

Oracle8i Parallel Server

Administrator's Guide

Release 2 (8.1.6) for Windows NT

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Oracle8i Parallel Server Administrator's Guide

Part No. A73025-01

Release 2 (8.1.6) for Windows NT

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Contents

Contact Us!	vii
How to Contact Oracle Technical Publications	vii
How to Contact Oracle Support Services	viii
Resources for Oracle Partners and Developers	xiii
Before You Begin	xvii
Intended Audience	xviii
Prerequisites	xviii
Structure	xviii
Related Documents	xix
Documentation and Code Conventions	xix
1 New Features in This Release	
New Features In This Release	1-2
Where to Find Information on Oracle Parallel Server for Windows NT	1-3
2 Migrating or Upgrading to Release 8.1	
New Features in Release 8.1	2-2
Rolling Upgrades	2-2
Migrating from Oracle7	2-3
Prepare the Oracle7 Source Database for Migration	2-3
Prepare the Cluster for Installation	2-8
Install the Release 8.1 Oracle8i Enterprise Edition	2-10
Perform Post-Installation Steps	2-13
Migrate the Oracle7 Source Database	2-15

Run the Migration Utility	2-18
Check the Migration Results	2-20
Preserve the Oracle7 Source Database	2-20
Perform Post-Oracle7 Migration Steps	2-21
Perform Migration Steps in the Oracle8i Environment	2-22
Perform Post-Migration Tasks	2-30
Upgrading the Previous Version 8 Database to the New Oracle8i Release	2-31
Prepare to Upgrade	2-31
Perform Post-Oracle8i Upgrade Steps	2-44
Perform Post-Upgrade Tasks	2-45
Multiple Oracle Homes	2-46

3 Creating Raw Devices

Raw Devices Overview	3-2
Raw Devices	3-2
Primary Partitions	3-2
Extended Partitions	3-3
Disk Definition	3-4
Physical Disk	3-5
Logical Partition	3-6
Physical Disk and Logical Partition Considerations	3-7
Creating Raw Devices for Automatic or Manual Database Creation	3-9
Creating Raw Devices for the Oracle Database Configuration Assistant	3-9
Step 1: Install Oracle Parallel Server Raw Devices Management Utilities	3-10
Step 2: Create an Extended Partition	3-11
Step 4: Assign Symbolic Link Names	3-15
Creating Raw Devices for Manual Database Creation	3-19
Step 1: Install Oracle Parallel Server Raw Devices Management Utilities	3-19
Step 2: Create an Extended Partition	3-19
Step 4: Assign Symbolic Link Names	3-24
Creating Raw Devices for Manual Database Creation with a Current Configuration	3-29
Backup Raw Partitions	3-29
Step 1: Install Oracle Parallel Server Raw Devices Management Utilities	3-30
Step 2: Create an Extended Partition	3-31
Step 4: Assign Symbolic Link Names	3-31

4 Managing Raw Devices

Raw Devices Management Utilities	4-2
Reformat an Entire Disk	4-2
Remove All Drive Letters	4-3
Initialize All Space on a Logical Partition	4-3
Create Logical Drives	4-4
Review Disk Layout	4-6
Troubleshooting	4-7

A Directory Structure

Understanding the 8.1.6 Database Directory Trees	A-2
Windows NT Directory Structure	A-2

Index

Contact Us!

Oracle8i Parallel Server Administrator's Guide, Release 2 (8.1.6) for Windows NT

Part No. A73025-01

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 vii	Have issues with Documentation
"How to Contact Oracle Support Services" on page viii	Have issues with Software
"Resources for Oracle Partners and Developers" on page xiii	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 to ntdoc@us.oracle.com.

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: http://www.oracle.com/support/contact_us/sup_hot_phone.html 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.

- The hardware name on which your application is running.

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

- To verify the operating system version on Windows NT, enter the following at the MS-DOS command prompt:

```
C:\> WINMSD
```

The *Windows NT Diagnostics* dialog box displays the operating system and Service Pack version.

- ❑ The release numbers of the Oracle Server and associated products involved in the current problem. For example, Oracle8 Enterprise Edition release 8.1.5.0.0 and Oracle Enterprise Manager release 2.0.0.0.0.

- 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 Enterprise Edition Release 8.1.6.0.0 - Production  
With the Partitioning and Java options  
PL/SQL Release 8.1.6.0.0 - Production
```

- ❑ The third-party software version you are using.

- To verify an application version, from the application's Help menu, select About...

- ❑ 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.

- ❑ A description of the issue, including:

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

- **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?

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

- **What is the extent of the problem?** For example, production system unavailable, or moderate impact but increasing with time, or minimal impact and stable.
- Did the problem affect one user, several users, or all users?
- 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?

- **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? Additionally:
 - Does installing a software component fail on all client machines, or just one?
 - Do all clients fail to connect to the server, or just one?
 - 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?

- ❑ 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.
- Check the operating system error logs, especially the System log and Application log. These files are relevant to the Oracle Server. To view these files, from the Start menu, choose Programs > Administrative Tools > Event Viewer, and choose System or Application from the Log main menu.

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 http://www.oracle.com	This Web site is the starting point for general information on Oracle Corporation.
Alliance Online http://alliance.oracle.com	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. 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.
Oracle Education http://education.oracle.com/	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.
Oracle Technology Network http://technet.oracle.com/	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.
Oracle Store http://oraclestore.oracle.com/	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.

Information Source	Description
<p>Oracle Support Services' Support Web Center http://www.oracle.com/support/</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>OracleMetaLink http://www.oracle.com/support/elec_sup/index.html</p>	<p><i>OracleMetaLink</i> is Oracle Support Services' premier Web support service. It is available to Oracle<i>metals</i> customers (Gold, Silver, Bronze), 24 hours a day, seven days a week.</p>
<p>OracleLifecycle http://www.oracle.com/support/sup_serv/lifecycle/index.html</p>	<p><i>OracleLifecycle</i> 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>
<p>ExpertONLINE http://www.oracle.com/support/sup_serv/online/index.html</p>	<p>Oracle Support Services has launched a new line of services called Expert<i>ONLINE</i>. These services provide online database administration for companies looking to supplement their existing DBA staff or fill a DBA role. Services range from Expert<i>DETECT</i>, a monitoring, diagnostic, and recommendation service, to Expert<i>DBA</i>, a full online database administration service.</p>
<p>Virtual Support Analyst (VSA) http://www.oracle.com/support/sup_serv/vsa_start.html</p>	<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>
<p>Customer Service http://www.oracle.com/support/cus_serv/index.html</p>	<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"> ■ Learn what is a CPU Support Identification (CSI) number ■ Update your technical contact information ■ Find out whom to contact for invoice and collection issues ■ Request product update shipments ■ Access a glossary of Oracle Support Services terms

Information Source	Description
U.S. Customer Visit Program http://www.oracle.com/support/cus_serv/cus_visit.html	This U.S.-based program has been established to help our customers understand and obtain maximum benefit from the support services they have purchased. 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.
Support Web Center Library http://www.oracle.com/support/library/index.html	This site contains articles, guides, and other documentation to help you leverage the wealth of knowledge and reference material that Oracle Support Services produces.

Before You Begin

This guide provides operating system-specific information on using Oracle Parallel Server for Windows NT. Other Oracle Parallel Server implementation, installation and configuration issues are covered in your Oracle Parallel Server documentation set.

Topics discussed are:

- Intended Audience
- Prerequisites
- Structure

Intended Audience

This guide is for network administrators and database administrators who install, configure, and use Oracle Parallel Server on Windows NT clusters.

Prerequisites

This guide assumes that you are familiar with:

- Windows NT and have installed and tested it for the cluster and network hardware
- Object-relational database management concepts

Structure

This guide contains the following chapters and appendices.

Chapter 1 New Features in This Release

Describes the new features in this release, and where to find information on Oracle Parallel Server for Windows NT.

Chapter 2 Migrating or Upgrading to Release 8.1

Describes the steps to migrate or upgrade to release 8.1.

Chapter 3 Creating Raw Devices

Describes setting up raw devices for Oracle Parallel Server data files, control files and redo log files for various configurations.

Chapter 4 Managing Raw Devices

Describes additional utilities in this release to manage raw devices.

Appendix A Directory Structure

Describes the directory structures for Oracle Parallel Server.

Related Documents

For more information on Oracle8i on Windows NT, see the following user guides:

- *Oracle8i Installation Guide for Windows NT*
- *Oracle8i Administrator's Guide for Windows NT*
- *Getting to Know Oracle8i*
- *Oracle8i Concepts*
- *Oracle8i Reference*
- *Net8 Administrator's Guide*

Documentation and Code Conventions

The following conventions are used in this guide:

Convention	Example	Meaning
All uppercase plain	ORANT\NETWORK	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	Italic is used to indicate a variable: <i>filename</i> Italic is used for emphasis: The WHERE clause may be used to <i>join</i> rows in different tables.	Indicates a value that you must provide. For example, if a command asks you to type <i>filename</i> , you must type the actual name of the file. Italic is also used for emphasis in the text and to indicate the titles of other guides.
Square brackets []	X:\[PATHNAME]\ORACLE\ <i>HOME_NAME</i>	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 > <i>HOME_NAME</i> > Network Administration > Net8 Easy Config	How to start a program. For example, to start Net8 Easy Config, you must click the Start button on the taskbar and then choose Programs, Oracle, <i>HOME_NAME</i> Oracle Universal Installer.

Convention	Example	Meaning
C:\>	C:\ORACLE\ORA81>	Represents the Windows NT command prompt of the current hard disk drive. Your prompt reflects the subdirectory in which you are working. Referred to as the <i>MS-DOS command prompt</i> in this guide.
Backslash (\) before a directory name	\OPS	Indicates that the directory is a subdirectory of the root directory.
<i>ORACLE_HOME</i> and <i>ORACLE_BASE</i>	Go to the <i>ORACLE_BASE\ORACLE_HOME\BIN</i> directory	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 C:\ORACLE.
<i>HOME_NAME</i>	Oracle <i>HOME_NAME</i> TNSListener80	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.

New Features in This Release

This chapter describes the new features in this release, and where to find information on Oracle Parallel Server for Windows NT.

Specific topics discussed are:

- New Features In This Release
- Where to Find Information on Oracle Parallel Server for Windows NT

New Features In This Release

This table describe the new products and features of Oracle Parallel Server release 8.1.6 specific to Windows NT.

New Feature	Description	See...
Oracle Parallel Server is now automatically installed with the Typical or Custom install type on Windows NT.	During installation, software components are installed on the node from which the Oracle Universal Installer is run and pushed to the selected nodes in the cluster.	<ol style="list-style-type: none"> 1. <i>Oracle8i Parallel Server Setup and Configuration Guide</i>, Chapter 2, "Pre-Installation". 2. <i>Oracle8i Installation Guide for Windows NT</i>
Create logical partitions and symbolic links utility	Oracle Object Link Manager (GUIORACLEOBJMANAGER.EXE) includes ORACLEOBJSERVICE, a Windows NT service that monitors symbolic link changes and updates all nodes.	This guide, Chapter 3, "Creating Raw Devices".
Manage raw devices (from the MS-DOS command prompt)	<ul style="list-style-type: none"> ■ DELETEDISK.EXE reformats an entire disk ■ LETTERDELETE.EXE removes all drive letters ■ LOGPARTFORMAT.EXE initializes all space in a logical partition to zero ■ IMPORTSYMLINKS.EXE reads a .TBL file and marks the hard disk partitions with the symbolic link names ■ EXPORTSYMLINKS.EXE exports the current symbolic links to a file 	This guide, Chapter 3, "Creating Raw Devices", and Chapter 4, "Managing Raw Devices".
Add and remove logical drives utility	The create logical drives (CRLOGDR) utility adds and removes logical drives and their associated symbolic drives from the end of the extended partition.	This guide, Chapter 4, "Managing Raw Devices".

Where to Find Information on Oracle Parallel Server for Windows NT

The following table describes where to find the information necessary to set up and configure Oracle Parallel Server on Windows NT.

To find information on...	See...
Oracle Parallel Server documentation	Oracle8i Parallel Server Documentation Online Roadmap.
<ul style="list-style-type: none"> ■ Installing and configuring Cluster Manager (CM) software ■ Operating System Dependent (OSD) layer, required DLLs and their registry entries* 	Your hardware vendor documentation.
<ul style="list-style-type: none"> ■ Setting up raw devices on various configurations ■ Backing up raw devices 	This guide, Chapter 3, "Creating Raw Devices".
Managing raw devices (exporting current symbolic links, removing drive letters, etc.)	This guide, Chapter 4, "Managing Raw Devices".
Other pre-installation tasks	<i>Oracle8i Parallel Server Setup and Configuration Guide</i>
Installing Oracle8i Enterprise Edition and the Oracle Parallel Server Option on Windows NT	<ol style="list-style-type: none"> 1. <i>Oracle8i Parallel Server Setup and Configuration Guide</i>, Chapter 3, "Installing and Creating an Oracle Parallel Server Database". 2. <i>Oracle8i Installation Guide for Windows NT</i>
Migrating or Upgrading to Release 8.1	<ol style="list-style-type: none"> 1. This guide, Chapter 2, "Migrating or Upgrading to Release 8.1" 2. <i>Oracle8i Parallel Server Setup and Configuration Guide</i>, Chapter 3, "Installing and Creating an Oracle Parallel Server Database". 3. <i>Oracle8i Migration</i>
Co-existence of different Oracle Parallel Server versions in the same cluster	This guide, Chapter 2, "Migrating or Upgrading to Release 8.1".
Configuration tasks common to all operating systems	<i>Oracle8i Parallel Server Setup and Configuration Guide</i>
Implementing parallel processing	<i>Oracle8i Parallel Server Administration, Deployment, and Performance Guide</i>

*The OSD layer on Windows NT consists of three required software components, CM, Inter-Process Communication (IPC) and IO, and an optional component, START, developed by your vendor.

Migrating or Upgrading to Release 8.1

This chapter describes how to migrate from Oracle7 or upgrade an Oracle8 database to the present Oracle8*i* release on Windows NT.

Specific topics discussed are:

- New Features in Release 8.1
- Rolling Upgrades
- Migrating from Oracle7
- Upgrading the Previous Version 8 Database to the New Oracle8*i* Release
- Multiple Oracle Homes

For more information on... See...

Installing the Oracle Parallel Server on Windows NT	<ul style="list-style-type: none"> ■ <i>Oracle8<i>i</i> Installation Guide for Windows NT</i> ■ <i>Oracle8<i>i</i> Parallel Server Setup and Configuration Guide</i>
Migrating and upgrading	<p><i>Oracle8<i>i</i> Migration guide:</i></p> <ul style="list-style-type: none"> ■ Chapter 4, "Migrating from Oracle7 Using the Migration Utility". ■ Chapter 7, "Upgrading from a Previous Version 8 Release to the New Oracle8<i>i</i> Release". ■ Chapter 8, "After Migrating or Upgrading the Database".
Configuration issues	<i>Oracle8<i>i</i> Parallel Server Setup and Configuration Guide</i>

New Features in Release 8.1

The new features in Oracle Parallel Server for Windows NT release 8.1 are described in the table below. These features are described in detail in your Oracle8i documentation set.

New Feature	Description
Optimal Flexible Architecture (OFA)	Provides a structured method for installing the Oracle8i database and applications in a manner which helps promote ease of maintenance, improved performance, and reliability.
Oracle Universal Installer	The new installer is based on a Java engine that provides an extensible environment able to handle advanced software installation requirements. Oracle Universal Installer provides users with a consistent interface across all platforms on which Oracle is available. Note: Versions of the Installer previous to release 8.1 are referred to as "Oracle Installer".
Easy configuration	Configuration was a manual process in Oracle8. While this manual process is still available for this release, Oracle Database Configuration Assistant can be run to create an Oracle Parallel Server database. The Oracle Database Configuration Assistant can be run automatically after installation or at a later time in stand-alone mode.
OSD Performance and Management (P&M) component implemented in Oracle Parallel Server Manager Option	The P&M component was a vendor-supplied component installed with the OSD layer. This component interacted with the Oracle Enterprise Manager tools. Because P&M must be implemented in a precise manner, this component is now installed with Oracle Parallel Server rather than as an OSD module.
Initialization parameter file name changes	The initialization parameter file that contains common parameters shared from node-to-node was called INIT_COM.ORA in prior releases. This file name has been replaced by INITDB_NAME.ORA. Each instance still has its own initialization file, typically named INIT.ORA.

Rolling Upgrades

Rolling upgrades—where different databases, or different instances of the same database in Oracle Parallel Server, are upgraded to a new version of Oracle one at a time—are not supported. All software upgrades must be upgraded at the same time on all nodes of the cluster, to maintain version consistency.

Migrating from Oracle7

If the Oracle Universal Installer detects an earlier version of an Oracle database on your hard drive, you will be prompted to migrate or upgrade the database to release 8.1. Do not click the Upgrade or Migrate... check box, as the Oracle Data Migration Assistant does not support Oracle Parallel Server. Instead, use the Migration utility to migrate after installation.

Migrating on Windows NT involves disabling the OracleCMService and starting and shutting down the Operating System Dependent (OSD) layer at a specific point during migration.

See: *Oracle8i Migration* guide, Chapter 4, "Migrating from Oracle7 Using the Migration Utility" page 4-9, for considerations on using the Migration Utility and system requirements.

Prepare the Oracle7 Source Database for Migration

Complete the following steps before you migrate your Oracle7 database to Oracle8i:

1. Start with an Oracle7 database supported by the Migration Utility. If your database release number is lower than the release supported by the Migration utility on Windows NT, then upgrade or migrate the database to a supported release.

See: *Oracle8i Installation Guide for Windows NT* for the Oracle7 database releases supported by the Migration Utility.

2. If the Procedural Option is not installed, then use your Oracle7 installation media to install it. To determine if it is installed, start Server Manager or SQL*DBA, depending on the version of Oracle7 you are migrating from.

See: *Oracle8i Installation Guide for Windows NT* for the Oracle7 database releases supported by Server Manager or SQL*DBA.

The following is an example of the messages you will see when Server Manager starts:

```
Oracle Server Manager Release 2.3.3.0.0 - Production
```

```
Copyright (c) Oracle Corporation 1994, 1995. All rights reserved.
```

```
Oracle7 Server Release 7.3.4.0.0 - Production
```

```
With the distributed, replication, parallel query, Parallel Server  
and Spatial Data options
```

