neglect to do so, you will not receive page notifications.
 - a. Within the Console go to System > Preferences > Schedule
 - b. Choose when you want to be notified by paging. If you do not select any days/hours to be notified by paging, you will never receive a page.

Refer to the *Oracle Enterprise Manager Administrator's Guide* for instructions on how to set up the notification schedule.

Other Paging Server Operations

Removing a Paging Server

Note: Only Super Administrators can remove a paging server; the functionality is not available to regular administrators.

1. From the Notification page, highlight the paging server object you want to remove from the tree list.
2. Right-click the paging server object to obtain the pop-up menu and choose the Remove item or click the Remove Server icon on the detail view to the right.
A warning dialog appears, saying "Remove Paging Server <servername>?"
3. Click "yes". The Console will check if anyone is currently using any carrier from the paging server. If not, all paging carriers will be removed, and the paging server will be removed as well. Otherwise an error dialog appears, saying "The paging server cannot be removed because at least one carrier is being used."

Viewing Information on Paging Server

Note: Only Super Administrators can view information on a paging server; the functionality is not available to regular administrators.

From the Notification page, left-click the paging server object.

The detail view to the right will show information about that paging server such as the paging carrier names, the pager types, the protocol, and whether or not they are in use.

Pinging a Paging Server

Note: Only Super Administrators can ping a paging server; the functionality is not available to regular administrators.

To check the status of the paging server, follow the steps below:

1. From the Notification page, highlight the paging server you want to ping.
2. Right-click the paging server object to obtain the pop-up menu and choose the Ping item or click the Ping Server icon on the detail view to the right.

Querying Status of the Paging Service

To check the paging status, right-mouse click the carrier name to access the Ping Paging Service item in the context-sensitive menu.

Stopping the Paging Service

Stop the paging service from the Windows NT or Windows 2000 Services Control Panel.

You can also stop paging service by typing

```
oemctrl stop paging
```

Removing a Paging Carrier

Note: Only Super Administrators can remove a paging carrier; the functionality is not available to regular administrators.

1. From the Notification page, highlight the paging carrier object you want to remove from the tree list.
2. Right-click the paging carrier object to obtain the pop-up menu and choose the Remove item or click the Remove Carrier icon on the detail view to the right.
A message appears, saying "Remove Paging carrier <carrier name>?"
3. Click "yes." The Console checks if anyone is current using the carrier. If not, it will be removed and the notification tree updated.

Editing a Paging Carrier

Note: Only Super Administrators can edit a paging carrier; the functionality is not available to regular administrators.

1. From the Notification page, select the paging carrier object. The paging carrier information appears in the detail view to the right.
2. Make the changes.
3. Click the OK button.

The Console will validate all the carrier information, update the notification tree. All administrators who have selected to use this carrier will automatically inherit the new changes.

If the validation fails, an error dialog appears stating which entry failed to validate and what type of input is expected. When you click the "OK" button in the error dialog, all the paging carrier's entries are set back to their original values.

Viewing Information about a Paging Carrier

From the Notification page, select the paging carrier object. The paging carrier information appears in the detail view to the right.

Testing a Paging Carrier

1. Right-click the paging carrier object and choose the "Test" menu item. A dialog appears, asking for the PIN.
2. Enter the PIN if your pager is an alphanumeric pager and click "OK" to continue. If it is a numeric pager, leave this field blank.

Creating Enterprise Manager Reports

The Report Wizard allows you to generate pre-defined reports for all managed targets. The Enterprise Manager Job system is used to schedule and execute the task of generating the actual report. For this reason, the prerequisites for successful Job system operation apply to correct functioning of the Report Wizard: node preferred credentials must be set, network communication between the Management Server and the agent/managed target, the Management Server must be operational.

IMPORTANT: You must be running an Intelligent Agent version 8.1.7 in order to generate a report. If you are running an earlier version of the Intelligent Agent, you need to apply an Agent update patch. The patch consists of a TAR file containing the necessary images and the HTML templates needed to generate the reports.

See the `README.agent_reports` file located in your `ORACLE_HOME/sysman/admin` directory for installation instruction. The patch file (`agent_reports.tar`) is also located in this directory.

Enterprise Report versus Database Configuration/Status Reports

Oracle Enterprise Manager allows you to generate two types of reports: Enterprise Reports and Database Configuration/Status Reports.

Enterprise Report (General Systems)

The Enterprise Report provides an overview of the information contained within the Enterprise Manager repository.

This report covers the includes the following information:

- The setup and configuration of the environment
Including the administrators, the discovered agent, the job and event library, and the available Data Gatherer collections.
- The current state of environment
This topology overview provides details on the state of all services known in the repository such as outstanding alerts, job information and basic configuration of the service.

An Enterprise Report cannot be customized.

Database Configuration/Status Report

A Database Configuration/Status Report may contain schema, instance, storage, and security information, depending on what options you select in the Generate Report dialog. This report can either be generated immediately, locally on the client machine, or it can be scheduled as a job.

If you schedule a Database Configuration/Status Report, information from the Enterprise Report is included in a single report. If an Enterprise Report has been

previously generated, and you then create a Database Configuration Report, database configuration information is added to the existing Enterprise Report.

Requirements

The following general requirement must be met to generate a report:

- Enterprise Manager Repository views: All the HTML reports are based on these repository views, which are created on top of the repository, are generated by default by the Enterprise Manager Configuration Assistant starting from Oracle Enterprise Manager Release 2.2.
- Enterprise Manager Release 2.2 or higher since it will have the ability to schedule the reports as a job
- Intelligent Agent version 8.1.7 or higher

Launching the Report Wizard

The Report Wizard can be launched in two ways, each generating a different type of report.

- By choosing Enterprise Report from the System main menu to create an Enterprise Report (user must have 'super administrator' privileges).
- By choosing Reports from the Navigator main menu and clicking Schedule from the Generate Report dialog to create a Database Configuration or Database Status Report. (available to all administrators).

Note: Although the Report Wizard is available to all administrators, the Report Wizard's Schedule button is enabled for super administrators only

Creating Enterprise Reports

To create an Enterprise Report, perform the following steps:

1. Choose "Report" from the Console Navigator menu to display the Reports Wizard. The wizard allows you to schedule the job for execution. Depending on the size of the Enterprise Manager repository and the need for up-to-date information, you can change the scheduling interval of the reports.

During the creation of the job, the wizard will ask for two parameters:

- The node which will generate the reports.
To minimize network traffic and make the setup easy and convenient, use the Intelligent Agent on the machine with the web server to generate the report. The generated HTML files will therefore be usable by the web server immediately.
 - The output directory where to place the reports.
The reports are first generated in the \$TEMP directory. To avoid partial updates and partially refreshed information, either copy the entire set of HTML files from the TEMP directory to their final destination after successful completion or remove all files if the job cannot complete successfully.
2. After the job has completed once, add the output directory where the HTML resides to your web server configuration so that it can be recognized as a virtual directory.

Creating DBA Studio Reports

From DBA studio reports, specific database reports can be scheduled as a job. This job follows the same conventions and has the same requirements as the system reports.

If there is no job currently scheduled for the system reports, the DBA Studio reports will generate this job and schedule it, together with the job to generate the database report.

If DBA Studio finds the job for the system reports, it will use the settings of this job (the Intelligent Agent to be used to generate the report, and the output directory) for its job definition.

The database reports can be scheduled in two ways.

From the Console

1. Select a database in the Navigator tree.
2. Connect to that database.
3. From the Navigator menu, select "Report."

From DBA studio (using the Management Server)

1. Select a database in the Navigator tree.
2. Connect to that database.

3. From the Object menu, select "Report" or right-click and select the "Report" item from the context-sensitive menu.

Navigator

The Navigator graphically displays network objects and allows you to administer the objects. The Navigator tree displays a direct view of the network's nodes and services, the objects they contain, and the relationships among objects. The topics discussed in this chapter include:

- Navigator Pane
- Navigator Menu
- Discovering Services
- Manipulating Objects in the Navigator
- Apache Web Servers
- Paging/Email Blackout
- Removing a Node from the Navigator
- Node Removal Failure

Navigator Pane

The Navigator pane provides:

- Identification of the objects or services on nodes in the managed environment.
- Views of the objects in a network environment and the relationships among the objects. By expanding an object, you can display any objects it contains.
- Methods of accessing and launching administration tools on the objects.
- A source of objects with which to populate groups.
- A source of objects upon which to launch DBA tools and other integrated applications.
- A source of objects for copying with the drag and drop method.

The Navigator window can be hidden or shown by selecting Show Navigator Pane in the Console View menu. You can also hide or show the pane by clicking on the Navigator icon in the Console toolbar.

Populating the Navigator Tree

The Navigator tree is populated with objects by selecting Discover Nodes from the Navigator menu. The types of services in the network may include, but are not limited to:

- Databases
- Groups
- Listeners
- Nodes
- Web Servers

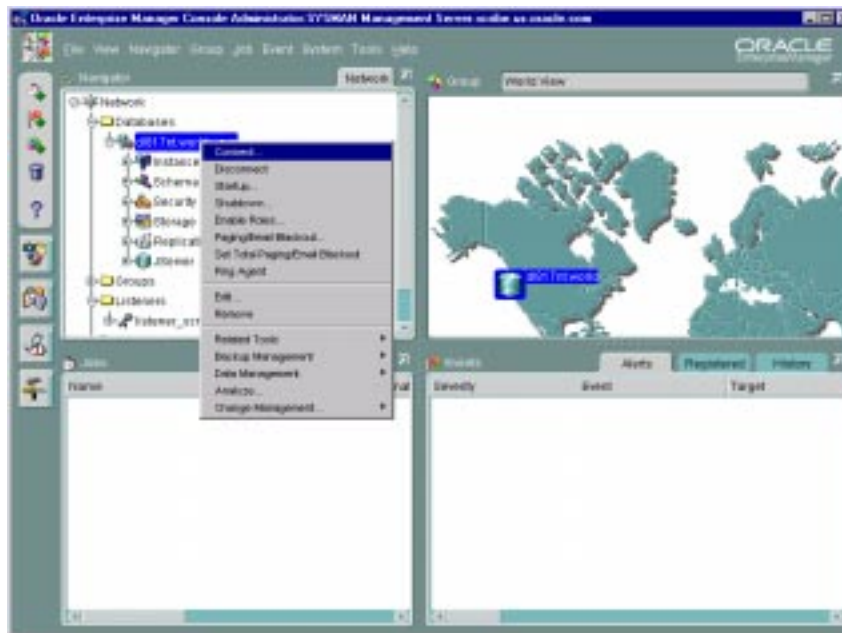
Expanding Objects in the Navigator

Each object type in the Navigator tree is identified by an icon and name. If there is a '+' or '-' to the left of an object's icon and name, the object is a container that can be expanded to display other objects. A container that is represented by a folder icon is a logical grouping, or collection, of one specific type of object, such as databases. Other containers are objects that hold multiple types of objects. See Figure 2-1, "Navigator Menu and Window" for an illustration of a Navigator pane.

The top-most object in the Navigator tree is the network container. The network folder can contain:

- Databases folder
- Groups folder
- Listeners folder
- Nodes folder
- Folders for additional services discovered.

You can expand tree containers to view the objects and relationships in the environment. For example, you can expand a node to view the databases and listeners on the node. If you expand a database, you can access common administration areas such as schema, instance, and security. When a connection is made to a database, an icon displays on the database in the tree. See "DBA Studio" on page 6-2 for more information on integrated database administration tools that are accessible from specific Navigator objects.

Figure 2–1 Navigator Menu and Window

Viewing Specific Tree Objects

In large, complex environments you may not want to view the entire network system in one tree. The Navigator has been designed to be highly flexible for viewing objects. With the Split View menu option, you can split the Navigator tree into views that are displayed in separate pages in the Navigator window. Simply click on the tab of a page to move the page and its contents to the front of the Navigator window.

Launching Tools

To launch a database tool in the context of a database or database object, select the object in the Navigator tree that you want to access. You can then execute a tool from the Tools menu or with the Related Tools option of the right-mouse menu.

You are connected to the database according to the preferred credentials that have been set up for the database. If connection to the database fails for any reason, the Database Connect Information dialog box displays. At that point, you can enter the

requisite information and optionally save that information as a preferred credential. See "Preferred Credentials" on page 1-25 for information.

Navigator Menu

The Navigator menu allows you to manage objects in the Navigator pane. The menu options are enabled according to the object selected in the Navigator tree. Usually the Create, Create Like, Edit, and Remove menu options are available when an object is selected. See Figure 2-1, "Navigator Menu and Window" for an illustration of the Navigator menu.

Clicking on an object in the Navigator with the right mouse button, displays a *context-sensitive menu* of all the options you can use to manipulate the object, as well as related tools.

For information on operations for an object type, see the chapter in this guide that discusses the specific application that manipulates the object type. See Chapter 6, "DBA Management Pack" for an overview of the database application tools.

Create

Allows you to create an object of a specified type.

Create Like

Allows you to create a copy of the selected object in the Navigator.

Edit

Allows you to alter or edit the object selected in the Navigator.

Remove

Allows you to delete all occurrences of the selected object in the Navigator.

If you remove a node from the Navigator tree, the node and all its services are removed from the Navigator tree.

If you remove a database, listener, or other service object from the Navigator tree the object appears again in the Navigator tree when the node that contains the service is rediscovered.

Discover Nodes

Discovers services on a node in the network. You can also display the status of network services. See "Discovering Services" on page 2-7 for more information.

Refresh All Nodes

Refreshes services for all discovered nodes.

Paging/Email Blackout

Allows a super administrator to specify paging and email blackouts for specified targets and/or services that have been previously discovered in the Navigator. Paging/email blackouts allow a super administrator to schedule deactivation of enhanced notification (email/paging), thus preventing Enterprise Manager administrators from being flooded with emails and pages if a managed target/service is brought down.

Ping Agent

Attempts to contact the Intelligent Agent on a specified node. If it fails, either the node is down or the Intelligent Agent isn't running. If either of these is true, no Job or Event notification will come through.

Split View

Creates a new view page in the Navigator window that contains only the currently selected object, such as a single folder, group, or user. This feature allows you to create separate views that display specific objects. For example, to create a new view that only contains the DEMO database:

1. Select the DEMO database in the tree.
2. Select the Split View menu option to create a separate view page in the Navigator pane.
3. Click on the tab of the page to move the page and its contents to the front of the Navigator pane.

Remove Split View

Removes the current split view from the Navigator. Make sure the view that you want to delete is at the front of the Navigator pane.

Find

Locates discovered databases within the Navigator Tree. It is available when you select a Database or Node icon on the tree.

Report

Allows you to generate an HTML database configuration, status, or Enterprise Manager Repository report.

Application SQL History

Displays SQL statements produced by DBA Studio. This option allows you to view the last 100 SQL statements (maximum) executed by the application you are using (i.e., DBA Studio, Schema Management, and others) against the selected database.

SQL Logging

Allows you to log SQL in a permanent status. The SQL Logging function allows you to specify the SQL logging file information and options. When you are connected to the Management Server, you can query the log. You must be logged in as super-administrator in order to enable and disable SQL Logging.

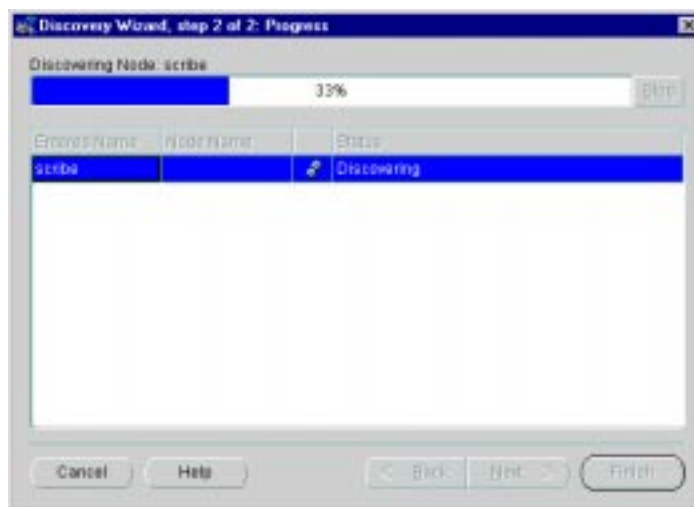
View SQL Log

Allows you to view the contents of a SQL log. All normal users can view their own SQL logs. If you are logged in as super-administrator, you can view the SQL logs of any user. You must be logged in as super-administrator to purge a log file.

Discovering Services

The Navigator provides service discovery functions for identifying network services and populating the Navigator tree through the Discovery Wizard.

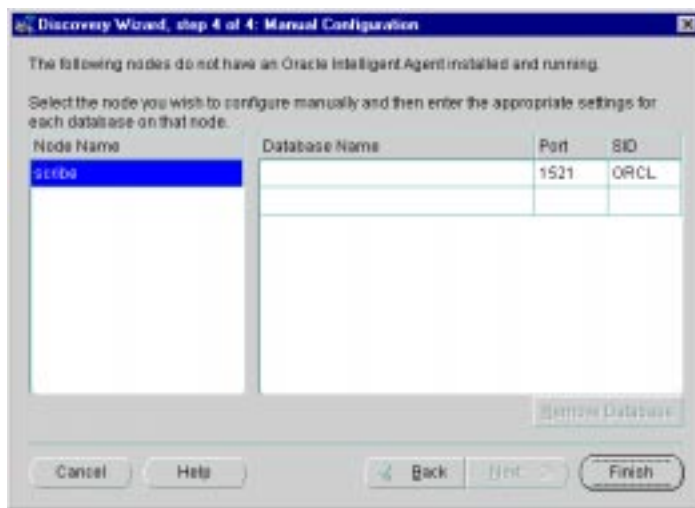
Figure 2–2 Discovery Wizard



The Discovery Wizard searches the network for the nodes you specify. If that node has an Oracle Intelligent Agent running, it will be added to the Enterprise Manager Console Navigator for management along with any services running on that node. You will be able use these services as targets in jobs, events, and groups.

If there is no Oracle Intelligent Agent running, you may perform a manual configuration. This allows you to define an Oracle database on that node so that it appears in the Console Navigator. While manual configuration permits database access from the Navigator, its use is not recommended since Enterprise Manager services, such as jobs and events, will not be available.

Figure 2–3 *Discovery Wizard: Manual Configuration*



When refreshing an existing node, the Discovery Wizard verifies and updates the list of services on a node that had been previously discovered. If the node was previously Manually Configured, the Discovery Wizard will check if that node now has an Oracle Intelligent Agent and if so, provide that information with the option to discover using that Intelligent Agent, or to update the previous configuration.

Note: Services on the machine where the Management Server is running are automatically discovered when you start the Console and connect to the Management Server.

Adding a Service

To discover new services, choose Discover Nodes from the Console Navigator menu to call up the Discovery Wizard. Any services running on that node will, if successfully discovered, appear in the Navigator. The Discovery Wizard guides you

through the service discovery process. For more information on service discovery and refresh, refer to Oracle Enterprise Manager online help.

Refreshing a Service

Refreshing a node verifies and updates the list of services on a node that has been previously discovered. You can refresh the discovery of a node by selecting a node from the Navigator, clicking the right mouse button, and choosing Refresh Node from the context-sensitive menu.

To refresh an existing service, choose Refresh Nodes from the Console Navigator menu to call up the Refresh Wizard. The Refresh Wizard performs a "rediscovery" of any node selected in the Console Navigator. This menu option is greyed out until a specific node is selected from the Navigator Nodes folder.

Removing a Service

Select a node or service from the Console Navigator. Using the right-mouse button, choose Delete from the context-sensitive menu.

Pinging the Intelligent Agent

Pinging the Intelligent Agent on a monitored node allows you to check whether the Management Server can communicate with the Intelligent Agent on a monitored node. Proper Intelligent Agent operation is required for successful service discovery. If discovery is successful, the discovered node and services appear in the Navigator tree. If discovery has failed, an error message displays.

The following are common problems if the service discovery has failed:

- The node must have an Oracle Intelligent Agent started and running.
- TCP/IP network protocol must be used.
- If a database has not been discovered, make sure an entry for the database is in the `tnsnames.ora` file on the node where the Intelligent Agent is running. On a UNIX platform, check the `oratab` file.
- If a database has not been discovered, you may need to stop and restart the Intelligent Agent if the database was not configured or installed when the Intelligent Agent was last started. When the Intelligent Agent starts, database entries are written to the `services.ora` file in the `ORACLE_HOME/network/agent` directory (Unix example).

Determining Node Properties

Since Enterprise Manager allows you to manage a heterogeneous environment, there will be situations where you may need to determine operational properties of that node (network name, operating system and version, and Intelligent Agent version). For example, you may want to find out which version of the Intelligent Agent is running on each node within your enterprise to determine which nodes require Intelligent Agent updates. To determine node properties:

1. Select the desired node in the Navigator.
2. Using the context-sensitive menu (right mouse button), choose Properties.

A popup window displaying the node name, operating system and version (Intelligent Agent version 8.1.7 is required to determine operating system information), and Intelligent Agent version,

3. Click OK to dismiss the popup.

Manipulating Objects in the Navigator

The Navigator interface provides easy manipulation of the services and objects in your managed network from the Enterprise Manager Console. From the Navigator, you can apply some or all functions available from the Console and any integrated applications to selected objects.

Administering Objects

To administer an object, select the object in the Navigator tree and choose the administration task from the Navigator menu, or use the menu options available when you click the right mouse button on the object. The menu options available vary according to the object selected. See "Navigator Menu" on page 2-5 for more information. When you create or edit an object, the property sheet for that object displays. For information on the property sheets, see the chapter on the DBA tool that administers the object.

Copying Navigator Objects

You can drag and drop some objects in the navigator to make copies of the object in different locations. For example, you can drag and drop a database user or role from one database to another to add that user or role to another user. However, if you drag and drop a group that resides within another group to a different group, it will move the group instead of copying it.

Apache Web Servers

Apache web server management allows you to discover and monitor the server's operational status via the Event system. Additional functionality (extra job tasks and event tests) are available when the e-Business Management Tools (part of the Diagnostics Pack) are installed.

Discovering Apache Web Servers

You discover a web server as you would any other managed service from the Enterprise Manager Console. See "Discovering Services" on page 2-7. The discovery process does not require the web server to be running. Once discovered, you set the server access authorization through the Enterprise Manager Preferred Credentials (Node). See "Preferred Credentials" on page 1-25.

Important: When running on UNIX, if the web server is listening on a port number less than 1024, the administrator must have root privileges in order to submit startup or shutdown jobs to the server.

Determining the Status of Apache Web Server

Select Edit Web Server from the context-sensitive menu to display the Edit Web Server General Page. Information displayed pertaining to the selected web server includes:

- **Server Name:** Server's Internet host name. Example: xyz-machine.your_company.com. If this machine does not have a registered DNS name, an IP address will appear.
- **Port:** The network port to which the web server listens.
- **Version:** Apache server version number.
- **Server Root Directory:** The top-level directory where all web server-related files (configuration, error, and log files) are stored.
- **Configuration File Location:** Location of the web server configuration file.
- **Status URL:** The location of the Apache-generated HTML page that provides the current server statistics in an easily readable form.

Paging/Email Blackout

Paging/Email Blackout allows an administrator with super administrator privileges to suspend paging and email notifications for specified targets and/or services that have been previously discovered in the Navigator. Paging/email blackouts deactivate enhanced notification (email/paging), thus preventing Enterprise Manager administrators from being flooded with emails and pages if a managed target/service is brought down. For example, if a target is brought down on a regular basis for scheduled maintenance, a super administrator administrator can schedule a paging/email blackout for that target to prevent enhanced notification during the maintenance period.

Specifying Total Paging/Email Blackout

Total paging/email blackout specifies that a blackout be started immediately with an indefinite duration. The super administrator must manually turn off Total Paging/Email before any new blackout schedules can take effect or existing blackout schedules resume. To specify a total paging/email blackout:

1. Choose Paging/Email Blackout from the Navigator menu.
2. Check Total Paging/Email Blackout.
3. Click OK.

Note: You can also access Total Paging/Email Blackout menu item from a target's context-sensitive menu in the Enterprise Manager Navigator.

Defining a Paging/Email Blackout

To define a paging/email blackout for a specific node:

1. Select a target from the Navigator and then choose Paging/Email Blackout from the Navigator menu. Optionally, you can select an object in the Navigator and access Paging/Email Blackout through the context-sensitive menu.
2. Click Create. The requisite naming and scheduling UI are displayed. Important: Be sure that Total Paging/Email Blackout is not checked for either the specific service or its parent target.

3. Specify a Blackout Name. All Blackout names for this node/service must be unique. Note: the Target name reflects the node/service selected in the Navigator and is not editable from this dialog.

4. Select an Occurrence

Select the frequency that you want the paging/email blackout to occur. The choices are Once, On Interval, On Day(s) of Week, and On Date(s) of Month.

- Once—schedules the blackout only one time beginning and ending on the dates and times you choose.
- On Interval—allows you to schedule a specific time interval between paging/email blackout periods. The interval can be a combination of hours and minutes, or number of days. Select the value you want to change and click on the scroll buttons. You can also type in a new value. Select an Effective Period in which your blackout schedule will be valid.
- On Day(s) of Week—allows you to schedule the blackout on one or multiple days (Sunday, Monday, etc.) of the week. Click on the days of the week to select the days you want the blackout period scheduled and set a start time or duration. Select an Effective Period in which your blackout schedule will be valid.
- On Day(s) of Month—allows you to schedule the blackout on one or multiple days (1 - 31) of the month. Click on the dates of the month to select the dates you want the blackout period scheduled and set a start time or duration. Select an Effective Period in which your blackout schedule will be valid.

5. Click OK.

Important: When selecting *On Day(s) of Month* or *On Day(s) of Week*, be aware that each day terminates at 12:00 A.M. This is important when scheduling paging/email blackout periods that span the day change (12:00 A.M.).

For example, if you wish to schedule a blackout that begins on Tuesday at 10:00 P.M. and lasts for six hours, you must define two blackout periods:

- Tuesday from 10:00 P.M. to 11:59 P.M.
 - Wednesday from 12:00 A.M. to 4:00 A.M.
-
-

Making a Copy of an Existing Blackout Schedule

To schedule a paging/email blackout schedule for a node that is identical to that of another managed node:

1. Choose Paging/Email Blackout from the Navigator menu. Optionally, you can select an object in the Navigator and access Paging/Email Blackout through the context-sensitive menu.
2. Select a Blackout Schedule entry from the Blackout Name list.
3. Click Create Like. A new entry is created in the list prefixed by "Copy of."
4. Modify the blackout period parameters (such as Blackout Name) as desired and click OK.

Turning Blackout Schedules On and Off

Once you have defined one or more paging/email blackout periods for a node/service, they persist in the Blackout Name list associated with the node/service until deleted. You can turn paging/email blackout on or off by checking the box located to the left of the individual blackout name. You can edit the Occurrence parameters to reflect the present date and time. Paging/email blackouts are set ON by default.

