

# Oracle8i™ Personal Edition

Administrator's Guide

Release 2 (8.1.6) for Windows 98

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ORACLE®

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# Contents

<b>Contact Us!</b> .....	xi
How to Contact Oracle Technical Publications .....	xii
How to Contact Oracle Support Services .....	xiii
Resources for Oracle Partners and Developers .....	xvii
<b>Before You Begin</b> .....	xxi
Prerequisites .....	xxii
Intended Audience .....	xxii
How This Guide Is Organized .....	xxii
Documentation and Code Conventions .....	xxv
<b>1 Oracle8i Differences among Windows 98, Windows NT and UNIX</b>	
<b>2 Database Tools Overview</b>	
<b>Choosing a Database Tool</b> .....	2-2
Database Tools and Operating System Compatibility .....	2-3
Preferred Database Tools .....	2-4
<b>Starting Database Tools</b> .....	2-5
Starting Database Tools in Multiple Oracle Homes .....	2-5
Starting Tools from Release 8.0.4 and later 8.0.x Multiple Oracle Homes .....	2-5
Starting Tools from Release 8.1.6 Personal Edition for Windows 98 Multiple Oracle Homes	2-6
Starting Database Tools .....	2-7
Starting Oracle Utilities from the Command Line .....	2-7

Starting Windows 98 Tools .....	2-10
<b>Using SQL*Loader</b> .....	2-10
Windows 98 Processing Options .....	2-10
Direct Path Option .....	2-11
Control File Conventions .....	2-11
<b>Using Windows 98 Tools</b> .....	2-12
Registry .....	2-12
What Database Parameters Are Configured? .....	2-12

### 3 Multiple Oracle Homes and Optimal Flexible Architecture

<b>Introduction to Multiple Oracle Homes and OFA</b> .....	3-2
<b>Multiple Oracle Homes Overview</b> .....	3-2
What Is an Oracle Home? .....	3-2
Benefits of Using Multiple Oracle Homes .....	3-3
Multiple Oracle Home Functionality in Different Releases .....	3-3
One-Listener Support of Multiple Oracle Homes .....	3-4
Multiple Oracle Home Environments .....	3-5
Release 8.0.4 and later 8.0.x Oracle Home Environments .....	3-5
Release 8.1 Oracle Home Environment .....	3-6
<b>Which Products Are Multiple Oracle Home-Enabled?</b> .....	3-6
Products Supporting Multiple Oracle Homes .....	3-7
Products Supporting a Single Oracle Home .....	3-7
Products Not Supporting Multiple Oracle Homes .....	3-7
Products Not Associated with an Oracle Home .....	3-7
<b>Changing the Value of PATH</b> .....	3-8
Using Oracle Home Selector .....	3-9
At the System Level .....	3-9
At the MS-DOS Command Prompt .....	3-10
<b>Exiting Oracle Universal Installer After Entering Name and PATH</b> .....	3-10
<b>Setting Variables in the Environment or the Registry</b> .....	3-11
ORACLE_HOME .....	3-11
Consequences of Setting ORACLE_HOME .....	3-12
TNS_ADMIN .....	3-13
<b>Optimal Flexible Architecture Overview</b> .....	3-13
Benefits of an OFA-Compliant Database .....	3-14

Characteristics of an OFA-Compliant Database .....	3-15
<b>Differences Between Directory Trees by Release .....</b>	<b>3-16</b>
<b>Directory Tree of a Sample OFA-Compliant Database .....</b>	<b>3-18</b>
<b>OFA Directory Naming Conventions .....</b>	<b>3-19</b>
<i>ORACLE_BASE</i> Directory .....	3-19
<i>ORACLE_HOME</i> Directory .....	3-20
ADMIN Directory .....	3-20
ORADATA Directory .....	3-21
<i>DB_NAME</i> Directory .....	3-21
<b>OFA and Multiple Oracle Home Configurations .....</b>	<b>3-22</b>
Specifying an <i>ORACLE_HOME</i> Directory .....	3-22
Default OFA Database .....	3-22
Non-Default OFA Database, Case 1 .....	3-23
Non-Default OFA Database, Case 2 .....	3-24

## 4 Installing, Migrating, and Upgrading Databases

<b>Intended Audience .....</b>	<b>4-2</b>
<b>What to Do with Previous Oracle Database Releases .....</b>	<b>4-2</b>
<b>Multiple Oracle Homes Overview .....</b>	<b>4-3</b>
<b>Migrating, Upgrading, and Downgrading Overview .....</b>	<b>4-4</b>
What Is Migrating? .....	4-4
What Is Upgrading? .....	4-4
What Is Downgrading? .....	4-4
Migrating and Upgrading Using Multiple Oracle Homes .....	4-4
Checklist of Database Release Numbers .....	4-5
<b>Export/Import Overview .....</b>	<b>4-5</b>
<b>Version 8 and Version 7 Client/Server Configurations .....</b>	<b>4-6</b>
Oracle7 Database Applications .....	4-6
Different Client and Database Release Considerations .....	4-7
Oracle8i Client Release 8.1 to Oracle8i Database Release 8.1 .....	4-7
Oracle8 Client Release 8.0/Oracle7 Client to Oracle8i Database Release 8.1 .....	4-7
Oracle8i Client Release 8.1 to Oracle8 Release 8.0/Oracle7 Databases .....	4-9
Multi-Versioning .....	4-10
Migrate an Oracle7 Database to an Oracle8i Database .....	4-11
Upgrade an Oracle8 Database to the Current Oracle8i Database Release .....	4-11

<b>Migrating an Oracle7 Database to Oracle8i.....</b>	<b>4-12</b>
Ten Issues That Can Affect Oracle7 to Oracle8i Migration .....	4-12
Installing Appropriate Versions of SQL*Net.....	4-15
Migrating Using Oracle Data Migration Assistant .....	4-15
What to do Before Using Oracle Data Migration Assistant .....	4-15
Migrating Using MIG.....	4-16
Step 1: What To Do Before Using MIG.....	4-17
Step 2: Shut Down the Oracle7 Database .....	4-19
Step 3: Back Up the Oracle7 Database .....	4-20
Step 4: Install MIG from CD-ROM.....	4-21
Step 5: Run MIG.....	4-23
Step 6: Create Oracle8i Database Files.....	4-26
Step 7: Remove Oracle7 Software (Optional) .....	4-30
<b>Upgrading an Oracle8 Database Release 8.0.x to 8.1.6.....</b>	<b>4-31</b>
Upgrading Using Oracle Data Migration Assistant .....	4-32
Upgrading Using SQL Scripts.....	4-33
Step 1: Shut Down the Release 8.0.x Database .....	4-34
Step 2: Back Up the Release 8.0.x Database .....	4-35
Step 3: Edit the COMPATIBLE Parameter in the 8.0.x INITSID.ORA File .....	4-36
Step 4: Install Oracle8i Personal Edition Release 8.1.6 .....	4-37
Step 5: Run the SQL Scripts.....	4-38
<b>Migration Issues for Net8 and SQL*Net .....</b>	<b>4-41</b>
Location of Network Configuration Files .....	4-42
Listener Configuration.....	4-42
Changing LISTENER.ORA for Migrated Databases .....	4-42
Changes in Handling of TCP/IP Listening Address.....	4-42
Disabling Native Authentication.....	4-43
Installing Appropriate Versions of SQL*Net.....	4-43
<b>Moving Database Files to an OFA-Compliant Directory.....</b>	<b>4-43</b>
<b>Post-Migration Tasks .....</b>	<b>4-44</b>

## 5 Post-Installation Configuration Tasks

<b>Configuring Oracle 8i Navigator .....</b>	<b>5-2</b>
Step 1: Create a PO8 User Account .....	5-2
Step 2: Changing the User Password.....	5-2

Step 3: Enable Two-Phase Commit .....	5-3
Step 4: Configure a Database Connection.....	5-3
Step 5: Create a Project.....	5-11

## 6 Post-Installation Database Creation

<b>Before You Create a Database</b> .....	6-2
Naming Conventions for Oracle Databases .....	6-2
<b>Creating a Database Using Tools</b> .....	6-3
<b>Using Oracle Database Configuration Assistant</b> .....	6-3
<b>Create a Database</b> .....	6-3
Delete a Database.....	6-6
<b>Using BUILD_DB.SQL</b> .....	6-6
How to Create a Database.....	6-7
Creating Directories .....	6-8
Exporting an Existing Database .....	6-8
Deleting Database Files .....	6-9
Modifying the INIT.ORA File.....	6-10
Creating and Starting an Oracle Instance .....	6-12
Putting the CREATE DATABASE Statement in a Script.....	6-13
Creating a Database .....	6-16
Importing a Database.....	6-18
Updating the ORACLE_SID in the Registry .....	6-19
Backing Up the New Database.....	6-20

## 7 Administering a Database

<b>Starting and Shutting Down a Database with SQL*Plus</b> .....	7-2
<b>Starting and Shutting Down a Database Using OSTART and OSTOP</b> .....	7-3
<b>Running Multiple Instances</b> .....	7-4
<b>Creating Password Files</b> .....	7-5
Viewing Password Files.....	7-7
<b>Deleting Password Files</b> .....	7-8
<b>Connecting as INTERNAL with a Password File</b> .....	7-8
<b>Changing the INTERNAL Password</b> .....	7-9
<b>Encrypting Database Passwords</b> .....	7-9
<b>Archiving Redo Log Files</b> .....	7-10

Step 1: Change the Archive Mode to ARCHIVELOG .....	7-10
Step 2: Enable Automatic Archiving.....	7-12
Using the ORADEBUG Utility.....	7-13

## 8 Monitoring a Database

Database Monitoring Overview .....	8-2
Using Trace and Alert Files.....	8-2

## 9 Backing Up and Recovering Database Files

Selecting a Backup and Recovery Tool.....	9-2
Backing Up Files with OCOPY .....	9-3
Recovering Files with OCOPY .....	9-5

## 10 Developing Applications

Finding Information on Application Development for Windows 98.....	10-2
Building External Routines.....	10-4
External Routines Overview .....	10-4
Step 1: Installing and Configuring .....	10-5
Installing the Oracle8i database.....	10-5
Configuring Net8.....	10-5
Step 2: Writing an External Routine.....	10-6
Step 3: Building a DLL .....	10-7
Step 4: Registering an External Routine .....	10-7
Step 5: Executing an External Routine .....	10-9
Accessing Web Data with Intercartridge Exchange .....	10-10
Configuring Intercartridge Exchange .....	10-10
Using Intercartridge Exchange .....	10-11
Packaged Function UTL_HTTP.REQUEST .....	10-12
Packaged Function UTL_HTTP.REQUEST_PIECES.....	10-12
UTL_HTTP Exception Conditions .....	10-13
Exception Conditions and Error Messages.....	10-14
Troubleshooting.....	10-16



## A Directory Structures

<b>Oracle8i Personal Edition Directory Structure .....</b>	<b>A-2</b>
<i>ORACLE_HOME</i> .....	A-2
ADMIN .....	A-6
<b>Filename Extensions.....</b>	<b>A-7</b>

## B Oracle8i Database Specifications for Windows 98

<b>Initialization Parameter File (INIT.ORA) Overview .....</b>	<b>B-2</b>
Location of the Initialization Parameter File .....	B-2
Editing the Initialization Parameter File .....	B-2
Sample File .....	B-3
<b>Initialization Parameters Without Windows 98-Specific Values .....</b>	<b>B-4</b>
Displaying Initialization Parameter Values.....	B-4
Database Initialization Parameters .....	B-5
<b>Calculating Database Limits.....</b>	<b>B-5</b>

## C Oracle8i Configuration Parameters and the Registry

<b>About Configuration Parameters.....</b>	<b>C-2</b>
<b>Registry Overview .....</b>	<b>C-2</b>
<b>Registry Parameters.....</b>	<b>C-2</b>
HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\HOME/ID .....	C-3
HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE.....	C-6
HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\ALL_HOMES.....	C-6
IDx .....	C-6
HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\ALL_HOMES Parameters.....	C-7
<b>Modifying a Registry Value with REGEDIT .....</b>	<b>C-8</b>
<b>Adding a Registry Parameter with REGEDIT .....</b>	<b>C-9</b>
<b>Adding or Modifying Initialization File Parameters and Registry Parameters with Oracle8i Navigation's "Parameter Configurer" .....</b>	<b>C-10</b>
Introducing Database Parameter Configuration Assistant .....	C-10
Introduction to Manipulating Database Initialization Parameters .....	C-11
Opening a window to manipulate database initialization files.....	C-13
Creating a new initialization file .....	C-13
To open an already existing parameter file .....	C-14

To add a parameter .....	C-14
Deleting a Parameter.....	C-15
Modifying a Parameter Value.....	C-15
Saving the parameters.....	C-16
Introduction to Manipulating Oracle8i Configuration Parameters .....	C-16
Opening a window to manipulate configuration parameters .....	C-17
Modifying a parameter value .....	C-18
Deleting a particular parameter .....	C-19

## D Net8 Configuration

<b>Unsupported Net8 Features</b> .....	D-2
<b>Understanding Net8 Registry Parameter and Subkeys</b> .....	D-2
Net8 Parameters.....	D-2
<b>Listener Requirements</b> .....	D-2
<b>Understanding Optional Configuration Parameters</b> .....	D-3
LOCAL .....	D-4
TNS_ADMIN.....	D-4
USE_SHARED_SOCKET.....	D-4
<b>Net8 Port Numbers</b> .....	D-5

## E Error Messages

<b>Logging Error Messages</b> .....	E-2
<b>Codes 04000-04999: Windows 98/NT-Specific Oracle Messages</b> .....	E-2
File I/O Errors: OSD-04000 to OSD-04099 .....	E-5
Memory Errors: OSD-04100 to OSD-04199 .....	E-10
Process Errors: OSD-04200 to OSD-04299 .....	E-12
Loader Errors: OSD-04300 to OSD-04399.....	E-16
Semaphore Errors: OSD-04400 to OSD-04499 .....	E-16
Miscellaneous Errors: OSD-04500 to OSD-04599 .....	E-17
<b>Database Connection Issues</b> .....	E-19

## Glossary

## Index

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# Contact Us!

## Oracle8i Personal Edition Administrator's Guide, Release 2 (8.1.6) for Windows 98

Part No. A85313-01

This document describes how to contact Oracle Corporation if you have issues with the documentation or software. It also provides a list of useful resources for Oracle partners and developers.

Read the section...	If you...
"How to Contact Oracle Technical Publications" on page xii	Have issues with Documentation
"How to Contact Oracle Support Services" on page xiii	Have issues with Software
"Resources for Oracle Partners and Developers" on page xvii	Want to join an Oracle partner or application developer program

## How to Contact Oracle Technical Publications

Oracle Corporation welcomes your comments and suggestions on the quality and usefulness of this publication. 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 about this guide?
- Do you have suggestions for improvement? Please indicate the chapter, section, and page number (if available).

You can send comments regarding documentation by sending an email to *win98doc@in.oracle.com*.

You can send your feedback about the products included in your CD and the features you would like to have for the database, Oracle8i Navigator or other products to *win98pe@in.oracle.com*.

If you would like a reply, please provide your name, address, email-id and telephone number.

# How to Contact Oracle Support Services

*Please copy this form and distribute within your organization as necessary.*

Oracle Support Services can be reached at the following telephone numbers and Web sites. The hours of business are detailed in your support contract and the *Oracle Customer Support Guide* in your kit.

Oracle Support Services In...	Call...
United States of America	+ (650) 506-1500 for customers with support contracts. + (650) 506-5577 to obtain a support contract.
Europe	+44 1344 860 160 or the local support center in your country.
All other locations	The telephone number for your country listed at the following Web site:  <a href="http://www.oracle.com/support/contact_us/sup_hot_phone.html">http://www.oracle.com/support/contact_us/sup_hot_phone.html</a>  Oracle Support Services telephone numbers are also listed in the <i>Oracle Customer Support Guide</i> in your kit.

Please complete the following checklist before you call. If you have this information ready, your call can be processed much quicker.

- ☐ Your CPU Support Identification Number (CSI Number) if applicable.

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- ☐ The hardware name on which your application is running.

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- ❑ The operating system name and release number on which your application is running.

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- ❑ The release numbers of the Oracle Server and associated products involved in the current problem. For example, Oracle8i Personal Edition release 8.1.6.0.0
  - To verify the release number of the Oracle Server, connect to the database using a tool such as SQL\*Plus. The release number is displayed. For example:

```
Connected to:
Oracle8i Personal Edition Release 8.1.6.0.0 - Production
With the Java option
PL/SQL Release 8.1.6.0.0 - Production
```

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- ❑ The third-party software version you are using.
  - To verify an application version, from the application's Help menu, select About...

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- ☐ The exact error codes and messages. Please write these down as they occur. They are critical in helping Oracle Support Services to quickly resolve your problem. Note whether there were no errors reported.

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- ☐ A description of the issue, including:

- **What happened?** For example, the command used and its result.

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- **When did it happen?** For example, during peak system load, or after a certain command, or after an operating system upgrade. In addition, what was happening when the problem occurred?

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- **Where did it happen?** For example, on a particular system, or within a certain procedure or table.

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- **What is the extent of the problem?** For example, production system unavailable, or moderate impact but increasing with time, or minimal impact and stable.
- **Has anything changed?** For example, if this is an operation that used to work and now fails, what is different? Can you undo any recent changes, to verify whether they are relevant to the issue?

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- **Can the problem be reproduced?** This is a critical question for support analysts. For example, did the problem recur on the same system, under the same circumstances? Can the problem be reproduced on another system?
- **If you are able to restart the server or database, does restarting the database or rebooting the server or client machine (if applicable) make a difference?**

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- ❑ Keep copies of the Oracle alert log, any trace files, core dumps, and redo log files recorded at or near the time of the incident. Oracle Support Services may need these to further investigate your problem.

To help analyze problems:

- Archive or delete old alert logs. When the database is started without an alert log, a new one is created. In some cases, if you force the problem to recur with a new alert log, the timestamps for the recorded events may indicate which events are relevant.
- Archive or delete old trace files. To check whether the file was modified, right-click and select Properties. The *Properties* dialog box displays the modification date.

## Resources for Oracle Partners and Developers

This section provides information on partner programs and resources for Oracle database administrators and application developers.

Information Source	Description
Oracle Corporation Home Page <a href="http://www.oracle.com">http://www.oracle.com</a>	This Web site is the starting point for general information on Oracle Corporation.
Alliance Online <a href="http://alliance.oracle.com">http://alliance.oracle.com</a>	<p>Oracle provides leading-edge technology, education, and technical support that enables you to effectively integrate Oracle into your business. By joining the Oracle Partner Program, you demonstrate to customers that you are committed to delivering innovative Oracle-based solutions and services.</p> <p>The greater your commitment to Oracle, the more we can help you grow your business. It's that simple. The value you derive is associated directly with your level of commitment.</p>

Information Source	Description
<p>Oracle Education</p> <p><a href="http://education.oracle.com/">http://education.oracle.com/</a></p>	<p>Customers come to Oracle Education with a variety of needs. You may require a complete curriculum based on your job role to enable you to implement new technology. Or you may seek an understanding of technology related to your key area of responsibility to help you meet technical challenges. You may be looking for self-paced training that can be used as an ongoing resource for reference and hands-on practice. Or, you may be interested in an overview of a new product upgrade. Whatever your training need, Oracle Education has the solution.</p>
<p>Oracle Technology Network</p> <p><a href="http://technet.oracle.com/">http://technet.oracle.com/</a></p>	<p>The Oracle Technology Network is your definitive source for Oracle technical information for developing for the Internet platform. You will be part of an online community with access to free software, Oracle Technology Network-sponsored Internet developer conferences, and discussion groups on up-to-date Oracle technology. Membership is free.</p>
<p>Oracle Store</p> <p><a href="http://oraclestore.oracle.com/">http://oraclestore.oracle.com/</a></p>	<p>This is Oracle's online shopping center. Come to this site to find special deals on Oracle software, documentation, publications, computer-based training products, and much more.</p>
<p>Oracle Support Services' Support Web Center</p> <p><a href="http://www.oracle.com/support/">http://www.oracle.com/support/</a></p>	<p>Oracle Support Services offers a range of programs so you can select the support services you need and access them in the way you prefer: by telephone, electronically, or face to face. These award-winning programs help you maintain your investment in Oracle technology and expertise.</p> <p>Here are some of the resources available in the Support Web Center:</p>
<p><b>OracleMetaLink</b></p> <p><a href="http://www.oracle.com/support/elec_sup/index.html">http://www.oracle.com/support/elec_sup/index.html</a></p>	<p><b>OracleMetaLink</b> is Oracle Support Services' premier Web support service. It is available to <i>Oraclemetals</i> customers (Gold, Silver, Bronze), 24 hours a day, seven days a week.</p>
<p><b>OracleLifecycle</b></p> <p><a href="http://www.oracle.com/support/sup_serv/lifecycle/index.html">http://www.oracle.com/support/sup_serv/lifecycle/index.html</a></p>	<p><b>OracleLifecycle</b> is designed to deliver customized, industry-focused, full life-cycle support solutions that enable industry leaders to use Oracle technology to make smart business decisions, achieve operational excellence, and succeed in their markets.</p>

Information Source	Description
<b>ExpertONLINE</b> <a href="http://www.oracle.com/support/sup_serv/online/index.html">http://www.oracle.com/support/sup_serv/online/index.html</a>	<p>Oracle Support Services has launched a new line of services called ExpertONLINE. These services provide online database administration for companies looking to supplement their existing DBA staff or fill a DBA role. Services range from ExpertDETECT, a monitoring, diagnostic, and recommendation service, to ExpertDBA, a full online database administration service.</p>
<b>Virtual Support Analyst (VSA)</b> <a href="http://www.oracle.com/support/sup_serv/vsa_start.html">http://www.oracle.com/support/sup_serv/vsa_start.html</a>	<p>VSA is Oracle's Internet e-mail service; it is available to U.S. customers with an Oracle<i>metals</i> support agreement. With VSA, you can initiate a request for assistance through e-mail, bypassing the queues you may encounter when using telephone support. VSA also enables you to access Oracle's bug database.</p>
<b>Customer Service</b> <a href="http://www.oracle.com/support/cus_serv/index.html">http://www.oracle.com/support/cus_serv/index.html</a>	<p>This site provides resources to make your interactions with Oracle as easy as possible. Among the things you can do are:</p> <ul style="list-style-type: none"> <li>■ Learn what is a CPU Support Identification (CSI) number</li> <li>■ Update your technical contact information</li> <li>■ Find out whom to contact for invoice and collection issues</li> <li>■ Request product update shipments</li> <li>■ Access a glossary of Oracle Support Services terms</li> </ul>
<b>U.S. Customer Visit Program</b> <a href="http://www.oracle.com/support/cus_serv/cus_visit.html">http://www.oracle.com/support/cus_serv/cus_visit.html</a>	<p>This U.S.-based program has been established to help our customers understand and obtain maximum benefit from the support services they have purchased.</p> <p>The visit typically offers a customized orientation presentation, a comprehensive overview and demonstration of Oracle's electronic services, and helpful tips on working more effectively with Oracle Support Services.</p>
<b>Support Web Center Library</b> <a href="http://www.oracle.com/support/library/index.html">http://www.oracle.com/support/library/index.html</a>	<p>This site contains articles, guides, and other documentation to help you leverage the wealth of knowledge and reference material that Oracle Support Services produces.</p>



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# Before You Begin

This guide is your primary source of introductory, post-installation, configuration, and administration information for Oracle8i Personal Edition.

Specific topics discussed are:

- Prerequisites
- Intended Audience
- How This Guide Is Organized
- Documentation and Code Conventions

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## Prerequisites

This guide assumes that you are familiar with the following:

- Windows 98, and have installed and tested it on your computer system
- Object-relational database management concepts

**Additional Information:** If you are not familiar with object-relational database management concepts, see *Oracle8i Concepts*.

## Intended Audience

This guide is necessary for anyone installing, configuring, or administering Oracle8i Personal Edition for Windows 98.

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**Note:** This guide describes *only* the features of Oracle8i Personal Edition that apply to the Windows 98 operating system.

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## How This Guide Is Organized

This guide is organized as follows:

**Chapter 1, "Oracle8i Differences among Windows 98, Windows NT and UNIX"**

Provides a list of differences between Oracle8i on Windows 98, Windows NT and on UNIX.

**Chapter 2, "Database Tools Overview"**

Provides a list of preferred and optional tools you can use to perform common database administration tasks.

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### **Chapter 3, "Multiple Oracle Homes and Optimal Flexible Architecture"**

Describes how to use multiple Oracle homes and an Optimal Flexible Architecture (OFA) configuration for placement of database files. Read this chapter *before* installing Oracle8i Personal Edition for Windows 98.

### **Chapter 4, "Installing, Migrating, and Upgrading Databases"**

Describes what to do if you have existing databases on your system and want to install the latest release of Oracle8i Personal Edition.

### **Chapter 5, "Post-Installation Configuration Tasks"**

Describes or references the configuration tasks you may need to perform before using such products as Oracle8i Navigator.

### **Chapter 6, "Post-Installation Database Creation"**

Describes how to create a database *after* installation with either the Oracle Database Configuration Assistant or the BUILD\_DB.SQL script.

### **Chapter 7, "Administering a Database"**

Describes how to administer a database.

### **Chapter 8, "Monitoring a Database"**

Describes how to monitor the Oracle8i Personal Edition database.

### **Chapter 9, "Backing Up and Recovering Database Files"**

Provides recommendations and procedures for backing up and recovering database files.

### **Chapter 10, "Developing Applications"**

Describes Windows 98-specific issues for application developers.

### **Appendix A, "Directory Structures"**

Describes the default directory structures created when you install Oracle components.

### **Appendix B, "Oracle8i Database Specifications for Windows 98"**

Describes Oracle8i database initialization parameters, how to edit them, and parameters without Windows 98-specific values. This appendix also explains how to calculate database limits.

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### **Appendix C, "Oracle8i Configuration Parameters and the Registry"**

Describes the use of the registry for various Oracle components. In addition, this chapter lists the recommended values and ranges for configuration parameters.

### **Appendix D, "Net8 Configuration"**

Describes configuration for the Windows 98 platform.

### **Appendix E, "Error Messages"**

Lists the error messages, causes, and corrective actions that are specific to the operation of Oracle8i Personal Edition for Windows 98.

### **Glossary**

Provides brief descriptions of terms used throughout this guide.



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## Documentation and Code Conventions

The following conventions are used in this guide:

Convention	Example	Meaning
All uppercase plain	C:\ORACLE\ORA81	Indicates command names, SQL reserved words, and keywords, as in ALTER DATABASE. All uppercase plain is also used for directory names and file names.
Italic	<ul style="list-style-type: none"><li>■ Used to indicate a variable: <i>file name</i></li><li>■ Used to indicate the title of a guide.</li></ul>	Indicates a value that you must provide. For example, if a command asks you to type <i>file name</i> , you must type the actual name of the file.
Square brackets [ ]	X:\[PATHNAME]\ORACLE\ HOME_NAME	Encloses optional items. For example, when you create an OFA-compliant Oracle home directory, you can place an optional pathname before the \ORACLE pathname.  Square brackets also indicate a function key, for example [Enter].
Choose Start >	Choose Start > Programs > Oracle - HOME_NAME > Network Administration > Net8 Assistant	How to start a program. For example, to start Net8 Assistant, you must click the Start button on the taskbar and then choose Programs, Oracle - HOME_NAME > Network Administration > Net8 Assistant.
C:\>	C:\ORACLE\ORADATA>	Represents the Windows 98 command prompt of the current hard disk drive. Your prompt reflects the subdirectory in which you are working. Referred to as the MS-DOS command prompt in this guide.
Backslash (\) before a directory name	\ORADATA	Indicates that the directory is a subdirectory of the root directory.

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Convention	Example	Meaning
<i>ORACLE_HOME</i> and <i>ORACLE_BASE</i>	Go to the <i>ORACLE_BASE\ORACLE_HOME\RDBMS\ADMIN</i> directory	<p>In previous releases when you installed Oracle8 Personal Edition, all subdirectories were located under a top level <i>ORACLE_HOME</i> directory, that by default was:</p> <p><i>C:\ORAWIN95</i> for Windows 95/98</p> <p>or whatever you may have called your Oracle home.</p> <p>In this Optimal Flexible Architecture (OFA)-compliant release, all subdirectories are no longer under a top level <i>ORACLE_HOME</i> directory. There is now a new top-level directory called <i>ORACLE_BASE</i> that by default is <i>C:\ORACLE</i>. If you install Oracle8i Personal Edition release 8.1.6 on a clean computer (that is, there is no other Oracle software on the computer), the default settings for the first Oracle home directory is <i>C:\ORACLE\ORA81</i>. If you run Oracle Universal Installer again and install release 8.2.x, the second Oracle home directory is called <i>\ORA82</i>. These Oracle home directories are located directly under <i>ORACLE_BASE</i>.</p> <p>All directory path examples in this guide follow OFA conventions.</p> <p>See Chapter 4, "Multiple Oracle Homes and Optimal Flexible Architecture" for additional information on OFA compliances and for information on installing Oracle products in non-OFA compliant directories.</p>
%ORACLE_HOME%	SQL> @%ORACLE_HOME%\ADMIN\DB_NAME\ADHOC\CATALOG.SQL	<p>In SQL*Plus commands, you may see %ORACLE_HOME%. SQL*Plus is able to locate your Oracle Home directory using the %ORACLE_HOME% variable. This convention can be used in Server Manager, SQL*Plus, Export Utility, and Import Utility.</p>

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Convention	Example	Meaning
<i>HOME_NAME</i>	Oracle <i>HOME_NAME</i> TNSListener	Represents the Oracle home name.  The home name can be up to sixteen alphanumeric characters. The only special character allowed in the home name is the underscore.
<i>HOMEID</i>	HOME0, HOME1, HOME2	Represents a unique registry subkey for each Oracle home directory in which you install products. A new <i>HOMEID</i> is created and incremented each time you install products to a different Oracle home directory on one computer. Each <i>HOMEID</i> contains its own configuration parameter settings for installed Oracle products.
Symbols	period . comma , hyphen - semicolon ; colon : equal sign = backslash \ single quote ' double quote " parentheses ()	Symbols other than brackets and vertical bars must be entered in commands exactly as shown.

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## Oracle8i Differences among Windows 98, Windows NT and UNIX

The following table lists the major differences among Oracle8i Personal Edition for Windows 98, Oracle8i on Windows NT and on UNIX. For Oracle database administrators moving from a UNIX platform to Windows 98/NT, this information may be helpful in understanding the Windows 98/NT features that are relevant to Oracle.

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Feature	On UNIX...	On Windows 98/NT...
<b>Services/Database instance</b> <b>See:</b> Chapter 7, "Administering a Database"	UNIX daemons are similar to services on Windows NT.	<b>On Windows 98:</b>  There is no service available on Windows 98. Multiple instances of Oracle databases can be run using OSTART. See Chapter 7, on how to use OSTART.  <b>On Windows NT:</b>  Oracle registers a database instance as a service (OracleService <i>SID</i> ).  To connect to and use an Oracle instance, an Oracle service is created during the database creation process and associated with the Oracle database. Once a service is created with the Oracle database, the service can run even while no user is logged on. This feature enables server security while running the Oracle database.  <b>To Access Services:</b>  By default, services run under the SYSTEM account.  <ol style="list-style-type: none"><li>1. Choose Start &gt; Settings &gt; Control Panel &gt; Services to access the <i>Services</i> dialog box.  OracleService<i>SID</i> and other Oracle services appear here.</li></ol>

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Feature	On UNIX...	On Windows 98/NT...
<b>Processes and Threads</b>	Each Oracle background process exists as a separate process, for example, ora_dbw0_V816.	<p>All Oracle background, dedicated server, and client processes are threads of the master ORACLE process.</p> <p>All the threads of the ORACLE process share resources on Windows 98/NT. This multithreaded architecture is highly efficient, allowing fast context switches with low overhead.</p> <p><b>To View Processes on Windows 98:</b></p> <p>You can use PVIEWER.EXE (Process Viewer of Microsoft C++ Developer Studio) to view processes and threads.</p> <p><b>To View Processes on NT:</b></p> <p>Use the Oracle Administration Assistant for Windows NT to view processes or kill individual threads.</p> <ol style="list-style-type: none"> <li>1. Choose Start &gt; Programs &gt; Oracle - <i>HOME_NAME</i> &gt; Database Administration &gt; Oracle Administration Assistant for Windows NT.</li> <li>2. Right-click the <i>SID</i>, for example V816, and choose Process Information.</li> </ol>
<b>File Sizes</b> <b>See:</b> Appendix B, "Oracle8i Database Specifications for Windows 98"	<p>UNIX file system (UFS) or journalled file system (JFS). Maximum file size supported by most vendors is now 32 GB.</p> <p>The Oracle block sizes vary between 2-8K.</p>	<p>Oracle can be installed on FAT and NTFS<sup>1</sup> file systems. By default, Oracle runs under the SYSTEM account, which does not have access to NTFS volumes, unless it is granted.</p> <p>The maximum file size for FAT is 4 GB; for NTFS, 16 Exabytes (EB).</p> <p>The Oracle block size is based on the parameter DB_BLOCK_SIZE set in init.ora file. The maximum number of blocks per data file is 4 million on Windows NT. The maximum number of data files per database depends on block size.</p> <p>When calculating database limits, the total maximum capacity of the database remains the same regardless of the way the bits are split up.</p>

Feature	On UNIX...	On Windows 98/NT...
<b>Initialization Parameters: Multiple Database Writers</b> <b>See:</b> Appendix B, "Oracle8i Database Specifications for Windows 98"	<p>You can specify more than one database writer process with the initialization parameter DB_WRITERS_PROCESSES.</p> <p>Multiple database writers can help, for example, when a UNIX port does not support asynchronous I/O.</p>	<p>DB_WRITERS_PROCESSES, which writes dirty buffers to disk, is not supported. Windows 98/NT supplies its own I/O slaves and uses them to see if I/O is complete.</p> <p>Multiple DB_WRITERS_PROCESSES might cause synchronization problems.</p>
<b>Direct Writes to Disk</b> <b>See:</b> <i>Oracle8i Concepts</i> On all three platforms, bypassing the file system buffer cache ensures the data is written to disk.	<p>Oracle uses the O_SYNC flag to bypass the file system buffer cache. The flag name depends on the UNIX port.</p>	<p>Oracle bypasses the file system buffer cache completely.</p>
<b>Memory Resources</b> <b>See:</b> <i>Oracle8i Concepts</i>	<p>The resources provided by the default kernels are often inadequate for a medium or large Oracle database.</p> <p>The maximum size of a shared memory segment (SHMMAX) and maximum number of semaphores available (SEMMNS) may be too low for Oracle recommendations.</p>	<p>Fewer resources are needed for interprocess communication (IPC) because the operating system is thread-based and not process-based. These resources, including shared memory and semaphores, are not adjustable by the user.</p>
<b>Install Accounts and Groups</b> <b>See:</b> Chapter 7, "Administering a Database"	<p>Uses the concept of a DBA group. The root account cannot be used to install Oracle. A separate Oracle account must be created manually.</p>	<p>On Windows 98 any user can install Oracle database, where as, on Windows NT Oracle must be installed by a Windows NT user name in the Administrator's group. The user name is automatically added to the Windows NT local group ORA_DBA, which receives SYSDBA the privilege. This allows the user to log into the database with the INTERNAL account and not be prompted for a password.</p> <p><b>Password Files:</b></p> <p>Password files are located in the ORACLE_BASE\ORACLE_HOME\DATABASE directory and are named PWDSID.ORA, where SID identifies the Oracle8i database instance.</p>



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Feature	On UNIX...	On Windows 98/NT...
<b>Dynamic Link Libraries (DLLs)</b> <i>See: Oracle8i Concepts</i>	Shared libraries are similar to the shared DLLs on Windows 98/NT. Object files and archive libraries are linked to generate the Oracle executables. Relinking is necessary after certain operations, such as installation of a patch.	Oracle DLLs form part of the executable at run time, and, therefore, are smaller. DLLs can be shared between multiple executables. Relinking by the user is not supported, but executable images can be modified using the ORASTACK utility. <b>Modifying Executable Images:</b> Modifying executable images on Windows 98/NT reduces the chances of running out of virtual memory when using a large SGA or an SGA with thousands of connections <sup>2</sup> . However, Oracle Corporation recommends doing this under the guidance of Oracle Support Services.
<b>Installation</b> <i>See: Oracle8i Installation Guide for Windows 98</i>	Many manual setup tasks required on UNIX are not required on Windows 98/NT.	You <i>do not need</i> to manually: <ul style="list-style-type: none"><li>■ set environment variables</li><li>■ create a DBA group for database administrators</li><li>■ create a group for users running Oracle Universal Installer</li><li>■ create an account dedicated to installing and upgrading Oracle components</li></ul>

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Feature	On UNIX...	On Windows 98/NT...
<b>Multiple Oracle Homes and OFA</b> <p>Using multiple Oracle homes and Optimal Flexible Architecture (OFA) provides many advantages when administering large databases. OFA is implemented on Windows 98/NT and UNIX in the same way. However, differences exist with regard to the following:</p> <ul style="list-style-type: none"> <li>■ The top-level names of the OFA directory tree differ between Windows 98/NT and UNIX. However, the main subdirectory and file names are the same on both operating systems.</li> <li>■ <i>ORACLE_BASE</i> directory.</li> <li>■ No support for symbolic links on Windows 98/NT.</li> </ul> <p><b>See:</b> Chapter 3, "Multiple Oracle Homes and Optimal Flexible Architecture"</p>	<p>Multiple Oracle homes on Windows NT is comparable to installation capabilities on UNIX. Environment variables can be set to specify Oracle homes. <i>ORACLE_BASE</i> is associated with a UNIX user's environment.</p> <p><b>Symbolic Links</b></p> <p>Symbolic links are supported. Although everything seems to be in one directory on the same hard drive, files can be on different hard drives if they are symbolically linked or have that directory as a mount point.</p>	<p><i>ORACLE_HOME</i> directories can be located under a single <i>ORACLE_BASE</i> directory. <i>ORACLE_BASE</i> is defined in the registry (for example, in HKEY_LOCAL_MACHINE \SOFTWARE\ORACLE\HOME0). Do not set <i>ORACLE_HOME</i> in the environment (software run from another Oracle home will not work reliably). In fact, beginning in release 8.1.6, the Oracle Universal Installer will reset it.</p> <p>The goal of OFA is to place all Oracle software under one <i>ORACLE_BASE</i> directory and to spread the files across different physical drives as your databases increase in size. Oracle Corporation recommends that you use one logical drive to store your database administration files and that you place other files, as needed, on other logical drives in an ORADATA\DB_NAME directory.</p> <p>For example, for a database named PROD, there are four logical drives:</p> <ul style="list-style-type: none"> <li>■ C:\ contains an Oracle home and the database administration files.</li> <li>■ F:\ contains the redo log files. (The F:\ drive could also represent two physical drives that have been striped to increase performance.)<sup>3</sup></li> <li>■ G:\ contains one of the control files and all of the tablespace files. (The G:\ drive could also use a RAID Level-5 configuration to increase reliability.)<sup>4</sup></li> <li>■ H:\ contains the second control file.</li> </ul> <p><b>Symbolic Links</b></p> <p>Symbolic links like those on UNIX are not supported, although Microsoft has announced the intention to support them in a near-future release.</p>

Feature	On UNIX...	On Windows 98/NT...
<b>Automatic Startup/Shutdown</b> <b>See:</b> <i>Oracle8i Administrator's Guide</i> and Chapter 7, "Administering a Database" in this guide.	<b>Automatic Startup</b> <p>Several files and scripts in different directories are used to start an instance automatically.</p> <b>Automatic Shutdown</b> <p>Scripts are run on computer shutdown, allowing applications such as Oracle to be shut down cleanly.</p>	<b>On Windows 98:</b> <p>There is no automatic startup or shutdown of database available while running on Windows 98.</p> <p>If the registry key HKEY_LOCAL_MACHINE\SOFTWARE\HOMEID\DATABASE_STARTUP is set to AUTO, then if no database instance is available while starting up SQL*Plus or SVRMGR, the instance whose SID is set to ORACLE_SID key will startup. If you want to change the value of DATABASE_STARTUP parameter, you can use ORAAUTO or Oracle8i Navigator (see Navigator help on how to modify registry keys for more information).</p> <b>On Windows NT:</b> <b>Automatic Startup</b> <p>Set the registry parameter ORA_SID_AUTOSTART to TRUE (the default) using an Oracle tool such as ORADIM.</p> <ol style="list-style-type: none"> <li>1. Enter the following with parameters at the MS-DOS command prompt:  <pre>C:\&gt; ORADIM PARAMETERS</pre> </li> <li>2. To start the listener automatically, set the service startup type to automatic.</li> </ol> <b>Automatic Shutdown</b> <ol style="list-style-type: none"> <li>1. Set the registry parameters ORA_SHUTDOWN and ORA_SID_SHUTDOWN to stop the relevant OracleServiceSID and shut down.</li> <li>2. Set the registry parameter ORA_SID_SHUTDOWNTYPE to control the shutdown mode (the default is I, or Immediate).</li> </ol>

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Feature	On UNIX...	On Windows 98/NT...
<b>Diagnostic and Tuning Utilities</b>  <b>See:</b> Chapter 2, "Database Tools Overview" and Chapter 8, "Monitoring a Database"	<p>Performance utilities are not included with the operating system. Utilities such as <code>sar</code> and <code>vmstat</code> are used to monitor Oracle background and shadow processes. These utilities are not integrated with Oracle.</p> <p>Task Manager on Windows NT displays currently running processes and their resource usage, similar to the UNIX <code>ps -ef</code> command or OpenVMS <code>SHOW SYSTEM</code>. However, Task Manager is easier to interpret and the columns can be customized.</p>	<p><b>On Windows 98:</b></p> <p>Performance utilities include Task Manager, Control Panel, the Registry, <code>PVIEWER.EXE</code> (Process Viewer of Microsoft's C++ Developer Studio) can be used to monitor processes and threads.</p> <p><b>On Windows NT:</b></p> <p>Performance utilities include Oracle Performance Monitor, Task Manager, Control Panel, Event Viewer, the registry, User Manager, and Microsoft Management Console (only included with Windows 2000).</p> <p>Oracle is integrated with several of these tools. For example:</p> <ul style="list-style-type: none"><li>■ Oracle Performance Monitor displays key Oracle database information.  This tool is the same in appearance and operation as the Windows NT Performance Monitor, except it has been preloaded with Oracle8i database performance elements.</li><li>■ Event Viewer displays system alert messages, including Oracle startup/shutdown messages and the audit trail.</li></ul>

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Feature	On UNIX...	On Windows 98/NT...
Raw Partitions	Raw partitions are supported.	<p>Raw partitions are not supported on Windows 98.</p> <p><b>On Windows NT:</b></p> <p>Data files for tablespaces can be stored on a file system, or on raw partitions. A raw partition is a portion of a physical disk that is accessed at the lowest possible level.</p> <p>Use the Windows NT Disk Administrator application to create an extended partition on a physical drive. An extended partition points to raw space on the disk that can be assigned multiple logical partitions for the database files.</p> <p>An extended partition avoids the four-partition limit on Windows NT by allowing you to define large numbers of logical partitions to accommodate applications using the Oracle8i database. Logical partitions can then be given symbolic link names to free up drive letters.</p>

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<sup>1</sup> NTFS is available on Windows NT only.

<sup>2</sup> On Windows 98 maximum 10 concurrent users are allowed.

<sup>3</sup> Disk stripping is not supported on Windows 98.

<sup>4</sup> RAID is not available for Windows 98.



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## Database Tools Overview

Oracle8i Personal Edition for Windows 98 includes various tools to perform database functions. This chapter describes the preferred tools to perform common database administration tasks.

Specific topics discussed are:

- Choosing a Database Tool
- Starting Database Tools
- Using SQL\*Loader
- Using Windows 98 Tools

## Choosing a Database Tool

*Database tools* is a collective term for tools, utilities, and assistants that you can use to perform database administration tasks. Some database tools perform similar tasks, though no one database tool performs all database administration tasks. The following sections indicate which database tools can be used on particular operating systems and the preferred tools to use for common database administration tasks.

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**Note:** This chapter describes tasks that use SQL\*Plus command line syntax. In this guide, all Server Manager text and examples have been replaced with SQL\*Plus equivalents. Although Server Manager continues to ship with 8.1.x releases, Oracle Corporation strongly recommends that you migrate to SQL\*Plus as soon as possible. See your SQL\*Plus documentation for information on using SQL\*Plus to perform database administration tasks.

Note that for all previous 8.0.x releases of Oracle8, the Server Manager executable was SVRMGR30. For 8.1.6, the Server Manager executable is SVRMGRL. The "L" indicates line mode.

Oracle8i Navigator can be installed from Oracle8i Personal Edition for Window 98 CD-ROM of release 8.1.6. It can be installed by selecting Typical Installation or through Custom Installation.

