Oracle9*i*

Installation Guide

Release 2 (9.2.0.2) for hp OpenVMS Alpha

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Oracle9*i* Installation Guide, Release 2 (9.2.0.2) for hp OpenVMS Alpha

Part No. B10508-01

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> osdwrite_us@oracle.com

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

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

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Preface

Purpose

This guide and the *Oracle9i Administrator's Reference Release 2 (9.2.0.2) for hp OpenVMS Alpha* provide instructions for installing and configuring Oracle9*i* Release 2 (9.2.0.2) on hp OpenVMS Alpha systems. Documentation for the products that are included with this software is in the Oracle9*i* generic documentation set.

Refer to important release information in .

Audience

This document is intended for anyone responsible for installing Oracle9*i* Release 2 (9.2.0.2) on OpenVMS Alpha systems.

Documentation Accessibility

Our goal is to make Oracle products, services, and supporting documentation accessible, with good usability, to the disabled community. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Standards will continue to evolve over time, and Oracle Corporation is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For additional information, visit the Oracle Accessibility Program Web site at

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JAWS, a Windows screen reader, may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, JAWS may not always read a line of text that consists solely of a bracket or brace.

Accessibility of Links to External Web Sites in Documentation

This documentation may contain links to Web sites of other companies or organizations that Oracle Corporation does not own or control. Oracle Corporation neither evaluates nor makes any representations regarding the accessibility of these Web sites.

Oracle9*i* Standard Edition and Oracle9*i* Enterprise Edition

Unless noted otherwise, features and functionality described in this document are common to both Oracle9i Standard Edition and Oracle9i Enterprise Edition.

For the Latest Information

For the latest information about Oracle9i and related products, see the **README** files in the Oracle product directories.

Install Only Licensed Products

You are entitled to install and use only those products for which you have a current Oracle license agreement.

Typographic Conventions

`monospace`	Monospace type indicates OpenVMS DCL commands, directory names, usernames, pathnames, and filenames.
brackets [ ]	Words enclosed in brackets indicate key names (for example, Press [Return]). Note that brackets have a different meaning when used in command syntax.
italics	Italic type indicates a logical, including logicals portions of filenames. It is also used for emphasis.
UPPERCASE	Uppercase letters indicate Structured Query Language (SQL) reserved words, initialization parameters, and environment logicals.

Command Syntax

HP OpenVMS Alpha command syntax appears in `monospace` font. The "`$`" character at the beginning of command examples should not be entered at the prompt.

hyphen -	A hyphen indicates a command that is too long to fit on a single line. Enter the line as printed or enter it as a single line without a hyphen:
	
	`copy disk$server25:[oracle920.rdbms.admin]*.sql -`
	`disk$server2:[oracle.rdbms.admin]`

braces { }	Braces indicate required items: `.DEFINE {macro1}`
brackets [ ]	Brackets indicate optional items: `cvtcrt` *`termname`* `[`*`outfile`*`]` Note that brackets have a different meaning when used in regular text.

ellipses ...	Ellipses indicate an arbitrary number of similar items:
	`CHKVAL fieldname value1 value2... valueN`
italics	Italic type indicates a variable. Substitute a value for the logical: `library_name`
vertical line |	A vertical line indicates a choice within braces or brackets:
	`SIZE filesize [K|M]`

Related Documentation

Information about system administration and tuning for a production database system is provided in the following documents:

- *Oracle9i Administrator's Reference Release 2 (9.2.0.2) for hp OpenVMS Alpha*

- *Oracle9i Database Administrator's Guide*

- *Oracle9i Net Services Administrator's Guide*

- *Oracle9i Net Services Reference Guide*

- *Oracle9i Database Performance Tuning Guide and Reference*

Information about migrating from a previous version of Oracle Server is provided in *Oracle9i Database Migration.*

Oracle Services and Support

The Oracle corporate web page is located at the following web site:

```
http://www.oracle.com
```

Oracle Corporation offers a wide range of services to help facilitate corporate system solutions, including Oracle Education courses, Oracle Consulting services, and Oracle Support Services from the website. In addition, Oracle Corporation provides free trial software, updates on Oracle products, and service and technical brochures and data sheets.

Oracle Support Services

Technical Support contact information worldwide is listed at the following web site:

```
http://www.oracle.com/support
```

Templates are provided to help you prepare information about your problem before you call. You will also need your CSI number (if applicable) or complete contact details, including any special project information.

Oracle MetaLink

Oracle MetaLink is the Oracle Corporation web service for technical information. Members of Oracle MetaLink can search for updates, alerts, patches, and other information about products, releases, and operating systems, and can set preferences to be notified automatically of new information. MetaLink offers a variety of services to assist in setting up and administering Oracle products, including procedures, scripts, commentary, and tuning and configuration best-practices bulletins. In addition, it offers forums for information sharing among Oracle customers, and direct communication with Oracle Support. Oracle MetaLink is available to Product Support Customers at no extra cost. Sign up for free membership for this service at the following web site:

```
http://www.oracle.com/support/metalink
```

Use your Support Access Code (SAC) number to register.

Products and Documentation

For U.S.A. customers, Oracle Store is at the following web site:

```
http://store.oracle.com
```

Links to Stores in other countries are provided from this site.

Product documentation can be found at the following web site:

```
http://docs.oracle.com
```

Customer Service

Global Customer Service contacts are listed at the following web site:

```
http://www.oracle.com/support/
```

Education and Training

Training information and worldwide schedules are available from the following web site:

```
http://education.oracle.com
```

Oracle Technology Network

Register with the Oracle Technology Network (OTN) at the following web site:

```
http://technet.oracle.com
```

OTN delivers technical papers, code samples, product documentation, self-service developer support, and Oracle key developer products to enable rapid development and deployment of applications built on Oracle technology.

Support for Hearing and Speech Impaired Customers

Oracle Corporation provides dedicated Text Telephone (TTY) access to Oracle Support Services within the United States of America 24 hours a day, 7 days a week.

- For technical questions, call:

  1.800.446.2398

- For non-technical questions, call:

  1.800.464.2330

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Oracle9*i* Installation Planning

This chapter describes the Oracle9*i* installation types and configurations.

The following topics are included:

- Oracle9i Installation Overview
- System Installation Requirements
- Product Dependencies
- Configuration Restrictions
- Oracle Net Linking Options

Oracle9*i* Installation Overview

The installation of Oracle9*i* products has five stages:

1. **Planning your installation:**   Use this chapter to help you plan and prepare for your installation.   This chapter provides information about products, installation types, database configurations, and concepts that you should be aware of during planning and installation.

2. **Completing pre-installation tasks:**   Refer to the release notes for your platform, and see Chapter 3, "CD-ROM Pre-installation Requirements" in this guide to complete pre-installation tasks.

3. **Installing software:**   Use the Oracle Universal Installer that is provided on your CD-ROM to install Oracle products (requires DECWindows Motif).   Refer to Chapter 4, "Installation".

4. **Completing the post-installation tasks:**   Create database objects, establish the user environment, and configure the installed Oracle products for the local system.   Refer to Chapter 5, "Post-Installation".

5. **Installing the clients:**   If you want to install client tools, applications, and client interfaces that are not included on the Oracle9*i* CD-ROM, then check the requirements and instructions in the documentation for those products.

The following sections describe the choices of installation for different systems and environments.

Oracle9*i* Products for Installation

During installation, you are asked to choose one of two products.   These products are:

- Oracle9*i* Database

- Oracle9*i* Client

Oracle9*i* Database

The Oracle9*i* Database is an object-oriented relational database management system that consists of an Oracle database and an Oracle instance. It may be installed in one of three installation types: Enterprise Edition, Standard Edition, or Custom installation.

- **Enterprise Edition:** If you select this type, then the Oracle Universal Installer installs a preconfigured starter database, licensable Oracle options, networking services, and Oracle utilities. The Enterprise Edition contains the set of products that are most commonly used for database environments.

- **Standard Edition:** If you select this type, then the Oracle Universal Installer installs a preconfigured starter database, networking services, and Oracle utilities.

- **Custom:** If you select this type, then the Oracle Universal Installer installs the products that you select from the Enterprise Edition and from the Standard Edition options.

Oracle9*i* Client

The Oracle9*i* Client is a front-end database application that connects to the database through one or more application servers. Three client installation types are available: Administrator, Runtime, and Custom.

- **Administrator:** If you select this type, then the Oracle Universal Installer installs networking services, utilities, and basic client software.

- **Runtime:** If you select this type, then the Oracle Universal Installer installs networking services and support files.

- **Custom:** If you select this type, then the Oracle Universal Installer prompts you to select individual components to install from the components that are available with Administrator and Runtime.

Oracle9*i* Database Configurations

When you install the Oracle9*i* database product, you are prompted to select a database configuration that is suited to your needs. Select from one of five Oracle9*i* database configurations:

1. General Purpose

2. Online Transaction Processing

3. Data Warehouse

4. Customized

5. Software Only

Options one through three are preconfigured databases that you can use for your Oracle9*i* database. Each preconfigured database is designed to provide optimal support for particular database needs. Options four and five are configurations for special needs. The following section describes some of these configurations.

Environment Descriptions

General Purpose

Users of this database type perform a variety of database tasks, ranging from simple transactions to complex queries. Select this database environment for general purpose use.

Online Transaction Processing

Users of this database type perform large numbers of concurrent transactions, in which each transaction is a relatively simple operation that is processing a small amount of data. Transactions consist of reading, writing, and deleting data in database tables.

Billing databases, such as those commonly found on Internet commerce sites, are the most common example of this database configuration. These databases are also known as Online Transaction Processing (OLTP) databases.

Customized

This environment allows you to create a customized database configuration of Oracle products that meets specialized requirements.

Select this option only if you are prepared to provide detailed product and database environment choices. Choosing this option requires a longer installation session than choosing a preconfigured database.

Software Only

This choice allows you to install Oracle products. It does not configure the listeners or the network infrastructure, and it does not create a database.

Oracle Corporation recommends that you install at least one preconfigured database to serve as a template for database configuration.

> **See Also:** *Oracle9i Concepts*, *Oracle9i Database Performance Tuning Guide and Reference,* and *Oracle9i Real Application Clusters Setup and Configuration* for more information on database environment issues.
>
> Refer to "Database Configuration Assistant" on page 1-5 for more information on how to choose a database.
>
> Many of the Oracle documents that are included in the Oracle9*i* Generic Documentation CD-ROM provide information about database environments, the effect that database environment settings have on performance, and how your database can be tuned to maximize performance.

Database Configuration Assistant

Database Configuration Assistant enables you to copy an Oracle9*i* preconfigured database, or to create a fully customized database to match your selected environment and database configuration. It starts automatically (unless you selected software only) after Oracle9*i* software has been installed during Oracle9*i* installation.

When installing Oracle9*i* software using any database configuration option other than the Custom and Software Only, the Oracle Universal Installer (OUI) prompts for a global database name and System Identifier (SID). After Oracle9*i* installation is complete, the Database Configuration Assistant uses this information to create the database.

The following list provides descriptions of database configurations:

- General Purpose configuration: If you select this option with an Enterprise Edition or Standard Edition installation, then the Database Configuration Assistant creates a preconfigured, ready-to-use, multipurpose database with the following features:

    - Default initialization parameters using server parameter file and Automatic Undo Management

    - Automatic installation and configuration of Oracle Options and *inter*Media

    - Advanced Replication capabilities

    - Database configuration of dedicated server mode

    - Archiving mode of NOARCHIVELOG

- Transaction Processing option: If you select this option, then the Database Configuration Assistant creates a preconfigured, ready-to-use OLTP database.

- Data Warehouse option: If you select this option, then the Database Configuration Assistant creates a database that is fully enabled for data warehousing applications.

- Customized installation option: If you select this option, then the Database Configuration Assistant guides you in creating a fully customized database. You can choose to automatically or manually configure options, Oracle Text components, and advanced replication.

    Select this option only if you are experienced with advanced database creation procedures.   You will need to customize some or all of the following settings or parameters:

    - Data, control, and redo log file settings

    - Tablespace and extent sizes

    - Database memory parameters

    - Archiving modes, formats, and destinations

    - Trace file destinations

    - Character set values

- Software Only option: If you select this option, then the Oracle Universal Installer (OUI) installs only Oracle9*i* software. Database Configuration Assistant does not start after installation, and no preconfigured database is installed.

  If a choice other than "Software Only option" is selected for database configuration, then OUI will launch DBCA (Database Configuration Assistant) during the installation session. If a "Software Only" installation is performed, then DBCA can be run later from the command line. For more information on running Database Configuration Assistant from the command line, refer to "Non-interactive Mode" on page 5-2. For more information on database character sets, refer to *Oracle9i Database Globalization Support Guide Release 2 (9.2).*

Installation With Existing Oracle Databases

You can access different versions of Oracle on the same computer system at the same time using Oracle Net Services. You can only access Oracle8*i* and Oracle9*i* databases separately. You cannot submit a single query to access the databases simultaneously.

> **See Also:** *Oracle9i Database Migration* and *Oracle9i Database Administrator's Guide* for more information on compatibility and interoperability issues, and on connecting different client versions to the database.

System Installation Requirements

Verify that your system meets the requirements that are described in the following sections before you install Oracle9*i* products.

> **Note:** You will not be able to complete an installation if your system does not meet the minimum requirements for the Oracle products that you select.

- Time Requirements
- Hardware Requirements
- Disk Space Requirements
- Images
- Operating System Software Requirements
- Additional Product-Specific Installation Requirements

Time Requirements

Installation time varies depending on the number of products installed and the type of hardware used. Duration of a typical installation takes approximately 1 to 3 hours.

Hardware Requirements

Software needs to be installed on an ODS-5 formatted disk. Refer to "Oracle9i Release 2 Dependency on ODS-5 Disk Structure" on page 2-3 for details.

Minimum Hardware Requirements

Following is a list of the minimum hardware requirements to install Oracle9*i* products on an HP OpenVMS Alpha system.

Memory

A minimum of 256 MB RAM is required to install Oracle9*i* products. Oracle9*i* Client products require 192 MB of RAM

Minimum global pages/sections

an amount of disk space equal to twice the amount of RAM for most systems.

CD-ROM Device

A CD-ROM drive supported by HP OpenVMS is required. Oracle uses ODS-5 format CD-ROM disks.

File System

ODS-5 is required for the software. Refer to Chapter 2, "Release Information" for details.

To determine the amount of random access memory (RAM) installed on your system as well as the amount of paging currently configured on your system, enter the following command:

```
$ SHOW MEMORY
```

To review memory reservations on your node, run the following command:

```
$ show memory/reserved
System Memory Resources on 13-JUL-2002 09:57:11.72

Memory Reservations (pages):   Group   Reserved  In Use  Type
ORA_PROD_SGA                   SYSGBL  5120      0       Allocated
ORA_PROD_SGA                   SYSGBL  5         0       Page Table
Total (40.04 Mbytes reserved)          5125      0
```

Please consult Hewlett-Packard documentation if you require more information about reserving memory.