Deleting Paging/Email Blackout Periods

1. Choose Paging/Email Blackout from the Navigator menu. Optionally, you can select an object in the Navigator and access Paging/Email Blackout through the context-sensitive menu.
2. Select the desired Blackout Name.
3. Click Delete.

Viewing Blackout Periods

Once you have defined blackout periods on multiple nodes, you can view them by selecting the desired target in the Console Navigator and choosing Paging/Email Blackout from the Navigator menu. If you select a high-level folder from the Navigator, such as Databases, Groups, or Nodes, rather than an individual target, all blackout periods defined in the container type are displayed.

Removing a Node from the Navigator

Before removing a discovered node from the Enterprise Manager Navigator, you must remove all jobs and events submitted against that node. If the Intelligent Agent is down when you attempt to remove the node, and jobs and events have not been cleared previously, Enterprise Manager will allow you to remove the node. However, when the Intelligent Agent is restarted and the node re-discovered, the Intelligent Agent will be out of sync with the Oracle Management Server. The following example illustrates how this situation can occur.

1. You register an event with the Intelligent Agent on a managed node.
2. The Intelligent Agent goes down.
3. You remove the node from the Navigator without removing the event.
4. The Intelligent Agent is started and the node is rediscovered.
5. The Console Event window is clear.
6. You attempt to register the same event with the managed node.
7. Enterprise Manager displays a message stating the event is already registered even though it is not.

The Intelligent Agent remembers the current status of jobs and events through a series of generated files. Oracle Intelligent Agents 8.0.6 (Oracle 8.0) and higher and Intelligent Agents 8.1.6 (Oracle 8.1) and higher automatically synchronize with the Oracle Management Server by removing old Intelligent Agent overhead files. For older versions of the Intelligent Agent, you must remove these files manually.

To manually remove the Intelligent Agent overhead files:

1. Stop the Intelligent Agent (if it is currently running).
2. Go to the Intelligent Agent directory (\$ORACLE_HOME/network/agent or \$ORACLE_HOME/net80/agent (Windows NT))
3. Delete files with the following extensions: .q, .jou, .inp
4. Restart the Intelligent Agent.

Node Removal Failure

Typically, node removal from the Navigator fails because of problems encountered by the Management Server. The following are the most probable causes.

- The Management Server encountered an error condition while accessing the repository. Check the Management Server log for detailed error messages. (ORACLE_HOME/sysman/log/oms.log). If problem resolution is not obvious from the error messages, contact Oracle Support.
- The Management Server could not open a database session to the repository. Ensure that the repository is up and running. You may have to shut down other Enterprise Manager applications that may be connected to the repository. Check the Management Server log for more detailed error messages.
- Different DNS servers may resolve node names in different ways. For example, if a Management Server is running on a machine whose DNS server resolves a particular node as "A", the Management Server discovers the node as "A". Next, the Management Server is run on another machine whose DNS server resolves the same node as "B". If you switch back to running the Management Server on the first machine (originally resolved the node as "A"), attempting to remove the node from the Console Navigator will now fail since the repository entries will be out of sync.

The solution is to run the Management Server on the machine from which you last discovered the node. In the example above, you would need to run the Management Server on the second machine (resolved the node as "B") and then remove the node from the Navigator. Always ensure that the DNS setup is consistent for all nodes where the Management Server is run.

The Group system lets you organize the objects you manage into logical categories for more efficient management and administration. You can organize groups based on any criteria you determine, such as function, department, geographical location, or number of administrators. You can then place the groups on a map or graphical view of the network making it easy to locate, diagnose, and act on encountered conditions. The system also lets you assign jobs to groups and monitor their status. The Groups system is especially useful for managing environments with many databases and services.

The topics discussed in this chapter include:

- Group Pane
- Group Menu
- Managing Groups

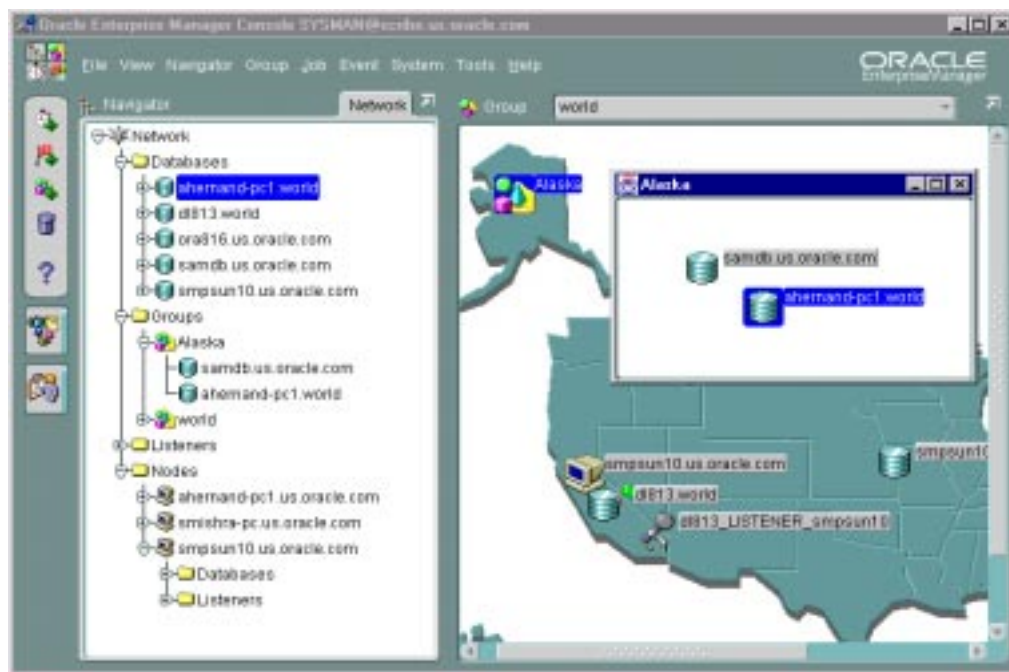
Group Pane

The Group pane provides an area for constructing a graphical custom view of the network environment. When all four panes are displayed, the Groups pane is located in the upper right corner of the console. See Figure 3–1, "Navigator and Group Panes" for an illustration of a Group pane.

The Group pane can be hidden or shown by selecting Show/Hide Group pane in the Console View menu. You can also hide or show the pane by clicking on the Show/Hide Group Display button above the Console toolbar.

Note that groups are also displayed in the Navigator pane. To display the members of a group in this pane, expand the group by clicking the "+" symbol next to the group name.

Figure 3–1 Navigator and Group Panes



Group Menu

The Group menu options allow you to perform such actions as create, modify, and remove groups.

Create Group

Adds a new group to the selected group. See "Adding Objects to a Group" on page 3-9 for more information.

Create Group Like

Copies an existing group.

Edit Group

Modifies an existing group. See "Modifying a Group" on page 3-10 for more information.

Remove Group

Removes an existing group from the current group, or deletes the group from the entire system. See "Removing Groups" on page 3-10 for more information.

Remove Item From Group

Deletes the selected item from the group pane. You can also delete an object from the group by selecting the object and pressing the Delete key. See "Removing Groups" on page 3-10 for more information.

Managing Groups

A group is a collection of objects, such as databases, listeners, or nodes, that share a common location or function. You can create, modify, and remove groups to further organize your network view. Different types of objects, like databases and listeners, can be grouped together.

Groups appear in two places: the Navigator and the Group pane.

A group is represented on the Navigator by an icon and a name. You can double-click on the group's icon to expand the group, and view and update the group's members and sub-groups.

The Group pane gives you a more graphical view of the objects in the group and their individual status. You can also add background maps to the Group pane to better visualize locations of particular objects.

Grouping nodes or services can simplify tasks that are applied to all members of the group. For example, in order to execute a SQL script on all the databases in the CHI_MAIL group, you can use the Job Scheduling services to schedule a job on the group. The job that executes the SQL script is scheduled on all the databases in the group. The job will not be applied to any other objects in the group.

Note: Jobs and events applied to an object before it joins a group will not be applied to the group retroactively. You must re-apply any jobs or events you want to apply to the entire group.

Important: If you submit a job or event against a group that contains a mixture of manually configured and discovered targets, the job or event will only be submitted against the discovered targets. If all the targets in a group are manually configured, then the job/event submitted against that group will fail.

Creating a Group

To create a group, select the Create Group menu item to display the Create a Group property sheet. The property sheet contains the General and Permissions pages (see Figure 3-2 and Figure 3-3). After you have completed the property sheet pages,

click the OK button to save the group. The new group appears under Groups in the Navigator. The Group pane will remain empty.

The new group is empty until you add objects to it. Dragging an object from the Navigator menu copies and pastes it into a group. Note that this action does not remove the object from the Navigator. In fact, you can add an object to any number of groups, and still be able to manipulate it individually, as well.

To add an object to a group, select it and drag it over to the Group pane, or drag it over to a group folder in the Navigator pane. To add an existing group to the new group, or to another existing group, drag and drop the group from the Navigator into the group folder or the Group pane. An icon representing the object or group appears in the Navigator and in the Group pane.

Figure 3–2 Create Group General Page



Group General Page

Group Name

Enter a unique name for the new group in the Group Name field of the dialog box.

Use a background image when viewing this group

Check this option if you want to display an image in the background of the group pane. Sample files are provided in the `oracle_home\classes\oracle\sysman\resources\images` directory on the machine where the Management Server is located. If you want to use your own images, Oracle recommends that you add them to this directory.

The sample images included are:

- asia.gif
- europe.gif
- japan.gif
- usa.gif
- world.gif

Do not specify a directory for graphics located in this directory. Specify only the file name, such as `usa.gif`. You can use `.GIF` or `.JPG` graphic files. If you check the box, enter the file name of the image in the Bitmap Relative URL field. When an image is added to a group, the file name is stored in the repository.

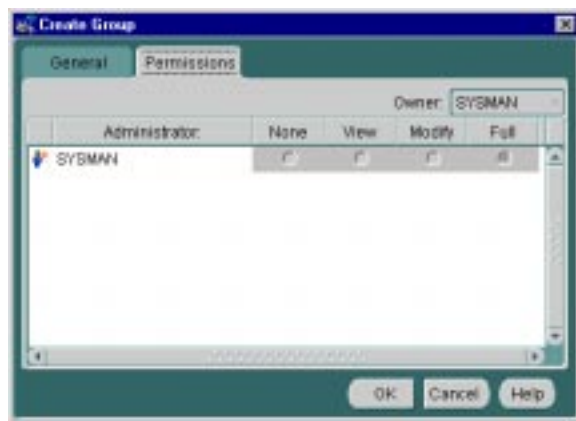
Icons

Determine whether you want to display large or small icons in the group.

Group Permissions Page

Determine the permissions that you want to assign to the group with the Permissions Page. This allows other users to view or modify the group. Any permissions assigned on this page over-write any user default permissions. See "Permissions" on page 1-23 for an explanation of the permissions that can be assigned.

Figure 3–3 *Group Permissions Page*



Manipulating Group Views

Groups are populated by dragging and dropping databases, groups, nodes, listeners or any other discovered services from the Navigator into the Group pane. You can create, update, and save any number of groups. In addition, you can add a graphic as a background to the group for visual identification or to graphically show the location of nodes. For example, you can use a group drawing of a city or state for the background of your group.

Double-clicking on a group in the Navigator pane opens the hierarchical list of its members. You can display groups in the Group pane by selecting the group name from the pull-down list in the Console toolbar.

Monitoring Status

The Group system provides an efficient way to monitor the alerts reported by the event system. If the object or group has events registered against it, a flag showing the state of the event condition is displayed. If an object in a group has more than one event registered against it, the flag will represent the most severe alert condition.

- If the flag is green, there are no problems on the monitored objects.
- If the flag is yellow, there is a condition detected that should be checked.
- If the flag is red, there is a severe problem detected by an event and the object requires immediate attention.
- If the flag is gray, the status of the object is unknown. For example, the UpDown event is registered to a database but the node is unavailable. The gray flag will only display if an up/down test is explicitly registered for the object.
- If there is no flag, then the object is not being monitored. Note that groups within groups do not show a status monitor when the event is clear (green).
- If there is a yellow hexagon, there is an error state (yellow hexagon). An error state indicates there is a problem with the evaluation of the event condition, as opposed to a threshold being met. Examples of error states are: registering an Archive Full event against a database in non-archivelog mode, registering an event that monitors segments but specifying a filter that excludes all available segments.

Groups inherit the worst state of any of the members. If one service in a group is down, the group displays a grey flag.

Note: For status monitors to display on a group or object, an Intelligent Agent must be running on the node where the object is located.

See Chapter 5, "Events" for more information on events.

Expanding Objects

Some group objects, such as database objects and defined group objects, can be expanded in the Group pane by double-clicking on the object's icon. You can double-click on some objects to open property sheets. The property sheets allow you to both view and alter the properties of the objects. You can double-click on databases to display property sheets.

See Figure 3-1, "Navigator and Group Panes" for an illustration of an expanded node in the Group pane.

Groups

When you double-click on a group icon, the group expands to display the objects in the group. You can drag and drop objects from the Group, the Navigator, and other groups to add them to the group. You can delete objects from the group by selecting them and pressing the Delete key, or clicking the right mouse button and selecting Remove.

Databases and Other Discovered Services

When you double-click on a database or other discovered service, you connect to that service. The instance property sheet displays if that service is a database. If the connection to the database fails for any reason, the Login Information dialog box displays. See "Preferred Credentials" on page 1-25 for information on preferred credentials.

Launching Tools from a Group

You can launch a database tool using an object in the group. Select a database icon in the Group pane, then select a DBA tool from the Tools menu or launch palette. You are connected to the database according to the user credentials that have been set up for the system. See "Preferred Credentials" on page 1-25 for more information on user credentials.

Adding Objects to a Group

To add objects to a group, drag and drop the object from its location on the Navigator to the group—either the group folder on the Navigator or the group shown in the Group pane.

Note: Only one copy of an item can exist in the group.

When you add objects in a group, the updates are reflected in every occurrence of the group. Any updates to a group are automatically saved as the updates are made.

Deleting Objects from the Group Pane

To delete objects in a group pane:

1. Double-click on a group icon in a group to expand the group.
2. Select an object in the group and press the Delete key to delete an object from a group.

To delete objects from a group in the Navigator:

1. Expand the group in the tree.
2. Select an object in the group and press the Delete key to delete an object from a group.

Note: When you delete objects from a group, the updates are reflected in every occurrence of that group. Any updates to a group are automatically saved as the updates are made.

Modifying a Group

You can modify the properties of a group.

1. Select a group in the Navigator.
2. Select the Edit Group menu item to display the Edit Group dialog box. The name of the group is automatically entered in the name field. The name cannot be modified.
3. Modify the properties for the group.
4. Click the OK button when you have finished.

Removing Groups

There are two ways to remove a group:

- Remove the group from within another group. This does not affect the existence of the group in the system or in any other groups.
- Remove the group completely (delete). This removes the group from every group where it has been copied.

After you select a group, there are four ways to remove it:

- Delete the group completely by selecting Remove Group from the Group menu.
- Delete the group completely by choosing a group (that is not inside another group) and selecting the Remove menu item from the group's context menu.
- Delete the group completely by choosing a group (that is not inside another group) and selecting the <DELETE> key.
- Remove a sub-group from within another group by selecting Remove Item from the Group menu. This will remove the sub-group from the selected group, but will not affect the sub-group's existence in other groups.
- Remove a sub-group from within another group by selecting the Remove menu item from the group's context menu. This will remove the sub-group from the selected group, but will not affect the sub-group's existence in other groups.
- Remove a sub-group from within another group by selecting the <DELETE> key. This will remove the sub-group from the selected group, but will not affect the sub-group's existence in other groups.

Example: Creating a Group

The following example illustrates how to create a new database group.

1. Select Create Group from the Group menu to display the Create a Group dialog.
2. Enter a name for the new group in the Group Name field.
3. Check the Use Background Image box to add a graphic to the background. Enter a graphic name, or select one of the supplied images from the drop-down list.
4. Choose small icons for the group.
5. Set the permissions so all Enterprise Manager administrators can view but not modify the group.
6. Click on the Create button to create the new group. A folder for the new group appears in the Navigator.
7. Select the new group from the pull-down group list over the Group pane to display the group.
8. Expand the Databases branch of the Navigator.
9. Drag a database into the Group pane.
10. Drag and drop a listener into the new group folder in the Navigator.

The new group can be added to other groups by dragging and dropping the group from the Navigator.

The Job system allows you to automate standard and repetitive tasks, such as executing a SQL script or executing an operating system command. With the Job system, you can create and manage jobs, share jobs with other administrators, schedule execution of jobs, and view information about the jobs. Jobs can be scheduled on a single node or multiple nodes in the network, provided that the node has an Intelligent Agent running on it. The topics discussed in this chapter include:

- Job Process
- Job Pane
- Job Menu
- Creating, Modifying, or Viewing a Job
- Oracle Job Tasks

Job Process

The Job process includes:

1. Creating a job. This involves:
 - a. Determining the type and destination of the job.
 - b. Determining the tasks.
 - c. Determining task dependencies of the job.
 - d. Determining the parameters for each task.
 - e. Scheduling the times that the job executes.
 - f. Assigning permissions to other administrators for notification purposes.
2. Submitting a job to the selected destinations in the network system.
3. Viewing the job history to review the results of the job.

Job Tasks

The Job system provides a variety of predefined job tasks, or you can submit your own tasks by executing a SQL*Plus script or running an operating system program. Job tasks are implemented in the Tool Command Language (Tcl) scripts with Oracle extensions (OraTcl) to include database-specific commands. You can write your own Tcl script and submit it with the Run Tcl job task. For more information on custom job scripts, see the *Oracle Intelligent Agent User's Guide*.

The tasks are grouped by the destination (target type) of the task:

- Databases
- Nodes
- Listeners

Note: All target types include Node tasks.

The tasks allow you to perform such operations as:

- Execute operating system commands or shell scripts.
- Execute SQL and DBA commands.

- Perform database administration tasks such as starting up and shutting down Oracle databases.
- Start up and shut down Listeners.

See the online help for Oracle job tasks and "Oracle Job Tasks" on page 4-23 for information on Oracle predefined job tasks and their parameters.

You can combine two or more tasks into one job, called a composite job. Composite jobs consist of separate tasks that are constructed such that some tasks may or may not execute upon completion of another task. For example, if a composite job consists of two tasks, starting up a database and then running a SQL script, you can specify that the script be run only if the database was successfully started. Here, you specify a dependency between the two tasks that determine whether the next task is executed. The Job system allows you to specify one of three dependencies for any task: Always (default), Only on Success, or Only on Failure.

You can create jobs that can be used as *fixit* jobs that are to be run when a condition is signalled by the Event system. Fixit jobs are not scheduled. See Chapter 5, "Events" for information on monitoring events in the system.

Note: You need to set up a password file to perform administration tasks, such as start up or shut down, on a remote database. See the "Configuring a Remote Database for Backup or SYSDBA Administration" in the *Oracle Enterprise Manager Configuration Guide* for more information.

Writing SQL*Plus Scripts

Creating your own job tasks using the SQL*Plus command language allows you to automate any number of complex database operations via the Job system and Intelligent Agent(s). The success or failure of a given SQL*Plus script is determined by the exit condition returned when the script completes. Because a SQL*Plus script can return an error condition that may not be recognized by the Intelligent Agent, such as a non-ORA error message, your job task can appear to complete successfully even though a command issued from within your script has failed. To avoid this situation, you must specify an operational clause when using a SQL*Plus EXIT command in your script. For example:

```
> EXIT sql.sqlcode  
> EXIT warning  
> EXIT 666
```

Using the EXIT command without specifying an operational clause (default) commits and exits with a value of SUCCESS. By explicitly defining the conditions

under which your script terminates, the Intelligent Agent can ascertain whether your job has succeeded or failed. For more information on SQL*Plus and the SQL*Plus command language, see the *SQL*Plus User's Guide and Reference*.

Job Credentials

Jobs are normally run with the preferences of the administrator who submitted the job. This ensures that jobs cannot be used to perform functions the administrator could not perform if logged into the machine directly. For example, to write a job output file to the `ORACLE_HOME/network/agent/` directory, the administrator must have permissions to write to that directory on that node.

Because jobs are categorized by the type of service they act on, the job system knows what credentials to pass to the Intelligent Agent. The Job system uses Enterprise Manager System Preferences (Preferred Credentials) to determine what preference information needs to be passed. When a job runs on a node, the job system passes the administrator preferences for the node. When a job runs on a service, such as a database, the job system also passes the administrator preferences for the service. See "Preferred Credentials" on page 1-25 for information on administrator preferences.

Important: You must set up valid user credentials for the nodes on which you want to run jobs. Node credentials are required for all jobs. If credentials are not set up correctly for an Windows NT node, you may get the "Failed to Authenticate User" error message. Make sure the Windows NT node account specified in your preferred credentials possesses the "log in as batch jobs" user right. See the *Enterprise Manager Configuration Guide* or your Windows NT documentation for instructions on creating NT user accounts.

Administrator preferences for nodes and/or services are given the following prioritization:

1. Preferred Credential Overrides (Highest Priority)
2. Preferred Credentials for the selected node or service.
3. Default Service
4. Null Credentials (Lowest Priority) **Note:** Jobs and events will fail.

Submitting Jobs

The Job system is simple to use because the task of scheduling and managing jobs is centralized in the Enterprise Manager Console. The administrator only needs to submit a job once, regardless of the number of destinations on which the job will run.

When you submit a job, the Management Server sends the job information to the appropriate Intelligent Agents on the destinations you selected. The Intelligent Agents are responsible for executing the job on the specified schedule and returning job status messages to the Console through the Management Server. Once submitted, jobs will run regardless of whether you are logged in or not.

Note: There is usually a slight delay between submitting the job and the notification by the Intelligent Agent.

To schedule a job, you do not have to connect at the time of job creation to the node on which the job will be run. You only need to submit the job from the Console and specify the destinations on which it should run. The destinations can include nodes, databases, listeners, user-defined groups that have been created with the Group system, or any other discovered services.

The Job system of Enterprise Manager allows you to efficiently run jobs on multiple remote nodes by transferring job information to the Intelligent Agents servicing the nodes. When a job is executed, it is run by the Intelligent Agent on that node, thus minimizing network traffic between the remote node and the Console and Management Server. In addition, jobs can be run on multiple nodes simultaneously because there is an Intelligent Agent residing on each node. Jobs can only be run on nodes where an Intelligent Agent is running. If you send a job to a group, the job is only scheduled on the nodes in the group where the Intelligent Agent is running.

When you submit a job to one or more remote sites, it is possible that any one of those site may be down. If a site or its Intelligent Agent is down, the Management Server queues any job requests that could not be delivered to the site. Once the site can be contacted, the Management Server submits the queued job to the Intelligent Agent, which in turn executes the job on the node.

Cancelling Jobs

You can cancel a job by selecting the desired job from the Job Active window and choosing Remove Job from the Job menu. Care should be taken when cancelling a job. Cancelling a job that is currently running will interrupt the job process and terminate the job. Problems can arise when the job is composed of multiple job tasks with sequential dependencies.

Job Pane

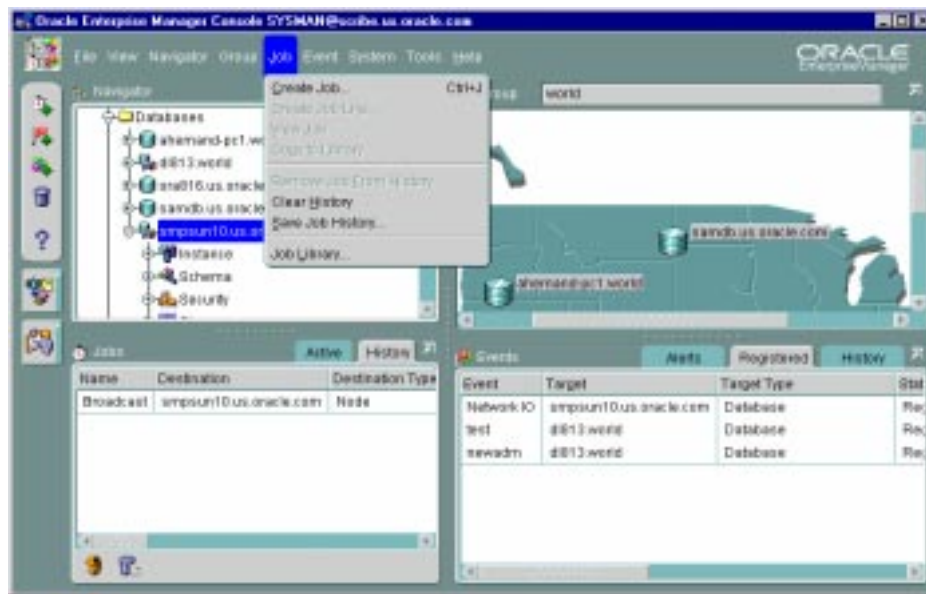
You can view the different pages of job information by selecting the page tabs in the Job pane. The pages in the Job pane are:

- Active
- History

You can switch between the pages by clicking the tab of each page. The rows in both pages can be sorted on any column by clicking the column heading.

The Job pane can be hidden or shown by selecting Job in the Console View menu. You can also hide or show the pane by clicking the Job system icon in the Console toolbar.

Figure 4–1 Job Pane in the Console



Active Job Pane

The Active pane contains a summary of the active jobs on the network. These are jobs that you have submitted to the job system and are not yet completed. Each row is an execution of a particular job scheduled on a specific destination. While a job may execute multiple times, the job listed in the Active page is the one that is currently scheduled or running. You can use the Edit Job menu option to display the details of the selected job. When selecting a job from the Active pane, the only job attribute you can modify is the job permission. See "Creating, Modifying, or Viewing a Job" on page 4-12

You can double-click on a job listed in the Active page to view the job details.

Name

Name of the job.

Destination

Destination of the job.

Destination Type

database, listener, node.

Owner

Administrator submitting the job.

Status

Status of job is one of the following:

- *Submitted*: The job has been submitted to the job destination running an Intelligent Agent.
- *Scheduled*: The job has been successfully delivered to the Intelligent Agent and is scheduled for execution.

Note: Under certain circumstances, a job will remain in a Submitted state. The most likely cause would be the Intelligent Agent on the node to which you are trying to submit the job is down, or the node is not connected to the network.

- *Started*: The job execution has started. After the job executes, the job execution is displayed in the Job History page. If this is the last scheduled execution of the

job, the job is removed from the Active Jobs page. Otherwise, the job remains in the Active Jobs page and has the status of Scheduled. Unless you view the Active Jobs page at the exact time that the job is executing, you would not see the Running status.

- *Pending Deletion*: The job has been selected for deletion. When the deletion is successful, the job is removed from the Active Jobs page and added to the Job History page.
- *Fixit*: The fixit job has been submitted.
- *Fixing*: The fixit job is executing. A fixit job remains in the Active Jobs page until it is deleted.

Date/Time

This is the time the Intelligent Agent returns after the job has been scheduled by the Intelligent Agent.

Context-sensitive Menu options

The following options are available by selecting a job and clicking the right mouse button.