```
PL/SQL Release 2.3.4.0.0 - Production
```

If you see "PL/SQL" in the messages, as in the last line in the preceding example, then the Procedural Option is installed. Otherwise, it is not installed.

The messages you see may be slightly different, based on the options you have installed and their release numbers.

3. Make sure all data files and tablespaces are either online or offline normal.

To determine whether any data files require recovery, issue the following SQL statement:

```
SELECT * FROM V$RECOVER_FILE;
```

You should see a "0 rows selected" message, which indicates that all data files are either online or offline normal. If any data files are listed, then you must restore the data files before you migrate the database. You can use the V\$DATAFILE dynamic performance view to find the data file name based on the data file number. The Oracle8i Migration utility will not proceed, and will display an error, if any data files require media recovery.

Tablespaces that are not taken offline cleanly must be dropped or brought online before migration. Otherwise, these tablespaces will not be available under Oracle8i after the migration. Typically, tablespaces that are taken offline by using an ALTER TABLESPACE OFFLINE IMMEDIATE or ALTER TABLESPACE OFFLINE TEMPORARY statement require media recovery.

After migration, tablespaces that are offline when you open the Oracle8i database remain in Oracle7 database file format. The offline tablespaces can be brought online at any time after migration, and the file headers are converted to Oracle8i format at that time. In addition, if you want to avoid large restores in the event of a failure, then you can make all tablespaces except SYSTEM and ROLLBACK offline normal; then, you can restore only the data files for SYSTEM and ROLLBACK if you need to run another migration.

4. Make sure no user or role has the name OUTLN, because this schema is created automatically when you install Oracle8i. If you have a user or role named OUTLN, then you must drop the user or role and recreate it with a different name.

To check for a user with the name OUTLN, issue the following SQL statement:

```
SELECT USERNAME FROM DBA_USERS WHERE USERNAME = 'OUTLN';
```

If you do not have a user named OUTLN, then zero rows are selected.

To check for a role with the name OUTLN, issue the following SQL statement:

```
SELECT ROLE FROM DBA_ROLES WHERE ROLE = 'OUTLN';
```

If you do not have a role named OUTLN, then zero rows are selected.

5. Make sure no user or role has the name MIGRATE, because the Oracle8i Migration utility creates this schema and uses it to replace any pre-existing user or role with this name, and finally drops it from the system.

To check for a user with the name MIGRATE, issue the following SQL statement:

```
SELECT USERNAME FROM DBA_USERS WHERE USERNAME = 'MIGRATE';
```

If you do not have a user named MIGRATE, then zero rows are selected.

To check for a role with the name MIGRATE, issue the following SQL statement:

```
SELECT ROLE FROM DBA_ROLES WHERE ROLE = 'MIGRATE';
```

If you do not have a role named MIGRATE, then zero rows are selected.

6. Make sure the SYSTEM rollback segment does not have an OPTIMAL setting. An OPTIMAL setting may cause errors during migration.

To check the OPTIMAL setting for the SYSTEM rollback segment, issue the following SQL statement:

```
SELECT A.USN, A.NAME, B.OPTSIZE
      FROM V$ROLLNAME A, V$ROLLSTAT B
      WHERE A.USN = B.USN AND NAME = 'SYSTEM';
```

Your output should be similar to the following:

```
USN          NAME                                OPTSIZE
-----
          0 SYSTEM
1 row selected.
```

If there is a value in the OPTSIZE column, then issue the following SQL statement to set optimal to NULL:

```
ALTER ROLLBACK SEGMENT SYSTEM STORAGE (OPTIMAL NULL);
```

You can reset OPTIMAL when migration is complete.

7. Increase the maximum number of extents for your SYSTEM rollback segment by altering the MAXEXTENTS parameter in the STORAGE clause of the ALTER ROLLBACK SEGMENT statement (optional).

The following is an example of the ALTER ROLLBACK SEGMENT statement:

```
ALTER ROLLBACK SEGMENT system
      STORAGE (MAXEXTENTS 121);
```

You may need more space in the SYSTEM rollback segment to complete the migration successfully. If there is not enough space in your SYSTEM rollback segment, then you may encounter errors when you run the Migration utility in the Oracle7 environment.

8. Make sure you have the required release of SQL*Net installed.

Migrating From	Required SQL*Net Release
Oracle release 7.3.2	SQL*Net release 2.3.2.1.12 or higher Note: If your release of SQL*Net is below release 2.3.2.1.4, you must first install release 2.3.2.1.4 before you can upgrade to release 2.3.2.1.12. Contact Oracle Support Services to obtain the patch that includes release 2.3.2.1.4.
Oracle release 7.3.3	SQL*Net release 2.3.3.0.3 or higher

If the required release of SQL*Net is not installed, complete the following steps to install it:

- a. Obtain the year 2000-compliant Oracle Installer for release 7.3 from Oracle Corporation.
- b. Start the Oracle Installer you obtained in Step a. Respond to the Oracle Installer screens until you reach the *Software Asset Manager* window.
- c. At the *Software Asset Manager* window, click the From button.
- d. Navigate to the drive containing the CD-ROM for the current 8.1 release of Oracle.
- e. Navigate to the appropriate directory on the CD-ROM:

If you are installing SQL*Net release 2.3.2.1.12, navigate to the following directory on the CD-ROM:

```
\PATCHES\SQLNET\232112\NT_X86\INSTALL
```

If you are installing SQL*Net release 2.3.3.0.3, navigate to the following directory on the CD-ROM:

```
\PATCHES\SQLNET\23303\NT_X86\INSTALL
```

- f. Open the NT.PRD file.
- g. Complete the installation.
- h. Exit the Oracle Installer.

Note: If you cannot install the required SQL*Net release, contact Oracle Support Services.

Prepare the Cluster for Installation

To prepare the cluster for the Oracle8i Enterprise Edition software, perform the following steps on each node in the cluster:

1. Shut down the Oracle7 database cleanly using the SHUTDOWN NORMAL or SHUTDOWN IMMEDIATE command; do not use SHUTDOWN ABORT. The Oracle7 source database must be shut down cleanly; therefore, no redo information or uncommitted transactions can remain.

```
C:> SVRMGR23
SVRMGR> CONNECT INTERNAL
SVRMGR> SHUTDOWN IMMEDIATE
```

2. Ensure all Oracle7 services are shutdown, including the OracleCMService service:
 - a. Double-click the Services icon in the *Control Panel* window.
The *Services* dialog box appears.
 - b. Select an OracleServiceSID.
 - c. Click Stop to stop a service.
3. Change *all* the version 7 OSDs including the OracleCMService service to Manual startup:
 - a. Double-click the corresponding version 7 OSD and the OracleCMService service. The *Services* dialog box appears.
 - b. Click Manual in the Startup Type group box.
 - c. Click OK to dismiss the *Services* dialog box.
 - d. Click Close in the *Services* dialog box.

4. Shut down the version 7 OSD layer, as described in your vendor documentation. In most cases, you can use the same procedure as stopping an Oracle service, described in Step 2.
5. Rename the OSD key under HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE to OSD73 using the registry editor, REGEDIT. OSD73 acts as a temporary storage for the version 7 OSD layer, which will be used later in the migration process.

To start the registry:

- a. Choose Start > Run, enter REGEDIT in the Open field, and click OK.

The *Registry Editor* window appears.

- b. Right-click to rename the OSD key.

6. Install the version 8.1 OSD layer, being sure not to overwrite the version 7 OSD files. See your vendor documentation for further information.
7. Start the version 8.1 OSD layer, as described in your vendor documentation. Perform diagnostics on the clusterware as described in your vendor documentation.
8. Backup raw partitions using OCOPY. Enter the following syntax:

```
C:\> OCOPY \\.\PHYSICALDRIVEN NEW_FILE
```

where:

- *PHYSICALDRIVE* is the physical drive that holds a single raw database file
- *N* is the number(s) representing each of the physical drives in the system
- *NEW_FILE* is the name and location of the backup copy

For example, to backup the logical partition for a system tablespace to a file, enter:

```
C:\> OCOPY \\.\OPS_SYSTEM1 OPS_SYSTEM1
```

Use your existing partitions and symbolic link names. Oracle Corporation recommends you backup logical partitions to files with the same name. For example, backup \\.\OPS_SYSTEM1 to a file named OPS_SYSTEM1.

See: *Oracle8i Administrator's Guide for Windows NT*, Chapter 11, Backing Up and Recovering Database Files, on using OCOPY.

Install the Release 8.1 Oracle8i Enterprise Edition

During installation, software components are installed on the node from which Oracle Universal Installer is run and pushed to the selected nodes in the cluster. The Oracle Universal Installer installs Oracle Parallel Server only if a cluster is detected.

Perform the following step before running Oracle Universal Installer:

From the node where you intend to run the installer, verify you have administrative privileges to the other nodes. Enter the following command for each node that is a part of the cluster:

```
NET USE \\HOST_NAME\C$
```

where *host_name* is the host name defined in the DefinedNodes registry value for Cluster Manager.

A successful connection results in the following message:

```
The command completed successfully.
```

Oracle Corporation recommends using the same user name and password on each node in a cluster or use a domain user name. If you use a domain user name, log on under a domain with username and password which has administrative privileges on each node.

To install Oracle8i Enterprise Edition on one node in the cluster:

See : *Oracle8i Installation Guide for Windows NT* to prepare for installation and start the Oracle Universal Installer.

1. At the *Welcome* screen of the Oracle Universal Installer, click Next. The *File Locations* screen appears.

If you need help at any screen or want to consult more documentation about the Oracle Universal Installer, then click the Help button to open the online help.

2. At the *File Locations* screen, complete the following steps:
 - a. Do not change the text in the Source field. This is the location of files used for installation.
 - b. If there is a Destination Name field, enter the name of a new Oracle home in this field.
 - c. Enter the complete path of the Oracle home directory where you want to install the new release in the Destination Path field. Click the Browse button to navigate to the directory. Click Next.

Note: You must install the new 8.1 release in an Oracle home separate from the Oracle7 release.

The *Available Products* screen appears.

3. Select Oracle8i Enterprise Edition from the Available Products page. Click Next.
4. Select either Typical or Custom from the Installation Types page. Minimal is not supported for Oracle Parallel Server.

Typical Installation Type	Custom Installation Type
Net8 Configuration Assistant and Oracle Database Configuration Assistant run after software installation with no user input. Net8 Configuration Assistant creates the network configuration. Oracle Database Configuration Assistant creates a starter database and adds necessary information to the network configuration.	Oracle Universal Installer prompts you with a choice to create a database by using one of the following methods: <ul style="list-style-type: none"> ▪ Oracle Database Configuration Assistant during installation ▪ Oracle Database Configuration Assistant or manual methods sometime after installation

After you make your selection, click Next.

If you chose Custom, the *Available Product Components* screen appears. Complete the following steps:

- a. Ensure Oracle Parallel Server under the Oracle Database Options folder is selected in the *Available Product Components* screen. Click Next.

Make sure you install Oracle Utilities to install the Migration utility.

Make sure you install all of the options you installed with the Oracle7 database, assuming you do not want to discontinue use of a particular option. For example, if you installed Oracle replication in Oracle7, then you should install it in Oracle8i.

- b. Select the nodes to which you want the software installed from the Cluster Node selection page. Click Next.

The node on which you are running the installation is selected whether or not you select it.

If the list of nodes does not include nodes you expect, the vendor-supplied clusterware is either not running, or not properly configured.

- c. In the Database Identification page, enter an appropriate **global database name**, a name comprised of the database name and database domain, such as OP.US.ACME.COM, and accept or change the common prefix that is to be used for the SID for each instance.

Each instance has a SID that is comprised of the common prefix entered here and a thread ID that is automatically generated. For example, if OP is entered, the first instance in the cluster is given a SID of OP1, and the second instance is given a SID of OP2.

- d. Respond to the remaining screens that enable you to specify your custom installation settings, until you reach the *Upgrading or Migrating an Existing Database* page.

5. At the *Upgrading or Migrating an Existing Database* page, leave the Upgrade or Migrate an Existing Database check box unselected. Click Next.

Attention: If you select the Upgrade or Migrate an Existing Database check box, then the Oracle Data Migration Assistant is started automatically after installation. The Oracle Data Migration Assistant does not support Oracle Parallel Server migrations. Do not start the Oracle Data Migration Assistant.

6. At the *Create Database* page, select the No option, indicating that you do not want to create a database, because you are migrating an existing database. Click Next.

Complete any remaining screens until you reach the *Summary* page. Click the Help button if you need help for a certain screen.

7. At the *Summary* screen, make sure all of the settings and choices are correct for your installation. Then, click Install. The Oracle Universal Installer performs the installation, which may take some time.

During installation no message appears to indicate components are installed to the other nodes.

8. When installation is completed successfully, click the Exit button to close the Oracle Universal Installer.

Perform Post-Installation Steps

To prepare the cluster for the Oracle7 migration process, perform the following steps:

1. Shut down and restart your computer.
2. Change the OracleCMService and the OracleServiceSID services to Manual startup:
 - a. Double-click the Oracle8i service. The *Services* dialog box appears.
 - b. Click Manual in the Startup Type group box.
 - c. Click OK to dismiss the *Services* dialog box.
 - d. Click Close in the *Services* dialog box.

3. Shut down the release 8.1 OSD layer on each node in the cluster, as described in your vendor documentation.
4. On the node from which you intend to run the Migration utility, rename the OSD key under HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE to OSD81 using the Registry Editor, REGEDIT. OSD81 acts as a temporary storage for the release 8.1 OSD layer while the Oracle7 database is being migrated or upgraded.

To start the registry:

- a. Choose Start > Run, enter REGEDIT in the Open field, and click OK.
The *Registry Editor* window appears.
- b. Right-click to rename the OSD key.
5. On the node from which you intend to run the Migration utility, start the version 7 OSD layer, as described in your vendor documentation.
6. On the node from which you intend to run the Migration utility, start the OracleCMService and the OracleServiceSID services:
 - a. Double-click the Services icon in the *Control Panel* window. The *Services* dialog box appears.
 - b. Select an Oracle service.
 - c. Click Start.
 - d. Click Close to dismiss *Services* dialog box.
7. On the node from which you intend to run the Migration utility, set the Oracle home path to the Oracle7 Oracle home path with a tool such as the Oracle Home Selector:
 - a. Choose Start > Programs > Oracle Installation Products > Oracle Home Selector.
 - b. Select the Oracle7 home from the drop-down list.

Migrate the Oracle7 Source Database

Complete the steps in the Oracle7 environment to migrate an Oracle7 source database to Oracle8i using the Migration utility.

1. Start up your Oracle7 database:

```
C:> SVRMGR23
SVRMGR> CONNECT INTERNAL
SVRMGR> STARTUP
```

2. Make sure the NLS_LANG environment variable is set to the character set you are using for your database.

To check your character set, issue the following SQL statement:

```
SELECT * FROM V$NLS_PARAMETERS
WHERE PARAMETER = 'NLS_LANGUAGE'
OR PARAMETER = 'NLS_TERRITORY'
OR PARAMETER = 'NLS_CHARACTERSET' ;
```

You use all three values returned by this query to set NLS_LANG. For example, suppose your output for the query above is the following:

PARAMETER	VALUE
NLS_LANGUAGE	AMERICAN
NLS_TERRITORY	AMERICA
NLS_CHARACTERSET	US7ASCII

In this case, set NLS_LANG to the following at an MS-DOS command prompt:

```
AMERICAN_AMERICA.US7ASCII
```

See: *Oracle8i National Language Support Guide* for information about setting NLS_LANG.

3. Make sure you have DBA privileges, which are required to run the Oracle8i Migration utility.

To check if you have DBA privileges, query the DBA_ROLE_PRIVS static data dictionary view. For example, if you are connected as user SYSTEM, then enter the following SQL statement:

```
SELECT * FROM DBA_ROLE_PRIVS WHERE GRANTEE = 'SYSTEM';
```

You have DBA privileges if 'DBA' is listed in the GRANTED_ROLE column for the user. If you do not have DBA privileges, then connect as a user who does.

4. Make sure no other DBA with RESTRICTED SESSION privilege connects to the database while the Migration utility is running. Also, "Normal" users should not connect to the database during migration.
5. Determine the files that you will back up in Step 8 by issuing the following SQL statements:

```
SPOOL V7FILES.LOG;  
SELECT MEMBER FROM V$LOGFILE;  
SELECT NAME FROM V$DATAFILE;  
SELECT VALUE FROM V$PARAMETER WHERE NAME = 'CONTROL_FILES';  
SPOOL OFF;
```

The V7FILES.LOG spool file lists all of the files that you must back up in Step 8.

6. Shutdown the Oracle7 database cleanly using the SHUTDOWN NORMAL or SHUTDOWN IMMEDIATE statement; *do not use* SHUTDOWN ABORT. The Oracle7 source database must be shut down cleanly; therefore, no redo information or uncommitted transactions can remain.