Disk Space Requirements

The Oracle Universal Installer (OUI) allows you to choose your installation category and type. Your choices will determine how much disk space that you will need. The disk space requirements do not include the size of your database. A production Oracle database server that is supporting many users requires significant disk space and memory.

Table 1–1 lists the disk space requirements for Oracle9*i* Server.

Table 1–1   Disk Space Requirements for Oracle9i Server

Installation Type	Required Disk Space
Enterprise Edition	3.3 GB
Standard Edition	3.3 GB
Custom	depends upon the components selected, but a minimum of 2 GB
From a staging area on disk	1 GB

Table 1–2 lists the disk space requirements for Oracle9i Client.

Table 1–2   Disk Space Requirements for Oracle9i Client

Installation Type	Required Disk Space
Administrator	750 MB
Runtime	650 MB
Custom	Up to a maximum of 800 MB

Images

Two shared images that are linked with client code are built and installed when you link Oracle9i Enterprise Edition. The new shared images reduce the size of all Oracle client executable images (including precompiled user programs) by removing direct references to Oracle Net and other common routines.

The image names are in the form of: `libclntsh.so` and `oracle.exe`

Operating System Software Requirements

Table 1–3 lists the operating system software requirements for Oracle9*i* products.

Table 1–3   Operating System Software Requirements

Software	Requirements
Operating System	HP OpenVMS version 7.3
Oracle Net Requirements	Oracle Net on HP OpenVMS is developed and certified using Hewlett-Packard TCP/IP Services for OpenVMS (UCX). If you wish to use the TCP/IP protocol adapter for Oracle Net, then you should have Version 5.1 ECO 4 or higher of TCP/IP Services for HP OpenVMS Alpha installed. TCP/IP protocol stacks from other vendors may work with Oracle, but customers use these products at their own risk. Any TCP/IP problems that cannot be reproduced using TCP/IP Services for HP OpenVMS Alpha will simply be referred to the TCP/IP vendor.
	Vendor-provided protocol services are usually upward compatible, so that existing applications will continue to work without modification. Thus, later releases of TCP/IP are upward compatible with Oracle Net, provided that the vendor-specified Application Programming Interface (API) does not change with new releases.
Window Manager	X-Windows **must be installed** on the system from which the Oracle Universal Installer is run. Use any Hewlett-Packard-supported X-Windows server (for example, `Excursion`, `dtwm`, `twm`, `mwm`) that supports Motif.

To determine your current operating system information, enter the following command:

```
$ SHOW SYSTEM /NOPROCESS /FULL
```

To see information about all nodes in a cluster, add the `/CLUSTER` qualifier to the above command.

To determine if your X-Windows system is working properly on your local system, enter the following command:

```
$ RUN   SYS$SYSTEM:DECW$CLOCK
```

If a clock is not displayed on your screen, then X-Windows is not configured correctly. See "Set Display" on page 3-19 for instructions on configuring X-Windows.

Oracle Net VMS Mailbox Driver

The Oracle Net VMS Mailbox driver (protocol IPC) is included in NETWORK. You do not need an Oracle Net license to use the VMS Mailbox driver.

Programmatic Interface Support

The following DEC compilers were used to certify the programmatic interfaces:

```
Programmatic Interface:  Certification Release
Pro*C:        C release 6.4-008, C++ release 6.3-020
Pro*COBOL:    DEC COBOL release 2.8
Pro*FORTRAN:  DEC FORTRAN release 7.1
SQL*Module:   DEC ADA 3.5a23
```

Product Dependencies

Some Oracle products depend on other Oracle products to work properly.   Use the following tables to determine the product dependencies.   This section has the following subsections:

- Important Compatibility Issues
- Additional Product-Specific Installation Requirements

Important Compatibility Issues

> **Warning:**   If you are upgrading to Oracle9*i* from a previous version, then ensure that you have no Oracle symbols and logicals defined prior to installing Oracle9*i*.   **DO NOT** run any `orauser` scripts as part of your login sequence.   Failure to heed this warning will result in numerous problems, including undefined symbols and overwriting of the previous code tree.

Review the compatibility issues given in this section:

- Oracle9*i* Enterprise Edition must be installed in a location separate from all other previous Oracle server installations.
- Oracle products released for earlier versions of Oracle server (such as release 9.0.1.x and release 8.1.7.x) must not be linked against an Oracle9*i* installation.   Contact your Sales Representative concerning releases of these products that have been certified with Oracle9*i*.

> **Note:**   To install National Language Support (NLS), build all Oracle products first.   Then install NLS.   The product directories must exist before NLS message files can be copied into them.

Additional Product-Specific Installation Requirements

This section provides additional product-specific information.   For descriptions of these products, see Appendix A, "Oracle9i Products".

List of the Restrictions and Requirements for Oracle9*i* and Options.

Product Name: Restrictions and Requirements

Oracle *inter*Media *9.2.0.2.0:*   You must have at least 10 MB of disk space available for the *inter*Media Text data dictionary.

Oracle Visual Information Retrieval 9.2.0.2.0:   Requires Oracle *inter*Media 9.2.0.2.0

List of the Restrictions and Requirements for Tools and Precompilers.

Product Name: Restrictions and Requirements

Java Runtime Environment (JRE):   JRE 1.1.8-5.

Oracle9*i* JVM 9.2.0.2.0:   (This product includes Java Virtual Machine (JVM) and Java utilities). See the Java README file on the Oracle9*i* CD-ROM for restrictions and requirements.

Pro*C/C++ 9.2.0.2.0:   C release 6.4-008, C++ release 6.3-020

Pro*COBOL 1.8.75:   DEC COBOL release 2.8

Pro*COBOL 9.2.0.2.0:   DEC COBOL release 2.8

Pro*FORTRAN 1.8.75:   DEC FORTRAN release 7.1

SQL*Module Ada: DEC Ada 3.5a23

Networking and System Management Products

All network products require the underlying software and operating system libraries for the supported network. The network software must be installed and running prior to installing the Oracle Net products.

List of the Restrictions and Requirements for Networking and System Management Products.

Product Name: Restrictions and Requirements

Oracle Advanced Security 9.2.0.2.0:   Refer to "Oracle Advanced Security" on page 1-15 for information about Oracle Advanced Security authentication support requirements.

Oracle TCP/IP with SSL Protocol Support 9.2.0.2.0:   SSL 3.0 or later

Oracle Advanced Security

Oracle Advanced Security is an add-on product that will be added to the standard Oracle Net Server or Oracle Net Client. If you purchase it, then install it on both the server and the client. Oracle Advanced Security release 9.2.0.2.0 requires Oracle Net release 9.2.0.2.0 and supports Oracle9i server.

Kerberos and Secure Socket Layer (SSL) have requirements for authentication protocols that are supported by Oracle Advanced Security. No additional authentication protocol software is required to relink Oracle products.

Kerberos: requires MIT Kerberos Version 5, release 1.1. The Kerberos authentication server must be installed on a physically secure machine.

Secure Socket Layer (SSL): requires a wallet that is compatible with the Oracle Wallet Manager version 2.1. Wallets that were created in earlier releases of the Oracle Wallet Manager are not forward-compatible. Oracle Advanced Security provides and installs Secure Socket Layer.

> **See Also:**   For more information about Oracle Advanced Security and system management products, see the *Oracle Advanced Security Administrator's Guide*.

> **Note:**   No additional authentication protocol software is required to relink Oracle products. However, Oracle Corporation does not provide the third-party authentication servers (Kerberos, for example). The appropriate authentication server for these protocols must be installed and configured separately. Secure Socket Layer is provided and is always installed with Oracle Advanced Security.

Configuration Restrictions

This section lists current restrictions for HP OpenVMS Alpha.

Copying Oracle Executables

Moving executables from one OpenVMS machine to another is not recommended due to the usage of shared libraries and to the difficulty of ensuring valid referencing. Oracle Corporation therefore recommends that you relink executables.

Oracle Net Linking Options

Keep the following guidelines in mind when linking Oracle Net:

- The Net Mailbox Adapter (IPC) is always installed. It provides inter-process communications through OpenVMS Mailboxes. The Mailbox Adapter can be used to connect an Oracle tool and the Oracle server, but only if the tool and the server are on the same OpenVMS system.

- Oracle Net TCP/IP configurations are available for both OpenVMS clients and servers.

The following table shows the range of use for Oracle Net drivers in client/server and distributed database configurations. The data in this table is provided with the assumption that clients in a client/server configuration run the Oracle tool and that servers run the Oracle database. For distributed database examples, the clients and servers each run both an Oracle tool and the Oracle database.

Table 1–4   Range of Use for Oracle Net Drivers

Oracle Net Driver	Client/Server Client Tool	Client/Server RDBMS Server	Distributed RDBMS Client	Distributed RDBMS Server
Oracle Net TCP/IP	Yes	Yes	Yes	Yes
Oracle Net OpenVMS Mailbox	Limited *	Limited *	Limited *	Limited *

Limited *:   Limited only for communication between products on the same ORACLE_HOME.

Silent Mode Installation

What Is a Silent Installation?

A silent installation with OUI (Oracle Universal Installer) is non-interactive, meaning that it takes place without using the Java GUI (Graphical User Interface). OUI gets its information from a text file that is specified on the command line by

using the `-responseFile` argument instead of interactive GUI input and output. If the `-responseFile` flag is given, then the installation is assumed to be a silent mode type.

> **Note:** Because the design of OUI causes GUI classes to be loaded (but not displayed), a silent installation still requires an X connection.

A silent installation can also be performed in BATCH mode, as long as the process has established an X connection via the SET DISPLAY command.

What Is a Response File?

A response file contains answers to installation questions that otherwise would be provided by the user in an interactive installation session. Each answer is stored as a value for a variable that is identified in the response file. For example, values for ORACLE_HOME or Install Type can be set automatically within the response file. Response file templates are generated by the installation developer. The response file template for the installation of your product can be found on your ship set (CD-ROM number 1) under the **<device>:[Disk1.stage.Response]** directory. You should be able to find one for your choice of install type (for example, **oracle.server.EE.rsp** for an Enterprise Edition server installation, **oracle.server.SE.rsp** for a Standard Edition, or **oracle.client.Runtime.rsp** for a client/runtime installation).

Why Perform a Silent Installation?

Silent installations can be useful if you need to install an Oracle product multiple times on multiple computers, or if you prefer not to use the GUI because of performance reasons over a slow remote X connection. If the options that you select while installing on each computer are always the same, then you save the time of reviewing each installation screen and selecting the various installation options.

Silent installations can also ensure that multiple users in your organization use the same installation options when they install your Oracle products. You can therefore more easily support those users because you already know what components and options have been installed on each computer.

Before you perform a silent installation, you should review the settings in the response file template that is provided with your Oracle product.

Modifying a Response File

If your product installation includes a response file template, then you can find it on your ship set (CD-ROM) under the **<device>:[Disk1.stage.Response]** directory. For a list of response files, refer to "List of Response File Names" on page 1-19. Mandatory items have the following comment just before the definition: # OPENVMS_VALUE_REQUIRED. Three values must be provided:

- FROM_LOCATION
- ORACLE_HOME
- ORACLE_HOME_NAME

FROM_LOCATION is the complete path of the source of the products to be installed (in other words, to the `[.Disk1.stage]products.jar` file) from CD number 1. If contents of CDs were copied to a local file system, then specify that path. ORACLE_HOME is the directory into which the Oracle software will be installed. The account from which the Oracle Universal Installer is run must have appropriate privileges to create a root-level directory if the directory that was specified for ORACLE_HOME does not already exist.

> **Note:** FROM_LOCATION must be in UNIX-style syntax.

> **Note:** ORACLE_HOME must be on an ODS-5 disk.

To modify the response file:

1. Make a copy of the response file for your product, and open it in a text editor.

2. Search for the three items that are listed above (or for the string OPENVMS_VALUE_REQUIRED), and provide values for those items.

3. Modify other fields as applicable (refer to comments within the response file that you are modifying).

List of Response File Names

File Name: Description

enterprise.rsp: Enterprise Edition Installation of Oracle9*i* Server
standard.rsp: Standard Edition Installation of Oracle9*i* Server
custom.rsp: Custom Edition Installation of Oracle9*i* Server
clientadmin.rsp: Administrator installation of Oracle9*i* Client
clientruntime.rsp: Runtime installation of Oracle9*i* Client
clientcustom.rsp: Custom installation of Oracle9*i* Client
dbca.rsp: Database Configuration Assistant

Invoking the Installer.

Setup the X Windows environment by using the following DCL command:

```
SET DISPLAY/CREATE/TRANSPORT=TCPIP/NODE=<workstation_name or IP_address>
@<path>runInstaller -responseFile <response_file>.
```

2

Release Information

This chapter provides information specific to this release of Oracle9*i* for HP OpenVMS. The following sections are included:

- Product Set on page 2-2

- Changes and Enhancements on page 2-2

- Known Restrictions on page 2-6

Product Set

The following components are included on the product CD-ROM:

Oracle9*i*   Release 2 (9.2.0.2)

Oracle Net   Release 2 (9.2.0.2)

Changes and Enhancements

In order to take full advantage of the latest OpenVMS CPU and compiler optimizations in Oracle software products, Oracle9*i* Release 2 (9.2.0.2) and associated Oracle9*i* Release 2-based products will require HP OpenVMS AlphaServers with EV56 or later generation CPUs. AlphaServers with earlier generation CPUs will see a performance degradation. Refer to Note 181307.1 on MetaLink for a list of affected models and for instructions on how to identify the CPU model number.

The following changes and enhancements are unique to this release of Oracle9*i* for HP OpenVMS:

2349006 - CHANGE CALL TO SYS$CREPRC TO HAVE PRC$M_IMGDMP SET

In releases prior to Oracle9*i* Release 2 (9.2.0.2), when one of the background processes terminated abruptly with an access violation, no useful information was readily available regarding the cause for termination. For troubleshooting, certain actions needed to be taken, and the crash needed to be reproduced. Starting with this release, by default, an image dump will be created when a background process aborts. If you do not want this feature enabled, you can turn it off using the following commands:

```
$ define/system ORA_<SID>_<PROCESS_NAME>_DMP FALSE
$ <start the instance and open the database>
```

Example:

```
$ define/system ORA_PROD_LMD0_DMP FALSE
$ sqlplus/nolog
SQL> connect / as sysdba
SQL> startup
```

Please note that this change has no effect on normal daily production behavior. Oracle Corporation recommends that you do not define the dump logical.

Oracle9*i* Release 2 Dependency on ODS-5 Disk Structure

In general, ODS-5 format allows VMS to support Microsoft Windows file naming formats. Longer file names, additional character support, and the ability to have lowercase and mixed-case file names are some of the features supported on ODS-5 disks.

The disks on which the Oracle code tree resides must be formatted in Files-11 On-Disk Structure Level 5 (ODS-5) format. This is the disk to which the VMS logicals `ora_root`, `ora_rootdir`, and `oracle_home` will point. The directory that is referenced by these logicals is the parent directory for all Oracle RDBMS software, such as APACHE, CTX, INSTALL, NETCONFIG, RDBMS, UTIL, and so forth. The disks on which Oracle database files reside can be formatted as either ODS-2 or ODS-5.