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## Database Tools and Operating System Compatibility

This table lists database tools and the operating system(s) on which each can be used:

Database Tools	Windows 98
<b>Application Development</b>	
SQL*Plus (SQLPLUS) <sup>1</sup>	Yes
Object Type Translator (OTT)	Yes
<b>Database Administration</b>	
Oracle Database Configuration Assistant	Yes
<b>Migration Utilities</b>	
Oracle Data Migration Assistant	Yes
<b>Oracle Utilities from the MS-DOS Command Line</b>	
Migration Utility (MIG)	Yes
DBVERIFY (DBVERF)	Yes
Export Utility (EXP)	Yes
Import Utility (IMP)	Yes
OCOPY	Yes
Password Utility (ORAPWD) <sup>2</sup>	Yes
Recovery Manager (RMAN)	Yes
SQL*Loader (SQLLDR)	Yes
TKPROF (TKPROF)	Yes
<b>Network Administration</b>	
Net8 Assistant	Yes
Net8 Configuration Assistant	Yes
<b>Windows 98 Tools</b>	
Registry	Yes

<sup>1</sup> The ORADEBUG utility can be used through SQL\*Plus to send debug commands to Oracle processes. See "Using the ORADEBUG Utility" on page 7-13.

<sup>2</sup> ORAPWD does not work on password files for remote databases.

Preferred Database Tools

This table lists common database administration tasks and the various database tools you can use to perform them. Oracle Corporation recommends you use the tools listed in the "Preferred Database Tool" column of the table. After choosing a tool to perform a task, go to "Starting Database Tools" on page 2-5 for instructions on how to start the tool.

Database Administration Task	Preferred Database Tool	Other Database Tools
Create a database	Oracle Database Configuration Assistant	
Delete a database	Oracle Database Configuration Assistant	
Start a database	Oracle Start Utility (OSTART)	SQL*Plus
Shut down a database	Oracle Stop Utility (OSTOP)	SQL*Plus and KNLSTOP together
Change internal database passwords	ORAPWD	
Migrate a database <ul style="list-style-type: none"><li>From release 7.3.x to release 8.1.6</li></ul>	Oracle Data Migration Assistant <sup>1</sup>	Migration Utility (MIG)
Upgrade a database <ul style="list-style-type: none"><li>From release 8.0.x to release 8.1.6</li></ul>	Oracle Data Migration Assistant	Run provided scripts in SQL*Plus
Export data	Export Utility (EXP)	
Import data	Import Utility (IMP)	
Load data	SQL*Loader (SQLLDR)	
Back up a database <ul style="list-style-type: none"><li>Recovery Manager (RMAN)</li><li>OCOPY<sup>2</sup></li></ul>		
Recover a database <ul style="list-style-type: none"><li>Recovery Manager (RMAN)</li><li>OCOPY</li></ul>		
Authenticate Database Administrators and Users	SQL*Plus	
Create database objects <sup>3</sup>	Oracle8i Navigator	SQL*Plus

<sup>1</sup> Oracle Data Migration Assistant can only be used to upgrade release 7.x, 8.0.x or 8.1.5 databases to release 8.1.6. It cannot be used to upgrade an earlier Oracle7 database release to a later Oracle7 database release. See your Oracle7 for Windows 95 documentation for information on how to upgrade from an earlier Oracle7 release to a later Oracle7 release.

<sup>2</sup> Do not back up files while you are shutting down the database, otherwise your backup will be invalid. You cannot use an invalid backup to restore files at a later date. See *Oracle8i Backup and Recovery Guide* for more information.

<sup>3</sup> See *Oracle8i Administrator's Guide* for guidelines on creating databases objects. This guide provides equations for estimating the space requirements for clusters, non-clustered tables, and indexes. Windows 98 uses the same fixed header, transaction header, and row header constants described in this guide.

## Starting Database Tools

This section describes how to start each of the database tools in the following categories:

- Starting Database Tools in Multiple Oracle Homes
- Starting Database Tools
- Starting Oracle Utilities from the Command Line
- Starting Windows 98 Tools

You will be referred back to this section for database tool startup procedures as you use this guide.

### Starting Database Tools in Multiple Oracle Homes

If you have multiple Oracle homes on your computer from previous releases, see "Multiple Oracle Home Functionality in Different Releases" on page 3-3 and "Multiple Oracle Home Environments" on page 3-5 for a description of the differences between pre-8.1.6 Oracle homes and release 8.1.6 and later Oracle homes.

#### Starting Tools from Release 8.0.4 and later 8.0.x Multiple Oracle Homes

If you are using multiple Oracle homes functionality, the command to start a tool includes a *HOME\_NAME*, where *HOME\_NAME* indicates the name of a different Oracle home. Note that *the first* Oracle home created on your computer does not have *HOME\_NAME* appended to the group. For example:

**To start SQL\*Plus from the first Oracle home, choose:**

Start > Programs > Oracle > Application Development > SQL Plus

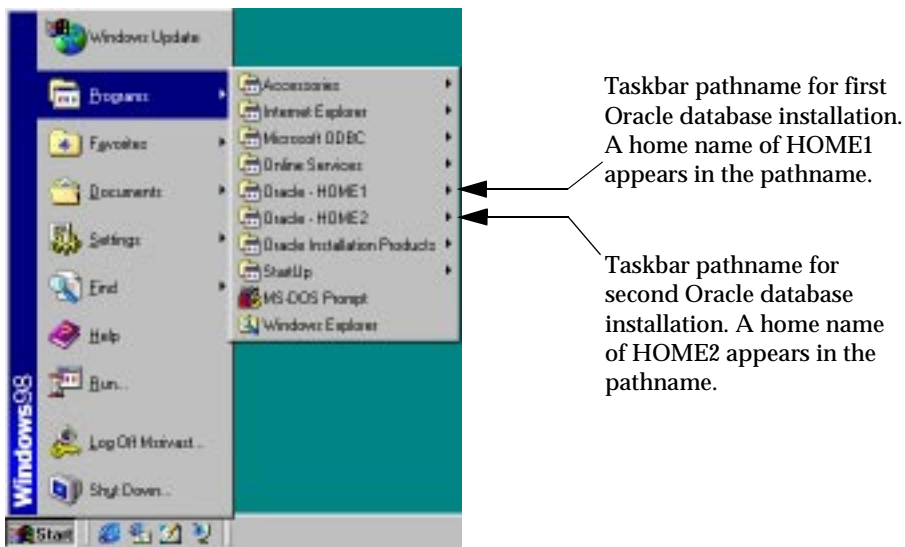
**To start SQL\*Plus from an additional Oracle home, choose:**

Start > Programs > Oracle - *HOME\_NAME* > Application Development > SQL Plus

## Starting Tools from Release 8.1.6 Personal Edition for Windows 98 Multiple Oracle Homes

In release 8.1.6, all Oracle homes, including the first Oracle home you create on your computer, have a unique *HOME\_NAME*. For example, the command to start Database Configuration Assistant is as follows:

Start > Programs > Oracle - *HOME\_NAME* > Database Administration > Database Configuration Assistant, where *HOME\_NAME* is the name of the Oracle home. For example, either HOME1 or HOME2 in the following figure:



## Starting Database Tools

This table describes how to start most tools, and where to go for further information on using these products:

Tool	Choose Start > Programs > Oracle - <i>HOME_NAME</i> >	For More Information, See...
Oracle Data Migration Assistant	Migration Utilities > Data Migration Assistant	<ul style="list-style-type: none"> <li>■ Oracle8i Migration</li> <li>■ <i>Oracle8i Installation Guide for Windows 98</i></li> </ul>
Oracle Database Configuration Assistant	Database Administration > Database Configuration Assistant	<ul style="list-style-type: none"> <li>■ "Using Oracle Database Configuration Assistant" on page 6-3</li> <li>■ <i>Oracle8i Installation Guide for Windows 98</i></li> </ul>
Net8 Assistant	Network Administration > Net8 Assistant	<i>Net8 Administrator's Guide</i>
Net8 Configuration Assistant	Network Administration > Net8 Configuration Assistant	<i>Net8 Administrator's Guide</i>

## Starting Oracle Utilities from the Command Line

This table describes how to start Oracle utilities from the MS-DOS command line, and where to go for further information on using these products:

Oracle Utilities	To Start...	For More Information, See...
DBVERIFY (DBV)	<p>Enter the following at the MS-DOS command prompt:</p> <pre>C:\&gt; DBV</pre> <p>DBVERIFY starts and prompts you for a file name parameter. To obtain a list of parameters, enter the following at the MS-DOS command prompt:</p> <pre>C:\&gt; DBV HELP=Y</pre>	<i>Oracle8i Utilities</i>

Oracle Utilities	To Start...	For More Information, See...
Export Utility (EXP)	<p>Enter the following at the MS-DOS command prompt followed by your user name and password:</p> <p>C:\&gt; EXP</p> <p>EXP starts and prompts you for parameters. To obtain a list of these parameters, enter the following at the MS-DOS command prompt:</p> <p>C:\&gt; EXP HELP=Y</p> <p><b>Note:</b> When running the Export Utility, the default values for the following parameters under Windows NT are:</p> <p>BUFFER 4 KB</p> <p>RECORDLENGTH 2 KB</p> <p><b>Note:</b> To export an entire database, you must use the user name SYSTEM. Do not use INTERNAL or SYS.</p>	<ul style="list-style-type: none"><li>▪ <i>Oracle8i Utilities</i>, which describes how to use the Export Utility</li><li>▪ <i>Oracle8i Error Messages</i> for information on error messages</li></ul>
Import Utility (IMP)	<p>Enter the following at the MS-DOS command prompt followed by your user name and password:</p> <p>C:\&gt; IMP</p> <p>IMP starts and prompts you for parameters. To obtain a list of these parameters, enter the following at the MS-DOS command prompt:</p> <p>C:\&gt; IMP HELP=Y</p> <p><b>Note:</b> When running the Import Utility, the default values for the following parameters under Windows NT are:</p> <p>BUFFER 4 KB</p> <p>RECORDLENGTH 2 KB</p>	<ul style="list-style-type: none"><li>▪ <i>Oracle8i Utilities</i>, which describes how to use the Import Utility</li><li>▪ <i>Oracle8i Error Messages</i> for information on error messages</li></ul>
Migration Utility (MIG)	<p>Enter the following at the MS-DOS command prompt:</p> <p>C:\&gt; MIG</p> <p>To obtain a list of parameters, enter the following at the MS-DOS command prompt:</p> <p>C:\&gt; MIG HELP=Y</p>	Oracle8i Migration
OCOPY	<p>Enter the following at the MS-DOS command prompt:</p> <p>C:\&gt; OCOPY</p>	"Backing Up Files with OCOPY" on page 9-3

Oracle Utilities	To Start...	For More Information, See...
Password Utility (ORAPWD)	Enter the following at the MS-DOS command prompt: C:\> ORAPWD  Note that the password file is a hidden file. To see it in a file list, from the Windows NT Explorer, choose View > Options > View > Show All Files	"Creating Password Files" on page 7-5
Recovery Manager (RMAN)	Enter the following at the MS-DOS command prompt: C:\> RMAN PARAMETERS	<ul style="list-style-type: none"> <li>Recovery Manager (RMAN) in command line mode on page 11-2 and <i>Oracle8i Backup and Recovery Guide</i> for instructions on using this tool</li> </ul>
SQL*Plus (SQLPLUS)	Enter the following at the MS-DOS command prompt: C:\> SQLPLUS	<ul style="list-style-type: none"> <li><i>SQL*Plus User's Guide and Reference</i></li> <li>"Starting and Shutting Down a Database with SQL*Plus" on page 7-2, for examples of starting and stopping the database with SQL*Plus</li> </ul>
SQL*Loader (SQLLDR)	Invoke SQL*Loader at the MS-DOS command prompt followed by certain keywords. Enter the following and SQL*Loader displays a Help screen with the available keywords and default values: C:\> SQLLDR	<ul style="list-style-type: none"> <li>Oracle8i Utilities, which describes how to use SQL*Loader</li> <li><i>Oracle8i Error Messages</i> for information on error messages</li> <li>"Using SQL*Loader" on page 2-10</li> </ul>
TKPROF (TKPROF)	Enter the following at the MS-DOS command prompt: C:\> TKPROF	<i>Oracle8i Tuning</i>

## Starting Windows 98 Tools

This table describes how to start Windows 98 tool, and where to go for more information on using this product:

Windows 98 Tools	To Start...	For More Information, See...
Registry	<ul style="list-style-type: none"><li>Enter the following at the MS-DOS command prompt on Windows 98: C:\&gt; REGEDIT The registry editor window appears.</li></ul>	<ul style="list-style-type: none"><li>"Registry" on page 2-12</li><li>Appendix C, "Oracle8i Configuration Parameters and the Registry"</li><li>Your Microsoft Windows 98 documentation</li></ul>

## Using SQL\*Loader

This section describes Windows 98-specific information for using SQL\*Loader (SQLLDR).

## Windows 98 Processing Options

These are the possible values for the Operating System Dependent (OSD) file processing specifications string option, referred to in the "SQL\*Loader Control File Reference" chapter of *Oracle8i Utilities*.

Processing Option	Description
"1"	Stream record format in which each record is terminated by a newline character. The maximum record size is 48 KB.
"FIX n"	Fixed record format in which each record is exactly <i>n</i> bytes long. If the record is terminated by a newline character, the newline character must be the <i>n</i> th byte. Note that the <i>Oracle8i Utilities</i> guide refers to this control file option as "RECSIZE".



Processing Option	Description
"VAR xxxx"	<p>Load variable length records. Specify the OSD "VAR <i>recsizehint</i>" in the control file for this option to take effect. The <i>xxxx</i> gives an estimate of the average record size to SQL*Loader so that it can approximate buffer sizes accurately and not waste memory. The default length is eighty characters. The <i>xxxx</i> does <i>not</i> specify how many leading bytes of length are included in each record. It only acts as a hint to SQL*Loader. Each record must always be preceded by five ASCII bytes containing the length of the remainder of the record. For example, a record must look like the following:</p> <pre>00024This is a 24 byte string</pre> <p>Any whitespace, carriage returns, or linefeeds at the end of the record are ignored unless specifically included in the byte count in the length field.</p>

<sup>1</sup> Two double quote characters with no space in between.

## Direct Path Option

SQL\*Loader includes a direct path option that bypasses Oracle8i for Personal Edition redo log and data verification features, thereby decreasing loading time. Use the direct path option with data files known to be error free.

## Control File Conventions

When preparing a SQL\*Loader control file (.CTL), you must follow certain syntax and notational conventions. When specifying datatypes in the SQL\*Loader control file, note that the default sizes of native datatypes are specific to Windows 98. You cannot override these defaults in the control file.

Native Datatypes	Default Field Length
DOUBLE	8
FLOAT	4
INTEGER	4
SMALLINT	2

**See:** *Oracle8i Utilities* for a complete list of options and instructions on using SQL\*Loader.

## Using Windows 98 Tools

The following Windows 98 tool can be used to administer an Oracle database:

- Registry

### Registry

The Oracle database stores its configuration information in a structure known as the registry. You can view and modify this configuration information through the registry editor. The registry contains configuration information for your computer, and must not be accessible for editing by inexperienced users. Only experienced administrators should view and change this information.

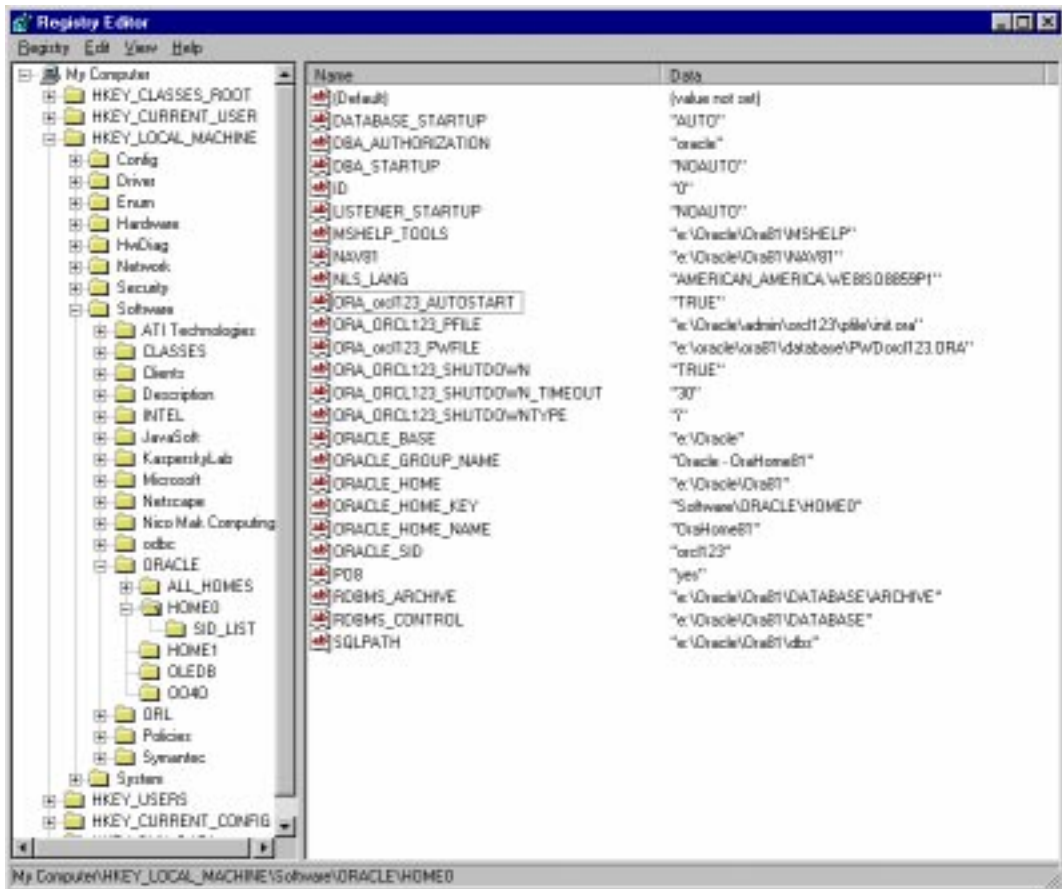
The registry editor displays configuration information in a tree-like format consisting of four keys (or folders). These keys are shown in the tree view in the left-hand window. In the right-hand window, the parameters and values assigned to that key are displayed.

#### What Database Parameters Are Configured?

When you install products from your CD-ROM, configuration parameters are automatically entered in the registry. These parameters are read each time your Windows 98 computer is restarted and whenever an Oracle product is launched. These parameters include settings for:

- Oracle home directory
- Language
- Company name
- Oracle home subdirectories for individual products
- Individual products such as SQL\*Plus

The following figure shows some of the Oracle database configuration parameters in the registry:



**See:** See Appendix C, "Oracle8i Configuration Parameters and the Registry" for definitions of Oracle database configuration parameters and specific instructions on using the registry to modify Oracle database configuration parameters.



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# Multiple Oracle Homes and Optimal Flexible Architecture

This chapter describes the concepts of multiple Oracle homes and Optimal Flexible Architecture (OFA) for Oracle8i Personal Edition for Windows 98.

Specific topics discussed are:

- Introduction to Multiple Oracle Homes and OFA
- Multiple Oracle Homes Overview
- Which Products Are Multiple Oracle Home-Enabled?
- Changing the Value of PATH
- Exiting Oracle Universal Installer After Entering Name and PATH
- Setting Variables in the Environment or the Registry
- Optimal Flexible Architecture Overview
- Differences Between Directory Trees by Release
- Directory Tree of a Sample OFA-Compliant Database
- OFA Directory Naming Conventions
- OFA and Multiple Oracle Home Configurations

## Introduction to Multiple Oracle Homes and OFA

When you install an Oracle database, you are installing one of the largest applications that your computer can support. Using multiple Oracle homes and OFA provides many advantages when administering large databases. The following advantages are the most important:

- Databases are easier to administer because of the structured organization of directories and files, and the consistent naming used for database files.
- A reduction of performance bottlenecks and improved safeguards against disk failures, because input/output (I/O) can be distributed across a number of disks.
- Software upgrades can be tested in an Oracle home in a separate directory from the Oracle home where your production database is located.

## Multiple Oracle Homes Overview

This section provides an overview of multiple Oracle homes. It includes the following topics:

- What Is an Oracle Home?
- Benefits of Using Multiple Oracle Homes
- Multiple Oracle Home Functionality in Different Releases
- One-Listener Support of Multiple Oracle Homes
- Multiple Oracle Home Environments

## What Is an Oracle Home?

An Oracle home corresponds to the environment in which Oracle products run. This environment includes the following:

- Location of installed product files (for example, C:\ORACLE\ORA81 )
- PATH variable pointing to the products' binary files
- Registry entries
- Program groups

Oracle homes also have a name associated with them, which you specify along with their location during installation.

## Benefits of Using Multiple Oracle Homes

The main benefit of using multiple Oracle homes is that you can run multiple releases of the same products concurrently. For example, you can test a Release 8.x.x database patch before you run your production database Release 8.x.x against it.

## Multiple Oracle Home Functionality in Different Releases

Modifications to multiple Oracle home functionality have occurred since it was introduced in Release 8.0.4. This table helps you determine the capabilities of your Oracle home depending on the release you are using.

Release	Oracle Home Functionality
Before 8.0.4	Releases of Oracle for Windows 95 prior to Release 8.0.4 only supported single Oracle homes, allowing you to install and run Oracle products in a single Oracle home. Different releases of Oracle products could be installed in the same Oracle home <i>provided</i> they had different first or second-digit release numbers. For example, you could install Release 7.2 products and Release 7.3 products and Release 7.x and 8.x products in the same Oracle home. However, you could not install multiple third-digit releases of the same products. For example, you could not install Release 7.3.2 and Release 7.3.3 of the same Oracle products on the same computer; one installation would overwrite the other.
8.0.4	<p>You can install one or more releases of Oracle products in multiple Oracle homes. For example, with multiple Oracle homes, you can install Releases 8.0.x and 8.1.3 products or 7.x and 8.0.x products in different Oracle homes on the same computer.</p> <p>You can also install different releases of Oracle products in the same Oracle home <i>provided</i> they have different first or second-digit release numbers. For example, you can install Release 7.2 products and Release 8.0.x products in the same Oracle home.</p>
8.1.5 to 8.1.6	<p>Releases 8.1.5 and 8.1.6 have the same multiple Oracle home functionality as Release 8.0.4 and later, but with these restrictions:</p> <ul style="list-style-type: none"> <li>■ You cannot install releases 8.1.5 or 8.1.6 into an Oracle home that was created using the old Installer. (The old Installer was called Oracle Installer and was used for pre-8.1.5 installations; the new Java-based Installer is called Oracle Universal Installer.)</li> <li>■ You cannot install releases of Oracle prior to Release 8.1.5 into an Oracle home that was created by Release 8.1.5 or 8.1.6.</li> <li>■ Releases 8.1.5 and 8.1.6 must be installed in separate Oracle homes. You cannot have more than one release per Oracle home.</li> <li>■ In Release 8.1.6 Personal Edition for windows 98, multiple oracle home support for RDBMS has been added.</li> </ul>

Release	Oracle Home Functionality
8.1.5 to 8.1.6	<p>You can use a Release 8.1.6 listener to spawn a connection to a Release 8.1.x, 8.0.x, or 7.3.x database. However, in a mixed environment, you cannot enable the use of shared sockets.</p> <p>Some restrictions exist in using 8.1.6 listeners to spawn connections to earlier versions of the database. These include:</p> <ul style="list-style-type: none"><li>■ You should enable process mode external procedures for Release 8.1.6 if you want to spawn a connection to a Release 8.0.4 databases.</li><li>■ You must install the Release 8.0.4.0.3 (or later) patch for Net8.</li><li>■ You cannot enable shared sockets.</li></ul>

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**WARNING: Multiple Oracle homes functionality only works with Releases 8.0.4 and later. You cannot install Release 7.3.4 products in a separate Oracle home.**

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### One-Listener Support of Multiple Oracle Homes

You can use one listener for spawning connections to databases for multiple Oracle homes. You only need to add all the System Identifiers (SIDs) to the SID\_LIST section in the *ORACLE\_BASE\ORACLE\_HOME\NETWORK\ADMIN\LISTENER.ORA* file.

Because the SID is unique to a system across different Oracle homes, the listener can spawn the database thread for a specific SID in the correct Oracle home, and the *ORACLE\_HOME* parameter (used in UNIX environments only) is not needed in the *LISTENER.ORA*.

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**Note:** There may be multiple *LISTENER.ORA* files on your computer, one for each Oracle home. To ensure that you use the correct *LISTENER.ORA* file, check the Oracle home name in the listener service.

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## Multiple Oracle Home Environments

This section describes the differences among multiple Oracle home environments since multiple Oracle homes were first introduced in Release 8.0.4.

### Release 8.0.4 and later 8.0.x Oracle Home Environments

If you have Release 8.0.4 or later 8.0.x Oracle homes on your computer, note these differences between the first Oracle home you installed and more recent Oracle homes you may install:

Element	First Oracle Home	Each Additional Oracle Home
Program Groups	Oracle for Windows 98  Oracle home name is not appended to the group.	Appends the Oracle home name to the program group. For example: Oracle for Windows 98 - <i>HOME_NAME</i>
Registry Entries	Located in HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE	Subkeys for each Oracle home are added below the HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE subkey (HOME0, HOME1, HOME2, and so on). For more information on the registry keys and subkeys, see Appendix C, "Oracle8i Configuration Parameters and the Registry".
System Identifier (SID) name for starter database	Automatically named ORCL	Having more than one instance of database was not supported on Windows 98 platform.

Release 8.1 Oracle Home Environment

Release 8.1 Oracle homes are slightly different from pre-8.1 Oracle homes.

Element	First Oracle Home	Each Additional Oracle Home
Program Groups	Oracle - <i>HOME_NAME</i>	Oracle - <i>HOME_NAME</i>
Registry Entries	Located in HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\HOME0	Subkeys for each Oracle home are added in the HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE subkey. For example, the next subkeys after HOME0 are HOME1, HOME2, HOME3, and so on. For more information on the registry keys and subkeys, see Appendix C, "Oracle8i Configuration Parameters and the Registry".
System Identifier (SID) <sup>1</sup> name and DB_NAME	For 8.1.5 and 8.1.6, you must type in the global database name and SID name of your choice when prompted during installation.	Having more than one instance of Personal Edition database on Windows 98 platform is supported in Release 8.1.6.

<sup>1</sup> For Releases 8.1.5 and 8.1.6, the SID can be a maximum of 64 alphanumeric characters in length. For all releases prior to 8.1.5, the SID was a maximum of 4 alphanumeric characters.

Which Products Are Multiple Oracle Home-Enabled?

You can install all products on the CD-ROM into your first Oracle home on a "clean" computer (that is, there is no other Oracle software on the computer) without any conflict.

If you create more Oracle homes, and install the same products that you installed into the first Oracle home, conflicts can arise that cause your original database to function incorrectly if the products are not multiple Oracle home-enabled (multiple Oracle home products.)

To avoid such problems, check the following product classifications before installing multiple versions of the same product on your computer. Oracle products are classified as follows:

- Products Supporting Multiple Oracle Homes
- Products Supporting a Single Oracle Home
- Products Not Supporting Multiple Oracle Homes
- Products Not Associated with an Oracle Home

## Products Supporting Multiple Oracle Homes

You can install multiple Oracle home products *multiple times in different Oracle homes*. All products are multiple Oracle home products unless they are listed in:

- "Products Supporting a Single Oracle Home" on page 3-7 or
- "Products Not Supporting Multiple Oracle Homes" on page 3-7

## Products Supporting a Single Oracle Home

You can install single Oracle home products into any Oracle home, but *only once per computer*. When installing groups of products, if any of the products in the following list are included in the group and already exist on the computer, do not install them a second time:

- Oracle Objects for OLE
- Oracle Open Database Connectivity (ODBC) Driver
- All products that depend on any of these products

## Products Not Supporting Multiple Oracle Homes

All Oracle7 products and all Release 8.0.3 products are non multiple Oracle home products. You can only install these products into an old-style Oracle home (pre-8.0.4 Oracle home is an old-style Oracle home).

## Products Not Associated with an Oracle Home

Products not associated with an Oracle home have no restrictions into how many Oracle homes you install them. They include the following:

- Oracle Universal Installer
- Java Runtime Environment

When you install these products, Oracle Universal Installer requires that you install them into any Oracle home. However, these files are actually installed in the directory X:\PROGRAM FILES\ORACLE, where X: is the hard drive where Windows 98 is installed.

## Changing the Value of PATH

Unless you specify otherwise at installation time, the Oracle home in which you installed products most recently is the first directory listed in your PATH (primary home). As such, it has priority over the other Oracle home entries in your PATH.

If you invoke a product from the MS-DOS command prompt, the release of the product invoked is the one in the Oracle home listed first in your path, unless you specifically invoke a different release of the product by one of the following methods:

- Specifying the full directory path name to the release of the product you want to use at the MS-DOS command prompt.
- Changing to the directory that contains the executable you want to use.
- Changing your PATH so that the first entry points to the binary files for the product release you want to use.

You can change the value of PATH by using one of the following methods:

- Using Oracle Home Selector
- At the System Level

You can assign a new value at the system level. The new value exists until you change the value of PATH again.

- At the MS-DOS Command Prompt

You can assign a new value at the MS-DOS command prompt. The new value reverts to its previous value when you quit the session.

## Using Oracle Home Selector

Oracle Home Selector is a graphical user interface (GUI) tool that enables you to edit your environment path to make an appropriate Oracle home directory your primary home. This tool can only be used when you have multiple, active Oracle home directories on a single computer.

### **To change the value of PATH using Oracle Home Selector:**

1. Choose Start > Programs > Oracle Installation Products > Home Selector.

The *Oracle Home Selector* window appears.

2. Select the Oracle home that you want as the primary Oracle home from the drop-down list.
3. Click OK.

## At the System Level

### **To change the value of PATH at the system level:**

#### **On Windows 98**

1. Open the AUTOEXEC.BAT file.
2. Edit the value of the PATH statement.
3. Reboot your computer.

## At the MS-DOS Command Prompt

**To change the value of PATH at the MS-DOS command prompt:**

At the MS-DOS command prompt, enter:

```
C:\> SET PATH=PATHNAME;%PATH%
```

where *PATHNAME* is the full path to the binary files for the products you want to use. This change is valid for the current session only. If you want to change the value of your PATH more permanently, use Oracle Home Selector or change the value of PATH at the system level. Both methods are described above.

## Exiting Oracle Universal Installer After Entering Name and PATH

If you have to exit Oracle Universal Installer unexpectedly after you have entered the name and path for an Oracle home (for example, because there is no more disk space in the path you specified), you cannot specify a different path until you delete the *HOMEID* key and the *IDx* key corresponding to that Oracle home from the registry. To do this:

1. Read the value of the *ORACLE\_HOME\_NAME* parameter for each *HOMEID* subkey in the *HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE* key until you find the value that matches the name of the Oracle home you need to delete.
2. Delete the *HOMEID* subkey you just located.
3. Delete the appropriate *IDx* subkey in the *HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE\ ALL\_HOMES* key, where *x* has the same value as the *ID* in *HOMEID*. For example, if the *HOMEID* subkey for the home name you want to delete is *HOME1*, then the appropriate *IDx* subkey is *ID1*.

**See Also:** Appendix C, "Oracle8i Configuration Parameters and the Registry" for more information on the registry keys and subkeys.

## Setting Variables in the Environment or the Registry

Variables set in the environment always override the value of equivalent variables set in the registry. The following section describes the consequences of setting two of the most commonly-used environment variables, ORACLE\_HOME and TNS\_ADMIN.

### ORACLE\_HOME

Oracle Corporation recommends that you *never set* the ORACLE\_HOME environment variable because it is not required for Oracle products to function properly. If you set the ORACLE\_HOME environment variable, Oracle Universal Installer will unset it for you. Oracle products find the value of ORACLE\_HOME at the location specified by the *ORACLE\_BASE\ORACLE\_HOME\BIN\ORACLE.KEY* file. If there is a need to set ORACLE\_HOME in the environment for another reason, care must be taken to only run software from that Oracle home when the variable is set.

When you run an Oracle program from the MS-DOS command prompt, the first executable by that name found in the directory path runs. For example, C:\>SQLPLUS. Alternately, if you specify a full directory path, the specified program runs. For example, C:\ORACLE\ORA81>SQLPLUS.

If you modify the value of PATH using any of the three methods described in the previous section, "Using Oracle Home Selector", "At the System Level", or "At the MS-DOS Command Prompt", you can change the choice of which version of a program is run from the MS-DOS command prompt. In sum, modifying the value of PATH indicates from which Oracle home to run executables, at the MS-DOS command prompt, when no full directory path is specified.

Once an Oracle program starts, it looks for all environment variables in the following order:

1. In the current environment
2. In the registry key for the Oracle home from which the program is running.

The program knows where it's running from by calling Window 98 to obtain the executable's path name, and then parsing the path name to get the directory from which it's running. In the *ORACLE\_BASE\ORACLE\_HOME\BIN* directory where the executable resides, there is a file called ORACLE.KEY. This file specifies where in the registry to look for variables when programs from that particular Oracle home are run.

For example, if you run `C:\ORACLE\ORA81\BIN\SQLPLUS.EXE`, `SQLPLUS.EXE` looks in `C:\ORACLE\ORA81\BIN\ORACLE.KEY` to find out where to look for its registry variables. If the `ORACLE.KEY` file does not exist (for version 7.x and some version 8.0 Oracle homes), Oracle uses `HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE` to locate the registry variables.

In a typical case, there are no Oracle variables (that is, `ORACLE_HOME`) set in the environment. Any programs run from a Release 8.0.4 Oracle home look in the `ORACLE.KEY` file in that Oracle home and find their variables (including `ORACLE_HOME`) in the correct registry key. Likewise for Release 8.1.6, the Oracle home that gets priority depends on the `PATH`, but regardless of the `PATH` setting, all the software works correctly.

### Consequences of Setting `ORACLE_HOME`

If you set `ORACLE_HOME` in the environment, then software run from another Oracle home will not work reliably. The conflict occurs when you set `ORACLE_HOME` to point to one Oracle home directory, then attempt to run programs from a second Oracle home. These programs first check for any environment variable settings (such as `ORACLE_HOME`), before checking the registry through the `ORACLE.KEY` file. Since `ORACLE_HOME` is set, the programs in the second Oracle home attempt to use files in the first Oracle home, causing a conflict.

For example, assume you have Release 8.0.4 installed in `C:\ORAWIN95`, and Release 8.1.6 installed in `C:\ORACLE\ORA81`, and `ORACLE_HOME` is set to `C:\ORAWIN95` in the environment. If you run a program from `C:\ORACLE\ORA81\BIN`, that program first looks in the environment for all variables *before* looking at its `ORACLE.KEY` file. So, a program run from your Release 8.1.6 Oracle home runs with `ORACLE_HOME=C:\ORAWIN95`. Therefore, anything that the program uses `ORACLE_HOME` for will be looked for in `C:\ORAWIN95`, where it may not exist. Examples include message files (.MSB), SQL scripts (.SQL), and any other files opened by the program and based on `ORACLE_HOME`.



## TNS\_ADMIN

Oracle software looks for TNS\_ADMIN in one location in the registry (depending upon the type of Oracle home installed). If you installed software into the default Oracle home, then any software running from that Oracle home will look in HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE. If you installed a new-style (8.0.4 or later) multiple Oracle home, then the Oracle software looks in HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE\HOMEID. The ALL\_HOMES key is used by the installer and plays no role when translating variables.

The environment always overrides the registry, so if TNS\_ADMIN is set in the environment, that takes precedence over the TNS\_ADMIN setting in the registry. No variables should be set in the environment by the Oracle Home Selector except for the PATH.

## Optimal Flexible Architecture Overview

The Oracle Optimal Flexible Architecture (OFA) is a set of file naming and placement guidelines for Oracle software and databases. It can also be thought of as a set of *good habits* to adopt when organizing Oracle directories and files on your computer. All Oracle products on the CD-ROM are OFA-compliant; that is, Oracle Universal Installer places Oracle products in directory locations that follow the OFA guidelines. Although using OFA is not a requirement, Oracle Corporation recommends that you use it if your database will grow in size, or if you plan to have multiple databases.

The aim of OFA is to prevent an entire class of problems that can occur when you have different versions of Oracle software and multiple, growing databases on your computer. OFA is designed to provide significant benefits in the following areas:

- Ease of maintenance of Oracle software and databases through standard file organization
- Reliability through data spanning multiple physical drives
- Performance through decreased I/O contention for disks

For example, one of the many benefits of OFA is that Oracle Universal Installer separates Oracle software executables from database files. Previously, database files were placed in `ORACLE_HOME\DATABASE`, a subdirectory of the Oracle home directory that also contained Oracle software. Using OFA, Oracle Universal Installer puts Oracle software in `ORACLE_BASE\ORACLE_HOME` and database files in `ORACLE_BASE\ORADATA`.

Putting database files in a subdirectory of the Oracle home directory that also contained Oracle software made upgrades unnecessarily difficult. Separating software from data is essential, because over time, when you upgrade a database to the latest release, the new Oracle software executables will be placed in a different Oracle home directory. After the upgrade is judged to have been successful, you can easily remove the old Oracle home directory and reclaim space because the database does not reside there.

## Benefits of an OFA-Compliant Database

An OFA-compliant database has the following benefits:

- **Easier database administration and management of database growth**

The file system is organized to simplify the following tasks:

- Locating specific database files
- Adding database files as the database grows

- **Fewer performance bottlenecks**

Disk contention decreases, because Oracle administration files, binary files, and data files that used to be on one disk can now reside in separate directories or in separate directories on separate disks.

- **Safeguards against disk failures**

By spreading files across more than one disk, disk failures impact as little data as possible.

- **Support for concurrent execution of application software**

You can run multiple versions of application software simultaneously, enabling you to test and use a new release of an application before abandoning the previous version. Transferring to a new version after an upgrade is simple for the database administrator and transparent for the user.

## Characteristics of an OFA-Compliant Database

An OFA-compliant database has the following characteristics:

- **Independent subdirectories**

Categories of files are separated into independent subdirectories so that files in one category are minimally affected by operations on files in other categories.

- **Consistent naming conventions for database files**

Database files are named to realize the following advantages:

- Database files are easily distinguishable from all other files
- Files of one database are easily distinguishable from files of another database
- Control files, redo log files, and data files are easily identifiable
- Clearly indicated association of data files to tablespaces

- **Integrity of Oracle home directories**

You can add, move, or delete Oracle home directories without having to revise programs that refer to them.

- **Distinguishes administrative information for each database**

The ability to separate administrative information about one database from that of another ensures a reasonable structure for the organization and storage of administrative data.

- **Separation of tablespace contents**

Tablespace contents are separated to realize the following advantages:

- Minimize tablespace-free space fragmentation
- Minimize I/O request contention
- Maximize administrative flexibility

- **Tuning I/O loads across all disks**

I/O loads are tuned across all disks, including disks storing Oracle data in raw devices, if needed.

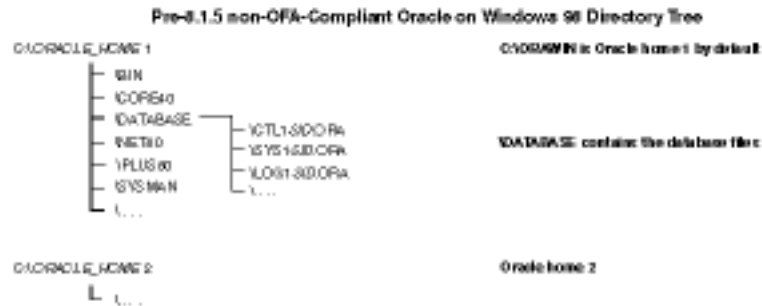
# Differences Between Directory Trees by Release

OFA has necessitated changes to the Oracle database directory tree. This table lists the differences:

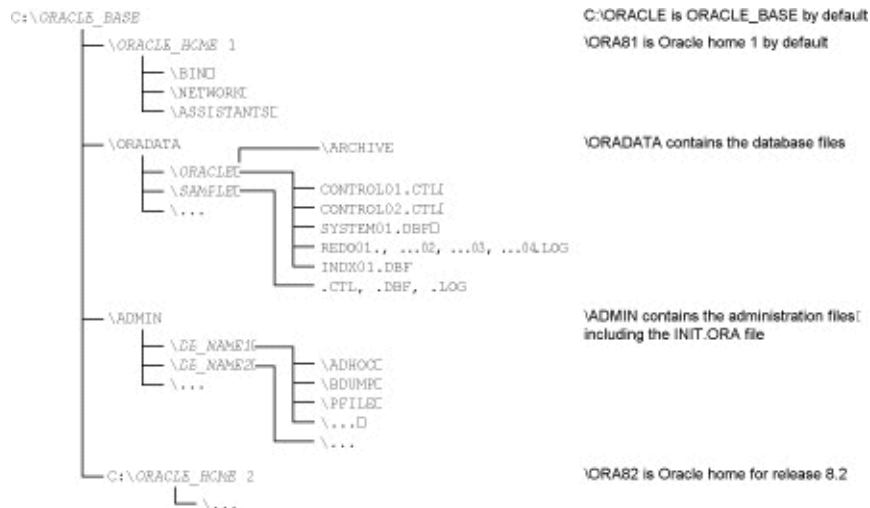
Element	Pre-8.1.5 non-OFA-Compliant	Post-8.1.5 OFA-Compliant
Name of the top-level directory where Oracle is installed.	<p>When you install Oracle8i Personal Edition all subdirectories are located under a top-level <i>ORACLE_HOME</i> directory that by default is C:\ORAWIN95.</p> <p>See the following figure on page 3-17 for a depiction of the pre-8.1.5 non-OFA-compliant directory tree.</p>	<p>When you install Oracle8i Personal Edition all subdirectories are no longer under a top-level <i>ORACLE_HOME</i> directory. There is now a new top-level directory called <i>ORACLE_BASE</i> that is of the form X:\ORACLE where X is any hard drive. If you install an OFA-compliant database using Oracle Universal Installer defaults, <i>ORACLE_BASE</i> is C:\ORACLE.</p> <p>\ORACLE_HOME directories are located under <i>ORACLE_BASE</i>. The \ORADATA and \ADMIN directories, which contain the database files and database administration files, are also located under <i>ORACLE_BASE</i>.</p> <p>See the following figure on page 3-17 for a depiction of the 8.1.5 and 8.1.6 OFA-compliant directory tree.</p>
Database file names	<p>Database files have the SID in the database file name. For example, the first control file is named CTL1SID.ORA.</p>	<p>Database files no longer have the SID in the database file name. For example, the first control file is named CONTROL01.CTL. There is no need for the presence of the <i>SID</i> in the file name because all the database files for a particular database are placed in \ORADATA under a directory called <i>DB_NAME</i> that is named for that database.</p>
Database file name extensions	<p>All database files have the same .ORA extension.</p>	<p>The convention of having .ORA as the file name extension for database files is no longer used. Database file names now have more meaningful extensions. These are .CTL for control files, .LOG for log files, and .DBF for data files.</p>

The following figure provides a top-level overview of the old and new database directory trees:

### Pre-8.1.5 non-OFA-Compliant Oracle on Windows 98 Directory Tree



### 8.1.6 OFA-Compliant Oracle on Windows 98 Directory Tree



## Directory Tree of a Sample OFA-Compliant Database

The following is the complete hierarchical directory tree of a sample OFA-compliant database:

<b>X:\ORACLE_BASE</b>		C:\ORACLE is the default ORACLE_BASE directory
<b>\ORACLE_HOME1</b>		\ORA81 is the name of the first Oracle home by default
<b>\BIN</b>		Subtree for Oracle binaries
<b>\NETWORK</b>		Subtree for Net8
<b>\ASSISTANTS</b>		Configuration assistants
<b>\ORADATA</b>		Subtree for Oracle database files
<b>\DB_NAME1</b>		Subtree for DB_NAME1 database files
<b>CONTROL01.CTL</b>		Control file 1
<b>CONTROL02.CTL</b>		Control file 2
<b>CONTROL03.CTL</b>		Control file 3
<b>DRO1.DBF</b>		interMedia related objects
<b>SYSTEM01.DBF</b>		System tablespace data file
<b>RBS01.DBF</b>		Rollback tablespace data file
<b>INDX01.DBF</b>		Index tablespace data file
<b>TEMP01.DBF</b>		Temporary tablespace data file
<b>USERS01.DBF</b>		Users tablespace data file
<b>REDO01.LOG</b>		Redo log file group 1, member 1
<b>REDO02.LOG</b>		Redo log file group 2, member 1
<b>REDO03.LOG</b>		Redo log file group 3, member 1
<b>\DB_NAME2</b>		Subtree for DB_NAME2 database files
<b>CTL DBF LOG</b>		Control, data, and redo log files
<b>\DB_NAME3</b>		Subtree for DB_NAME3 database files
<b>CTL DBF LOG</b>		Control, data, and redo log files
<b>\ADMIN</b>		Subtree for database administration files
<b>\DB_NAME1</b>		Subtree for DB_NAME1 database administration files
<b>\ADHOC</b>		Ad hoc SQL scripts
<b>\ADUMP</b>		Audit files
<b>\ARCH</b>		Archived redo log files
<b>\BDUMP</b>		Background process trace files
<b>\CDUMP</b>		Core dump files
<b>\CREATE</b>		Database creation files
<b>\EXP</b>		Database export files
<b>\PFILE</b>		Initialization parameter file
<b>\UDUMP</b>		User SQL trace files
<b>\DB_NAME2</b>		Subtree for DB_NAME2 database administration files
...		
<b>\DB_NAME3</b>		Subtree for DB_NAME3 database administration files
...		