```
C:> SVRMGR23  
SVRMGR> CONNECT INTERNAL  
SVRMGR> SHUTDOWN IMMEDIATE
```

Note: If you do not shut down the Oracle7 database before migration starts, then the Migration utility will stop and display an error message.

7. Shutdown all Oracle Parallel Server services.
 - a. Double-click the Services icon in the *Control Panel* window. The *Services* dialog box appears.
 - b. Select an Oracle Parallel Server OracleServiceSID.
 - c. Click Stop.
 - d. Click Close to dismiss *Services* dialog box.
8. Make a complete backup of your Oracle7 database. Make sure you back up the files listed in the V7FILES.LOG spool file that you generated in Step 5.

Caution: If you encounter any problems with the migration, you will need to restore the database from this backup. Make sure you back up your database now as a precaution.

See: The *Oracle7 Server Administrator's Guide* for information about backing up your Oracle7 database.

Run the Migration Utility

Complete the following steps to run the Migration Utility:

1. In the new Oracle8i Oracle home, run the Migration utility by entering the Migration utility command at the MS-DOS command line with the PFILE option included:

```
C:\> MIG PFILE=ORACLE7_HOME\DATABASE\INIT_PARAM_FILE
```

Replace the *ORACLE7_HOME* variable with the complete path to the Oracle7 Oracle home directory. Also, replace the *INIT_PARAM_FILE* variable with the full name of the initialization parameter file for the Oracle7 database.

For example, if the *ORACLE7_HOME* is C:\ORANT and the *INIT_PARAM_FILE* is INITORCL.ORA, then enter the following:

```
C:\> MIG PFILE=C:\ORANT\DATABASE\INITORCL.ORA
```

You can enter MIG with the PFILE option only to run the Migration utility with a default set of options, or you can enter MIG followed by more selected options.

See: *Oracle8i Migration* guide, "Review Migration Utility Command-Line Options" on page 4-17 for information about MS-DOS command line options. Oracle Corporation recommends using the spool option, because it makes it easier to check your migration results when the migration is complete.

2. If the *Oracle7 Password* dialog box appears when you run the Migration utility, then enter the password for the INTERNAL user on the Oracle7 database. This prompt appears because the DBA_AUTHORIZATION registry parameter is set improperly or is not set at all.
3. After the Migration utility has run successfully, stop the Oracle7 service OracleServiceSID. For example, if your SID is OP1:
 - a. Double-click the Services icon in the *Control Panel* window. The *Services* dialog box appears.
 - b. Select OracleServiceOP1.
 - c. Click Stop.
 - d. Click Close to dismiss *Services* dialog box.

4. Delete the Oracle7 service at the MS-DOS command prompt using ORADIM7x. The following table lists the MS-DOS command to run for each Oracle7 release:

Oracle7 Release...	Enter at the MS-DOS Command Prompt...
7.1	C:\> ORADIM71 -DELETE -SID <i>SID</i>
7.2	C:\> ORADIM72 -DELETE -SID <i>SID</i>
7.3	C:\> ORADIM73 -DELETE -SID <i>SID</i>

For example, if your Oracle7 release is release 7.3.4 and your *SID* is ORCL, then enter the following at the MS-DOS command prompt:

```
C:\> ORADIM73 -DELETE -SID ORCL
```

5. Restart your computer.
6. Create the Oracle8i database service at the MS-DOS command line:

```
C:\> ORADIM -NEW -SID SID -INTPWD PASSWORD -MAXUSERS USERS -STARTMODE AUTO
      -PFILE ORACLE_HOME\DATABASE\INITSID.ORA
```

This syntax includes the following variables:

<i>SID</i>	is the same <i>SID</i> name as the <i>SID</i> of the version 7 database you migrated.
<i>PASSWORD</i>	is the password for the new release 8.1 database instance. This is the password for INTERNAL user. The -INTPWD option is not required. If you do not specify it, then operating system authentication is used, and no password is required.
<i>USERS</i>	is the maximum number of users who can be granted SYSDBA and SYSOPER privileges.
<i>ORACLE_HOME</i>	is the release 8.1 Oracle home directory. Ensure that you specify the full pathname with the -PFILE option, including drive letter of the Oracle home directory.

For example, if your *SID* is ORCL, your *PASSWORD* is TWxy579, the maximum number of *USERS* is 10, and the *ORACLE_HOME* directory is C:\ORA81, then enter the following command:

```
C:\> ORADIM -NEW -SID ORCL -INTPWD TWxy579 -MAXUSERS 10 -STARTMODE AUTO
      -PFILE C:\ORA81\DATABASE\INITORCL.ORA
```


Check the Migration Results

Check the results after running the Migration utility. The Migration utility generates informational messages and echoes its progress as it runs the MIGRATE.BSQ script.

See: If the Migration utility exits with an ORA- error, check the *Oracle8i Migration* guide, Appendix A, "Troubleshooting Migration Problems" for information about the error and the actions to perform to resolve the problem.

The Migration utility creates a convert file that contains the information of the Oracle7 control file. Later in the migration process, the convert file is used by ALTER DATABASE CONVERT to create a new control file in Oracle8i.

The default location is *ORACLE_HOME\RDBMS* in the Oracle8i environment, and the default file name in this directory is CONVERT.ORA.

Caution: Do not open the Oracle7 database, which was shut down by the Oracle8i Migration 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 Oracle8i. If the Oracle7 database is opened after running the Migration utility, then the SCN check will fail when the database is converted to Oracle8i, and an ORA-1211 error will be displayed, stating "Oracle7 data file is not from migration to Oracle8". Therefore, if the Oracle7 database is opened, then you must rerun the Migration utility, starting at Step 6 on page 2-16.

Preserve the Oracle7 Source Database

After you successfully run the Migration utility, perform a cold backup of the Oracle7 database. This backup serves the following purposes:

- If you wish to return to the Oracle7 database after executing the ALTER DATABASE CONVERT statement on Oracle8i, then you can restore the backup, start the Oracle7 database, and complete procedures in abandoning migration.

See: *Oracle8i Migration* guide, "Abandoning the Migration" on page 4-35.

- It can be used as the first Oracle8i backup for an Oracle8i recovery.
- If an error occurs at Oracle8i database convert time (ALTER DATABASE CONVERT or ALTER DATABASE OPEN RESETLOGS), then you can restore this backup, fix the problems, and continue the conversion process. However, if you restore a backup that was performed before you ran the Migration utility, then you must rerun the Migration utility.

See: The *Oracle7 Server Administrator's Guide* for information about performing backup and restore operations on your Oracle7 database.

In addition, perform a backup of the entire Oracle7 software distribution, including the Oracle7 home directory. Make sure the backup includes the following:

- all of the subdirectories
- control files
- data files and online redo log files (in case any data files in the Oracle7 database are lost or unreadable), although these files should not contain any outstanding redo information.
- parameter files
- convert file
- scripts that create objects in the Oracle7 database
- scripts that could restore the original database, if necessary

Perform Post-Oracle7 Migration Steps

To complete the Oracle Parallel Server migration, perform the following steps:

1. On the node from which you ran the Migration utility:
 - a. Stop the OracleCMService and the OracleService.SID services:
 1. Double-click the Services icon in the *Control Panel* window. The *Services* dialog box appears.
 2. Select an Oracle service.
 3. Click Stop.
 4. Click Close to dismiss *Services* dialog box.

- b. Stop the version 7 OSD layer, as described in your vendor documentation.
- c. Rename the OSD key under HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE to OSD73 using the Save Subtree As option under the File menu.

This disables the version 7 OSD layer.

- d. Rename the OSD81 key under HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE to OSD using the Save Subtree As option under the File menu.

This enables the release 8.1 OSD layer.

- e. Set the Oracle home path to the Oracle8i Oracle home path with a tool such as the Oracle Home Selector:

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

2. Select the Oracle8i home from the drop-down list.

2. Perform the following on each node in the cluster:

- a. Delete the Oracle7 OracleServiceSID service using the appropriate version of ORADIM. From the Oracle7 Oracle home MS-DOS command prompt, enter:

```
C:> CD ORACLE7_HOME\BIN
C:> ORADIM73 -DELETE - SID SID
```

- b. Create an Oracle8i OracleServiceSID service for each instance

```
C:> ORADIM -NEW -SID SID -INTPWD INTERNAL_PWD -STARTMODE AUTO -PFILE
DRIVE:\PATH\INITSID.ORA
```

Perform Migration Steps in the Oracle8i Environment

Complete the following migration steps in the Oracle8i environment:

1. On all nodes, either remove or rename the database's control files, or use the CONTROL_FILES initialization parameter to specify new control file names. The CONTROL_FILES initialization parameter typically is set in the initialization parameter file, but it may be set in the INITDB_NAME.ORA file instead.

You will issue the ALTER DATABASE CONVERT statement in Step 10 on page 2-27. This statement automatically creates new control files. If you do not use the CONTROL_FILES parameter, then this statement uses the control file names of your pre-migration database (derived from the CONVERT file) and returns an error if the control files already exist. Therefore, in this case, you must remove or rename the control files.

However, if you use the CONTROL_FILES initialization parameter to specify new control file names, then the ALTER DATABASE CONVERT statement creates the new control files with the names you specify, and you do not need to remove the old control files. For a complete list of your existing control files, check the V7FILES.LOG spool file you created.

Control files are considerably larger in Oracle8i than in Oracle7. For example, Oracle7 control files in the hundreds of kilobytes may expand into tens of megabytes in Oracle8i. The larger size in Oracle8i results from the storage of more information in the control file, such as backup and tablespace records. This size increase could be important if a control file is on a raw device or if its available disk space is restricted.

Note: The CONTROL_FILES initialization parameter specifies one or more names of control files, separated by commas. Oracle Corporation recommends using multiple files on different devices or mirroring the file at the operating system level. See *Oracle8i Administrator's Guide* for more information.

2. On all nodes, copy files that are important for migration to a location outside of the Oracle7 Oracle home:
 - a. The convert file, CONVERT.ORA, should reside in *ORACLE_HOME\RDBMS* in the Oracle8i environment. It is placed in this directory automatically by the Migration utility, and you do not need to move it.
 - b. If you have a password file that resides within the Oracle7 Oracle home, then move or copy the password file to the Oracle8i Oracle home directory. The default password file is *ORACLE_HOME\DATABASE\PWDSID.ORA*, where *SID* is your Oracle instance ID.

- c. If your initialization parameter file resides within the Oracle7 Oracle home, then move or copy it to a location outside of the Oracle7 Oracle home. By default Oracle looks for the initialization parameter file in *ORACLE_HOME\DATABASE*. The initialization parameter file can reside anywhere you wish, but it should not reside in the Oracle7 Oracle home after you migrate to Oracle8i.
 - d. If the initialization parameter file contains an IFILE (include file) entry that resides within the Oracle7 Oracle home, then move or copy the file specified in the IFILE entry to a location outside of the Oracle7 Oracle home.
 - e. If your *INITDB_NAME.ORA* file resides within the Oracle7 Oracle home, then move or copy the *INITDB_NAME.ORA* file to a location outside of the Oracle7 Oracle home.
3. On all nodes, adjust the initialization parameter file in the Oracle8i environment for use with Oracle8i. Specifically, complete the following steps:
 - a. Set the COMPATIBLE initialization parameter in your initialization parameter file to a valid version 8 setting, such as 8.0.6 or 8.1.6. Make sure the COMPATIBLE parameter is not set to any Oracle7 release, because if it is, then you will not be able to start the Oracle8i database.
See : *Oracle8i Migration* guide, "Setting the COMPATIBLE Initialization Parameter" on page 9-6 for information.
 - b. Remove obsolete parameters and adjust changed parameters. Certain Oracle7 initialization parameters are obsolete in version 8. Remove all obsolete initialization parameters from any initialization parameter file that will start an Oracle8i instance; obsolete parameters may cause errors in Oracle8i. Also, alter any parameter whose syntax has changed in version 8.
See: *Oracle8i Migration* guide, Appendix B, "Changes to Initialization Parameters" for lists of new, renamed, and obsolete parameters, and *Oracle8i Parallel Server Concepts and Administration* for more information about obsolete Oracle Parallel Server initialization parameters.
 - c. If you are updating snapshots automatically by using the *JOB_QUEUE_PROCESSES* initialization parameter, set *JOB_QUEUE_PROCESSES* to 0 (zero) during migration. After migrating your database, you can reset it to use this parameter.

- d. Set the `PARALLEL_SERVER` parameter to `FALSE` in the `INIT.ORA` file. This only needs to be set on the node from which you ran the Migration utility. Setting this parameter to `FALSE` ensures the database will be started in `EXCLUSIVE` mode, which is required to run the Oracle8i migration. You can change it back to `TRUE` after migration is complete.
- e. Make sure your `DB_DOMAIN` initialization parameter is set properly.
See: *Oracle8i Migration* guide, "The `DB_DOMAIN` Parameter" on page B-9 for more information about setting this initialization parameter.
- f. Change the `BACKGROUND_DUMP_DEST` and `USER_DUMP_DEST` initialization parameters that point to `RDBMS71`, `RDBMS72`, or `RDBMS73` to point to the following directories instead (optional):

Initialization Parameter	Change Setting To
<code>BACKGROUND_DUMP_DEST</code>	<code>ORACLE_BASE\ORADATA\DB_NAME</code>
<code>USER_DUMP_DEST</code>	<code>ORACLE_BASE\ORADATA\DB_NAME\ARCHIVE</code>

In the settings, substitute the complete `ORACLE_BASE` path for `ORACLE_BASE` and substitute the database name for `DB_NAME`.

- g. Make sure all path names in the initialization parameter file are fully specified. You should not have relative path names in the initialization parameter file.
- h. If the initialization parameter file contains an `IFILE` entry, then change the `IFILE` entry in the initialization parameter file to point to the new location you copied it to in Step 2. Then, edit the file specified in the `IFILE` entry in the same way that you edited the initialization parameter file in sub-steps a to g.
- i. Modify the `INITDB_NAME.ORA` file in the same way that you modified the initialization parameter file on page 2-24, steps a to g.

Make sure you save all of the files you modified after making these adjustments.

4. If the Oracle8i DB_NAME is different from the Oracle7 DB_NAME, then complete the following step. Otherwise, skip to Step 5.

Set the DB_NAME initialization parameter in the initialization parameter file to the Oracle8i database name.

5. Make sure all online data files are accessible and in the correct directories. If you are using a raw disk, then log files also must be accessible.
6. Change to the *ORACLE_HOME\RDBMS\ADMIN* directory. You should be in the Oracle8i Oracle home.
7. Start Server Manager. Enter SVRMGR at the MS-DOS command prompt to start Server Manager in Oracle8i.
8. Connect to the database instance as user INTERNAL.

```
SVRMGR> CONNECT INTERNAL
```

9. Start an Oracle8i database instance without mounting the new Oracle8i database:

```
SVRMGR> STARTUP NOMOUNT
```

Caution: Starting the database instance in any other mode might corrupt the database.

You may need to use the PFILE option to specify the location of your initialization parameter file.

You may see error messages listing obsolete initialization parameters. If so, then make a note of the obsolete initialization parameters and continue with the migration normally. Then, remove the obsolete initialization parameters the next time you shut down the database (Step 18).

10. Create a new Oracle8i database control file and convert the file headers of all online tablespaces to Oracle8i format by issuing the following statement:

```
SVRMGR> ALTER DATABASE CONVERT;
```

Successful execution of this statement is the "point of no return" to Oracle7 for this database. However, if necessary, you can restore the Oracle7 database from backups.

If errors occur during this step, then correct the conditions that caused the errors and rerun the Migration utility. Restart at Step 1, "Startup your Oracle7 database:" on page 2-15. Otherwise restore the backup you performed after you ran the Migration utility.

See: *Oracle8i Migration* guide, "Problems at the ALTER DATABASE CONVERT Statement" on page A-16 for information about common errors encountered at this step and the actions required to resolve them.

11. Open the Oracle8i database with the following statement:

```
SVRMGR> ALTER DATABASE OPEN RESETLOGS;
```

When the Oracle8i database is opened, all rollback segments that are online are converted to the new Oracle8i format.

If you encounter errors when you issue this statement, then start the migration process over from the beginning, ensuring the database is not opened in the Oracle7 environment after the Migration utility completes. Make sure you completed all of the pre-migration steps.

12. Set the system to spool results to a log file for later verification of success:

```
SVRMGR> SPOOL CATOUTM.LOG
```

If you want to see the output on your screen of the scripts you will run, then you also can issue a SET ECHO ON statement:

```
SVRMGR> SET ECHO ON
```


13. Run the Oracle8i database conversion script U0703040.SQL:

```
SVRMGR> @U0703040.SQL
```

The U0703040.SQL script is the database conversion script for all 7.1, 7.2, and 7.3 releases supported by the Migration utility. The U0703040.SQL script creates and alters certain system tables and drops the MIGRATE user. It also runs the CATALOG.SQL and CATPROC.SQL scripts, which create the system catalog views and all the necessary packages for using PL/SQL.

If you encounter any problems when you run this script, or any of the scripts in the remaining steps, then correct the cause(s) of the problems and rerun the script. You can rerun any of the scripts described in this chapter as many times as necessary.

See: *Oracle8i Migration* guide, "Running Scripts" on page 1-11 for information about the types of errors to look for when you run a script.

14. If the Oracle system has Oracle replication installed, then complete the following steps:**a. Run CATREP.SQL:**

```
SVRMGR> @CATREP.SQL
```

b. Run R0703040.SQL:

```
SVRMGR> @R0703040.SQL
```

This R0703040.SQL script performs a post-CATREP.SQL Oracle replication related upgrade.

15. Run CATPARR.SQL:

```
SVRMGR> @CATPARR.SQL
```

16. Run UTLRP.SQL (optional):

```
SVRMGR> @UTLRP.SQL
```

The UTLRP.SQL script recompiles all existing PL/SQL modules that were previously in an INVALID state, such as packages, procedures, types, and so on. These actions are optional; however, they ensure that the cost of recompilation is incurred during installation rather than in the future.

Oracle Corporation highly recommends performing this optional step.

17. Turn off the spooling of script results to the log file:

```
SVRMGR> SPOOL OFF
```

Then, check the spool file and verify that the packages and procedures compiled successfully. You named the spool file in Step 12; the suggested name was CATOUTM.LOG.

You should look for errors that alert you to insufficient space, and for errors that alert you that a script failed to run. If you see these types of errors, then your migration may not be completely successful. However, you typically can ignore errors about the failure to alter or drop an object that does not exist.

If you specified SET ECHO ON, then you may want to SET ECHO OFF now:

```
SVRMGR> SET ECHO OFF
```

18. Run SHUTDOWN on the Oracle8i database:

```
C:> SVRMGRL
SVRMGR> CONNECT INTERNAL
SVRMGR> SHUTDOWN IMMEDIATE
```

Caution: Use SHUTDOWN NORMAL or SHUTDOWN IMMEDIATE. Do not use SHUTDOWN ABORT.

Executing this clean shutdown flushes all caches, clears buffers, and performs other DBMS housekeeping activities. These measures are an important final step to ensure the integrity and consistency of the newly migrated Oracle8i database.

The COMPATIBLE initialization parameter controls the compatibility level of your database. Set the COMPATIBLE initialization parameter in your initialization parameter file based on the compatibility level you want for your migrated database.

See: *Oracle8i Migration* guide, "Setting the COMPATIBLE Initialization Parameter" on page 9-6 for information.

Also, if you encountered a message listing obsolete initialization parameters when you started the database in Step 9, then remove the obsolete initialization parameters from the initialization parameter file now.

19. Set the PARALLEL_SERVER parameter back to TRUE in the INIT.ORA file.

Perform Post-Migration Tasks

Complete the post-migration procedures listed in the table below. These are described in *Oracle8i Migration* guide, Chapter 8, "After Migrating or Upgrading the Database".

Post-Migration Tasks

- Perform a complete backup of the production database.
- Change the password for the OUTLN user.
- Copy LONGs to LOBs.
- Check for bad date constraints.
- Adjust the initialization parameters SHARED_POOL_SIZE and LARGE_POOL_SIZE in your initialization parameter file to avoid problems with parallel execution.
- If you installed the Java option, install ODCI.JAR AND CARTRIDGESERVICES.JAR files.
- Modify your LISTENER.ORA file.
- Migrate or upgrade your standby database to Oracle8i release 8.1.
- Add new features as appropriate. It is not necessary to make any immediate changes to begin using your Oracle8i database. You may prefer to introduce these enhancements into your database and corresponding applications gradually.
- Develop new administrative procedures as needed.
- Adjust your initialization parameter file for the new release.
- Rebuild unusable bitmap indexes.
- Migrate partition views to partition tables.
- Migrate or upgrade to the new release of Net8 (optional).
- Test the database and compare results.
- Tune the migrated database.

Upgrading the Previous Version 8 Database to the New Oracle8i Release

This section guides you through the process of upgrading your database to the new Oracle8i release.

See: *Oracle8i Migration* guide for important information on upgrade paths.

Prepare to Upgrade

Perform the following steps on one node only:

1. Review upgrade issues relating to SQL*Net and Net8.

See: *Oracle8i Migration* guide, Appendix F, "SQL*Net and Net8 Considerations for Migrations and Upgrades" for information.

2. Make sure your DB_DOMAIN initialization parameter is set properly.

See: *Oracle8i Migration* guide, "The DB_DOMAIN Parameter" on page B-9 for more information about setting this initialization parameter.

3. Start Server Manager and connect to the database instance as INTERNAL user.