Edit/View Job

Displays the property sheet for the selected job. Only the permissions, notifications, and owner can be changed.

Create Like

Displays a copy of the selected job. You can edit the property sheet and submit this job.

Copy to Library

Copies the selected job to the Job Library if it does not already exist there.

Remove Job

Delete the selected job. If the job has not been saved to the Job Library, a warning dialog appears indicating that you are about to perform a remove operation. You may wish to copy the job to the job library before removing it.

History Page

Job History contains a list of previous job executions. These are jobs that have been submitted to an Intelligent Agent and have executed successfully or unsuccessfully. You cannot modify these jobs.

- Job Name is the name of the job.
- Destination of the job.
- Owner of the job.
- Destination type
- Status of job is one of the following:
 - Completed: The job has executed successfully.
 - Failed: The job execution has failed.
 - Deleted: The job has been deleted.
 - For the other status categories, see "Active Job Pane" on page 4-7.
- Finish Time is the time when the job finished, failed, or was deleted.

Refresh History Icon

Refreshes the job history list. Job history is refreshed each time you move from the Active tab to the History tab. However, to refresh the job history list while currently viewing the History pane, you must click the Refresh History icon located at the bottom left of the Job pane.

Clear All History Icon

Clears all entries in the Job History list.

You can double-click on a job listed in the Job History page to display the Job property sheet and view the Job Output dialog box, if output exists for the job. If no output is produced by a job, a message displays that states that there is no output for the job. If the output includes only blank spaces, the dialog box is blank.

Context Menu options

The following options are available by selecting a job and clicking the right mouse button.

View Job

Displays the property sheet for the selected job.

Create Like

Displays a copy of the selected job. You can edit the property sheet and submit this job.

Copy to Library

Copies the selected job to the Job Library if it does not already exist there.

Remove Job

Delete the selected job. If the job has not been saved to the Job Library, a warning dialog appears indicating that you are about to perform a remove operation. You may wish to copy the job to the job library before removing it.

You can save the jobs from the History page to a file, then clear the jobs from the History page. This prevents the History page from being overloaded with obsolete jobs that occurred in previous days. Choose the Report Job History option from the Job menu to save the history to a report. This report is a file on the machine where the Enterprise Manager Console is running.

You can create a new job similar to a job in the History page with the Create Like option. See "Creating, Modifying, or Viewing a Job" on page 4-12 for more information.

Job Menu

The Job menu allows you to create, modify, save, submit, and manage jobs. The menu options are enabled depending on the items selected in the Job pane. See Figure 4-1, "Job Pane in the Console" for an illustration of the Job menu.

Create Job

Allows you to create a new job. See "Creating, Modifying, or Viewing a Job" on page 4-12 for more information.

Create Job Like

Allows you to create a new job like the selected job in the Job pane. See "Creating, Modifying, or Viewing a Job" on page 4-12 for more information.

Edit Job

Allows you to modify the job selected in the Job pane. The property sheet is the same as the property sheet for creating a new job, however, you can only modify job permissions. See "Creating, Modifying, or Viewing a Job" on page 4-12 for more information.

Copy to Library

Copies the selected job to the Job Library if it does not already exist there.

View Job

Displays the property sheet for the selected job in the Job pane. The property sheet is in read-only format. Active jobs can be removed but not modified. See "Creating, Modifying, or Viewing a Job" on page 4-12 for more information.

Remove Job

Removes the selected job from the Active or History page of the Job pane. When you delete a job, there is usually a slight delay while the request is processed. See "Cancelling Jobs" on page 4-5 for specifics on job cancellation.

Job Library

Displays the Job Library dialog. See "Job Library" on page 4-11 for more information.

Clear History

Clears the jobs listed in the Job History page.

Refresh History

Refreshes the job history list. Job history is refreshed each time you move from the Active tab to the History tab. However, to refresh the job history list while currently viewing the History pane, you must select this menu item.

Remove Job from History

Clears the selected job listed in the Job History page.

Report Job History/Active Jobs

Generates an HTML-based report summarizing the History or Active Job pane, depending on which pane is active when this menu item is selected. By default, the report is saved to the ORACLE_HOME/sysman/reports directory.

Job Library

The Job Library dialog contains a list of the jobs that you have created and saved. In the dialog, you can view summary information about a job:

- **Job Name** is the name of the job.
- **Description** is the user-supplied description of the job.
- **Owner** is the administrator that is assigned as the owner of the job.

These jobs can be submitted to the job system with the Submit button. You can use the Edit button to modify a job selected in this page. You can also double-click on a job listed in the Job Library page to edit the job. You can create a new job based on an existing job with the Create Like button.

Creating, Modifying, or Viewing a Job

When you create, modify, or view details of a job, similar property sheets display. See Figure 4–3, "Job Tasks Page" for an illustration of a Job property sheet. The property sheets contains:

- General Page
- Task Page
- Parameters Page
- Schedule Page
- Permissions Page
- Progress Page (this page only appears when a job is selected from the Active or History pane)

Attention: When submitting a job that consists of multiple tasks, an error may occur if the string of arguments that was sent is longer than the internal buffer. If that error occurs when submitting a job, divide the tasks among multiple jobs and resubmit the jobs.

Creating a New Job

1. Select Create Job from the Job menu to display the Create Job property sheet.
2. Complete the pages of the Create Job property sheet.
3. Determine whether the job is ready to submit.
 - a. Select the Submit option and click Submit to send the job to the Intelligent Agents at the selected destinations. The job appears in the Active page.
 - OR -
 - b. Select the Add to Library option and click Add. The job appears in the Job Library. You can modify or submit a saved job at a later time.

- OR -

- c. Select the Submit and Add to Library option and click Submit and Add to send the job to the Intelligent Agents at the selected destinations and save the job to the job library. The job appears in the Active page and the Job Library. You can modify or submit a saved job at a later time.

Note: There is usually a slight delay between the time you submit the job and Intelligent Agent notification.

Modifying a Saved Job

Note: For submitted jobs in the Active Jobs page, you can only modify permissions or notifications. If you want to change other job attributes, you need to first delete the job from the Active pane, then re-submit the job with the necessary changes. It is more convenient to save the job definition first in the Job Library, then make the necessary changes.

1. If you have not already done so, copy the job to the Job Library using the Copy to Library menu option.
2. Select Job Library from the Job menu. The Job Library dialog appears.
3. Select the job from the library.
4. Click Edit. The Job property sheet appears.
5. Update the pages of the Job property sheet and determine whether the job is ready to submit.
 - a. Select the Submit option and click OK to submit the job to the Intelligent Agents at the selected destinations. The job appears in the Active window.
- OR -
 - b. Select the Save to Library option and click OK. The job appears in the Job Library. You can modify or submit a saved job at a later time.
- OR -
 - c. Select the Submit and Save to Library option and click OK to submit the job to the Intelligent Agents at the selected destinations and save the job to the job library. The job appears in the Active window and the Job Library. You can modify or submit a saved job at a later time.

Viewing Job Details

To view the details of a particular job, double-click on a job in the Active or History Job pane. The Job property sheet for that job appears.

General Page

The General page allows you to determine job name, description, type, fixit job status, and destinations.

Figure 4–2 Job General Page



Job Name

Enter the name of the new job.

Description

Enter the optional description of the job.

Fixit Job

Check this box if you want to use this job as a fixit job to correct an event condition. The fixit job must be submitted to the destination where the event is being monitored. A fixit job cannot be scheduled.

The fixit job can be selected from the Fixit Job list in the Event Parameters page after it has been successfully submitted to an Intelligent Agent. See "Creating, Modifying, and Registering an Event" on page 5-29 for more information.

Destination Type

Select the destination type from the pull-down list: Database, Listener, Node, Group, or other service that is integrated into the Console.

Job destinations

Select the destinations of the job in the Available Destinations list and click the < (Add) button to move the destination to the Selected Destinations list.

The destinations are determined by the Destination Type. The destinations include databases, listeners, nodes, and groups or other discovered services of these objects.

Note: Only network objects that have been discovered correctly and have an Intelligent Agent running are included in the list of available destinations. See "Discovering Services" on page 2-7 for more information.

Job Task Page

The Task page allows you to choose the tasks that you want the job to perform.

Available Tasks

Tree list of available job tasks. Tasks vary depending on the Destination Type selected on the General page. Select a task and click on the < (Add) button to include the task in the job. You can add multiple tasks to the job from the Available Tasks scrolling list. See the online help for Oracle job tasks and "Oracle Job Tasks" on page 4-23 for information on Oracle predefined job tasks and their parameters.

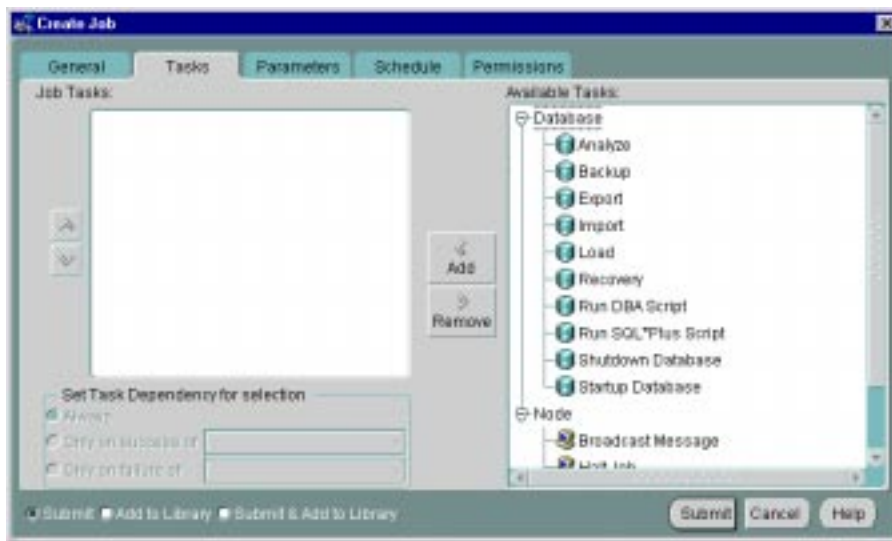
Job Tasks

Tasks currently selected for the current job. You can remove tasks from this list by selecting the task and clicking on the >> (Remove) button.

Up/Down Arrows

Use the arrow buttons to change the order of the tasks or to make a task conditional on a previous task. Select a task in the Selected Tasks list and click on the up or down arrow button to position the task.

Figure 4–3 Job Tasks Page



Conditions for running a task

Select a task in the Job Tasks window and select from the following:

- Always - The task is always executed regardless of the failure or success of other tasks.
- Only on success of - The task is only executed if the task selected in the list is successful.
- Only on failure of - The task is only executed if the task selected in the list has failed.

Note: If any task does not execute, control moves to the next task on the same level as the task that did not execute.

Important: You can add up to five job tasks per job. Adding more than five tasks will generate an error message stating the maximum number of input files have been exceeded.

Stopping Jobs

Normally, a job stops when all tasks have been executed. In some cases, you may want the job to stop before completing the task sequence, which might be the case when one task in the sequence fails. To handle situations like this, you can include the Halt Job task as part of a composite job to stop execution at any point within the task sequence. You specify the Halt Job task dependency as you would any other task.

Job Parameters Page

On the Parameters Page, you specify parameter settings for the selected job tasks. To set the parameters for a task, select the task in the Selected Tasks list. The parameters for the selected task are displayed on the right side of the Parameters Page.

Selected Tasks

Select the task for which you want to set parameters.

Task Parameters

Specify the parameters for the selected task. You can enter values in the entry boxes or select values from the pull-down lists. The parameters vary according to the job task. See the online help for Oracle job tasks and "Oracle Job Tasks" on page 4-23 for information on Oracle predefined job tasks and their parameters.

For some jobs, you can override the preferred credentials for connecting to the service. This allows you to enter a username and password. See "Job Credentials" on page 4-4 and "Preferred Credentials" on page 1-25 for information on administrator preferences.

Job Schedule Page

The Schedule page allows you to schedule the execution of the job task.

Run Job

Select the frequency that you want the task executed. The choices are Immediately, Once, On Interval, On Day of Week, and On Date of Month.

Start Execution

Choose the first date and time that you want the task executed. This is the starting time for any task scheduled on an interval.

Stop Execution

Choose the last date and time that you want the task executed. This option does not apply if you chose the Immediately or Once execution options.

Note: When scheduling a job, the Intelligent Agent time zone (the local time zone of the destination where the job will be executed) is used.

Job Permissions Page

Determine the permissions that you want to assign to the job with the Permissions Page. This allows other administrators to view or modify the job. Notifications can be assigned with this page.

The levels of permission that you can assign to an Enterprise Manager administrator are:

None

Does not allow the administrator to view this job anywhere.

View

Allows the administrator to view the job and inspect job properties.

Modify

Allows the administrator to suspend and resume the job. The administrator will also be able to edit the job's properties except those reserved for administrators with Full permission.

Full

Allows the administrator to delete the job from the Active or History pages of the Job window, modify permissions for other administrators, and change the ownership of the job.

Notify

Allows the administrator to receive enhanced notifications (paging and email) for the job. Notify permission cannot be assigned if the administrator's permission level is set to None.

Note: All administrators possessing at least the View permission will receive notifications through the Console when a job is executed.

Any permissions assigned on this page supersede any administrator default permissions. See "Permissions" on page 1-23 for more information.

Show Notification Schedule

Show Notification Schedule displays when administrators are scheduled to receive notifications.

To remove an administrator from receiving an enhanced notification, display the context menu (press the right mouse button) on any time block. The context menu provides options for adding and removing recipients of the notifications. Administrators that appear via the Add Recipient and Remove Recipient menu options are those whose schedules match the selected time slot.

Job Progress Page

The Job Progress page is available for jobs in the Active and History pages of the Job window. The Progress page provides a log of the job's activities.

The Progress page contains all status changes that have been received for a specific job. Each row in the page summarizes a status change of the job. If you display the Progress page for an execution in the History page, the page typically displays Submitted, Scheduled, Started, and Completed or Failed statuses for that execution. If you display an execution from the Active Jobs page, the Progress page displays only those status changes that have been received.

When you display the Progress page, the page displays the statuses only for the destination and execution time of the job occurrence selected. To view the status changes associated with other destinations or execution times, select other destinations or execution times from the Destination or Execution pull-down lists. You can also select <All> in either list to view all statuses. If the job has been Deleted on a destination, the Deleted status always displays at the top of the Progress Page.

The following options are available on the Progress page:

Destination

Select the destination of the job occurrences you want to view from the pull-down list. Select <All> for all destinations. The list of job occurrences changes according to the selection.

Execution

Select the execution time of the job occurrences you want to view from the pull-down list. Select <All> for all executions. The list of job occurrences changes according to the selection.

Save List

Select the Save List button to save the list of job occurrences as a local file using the standard Windows file dialog box.

Notification Details

This option displays the notifications for this job.

Show Output

If output exists for the selected occurrence of a job, you can display the output in the Output dialog box. You can also double-click on a selected job to display output.

The columns in the Progress page contain the following information:

Status

See "Active Job Pane" on page 4-7 and "History Page" on page 4-9 for information on the status of a job.

Destination

This is the destination of the specific occurrence of the job.

Date/Time

This is the time the Management Server was notified by the Intelligent Agent that a status change had occurred.

Job Output Dialog Box

The Output dialog box is displayed by double-clicking on an entry in the Progress page, or selecting an entry and clicking on the Show Output button, if enabled. This dialog displays any output, including error messages, as a result of the execution of an occurrence of a job. If no output is produced by a job, a message displays stating there is no output for the job. If the output includes only blank spaces, the dialog box is blank.

With the Output dialog box displayed, the following options are available:

Close

Select the Close button to exit the dialog box after viewing it.

Print

Select the Print button to print the contents of the dialog box.

Save As

Select the Save As button to save the contents of the dialog box to a text file.

Changing the Maximum Limit for Job Output Because the output of some jobs may be quite large, Oracle Enterprise Manager provides you with the option of specifying the maximum size for any job output returned by the Intelligent Agent. If the job output exceeds the maximum limit, any output generated beyond this maximum is truncated. By default, the maximum job output size is set to 128K (smallest allowable value). The largest permissible value is two megabytes.

You can set this parameter (`oms.vdg.joboutput.maxsize`) in the following file:

```
$ORACLE_HOME/sysman/config/omsconfig.properties
```

Example omsconfig.properties entry:

```
oms.vdg.joboutput.maxsize=128K
```

Units must be specified in kilobytes (K) or megabytes (M).

Example: Creating a Job

This example illustrates how to complete the General, Tasks, Parameters, and Schedule Pages when creating a job. It also describes how to save and submit a job.

1. Select Create from the Job menu to create a new job. The Create Job property sheet displays.
2. Enter a name for the new job in the Job Name field of the General Page. You may also enter a description for the job in the Description field.
3. Select Database from the Destination Type pull-down list.
4. Do not check the Fixit Job box for this job. You can create jobs that are used specifically as fixit jobs. Fixit jobs can be run automatically in response to an event occurrence. See "Event Parameters Page" on page 5-34 for information on fixit jobs with events.

5. Select a destination from the Available Destinations list, then click on the << (Add) button to add the destination to the Selected Destinations list. These are destinations where an Intelligent Agent is running. The Job Credentials must be set up correctly for these destinations. See "Job Credentials" on page 4-4 for more information.
6. Repeat the previous step for another destination. You are choosing the destinations where the job will be run.
7. Click on the Task Page tab of the Create Job property sheet.
8. Select Run SQL*Plus Script from the Available Tasks list, then click the << (Add) button to add the task to the Selected Tasks list. For this example, add only the Run SQL*Plus task. You can specify multiple tasks for a job and make a task conditional on a previous task.
9. Make sure the task is set to run Always. If you specified multiple tasks for this job, you could make a task conditional on a previous task.
10. Click on the Parameters Page tab of the Create Job property sheet to set the parameters:
 - Enter "SELECT * FROM dba_users;" in the Script Text box.
 - Do not check the Override Preferred Credentials box. If you do not override the credentials, the information that is set up with the administrator Preferred Credentials property sheet is used. See "Job Credentials" on page 4-4 for permissions needed to run job tasks. This particular job task requires database credentials that permit access to the data dictionary views. Make sure the Preferred Credentials for the chosen target have this.
11. Click on the Schedule Page tab of the Create Job property sheet to schedule the execution of the job.
12. Select the On Interval under Run Job to execute the job on a specific interval.
13. Set the Start Execution Date of the job to 1/1/2001. Select the month value in the Start Execution Date field and enter 7. You can also click the up and down arrows to change the value when a number is selected.
14. Repeat the process in the previous step for the day and year values of the Start Execution Date.
15. Change the Start Execution Time to 12:00 AM. Use the same procedure that you used to set the date.
16. Check the End Execution box to set a final execution date for this job.

17. Set the End Execution Date of the job to 1/3/2001. Set the End Execution Time of the job to 12:00 AM.
18. The Time Zone should be set to Intelligent Agent (currently static text). This job will execute at the local time zone where the Intelligent Agent is located. This is the time zone of the destination.
19. Select the Every ... Days button to set the job frequency for day interval. Click on the up arrow to change the value to 3 days.
20. Click on the Permissions Page tab of the Create Job property sheet to assign permissions on this job for other administrators.
21. Allow all other Enterprise Manager administrators to view and receive notifications for this job.
22. Click the Submit and Add to Library button to save the new job in the Job Library and submit the job to the selected destinations.
23. If you want to modify this job later, select the job in the Job Library dialog and choose the Edit option. You can also double-click on the job.

A submitted job is sent to the Intelligent Agents at the selected destinations. The Intelligent Agent for a destination begins processing the job, the job appears in the Active Jobs page in the Job window. If the job is processed successfully, the job will start executing on 1/1/2001 at 12:00 AM. After an execution of a job, it is moved to the Job History page of the Job window. You can view the progress of the job and any output in the Job Progress Page.

Note: If you have a domain user set up, you must set the domain password to be the same as the local password in order for scheduled jobs to run when they are submitted using the domain user account. (Windows NT only)

Oracle Job Tasks

This section lists the Oracle predefined job tasks and parameters for:

- Oracle databases
- Operating systems or hosts (Nodes)
- Listeners

This information is entered in the Job Task Page and Job Parameters Page of the Create Job property sheet. The name and the parameters are listed for each task.

Oracle Database Tasks

These are the tasks that can be run on databases and database groups. In addition, you can run operating system or host job tasks.

- Run SQL*Plus Script
- Run DBA Script
- Shutdown Database
- Startup Database

Note: You need to set up a password file to perform administration tasks on a remote database. See the *Oracle Enterprise Manager Configuration Guide* for more information.

Enterprise Manager Wizard Database Tasks

Specific database job tasks are used by the Enterprise Manager data and backup management wizards that are accessed through the Console Navigator popup and main menus. The job tasks are:

- Analyze
- Import
- Export
- Load
- Backup
- Recovery

Since these job tasks are used only by their respective wizards, the tasks will not have directly editable parameters. To modify parameters for any Wizard database task, click on the Load Wizard button located on the Parameters page of the Job property sheet to activate the associated Wizard. For more information about these wizards and associated job tasks, see the Enterprise Manager online help.

Run SQL*Plus Script

This job executes a SQL*Plus script, allowing any legal SQL or PL/SQL scripts to be run, including all SQL*Plus formatting commands. You can copy and paste the text

of the script into the Script Text box of the Parameters page (Create Job property sheet), or simply type SQL commands in the Script Text box.

Parameters:

1. SQL Parameters. Enter one or more arguments that you want the script to use.
2. Override Preferred Credentials. You can use the preferred credentials that have been set up for the database, or you can enter a username and password. If you check the box to override the credentials, then you need to enter:
 - a. User Name. Username for accessing the database.
 - b. Password. Password for the username.

Note: See "Preferred Credentials" on page 1-25 for more information.

3. Script Text. You can copy and paste your script into the Script Text box.

Hint: If you need to determine whether a SQL error has occurred during the running of a SQL script, include "WHENEVER SQLERROR EXIT SQL.SQLCODE" at the beginning of the script. If a SQL error occurs, the job status is set to failed.

Run DBA Script

This job executes a Server Manager line mode script that contains DBA commands.

Parameters:

1. Override Preferred Credentials. You can use the preferred credentials that have been set up for the database, or you can enter a username and password. If you check the box to override the credentials, then you need to enter:
 - a. User Name. Username for accessing the database.
 - b. Password. Password for the username.
 - c. Connect As. Select the role you want to connect as from the pull-down list.

Note: See "Preferred Credentials" on page 1-25 for more information.

2. Script Text. You can copy and paste your script into Script Text box.

Shutdown Database

This job task shuts down an Oracle database instance.

Parameters:

1. Mode:

- Immediate
 - Abort
2. Connect As:
 - SYSDBA
 - SYSOPER
 3. Override Preferred Credentials. Check the box if you want to override the preferred credentials that have been set up for the database. If you check the box to override the credentials, then you need to enter:
 - a. User Name. Enter the username for accessing the database.
 - b. Password. Enter the password for the username.

Note: See "Preferred Credentials" on page 1-25 for more information.

Startup Database

This job task starts up an Oracle database instance.

Parameters:

1. Startup State. Select the start up state from the pull-down list:
 - Startup instance, mount, and open database
 - Startup instance and mount database
 - Startup instance only
2. Parameter File. Enter the initialization parameter filename you want to use for the database. This file is located on the node where the Intelligent Agent and database reside. For example with a database on a Unix platform:

```
/private/oracle/admin/ora8db/myinit.ora
```

If you do not enter a filename, the default platform-specific initialization file is used.

3. Override Preferred Credentials. Check the box if you want to override the preferred credentials that have been set up for the database. If you check the box to override the credentials, then you need to enter:
 - a. User Name. Enter the username for accessing the database.
 - b. Password. Enter the password for the username.

Note: See "Preferred Credentials" on page 1-25 for more information.

4. **Mount Mode.** Select the mount option from the pull-down list:
 - Exclusive
 - Normal
 - Parallel
5. **Connect As.** Select the connecting role from the pull-down list:
 - SYSDBA
 - SYSOPER
6. **Restrict Connections.** Check this box if you want to start the database in Restricted mode.
7. **Force Startup.** Check this box if you want to start up the database with the Force option. Refer to the Oracle 8i Administrator's Guide for more information on startup options.

Halt Job

Normally, a job stops when all tasks have been executed. In some cases, you may want the job to stop before completing the task sequence, which might be the case when one task in the sequence fails. To handle situations like this, you can include the Halt Job task as part of a composite job to stop execution at any point within the task sequence. You specify the Halt Job task dependency as you would any other task.

Operating System or Node Tasks

These are the tasks that can be run on the host's operating system.

- Broadcast Message
- Run OS Command
- Run Tcl Script
- Halt Job

Broadcast Message

This job allows you to submit a message to the selected destinations using the platform-specific mechanism. To send the message to a destination, you may need to have permissions on specific directories. For example, you may need permissions

on `/dev/console` (system console device) to send a message to a Unix destination.

Note: On a Windows platform, this task sends the message to ALL users on the network. To send a message to specific users, use the Run OS Command task to execute the `net` command with the `send` option. See the Windows online help for information on net command line arguments. You can also enter

```
net send /help
```

at the MSDOS command prompt.

Parameters:

Message Text. Enter the message text that you want sent to the selected destinations.

Run OS Command

This is a generic method of running any program or script that is executable on that host, provided your credentials allow you to do that.

Parameters:

1. OS command or shell script name. The command or script must be accessible from the node where the Intelligent Agent and database reside. You may have to include the path for the Intelligent Agent to locate and execute the command or script. For example: `ls`
2. One or more arguments to the command. For example: `-l /export/oracle`

Run Tcl Script

This job executes a Tcl script. This is a generic method of running any Tcl script that is executable on that host, provided the preferred credentials allow that. See "Preferred Credentials" on page 1-25 for more information.

Parameters:

1. Parameters. One or more command-line arguments that you want the script to use. The arguments must be delimited by quotes.

Note: Multiple parameters, such as "one two three", are treated as only one parameter. To ensure that the parameters entered in the field are treated as separate arguments and to ensure that the Tcl script functions in future releases, include the following at the beginning of the Tcl script:

```
set argc [llength $argv]
```

```
if { $argc == 1 } { set argv [lindex $argv 0]}
```

2. Script Text. Copy and paste the Tcl script into the Script Text box.

Tcl Script Examples

For information on writing Tcl job tasks, see the *Intelligent Agent User's Guide*. For information on Tcl, see "Tcl and the Tk Toolkit," by John K. Outsterhout, published by Addison-Wesley Publishing Company, 1994. For examples of Tcl job scripts, review the scripts located in `ORACLE_HOME\network\agent\jobs\oracle` subdirectories on the machine where an Intelligent Agent has been installed. Do not edit these Tcl scripts.