> **Caution:** Oracle Corporation **STRONGLY** urges you to read the OpenVMS Guide to Extended File Specifications **PRIOR** to changing the structure of any disk. This guide discusses ODS-2 and ODS-5 formats in much more detail and has important information that you must understand and follow.

Oracle Note 205630.1 can be viewed at Oracle MetaLink. Alternatively, use the search function and search for "ODS-5" for more information.

Precautions

- Do not change the format of any VMS disk without first making a backup of the disk.

- Conversion from ODS-2 to ODS-5 **does not** require you to restore files.

- Conversion from ODS-5 to ODS-2 **does** require you to restore files.

  - Contact Hewlett-Packard for more information on reverting back to ODS-2 format from ODS-5 format.

Checking Disk Format

To check the current disk format, use the following DCL command:

```
$ SHOW DEVICE/FULL <device-name>
```

The **Volume Status:** will display the current ODS level. The default when initializing disks is ODS-2.

Changing Disk Format

If you plan to reformat an existing (in use) disk from ODS-2 to ODS-5 format, then do the following:

1. Make at least one VMS backup of the disk.

2. Use the Set Volume command:

   ```
   $ SET VOLUME /STRUCTURE_LEVEL=5  <device-name>
   ```

   Example:

   ```
   $ SET VOLUME/STRUCTURE_LEVEL=5  $2$DKC100:
   ```

Formatting a New Disk

If you plan to use a new (empty) disk, then use the Initialize command to format the new disk to ODS-5 format, as follows:

```
$ INITIALIZE/STRUCTURE=5 <device-name>: <volume-label>
```

Example:

```
INITIALIZE/STRUCTURE=5 $2$DKC100: TESTVOL
```

Oracle9*i* Release 2 New Directory Structure

Beginning with this release, the directory structure of Oracle9*i* for HP OpenVMS closely resembles that of Oracle9*i* on UNIX systems. Database Administrators will more quickly become familiar with Oracle9*i* as the platform by being able to make file locations more consistent and predictable.

Initialization Parameters in Oracle9*i* Release 2 That Have Been Desupported

ALWAYS_ANTI_JOIN

ALWAYS_SEMI_JOIN

JOB_QUEUE_INTERVAL

OPTIMIZER_PERCENT_PARALLEL

HASH_MULTIBLOCK_IO_COUNT

DB_BLOCK_LRU_LATCHES

DB_BLOCK_MAX_DIRTY_TARGET

SORT_MULTIBLOCK_READ_COUNT

DB_FILE_DIRECT_IO_COUNT

GC_DEFER_TIME

GC_RELEASABLE_LOCKS

GC_ROLLBACK_LOCKS

LM_LOCKS

LM_RESS

USE_INDIRECT_DATA_BUFFERS

Initialization Parameters in Oracle9*i* Release 2 That Are Becoming Obsolete

ROLLBACK_SEGMENTS

FAST_START_IO_TARGET

TRANSACTIONS_PER_ROLLBACK_SEGMENT

LOG_CHECKPOINT_INTERVAL

DB_BLOCK_BUFFERS

BUFFER_POOL_KEEP

BUFFER_POOL_RECYCLE

Known Restrictions

RMAN Runs Only Over TCP/IP

The connection to both the catalog and the database must be a TCP/IP connection.

OpenVMS

OpenVMS always performs its I/O asynchronously. Several `init.ora` parameters that mimic asynchronous behavior are not needed on OpenVMS. Refer to the *Oracle9i Administrator's Guide*, section 1.5.3 for the list of parameters that are not supported on OpenVMS.

PORTAL

With some limitations, Oracle9*i* for HP OpenVMS with *i*AS mid tier (with VMS back end database configuration) is supported. For information about *i*AS support, contact:

http://infodec_us@oracle.com/

The following items are not supported:

RAC Guard and RAC High Availability Extensions

RAC Guard and RAC High Availability Extensions are not supported in this release due to the lack of cluster failover in the Operating System.

RAC Management Pack

RAC Management Pack is not supported in this release.

LDAP

LDAP (OID) is currently not supported. This feature is a candidate for support in future releases.

*i*FS and Ultra Search

*i*FS and Ultra Search are not supported due to the lack of third party software called INSO filter.

EJB BEANS

Oracle9*i* for HP OpenVMS does not support EJB on the server. If customers have *i*AS in mid tier, however, they can still use the database on OpenVMS in order to use EJB.

3

CD-ROM Pre-installation Requirements

This chapter describes the pre-installation steps required for an Oracle9*i* software installation.

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HP OpenVMS and Installation-Specific Issues and Restrictions

The following issues and restrictions can affect the installation or use of Oracle9*i* on HP OpenVMS Alpha.

Re-installing Oracle9*i* Release 2 (9.2.0.2)

If you re-install Oracle9*i* server into an ORACLE_HOME where Oracle9*i* server Release 2 (9.2.0.2) is already installed, then you must also re-install any product options, such as Oracle Partitioning, that were enabled before you began the re-installation

New ORA_ROOT

Do not install Oracle9*i* Release 2 (9.2.0.2) into the root directory of an existing Oracle installation containing any Oracle Software.

Oracle Corporation recommends that you install Oracle9*i* Release 2 (9.2.0.2) products into a new ORA_ROOT.

Java Runtime Environment (JRE)

The JRE that is shipped with Oracle9*i* is used by Oracle Java applications such as the Oracle Universal Installer and is the only Java application that is supported to run with these applications. Customers must not modify this JRE, unless it is done through a patch provided by Oracle Support Services.

The inventory can contain multiple versions of the JRE, each of which can be used by one or more products or releases. The Oracle Universal Installer creates the `oraInventory` directory the first time that it is run in order to keep an inventory of products that it installs (as well as other installation information) on your system.

Character Mode

Installation cannot be performed using character mode with the Oracle Universal Installer (OUI). For non-interactive installations, use the Silent Mode Installation, which is described in Chapter 1, "Oracle9i Installation Planning" on page 1-16. The Oracle Universal Installer can be run in the interactive mode directly from your system X-Windows console or via an X-Terminal or PC X-Terminal on a remote system.

Upgrading and Migrating

If you are upgrading an existing system, then some issues may exist that exceed the scope of this manual.

It is possible to migrate Oracle8*i* Release 2 (8.1.6) and Oracle8*i* Release 3 (8.1.7) and Oracle9*i* Release 1 (9.0.1) to Oracle9*i* Release 2 (9.2.0.2). To migrate from an Oracle database earlier than these releases, you must first upgrade to an Oracle8*i* Release 2 or Release 3 or to an Oracle9*i* Release 1, and then follow the steps outlined in the document *ora_rdbms:readmemigvms.doc* to migrate to Oracle9*i* Release 2 (9.2.0.2).

File Systems

As noted previously (refer to "Oracle9i Release 2 Dependency on ODS-5 Disk Structure" on page 2-3), the Oracle9*i* release 2 software must be installed on an ODS-5 formatted disk. The datafiles and redolog files, however, can be placed on ODS-2 formatted disks as well.

Oracle9*i* server must be able to verify that files have been written to disk. File systems that do not support this verification are not supported for use with Oracle databases, although Oracle software can be installed on them.

> **Note:**   Because of this requirement for verification, third party software that creates one or more virtual disks in memory **MUST NOT BE USED** for datafiles.

Optimal Flexible Architecture

Optimal Flexible Architecture (OFA), the Oracle standard set of configuration guidelines for Oracle databases, is not supported on HP OpenVMS Alpha.

Using Hummingbird Exceed

If you use the Hummingbird Exceed X Windows emulator while installing and using Oracle9*i*, then set the window manager to run in **Native** mode so that Microsoft Windows functions as the window manager. Refer to your Exceed documentation for instructions on configuring the window manager.

Following are common problems with the Hummingbird Exceed X Windows emulator:

- Exceed does not handle screen coordinates correctly. The Oracle Universal Installer window and related Oracle Universal Installer dialogs or configuration assistants can encounter display problems when run through the emulator. One display problem is the sudden truncation of the main window when clicking the **Next** button during the installation, rendering the screen unreadable. Another display problem is that the expansion of an installer window can display the dialog buttons off the screen so that they are not selectable with a mouse. If one of these display problems occurs, then exit the entire X Windows session and start a new session.

- Display problems exist in the **AQ Database Information** dialog box of the Oracle Applications InterConnect installation. The last text field on this dialog box, which prompts for **Consumer Name,** appears truncated when viewed through Exceed. This dialog box displays as expected when viewed through native X Windows on OpenVMS.

   To correct any problems with hidden dialog fields, perform the following steps:

   1. Select the **xconfig application** under the **Exceed Program Group** from the **Windows Start** Menu.

   2. Select the **Fonts** applet.

   3. Select the **Font Database** button in the **Font Settings** dialog box.

   4. Deselect the **Automatic Font Substitution** option in the **Font Database** dialog box.

   5. Select the **Add…** button.

      The **Add Font Directory** dialog box is displayed.

   6. Select the **Server** radio button in the **Add Font Directory** dialog box.

   7. Enter the host name for your machine in the **Host Name** field in the **Add Font Server** dialog box.

   8. Leave all other entries at their default settings.

   9. Select **OK**.

   10. Select **Close** on all dialog boxes to save the settings.

Installation Procedure Requirements

This section provides installation procedure requirements.

Oracle Server Database Administrator Account

Create an HP OpenVMS Alpha user account to administer the Oracle9*i* Enterprise Edition installation and maintenance, or modify your existing Oracle user account to meet the account quotas and privileges that are specified in this guide.

Setting up an Oracle9*i* account is the same as setting up any other HP OpenVMS Alpha user account. The following are the steps to set up an Oracle9*i* account:

1. Decide which values that you will supply to create the account.

2. Run AUTHORIZE to add a record in the User Authorization File (UAF).

3. Use AUTHORIZE to set the following account requirements:

   - Account quotas

   - Account privileges

   - Process rights identifiers

4. Exit AUTHORIZE to complete the account setup.

Note: The Oracle9*i* account use of HP OpenVMS Alpha resources affects other user processes. Before setting up an Oracle9*i* account, you must thoroughly understand the reasons for changing system resources at your site.

Additional Information: See the Hewlett-Packard documentation for more information about running the AUTHORIZE utility.

Deciding Account Information

To add an account, you must supply the following information:

- Account name

- Account password

- USER and GROUP numbers for the UIC (octal values)

- Login device and directory

- Owner

Although this guide refers to this account as the Oracle9*i* account, you can assign any name or number to the account with the UIC restrictions noted below.

The Oracle9*i* account will own the runtime libraries and executable images for every Oracle product. Therefore, the database administrator (DBA) should manage this account and install all Oracle products from it.

Oracle9*i* Account is NOT the SYS or SYSTEM Account

In the *Oracle9i Administrator's Guide*, the Oracle9*i* account is sometimes referred to as the DBA account. The Oracle9*i* account is not the same as the SYS or SYSTEM database usernames that are created for every database. It is an OpenVMS account name.

Oracle9*i* Account UIC Must Be Greater than MAXSYSGROUP

The UIC GROUP number of the Oracle9*i* account **must** be greater than the system parameter MAXSYSGROUP (which defaults to octal 10). GROUP numbers 1 through MAXSYSGROUP are reserved for use by the OpenVMS operating system itself. If the UIC GROUP number is not greater than the system parameter MAXSYSGROUP, then the Oracle9*i* account **cannot** issue the following commands:

- STARTUP
- CREATE DATABASE/TABLESPACE
- ALTER DATABASE/TABLESPACE

If your Oracle9*i* account has a UIC group number that is less than MAXSYSGROUP, then you **must** create a new account with a UIC group number higher than MAXSYSGROUP before you install Oracle9*i*.

Finding MAXSYSGROUP

The following command gives the value of MAXSYSGROUP (in decimal format):

```
$ WRITE SYS$OUTPUT F$GETSYI("MAXSYSGROUP")
```

Adding a Record in the User Authorization File (UAF)

Use the AUTHORIZE utility to create or modify records in the User Authorization File (UAF):

1. To run AUTHORIZE, enter:

```
$ SET DEFAULT SYS$SYSTEM
$ RUN AUTHORIZE
```

2. At the UAF prompt, enter the ADD command to create the user account from which you will install the product software:

```
UAF> ADD Oracle9i /PASSWORD=ORACLE/UIC=[277,100]-
/DEVICE=<device>/DIRECTORY=[Oracle9i]/OWNER="ORACLE DBA"
```

In this example, the account name is Oracle9*i*. Note that the UIC GROUP number is 277. The UIC GROUP number must be larger than MAXSYSGROUP.

After adding the account, you must alter the account privileges and quotas. Although this can be done in any order, usually the account privileges are set before the account quotas.

For more information on using AUTHORIZE, refer to the Hewlett-Packard documentation.

Setting Account Privileges

The following privileges are required as **both** authorized and default privileges for the Oracle9*i* database administrator account:

> **Note:** An exception is explained in "Security Issues with Multiple Databases" on page 3-12.

- CMKRNL
- GROUP
- GRPNAM
- IMPERSONATE
- LOG_IO
- NETMBX
- OPER
- PFNMAP
- PRMGBL
- PRMMBX
- SHARE
- SYSGBL
- SYSLCK
- SYSNAM
- SYSPRV
- TMPMBX
- WORLD

> **Note:** Appendix B, "Oracle9i 64-bit Feature" has additional information that explains the meanings of the privileges.

Use the AUTHORIZE utility to set the account privileges for the Oracle9*i* database administrator account.

At the UAF prompt, use the MODIFY command to add the required default and authorized privileges as follows:

```
UAF> MODIFY ORACLE9 -
/PRIVILEGE=(CMKRNL,NETMBX,OPER,PFNMAP,PRMGBL,PRMMBX,SHARE,SYSGBL, -
  SYSNAM,TMPMBX,GROUP,GRPNAM,IMPERSONATE,LOG_IO,WORLD,SYSLCK, SYSPRV) -
/DEFPRIVILEGE=(CMKRNL,NETMBX,OPER,PFNMAP,PRMGBL,PRMMBX,SHARE, SYSGBL, -
  SYSNAM,TMPMBX,GROUP,GRPNAM,IMPERSONATE,LOG_IO,WORLD,SYSLCK, SYSPRV)
```

Setting Account Quotas

Use the AUTHORIZE utility to change account quotas to accommodate the requirements of your Oracle9*i* installation.

Modifying the Default Quotas

After adding a record with the default quotas, use the MODIFY command to alter the default values. The following example changes the Enqueue quota (ENQLM) from the default value to a value of 150:

```
UAF> MODIFY ORACLE9i/ENQLM=150
```

Account Quotas

The following table lists the Oracle9*i* account quotas, their minimum recommended values, and their equivalent HP OpenVMS Alpha quota names as displayed by the DCL commands SHOW PROCESS/QUOTA and SHOW WORKING_SET.

> **Note:**   These quotas depend on the number of log files, the number of databases, the number of network connections, and other logicals on your system. You might need to customize them.