```
C:> SVRMGRL  
SVRMGR> CONNECT INTERNAL
```

4. If you are upgrading from an 8.0 release, then make sure no user or role has the name OUTLN, because this schema is created automatically when you install Oracle8i. If you have a user or role named OUTLN, then you must drop the user or role and recreate it with a different name.

Note: If you are upgrading from an 8.1 release, then you do not need to perform this check because the OUTLN user should have been created when you installed the previous 8.1 release. Therefore, if you are upgrading from an 8.1 release, then go to Step 5 now. *Do not* drop the OUTLN user if you are upgrading from a previous 8.1 release.

To check for a user with the name OUTLN, enter the following SQL statement:

```
SELECT USERNAME FROM DBA_USERS WHERE USERNAME = 'OUTLN';
```

If you do not have a user named OUTLN, then zero rows are selected.

To check for a role with the name OUTLN, enter the following SQL statement:

```
SELECT ROLE FROM DBA_ROLES WHERE ROLE = 'OUTLN';
```

If you do not have a role named OUTLN, then zero rows are selected.

5. Add space to your SYSTEM tablespace and to the tablespaces where you store rollback segments, if necessary.

Upgrading to a new release requires more space in your SYSTEM tablespace and in the tablespaces where you store rollback segments. If you have enough space on your system, then consider adding more space to these tablespaces. In general, you need at least 20 MB of free space in your SYSTEM tablespace to upgrade. If you run out of space during the upgrade, then you will need to perform the upgrade again.

The following SQL statement illustrates how to add more space to a tablespace:

```
ALTER TABLESPACE SYSTEM
  ADD DATAFILE 'C:\PATH\HOME\USER1\MOUNTPOINT\ORADATA\DB1\SYSTEM02.DBF'
  SIZE 20M;
```

6. Determine the files that you will back up in Step 9 in the next section (when performing a full backup) by issuing the following SQL statements:

```
SPOOL V8FILES.LOG;
SELECT MEMBER FROM V$LOGFILE;
SELECT NAME FROM V$DATAFILE;
SELECT VALUE FROM V$PARAMETER WHERE NAME = 'CONTROL_FILES';
SPOOL OFF;
```

The V8FILES.LOG spool file lists all of the files that you must back up in Step 9 in the next section.

Prepare the Cluster for Upgrade

To prepare the cluster for the new version of the Oracle8i Enterprise Edition software, perform the following steps on each node in the cluster:

1. Shut down the Oracle8 database cleanly using the SHUTDOWN NORMAL or SHUTDOWN IMMEDIATE command; do not use SHUTDOWN ABORT. The Oracle8 source database must be shut down cleanly; therefore, no redo information or uncommitted transactions can remain.

```
C:> SVRMGR  
SVRMGR> CONNECT INTERNAL  
SVRMGR> SHUTDOWN IMMEDIATE
```

2. Ensure all version 8 services are shutdown, including the OracleCMService service:
 - a. Double-click the Services icon in the *Control Panel* window.
The *Services* dialog box appears.
 - b. Select an Oracle service.
 - c. Click Stop to stop a service.
3. Change *all* the version 8 OSDs including the OracleCMService service to Manual startup:
 - a. Double-click the corresponding version 8 OSD and the OracleCMService service. The *Services* dialog box appears.
 - b. Click Manual in the Startup Type group box.
 - c. Click OK to dismiss the *Services* dialog box.
 - d. Click Close in the *Services* dialog box.
4. Shut down the version 8 OSD layer, as described in your vendor documentation. In most cases, you can use the same procedure as stopping an Oracle service, described in Step 2

5. Rename the OSD key under HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE to OSD80 using the registry editor, REGEDIT. OSD80 acts as a temporary storage for the version 8 OSD layer, which will be used later in the upgrade process.

To start the registry:

- a. Choose Start > Run, enter REGEDIT in the Open field, and click OK.

The *Registry Editor* window appears.

- b. Right-click to rename the OSD key.

6. Install the version 8.1 OSD layer, being sure not to overwrite the old version 8 OSD files. See your vendor documentation for further information.
7. Start the version 8.1 OSD layer, as described in your vendor documentation. Perform diagnostics on the clusterware as described in your vendor documentation.
8. Backup raw partitions using OCOPY. Enter the following syntax:

```
C:\> OCOPY \\.\PHYSICALDRIVEN NEW_FILE
```

where:

- *PHYSICALDRIVE* is the physical drive that holds a single raw database file
- *N* is the number(s) representing each of the physical drives in the system
- *NEW_FILE* is the name and location of the backup copy

For example, to backup the logical partition for a system tablespace to a file, enter:

```
C:\> OCOPY \\.\OPS_SYSTEM1 OPS_SYSTEM1
```

Use your existing partitions and symbolic link names. Oracle Corporation recommends you backup logical partitions to files with the same name. For example, backup \\.\OPS_SYSTEM1 to a file named OPS_SYSTEM1.

See: *Oracle8i Administrator's Guide for Windows NT*, Chapter 11, Backing Up and Recovering Database Files, on using OCOPY.

9. Perform a full offline backup of the database. Make sure you back up the files listed in the V8FILES.LOG spool file that you generated in Step 6 on page 2-32.

Caution: If you encounter any problems with the upgrade, then you will need to restore the database from this backup. Therefore, make sure you back up your database now as a precaution.

See: *Oracle8i Backup and Recovery Guide* for more information about backing up a release 8.1 database, or see *Oracle8 Backup and Recovery Guide* for information about backing up a release 8.0 database.

10. Exit Server Manager.
11. Deinstall your current release of Oracle if both of the following conditions are true:
 - You are upgrading from a previous 8.1 release.
 - You plan to use the same Oracle home for your current release and the new release to which you are upgrading.

If you plan to use separate Oracle home directories for your current release and the new release to which you are upgrading, then you do not need to deinstall your current release.

Note: If you are upgrading from an 8.0 release, then you must install the new 8.1 release in an Oracle home separate from the 8.0 release. However, if you are upgrading from a previous 8.1 release, then this restriction does not apply, and you can install the new release into the same Oracle home as the previous release if you wish.

Install Release 8.1 Oracle8i Enterprise Edition

During installation, software components are installed on the node from which Oracle Universal Installer is run and pushed to the selected nodes in the cluster. The Oracle Universal Installer installs Oracle Parallel Server only if a cluster is detected.

To install, perform the following steps:

On one node, follow from Step 1, on page 2-10, to Step 8 on page 2-13, to install the Release 8.1 Oracle8i Enterprise Edition.

Perform Post-Installation Steps

To prepare the cluster for the upgrade process, perform the following steps:

1. Shut down and restart your computer.
2. Change the OracleCMService and the OracleServiceSID services to Manual startup:
 - a. Double-click the Oracle service. The *Services* dialog box appears.
 - b. Click Manual in the Startup Type group box.
 - c. Click OK to dismiss the *Services* dialog box.
 - d. Click Close in the *Services* dialog box.
3. Make sure the new release 8 OSD layer is running on each node in the cluster.
4. Perform the following steps on the node from which you intend to run the upgrade scripts:
 - a. Start the OracleCMService and the OracleServiceSID services:
 1. Double-click the Services icon in the *Control Panel* window. The *Services* dialog box appears.
 2. Select an Oracle service.
 3. Click Start.
 4. Click Close to dismiss *Services* dialog box.
 - b. Set the Oracle home path to the new Oracle8i Oracle home path with a tool such as the Oracle Home Selector:
 1. Choose Start > Programs > Oracle Installation Products > Oracle Home Selector.
 2. Select the Oracle8i home from the drop-down list.

Upgrade the Database Manually

Complete the following steps to upgrade:

1. Stop the Oracle8 service OracleService*SID* of the database you are upgrading, where *SID* is the instance name. For example, if your *SID* is ORCL:
 - a. Double-click the Services icon in the *Control Panel* window.
The *Services* dialog box appears.
 - b. Select OracleServiceORCL.
 - c. Click Stop.
 - d. Click Close to dismiss *Services* dialog box.
2. Delete the Oracle service at the MS-DOS command prompt using ORADIM. The following table lists the MS-DOS command to run for each Oracle8*i* release:

Oracle Release...	Enter at the MS-DOS Command Line...
8.0	C:\> ORADIM80 -DELETE -SID <i>SID</i>
8.1	C:\> ORADIM -DELETE -SID <i>SID</i>

For example, if your Oracle release is release 8.1.5 and your *SID* is ORCL, then enter the following at the MS-DOS command prompt:

```
C:\> ORADIM -DELETE -SID ORCL
```

3. Create the Oracle8i database service at the MS-DOS command prompt:

```
C:\> ORADIM -NEW -SID SID -INTPWD PASSWORD -MAXUSERS USERS  
-STARTMODE AUTO -PFILE ORACLE_HOME\DATABASE\INITSID.ORA
```

This syntax includes the following variables:

<i>SID</i>	is the same SID name as the SID of the database you are upgrading.
<i>PASSWORD</i>	is the password for the new release 8.1 database instance. This is the password for the INTERNAL user. The -INTPWD option is not required. If you do not specify it, then operating system authentication is used, and no password is required.
<i>USERS</i>	is the maximum number of users who can be granted SYSDBA and SYSOPER privileges.
<i>ORACLE_HOME</i>	is the release 8.1 Oracle home directory. Ensure that you specify the full pathname with the -PFILE option, including drive letter of the Oracle home directory.

For example, if your *SID* is ORCL, your *PASSWORD* is TWxy579, the maximum number of *USERS* is 10, and the *ORACLE_HOME* directory is C:\ORA81, then enter the following command:

```
C:\> ORADIM -NEW -SID ORCL -INTPWD TWxy579 -MAXUSERS 10  
-STARTMODE AUTO -PFILE C:\ORA81\DATABASE\INITORCL.ORA
```

4. On all nodes, copy configuration files to a location outside of the old Oracle home:

- a. If your initialization parameter file resides within the old environment's Oracle home, then copy it to a location outside of the old environment's Oracle home. By default Oracle looks for the initialization parameter file in ORACLE_HOME\DATABASE. The initialization parameter file can reside anywhere you wish, but it should not reside in the old environment's Oracle home after you upgrade to the new release.
- b. If your initialization parameter file has an IFILE (include file) entry and the file specified in the IFILE entry resides within the old environment's Oracle home, then copy the file specified by the IFILE entry to a location outside of the old environment's Oracle home. The file specified in the IFILE entry has additional initialization parameters.

- c. If you have a password file that resides within the old Oracle home, then move or copy the password file to the Oracle8i Oracle home. The default password file is `ORACLE_HOME\DATABASE\PWDSID.ORA`. Edit the file specified in the `IFILE` entry in the same way you edited the initialization parameter file in the previous steps a and b.
 - d. If your `INITDB_NAME.ORA` file resides within the old environment's Oracle home, then move or copy the `INITDB_NAME.ORA` file to a location outside of the old environment's Oracle home.
5. On all nodes, adjust the initialization parameter file for use with the new release.
- a. Remove obsolete parameters and adjust changed parameters. Certain initialization parameters are obsolete in the new 8.1 release. Remove all obsolete parameters from any initialization parameter file that will start a new release 8.1 instance. Obsolete parameters may cause errors. Also, alter any parameter whose syntax has changed in the new 8.1 release.
See: *Oracle8i Migration* guide, Appendix B, "Changes to Initialization Parameters" for lists of new, renamed, and obsolete parameters, and *Oracle8i Parallel Server Concepts and Administration* for more information about obsolete Oracle Parallel Server initialization parameters.
 - b. If you are updating snapshots automatically by using the `JOB_QUEUE_PROCESSES` initialization parameter, set `JOB_QUEUE_PROCESSES` to 0 (zero) during upgrading. Also, if you are using Advanced Queuing and have propagation schedules, then set both the `JOB_QUEUE_PROCESSES` and `AQ_TM_PROCESSES` initialization parameters to 0. After upgrading your database, you can reset it to use these parameters.
 - c. If the initialization parameter file contains an `IFILE` entry, then change the `IFILE` entry in the initialization parameter file to point to the new location you copied it.
 - d. Modify the `INITDB_NAME.ORA` file in the same way that you modified the initialization parameter file.

Make sure you save all of the files you modified after making these adjustments.
 - e. Set the `PARALLEL_SERVER` initialization parameter to `FALSE`. You can change it back to `TRUE` after the upgrade operation is complete.

6. At the MS-DOS command prompt, change to the *ORACLE_HOME\RDBMS\ADMIN* directory.
7. Start Server Manager and connect to the database instance as INTERNAL user.

```
C:> SVRMGR  
SVRMGR> CONNECT INTERNAL
```

8. Run **STARTUP RESTRICT**:

```
SVRMGR> STARTUP RESTRICT
```

You may need to use the PFILE option to specify the location of your initialization parameter file.

You may see error messages listing obsolete initialization parameters. If so, then make a note of the obsolete initialization parameters and continue with the upgrade normally. Then, remove the obsolete initialization parameters the next time you shut down the database (Step 14).

9. Set the system to spool results to a log file for later verification of success:

```
SVRMGR> SPOOL CATOUTU.LOG
```

If you want to see the output of the script you will run on your screen, then you also can issue a SET ECHO ON statement:

```
SVRMGR> SET ECHO ON
```

10. Run `UOLD_RELEASE.SQL` where `OLD_RELEASE` refers to the release you had installed prior to upgrading. See the table below to choose the correct script. Each script provides a direct upgrade from the release specified in the "Old Release" column. The "Old Release" is the release from which you are upgrading.

To run a script, enter the following:

```
SVRMGR> @UOLD_RELEASE.SQL
```

See: *Oracle8i Migration* guide, "Upgrade Paths" on page 7-2 for more information on the upgrade paths and scripts.

Old Release	Run Script
8.0.1	Direct upgrade <i>is not supported</i> .
8.0.2	Direct upgrade <i>is not supported</i> .
8.0.3	U0800030.SQL
8.0.4	U0800040.SQL
8.0.4S	Direct upgrade <i>is not supported</i> .
8.0.5	U0800050.SQL
8.0.6	U0800060.SQL
8.1.1	Upgrading to the new release <i>is not supported</i> .
8.1.2	Upgrading to the new release <i>is not supported</i> .
8.1.3	Direct upgrade <i>is not supported</i> .
8.1.4	Direct upgrade <i>is not supported</i> .
8.1.5	U0801050.SQL

Note: If the old release you had installed prior to upgrading is not listed, see the README files in the new installation for the correct upgrade script to run.

Make sure you follow these guidelines when you run the script:

- You must use the version of the script supplied with new release 8.1 installation.
- You must run the script in the new release 8.1 environment.
- You only need to run ONE script, even if your upgrade spans several releases. For example, if your old release was 8.0.4, then you need to run only U0800040.SQL.

The script you run creates and alters certain dictionary tables. It also runs the CATALOG.SQL and CATPROC.SQL scripts that come with the release to which you are upgrading, which create the system catalog views and all the necessary packages for using PL/SQL.

If you encounter any problems when you run the script, or any of the scripts in the remaining steps, then correct the causes of the problems and rerun the script. You can rerun any of the scripts described in this chapter as many times as necessary.

See: *Oracle8i Migration* guide, "Running Scripts" on page 1-11 for information about the types of errors to look for when you run a script.

You may encounter a series of messages similar to the following during the upgrade:

```
ORA-00604: error occurred at recursive SQL level 1
ORA-00001: unique constraint (SYSTEM.AQS_QUEUES_CHECK) violated
ORA-06512: at "SYS.DBMS_AQADM", line 2023
ORA-06512: at line 2
```

You can ignore these messages.

11. Run CATPARR.SQL:

```
SVRMGR> @CATPARR.SQL
```

12. Set the PARALLEL_SERVER initialization parameter to TRUE.

13. Turn off the spooling of script results to the log file:

```
SVRMGR> SPOOL OFF
```

Then, check the spool file and verify that the packages and procedures compiled successfully. You named the spool file CATOUTU.LOG. Correct any problems you find in this file.

If you specified SET ECHO ON, then you may want to SET ECHO OFF now:

```
SVRMGR> SET ECHO OFF
```

14. Run SHUTDOWN on the Oracle8i database:

```
SVRMGR> SHUTDOWN IMMEDIATE
```

Caution: Use SHUTDOWN NORMAL or SHUTDOWN IMMEDIATE. Do not use SHUTDOWN ABORT.

Executing this clean shutdown flushes all caches, clears buffers, and performs other DBMS housekeeping activities. These measures are an important final step to ensure the integrity and consistency of the newly upgraded Oracle8i database.

Also, if you encountered a message listing obsolete initialization parameters when you started the database in Step 8, then remove the obsolete initialization parameters from the initialization parameter file now.

Your database and Oracle Parallel Server are now upgraded to the new 8.1 release.

Caution: If you retain the old Oracle software, then never start the upgraded database with the old software. Only start the database with the executables in the new release 8.1 installation directory. Also, before you remove the old Oracle environment, make sure you relocate any data files in that environment to the new Oracle8i environment. See the *Oracle8i Administrator's Guide* for information about relocating data files.

Perform Post-Oracle8i Upgrade Steps

Perform the following steps to complete the upgrade for Oracle Parallel Server:

1. On the node from which you ran the upgrade scripts:
 - a. Stop the OracleCMService and the OracleServiceSID services:
 1. Double-click the Services icon in the *Control Panel* window. The *Services* dialog box appears.
 2. Select an Oracle8i service.
 3. Click Stop.
 4. Click Close to dismiss *Services* dialog box.
2. Set the Oracle home path to the new Oracle8i Oracle home path with a tool such as the Oracle Home Selector:
 - a. Choose Start > Programs > Oracle Installation Products > Oracle Home Selector.
 - b. Select the Oracle8i home from the drop-down list.

See: To upgrade additional components, such as Java and the Advanced Queuing (AQ) option, see "Upgrading Specific Components" in *Oracle8i Migration* guide.

Perform Post-Upgrade Tasks

Complete the post-upgrade procedures listed in the table below. These are described in the *Oracle8i Migration* guide, Chapter 8, "After Migrating or Upgrading the Database".

Post-Upgrade Tasks	Additional Task Performed after Upgrading from Version 8.0 or Version 8.1
<ul style="list-style-type: none"> ■ Perform a complete backup of the production database. ■ Change the password for the OUTLN user. ■ Copy LONGs to LOBs. ■ Check for bad date constraints. ■ Adjust the initialization parameters SHARED_POOL_SIZE and LARGE_POOL_SIZE in your initialization parameter file to avoid problems with parallel execution. ■ If you installed the Java option, install ODCI.JAR AND CARTRIDGESERVICES.JAR files. ■ Modify your LISTENER.ORA file. ■ Migrate or upgrade your standby database to Oracle Release 8.1. ■ Add new features as appropriate. It is not necessary to make any immediate changes to begin using your Oracle8i database. You may prefer to introduce these enhancements into your database and corresponding applications gradually. ■ Develop new administrative procedures as needed. ■ Adjust your initialization parameter file for the new release. ■ Normalize filenames. 	<ul style="list-style-type: none"> ■ Rebuild unusable function-based indexes.

Multiple Oracle Homes

Oracle Parallel Server for Windows NT supports multiple Oracle homes, but all the Oracle homes must contain the same release of the Oracle8i Enterprise Edition and Oracle Parallel Server.

Windows NT requires that each node have only one copy of the vendor-supplied Operating System Dependent layer active.

Creating Raw Devices

This chapter describes how to create the raw devices required by Oracle Parallel Server data files, control files and redo log files. These steps assume you have installed the vendor-supplied Operating System Dependent layer and performed diagnostics on the clusterware, as described in your vendor documentation.

Specific topics discussed are:

- Raw Devices Overview
- Disk Definition
- Creating Raw Devices for Automatic or Manual Database Creation
- Creating Raw Devices for the Oracle Database Configuration Assistant
- Creating Raw Devices for Manual Database Creation
- Creating Raw Devices for Manual Database Creation with a Current Configuration

See Also: This chapter is a supplement to the following guide: *Oracle8i Parallel Server Setup and Configuration Guide*, Chapter 2, "Pre-Installation".

Raw Devices Overview

As Windows NT does not support a proper distributed file system, Oracle bypasses it by using raw devices. This allows nodes running different instances to access shared disks. Data files, redo log files, and control files are stored on the raw devices. The shared disks are then a collection of unformatted raw devices.

Raw devices are created on a disk that does not have a primary partition and has only one extended partition. Raw devices are created prior to installation and creating a database.

Note: You need to create raw devices if you are creating a database manually, or using the Oracle Database Configuration Assistant to create the files for the database. However, if you are using the Oracle Database Configuration Assistant, a precise number of raw devices must be set up.

Raw Devices

A raw device is a portion of a physical disk that Oracle8i on Windows NT uses for its database files. Raw devices are not like regular file management systems. The information they store cannot be identified or accessed by users. The use of raw devices may improve disk I/O performance by 5% to 10% when compared with disk I/O to a partition with a file system on it.

A raw device is created when an extended partition is created and logical partitions are assigned to it without applying any formatting. The Windows NT Disk Administrator application allows you to create an extended partition on a physical drive.

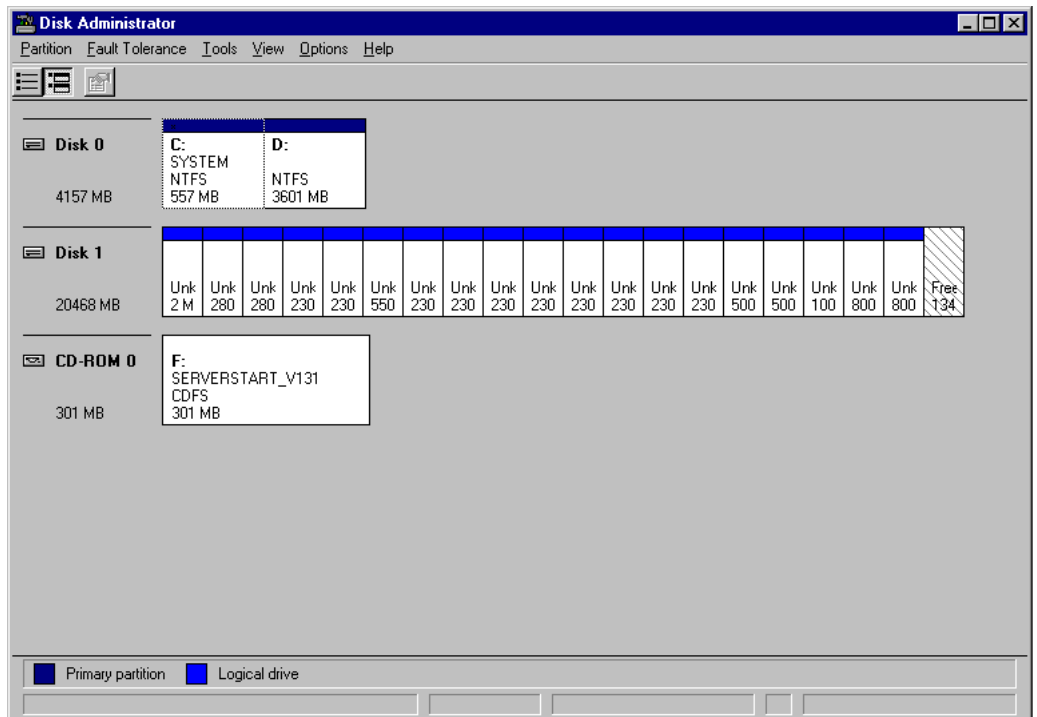
Primary Partitions

A primary partition is one into which you can install the files needed to load an operating system. It is usually formatted for a particular file system and is assigned a drive letter. There can be, at most, four primary partitions on a physical drive.

Extended Partitions

An extended partition points to raw space on the disk that can be assigned multiple logical partitions for the database files. An extended partition avoids the four-partition limit by allowing you to define large numbers of logical partitions to accommodate applications using Oracle8i on Windows NT. Logical partitions can then be given symbolic link names to free up drive letters. This makes Oracle Parallel Server on Windows NT more scalable.

The *Disk Administrator* window below shows two disks. Disk 1 has an extended partition:



The following table describes the partitions on disk 0 and disk 1:

This disk...	Contains...
Disk 0	Two primary partitions
Disk 1	An extended partition with nineteen logical partitions and 134 MB of free space (this disk device includes six physical disk drives)

The data files, control files and redo log files must be created on the logical partitions.

Note: You can tell whether space is unpartitioned free space or free space within an extended partitions by the direction of the diagonal lines. Lines for free space within an extended partition display from top left to the bottom (\\), and lines for unpartitioned free space display from top right to the bottom (/).

Disk Definition

Windows NT uses the following naming convention to define each disk drive it finds at startup, where *m* is the number of the physical drive, and *n* is a partition number (logical partition number) as shown in the Disk Administrator window:

```
\Device\Harddiskm\Partitionn
```

For example, the first drive on a system (normally the C: drive) has the following name:

```
\Device\Harddisk1\Partition0
```

The first logical drive (E:) defined on the second physical drive has the following name:

```
\Device\Harddisk2\Partition1
```

Note: When the nodes are rebooted, the hard disk and partition names can change, and symbolic link names mapped to a different partition. However, the physical disk remains the same. The Oracle Object Link Manager, described in this chapter, tracks and updates the symbolic links, so that the links are mapped correctly after rebooting.

Physical Disk

A physical disk represents the entire disk. It points to `\Device\Harddiskx\Partition0`. Windows NT automatically creates a symbolic link name of `\\.\PhysicalDriveX`, where *X* is the number corresponding to your hard disk drive number in the Disk Administrator. The *X* matches the *X* in `\Device\HarddiskX\Partition0`.

`\\.\PhysicalDriveX` is automatically defined by Windows NT for every hard disk in the machine. For example, a machine with three hard disks will have the following names defined by Windows NT:

```
\\.\PhysicalDrive0
```

```
\\.\PhysicalDrive1
```

```
\\.\PhysicalDrive2
```

Internally, these names expand to:

```
\\.\PhysicalDrive0 = \Device\Harddisk0\Partition0
```

```
\\.\PhysicalDrive1 = \Device\Harddisk1\Partition0
```

```
\\.\PhysicalDrive2 = \Device\Harddisk2\Partition0
```


Partition0 is special in that it represents the entire physical disk regardless of any partitioning scheme on that disk. On all disks recognized by Windows NT, the Disk Administrator writes a signature on the first block of all disks. To avoid overwriting that block, Oracle skips the first block of a physical raw partition which is used for an Oracle data file.

Physical Partition Naming Conventions for Oracle Parallel Server

Oracle Parallel Server adopts a special naming convention to distinguish physical partitions within an extended raw partition from files on a file system. The first 17 characters of the name must be:

```
\\.\PhysicalDrive
```

Logical Partition

A logical partition is a partition created by the Disk Administrator that points to a drive other than `\Device\Harddiskx\Partition0`. Logical partitions are initially assigned names with drive letters (`\\.\drive_letter:`) and typically re-assigned symbolic link names (`\\.\symbolic link name`).

For example, `\\.\D:` may be assigned a symbolic link name of `\\.\ops_sys1`. Regardless of whether a drive letter or symbolic link name is used, logical partitions are defined to represent a specific partition in a disk rather than the entire disk. Internally, these names may expand to:

```
\\.\D:= \Device\Harddisk2\Partition1
```

```
\\.\op_system1= \Device\Harddisk3\Partition2
```

Note: Oracle does *not* skip the first block of a logical raw partition used for an Oracle data file.

Physical Disk and Logical Partition Considerations

Please consider the following when deciding which raw partition to use:

- Physical disks are automatically defined by Windows NT to represent the entire disk, and should *never* be defined by the user.
- Logical partitions need to be defined by the user to represent a specific partition in a disk. These partitions should be logical partitions or drives contained in an extended partition. They should *never* be defined as Partition0.
- Using an entire disk (Partition 0) for an Oracle data file and using a partition which occupies the entire disk for an Oracle data file is *not* the same thing. Even when a partition occupies the entire disk, there is still a small space on the disk that is not part of the partition.
- If you are using an entire disk for an Oracle data file (Partition 0), use the pre-defined physical raw names which Windows NT provides.
- Use a logical partition if you are using a specific partition and it occupies the entire disk.
- If using a specific partition created with the Disk Administrator, define and use a symbolic link name rather than a logical partition number (even if it occupies the entire disk).

Frequently Asked Questions

Question: What is the impact if I have created logical partitions, but defined physical disk convention names for them. For example:

```
\\.\PhysicalDrivesys1 = \Device\Harddisk2\Partition1
```

```
\\.\PhysicalDriveusr1 = \Device\Harddisk3\Partition1
```

Answer: An Oracle database will handle the data file using the physical disk convention, even though it really is a logical partition. This will not cause any data corruption or loss, as long as you continue using the physical disk naming conventions. Oracle Corporation recommends you convert to the logical partition at your earliest convenience. See "Compatibility Issues" on page 3-8.

Question: What is the impact if I have created logical names representing Partition0. For example:

```
\\.\op_system1 = \Device\Harddisk1\Partition0
```

Answer: This will pose severe problems, as the Disk Administrator typically writes a signature into the first block of every disk, and consequently may overwrite a portion of the data file header.

Note: This may also cause data loss. Never use Partition0 with the logical partition convention. See "Compatibility Issues" on page 3-8 for information on rebuilding your Oracle database with the proper conventions.

Question: How do I transfer the contents of any raw partition to a standard file system for backup purposes?

Answer: Use the Oracle utility OCOPI to copy data to or from a raw partition for both physical and logical raw conventions. See "Compatibility Issues" on page 3-8 for further information.

Compatibility Issues

The physical and logical partition conventions are not compatible with one another due to the extra block that is skipped for physical raw conventions. This also means you cannot simply do an OCOPI from a physical disk to a logical partition, as the contents of these partitions are incompatible.

To convert from a physical convention to a logical convention, you must:

1. Perform a full database export to a (local) file system.
2. Create logical partitions and define logical names for these partitions.
3. Re-create the database using the new logical partitions.
4. Perform the full database import to the newly created database.

If your database installation uses physical disk conventions with logical partitions, Oracle Corporation recommends converting to the logical partition conventions at your earliest convenience using the steps above.

Creating Raw Devices for Automatic or Manual Database Creation

The following sections describe how to create the raw devices for three types of configurations:

- Creating Raw Devices for the Oracle Database Configuration Assistant
- Creating Raw Devices for Manual Database Creation
- Creating Raw Devices for Manual Database Creation with a Current Configuration

Creating Raw Devices for the Oracle Database Configuration Assistant

Using the Oracle Database Configuration Assistant on a clean machine is the preferred method to create a database for Oracle Parallel Server.

To create the raw devices, perform the following steps:

- Step 1: Install Oracle Parallel Server Raw Devices Management Utilities
- Step 2: Create an Extended Partition
- Step 3: Create Logical Partitions
- Step 4: Assign Symbolic Link Names

Note: The Oracle Database Configuration Assistant requires a precise number of raw devices for the database files. See *Oracle® Parallel Server Setup and Configuration Guide*, page 2-5, for the number of raw devices, the sizes of the raw partitions, and the symbolic link names necessary for Oracle Database Configuration Assistant files.

Step 1: Install Oracle Parallel Server Raw Devices Management Utilities

To install the Oracle Parallel Server raw devices management utilities, perform the following tasks on *one* node of the cluster:

1. Create a temporary directory.
2. Insert the Oracle8i Enterprise Edition CD-ROM.
3. Copy the contents of the \OPS_PREINSTALL directory to the temporary directory you created.

Note: If you plan to assign symbolic link names after installing Oracle8i Enterprise Edition and creating a database using the Oracle Database Configuration Assistant, do not perform the following step. The ORACLEOBJSERVICE is automatically installed.

4. Install ORACLEOBJSERVICE on all nodes of the cluster by entering the following command from the temporary directory you created:

```
C:\> ORACLEOBJSERVICE /INSTALL
```

This installs the ORACLEOBJSERVICE as an automatic startup type whenever you reboot. This service monitors symbolic link changes and updates all nodes when changes occur on one node.

To remove ORACLEOBJSERVICE, use the following command:

```
C:\> ORACLEOBJSERVICE /REMOVE
```

For more information about the install and remove options, use the following command:

```
C:\> ORACLEOBJSERVICE /HELP
```

Step 2: Create an Extended Partition

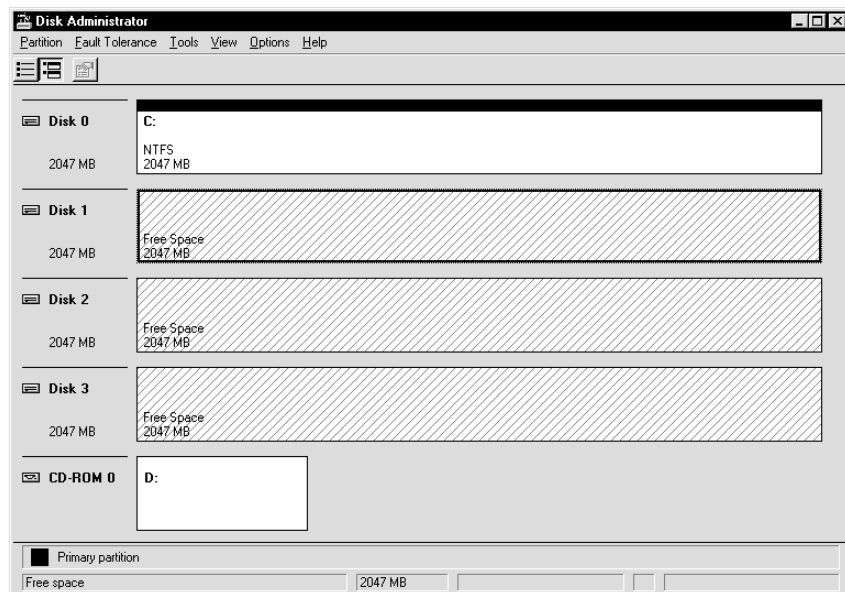
Extended partitions point to raw space on disk drives. Multiple logical partitions are created in these extended partitions.

Only one extended partition can be created per disk. You can use the free space in the extended partition to create multiple logical partitions or use all or part of it when creating volume sets or other kinds of volumes for fault-tolerance purposes.

To create an extended partition, perform the following tasks:

1. Shut down all nodes except one of the nodes.
2. On the node that is up, choose Start > Programs > Administrative Tools > Disk Administrator.

The *Disk Administrator* window appears:



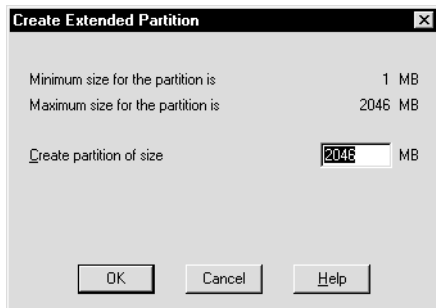
Note the lines display diagonally from top right to the bottom left, indicating unpartitioned devices.

3. Select an area of free space in an extended partition on a disk that is on the shared disk subsystem by clicking the mouse.

Oracle Corporation recommends you use the entire disk.

4. Choose Partition > Create Extended.

The Disk Administrator displays the minimum and maximum sizes for the extended partition:



5. Use the default maximum size, then click OK.

Note: Changes you have made are not saved until you choose Commit Changes Now from the Partition menu or quit the *Disk Administrator*.

The extended partition is created.

Note the lines now display diagonally from top left to bottom right, indicating the partition is an extended partition.

Step 3: Create Logical Partitions

Logical partitions are created on one node of the cluster. To create logical partitions in an extended partition:

Note: Oracle Corporation recommends you do not create more than 120 logical partitions in an extended partition.

1. On one of the nodes, select an area of free space in an extended partition by clicking the mouse on it.
2. Choose Partition > Create.
The *Disk Administrator* window displays the minimum and maximum sizes for the logical partition.
3. Enter the size of the logical partition, then click OK.

Note: You can modify file sizes later, but not the raw devices. File sizes cannot expand the size of the raw device.

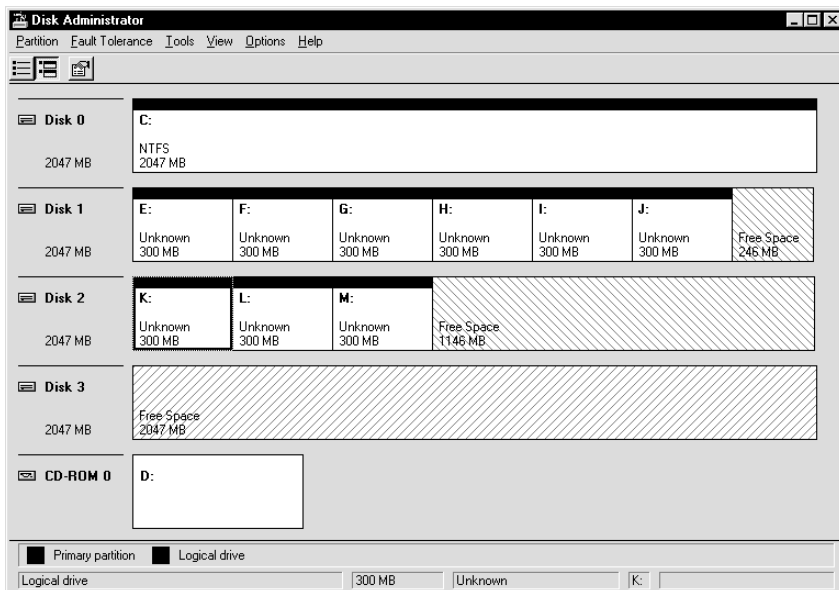
4. Repeat Steps 1-3 until you have the required number of logical partitions.
5. Choose Partition > Commit Changes Now.
A confirmation dialog appears, informing you changes have been made to the disk.
6. Click Yes to acknowledge the message.
A dialog box appears, informing you the disks have been updated successfully.
7. Click OK.
8. Choose Partition > Close.

To make the changes visible, on all nodes of the cluster, choose Options > Refresh.

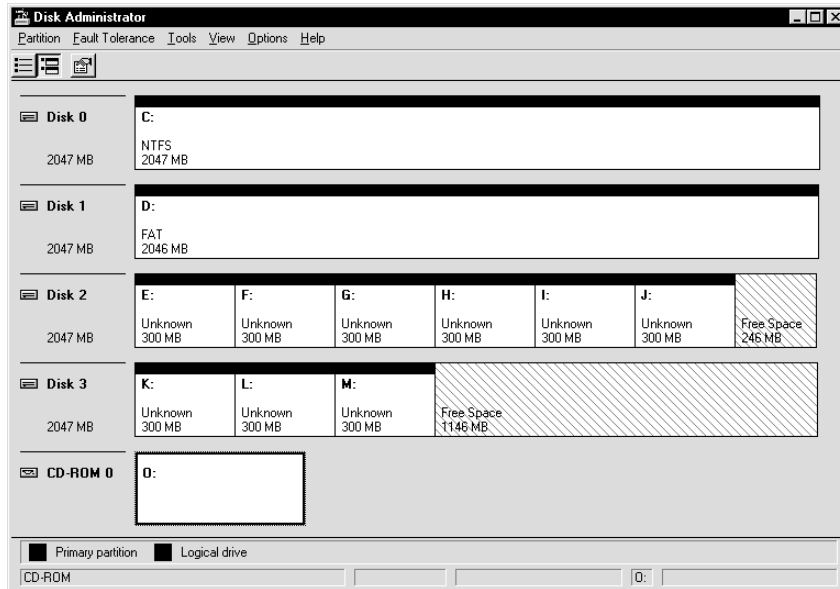
Note: In previous releases, you needed to unassign drive letters. You no longer need to unassign drive letters. This release includes the utility, Oracle Object Link Manager, which automatically unassigns link names.

The hard disks that access the shared area may be different from node to node. The logical partitions, however, that reside on the hard disks must be identical on all nodes.

For example, Node 1 may look like:



Node 2 may look like:



On Node 1, the logical partition E is defined as `\Device\Harddisk1\Partition1`. On Node 2, it is defined as `\Device\Harddisk2\Partition1`. Even though these map to different disks, they map to the same space on the shared disk.

Note: Oracle Database Configuration Assistant requires at least 10 logical partitions.

Step 4: Assign Symbolic Link Names

The Oracle8i Enterprise Edition CD-ROM contains ASCII files (in the `\OPS_PREINSTALL` directory), with symbolic link names already associated with raw partitions for a two-node cluster, supporting a database type created with the Oracle Database Configuration Assistant.

When the Oracle Database Configuration Assistant creates the database, it verifies that the symbolic link names to the extended partitions have been created and stores the files in the raw devices. The names of the partitions use the following format:

```
\\.\ \SYMBOLIC_LINK_NAME
```

The symbolic name uses the database name and the file type.

For example, you can create a symbolic link called OP_REDO1_1 to the second logical partition on the second physical disk:

```
OP_REDO1_1 \DEVICE\HARDDISK2\PARTITION2
```

where OP is the database name and REDO1_1 is the REDO log file.

This release includes a new utility, the Oracle Object Link Manager. Oracle Object Link Manager (GUIORACLEOBJMANAGER.EXE) is a GUI utility that enables you to assign the logical partitions symbolic link names. When you install Object Link Manager, a service named ORACLEOBJSERVICE is installed on each node. This service monitors symbolic link changes and updates all nodes when changes occur on one node.

To assign symbolic link names, perform the following tasks:

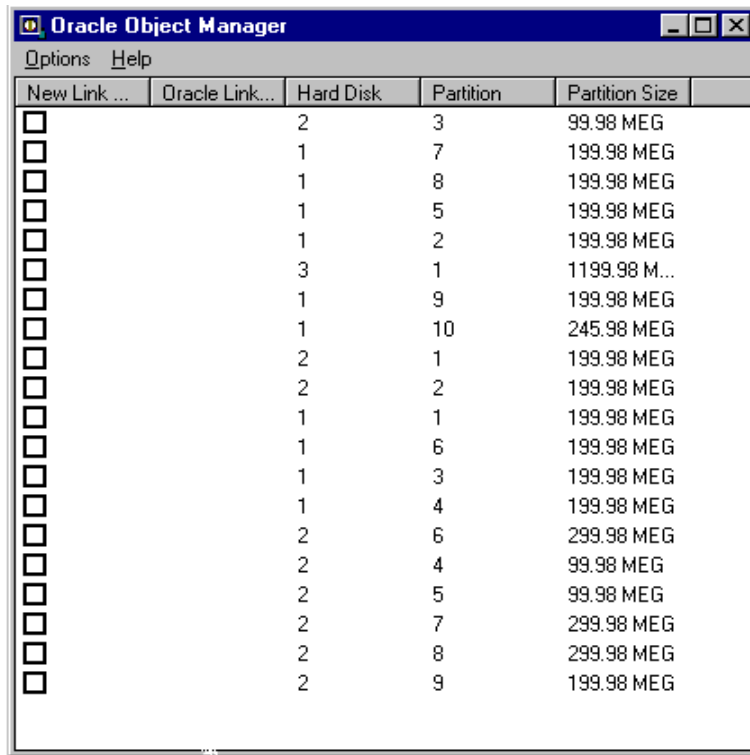
1. Refer to the *Oracle8i Parallel Server Setup and Configuration Guide*, Chapter 2, "Pre-Installation", for the symbolic link names required for Oracle Database Configuration Assistant files.

In addition, add additional entries for log files if your cluster contains more than two nodes or your node numbers are not 0 and 1.

2. Make sure the ORACLEOBJSERVICE is running on all nodes:
 - a. Double-click the Services icon in the *Control Panel* window. The *Services* dialog box appears.
 - b. Select ORACLEOBJSERVICE.
 - c. Click Start.
 - d. Click Close to dismiss *Services* dialog box.
3. To run the Object Link Manager, use the following command on one node in the cluster:

```
C:> GUIORACLEOBJMANAGER.EXE
```

The Object Link Manager appears.



New Link ...	Oracle Link...	Hard Disk	Partition	Partition Size
<input type="checkbox"/>		2	3	99.98 MEG
<input type="checkbox"/>		1	7	199.98 MEG
<input type="checkbox"/>		1	8	199.98 MEG
<input type="checkbox"/>		1	5	199.98 MEG
<input type="checkbox"/>		1	2	199.98 MEG
<input type="checkbox"/>		3	1	1199.98 M...
<input type="checkbox"/>		1	9	199.98 MEG
<input type="checkbox"/>		1	10	245.98 MEG
<input type="checkbox"/>		2	1	199.98 MEG
<input type="checkbox"/>		2	2	199.98 MEG
<input type="checkbox"/>		1	1	199.98 MEG
<input type="checkbox"/>		1	6	199.98 MEG
<input type="checkbox"/>		1	3	199.98 MEG
<input type="checkbox"/>		1	4	199.98 MEG
<input type="checkbox"/>		2	6	299.98 MEG
<input type="checkbox"/>		2	4	99.98 MEG
<input type="checkbox"/>		2	5	99.98 MEG
<input type="checkbox"/>		2	7	299.98 MEG
<input type="checkbox"/>		2	8	299.98 MEG
<input type="checkbox"/>		2	9	199.98 MEG

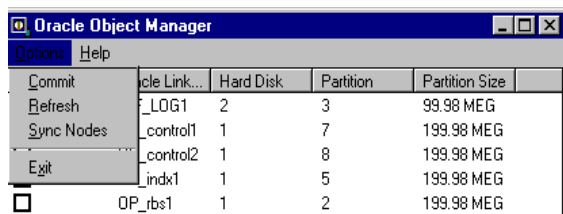
4. To add a mapping:
 - a. Select the row containing the partition that you want to assign a link name.
 - b. Click on the highlighted row to invoke the Edit window.
 - c. Enter the new link name required for the Oracle Database Configuration Assistant file in the New Link Name column. For example, if the database name is OP, add OP_SYSTEM1 for the name of the SYSTEM tablespace data file.
 - d. Press Enter.

Repeat steps a to d for any additional edits.

- e. Choose Options > Commit to save all changes to disk.
 - f. Verify all mappings are correct using Object Link Manager.
5. On all nodes in the cluster, use the Object Link Manager to verify that symbolic links are correct. If you make any changes, choose the Commit menu item.

The logical partitions and their symbolic links appear on the node from which the Oracle Object Manager application is run. Link names may appear in upper case; however, the names are case insensitive.

To force all active nodes to re-synchronize the links, choose Options > Sync Nodes. Run the Object Link Manager on all nodes to refresh the links.



Note: If you create or remove a partition, you need to reassign links by rerunning the Oracle Object Link Manager on the node you made the disk configuration.

You do not need to reboot after making changes. However, if a node is down, it is automatically updated when you reboot. Rebooting also generates a log file, OOBJSERVICE.LOG in the directory where you installed the Oracle Object Service.

Creating Raw Devices for Manual Database Creation

Use this method to create raw devices for manual database creation on a machine that does not contain a previous installation of Oracle Parallel Server on raw devices.

Step 1: Install Oracle Parallel Server Raw Devices Management Utilities

To install the raw devices management utilities, perform the following tasks on *one* node of the cluster:

1. Create a temporary directory.
2. Insert the Oracle8i Enterprise Edition CD-ROM.
3. Copy the contents of the \OPS_PREINSTALL directory to the temporary directory you created.
4. Install ORACLEOBJSERVICE by entering the following command from the temporary directory you created:

```
C:\> ORACLEOBJSERVICE /INSTALL
```

This installs the ORACLEOBJSERVICE as an automatic startup type whenever you reboot. This service monitors symbolic link changes and updates all nodes when changes occur on one node.

To remove ORACLEOBJSERVICE, use the following command:

```
C:\> ORACLEOBJSERVICE /REMOVE
```

For more information about the install and remove options, use the following command:

```
C:\> ORACLEOBJSERVICE /HELP
```

Note: Do *not* run ORACLEOBJSERVICE before using the EXPORTSYMLINKS utility described in Step 3.

Step 2: Create an Extended Partition

Extended partitions point to raw space on disk drives. Multiple logical partitions are created in these extended partitions.

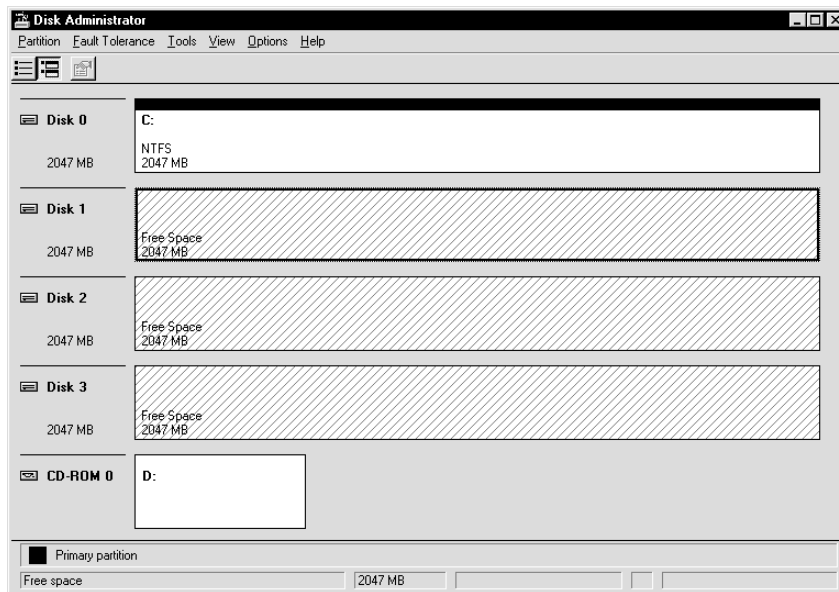
Only one extended partition can be created per disk. You can use the free space in the extended partition to create multiple logical partitions or use all or part of it when creating volume sets or other kinds of volumes for fault-tolerance purposes.

You will need to create a logical partition for each log file, control file, and data file associated with the database. The number of raw devices created depends on the number of the data files, redo log files and control files you plan to create. Oracle Corporation recommends a logical partition of 100 MB.

To create an extended partition, perform the following tasks:

1. Shut down all nodes except one of the nodes.
2. On the node that is up, choose Start > Programs > Administrative Tools > Disk Administrator.

The *Disk Administrator* window appears:



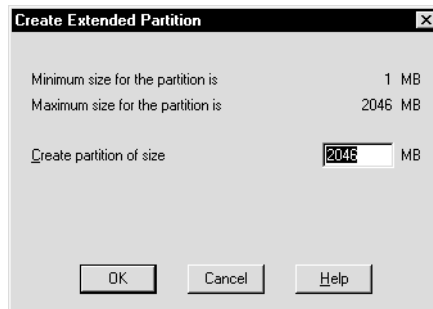
Note the lines display diagonally from top right to the bottom left, indicating unpartitioned devices.

3. Select an area of free space in an extended partition on a disk that is on the shared disk subsystem by clicking the mouse.

Oracle Corporation recommends you use the entire disk.

4. Choose Partition > Create Extended...

The Disk Administrator displays the minimum and maximum sizes for the extended partition:



5. Use the default maximum size, then click OK.

Note: Changes you have made are not saved until you choose Commit Changes Now from the Partition menu or quit the Disk Administrator.

The extended partition is created.

Note the lines now display diagonally from top left to bottom right, indicating the partition is an extended partition.

Step 3: Create Logical Partitions

Logical partitions are created on one node of the cluster. To create logical partitions in an extended partition:

Note: Oracle Corporation recommends you do not create more than 120 logical partitions in an extended partition.

1. On one of the nodes, select an area of free space in an extended partition by clicking the mouse on it.
2. Choose Partition > Create.

The *Disk Administrator* window displays the minimum and maximum sizes for the logical partition.

3. Enter the size of the logical partition, then click OK.

Note: You can modify file sizes later, but not the raw devices. File sizes cannot expand the size of the raw device.

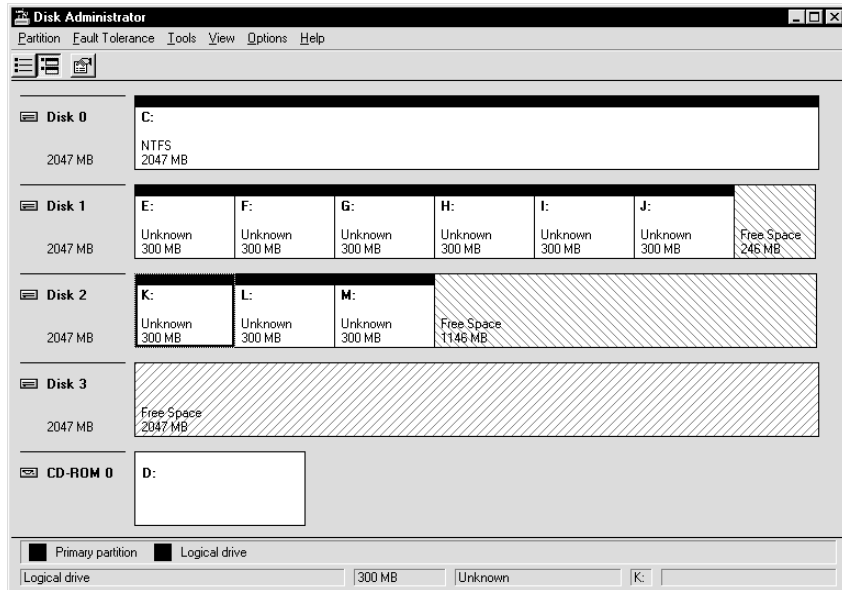
4. Repeat Steps 1-3 until you have the required number of logical partitions.
5. Choose Partition > Commit Changes Now.
A confirmation dialog appears, informing you changes have been made to the disk.
6. Click Yes to acknowledge the message.
A dialog box appears, informing you the disks have been updated successfully.
7. Click OK.
8. Choose Partition > Close.

To make the changes visible, on all nodes of the cluster, choose Options > Refresh.

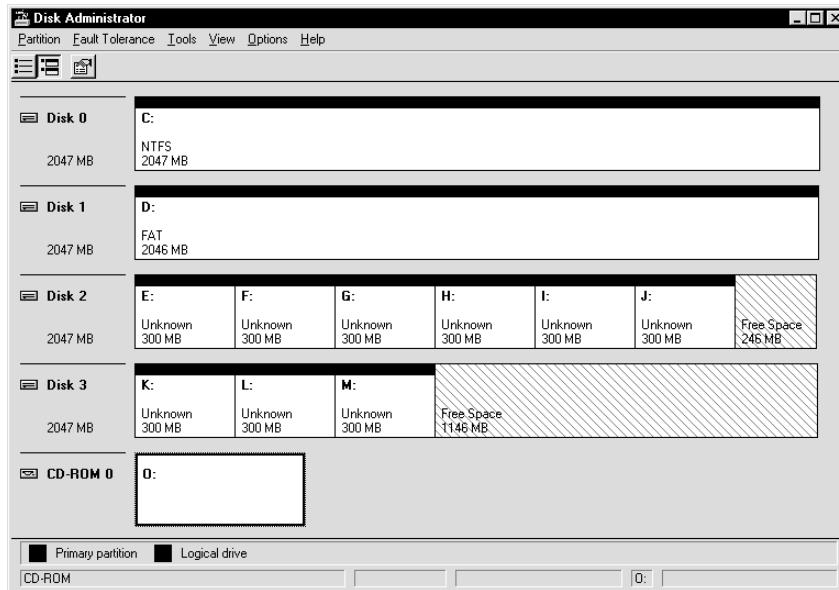
Note:: In previous releases, you needed to unassign drive letters. You no longer need to unassign drive letters. This release includes the utility Oracle Object Link Manager, which automatically unassigns link names.

The hard disks that access the shared area may be different from node to node. The logical partitions, however, that reside on the hard disks must be identical on all nodes.

For example, Node 1 may look like:



Node 2 may look like:



On Node 1, the logical partition E is defined as `\Device\Harddisk1\Partition1`. On Node 2, it is defined as `\Device\Harddisk2\Partition1`. Even though these map to different disks, they map to the same space on the shared disk.

Step 4: Assign Symbolic Link Names

This release includes a new utility, the Oracle Object Link Manager. Oracle Object Link Manager (GUIORACLEOBJMANAGER.EXE) is a GUI utility that enables you to assign the logical partitions symbolic link names. When you install Object Link Manager, a service named ORACLEOBJSERVICE is installed on each node. This service monitors symbolic link changes and updates all nodes when changes occur on one node.

To assign symbolic link names, you create a .TBL file and import it into the Oracle Object Link Manager. Before you proceed, make sure you know the partition sizes and the symbolic link names you want to assign to them.

To assign symbolic links:

Use the EXPORTSYMLINKS utility to generate a list of device names and create a file named SYMMAP.TBL.

1. Use the following command line syntax:

/f:filename If this parameter is not used, the EXPORTSYMLINKS utility exports the symbolic link mappings to the SYMMAP.TBL file in the current directory. Otherwise, the utility exports the symbolic link mappings to the file named *filename*.

For example:

```
EXPORTSYMLINKS /f:MYLINKS.TBL
```

The following table shows a sample disk layout.

Symbolic Name	Raw Device	Size (MB)
system1	\Device\Harddisk2\Partition1	11.98
users1	\Device\Harddisk2\Partition1	11.98
temp1	\Device\Harddisk2\Partition1	11.98
rbs1	\Device\Harddisk2\Partition1	11.98
indx1	\Device\Harddisk2\Partition2	11.98
tools1	\Device\Harddisk2\Partition2	11.98
drsys1	\Device\Harddisk2\Partition2	11.98
control1	\Device\Harddisk2\Partition3	11.98
control2	\Device\Harddisk2\Partition3	11.98
redo1_1	\Device\Harddisk2\Partition3	11.98
redo1_2	\Device\Harddisk2\Partition3	11.98

2. Modify the SYMMAP.TBL file by adding your own symbolic link names to their logical partition assignments.

Note: If you add or delete partitions, you must use EXPORTSYMLINKS to export the SYMMAP.TBL file again on the node you configured the disk. The .TBL file will not be valid.

3. Import the SYMMAP.TBL file into Oracle Object Link Manager with the IMPORTSYMLINKS.EXE utility.

The IMPORTSYMLINKS utility reads a .TBL file and marks the hard disk partitions with the symbolic link names. Use the following command line parameters:

- | | |
|--------------------------|--|
| <code>/f:filename</code> | If this parameter is not used, the IMPORTSYMLINKS utility uses the symbolic link mappings in the SYMMAP.TBL file. Otherwise, the utility uses the symbolic link mappings in the file named <i>filename</i> . |
| <code>/8i</code> | Use this parameter to update all active nodes. |

For example:

```
IMPORTSYMLINKS /f:C:\TEMP\MYLINKS.TBL
```

Note: IMPORTSYMLINKS detects duplicate names and does not import mappings if duplicates are present.

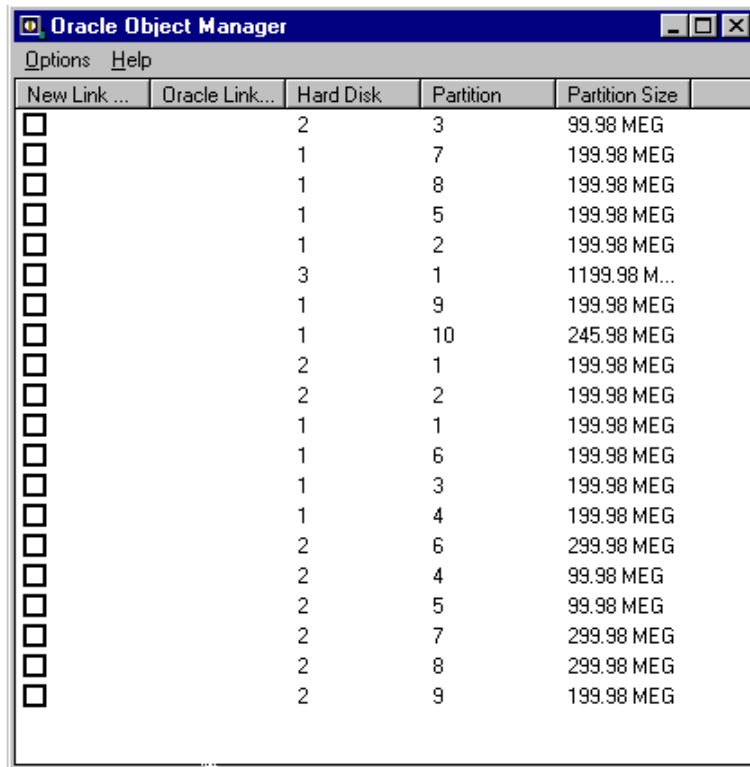
4. Use the Object Link Manager to select and update the symbolic mappings.
 - a. Start the ORACLEOBJSERVICE by entering the following command on all nodes in the cluster:

```
C:\> NET START ORACLEOBJSERVICE
```

- b. To run the Object Link Manager, use the following command on one node in the cluster:

```
C:> GUIORACLEOBJMANAGER.EXE
```

The Object Link Manager appears.



New Link ...	Oracle Link...	Hard Disk	Partition	Partition Size
<input type="checkbox"/>		2	3	99.98 MEG
<input type="checkbox"/>		1	7	199.98 MEG
<input type="checkbox"/>		1	8	199.98 MEG
<input type="checkbox"/>		1	5	199.98 MEG
<input type="checkbox"/>		1	2	199.98 MEG
<input type="checkbox"/>		3	1	1199.98 M...
<input type="checkbox"/>		1	9	199.98 MEG
<input type="checkbox"/>		1	10	245.98 MEG
<input type="checkbox"/>		2	1	199.98 MEG
<input type="checkbox"/>		2	2	199.98 MEG
<input type="checkbox"/>		1	1	199.98 MEG
<input type="checkbox"/>		1	6	199.98 MEG
<input type="checkbox"/>		1	3	199.98 MEG
<input type="checkbox"/>		1	4	199.98 MEG
<input type="checkbox"/>		2	6	299.98 MEG
<input type="checkbox"/>		2	4	99.98 MEG
<input type="checkbox"/>		2	5	99.98 MEG
<input type="checkbox"/>		2	7	299.98 MEG
<input type="checkbox"/>		2	8	299.98 MEG
<input type="checkbox"/>		2	9	199.98 MEG

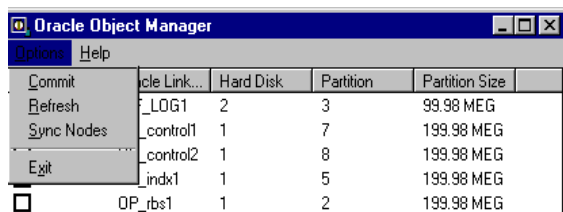
5. To add or rename a mapping:
 - a. Select the row containing the partition that you want to assign a link name.
 - b. Click on the highlighted row to invoke the Edit window.
 - c. Enter the new link name in the New Link Name column. For example, if the database name is OP, add OP_SYSTEM1 for the name of the SYSTEM tablespace data file.
 - d. Press Enter.

Repeat steps a to d for any additional edits.

- e. Choose Options > Commit to save all changes to disk.
 - f. Verify all mappings are correct using Object Link Manager.
6. On all nodes in the cluster, start the ORACLEOBJSERVICE
- a. Double-click the Services icon in the *Control Panel* window.
The *Services* dialog box appears.
 - b. Select ORACLEOBJSERVICE.
 - c. Click Start.
 - d. Click Close to dismiss *Services* dialog box.
7. On all nodes in the cluster, use the Object Link Manager to verify that symbolic links are correct.

The logical partitions and their symbolic links appear on the node from which the Oracle Object Manager application is run. Link names may appear in upper case; however, the names are case insensitive.

To force all active nodes to re-synchronize the links, choose Options > Sync Nodes. Run the Object Link Manager on all nodes to refresh the links.



Note: If you create or remove a partition, you need to reassign links by rerunning the Oracle Object Link Manager on the node you made the disk configuration.

You do not need to reboot after making changes. However, if a node is down, it is automatically updated when you reboot. Rebooting also generates a log file, OOBISERVICE.LOG in the directory where you installed the Oracle Object Service.

Creating Raw Devices for Manual Database Creation with a Current Configuration

Use the method described in this section to create raw devices for manual database creation if you have a current configuration.

To create the raw devices, perform the following steps:

- Backup Raw Partitions
- Step 1: Install Oracle Parallel Server Raw Devices Management Utilities
- Step 2: Create an Extended Partition
- Step 3: Create Logical Partitions
- Step 4: Assign Symbolic Link Names

Backup Raw Partitions

To back up the raw partitions, perform the following tasks:

1. Start the OSD layer, as described in your vendor documentation. Perform diagnostics on the clusterware as described in your vendor documentation.
2. Backup raw partitions using OCOPY. Enter the following syntax:

```
C:\> OCOPY \\.\PHYSICALDRIVEN NEW_FILE
```

where:

- *PHYSICALDRIVE* is the physical drive that holds a single raw database file
- *N* is the number(s) representing each of the physical drives in the system
- *NEW_FILE* is the name and location of the backup copy

For example, to backup the logical partition for a system tablespace to a file, enter:

```
C:\> OCOPY \\. \OPS_SYSTEM1 OPS_SYSTEM1
```

Use your existing partitions and symbolic link names. Oracle Corporation recommends you backup logical partitions to files with the same name. For example, backup \\. \OPS_SYSTEM1 to a file named OPS_SYSTEM1.

See: *Oracle8i Administrator's Guide for Windows NT*, Chapter 11, Backing Up and Recovering Database Files, on using OCOPY.

Step 1: Install Oracle Parallel Server Raw Devices Management Utilities

To install the raw devices management utilities, perform the following tasks on one node of the cluster:

1. Create a temporary directory.
2. Insert the Oracle8i Enterprise Edition CD-ROM.
3. Copy the contents of the \OPS_PREINSTALL directory to the temporary directory you created.
4. Install ORACLEOBJSERVICE by entering the following command from the temporary directory you created:

```
C:\> ORACLEOBJSERVICE /INSTALL
```

This installs the ORACLEOBJSERVICE as an automatic startup type whenever you reboot. This service monitors symbolic link changes and updates all nodes when changes occur on one node.

To remove ORACLEOBJSERVICE, use the following command:

```
C:\> ORACLEOBJSERVICE /REMOVE
```

For more information about the install and remove options, use the following command:

```
C:\> ORACLEOBJSERVICE /HELP
```

Note: Do *not* run ORACLEOBJSERVICE before using the EXPORTSYMLINKS utility described in Step 3.

Step 2: Create an Extended Partition

Follow the steps in the previous section, on page 3-19, if you need to create an extended partition for additional logical partitions.

Step 3: Create Logical Partitions

Follow the steps in the previous section, on page 3-24, to create additional logical partitions in the extended partition.

Step 4: Assign Symbolic Link Names

This release includes a new utility, the Oracle Object Link Manager. Oracle Object Link Manager (GUIORACLEOBJMANAGER.EXE) is a GUI utility that enables you to assign the logical partitions symbolic link names. When you install Object Link Manager, a service named ORACLEOBJSERVICE is installed on each node. This service monitors symbolic link changes and updates all nodes when changes occur on one node.

To verify and assign symbolic link names, use the EXPORTSYMLINKS utility to generate a list of device names and create a file named SYMMAP.TBL. If valid symbolic mappings exist in a .TBL file, you can also import that file.

To use the EXPORTSYMLINKS utility:

1. Use the following command line syntax:

/f:filename

If this parameter is not used, the EXPORTSYMLINKS utility exports the symbolic link mappings to the SYMMAP.TBL file in the current directory. Otherwise, the utility exports the symbolic link mappings to the file named *filename*.

For example:

```
EXPORTSYMLINKS /f:MYLINKS.TBL
```

The following table shows a sample disk layout.

Symbolic Name	Raw Device	Size (MB)
system1	\Device\Harddisk2\Partition1	11.98
users1	\Device\Harddisk2\Partition1	11.98
temp1	\Device\Harddisk2\Partition1	11.98
rbs1	\Device\Harddisk2\Partition1	11.98
indx1	\Device\Harddisk2\Partition2	11.98
tools1	\Device\Harddisk2\Partition2	11.98
drsyst1	\Device\Harddisk2\Partition2	11.98
control1	\Device\Harddisk2\Partition3	11.98
control2	\Device\Harddisk2\Partition3	11.98
redo1_1	\Device\Harddisk2\Partition3	11.98
redo1_2	\Device\Harddisk2\Partition3	11.98

2. Only links mapped to a valid shared disk and partition are exported. Duplicate symbolic links are indented. Check the SYMMAP.TBL file carefully for the following:
 - Duplicate symbolic link names
 - Symbolic link names point to partitions which are not logical partitions
 - Symbolic link names point to logical partitions which are not part of a valid file system
 - Symbolic link names are missing

If any of these issues exist, see the Troubleshooting section in Chapter 4, "Managing Raw Devices" before proceeding.
3. Modify the SYMMAP.TBL file as needed.

Note: If you add or delete partitions, you must use EXPORTSYMLINKS to export the SYMMAP.TBL file again on the node you reconfigured the disk. The .TBL file will not be valid.

4. Import the SYMMAP.TBL file into Oracle Object Link Manager with the IMPORTSYMLINKS.EXE utility.

The IMPORTSYMLINKS utility reads a .TBL file and marks the hard disk partitions with the symbolic link names. Use the following command line parameters:

- | | |
|--------------------|--|
| <i>/f:filename</i> | If this parameter is not used, the IMPORTSYMLINKS utility uses the symbolic link mappings in the SYMMAP.TBL file. Otherwise, the utility uses the symbolic link mappings in the file named <i>filename</i> . |
| <i>/8i</i> | Use this parameter to update all active nodes. |

For example:

```
IMPORTSYMLINKS /f:C:\TEMP\MYLINKS.TBL
```

Note: IMPORTSYMLINKS detects duplicate names and does not import mappings if duplicates are present.

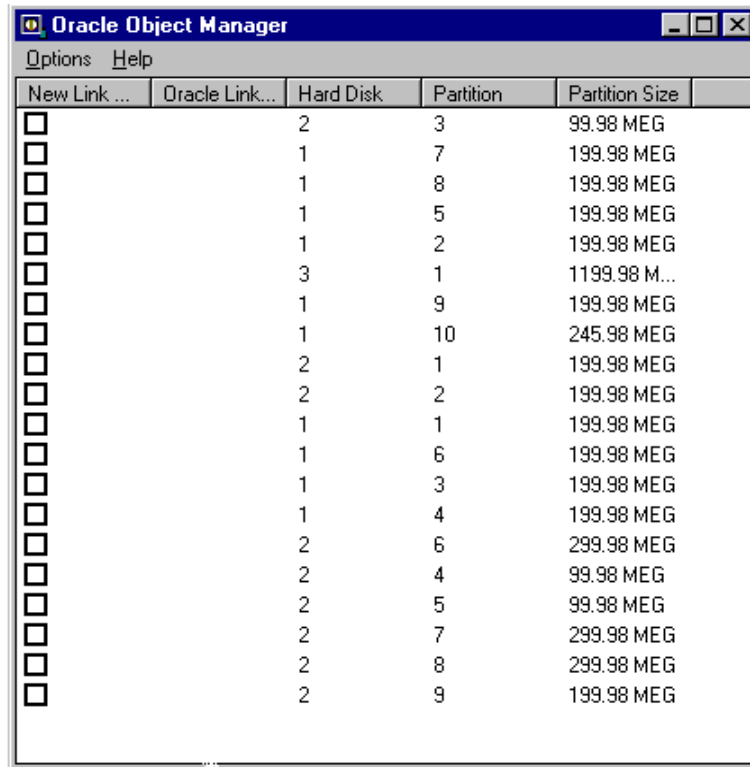
5. Use the Object Link Manager to select and update the symbolic mappings.
 - a. Start the ORACLEOBJSERVICE by entering the following command on all nodes in the cluster:

```
C:\> NET START ORACLEOBJSERVICE
```

- b. To run the Object Link Manager, use the following command on one node in the cluster:

```
C:> GUIORACLEOBJMANAGER.EXE
```

The Object Link Manager appears.



6. To add or rename a mapping:
 - a. Select the row containing the partition that you want to assign a link name.
 - b. Click on the highlighted row to invoke the Edit window.
 - c. Enter the new link name in the New Link Name column. For example, if the database name is OP, add OP_SYSTEM1 for the name of the SYSTEM tablespace data file.
 - d. Press Enter.

Repeat steps a to d for any additional edits.

- e. Choose Options from the menu and then choose the Commit menu item to save all changes to disk.
 - f. Verify all mappings are correct using Object Link Manager.
7. On all nodes in the cluster, start the ORACLEOBJSERVICE
 - a. Double-click the Services icon in the *Control Panel* window. The *Services* dialog box appears.
 - b. Select ORACLEOBJSERVICE.
 - c. Click Start.
 - d. Click Close to dismiss *Services* dialog box.
 8. On all nodes in the cluster, use the Object Link Manager to verify that symbolic links are correct.

The logical partitions and their symbolic links appear on the node from which the Oracle Object Manager application is run. Link names may appear in upper case; however, the names are case insensitive.

To force all active nodes to re-synchronize the links, choose Options > Sync Nodes menu item. Run the Object Link Manager on all nodes to refresh the links.

The screenshot shows the Oracle Object Manager application window. The menu bar includes 'Options' and 'Help'. The 'Options' menu is open, showing 'Commit', 'Refresh', 'Sync Nodes', and 'Exit'. Below the menu is a table with the following data:

	cle Link...	Hard Disk	Partition	Partition Size
	_LOG1	2	3	99.98 MEG
	_control1	1	7	199.98 MEG
	_control2	1	8	199.98 MEG
	_indx1	1	5	199.98 MEG
<input type="checkbox"/>	OP_rbs1	1	2	199.98 MEG

Note: If you create or remove a partition, you need to reassign links by rerunning the Oracle Object Link Manager on the node you made the disk configuration.

You do not need to reboot after making changes. However, if a node is down, it is automatically updated when you reboot. Rebooting also generates a log file, OOBJSERVICE.LOG in the directory where you installed the Oracle Object Service.

Managing Raw Devices

This chapter describes additional command line utilities that allow you to manage raw devices. Specific topics discussed are:

- Raw Devices Management Utilities
- Reformat an Entire Disk
- Remove All Drive Letters
- Initialize All Space on a Logical Partition
- Create Logical Drives
- Review Disk Layout
- Troubleshooting

Raw Devices Management Utilities

The raw devices management utilities work only with raw devices set up for Oracle8i applications. The raw devices and their partitions have the following characteristics:

- Must contain only one extended partition
- Must not contain a valid NTFS or FAT partition
- Must not contain a primary partition

Before you run these utilities, it is assumed you have created logical partitions. If you need to create a logical partition to add a symbolic link name, use the CRLOGDR utility or Windows NT Disk Administrator. For the steps to create logical partitions, see page 3-11.

Reformat an Entire Disk

The DELETEDISK utility reformats an entire disk and deletes the contents. It uses the following command line parameters:

<i>/ddrive_number</i>	Required. You must specify this parameter where <i>drive_number</i> is the number of the disk.
<i>/q</i>	Optional. Quiet mode. You are not prompted for format confirmation.
<i>/fsd</i>	Optional. Use this parameter to format a hard disk even if it contains a valid File System partition.

For example, if you want to delete all the logical partitions on disk 2, use the following command:

```
C:> DELETEDISK /d2
```

After you run the DELETEDISK utility, you must run Disk Administrator on all nodes to reinitialize the disk signatures.

To run Disk Administrator:

1. Choose Start > Programs > Administrative Tools > Disk Administrator on *all* the nodes.

On all nodes a dialog box appears, informing you the disk configuration has been detected. If the dialog box does not appear, the disk configuration may still have changed.

2. Click OK.

Remove All Drive Letters

The LETTERDELETE utility removes all drive letters from partitions and updates the disk key registry to disable reboot mappings. Use this utility when drive letters are reassigned after partitions are created, and for troubleshooting. You do not need to specify any command line parameters.

For example:

```
C:> LETTERDELETE
```

Initialize All Space on a Logical Partition

The LOGPARTFORMAT utility initializes all space in a logical partition to zero and removes the symbolic link name. Use this utility if you have old information in the control files. The only parameter you need to specify is the name of the logical partition that you want to use. For example if you want to initialize all space on the \\.\ops_db12 partition to zero, use the following command:

```
C:> LOGPARTFORMAT \\.\OPS_DB12
```

Create Logical Drives

The CRLOGDR utility enables you to create and delete logical drives and their associated symbolic names on a disk that does not have a primary partition and has only one extended partition.

The utility supports eight parameters, as follows:

- /d Zero indexed drive number (required parameter)
- /s Logical drive size
- /n Logical drive number
- /o Free space offset from beginning of extended partition
- /l Symbolic name
- /r Removes logical drive or symbolic name
- /p Print disk layout
- /b Suppress banner

Usage Notes

To avoid re-sequencing problems when the server reboots, Oracle Corporation recommends that you use the CRLOGDR utility only to:

- Remove logical drives from the end of the extended partition
- Add logical drives to the end of the partition by specifying the offset of the last free space

Examples

The following examples show how to use CRLOGDR.

Example 1

To create a logical drive of 300 MB on disk 3 with no symbolic name:

```
CRLOGDR /d3 /s 300
```

Example 2

To create a logical drive of 100 MB on disk 3 with the symbolic name 'CONTROL1':

```
CRLOGDR /d3 /s 100 /l CONTROL1
```

Example 3

To assign the symbolic name 'SYSTEM1' to the previously created second logical drive (2):

```
CRLOGDR /d3 /n 2 /l SYSTEM1
```

Example 4

To create a logical drive of 300 MB on disk 3 at offset 100 MB with no symbolic name:

Note: The offset /o parameter must be the starting offset of the free space.

```
CRLOGDR /d3 /s 300 /o 100
```

Example 5

To remove the second logical drive on disk 3:

Note: This command also removes the symbolic name associated with the drive.

```
CRLOGDR /d3 /r /n 2
```

Example 6

To remove the symbolic name 'CONTROL1' (there is no need to supply disk number):

```
CRLOGDR /r /l CONTROL1
```

Review Disk Layout

You can review the disk layout by using the CRLOGDR utility's print parameter (/p). To print the layout of disk 4, for example:

```
CRLOGDR /d4 /p
```

```
Oracle Corporation. Copyright (c) 1998. All rights reserved.
```

```
crlogdr - Version 1.0
```

NUM	SIZE(MB)	SYMBOLIC NAME	TYPE	OFFSET(MB)
1	300	DSS_TABLES	6	0
2	300	OLTP_TABLES	6	300
3	300	PD_TPCB01	6	600
4	300	OLTP_INDX	6	900
5	300	OLTP_RBS	6	1200
6	300	PD_TPCB04	6	1500
7	200	OPS_RBS01	6	1800
*Free	5	--	--	2000

```
Total Free Space: 5MB
```

The columns have the following significance:

Column	Description
NUM	Logical drive number or free space.
SIZE	Size of logical drive or free space.
SYMBOLIC NAME	Symbolic name associated with the drive, if any. Two hyphens (-) mean no symbolic name has been assigned to the drive.
TYPE	Type of partition, where 6 indicates a large MS-DOS partition and 7 indicates an NTFS partition. Note: Raw disk partitions have no file system.
OFFSET	Offset of the partition from the beginning of the extended partition.

Troubleshooting

Mappings Do Not Appear

If mappings do not appear in the Oracle Object Link Manager, make sure the ORACLEOBJSERVICE is started on all nodes in the cluster.

To start the service:

1. Double-click the Services icon in the *Control Panel* window. The *Services* dialog box appears.
2. Select ORACLEOBJSERVICE.
3. Click Start.
4. Click Close to dismiss *Services* dialog box.

General Troubleshooting

Some troubleshooting items are related to improper installation of the clusterware. Consult your hardware vendor documentation.

Unable to Start a Dedicated Server Process

Make sure ORACLESERVICESID and TNS LISTENER run under the same Windows NT account with the same user ID.

Windows NT Disk Administrator Cannot Create Partitions

Most likely, an extended partition was not created. Follow the steps page 3-11, *Create Logical Partitions in an Extended Partition*, to first create the extended partition and the multiple logical partitions within the extended partition.

Symbolic Link Names in .TBL File Are Not Exported

Only symbolic link names mapped to a valid shared disk and partition are exported. If you are exporting a .TBL file with current mappings (the default name is SYMMAP.TBL), check the file carefully.

The following table describes the problems you may encounter, and their solutions.

Problem	Solution
Duplicate symbolic link names	Edit the .TBL file by deleting the second occurrence of the symbolic link name. The IMPORTSYMLINKS utility removes duplicate names for any devices.
Symbolic link names point to logical partitions which are not part of a valid file system	<p>The raw devices and their partitions must not contain a valid NTFS or FAT partition.</p> <ol style="list-style-type: none"> 1. Use the Windows NT Disk Administrator to assign a drive letter. 2. Verify that you do not want to use the partition. Most likely, the logical partition does not contain any valid data. 3. Use the LOGPARTFORMAT utility to delete the partition and file system.
Symbolic link names point to partitions which are not logical partitions	<p>The raw devices and their partitions must contain only one extended partition, and not a primary partition.</p> <ol style="list-style-type: none"> 1. Use OCOPY to copy the partition data for every partition. 2. Verify that you do not want to use any logical partitions. Use the DELETEDISK utility to reformat the entire disk. 3. Run Disk Administrator to reinitialize the disk signatures. 4. Follow the steps page 3-29, Creating Raw Devices for Manual Database Creation with a Current Configuration. (You will need to create logical partitions within an extended partition.) <p>See: Backup Raw Partitions on page 3-29 on how to use OCOPY.</p>
Symbolic link names are missing in the .TBL file.	Add symbolic link names to the .TBL file before exporting.

A

Directory Structure

Specific topics covered in this appendix are:

- Understanding the 8.1.6 Database Directory Trees
- Windows NT Directory Structure

Understanding the 8.1.6 Database Directory Trees

When you install Oracle8i Enterprise Edition and the Oracle Parallel Server Option with the Typical installation option, all subdirectories are under a top level *ORACLE_BASE* 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, *ORACLE_BASE* is *C:\ORACLE*.

\ORACLE_HOME directories are located under *ORACLE_BASE*. The *\ADMIN* and *\OPS* directories are also located under *ORACLE_BASE*.

Windows NT Directory Structure

The following is the hierarchical directory tree of a sample OFA-compliant database for Oracle Parallel Server:

<i>C:\ORACLE_BASE</i>	<i>C:\ORACLE</i> is the default <i>ORACLE_BASE</i> directory
<i>\ORACLE_HOME</i>	<i>\ORA81</i> is the name of the Oracle home by default
<i>\BIN</i>	Subtree for Oracle binaries
<i>\NETWORK</i>	Subtree for Net8 configuration files, including <i>TNSNAMES.ORA</i> , <i>LISTENER.ORA</i> and <i>SQLNET.ORA</i>
<i>\OPS</i>	Files created by Oracle Database Configuration Assistant
<i>\OPSM</i>	<i>\ADMIN</i> subdirectory
<i>\ADMIN</i>	Oracle Parallel Server <i>OPS.SQL</i> script and initialization parameter files for database creation
<i>\DATABASE</i>	This is a legacy directory from previous releases. It contains initialization files that point to the new directory location for the initialization parameter files, <i>ORACLE_BASE\ADMIN\DB_NAME\PFIL</i> .
...	
<i>\ADMIN</i>	Subtree for Oracle Parallel Server database administration files

\DB_NAME	DB_NAME database administration files for the instance identified by SID
\ADHOC	Ad hoc SQL scripts
\ADUMP	Audit files
\ARCH	Archived redo log files
\BDUMP	Background process trace files
\CDUMP	Core dump files
\CREATE	Programs used to create the database
\EXP	Database export files
\PFILE	Initialization parameter files
\UDUMP	User SQL trace files

Index

Symbols

\\.\PhysicalDriveX, 3-5

A

ALTER DATABASE CONVERT statement, 2-27

ALTER DATABASE OPEN RESETLOGS
statement, 2-27

B

backups

- before migration, 2-20
- raw partitions, 2-34, 3-29

C

C:\ORACLE, explained, A-2

CATALOG.SQL script, 2-28, 2-42

CATPARR.SQL script, 2-28

CATPROC.SQL script, 2-28, 2-42

CATREP.SQL script, 2-28

CHECK_ONLY

Migration utility option, 2-17

Choose Start >, defined, xix

cluster

- preparing for migration, 2-13
- preparing for upgrade, 2-33

co-existence, 2-2

configuring

- global database name, 2-12
- SID Prefix, 2-12

contacting

Oracle Support Services, viii

Technical Publications, vii

control files

renaming or removing for migration, 2-19, 2-38

CRLOGDR

parameters, 4-4

reviewing disk layout, 4-6

current configuration

raw devices, 3-29

D

database files

for raw devices, 3-9

databases

backing up for migration, 2-20

DELETEDISK

parameters, 4-2

directory structure, A-1 to A-3

disk definition

naming convention, 3-4

disk layout

reviewing, 4-6

sample, 3-25

drive letters

removing, 4-3

unassigning, 3-22

E

environment variables

required for migration, 2-15

EXPORTSYMLINKS

exporting SYMMAP.TBL, 3-25

parameters, 3-24

extended partition
defined, 3-3

F

features
new in release 8.1, 2-2
file sizes
modifying, 3-22

G

general troubleshooting, 4-7
global database name, 2-12

H

HOME_NAME, defined, xx
HOMEID, defined, xx

I

IMPORTSYMLINKS, 3-26
importing SYMMAP.TBL, 3-26
parameters, 3-26
information on Oracle Parallel Server, generic, 1-3
initialization parameters
adjusting for release 8.1, 2-39
initializing all space, 4-3
installing
Oracle Parallel Server
with Typical installation type, 2-10, 2-11,
2-36
raw management utilities, 3-10
with Oracle Universal Installer, 2-10
instances
SID Prefix, 2-12
italics, defined, xx

L

LETTERDELETE
parameters, 4-3
logical partitions
for Oracle Database Configuration
Assistant, 3-12

initializing all space, 4-3
naming convention, 3-6
LOGPARTFORMAT, 4-3

M

manual database creation
raw devices, 3-19
mappings do not appear, troubleshooting, 4-7
MIGRATE.BSQ script, 2-20
migrating
ALTER DATABASE CONVERT statement, 2-27
ALTER DATABASE OPEN RESETLOGS
statement, 2-27
control files, 2-19, 2-38
from Oracle7, 2-3
MIGRATE user, avoid, 2-5
MIGRATE.BSQ script, 2-20
offline tablespaces, 2-5
ORADIM, 2-18, 2-37
OUTLN user, avoid, 2-5
post-migration steps, 2-21
prepare the Oracle7 source database, 2-3
preparing the cluster, 2-13
scripts
CATALOG.SQL, 2-28
CATPARR.SQL, 2-28
CATPROC.SQL, 2-28
CATREP.SQL, 2-28
R0703040.SQL, 2-28
rerunning, 2-28
U0703040.SQL, 2-28
UTLRP.SQL, 2-28
SQL*Net requirement, 2-7
Migration utility
options
CHECK_ONLY, 2-17
privileges required, 2-15
running, 2-18
multiple Oracle homes, 2-46
defined, xx

N

naming conventions

disk definition, 3-4
new features, 1-2

O

OCOPY

backing up raw partitions, 3-29

Oracle Database Configuration Assistant

logical partitions, 3-12

raw devices, 3-9

symbolic link names, 3-15

Oracle Object Link Manager, 3-16

ORACLEOBJSERVICE, 3-24

Oracle Parallel Server

documentation, 1-3

generic information, 1-3

overview, 1-1 to 1-3

Oracle Universal Installer, 2-10

ORACLE_HOME

explained, xx

Oracle7

preparing for migration, 2-3

ORACLEOBJSERVICE, 3-24

ORADIM

migrating, 2-18, 2-37

upgrading, 2-37

OUTLN user

avoid, 2-5, 2-31

P

partition

extended, 3-3

logical partition, 3-6

physical disk, 3-5

PhysicalDrive, 3-5

post-migration steps, 2-21

post-upgrade steps, 2-44

prerequisites, xviii

primary partitions

definition, 3-2

Procedural Option

required for migration, 2-3

R

R0703040.SQL script

replication, 2-28

raw devices

additional management utilities, 4-2

CRLOGDR utility, 4-4

for current configuration, 3-29

for manual database creation, 3-19

for Oracle Database Configuration

Assistant, 3-9

LOGPARTFORMAT, 4-3

modifying file sizes, 3-22

reformatting a disk, 4-2

removing drive letters, 4-3

troubleshooting SYMMAP.TBL file, 4-8

raw partition

backing up, 2-34, 3-29

definition, 3-2

logical partition, 3-6

overview, 3-2

physical disk, 3-5

reformatting disk, DELETEDISK, 4-2

related documents, xix

release 8.1, new features, 2-2

resources, for database administrators and

developers, xiii

rolling upgrades, 2-2

S

scripts

rerunning, 2-28, 2-42

upgrading, 2-41

SID Prefix, 2-12

SQL*Net

requirement, 2-7

square brackets, defined, xix

Support Services, contacting, viii

symbolic link names

for Oracle Database Configuration

Assistant, 3-15

re-synchronize links, 3-18

troubleshooting, 4-8

unassign drive letters, 3-22

using Oracle Object Link Manager, 3-16

SYMMAP.TBL

creating, 3-25

modifying, 3-25

troubleshooting, 4-8

T

tablespaces

- migrating offline tablespaces, 2-5

Technical Publications, contacting, vii

troubleshooting

- general, 4-7

- mappings do not appear, 4-7

- symbolic link names in *.TBL File not exported, 4-8

- unable to start a dedicated server process, 4-7

- Windows NT Disk Administrator cannot create partitions, 4-7

U

U0703040.SQL script, 2-28

upgrading

- initialization parameters, 2-39

- manually, 2-37

- ORADIM, 2-37

- OUTLN user, avoid, 2-31

- post-upgrade steps, 2-44

- preparing the cluster, 2-33

- preparing to upgrade, 2-31

- scripts, 2-41

 - CATALOG.SQL, 2-42

 - CATPROC.SQL, 2-42

 - rerunning, 2-42

- steps, 2-31

UTLRP.SQL script, 2-28

W

Windows NT Disk Administrator

- troubleshooting, 4-7

- using, 3-3