The following is an example of a Tcl script (Unix platform) that logs on to a database and runs a SQL statement:

```
set argc [llength $argv]
if { $argc == 1 } {set argv [lindex $argv 0]}
set connect_str [lindex $argv 0]
set sql_statement [lindex $argv 1]
set lda [oralogon $connect_str]
set curl [oraopen $lda]
orasql $curl $sql_statement
set result_row [orafetch $curl]
while { $oramsq(rc) == 0 } {
    puts $result_row
    set result_row [orafetch $curl]
}
oraclose $curl
oralogoff $lda
```

When the script is executed with the Run Tcl Script task, the following are examples of command line arguments that should be entered in the Parameters field:

```
"scott/tiger@or817.world" "select * from emp"
```

The following is an example of a Tcl script (Unix platform) that displays the contents of a file if it exists and triggers a third-party event if it does not exist:

```
set argc [llength $argv]
if { $argc == 1 } {set argv [lindex $argv 0]}
set myfile [lindex $argv 0]
append mymessage "File not found:" $myfile
if {[file exists $myfile]} {
    catfile $myfile
} else {
```

```
puts $mymessage
orareporevent /user/host/file/alert $oramsg(nodename) 1 $mymessage
}
```

When the script is executed with the Run Tcl Script task, the following is an example of a command line argument that should be entered in the Parameters field:

```
"/export/oracle/network/agent/dbsnmp.ver"
```

Note: When `orareporevent` is used to trigger a third-party event with a job script, you need to create and register an event that has the "Unsolicited events" box checked. See "Event General Page" on page 5-31 for more information.

Listener Tasks

These are the tasks that can be run on Listeners. In addition, you can run operating system or host job tasks.

- Shutdown Listener
- Startup Listener

Shutdown Listener

This stops the Listener. The preferred credentials for the node must have a user that has system administration privileges. See "Preferred Credentials" on page 1-25 for information on user preferences.

Parameters:

Password. Enter a password for the listener if you choose to override the default password.

Startup Listener

This can be invoked to start the Listener. The preferred credentials for the node must have a user that has system administration privileges. See "Preferred Credentials" on page 1-25 for information on user preferences.

Parameters:

None

Important: See "Numeric Pager Job/Event Ids" on page 5-42 for specific ids.

The Event system allows you to monitor your network for specific conditions, such as loss of service or lack of storage, that may occur in your managed environment. You select tests to run on managed targets (databases, nodes, listeners, or other services), then set the threshold parameters for which you want to be notified. You can share events with other administrators, in addition to being able to notify specific administrators when an event condition occurs. For some event tests, you can also choose to execute a *fixit* job that automatically corrects the problem.

The following topics are discussed in this chapter:

- Event System Overview
- Event Categories and Types
- Event Pane
- Event Menu
- Creating, Modifying, and Registering an Event
- Oracle Event Tests
- Event System Features and Requirements

What's New in Events

This section discusses the enhancements to the Events System in Enterprise Manager 2.2.

- **New operating system event tests**

These event tests monitor operating system-specific metrics for Solaris, HP-UX, Compaq Tru64, IBM AIX and Windows NT. These new events require an 8.1.7 or higher Intelligent Agent. As with other Advanced Events, these events are available with the Oracle Diagnostics Pack.

- **Support for duplicate events**

Duplicate events can now be registered against 8.1.7 or higher Agents. Duplicate events are those that contain the same event tests and parameters against the same target. For example, 2 or more administrators can create their own events that register the same Tablespace Full event with the same parameters against the same tablespace.

You cannot, however, have duplicate event tests within the same Event. For example, if you create an Event called "Database Availability", it cannot have 2 or more of the same Database Up/Down event test against the same database A.

Refer to the Enterprise Manager release notes for details on duplicate events with earlier versions of Enterprise Manager and the agents.

- **Improved Node Up/Down Monitoring**

The Node Up/Down event test is enhanced to distinguish between situations where the target node is unreachable, the agent is down, or the agent is not responding.

- **Enhanced Monitoring for Target Subcomponents**

For Events that monitor targets with multiple subcomponents, (e.g. a group of tablespaces), notifications will now be sent each time the status of any subcomponent changes, even if it does not change the overall severity of the Event.

For example, you register a Tablespace Full event for tablespaces A, B, C. If tablespace A becomes full, the event triggers an Alert. If tablespace B also becomes full, then even though the event is still in Alert due to tablespace A, another notification will be sent due to tablespace B becoming full.

- **Error State for Events**

When there are problems evaluating an event (e.g. an archive full event against a database that is NOT running in archivelog mode), then an alert may be sent indicating the event is in error. This error state is denoted by a yellow hexagon. In most cases, events in error are due to user errors and can thus be corrected.

Some examples of error situations are:

- registering an Archive Full event against a database running in noarchivelog mode
- registering an event that monitors segments but specifying a filter that excludes all available segments
- registering an event that needs to connect to the database but providing the wrong database credential

Refer to "Interpreting Events" on page 5-8 for more information.

- **Enhanced Datablock Corruption event**
When registered against 8.1.7 or higher Agents, the Datablock Corruption event test will now also monitor for ORA-1157 (cannot identify/lock data file string – see DBWR trace file) and ORA-27048 (skgfifi: file header information is invalid) errors.
- **Enhanced User-Defined SQL Test**
The User-Defined SQL event test can support pl/sql functions. This means you can select from a pl/sql function and have the return value evaluated against a specified threshold. The actual pl/sql function needs to be defined separately.
- **Enhancements to the Event Handler**
To simplify setup and configuration, the Event Handler is now solely available as an external service of the Management Server. Error handling has also been improved.
- **Context-Sensitive Help for Event Tests**
When creating/editing events, this feature will allow users to select an individual event test and press the F1 key or click the Help button to access online help for that particular event.

Event System Overview

The Event system allows you to efficiently monitor a large system. Using the Event system and Intelligent Agents, you can effectively monitor any number of databases, nodes, or other services 24 hours a day, and be alerted when a problem or specific condition is detected. You can also pinpoint only the services you wish to monitor. The Event system can be extended to include other third-party applications that detect events independent of the Intelligent Agents.

In the Event system, event settings are stored based on the administrator registering the event. This allows administrators of large systems to customize their event systems to their preferences and tasks. Administrators receive messages for events for which they have been selected to receive notifications by other administrators.

The Event system includes the following processes:

1. Creating an event by completing the Event property sheet pages. This involves:
 - a. Determining the destination and frequency of the event.
 - b. Selecting the event tests that you want to run.
 - c. Determining the parameters for the event tests.
 - d. Specifying a fixit job to be run when an event triggers.
 - e. Assigning permissions to allow other administrators to share the event.
2. Saving and modifying an event.
3. Registering, or submitting, an event to a destination.
4. Interpreting and correcting an event occurrence.
 - a. Logging information pertinent to your interpretation of the event to the Event log.
 - b. Assigning the Event to a different administrator if appropriate.

Using Events

You need to create and register events, which are simply a group of event tests that you want to run on your managed systems. Oracle Enterprise Manager includes a variety of predefined event tests that you can use when creating events. The event tests are grouped by service type, for instance:

- Database
- Listener

- Web Servers
- Concurrent Manager
- Node

Creating Events

You can create events using the predefined event tests that have been installed with Oracle Enterprise Manager. See "Event Categories and Types" on page 5-10 for more information.

The events are created with information entered in the Event property sheet. You determine parameters such as the destination that is monitored, the specific tests to perform, the frequency that the event test is executed, and whether other administrators can share the events. See "Permissions" on page 1-23 for more information. Some event tests have parameters with threshold values that you can customize for your system. See "Event Parameters Page" on page 5-34 for more information. To use the Event system, an administrator must have sufficient privileges to access database objects from the Console. Under most circumstances, full DBA privileges are not required, nor would be appropriate to assign full DBA privileges to every administrator. For this reason, the Event Handler role was created.

Enterprise Manager Monitor Role Beginning with Oracle 8.0.6 databases and higher, the OEM_MONITOR role is created by the Oracle database creation scripts. This role permits access to database functionality within Enterprise Manager. For example, running events against a database (tablespace full, buffer cache hit ratio) or browsing through the objects in a database via the Console Navigator tree. These types of functionality require database credentials on which to perform these operations. Rather than granting the powerful DBA role to the database credentials, many administrators prefer to provide only the necessary privileges required to do these operations. Granting the OEM_MONITOR role to the database credentials, ensures that the user has the minimum sufficient privileges required for these operations.

For database users on 7.3.x databases, you need to define the OEM_MONITOR role manually.

Note: You need to create the OEM_MONITOR role using the SYS account.

Here are the steps you need to perform:

1. Create a role called OEM_MONITOR

```
drop role OEM_MONITOR;  
create role OEM_MONITOR;
```

2. Grant the 'connect' role to OEM_MONITOR

```
grant connect to OEM_MONITOR;
```

3. Grant the system privileges 'Analyze any' & 'Create table' to OEM_MONITOR

```
grant analyze any to OEM_MONITOR;  
grant create table to OEM_MONITOR;
```

4. Create the SELECT_CATALOG_ROLE role as defined in sc_role.sql .

5. Grant the SELECT_CATALOG_ROLE to the OEM_MONITOR role

```
grant select_catalog_role to OEM_MONITOR;
```

You are now ready to grant the OEM_MONITOR role to the database user that will be used as “database preferred credentials” in Enterprise Manager. In addition to granting the OEM_MONITOR role to a user, you must also ensure that the QUOTA for the user account is set to UNLIMITED.

The “Continued Row” event test needs to analyze results into a table so it needs both the "analyze any" and "create table" privileges.

Note: The "analyze any" privilege is used by the "index rebuild" event to compute statistics.

Registering Events

Events are registered, or submitted, to specific destinations, such as nodes, listeners, or databases. The status of a registered event is viewed in the Registered page of the Event pane.

The event scripts are executed on nodes with the permissions of the Intelligent Agent. However, some of the database event tests, such as Continued Rows, require access to system tables and require additional permissions. You need to set up preferred credentials for the monitored database with an administrator that has system privileges. See "Preferred Credentials" on page 1-25 for more information.

The Intelligent Agent is responsible for detecting when a specific event condition has occurred. The Intelligent Agent first notifies a Management Server, which in

turn notifies interested administrators either through the Oracle Enterprise Manger Console, or by external means such as Email or Paging.

The Management Server is responsible for registering event information with the appropriate Intelligent Agents on nodes in the network. You determine the frequency that an Intelligent Agent checks an event. See "Frequency" on page 5-32 for details on setting the frequency interval for an event. An exception to this is the Up/Down (node) event test, which is checked at an interval set by the system itself. See "Fault Management Event Tests" on page 5-11 for more information on this event test.

Event Occurrences

When an alert condition occurs, the Intelligent Agent is responsible for notifying the Management Server. Each event is logged in the repository and can be viewed and acknowledged in the Alerts page of the Console. See Figure 5-1, "Event Menu and Pane" for an illustration of the Event pane.

Event Notifications

Events can consist of multiple event tests. If any one of these tests identify a specified condition, the event is triggered and a notification is sent to the Console. If enhanced notification is configured for your system, paging and/or email notifications are sent.

Event notification occurs as follows:

- A notification is sent when the threshold of an event test exceeds the level specified by parameter values. If the event does not have parameters, a notification is sent when the event occurs.
- If the event test condition remains above the threshold specified, a new notification is not sent. If the condition does not exist when the next test is run, the event clears. Notifications are also sent (email/paging) when an event clears.
- If an event test condition changes from warning to critical or critical to warning, a new notification is sent to the Event pane or via E-mail or paging.
- If you acknowledge and move an alert to history, a new notification is not sent to the Alerts page unless a moved warning changes to a critical alert.

Notifying Administrators

Enterprise Manager administrators can be notified in various ways, such as electronic mail or paging, depending on the administrator's setups and permissions. You need to set up the notification services and determine the administrators that need to be notified for the events. See "Event Permissions Page" on page 5-35 and "Permissions" on page 1-23 to determine the administrators that receive notifications. See "Notification" on page 1-12 and "Schedule" on page 1-22 to determine how and when an administrator is notified.

If you plan to notify administrators with email or paging, you need to make sure the following are set up properly:

- The settings for the system modem.
- The notification schedules for the administrators.
- The mail and paging services that are used to contact administrators.
- The mail address and paging numbers for each administrator.

Interpreting Events

An event is composed of one or more event tests. While an individual event test may result in a different status (For example, some clear, some are in alert), there is a general status for the Event. To determine the general severity for the event, the following rules apply in succession:

- a. If the event includes an UpDown event test, and this test triggers, then the general status of the Event is "Unknown" (gray flag)
- b. Otherwise, if the event includes a test that reaches an alert state, then the general status of the Event is "Critical" (red flag)
- c. Otherwise, if the event includes a test that reaches a warning state, then the general status of the Event is "Warning" (yellow flag)
- d. Otherwise, if the event includes a test that is in error, then the general status of the Event is "Error" (yellow hexagon)
- e. Otherwise, all tests should be clear, so the general status of the event is "Clear"

You can still see the individual status of each event test in the Event Viewer.

Event Colors and Icons All events return values and some events produce output messages. The events return different icons depending on the severity of the event. These severity levels are determined by parameter thresholds you set for the event

tests during event creation. The colors are displayed on the event severity icon that is located:

- Next to the event name listed in the Alerts page.
- On the object in the Group pane if it is part of a group. See Chapter 3, "Groups" for information on the Group pane.

The colors of the event severity icons are:

- Error State (yellow hexagon with an exclamation point)
An error state indicates there is a problem with the evaluation of the event condition, as opposed to a threshold being met. Examples of error states are: registering an Archive Full event against a database in non-archivelog mode, registering an event that monitors segments but specifying a filter that excludes all available segments.
- Event cleared (green flag)
- Warning (yellow flag)
- Critical (red flag)
- Unknown (gray flag)

A gray flag represents an "unknown" state where it is not possible for Enterprise Manager to ascertain the event status because the node is unreachable or the Intelligent Agent is not working. The gray flag will appear on the group pane and as the flag for the event in the Alert tab if your event includes at least one up/down event test (any target: node/database/listener). When the gray flag occurs, it will be set for the Event. When you see the event in the Event viewer, the flag for the up/down event test will be gray, and the flags for the other event tests will remain the color of their original state.

If you have a single db up/down event test in an event, it will also turn gray (at the Event level). When you look at the Event in the Event Viewer, you will see two event tests: db up/down and node up/down (which is always added whenever you have any up/down event test). Both these event tests will have gray flags.

If you have an event that does not include any up/down event test, then it will remain the same color even though other events are showing gray flags.

If an UpDown event test is specified for a particular event, and the node to which the event is assigned goes down, the event will return an "unknown" severity (gray flag). The original event severity will be restored when the node comes back up. At least one UpDown event test (node, listener, database, etc.)

must be specified for an event in order for the "unknown" severity to be returned. Events not containing an UpDown event test will not provide any node down notification.

Note: Some events, such as Probe and User Blocks events, do not return a warning value because the warning threshold parameter is not used. The event has either occurred or not occurred.

Correcting Problems

When an event occurs, you need to correct the problem. In some cases, you can create a fixit job that responds to specific event conditions. These situations are noted in the online help for Oracle events.

In other cases, the solution requires careful attention by a system administrator. For example, space management event conditions may require an administrator to increase space requirements and resource management conditions may require an administrator to adjust initialization parameters.

For information on how to correct event conditions, refer to the appropriate documentation. To correct Oracle database problems, refer to the Oracle Server Administrator's, Tuning, and Reference Guides. For network problems, refer to the Oracle networking guides for your system.

Event Categories and Types

The Oracle event tests for the database, listener, and node destination types are grouped into categories:

- Fault Management event tests
- Space Management event tests
- Resource Management event tests
- Performance Management event tests
- Unsolicited events

Only the UpDown event tests are included with Oracle Enterprise Manager. These fall under the category of 'Fault Management event tests'. Additional advanced events for all categories are available with the optional Oracle Diagnostics Pack. Beginning with the Oracle Diagnostics Pack for Enterprise Manager version 2.2, operating system-specific tests are also available for NT and UNIX platforms.

See the online help for Oracle predefined event tests, "Oracle Event Tests" on page 5-40, and the Diagnostic Pack documentation for information on events and their parameters. All the Node events are supported on Unix and Windows NT platforms. For other platforms, see your platform-specific documentation.

Fault Management Event Tests

This category of event tests monitors for catastrophic conditions on the system, such as a database, node, or listener is down. Immediate action must be taken by the administrator. Examples of event tests available in this category include:

- Alert
- UpDown

Most of the fault management event tests do not require any threshold values because the event test only checks whether the service is up or down. For the Alert event test, the event test checks whether error messages are written into the database alert log file.

The UpDown event tests are provided with the Enterprise Manager base product. These event tests check whether a database, listener, or node is available. With the UpDown event test for databases or listeners, you can use the Startup Database or Startup Listener task as a fixit job to re-start the database or listener. To avoid executing that job when the database or listener is brought down intentionally, you need to remove the event registration.

Space Management Event Tests

This category of event tests track possible space problems, such as running out of space on a disk or archive device. Examples of space management event tests in this category include:

- Disk Full
- Archive Full

To check for space management events, set a threshold on the free space left. For example, set an alert if the free space on a disk falls below a specific number of bytes. In order to properly choose the threshold value, you need to know the characteristics of the tablespaces. For example, you would want to know whether the tablespaces contain online transaction processing (OLTP) tables or decision support tables. The former usually has a very fast growth rate, while the latter almost never grows.

Resource Management Event Tests

This category of event tests track possible resource problems, such as exceeding datafile or lock limits. Examples of resource management event tests in this category include:

- Datafile Limit
- Lock Limit

To check for resource management events, set a threshold on the percentage of a resource used. For example, you can set an alert if the percentage of the datafile resource used is greater than a specified value.

Performance Management Event Tests

This category of event test monitors the system for performance problems, such as excessive disk input/output or library cache miss rate. Examples of events in this category include:

- Disk I/O
- Library Cache

To check for performance management events, set a threshold on a system value. For example, you can set an alert if the library cache miss rate is greater than a specific value. The set of threshold values is system specific, depending on the hardware platform, number of users, and other factors.

Unsolicited Event Tests

Unsolicited event tests are event tests that have been initiated outside the Enterprise Manager Event system. An event is considered unsolicited if it is raised by a process other than the Oracle Intelligent Agent, but is running on the same node as the Intelligent Agent. These events are usually provided by third-party software. Creating an unsolicited event allows you to integrate and monitor third-party events. Essentially, there are two phases to setting up an unsolicited event:

- Registering interest in an unsolicited event
- Raising the unsolicited event

Registering Interest in an Unsolicited Event

To register interest in an unsolicited event, check the Unsolicited Event Test box in the Event General page and complete the information in the succeeding property

sheet pages. Select the Unsolicited event in the Test page and complete the Parameters pages. Information on how to fill out the Parameters page is discussed in the next section. After completing the unsolicited event, you can save and submit the event. See "Creating, Modifying, and Registering an Event" on page 5-29 for more information.

Setting the Parameters Property Sheet for Unsolicited Events

Because unsolicited events originate outside the Event system, you may wish to screen only for specific external events. The Parameters page for the Unsolicited Event Test allows you to filter unsolicited events based upon the following field entries:

- **Event Name:** Name of the event
- **Object:** Name of the object that the event is monitoring
- **Severity:** Level of severity of the event
- **Message:** Message to be displayed in the Console

You can enter a wildcard "*" (no filtering) or a character string in these fields to define the filtering mechanism.

Event Name

This is the four-part name of the event in the form:

`/vendor/product/category/name`

You can enter any character strings but all four parts and the forward slashes (/) are required. The `eventname` is assumed to be in 7-bit ASCII, so that it never changes regardless of platform or language. The name of the event that fires must match the value specified in this parameter field in order for the unsolicited event to fire.

Enter a "*" if you do not want to filter on an event name.

Object

An object can be any service the unsolicited event is monitoring, such as a database, listener, or node name. **Important:** The object must be a service that the Intelligent Agent has already discovered.

Enter a wildcard character ("*") if you want to receive unsolicited events from any type of object. Or, you can use the percent sign "%" for partial filtering. For example, `ORCL%` for events fired on objects whose name starts with "ORCL."

Severity

Enter the numeric severity level (-1, 1, 2) corresponding to the severity of the event.

Severity levels map to different flags in the Console Event Pane:

Table 5–1 Severity Level/Event Flag Mapping

Flag Color	Severity	Severity Level
Green	Cleared	Severity -1
Yellow	Warning	Severity 1
Red	Critical	Severity 2

Message

Message is a quoted text string that is displayed in the Console, such as "File not found." If a message filter is specified, then the event is passed only if the message matches what is specified in the message filter.

You can specify wildcard characters as part of the filter i.e. Message Filter : ERROR%. In this case the unsolicited event should fire on anything with a message that starts with "ERROR:"

Raising an Unsolicited Event Test

To raise unsolicited events, users have a choice of a command-line interface (oemevent executable) or an OraTcl verb (orareporevent). The related syntax is as follows:

```
oemevent [event_name] [object_name] [severity] [message]
orareporevent [event_name] [object_name] [severity] [message]
```

where `event_name` is the name of the event that triggered the unsolicited event. `object_name` is the name of the object that the event is monitoring, `severity` is the level of severity for the event, and `message` is the text string displayed in the Enterprise Manager Console. For additional details, please refer to the *Intelligent Agent User's Guide*.

Note that the severity is specified as a string in `oemevent` and as an integer in `orareporevent`. Also, note that the `event_name` must be a four-part string of the form `/a/b/c/d`, where the different elements may be used to organize the event test within a hierarchy of event tests. For example, `/myevents/node/files/filefound` may be an event test you developed. It

relates to nodes, more specifically space on nodes, and it monitors for the existence of a particular file.

For an example of using OraTcl to trigger a third-party event, see Tcl Script Examples in the Run Tcl job task. For information on OraTcl and event scripts, see the *Oracle Intelligent Agent User's Guide*.

Raising Unsolicited Events Via Enterprise Manager Jobs

Typically, unsolicited events are evaluated and raised by third-party software. Enterprise Manager allows you to implement unsolicited events through the Job system and Tcl. You create a Tcl job and submit it as a periodic job. The Tcl contains logic to evaluate the underlying test and decide whether it needs to raise the event and at what severity level. Since the job is submitted as a periodic job, the underlying test is evaluated periodically like all regular Enterprise Manager event tests. Using techniques like the ones scribed below, users of Enterprise can implement event monitoring specific to their environments.

Example 1: Simple Job Raising an Unsolicited Event It is possible to submit a job with an imbedded OS command task that executes the `oemevent` program and passes the program all necessary arguments. All users that have registered for the event raised by `oemevent`, will receive the event notification. The event has to be known to the administrator submitting the job that raises it.

However, the job that raises the event may contain enough logic to evaluate the underlying test and decide whether it needs to raise the event and at what severity level. Such a job may be submitted as a periodic job so that the underlying test is evaluated periodically, which is similar to regular OEM event tests.

Unsolicited events (their logic actually) are evaluated in their own process and within the proper OS security envelope. For this reason, no longer pose security or robustness threats to the system. What we have introduced here is a procedure where one needs to submit a job in order to monitor for an event.

Consider as an example how to implement an event test which triggers when a particular file is found. Lets call this event `/myevents/node/files/filefound`. The following Tcl script needs to be submitted as the job:

```
# event name
set event_name /myevents/node/files/filefound
# filename to look for comes at the first (and only) argument
set file_name [lindex $argv 0]
# check for the file, and if it's found trigger the event as critical
```

```
if { [file exists $file_name] } {  
    orareporevent $event_name $oramsg(oraobject) 2 "$file_name found"  
}
```

In order to receive this event, a user needs to register an event with the Unsolicited test selected and configured to filter in events with name `/myevents/node/files/filefound`. This event should be registered against a node and will trigger against it. The message attached to the event occurrence will contain the values of all parameters passed into `orareporevent`.

Although this event is fairly straightforward, there are two things wrong::

1. The event does not ever clear – it should, if the file disappears
2. The event will trigger every time the above script is evaluated, even if it has triggered the time before – you will receive the same alert multiple (possibly infinite) times. An event should not trigger unless there is a severity change.

Any other scripting language or executable program can also be used to implement the logic of an unsolicited event test. However, Tcl is preferable because it allows platform-independent implementation and the fact that the code may be sent from the Enterprise Manager Console ‘on-demand’ without requiring anything to be installed on the Intelligent Agent side.

Example 2: Unsolicited Events with the Proper Lifecycle As with regular Enterprise Manager events, unsolicited events could be triggered only once per condition detected and could clear automatically if the condition that triggers the event is no longer met. Events adhering to this operational pattern are said to have a "proper lifecycle."

Typically, scripts that implement unsolicited events are composed of two basic parts:

1. The part that evaluates the event and sets its associated severity
2. The part that handles the event reporting and avoids multiple notifications if the severity does not change

The following Tcl script illustrates this two-part script implementation, as well as a technique that allows proper event lifecycle.

```
#-----  
#  
# Tcl Procedure  
#     orareporevent1  
#
```

```

# Purpose:
#   Trigger an unsolicited event only previous state is different
#
# Arguments:
#   - event_name: event test to trigger
#   - severity: new severity
#   - message: message to be attached to the event report
#
#-----
proc orareporevent1 {event_name severity message} {
  # define a 'lock' that its contents define the previous event status
  # and figure out the event state during the previous execution
  global oramsmsg
  append event_lock [tempdir] "/" $oramsmsg(jobid) ".el"
  if { [file exists $event_lock] } {
    set f [open $event_lock r]
    gets $f previous_severity
    close $f
  } else {
    set previous_severity -1
  }
  # if event test state has changed, trigger the event at new severity
  if { $previous_severity != $severity } {
    orareporevent $event_name $oramsmsg(oraobject) $severity $message
    if { $severity == -1 } {
      rmfile $event_lock
    } else {
      set f [open $event_lock w]
      puts $f $severity
      close $f
    }
  }
}

#-----
#
# Event Test Name:
#   /myevents/node/files/filefound
#
# Purpose:
#   Monitor for the existence of a particular file
#   The test triggers at warning level if the file exists, but
#   at critical level if the file is larger than the specified
#   value
#

```

```
# Arguments:
#     - filename to look for
#     - critical file size
#
#-----
set event_name /myevents/node/files/filefound
set file_name [lindex $argv 0]
set critical_filesize [lindex $argv 1]

if { [file exists $file_name] } {
    # if the file exists calculate its size in Kilobytes
    set file_size [expr [file size $file_name] / 1024]
    if { $file_size > $critical_filesize } {
        # if file is larger than the critical value, trigger as critical
        orareporevent1 $event_name 2 "Size: $file_size Kb"
    } else {
        # if file is smaller than the critical value, trigger as warning
        orareporevent1 $event_name 1 "Filesize: $file_size Kb"
    }
} else {
    # if file in no longer there, clear the event
    orareporevent1 $event_name -1 "File does not exist"
}
}
```

Example 3: An Unsolicited Event Script that Accesses the Oracle Database This section contains an example of unsolicited event tests. In this case, the test evaluation involves connecting to an Oracle instance and performing some SQL against it.