Table 3–1   Oracle9i Account Quotas

Account Quota	Minimum Value	Quota Name
ASTLM	250 (the default)	Asynchronous System Trap limit
BYTLM	150,000	Buffered I/O limit
CHANNELCNT	31	Channel Count
ENQLM	2000 (the default)	Enqueue quota

Table 3–1   Oracle9i Account Quotas (Cont.)

Account Quota	Minimum Value	Quota Name
FILLM	100	Open file quota
JTQUOTA	8192	Job table quota
MAXDETACH	0 (the default)	Max detached processes
MAXJOBS	0 (the default)	Max active jobs
PGFLQUOTA	1,500,000 (recommended)	Paging file quota
WSDEFAULT	2048	Working set default
WSEXTENT	8192	Working set extent
WSQUOTA	4096	Working set quota

Appendix B, "Oracle9i 64-bit Feature" has additional information explaining the meanings of the quotas and how to determine their values.

Process Rights for Database Administrators

The Oracle server Database Administrator (DBA) account must be granted one or more process rights identifiers.   These identifiers provide the ability to issue the CONNECT / AS SYSDBA command that is required to perform database administration functions.   The following table displays the combinations of adding and granting rights identifiers to this account:

Table 3–2   Adding and Granting Process Rights Identifiers

Adding...	and Granting...	Allows Control of...
ORA_DBA	ORA_DBA	any database instance, provided it does not also have an ORA_*<sid>*_DBA identifier defined for it.
ORA_*<sid>*_DBA	ORA_*<sid>*_DBA	database instance *<sid>* only
ORA_*<sid>*_DBA	ORA_DBA	all database instances except *<sid>*

For example, to grant the ORA_*<sid>*_DBA rights identifier to the Oracle9i account for an instance called TEST, issue the following command:

```
UAF> ADD/IDENTIFIER ORA_TEST_DBA
```

Then grant the rights identifier to the Oracle9*i* account as follows:

```
UAF> GRANT/IDENTIFIER ORA_TEST_DBA ORACLE9i
```

If you add the `ORA_TEST_DBA` rights identifier, but grant only `ORA_DBA` to `ORACLE9i`, then the account would have insufficient privileges to administer the instance TEST.

The third line of the table shows that you can add and grant different identifiers, thereby restricting control of a particular instance while still granting control to other instances.

You can grant database maintenance privileges to accounts (for example, privileges to start up and shut down the database) in addition to the Oracle9*i* account. (However, with the Oracle9*i* account, the user `UIC GROUP` number must be greater than MAXSYSGROUP). By granting the `ORA_<sid>_DBA` identifier, you can similarly restrict user privileges to an instance named `<sid>`.

Process Rights for SGA Protection

Releases of the Oracle RDBMS on HP OpenVMS Alpha after Release 7.3.2.3.0 feature a change in the way that the software runs and accesses the SGA. Previous to Release 7.3.2.3.2, the SGA was protected by allowing only processes that are running in supervisor mode to access it directly. Starting with Release 7.3.2.3.2, the SGA is protected by an Access Control List to accommodate the kernel remaining in user mode.

Before bringing up a database, add a rights identifier to the User Authorization File (UAF). Have your system manager adhere to the following directions.

At the `UAF>` prompt, type:

```
UAF > ADD/IDENTIFIER/ATTRIBUTES=SUBSYSTEM ORA_SGA
```

> **Warning:** **DO NOT GRANT THE RIGHTS IDENTIFIER TO ANY USER. Oracle manages the assignment of the rights identifier when it starts the database.**

Process Rights for Intelligent Agent (OEMAGENT)

To install the Intelligent Agent, you **must** add the ORA_AGENT_ID identifier to your system before starting the installation. Use the following command:

```
UAF > ADD/IDENTIFIER ORA_AGENT_ID
```

All users that will submit jobs to the Intelligent Agent must have ORA_AGENT_ID. Use the following command:

```
UAF > GRANT/IDENTIFIER ORA_AGENT_ID <user name>
```

Security Issues with Multiple Databases

If your site has several databases managed by different DBAs, then you might not want to grant the CMKRNL privilege to every DBA Oracle9*i* account. This privilege allows a DBA to activate any process rights identifiers and to install shared images.

For security reasons, Oracle Corporation recommends that the OpenVMS system administrator handle these tasks. This person should be responsible for starting Oracle9*i* instances from a controlled account with a UIC group greater than MAXSYSGROUP. If this is not possible, then at least one Oracle9*i* database administrator must have the CMKRNL privilege.

Completing Account Setup

Exit the AUTHORIZE utility.

If the user account that you modified was logged on at the time, then this user must log out and log back in before the changes take effect.

Verifying Privileges

Use the following command to verify that your account has the correct privileges and rights identifiers:

```
$ SHOW PROCESS/PRIVILEGE
```

HP OpenVMS Alpha SYSGEN Parameters

For instructions on calculating MIN_GBLPAGES, MIN_GBLSECTIONS, and MIN_MAXBOBMEM, refer to the READMEVMS.DOC in the RDBMS directory.

Using the Reserved Memory Registry

Through its interface within the SYSMAN utility, the Reserved Memory Registry allows an HP OpenVMS Alpha system to be configured with large amounts of memory set aside for use within memory-resident global sections. The AUTOGEN utility considers the pre-allocated reserved memory when it tunes the system.

The advantages to reserving memory for an SGA are as follows:

- You can be certain that the memory is available and that the system is correctly tuned.

- The memory is reserved at boot time as contiguous aligned physical pages. This allows the system to optimize the mapping of the SGA.

- The memory is pre-allocated and zeroed. This results in faster SGA mapping and faster instance startup.

To reserve memory for an SGA, use the SYSMAN utility. The size qualifier is specified in megabytes. For example, to reserve memory for a 6 GB SGA for the SID named TEST, use the following commands:

```
$ MCR SYSMAN
SYSMAN> RESERVED_MEMORY ADD ORA_TEST_SGA/SIZE=6144/ALLOCATE/ZERO/PAGE
SYSMAN> EXIT
```

Note: 1 GB = 1024 MB

Then run AUTOGEN and reboot the system to allow AUTOGEN to adjust other system parameters for the reduced amount of memory that is available to the rest of the system.

Memory for multiple SGAs may be reserved. Any change to the name or size of a piece of reserved memory may require rebooting the system. During instance startup, Oracle server compares the size of the reserved memory, if any, with the size of the SGA. If appropriate, one of the following messages will be included in the Alert log:

```
** Reserved memory size = <size> greater than created SGA size = <size>**
** Please reduce reserved memory size to avoid wasting memory. **
** Memory was not reserved for the SGA. SGA size = <size> **
** There might be performance advantages to allocating memory for
   the SGA in the VMS reserved memory registry. **
```

If memory is reserved for an SGA, but not enough memory is reserved, then the instance startup will fail. In this case, the amount of reserved memory must be adjusted, AUTOGEN must be run, and the system must be rebooted. For example, to expand the SGA to 6.5 GB for the TEST instance, use the following commands:

```
$ MCR SYSMAN
SYSMAN> RESERVED_MEMORY REMOVE ORA_TEST_SGA
SYSMAN> RESERVED_MEMORY ADD ORA_TEST_SGA/SIZE=6656/ALLOCATE/ZERO/PAGE
SYSMAN> EXIT
```

Then run AUTOGEN and reboot the system.

To avoid rebooting the system, SYSMAN can be used to free the memory reservation. Then you may start the instance. The risk is that the system may not have enough fluid pages to create the SGA. Also, the performance advantages of using reserved memory are not available.

> **Additional Information:** For more information about the reserved memory registry, refer to the Hewlett-Packard documentation.

To review memory reservations on your node, run the following command:

```
$ show memory/reserved

System Memory Resources on 13-JUL-2001 09:57:11.72
Memory Reservations (Pages)     Group    Reserved   In Use   Type
ORA_PROD_SGA                    SYSGBL   5120       0        Allocated
ORA_PROD_SGA                    SYSGBL   5          0        Page Table
Total (40.04 Mbytes reserved)            5120       0
```

Please consult Hewlett-Packard if you need more information about reserving memory.

Using AUTOGEN

Because SYSGEN parameters affect the entire operating system, your system administrator is the only person who should modify them. Of course at some sites,

the DBA and system administrator may be the same person. The instructions in this section are directed to the system administrator.

For setting or modifying SYSGEN parameters, OpenVMS provides the AUTOGEN utility. You can also use SYSGEN, but this is an older utility, and its use is discouraged, except perhaps for checking current values. You must have SYSPRV or BYPASS privilege to run these utilities.

AUTOGEN provides a permanent method for setting parameters, and it documents all changes. AUTOGEN also lets you recalculate any parameters that depend on other parameters that you might have changed. Remember to record parameter values before changing them, and determine beforehand what results you expect from your changes. If the expected changes do not occur, then restore the old values before trying again.

1. Run the AUTOGEN utility with the SAVPARAMS parameter by entering the following command:

   ```
   $ @SYS$UPDATE:AUTOGEN SAVPARAMS GETDATA
   ```

   This step saves current parameters to a file named AGEN$FEEDBACK.DAT.

2. If you have not already done so, then run AUTOGEN GETDATA to ensure that the file PARAMS.DAT has been generated.

   ```
   $ @SYS$UPDATE:AUTOGEN GETDATA
   ```

3. Examine the parameter settings in the current PARAMS.DAT, and if they are inappropriate, then change them in the MODPARAMS.DAT file by using the format MIN_<*parameter*>=<*value*> as in the following commands:

   ```
   MIN_GBLSECTIONS=3000
   MIN_GBLPAGES=300000
   ```

   The MIN prefix indicates that you are setting a lower limit for the specified parameter. To use the MIN prefix, identify the current value of the specified parameter (using SYSGEN) and the amount by which you want to increase the parameter. The sum of these two values is used for the `MIN_<parameter>` entry.

4. Run the AUTOGEN utility with the GENPARAMS and REBOOT parameters by entering the following command:

   ```
   $ @SYS$UPDATE:AUTOGEN GENPARAMS REBOOT
   ```

> **Warning:** The REBOOT parameter in this example will cause the system to automatically reboot when the SYSGEN is complete.

This step generates new SYSGEN parameters in a file named SETPARAMS.DAT and runs the SYSGEN utility to set these parameter values as specified in that file.

> **See Also:** For more information about using the AUTOGEN utility, see the OpenVMS *System Management Utilities Reference.*

HP OpenVMS Alpha System Configuration

If your system fails to satisfy any listed requirement, then perform the tasks listed in the next section as necessary to configure your system to meet these requirements.

Table 3–3 lists the requirements for installing Oracle9*i* on your HP OpenVMS system.

Table 3–3   HP OpenVMS Alpha System Configuration Summary

System Factors	Requirement for Oracle9*i*
HP OpenVMS Alpha Parameters:	
Minimum Global Pages/ Sections	Verify that the values for MIN_GBLPAGES and MIN_GBLSECTIONS are greater than, or equal to, the values that were calculated for these parameters, as documented in READMEVMS.DOC.
OpenVMS Accounts	You need an OpenVMS account that is dedicated solely to installing and upgrading Oracle products. The instructions in this book are provided with the assumption that the account is called *oracle9*.
Permissions for File Creation	Default Protections

Setup Tasks to Perform as the SYSTEM User

Log in as the system user and perform the following tasks to set up your environment for Oracle9*i*:

- Create an OpenVMS Account to Own Oracle Software
- Create an OpenVMS Account to Own the Apache Server

Create an OpenVMS Account to Own Oracle Software

The *oracle9* account is the OpenVMS user account that owns the Oracle9*i* software after installation. Run Oracle Universal Installer with this user account.

Use the AUTHORIZE utility to create an *oracle9* account with the following properties:

Table 3–4 lists the properties of Oracle9*i* accounts.

Table 3–4   Properties of the Oracle9i Account

Login Name	Any name, but this document refers to it as the *oracle9* account.
UIC	The group UIC number, which is greater than MAXSYSGROUP.
Home Directory	Choose a home directory consistent with other user home directories. The home directory of the *oracle9* account does **not** need to be the same as the ORA_ROOT directory.

> **Caution:**   Use the *oracle9* account only for installing and maintaining Oracle software. Never use it for purposes unrelated to the Oracle9*i* server. Do not use SYSTEM as the *oracle9* account.

Sites with multiple ORA_ROOT directories on one system may install Oracle software with the same *oracle9* account, or separate accounts. Each *oracle9* account must have the same group UIC.

Create an OpenVMS Account to Own the Apache Server

The *Apache* account is an OpenVMS user account that owns the Apache server after installation. If you use a default Apache configuration (one that listens to ports lower than 1024, which are reserved to System), then Oracle Corporation recommends, for security reasons, that a separate account owner be set up for Apache. Configure the Apache server to assign ownership of listener and module actions to this account. It is not necessary for the Apache user account to have

privileges to run the Apache Server on a port < 1023. Images that are linked with privileges during installation in the 'oracle' account ensure that this can be done. For details on how to configure the server to run as a user other than the 'oracle' user, refer to section "Customizing the Server Environment" on page D-8.

The Apache account owner should have minimal user privileges, and should not be a member of any groups whose files are not intended to be visible to the public. The *nobody* account may serve as a model for the *Apache* account.

Setup Tasks to Perform as the Oracle User

Log in to the Oracle9 account and perform the following tasks as necessary:

- Set Permissions for File Creation
- Set Display

Set Permissions for File Creation

Set default file protections for the *oracle9* account to ensure that group and world have read and execute permissions, but not write permission, on installed files.

1. Enter the $SHOW PROTECTION command to check the current setting.

2. If the $SHOW PROTECTION command does not show the expected protection, then set protection in the login.com of the *oracle9* as follows:

```
$ SET PROTECTION=(s:RWE, o:RWED, g:RE, w:RE)/default
```

Set Display

Before starting the Oracle Universal Installer, set your display appropriately. Enter:

```
$ SET DISPLAY/CREATE/TRANSPORT=TCPIP/NODE=<workstation_name or IP_address>
```

and verify that it is correct by using the following command:

```
$ RUN SYS$SYSTEM:DECW$CLOCK
```

Refer to each logical entry in this section for instructions on setting the logical correctly.

> **Note:**   If an Oracle server already exists on your system, then its settings may have a bearing on the settings that you choose for the new environment.

Do not use the hostname or IP address of the system where the software is being installed unless you are performing the installation from the X-Windows console of that system. Use the machine name or IP address of your own workstation if you are installing from a remote system.   If you are not sure of the X server and screen settings, then use 0 (zero) for both.

Setup Tasks for Oracle Products

The following products require pre-installation steps to be completed before you install Oracle9*i* software:

- Precompilers and Tools

- Network and System Management Products

Precompilers and Tools

Complete pre-installation tasks for the precompilers and tools that are required for hp OpenVMS Alpha.

Pro*COBOL Restriction

The use of incorrectly aligned binary data (such as COMP-1) in Pro*COBOL applications will generate unaligned access warnings that will prevent optimum compiler performance, but will not affect the application results.

Java Runtime Environment

The Java Runtime Environment (JRE) that is certified for use with Oracle9*i* software is used by Oracle Java applications such as the Oracle Universal Installer and is the only Java application supported to run with these applications. Do not modify this JRE unless you use a patch that is provided by Oracle Support Services.