<code>\ORACLE_HOME2</code>	Second Oracle home
<code>\...</code>	
<code>\ORACLE_HOME3</code>	Third Oracle home
<code>\...</code>	

## OFA Directory Naming Conventions

OFA uses directory naming conventions that make it easy to identify the precise Oracle home and database name that is associated with a set of files. This section describes the naming conventions used for the top-level directories of an OFA-compliant database directory tree:

- ORACLE\_BASE Directory
- ORACLE\_HOME Directory
- ADMIN Directory
- ORADATA Directory
- DB\_NAME Directory

### *ORACLE\_BASE* Directory

*ORACLE\_BASE* is the root of the Oracle directory tree. If you install an OFA-compliant database using Oracle Universal Installer defaults, *ORACLE\_BASE* is *X:\ORACLE* where *X* is any hard drive. For example, *C:\ORACLE*.

If you are installing Oracle8i Personal Edition for Windows 98 on a clean computer, you may want to change *ORACLE\_BASE* to an appropriate value before running Oracle Universal Installer. Most users will not need or want to do this.

Before you run Oracle Universal Installer for the first time, change the value of *ORACLE\_BASE* at the system level. Only change the value of *ORACLE\_BASE* before you run Oracle Universal Installer for the first time because if there is an existing *ORACLE\_BASE*, and you change it, there will be a conflict of Oracle base directories. If you create another *ORACLE\_BASE* when the original *ORACLE\_BASE* already exists, certain tools and the database will not be able to find previously created files because they will look for them in the new *ORACLE\_BASE* instead of the original *ORACLE\_BASE*.

**To change the value of *ORACLE\_BASE* at the system level:**

*Windows 98:*

1. Open the AUTOEXEC.BAT file, using a text editor.

- 2. Edit the value of the ORACLE\_BASE statement.
- 3. Reboot your computer.

---

**Note:** An ORACLE\_BASE registry key exists for every Oracle home. Ideally, the value of the ORACLE\_BASE registry key will be identical for each Oracle home.

---

**ORACLE\_HOME Directory**

\ORACLE\_HOME is located beneath X:\ORACLE\_BASE and contains subdirectories for Oracle software executables and network files.

If you install Oracle8i Personal Edition for Windows 98 on a clean computer and use the default settings, the first Oracle home directory that you create is called \ORA81.

**ADMIN Directory**

Database administration files are stored in subdirectories of ORACLE\_BASE \ADMIN\DB\_NAME.

The following table describes the subdirectories for database administration files:

Subdirectories of \ADMIN\DB_NAME	Contain...
\ADHOC	Ad hoc SQL scripts for a given database
\BDUMP	Background process trace files
\CDUMP	Core dump files
\CREATE	Database creation files
\EXP	Database export files
\PFILE	Initialization parameter files
\UDUMP	User process trace files



## ORADATA Directory

Database files are stored in *ORACLE\_BASE\ORADATA\DB\_NAME*.

The following table describes the database files:

<b>Files in \ORADATA\DB_NAME</b>	<b>Description</b>
CONTROL01.CTL	Control file 1
CONTROL02.CTL	Control file 2
CONTROL03.CTL	Control file 3
SYSTEM01.DBF	SYSTEM tablespace data file
RBS01.DBF	RBS tablespace data file
INDX01.DBF	INDX tablespace data file
TEMP01.DBF	TEMP tablespace data file
USERS01.DBF	USERS tablespace data file
REDO01.LOG	Redo log file group one, member one
REDO02.LOG	Redo log file group two, member one
REDO03.LOG	Redo log file group three, member one

## DB\_NAME Directory

*DB\_NAME* is the unique name for a particular database and has the same value as the *DB\_NAME* parameter in the initialization parameter file. When you create a database, *DB\_NAME* can be no more than eight characters long and can contain only the following characters:

- Alphabetic characters
- Numbers
- Underscores (\_)
- Pound sign (#)
- Dollar sign (\$)

## OFA and Multiple Oracle Home Configurations

The following sections describe various OFA and multiple Oracle home configurations.

### Specifying an *ORACLE\_HOME* Directory

To install an OFA-compliant database, you must specify an Oracle home directory in the *Path:* field of Oracle Universal Installer of the form:

*X:\[PATHNAME]\ORACLE\HOME\_NAME*

where:

<i>X:\</i>	is any hard drive. For example, C:\.
<i>[PATHNAME]</i>	is an optional directory pathname.
<i>\ORACLE</i>	is a mandatory directory pathname unless you have changed the value of the ORACLE_BASE registry key before performing the installation. See "ORACLE_BASE Directory" on page 3-19 for information on how to change the <i>ORACLE_BASE</i> from the default value ORACLE.
<i>HOME_NAME</i>	is the name of the Oracle home.

The following are examples of OFA-compliant Oracle home directories:

- C:\TEST\ORACLE\ORA81
- D:\ORACLE\ORA81

### Default OFA Database

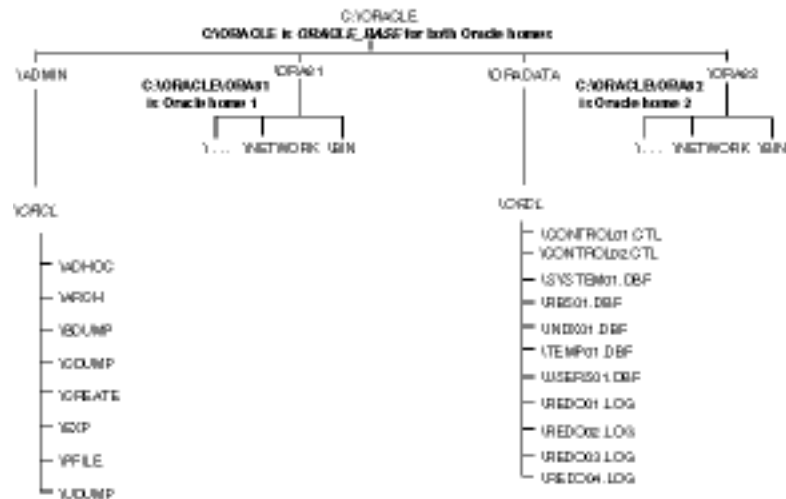
**To install a default OFA database:**

1. Install Oracle8i Personal Edition for Windows 98 Release 8.1.6 on a clean computer (one with no other Oracle software on the computer), and accept the default Oracle Universal Installer settings for the first Oracle home (C:\ORACLE\ORA81) in the *Path:* field.
2. Complete the installation.
3. Run Oracle Universal Installer again and the same release a second time or Release 8.2.x (when it is available). Accept the default Oracle Universal Installer settings for the first Oracle home (C:\ORACLE\ORA82) in the *Path:* field.

The default OFA database settings are as follows:

Setting	Value
<i>ORACLE_BASE</i>	is C:\ORACLE and is the same for all Oracle homes
Oracle home 1	is C:\ORACLE\ORA81
Oracle home 2	is C:\ORACLE\ORA82

This figure below illustrates the directory tree:



## Non-Default OFA Database, Case 1

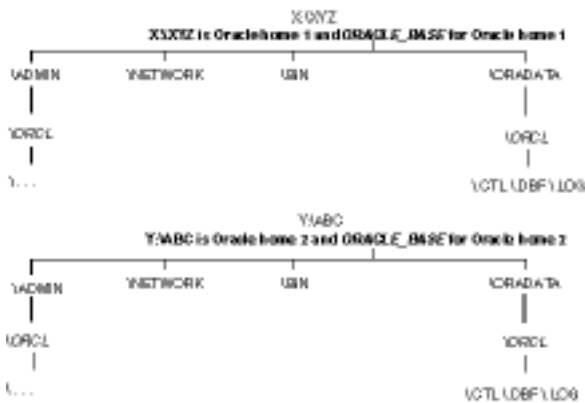
To install a non-default OFA database, case 1:

1. Install Oracle8i Personal Edition for Windows 98 Release 8.1.6 and change the default Oracle Universal Installer settings for the first Oracle home from C:\ORACLE\ORA81 in the *Path:* field to X:\XYZ.
2. Complete the installation.
3. Run Oracle Universal Installer again and change the default Oracle Universal Installer settings for the second Oracle home from C:\ORACLE\ORA82 in the *Path:* field to Y:\ABC.

For case 1, the non-default OFA database settings are as follows:

Setting	Value
ORACLE_BASE	is X:\XYZ for the first Oracle home and is Y:\ABC for the second Oracle home
Oracle home 1	is X:\XYZ
Oracle home 2	is Y:\ABC

This figure illustrates the resulting directory trees:



## Non-Default OFA Database, Case 2

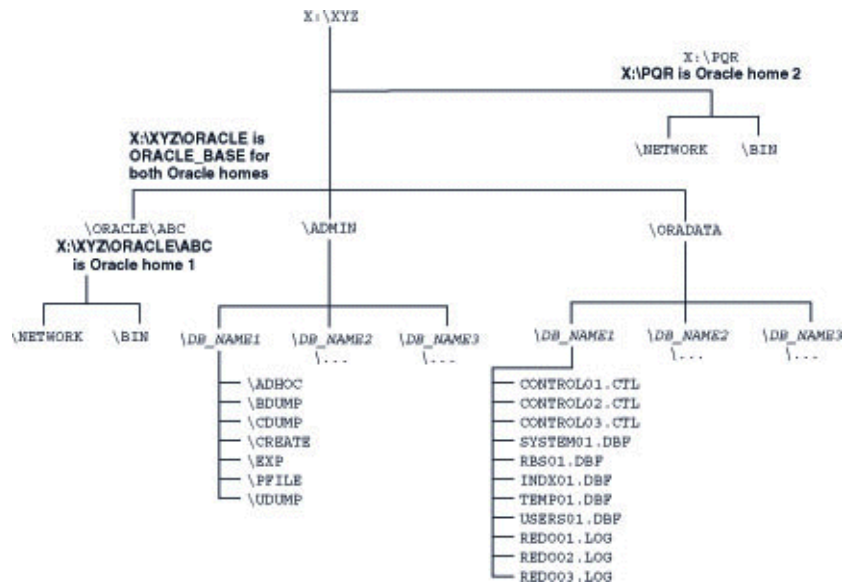
To install a non-default OFA database, case 2:

1. Install Oracle8i Personal Edition for Windows 98 Release 8.1.6 and change the default Oracle Universal Installer settings for the first Oracle home from C:\ORACLE\ORA81 in the *Path:* field to X:\XYZ\ORACLE\ABC.
2. Complete the installation.
3. Run Oracle Universal Installer again and change the default Oracle Universal Installer settings for the second Oracle home from C:\ORACLE\ORA82 to X:\PQR.

For case 2, the non-default OFA database settings are as follows:

Setting	Value
<i>ORACLE_BASE</i>	is X:\XYZ\ORACLE and is the same for both Oracle homes
Oracle home 1	is X:\XYZ\ORACLE\ABC
Oracle home 2	is X:\PQR

This figure illustrates the resulting directory tree:





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# Installing, Migrating, and Upgrading Databases

This chapter describes the options available to you when you have *existing databases* on your computer and want to install the latest release of Oracle8i Personal Edition. In particular, it describes how to migrate an Oracle7 database or upgrade an earlier Oracle8 database release to the current release of Oracle8i Personal Edition.

Specific topics discussed are:

- Intended Audience
- What to Do with Previous Oracle Database Releases
- Multiple Oracle Homes Overview
- Migrating, Upgrading, and Downgrading Overview
- Export/Import Overview
- Version 8 and Version 7 Client/Server Configurations
- Migrating an Oracle7 Database to Oracle8i
- Upgrading an Oracle8 Database Release 8.0.x to 8.1.6
- Migration Issues for Net8 and SQL\*Net
- Moving Database Files to an OFA-Compliant Directory
- Post-Migration Tasks

## Intended Audience

Read this chapter if you have *existing* Oracle7 and/or Oracle8 databases on your computer and you want to install Oracle8i Personal Edition for Windows 98 Release 8.1.6. If you are installing Oracle8i Personal Edition on a computer that has no other Oracle database releases, you do not have to read this chapter.

**Additional Information:** See *Oracle8i Installation for Windows 98* if you want to install Oracle8i Personal Edition on a computer containing no other databases.

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**Note:** The generic *Oracle8i Migration* guide is the primary source of migration and upgrading information in the Oracle documentation set. You are frequently referred to the generic guide throughout this chapter, in particular to obtain information on what you must do *before and after* migrating or upgrading. Information on how to run the various migration and upgrade utilities is also provided in the generic guide, but the focus is on UNIX. This chapter provides information on using these utilities on Windows 98.

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**Note:** The directory path examples in this chapter follow Optimal Flexible Architecture (OFA) guidelines (for example, `ORACLE_BASE\ORACLE_HOME\`). If you specified non-OFA compliant directories during installation, your directory paths will differ. See section "OFA and Multiple Oracle Home Configurations" on page 3-22 for information.

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## What to Do with Previous Oracle Database Releases

If you already have Oracle7, and/or Oracle8 databases on your computer and want to install Release 8.1.6, the following options are available to you.

- Install Release 8.1.6 in a separate Oracle home on the same computer (this procedure is known as using *multiple Oracle homes*).

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**Note:** It is not possible to install Release 8.1.6 products into an existing Oracle home created using the pre-8.1.5 Oracle Installer.

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- Migrate Release 7.x to Release 8.1.6.
- Upgrade Release 8.0.x to Release 8.1.6.
- Upgrade Release 8.1.5 to Release 8.1.6.
- Use Export/Import utilities to physically copy data in the previous database release to a new Release 8.1.6 database.

If you are not sure what option is best for you, read the following overview sections:

- Multiple Oracle Homes Overview on page 4-3
- Migrating, Upgrading, and Downgrading Overview on page 4-4
- Export/Import Overview on page 4-5

## Multiple Oracle Homes Overview

An Oracle home is a directory location where you can install software. Multiple Oracle homes functionality enables you to preserve your previous Release 7.x or 8.0.x databases in locations separate from where you will install Release 8.1.6. Installing a new database release in a separate Oracle home allows you to test it before migrating or upgrading your production databases to the new release. There have been modifications to multiple Oracle home functionality since it was introduced in Release 8.0.4. In particular, note:

- You cannot install Release 8.1.6 into an existing Oracle home that was created using the old Oracle Installer.
- Releases 8.1.6 and later must be installed in separate Oracle homes. You cannot have more than one release per Oracle home.

## Migrating, Upgrading, and Downgrading Overview

This section explains the difference between migrating, upgrading, and downgrading, and lists the Oracle database versions that can be migrated or upgraded.

### What Is Migrating?

Migrating is the process of transforming *an installed version of an Oracle database into a later version*. For example, transforming an Oracle7 database to an Oracle8i database is migrating the database system.

**Additional Information:** See “Migrating an Oracle7 Database to Oracle8i” on page 4-12.

### What Is Upgrading?

Upgrading is the process of transforming *an installed version of an Oracle database release into another release of the same version*. For example, transforming an Oracle8 database Release 8.0.4 to Release 8.1.6 is upgrading the database system.

**Additional Information:** See “Upgrading an Oracle8 Database Release 8.0.x to 8.1.6” on page 4-31.

### What Is Downgrading?

Downgrading is the process of transforming *an installed version of an Oracle database from a later release back into an earlier release*. For example, transforming an Oracle database from Release 8.1.6 back into Release 8.0.4 is downgrading, and transforming an Oracle database from Version8 back into Version7 is downgrading.

**Additional Information:** See Chapter 10, “Downgrading to an Older Version8 Release” for information about downgrading to Release 8.0, or Chapter 11, “Downgrading to Version7” for information about downgrading to version7 of *Oracle8i Migration*.

## Migrating and Upgrading Using Multiple Oracle Homes

You can easily migrate or upgrade databases across multiple Oracle homes. If you use the graphical user interface (GUI) Oracle Data Migration Assistant, the earlier database instance on your system is displayed in a list box. You select the Oracle database instance you want to migrate or upgrade and the assistant takes care of any multiple Oracle homes issues.

If you use the command line tool MIG to migrate, or a U\*.SQL script to upgrade, you need to copy files from one Oracle home directory to another. You must also ensure the PATH variable is set correctly so that any Oracle database tools you run are started from the correct Oracle home directory.

**Additional Information:** See "Changing the Value of PATH" on page 3-8.

### Checklist of Database Release Numbers

Check that your Oracle database release can be migrated or upgraded directly to Release 8.1.6. This table provides a list of the database releases you can migrate or upgrade and the tools you can use to perform these tasks:

Oracle Database Release	Use This Tool...
Release 7.3.4.x	<ul style="list-style-type: none"><li>■ MIG or Oracle Data Migration Assistant can migrate databases that are Oracle7, Release 7.3.4.x or later to Release 8.1.6</li></ul>
Release 8.0.4.0.0 to 8.1.x	<ul style="list-style-type: none"><li>■ SQL scripts executed in SQL*Plus can upgrade databases Release 8.0.4.0.0 to Release 8.1.6</li><li>■ Oracle Data Migration Assistant upgrades from Release 8.0.4.0.0 or later to Release 8.1.6</li></ul>
Release 8.1.5 to 8.1.6	<ul style="list-style-type: none"><li>■ SQL scripts executed in SQL*Plus can upgrade databases Release 8.1.5 to Release 8.1.6</li></ul>

### Export/Import Overview

An alternative method of migrating or upgrading is to:

1. Export your data from the source database using the Export Utility (EXP). This will physically copy the data to the export dump file.
2. Create an Oracle8i database into which you will import the exported data.
3. Import the exported data into the new Oracle8i database using the Import Utility (IMP).

The Export Utility puts all of the data in one large binary file that might require large amounts of disk space.

**Additional Information:** See "Choose a Migration Method" in Chapter 2, "Preparing to Migrate" of *Oracle8i Migration* for information on when to use the Export/Import utilities for migrating a database. See "Exporting an Existing Database" on page 6-8 and "Importing a Database" on page 6-18 for information on using these tools on Windows 98.

## Version 8 and Version 7 Client/Server Configurations

Oracle7 and Oracle8i clients can communicate either with Oracle7 or Oracle8i databases. This functionality gives you maximum flexibility when designing your network and deciding when to:

- Migrate an Oracle7 Database to an Oracle8i Database
- Upgrade an Oracle8 Database to the Current Oracle8i Database Release
- Migrating an Oracle7 Database to Oracle8i

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**Note:** It is not possible to install Release 8.1.6 products into an existing Oracle home created using the pre-8.1.5 Oracle Installer.

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Consider the following "database coexistence" issues before you decide which of the above options is most suitable for your requirements:

- Oracle7 Database Applications
- Different Client and Database Release Considerations
- Multi-Versioning

## Oracle7 Database Applications

Most Oracle7 applications can run on an Oracle8i database. Some applications cannot run on an Oracle8i database unless you upgrade them to versions that support Oracle8i databases. Contact your application vendor to check if your third-party applications are supported with.

**Additional Information:** See Chapter 8, "Upgrading Your Applications" of *Oracle8i Migration*.

## Different Client and Database Release Considerations

Consider the following "client to database connection" issues before you decide if upgrading or migrating is appropriate for your environment:

- Oracle8i Client Release 8.1 to Oracle8i Database Release 8.1
- Oracle8 Client Release 8.0/Oracle7 Client to Oracle8i Database Release 8.1
- Oracle8i Client Release 8.1 to Oracle8 Release 8.0/Oracle7 Databases

### Oracle8i Client Release 8.1 to Oracle8i Database Release 8.1

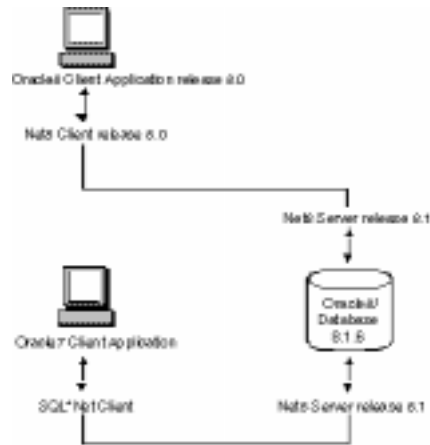
As the following diagram depicts, an Oracle8i Client Release 8.1 requires Net8 Client Release 8.1, and Oracle8i Release 8.1 database requires Net8 Server Release 8.1.



The Oracle8 Client Release 8.1 and clients must be configured with a service name, as described in "Using the Local Naming Method" in Chapter 5, "Configuring the Network" of *Net8 Administrator's Guide*.

### Oracle8 Client Release 8.0/Oracle7 Client to Oracle8i Database Release 8.1

As the following diagram depicts, an Oracle8 Client Release 8.0 requires a compatible release of Net8 Client, an Oracle7 Client requires SQL\*Net Client, and an Oracle8 database Release 8.1 requires Net8 Server Release 8.1 to connect successfully to an Oracle8i database Release 8.1.



While it is *not* necessary to reconfigure Release 8.0 and Release 7.x clients with a service name, Oracle Corporation recommends doing so to take advantage of new functionality. For example, in the TNSNAMES.ORA file:

```
net_service_name =
(DESCRIPTION=
  (ADDRESS =...)
  (ADDRESS =...)
)
(CONNECT_DATA=
  (SERVICE_NAME=SALES)
)
```

This effect may be accomplished by manually replacing `SID=SID` with `SERVICE_NAME=SERVICE_NAME` or using the Net8 Assistant's compatibility mode. See "Using the Release 8.0/2.x Compatibility Mode" in Chapter 3 "Upgrading and Migrating" of *Net8 Administrator's Guide*.

Consider the following questions for an environment with Oracle7 clients connecting to an Oracle8 Release 8.1 database:

- *Will my third party Oracle7 applications be able to take advantage of Net8 features?*  
*No.* You must rebuild or upgrade applications to work with Net8 libraries.
- *Do my Oracle7 clients require Net8 Client to connect to a remote Oracle8i database?*

*No.* If an Oracle7 client needs to connect to a *remote* Oracle8i database, only SQL\*Net Client Release 2.x has to be configured on the Oracle7 client. Net8 is backward compatible with SQL\*Net Release 2.x. The only limitation is that the new network features available with Net8 are unavailable with this connection type.

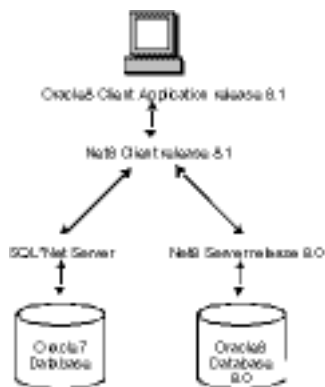
- *Do my Oracle7 clients require Net8 Client to connect to a local Oracle8i database?*

*Yes.* If the Oracle7 client needs to connect to a *local* Oracle8i database, you must have SQL\*Net Client Release 2.x, Net8 Client, and Net8 Server in the same system. Note that Net8 Client and Net8 Server are already installed during the installation of Oracle8i or Oracle8.

If you are using Oracle7 Release 7.3.4 and SQL\*Net Release 2.3.4, you can connect to the local Oracle8 database without specifying a service name. Oracle7 client automatically uses the Bequeath Protocol Adapter when connecting to an Oracle8 database.

### Oracle8i Client Release 8.1 to Oracle8 Release 8.0/Oracle7 Databases

An Oracle8 Client Release 8.1 requires Net8 Client Release 8.1, an Oracle7 Server requires SQL\*Net Server, and an Oracle8 Server Release 8.0 requires Net8 Server Release 8.0.



The Release 8.1 clients must be configured with the SID of the database. For example, the TNSNAMES.ORA would have the following effect:

```

net_service_name =
(DESCRIPTION=
  (ADDRESS = . . . )

```

```
(ADDRESS = . . . )  
)  
(CONNECT_DATA=  
  (SID=SALES)  
)
```

This effect may be accomplished by manually editing the TNSNAMES.ORA file or using the Net8 Assistant's compatibility mode. See "Using Release 8.0/7.x Features and Connecting To a Release 8.0/7.x Service" in Chapter 3, "Upgrading and Migrating" of *Net8 Administrator's Guide*.

Additionally, the LISTENER.ORA on the database server must still be configured with the description of the SID, as described in "Statically Configuring a Listener" in Chapter 5, "Configuring the Network" of *Net8 Administrator's Guide*.

Consider the following questions for an environment with Oracle8 clients Release 8.1 connecting to an Oracle7 database.

- *Do my Oracle8 clients require SQL\*Net Client Release 2.x to connect to a remote Oracle7 database?*

*No.* If an Oracle8 client needs to connect to a *remote* Oracle7 database, only Net8 Client needs to be configured on the Oracle8 client. SQL\*Net Release 2.x is upwards compatible with Net8. The only limitation is that the new network features available with Net8 are unavailable with this connection type.

- *Do my Oracle8 clients require SQL\*Net Release 2.x to connect to a local Oracle7 database?*

*Yes.* If the Oracle8 client needs to connect to a *local* Oracle7 database, you need both SQL\*Net Server Release 2.x and Net8 Client on the same system.

**Additional Information:** For more detailed information on installing, migrating, and upgrading SQL\*Net and Net8, see:

Chapter 4, "Installing, Upgrading, and Migrating Net8" in *Oracle Net8 Administrator's Guide*.

## Multi-Versioning

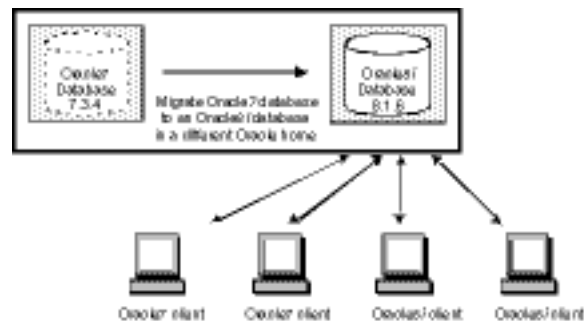
Oracle8i Personal Edition Server Release 8.1.6 for Windows 98 supports multiple Oracle Homes. You can run different versions of Oracle databases on the same computer system at the same time. However, each version can only access a database that is consistent with its version. For example, if you have Version 7 Server and Version 8 of Oracle installed on the same computer system, the Version 7 Server can access Version 7 databases, but not Version 8 databases, and the Version 8



Server can access Version8 databases but not Version7 databases. The only way for a Version8 database to read Version7 database files is to perform a migration. You should be aware that after migration the Version7 Server will no longer be able to read the migrated databases.

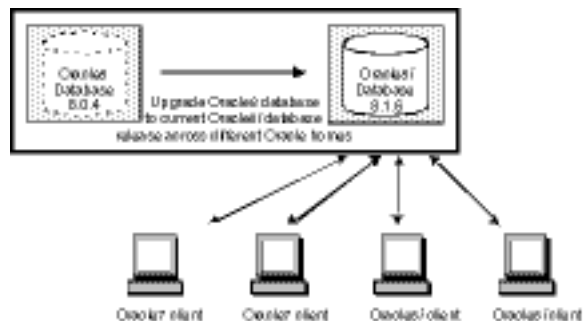
## Migrate an Oracle7 Database to an Oracle8i Database

You can migrate your Oracle7 database to an Oracle8i database and have both Oracle7 and Oracle8i clients connecting to the Oracle8i database. You can not migrate your Oracle7 database to an Oracle8i database in the same Oracle home. The following figure illustrates this network configuration:



## Upgrade an Oracle8 Database to the Current Oracle8i Database Release

You can upgrade your Oracle8 database, for example, Release 8.0.4, to Release 8.1.6 and have both Oracle7 and Oracle8 clients connecting to the Release 8.1.6 Oracle8i database. You can upgrade databases either in the same Oracle home or across different Oracle homes. See “Upgrading an Oracle8 Database Release 8.0.x to 8.1.6” on page 4-31 for instructions. The following figure illustrates this network configuration:



## Migrating an Oracle7 Database to Oracle8i

This section describes how to migrate an Oracle7 database to the current Oracle8i database release. You can choose either of the following tools to perform a migration:

- Oracle Data Migration Assistant
- MIG

Oracle Corporation recommends that new users use Oracle Data Migration Assistant to migrate databases because it is the easiest method to perform a migration. If you want to perform a migration manually using command line tools, use MIG.

Before you start a migration using the assistant or MIG, read the following sections:

### Ten Issues That Can Affect Oracle7 to Oracle8i Migration

The following table lists and describes the ten issues you should be aware of that can affect Oracle7 to Oracle8i migration.

Issues That Affect Migration	Description
1. Running out of space	<ul style="list-style-type: none"> <li>Version8 binaries may require as much as three times the disk space required by Version7 binaries. This requirement may cause you to run out of disk space during migration. It is very important that you read "System Considerations and Requirements" and "Prepare the Version7 Source Database for Migration" in <i>Oracle8i Migration</i> to find out more about this and other requirements before you migrate.</li> <li>During migration, the data dictionary requires 50% more space to hold both Oracle7 and Oracle8i data dictionaries. Actual usage can be verified by running MIG in CHECK_ONLY mode.</li> </ul>
2. Duration of migration is unrelated to database size	<p>The time it takes to migrate is not dependent on the size of the database, but on the number of objects in the data dictionary. For example, actual migration for a 3 1/2 GB database with 25,473 objects on a Sun E6000 with 20 CPUs, with datafiles stripped on the file system on 128 KB slices can take 1 1/2 hours. Remember to allow extra time for backing up and restoring database in case of problems.</p>
3. Avoiding problem areas	<ul style="list-style-type: none"> <li>Check for usage of ROWIDs in both user columns as well as application code (including triggers &amp; packaged procedures). These may require to be converted to use the DBMS_ROWID package.</li> <li>Check the names of any Oracle7 database objects (for example, tables and columns) that use names that are key words or reserved words for Oracle8i. Usage of key words and reserved words can cause unexpected failures during migration. See Appendix C, "Oracle Reserved Words" of <i>Oracle8i SQL Reference</i> for a list of reserved words.</li> <li>Certain Version7 initialization parameters are obsolete in Version8. Remove all obsolete parameters from the Release 7.x INITSID.ORA file that start a Version8 instance. Obsolete parameters may cause errors if used with a Version8 database. Also, alter any parameter whose syntax has changed in Version8. See Appendix B, "Changes to Initialization Parameters" of <i>Oracle8i Migration</i> for lists of new, changed, and obsolete parameters.</li> </ul>
4. Compatibility	<p>Make sure that all Oracle product versions, operating system versions, and third-party software versions are certified against Oracle8i.</p>

Issues That Affect Migration	Description
5. Invalid objects and lost statistics	Migration leaves all objects (packages, triggers, views, and so on) invalid except for tables. All other objects must be made valid again by recompilation. This can either be done manually (preferably by building a dependency tree before migration from dependency), otherwise this is done automatically as the objects are first accessed. The latter will of course slow down initial access. All estimated or calculated statistics are lost during migration. These need to be recalculated to ensure proper functionality of the Cost Based Optimizer. Some bitmapped indexes will get invalidated. Check all bitmapped indexes in the DBA_INDEXES table and recreate any that are marked as status unusable.
6. Editing the registry	If you edit the registry for any reason during the migration process, you need to reboot your computer.
7. Read-only tablespace confusions	Oracle7 read-only tablespaces are readable by Oracle8i and do not require any conversion. But to prevent Oracle8i rowid conversions to take place every time a table is accessed, the tablespaces in read-only mode should be made read-write. Perform full table scans on all tables in the tablespace. After the full table scans are complete, you can put the tablespaces in read-only mode again.
8. The point of no return	You can return the database to an Oracle7 version up until the ALTER DATABASE CONVERT command is run. If a failure occurs during ALTER DATABASE CONVERT (when it is converting the physical file headers of the datafiles), you must restore the database from backup and rerun the migration. Do not open the database between running the migration and executing the ALTER DATABASE CONVERT command.
9. Preventing large restores	To avoid restoring the entire database due to any failures during the ALTER DATABASE CONVERT, put all tablespaces, except SYSTEM and ROLLBACK into read-only or offline normal mode. This causes the ALTER DATABASE CONVERT command to only convert the datafile headers for SYSTEM and ROLLBACK. If any errors occur, you need only restore the datafiles for the SYSTEM and ROLLBACK and rerun the migration. If the migration is successful, the headers for the rest of the datafiles will be converted when they are read-write or online.
10. Testing	Most migration problems can be avoided if a test migration is performed first. Performing a test migration helps raise any problems that can occur as well as letting you see the amount of time it takes to migrate. See "Test the Migration Process" in Chapter 2, "Preparing to Migrate" in <i>Oracle8i Migration</i> .

### Installing Appropriate Versions of SQL\*Net

When migrating from Oracle7 Server Release 7.3.x to Oracle8i Release 8.1.6, install the appropriate version of SQL\*Net in the 7.3.x Oracle home *before* using Oracle Data Migration Assistant or MIG. Migration will be unsuccessful if you do not install the appropriate versions of SQL\*Net.

## Migrating Using Oracle Data Migration Assistant

Oracle Data Migration Assistant helps you migrate data from an Oracle7 database to an Oracle8i database. During installation of Oracle8i Personal Edition, you are prompted to migrate a database with this assistant if Oracle Universal Installer detects that an earlier database release exists on your computer. If you do not want to migrate a database, uninstall the existing Oracle database, before installing the new database.

### What to do Before Using Oracle Data Migration Assistant

**Complete the following steps before you use this assistant:**

- Read Chapter 4, "Migration Using the Oracle Data Migration Assistant" in *Oracle8i Migration* for background information, before starting the migration process.

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**IMPORTANT:** Version8i binaries may require as much as three times the disk space required by Version7 binaries. This requirement may cause you to run out of disk space during migration. It is very important that you read "System Considerations and Requirements" and "Prepare the Version7 Source Database for Migration" to find out more about this and other requirements before you migrate.

---

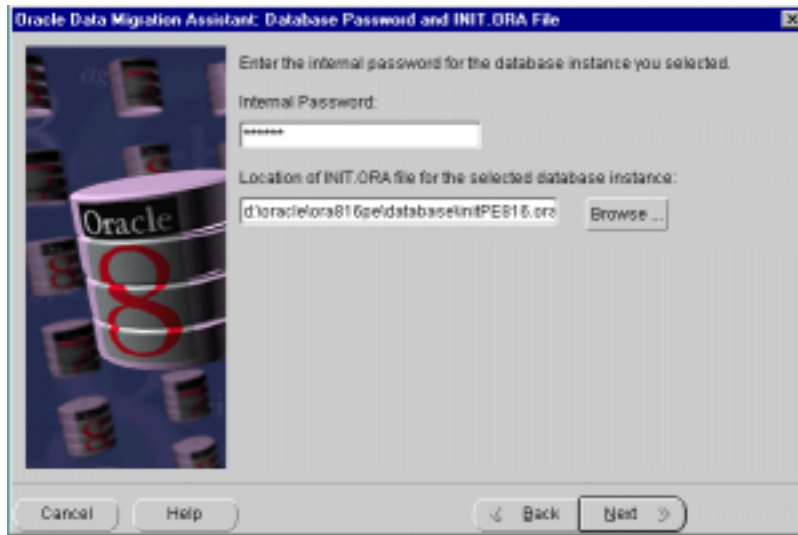
---

- Ensure SQL\*Net Server Release 2.x or later is installed.

**To migrate a database using Oracle Data Migration Assistant:**

1. Choose Start > Programs > Oracle - *HOME\_NAME* > Migration Utilities > Oracle Data Migration Assistant.

The following window appears:



2. Respond to instructions in each *Oracle Data Migration Assistant* window, and click **Next** when you are ready to continue to the next window. When you get to the last window, click **Next** to start the migration of the database. More documentation on this product can be accessed by clicking **Help**.

## Migrating Using MIG

This section describes how to use MIG to migrate your Oracle7 database to an Oracle8i database.

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**Note:** Information on how to run MIG (sometimes referred to as the Migration Utility) is provided in *Oracle8i Migration*, but there the focus is on UNIX. This section provides information on using MIG on Windows 98.

---

**To migrate an Oracle7 database using MIG:**

Step 1: What To Do Before Using MIG

Step 2: Shut Down the Oracle7 Database

Step 3: Back Up the Oracle7 Database

Step 4: Install MIG from CD-ROM

Step 5: Run MIG

Step 6: Create Oracle8i Database Files

Step 7: Remove Oracle7 Software (Optional)

**Step 1: What To Do Before Using MIG**

Complete the following steps before you use MIG:

- Review Migration Concepts
- Use Appropriate SQL\*DBA or SQL\*Plus Versions
- Check the Version Number of the Database to be migrated
- Check Character Set

**Review Migration Concepts**

- Read Chapter 1, "Overview" and Chapter 2, "Preparing to Migrate" in *Oracle8i Migration* for background information before starting the migration process.
- Read "System Considerations and Requirements" and "Prepare the Version7 Source Database for Migration" in Chapter 3 "Migrating Using the Migration Utility" of *Oracle8i Migration* for information on *tasks you must perform* before using MIG.

---

---

**IMPORTANT:** Version8 binaries may require as much as three times the disk space required by Version7 binaries. This requirement may cause you to run out of disk space during migration. It is very important that you read "System Considerations and Requirements" and "Prepare the Version7 Source Database for Migration" to find out more about this and other requirements before you migrate.

---

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**Use Appropriate SQL\*Plus Versions**

When you are asked to enter commands at the SQL\*Plus prompt, remember to use the appropriate version of the tool for the version of Oracle7 Server you are migrating:

Use...	When Migrating From...
SVRMGR23	Oracle7 Release 7.3.x

**Check the Version Number of the Database to be Migrated**

Check that your database release can be directly migrated to Oracle8i Personal Edition. MIG only migrates databases that are Oracle7 Release 7.3.x or later.

**Check Character Set**

1. Check the character set of your Oracle7 database, and compare it with the character set in the NLS\_LANG environment variable, or in the registry (if the character set does not exist as an environment variable).
2. Start SQL\*Plus at the MS-DOS command prompt. If you are migrating from:

Oracle7 Release...	Enter at the MS-DOS Command Prompt...
7.3.x	C:\> SVRMGR23

3. Connect to the Oracle7 database as INTERNAL, where *PASSWORD* is the password of the database you want to migrate:

Oracle7 Release...	Enter at the SQLDBA or SQLPLUS Command Prompt...
7.3.x	SQL> CONNECT INTERNAL/ <i>PASSWORD</i>

4. Obtain the value of NLS\_CHARACTERSET:



Oracle7 Release...	Enter at the SQLDBA or SQLPLUS Command Prompt...
7.3.x	SQL> SELECT VALUE FROM NLS_DATABASE_PARAMETERS WHERE PARAMETER='NLS_CHARACTERSET' ;

The character set value is returned by the database. If the character sets are identical, then you can proceed to run MIG.

If the character sets are different, before you run MIG, you must set the NLS\_LANG environment variable at the MS-DOS command prompt as follows:

AMERICAN\_AMERICA.*database character set*

where *database character set* is substituted with the character set of your Oracle7 database. For example, if the character set of your Oracle7 database is JA16EUC, set the NLS\_LANG environment variable as follows:

```
C:\> SET NLS_LANG=AMERICAN_AMERICA.JA16EUC
```

Messages output from MIG will now be in English. After MIG finishes, reset the NLS\_LANG environment variable to its original value.

## Step 2: Shut Down the Oracle7 Database

Shut down the database. Do *not* use SHUTDOWN IMMEDIATE or SHUTDOWN ABORT. If the database is not shut down before you start the migration, MIG stops and issues an error message. Also, if the database is not cleanly shutdown, any backup you make may be useless as it was taken while data was being written to the data files.

1. Start SQL\*Plus:

Oracle7 Release...	Enter at the MS-DOS Command Prompt...
7.3.x	C:\> SQLPLUS

2. Connect to the Oracle7 database as INTERNAL, where *PASSWORD* is the password of the database you want to migrate:

Oracle7 Release...	Enter at the SQLPLUS Command Prompt...
7.3.x	SQL> CONNECT INTERNAL/PASSWORD

The message *Connected* appears if you are successfully connected to the database.

3. Shut down the database:

Oracle7 Release...	Enter at the SQLPLUS Command Prompt...
7.3.x	SQL> SHUTDOWN

Step 3: Back Up the Oracle7 Database

Back up the entire Oracle home directory and all its subdirectories.

**WARNING: If anything goes wrong with the Oracle7 database during migration, you will need to restore the database from the backup. Back up your database now as a precaution!**

Ensure the database was cleanly shut down before you back up. Ensure you back up the database files in the following list (and any other database files you may have created). Also, back up any scripts you may have created.

- Data files                               SYS1SID.ORA, USR1SID.ORA,  
   RBS1SID.ORA, TMP1SID.ORA
- Initialization parameter file    INITSID.ORA
- Redo log files                       LOG1SID.ORA, LOG2SID.ORA,  
   LOG3SID.ORA, LOG4SID.ORA  
  
   (the last two redo log files are only available for  
   Oracle Release 7.3.4)
- Control files                        CTL1SID.ORA and CTL2SID.ORA

To obtain the list of database files you must back up:

- a. Create a spool file called V7DBFILES.LOG:

Oracle7 Release...	Enter at the SQLPLUS Command Prompt...
7.3.x	SQL> SPOOL V7DBFILES.LOG

- b. Enter the following commands at the SQL\*DBA or SQL\*Plus prompt where the WHERE clause equals counteroffers, DB\_FILES, or LOG\_FILES. Note that counteroffers must be lowercase. The list of database files is output to V7DBFILES.LOG.

Oracle7 Release...	Enter at the SQLPLUS Command Prompt...
7.3.x	SQL> SELECT MEMBER FROM V\$LOGFILE; SQL> SELECT NAME FROM V\$DATAFILE; SQL> SELECT VALUE FROM V\$PARAMETER WHERE NAME = 'control_files';

- c. Turn off the SPOOL command:

Oracle7 Release...	Enter at the SQLPLUS Command Prompt...
7.3.x	SQL> SPOOL OFF

See "Backing Up and Recovering Database Files" on page 12-1, *Oracle8 Concepts*, *Oracle8 Backup and Recovery Guide*, and *Oracle8i Administrator's Guide* for information on how to back up a database.

Step 4: Install MIG from CD-ROM

You can install MIG in either of two ways depending if you want to install the Release 8.1.6 software that includes MIG or just MIG.

**Note:** The following installation steps are a shorter version of the complete installation instructions you can find in *Oracle8i Personal Edition Installation Guide for Windows 98*.

To install Oracle8i Personal Edition, including MIG:

- 1. Run Oracle Universal Installer.  
The *File Locations* dialog box appears.
  - a. Enter the name of a new Oracle home in the *Oracle Home Name*: text box. For example, enter MIGTO81.
  - b. Enter the location of the Oracle home directory where you want to install the Oracle8i product. In this example, enter C:\ORACLE\ORA81 in the *Location*: text box.

c. Click **Next**.

The *Available Products* dialog box appears.

2. Select Typical Installation, and click Next.

The *Upgrading and Migrating an Existing Database* dialog box appears, telling you that a previous Oracle database is detected on your computer. The dialog asks if you want to migrate your older database to the current release using Oracle Data Migration Assistant.

3. Check the check box to migrate the previous version of database and then click Next.

4. The *Location for Oracle Documentation* dialog box appears, asking if you want to install the documentation onto your hard drive or keep the documentation on your CD-ROM.

Select a documentation option, and click Next.

The *Summary* window appears.

5. Click **Install**.

The *Configuration Tools* window appears.

DBMA window will pop-up. Click Cancel. Configuration tool will show DBMA has failed, but that is OK.

6. Click **Next**.

The *End of Installation* window appears.

7. Click **Exit**.

MIG has been installed as part of Oracle Utilities.

**If you just want to install MIG, perform the following steps:**

1. Run Oracle Universal Installer.

The *File Locations* dialog box appears.

a. Enter the name of a new Oracle home in the *Oracle Home Name*: text box. For example, enter MIGTO81.

b. Enter the location of the Oracle home directory where you want to install MIG. In this example, enter C:\ORACLE\ORA81 in the *Location*: text box.

c. Click **Next**.

The *Available Products* dialog box appears.

2. Select *Oracle8i* Personal Edition, then click **Next**.  
The *Installation Types* dialog box appears.
3. Select **Custom**.  
The *Available Product Components* dialog box appears.  
Click Oracle Utilities, of which MIG is a component.
4. Click **Next**.  
The *Summary* window appears.
5. Click **Install**.  
The *Configuration Tools* window appears.
6. Click **Next**.  
The *End of Installation* window appears.
7. Click **Exit** to quit Oracle Universal Installer.  
MIG is located in C:\ORACLE\ORA81\BIN.