This example checks the size of a particular table in the database and triggers the event when a set threshold is crossed. There is a warning value and a critical value. The size of the table is measured by counting the number of its rows.

```
#-----
#
# Tcl Procedure
#     orareporevent1
#
# Purpose:
#     Trigger an unsolicited event only previous state is different
#
# Arguments:
#     - event_name: event test to trigger
#     - severity: new severity
#     - message: message to be attached to the event report
```

```

#
#-----
proc orareporevent1 {event_name severity message} {
  # define a 'lock' that its contents define the previous event status
  # and figure out the event state during the previous execution
  global oramsmsg
  append event_lock [tempdir] "/" $oramsmsg(jobid) ".el"
  if { [file exists $event_lock] } {
    set f [open $event_lock r]
    gets $f previous_severity
    close $f
  } else {
    set previous_severity -1
  }
  # if event test state has changed, trigger the event at the new severity
  if { $previous_severity != $severity } {
    orareporevent $event_name $oramsmsg(oraobject) $severity $message
    if { $severity == -1 } {
      rmfile $event_lock
    } else {
      set f [open $event_lock w]
      puts $f $severity
      close $f
    }
  }
}
}

#-----
#
# Event Test Name:
#       /myevents/database/space/tablesize
#
# Purpose:
#       Monitor the size of a particular database table
#       The test triggers at warning level when the warning threshold
#       is crossed and at critical level when the critical threshold
#       is crossed
#
# Arguments:
#       - table name
#       - critical threshold
#       - warning threshold
#       - username/password for connecting to target (optional)
#
#-----

```

```
set event_name /myevents/database/space/tablesize
set table_name [lindex $argv 0]
set critical_threshold [lindex $argv 1]
set warning_threshold [lindex $argv 2]

if { $argc == 4 } {
    set connect [format "%s@s" [lindex $argv 3] $oramsg(oraobject)]
} else {
    set connect [format "%s/%s@s" $SMP_USER $SMP_PASSWORD $oramsg(oraobject)]
}

if {[catch {oralogon $connect} lda]} {
    append msg "Cannot connect to target." "\n" $oramsg(errortxt)
    orafail $msg
}

if {[catch {oraopen $lda} cur]} {
    append msg "Cannot connect to target." "\n" $oramsg(errortxt)
    oralogoff $lda
    orafail $msg
}

set sql [format "select count(*) from %s" $table_name]
if {[catch {orasql $cur $sql}]} {
    append msg "Cannot execute SQL against the target." "\n" $oramsg(errortxt)
    oraclose $cur
    oralogoff $lda
    orafail $msg
}

if {[catch {orafetch $cur} row]} {
    append msg "Cannot execute SQL against the target." "\n" $oramsg(errortxt)
    oraclose $cur
    oralogoff $lda
    orafail $msg
}

set current_tablesize [lindex $row 0]

if { $current_tablesize > $critical_threshold } {
    orareporevent1 $event_name 2 "Table:$table_name #rows:$current_tablesize"
} elseif { $current_tablesize > $warning_threshold } {
    orareporevent1 $event_name 1 "Table:$table_name #rows:$current_tablesize"
} else {
    orareporevent1 $event_name -1 "Table:$table_name #rows:$current_tablesize"
```

```
}
```

A number of OraTcl verbs were used in this script. Refer to the *Intelligent Agent User's Guide* for details on OraTcl verbs. Note that the preferred credentials, specified in the console, are available to the script writer via the SMP_USER and SMP_PASSWORD Tcl global variables. For jobs against a database, the values of those variables are set to the username and password specified as preferred credentials for that database. Notice that this script allows for an optional overwrite of the preferred credentials via an optional forth input argument.

Unsolicited Event Caveats

- To monitor for an unsolicited event against multiple targets on the same node (say the event above against multiple databases on the same node), you need to register for the unsolicited event multiple times so that you may have the flexibility of proper filtering.
- Unsolicited Events cannot be used with Fixit Jobs.

Event Pane

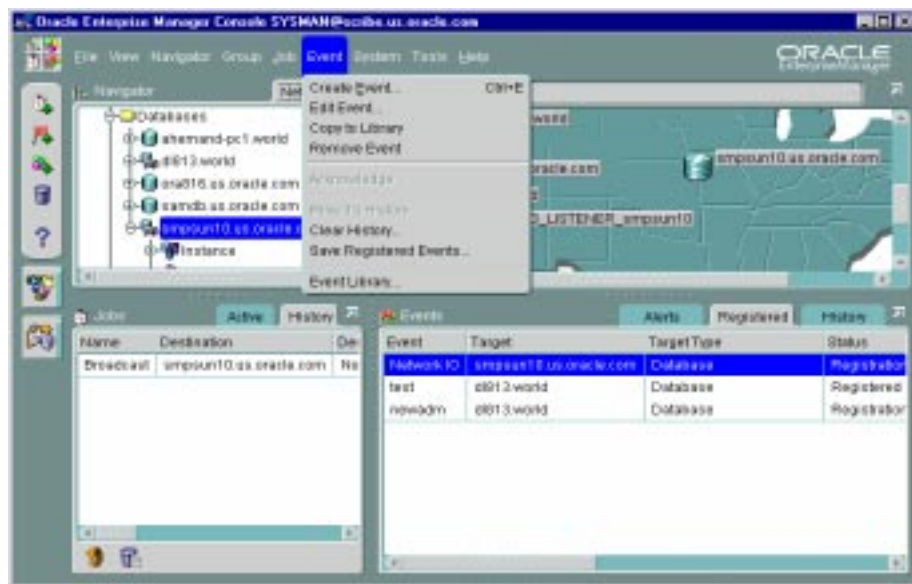
The Event pane contains the following pages:

- Alerts Page
- History Page
- Registered Page

You can switch between the pages by clicking the tab of each page. The rows in any page can be sorted on any column by clicking the column heading. See Figure 5-1, "Event Menu and Pane" for an illustration of the Event pane.

The Event pane can be hidden or shown by selecting Show/Hide Event Display in the Console View menu. You can also hide or show the pane by clicking on the flag icon in the Console toolbar.

Figure 5–1 Event Menu and Pane



Alerts Page

The Alerts page displays event tests that have been triggered.

Severity

Severity of the event occurrence: critical (red flag), warning (yellow flag), clear (green flag), unknown (gray flag), or error state (yellow hexagon).

Event

Name of the event.

Target

Target where the event was triggered.

Time/Date

Time and date of the event occurrence.

Assigned To

Administrators assigned to work on the event occurrence.

Owner

Administrator who owns the event.

Viewing Alerts

To view details of an event that has occurred, double-click on the event to display the Event Viewer property sheet. You can enter notes on the nature and progress of the event condition. **Note:** Comments entered into the log are viewable/editable by admins with the Modify permission. After you have reviewed an event, you can move it to the History page. See "Event Viewer" on page 5-27 for more information.

History Page

The Event History page displays a history of events that have occurred and have been moved to History by an administrator or cleared by an Intelligent Agent. The Event History page displays the same columns as the Alerts page.

The History page is refreshed automatically each time you move between the History page and the Alerts or Registered page. However, to refresh the event history list while currently viewing the History pane, you must click the Refresh History icon located at the bottom left of the event History page.

To clear all entries in the History page, click the Clear History icon located next to the Refresh History icon.

Registered Page

The Registered page displays the events that have been registered, or submitted, to monitor test conditions on any network objects. The Registered page contains the following information:

Event

Name of the event.

Target

Target where the event was monitored.

Target Type

Type of event destination: database, node, listener, web server, Concurrent Manager,

Status

Current registration status of the event: Registered, Registration Pending, De-Registration Pending, and Registration Failed.

Owner

Administrator who owns the event.

Note: Under certain circumstances, an event will remain in a Registration Pending state. There are two probable causes:

1. The Intelligent Agent on the node with which you are trying to register the event is down, or the node is not connected to the network.
2. The node with which you want to register the event was defined manually (without using the Intelligent Agent). Connections to a manually defined node will not allow you to utilize remote management functionality such as Jobs or Events. You must first de-register any jobs or events against the node, remove the node from the Console navigator, and then rediscover the node while it is running a 7.3.4 or later Intelligent Agent.

Event Menu

The Event menu allows you to set up event and administrator information. This menu also provides options to register, track, and view specific events. Menu options are enabled or displayed according to the items selected in the Event pane. See Figure 5-1, "Event Menu and Pane" for an illustration of the Event menu.

Note: When you register or remove an event, there is usually a slight delay while the Intelligent Agent processes the request.

Create Event

Displays the Event property sheet and allows you to create the definition of a new event. See "Creating, Modifying, and Registering an Event" on page 5-29 for more information.

Edit Event

Displays the definition of the selected event and allow you to edit the event permissions.

Edit Event Occurrence

Displays the definition of an existing event. See "Creating, Modifying, and Registering an Event" on page 5-29 for more information.

Acknowledge

Acknowledges the selected event in the Alerts page. When an event triggers, an entry is added to the Alerts page. In the severity column, a flag of the appropriate color is displayed along with a pair of eyeglasses. The eyeglasses also appear

whenever there is a change in the status of the event (e.g. from 'warning' to 'critical') If you choose to "acknowledge" this event, then it means you are aware of this event occurrence and hence the eyeglasses will disappear.

Copy to Library

Copy the selected event in the Event pane to the Event Library.

Remove Event

Removes the selected event from the Event pane, effectively de-registering the event. This menu option only appears when an event test is selected in the Registered page.

Move to History

Moves the selected event in the Alerts page to Event History page of the Event pane.

Refresh History

Updates the History pane with the most recent entries.

Clear History

Clears the contents of the Event History page.

Report Event History

Saves the contents of the Event History page to a report.

Report Registered Events

Creates a report of currently registered events.

Report Event Alerts

Creates a report of the events that have triggered.

Event Library

Displays the Event Library dialog. See "Event Library Dialog" on page 5-26 for more information.

Context-Sensitive Menus

If you select an item in the Event pane with the right mouse button, the context-sensitive menu for that item appears. This menu is a subset of the Event menu plus selection-specific menu options.

Event Library Dialog

The Event Library dialog displays the events that have been created and saved to the Event Library. The advantage to using the Event Library is that both events and any associated target information can be stored, copied, or modified in the library for future use. When you create an event, you have the option of submitting, saving to the Event Library, or submitting and saving to the Event Library.

This dialog contains the following information:

Event

Name of the event.

Owner

Administrator who created the event.

Editing an Event

Select an event and click Edit to display the property sheet for the event. The property sheet allows you to view and modify the events. Editing most event parameters can only be done via the Event Library dialog box.

Oracle Event Tests

Several predefined event tests have been installed with Oracle Enterprise Manager. These appear in the Tests page of the Event property sheet. You can add these tests to an event. The tests include:

- Oracle DB UpDown: checks whether a database is up or down.
- Oracle Host UpDown: checks whether a node is up or down.
- Oracle Listener UpDown: checks whether a listener is up or down.
- Data Gatherer UpDown: checks whether the data gatherer is up or down.

Note: Only the UpDown tests are included with Oracle Enterprise Manager. Additional advanced event tests are available with the optional Oracle Diagnostics Pack.

To view the specific tests assigned to an event, double-click on the event in the Event Library dialog and view the Test page of the Event property sheet. See the online help for Oracle events, "Oracle Event Tests" on page 5-40, or the Diagnostic Pack documentation for information on Oracle events and their parameters.

Event Viewer

The Event Viewer property sheet displays details on a selected event in the History or Alerts page. When an event triggers, you select the triggered event and bring it up in the Event Viewer. The Event Viewer contains information on why the event triggered. You can also assign the event to the a particular administrator and put instructions for other administrators via the Log page.

You can enter optional comments in the Log page, which is good way to share information about an event with other administrators. Once cleared, events are automatically moved to the History page. The pages of the Event Viewer include:

- General
- Log
- Notification Details

General

The Event Viewer General page displays statistics and owner information on a selected event. You can display the property sheet for the event with the Show Event Definition option. The following statistics are displayed on the General page:

Target

Service (database, node, etc.) where the event triggered.

Target Type

Type of service, such as database, listener, or node.

Last Updated

Time of last update.

Owner

Administrator that created the event.

Assigned To

List of administrators that are receiving notifications for this event.

Test Name

Event test that was evaluated.

Severity

Severity of the event occurrence: critical, warning, clear, unknown, or error..

Time/Date

Time and date of the event occurrence.

Message

Message generated from the alert. You may position your cursor above the message to see it displayed as balloon text.

Log

The Event Viewer Log page displays an entry whenever an event is moved to history. An event can be moved manually with the Move to History menu option or automatically when the severity of the event changes.

The Log page also allows comments to be entered on a selected event. Any administrator with permissions to modify the event can add comments in this page. You enter comments in the text box and select the Apply or OK button to add the comment.

The information displayed in the Log page includes:

Type Entry

Text input field allowing you to add comments.

Entry

Comment that has been entered for this event.

Author

Administrator that entered the comment.

Date/Time

The date and time when the comment was entered.

Notification Details

The Event Viewer Notification Details displays details of email and paging notifications sent for a selected event. The information displayed in Details page includes:

Severity

The severity flag associated with the event occurrence.

Administrator

Administrator that was notified.

Date/Time

The date and time of the notification.

Method

Method of notification: E-mail or page.

Notification Status

Status of the notification, indicating whether the notification was sent, is pending, or has failed.

Message

If the notification failed, this message indicates the reason for notification failure.

Creating, Modifying, and Registering an Event

Events include the destination type and the event information that you want to monitor. Events can consist of multiple event tests. To create or modify an event:

1. Choose the Create Event option from the Event menu to display the Event property sheet. (you can also display the Event property sheet by opening an event from the Event Library dialog.)
2. Complete or modify the fields in the General, Parameter, and Permissions pages of the property sheet to create a new event. If you modify an event that has been registered, those changes are not used by the registered event.
3. When you have completed the Event property sheet:
 - a. Choose Submit, to register the event against the selected destinations. The new event is not saved to the Event Library.
 - b. Choose Add to the Library (or Save to Library if editing an event from the Library) to save the event to the Event Library. The event will not be submitted to the target destinations at this time. The new event appears in the Event Library dialog.
 - c. Choose Submit and Add to Library (or Submit and Save to Library) to submit the event to the selected destinations and save the event to the Event Library. The new event appears in the Event Library dialog.

If you registered an event, the Intelligent Agent for a destination processes the event and the event appears in the Registered page of the Event pane. Each destination service is listed separately with the event.

Note: There is usually a slight delay between the time the event is registered and the actual notification by the Intelligent Agent.

When threshold values are exceeded for the tests in an event, the event appears in the Alerts page of the Event pane. This notification changes the color of the severity flag for the event in the Alerts page. If the destination database icon is displayed in the Group pane, the flag on the icon changes color. The colors and their meaning are:

- Unknown (gray flag)
- Event cleared (green flag)
- Warning (yellow flag)
- Alert (red flag)
- Error (yellow hexagon)

Cases where an event notification is Unknown (gray flag) indicate the target or node where the event is registered is unavailable.

Warning: Do not register an UpDown event (included in the Oracle DB Fault event) against the database or node where the Repository schema is stored. If the database containing Repository goes down, the Management Server also shuts down. Hence, the Intelligent Agent cannot inform the Management Server that the database is down.

The property sheet for creating a new event is the same as the property sheet for modifying an event, except that the event name field is read-only. See Figure 5-2, "Event General Page" for an illustration of the Event property sheet.

See "Event Categories and Types" on page 5-10 for more information.

Modifying a Registered Event

To modify a registered event, perform the following steps:

1. If you need to modify any of the administrator permissions for the event, including enabling or disabling notifypermissions, then you can select the Event from the Registered pane, make the modifications, then click "OK" to accept the changes.

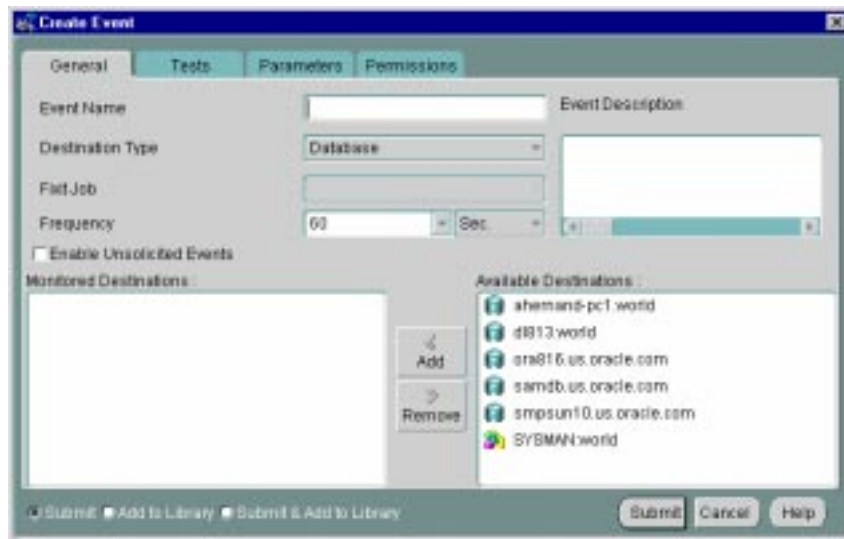
If the monitored destinations for the event specify multiple targets, e.g. databases A, B, C, then any changes made to the permissions for the Event will apply to all targets, A, B and C.

2. If you need to modify any other event parameter (destination list, parameter values, etc). then first make a copy of the event to the library if you haven't already done so. The "Copy to Library" is an option available from the right-mouse context menu of the registered event. Next, de-register the Event(s) you'd like to modify. Then, go to the Event library, and select and edit the event. Finally 'Submit' the event for registration.

Event General Page

On the General page, you determine the event name, destination type, description, fixit job, polling frequency, and whether this event should monitor third-party events.

Figure 5–2 *Event General Page*



Event Name:

Enter an event name.

Destination Type:

Select the destination type you want to monitor from the pull-down list. The types include Database, Listener, Node, or other service that is integrated into the Console.

If the selected Destination Type is "Node", then a second pull-down list of operating systems will appear. If you choose 'All', then event tests that apply to all types of nodes, i.e. operating systems, will be available. If you choose a particular operating system, (e.g. Solaris), then additional operating-system specific event tests will be available.

In general, the selection of the Destination Type determines the list of Available Destinations. If you choose "Node" and a particular operating system, such as Solaris, then the list of available destinations will show all Solaris nodes that are running at least an 8.1.7 Intelligent Agent. Any Solaris nodes that use older agents will not be shown.

Event Description:

Enter a description or comment for the event

Fixit Job

A fixit job is designed to correct a problem. For example, you may want the Intelligent Agent to run a job to restart a database when the database instance has shut down unexpectedly. Fixit jobs have been created with the Job system and have been designated as fixit jobs. The jobs must be submitted and running on the same destination that the event is set on. You must select destinations to make fixit jobs available in the pull-down list. See "General Page" on page 4-14 for more information.

Fixit job options are:

- To choose a fixit job, select an existing fixit job from the pull-down list.
- Select <None> if you do not want to use a fixit job.

To turn off a fixit job after an event has been registered, you can copy the registered event to Event Library, remove the event registration, edit the event from the Library to remove the fixit job, and re-submit the event for registration.

Note: Each event must use a unique fixit job on each destination where the event is registered. Also, when a single Intelligent Agent is monitoring multiple databases at a destination, create a separate event and fixit job for each database.

Frequency

Determine the frequency that you want the test to be evaluated on the selected destinations. The frequency determines how often the event condition is checked. For example, if the frequency is set to 60 seconds, the event condition is checked every 60 seconds. The frequency should not be less than 60 seconds. To set the frequency:

- Enter a value in the frequency field or select a value from the pull-down list.
- Select the interval units from the pull-down list.

Consider carefully the value for frequency. Some event evaluations may take more time, particularly if there are large numbers of objects to be monitored. The following list covers some of the potentially longer-running database event tests:

- Continued Row*
- Index Rebuild*
- Chunk Small
- Fast Segment Growth
- Maximum Extents
- Multiple Extents
- Tablespace Full
- SnapShot Log Full

* Continued Row and Index Rebuild are resource expensive because they perform an ANALYZE on the segments they monitor.

See "Event Notifications" on page 5-7 for details on the notification frequency.

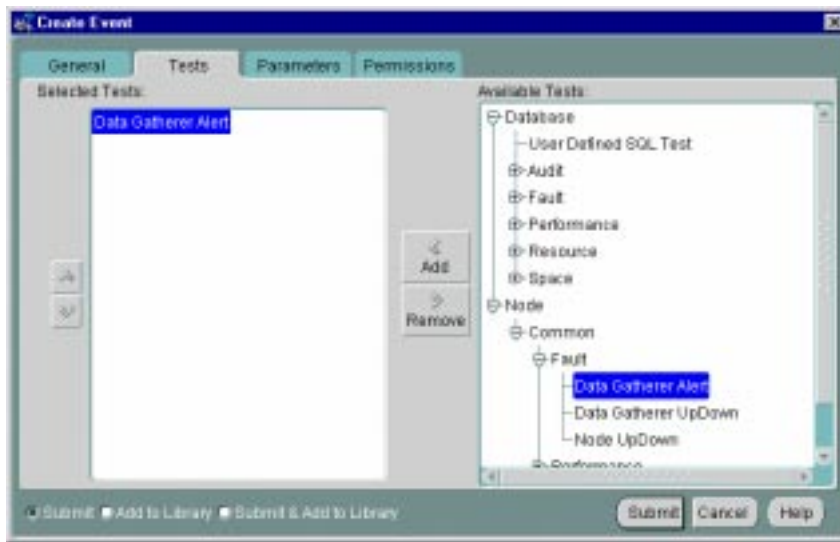
Enable Unsolicited Events

Check this box to monitor unsolicited events. See "Unsolicited Event Tests" on page 5-12 for more information.

Event Tests Page

On the Tests page, you determine the event tests that you want to perform. Event tests are arranged hierarchically in a tree list for ease of viewing and selection. As with the Console Navigator, you can expand and compress entries in the tree list.

Figure 5–3 Event Tests Page



Available Tests:

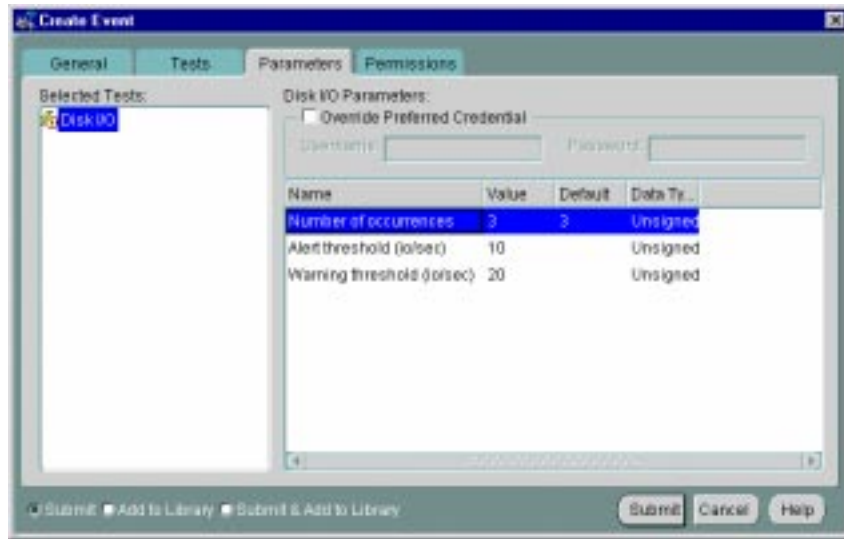
Select the event tests in the list you want to perform in this event, then click on the << (Add) button to move the events to the Selected Events list.

Selected Tests:

Select the event tests in the list you want to remove from this event, then click on the >> (Remove) button.

Event Parameters Page

The parameter settings for the selected event tests are entered in the Parameters page of the Event property sheet. The settings and types of parameters vary according to the event test selected. Some event tests do not have parameters. See the online help for Oracle events and "Oracle Event Tests" on page 5-40 for information on tests and their parameters.

Figure 5–4 Event Parameters Page

Parameters

The parameters for an event are displayed when the event is selected in the Selected Tests list. The parameters vary according to the event selected. Some events do not have parameters.

You can accept the default values or change the values for the parameters. To enter parameter values for an event, you can enter a value directly into a parameter field.

Filtering

Filtering is used in events such as Chunk Small and Maximum Extents. Examples of filters are = 'SYSTEM', LIKE '%SMP%', and IN ('SYSTEM', 'TOOLS'). Note that the quotes are single quotes. Use uppercase to match the case of the database object names. If you enter a filter value that does not select any objects or is an incorrect value, the event fails.

Event Permissions Page

Determine the permissions that you want to assign to the event with the Permissions Page. This allows other administrators to view or modify the event. Notifications are also assigned with this page.

The levels of permission that you can assign to an Enterprise Manager administrator are:

None

Does not allow the administrator to view this event anywhere.

View

Allows the administrator to view the event, inspect event properties, and receive notifications.

Modify

Allows the administrator to modify the event's log (See "Event Viewer" on page 5-27), and edit the event's properties except those reserved for Full permission.

Full

Allows the administrator to delete the event, modify permissions for other administrators, and change the ownership of the event.

Notify

Allows the administrator to receive enhanced event notifications on the objects through paging or email. Other notifications will be routed to that particular administrator's Console. Notify permission cannot be assigned if the administrator's permission level is set to None.

Any permissions assigned on this page supersede any administrator default permissions. See "Permissions" on page 1-23 for more information. Also, the administrator's notification schedule must be set up in order for them to receive the E-mail/page notification.

Enable SNMP Notifications

When checked, permits external notification (SNMP traps) for third-party event tests at the destination where the Intelligent Agent is located.

Show Notification Schedule

Show Notification Schedule displays the notification schedule for the event. The schedule shown on this page is a combined schedule for all administrators that have been given "Notify" privileges for this event. To view administrators assigned to a particular time slot, use the right mouse button to call up the context-sensitive menu, choose the "Remove Recipient" option, and view the list of administrators. To add or remove notifications for an administrator, display the context menu (press the right mouse button) on any time block. The context menu provides options for adding and removing recipients of the notifications.

Event Progress Page

The Event Progress page displays when you edit an event from the Registered page of the Events pane. This page provides the current registration status for the event selected: Registered, Registration Failed, or Registration Pending. In addition, the destination and time and date when registration was attempted is shown.

When the Progress page is displayed, it shows only the status for the selected event. If the selected event is registered, or had been submitted for registration on other destinations, you can view the status of this event for those destinations by selecting the desired target from the Destination pull-down list. The status of the event displays for that destination. To view the status of this event for all destinations simultaneously, select <All>.

The following options are available on the Progress page:

Destination (pull-down list)

Select the destination of the event you want to view from the pull-down list. Select <All> for all destinations for which this event has either been registered or failed to be registered.

Status

Status for the event: Registered, Registration Pending, or Registration Failed.

Destination

Network destination for the event.

Date/Time

Date and Time the event was submitted for registration.

Show Output

Displays the Event Status Message dialog. This button is active only when you have selected a failed event registration. Selecting this option will allow you to view the reasons for the failure.

Save List

Saves the contents of the list to a text file.