Network and System Management Products

This section describes tasks that need to be completed prior to installation if you have existing network and system management products.

Setup Tasks for Oracle Net Services

If you have an existing installation of Oracle Net8 server, then shut down all listeners before installing Oracle Net. To determine if any listeners are running, enter the following command:

```
$ lsnrctl status [listener_name]
```

The *listener_name* field is required if the listener has a name other than the default name listener.

To shut down a running listener, enter the following command:

```
$ lsnrctl stop listener_name
```

Verify Oracle Supported Protocols

Oracle Universal Installer automatically installs the TCP/IP protocol with all Oracle9*i* database installations. Before installing any protocol, verify that the underlying network is functioning and is configured properly.

To verify that the network is functioning properly, transfer and retrieve a test file using the ftp utility by entering the following commands:

```
$ ftp remote_server_name
ftp> put test_filename
ftp> get test_filename
```

4

Installation

This chapter describes how to start the Oracle Universal Installer and how to install Oracle9*i* products on your system. Review and complete the tasks that are listed in Chapter 1, "Oracle9i Installation Planning" and Chapter 3, "CD-ROM Pre-installation Requirements" before beginning the installation.

This chapter contains the following sections:

- Installation Mount Options on page 4-2

- Installation Option, Installing Oracle9i from the Hard Drive on page 4-2

- Oracle Universal Installer on page 4-3

Installation Mount Options

Mount and Unmount the Oracle9*i* CD-ROM

If you run the Oracle Universal Installer while the current working directory is in the CD-ROM, then perform the following steps to mount the next CD-ROM:

Mount the Oracle9*i* CD-ROM device. For example:

```
$ MOUNT/OVERRIDE=IDENTIFICATION <ddcn>
```

where:

<ddcn> is a valid CD-ROM device.

> **Note:** Oracle Corporation **does not support** using the Oracle Universal Installer that is shipped with releases 8.1.*x* or 9.0.1 to install release 9.2.0.1.0 components.

Installation Option, Installing Oracle9*i* from the Hard Drive

You can avoid the need to mount and unmount CD-ROMs during installation by copying the contents of each CD-ROM to your system hard drive. You must have a file system that is not in use by other applications. You must also have at least 2.5 GB of disk space available.

1. Copy the CD-ROMs to your system hard drive. Copy the contents of each CD-ROM to a directory on a disk. For example:

```
$ copy <first CD> disk$disk1:[cdrom]
$ copy <second CD> disk$disk1:[cdrom]
```

2. Start the Oracle Universal Installer from the hard disk. The Oracle Universal Installer automatically finds the contents of each CD-ROM and does not prompt for the location of any CD-ROM during the course of the installation.

Oracle Universal Installer

The following procedure describes the installation of products with the use of the Oracle Universal Installer (OUI).

Installing an Oracle9*i* Database

1. Log in as the Oracle user.

2. Start the Oracle Universal Installer from the CD-ROM mount-point directory at the SYSTEM directory level with the following command:

   ```
   $ @<ddcn>:[disk1]runInstaller
   ```

   If the default temp directory (SYS$SCRATCH) is not ODS-5, then you will need to use the **-scratchPath** flag to specify an alternate temporary directory. For more information about ODS-5 format requirements, refer to "Oracle9i Release 2 Dependency on ODS-5 Disk Structure" on page 2-3.

   ```
   $ @<ddcn>:[disk1]runInstaller -scratchPath <ODS5_temp_dir>
   ```

   - After the Oracle Universal Installer starts, the **Welcome** window appears.

   - Click **Next** to continue the installation.

3. The **Inventory Location** window appears.

   - If this is the first time that any Oracle9*i* products are installed on the current system, then the **Inventory Location** window appears.

   - Enter a directory where the inventory of all installations will be kept.

     Note: This directory must be on an ODS-5 disk.

   - If this is not the first time any Oracle9*i* products are installed on the current system, then go to the next step.

   - Click **Next** to continue the installation.

4. The **File Locations** Window appears.

- **Source:** You should not need to change the default. This points to the installation files.

- **Destination (Name):** Enter a name to refer to your ORACLE_HOME.

- **Destination (Path):** Enter the path of your ORACLE_HOME.

Note: ORACLE_HOME must be on an ODS-5 disk.

- Click **Next**

5. The **Available Products** window appears.

- Choose Oracle9*i* Database.

- Click **Next** to continue.

6. The **Installation Types** window appears.

- Choose an installation type: Enterprise Edition, Standard Edition, or Custom.

- Click **Next.**

7. The **Database Configuration** window appears.

- Select a database that is suited to your needs.

- Click **Next**.

8. The **Database Identification** window appears.

- The Software Only option will not install the starter database.

  If you choose this option, the next step will use the **Enable Real Application Clusters** window (step 12).

- Click **Next**.

9. The **Database Identification** window appears.

- Enter the Global Database Name for this database.

- Enter the system identifier (SID).

- Click **Next**.

10. The **Datafiles Location** window appears.

- Enter a path for the location of the data files.

- Click **Next**.

11. The **Database Character Set** window appears.

- choose the desired character set.

- Click **Next**.

12. The **Enable Real Application Clusters (RAC)** window appears.

- Select **YES** if you wish to enable RAC.

13. The **Summary** window appears.

- This window displays all of the options that have been chosen.

- Click **Install** to proceed with the installation, or click **Previous** to change your selections.

14. The **Install** window appears.

- This window indicates installation progress.

- Errors or warnings produce a dialog box where you can choose to fix and retry, to ignore and continue, or to abort.

a. If you chose to install Software Only, then the **End of Installation** window appears next.

b. If you chose to install a starter database, then the **Configuration Tools** window appears, followed by the **Database Configuration Assistant** window.

c. When configuration is complete, the **End of Installation** window appears.

15. From the **End of Installation** window, you may exit or install additional products.

- This window appears when your installation is complete. You may choose to exit OUI or to begin another installation:

a. Click **Exit** to end this session with OUI.

b. Click **Next Install** to begin another installation without stopping and restarting the Oracle Universal Installer.

Installing Oracle9*i* Client

1. Log in as the Oracle user.

2. Start the Oracle Universal Installer from the CD-ROM mount-point directory at the SYSTEM directory level with the following command:

   ```
   $ @<ddcn>:[disk1]runInstaller
   ```

   If the default temp directory (SYS$SCRATCH) is not ODS-5, then you will need to use the **-scratchPath** flag to specify an alternate temporary directory. For more information about the use of ODS-5 format, refer to "Oracle9i Release 2 Dependency on ODS-5 Disk Structure" on page 2-3.

   ```
   $ @<ddcn>:[disk1]runInstaller -scratchPath <ODS5_temp_dir>
   ```

3. After the Oracle Universal Installer starts, the **Welcome** window appears.

   - Click **Next** to continue the installation.

4. The **Inventory Location** window appears.

   - If this is the first time that any Oracle9*i* products are installed on the current system, then the **Inventory Location** window appears.

     Enter a directory where the inventory of all installations will be kept.

     Note: This directory must be on an ODS-5 disk.

   - If this is not the first time any Oracle9*i* products are installed on the current system, then refer to the next step.

5. The **File Locations Window** appears.

   - **Source:** You should not need to change the default. This points to the installation files.

   - **Destination (Name):** Enter a name to refer to your ORACLE_HOME.

   - **Destination (Path):** Enter the path of your ORACLE_HOME.

     Note: ORACLE_HOME must be on an ODS-5 disk.

   - Click **Next.**

6. The **Available Products** window appears.

   - Choose Oracle9*i* Client.

   - Click **Next** to continue.

7. The **Installation Types** window appears.

   - Choose an installation type: Custom, Administrator, or Runtime.

   - Click **Next.**

8. The **Summary** window appears.

   - This window displays all of the options that have been chosen.

   - Click **Install** to proceed with the installation, or click **Previous** to change your selections.

9. The **Install** window appears.

   - This window indicates installation progress.

   - Errors or warnings produce a dialog box where you can choose to fix and retry, to ignore and continue, or to abort.

10. From the **End of Installation** window, you may exit or install additional products.

    - This window appears when your installation is complete. You may choose to exit OUI or to begin another installation:

    a. Click **Exit** to end this session with OUI.

    b. Click **Next Install** to begin another installation without stopping and restarting the Oracle Universal Installer.

Oracle9*i* Database Custom Installation

When you select Custom Installation, the **Available Product Components** window appears. It displays all products and components that are available for installation. A typical Custom installation configuration is selected by default. Some actions that may differ from a standard installation are:

1. Select the products that you want to install, or deselect products that you do not want to install, and click **Next**.

2. Provide responses to any window prompts that appear.

   With custom selection of products, you may want to change default values for items such as: port numbers, product-specific directory names, or Rdb gateway attributes.

   The **Summary** window appears.

Reviewing a Log of an Installation Session

The Oracle Universal Installer creates the **oraInventory** directory the first time that it is run in order to keep an inventory of products that it installs on your system as well as an inventory of other installation information.

The location of the **OraInventory** directory is defined in the `OraInst.loc` file, which is located in the directory where OUI is run. An inventory is created the first time that an OUI installation is performed on a particular system. The inventory is then detected and referenced during subsequent installation sessions.

The log file of the most recent installation is **oraInventory_location:[logs]installActions.log**. Previous installation log files use the following log file name format:

installActions*date_time*.log

For example:

installActions2001-02-14_09-00-56-am.log

> **Caution:** Do not delete or manually alter the `oraInventory` directory or its contents. Doing so can prevent the Oracle Universal Installer from locating products that you install on your system.
>
> The `make.log` file in the `ORA_ROOT:[install]` directory contains a log of every `make` file action that is executed during the installation process. The `make.log` file also records any link errors during installation. Do not delete or alter the `make.log` file.

Installing Real Application Clusters

Because the disk on which the Oracle software will be installed is mounted cluster wide, and is therefore accessible from multiple nodes, installing Real Application Clusters (RAC) on OpenVMS is no different than installing non-RAC, except for the screen in OUI (Oracle Universal Installer) on which you are presented the option. For complete details about configuring RAC, refer to the generic documentation. The following steps are taken after the software has been installed and a database has been created.

> **Note:** The following steps are provided here with the assumption that the instance on node1 is sidA, and that the instance on node2 is sidB.

Node1:

1. Set up your environment:

   `$ @orauser ` *sidA*

2. `$ set default ora_root:[network]`

3. Create the DCL script needed for bequeath connections:

   `$ @create_orasrv_beq <ora_db> ` *<sidB>* ` <db_name>`

   for example:

   `$ @create_orasrv_beq DISK$DISK1:[Oracle9i.Home1.ORADATA.DB92] -`
   `_$ ` *sidB* ` DB92`

4. `$ set default ora_root:[dbs]`

5. Create a copy of the Password file:

   ```
   $ copy orapwsidA.; orapwsidB.;
   ```

6. Create a copy of the instance specific parameter file:

   ```
   $ copy initsidA.ora initsidB.ora
   ```

7. Create a copy of the properties file:

   ```
   $ copy sid_sidA.properties sid_sidB.properties
   ```

8. Edit the files that were created in step 6 and step 7.   (Before starting the instance, refer to the "List Of Parameters" following these numbered steps.)

9. Ensure that parameter **remote_login_passwordfile** is set to SHARED (default: EXCLUSIVE).

10. SQL> connect / as sysdba

11. SQL> startup

12. SQL> alter database add logfile thread 2

    ```
        group 4 ('ora_db:redo04.rdo') size 100m,
        group 5 ('ora_db:redo05.rdo') size 100m,
        group 6 ('ora_db:redo06.rdo') size 100m;
    ```

13. SQL> alter database enable public thread 2;

14. SQL> create undo tablespace UNDOTBS2 datafile

    ```
        '<filespec>' size <size>;
    ```

15. SQL> @ora_root:[rdbms.admin]catclust

Node2:

16. Set up your environment:

    ```
    $ @orauser sidB
    ```

17. SQL> connect / as sysdba

18. SQL> startup

List Of Parameters

The following parameters need to be defined before starting an instance that will participate in RAC:

```
cluster_database  = true
undo_tablespace   = UNDOTBS1 or UNDOTBS2
service_names     = sidA or sidB
instance_name     = sidA or sidB
instance_number   = 1 or 2
thread            = 1 or 2
cluster_database_instances = 4    # optional
```

Completing Installation of Oracle9*i* Server Enterprise Edition

If no errors occurred during installation, then your installation is complete. To create a database and instance, use the DBCA tool (refer to "Database Configuration Assistant (DBCA)" on page 5-2).

Non-Interactive Installation and Configuration

For non-interactive installations, use the Silent Mode Installation, which is described in Chapter 1, "Oracle9i Installation Planning" on page 1-16.

Cleaning Up After a Failed Installation

If an installation fails, then (before you attempt another installation) you might need to remove files that the Oracle Universal Installer created during the last session.

To clean up after a failed installation:

1. Start the Oracle Universal Installer.

2. Click the **De-install Products** button and select any products that were left after the failed installation.

3. Click the **Remove** button.

To complete the clean up, you might need to manually remove the ORA_ROOT directory.

5

Post-Installation

After completing the Oracle Universal Installer session, you must perform certain post-installation steps, and you must configure Oracle9*i*.

This chapter contains the following sections:

> **Note:** This chapter describes basic configuration only. Refer to the *Oracle9i Administrator's Reference Release 2 (9.2.0.2) for hp OpenVMS Alpha* and to the product administration and tuning guides for more sophisticated configuration and tuning information.

Database Configuration Assistant (DBCA)

Interactive Mode

To invoke DBCA (Database Configuration Assistant) in the interactive mode, perform the following:

1. Set up the X-Windows environment by using the following DCL command:

   ```
   SET DISPLAY/CREATE/TRANSPORT=TCPIP/NODE=< workstation_name or IP_address>
   ```

2. Invoke @<ORACLE_HOME>orauser.com

3. Invoke dbca.com

The DBCA GUI appears.

Non-interactive Mode

Silent mode does not have any user interface (other than what you provide in an argument or response file) or user interaction. It displays all messages (including information, errors, and warnings) into a log file.

From the command line, enter the following command to see all of the DBCA options that are available when using silent mode:

```
dbca -help
```

> **Note:** Because of the DCL limit of eight command line parameters on OpenVMS, it is not possible to specify directly on the command line all of the required parameters to create a database. Therefore, as a workaround, DBCA command line arguments may be placed into a file called SYS$SCRATCH:DBCA.ARGS. The DBCA.COM script looks for this file and, if present, passes the specified arguments to the DBCA Java application. DBCA.COM will ignore all arguments that are passed on the command line except: -silent, -responseFile <response_file>, and -help. In order to avoid inadvertently applying the same arguments to the next invocation of DBCA when DBCA.ARGS exits, if an arguments file was used, then it is renamed to SYS$SCRATCH:DBCA.ARGS_OLD.

> **Note:** Because the DBCA design (in a similar manner to that of the Oracle Universal Installer) causes GUI classes to be loaded (even in silent mode), a silent installation still requires an X connection.