### Step 5: Run MIG

There are some tasks that you may have to perform before you run MIG.

1. Ensure that you have DBA privileges, which are necessary to run MIG.
2. Ensure that SQL\*Net Version2.x is installed in the Oracle home directory of the database you are migrating. If it is not installed, MIG will be unable to connect to the Oracle7 database. You will receive the error *ORA-12203: TNS: Unable to connect to destination*, if this is the case. If this product is not installed, install it from the Oracle8i Personal Edition CD-ROM. See "Installing Appropriate Versions of SQL\*Net" on page 4-15 for more information.
3. Ensure that no other DBA (connected as INTERNAL or SYS) with the RESTRICTED SESSION privilege connects to the database while MIG is running. Normal users cannot connect to the database during this phase.
4. *Do not start the Oracle7 database.* MIG starts the Oracle7 database as part of its processing.

5. Enter at the MS-DOS command prompt:

PersonalOracle7 Release...	Enter at the MS-DOS Command Prompt...
7.3	C:\> ORAVER 73
	C:\> ORAAUTOS OFF

6. Set ORACLE\_SID to the SID of the database you want to migrate. For example, if the database you want to migrate is the starter database with the SID named ORCL, enter the following at the MS-DOS command prompt. Note there are no spaces around the equal sign (=) character.

C:\> SET ORACLE\_SID=ORCL

7. Run MIG. You can enter MIG HELP=YES at the MS-DOS command prompt for a complete list of parameters that can be included with the MIG command. You *must* include the PFILE parameter to specify the exact location of the Version7 INITSID.ORA file because MIG is in a different directory from the Version7 initialization parameter file. Ensure you specify the complete pathname of ORACLE\_HOME including drive letter.

C:\> MIG PFILE=ORACLE\_HOME\DATABASE\INITSID.ORA SPOOL=C:\MIG.LOG

The MIG command creates the MIGSID.ORA file that is required in a later step to create Oracle8i Personal Edition control files.

8. If the prompt for *Oracle7 Password:* appears, enter the same password as the INTERNAL password for the Oracle7 database. This prompt displays because the DBA\_AUTHORIZATION registry parameter is not set properly or not set at all for Oracle7.

MIG runs and displays the operations being performed. MIG can take considerable time to run. Please wait until it has finished running.

Check the results after running MIG. If there are error messages, see Appendix A, "Troubleshooting Migration Problems" of *Oracle8i Migration* for more information before going to Step 9.

9. Stop the Oracle7 database at the MS-DOS command prompt when MIG has completed successfully:

C:\> KNLSTOP

MIG creates a convert file that contains the information of the Version7 control file. Later in the migration process, the convert file is used when you execute

the ALTER DATABASE CONVERT command to create a new control file for Version8.

The default location of the convert file is *ORACLE\_BASE\ORACLE\_HOME\RDBMS* where *ORACLE\_HOME* is the Version8 Oracle home. The default filename is CONVERT.ORA.

---

---

**WARNING:** Do not open the Oracle7 database, which was shut down by the Version8 MIG utility. To ensure data file version integrity, the SCNs in the dictionary, the convert file, and file header must all be consistent when the database is converted to Version8. If the Oracle7 database is opened after running MIG, the SCN check will fail when the database is converted to Version8, and an ORA-01211 error will be displayed, stating "Oracle7 data file is not from migration to Oracle8i." If the Oracle7 database is opened, you must rerun the Migration Utility, starting at "Step 2: Shut Down the Oracle7 Database".

---

---

After successfully running MIG, perform a cold backup of the Oracle7 database. This backup serves the following purposes:

- If you want to return to the Oracle7 database after executing the ALTER DATABASE CONVERT command, you can restore the backup and start the Version7 database.
- It can be used as the first Version8 backup for a Version8 recovery.
- If an error occurs at Version8 database convert time (ALTER DATABASE CONVERT or ALTER DATABASE OPEN RESETLOGS), you can restore this backup, fix the problem(s), and continue the conversion process. However, if you restore a backup performed before you ran MIG, you must rerun MIG.

**Additional Information:** See Chapter 10, "Developing Applications", *Oracle8 Concepts*, *Oracle8 Backup and Recovery Guide*, and *Oracle8i Administrator's Guide* for information on how to back up a database.

## Step 6: Create Oracle8i Database Files

1. If you have not already installed the Oracle8i software, do so now. Do not install a database when prompted.

2. Edit the INITSID.ORA initialization parameter file:

- a. Comment out the existing CONTROL\_FILES entry by entering a hash (#) mark in front of the line:

```
#control_files = ORACLE_HOME\DATABASE\ctl1SID.ora
```

where:

- *ORACLE\_HOME* is the full path name of your Oracle home directory where the INITSID.ORA file exists
- *CTL1SID.ORA* is the file name of your Personal Oracle7 database control file. SID is the unique value identifying your Personal Oracle7 database instance

- b. Add two new entries:

1. CONTROL\_FILE = ORACLE\_HOME\DATABASE\NEWCONTROL.ORA

where:

- *ORACLE\_HOME* is the full path name of your Oracle home directory where the INITSID.ORA file exists
- *NEWCONTROL.ORA* is the file name of your Oracle8i Personal Edition database control file. SID is the unique value identifying your Oracle8i Personal Edition database instance

2. DISK\_ASYCH\_IO = FALSE

See *Oracle8 Reference* for a complete description of the DISK\_ASYNCH\_IO parameter and other initialization parameters.

- c. Enter at the MS-DOS command prompt:

```
C:\> ORAVER 80
```

3. Check the file V7DBFILES.LOG that you created in "Step 3: Back Up the Oracle7 Database" for the complete list and location of control files you must delete.

4. Before starting SQL\*Plus:

- a. Ensure all Release 7.x data files and log files are accessible and in the correct directories.



- b. Ensure all Release 7.x control files are deleted or renamed.
- c. Change any parameters that point to RDBMS72, or RDBMS73 to point to RDBMS in the Release 7.x *INITSID.ORA* file.
- d. Certain Version7 initialization parameters are obsolete in Version8. Remove all obsolete parameters from the Release 7.x *INITSID.ORA* file that start a Version8 instance. Obsolete parameters may cause errors if used with a Version8 database. Also, alter any parameter whose syntax has changed in Version8. See Appendix B, "Changes to Initialization Parameters" of *Oracle8i Migration* for lists of new, changed, and obsolete parameters.
- e. Ensure the COMPATIBLE parameter is set to 8.0.5.0.0 in the Release 7.x *INITSID.ORA* file. Set the COMPATIBLE parameter to the following:

```
COMPATIBLE=8.0.5.0.0
```

**Additional Information:** Some new features of Oracle8i Release 8.1.x require a compatibility setting of 8.1.0 or higher. See Chapter 8, "Compatibility and Interoperability" of *Oracle8i Migration* for more information.

- 5. Start the Oracle8i Personal Edition version of SQL\*Plus at the MS-DOS command prompt:

```
C:\> SQLPLUS
```

- 6. Connect to the Oracle8i instance as INTERNAL:

```
SQL> CONNECT INTERNAL/PASSWORD
```

- 7. Start an Oracle8i instance without mounting the new Oracle8i database:

```
SQL> STARTUP NOMOUNT PFILE=ORACLE_HOME\DATABASE\INITSID.ORA
```

---

---

**WARNING: Starting in any other mode will corrupt the database!**

---

---

- 8. Create new Version8 control files:

```
SQL> ALTER DATABASE CONVERT;
```

---

---

**WARNING:** Successful execution of this command is the point of no return to Oracle7. If you need to return to the Oracle7 database, please restore it from the backup you made in "Step 3: Back Up the Oracle7 Database". If an error occurs during this step, you must correct the condition(s) that caused the error(s).

---

---

This command uses the `MIGSID.ORA` file that was created earlier when you ran MIG. All data files that are online are converted to Oracle8i Personal Edition format, and new control files are built. Control files are considerably larger in Version8 than in Version7. Control files in the tens of kilobytes size range in Version7 could be expanded into the range of tens of megabytes automatically during migration to Version8. This size increase could be important if a control file is on a raw device or if its available disk space is restricted.

9. Open the Oracle8i database:

```
SQL> ALTER DATABASE OPEN RESETLOGS;
```

All rollback segments that are online when the Oracle8i database is opened are also opened and converted to the Oracle8i database format.

10. Create a spool file called `CATOUT.LOG` by entering the following at the SQL\*Plus prompt:

```
SQL> SPOOL CATOUT.LOG
```

11. Run the following scripts in sequence:

Script	Required by...	Enter at the SQL*Plus Prompt...
U0703040.SQL	All databases	<p>SQL&gt; @%ORACLE_HOME%\RDBMS\ADMIN\U0703040.SQL</p> <p>where %ORACLE_HOME% represents your drive letter and Release 8.1.6 Oracle home directory. This script can take over thirty minutes to run depending on the size of your database. Check CATOUT.LOG to verify that the operation was successful.</p> <p>U0703040.SQL creates and alters certain system tables and drops the MIGRATE user. Objects in the MIGRATE user's schema are not needed after the conversion is complete. You can also delete the binary file (ORACLE_HOME\RDBMS\CONVERT.ORA) that is used as part of the conversion process.</p> <p>U0703040.SQL also runs the CATALOG.SQL and CATPROC.SQL scripts, which create the system catalog views and all the necessary packages for using PL/SQL.</p> <p><b>Note:</b> If the U0703040.SQL script runs for an inordinately long time, it may be caused by a setting for LARGE_POOL_SIZE that is too large for your installation. Use the V\$PARAMETER view to check the setting for LARGE_POOL_SIZE, and if it is too large, set it to a smaller value in your INITSID.ORA file.</p>
UTLRP.SQL	All databases	<p>SQL&gt; @%ORACLE_HOME%\RDBMS\ADMIN\UTLRP.SQL</p> <p>where %ORACLE_HOME% represents your drive letter and Release 8.1.6 Oracle home directory.</p> <p>Oracle Corporation recommends you run this script to compile all existing PL/SQL modules that were previously in an INVALID state, such as packages, procedures, types, and so on. Doing this at this stage is optional; however, it will ensure that the cost of recompilation is incurred during installation time rather than later on.</p>

Oracle Corporation supplies other scripts with Oracle8i Personal Edition that create additional structures you can use in managing your database and creating database applications. These scripts are also located in *ORACLE\_HOME\RDBMS\ADMIN*. See the chapter "SQL\*Scripts" in *Oracle8 Reference* for a complete list and descriptions of available scripts.

12. Turn off the SPOOL command:

```
SQL> SPOOL OFF
```

13. Check the spool file CATOUT.LOG and verify that the scripts you ran compiled every package and procedure successfully. Correct any problems you find in this file.

14. Shut down the Oracle8i database in NORMAL mode to perform a clean database shutdown. Do *not* use SHUTDOWN IMMEDIATE or SHUTDOWN ABORT. Note that NORMAL is the default parameter.

```
SQL> SHUTDOWN
```

Performing a clean database shutdown flushes all caches, clears buffers, and performs other Relational Database Management System (RDBMS) housekeeping activities. These measures are an important final step to ensure the integrity and consistency of the newly migrated Release 8.1.6 database.

15. Back up the Oracle8i database. See Chapter 10, "Developing Applications" for a list of tools to back up the database.

The Oracle7 database has now been migrated to the Oracle8i database and is ready for use.

---

---

**Note:** After a migration, all objects have the status INVALID, unless you have run the UTLRP.SQL script. To check the status of objects, enter the following at the SQL\*Plus prompt.

```
SQL> SELECT * FROM ALL_OBJECTS WHERE STATUS =  
'INVALID' ;
```

---

---

16. Complete the procedures described in Chapter 5, "After Migrating the Database" of *Oracle8i Migration*.

---

---

**WARNING:** If you retain the old Version7 software, never start the migrated database with the old Version7 software. Only start the database with the executables in the new Version8 installation directory.

---

---

### Step 7: Remove Oracle7 Software (Optional)

You can remove Oracle7 software if you have successfully migrated to Oracle8i Personal Edition and have a backup of the Oracle7 software. Oracle Installer warns you of any product dependencies that might cause problems if particular products are removed, and prompts you to confirm the deinstallation.

**To remove Oracle7 software:**

1. Stop all Oracle executable (e.g.Listener) if running.
2. Choose Start > Programs > Oracle for Windows 95 > *ORACLE\_HOME* > Oracle Installer to start Oracle Installer.

The *Software Asset Manager* window appears.

3. Select the Oracle7 product(s) you want to remove from the Installed Products window of the *Software Asset Manager* window.
4. Click **Remove**.

## Upgrading an Oracle8 Database Release 8.0.x to 8.1.6

This section describes how to upgrade an Oracle8 database Release 8.0.x to Release 8.1.6. You can choose either of the following database tools to upgrade:

- Oracle Data Migration Assistant
- SQL scripts

Oracle Corporation recommends that new users use Oracle Data Migration Assistant to upgrade databases because it is the easiest and quickest method to perform an upgrade. If you already have upgrade scripts from a previous Oracle database release, you can edit them to include the new upgrade scripts.

## Upgrading Using Oracle Data Migration Assistant

Oracle Data Migration Assistant helps you upgrade data from an Oracle8 database Release 8.0.x to Release 8.1.6. During installation of Oracle8i Personal Edition, you are prompted to upgrade a database with this assistant if Oracle Universal Installer detects that a Release 8.0.x database exists on your system. If you do not want to upgrade during the installation process, you can just install this assistant and use it later.

---

---

**Note:** Oracle Data Migration Assistant cannot be used to upgrade Oracle7 releases. For example, you cannot use the assistant to upgrade from Release 7.1.3.3.6 to Release 7.3.3.0.0. If you need to upgrade Version7 releases, see *Oracle7 Server Migration Guide* and the upgrading documentation that came with your Oracle7 software.

---

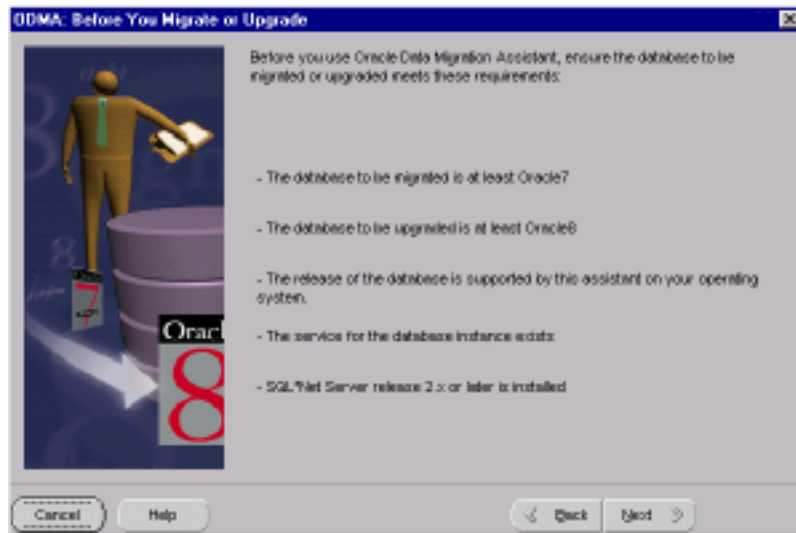
---

Before you use this assistant, ensure the Oracle8 database to be upgraded is at least Release 8.0.3.0.0

**To upgrade a database using Oracle Data Migration Assistant:**

1. Choose Start > Programs > Oracle - *HOME\_NAME* > Migration Utilities > Oracle Data Migration Assistant.

The following window appears:



2. Respond to instructions in each Oracle Data Migration Assistant window, then click **Next** when you are ready to continue to the next window. When you get to the last window, click **Next** to start the upgrade of the database. More documentation on this product can be accessed by clicking Help.

**Upgrading Using SQL Scripts**

You can run SQL scripts in SQL\*Plus to upgrade an Oracle8 database Release 8.0.x to Release 8.1.6.

---

---

**WARNING:** If you are using mutually referencing types, downgrading back to your current release may not be supported after you upgrade to Release 8.1.6. See the section "Downgrading From Release 8.0.5 to Release 8.0.x" of the READMEMIG.DOC located in the *ORACLE\_HOME\RDBMS* directory for more information.

---

---

**Upgrading consists of the following tasks:**

Step 1: Shut Down the Release 8.0.x Database

Step 2: Back Up the Release 8.0.x Database

Step 3: Edit the COMPATIBLE Parameter in the 8.0.x INITSID.ORA File

Step 4: Install Oracle8i Personal Edition Release 8.1.6

Step 5: Run the SQL Scripts

**Step 1: Shut Down the Release 8.0.x Database**

1. Start SQL\*Plus at the MS-DOS command prompt:

```
C:\> SQLPLUS
```

2. Connect to the Release 8.0.x database as INTERNAL, where *PASSWORD* is the password of the database you want to migrate:

```
SQL> CONNECT INTERNAL/PASSWORD
```

The message *Connected* appears if you successfully connected to the database.

3. Shut down the database in NORMAL mode. Do *not* use SHUTDOWN IMMEDIATE or SHUTDOWN ABORT. If the database is not cleanly shutdown, any backup you make may be useless as it was taken while data was being written to the data files. Note that NORMAL is the default mode. Enter the following at the SQL\*Plus prompt:

```
SQL> SHUTDOWN
```



## Step 2: Back Up the Release 8.0.x Database

Perform a full offline backup of the database.

1. Back up the entire Oracle home directory and all of its subdirectories.

---

---

**WARNING: If anything goes wrong with the Release 8.0.x database during upgrade, you will need to restore the database from the backup. Back up your database now as a precaution!**

---

---

Ensure the database is cleanly shutdown before you back up. Ensure you back up the database files in the following list (and any other database files you may have created). Also, back up any scripts you may have created.

- Data files                               SYS1SID.ORA, USR1SID.ORA, RBS1SID.ORA, TMP1SID.ORA
- Initialization parameter file        INITSID.ORA
- Redo log files                       LOG1SID.ORA, LOG2SID.ORA
- Control files                         CTL1SID.ORA

### To obtain the list of database files you must back up:

- a. Create a spool file called V8DBFILES.LOG. Enter the following at the SQL\*Plus prompt:

```
SQL> SPOOL V8DBFILES.LOG
```

- b. Enter the following commands at the SQL\*Plus prompt, where the WHERE clause equals control\_files, DB\_FILES, or LOG\_FILES. Note that control\_files must be lowercase. The list of database files is output to V8DBFILES.LOG.

```
SQL> SELECT MEMBER FROM V$LOGFILE;
```

```
SQL> SELECT NAME FROM V$DATAFILE;
```

```
SQL> SELECT VALUE FROM V$PARAMETER WHERE NAME = 'control_files';
```

- c. Turn off the SPOOL command:

```
SQL> SPOOL OFF
```

See Chapter 10, "Developing Applications", *Oracle8 Concepts*, *Oracle8 Backup and Recovery Guide*, and *Oracle8i Administrator's Guide* for information on how to back up a database.

### **Step 3: Edit the COMPATIBLE Parameter in the 8.0.x INITSID.ORA File**

Ensure the COMPATIBLE parameter is left unset if it has not been set in the INITSID.ORA file. Leave the COMPATIBLE parameter unchanged if it has been previously set.

**Additional Information:** Some new features of Oracle8i Release 8.1.x require a compatibility setting of 8.1.0. See Chapter 7 "Compatibility and Interoperability" of *Oracle8i Migration* for more information.

**Step 4: Install Oracle8i Personal Edition Release 8.1.6**

1. Ensure Oracle database has been shutdown and Listener has been stopped.

2. The *Autorun* dialog box appears and prompts you to make a selection:

- Add/Remove Products
- Explore CD
- Browse Information

3. Click **Add/Remove Products**.

The *Oracle Universal Installer Welcome* dialog box appears.

4. Click **Next**. The *Oracle License Terms* dialog box appears.

5. Click "I accept the License Terms and Export Restrictions." If you do not accept the terms, you cannot proceed with the installation.

The *File Locations* dialog box appears. Do not change the text in the *Source:* text box. This is the location of files for installation.

- a. Enter the name of a new Oracle home in the *Destination Name:* text box. In this example, enter TEST81.
- b. Enter the location of the Oracle home directory where you want to install Release 8.1.6. In this example, enter C:\ORACLE\ORA81 in the *Path:* text box. You must install the Release 8.1 software into a directory that is separate from your Release 8.0 Oracle home. Installing the Release 8.1 software into the same Oracle home as the Release 8.0 software is not supported in Release 8.1.
- c. Click **Next**.

The *Available Products* dialog box appears.

6. Select Typical Installation, and click **Next**.

The *Upgrading and Migrating an Existing Database* dialog box appears, telling you that a previous Oracle database is detected on your computer. The dialog asks if you want to migrate your older database to the current release using Oracle Data Migration Assistant.

7. Check the check box to migrate the previous version of database and then click **Next**.

8. The *Location for Oracle Documentation* dialog box appears, asking if you want to install the documentation onto your hard drive or keep the documentation on your CD-ROM.

Select a documentation option, and click **Next**.

The *Summary* window appears.

9. Click **Install**.

The *Configuration Tools* window appears.

DBMA window will pop-up. Click **Cancel**. Configuration tool will show DBMA has failed, but that is OK.

10. Click **Next**.

The *End of Installation* window appears.

11. After installation is complete, copy the Release 8.0.x *INITSID.ORA* file from the Release 8.0.x *ORACLE\_HOME\DATABASE* directory to the Release 8.1.6 *ORACLE\_BASE\ORACLE\_HOME\DATABASE* directory.

12. Shut down and restart the computer.

13. Certain Release 8.0 initialization parameters are obsolete in Release 8.1. Remove all obsolete parameters from any initialization parameter file that will start a Release 8.1 instance; obsolete parameters may cause errors in Release 8.1. Also, alter any parameter whose syntax has changed in Release 8.1. See Appendix B, "Changes to Initialization Parameters" of *Oracle8i Migration* for lists of new, renamed, and obsolete parameters.

14. If you are updating snapshots automatically by using the *JOB\_QUEUE\_PROCESSES* initialization parameter, comment out this parameter in the *INITSID.ORA* file. After upgrading your database, you can remove the comments to use the parameter normally.

### Step 5: Run the SQL Scripts

1. Set *ORACLE\_SID* to the SID of the Release 8.0.x database you want to upgrade. For example, if the database you are upgrading is the starter database with a SID of *ORCL*, enter the following at the MS-DOS command prompt. Note there are no spaces around the equal sign (=) character.

```
C:\> SET ORACLE_SID=ORCL
```

2. Start *SQL\*Plus* at the MS-DOS command prompt:

```
C:\> SQLPLUS
```

3. Connect to the Release 8.0.x Oracle8 instance as INTERNAL:

```
SQL> CONNECT INTERNAL/PASSWORD
```

4. Run STARTUP RESTRICT:

```
SQL> STARTUP RESTRICT
```

---

**Note:** STARTUP RESTRICT only applies to a single instance, not to the database.

---

5. Create a spool file called UPGRADE.LOG:

```
SQL> SPOOL UPGRADE.LOG
```

6. Run the following scripts:

To Upgrade...	Run Script <sup>1</sup>	Enter at the SQL*Plus Prompt...
8.0.4.0 or 8.0.4.1 to 8.1.6	U0800040.SQL	SQL> @%ORACLE_HOME%\RDBMS\ADMIN\U0800040.SQL where %ORACLE_HOME% represents your drive letter and Release 8.1.6 Oracle home directory.

<sup>1</sup> The CATALOG.SQL and CATPROC.SQL scripts, which create the system catalog views and all the necessary packages for using PL/SQL, are run whenever you execute any of these U\*.SQL scripts.

---

---

**Note:**

- You must use the version of the script supplied with the Release 8.1.6 installation.
  - You must run the script in the Release 8.1.6 environment.
  - You only need to run one script, even if your upgrade spans several releases. For example, if your current release is 8.0.4.0.0, then you only need to run U0800040.SQL.
  - If the old release you had installed prior to upgrading was higher than Release 8.0.5.0, see the READMEIG.doc file in the new installation for the correct upgrade script to run.
  - If the upgrade script runs for an inordinately long time, it may be caused by a setting for LARGE\_POOL\_SIZE that is too large for your installation. Use the V\$PARAMETER view to check the setting for LARGE\_POOL\_SIZE, and if it is too large, set it to a smaller value in your INIT.ORA file.
- 
- 

7. Run the UTLRP.SQL script. This is a script that Oracle Corporation recommends you run to compile all existing PL/SQL modules that were previously in an INVALID state, such as packages, procedures, types, and so on. Doing this at this stage is optional; however, it will ensure that the cost of recompilation is incurred during installation time rather than later on. Enter at the SQL\*Plus prompt:

```
SQL> @%ORACLE_HOME%\RDBMS\ADMIN\UTLRP.SQL
```

8. Turn off the SPOOL command.

```
SQL> SPOOL OFF
```

Check the spool file UPGRADE.LOG you created in Step 6 and verify that every package and procedure compiled successfully. Correct any problems you find in the file. If you are upgrading from Release 8.0.2, also check the UPGRADE2.LOG spool file.

9. Run ALTER SYSTEM DISABLE RESTRICTED SESSION:

```
SQL> ALTER SYSTEM DISABLE RESTRICTED SESSION
```

10. Run UTLCONST.SQL to check for bad date constraints. If you already ran UTLCONST.SQL after you migrated or upgraded to a previous Version8 release, you do not need to run it again. However, running the script many

times will not damage your system; therefore, if you are unsure about whether it has been run on your system, run it now.

```
SQL> SPOOL UTLRESULT.LOG
```

```
SQL> @%ORACLE_HOME%\RDBMS\ADMIN\UTLCONST.SQL
```

```
SQL> SPOOL OFF
```

A bad date constraint involves invalid date manipulation. An invalid date manipulation is one that implicitly assumes the century in the date, causing problems at the year 2000. The UTLCONST.SQL script runs through all of the check constraints in the database and sets constraints as bad if they include any invalid date manipulation. UTLCONST.SQL selects all the bad constraints at the end. After you run the script, the UTLRESULT.LOG file includes all the constraints that have invalid date constraints. UTLCONST.SQL does not correct bad date constraints, but it does disable them. Either drop the bad constraints or recreate them after you make the necessary changes.

**11. Exit SQL\*Plus:**

```
SQL> EXIT
```

**12. Ensure the COMPATIBLE parameter is left unset if it has not been set in the INITSID.ORA file. Leave the COMPATIBLE parameter unchanged if it has been previously set.**

**Additional Information:** Some new features of Oracle8 Release 8.1.x require a compatibility setting of 8.1.0. See Chapter 7 "Compatibility and Interoperability" of *Oracle8i Migration* for more information.

Your database is upgraded to Release 8.1.6.

## Migration Issues for Net8 and SQL\*Net

During migration from Oracle 7.x or Oracle 8.0.x to Oracle8i, the following issues need to be addressed:

- Location of Network Configuration Files
- Listener Configuration
- Changing LISTENER.ORA for Migrated Databases
- Changes in Handling of TCP/IP Listening Address

- Disabling Native Authentication
- Installing Appropriate Versions of SQL\*Net

## Location of Network Configuration Files

SQL\*Net and Net8 8.1 use configuration files from ORACLE\_HOME\network\admin by default, while Net8 8.0 uses configuration files from ORACLE\_HOME\net80\admin by default. If you want all the Oracle products to use configuration files from the same location, you can set the registry variable TNS\_ADMIN.

**Additional Information:** Please refer to Appendix D, "Net8 Configuration", for more information.

## Listener Configuration

Before installing an Oracle8i server ensure that any existing Net8 or SQL\*Net listeners on the same computer are stopped. An existing listener may prevent the Net8 8.1 listener from starting during the Oracle8i install due to listener endpoint conflicts with an existing listener.

If Net8 8.1 listener could not be started during Oracle8i installation due to conflicts in listening endpoints, you can start your Net8 8.1 listener by using the listener control program:

From a command prompt:

```
lsnrctl start <listener_name>
```

where <listener\_name> is LISTENER for typical install or the name given during custom install.

## Changing LISTENER.ORA for Migrated Databases

When you migrate Oracle7 or Oracle8.0 database to an Oracle8i database, the SID of the database needs to be removed from the Oracle7/8.0 home LISTENER.ORA and added to Oracle8i home LISTENER.ORA file.

## Changes in Handling of TCP/IP Listening Address

In Oracle8i, when the LISTENER.ORA contains the TCP/IP system name in ADDRESS, the Listener listens on all addresses for the system. Therefore, even if a system has multiple interface cards with different TCP/IP host names, listening



using any of the host names ensures that the Listener will listen on all interface cards. It is an error to configure multiple addresses for the same port in LISTENER.ORA.

For Oracle7 or Oracle8.0, the Listener only listened for the TCP/IP host name specified in LISTENER.ORA and you had to specify listening addresses for multiple TCP/IP host names of a system. The default LISTENER.ORA created for Oracle7/Oracle8.0 contained multiple addresses, for example,

```
LISTENER = (ADDRESS_LIST=
    (ADDRESS= (PROTOCOL=TCP) (HOST=system1) (PORT=1521))
    (ADDRESS= (PROTOCOL=TCP) (HOST=127.0.0.1) (PORT=1521))
)
```

The above addresses are invalid for Oracle8*i* and the ADDRESS line containing 127.0.0.1 must be removed.

## Disabling Native Authentication

For Oracle7 and Oracle8.0 default installation, native authentication is turned off. Make sure that native authentication, has not been set to sqlnet.ora for Oracle client and Oracle server, in other words:

```
sqlnet.authentication_services = (NTS)
```

This should be commented if present in sqlnet.ora file.

## Installing Appropriate Versions of SQL\*Net

When migrating from Oracle7 Server Release 7.3.x to Oracle8*i* Release 8.1.6, install the appropriate version of SQL\*Net in the 7.3.x Oracle home *before* using Oracle Data Migration Assistant or MIG. Migration will be unsuccessful if you do not install the appropriate versions of SQL\*Net.

## Moving Database Files to an OFA-Compliant Directory

The Oracle Optimal Flexible Architecture (OFA) is a feature of Oracle8*i* for Windows 98 Release 8.1.6. It has been available for Oracle on UNIX for some years. OFA is a set of file naming and placement guidelines recommended by Oracle Corporation for Oracle software and databases. It can also be thought of as a set of "good habits" to adopt when organizing Oracle directories and files on your computer. All Oracle products on the Oracle8*i* for Windows 98 are OFA-compliant;

that is, Oracle Universal Installer places Oracle products in directory locations that follow the OFA guidelines.

One of the many benefits of OFA is that you can separate Oracle software executables from database files. Previously, database files were placed in *ORACLE\_HOME\DATABASE*, (for example, *C:\ORAWIN95\DATABASE*) a subdirectory of the Oracle home directory that also contained Oracle software. Using OFA, you can put Oracle software in *X:\ORACLE\_BASE\ORACLE\_HOME* and database files in *X:\ORACLE\_BASE\ORADATA\DB\_NAME*.

**Additional Information:** For more information on OFA and the type of directory structure where you should place your database files after migration or upgrade, see "Optimal Flexible Architecture Overview" on page 3-13.

## Post-Migration Tasks

Oracle8i Navigator uses the PO8 user account to connect to the local Oracle8i Personal Edition database. Create the PO8 user account for the Oracle8i Navigator to function properly.

### To create the PO8 user account:

1. Start SQL\*Plus from the MS-DOS command prompt:

```
C:\> SQL*Plus
```

2. Connect to the SYSTEM user account:

```
SQL> CONNECT SYSTEM/MANAGER
```

where *MANAGER* is the password for the SYSTEM account when Oracle8i Personal Edition is initially installed. If you have changed this password, enter the new one.

3. Enter the following SQL commands:

```
SQL> CREATE USER PO8 IDENTIFIED BY PO8;
```

```
SQL> GRANT DBA TO PO8;
```

These commands create the PO8 user with the password PO8.

4. Exit SQL\*Plus:

```
SQL> EXIT
```

---

## Post-Installation Configuration Tasks

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This chapter describes some of the configuration tasks you must perform before using products like Oracle8i Navigator. Where appropriate, the chapter provides references to other guides for those configuration tasks.

Specific topic discussed:

- Configuring Oracle 8i Navigator

---

**Note:** The directory path examples in this chapter follow Optimal Flexible Architecture (OFA) guidelines (for example, *ORACLE\_BASE\ORACLE\_HOME\*). If you specified non-OFA compliant directories during installation, your directory paths will differ. See "OFA and Multiple Oracle Home Configurations" on page 3-22 for more information.

---

## Configuring Oracle 8i Navigator

### Step 1: Create a PO8 User Account

Oracle8i Navigator uses the PO8 user account to connect to the local Oracle8i Personal Edition database. Create PO8 user account if you have migrated your Personal Oracle7 Release 7.x or Personal Oracle8 Release 8.x to an Oracle8i Personal Edition Release 8.1.6 database.

**To create a PO8 user account:**

1. Start Server Manager from the MS-DOS command prompt:

```
C:\> SVRMGR
```

2. Connect to the SYSTEM user account:

```
SVRMGR> CONNECT SYSTEM/MANAGER
```

where *MANAGER* is the password for the SYSTEM account when Oracle8i Personal Edition is initially installed. If you have changed this password, enter the new password.

3. Enter the following commands:

```
SVRMGR> CREATE USER PO8 IDENTIFIED BY PO8;
```

```
SVRMGR> GRANT DBA TO PO8;
```

4. Exit Server Manager:

```
SVRMGR> EXIT
```

### Step 2: Changing the User Password

Change the password for each of these user names after you install Oracle8i Personal Edition. Use the Oracle8i Navigator to change these passwords.

**To change the user account passwords using Oracle8i Navigator:**

1. In the Oracle8i Navigator window, right-click the user whose password you want to change.
2. Choose Properties from the pop-up menu.
3. Type the new password in the New field.
4. Type the new password again in the Confirm field.
5. Click **OK**.

By default, the Navigator stores the password for the PO8 account in the registry. If you do not want the password stored in the registry, then disable the feature.

**To disable the save password feature:**

1. Select Local Database in the Oracle8i Navigator.
2. Right-click, and choose Properties from the pop-up menu.
3. Clear the check from the Save Password box, and click **OK**.

### Step 3: Enable Two-Phase Commit

When the database is started, it does not automatically enable support for an incoming connection that allows for the two-phase commit (a distributed feature).

**To enable two-phase commit:**

1. From the Taskbar, choose Start > Run.
2. Enter:  
`ORACONCT ON`
3. Click **OK**.

**To disable this feature:**

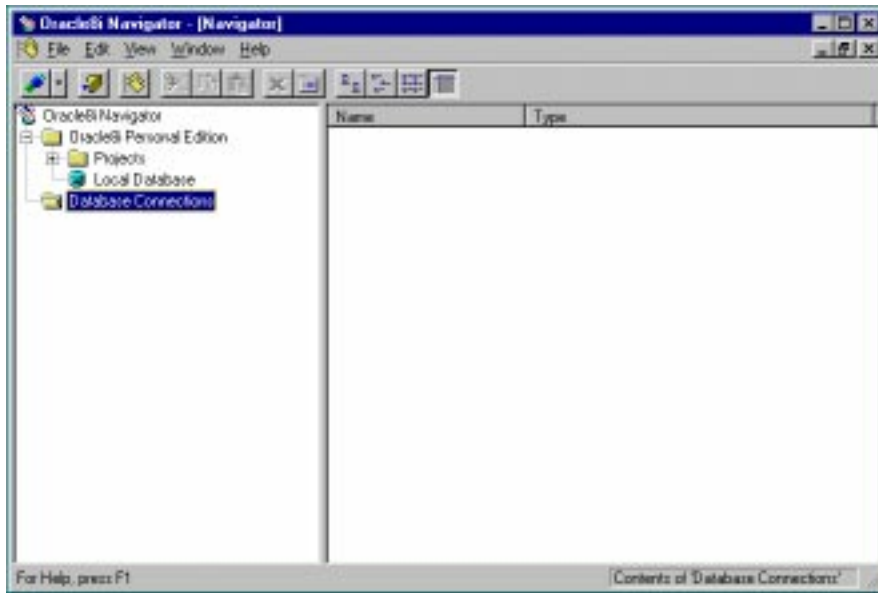
1. From the Taskbar, choose Start > Run.
2. Enter:  
`ORACONCT OFF`
3. Click **OK**.

### Step 4: Configure a Database Connection

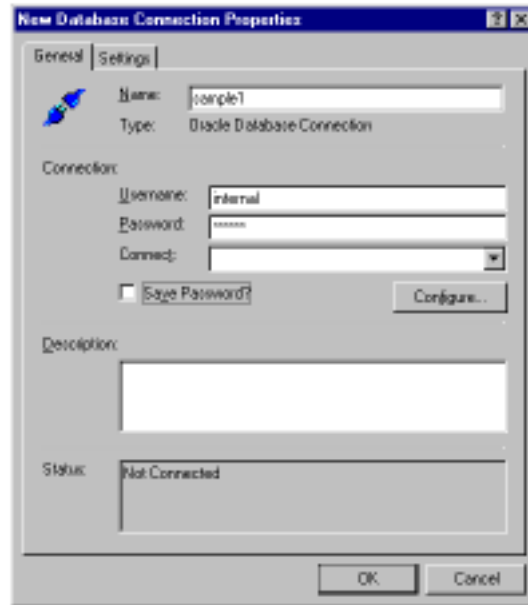
A connection is predefined for the local database. If you want to establish a connection to a remote database, then create the database connection. Once you have created a database connection to a remote database, select the database connection in Oracle8i Navigator to establish an *active* database connection to a remote database. After you have connected to a remote database, you can view and copy objects located on a remote database. If the remote database is a master replication site, then you can also perform replication.

**To create a database connection to a remote database:**

1. From the Oracle8i Navigator, select Database Connections.



2. Right-click on Database Connections, and choose New from the pop-up menu.  
The New Database Connections Properties sheet appears:

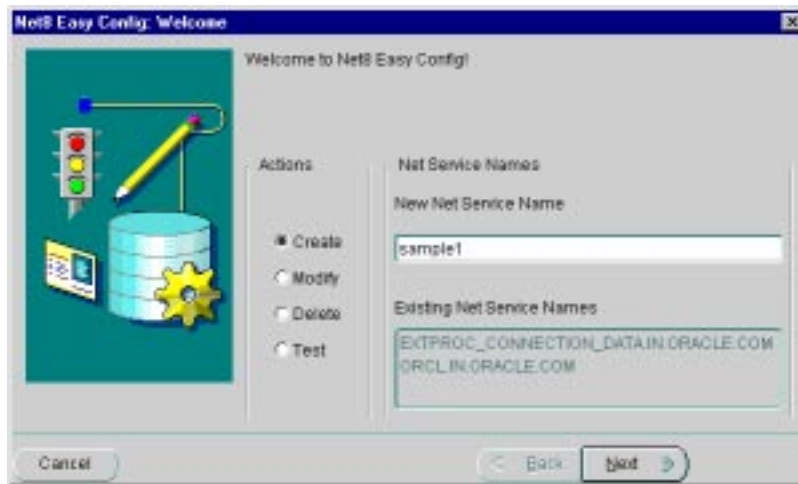


3. Enter the name of the new database connection.
4. Enter the user name and password that you will use to connect to the database.

Remember that the privileges associated with the user name you specify will affect how you can use the database with this database connection.

5. Click **Configure**.

Oracle Net8 Easy Config appears:

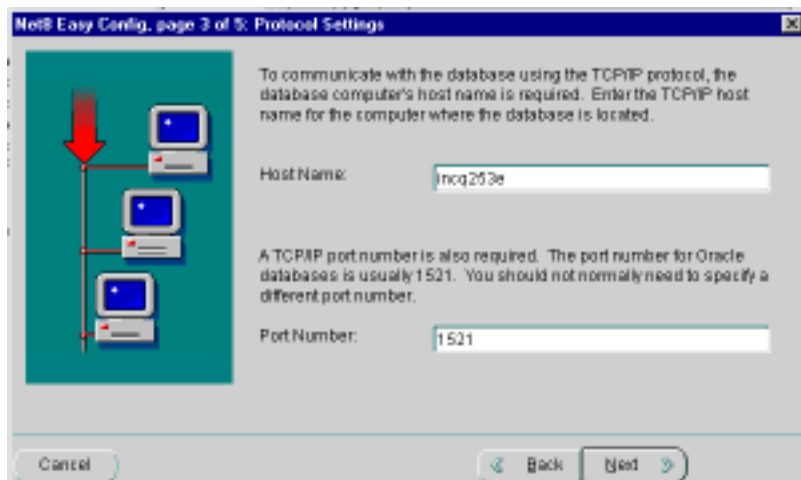


6. Enter a service name (database connection), and click **Next**.  
The next page appears:



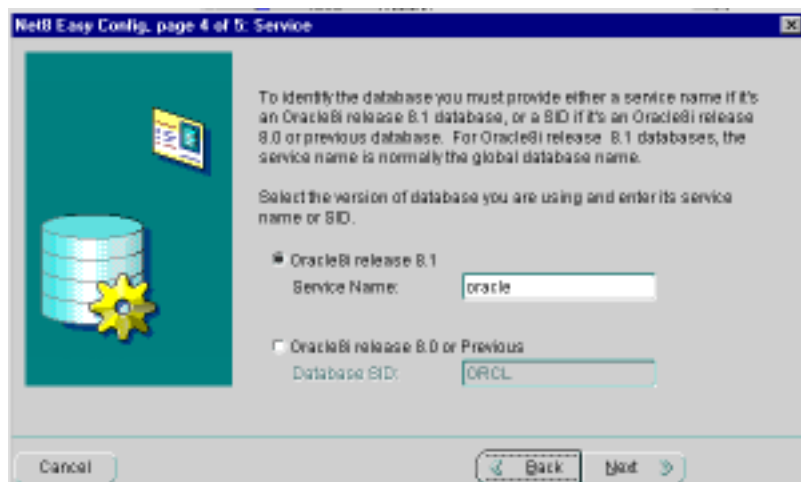
7. Select the networking protocol you want to use to connect to the remote database, and click **Next**.  
The next page appears:





8. Enter the host machine name of the database you want to connect to, and specify the port number which the host machine network listener is using. Then click **Next**. You may need to consult with your network administrator for this information.

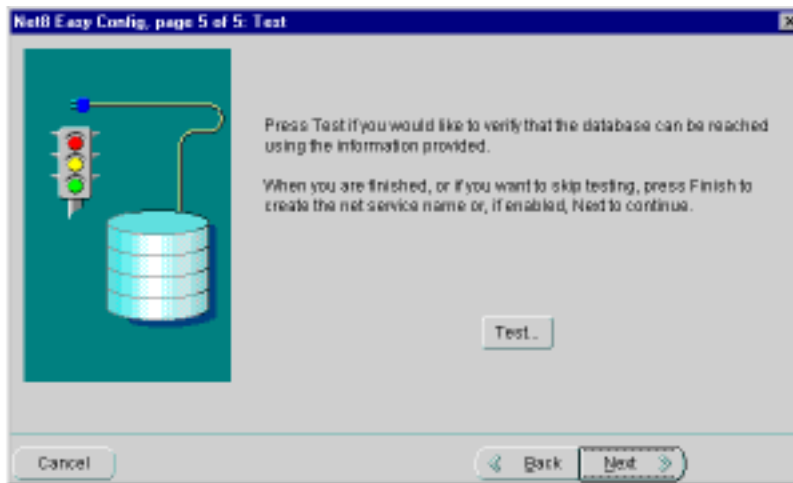
The next page appears:



9. Specify the 'Service Name' if you are using Oracle8i 8.1.x database or, specify the SID of the remote database you want to connect to if you are using Oracle8i 8.0.x database, and click **Next**.

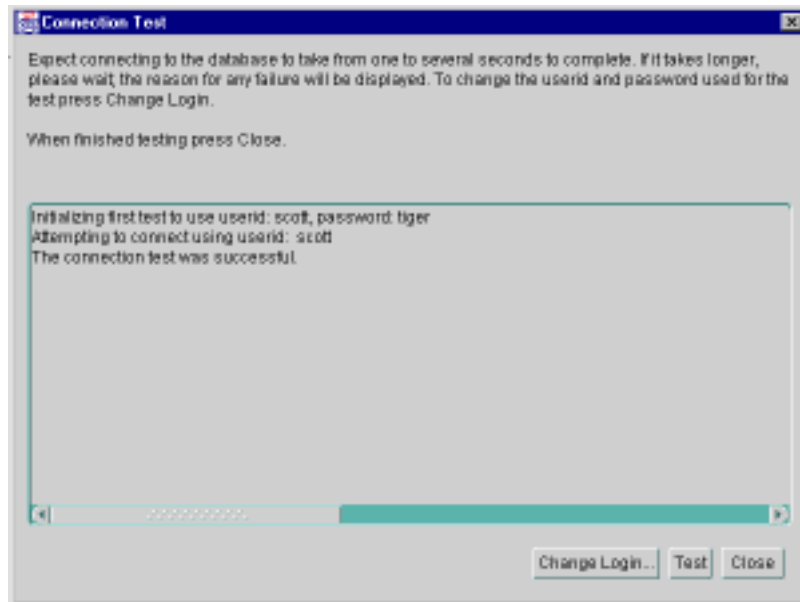
The SID is a unique identifier for an Oracle database instance. You may need to consult with your database administrator for this information.