Example: Creating and Registering an Event

In the following example, a new event for monitoring extents in a database is created and registered at several databases. When creating an event, the General, Tests, Parameters, and Permissions Pages are completed to define the event. You

need to register, or submit, an event to run event tests on specific destinations in the network environment.

The following example is used for illustrative purposes. When creating actual events, you must enter accurate values for the polling frequency, and parameter values.

1. To create a new event, select Create Event from the Event Menu to display the General Page of the Event property sheet.
2. Enter an event name in the Event Name field, such as Maximum Extents. Provide a descriptive name so the event can be easily identified from the Event pane.
3. Enter a brief description of and comments about the event in the Description field. The event in this example will monitor Maximum Extents. This event is only available with the Oracle Diagnostics Pack.
4. Select Database from the Destination Type pull-down list.
5. Keep the frequency at 60 seconds.
6. Do not select a fixit job (if any are available). These are jobs that have been created with the Job system and have been designated as fixit jobs.
7. Select a database from the Available Destinations list, then click on the << (Add) button. The database is moved to the Selected Destinations list and will be monitored for the events in the event.
8. Repeat the previous step for several additional databases.
9. Click on the Tests page tab to display the Tests page.
10. Select the Maximum Extents event test. This test checks the number of available extents for table, index, cluster, or rollback segments. Because this test accesses system tables, you must set up Administrator Preferred Credentials with an administrator that has system privileges. See "Preferred Credentials" on page 1-25 for more information.

Note: The Maximum Extents event test is only available with the optional Diagnostics Pack. The standard Up/Down event tests provided with Enterprise Manager do not require parameter settings.

11. Click on the << (Add) button. The event test is moved to the Selected Tests list and will be added to the event.
12. Click on the Parameters page tab to display that page. If you had selected several tests, you would need to select a specific test in the Selected Tests list to display the Parameters for the event test.
13. Click on Warning threshold in the scrolling list, to change the value of the parameter. Enter 3 in the text field.
14. Click on Alert threshold in the scrolling list, to change the value of the parameter. Enter 2 in the text field.
15. Do not change the other parameters. Note that the * in the Tablespace name, Segment name, and Segment type parameter fields signifies all existing values. To monitor a specific tablespace, such as USERS, you would enter = 'USERS' in the Tablespace name field.
16. Click on the Permissions page tab to display that page. Assign permissions to all administrators to allow them to view the event and receive notifications.
17. After you have completed the event property sheet, select the Submit and Add to the Library button at the bottom of the property sheet to submit the event to the selected destinations.
18. If you want to modify the event, you can edit this event in Event Library dialog. In order for new values to affect event monitoring, you need to de-register and then re-register the event.

When an event is submitted, each destination is validated and the Intelligent Agent for each destination processes the event. If the registration is successful, the event appears in the Registered page of the Event pane. Each destination database is listed separately with the event.

If an event condition occurs or threshold values are exceeded for an event test, a notification is sent to the Alerts page of the Console Event pane. If administrators have been selected to be notified by email or paging, an email or page is sent. The event notification changes the color of the severity flag for the event in the Alerts page. If the destination database icon is displayed in the Group pane, the flag on the icon changes color. The colors and their meaning are:

- Unknown (gray flag)
- Cleared (green flag)
- Warning (yellow flag)
- Critical (red flag)

- Error (yellow hexagon)

After an event condition is fixed, the event is cleared automatically. There are four event tests that are exceptions to this rule: Alert, Data Block Corruption, Session Terminated, Archiver Hung. Since there is no way to determine automatically that these event conditions have been resolved, these events must be manually cleared.

Administrator Event Notification

Oracle Enterprise Manager allows you to specify administrators that are notified when a particular event condition occurs. Each administrator can be associated with an email ID and/or a pager number. When using a paging service or email notification, each administrator can be assigned responsibility for specific systems at specific days and times.

For more information on setting up Oracle Enterprise Manager administrators, see "Managing Enterprise Manager Administrators" on page 1-8.

Oracle Event Tests

This section lists the Event system event tests with their parameters and return values. See "Event Parameters Page" on page 5-34 for information on entering parameter values. A list of event tests with numeric pager event Ids is also provided. See "Numeric Pager Job/Event Ids" on page 5-42 for more information.

Event tests are specified for database, listener, and node services. The event tests are also divided into fault, space, resource, and performance management categories. Only the UpDown event tests are included with Oracle Enterprise Manager. Additional advanced event tests are available with the optional Oracle Diagnostics Pack.

The event test scripts are written in the Tool Command Language (Tcl) enhanced with Oracle Tcl commands (OraTcl). For information on using Tcl and OraTcl to write event scripts, see *Oracle Intelligent Agent User's Guide*.

Some of the event tests require special tables in the database. For example, the `catblock.sql` script needs to be run to use the User Blocks event test.

Some of the database event tests, such as Chain Row, require access to system tables and require additional permissions. You need to set up preferred credentials for the monitored database with an administrator that has system privileges. See "Enterprise Manager Monitor Role" on page 5-5 and "Preferred Credentials" on page 1-25 for more information.

Database Fault Management Event Tests

This category of event test tracks severe problems that require immediate attention.

UpDown (Database)

This event test checks whether the database being monitored is running. If this event test is triggered, other database events are not ignored.

Parameters

none

Action

The Startup Database job task can be set up as a fixit job for automatically correcting the problem.

Note: If the listener serving a database is down, this event test may be triggered because the Intelligent Agent uses the listener to communicate with the database.

Node Fault Management Events

This category of events monitors for catastrophic conditions on the system. Immediate action needs to be taken by the administrator.

Note: If an Up/Down event test (Database Up/down, Listener Up/Down) has been registered on a node, then the UpDown Node event test is implicitly registered and is triggered when the Intelligent Agent is down, or when the Management Server loses contact with the node.

UpDown (Node)

This event checks whether the Intelligent Agent on a node can be accessed from the Console via periodic "heartbeating" between the Management Server and the Intelligent Agent. Since this event does not actually register with the Intelligent Agent, no fixit jobs can be associated with it. If the defaults are accepted, this event will trigger within five minutes of the Intelligent Agent becoming inaccessible and will clear within three minutes of the Intelligent Agent becoming accessible again.

Parameters

none

Listener Fault Management Events

This category of events monitors for catastrophic conditions on the system. Immediate action needs to be taken by the administrator.

SQL*Net UpDown (Listener)

This event checks whether the listener on the node being monitored is available.

Parameters

none

Action

The Startup Listener job task can be set up as a fixit job for automatically correcting the problem.

Data Gatherer Fault Management Events

The Oracle Data Gatherer Alert and UpDown events are both Fault Management events for the node destination type. This category of events monitors for catastrophic conditions on the system. Immediate action needs to be taken by the administrator.

UpDown (Data Gatherer)

This event checks whether the Intelligent Agent data gathering service on a node can be accessed from the Console. If the Intelligent Agent data gathering service is down, this event is triggered.

Parameters

none

Numeric Pager Job/Event Ids

The Event Management System provides paging services that notify an administrator with a page when an event has occurred. Alphanumeric pagers provide a brief text message identifying the event. Numeric pagers provide the numeric pager event Ids to identify the event.

For job notifications, you will receive a 6 digit number. The first 3 digits indicate the job-id. The last 3 digits indicate job status.

For event notifications you will receive the event ID with the status code.

For a complete list of pager job/event IDs, see "Paging Status Codes for Numeric Pages" on page 1-18

General Event System Troubleshooting Procedures

The following procedures will assist you and/or Oracle Support if problems are encountered with the Event subsystem.

Obtaining Enterprise Manager Repository Status

If you need to contact Oracle Support, you must provide specific information on the status of your Oracle Enterprise Manager repository. To assist you, a SQL script has been provided that extracts pertinent Repository data and generates a debug log file.

To generate the log file, perform the following procedure:

1. Save `oms.log.*` for every Management Server connected to the repository. The log files are, by default, located in

`$ORACLE_HOME/sysman/log.`

2. Log on as the repository user and connect to the repository using SQL*Plus. For example:

```
connect <repository name>/<repository password>
```

3. Run the following SQL script:

```
@$ORACLE_HOME/sysman/admin/evtdbg.sql
```

4. This SQL script will generate a file called `evtdbg.log` in the directory where Server Manager or SQL*Plus is invoked.
5. Submit the Management Server log files along with `evtdbg.log` to Oracle Support.

Note: The size of the `evtdbg.log` file can be quite large.

Event System Features and Requirements

Because the Enterprise Manager framework is a three-tier system that can manage a heterogeneous environment, it is important to keep in mind various software

version requirements necessary for proper event system operation. The following table lists event system features and associated software version requirements.

Table 5–2 Event Features and Their Requirements

Feature Name	Description	Enterprise Manager Version	Required Agent	Management Server/Console Required	Works In Browser
Advanced Events	All events for databases, nodes, listeners. See Enterprise Manager online help for more information.	Diagnostics Pack 1.5.5 and higher	All supported agents, latest recommended	For EM 2.x, the Management Server and Console that corresponds with that Pack	yes
Event Handler	Component that allows you to log event information or execute custom commands in response to an event occurrence. See Appendix A, "Enterprise Manager Event Handler" for more information	2.0.4 and higher/ beta	n/a	2.0.4 OMS	n/a
		2.1 and higher / production	n/a	2.1 OMS	n/a
Improved Node Up/Down Monitoring	Enhancement to the Node Up/Down event test. Provides more information on whether or not the node is down, the agent is down, etc.	2.2 and higher	all supported	2.2 and higher	yes
User-Defined SQL Test	Allows you to write your own custom SQL to monitor database events	Diagnostics Pack 2.1 and higher	8.1.6 and higher	2.1 and higher	yes
Enhanced monitoring for target subcomponents	"For events whose targets involve multiple subcomponents (e.g. monitor tablespace full for ALL tablespaces), information on which subcomponent is in alarm is now provided	"2.2 and higher	8.1.7 and higher	2.2 and higher	yes
Context sensitive help for Event tests	"In the Parameters tab of the Event dialog, invoking ""Help"" will bring up information pertinent to the current selected event test	"2.2 and higher	n/a	2.2 and higher	yes

Table 5–2 Event Features and Their Requirements

Feature Name	Description	Enterprise Manager Version	Required Agent	Management Server/Console Required	Works In Browser
Events with synonymous event tests	"Events can be created that have more than one of the same event test (e.g. a ""Tablespace Full"" test for ""SYSTEM"", another ""Tablespace Full"" event test for ""USER"")	"2.2 and higher	all supported by EM 2.2	2.2. and higher	yes
Job and Events Notification filters					
<ul style="list-style-type: none"> ■ Filters that apply to both paging & email 	Allows you to filter pages & emails based on job and event status	2.1	all agents supported by EM 2.1	2.1	yes
<ul style="list-style-type: none"> ■ Different filters for paging & email 	Allows separate filters for pages & emails based on job and event status	2.2 and higher	all agents supported by EM 2.2	2.2 and higher	yes
Customization for paging & email messages	Allows you to customize the messages for email and pages	Diagnostics Pack 2.2. and higher	all agents supported by EM 2.2	2.2 and higher	yes
Advanced O/S event tests	New event tests that monitor operating system specific metrics	2.2 and higher	8.1.7 and higher	2.2 and higher	yes
Concurrent Manager Events	Events to monitor error conditions against the Oracle Applications Concurrent Processing Server	2.0.4 and higher	8.1.5 and higher	2.0.4 and higher	yes
Forms Server Events	Events to monitor error conditions against the Oracle Developer Forms Server	2.0.4 and higher (2.0.4 console needs Forms Extensions.	8.0.6 and higher (requires Forms Agent Extensions.	2.0.4 and higher (2.0.4 console needs Forms Extensions.	yes
Program Filtering in Concurrent Manager Events	Allows you to monitor particular Oracle Applications Concurrent Programs. Also allows you to exclude particular Concurrent Programs from being monitored.	2.2 and higher	8.1.7 and higher	2.2 and higher	yes

Part II

The Database Administration Tools

DBA Management Pack

The primary database administration components of Oracle Enterprise Manager are contained in the DBA Management Pack, which is a suite of database administration tools and wizards bundled with Oracle Enterprise Manager. This functionality can be accessed with the new DBA Studio tool or launched separately from the Oracle Enterprise Manager Console or operating system. DBA Management Pack features can be used to perform most of your database administration tasks, and support all versions of Oracle databases.

DBA Studio or individual DBA Management Pack tools can be launched by either connecting to the Oracle Management Server using Oracle Enterprise Manager's three-tier framework, or by connecting directly to a database.

DBA Management Pack includes the following functionality:

- Instance Management
- Schema Management
- Security Management
- Storage Management
- Replication Management
- JServer Management
- Cache Management
- SQL*Plus Worksheet

With this functionality you can:

- Complete database administration operations quickly and conveniently using a mouse rather than manually entering SQL commands

- Concurrently perform multiple tasks in multiple Oracle Enterprise Manager windows
- Administer multiple databases simultaneously
- Perform database administration tasks from a central location for both local and remote databases running on any Oracle platform in any location worldwide

DBA Management Pack also includes wizards for assisting with such tasks as importing, exporting, loading, backing up, and recovering data.

This chapter contains the following sections:

Topic	See Page
DBA Studio	6-2
Common Features of DBA Management Pack Functionality	6-3
DBA Management Pack Functionality and Wizards	6-5

DBA Studio

DBA Management Pack features can now be accessed from the new DBA Studio, as well as from the Oracle Enterprise Manager Console or operating system. DBA Studio is an interface from which all DBA Management Pack features can be accessed (with the exception of SQL*Plus Worksheet) and can either be run with a connection to an Oracle Management Server, which utilizes Oracle Enterprise Manager's three-tier framework, or connected directly to a database.

With DBA Studio, you can manage database security, schemas, instances, and storage from a unified tree view without launching separate tools. This integrated access to DBA functionality simplifies switching between DBA tasks and provides an accurate view of database configuration status.

DBA Studio can be launched from the operating system, from the Enterprise Manager Console, or from a browser.

Common Features of DBA Management Pack Functionality

This section discusses the common features shared by the different tools in DBA Management Pack.

Tree Views and Property Sheets

Most DBA tools display a tree view of connected databases, which can be expanded to show subordinate objects. When you select a database or object in the tree, a property sheet appears on the right where you can view or edit database properties. Wizards also display tree views and property sheets as necessary.

Multi-Column Lists

When you select a folder in a tree list, a multi-column list of all the folder's objects appears on the right side of the window, providing a quick summary of information about each object in the selected folder.

Database Version Awareness

All DBA Management Pack tools and wizards are aware of the features that are available in each database version. When you select a database in a tree view, the tool only displays objects and properties that are enabled in that database version.

Database Reports

You can extract information from the database such as object definitions, object dependencies, database configuration, or reports, including custom SQL queries, and save it in a variety of formats (text, HTML, or comma-separated-values).

Logging of Database Changes

You can now log all Data Definition Language (DDL) and Data Manipulation Language (DML) changes made by an application when connected to a database.

Showing Object DDL

Data Definition Language (DDL) commands set up the data such as creating and altering databases and tables. In DBA Studio, you can display the Data Definition DDL for objects.

Show SQL

Though one of the benefits of DBA Management Pack is that DBA tasks can be performed without manually entering SQL, you do have the option of viewing the SQL code generated for you. By selecting Show SQL, you can review this code before implementing any changes, as well as copy and paste it into your own SQL scripts if you wish.

Show Dependencies

Database object dependencies and dependents can be viewed by right-mouse clicking an object in the tree view and choosing Show Dependencies. Dependencies show what the selected object depends on, such as the tablespace location and the owner of the selected object. Dependents rely on the selected object, such as which indexes will be dropped and which synonyms will be affected if you drop the selected object.

Right-Mouse Commands

With DBA Management Pack, you can right-mouse click any folder or object in a tree list to perform administrative tasks. Right-mouse clicking an object shows all the tasks that can be performed on the object, such as connecting to or disconnecting from the database, creating users, adding or removing profiles, assigning privileges, showing dependencies, and bringing up wizards.

Font Settings

DBA Studio provides you the option of changing the font settings for its graphical interface. You can apply a different font or different font size, apply or remove the bold style, apply or remove italics style, or restore the application's default font.

Advanced Mode

DBA Management Pack features can be run in Advanced Mode, which displays additional tabbed pages in property sheets from which a tool's advanced database administration features can be accessed.

DBA Management Pack Functionality and Wizards

This section describes DBA Management Pack's features and wizards.

DBA Studio Tool	Task	See Page
Instance Management	Manages instances and sessions	6-6
Schema Management	Manages schema objects	6-10
Security Management	Manages security parameters	6-13
Storage Management	Manages database storage	6-16
Replication Management	Enables an administrator to quickly set up, configure, and manage an Oracle replication environment	6-18
JServer Management	Enables you to manage the namespace, browse CORBA and EJB components published in the namespace, change permissions on the published components, and execute the main() method in schema-resident Java classes and view the output.	6-19
Cache Management	Enables you to set up, manage, and monitor caches created by Oracle8i Cache.	6-19
SQL*Plus Worksheet	Executes SQL and PL/SQL commands	6-20
Wizards	Assist with importing, exporting, loading, backing up, and recovering data, as well as analyzing and creating tables and views	6-20

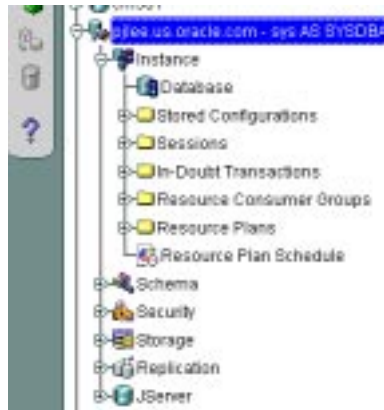
Instance Management

Instance Management functionality helps you manage database instances and sessions in your Oracle environment. With Instance Management features you can:

- Start up and shut down a database
- View and edit the values of initialization parameters
- View current session SQL and the explain plan
- Manage stored configurations (when connected to the Oracle Management Server)
- Manage resource allocations (with Oracle8i)
- Manage users' sessions
- Monitor long running operations (with Oracle8i)

When you expand the Instance node under the database in the tree view, the following list of objects and folders appears:

- Database
- Stored Configurations (only when connected to Oracle Management Server)
- Sessions
- In-Doubt Transactions
- Resource Consumer Groups (with Oracle8i)
- Resource Plans (with Oracle8i)
- Resource Plan Schedule (with Oracle8i Release 2)

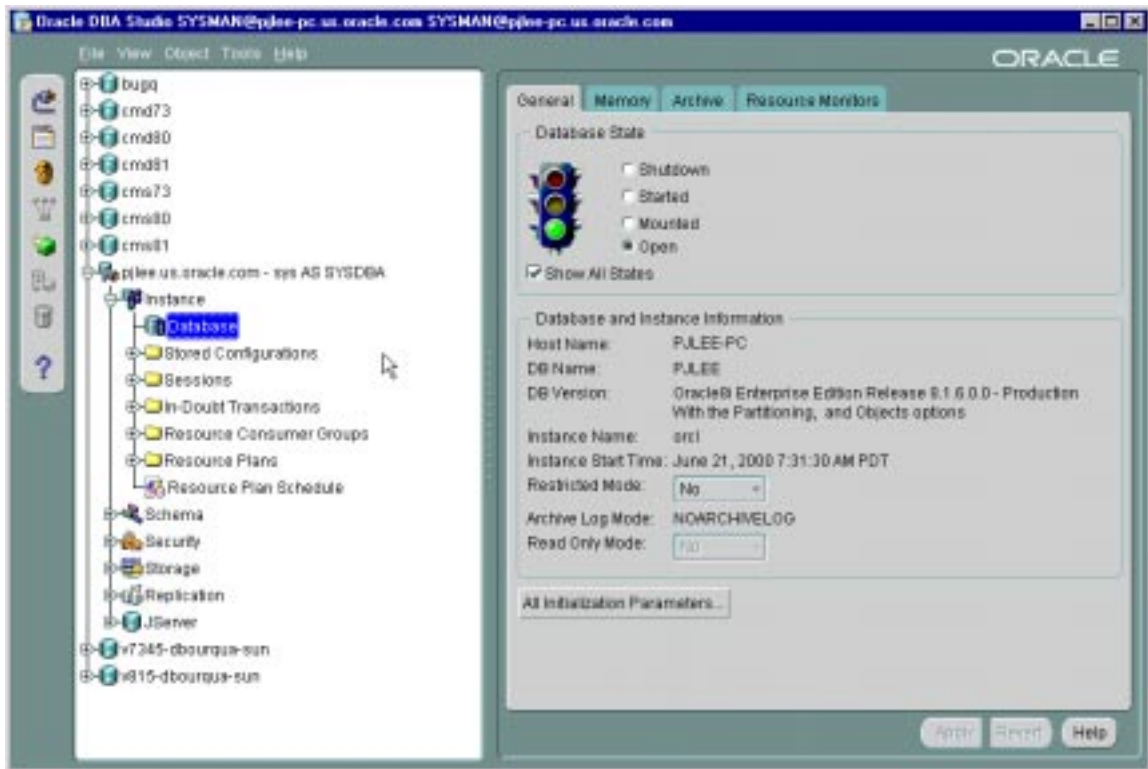
Figure 6–1 Instance Management Tree

Database Operations

When you select the Database node under Instance, a property sheet of tabbed pages appears on the right for viewing information about the database instance and editing database properties. In this property sheet, the following information can be viewed and/or edited:

- Status of the database, including the database version and any installed options, and allows you to start up and shut down a database
- Memory usage of the current database
- Current state of redo log archival
- Resource management (with Oracle8i)

Figure 6–2 Instance Management Window



Stored Configurations

When the database is connected to the Oracle Management Server, the Stored Configurations folder appears in the tree view with which you can create multiple database start-up configurations without the need to track initialization parameter files (INIT<SID>.ORA). Stored configurations exist in the Oracle Enterprise Manager repository (they are not external files) and can be created, edited, and deleted. You can also add and delete parameters and export a configuration to a file.

Sessions

The Sessions folder lists all users connected to the discovered database. When you select a user in the list, the Sessions property sheet appears with which you can edit user properties, view information about the status of each user, view current SQL or

the last run SQL for the database session, and view the database session explain plan.

In-Doubt Transactions

The In-Doubt Transactions folder contains information about distributed transactions that failed in the PREPARED state. You can sort the Transactions list on each of the columns by clicking on the column heading.

The In-Doubt Transactions property sheet displays information about distributed transactions in which a commit was interrupted by a system, network, or any failure resulting from external factors.

Resource Consumer Groups

The Resource Consumer Groups folder lists sets of users who have similar resource usage requirements. When you select a resource consumer group object in the folder, a property sheet appears in which you can view or specify properties and assign or remove users from the resource consumer group.

Resource Plans

The Resource Plans folder lists objects that represent resource plans, which are ways of allocating resources among consumer groups. Resource plans contain directives that specify the resources to be given to each group and can be specified in hierarchical fashion using subplans.

The Resource Plans property sheet, which appears when you select an object representing a Resource Plan, allows you to choose available groups/subplans to include in the resource plan, select the percentage of CPU resources allocated to a group, and then activate the plan. You can also view the degree of parallelism for each consumer group.

Resource Plan Schedule

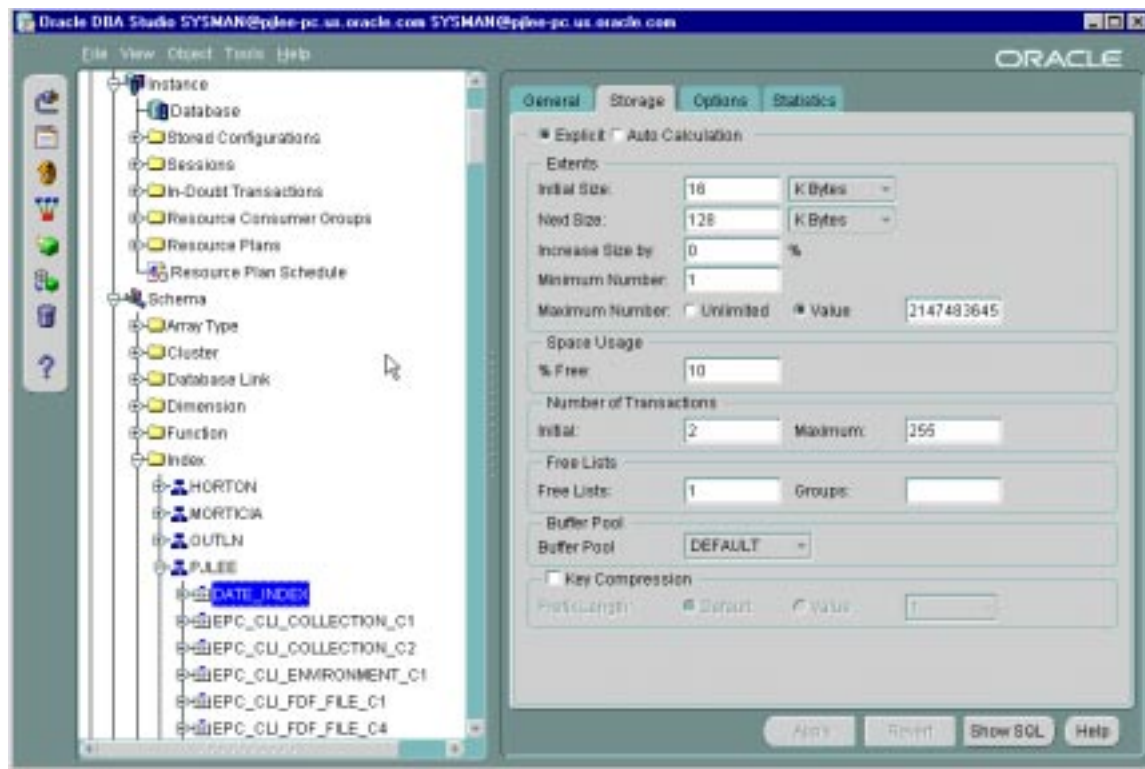
The Resource Plan Schedule property sheet allows you to automate when to activate a resource plan.

Note: The scheduling job is implemented using DBMS_JOB.

Schema Management

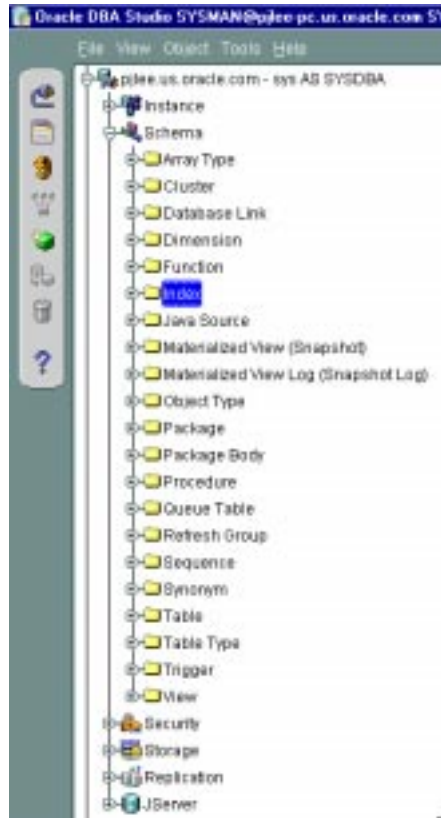
With DBA Management Pack's Schema Management functionality, you can create, alter, or drop database schema objects such as clusters, indexes, materialized views, tables, and views, as well as view dependencies of schema objects. Oracle Schema Management features also support Oracle8*i* objects, which include index organized tables, partitioned tables and indexes, advanced queues, and Java stored procedures.