The following sections contain examples that illustrate the use of silent mode.

DBCA Silent Mode Example 1: Creating a Clone Database

To create a clone database, enter the following into SYS$SCRATCH:DBCA.ARGS:

```
-silent
-createDatabase
-templateName Transaction_Processing.dbc
-gdbname ora9i
-sid ora9i
-datafileJarLocation /disk$disk1/oracle9i/ora9i/assistants/dbca/templates
-datafileDestination /disk$disk1/oracle9i/ora9i/oradata
-responseFile NO_VALUE
-characterset WE8ISO8859P1
```

> **Note:** Either VMS-style arguments or UNIX-style arguments may be used in the arguments that are contained in an argument file.

Then, assuming that the ORACLE_HOME environment is set up by executing:

```
$ @<ORACLE_HOME>orauser
```

invoke DBCA. Log files are located in the same place as with an interactive install. In this example:

```
Disk$disk1:[oracle9i.ora9i.admin.ora9i.create]
```

Also, check the **<ORACLE_HOME>[.assistants.dbca.logs]** directory.

DBCA Silent Mode Example 2: Creating a Seed Template

To create a seed template, enter the following into SYS$SCRATCH:DBCA.ARGS:

```
-silent
-createCloneTemplate
-sourceDB ora9i
-sysDBAUserName sys
-sysDBAPassword change_on_install
```

```
-templateName copy_of_ora9i
-datafileJarLocation /disk$disk1/oracle9i/ora9i/assistants/dbca/templates
```

Then, assuming that the ORACLE_HOME environment is set up by executing the orauser script, invoke DBCA. Log files for creating a seed template are located in the **<ORACLE_HOME>[.assistants.dbca.logs]** directory.

Using DBCA Response Files

An alternative to creating an argument file to pass command line options to DBCA is to use a response file. A sample response file (**dbca.rsp**) is provided in the **<ORACLE_HOME>[.assistants.dbca]** directory. Make a copy of this file and customize it as necessary. Follow the instructions that are contained in comments. The value that is specified for the CREATE_TYPE field determines which of the other sections are applicable. Each field has a comment header block with the following entries: Name, Datatype, Description, Valid values, Default value, and Mandatory (Yes/No) descriptions.

For example:

```
#-----------------------------------------------------------------------------
# Name          : CREATE_TYPE
# Datatype      : String
# Description   : Type of database creation
# Valid values  : "createDatabase" \ "createTemplateFromDB" \
#                  "createCloneTemplate"
# Default value : None
# Mandatory     : Yes
#-----------------------------------------------------------------------------
CREATE_TYPE = "createDatabase"
```

All mandatory values must be provided, but only for the applicable sections as indicated by the **CREATE_TYPE** value. After customizing the response file, invoke DBCA, passing the name of the response file on the command line, as follows:

```
$ dbca -silent -responseFile <full_response_file_name>
```

> **Note:** Either VMS-style arguments or UNIX-style arguments may be used in fields that are contained within a response file, but the response file argument that is passed to the DBCA.COM script on the command line with the **-responseFile** keyword must be in VMS-style syntax.

The following sample DBCA.RSP file is included here for reference:

```
###############################################################################
##                                                                           ##
##                           DBCA response file                              ##
##                           ------------------                              ##
## Copyright   1998, 2001, Oracle Corporation. All Rights Reserved.          ##
##                                                                           ##
## Specify values for the variables listed below to customize Oracle         ##
## Database Configuration installation.                                      ##
##                                                                           ##
## Each variable is associated with a comment. The comment identifies the    ##
## variable type.                                                            ##
##                                                                           ##
## Please specify the values in the following format :                       ##
##         Type      :  Example                                              ##
##         String    :  "<value>"                                            ##
##         Boolean   :  True or False                                        ##
##         Number    :  <numeric value>                                      ##
##         StringList : {"<value1>","<value2>"}                              ##
##                                                                           ##
## Examples :                                                                ##
##     1. dbca -progress_only -responseFile <response file>                  ##
##                                                                           ##
##        Display a progress bar depicitng progress of database creation     ##
##        process.                                                           ##
##                                                                           ##
##     2. dbca -silent -responseFile <response file>                         ##
##                                                                           ##
##        Creates database silently. No user interface is displayed.         ##
##                                                                           ##
##     3. dbca -silent -createDatabase -cloneTemplate                        ##
##                       -responseFile <response file>                       ##
##                                                                           ##
##        Creates database silently with clone template. The template in     ##
##             reponsefile is a clone template.                              ##
###############################################################################

#-----------------------------------------------------------------------------
# GENERAL section is required for all types of database creations.
#-----------------------------------------------------------------------------
[GENERAL]


#-----------------------------------------------------------------------------
```

```
            # Name         : RESPONSEFILE_VERSION
            # Datatype     : String
            # Description   : Version of the database to create
            # Valid values : "9.0.0"
            # Default value : None
            # Mandatory     : Yes
            #-------------------------------------------------------------------------------
            RESPONSEFILE_VERSION = "9.0.0"


            #-------------------------------------------------------------------------------
            # Name         : CREATE_TYPE
            # Datatype     : String
            # Description   : Type of database creation
            # Valid values : "createDatabase" \ "createTemplateFromDB" \
            "createCloneTemplate"
            # Default value : None
            # Mandatory     : Yes
            #-------------------------------------------------------------------------------
            CREATE_TYPE = "createDatabase"



            #----------------------*** End of GENERAL section ***-----------------------

            #-------------------------------------------------------------------------------
            # CREATEDATABASE section is used when CREATE_TYPE is defined as
            # "createDatabase".
            #-------------------------------------------------------------------------------
            [CREATEDATABASE]


            #-------------------------------------------------------------------------------
            # Name         : GDBNAME
            # Datatype     : String
            # Description   : Global database name of the database
            # Valid values : <db_name>.<db_domain> - when database domain isn't NULL
            #                <db_name>              - when database domain is NULL
            # Default value : None
            # Mandatory     : Yes
            #-------------------------------------------------------------------------------
            GDBNAME = "orcl9i.us.oracle.com"


            #-------------------------------------------------------------------------------
            # Name         : SID
            # Datatype     : String
            # Description   : System identifier (SID) of the database
            # Valid values : Check Oracle9i Administrator's Guide
```

```
# Default value : <db_name> specified in GDBNAME
# Mandatory     : No
#-------------------------------------------------------------------------------
SID = "orcl9i"


#-------------------------------------------------------------------------------
# Name          : TEMPLATENAME
# Datatype      : String
# Description   : Name of the template
# Valid values  : Template name as seen in DBCA
# Default value : None
# Mandatory     : Yes
#-------------------------------------------------------------------------------
TEMPLATENAME = "New Database"



#-------------------------------------------------------------------------------
# Name          : DATAFILEJARLOCATION
# Datatype      : String
# Description   : Location of the data file jar
# Valid values  : Directory containing compressed datafile jar
# Default value : None
# Mandatory     : Yes, when the clone template is used for database creation
#-------------------------------------------------------------------------------
#DATAFILEJARLOCATION =



#-------------------------------------------------------------------------------
# Name          : CHARACTERSET
# Datatype      : String
# Description   : Character set of the database
# Valid values  : Check Oracle9i National Language Support Guide
# Default value : "US7ASCII"
# Mandatory     : NO
#-------------------------------------------------------------------------------
#CHARACTERSET = "US7ASCII"


#-------------------------------------------------------------------------------
# Name          : NATIONALCHARACTERSET
# Datatype      : String
# Description   : National Character set of the database
# Valid values  : "UTF8" or "AL16UTF16". For details, check Oracle9i National
# Language Support Guide
# Default value : "AL16UTF16"
# Mandatory     : No
```

```
#-------------------------------------------------------------------------------
#NATIONALCHARACTERSET= "UTF8"


#-------------------------------------------------------------------------------
# Name          : REGISTERWITHDIRSERVICE
# Datatype      : Boolean
# Description   : Specifies whether to register with Directory Service.
# Valid values  : TRUE \ FALSE
# Default value : FALSE
# Mandatory     : No
#-------------------------------------------------------------------------------
#REGISTERWITHDIRSERVICE= TRUE


#-------------------------------------------------------------------------------
# Name          : DIRSERVICEUSERNAME
# Datatype      : String
# Description   : Specifies the name of the directory service user
# Mandatory     : YES, if the value of registerWithDirService is TRUE
#-------------------------------------------------------------------------------
#DIRSERVICEUSERNAME= "name"


#-------------------------------------------------------------------------------
# Name          : DIRSERVICEPASSWORD
# Datatype      : String
# Description   : The password of the directory service user.
#                 You can also specify the password at the command prompt
# instead of here.
# Mandatory     : YES, if the value of registerWithDirService is TRUE
#-------------------------------------------------------------------------------
#DIRSERVICEPASSWORD= "password"


#-------------------------------------------------------------------------------
# Name          : LISTENERS
# Datatype      : String
# Description   : Specifies list of listeners to register the database with.
#                 By default the database is configured for all the listeners
#                 specified in the
#                 $ORACLE_HOME/network/admin/listener.ora
# Valid values  : The list should be space separated names like
#                 "listener1 listener2".
# Mandatory     : NO
#-------------------------------------------------------------------------------
#LISTENERS = "listener1 listener2"


#-------------------------------------------------------------------------------
```

```
# Name        : VARIABLESFILE
# Datatype    : String
# Description : Location of the file containing variable value pair
# Valid values : A valid file-system file. The variable value pair format
#                in this file
#                is <variable>=<value>. Each pair should be in a new line.
# Default value : None
# Mandatory   : NO
#--------------------------------------------------------------------------
#VARIABLESFILE =

#----------------*** End of CREATEDATABASE section ***----------------------

#--------------------------------------------------------------------------
# createTemplateFromDB section is used when CREATE_TYPE is defined as
# "createTemplateFromDB".
#--------------------------------------------------------------------------
[createTemplateFromDB]
#--------------------------------------------------------------------------
# Name        : SOURCEDB
# Datatype    : String
# Description : The source database from which to create the template
# Valid values : The format is <host>:<port>:<sid>
# Default value : none
# Mandatory   : YES
#--------------------------------------------------------------------------
SOURCEDB = "myhost:1521:orcl"

#--------------------------------------------------------------------------
# Name        : SYSDBAUSERNAME
# Datatype    : String
# Description : A user with DBA role.
# Default value : none
# Mandatory   : YES
#--------------------------------------------------------------------------
SYSDBAUSERNAME = "system"

#--------------------------------------------------------------------------
# Name        : SYSDBAPASSWORD
# Datatype    : String
# Description : The password of the DBA user.
#               You can also specify the password at the command prompt
#               instead of here.
# Default value : none
# Mandatory   : YES
```

```
#-------------------------------------------------------------------------------
#SYSDBAPASSWORD = "password"


#-------------------------------------------------------------------------------
# Name          : TEMPLATENAME
# Datatype      : String
# Description   : Name for the new template.
# Default value : None
# Mandatory     : Yes
#-------------------------------------------------------------------------------
TEMPLATENAME = "My Copy TEMPLATE"


#----------------*** End of createTemplateFromDB section ***------------------


#-------------------------------------------------------------------------------
# createCloneTemplate section is used when CREATE_TYPE is defined as
# "createCloneTemplate".
#-------------------------------------------------------------------------------
[createCloneTemplate]
#-------------------------------------------------------------------------------
# Name          : SOURCEDB
# Datatype      : String
# Description   : The source database is the SID from which to create the
#                 template.
#                 This database must be local and on the same ORACLE_HOME.
# Default value : none
# Mandatory     : YES
#-------------------------------------------------------------------------------
SOURCEDB = "orcl"


#-------------------------------------------------------------------------------
# Name          : SYSDBAUSERNAME
# Datatype      : String
# Description   : A user with DBA role.
# Default value : none
# Mandatory     : YES
#-------------------------------------------------------------------------------
SYSDBAUSERNAME = "system"


#-------------------------------------------------------------------------------
# Name          : SYSDBAPASSWORD
# Datatype      : String
# Description   : The password of the DBA user.
#                 You can also specify the password at the command prompt
# instead of here.
```

```
# Default value : none
# Mandatory     : YES
#------------------------------------------------------------------------------
#SYSDBAPASSWORD = "password"


#------------------------------------------------------------------------------
# Name          : TEMPLATENAME
# Datatype      : String
# Description   : Name for the new template.
# Default value : None
# Mandatory     : Yes
#------------------------------------------------------------------------------
TEMPLATENAME = "My Clone TEMPLATE"


#------------------------------------------------------------------------------
# Name          : DATAFILEJARLOCATION
# Datatype      : String
# Description   : Location of the data file jar
# Valid values  : Directory where the new compressed datafile jar will be placed
# Default value : $ORACLE_HOME/assistants/dbca/templates
# Mandatory     : NO
#------------------------------------------------------------------------------
#DATAFILEJARLOCATION =
```

User Passwords

Oracle Corporation recommends that you change the password for user names **immediately** after installation.

To change a password:

1. Start SQL*Plus by using the following command:

   ```
   $ sqlplus
   ```

2. Connect with the user name and password that you want to change by using the following command:

   ```
   Enter user-name: username/password
   ```

3. Change the password by using the following command:

   ```
   SQL> ALTER USER USERNAME IDENTIFIED BY PASSWORD;
   ```

Configuration Tasks to Perform as the System User

Log in as the system user and perform the following tasks:

❏ Create Additional OpenVMS Accounts

❏ Automate Database Startup and Shutdown (Optional)

❏ Set Initialization Parameters

Create Additional OpenVMS Accounts

If necessary, create additional OpenVMS accounts with the AUTHORIZE utility. Each DBA user on the system must be granted the ORA_DBA or ORA_<sid>_DBA Rights Identifier.

Query the data dictionary view using SQL*Plus to list the accounts in the default database. Accounts in the database are based upon the products chosen in the Oracle Universal Installer.

```
SQL> SELECT username from dba_users;
```

You should delete accounts that you do not need.

Automate Database Startup and Shutdown (Optional)

You can configure your system to automatically start Oracle databases when your system starts up and to shut down Oracle databases when your system shuts down. Automating database startup is optional, but automatic shutdown is recommended because it guards against improper shutdown of the database.

Configuration Tasks to Perform as the Oracle User

Perform the following task as the *oracle* user.

Set Initialization Parameters

Modify init.ora Parameters

When you create a database, your init*sid*.ora parameters are automatically set. You can manually modify the initialization parameters in the init*sid*.ora with an OpenVMS editor. Activate the modified init*sid*.ora file by shutting down and restarting the database.

Do not use logicals in parameter files unless they are defined at an appropriate high level (in other words, at a group level or system level).

> **See Also:** *Oracle9i Administrator's Reference Release 2 (9.2.0.2) for hp OpenVMS Alpha* for information on init.*ora* parameters.

Post-Installation for Oracle Products

Perform the product-specific steps as necessary for your installation. Not all products require post-installation setup.

It is not necessary to read product documentation before completing the configuration tasks in this manual, but more sophisticated tuning requires information that is located in the product documentation.