The next page appears:



10. Click **Test**.

The Connection Test page appears:

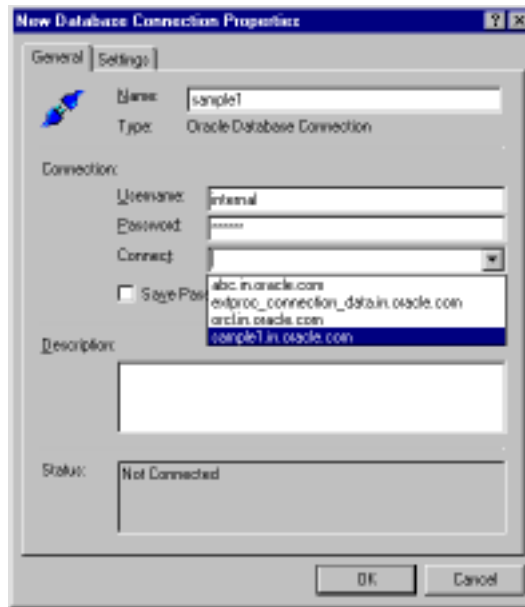


Oracle Net8 Easy Config tests the connection using the information you have provided, and returns a message of either success or failure. If your connection test is not successful, then an error message code appears. Use the online help to research the code to help you correct the problem.

11. If you want to test with a different user connection, click **Change Login**. Enter username, password and click **Test**.
12. Click **Close**.

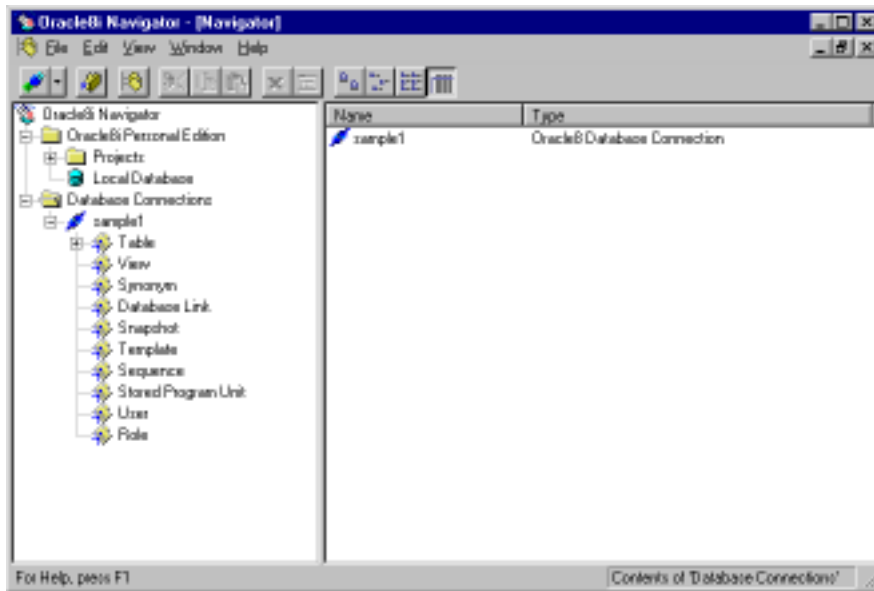
You will be taken back to the previous screen, click **Next**. The next page appears.

13. Click **Finish** or click **Back** to return to previous pages and make modifications to your connection information, if needed.
14. Select the service (connection) name that you just created from the drop-down list in the New Database Connection Properties sheet:



**15. Click OK.**

The new database connection is added to the Database Connections folder in Oracle8i Navigator. To connect to the remote database specified by the connection, single-click the database connection name (in this case 'sample1'). A list of database objects appears in the right side window of the Navigator.



## Step 5: Create a Project

A project is a collection of different database objects. You choose which objects you want to include in a project. For example, you may want to create a project called Clients. You might include tables or views containing customer names, addresses, past items purchased, past sales, and payables. You may create these tables or views yourself, or you may copy an object from another database. You may include other objects such as spreadsheets. See the Oracle8i Navigator online help for detailed instructions on how to create a project.



---

## Post-Installation Database Creation

This chapter describes how to create a database with Oracle Database Configuration Assistant or the BUILD\_DB.SQL script after installing Oracle.

Specific topics discussed are:

- Before You Create a Database
- Creating a Database Using Tools
- Using Oracle Database Configuration Assistant
- Using BUILD\_DB.SQL

## Before You Create a Database

Before you create a database, consider the following requirements described below.

### Naming Conventions for Oracle Databases

With Oracle8i databaseOracle8i, all mounted Oracle databases in a network *must* have unique database names.

A name is associated with a database at database creation time and stored in its control files. If the database keyword is provided in the CREATE DATABASE statement or when prompted by the Oracle Database Configuration Assistant, that value becomes the name for that database. If not, the program uses the value of the DB\_NAME parameter in the INIT.ORA file.

If you attempt to mount two Oracle8i databases with the same database name, you receive the following error during the second mount:

```
ORA-01102: cannot mount database in EXCLUSIVE mode
```

If there are two or more Oracle8i databases on the same computer, but located in different Oracle homes, the following rules apply:

- Each database name must be unique
- Each SID must be unique

To change the name of an existing database, you must use the CREATE CONTROLFILE statement to recreate your control file(s) and specify a new database name. This restriction only exists for Oracle8i instances. Any Oracle7 instances running simultaneously with an Oracle8i instance are not subject to this restriction.

---

---

**Note:** The directory path examples in this chapter follow Optimal Flexible Architecture (OFA) guidelines (for example, *ORACLE\_BASE\ORACLE\_HOME\RDBMS\ADMIN*). If you specified non-OFA compliant directories during installation, your directory paths will differ. See "OFA and Multiple Oracle Home Configurations" on page 3-22 for information.

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## Creating a Database Using Tools

You can choose either of the following tools to create a database:

- Oracle Database Configuration Assistant
- BUILD\_DB.SQL script

Use Oracle Database Configuration Assistant to create a database, because it is the easier method.

If you want to create a database using command line tools, you can use the BUILD\_DB.SQL script located in *ORACLE\_BASE\ORACLE\_HOME\RDBMS\ADMIN*.

## Using Oracle Database Configuration Assistant

Oracle Database Configuration Assistant enables you to:

- Create a Database
- Delete a Database

---

---

**Note:** This chapter describes running Oracle Database Configuration Assistant in standalone mode (that is, after installation). See Chapter 4 of *Oracle8i Installation Guide for Windows 98* for information on running Oracle Database Configuration Assistant during installation to create a database.

---

---

### Create a Database

---

---

**Note:** If you use Oracle Database Configuration Assistant to create a new database in a new multiple Oracle home, the LISTENER.ORA file located in *ORACLE\_HOME\NETWORK\ADMIN* is updated with the SID information. Also a new TNS entry is generated in the TNSNAMES.ORA file located in *ORACLE\_HOME\NETWORK\ADMIN*.

---

---

**To create a database using Oracle Database Configuration Assistant:**

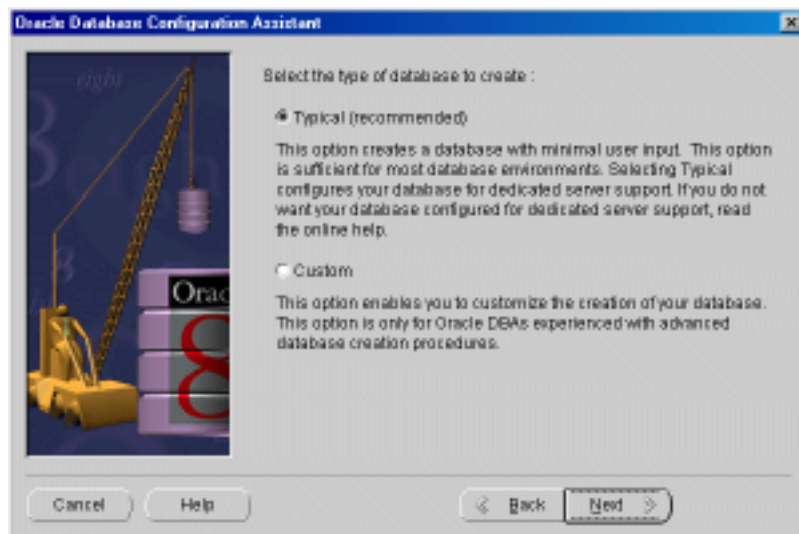
1. Choose Start > Programs > Oracle - *HOME\_NAME* > Database Administration > Database Configuration Assistant.

The Oracle Database Configuration Assistant Welcome page appears.



2. Select Create a database, then click **Next**.

The following page appears:



Option	Description
Typical	<p>Consists of two suboptions:</p> <ul style="list-style-type: none"> <li>■ Copy existing database files from the CD Automatically installs a starter database with the default initialization parameter settings</li> <li>■ Create new database files Asks you several database environment questions before dynamically creating a database</li> </ul>

Option	Description
Custom	<p>Enables you to customize the creation of your database. This option is only for Oracle database administrators (DBAs) experienced with advanced database creation procedures, such as customizing:</p> <ul style="list-style-type: none"><li>■ Data, control, and redo log file settings</li><li>■ Tablespace sizes</li><li>■ Extent sizes</li><li>■ Database memory parameters</li><li>■ Archiving formats and destinations</li><li>■ Trace file destinations</li><li>■ Character set values</li></ul>

3. Respond to instructions on each Oracle Database Configuration Assistant page, then click **Next** when you are ready to continue to the next page. When you get to the last page, click **Finish** to start the creation of the Oracle8i database.

Delete a Database

The "Delete a Database" option of Oracle Database Configuration Assistant lets you quickly and easily delete all database files including the initialization parameter file.

Using BUILD\_DB.SQL

This section describes how to create a new database manually using a SQL script. There are a number of ways to create a database depending on if you want to:

- Make a copy of an existing database and remove the old database.
- Make a copy of an existing database and keep the old database.
- Create a new database when no database exists on your system that you can copy.

The following table summarizes the steps involved in creating a new database for each of these database creation scenarios. Each step is explained in detail in the following subsections.

Perform these tasks...	If you want to...		
	Copy an existing database to a new database, then remove the old database	Copy an existing database to a new database, then keep the old database	Create a new database when no other database exists on your system
Exporting an Existing Database	Yes	Only if you want to copy data from the existing database to the new database	Not applicable
Deleting Database Files	Yes	No	Not applicable
Modifying the INIT.ORA File	Yes	Yes	Yes
Creating and Starting an Oracle Instance	No	Yes	Yes
Putting the CREATE DATABASE Statement in a Script	Yes	Yes	Yes
Creating a Database	Yes	Yes	Yes
Importing a Database	Yes	Only if you want to import tables and other objects exported from the existing database	Not applicable
Updating the ORACLE_SID in the Registry	No	Only if you want to change the default SID	Yes
Backing Up the New Database	Yes	Yes	Yes

## How to Create a Database

An example is used in the following sections to demonstrate how to create a database.

In this example, you will copy an existing database (the starter database with a SID of ORCL located in the C:\ORACLE\ORADATA\ORCL directory) to a new database with a database name and SID of PROD located in the C:\ORACLE\ORADATA\PROD directory.

You will delete the starter database ORCL after you have created the PROD database.

---

**Note:** In this example, *ORACLE\_BASE* is C:\ORACLE. See Chapter 3, "Multiple Oracle Homes and Optimal Flexible Architecture" for more information on *ORACLE\_BASE*.

---

### Creating Directories

Create the following directories in which to put the administration and database files for the new database PROD:

- C:\ORACLE\ADMIN\PROD
- C:\ORACLE\ADMIN\PROD\BDUMP
- C:\ORACLE\ADMIN\PROD\PFIL
- C:\ORACLE\ADMIN\PROD\UDUMP
- C:\ORACLE\ORADATA\PROD

### Exporting an Existing Database

You only need to export an existing database if you want to copy its contents to a new database.

You can invoke the Export Utility by using either parameter mode or interactive mode. However, parameter mode is the recommended mode. Interactive mode provides less functionality than parameter mode and exists for backward compatibility only.

#### **Example 6–1 Parameter Mode**

```
C:\> EXP SYSTEM/PASSWORD FILE=MYEXP.DMP FULL=Y LOG=MYEXP.LOG
```

#### **Example 6–2 Interactive Mode**

```
C:\> EXP SYSTEM/PASSWORD
```

Enter only the command EXP SYSTEM/PASSWORD to begin an interactive session and let the Export Utility prompt you for the information it needs.

See *Oracle8i Utilities* for more information on using the Export Utility.

---

**Note:** If you use parameter mode, the Export Utility considers file names and directory names to be invalid if a blank space is present. Enclose the full path in the FILE= parameter in triple quotes. For example:

```
FILE=" "C:\PROGRAM FILES\EXPORT.DMP" " "
```

or

```
FILE=" "C:\PROGRAM FILES\EXPORT FILE.DMP" " "
```

If the Export Utility is used in interactive mode, the file name or directory name can contain a space without quotes.

---

### To export all data from an existing database to a new database:

1. Set ORACLE\_SID to the database service of the database whose contents you want to export. For example, if the database you want to export is the starter database ORCL, enter the following at the MS-DOS command prompt. Note that there are no spaces around the equal sign (=) character.

```
C:\> SET ORACLE_SID=ORCL
```

2. Start the Export Utility from the MS-DOS command prompt:

```
C:\> EXP SYSTEM/PASSWORD FILE=MYEXP.DMP FULL=Y LOG=MYEXP.LOG
```

You now have a full database export of the starter database ORCL in the file MYEXP.DMP. All messages from the Export Utility are logged in the file MYEXP.LOG.

### Deleting Database Files

Deleting database files is only required when you want to copy an existing database to a new database to replace the old database. In the following example, you delete the database files of the starter database ORCL.

#### To delete database files:

1. Shut down the starter database ORCL using OSTOP

2. Delete the following database files located in the C:\ORACLE\ORADATA\ORCL directory:

- CONTROL01.CTL
- CONTROL02.CTL
- CONTROL03.CTL
- INDX01.DBF
- DR01.DBF
- RBS01.DBF
- SYSTEM01.DBF
- TEMP01.DBF
- USERS01.DBF
- REDO01.LOG
- REDO02.LOG
- REDO03.LOG
- TOOLS01.DBF

### Modifying the INIT.ORA File

If you are using the starter database ORCL as the basis for your new database, copy INIT.ORA file:

```
C:\ORACLE\ORACLE_HOME\ADMIN\ORCL\PFIL\INIT.ORA  
to
```

```
C:\ORACLE\ORACLE_HOME\ADMIN\PROD\PFIL\INIT.ORA
```

and modify the file as described in this section.

If you do not have an existing database on your system, you cannot copy an initialization parameter file to use as the basis for your new INIT.ORA file. However, you can use the sample initialization parameter file INITSMP.LORA provided in the ORACLE\_BASE\ORACLE\_HOME\ADMIN\SAMPLE\PFIL directory as the basis for the INIT.ORA file for the PROD database.



If you use INITSMPL.ORA as the basis for the INIT.ORA file, you must modify the following initialization parameters in the INIT.ORA file, or you will not be able to start the PROD database:

- DB\_NAME
- INSTANCE\_NAME
- SERVICE\_NAMES
- CONTROL\_FILES
- BACKGROUND\_DUMP\_DEST
- USER\_DUMP\_DEST

Modifying the DB\_FILES initialization parameter is recommended to optimize performance.

Initialization Parameter	Modification Instructions.
DB_NAME	<p>This parameter indicates the name of the database, and must match the name used in the CREATE DATABASE statement in "Putting the CREATE DATABASE Statement in a Script" on page 6-13. You give a unique database name to each database. You can use up to eight characters for a database name. The name does not need to match the SID of the database service.</p> <p>Set this parameter to:</p> <p>DB_NAME=PROD.DOMAIN</p>
INSTANCE_NAME	<p>Set this parameter to:</p> <p>INSTANCE_NAME=PROD.DOMAIN</p>
SERVICE_NAMES	<p>Set this parameter to:</p> <p>SERVICE_NAMES=PROD.DOMAIN</p>

Initialization Parameter	Modification Instructions.
CONTROL_FILES	<p>This parameter lists the control files of the database. You do not have the control files on your file system at this point, because the control files are created when you run the CREATE DATABASE statement. Ensure that you specify the complete path and file name, including drive letter.</p> <p>Set this parameter to:</p> <pre>CONTROL_FILES = ( "C:\ORACLE\ORADATA\PROD\CONTROL01.CTL",   "C:\ORACLE\ORADATA\PROD\CONTROL02.CTL",   "C:\ORACLE\ORADATA\PROD\CONTROL03.CTL" )</pre>
BACKGROUND_DUMP_DEST	<p>Set this parameter to:</p> <pre>BACKGROUND_DUMP_DEST = C:\ORACLE\ADMIN\PROD\BDUMP</pre>
USER_DUMP_DEST	<p>Set this parameter to:</p> <pre>USER_DUMP_DEST = C:\ORACLE\ADMIN\PROD\UDUMP</pre>
DB_FILES	<p>Set this parameter to the same number as the value of the MAXDATAFILES option of the CREATE DATABASE statement. The value of 100 is used for this example.</p> <pre>DB_FILES=100</pre>

**See Also:** Appendix B, "Oracle8i Database Specifications for Windows 98" and Oracle8i Reference for information on other initialization parameters that you may want to add or modify.

Creating and Starting an Oracle Instance

You only need to create and start an Oracle instance if you want to do one of the following:

- Copy an existing database to a new database and keep the old database
- Create a new database when no other database exists on your system that you can copy

**To create an Oracle instance:**

1. Run ORADIM from the MS-DOS command prompt:

```
C:\> ORADIM -NEW -SID PROD -INTPWD PASSWORD -STARTMODE MANUAL  
-PFILE C:\ORACLE\ADMIN\PROD\PFILE\INIT.ORA -ORA_REQ_HOME HOME_NAME
```

Note that the previously created INIT.ORA file is specified, with complete path, including drive name.

2. Set ORACLE\_SID to equal PROD. Note that there are no spaces around the equal sign (=) character:

```
C:\> SET ORACLE_SID=PROD
```

**Putting the CREATE DATABASE Statement in a Script**

The CREATE DATABASE statement is a sequence of SQL statements that creates the database. Create a script containing this statement that you can reuse anytime you want to create a database.

Open the BUILD\_DB.SQL script located in C:\ORACLE\ORA81\RDBMS\ADMIN and save it as BUILD\_PROD.SQL.

This file becomes the basis for your script.

---

---

**Note:** The following example uses the BUILD\_DB.SQL script to create a database. You can also use the BUILDALL.SQL script to create a database. BUILDALL.SQL not only creates the database by calling BUILD\_DB.SQL but also runs many other scripts such as CATALOG.SQL, CATSNMP.SQL, SCOTT.SQL, and COMDEMO.SQL.

---

---

**To prepare the CREATE DATABASE script:**

Make the following changes to the BUILD\_PROD.SQL script.

1. Set PFILE so it points to the C:\ORACLE\ADMIN\PROD\PFILE\INIT.ORA initialization file.
2. Change CREATE DATABASE SAMPLE to CREATE DATABASE PROD.
3. Change all occurrences of SAMPLE to PROD. For example, change C:\ORACLE\ORADATA\SAMPLE\REDO01.LOG to C:\ORACLE\ORADATA\PROD\REDO01.LOG

The following is the sample BUILD\_DB.SQL script. Areas that you must modify to create a database called PROD are highlighted.

```
--
-- This file must be run out of the directory containing the
-- initialization file.

startup nomount pfile=C:\Oracle\ADMIN\SAMPLE\pfile\initssmpl.ora

-- Create database

create database SAMPLE
  controlfile reuse
  logfile 'C:\Oracle\ORADATA\SAMPLE\redo01.log' size 1M reuse,
         'C:\Oracle\ORADATA\SAMPLE\redo02.log' size 1M reuse,
         'C:\Oracle\ORADATA\SAMPLE\redo03.log' size 1M reuse
  datafile 'C:\Oracle\ORADATA\SAMPLE\system01.dbf' size 10M reuse
  autoextend on
  next 10M maxsize 200M
  character set WE8ISO8859P1;

create rollback segment rb_temp storage (initial 100 k next 250 k);

-- Create additional tablespaces ...

-- USERS: Create user sets this as the default tablespace
-- TEMP: Create user sets this as the temporary tablespace
-- RBS: For rollback segments

create tablespace users
  datafile 'C:\Oracle\ORADATA\SAMPLE\users01.dbf' size 3M reuse autoextend on
  next 5M maxsize 150M;
create tablespace rbs
  datafile 'C:\Oracle\ORADATA\SAMPLE\rbs01.dbf' size 5M reuse autoextend on
  next 5M maxsize 150M;
create tablespace temp
  datafile 'C:\Oracle\ORADATA\SAMPLE\temp01.dbf' size 2M reuse autoextend on
  next 5M maxsize 150M;
create tablespace oem_repository
  datafile 'C:\Oracle\ORADATA\SAMPLE\oemrep01.dbf' size 3M reuse autoextend on
  next 5M maxsize 150M;
create tablespace indx;
  datafile 'C:\Oracle\ORADATA\SAMPLE\indx01.dbf' size 2M reuse autoextend on
  next 5M maxsize 150M;
--      next 5M maxsize 150M;
alter rollback segment rb_temp online;

-- Change the SYSTEM users' password, default tablespace and
-- temporary tablespace.
```

```
alter user system temporary tablespace temp;
alter user system default tablespace users;

-- Create 16 rollback segments. Allows 16 concurrent users with open
-- transactions updating the database. This should be enough.

create public rollback segment rb1 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb2 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb3 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb4 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb5 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb6 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb7 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb8 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb9 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb10 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb11 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb12 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb13 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb14 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb15 storage(initial 50K next 250K)
    tablespace rbs;
create public rollback segment rb16 storage(initial 50K next 250K)
    tablespace rbs;
```

You will run this script at the SQL\*Plus prompt in "Creating a Database" on page 6-16.

## Creating a Database

**To use the BUILD\_PROD.SQL script to create a database:**

1. Make PROD the current SID:

```
C:\> SET ORACLE_SID=PROD
```

2. Start SQL\*Plus from the MS-DOS command prompt, and connect to the database as INTERNAL:

```
C:\> SQLPLUS
```

```
SQL> CONNECT INTERNAL/PASSWORD
```

The password is the one that you used to create the service, with the ORADIM-NEW command in "Creating and Starting an Oracle Instance" on page 6-12.

The message *Connected* appears.

3. Turn on spooling to save the messages:

```
SQL> SPOOL BUILD_PROD.LOG
```

4. Run the BUILD\_PROD.SQL script that you created in "Putting the CREATE DATABASE Statement in a Script" on page 6-13:

```
SQL> @C:\ORACLE\ORA81\RDBMS\ADMIN\BUILD_PROD.SQL;
```

If the database is created successfully, the instance is started and the message *Statement processed* appears numerous times.

If you receive any errors, there are three possible causes, as illustrated below.

Cause	Solution
The BUILD_PROD.SQL script contains syntax errors.	Correct them.
Some of the files to be created by the BUILD_PROD.SQL script already exist in the file system.	Make sure you are not using any file names already used by another database on the system.
An error occurred at the operating system level, such as a file or directory permission problem.	<p>You should have received a series of errors in SQL*Plus, the last one of which should have the OSD- prefix. At the end of the OSD error, you typically see an operating system error number in parentheses.</p> <p>To see what the error means, do either of the following:</p> <p>From the MS-DOS command prompt, enter:</p> <pre>C:\&gt; NET HELP n</pre> <p><i>or</i></p> <p>From the SQL*Plus prompt, enter:</p> <pre>SQL&gt; HOST NET HELP n</pre> <p>where <i>n</i> is the operating system error number.</p>

You *must* correct these problems before making another attempt to create a database.

5. Run the CATALOG.SQL script to create the data dictionary:

```
SQL> @C:\ORACLE\ORA81\RDBMS\ADMIN\CATALOG.SQL;
```

---

**Note:** You may see messages such as *ORA-01432: public synonym to be dropped does not exist* while the CATALOG.SQL, CATPROC.SQL, and CATREP.SQL scripts are running. These are information messages and are intended to occur while creating a new database.

---

6. Run the CATPROC.SQL script to install the objects used by the Oracle8i database's PL/SQL functionality:

```
SQL> @C:\ORACLE\ORA81\RDBMS\ADMIN\CATPROC.SQL;
```

7. Turn off spooling:

```
SQL> SPOOL OFF
```

8. Examine the BUILD\_PROD.LOG file for any unusual errors.

---

**IMPORTANT:** The new database contains two users, SYS and SYSTEM, with passwords CHANGE\_ON\_INSTALL and MANAGER, respectively. For security reasons, change the passwords now. Use the ALTER USER statement to change the passwords:

```
SQL> ALTER USER SYS IDENTIFIED BY NEW_SYS_PASSWORD;  
SQL> ALTER USER SYSTEM IDENTIFIED BY NEW_SYSTEM_PASSWORD;
```

---

9. Exit SQL\*Plus:

```
SQL> EXIT
```

## Importing a Database

You can import the full export created in "Exporting an Existing Database" on page 6-8 into the new database.

You can also invoke the Import Utility, using parameter mode or interactive mode. Parameter mode is recommended, because interactive mode provides less functionality. Interactive mode exists solely for backward compatibility.

### **Example 6–3 Parameter Mode**

```
C:\> IMP SYSTEM/PASSWORD FILE=MYEXP.DMP FULL=Y LOG=MYEXP.LOG
```

### **Example 6–4 Interactive Mode**

```
C:\> IMP SYSTEM/PASSWORD
```

Enter only the command IMP SYSTEM/PASSWORD to begin an interactive session and let the Import Utility prompt you for the information it needs.

See *Oracle8i Utilities* for more information on using the Import Utility.



---

**Note:** If you use parameter mode, the Import Utility considers file names and directory names to be invalid if there is a blank space. Enclose the full path in the FILE= parameter in triple quotes. For example:

```
FILE=" " "C:\PROGRAM FILES\EXPORT.DMP" " "
```

or

```
FILE=" " "C:\PROGRAM FILES\EXPORT FILE.DMP" " "
```

If you use the Import Utility in interactive mode, the file name or directory name can contain a space without quotes.

---

### To import a database:

- Run the Import Utility:

```
C:\> IMP SYSTEM/PASSWORD FILE=MYEXP.DMP FULL=Y LOG=MYIMP.LOG
```

---

**IMPORTANT:** If the original database from which the export file was generated contains tablespaces that are not in the new database, the Import Utility tries to create those tablespaces with associated data files.

The easy solution is to ensure that both databases contain the same tablespaces. The data files do not have to be identical. Only the tablespace names are important.

---

### Updating the ORACLE\_SID in the Registry

If this is the first database on the system or if you want to make the new database the default database, you must make a change in the registry.

1. Start the registry editor at the MS-DOS command prompt:

```
C:\> REGEDIT
```

The registry editor window appears.

2. Choose the \HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE\HOME0 subkey for the first Oracle home on your computer. For subsequent installations to different Oracle homes on the same computer, the path is \HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE\HOMEID, where ID is the unique number identifying the Oracle home.

**See Also:** See Appendix C, "Oracle8i Configuration Parameters and the Registry" for more information on the subkey locations for multiple Oracle homes.

3. Locate the ORACLE\_SID parameter on the right side of the registry editor window.
4. Double-click the parameter name and change the data to the new SID, which is PROD in this example.

If you do not yet have the ORACLE\_SID parameter, because this is the first database on your system, you must create it.

**Additional Information:** To create the ORACLE\_SID parameter, see Appendix C "Adding a Registry Parameter with REGEDIT" on page C-9.

## Backing Up the New Database

---

---

**WARNING:** If anything goes wrong while operating the new database without a backup, you must repeat the database creation procedure. Back up your database now to prevent loss of data.

---

---

### To back up the new database:

1. Shut down the database instance using OSTOP

See "Starting and Shutting Down a Database Using OSTART and OSTOP" on page 7-3 for more information on how to use OSTART and OSTOP.

2. Using the tool of your choice, back up the database files.

Database files consist of the initialization parameter file, control files, online redo log files, and data files.

When the backup is complete, you can start the database again, create users and objects, if necessary, make any other changes, and use the database.

Be sure to back up the database backup after making any significant changes to the database, such as switching the ARCHIVELOG mode, or adding a tablespace or data file.

**See Also:** Chapter 9, "Backing Up and Recovering Database Files", *Oracle8i Concepts*, *Oracle8i Backup and Recovery Guide*, and *Oracle8i Administrator's Guide* for more information on archiving and backup/recovery.

---

---

**WARNING:** Do not store database files on a compressed drive. This can result in write errors and decreased performance.

---

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# Administering a Database

This chapter describes how to administer Oracle8i Personal Edition for Windows 98.

Specific topics discussed are:

- Starting and Shutting Down a Database with SQL\*Plus
- Starting and Shutting Down a Database Using OSTART and OSTOP
- Running Multiple Instances
- Creating Password Files
- Deleting Password Files
- Connecting as INTERNAL with a Password File
- Changing the INTERNAL Password
- Encrypting Database Passwords
- Archiving Redo Log Files
- Using the ORADEBUG Utility

# Starting and Shutting Down a Database with SQL\*Plus

These instructions assume that a database instance is created.

**Note:** The directory path examples in this chapter follow Optimal Flexible Architecture (OFA) guidelines (for example, *ORACLE\_BASE\ORACLE\_HOME\RDBMS\ADMIN*). If you specified non-OFA compliant directories during installation, your directory paths will differ. See section "OFA and Multiple Oracle Home Configurations" on page 3-22 for information.

**To start or shut down an Oracle8i database:**

- 1. Go to your Oracle8i database server.
- 2. Start SQL\*Plus at the MS-DOS command prompt:

```
C:\> SQLPLUS
```

- 3. Connect to the Oracle8i database with the INTERNAL user name:

```
SQL> CONNECT INTERNAL
```

- 4. Follow the instructions below:

If You Want to...	Then Enter...
Start a database with the default parameter file	<pre>SQL&gt; STARTUP</pre> <p>This command uses the default INIT.ORA file located in the <i>ORACLE_BASE\ADMIN\DB_NAME\PFIL</i>e directory.</p>
Start a database with a file other than the default parameter file	<pre>SQL&gt; STARTUP PFILE=PATH\FILENAME</pre> <p>This command uses the INIT.ORA file specified in <i>PATH\FILENAME</i>. This example starts the database using a file named INIT2.ORA in C:\ORA81\ADMIN\ORCL\PFIL</p> <pre>SQL&gt; STARTUP PFILE=C:\ORA81\ADMIN\ORCL\PFIL\INIT2.ORA</pre>
Stop the database	<pre>SQL&gt; SHUTDOWN [MODE]</pre> <p>where <i>MODE</i> is one of the following:</p> <ul style="list-style-type: none"><li>■ Normal</li></ul>

If You Want to...	Then Enter...
	The database waits for all currently-connected users to disconnect and disallows any new connections before shutting down. This is the <i>default</i> mode. <ul style="list-style-type: none"><li>■ Immediate</li></ul>
	The database terminates and rolls back active transactions, disconnects clients, and shuts down. <ul style="list-style-type: none"><li>■ Abort</li></ul>
	The database terminates active transactions and disconnects users; it does not roll back transactions. The database performs automatic recovery and rollback the next time it is started. Use this mode only in emergencies.

---

---

**Note:** See "Choosing a Database Tool" on page 2-2 for a list of other tools that can start the database and the *Oracle8i Administrator's Guide* for information on options you can specify when starting your database.

---

---

## Starting and Shutting Down a Database Using OSTART and OSTOP

### Using OSTART:

Choose Start>Programs>Oracle\_Home\_Name>Database Administration>Start Database.

OR

At the MS-DOS Prompt execute :

```
c:\>OSTART SCREEN
```

Select the instance you want to start by choosing the SID from the combo box, then press OK.



If you are executing OSTART from command prompt, the SID list displayed will be of the Oracle Home which comes first in the PATH. To get the SID list of another Oracle Home, go to the BIN directory of that Home and execute OSTART SCREEN.

**Using OSTOP:**

Choose Start>Programs>Oracle\_Home\_Name>Database Administration>Stop Database.

OR

At the MS-DOS Prompt execute :

```
c:\> OSTOP SCREEN
```

OSTOP will stop the instance whose SID is found in HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE\HOME\_NAME\ORACLE\_SID if ORACLE\_SID is not set in the environment.

To stop any other instance started from the same Home, User, can do:

1. Set the SID of that instance to ORACLE\_SID either in the registry or in the environment and then run OSTOP or right click on the database icon on the systray and select "shutdown".
2. Run KNLSTOP from the same Home with the SID of the instance to be stopped;

```
c:\> KNLSTOP <SID Name>
```

## Running Multiple Instances

To run multiple instances, ensure that you have already created each instance. You then run multiple instances by starting each of the instances using SQL\*Plus.

**To run multiple instances:**

1. Ensure that you have already created each instance.
2. Set the ORACLE\_SID configuration parameter at the MS-DOS command prompt to the SID for each instance you want to run:

```
C:\> SET ORACLE_SID=SID
```

where *SID* is the name of the Oracle8i database instance.

3. Start SQL\*Plus:

```
C:\> SQLPLUS
```

4. Connect as INTERNAL:

```
SQL> CONNECT INTERNAL
```



5. Start up the database with the new instance:

```
SQL> STARTUP PFILE=ORACLE_BASE\ADMIN\DB_NAME\PFIL\INIT.ORA
```

where *ORACLE\_BASE* is C:\ORACLE by default (unless you changed it during installation) and *DB\_NAME* is the name of the instance.

## Creating Password Files

Use the Password Utility ORAPWD to create password files. ORAPWD is automatically installed with the Oracle8i Utilities. Password files are located in the *ORACLE\_BASE\ORACLE\_HOME\DATABASE* directory and are named *PWDSID.ORA*, where *SID* identifies the Oracle8i database instance. Password files can be used for local or remote connections to an Oracle8i database. The example below describes how to perform a local connection.

### To create a password file:

1. Create a password file with ORAPWD:

```
C:\> ORAPWD FILE=PWDSID.ORA PASSWORD=PASSWORD ENTRIES=MAX_USERS
```

The essential elements of a password file are:

Element	Description
SID	Identifies the database instance.
FILE	Specifies the password file name.
PASSWORD	Sets the password for the INTERNAL and SYS accounts.
ENTRIES	Sets the maximum number of entries in the password file. This corresponds to the maximum number of distinct users allowed to connect to the database with the SYSDBA and SYSOPER DBA privileges simultaneously.

2. Set the INIT.ORA file parameter *REMOTE\_LOGIN\_PASSWORDFILE* to *EXCLUSIVE* or *SHARED*. Definitions for all possible values are described below:

Element	Description
EXCLUSIVE	Specifies that only one instance can use the password file and that the password file contains names other than SYS and INTERNAL. Oracle8i looks in the registry for the value of the <code>ORA_SID_PWFIL</code> parameter. If a value is unspecified, it looks in the registry for the value of the <code>ORA_PWFIL</code> parameter, which points to a file containing the INTERNAL password as well as user names, passwords, and privileges. If that is not set, it uses the default of <code>ORACLE_BASE\ORACLE_HOME\DATABASE\PWDSID.ORA</code> .
SHARED	Specifies that multiple instances can use the password file (for example, a parallel server environment). However, the only users recognized by the password file are SYS and INTERNAL. You cannot log in with SYSOPER or SYSDBA privileges even if those privileges are granted in the password file. The SHARED value of this parameter affords backward compatibility with earlier releases. The Oracle8i database looks for the same files as it does when the value is EXCLUSIVE, but only the INTERNAL account is available for privileged access. This is the default value.
NONE	Specifies that the Oracle8i database ignores the password file and that privileged users are authenticated by the Windows NT operating system. NONE is the default setting.

**3. Start SQL\*Plus:**

```
C:\> SQLPLUS
```

**4. Connect as INTERNAL:**

```
SQL> CONNECT INTERNAL
```

**5. Start the Oracle8i database:**

```
SQL> STARTUP
```

**6. Grant appropriate privileges to each user who needs to perform database administration. For example:**

```
SQL> GRANT SYSDBA TO SCOTT;
```

If successful, the following message displays:

```
Statement Processed.
```

This adds SCOTT to the password file and enables SCOTT to connect to the database with SYSDBA privileges. Use SQL\*Plus to add or delete user names, user passwords, and user privileges in password files.

**7. Connect to the Oracle8i database with DBA privileges for SCOTT:**

```
SQL> CONNECT SCOTT/TIGER AS SYSDBA
```

You are connected to the Oracle8i database.

## Viewing Password Files

The password file is automatically hidden. This section describes two ways of viewing the password file:

- To see the password file from the MS-DOS command prompt:
- To see the password file from Windows 98 Explorer:

**To see the password file from the MS-DOS command prompt:**

To...	Enter...
See the password file	<pre>C:\ORACLE\ORA81\DATABASE&gt; ATTRIB</pre> <p>The password file displays:</p> <pre>A    H    C:\ORACLE\ORA81\DATABASE\PWDSID.ORA</pre>
Make the password file visible	<pre>C:\ORACLE\ORA81\DATABASE&gt; ATTRIB -H PWDSID.ORA</pre> <p><b>Note:</b> The password file must be visible before you can move or copy it.</p>
Hide the password file again	<pre>C:\ORACLE\ORA81\DATABASE&gt; ATTRIB +H PWDSID.ORA</pre>

**To see the password file from Windows 98 Explorer:**

1. Open Windows 98 Explorer.
2. Open the folder to view.
3. Click Folder Options from the View main menu.
4. Click the View tab.
5. Follow the instructions below:

To...	Click...
See the password file	Show all files.
Hide the password file	Do not show hidden files.

## Deleting Password Files

This section describes how to delete a password file.

### To delete a password file:

1. Make the password file visible at the MS-DOS command prompt or in Windows 98 Explorer by following the instructions in section "Viewing Password Files" on page 7-7.
2. Delete the password file based on whether you made it visible at the MS-DOS command prompt or in Windows 98 Explorer.

## Connecting as INTERNAL with a Password File

You can connect as INTERNAL with a password file. The password for INTERNAL is ORACLE if you installed your database through the Typical or Minimal installation types.

### To connect as INTERNAL with a password file:

1. Follow the procedures in "Creating Password Files" on page 7-5 to create a password file with ORAPWD.
2. Set the INIT.ORA file parameter REMOTE\_LOGIN\_PASSWORDFILE to EXCLUSIVE or SHARED.

---

---

**Note:** When REMOTE\_LOGIN\_PASSWORDFILE is set to NONE, connecting remotely to a database as INTERNAL is prohibited even if the correct password is supplied.

---

---

3. Connect to your Oracle8i database as follows:

```
SQL> CONNECT INTERNAL/PASSWORD
```

where *PASSWORD* is the password created with ORAPWD.

## Changing the INTERNAL Password

Change the INTERNAL user account password with either ORAPWD or SQL\*Plus.

### To change the password with ORAPWD:

1. See section "Deleting Password Files" on page 7-8 for instructions on deleting the password file.
2. See section "Creating Password Files" on page 7-5 for instructions on creating a password file.

### To change the password with SQL\*Plus:

The section assumes the password file is already created and the INIT.ORA file parameter REMOTE\_LOGIN\_PASSWORDFILE is set to SHARED or EXCLUSIVE.

1. Start SQL\*Plus:

```
C:\> SQLPLUS
```

2. Connect with the INTERNAL user name:

```
SQL> CONNECT SYS/password
```

3. Change the password for the SYS user name, for which INTERNAL is an alias:

```
SQL> ALTER USER SYS IDENTIFIED BY NEW_PASSWORD;
```

INTERNAL is now also identified by NEW\_PASSWORD.

## Encrypting Database Passwords

With the Oracle8i database, you can encrypt the password used to verify a remote database connection.

### To enable password encryption:

1. Add DBLINK\_ENCRYPT\_LOGIN to the initialization parameter INIT.ORA file on the server computer.
2. Set DBLINK\_ENCRYPT\_LOGIN equal to TRUE.
3. Set the ORA\_ENCRYPT\_LOGIN configuration variable on the client computer to TRUE. See Appendix C, "Oracle8i Configuration Parameters and the Registry" for instructions on adding and setting configuration parameters in the registry.

Once these parameters are set to TRUE, whenever a user attempts a remote login, the Oracle8i database encrypts the password before sending it to the remote database. If the connection fails, the failure is noted in the audit log. The Oracle8i database then checks if either of these parameters is set to FALSE. If so, the Oracle8i

database attempts the connection again using an unencrypted version of the password. If the connection is successful, the success is noted in the audit log, and the connection proceeds.

---

---

**Note:** Releases prior to Release 7.1 do not support encrypted passwords. If you are connecting to an earlier version of the Oracle database, you must set the initialization parameter `DBLINK_ENCRYPT_LOGIN` to `FALSE` for the connection to succeed.

---

---

## Archiving Redo Log Files

Your Oracle8i database is created in NOARCHIVELOG mode if you installed your database through the Typical or Minimal installation. If you created your database through the Custom option of Database Configuration Assistant, you had the choice of either ARCHIVELOG or NOARCHIVELOG.

In NOARCHIVELOG mode, redo logs are not archived. This protects the database from instance failure, but not from disk failure. Setting your archive mode to ARCHIVELOG and enabling automatic archiving causes redo log files to be archived. This protects the database from both instance and disk failure.

This section describes how to change the archive mode to ARCHIVELOG and enable automatic archiving. See the chapter "Archiving Redo Information" of the *Oracle8i Administrator's Guide* for complete descriptions of the ARCHIVELOG and NOARCHIVELOG modes.

### Step 1: Change the Archive Mode to ARCHIVELOG

**To change the archive mode to ARCHIVELOG:**

1. Start SQL\*Plus at the MS-DOS command prompt:

```
C:\> SQLPLUS
```

2. Connect to the Oracle8i database with the INTERNAL user name:

```
SQL> CONNECT INTERNAL
```

3. If the database is open, shut it down:

```
SQL> SHUTDOWN
```

4. Mount the database:

```
SQL> STARTUP MOUNT
```

**5. Enter the following command:**

```
SQL> ARCHIVE LOG LIST
```

The following output indicates the database is not in archive mode:

Database log mode	No Archive Mode
Automatic archival	Disabled
Archive destination	%RDEMS%\
Oldest online log sequence	34
Current log sequence	37

**6. Change the archive mode to ARCHIVELOG:**

```
SQL> ALTER DATABASE ARCHIVELOG;
```

**7. Enter the following command:**

```
SQL> ARCHIVE LOG LIST
```

The following output indicates the database is now in archive mode:

Database log mode	Archive Mode
Automatic archival	Disabled
Archive destination	%RDEMS%\
Oldest online log sequence	34
Current log sequence	37

**8. Open the database:**

```
SQL> ALTER DATABASE OPEN;
```

**9. Continue to "Step 2: Enable Automatic Archiving" on page 7-12.**

## Step 2: Enable Automatic Archiving

To enable automatic archiving:

- 1. Open the *ORACLE\_BASE\ADMIN\DB\_NAME\INIT.ORA* file.
- 2. Find the following three parameters:

```
# LOG_ARCHIVE_START = TRUE
# LOG_ARCHIVE_DEST_1 = %ORACLE_HOME%\DATABASE\ARCHIVE
# LOG_ARCHIVE_FORMAT = "%%ORACLE_SID%%T%S.ARC"
```

- 3. Remove the # sign from in front of each.

**Note:** The double quotes around LOG\_ARCHIVE\_FORMAT do not need to be removed.

- 4. Edit the LOG\_ARCHIVE\_DEST\_1 value to identify an existing drive and directory in which to archive your filled redo logs.
- 5. Edit the LOG\_ARCHIVE\_FORMAT value to indicate the appropriate archiving format:

Format	Description	Example
%%ORACLE_SID%%T.ARC	Specifies the thread number. This number is padded to the left by zeroes. The default value is one with a range of up to three characters.	SID0001.ARC
%%ORACLE_SID%%S.ARC	Specifies the log sequence number. This number is padded to the left by zeroes. The default value is one with a range of up to five characters.	SID0001.ARC
%%ORACLE_SID%%t.ARC	Specifies the thread number. The number is not padded. The default value is one with no range limit on characters.	SID1.ARC
%%ORACLE_SID%%s.ARC	Specifies the log sequence number. The number is not padded. The default value is one with no range limit on characters.	SID1.ARC



6. Save your changes.
7. Exit the file.
8. Shut down the database:

```
SQL> SHUTDOWN
```

9. Restart the database

```
SQL> STARTUP
```

10. Enter the following command:

```
SQL> ARCHIVE LOG LIST
```

The following output indicates that automatic archiving of redo log files is enabled and an archiving destination is specified:

Database log mode	Archive Mode
Automatic archival	Enabled
Archive destination	C:\BACKUP
Oldest online log sequence	34
Current log sequence	37

## Using the ORADEBUG Utility

The ORADEBUG utility is a debugging tool that sends debug commands through SQL\*Plus to Oracle processes. It is primarily for use by developers and Oracle Support Services personnel. Only use this utility when instructed to do so by Oracle Support Services. Note that you must have database administrator privileges to use ORADEBUG.