Figure 6–3 *Schema Management Window*



When you expand the Schema node under the database in the tree view, a list of schema objects appears.

Figure 6–4 Schema Objects



Tree List by Schema

Databases contain at least one named schema for each database user. Each schema object belongs to one of these named schemas, regardless of object type. Several objects belonging to the same schema can be edited by opening the View menu and selecting By Schema. The tree view then reorders all schema objects within a set of schema folders listed alphabetically by name.

Editing an Object

To edit an object, you use the object's property sheet, which appears when you select the object in the tree view. You can then modify the object's parameters.

Schema Management features also include the Table Data Editor content viewer, which allows you to view, update, and delete the contents of a table and display the contents of a view or synonym by selecting a right-mouse command on a table in the tree view.

Creating Objects

Schema Management allows you to create an object or a clone of an object by selecting Create or Create Like from the Object menu. When creating a clone of an object, all attributes are identical except for the name. Parameters for new objects and cloned objects are specified in property sheets which appear when you select Create or Create Like from the Object menu.

Security Management

In a large network environment, security parameters for objects, administrators, and users are in constant change. With DBA Management Pack's Security Management features, an administrator can make these necessary changes quickly and efficiently.

When you expand the Security node under the database in the tree view, folders for users, roles, and profiles appear.

Figure 6–5 *Managing Users, Roles, and Profiles*

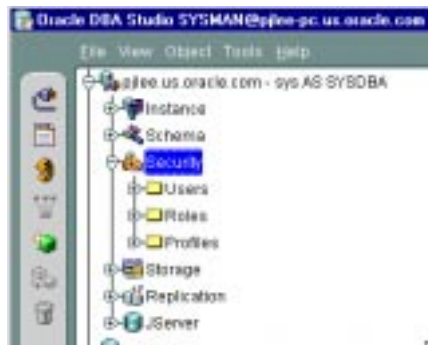
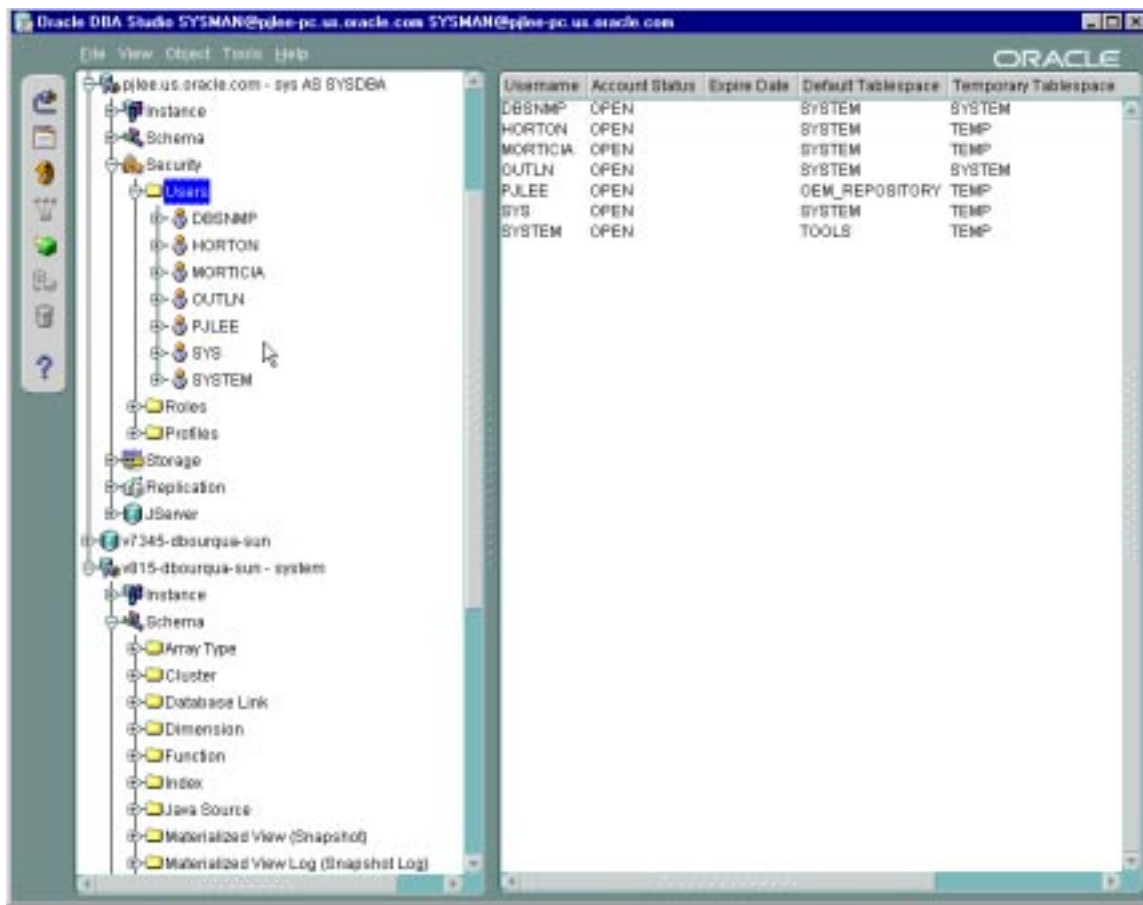


Figure 6–6 Security Management Window

User Operations

Security Management features help you manage the database users in your network by helping you create users and clones of users, add and remove user permissions and roles, and alter user properties, including account status and default profiles. Security Management capabilities also allow you to easily see users' dependents and dependencies.

Role Operations

With Security Management role operations features, you can modify role properties as easily as user properties. You can also create roles and clones of roles, add and remove permissions from roles, and see grantees of roles.

Profile Operations

A profile is a set of limits on a user's database resources. As with users and roles, you can create a profile or a clone of a profile, alter a profile's properties, and assign and remove profiles from users. You also have the ability to see profile dependents and dependencies, as well as grantees of profiles.

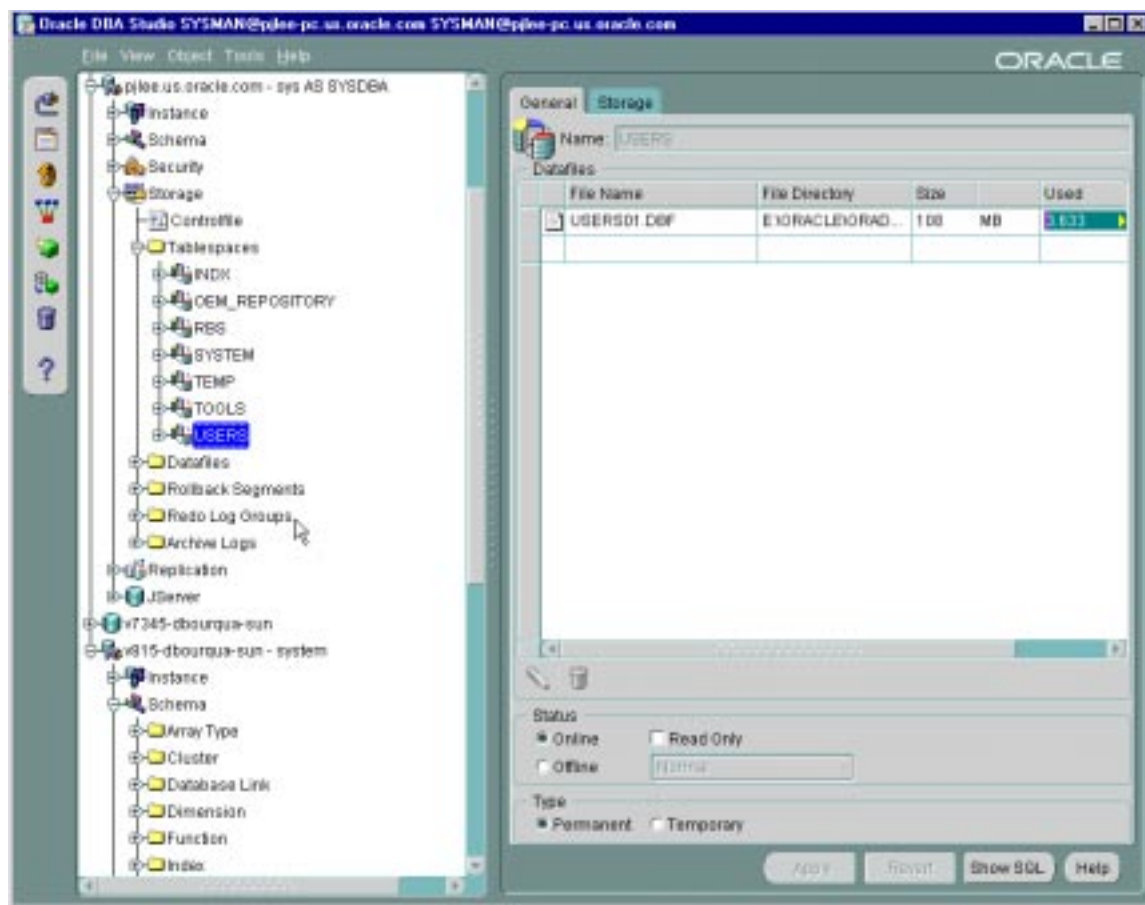
Profiles, roles, and the users to which they are assigned can easily be seen in security lists provided by Security Management. Administrators can then use property sheets to determine security parameters, simplifying the process of making changes.

Security Management features also support Oracle8 password management, which increases system security. Supported features include: account locking, password lifetime and expiration, password history, password complexity, verifications, and export/import of passwords.

Storage Management

DBA Management Pack's Storage Management features help you administer tablespaces, datafiles, redo logs, and rollback segments for optimum database storage.

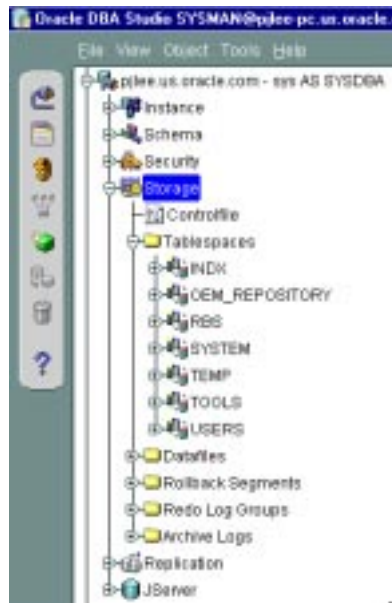
Figure 6–7 Storage Management Window



When you connect to a database, the Storage Management branch of the tree view lists an icon for the Controlfile and five folders which contain all the storage objects in the selected database. The five folders include:

- Tablespaces
- Datafiles
- Rollback Segments
- Redo Log Groups
- Archive Logs

Figure 6–8 *Managing Database Storage Parameters*



The following sections describe the Storage Management operations that can be performed with the objects in each of these folders:

Controlfile Operations

When you select the Controlfile icon, a property sheet appears where you can see the number of controlfiles created for the database and other statistics.

Tablespace Operations

Using the contents of the Tablespaces folder, you can create, edit, or drop a tablespace, add a datafile or rollback segment, take a tablespace off- or on-line, make a tablespace read-only or writable, and set tablespace storage parameters. You can also click the tablespace to see the used and free space of the tablespace or datafile.

Datafile Operations

With the contents of the Datafiles folder, you can create a datafile or a clone of a datafile, edit a datafile, and take a datafile off- or on-line. You can also click the datafile to see the used and available space.

Rollback Segment Operations

Using the Rollback Segments folder, you can create, alter, drop, or shrink a rollback segment as well as take one off- or on-line.

Redo Log Group Operations

Using the Redo Log Groups folder, you can switch the current redo log group, trigger a checkpoint in a redo log group, create a new redo log group, and rename, remove, or add new redo log group members.

Archive Log Operations

The archive log folder allows you to view the current archive logs in the database.

Replication Management

The Replication Management tool is part of DBA Studio and enables an administrator to quickly set up, configure, and manage an Oracle replication environment. Specifically, the Replication Management tool provides a comprehensive wizard to prepare a database for supporting multimaster and/or snapshot replication. Once set up, additional wizards help you replicate schema objects using either multimaster or a combination of multimaster and snapshot replication. After you have configured your replication environment, you can use the Replication Management tool and the other tools in DBA Studio to monitor and manage your replication environment.

JServer Management

JServer is the name of the Java engine embedded in Oracle8i database. CORBA and EJB components implemented in Java can be stored and executed inside the database. Client applications access these components through a name service.

Use DBA studio to:

- Manage the namespace
- Browse CORBA and EJB components published in the namespace
- Change permissions on the published components
- Execute the main() method in schema-resident Java classes and view the output

Cache Management

With Cache Manager, you can set up, manage, and monitor caches created by Oracle8i Cache.

Oracle8i Cache increases the capacity of applications, such as Web applications, enterprise resource planning (ERP) applications, and vertical applications, by adding intelligent middle-tier caching. Use Oracle8i Cache to cache frequently used data on the middle-tier node, increasing the number of requests that your environment can process.

Oracle8i Cache maintains a history of queries and, based on that history, intelligently routes queries either to the caches on the middle-tier nodes or to the origin database. The origin database is the original and primary storage for the data. For more information about Oracle8i Cache, see the *Oracle8i Cache Concepts and Administration Guide*.

Cache Manager lets you:

- Add tables to or remove tables from one or more caches.
- Allocate disk space and memory to the caches.
- Set the synchronization policy of each table.
- Synchronize tables in one or more caches.
- Start and stop caches and enable and disable caching.
- Monitor the ratio of queries that are satisfied by the cache to the queries that are routed to the origin database.
- Monitor the performance of the caches.

- Update the list of users in a cache.

SQL*Plus Worksheet

When you need to administer your database environment with SQL, PL/SQL, or SQL*Plus commands, use Oracle SQL*Plus Worksheet. With Oracle SQL*Plus Worksheet, you can enter SQL and PL/SQL code and DBA commands dynamically and run scripts which are stored as files.

The SQL*Plus Worksheet window consists of an Input pane (top) where commands are entered, and an Output pane (bottom) where the results of your commands appear after you click the Execute button.

SQL*Plus Worksheet maintains a history of the commands you have entered, allowing you to edit and re-execute an earlier command without having to retype it. The last 50 command executions can be displayed by clicking the Command History button. Selections from the Command History dialog box can then be copied and inserted into the Input pane.

With SQL*Plus Worksheet, you can have multiple copies of the worksheet open at a time, each of which is separate from the others; so work can be committed or rolled back in each worksheet independently.

SQL*Plus Worksheet can be accessed from the Enterprise Manager Console or the browser.

Note: Additional information on all tools and wizards in DBA Management Pack can be found in the Oracle Enterprise Manager online Help.

Wizards

For help with database administration tasks, the DBA Management Pack offers a variety of wizards:

- Analyze Wizard
- Backup and Recovery Management Wizards
- Create Table Wizard
- Data Management Wizards (Import/Export/Load)
- Dimension Creation Wizard

- Resource Plan Wizard
- Summary Advisor Wizard
- View Wizard

These wizards increase the ease-of-use of the DBA applications.

For more information on wizards, see the DBA Management Pack Quick Tour or the Oracle Enterprise Manager online Help.

Enterprise Manager Event Handler

Important: The Event Handler is a pre-production feature in this release of Enterprise Manager and should not be used in a production environment.

Applications accessing the Oracle Management Server event services may require trapping of specific event conditions and the ability to handle them appropriately. This can be achieved using the Event Handler, an application that listens for event notifications from the Oracle Management Server and allows these events to be further processed by event "adapters". An adapter is an additional piece of software that takes events from the Event Handler for further processing.

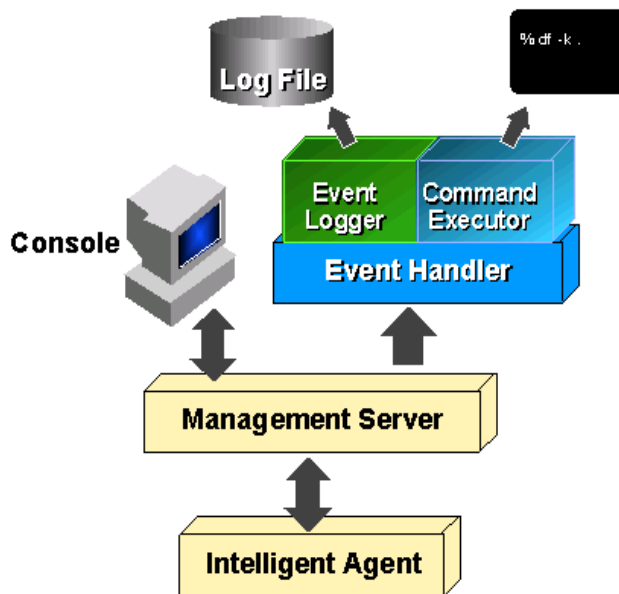
Enterprise Manager 2.2 ships with 2 event adapters:

- *Event Logger* - allows the Event Handler to log events to designated log files and
- *Command Executor* - allows simple operating system commands to be executed in response to an event occurrence.

These adapters permit other types of applications to integrate with the Enterprise Manager event system and trigger other operations based on these trapped events. You can have either or both adapters working with the Event Handler.

Prior to passing event notifications for further processing, the Event Handler also provides a simple filtering mechanism that allows system administrators to specify the conditions by which the events are passed to either or both event adapters.

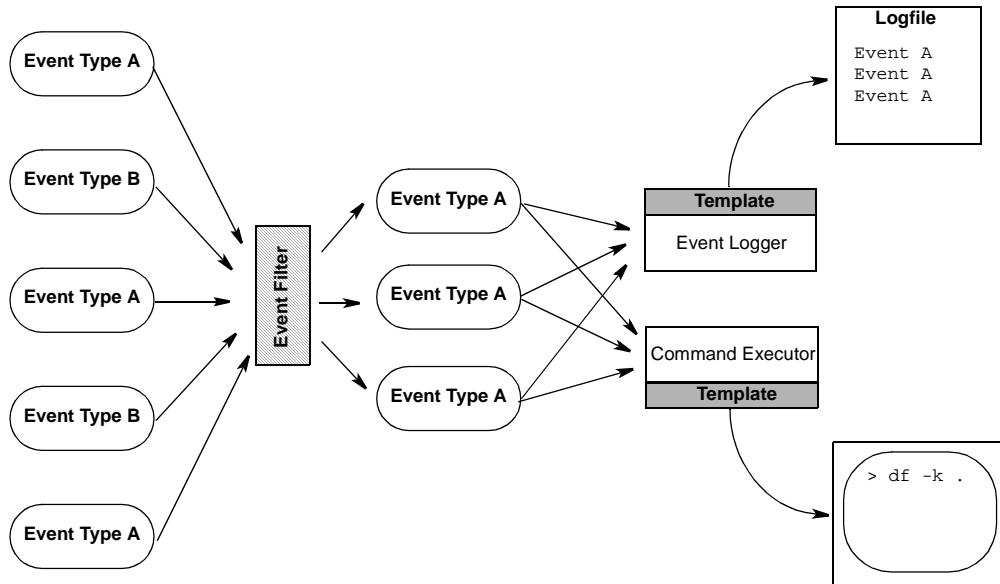
Figure A-1 Event Handler Architecture



How the Event Handler Works

When the Event Handler starts, information from the *filters* are used to determine which events the Event Handler should select and pass on to the Event Logger and/or Command Executor adapters. Once the adapters receive the event, they further process the event based on the *templates* set up for the adapter. Templates provide a way to customize the behavior of the adapters. For the Event Logger, this means specifying which events should be logged. For the Command Executor, this means specifying the types of events it should respond to and the operating system command it should execute in response to that event.

Figure A-2 Event Handler Process



How to Set Up the Event Handler

To set up and implement an Event Handler, you must perform the following steps:

1. Define the filters.

Filters determine which events are passed on to the Event Logger and Command Executor adapters.

2. Define the templates.

Templates tell the Event Logger and Command Executor adapters how to process the event. For the Event Logger, a template specifies which events should be logged and how the information should be formatted. For the Command Executor, a template specifies the events the adapter should respond to and the operating system command it should execute in response to that event.

3. Start up the Event Handler. For Enterprise Manager 2.2, the Event Handler starts up as one of the services of the Management Server.

Each of these steps are discussed in detail later in this appendix.

Defining Event Filters

When the Event Handler starts, it uses "filters" to determine which events are passed on to the Event Logger and/or Command Executor adapters. The system administrator can designate what events, if any, are sent to the Event Logger and Command Executor adapters. This is called "filtering." Events may be filtered on a global basis (applied to both adapters) or on a per adapter basis. Filters apply to either the Event Logger or the Command Executor. Filters are set up by means of entries in the *omsconfig.properties* file located in the `$ORACLE_HOME/sysman/config` directory. Each entry specifies the conditions by which the events are passed to the adapters. The conditions are based on 'eventname' and/or 'node' on which the event occurred. An event passes through the filter if it meets the conditions specified by the filter.

Each filter is distinguished by having a common name associated with it and the entries for that filter are grouped under this common name.

Filter Syntax

Actual filter entries are defined in the *omsconfig.properties* file. The syntax for filters are as follows:

Syntax for global filters:

```
/com/oracle/sysman/em/eventHandler/global_filters/<filter-name>/<'eventname' or 'node'> = <value>
```

Syntax for filters for the Event Logger only:

```
/com/oracle/sysman/em/eventHandler/eventlogger_filters/<filter-name>/<'eventname' or 'node'> = <value>
```

Syntax for filters for the Command Executor only:

```
/com/oracle/sysman/em/eventHandler/commandexecutor_filters/<filter-name>/<'eventname' or 'node'> = <value>
```

The character "*" can be used as a wildcard character to specify all possible values. The sense of the condition can be negated by prefixing a "!" in front of the value.

The following rules apply to all event filters:

1. All conditions specified by a given filter must hold true for the event.

Example: For the `global_filter MyFilter`:

```
/com/oracle/sysman/em/eventHandler/global_filters/MyFilter/eventname =  
cptest  
/com/oracle/sysman/em/eventHandler/global_filters/MyFilter/node =  
prodserver.us.oracle.com
```

If the name of the event is 'cptest' and if it occurred on node 'prodserver.us.oracle.com', then the event will be passed to all event adapters.

2. The event must pass at least one filter
3. An event is forwarded to an adapter (Event Logger or Command Executor) if it passes through either a global filter or a filter for that particular adapter.

By default, all events are suppressed, and at least one filter (global or adapter) must be present in order for events to be forwarded to any of the adapters. See *Sample Filters and Templates*: on page A-15 for examples of filters.

Assuming the event has passed through the filters, they are forwarded on to the event adapters, Event Logger or Command Executor. We will describe what happens to them next.

Important: Another level of filtering occurs when you start the Event Handler itself. In order to start the Event Handler, you need to provide a valid Management Server administrator and password. This Management Server administrator will have associated events that it will be able to receive. If you start the Event Handler using a particular Management Server administrator, then the Event Handler will only be able to receive event notifications to which that Management Server administrator has been given at least VIEW permissions. If you start the Event Handler using the sysman or superuser account, it will receive ALL events. Hence all events that the Management Server administrator is not entitled to receive will *not* be received by the Event Handler.

The Event Logger Templates

The Event Logger logs events received from the Management Server to a file.

The default log file is \$ORACLE_HOME/sysman/log/event.log. By default, the format of an Event Logger message is:

```
<name>;<occurrence number>;<timestamp>;<assignee, if any>;<severity>
```

and is overwritten each time the Event Handler starts.

The format and behavior of the default log message can be modified slightly by using the following properties, read as entries in the *omsconfig.properties* file.

```
/com/oracle/sysman/em/eventlogger/logfile=<full logfile path>
/com/oracle/sysman/em/eventlogger/separatorstring=<separator string for logfile entries>
/com/oracle/sysman/em/eventlogger/appendonstart=<true/false>
```

The *appendonstart* property determines whether or not the log file will be overwritten each time the Event Handler starts. The default is false, which means overwrite. Set this to true if new log entries should be appended to an existing log file.

You can further customize Event Logger operation by using templates. Templates are strings that generically represent the format of a message as a way to customize the format of event notifications written to a log file. A template contains one or more place holders, which are symbolic representations for pertinent pieces of information about the event. Place holders are enclosed within "%" characters to distinguish them from ordinary words in the template string. Available place-holders are:

Table 6–1 Event Handler Place Holders

Place Holder	Definition
%eventname%	The name of the event.
%severity%	The severity of the event as a string. (Alert, Clear, Warning, Node Down)
%timestamp%	The timestamp of the event occurrence. (MM-dd-yyyy hh:mm:ss Example: 05-22-00 05:22:00 AM)
%targetname%	Name of the target.
%targettype%	Type of the target. (oracle_sysman_node, oracle_sysman_database, oracle_sysman_listener)
%occ_no%	The occurrence number of the event.
%assignee%	The assignee for this event.

Table 6–1 Event Handler Place Holders

Place Holder	Definition
%node%	The node on which the event occurred, not to be confused with target.
%output%	The output associated with the event occurrence.

Templates are declared by making entries in the *omsconfig.properties* file. Events can be assigned to templates based on event names or originating node (the same criteria used by the Event Handler filtering system). Templates use this format to specify which events the template should apply:

```
/com/oracle/sysman/em/eventlogger/templates/<template-name>/<'event_name' or 'node'>=<value>
```

To specify the message format that the template should use, the following format must be used:

```
/com/oracle/sysman/em/eventlogger/templates/<template-name>/message=<message format>
```

An example of a template entry in the *omsconfig.properties* file would be:

```
/com/oracle/sysman/em/eventlogger/templates/foo/eventname=cputest

/com/oracle/sysman/em/eventlogger/templates/foo/message=%eventname% fired on %node%: Cpu usage on %targetname% is high! occ_no: %occ_no% Severity: %severity% Time: %timestamp%
```

The template definition above assigns all events named *cputest* to the template named *foo*. Whenever a *cputest* event fires, the logged output will appear as follows:

```
cputest fired on smptest16: Cpu usage on smptest16 is high! occ_no: 21 Severity: Alert
Time: 10-21-1999 02:39:29 PM
```

Note: Templates override the default message format.

As with Event Handler filters, the wildcard character "*" can be used for event names and node names. If more than one template criterion matches an event occurrence, only one of them is randomly chosen. For this reason, care should be used when assigning events to templates.