The following products have post-installation steps:

- Oracle Net
- Oracle Options
- Oracle Precompilers (Pro*COBOL, Pro*C/C++, Pro*FORTRAN)
- Oracle Supported Protocols

Oracle Net

Configuring a complete Oracle network is beyond the scope of this manual and is covered in detail in the *Oracle9i Net Services Administrator's Guide* and the *Oracle9i Net Services Reference Guide*.

Verify and complete your initial configuration with the following steps:

1. Following installation, check the status of the listener by using the command:

   ```
   $ lsnrctl status <listener_name>
   ```

   The *listener_name* field is required if the listener has a name other than the default, which is listener.

   If the listener is not running, then start it with the following command:

   ```
   $ lsnrctl start <listener_name>
   ```

2. Install and configure Oracle client software on a remote system, if necessary, then start SQL*Plus to test the connection to the server.

   ```
   $ sqlplus username/password@net_service_name
   ```

   > **Note:** 1521 is the default port.

If you can successfully connect to the server with SQL*Plus, then you have established network connectivity over TCP/IP. For more advanced network configuration, refer to the *Oracle9i Net Services Administrator's Guide*.

Oracle Options

Oracle *inter*Media

> **Note:** There is no upgrade from previous releases of ConText Cartridge to Oracle *inter*Media Text. However, there is a migration that can be performed manually. See the *Oracle9i ConText to interMedia Text Migration Guide* for documentation of this process.

If you intend to install Oracle *inter*Media Text after your initial server installation, then ensure that you have at least 10 MB of disk space for the data dictionary.

Your database must include tablespaces that are specific to *inter*Media Text data. Verify that tablespaces exist to serve as default and temporary tablespaces for Oracle *inter*Media Text. Oracle *inter*Media Text uses the DRSYS tablespace for its default and temporary tablespaces. If tablespaces for Oracle *inter*Media Text do not exist, or if you do not want to use the DRSYS tablespace, then create additional tablespaces before proceeding.

> **See Also:** *Oracle9i SQL Reference* for information on creating tablespaces.

Shared Server

Oracle servers that are configured with Shared Server require a higher setting for the initialization parameter SHARED_POOL_SIZE or a custom configuration that uses LARGE_POOL_SIZE. If you created a database manually, then you should raise SHARED_POOL_SIZE in the init*sid*.ora file. Typically, you should add 1 KB for each anticipated concurrent user. Refer to *Oracle9i Database Performance Tuning Guide and Reference* for further information on configuring Shared Server.

Oracle Precompilers

The following list provides references and configuration files that are associated with Oracle precompilers.

Pro*C/C++

For precompiler Pro*C/C++, the configuration file is `pcscfg.cfg`. This file installs without content. Use any text editor to customize it to your site requirements. For more information on configuring the `pcscfg.cfg` file, refer to *Pro*C/C++ Precompiler Programmer's Guide*.

Pro*COBOL

For precompiler Pro*COBOL, the configuration file is `pcbcfg.cfg`. This file installs without content. Use any text editor to customize it to your site requirements. For more information on configuring the `pcbcfg.cfg` file, refer to *Pro*COBOL Precompiler Programmer's Guide*.

Pro*COBOL18

For precompiler Pro*COBOL18, the configuration file is `pcccob.cfg`. This file installs without content. Use any text editor to customize it to your site requirements. For more information on configuring the `pcccob.cfg` file, refer to *Pro*COBOL Precompiler Programmer's Guide*.

Pro*FORTRAN

For precompiler Pro*FORTRAN, the configuration file is `pccfor.cfg`. This file installs without content. Use any text editor to customize it to your site requirements. For more information on configuring the `pccfor.cfg` file, refer to the *Pro*FORTRAN Supplement to the Oracle Precompilers Guide*.

SQL*Modula Ada

For precompiler SQL*Modula Ada, the configuration file is `pmscfg.cfg`. This file installs without content. Use any text editor to customize it to your site requirements. For more information on configuring the `pmscfg.cfg` file, refer to the *SQL*Module for Ada Programmer's Guide*.

PROTOTYPE INFO

For precompiler PROTOTYPE INFO, the configuration file is `xxxcfg.cfg`. This file installs without content. Use any text editor to customize it to your site requirements. For more information on configuring the `pmscfg.cfg` file, refer to the *SQL*Module for Ada Programmer's Guide*.

> **Note:** You cannot use Oracle Precompilers independently of Oracle9*i* to convert embedded PL/SQL.

Oracle Supported Protocols

All Supported Protocols

Perform the following steps after installing any protocol:

1. Verify that you have created and installed the necessary configuration files for the network.

2. Start the listener on the server:

   ```
   $ lsnrctl start <listener-name>
   ```

3. Check the listener process:

   ```
   $ lsnrctl status <listener-name>
   ```

4. As the `oracle` user, start SQL*Plus to test the connection:

   ```
   $ sqlplus username/password@service_name
   ```

Configuring the Secure Socket Layer

For details on Secure Socket Layer, refer to the *Configuring Secure Socket Layer Authentication* in the *Oracle Advanced Security Administrator's Guide* in the generic documentation set.

Starter Database Contents

The starter database is a seed database that is shipped with the Oracle9*i* software. It contains all that is needed in a "general purpose" environment. If the starter database files are selected, then the Oracle Universal Installer will install the starter database.

The following sections provide database administrative information on the default starter database, as well as basic information on Oracle database usernames, passwords, and file locations.

- Unlocking and Resetting User Passwords

- Reviewing User Names and Passwords

- Identifying Databases

- Tablespaces and Data Files

- Locating the Initialization Parameter File

- Locating Redo Log Files

- Locating Control Files

- Using Rollback Segments

- Using the Data Dictionary

Unlocking and Resetting User Passwords

Passwords for all Oracle system administration roles and privileges (except **SYS**, **SYSTEM**, and **SCOTT**) are expired upon installation. You are required to unlock user names and to reset passwords for all other administrative user names before using them. You can do this through Database Configuration Assistant (DBCA).

Unlocking and Resetting Passwords Automatically

During installation, click the **Password Management** button from the Database Configuration Assistant window to change passwords immediately after installation.

An alternative method is available to reset your passwords. If you unlock the password but do not specify a new password, then the database user account will be unlocked, and the password will remain expired until the next time that you log in as that user. SQL*Plus will then prompt you for a new password.

Unlocking and Resetting Passwords Manually

To manually change a password and unlock an account, review the list of default administrative user names, passwords, and functions in Table 5–1, "Default User Names and Passwords". Select a user, and then unlock and reset the password by using the following commands:

1. Start SQL*Plus and log in as SYSDBA by using the following commands:

```
$ sqlplus /nolog
SQL> connect / as sysdba
```

2. Change the password by using the following command:

```
SQL> ALTER USER USERNAME IDENTIFIED BY PASSWORD ACCOUNT UNLOCK
```

The alter statement will both reset the password and unlock the account.

> **Note:** If you want unauthenticated access to your data via HTTP, then unlock the ANONYMOUS user account.

> **See Also:** *Oracle9i Database Administrator's Guide* for more information on unlocking passwords after installation and for information on Oracle security procedures and best security practices.
>
> *Oracle Enterprise Manager Administrator's Guide* for more information on using Oracle Security Manager or Oracle DBA Studio to change passwords.

Reviewing User Names and Passwords

All databases that are created by Database Configuration Assistant include the SYS, SYSTEM, and DBSNMP user names and passwords. In addition, Oracle Corporation provides several other administrative users. Unlock users and reset passwords before using these administrative accounts.

> **Note:** To unlock administrative user passwords after installation, click the **Password Management** button in the **Database Configuration Assistant** window.

Table 5–1 describes the default user names and passwords.

Table 5–1   Default User Names and Passwords

User Name	Password	Description	See Also
CTXSYS	CTXSYS	CTXSYS is the Oracle *Text* user name with CONNECT, DBA, and RESOURCE database roles.	*Oracle9i Oracle Text Reference*
DBSNMP	DBSNMP	DBSNMP includes the CONNECT, RESOURCE, and SNMPAGENT database roles. Run `catnsmp.sql` if you want to delete this role and user.	*Oracle Intelligent Agent User's Guide*
MDSYS	MDSYS	MDSYS is the Oracle Spatial and Oracle *inter*Media Locator administrator user name.	*Oracle Spatial User's Guide and Reference*
ORDPLUGINS	ORDPLUGINS	ORDPLUGINS is the Oracle *inter*Media Audio and Video user name with the CONNECT and RESOURCE roles. ORDPLUGINS allows non-native plug-in formats.	*Oracle9i interMedia User's Guide and Reference*
ORDSYS	ORDSYS	ORDSYS is the Oracle *inter*Media Audio, Video, and Image administrator user name with CONNECT, JAVAUSERPRIV, and RESOURCE database roles.	*Oracle9i interMedia User's Guide and Reference*
OUTLN	OUTLN	OUTLN includes the CONNECT and RESOURCE database roles, and supports plan stability. Plan stability allows you to maintain the same execution plans for the same SQL statements. OUTLN acts as a role to centrally manage metadata associated with stored outlines.	*Oracle9i Database Concepts* *Oracle9i Database Performance Guide and Reference*

Table 5–1 Default User Names and Passwords (Cont.)

User Name	Password	Description	See Also
SYS	CHANGE_ON _INSTALL	SYS is used for performing database administration tasks. SYS includes the following database roles: AQ_ADMINISTRATOR_ROLE AQ_USER_ROLE CONNECT CTXAPP DBA DELETE_CATALOG_ROLE EXECUTE_CATALOG_ROLE EXP_FULL_DATABASE HS_ADMIN_ROLE IMP_FULL_DATABASE JAVA_ADMIN JAVADEBUGPRIV JAVAIDPRIV JAVAUSERPRIV OEM_MONITOR RECOVERY_CATALOG_OWNER RESOURCE SELECT_CATALOG_ROLE SNMPAGENT TIMESERIES_DBA TIMESERIES_DEVELOPER	*Oracle9i Database Administrator's Guide*
SYSTEM	MANAGER	You can use SYSTEM to perform database administration tasks. SYSTEM includes the AQ_ADMINISTRATOR_ROLE and DBA database roles.	*Oracle9i Database Administrator's Guide*
SCOTT	TIGER	SCOTT includes the CONNECT and RESOURCE database roles.	*Oracle9i Database Administrator's Guide*

> **Note:** Any database user can be granted limited SYS role database privileges to use the Oracle Enterprise Manager Diagnostics Pack. Grant users access to these necessary SYS privileges by granting them the OEM_MONITOR role. This role is created when the database is installed. The role is defined in the following SQL script:
>
> ```
> ora_root:[rdbms.admin]catsnmp.sql
> ```
>
> In addition to being granted the OEM_MONITOR role, users must have sufficient default tablespace quota within the monitored database in order for OEM to run and to evaluate some advanced events. Failure to allocate sufficient tablespace to users that are granted the OEM_MONITOR role will result in an insufficient privilege message.
>
> The passwords are necessary only when the user resets and unlocks the passwords manually. They are not required when it is done automatically.

Identifying Databases

The Oracle9*i* software identifies a database by its global database name. A global database name consists of the database name and network domain. The global database name uniquely distinguishes a database from any other database in the same network domain. Enter a global database name when prompted in the **Database Identification** window during Oracle9*i* database installation.

Example of a Global Database Name:

```
sales.us.acme.com
```

In the preceding example, sales is the name of the database. The database name portion is a string of no more than 8 characters that can contain alphanumeric and additional characters. The database name is also assigned to the DB_NAME parameter in the init.ora file.

Also in the preceding example, us.acme.com is the network domain in which the database is located. Together, the database name and the network domain make the global database name unique. The domain portion is a string of no more than 128 characters that can contain alpha, numeric, period (.), and additional characters. The domain name is also assigned to the DB_DOMAIN parameter in the init.ora file.

The DB_NAME parameter and the DB_DOMAIN name parameter combine to create the global database name value that is assigned to the SERVICE_NAMES parameter in the `init.ora` file.

The System Identifier (SID) identifies a specific Oracle9*i* database instance. The SID uniquely distinguishes a database from any other database on the same computer. Multiple ORACLE_HOME directories enable you to have multiple, active Oracle databases on a single computer. Each database requires a unique SID and database name.

The SID name comes from the value entered for the SID prefix in the **Database Identification** window. The SID can be up to 8 alphanumeric characters in length.

For example, if the SID and database name for an Oracle database are ORCL, each database file is in the `ora_root:[oradata.orcl]` directory and the initialization parameter file is in the `ora_root:[admin.orcl.pfile]` directory. The ORCL directory is named after the DB_NAME parameter value.

Tablespaces and Data Files

An Oracle9*i* database is divided into smaller logical areas of space known as tablespaces. Each tablespace corresponds to one or more physical data files. Data files contain the contents of logical database structures such as tables and indexes. You can associate each data file with only one tablespace and database.

> **Note:** Unless you specify different names with Database Configuration Assistant, the tablespaces and data files that are described in the following table are automatically included in the Custom database.

Table 5–2 describes the tablespaces in the Oracle9*i* database that is located in the `ora_root:[oradata.<db_name>]` directory.

Table 5–2 Tablespaces and Data Files

Tablespace	Data File	Contains...
EXAMPLE	example01.dbf	Example Schema
DRSYS	drsys01.dbf	Oracle Text-related schema objects
INDX	indx01.dbf	Indexes associated with the data in the USERS tablespace.

Table 5–2   Tablespaces and Data Files (Cont.)

Tablespace	Data File	Contains...
SYSTEM	system01.dbf	The data dictionary. This includes definitions of tables, views, and stored procedures needed by the Oracle database. **Note:** The database maintains information in this area automatically. The SYSTEM tablespace is present in all Oracle databases.
TEMP	temp01.dbf	Temporary tables and/or indexes created during the processing of your SQL statement **Note:** You might need to expand this tablespace if you are executing a SQL statement that involves a lot of sorting, such as ANALYZE COMPUTE STATISTICS on a very large table, or the constructs GROUP BY, ORDER BY, or DISTINCT.
TOOLS	tools01.dbf	The Installer creates this data file when the user wants to install any third-party or Oracle tools/products.
USERS	users01.dbf	As you generate and enter data into tables, you fill this space with your data.

> **See Also:**   *Oracle9i Database Concepts* and *Oracle9i Database Administrator's Guide* for more information on tablespaces and data files.

Locating the Initialization Parameter File

The database initialization parameter file (init.ora) is generated when a database is created. The init.ora file is used to bring up the instance and to create the database and the data dictionary. When the database is complete, the instance is shutdown, and the init.ora file is saved to **ora_root:[dbs]init<SID>.ora**. The logical, ORA_PARAMS, points to **ora_root:[dbs]init<SID>.ora**.

The init.ora file is a text file that contains a list of preconfigured instance configuration parameters and that must exist for an instance to start. No edits are required to this file in order to use the starter database.

> **See Also:** *Oracle9i Database Administrator's Guide* and *Oracle9i Database Reference* for more information on database-specific initialization parameters and their default values.

Locating Redo Log Files

The starter database and the custom database each contain three redo log files that are located in the **ora_root:[oradata.<db_name>]** directory. Table 5–3 describes the redo log files.