### To start ORADEBUG:

1. Start SQL\*Plus from the MS-DOS command prompt and connect to the database as INTERNAL. For example:

```
C:\> SQLPLUS
SQL> CONNECT INTERNAL
```

2. Enter the following at the SQL\*Plus prompt:

```
SQL> ORADEBUG
```

ORADEBUG runs and prompts you for parameters. To obtain a list of these parameters, enter the following at the SQL\*Plus prompt:

```
SQL> ORADEBUG HELP
```

The output from most debug commands is written to a trace file. Trace files are created in the directory specified by the INIT.ORA initialization parameters BACKGROUND\_DUMP\_DEST and USER\_DUMP\_DEST. By default, these parameters are set to *ORACLE\_BASE\ADMIN\DB\_NAME\BDUMP* and *ORACLE\_BASE\ADMIN\DB\_NAME\UDUMP*, respectively. If you want to find the location of your trace file, enter the following at the SQL\*Plus prompt:

```
SQL> ORADEBUG TRACEFILE_NAME
```

If the output from a debug command produces more than one line of output, the result is sent to a trace file, and a message indicating that the command has completed is relayed to SQL\*Plus. If the output from a debug command produces only one line of output, the output is relayed directly to SQL\*Plus.

---

---

**Note:** There is currently a limitation when using ORADEBUG that can cause SQL\*Plus to hang if you attempt to debug a thread that is blocking on input/output (I/O) until that I/O completes.

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# Monitoring a Database

This chapter describes how to monitor Oracle8i Personal Edition for Windows 98.

Specific topics discussed are:

- Database Monitoring Overview
- Using Trace and Alert Files

# Database Monitoring Overview

The following tools enable you to monitor your Oracle8i database:

This Tool	Enables You To...
Trace Files	Record occurrences and exceptions of database operations.
Alert Files	Record important information about error messages and exceptions during database operations.

Each tool is described in the following sections.

**Additional Information:** See *Oracle8i Tuning and Performance* for general tuning information.

## Using Trace and Alert Files

Oracle8i Personal Edition for Windows 98 background threads use trace files to record occurrences and exceptions of database operations, as well as errors. Background thread trace files are created regardless of whether the BACKGROUND\_DUMP\_DEST parameter is set in the INIT.ORA initialization parameter file. If BACKGROUND\_DUMP\_DEST is set, the trace files are stored in the directory specified. If the parameter is not set, the trace files are stored in the ORACLE\_BASE\ADMIN\DB\_NAME\BDUMP directory.

Oracle8i database creates a different trace file for each background thread. The name of the trace file contains the name of the background thread, followed by the extension.TRC. Sample trace file syntax includes:

- SIDDBWR.TRC
- SIDSMON.TRC

where SID represents the name of the instance.

Trace files are also created for user threads if the USER\_DUMP\_DEST parameter is set in the initialization parameter file. The trace files for the user threads have the form ORAxxxxx.TRC, where xxxxx is a 5-digit number indicating the Windows 98 thread ID.

The alert file contains important information about error messages and exceptions that occur during database operations. Each Oracle8i Personal Edition for Windows 98 instance has one alert file; information is appended to the file each time you start the instance. All threads can write to the alert file.

For example, when automatic archiving of redo logs is halted because no disk space is available, a message is placed in the alert file. The alert file is the first place to check if something goes wrong with the database and the cause is not immediately obvious.

The alert file is named *SIDALRT.LOG* and is found in the directory specified by the `BACKGROUND_DUMP_DEST` parameter in the `INIT.ORA` initialization parameter file. If the `BACKGROUND_DUMP_DEST` parameter is not set, the *SIDALRT.LOG* file is generated in *ORACLE\_BASE\ADMIN\DB\_NAME\BDUMP*. Alert files should be deleted or archived periodically.



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# Backing Up and Recovering Database Files

This chapter provides information on backing up and recovering your database.

Specific topics discussed are:

- Selecting a Backup and Recovery Tool
- Backing Up Files with OCOPY
- Recovering Files with OCOPY

## Selecting a Backup and Recovery Tool

Backing up and recovering your Oracle8i database is one of the most critical operations that a database administrator (DBA) performs. For this reason, it is extremely important to choose the correct tools. The table below describes available backup and recovery tools and makes recommendations on which tool to use with your Oracle8i database:

Tool	Description	Analysis of Tool	To Use this Tool, See...
Recovery Manager (RMAN) in command line mode	Recovery Manager in command line mode is an Oracle8i tool that manages the process of backing up, restoring, and recovering files. Recovery Manager is automatically installed with Oracle Utilities. Recovery Manager uses a special PL/SQL interface to the server for invoking backup functions. The user is unaware of this interface and instead interfaces only with a command line.	Command line usage only. Must clearly understand the command line syntax described in <i>Oracle8i Recovery Manager User's Guide and Reference</i> before using. Backing up to tape requires an optional MML from a third-party vendor.	Chapter 2, "Database Tools Overview" for instructions on accessing this tool and <i>Oracle8i Recovery Manager User's Guide and Reference</i> for instructions on using this tool.
Third-party vendor products	Third-party vendors provide tape backup software that works with Backup Wizard and RMAN.	Can back up to tape. Contact your third-party vendors for additional information.	Third-party vendor documentation.
OCOPY	OCOPY is needed when performing a hot backup manually (that is, backing up a tablespace that is in offline backup mode).	Command line usage only. Can back up only to disk. Can only perform local backups.	"Backing Up Files with OCOPY" and "Recovering Files with OCOPY" in this chapter.

**Note:** Before performing a cold backup, and regardless of the backup tool you use, stop the Oracle Instance in order to clear locks on the database files. If you do not stop Oracle Instance, some database files may not be backed up.



## Backing Up Files with OCOPY

Use OCOPY for both hot and raw database file backups of the following file types:

File	Description
File Allocation Table (FAT) files	File allocation table (FAT) files you want to back up.
Logical raw files:	A logical drive (accessed with the direct I/O) identified by the name:  \\.\x:  where x: is the logical drive designator.
Physical raw files	A physical hard drive (accessed with direct I/O) identified by a device name of the form:  \\.\physicaldriveN  where N is 0, 1, 2, and so on, representing each of the physical drives in the system.

This table describes the two copy modes in which to use OCOPY:

Copy Mode	OCOPY is used to...
Hard disk	Copy hot files to a new name and location on a hard disk where you can use an archive utility to back them up.
Multiple diskettes	Back up large hot files directly to multiple diskettes.

This table describes the syntax to use when backing up all file types to hard disk or multiple diskettes:

Copy Mode	File Type	Syntax
Hard disk	FAT files	C:\> OCOPY <i>old_file</i> <i>new_file</i>
	Logical raw	C:\> OCOPY \\.\C: <i>new_file</i>
	Physical raw	C:\> OCOPY \\.\physicaldrive <i>N</i> <i>new_file</i>
Multiple diskettes	FAT files	C:\> OCOPY /B <i>hot_file</i> a:
	Logical raw	C:\> OCOPY /B \\.\C: a:
	Physical raw	C:\> OCOPY /B \\.\physicaldrive <i>N</i> a:

Where...	Indicates the...
<i>old_file</i>	Name and location of the hot file you want to back up.
<i>new_file</i>	Name and location of the backup copy.
C:	Raw drive that holds a single RAW database file.
physical drive	Physical drive that holds a single RAW database file.
<i>N</i>	Number(s) representing each of the physical drives in the system.
<i>hot_file</i>	Path and filename of the hot file you want to back up.
a:	Diskette drive containing the diskette on which to save the backup copy. If the file is too large to fit on one diskette, OCOPY prompts you to insert new diskettes as needed. OCOPY catalogs the parts of the file automatically so that it can be reconstructed at a later time.
/B	Large files must be split over multiple diskettes.

**Note:** Always use a fresh diskette for each OCOPY procedure; do not use OCOPY to back up a file onto a diskette that contains part or all of another file backed up using OCOPY.

## Recovering Files with OCOPIY

The table below describes the syntax to use when recovering all file types from hard disk or multiple diskettes.

Restore From...	File Type to Restore	Syntax
Hard Disk <sup>1</sup>	FAT files	Use the Windows 98 COPY command.
	Logical raw	C:\> OCOPIY <i>new_file</i> \\.\c:
	Physical raw	C:\> OCOPIY <i>new_file</i> \\.\physicaldriveN
Multiple diskettes <sup>2</sup>	FAT files	C:\> OCOPIY /R a: restore_dir <b>Note:</b> First insert the diskette containing the initial part of the backed up file.
	Logical raw	C:\> OCOPIY /R a: \\.\c:
	Physical raw	C:\> OCOPIY /R a: \\.\physicaldriveN

<sup>1</sup> These are files originally backed up without the /B option.

<sup>2</sup> These are files originally backed up with the /B option.

Where...	Indicates the...
C:	Raw drive, which holds a single RAW database file. If you use a different drive as your raw drive, substitute it for C:. OCOPIY prompts you to insert diskettes as needed.
<i>new_file</i>	File name to which to restore the file.
physicaldrive	Physical drive that holds a single RAW database file.
N	Number(s) representing each of the physical drives in the system.
/R	Restore option.
a:	Drive containing the diskette with the backed up file.
<i>restore_dir</i>	Directory on the server in which to place the file. (The restored file has the same name as the original file.)



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## Developing Applications

This chapter describes topics of interest to application developers.

Specific topics discussed are:

- Finding Information on Application Development for Windows 98
- Building External Routines
- Accessing Web Data with Intercartridge Exchange

## Finding Information on Application Development for Windows 98

The following table describes where to find the information on developing applications specifically for Windows 98. These products are included on the CD-ROM.

To find information on...	Look in the guide...
Oracle JServer	<ul style="list-style-type: none"><li>▪ <i>Supplied Java Packages Reference</i></li></ul>
Oracle8i includes Oracle JServer, the integrated Java Virtual Machine, and provides Java2 support (JDK1.2), an embedded JDBC driver, a SQLJ translator.	<ul style="list-style-type: none"><li>▪ <i>Oracle8i Java Developer's Guide</i></li><li>▪ <i>Oracle8i Java Stored Procedures Developer's Guide</i></li></ul>
XML	<i>Oracle8i Application Developer's Guide - XML</i>
Oracle's XML products include the XML Parser for Java - Version 1 and Version 2 (which includes an XSLT processor), the XML Class Generator, and the XML Parsers for C, C++, and PL/SQL as well as demos, utilities and sample code designed to illustrate the simplest and most powerful ways to work with XML-formatted data.	
OLE Automation Feature	<ul style="list-style-type: none"><li>▪ <i>Oracle COM Automation Developer's Guide for Windows NT</i></li><li>▪ Oracle Objects for OLE (online Help) for Windows NT</li></ul>

To find information on...	Look in the guide...
Writing external routines and the call specification	<ul style="list-style-type: none"> <li>■ This chapter.</li> <li>■ <i>PL/SQL User's Guide and Reference</i></li> <li>■ <i>Oracle8i Java Stored Procedures Developer's Guide</i></li> <li>■ <i>Oracle8i Application Developer's Guide - Fundamentals</i>, Chapter 10 "External Routines."</li> <li>■ The following files in <i>ORACLE_BASE\ORACLE_HOME\RDBMS\EXTPROC</i>:  EXTERN.C (code example shown in "Step 2: Writing an External Routine")  MAKE.BAT (batch file that builds the dynamic link library)  EXTERN.SQL (automates the instructions described in "Step 4: Registering an External Routine" and "Step 5: Executing an External Routine")  README.DOC (explains how to run the sample and provides debugging advice)</li> </ul>
OLE DB	<i>Oracle Provider for OLE DB</i>

**Additional Information:** Oracle ODBC Driver Release 8.1.6 is included on your CD-ROM. This driver is updated on a regular basis. To download the latest release of this driver, visit the following Web site:

[http://technet.oracle.com/software/utilities/software\\_index.htm](http://technet.oracle.com/software/utilities/software_index.htm)

## Building External Routines

This section describes how to create and use external routines on Windows 98.

### External Routines Overview

External routines, previously referred to as external procedures, are functions written in a third-generation language (3GL), such as C, and callable from within PL/SQL or SQL as if they were a PL/SQL routine or function. External routines let you take advantage of the strengths and capabilities of a 3GL programming language in a PL/SQL environment.

---

---

**Note:** Oracle also provides a special purpose interface, the call specification, that lets you call external routines from other languages, as long as it is callable by C.

---

---

The main advantages of external routines consist of the following:

- Performance, because some tasks are performed more efficiently in a 3GL language than in PL/SQL, which is better suited for SQL transaction processing
- Code re-usability, because dynamic link libraries (DLLs) can be called directly from PL/SQL programs on the server or in client tools such as SQL\*Forms

You can use external routines to perform specific processes, such as the following:

- Solving scientific and engineering problems
- Analyzing data
- Controlling real-time devices and processes



Creating and using an external routine would involve the following sequential tasks:

- Step 1: Installing and Configuring
- Step 2: Writing an External Routine
- Step 3: Building a DLL
- Step 4: Registering an External Routine
- Step 5: Executing an External Routine

---

---

**Attention:** You can combine the instructions described in the fourth and fifth tasks into one SQL script that automates the process of registering and executing your external routine. For an example of a SQL script that combines these steps, see *ORACLE\_BASE\ORACLE\_HOME\RDBMS\EXTPROC\EXTERN.SQL*.

---

---

## Step 1: Installing and Configuring

This section describes the installation and configuration of the Oracle8i Personal Edition database and Net8.

### Installing the Oracle8i database

Follow the steps in the *Oracle8i Personal Edition Installation Guide for Windows 98* to install these products on your Windows 98 workstation:

- Oracle8i Personal Edition contains PL/SQL, from which external routines are called, and the PL/SQL external routine program (EXTPROC), which executes external routines.
- Net8 Client, Net8 Server, and Oracle Protocol support

---

---

**Note:** You must also have a C compiler and linker installed on your system to build DLLs.

---

---

### Configuring Net8

If you install Net8 Server from your CD-ROM, your server network files are automatically configured to use external routines.

When PL/SQL calls an external routine, the Net8 listener launches a session-specific process called EXTPROC. Through Net8, PL/SQL passes the following information to EXTPROC:

- DLL name
- External routine name
- Parameters (if necessary)

EXTPROC then loads the DLL and invokes the external routine.

If you copy your Oracle7 server network files into your Oracle8i network files directory, you must manually configure the following files for the external routine behavior described previously to occur:

- `ORACLE_BASE\ORACLE_HOME\NETWORK\ADMIN\LISTENER.ORA`
- `ORACLE_BASE\ORACLE_HOME\NETWORK\ADMIN\TNSNAMES.ORA`

See Chapter 8 of the Net8 Administrator's Guide for instructions.

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**Note:** The `SQLNET.ORA` file requires no changes. By default, the values for the parameters `NAMES.DEFAULT_DOMAIN` and `NAME.DEFAULT_ZONE` are set to `WORLD`. These values match with the `.WORLD` extension on the end of `EXTPROC_CONNECTION_DATA` in the `TNSNAMES.ORA` file.

---

---

## Step 2: Writing an External Routine

Using a 3GL programming language, such as C, you can write functions to be built into DLLs and invoked by EXTPROC. The following is a simple Microsoft Visual C++ example of an external routine:

---

---

**Note:** Since external routines are built into DLLs, they must be explicitly exported. In this example, the `dllexport` storage class modifier exports the function `find_max` from a dynamic link library.

---

---

```
#include <windows.h>
#define NullValue -1
/*
    This function simply returns the larger of x and y.
*/
long __declspec(dllexport) find_max(long x,
```

```

short x_indicator,
long y,
short y_indicator,
short *ret_indicator)
{
    /* It can be tricky to debug DLL's that are being called by a process
       that is spawned only when needed, as in this case.
       Therefore try using the DebugBreak(); command.
       This will start your debugger. Uncomment the line with DebugBreak();
       in it and you can step right into your code.
    */
    /* DebugBreak(); */

    /* first check to see if you have any nulls */
    /* Just return a null if either x or y is null */

    if ( x_indicator==NullValue || y_indicator==NullValue) {
        *ret_indicator = NullValue;
        return(0);
    } else {
        *ret_indicator = 0;          /* Signify that return value is not null */
        if (x >= y) return x;
        else return y;
    }
}

```

### Step 3: Building a DLL

After writing your external routine(s) in a 3GL programming language, use the appropriate compiler and linker to build a DLL, making sure to export the external routines, as noted above. See your compiler and linker documentation for instructions on building a DLL and exporting its functions.

After building the DLL, you can move it to any directory on your system. For the example above, you can build the external routine `find_max` into a DLL called `EXTERN.DLL`. To build the above example, go to `ORACLE_BASE\ORACLE_HOME\RDBMS\EXTPROC` and type `MAKE`.

### Step 4: Registering an External Routine

Once you have built a DLL containing your external routine(s), you must register your external routine(s) with the Oracle8i database:

1. Create a PL/SQL library to map to the DLL.

- 2. Start SQL\*Plus:
- 3. Connect to the database with the appropriate user name and password.
- 4. Create the PL/SQL library using the CREATE LIBRARY command:

```
SQL> CREATE LIBRARY externProcedures AS 'C:\ORACLE\ORA81\RDBMS\
EXTPROC\EXTERN.DLL';
```

Where...	Represents the...
externProcedures	Alias library (essentially a schema object in the database)
C:\ORACLE\ORA81\RDBMS\EXTPROC\EXTERN.DLL	Path to the Windows 98 operating system DLL EXTERN.DLL. This example uses C:\ORACLE as your Oracle base and \ORA81 as your Oracle home.

**Note:** The DBA must grant EXECUTE privileges on the PL/SQL library to users who want to call the library’s external routine from PL/SQL or SQL.

- 5. Create a PL/SQL program unit specification.  
Do this by writing a PL/SQL subprogram that uses the EXTERNAL clause instead of declarations and a BEGIN...END block. The EXTERNAL clause is the interface between PL/SQL and the external routine. The EXTERNAL clause identifies the following information about the external routine:
  - Name
  - DLL alias
  - Programming language in which it was written
  - Calling standard (defaults to C if omitted)

```

CREATE OR REPLACE FUNCTION PLS_MAX(
    x BINARY_INTEGER,
    y BINARY_INTEGER)
RETURN BINARY_INTEGER AS
    EXTERNAL LIBRARY externProcedures
    NAME "find_max"
    LANGUAGE C
    PARAMETERS (
        x long,          -- stores value of x
        x_INDICATOR short, -- used to determine if x is a NULL value
        y long,          -- stores value of y
        y_INDICATOR short, -- used to determine if y is a NULL value

        RETURN INDICATOR short ); -- need to pass pointer to return value's indicator
                                -- variable to determine if NULL.
                                -- This means that my function will be defined as:
                                --   long max(long x, short x_indicator,
                                --   long y, short y_indicator, short * ret_indicator)

```

## Step 5: Executing an External Routine

To execute an external routine, you must call the PL/SQL program unit (that is, the alias for the external function) that registered the external routine. These calls can appear in any of the following:

- Anonymous blocks
- Standalone and packaged subprograms
- Methods of an object type
- Database triggers
- SQL statements (calls to packaged functions only)

In "Step 4: Registering an External Routine", the PL/SQL function PLS\_MAX registered the external routine find\_max. Follow the steps below to execute find\_max:

1. Call the PL/SQL function PLS\_MAX from a PL/SQL routine named UseIt:

```

CREATE OR REPLACE PROCEDURE UseIt AS
    a integer;
    b integer;
    c integer;

BEGIN

```

```

a := 1;
b := 2;
c := PLS_MAX(a,b);
dbms_output.put_line('The maximum of '||a||' and '||b||' is '||c);
END;
```

2. Run the routine:

```
SQL> EXECUTE UseIt;
```

## Accessing Web Data with Intercartridge Exchange

This section discusses the following topics:

- Configuring Intercartridge Exchange
- Using Intercartridge Exchange
- UTL\_HTTP Exception Conditions
- Exception Conditions and Error Messages
- Troubleshooting

### Configuring Intercartridge Exchange

You must add a parameter to the registry before using Intercartridge Exchange.

**To configure Intercartridge Exchange:**

1. Start the registry editor from the MS-DOS command prompt:

```
C:\> REGEDIT
```

The *Registry Editor* window appears.

2. Add HTTP\_PROXY to the registry subkey of the Oracle home directory that you are using. The location of this parameter is determined by how many Oracle home directories are on your computer:

If you have...	Add HTTP_PROXY to...
One home directory	HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\HOME0
Additional directories	HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\ HOMEID where ID is incremented for each additional Oracle home directory on your computer.

3. Choose Add String Value from the Edit menu(Edit -> New -> String Value).
4. Type HTTP\_PROXY in the Name field and press 'Enter'. Data field is empty now.
5. Double click on HTTP\_PROXY, Edit String dialog box will pop up.
6. Type *www-proxy.your-site* in the value data text box, e.g., *www-proxy.marketing.com*, where *marketing.com* is an example of a Web site. (Type the domain name of your real Web site.)

---

---

**Note:** See Appendix C "Adding a Registry Parameter with REGEDIT" on page C-9 for more instructions on adding a key.

---

---

## Using Inter cartridge Exchange

Inter cartridge Exchange enables you to use a stored package called UTL\_HTTP to make Hypertext Transfer Protocol (HTTP) calls from PL/SQL, SQL, and SQL\*Plus statements.

UTL\_HTTP can do both of the following:

- Access data on the Internet
- Call Oracle Web Application Server cartridges

UTL\_HTTP contains two similar entry points, known as packaged functions, that turn PL/SQL and SQL statements into HTTP callouts:

- UTL\_HTTP.REQUEST
- UTL\_HTTP.REQUEST\_PIECES

Both packaged functions perform the following tasks:

- Take a string universal resource locator (URL) of a site
- Contact that site
- Return the data (typically HTML) obtained from that site

The declarations to use with both packaged functions are described in the following subsections.

## Packaged Function UTL\_HTTP.REQUEST

UTL\_HTTP.REQUEST uses a URL as its argument and returns up to the first 2000 bytes of data retrieved from that URL.

Specify UTL\_HTTP.REQUEST as follows:

```
FUNCTION REQUEST (URL IN VARCHAR2) RETURN VARCHAR2;
```

To use UTL\_HTTP.REQUEST from SQL\*Plus, enter:

```
SQL> SELECT UTL_HTTP.REQUEST('HTTP://WWW.ORACLE.COM/') FROM DUAL;
```

which returns:

```
UTL_HTTP.REQUEST('HTTP://WWW.ORACLE.COM/')
```

```
-----  
<html>  
<head><title>Oracle Corporation Home Page</title>  
<!--changed Jan. 16, 19  
1 row selected.
```

## Packaged Function UTL\_HTTP.REQUEST\_PIECES

UTL\_HTTP.REQUEST\_PIECES uses a URL as its argument and returns a PL/SQL table of 2000 bytes of data retrieved from the given URL. The final element may be shorter than 2000 characters. The UTL\_HTTP.REQUEST\_PIECES return type is a PL/SQL table of type UTL\_HTTP.HTML\_PIECES.

UTL\_HTTP.REQUEST\_PIECES, which uses type UTL\_HTTP.HTML\_PIECES, is specified as:

```
type html_pieces is table of varchar2(2000) index by binary_integer;  
function request_pieces (url in varchar2,  
    max_pieces natural default 32767)  
return html_pieces;
```

A call to REQUEST\_PIECES can look like the example below. Note the use of the PL/SQL table method COUNT to discover the number of pieces returned; this may be zero or more:

```
declare pieces utl_http.html_pieces;  
begin  
    pieces := utl_http.request_pieces('http://www.oracle.com/');  
    for i in 1 .. pieces.count loop  
        .... -- process each piece  
    end loop;  
end;
```



The second argument to `UTL_HTTP.REQUEST_PIECES`, (`MAX_PIECES`) is optional. `MAX_PIECES` is the maximum number of pieces (each 2000 characters in length, except for the last, which may be shorter) that `UTL_HTTP.REQUEST_PIECES` returns. If provided, that argument is usually a positive integer.

For example, the following block retrieves up to 100 pieces of data (each 2000 bytes, except perhaps the last) from the URL. The block prints the number of pieces retrieved and the total length, in bytes, of the data retrieved.

```

set serveroutput on
/
declare
  x utl_http.html_pieces;
begin
  x := utl_http.request_pieces('http://www.oracle.com/', 100);
  dbms_output.put_line(x.count || ' pieces were retrieved. ');
  dbms_output.put_line('with total length ');
  if x.count < 1
  then dbms_output.put_line('0');
  else dbms_output.put_line
    ((2000 * (x.count - 1)) + length(x(x.count)));
  end if;
end;
/

```

which outputs:

```

Statement processed.
4 pieces were retrieved.
with total length
7687

```

The elements of the PL/SQL table returned by `UTL_HTTP.REQUEST_PIECES` are successive pieces of data obtained from the HTTP request to that URL.

## UTL\_HTTP Exception Conditions

This subsection describes the exceptions (errors) that can be raised by packaged functions `UTL_HTTP.REQUEST` and `UTL_HTTP.REQUEST_PIECES`.

### UTL\_HTTP.REQUEST

`PRAGMA RESTRICT_REFERENCES` enables the display of exceptions:

```

create or replace package utl_http is
function request (url in varchar2) return varchar2;
pragma restrict_references (request, wnds, rnds, wnps, rnps);

```

**UTL\_HTTP.REQUEST\_PIECES**

PRAGMA RESTRICT\_REFERENCES enables exceptions to be displayed:

```
create or replace package utl_http is
type html_pieces is table of varchar2(2000) index by binary_integer;
function request_pieces (url in varchar2,
    max_pieces natural default 32767)
return html_pieces;
pragma restrict_references (request_pieces, wnds, rnds, wnps, rnps);
```

**Exception Conditions and Error Messages**

The following table describes error messages that may appear.

If...	Then...
Initialization of the HTTP callout subsystem fails for environmental reasons such as lack of available memory	Exception UTL_HTTP.INIT_FAILED is raised: init_failed exception;
The HTTP call fails due to failure of the HTTP daemon or because the argument to REQUEST or REQUEST_PIECES cannot be interpreted as a URL, because it is NULL or has non-HTTP syntax	Exception UTL_HTTP.REQUEST_FAILED is raised : request_failed exception;

If...	Then...
No response is received from a request to the given URL, because the function made no contact with a site corresponding to that URL	<p>A formatted HTML error message may be returned:</p> <pre>&lt;HTML&gt; &lt;HEAD&gt; &lt;TITLE&gt;Error Message&lt;/TITLE&gt; &lt;/HEAD&gt; &lt;BODY&gt; &lt;H1&gt;Fatal Error 500&lt;/H1&gt; Can't Access Document: http://home.nothing.comm. &lt;P&gt; &lt;B&gt;Reason:&lt;/B&gt; Can't locate remote host: home.nothing.comm. &lt;P&gt; &lt;P&gt;&lt;HR&gt; &lt;ADDRESS&gt;&lt;A HREF="http://www.w3.org"&gt; CERN-HTTPD3.0A&lt;/A&gt;&lt;/ADDRESS&gt; &lt;/BODY&gt; &lt;/HTML&gt;</pre>

---

**Note:** The first two exceptions in the preceding table, unless explicitly caught by an exception handler, are reported by this generic message:

```
ORA-06510: PL/SQL: unhandled user-defined
exception
```

that shows them as "user-defined" exceptions, although they are defined in this system package.

If any other exception is raised during the processing of the HTTP request (for example, an out-of-memory error), then function UTL\_HTTP.REQUEST or UTL\_HTTP.REQUEST\_PIECES raises that exception again.

---

### **Troubleshooting**

Do not expect UTL\_HTTP.REQUEST or UTL\_HTTP.REQUEST\_PIECES to succeed in contacting a URL unless you can contact that URL by using a browser on the same computer (and with the same privileges, environment variables, and so on).

If UTL\_HTTP.REQUEST or UTL\_HTTP.REQUEST\_PIECES fails (that is, if it raises an exception or returns an HTML-formatted error message, yet you believe that the URL argument is correct), try contacting that same URL with a browser to verify network availability from your computer.

---

## Directory Structures

This appendix describes the default directory structures created when you install Oracle8i Personal Edition components.

Specific topics discussed are:

- Oracle8i Personal Edition Directory Structure
- Filename Extensions

**See:**

Chapter 3, "Multiple Oracle Homes and Optimal Flexible Architecture" for more information on Oracle homes and OFA. See especially "Directory Tree of a Sample OFA-Compliant Database" on page 3-18 for a depiction of how the default OFA-compliant directory tree is organized.

# Oracle8i Personal Edition Directory Structure

*ORACLE\_BASE* is the root of the Oracle directory tree.

Oracle Universal Installer places Oracle products into the *\ORACLE\_HOME*, *\ADMIN*, and *\ORADATA* directories of *ORACLE\_BASE*.

The *\ADMIN* and *\ORADATA* directories contain one or more *\DB\_NAME* directories. *DB\_NAME* is the unique name for a database and has the same value as the *DB\_NAME* parameter in the *INIT.ORA* file. Database files are stored in *ORACLE\_BASE\ORADATA\DB\_NAME*.

**See:** *Oracle8i Installation Guide for Windows 98* for the database files stored in *ORACLE\_BASE\ORADATA\DB\_NAME*.

The following sections describe these directories in *ORACLE\_BASE*:

- *ORACLE\_HOME*
- *ADMIN*

## *ORACLE\_HOME*

If you install Oracle8i Personal Edition with the Typical installation type, the following directories are created. If you install additional Oracle products, other directories are also created.

Directory	Contents
\ASSISTANTS	Oracle assistants. \ASSISTANTS contains the following subdirectories:
\DBCA	■ Oracle Database Configuration Assistant files
\DBMA	■ Oracle Data Migration Assistant files
\IFA	■ Oracle INTYPE File Assistant files
\JLIB	■ Java files used by the assistants
\BIN	Executable files
\COM	Oracle COM Automation feature files
\DEMOS	■ Sample SQL File
\MESG	■ Message Files

Directory	Contents
\DATABASE	This is a legacy directory from previous releases. It contains an initialization parameter file that points to the new directory location for initialization parameter files.
\DOC	HTML documentation library
\JAVAVM	Java Virtual Machine files.
\ADMIN	■ DLLs for JAVAVM
\DOC	■ Readme files
\IDL	■ Interface Definition Language files
\INSTALL	■ SQL files for JAVAVM
\LIB	■ Library Class files
\JDBC	Java Database Connectivity (JDBC) drivers files. \JDBC contains the following subdirectories:
\DOC	■ Documentation
\LIB	■ Library class files
\DEMO	■ Sample programs
\JLIB	Java files used by various applications
\LDAP	Directory Server files
\LIB	Library Class files
\MSHELP	Help files
\NAV81	Navigator project files
\NETWORK	Net8 files. \NETWORK contains the following subdirectories:
\ADMIN	■ Configuration files
\DOCS	■ Release notes
\INSTALL	■ Contains response file template for silent installation.
\JLIB	■ Java files used by Net8 assistants
\LOG	■ Log files (default location)
\MESG	■ Message files
\TNSAPI	■ Net8 Open API-related files

Directory	Contents
\TOOLS	<ul style="list-style-type: none"><li>■ Net8 assistant files</li></ul>
\TRACE	<ul style="list-style-type: none"><li>■ Trace files (default location)</li></ul>
\OCI	Oracle Call Interface files. \OCI contains the following subdirectories:
\INCLUDE	<ul style="list-style-type: none"><li>■ Header files</li></ul>
\LIB	<ul style="list-style-type: none"><li>■ Library files</li></ul>
\SAMPLES	<ul style="list-style-type: none"><li>■ Sample files</li></ul>
\OCOMMON	Oracle common files
\NLS	NLS files
\ODBC	Oracle ODBC files
\OLEDB	Oracle OLEDB files. \OLEDB contains the following subdirectories:
\DOC	<ul style="list-style-type: none"><li>■ User's Guide and Readme files</li></ul>
\INCLUDE	<ul style="list-style-type: none"><li>■ Header files</li></ul>
\LIB	<ul style="list-style-type: none"><li>■ Library files</li></ul>
\MESG	<ul style="list-style-type: none"><li>■ Message files</li></ul>
\SAMPLES	<ul style="list-style-type: none"><li>■ Sample Files</li></ul>
\OO4O	Oracle Objects for OLE files. \OO4O contains the following subdirectories:
\CPP	<ul style="list-style-type: none"><li>■ Header files, library files, and sample files</li></ul>
\EXCEL	<ul style="list-style-type: none"><li>■ Microsoft Excel sample files</li></ul>
\IIS	<ul style="list-style-type: none"><li>■ Internet Information Server sample files</li></ul>
\MESG	<ul style="list-style-type: none"><li>■ Message files</li></ul>
\VB	<ul style="list-style-type: none"><li>■ Visual Basic sample files</li></ul>
\ORACORE	Message files
\ORAINST	Sample Registry export
\OTRACE	Oracle Trace files. \OTRACE contains the following subdirectories:
\ADMIN	<ul style="list-style-type: none"><li>■ Administration files, including SQL scripts</li></ul>
\DEMO	<ul style="list-style-type: none"><li>■ Sample programs</li></ul>



Directory	Contents
\LIB	<ul style="list-style-type: none"> <li>Library files</li> </ul>
\MSG	<ul style="list-style-type: none"> <li>Message files</li> </ul>
\PUBLIC	<ul style="list-style-type: none"> <li>Header files</li> </ul>
\PLSQL	SQL scripts, sample files, and message files for PL/SQL
\DEMO	<ul style="list-style-type: none"> <li>Demo files</li> </ul>
\MSG	<ul style="list-style-type: none"> <li>Message files</li> </ul>
\PRECOMP	Object Type Translator (OTT)
\ADMIN	<ul style="list-style-type: none"> <li>OTT configuration log file</li> </ul>
\DEMO	<ul style="list-style-type: none"> <li>Demo SQLs</li> </ul>
\DOC	<ul style="list-style-type: none"> <li>OTT Readme files</li> </ul>
\MESSG	<ul style="list-style-type: none"> <li>Message files</li> </ul>
\PUBLIC	<ul style="list-style-type: none"> <li>Header files</li> </ul>
\RDBMS	Oracle Server files. \RDBMS contains the following subdirectories:
\ADMIN	<ul style="list-style-type: none"> <li>Oracle database SQL scripts (including CATALOG.SQL and CATPROC.SQL). Use SQL scripts to create data dictionary tables and views, and other views used by Oracle software.</li> </ul> <p><b>Additional Information:</b> See Chapter 5, "SQL Scripts" in <i>Oracle8i Reference</i>.</p>
\DEMO	<ul style="list-style-type: none"> <li>Demo files</li> </ul>
\LIB	<ul style="list-style-type: none"> <li>Library files</li> </ul>
\TRACE	<ul style="list-style-type: none"> <li>Oracle Trace and Log files</li> </ul>
\EXTPROC	<ul style="list-style-type: none"> <li>External procedure sample files</li> </ul>
\MSG	<ul style="list-style-type: none"> <li>Message files</li> </ul>
\XA	<ul style="list-style-type: none"> <li>Oracle XA files</li> </ul>
\RELNOTES	Release notes and Readme files
\COM	<ul style="list-style-type: none"> <li>Readme file of COM Automation Feature Support</li> </ul>
\JAVAVM	<ul style="list-style-type: none"> <li>Readme file of JavaVM</li> </ul>

Directory	Contents
\0040	<ul style="list-style-type: none"><li>Release notes of Oracle Objects for OLE</li></ul>
\PRECOMP	<ul style="list-style-type: none"><li>Readme file for Object Type Translator</li></ul>
\SQLJ	<ul style="list-style-type: none"><li>Readme file for SQLJ and JPublisher</li></ul>
\SLAX	Oracle SLAX files. \SLAX contains the following subdirectory:
\MSG	<ul style="list-style-type: none"><li>Message file of SLAX</li></ul>
\SQLJ	Oracle SQLJ Translator files. \SQLJ contains the following subdirectories:
\DEMO	<ul style="list-style-type: none"><li>Sample programs</li></ul>
\DOC	<ul style="list-style-type: none"><li>Release notes, white papers, package descriptions, the SQLJ specification, and the <i>Oracle SQLJ Developer's Guide and Reference</i></li></ul>
\LIB	<ul style="list-style-type: none"><li>Class files and a SQL script</li></ul>
\SQLPLUS	SQL*Plus files. \SQLPLUS contains the following subdirectories:
\ADMIN	<ul style="list-style-type: none"><li>SQL scripts for administering SQL*Plus</li></ul>
\DEMO	<ul style="list-style-type: none"><li>SQL scripts for sample tables</li></ul>
\DOC	<ul style="list-style-type: none"><li>Release notes</li></ul>
\MSG	<ul style="list-style-type: none"><li>Message files</li></ul>
\SVRMGR	Oracle Server Manager files. \SVRMGR contains the following directory:
\ADMIN	<ul style="list-style-type: none"><li>Server Manager files</li></ul>

ADMIN

Database administration files are stored in subdirectories of *ORACLE\_BASE\ADMIN\DB\_NAME*.

The following table describes these subdirectories.

Directory	Contents
\ADHOC	Ad hoc SQL scripts

Directory	Contents
\BDUMP	Background process trace files (default location)
\CDUMP	Core dump files
\CREATE	Database creation files
\EXP	Database export files
\PFILE	Initialization parameter files
\UDUMP	User process trace files (default location)

## Filename Extensions

A description of filename extensions is shown below.

Extension	Description
.aud	Oracle audit file
.bmp	bitmap file
.c	C source file
.ctl	SQL*Loader control file; Oracle Server control file
.dat	SQL*Loader datafile
.dbf	Oracle Server tablespace file
.dmp	Export file
.doc	ASCII text file
.h	C header file; also, <code>sr.h</code> is a SQL*Report Writer help file
.idl	Interface Definition Language files
.jar	Java class archive
.lis	output of SQL*Plus scripts
.log	installation log files; Oracle Server redo log files
.mk	make files
.msb	NLS message file (binary)
.msg	NLS message file (text)
.o	object module
.ora	Oracle configuration files
.rsp	Response file for silent installation

.sql	SQL* script files
.tab	SQL* script file
.trc	trace files

---

# **Oracle8*i* Database Specifications for Windows 98**

Oracle8*i* Personal Edition uses initialization parameters on Windows 98 to enable various features of the database every time an instance is started.

Specific topics discussed are:

- Initialization Parameter File (INIT.ORA) Overview
- Initialization Parameters Without Windows 98-Specific Values
- Calculating Database Limits

## Initialization Parameter File (INIT.ORA) Overview

An initialization parameter file is an ASCII text file containing parameters. By changing the parameters and values in an initialization file, you can specify, for example:

- the amount of memory the database uses
- whether to archive filled online redo logs
- which control files currently exist for the database

Every database instance has a corresponding initialization parameter file and ORACLE\_SID registry parameter that points to the system identifier (SID) for the instance.

The initialization parameter file name takes the form INIT.ORA. A single instance might have several initialization parameter files, each having some differences that affect system performance.

### See:

- Your INIT.ORA file for initialization parameters set by Oracle Universal Installer during an Oracle8i Personal Edition typical installation type. These parameters may vary, depending on your hardware configuration.
- *Oracle8i Reference* for descriptions of all initialization parameters and instructions for setting and displaying their values.

## Location of the Initialization Parameter File

By default, Oracle8i Personal Edition uses the initialization parameter files located in `ORACLE_BASE\ADMIN\DB_NAME\PFIL`, unless you specify a different initialization file with the PFIL option at database startup.

## Editing the Initialization Parameter File

To customize Oracle8i database functions, you may need to edit the initialization parameter files. Only use an ASCII text editor to modify the file.

## Sample File

A sample file called INITSMPL.ORA is located in the *ORACLE\_BASE* \ADMIN\SAMPLE\PFILE directory.

---

---

**Note:** If you create a database manually using the BUILD\_DB.SQL script, you need to create an INIT.ORA file or copy an existing INIT.ORA file and modify the contents. If you use Oracle Database Configuration Assistant to create a database, the INIT.ORA file is automatically created for you.

---

---

If you want to use the sample INITSMPL.ORA file as part of database creation:

1. Rename the file INIT.ORA.
2. Edit this file to reflect the correct location of your database control files and the name of your database, as a minimum.

If you installed a starter database, the initialization parameter file INIT.ORA used by the starter database is located in *ORACLE\_BASE*\ADMIN\DB\_NAME\PFILE. You can use either INITSMPL.ORA or the starter database INIT.ORA as a basis for creating a new Oracle8i database initialization parameter file.

The annotated, sample initialization parameter file contains alternative values for the initialization parameters. These values and the annotations are preceded by comment signs (#), which prevent them from being processed. To activate a particular parameter, remove the preceding # sign. When you no longer want to use a particular parameter, edit the initialization parameter file to add a comment sign.

For example, several initialization parameters are specified with three different values to create small, medium, or large System Global Areas (SGAs), respectively. The parameter that creates a small SGA is active in the following example:

```
db_block_buffers = 200 # SMALL
# db_block_buffers = 550 # MEDIUM
# db_block_buffers = 3200 # LARGE
```

To create a medium-sized SGA, comment out the small parameter definition and activate the medium parameter definition. Edit the initialization parameter file as follows:

```
# db_block_buffers = 200 # SMALL
db_block_buffers = 550 # MEDIUM
# db_block_buffers = 3200 # LARGE
```

## Initialization Parameters Without Windows 98-Specific Values

*Oracle8i Reference* describes the default values for many initialization parameters as being *operating system-specific*. However, not all the parameters that *Oracle8i Reference* describes as having operating system-specific values affect Windows 98. In these cases, Windows 98 uses either the default value set in the Oracle8i kernel or does not use the parameter. This table describes these initialization parameters:

Parameter	Description
AUDIT_FILE_DEST	Not supported on Windows 98 and should not be added to the initialization parameter file.
DB_WRITER_PROCESSES	Not applicable or necessary on Windows 98.
COMPATIBLE_NO_RECOVERY	Uses default value set in Oracle8i kernel (no Windows 98-specific value).
CORE_DUMP_DEST	Not applicable to Windows 98.
CPU_COUNT	Oracle8i automatically sets value to number of CPUs available for your Oracle instance.
HI_SHARED_MEMORY_ADDRESS	Not applicable to Windows 98.
SHARED_MEMORY_ADDRESS	Not applicable to Windows 98.
LARGE_POOL_SIZE	Uses maximum value limited by available memory.
LOG_BUFFER	Starter database uses value set in Oracle8i kernel (no Windows 98-specific value). The Custom database creation option of the Oracle Database Configuration Assistant enables you to customize the value for this parameter.
ORACLE_TRACE_COLLECTION_PATH	Uses default value set in Oracle8i kernel (no Windows 98-specific value).
ORACLE_TRACE_FACILITY_NAME	Uses default value set in Oracle8i kernel (no Windows 98-specific value).
ORACLE_TRACE_FACILITY_PATH	Uses default value set in Oracle8i kernel (no Windows 98-specific value).

## Displaying Initialization Parameter Values

Windows 98-specific parameter values can be viewed by using an ASCII editor to open the *ORACLE\_BASE\ADMIN\DB\_NAME\PFIL\INIT.ORA* file. To display *all* parameter values (whether set in the INIT.ORA file or the Oracle8i kernel), enter the following command at the SQL\*Plus command prompt:

```
SQL> SHOW PARAMETER PARAMETER_NAME
```



where *PARAMETER\_NAME* is the name of a specific initialization parameter.

The value for this parameter, whether defined in the *ORACLE\_BASE\ADMIN\DB\_NAME\PFIL\INIT.ORA* file or the Oracle8i kernel, displays on-screen.

## Database Initialization Parameters

Check the following initialization parameters when creating a new database. They *cannot* be modified after you have created the database. See Chapter 6, "Post-Installation Database Creation" for details on creating a new database, including the part of the procedure when you modify these parameters.

Parameter	Description
CHARACTER SET <sup>1</sup>	Specifies the database National Language Support (NLS) character set to use. This parameter can be set only when you create the database.
DB_BLOCK_SIZE	Specifies the size in bytes of Oracle database blocks.
DB_NAME	Specifies the name of the database to be created. The database name is a string of eight characters or less. You cannot change the name of a database.

<sup>1</sup> Not an initialization parameter, but rather a clause in the CREATE DATABASE statement. See Chapter 6, "Post-Installation Database Creation" for an example of using this clause.

## Calculating Database Limits

Use the size guidelines in the following table to calculate Oracle8i database limits using the equations given in the *Oracle8i Administrators Guide*.