The Command Executor Templates

The Command Executor adapter executes simple commands in response to event occurrences. The command executor looks at a set of user-defined templates to decide what command to execute in response to an event occurrence. A template can contain several place-holders, which are symbolic representations for interesting pieces of information about the event. Place-holders are enclosed within '%' characters to distinguish them from ordinary words in the template string. For a list of currently used place-holders, see Table 6-1, "Event Handler Place Holders" on page A-6

As with the Event Logger, templates are declared by making entries in the *omsconfig.properties* file. Events can be assigned to templates based on event names or originating node (the same criteria offered by the event-handler filtering system).

Templates use this format to specify the events to which the template should apply.

```
/com/oracle/sysman/em/eventlogger/templates/<template-name>/<'event_name' or 'node'>=<value>
```

Note: As with event-handler filters, the wildcard character '*' can be used within event names and node names. If more than one template criterion matches an event occurrence, only one criteria is randomly chosen. It is important, to be careful when assigning events to templates.

Templates use the following format to specify the command to which the template should apply:

```
/com/oracle/sysman/em/commandexecutor/templates/<template-name>/command=<value>
```

A typical entry for a template would be:

```
/com/oracle/sysman/em/commandexecutor/templates/foo/eventname=cputest
```

```
/com/oracle/sysman/em/commandexecutor/templates/foo/command=net send my-machine-name  
%eventname% fired on %node%: CPU usage on %targetname% is high! occ_no %occ_no% Severity:  
%severity% Time: %timestamp%
```

where "my-machine-name" is the name of the machine to which you want to send a message.

The template definition above assigns all events named *cputest* to the template named *foo*. Whenever a *cputest* event fires, the following message will be sent to machine "my-machine-name":

```
cputest fired on smptest16: Cpu usage on smptest16 is high! occ_no: 21 Severity: Alert
Time: 10-21-1999 02:39:29 PM
```

There may be situations where the command you want to execute has an argument consisting of several items, for example:

```
foo a b c "this is a test" "d=e"
```

where:

foo is the executable command, and

- *a* is its first argument
- *b* is its second argument
- *c* is its third argument

this is a test is its fourth argument

d=e is its fifth argument.

In this case, you can use quotes (") to group items within a single argument together as indicated in the example above, e.g. "this is a test". To include literal quotes as part of the argument, you need to prefix these quotes with backslashes (\). For example:

```
foo a b c "d=\"e\"" "this is \"quoted\" "
```

will be pass the following arguments to *foo*:

- a* is the 1st argument
- b* is the 2nd argument
- c* is the 3rd argument
- d="e"* is the 4th argument
- this is "quoted" is the 5th argument

Starting up and Running the Event Handler

The Event Handler is one of the Management Server services. Hence, it is started or shut down when the Management Server is started or shut down.

1. Add the following entries to the *omsconfig.properties* file.

To start the Event Handler, make sure you have the following entries in the *omsconfig.properties* file. This is located in the `%ORACLE_HOME%\sysman\config` directory. `%ORACLE_HOME%` refers to the Oracle Home directory where Enterprise Manager was installed.

Note: For convenience, these entries are in the `%ORACLE_HOME%/sysman/admin/omsconfig.properties.EventHandler` file. Simply copy the entries from this file into the *omsconfig.properties* file.

The following configuration file entries relate to the Event Logger:

```
/com/oracle/sysman/em/eventHandler/handlers/eventlogger/entrypoint=oracle.sysman.vda.vdae.VdaeEventLogger
/com/oracle/sysman/em/eventHandler/handlers/eventlogger/processOnStartup=true
```

The following configuration file entries relate to the Command Executor:

```
/com/oracle/sysman/em/eventHandler/handlers/commandexecutor/entrypoint=oracle.sysman.vda.vdae.VdaeCommandExecutor
/com/oracle/sysman/em/eventHandler/handlers/commandexecutor/processOnStartup=true
```

Important: There should be **NO carriage returns** or **linefeed** characters within each entry. This is true for all entries in any of the Enterprise Manager configuration files.

2. Add the Enterprise Manager Administrator to the *omsconfig.properties* file.

You need to start up the Event Handler using a valid set of Enterprise Manager credentials.

Specify the Enterprise Manager Administrator by adding the following entries to the `omsconfig.properties` file.

```
eventhandler.user=<EM administrator>
eventhandler.passwd=<corresponding password>
```

When the Event Handler is started for the first time, it reads the `eventhandler.passwd` entry, encrypts it, and writes it back in encrypted form as another entry, `eventhandler.passwd.enchr`. The original non-encrypted password will be removed. Thereafter, it will use the encrypted password only.

If you need to change the password, remove the `eventhandler.passwd.enchr` entry, and add the `eventhandler.passwd` again.

3. Add the appropriate entries to the `OMSEExternalRegistry.registry` file.

Add the following entries to the `OMSEExternalRegistry.registry` file (located in `%ORACLE_HOME%/sysman/config`), substituting the appropriate values for `<oracle-home>`:

```
/com/oracle/sysman/em/oms/services/external/EventHandlerSession/external_
service_name = EventHandlerSession
/com/oracle/sysman/em/oms/services/external/EventHandlerSession/name =
EventHandlerSession
/com/oracle/sysman/em/oms/services/external/EventHandlerSession/oms_service_
interface = oracle.sysman.vda.vdae.VdaeEventHandlerSession
/com/oracle/sysman/em/oms/services/external/EventHandlerSession/startup_
mode=1
/com/oracle/sysman/em/oms/services/external/EventHandlerSession/name_value_
pair=ORACLE_HOME=<oracle-home>
/com/oracle/sysman/em/oms/services/external/EventHandlerSession/args=-s
/com/oracle/sysman/em/oms/services/external/EventHandlerSession/service_
classpath=
/com/oracle/sysman/em/oms/services/external/EventHandlerSession/outfile_
destination=<oracle-home>/sysman/log
/com/oracle/sysman/em/oms/services/external/EventHandlerSession/errfile_
destination=<oracle-home>/sysman/log
/com/oracle/sysman/em/oms/services/external/EventHandlerSession/logfile_
name=eventHandler
```

Note: For convenience, these entries can be found in the `%ORACLE_HOME%/sysman/admin/OMSEExternalRegistry.registry.EventHandler` file. Simply copy the entries from this file and paste them into the `OMSEExternalRegistry.registry` file located in your `%ORACLE_HOME%/sysman/config` directory.

4. In the `omsconfig.properties` file, specify your filters and templates for the Event Logger and Command Executor as discussed in the previous sections.
5. Start the Management Server.

For UNIX and Windows NT, enter the following at the command line:

```
oemctrl start oms
```

For Windows NT, you can start and stop the Management Server as a Service in the Control Panel (OracleORANTManagementServer).

Stopping the Event Handler

The Event Handler stops when the Management Server is stopped. Use the OEMCTRL utility to stop the Management Server.

```
oemctrl stop oms <oms-user>/<oms-password>
```

Or, on machines running Windows NT, you can stop the Management Server by stopping the corresponding service (from Control Panel Services).

Troubleshooting Tips

- If the logger/executor doesn't seem to respond to events, check the following:
 1. Make sure you have the appropriate entries to start the logger and executor in the `omsconfig.properties` file. These are:

```
/com/oracle/sysman/em/eventHandler/handlers/eventlogger/entrypoint=oracle.sysman.vda.vdae.VdaeEventLogger
```

```
/com/oracle/sysman/em/eventHandler/handlers/eventlogger/processOnStartup=true
```

```
/com/oracle/sysman/em/eventHandler/handlers/commandexecutor/entrypoint=
```

```

oracle.sysman.vda.vdae.VdaeCommandExecutor
/com/oracle/sysman/em/eventHandler/handlers/commandexecutor/processOnSta
rtup=true

```

2. Make sure the Management Server administrator used to start the Event Handler receives the event notification via the EM console. The Management Server administrator needs to have at least VIEW permissions on the event.
3. Make sure you have set a filter that allows events to pass through to them. Try initially setting a filter that allows *all* events to pass through.

Example:

```

/com/oracle/sysman/em/eventHandler/global_filters/allEvents/eventname=*

```

4. Check the syntax of any templates associated with the logger/executor. Try using a simple template or any of the samples given below.
 5. When using the logger on unix, make sure you have the appropriate permissions to create the log file. It will use the permissions of the operating system user who started the Event Handler. Try creating a file in the directory where the logger's log file should have been created.
 6. When using the command executor on unix, make sure you have the appropriate permissions to execute the command. It will use the permissions of the operating system user who started the Event Handler. Try running the command directly on the operating system to make sure it works.
 7. Make sure the Event Handler service is still up. Check the screen where you started the Management Server and watch for messages that indicate the Event Handler is no longer running. If on a UNIX system, check to see if the service is running.
 8. Make sure there are no linefeed characters within any single entry in the *omsconfig.properties* and *OMSExternalRegistry.registry* file.
 9. When using templates, make sure you specify both the event condition on which the template applies as well as the message format (for the Event Logger) or the command to be executed (for the Command Executor)
- The Event Handler is an English-only release.

Tracing

Should come as a last resort to find out errors that have occurred with the Event Handler. Trace information can be directed either to the screen or to a log file in the %ORACLE_HOME%\sysman\log directory. To enable logging or tracing, turn on the options specified in the `omsconfig.properties` file and restart the Event Handler.

```
/com/oracle/sysman/em/eventHandler/tracing_enabled = true or false  
/com/oracle/sysman/em/eventHandler/logging_enabled = true or false
```

The trace information generated can either be generated to a file or to the screen. If `tracing_enabled` is set to true, then any trace information will be sent to the screen. If `logging_enabled` is set to true, then trace information will be generated in the log file. However, logging takes precedence, i.e. if `logging_enabled` is true, then trace information will always be sent to the log file.

These are the various combinations and their output:

```
tracing_enabled = false  
logging_enabled = false  
No trace on screen or in the log file.
```

```
tracing_enabled = false  
logging_enabled = true  
Trace information will be generated to the log file.
```

```
tracing_enabled = true  
logging_enabled = false  
Trace information will be generated to the screen.
```

If the Event Handler was started as an external service, then the trace will be written to the file specified by the `logfile_name` entry and in the directory specified by `outfile_destination` entry in the *OMSEExternalRegistry.registry* file

```
tracing_enabled = true  
logging_enabled = true  
Trace information will be generated to the log file.
```

Sample Filters and Templates:

The following are useful filters and templates. Some of these entries can be found in the %ORACLE_HOME%/sysman/admin/omsconfig.properties.EventHandler file.

Filters:

Pass all events to both event logger and command executor

```
/com/oracle/sysman/em/eventHandler/global_filters/allNodes/node = *
```

Pass all events to the event logger

```
/com/oracle/sysman/em/eventHandler/eventlogger_filters/allEvents/eventname=*
```

Pass all events to the command executor

```
/com/oracle/sysman/em/eventHandler/commandexecutor_filters/allEvents/node=*
```

Pass on all events except "cputest" to both event logger and command executor

```
/com/oracle/sysman/em/eventHandler/global_filters/not-cputest/eventname =  
!cputest
```

Pass on all events named cputest that did not originate on the node smptest16 to the Event Logger:

```
/com/oracle/sysman/em/eventHandler/eventlogger_  
filters/pass-some-cputest/eventname=cputest  
/com/oracle/sysman/em/eventHandler/eventlogger_  
filters/pass-some-cputest/node=!smptest16
```

Pass all events except cputest to the Command Executor adapter:

```
/com/oracle/sysman/em/eventHandler/commandexecutor_  
filters/pass-no-cputest/eventname=!cputest
```

Templates

Sample template for the event logger:

```
/com/oracle/sysman/em/eventlogger/templates/allEvents/eventname=*  
/com/oracle/sysman/em/eventlogger/templates/allEvents/message=%eventname% fired  
on %node%: Target %targetname%: Output %output% Severity: %severity% Time:  
%timestamp%
```

A sample log entry using this template would look like:

```
cptest fired on smptest16: Target smptest16: Output Cpu usage is high.  
Severity: Alert Time: 10-21-1999 02:39:29 PM
```

Sample templates for the command executor:

For Windows NT:

```
/com/oracle/sysman/em/commandexecutor/templates/allEvents2/eventname=*
```

```
/com/oracle/sysman/em/commandexecutor/templates/allEvents2/command=net send  
my-machine %eventname% fired on %node%: Target %targetname%: Output %output%  
Severity: %severity% Time: %timestamp%
```

where my-machine is the name of the PC to which the message will be sent.

Whenever any event fires, a message using the above format is sent to machine my-machine.

For Solaris:

```
/com/oracle/sysman/em/commandexecutor/templates/allEvents/command=xterm  
-display hgsun1:0 -e telnet
```

Here, whenever any event fires, a telnet session is opened.

Known Issues

- The Event Handler may not start if there are any carriage return characters within any of the required entries.
- If you specify incomplete template entries, for example:

```
/com/oracle/sysman/em/eventlogger/templates/allEvents/eventname=*
```

but do not specify the message format to use, for example:

```
/com/oracle/sysman/em/eventlogger/templates/allEvents/message= ...
```

You may see a NullPointerException.

- If there is a problem starting the Event Logger, as indicated previously, this problem may affect the Command Executor also. The reverse is also true: if there is a problem starting the Command Executor due to incorrect

configuration entries, then it may affect the operation of the Logger. Set up Event Handler tracing to determine the root problem.

Differences between Solaris and Windows NT

For Event Handler entries that require a directory path, use the syntax that is appropriate to the operating system. For example

Solaris:

```
/com/oracle/sysman/em/eventlogger/logfile=/app/oracle/8.1.6/sysman/log/MyEvents.log
```

Windows NT:

```
/com/oracle/sysman/em/eventlogger/logfile=c:\\orant\\sysman\\log\\MyEvents.log
```


B

Keyboard Shortcuts

This appendix provides a list of general Windows keyboard shortcuts. For a complete list of Windows keyboard shortcuts and navigation, refer to your operating system documentation.

Figure B–1 General Windows Keyboard Shortcuts

Key	Action
F1	Displays Help information for the active object or the window as a whole.
WINDOWS LOGO KEY OR CTRL+ESC	Opens the Start menu located on the taskbar.
CTRL+ALT+DELETE	<p>In Microsoft Windows, opens the Close Program dialog box, which contains a list box of applications to be closed and the command buttons End Task, Shut Down, and Cancel.</p> <p>In Microsoft Windows NT, opens the Windows NT Security dialog box, with the following options: Lock Workstation, Logoff, Shut Down, Change Password, Task Manager, and Cancel. If you are not logged on, opens the logon dialog box.</p>
DELETE	Deletes the selected item(s). If the items are files, moves them to the Recycle Bin.
SHIFT+DELETE	Delete the selected item(s). If the items are files, destroys them immediately without moving them to the Recycle Bin.
CTRL+N	Opens the New dialog box. (You also can choose the New command from the File menu.)
CTRL+O	Opens the Open dialog box. (You also can choose the Open command from the File menu.)
CTRL+P	Opens the Print dialog box. (You also can choose the Print command from the File menu.)
CTRL+S	Opens the Save dialog box. (You also can choose the Save command from the File menu.)
CTRL+X	Cuts the selected item(s) to the Clipboard. (You also can choose the Cut command from the Edit menu.)
CTRL+INSERT OR CTRL+C	Copies the selected item(s) to the Clipboard. (You also can choose the Copy command from the Edit menu.)
SHIFT+INSERT OR CTRL+V	Pastes the copied items(s) from the Clipboard. (You also can choose the Paste command from the Edit menu.)
ALT+BACKSPACE OR CTRL+Z	Undoes the last action. Note that not all actions, such as shutting down, can be undone. (You also can choose the Undo command from the Edit menu.)
ALT+SHIFT+BACKSPACE	Redoes the previously undone action. (You also can choose the Redo command from the Edit menu.)

Key

WINDOWS LOGO KEY+M

Action

Minimizes all open windows. The keyboard focus goes to the least recently selected icon on the desktop. Add SHIFT to expand previously opened windows and return focus to the most recently used application.

Index

Symbols

, 1-26

A

acknowledging events

Event menu, 5-24

Event window, 5-23

Active Jobs page, 4-7

add a group to a map

Map menu, 3-3

additional services folders

Navigator tree, 2-3

administration task

Navigator objects, 2-10

administrator

adding, editing, and deleting, 1-9

managing, 1-8

preferences, 1-11

reassigning objects when deleting, 1-11

super, 1-8

Administrator Notification

email and paging, 5-40

Advanced Mode

View menu, 1-5

agent

down, 5-41

UpDown Node event, 5-41

Apache Web Server, 2-11

Apache Web Server, discovering, 2-11

apply (register) an event set, 5-38

Archive Log Operations in Storage Management

features, 7-18

audience for this guide, xv

Available Destinations list

Job system, 4-15

B

Background images

adding to groups, 3-5

blackouts, paging/email, 2-12

Broadcast Message task, 4-27

C

checking status

paging service, 1-34

clone (of a database object), 7-12

Command Executor Templates, A-8

communication daemon

populating Navigator, 2-2

Components, 1-2

Event, 1-3

Group, 1-2

Job, 1-3

Navigator, 1-2

composite job, 4-3

configuring

paging service, 1-28

Console

customize layout, 1-5

File menu, 1-5

Help menu, 1-7

menus, 1-4

user preferences, 1-25

using menus, 1-4

- console
 - list of tasks that can be performed from, xiv
- Console panes
 - Groups, 3-1
 - Navigator, 2-1
- context menu, 2-5
- context-sensitive menus
 - Navigator, 1-4
 - using in the Navigator, 1-4
- Controlfile Operations of Storage Management
 - features, 7-17
- copying tree objects
 - Navigator, 2-10
- create
 - event set, 5-24
 - job, 4-10
 - or modify a job, 4-12
 - or modify an event set, 5-29
 - specified object type in the Navigator, 2-5
- customize and manage network views
 - Map system, 3-3

D

- Data Gatherer events, 5-42
- database
 - connection made in tree, 2-3
- Database Fault Management Events, 5-41
- Database Operations, 7-7
- Databases folder
 - Navigator tree, 2-3
- datafile operations of Storage Management
 - features, 7-18
- DBA Management Pack, 7-1
- DBA Studio, 7-2
- delete
 - group, 3-3
- discovering services
 - Navigator, 2-7
 - SQL*Net network, 2-2
- discovery
 - problems, 2-9
- discovery status, 2-9
- drag and drop
 - Navigator, 2-10

- Navigator objects, 2-2

E

- edit
 - group, 3-3
- EMS
 - Event Management system, 5-1
- event
 - set, 5-4
 - unsolicited, 5-12, 5-33
- Event Filters, A-4
- Event Handler, A-1
- Event History page
 - Event window, 5-23
- Event Logger Templates, A-5
- Event Management, 5-1
 - categories of events, 5-10
 - creating an event set, 5-29
 - Enterprise Manager, 1-3
 - fault management, 5-11
 - introduction, 5-1
 - menu, 5-24
 - modifying a registered event set, 5-38
 - modifying an event set, 5-29
 - Oracle events, 5-40
 - parameter settings, 5-35
 - performance management, 5-12
 - process, 5-4
 - registering an event set, 5-38
 - resource management, 5-12
 - space management, 5-11
 - types of events, 5-10
 - viewing a registered event set, 5-38
 - viewing an event set, 5-26
 - window, 5-21
- Event Set Library page
 - Event window, 5-26
 - predefined event sets, 5-26
- Event Set Management property sheet
 - creating an event, 5-24
 - modifying a new event, 5-24
- example
 - creating an event set, 5-37
 - group, 3-11

- Job Scheduling, 4-21
 - registering an event, 5-37
- expanding
 - map objects, 3-8

F

- Fault Management events, 5-10
- fixit job, 4-3, 5-1
 - creating, 4-14
 - events, 5-32
 - removing, 5-32
 - submitting, 5-32
 - with events, 5-1

G

- General page
 - job, 4-14
- Group
 - pane, 3-2
- group, 3-4
 - add or delete, 3-9
 - adding background images, 3-5
 - create, 3-4
 - edit, 3-3
 - example, 3-11
 - job destination, 4-15
 - modify, 3-10
 - modifying properties, 3-10
- Group system, 1-2
- Groups folder
 - Navigator tree, 2-3

H

- history
 - Command History Button, SQL*Plus Worksheet, 7-20

I

- Input pane, SQL*Plus Worksheet, 7-20

J

- job
 - alter, 4-10
 - composite, 4-3
 - create, 4-10
 - manage, 4-10
 - modify, 4-10
 - view, 4-11
- Job History page, 4-9
- Job Library, 4-12
- job output
 - Progress Page, 4-20
- Job Scheduling, 4-1
 - credential preference, 4-4, 4-17
 - destination requirements, 4-15
 - Enterprise Manager, 1-3
 - example, 4-21
 - General page, 4-14
 - job destination, 4-14
 - job destinations, 4-15
 - job name, 4-14
 - job tasks, 4-15
 - job type, 4-14
 - managing jobs, 4-5
 - menu, 4-10
 - scheduling jobs, 4-5
 - scheduling process, 4-2
 - task parameters, 4-17
 - window, 4-6
- Job Tasks
 - wizards, 4-24
- jobs, cancelling, 4-5

K

- keyboard shortcuts, general Windows platform, B-1

L

- launching a database tool
 - from a map, 3-8
 - from the Console, 2-5
 - from the Navigator, 1-2
 - Navigator, 2-4

- with the right-mouse button, 2-4
- levels of permission, 1-24
- Listener Fault Management Events, 5-42
- Listeners folder
 - Navigator tree, 2-3
- Lists, Saving, 1-27
- LRS
 - See Log roll-forward server (LRS), A-1

M

- manipulation of the objects
 - in the Navigator, 2-10
- Map, 3-1
 - bitmap background, 3-6
 - create, 3-7
 - creating with dragging and dropping, 3-7
 - customized views, 3-1
 - expanding objects, 3-8
 - status of objects, 3-7
 - user-defined views, 3-4
- menus
 - Console, 1-4
 - File menu, 1-5
 - Help menu, 1-7
 - Job, 4-10
 - View, 1-5
- modify
 - event set, 5-24
 - group, 3-3
- multiple tasks
 - submitting a job, 4-12

N

- Navigator, 2-1
 - Enterprise Manager, 1-2
 - manipulating objects, 2-10
 - menu, 2-5
 - new view, 2-6
 - objects, 1-2
 - splitting the tree, 2-4, 2-6
 - window, 2-2
- network
 - container, 2-3

- new view
 - Navigator tree, 2-6
- Node Fault Management Events, 5-41
- Node Properties, 2-10
- Nodes folder
 - Navigator tree, 2-3

O

- object
 - creating, 7-12
 - editing, 7-12
- Oracle DB UpDown
 - event profile, 5-26
- Oracle events, 5-40
- Oracle Host UpDown
 - event profile, 5-26
- Oracle Listener UpDown
 - event profile, 5-26
- Oracle Security Management, 7-13
- Oracle SQL*Plus Worksheet, 7-20
- Oracle8i objects, 7-10
- OraTcl
 - job scripts, 4-2
- Output Dialog box
 - Job Scheduling, 4-20
- Output pane, SQL*Plus Worksheet, 7-20
- Outstanding Events page
 - Event system, 5-22

P

- paging service
 - querying status, 1-34
 - setting up, 1-28
 - stopping, 1-34
- paging status codes for numeric pages, 1-18
- Paging/Email Blackout, 2-12
 - Total, 2-12
- parameters
 - events, 5-34
 - jobs, 4-17
- Parameters Page
 - job, 4-17
- password management, 7-15

- Performance Management events, 5-10
- Ping Agent, 2-6
- ping agent menu item, 2-9
- PL/SQL
 - using with Oracle SQL*Plus Worksheet, 7-20
- Pre-defined Profiles
 - Event system, 5-26
- Preferred credentials
 - , 1-26
- preferred credentials
 - connecting in a map, 3-8
 - Console, 1-25
- problems
 - Navigator discovery, 2-9
- profile operations, Security Management, 7-15
- Progress page
 - job, 4-20
- purpose of this guide, xiv

R

- redo log group operations of Storage Management
 - features, 7-18
- Refreshing Discovery
 - Refresh Topology Menu Choice, 2-9
- registered destination
 - map objects, 3-7
- registering events, 5-29
- Registrations page
 - Event window, 5-23
- related publications, xx
- removing
 - a split page in the Navigator, 2-6
 - job with Remove menu item, 4-11
 - problems with a job, 4-11
 - problems with an event, 5-25
 - registered events, 5-25
- Report, 1-35
 - creating, 1-35
 - database configuration, 1-36
 - enterprise, 1-36
 - system requirements, 1-37
- Report Wizard, 1-35
 - launching, 1-37
- Resource Management events, 5-10

- right mouse button
 - used in the Navigator, 1-4
- right-mouse button
 - Related Tools menu, 2-4
- role operations, Security Management, 7-15
- rollback segment operations of Storage Management
 - features, 7-18
- rollback segments, 7-16
- Run DBA Script task, 4-25
- Run OS Command task, 4-28
- Run SQL*Plus task, 4-24
- Run Tcl Script task, 4-28

S

- sample images, 3-6
- saving
 - job history, 4-10
- schedule
 - and manage jobs, 4-5
 - execution of a job, 4-17
 - job, 4-5
- Schema Management, 7-10
- Security Management, 7-13
- Service Discovery
 - Navigator menu option, 2-5
- Service Name, 1-25
- Service Type, 1-25
- setting a bitmap background
 - Map menu, 3-6
- setting up
 - paging service, 1-28
- short-cut menu, 1-4
- Shutdown Database task, 4-25
- Shutdown Listener task, 4-30
- signal flag
 - on map objects, 3-7
- SMTP mail
 - setup, 1-6
- Space Management event, 5-10
- specifying service names, 1-26
- split (new) view
 - Navigator, 2-6
- splitting the Navigator tree, 2-4, 2-6
 - new view, 2-6

SQL

- Oracle SQL*Plus Worksheet, 7-20
- SQL error
 - job task, 4-25
- SQL*Net network services, 2-2
- SQL*Plus Worksheet, 7-20
- starting
 - paging service, 1-32
- Startup Database task, 4-26
- Startup Listener task, 4-30
- status
 - of a map object, 3-7
 - of a registered event set, 5-6
- stopping
 - paging service, 1-34
- Storage Management, 7-16
- summary of the pending jobs
 - Active Jobs page, 4-7
- Super Administrator, 1-8

T

- tablespace operations of Storage Management
 - features, 7-18
- tablespaces, 7-16
- task parameters
 - Job system, 4-17
- Tcl
 - job scripts, 4-2
 - script examples, 4-29
- third-party events
 - creating, 5-12
 - with job task, 4-29
- tnsnames.ora, 2-9
- tools
 - DBA Studio, 7-2
- Tools menu, 1-6

U

- unsolicited event, 5-12, 5-33
- unsolicited events, 5-10
- UpDown (Database) event, 5-41
- UpDown (Listener) event, 5-42

- UpDown (Node) event, 5-41
- user operations, Security Management, 7-14
- user preferences
 - jobs, 4-4, 4-17
 - when running jobs, 4-4, 4-17
- user-defined groups
 - job destinations, 4-15
- user-defined map views
 - creating, 3-4

W

- web server
 - discovering, 2-11
- Wizard Job Tasks, 4-24
- worksheet, Oracle SQL*Plus Worksheet, 7-20