Type	Size
Maximum block size	16,384 bytes or 16 kilobytes (KB)
Maximum blocks per file	4,194,304 blocks
Maximum possible file size with 16 K sized blocks	64 Gigabytes (GB) (4,194,304 * 16,384) = 64 gigabytes (GB)
Maximum number of files per database (depends on block size):	

Type	Size
2 K sized blocks	20,000 files
4 K sized blocks	40,000 files
8 K sized blocks	65,536 files
16 K sized blocks	65,536 files
Maximum file size for a FAT file <sup>1</sup>	4 GB
Maximum database size	65,536 * 64 GB equals approximately 4 Petabytes (PB)
Maximum number of extents per database (depends on block size). Typical values are:	
2 KB sized blocks	121 extents
4 KB sized blocks	255 extents
8 KB sized blocks	504 extents
16 KB sized blocks	1032 extents
32 KB sized blocks	2070 extents
Shadow Process Memory:	
Release 8.1.6	335 K
Release 8.0.4	254 K

<sup>1</sup> Maximum file size for a 16 bit FAT partition is 2 GB

**See:** To calculate the space required by an index, use the equations given in *Oracle8i Administrator's Guide*.

---

## Oracle8i Configuration Parameters and the Registry

This appendix describes use of the registry for various Oracle8i Personal Edition for Windows 98 components. It also lists the recommended values and ranges for configuration parameters.

Specific topics discussed are:

- About Configuration Parameters
- Registry Overview
- Registry Parameters
- Adding a Registry Parameter with REGEDIT
- Adding or Modifying Initialization File Parameters and Registry Parameters with Oracle8i Navigator's "Parameter Configurer"

## About Configuration Parameters

Oracle8i Personal Edition for Windows 98 uses configuration parameters to locate files and specify runtime parameters common to all Oracle products. When an Oracle program or application requires a translation for a particular configuration variable, Oracle8i Personal Edition for Windows 98 uses the associated parameter. All Oracle parameters are stored in the registry.

## Registry Overview

Oracle8i Personal Edition for Windows 98 stores its configuration information in a database (the registry) that is organized in a tree format. The tree format consists of keys in the registry and parameter values for the keys. Keys and parameter values can be viewed and modified in the Registry Editor.

Keys are folders that appear in the left pane of a Registry Editor window. A key contains subkeys or parameters.

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**WARNING:** Although the Registry Editor lets you view and modify registry keys and parameter values, you normally do not need to do so. In fact, you may render your system useless if you make incorrect changes. Therefore, only advanced users should edit the registry! Back up your system before making any changes in the registry.

---

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Parameters in the Registry Editor appear as a string, consisting of two components:

- Parameter name
- Value itself

For example, parameter ORACLE\_SID can have the following entry in the registry:

ORACLE\_SID:ORCL1

Most Oracle8i Personal Edition for Windows 98 parameter values are string types. Use Oracle Universal Installer defaults when a type is not given.

## Registry Parameters

This section describes the Oracle8i Personal Edition for Windows 98 registry parameters for the following keys. Other products may have additional keys and parameters that are not described in this appendix.

- HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE\HOMEID
- HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE
- HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE\ALL\_HOMES
- HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet

To modify the registry values described below, see "Modifying a Registry Value with REGEDIT" on page C-8.

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**Note:** This appendix describes how to use REGEDIT to edit your registry.

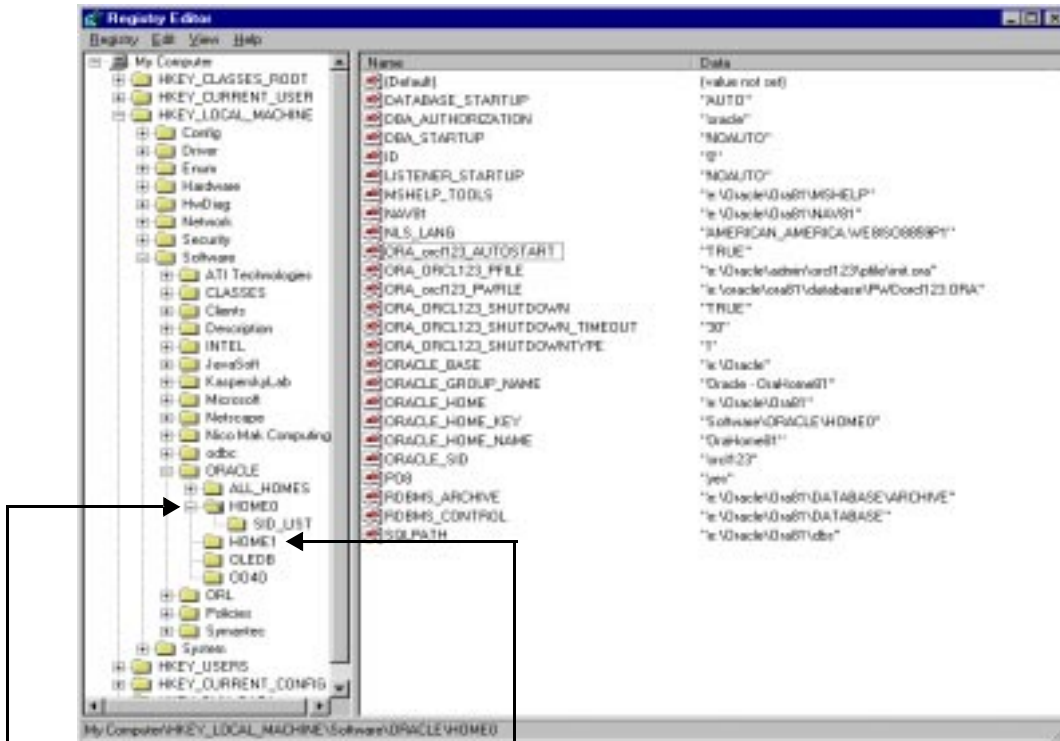
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## HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE\HOME/*ID*

Each time you install Oracle products into a new Oracle home on your computer, HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE\HOME/*ID* is created and *ID* is incremented. This subkey contains parameter values for most Oracle products.

**Additional Information:** See Chapter 3, "Multiple Oracle Homes and Optimal Flexible Architecture" for details on the PATH variable and registry values when you are working with multiple Oracle homes.

This figure shows the parameter subkeys created with two Oracle home directories on the same computer.



The first Oracle installation on a computer creates parameter subkey HOME0.

The second installation of a "Multiple Oracle Homes" enabled product (e.g. SQL\*Plus) on a computer creates parameter subkey HOME1. With each installation into a new Oracle home, HOMEID is created and incremented.

HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE\HOMEID includes the following parameters for an Oracle home directory on a computer. Depending on the products you install, additional parameters can also be created.

Parameter	Description	Default Value
MSHELP_TOOLS	Specifies the location of the Windows help files.	<i>ORACLE_BASE\ORACLE_HOME\MSHELP</i>
NLS_LANG	Specifies the supported language, territory, and character set. This parameter specifies the language in which the messages are displayed, the territory and its conventions for calculating week and day numbers, and the character set displayed.	<p>During installation, Oracle Universal Installer sets this value based on the language setting of the operating system. See <i>Oracle8i Installation Guide for Windows 98</i> for a list of commonly used values.</p> <p><b>Note:</b> If this parameter is deleted at a later time, Oracle uses the value <i>AMERICAN_AMERICA.US7ASCII</i>.</p>
ORA_CWD	Specifies the current working directory. This parameter must be manually set.	The value for this parameter must be set manually.
ORA_SID_PFILE	The full path to the initialization parameter file.	<i>ORACLE_BASE\ADMIN\DATABASE\PFIL\INIT.ORA</i>
ORACLE_BASE	The top-level Oracle directory (for example, C:\ORACLE) that contains <i>ORACLE_HOME</i> , <i>\ADMIN</i> , and <i>\ORADATA</i> .	<i>ORACLE_BASE</i>
ORACLE_GROUP_NAME	Specifies the name of the group containing icons of the Oracle products installed. The parameter is added to your registry when you first install Oracle products, even if Oracle Universal Installer does not create a program group for the Oracle products you have installed (for example, if you have installed only Net8 software).	Oracle - <i>HOME_NAME</i>
ORACLE_HOME	Specifies the Oracle home directory in which Oracle products are installed. This directory is immediately beneath the Oracle base directory in the Oracle directory hierarchy.	The drive letter and name that you specify during installation
ORACLE_HOME_KEY	The HKEY_LOCAL_MACHINE location of Oracle parameters.	<i>SOFTWARE\ORACLE\HOMEID</i>
ORACLE_HOME_NAME	Specifies the home name of the Oracle home directory in which Oracle products are installed.	The name that you specify during installation
NAV81	Specifies Oracle8i Navigator files	<i>ORACLE_BASE\ORACLE_HOME\NAV81</i>
PO8	Specifies that the Oracle8i Navigator be used	YES

Parameter	Description	Default Value
DATABASE_STARTUP	Specifies whether the database should be mounted, if not started and mounted already, when connected using Server Manager/ SQL*Plus/ Oracle8i Navigator	AUTO  (If it is set to NOAUTO, database will not be mounted even if not already mounted when connected using Server Manager/ SQL*Plus/ Oracle8i Navigator)
ORACLE_SID	Specifies the name of the Oracle database instance on the host machine. The value of this parameter is the SID for the instance.	The default value is specified by the entry in the <i>Database Identification</i> window of Oracle Universal Installer.
RDBMS_ARCHIVE	Specifies the location of the backup database files.	ORACLE_BASE\ORACLE_HOME\DATABASE\ARCHIVE
RDBMS_CONTROL	Specifies the location of the backup database control files.	ORACLE_BASE\ORACLE_HOME\DATABASE
SQLPATH	Specifies the location of SQL scripts.	ORACLE_BASE\ORACLE_HOME\DBS

**HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE**

This subkey contains the following parameters:

Parameter	Description	Default Value Entry
INST_LOC	Specifies the location of Oracle Universal Installer files.	System Drive:\Program Files\Oracle\Inventory
OO4O	Specifies the location of Oracle Objects for OLE message files.	ORACLE_BASE\ORACLE_HOME\OO4O\MESG

**HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE\ALL\_HOMES**

This subkey provides general information on each Oracle home directory on a computer. This subkey contains the IDx subkey(s) and its parameters, described below, as well as other parameters listed on page C-7.

**IDx**

This subkey corresponds to the HOMEID of the same number (for example, HOME0 for the first installation, HOME1 for the second installation, and so on). IDx contains



the following parameters. The values that display are determined by what you enter during installation in the *File Locations* dialog box of Oracle Universal Installer.

Parameter	Description	Default Value Entry
NAME	Specifies the home name of the Oracle home for ID $x$ . This is the value that you specify when prompted for an Oracle home name.	The name that you specify during installation.
PATH	Specifies the Oracle home directory for ID $x$ .	<i>ORACLE_BASE\ORACLE_HOME</i>

### HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE\ALL\_HOMES Parameters

This subkey contains the following parameters.

Parameter	Description	Default Value
DEFAULT_HOME	Specifies the default Oracle home name (that is, the first Oracle home installed on your machine).	The name that you specify during installation.
HOME_COUNTER	Specifies the number of installed Oracle homes.	1
LAST_HOME	Displays the ID number of the most recently installed Oracle home. For example, if HOME0 was the most recently installed Oracle home, the number 0 appears.	0

## Modifying a Registry Value with REGEDIT

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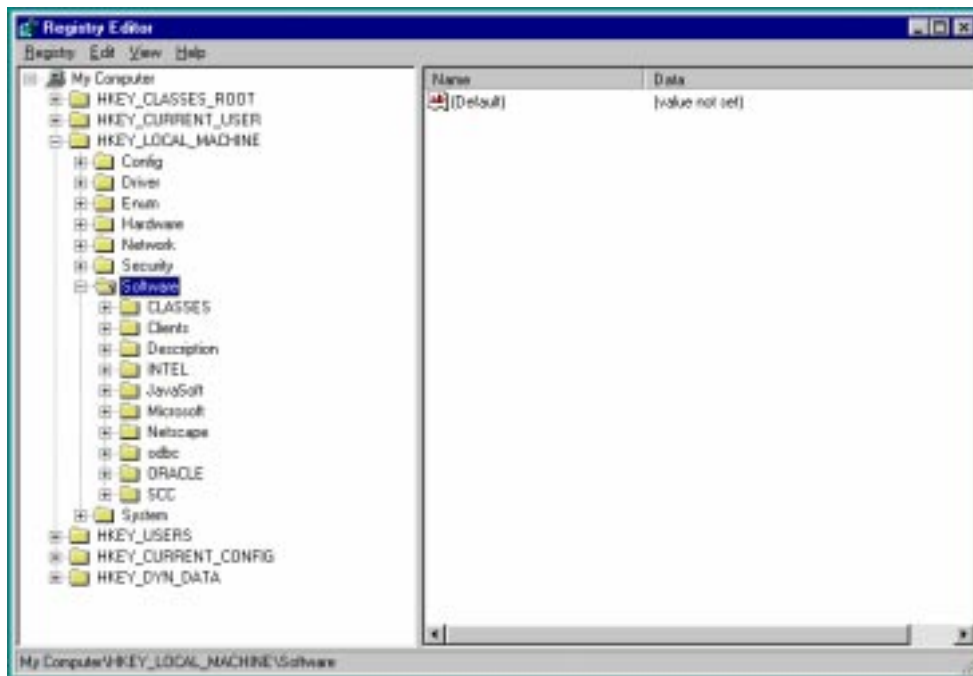
**CAUTION:** Do not edit your registry unless absolutely necessary. If an error occurs in your registry, Oracle8i Personal Edition for Windows 98 can stop functioning and the registry itself can become unusable.

---

**To edit the Oracle-related settings:**

1. Start the registry in one of two ways:
  - From the command prompt, enter:  

```
C:\> REGEDIT
```
  - Choose Start > Run, enter REGEDIT in the Open field, and click **OK**.  
The *Registry Editor* window appears.

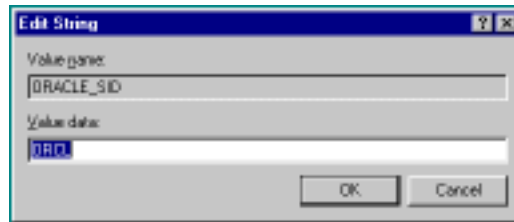


2. Navigate to the values you want to view or modify by double-clicking the appropriate keys.

The left-hand side of the window shows the hierarchy of registry keys, and the right-hand side of the window shows various values associated with a key.

3. Double-click the parameter to edit.

The *String Editor* dialog box appears:



4. Make any necessary edits.
5. Click **OK**.
6. Choose Exit from the Registry menu.

## Adding a Registry Parameter with REGEDIT

To add a parameter to the registry:

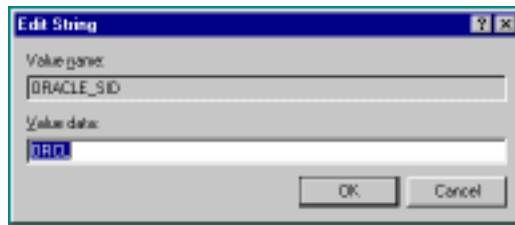
1. Start the registry in one of two ways:
  - From the MS-DOS command prompt, enter:  

```
C:\> REGEDIT
```
  - Choose Start > Run, enter REGEDIT in the Open field, and click **OK**.

The *Registry Editor* window appears.

2. Navigate to the key to which you want to add the new value.
3. Choose New-> String Value from the Edit menu. You can select either of the following three types of values
  - String Value
  - Binary Value

- DWORD Value (hexadecimal data)
- 4. Type the name that you want to assign to the currently created values for the selected key.
- 5. To enter the data, select the 'Value' then select 'Modify' from 'Edit' menu.  
A *Edit* dialog box appropriate for the data type appears:



6. Type the value for the parameter.
7. Click **OK**.  
The Registry Editor adds the parameter.
8. Choose **Exit** from the Registry menu.
9. The registry exits.

## Adding or Modifying Initialization File Parameters and Registry Parameters with Oracle8i Navigator's "Parameter Configurer"

Oracle8i Navigator has been enhanced with the capability of modifying database initialization parameter files and registry parameters. The following sections describe this new feature in detail.

### Introducing Database Parameter Configuration Assistant

Database Parameter Configuration Assistant provides an easy to use interface to manipulate the parameters in the database initialization files (for example, `init.ora` file). These parameters are also called the Database Initialization Parameters. It also provides a user interface for safe manipulation of the registry parameters used by the Oracle8i Database Server. These parameters in the registry are called Oracle8i Configuration Parameters.

## Introduction to Manipulating Database Initialization Parameters

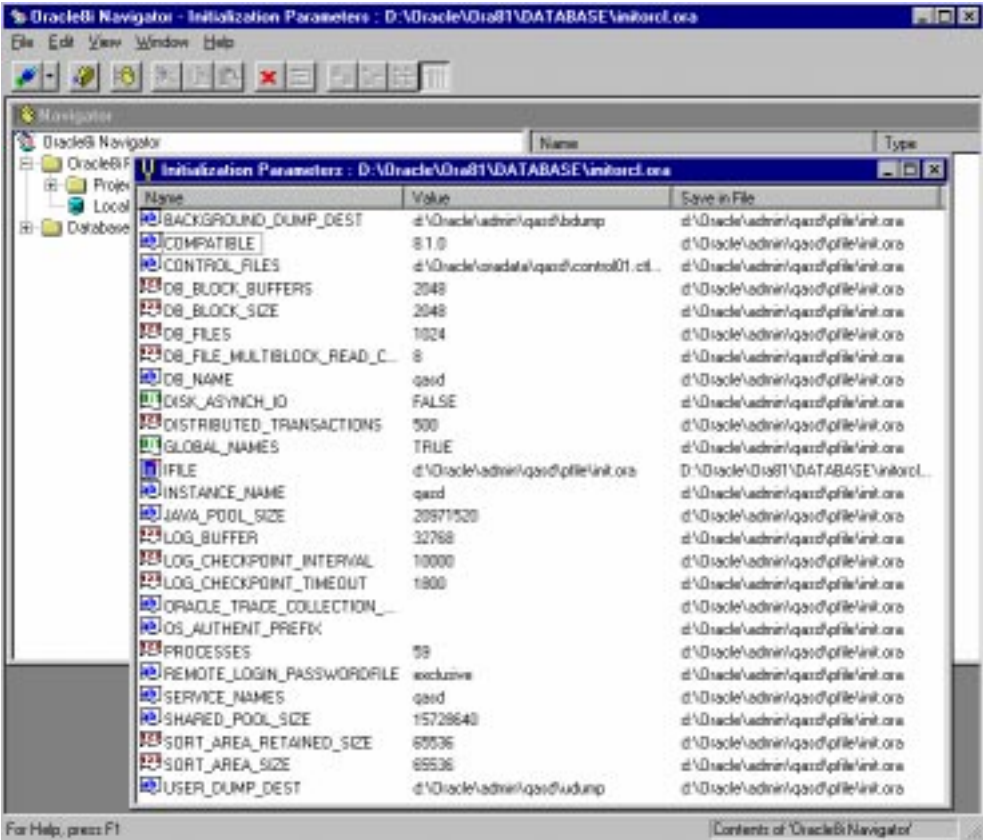
The Initialization Parameter file is a text file that contains a list of parameters and a value for each parameter. The name of the parameter file varies depending on the operating system. For example, it can be in mixed case or lowercase, or it can have a logical name or a variation of the name `init.ora`.

Database administrators can use initialization parameters to:

- Optimize performance by adjusting memory structures, such as the number of database buffers in memory
- Set some database-wide defaults, such as the amount of space initially allocated for a context area when it is created
- Set database limits, such as the maximum number of database users
- Specify names of files

For more details on the Initialization Parameter file and individual parameters in this file refer to the *Oracle8i Reference* documentation available under Oracle 8i Server in the documentation accompanying the CD.

On opening an already existing database initialization file, you will see a list of parameters present in that file and all the files included therein as shown in the following figure:



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**Note:**

1. The parameters specified in the initialization files are used by the database to initialize itself when starting up. Hence any changes that you make to this file will take effect only after you restart the database.
  2. Alter Session and Alter System commands are not supported by the Parameter Configuration Assistant.
  3. The Parameter Configuration Assistant will not list parameters whose value is dependent on other parameters.
  4. The system will maintain a backup of initialization file being modified. For example, if you are modifying a file init.ora in the directory c:\oracle\ora81\database, then a backup of the file named as init.ora.<timestamp> in the same directory location will be kept.
- 
- 

### **Opening a window to manipulate database initialization files**

1. Click on menu option View.
2. Under the Parameter Configuration menu option, a menu will pop up
3. Click on the initialization file and a window to manipulate the database parameters will be opened.

### **Creating a new initialization file**

1. Click on menu File -> New
2. A file dialogue will pop up. Choose the file into which the parameters have to be saved.
3. Start adding parameters.
4. After you are done, save the file.

### To open an already existing parameter file

1. Click on menu File -> open
2. From the popped up file dialogue, choose the parameter file to open.
3. If the parameter file is successfully opened, then you should see the list of parameters and their values on the window.

### To add a parameter

1. Before adding a parameter, you should either have opened an already existing parameter file or created a new parameter file.
2. Click on menu Edit -> Add or right-click in the window and select Add from the menu.
3. A dialogue box will pop up containing the following fields.

Name	The name of the parameter.
Value	The value of that parameter.
Range	The valid range of the parameter, if any.
Save in File	The file in which the parameter has to be saved.

4. Select the parameter you want to add from the available list present against Name.
5. Enter the value of the parameter in the Value field. (The range of the chosen parameter is shown in the Range field. The Range field is not editable.)
6. In Save in File field, you will see a filename where the parameter will be saved. This filename will be same as the filename you provided while creating a new parameter file or opening an already existing file. In case you want to organize the parameters across many files and include the files from one file using IFILE parameter, change the Save in File to a suitable file name.
7. Click **OK** to reflect the change on the window, click **Cancel** to discard the change.



### Deleting a Parameter

1. Click on the parameter to be deleted.
2. Click Edit -> Delete or right click on the parameter to be deleted and select Delete from the menu.

### Modifying a Parameter Value

1. Double-Click on the parameter to be modified or right click on the parameter to be modified and select Modify from the menu.
2. Change the value of the parameter in the Dialogue box that appears.
3. Click **OK** to reflect the change on the window, click **Cancel** to discard the change.

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**Note:** For using parameter IFILE, to include an initialization file in a nested initialization file, you should also specify the filename in which the value of the ifile has to be placed.

For example, if you have a `init1.ora` file including `init2.ora` file which in turn includes `init3.ora` file, then the GUI will show the value for the parameter IFILE as:

```
init1.ora::init2.ora, init2.ora::init3.ora.  
init1.ora  
|  
+----> init2.ora  
|  
+-----> init3.ora
```

If you want to include another file `init4.ora` into `init2.ora`, the value of IFILE shown in the GUI has to be modified to:

```
init1.ora::init2.ora, init2.ora::init3.ora,  
init2.ora::init4.ora.
```

Now the structure of the files included will be:

```
init1.ora  
|  
+----> init2.ora  
|  
+-----> init3.ora  
+-----> init4.ora
```

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**Saving the parameters**

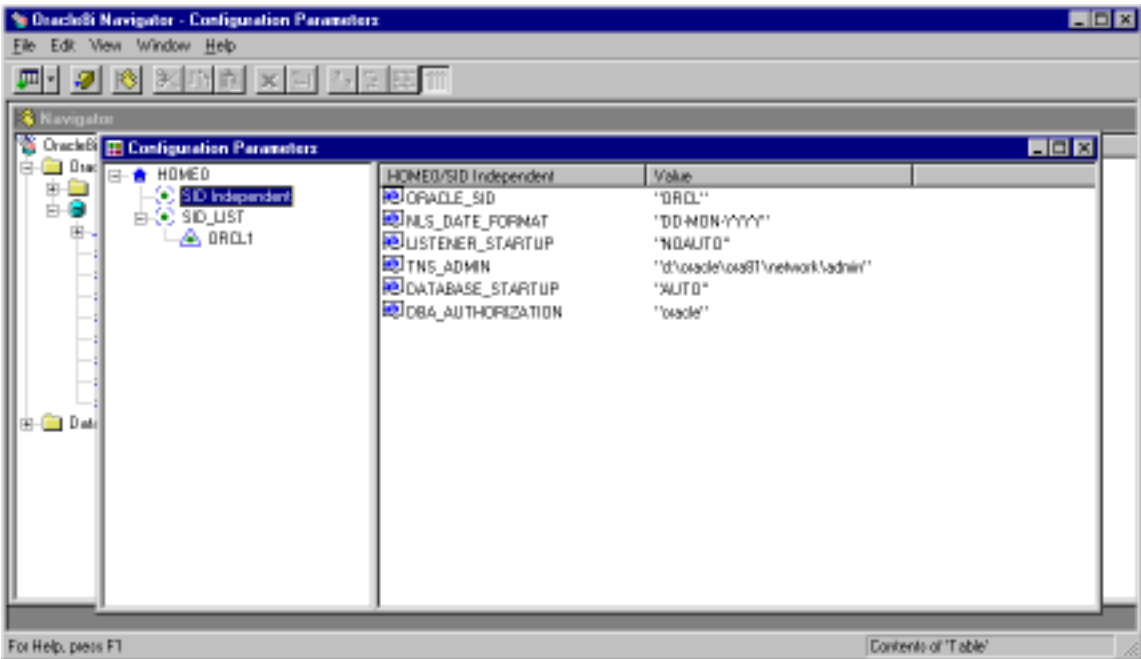
Click on Menu File -> Save.

The parameters will be saved into the files that appears in the "Save in File" field of the respective parameters.

**Introduction to Manipulating Oracle8i Configuration Parameters**

Oracle8i Personal Edition uses configuration parameters to locate files and specify run time parameters common to all Oracle products. All Oracle parameters are stored in the registry. Database Parameter Configuration Assistant provides a user interface for safe manipulation of the registry parameters used by the Oracle8i Database Server.

The following is a short description of the window used to modify the configuration parameters.



1. On opening a window to manipulate the Oracle 8i configuration parameters (and if you have Oracle Server installed in any of the Oracle Home locations), you will see a tree of Oracle Homes in the left window.
2. Each Oracle Home has a list of predefined number of SID-independent parameters i.e., the parameters that are common to all SIDs like DBA\_AUTHORIZATION, DATABASE\_STARTUP etc., and a list of SIDs belonging to that Home.
3. Each SID has a list of predefined number of SID-specific parameters i.e., parameters that are specific for different SIDs like ORA\_SID\_PFILE, ORA\_SID\_PWFIL.
4. On expanding each of the Oracle Home that appears in the tree, you will see two folders, one for SID-independent parameters; another for SID specific parameters.
5. On expanding the SID-Independent Parameters folder, you will see the list of SID-independent parameters and their corresponding values for that Oracle Home in the right window.
6. On expanding the SID List folder, you will see a list of available SIDs under that Home. Clicking on any of the SID folders will show a list of SID specific parameters and their corresponding values in the right window.

### **Opening a window to manipulate configuration parameters**

1. Click on menu option View.
2. Under the Parameter Configuration menu option, a menu will pop up.
3. Click on the Configuration Parameters and a window to manipulate the registry parameters will pop up.

---

---

**Note:**

1. You will see a tree of installed Oracle Homes in the left window.
  2. Each Oracle Home has a list of predefined number of SID-independent parameters and a list of SIDs belonging to that Home.
  3. Each SID has a list of predefined number of SID specific parameters.
  4. On expanding each of the Oracle Home that appears in the tree, you will see two folders, SID Independent and SID List.
  5. On expanding the SID Independent folder, you will see the list of SID independent parameters and their corresponding values for that Oracle Home in the right window.
  6. On expanding the SID List folder, you will see a list of available SIDs under that Home.
  7. Clicking on any of the SID folders will show a list of SID specific parameters and their corresponding values in the right window.
- 
- 

### Modifying a parameter value

1. By clicking on the appropriate tree elements in the left window, have the parameter -- that needs to be changed -- to appear in the right window.
2. For example, if you want to change the ORA\_ORCL\_PFILE parameter for SID = ORCL in Home\_0, then expand Home\_0, expand SID List that is present under Home\_0, click on ORCL, that should appear on the left window on expanding the SID List. You should see the parameter ORA\_ORCL\_PFILE on the right window.
3. Double click on the parameter to be modified or right click on the parameter to be modified and select Modify from the menu.
4. A dialogue box will pop up. Enter the new value for the parameter in the dialogue box.
5. Click **OK** to reflect the change, click **Cancel** to discard the change.

### Deleting a particular parameter

The parameters cannot be deleted. If you want to avoid writing the parameter into the registry then modify the parameter and make that parameter value as NULL.

For example, to delete ORA\_ORCL\_PFILE for the SID ORCL , modify ORA\_ORCL\_PFILE and clear the string that appears on the modify dialogue box and click on OK. You should see a "" against the value for ORA\_ORCL\_PFILE after this modification. Or right click on the parameter you want to delete and select Clear.

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**Note:** For saving the registry parameter value changes, Click on menu File -> Save.

To reload the parameter values from the registry, Click on menu View -> Refresh.

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## Net8 Configuration

This appendix describes Net8 configuration for Windows 98. For an overview of Net8 configuration in general, see the *Net8 Administrator's Guide*.

Specific topics discussed are:

- Unsupported Net8 Features
- Understanding Net8 Registry Parameter and Subkeys
- Listener Requirements
- Understanding Optional Configuration Parameters
- Net8 Port Numbers

# Unsupported Net8 Features

The following Net8 features are currently unsupported on Windows 98 platform.

Feature	Description
TRCROUTE	Client application not supported.
SPAWN	SPAWN command in the listener control utility is not supported.
Pre-SPAWNED dedicated server processes	Not supported by the listener. Therefore, do not include the following parameters in the SID_DESC's of the LISTENER.ORA file: PRESPAWN_MAX, PROTOCOL, POOL_SIZE, and TIMEOUT.

# Understanding Net8 Registry Parameter and Subkeys

Net8 contains the registry entries for Net8 parameters and Net8 service subkeys. To successfully add or modify Net8 configuration parameters, you must understand where they are located and the rules that apply to them.

## Net8 Parameters

The location of the Oracle Net8 registry parameters is:

HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE\HOMEID

where ID is incremented for each additional Oracle home directory on your computer (for example, HOME0 is for a first directory, HOME1 is for a second directory, and so forth).

# Listener Requirements

A release 8.1.6 listener is required for the Oracle8i release 8.1.6 database. Previous versions of the listener are not supported with the Oracle8i release 8.1.6 database. However, the release 8.1.6 listener is supported with previous versions of the database.

Once Oracle8i is installed, Oracle Corporation recommends that you use the release 8.1.6 listener for all of your Oracle release 8.1 databases and previous releases (such as an Oracle8 8.0 database). Even if you install Oracle8i in multiple Oracle homes on the same computer, you should only use one listener for all your databases on the same computer.



If you must use multiple listeners (such as a Net8 8.0 listener and Net8 8.1 listener) on the same computer, see the *Net8 Administrator's Guide* and Chapter 5 for more information.

You can start your 8.1.6 listener by using the LSNRCTL control utility:

**To start the listener using LSNRCTL:**

```
C:\> LSNRCTL START LISTENER_NAME
```

where *LISTENER\_NAME* is the listener name for typical install or a name given during custom install.

**To exit the utility:**

```
LSNRCTL> EXIT
```

In past releases, information about instances was configured manually in the LISTENER.ORA file. Instance registration is now automatic. Instances register themselves with the listener when they are started.

## Understanding Optional Configuration Parameters

You can use the following parameters on Windows 98:

- LOCAL
- TNS\_ADMIN
- USE\_SHARED\_SOCKET

Net8 first checks for the parameters as environment variables, and uses the values defined. If environment variables are not defined, it searches for these parameters in the registry.

**Additional Information:** See Appendix C, "Oracle8i Configuration Parameters and the Registry" for instructions on editing Windows registry keys.

## LOCAL

You can add the LOCAL parameter to make a connection without specifying a connect string service name. The value for LOCAL is the service name in the `TNSNAMES.ORA` file located in the `ORACLE_BASE\ORACLE_HOME\NETWORK\ADMIN` directory.

For example, if the LOCAL parameter is specified as finance, you connect to a database from SQL\*Plus with the following command:

```
SQL> CONNECT SCOTT/TIGER
```

Net8 checks if LOCAL is defined as an environment variable or as a parameter in the registry, and uses finance as the service name. If it exists, Net8 connects.

## TNS\_ADMIN

You can add the TNS\_ADMIN parameter to change the directory name for configuration files from the default location. For example, if you set TNS\_ADMIN to `ORACLE_BASE\ORACLE_HOME\TEST\ADMIN`, the configuration files are used from `ORACLE_BASE\ORACLE_HOME\TEST\ADMIN`.

## USE\_SHARED\_SOCKET

You can set the USE\_SHARED\_SOCKET parameter to TRUE to enable the use of shared sockets. If this parameter is set to TRUE, the network listener passes the socket descriptor for client connections to the database thread. As a result, the client does not need to establish a new connection to the database thread and database connection time improves. Also, all database connections share the port number used by the network listener, which can be useful if you are setting up third-party proxy servers.

This parameter only works in dedicated server mode in a TCP/IP environment. If this parameter is set, you cannot use the 8.1.6 listener to spawn Oracle 7.x databases. To spawn an Oracle 8.0.x database from an 8.1.6 listener with the shared socket enabled, you must also set the variable `USE_SHARED_SOCKET` for the 8.0.x Oracle home.

## Net8 Port Numbers

The following table describes the port numbers used by Net8.

Product	Default Port Number	How do I change the port number?
Listener	1521	Modify the LISTENER.ORA and TNSNAMES.ORA files, using Net8 Assistant. These files are located in the <i>ORACLE_BASE\ORACLE_HOME\NETWORK\ADMIN</i> directory, or in the directory specified by the TNS_ADMIN environment variable or registry value.



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## Error Messages

This appendix lists the error messages, causes, and corrective actions that are specific to the operation of Oracle8i Personal Edition for Windows 98. This appendix also includes database connection issues.

Specific topics discussed are:

- Logging Error Messages
- Codes 04000-04999: Windows 98/NT-Specific Oracle Messages
- Database Connection Issues

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**Note:** The ORA.HLP file, which was shipped in previous releases, is no longer available. See this Appendix and *Oracle8i Error Messages* for information on error messages.

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## Logging Error Messages

Keep a log of error messages you receive by redirecting the messages to a file. You can record the contents of normal utility messages by using the LOGFILE parameter discussed in *Oracle8i Utilities*. You can separately record the error message portion by using standard Windows 98 file redirection. For example, use the following syntax to redirect the output from the Export Utility:

```
C:\> EXP USERNAME/PASSWORD PARFILE=FILENAME >FILE1.LOG 2>FILE2.ERR
```

In this command line, FILE1.LOG receives the standard output from Export, while FILE2.ERR receives the standard error messages.

## Codes 04000-04999: Windows 98/NT-Specific Oracle Messages

The error messages in this section are Oracle operating system-dependent (OSD) messages issued in response to an error condition in Windows 98/NT. Each message in this section triggers an Oracle8i database error message.

- File I/O Errors: OSD-04000 to OSD-04099
- Memory Errors: OSD-04100 to OSD-04199
- Process Errors: OSD-04200 to OSD-04299
- Loader Errors: OSD-04300 to OSD-04399
- Semaphore Errors: OSD-04400 to OSD-04499
- Miscellaneous Errors: OSD-04500 to OSD-04599

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**Note:** In the description of the error codes (in "cause" and "action") you might observe the mention of "Windows NT" only. This should be read as **Windows NT/98** where applicable. There is **no** Windows 98 specific error messages which is not there for Windows NT.

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File I/O Errors:	OSD-04000 to OSD-04099
4000	logical block size mismatch
4001	invalid logical block size
4002	unable to open file

<b>File I/O Errors:</b>	<b>OSD-04000 to OSD-04099</b>
4003	unable to read file header block
4004	invalid file header
4005	SetFilePointer() failure, unable to read from file
4006	ReadFile() failure, unable to read from file
4007	truncated read
4008	WriteFile() failure, unable to write to file
4009	truncated write
4010	<create> option specified, file already exists
4011	GetFileInformationByHandle() failure, unable to obtain file info
4012	file size mismatch
4013	unable to read line from file
4014	unable to close file
4015	An asynchronous I/O request returned an error
4016	Error queuing an asynchronous I/O request
4017	Unable to open the specified RAW device
4018	Unable to access the specified directory or device
4019	Unable to set file pointer
4020	Unable to set eof file marker
4021	Unable to read file
4022	Unable to write file
4023	SleepEx() failure, unable to Sleep
4024	Unable to delete file
4025	Invalid question asked
4026	Invalid parameter passed

<b>Memory Errors:</b>	<b>OSD-04100 to OSD-04199</b>
4100	malloc() failure, unable to allocate memory
4101	invalid SGA: SGA not initialized
4102	Unable to open/create file for shared memory objec
4103	unable to attach to SGA: SGA does not exist

<b>Memory Errors:</b>	<b>OSD-04100 to OSD-04199</b>
4104	Unable to map shared memory (SGA) into the address space
4105	Shared memory (SGA) mapped to wrong address
4106	Unable to allocate memory with VirtualAlloc
4107	Unable to deallocate memory with VirtualFree
4108	Unable to protect memory with VirtualProtect

<b>Process Errors:</b>	<b>OSD-04200 to OSD-04299</b>
4200	unable to begin another thread
4201	no pid structure supplied to spdcr()
4202	DosSetPriority() failure, unable to set process priority
4203	DosKillProcess() failure, unable to kill process
4204	invalid pid
4205	CreateProcess() failure, unable to spawn process
4207	invalid priority specified in CONFIG parameter ORACLE_PRIORITY
4208	OpenProcess() failure, unable to open process handle
4209	Incorrect or unknown background image name given to spdcr()
4210	Timeout waiting for thread semaphore
4211	Thread information not found
4212	Maximum number of ORACLE threads reached
4213	ORACLE thread unable to DuplicateHandle()
4214	ORACLE thread unable to CreateEvent()
4215	Bad function code supplied to ssthreadop
4216	Unable to find file handle for that thread
4217	Unable to retrieve system user name for current user
4218	Can not post thread
4219	Bad thread list semaphore
4221	Target thread is currently busy
4222	Unable to get the threads context
4223	Unable to set the threads context
4224	Unable to suspend the target thread



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**Process Errors:            OSD-04200 to OSD-04299**

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4225	Unable to resume the target thread
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**Loader Errors:            OSD-04300 to OSD-04399**

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4300	unable to read complete record from data file
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4301	record size too large
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4302	invalid record type and/or load options
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**Semaphore Errors:        OSD-03400 to OSD-03499**

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4400	unable to acquire internal semaphore for process
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4401	WaitForSingleObject() failure, unable to obtain semaphore
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**Miscellaneous Errors:    OSD-04500 to OSD-04599**

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4500	illegal option specified
------	--------------------------

4501	internal buffer overflow
------	--------------------------

4502	translations nested too deep
------	------------------------------

4503	text contains no translatable elements
------	--

4505	stdin not responding
------	----------------------

4506	unable to spawn process via system()
------	--------------------------------------

4507	password for 'internal' is incorrect
------	--------------------------------------

4508	no password given
------	-------------------

4509	no password found
------	-------------------

4510	operating system roles are not supported
------	--

4511	unable to get date and time from the operating system
------	---

4512	unable to translate the 'USERNAME' config.ora variable on server
------	--

4513	'remote_os_authent' init.ora variable not set to true
------	---

4514	The NT Group name is too long for internal buffer
------	---

4515	This command is not implemented at this time
------	--

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**File I/O Errors: OSD-04000 to OSD-04099****OSD-04000***Logical block size mismatch*

**Cause:** The database block size specified in the initialization parameter file does not match the block size of the actual database files.

**Action:** Use matching logical block sizes.

**OSD-04001**

*Invalid logical block size*

**Cause:** The logical block size is not a multiple of 512 bytes, or it is too large.

**Action:** Change the value of DB\_BLOCK\_SIZE in the initialization parameter file.

**OSD-04002**

*Unable to open file*

**Cause:** The specified path or file name is invalid, or the destination device is full. This error can also be caused by insufficient Windows NT file handles.

**Action:** Make sure the path and file exist, and the device has free space. If this fails, increase the number of Windows NT file handles.

**OSD-04003**

*Unable to read file header block*

**Cause:** The media has been damaged.

**Action:** Recover the file if necessary, and verify that Windows NT is functioning correctly.

**OSD-04004**

*Invalid file header*

**Cause:** The file is corrupted.

**Action:** Recover the file.

**OSD-04005**

*SetFilePointer() failure, unable to read from file*

**Cause:** There was an unexpected return from the Windows NT system service, SetFilePointer().

**Action:** Check the operating system error code and consult the Windows NT documentation.

**OSD-04006**

*ReadFile() failure, unable to read from file*

**Cause:** There was an unexpected return from the Windows NT system service, ReadFile().

**Action:** Check the operating system error code and consult the Windows NT documentation.

**OSD-04007**

*Truncated read*

**Cause:** The system encountered an unexpected end-of-file, which is due to damaged media.

**Action:** Verify that the file is not damaged.

**OSD-04008**

*WriteFile() failure, unable to write to file*

**Cause:** There was an unexpected return from the Windows NT system service, WriteFile().

**Action:** Check the operating system error code and consult the Windows NT documentation.

**OSD-04009**

*Truncated write*

**Cause:** The destination device is full or the media is damaged.

**Action:** Verify that the device has free space and the file is not damaged.

**OSD-04010**

*<create> option specified, file already exists*

**Cause:** The file you attempted to create already exists.

**Action:** Delete the existing file or use the REUSE option in the SQL statement.

**OSD-04011**

*GetFileInformationByHandle() failure, unable to obtain file info*

**Cause:** There was an unexpected return from the Windows NT system service, GetFileInformationByHandle().

**Action:** Check the operating system error code and consult the Windows NT documentation.

**OSD-04012**

*File size mismatch*

**Cause:** The file to be re-used is either too large or too small.

**Action:** Specify the correct file size or delete the existing file.

**OSD-04013**

*Unable to read line from file*

**Cause:** This error is caused by an operating system error or by damaged media.

**Action:** Check the operating system error code (if available) and consult the Windows NT documentation. If no operating system error code is presented, verify that the media is not damaged.

**OSD-04014**

*Unable to close file*

**Cause:** The media has been damaged.

**Action:** Recover the file, if necessary, and verify that Windows NT is functioning correctly.

**OSD-04015**

*Asynchronous I/O request returned an error*

**Cause:** There was an unexpected return from the Windows NT system service.

**Action:** Check the operating system error code and consult the Windows NT documentation.

**OSD-04016**

*Error queuing an asynchronous I/O request*

**Cause:** There was an unexpected return from the Windows NT system service.

**Action:** Check the operating system error code and consult the Windows NT documentation.

**OSD-04017**

*Unable to open the specified RAW device*

**Cause:** An invalid path or file name was specified or the device is full.

**Action:** Make sure the file exists and/or device is not full; verify that the operating system is functioning correctly.

**OSD-04018**

*Unable to access the specified directory or device*

**Cause:** An invalid path name was specified.

**Action:** Make sure the directory or device exists and is accessible.

**OSD-04019**

*Unable to set file pointer*

**Cause:** This error is caused by an operating system error or by damaged media.

**Action:** Check the operating system error code (if available) and consult the Windows NT documentation. If no operating system error code is presented, verify that the media is not damaged.

**OSD-04020**

*Unable to set eof file marker*

**Cause:** This error is caused by an operating system error or by damaged media.

**Action:** Check the operating system error code (if available) and consult the Windows NT documentation. If no operating system error code is presented, verify that the media is not damaged.

**OSD-04021**

*Unable to read file*

**Cause:** This error is caused by an operating system error or by damaged media.

**Action:** Check the operating system error code (if available) and consult the Windows NT documentation. If no operating system error code is presented, verify that the media is not damaged.

**OSD-04022**

*Unable to write file*

**Cause:** This error is caused by an operating system error or by damaged media.

**Action:** Check the operating system error code (if available) and consult the Windows NT documentation. If no operating system error code is presented, verify that the media is not damaged.

**OSD-04023**

*SleepEx() failure, unable to Sleep*

**Cause:** There was an unexpected return from the Windows NT system service.

**Action:** Check the operating system error code and consult the Windows NT documentation.

**OSD-04024**

*Unable to delete file*

**Cause:** This error is caused by an operating system error or by damaged media.

**Action:** Check the operating system error code (if available) and consult the Windows NT documentation. If no operating system error code is presented, verify that the media is not damaged.

**OSD-04025**

*Invalid question asked*

**Cause:** This is an internal error, not normally expected to occur.

**Action:** Contact Oracle Support Services.

**OSD-04026**

*Invalid parameter passed*

**Cause:** This is an internal error, not normally expected to occur.

**Action:** Contact Oracle Support Services.

## Memory Errors: OSD-04100 to OSD-04199

**OSD-04100**

*Malloc() failure, unable to allocate memory*

**Cause:** The program is out of memory.

**Action:** Shut down all unnecessary processes or install more memory in the computer.

**OSD-04101**

*Invalid SGA: SGA not initialized*

**Cause:** The System Global Area (SGA) has been allocated but not initialized.

**Action:** Wait until the STARTUP has completed before attempting to connect.

**OSD-04102**

*Unable to open/create file for shared memory object*

**Cause:** There was an unexpected return from the Windows NT system service, CreateFile().

**Action:** Check the operating system error code and consult the Windows NT documentation.

**OSD-04103**

*Unable to attach to SGA: SGA does not exist*

**Cause:** The SGA does not exist.

**Action:** Start up an Oracle instance.

**OSD-04104**

*Unable to map shared memory (SGA) into the address space*

**Cause:** There was an unexpected return from the Windows NT system service, MapViewOfFileEx().

**Action:** Check the operating system error code and consult the Windows NT documentation.

**OSD-04105**

*Shared memory (SGA) mapped to wrong address*

**Cause:** There was an unexpected return from the Windows NT system service, MapViewOfFileEx().

**Action:** Check the operating system error code and consult the Windows NT documentation.

**OSD-04106**

*Unable to allocate memory with VirtualAlloc*

**Cause:** The program is out of memory.

**Action:** Shut down all unnecessary processes or install more memory in the computer.

**OSD-04107**

*Unable to deallocate memory with VirtualFree*

**Cause:** There was an unexpected return from the Windows NT system service, VirtualFree().

**Action:** Check the operating system error code and consult the Windows NT documentation.

**OSD-04108**

*Unable to protect memory with VirtualProtect*

**Cause:** There was an unexpected return from the Windows NT system service, VirtualProtect().

**Action:** Check the operating system error code and consult the Windows NT documentation.

## Process Errors: OSD-04200 to OSD-04299

### OSD-04200

*Unable to begin another thread*

**Cause:** The program has run out of system resources.

**Action:** Shut down all unnecessary processes; install more memory in the computer.

### OSD-04201

*No pid structure supplied to spdcrc()*

**Cause:** This is an internal error, not normally expected to occur.

**Action:** Contact Oracle Support Services.

### OSD-04202

*DosSetPriority() failure, unable to set process priority*

**Cause:** There was an unexpected return from the Windows NT system service, DosSetPriority().

**Action:** Check the operating system error code and consult the Windows NT documentation.

### OSD-04203

*DosKillProcess() failure, unable to kill process*

**Cause:** There was an unexpected return from the Windows NT system service, DosKillProcess().

**Action:** Check the operating system error code and consult the Windows NT documentation.

### OSD-04204

*Invalid pid*

**Cause:** Process ID not recognized by system, process previously terminated.

**Action:** Verify that process ID is correct and that process is active.



**OSD-04205**

*CreateProcess() failure, unable to spawn process*

**Cause:** There was an unexpected return from the Windows NT system service, CreateProcess().

**Action:** Check the operating system error code and consult the Windows NT documentation.

**OSD-04207**

*Invalid priority specified in CONFIG parameter ORACLE\_PRIORITY*

**Cause:** The priority specified is invalid or out of range.

**Action:** Specify a valid setting for ORACLE\_PRIORITY.

**OSD-04208**

*OpenProcess() failure, unable to open process handle*

**Cause:** There was an unexpected return from the Windows NT system service, OpenProcess().

**Action:** Check the operating system error code and consult the Windows NT documentation.

**OSD-04209**

*Incorrect or unknown background image name given to spdcr()*

**Cause:** There was an unexpected background name given to spdcr().

**Action:** Contact Oracle Support Services.

**OSD-04210**

*Timeout waiting for thread semaphore*

**Cause:** An Oracle8 database thread died holding the semaphore.

**Action:** Restart Oracle8 database instance.

**OSD-04211**

*Thread information not found*

**Cause:** An Oracle8 database thread died without deleting its information.

**Action:** Restart Oracle8 database instance.

**OSD-04212**

*Maximum number of Oracle threads reached*

**Cause:** The maximum number of Oracle8 database threads for the instance is reached.

**Action:** Wait until some connections exit before trying again.

**OSD-04213**

*Oracle thread unable to DuplicateHandle()*

**Cause:** This is an internal error, not normally expected to occur.

**Action:** Contact Oracle Support Services.

**OSD-04214**

*Oracle thread unable to CreateEvent()*

**Cause:** This is an internal error, not normally expected to occur.

**Action:** Contact Oracle Support Services.

**OSD-04215**

*Bad function code supplied to ssthreadop*

**Cause:** This is an internal error, not normally expected to occur.

**Action:** Contact Oracle Support Services.

**OSD-04216**

*Unable to find file handle for that thread*

**Cause:** This is an internal error, not normally expected to occur.

**Action:** Contact Oracle Support Services.

**OSD-04217**

*Unable to retrieve system username for current user*

**Cause:** This is an internal error, not normally expected to occur.

**Action:** Contact Oracle Support Services.

**OSD-04218**

*Cannot post thread*

**Cause:** This is an internal error, not normally expected to occur.

**Action:** Contact Oracle Support Services.

**OSD-04219**

*Bad thread list semaphore*

**Cause:** This is an internal error, not normally expected to occur.

**Action:** Contact Oracle Support Services.

**OSD-04221**

*Target thread is currently busy*

**Cause:** The target thread is processing an oradebug command.

**Action:** Wait and re-issue command.

**OSD-04222**

*Unable to get the threads context*

**Cause:** Check OS error code.

**Action:** Remedy OS error.

**OSD-04223**

*Unable to set the threads context*

**Cause:** Check OS error code.

**Action:** Remedy OS error.

**OSD-04224**

*Unable to suspend the target thread*

**Cause:** Check OS error code.

**Action:** Remedy OS error.

**OSD-04225**

*Unable to resume the target thread*

**Cause:** Check OS error code.

**Action:** Remedy OS error.

## Loader Errors: OSD-04300 to OSD-04399

### OSD-04300

*Unable to read complete record from data file*

**Cause:** The data file ended in the middle of a record. This error occurs when loading files with a fixed record length.

**Action:** Verify that the data file is of the correct length and contains complete records.

### OSD-04301

*Record size too large*

**Cause:** The specified record size is too large to load.

**Action:** Reduce record size and reload the data.

### OSD-04302

*Invalid record type and/or load options*

**Cause:** The control file's Windows NT file processing options string contains an invalid option or keyword.

**Action:** Set the Windows NT file processing options string to an acceptable value.

## Semaphore Errors: OSD-04400 to OSD-04499

### OSD-04400

*Unable to acquire internal semaphore for process*

**Cause:** Oracle8 database has exceeded the maximum number of connections.

**Action:** Delete any unused connections and try again.

### OSD-04401

*WaitForSingleObject() failure, unable to obtain semaphore*

**Cause:** There was an unexpected return from the Windows NT system service, WaitForSingleObject().

**Action:** Check the operating system error code and consult the Windows NT documentation.

## Miscellaneous Errors: OSD-04500 to OSD-04599

### OSD-04500

*Illegal option specified*

**Cause:** This is an internal error, not normally expected to occur.

**Action:** Contact Oracle Support Services.

### OSD-04501

*Internal buffer overflow*

**Cause:** This is an internal error, not normally expected to occur.

**Action:** Contact Oracle Support Services.

### OSD-04502

*Translations nested too deep*

**Cause:** The program encountered too many intermediate translations while attempting to translate a configuration variable.

**Action:** Simplify the values of configuration parameters to include fewer intermediate translations.

### OSD-04503

*Text contains no translatable elementsx*

**Cause:** The program cannot recognize variables in the text to be translated.

**Action:** Check and, if necessary, correct the text to be translated.

### OSD-04505

*Stdin not responding*

**Cause:** The system is unable to receive input from the standard input stream.

**Action:** Verify that the process has access to an input device.

### OSD-04506

*Unable to spawn process via system()*

**Cause:** The system is out of memory or the executable is invalid.

**Action:** Shut down unnecessary processes; install more memory in the computer. Verify the name of the executable.

**OSD-04507**

*Password for 'internal' is incorrect*

**Cause:** An attempt was made to connect as 'internal' with an invalid password.

**Action:** Verify that the password is correct and try again.

**OSD-04508**

*No password given*

**Cause:** An attempt was made to connect as 'internal' without a password.

**Action:** Enter a valid password when connecting as internal.

**OSD-04509**

*No password found*

**Cause:** Oracle was unable to locate and retrieve the password for 'internal'.

**Action:** Verify that Oracle is installed and configured correctly.

**OSD-04510**

*Operating system roles are not supported*

**Cause:** An attempt was made to use an operating system role.

**Action:** Only use roles that were created 'IDENTIFIED BY PASSWORD' as opposed to 'IDENTIFIED EXTERNALLY'.

**OSD-04511**

*Unable to get date and time from the operating system*

**Cause:** There was an unexpected return from GetLocalTime() call.

**Action:** Verify that the system time is correct on the computer.

**OSD-04512**

*Unable to translate the 'USERNAME' configuration variable on server*

**Cause:** The 'USERNAME' configuration parameter variable on the host is not properly set.

**Action:** Verify the 'USERNAME' variable is set.

**OSD-04513**

*'REMOTE\_OS\_AUTHENT' variable not set to TRUE'*

**Cause:** For remote operating system log on to function, the 'REMOTE\_OS\_AUTHENT' parameter must be set to TRUE.

**Action:** Shut down and start up the instance with 'REMOTE\_OS\_AUTHENT = TRUE' in the initialization parameter file.

OSD-04514

*The Windows NT Group name is too long for internal buffer*

**Cause:** The Windows NT Group name is too long.

**Action:** Use a shorter Windows NT group name.

Database Connection Issues

This table lists and provides answers to common Oracle8i database connection issues:

If You Receive This Error...	Ensure Your...
TNS-12203 TNS: unable to connect to destination	Oracle Instance and OracleHome_ NameTNSListener <sup>1</sup> are started. See the <i>Net8 Administrator's Guide</i> .
ORA-12547 TNS: lost contact	Oracle Instance and OracleHome_ NameTNSListener <sup>1</sup> are started. You receive this error if you attempt to use any of the Oracle8i Utilities, such as SQL*Plus.  <b>Note:</b> This error is analogous to the following Oracle7 error:  ORA-09352: Windows 32-bit Two-Task driver unable to spawn new ORACLE task
ORA-28575: unable to open RPC connection to external procedure agent ORA-06512: at "APPLICATIONS.OSEXEC", line 0 ORA-06512: at "APPLICATIONS.TEST", line 4 ORA-06512: at line 2	TNSNAMES.ORA and LISTENER.ORA files have been correctly configured to use external routines. See Chapter 8 of <i>Net8 Administrator's Guide</i> .

<sup>1</sup> Ensure that OracleHOME\_NAME\_TNSListener is started if you are using an Oracle8i database that has a home name.





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# Glossary

**alert file**

A file that contains important information and error messages that are generated during database operations.

**authenticate**

To verify the identity of a user, device, or other entity in a computer system, often as a prerequisite for allowing access to resources in a system.

**authorization**

Permission given to a user, program, or process to access an Oracle database or operating system.

**backup**

A representative copy of data. This copy includes important parts of your database such as the control file, redo log files, and data files.

A backup is a safeguard against unexpected data loss; if you lose your original data, you can use the backup to make the data available again. A backup is also a safeguard against an application error; if an application makes incorrect changes, you can restore the backup.

**connect string**

See "net service name".

**control file**

A file that records the physical structure of a database and contains the database name, the names and locations of associated databases and online redo log files, the timestamp of the database creation, the current log sequence number, and checkpoint information.

**data dictionary**

A set of read-only tables that provide information about a database.

**database alias**

See "net service name".

**downgrade**

To transform an installed version of an Oracle database from a later release back into an earlier release.

**Dynamic Link Library (DLL)**

An executable file that a Windows application can load when needed.

**external routine**

A function written in a third-generation language (3GL), such as C, and callable from within PL/SQL or SQL as if it were a PL/SQL function or procedure.

**HOMEID**

Represents a unique registry subkey for each Oracle home directory in which you install products. A new HOMEID is created and incremented each time you install products to a different Oracle home directory on one computer. Each HOMEID contains its own configuration parameter settings for installed Oracle products.

**HOME\_NAME**

Represents the name of an *ORACLE\_HOME*. In Release 8.1.6, all Oracle homes have a unique *HOME\_NAME*.

**initialization parameter file**

An ASCII text file that contains information needed to initialize a database and instance.

**instance**

Every running Oracle database is associated with an Oracle instance. When a database is started on a database server (regardless of the type of computer), Oracle allocates a memory area called the System Global Area (SGA) and starts one or more Oracle processes. This combination of the SGA and the Oracle processes is called an instance. The memory and processes of an instance manage the associated database's data efficiently and serve the one or more users of the database.

**instantiate, instantiation**

Producing a more defined version of some object by replacing variables with values (or other variables).

In object-oriented programming, producing a particular object from its class template. This involves allocation of a structure with the types specified by the template, and initialization of instance variables with either default values or those provided by the constructor function of the class.

**listener**

The server process that listens for and accepts incoming connection requests from client applications. Oracle listener processes start up Oracle database processes to handle subsequent communications with the client.

**LISTENER.ORA**

A configuration file that describes one or more Transparent Network Substrate (TNS) listeners on a server.

**migrate**

To transform an installed version of an Oracle database from a major release to another major release, for example, from Oracle8 to Oracle8i.

**mount**

To associate a database with an instance that has been started.

**multiple Oracle homes**

The capability of having more than one ORACLE\_HOME on a computer.

**National Language Support (NLS)**

The Oracle architecture that ensures that database utilities, error messages, sort order, date, time, monetary, numeric, and calendar conventions automatically adapt to the native language and locale.

**net service name**

The name used by clients to identify a Net8 server. A net service name is mapped to a port number and protocol. Also known as a connect string, database alias, or service name.

**Net8**

The Oracle network interface that enables Oracle tools running on network workstations and servers to access, modify, share, and store data on other servers.

**network listener**

A listener on a server that listens for connection requests for one or more databases on one or more protocols. See "listener".

**network service**

In an Oracle application network, a service performs tasks for its service consumers. For example, a Names Server provides name resolution services for clients.

**NLS**

See "National Language Support (NLS)".

**Optimal Flexible Architecture (OFA)**

A set of file naming and placement guidelines for Oracle software and databases.

**Oracle Call Interface (OCI)**

An application programming interface that enables you to manipulate data and schemas in an Oracle database. You compile and link an Oracle Call Interface program in the same way that you compile and link a non-database application. There is no need for a separate preprocessing or precompilation step.

***ORACLE\_HOME***

Corresponds to the environment in which Oracle products run. This environment includes the location of installed product files, the *PATH* variable pointing to the products' binary files, registry entries, net service names, and program groups.

If you install an OFA-compliant database, using Oracle Universal Installer defaults, Oracle home (known as *\ORACLE\_HOME* in this guide) is located beneath *X:\ORACLE\_BASE*. It contains subdirectories for Oracle software executables and network files.

**Oracle JServer**

Oracle8i Personal Edition includes Oracle JServer, the integrated Java Virtual Machine. Oracle JServer provides Java2 support (JDK1.2), an embedded JDBC driver and a SQLJ translator.

**Oracle Protocol Support**

A product that maps the functions of a given network protocol into Oracle Transparent Network Substrate (TNS) architecture. This process translates TNS function calls into requests to the underlying network protocol. This allows TNS to act as an interface among all protocols. Net8 requires Oracle protocol support.

***ORACLE\_BASE***

Oracle base, known as *ORACLE\_BASE* in this guide, is the root of the Oracle directory tree.

If you install an OFA-compliant database using Oracle Universal Installer defaults, *ORACLE\_BASE* is *X:\ORACLE* where *X* is any hard drive (for example, *C:\ORACLE*).

**PL/SQL**

Oracle Corporation's procedural language extension to SQL.

PL/SQL enables you to mix SQL statements with procedural constructs. You can define and execute PL/SQL program units such as procedures, functions, and packages.

**precompiler**

A programming tool that enables you to embed SQL statements in a high-level source program.

**privilege**

A right to execute a particular type of SQL statement or to access another user's object.

**process**

A mechanism in an operating system that can run an executable. (Some operating systems use the terms job or task.) A process normally has its own private memory area in which it runs.

**quota**

A limit on a resource, such as a limit on the amount of database storage used by a database user. A database administrator can set tablespace quotas for each Oracle user name.

**recovery**

To *restore* a physical backup is to reconstruct it and make it available to the Oracle server. To *recover* a restored backup is to update it using redo records (that is, records of changes made to the database after the backup was taken). Recovering a backup involves two distinct operations: rolling forward the backup to a more current time by applying redo data, and rolling back all changes made in uncommitted transactions to their original state.

**redo log file**

A file that contains a record of all changes made to data in the database buffer cache. If an instance failure occurs, the redo log files are used to recover the modified data that was in memory.

**redo log buffer**

A circular buffer in the System Global Area (SGA) that contains information about changes made to the database.

**registry**

A Windows repository that stores configuration information for a computer.

**remote computer**

A computer on a network other than the local computer.

**remote database**

A database on a computer other than the local database.

**replication**

The process of copying and maintaining database objects in multiple databases that make up a distributed database system.

**role**

A named group of related privileges. You can grant a role to users or other roles.

**schema**

A named collection of objects, such as tables, views, clusters, procedures, and packages, associated with a particular user.

**service name**

See "net service name".

**SID**

See "system identifier (SID)".

**snapshot**

(1) Information stored in rollback segments to provide transaction recovery and read consistency. Rollback segment information can be used to recreate a snapshot of a row before an update.

(2) A read-only copy of a master table located on a remote node. Snapshots can be queried, but not updated; only the master table can be updated. Snapshots are periodically refreshed to reflect changes made to the master table.

**starter database**

A preconfigured, ready-to-use database that requires minimal user input to create.

**synonym**

An alias for a table, view, sequence, or program unit. A synonym is not actually an object itself; rather, it is a direct reference to its base object.

**SYSDBA**

A special database administration role that contains all system privileges with the ADMIN OPTION, and the SYSOPER system privilege. SYSDBA also permits CREATE DATABASE actions and time-based recovery.

**SYSOPER**

A special database administration role that permits a database administrator to perform STARTUP, SHUTDOWN, ALTER DATABASE OPEN/MOUNT, ALTER DATABASE BACKUP, ARCHIVE LOG, and RECOVER, and includes the RESTRICTED SESSION privilege.

**System Global Area (SGA)**

A group of shared memory structures that contain data and control information for an Oracle instance.

**system identifier (SID)**

A unique name for an Oracle instance. To switch between Oracle databases, users must specify the desired SID. The SID is included in the CONNECT DATA parts of the connect descriptors in a TNSNAMES.ORA file, and in the definition of the network listener in a LISTENER.ORA file.

**SYSTEM user name**

One of two standard DBA user names automatically created with each database. (The other user name is SYS.) SYSTEM is created with an initial password of MANAGER. The SYSTEM user name is the preferred user name for DBAs to use for database maintenance.

**tablespace**

A database is divided into one or more logical storage units called tablespaces. Tablespaces are divided into logical units of storage called segments, which are further divided into extents.

**thread**

An individual path of execution within a process. Threads are objects within a process that execute program instructions.

**TNSNAMES.ORA**

A file that contains connect descriptors mapped to net service names. The file may be maintained centrally or locally, for use by all or individual clients.

**trace file**

Each server and background process can write to an associated trace file. When a process detects an internal error, it dumps information about the error to its trace file. Some of the information written to a trace file is intended for the database administrator, while other information is intended for Oracle Support Services. Trace file information is also used to tune applications and instances.

**upgrade**

To transform an installed version of an Oracle database major release into another major release of the same version. Compare with "migrate".



**user name**

A name that can connect to and access objects in a database.

**view**

A selective presentation of the structure of, and data in, one or more tables (or other views).



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# Index

## Symbols

---

"", SQL\*Loader parameter, 2-10  
"FIX n", SQL\*Loader parameter, 2-10  
"RECSIZE", SQL\*Loader parameter, 2-10  
"VAR xxxx", SQL\*Loader parameter, 2-11

## Numerics

---

1521 port, D-5  
1526 port, D-5

## A

---

ADMIN directory, explained, 3-20  
alert files, 8-2  
    for monitoring a database, 8-2  
    using, 8-2  
alias, creating, 5-3  
ALL\_HOMES, registry subkey for multiple Oracle homes, C-6  
ALTER DATABASE ARCHIVELOG command, 7-11  
ALTER DATABASE CONVERT command, 4-27  
ALTER DATABASE OPEN RESETLOGS command, 4-28  
application development  
    finding information, 10-2  
ARCHIVE LOG LIST command, 7-11  
ARCHIVELOG mode, 7-11  
archiving mode  
    custom database, 7-10  
    starter database, 7-10  
archiving procedures, 7-12

    for redo log files, 7-10  
    specifying an archive destination, 7-12  
AUDIT\_FILE\_DEST parameter, B-4  
authentication  
    using a password file, 7-5  
automatic startup/shutdown  
    on Windows 98, NT and UNIX, 1-7

## B

---

BACKGROUND\_DUMP\_DEST parameter, 6-12  
    using with trace files, 8-2  
backslash (\), defined, xxv  
backup  
    databases, 6-20  
    OCOPY file types, 9-3  
    stopping services to perform cold backups, 9-2  
backup and recovery tools  
    OCOPY, 9-2  
    Recovery Manager (RMAN.EXE), 9-2  
    selecting, 9-2  
    third-party backup and recovery vendors, 9-2  
block size, maximum, B-5  
blocks per file, maximum, B-5  
BUILD\_DB.SQL script, 6-6, 6-13  
    location of, 6-3  
BUILDALL.SQL script, 6-13

## C

---

C:\>, defined, xxv  
C:\ORACLE, defined, 3-16  
C:\ORAWIN95, defined, xxvi, 3-16  
CAT8004.SQL, 4-33

- CATALOG.SQL script, 4-39, 6-17
  - location of, A-5
- CATEXP.SQL script
  - location of, A-5
- CATOUT.LOG file, 4-28
- CATPROC.SQL script, 4-39, 6-17
  - location of, A-5
- changing passwords, 5-2
- Choose Start >, defined, xxv
- code conventions, used in this guide, xxv
- cold backups, performing, 9-2
- COMPATIBLE parameter, 4-27, 4-36, 4-41
- COMPATIBLE\_NO\_RECOVERY parameter, B-4
- configuration parameters
  - defined, C-2
  - LOCAL, D-4
  - registry, C-1
  - TNS\_ADMIN, D-4
  - USE\_SHARED\_SOCKET, D-4
- CONNECT INTERNAL, 7-8
  - changing the INTERNAL password, 7-9
  - password, 7-8
  - using, 7-2, 7-8, 7-10
- connect string, 5-3
- connecting
  - LOCAL parameter, D-4
  - Oracle8 Client Release 8.0/Oracle7 Client to Oracle8i Database Release 8.1, 4-7
  - Oracle8i Client Release 8.0/SQL\*Net to Oracle8i database Release 8.1, 4-7
  - Oracle8i Client Release 8.1 to Oracle Database Version7 and Release 8.0, 4-9
  - to a database, 7-2, 7-10
- connecting Oracle8i Client Release 8.1 to Oracle8i database Release 8.1, 4-7
- contacting
  - Oracle Support Services, xi
  - Oracle Technical Publications, xi
- CONTROL\_FILES parameter, 4-26, 6-12
- copy modes, for OCOPY, 9-3
- CORE\_DUMP\_DEST parameter, B-4
- CPU\_COUNT parameter, B-4
- CREATE DATABASE command, 6-13
- CREATE LIBRARY command, 10-8
- creating
  - database connections, 5-3

- custom database
  - archiving mode, 7-10

## D

---

- database backup and recovery tools
  - OCOPY, 9-2
  - Recovery Manager (RMAN), 9-2
  - third-party vendors, 9-2
- database coexistence
  - issues, 4-6
  - overview, 4-3
- database files
  - deleting, 6-9
- database monitoring
  - with alert files, 8-2
  - with trace files, 8-2
- database release coexistence issues, 4-7
- database tools
  - operating system support, 2-2
  - starting, 2-5
- databases
  - backing up, 6-20
  - BUILD\_DB.SQL script, 6-6
  - BUILDALL.SQL, 6-13
  - changing passwords, 6-18
  - coexistence, 4-3
  - connecting to, 7-2, 7-10
  - connections, creating, 5-3
  - deleting, 6-9
  - exporting, 6-8
  - file names, 3-16
  - importing, 6-18
  - installation in multiple homes, 4-11
  - maximum size possible, B-6
  - migration, 4-4, 4-11
  - monitoring, 8-1, 8-2
  - multi-versioning, 4-10
  - naming conventions, 6-2
  - Optimal Flexible Architecture, 3-22, 3-23, 3-24
  - Oracle Database Configuration Assistant, 6-3
  - password encryption, 7-9
  - shutting down, 7-2, 7-3
  - starting, 7-2

- upgrading, 4-4, 4-11, 4-31
  - what to do with existing databases, 4-2
- DB\_FILES parameter, 6-12
- DB\_NAME directory, explained, 3-21
- DB\_NAME parameter, 6-11
- DB\_WRITER\_PROCESSES parameter, B-4
- DBLINK\_ENCRYPT\_LOGIN parameter, 7-9
- DBVERIFY
  - operating system compatibility, 2-3
  - starting, 2-7
- DEFAULT\_HOME parameter, C-7
- deleting
  - password file, 7-8
- developing applications
  - for Windows 98, 10-2
- differences
  - between Windows 98, NT and UNIX, 1-2
- direct writes to disk
  - on Windows 98, NT and UNIX, 1-4
- directory names, convention used, xxv
- directory structures
  - OFA-compliant directory tree, 3-18
  - Oracle8i Personal Edition, A-2
- DISK\_ASYNC\_IO parameter, 4-26
- DLLs
  - differences on Windows 98, NT and UNIX, 1-5
  - external routines, 10-7
- documentation conventions, used in this guide, xxv

## E

---

- encrypting, database passwords, 7-9
- environment variables
  - ORACLE\_HOME, 3-11
  - TNS\_ADMIN, 3-13
- error messages
  - Intercartridge Exchange, 10-14
  - logging, E-2
  - ORA-01102, 6-2
  - ORA-12547, E-19
  - OSD-04000 to OSD-04099, E-5
  - OSD-04100 to OSD-04199, E-10
  - OSD-04200 to OSD-04299, E-12
  - OSD-04300 to OSD-04399, E-16

- OSD-04400 to OSD-04499, E-16
  - OSD-04500 to OSD-04599, E-17
- exception conditions, Intercartridge Exchange, 10-13
- EXECUTE privileges, on a PL/SQL library, 10-8
- existing databases, installation types, 4-2
- Export Utility
  - databases, 6-8
  - interactive mode, 6-8
  - operating system compatibility, 2-3
  - parameter mode, 6-8
  - redirecting output, E-2
  - starting, 2-8
- extents
  - maximum number per database, B-6
- EXTERNAL clause, 10-8
- external routines
  - building a DLL, 10-7
  - creating a PL/SQL library, 10-8
  - EXTERNAL clause, 10-8
  - granting EXECUTE privileges, 10-8
  - registering with Oracle database, 10-7
  - using EXTPROC, 10-6
  - writing, 10-6
- EXTPROC
  - responsibilities, 10-6

## F

---

- file names
  - convention used, xxv
- file sizes
  - maximum possible, B-5
  - on Windows 98, NT and UNIX, 1-3
- files
  - alert, 8-2
  - database file names, 3-16
  - LISTENER.ORA, 10-5
  - maximum number per database, B-5
  - maximum size possible, B-5
  - ORACLE.KEY, 3-11
  - sample INIT.ORA, B-3
  - trace, 8-2

## G

---

### generic documentation references

- calculating index size, B-5
- CREATE DATABASE, 6-13
- custom database archiving mode, 7-10
- earliest releases that can be migrated, 4-5
- install test databases in a separate Oracle home, 3-3
- location of initialization parameter file, B-2
- LOG parameter use, E-2
- maximum number of data files, 6-12
- multi-versioning, 4-10
- name and location of convert file, 4-27
- PL/SQL sample programs, location of, A-5
- running CATPROC.SQL, 6-17
- starter database archiving mode, 7-10
- Windows 98/NT-specific error messages, E-2
- Windows 98-specific archiving procedures, 7-12
- Windows 98-specific control file
  - specifications, 6-10
- Windows 98-specific database creation
  - procedures, 6-3
- Windows 98-specific database migration
  - instructions, 4-12
- Windows 98-specific initialization parameter file, B-2
- Windows 98-specific instance startup file
  - names, 7-2
- Windows 98-specific location of SQL scripts, A-5
- Windows 98-specific migration instructions, 5-1
- Windows 98-specific parameter file name and location, B-2
- Windows 98-specific password file name and location, 7-5
- Windows 98-specific trace file names, 8-2
- Windows 98-specific upgrading instructions, 5-1

## H

---

- HI\_SHARED\_MEMORY\_ADDRESS parameter, B-4
- HOME\_COUNTER parameter, C-7

- HOMEID, defined, xxvii
- host string, 5-3

## I

---

ICX. *See* Intercartridge Exchange

### Import Utility

- databases, 6-18
  - interactive mode, 6-18
  - operating system compatibility, 2-3
  - parameter mode, 6-18
  - starting, 2-8
- index size, calculating, B-5
- initialization parameter file
  - defined, B-2
  - editing, B-2
  - location, B-2
  - modifying, 6-10
  - using PFILE option for database startup, 7-2
  - using the default file for database startup, 7-2
- initialization parameters
  - COMPATIBLE\_NO\_RECOVERY, B-4
  - CORE\_DUMP\_DEST, B-4
  - CPU\_COUNT, B-4
  - DB\_WRITER\_PROCESSES, B-4
  - HI\_SHARED\_MEMORY\_ADDRESS, B-4
  - LARGE\_POOL\_SIZE, B-4
  - LOG\_BUFFER, B-4
  - on Windows 98, NT and UNIX, 1-4
  - ORACLE\_TRACE\_COLLECTION\_PATH, B-4
  - ORACLE\_TRACE\_FACILITY\_NAME, B-4
  - ORACLE\_TRACE\_FACILITY\_PATH, B-4
  - SHARED\_MEMORY\_ADDRESS, B-4
- INITSID.ORA file
  - CONTROL\_FILES parameter, 4-26
- INST\_LOC parameter, C-6
- install accounts
  - on Windows 98, NT and UNIX, 1-4
- installation
  - differences on Windows 98, NT and UNIX, 1-5
- INSTANCE\_NAME parameter, 6-11
- instances
  - running multiple instances, 7-4
- interactive mode
  - Export Utility, 6-8

- Import Utility, 6-18
- Inter cartridge Exchange
  - accessing Web data, 10-10
  - configuring, 10-10
  - error messages, 10-14
  - exception conditions, 10-13
  - packaged functions, 10-11
  - stored packages, 10-11
  - troubleshooting, 10-16
  - using, 10-11
- INTERNAL
  - changing the INTERNAL password, 7-9
  - connecting as, 7-8
  - password, 7-8
- italic letters, defined, xxv

## L

---

- LARGE\_POOL\_SIZE parameter, B-4
- LAST\_HOME parameter, C-7
- listener
  - 1521 port, D-5
  - 1526 port, D-5
- LOCAL parameter, D-4
- LOG parameter
  - use of, E-2
- LOG\_ARCHIVE\_DEST\_n parameter, 7-12
- LOG\_ARCHIVE\_FORMAT parameter, 7-12
- LOG\_ARCHIVE\_START parameter, 7-12
- LOG\_BUFFER parameter, B-4
- logging error messages, E-2

## M

---

- memory resources
  - on Windows 98, NT and UNIX, 1-4
- migrating
  - creating PO8 user account, 5-2
  - DISK\_ASYNC\_IO parameter for Windows 98, 4-26
  - Windows 98, editing INITSID.ORA file, 4-26
- migration
  - instructions, 4-16
  - multiple Oracle homes, 4-4
  - Optimal Flexible Architecture, 4-43

- overview, 4-4
- SQL\*Net, 4-15, 4-43
- U0703040.SQL script, 4-29
- using appropriate tool versions, 4-18
- Migration Utility
  - operating system compatibility, 2-3
  - starting, 2-8
  - using, 4-16
- MIGSID.ORA file, 4-24, 4-28
- monitoring
  - alert files, 8-2
  - databases, 8-1
  - trace files, 8-2
- MSHELP\_TOOLS parameter, C-5
- multiple instances, running, 7-4
- multiple Oracle home products, 3-7
- multiple Oracle homes
  - ALL\_HOMES registry subkey, C-6
  - before Release 8.0.4, 3-3
  - benefits, 3-3
  - classification of products, 3-6
  - defined, xxvi
  - environment, 3-5
  - for Release 8.0.4, 3-3
  - for Releases 8.1.5 and 8.1.6, 3-3
  - functionality in different releases, 3-3
  - introduction, 3-2
  - migration, 4-4
  - on Windows 98, NT and UNIX, 1-6
  - overview, 3-2
  - program groups, 3-5, 3-6
  - registry entries, 3-5, 3-6
  - system identifier, 3-5, 3-6
  - upgrading, 4-4
  - use of one listener for spawning, 3-4
- multi-versioning, 4-10

## N

---

- NAME parameter, C-7
- Navigator
  - PO8 user account, 5-2
- Net8
  - configuring for external routines, 10-5
  - unsupported features, D-2

- Net8 Assistant
  - operating system compatibility, 2-3
  - starting, 2-7
- Net8 Configuration Assistant
  - operating system compatibility, 2-3
  - starting, 2-7
- Net8 Easy Config, using, 5-3
- NET8 parameter, D-2
- NLS\_LANG environment variable, 4-18
- NLS\_LANG parameter, C-5
- NOARCHIVELOG mode, 7-11
- non-multiple Oracle home products, 3-7
- non-Oracle home products, 3-7

## O

---

### OCOPY

- backup file types, 9-3
- capabilities, 9-2
- copy modes, 9-3
- operating system compatibility, 2-3
- recovery file types, 9-5
- starting, 2-8
- syntax for backing up files, 9-4
- syntax for recovering files, 9-5

OO4O parameter, C-6

Optimal Flexible Architecture

- benefits, 3-14
- characteristics of a database, 3-15
- default OFA database, 3-22
- differences since previous releases, 3-16
- introduction, 3-2
- moving database files, 4-43
- non-default OFA database 1, 3-23
- non-default OFA database 2, 3-24
- OFA-compliant directory tree, 3-18
- overview, 3-13

ORA\_CWD parameter, C-5

ORA\_ENCRYPT\_LOGIN parameter, 7-9

ORA\_SID\_PFILE parameter, C-5

ORA-12547 error, E-19

Oracle Data Migration Assistant

- starting, 2-7
- using, 4-15, 4-32

Oracle Database Configuration Assistant

- deleting databases, 6-6
- starting, 2-7

Oracle home

- new-style, defined, 3-13
- old-style, defined, 3-7

Oracle Home Selector

- changing PATH value, 3-9

Oracle Objects for OLE

- single Oracle home product, 3-7

Oracle Open Database Connectivity Driver

- single Oracle home product, 3-7

Oracle Services

- shutting down a database by stopping a service, 7-3

Oracle SQLJ Translator

- directory structure, A-6

ORACLE.KEY file, 3-11

ORACLE\_BASE

- changing the value, 3-19
- explained, xxvi, 3-16, 3-19

ORACLE\_BASE parameter, C-5

ORACLE\_GROUP\_NAME parameter, C-5

ORACLE\_HOME

- directory structure, A-2
- explained, xxvi

ORACLE\_HOME directory

- explained, 3-20
- specifying, 3-22

ORACLE\_HOME environment variable

- consequences of setting, 3-12
- how it is set, 3-11

ORACLE\_HOME parameter, C-5

ORACLE\_HOME\_KEY parameter, C-5

ORACLE\_HOME\_NAME parameter, C-5

ORACLE\_SID parameter, 6-19, 7-4, C-6

ORACLE\_TRACE\_COLLECTION\_PATH

- parameter, B-4

ORACLE\_TRACE\_FACILITY\_NAME

- parameter, B-4

ORACLE\_TRACE\_FACILITY\_PATH

- parameter, B-4

Oracle7 database, migrating, 4-12

Oracle8i database

- connecting to, 7-2, 7-10
- password encryption, 7-9



- selecting a backup and recovery tool, 9-2
- shutting down, 7-2, 7-3
- specifications, B-5
- starting, 7-2
- using User Manager, 2-13
- Oracle8i database backup and recovery tools
  - OCOPY, 9-2
  - Recovery Manager (RMAN.EXE), 9-2
  - third-party vendors, 9-2
- Oracle8i Navigator
  - changing passwords, 5-2
  - PO8 user account, 5-2
- Oracle8i Personal Edition
  - directory structure, A-2
- ORADATA directory, explained, 3-21
- ORADEBUG
  - debugging utility, 7-13
  - starting, 7-13
- ORADIM
  - changing the INTERNAL password, 7-9
- ORAPWD
  - creating password files, 7-5
  - operating system compatibility, 2-3
  - starting, 2-9
- OSD-04000 to OSD-04099 error codes, E-5
- OSD-04100 to OSD-04199 error codes, E-10, E-12
- OSD-04300 to OSD-04399 error codes, E-16
- OSD-04400 to OSD-04499 error codes, E-16
- OSD-04500 to OSD-04599 error codes, E-17

## P

---

- packaged functions
  - Intercartridge Exchange, 10-11
  - UTL\_HTTP.REQUEST, 10-12
  - UTL\_HTTP.REQUEST\_PIECES, 10-12
- parameter mode
  - Export Utility, 6-8
  - Import Utility, 6-18
- parameters
  - DISK\_ASYNC\_IO for Windows 98, 4-26
- PARFILE, using, E-2
- password
  - changing user account passwords, 5-2
- password file

- authenticating database administrators, 7-5
- connecting as INTERNAL, 7-8
- creating, 7-5
- deleting, 7-8
- hiding, 7-5
- viewing, 7-7
- passwords
  - changing for SYS user name, 7-9
  - changing for SYSTEM user name, 7-9
  - changing the INTERNAL password, 7-9
  - encryption, 7-9
  - for databases, 6-18
  - for INTERNAL user name, 7-8
- PATH parameter, C-7
- PATH, changing the value of, 3-8
- performance utilities
  - on Windows 98, NT and UNIX, 1-7
- PFILE option, 7-2
- PL/SQL
  - sample programs, location of, A-5
- PO8 user, 4-44, 5-2
- PRAGMA RESTRICT\_REFERENCES, with Intercartridge Exchange, 10-13
- Pre-SPAWNEDED dedicated server processes
  - Net8 unsupported feature, D-2
- processes
  - on Windows 98, NT and UNIX, 1-3
- products
  - multiple Oracle home products, 3-7
  - non-multiple Oracle home products, 3-7
  - single Oracle home products, 3-7
  - supporting multiple Oracle homes, 3-7
- program groups
  - multiple Oracle homes, 3-5, 3-6
- PWDSID.ORA file, 7-5

## R

---

- raw partition
  - on Windows 98, NT and UNIX, 1-9
- RDBMS\_ARCHIVE parameter, C-6
- RDBMS\_CONTROL parameter, C-6
- recovering, an Oracle8i database, 9-2
- recovery file types, OCOPY, 9-5
- Recovery Manager

- capabilities, 9-2
- operating system compatibility, 2-3
- overview, 9-2
- starting, 2-9
- redo log files
  - archiving, 7-10
- REGEDIT command, 6-19
- registering, an external routine, 10-7
- registry
  - adding parameters, C-9
  - ALL\_HOMES subkey, C-6
  - configuration parameters, C-1
  - DEFAULT\_HOME, C-7
  - HOME\_COUNTER, C-7
  - INST\_LOC, C-6
  - keys, C-2
  - LAST\_HOME, C-7
  - modifying values, C-8
  - MSHELP\_TOOLS, C-5
  - NAME, C-7
  - NET8 parameter, D-2
  - NLS\_LANG, C-5
  - OO4O, C-6
  - ORA\_CWD, C-5
  - ORA\_SID\_PFILE, C-5
  - ORACLE\_BASE, C-5
  - ORACLE\_GROUP\_NAME, C-5
  - ORACLE\_HOME, C-5
  - ORACLE\_HOME\_KEY, C-5
  - ORACLE\_HOME\_NAME, C-5
  - ORACLE\_SID, C-6
  - parameter values, C-2
  - PATH, C-7
  - RDBMS\_ARCHIVE, C-6
  - RDBMS\_CONTROL, C-6
  - REGEDIT, C-8
  - starting, 2-10
  - update ORACLE\_SID, 6-19
- Registry Editor, C-2
- registry entries
  - multiple Oracle homes, 3-5, 3-6
- remote database, creating alias to, 5-3
- REMOTE\_LOGIN\_PASSWORDFILE parameter, 7-5
- resources, xi

## S

---

- scripts
  - location of, A-5
- Server Manager
  - running multiple instances, 7-4
  - shutting down the database, 7-2
  - starting, 7-2
  - starting the database, 7-2
  - using appropriate version, 4-18
  - using ORADEBUG, 7-13
- service
  - how to start and stop, D-5
  - listed, D-5
- service name, creating, 5-3
- SERVICE\_NAME parameter, 6-11
- services
  - on Windows 98, NT and daemons on UNIX, 1-2
  - shutting down a database by stopping a
    - service, 7-3
  - starting, 6-12
- SET ORACLE\_SID=SID, 7-4
- shadow process memory, B-6
- SHARED\_MEMORY\_ADDRESS parameter, B-4
- SHUTDOWN command
  - options, 7-2
  - using, 7-2
- shutting down
  - databases, 7-2, 7-3
- single Oracle home products, 3-7
- SPAWN
  - Net8 unsupported feature, D-2
- specifying an archiving file format, 7-12
- SQL scripts
  - location of, A-5
- SQL\*DBA, using appropriate version, 4-18
- SQL\*Loader
  - control file conventions, 2-11
  - direct path option, 2-11
  - operating system compatibility, 2-3
  - starting, 2-9
  - using, 2-10
- SQL\*Net
  - appropriate versions, 4-15, 4-43
- SQL\*Plus

- operating system compatibility, 2-3
- starting, 2-9
- square brackets, defined, xxv
- starter database
  - archiving mode, 7-10
- starting
  - databases, 7-2
  - Server Manager, 7-2
- STARTUP command, 7-2
- stored packages, Interchange Exchange, 10-11
- SVRMGR versions, 4-18
- symbols, list of, xxvii
- syntax
  - for backing up files with OCOPY, 9-4
  - for recovering files with OCOPY, 9-5
- SYS user name
  - changing the password, 7-9
- system identifier
  - multiple Oracle homes, 3-5, 3-6
- SYSTEM user name
  - changing the password, 7-9

## T

---

- third party applications, 4-8
- third-party backup and recovery vendors, 9-2
- threads
  - on Windows 98, NT and UNIX, 1-3
- TKPROF
  - operating system compatibility, 2-3
  - starting, 2-9
- TNS\_ADMIN parameter, D-4
  - setting in the environment, 3-13
- TNSNAMES.ORA file, 10-5
- top-level directory, explained, 3-16
- trace files, 8-2
  - creating with ORADEBUG, 7-13
  - for monitoring a database, 8-2
  - using, 8-2
  - using BACKGROUND\_DUMP\_DEST parameter, 8-2
  - using USER\_DUMP\_DEST, 8-2
- TRCROUTE
  - Net8 unsupported feature, D-2
- troubleshooting

- Interchange Exchange, 10-16
- ORA-12547 error, E-19
- ORA-28575 error, E-19
- TNS-12203 error, E-19
- with ORADEBUG, 7-13

## U

---

- U0703040.SQL script, 4-29
- U0800040.SQL script, 4-39
- UNIX
  - differences between UNIX and Windows 98, NT, 1-2
- unsupported features
  - Net8, D-2
- upgrading
  - multiple Oracle homes, 4-4
  - Optimal Flexible Architecture, 4-43
  - overview, 4-4
  - tools, 4-31
  - U0800040.SQL script, 4-39
- USE\_SHARED\_SOCKET parameter, D-4
- User Manager
  - defined, 2-13
  - integration with Oracle8i database, 2-13
- user names
  - changing passwords, 5-2
  - creating PO8, 5-2
- USER\_DUMP\_DEST parameter, 6-12, 8-2
- UTL\_HTTP.REQUEST, Interchange Exchange, 10-12
- UTL\_HTTP.REQUEST\_PIECES, Interchange Exchange, 10-12
- UTLXPLAN.SQL script
  - location of, A-5

## V

---

- variables, convention used, xxv
- viewing
  - password file, 7-7

## W

---

- Web data, Interchange Exchange, 10-10

Windows 98

directory structure for database, A-2

tools, 2-3

Windows 98 tools

operating system compatibility, 2-3

## **X**

---

XAVIEW.SQL script

location of, A-5