Table 5–3 Redo Log files

Redolog Files	Disk Size	Description
redo01.rdo	100 MB	Redo log files hold a record of all changes that are made to data in the database buffer cache. If an instance failure occurs, then Oracle9*i* uses the redo log files to recover the modified data in memory.
redo02.rdo	100 MB	
redo03.rdo	100 MB	
		Oracle9*i* uses redo log files in a cyclical fashion. For example, if three files constitute the online redo log, then Oracle9*i* fills the first file, then fills the second file, and then fills the third file. In the next cycle, it reuses and fills the first file, the second file, and so on.

> **See Also:** *Oracle9i Backup and Recovery Concepts* for more information on redo log files.

Locating Control Files

The starter database contains three control files. These files are located in the `ora_root:[oradata.<db_name>]` directory. The files `control01.ctl`, `control02.ctl`, and `control03.ctl` are automatically included in the Custom database. Oracle Corporation recommends that you keep at least three control files (on separate physical drives) for each database and set the CONTROL_FILES initialization parameter to list each control file. Table 5–4 describes the database control files.

Table 5–4   Database Control Files

Control Files	Description
`control01.ctl`	A control file is an administrative file. Oracle9*i* requires a
`control02.ctl`	control file to start and run the database. The control file
`control03.ctl`	records the physical structure of the database. For example, a control file contains the database name, and the names and locations of the database data files and redo log files.

> **See Also:** *Oracle9i Database Administrator's Guide* for more information on setting this initialization parameter value.

Using Rollback Segments

Rollback segments record the old values of data that are changed by each transaction, whether or not the transaction has been committed. Every database contains one or more rollback segments. Use rollback segments to provide read consistency, to roll back transactions, and to recover the database. The rollback segments of the starter database are as follows:

- Rollback segment **SYSTEM** is contained in tablespace **SYS** and is used by **SYS**.

- Rollback segments **_SYSSMU1$** through **_SYSSMU10$** are a pool of rollback segments that any instance can use if it requires a rollback segment. They are contained in tablespace **UNDOTBS<n>** and are used by **PUBLIC**.

Using the Data Dictionary

The data dictionary is a protected collection of tables and views containing reference information on the database, its structure, and its users. The data that is stored in the dictionary includes the following:

- Names of the Oracle database users

- Privileges and roles granted to each user

- Names and definitions of schema objects, including tables, views, snapshots, indexes, clusters, synonyms, sequences, procedures, functions, and packages

- Integrity constraints

- Space allocation for database objects

- Auditing information, such as who accessed or updated various objects

    See Also: *Oracle9i Concepts* and *Oracle9i Database Reference* for more information about data dictionary.

Adding or Upgrading Products

This section includes:

- Preparing to Add a Product

- Adding a Product Summary

Preparing to Add a Product

Before you add or upgrade a product, perform the following steps:

1. Verify that your system has Oracle9*i* installed.

2. Log onto your HP OpenVMS Alpha machine.

3. Run the following ORAUSER file for your database:

   ```
   $ set default <Oracle_Home>
   $ @orauser <sid>
   ```

4. If you plan to upgrade any Oracle product tables, change the Oracle SYSTEM password to MANAGER.

    Note: If you do not change the Oracle SYSTEM password to MANAGER, your installation may fail. Oracle installation scripts often assume that the password is MANAGER. Alternatively, you can check for hard coded user names and passwords in the Oracle scripts and change them to your own user names and passwords.

5. Back up the old code and database files (data, redo log, and control).

6. Mount the distribution media.

7. Run Oracle Universal Installer.

   Select custom install.

After completing these preliminary steps, you are ready to load and configure your Oracle products.

Adding a Product Summary

1. Execute `ora_root:[bin]runInstaller`.

2. Point to existing ORACLE_HOME.

3. Select custom install.

4. Select products to install.

5. Configure products if OUI asks questions.

6. Click **Install** button.

7. Exit OUI.

8. Start an instance.

9. Build or upgrade database tables menu.

Relinking the Oracle Code

The Oracle code must be relinked under the following conditions:

- Change to operating system, for example upgrade

- Change to Oracle Net configuration

- Change to RDBMS configuration

Step 1 Shutdown the Given Database(s)

First verify that you are pointed to the right database instance. At the DCL prompt:

```
$ SHOW LOGICAL ORA_SID
ORA_SID" = "V9" (LNM$JOB_TABLE)
```

Invoke SQLPLUS and connect **SYS.** Select from the view **V$PROCESS.** If no other processes are active, and if you are pointed to the right instance, then shut down the given database.

After the database is shut down, all Oracle background processes will no longer exist. Type **SHOW SYSTEM** at the DCL prompt to verify.

Step 2 Remove Images

- Type **REMORACLE** at the system prompt.

  ```
  $ REMORACLE
  ```

Note: Generally, no response is returned except for the return of the DCL prompt.

Step 3 Invoke the Oracle Installation Utility

1. Type at the DCL prompt:

   ```
   $ ora_root:[bin]relink <product | all>
   ```

2. Select option 4, "Build Selected Licensed Products".

A

Oracle9*i* Products

This appendix describes the products that are included with Oracle9*i*:

- Oracle9i Database Components on page A-2
- Oracle9i Client Components on page A-8
- Product Descriptions on page A-2

> **Note:** The Custom installation type is not listed for any of the three top-level components because it allows you to install all components in the current top-level component category. Some components can be installed **only** through a Custom installation. Such components have an availability of "No" listed in this appendix for other installation types.

Oracle9*i* Database Components

The following sections contain alphabetical lists of the components that are available with each installation type of the Oracle9*i* server top-level component.

Enterprise Edition

This section alphabetically lists additional components available with each installation type of the Oracle9*i* server Enterprise Edition. Enterprise Edition includes all the components in the Standard Edition, with the exception of the Oracle Enterprise Manager Standard Management Pack. Refer to the release notes for your platform for updates on component availability.

- Advanced Queuing

- Advanced Replication

- Character Set Scanner

- Common Schema Demos

- Object Type Translator, which includes the following:

  - Oracle INTYPE File Assistant

- Oracle Advanced Security, which includes the following:

  - Encryption and Integrity Support, including:

    * DES40 Encryption

    * DES56 Encryption

    * 3DES_112 Encryption (2-key option)

    * 3DES_168 Integrity (3-key option)

    * MD5 Integrity

    * RC4_40 Encryption

    * RC4_56 Encryption

    * RC4_128 Encryption

    * RC4_256 Integrity

    * SHA-1 Integrity

- Thin JDBC Java-based Encryption Support, including:

    * DES40 Encryption

    * MD5 Integrity

    * RC4_40 Encryption

    * RC4_56 Encryption

    * RC4_128 Encryption

    * RC4_256 Integrity

    * SHA-1 Integrity

- Authentication Support, including:

    * Kerberos (with SSO support)

    * SSL (with X.509 version 3)(with SSO support)

- Enterprise User Security, including:

    * Oracle Wallet Manager

Note: Oracle Wallet Manager is a feature of Oracle Advanced Security. You can use it only if you purchase an Oracle Advanced Security license.

- Oracle Call Interface

- Oracle Dynamic Services

- Oracle JDBC Drivers, which include the following:

    - Oracle JDBC Thin Driver for JDK 1.1

    - Oracle JDBC Thin Driver for JDK 1.2

    - Oracle JDBC/OCI Driver for JDK 1.1

    - Oracle JDBC/OCI Driver for JDK 1.2

- Oracle Locale Builder

- Oracle Locator

- Oracle Net, which includes the following:

  - Oracle Net Listener

  - Oracle Protocol Support

  > **Note:** When Oracle Net Client is installed by using the Enterprise Edition or Standard Edition installation type, the Oracle Universal Installer installs Oracle Protocol Support for the networking protocols that it detects.

- Oracle Partitioning

- Oracle Real Application Clusters

- Oracle Spatial

- Oracle SQLJ, which includes the following:

  - SQLJ Runtime

  - SQLJ Translator

- Oracle Text

- Oracle Trace

- Oracle Universal Installer, which includes the following:

  - Oracle's Java Runtime Environment version

- Oracle Utilities, which includes the following:

  - Export

  - Migration Utility

  - Recovery Manager

  - SQL*Loader

- Oracle XML Developer's Kit

- Oracle XML SQL Utility

- Oracle9*i* Advanced Analytic Services — Data Mining

- Oracle9*i* JVM, which includes the following:

  - Java Virtual Machine

- Oracle9*i* Server (the Oracle9*i* database), which includes the following:

  - Oracle Database Demos

  - PL/SQL

  - PL/SQL Gateway

  - SQL*Plus

SE List

This section alphabetically lists the components that are available with each installation type of the Oracle9*i* server Standard Edition top-level component. Refer to the release notes for your platform for updates on component availability.

- Advanced Queuing

- Advanced Replication

- Character Set Scanner

- Common Schema Demos

- Object Type Translator, which includes the following:

  - Oracle INTYPE File Assistant

  - Enterprise User Security, including:

    * Oracle Wallet Manager

    Note: Oracle Wallet Manager is a feature of Oracle Advanced Security. You can use it only if you purchase an Oracle Advanced Security license.

- Oracle Call Interface

- Oracle Dynamic Services

- Oracle JDBC Drivers, which include the following:
    - Oracle JDBC Thin Driver for JDK 1.1
    - Oracle JDBC Thin Driver for JDK 1.2
    - Oracle JDBC/OCI Driver for JDK 1.1
    - Oracle JDBC/OCI Driver for JDK 1.2
- Oracle Locale Builder
- Oracle Locator
- Oracle Net, which includes the following:
    - Oracle Net Listener
    - Oracle Protocol Support

    > **Note:** When Oracle Net Client is installed by using the Enterprise
    > Edition or Standard Edition installation type, the Oracle Universal
    > Installer installs Oracle Protocol Support for the networking
    > protocols that it detects.

- Oracle SQLJ, which includes the following:
    - SQLJ Runtime
    - SQLJ Translator
- Oracle Text
- Oracle Trace
- Oracle Universal Installer, which includes the following:
    - Oracle's Java Runtime Environment version
        * Oracle Utilities, which includes the following:
    - Export
    - Migration Utility
    - Recovery Manager
    - SQL*Loader
- Oracle XML Developer's Kit

- Oracle XML SQL Utility
- Oracle9*i* JVM, which includes the following:
    - Java Virtual Machine
- Oracle9*i* Server (the Oracle9*i* database), which includes the following:
    - Oracle Database Demos
    - PL/SQL
    - PL/SQL Gateway
    - SQL*Plus

Oracle9*i* Client Components

The following sections provide information on the Oracle9*i* Client components.

Runtime Edition

This section alphabetically lists the components that are available with each installation type of the Oracle9*i* Client Runtime top-level component. Refer to the release notes for your platform for updates on component availability.

- Advanced Queuing

- Documentation for your HP OpenVMS Alpha

- Oracle Advanced Security, which includes the following:

    - Encryption and Integrity Support, including:

        * DES40 Encryption

        * DES56 Encryption

        * 3DES_112 Encryption (2-key option)

        * 3DES_168 Integrity (3-key option)

        * MD5 Integrity

        * RC4_40 Encryption

        * RC4_56 Encryption

        * RC4_128 Encryption

        * RC4_256 Integrity

        * SHA-1 Integrity

- Thin JDBC Java-based Encryption Support, including:

    * DES40 Encryption

    * DES56 Encryption

    * MD5 Integrity

    * RC4_40 Encryption

    * RC4_56 Encryption

    * RC4_128 Encryption

    * RC4_256 Integrity

    * SHA-1 Integrity

- Authentication Support, including:

    * Kerberos (with SSO support)

    * SSL (with X.509 version 3) (with SSO support)

    Note: Kerberos is installable through the Custom installation Authentication Methods window.

- Enterprise User Security, including:

    * Oracle Wallet Manager

    Note: Oracle Wallet Manager is a feature of Oracle Advanced Security. You can only use it, if you purchase an Oracle Advanced Security license.

- Oracle Dynamic Services Server

- Oracle JDBC Drivers, which include the following:

    - Oracle JDBC Thin Driver for JDK 1.1

    - Oracle JDBC Thin Driver for JDK 1.2

    - Oracle JDBC/OCI Driver for JDK 1.1

    - Oracle JDBC/OCI Driver for JDK 1.2

- Oracle Net

- Oracle SQLJ, which includes the following:

  - SQLJ Runtime

  - SQLJ Translator

- Oracle Universal Installer, which includes the following:

  - Oracle Java Runtime Environment version

- Oracle Utilities, which includes the following:

  - Export

  - Import

  - Recovery Manager

  - SQL*Loader

- PL/SQL

Administrator Edition

Oracle9*i* Client Administrator includes the components in the Oracle9*i* Client Runtime and also the following components, which are listed alphabetically. Refer to the release notes for your platform for updates on component availability.

- Advanced Queuing

- Documentation for your HP OpenVMS Alpha

- Object Type Translator

- Oracle Advanced Security, which includes the following:

    - Encryption and Integrity Support, including:

        * DES40 Encryption

        * DES56 Encryption

        * 3DES_112 Encryption (2-key option)

        * 3DES_168 Integrity (3-key option)

        * MD5 Integrity

        * RC4_40 Encryption

        * RC4_56 Encryption

        * RC4_128 Encryption

        * RC4_256 Integrity

        * SHA-1 Integrity

- Thin JDBC Java-based Encryption Support, including:
  - * DES40 Encryption
  - * DES56 Encryption
  - * MD5 Integrity
  - * RC4_40 Encryption
  - * RC4_56 Encryption
  - * RC4_128 Encryption
  - * RC4_256 Integrity
  - * SHA-1 Integrity
- Authentication Support, including:
  - * Kerberos (with SSO support)
  - * SSL (with X.509 version 3) (with SSO support)

Note: Kerberos is installable through the Custom installation Authentication Methods window.

- Enterprise User Security, including:
  - * Oracle Wallet Manager

Note: Oracle Wallet Manager is a feature of Oracle Advanced Security. You can only use it, if you purchase an Oracle Advanced Security license.

- Oracle Call Interface
- Oracle Dynamic Services Server
- Oracle Enterprise Manager, which includes the following:

- Oracle JDBC Drivers, which include the following:
    - Oracle JDBC Thin Driver for JDK 1.1
    - Oracle JDBC Thin Driver for JDK 1.2
    - Oracle JDBC/OCI Driver for JDK 1.1
    - Oracle JDBC/OCI Driver for JDK 1.2
- Oracle Net
- Oracle SQLJ, which includes the following:
    - SQLJ Runtime
    - SQLJ Translator
- Oracle Universal Installer, which includes the following:
    - Oracle's Java Runtime Environment version
- Oracle Utilities, which includes the following:
    - Export
    - Import
    - Recovery Manager
    - SQL*Loader
- Oracle XML Developer's Kit
- Oracle XML SQL Utility
- PL/SQL
- Pro*C/C++
- Pro*COBOL 1.8.75
- Pro*COBOL 9.0.1
- Pro*FORTRAN 1.8.75
- SQL*Module Ada
- SQL*Plus

Product Descriptions

The following list provides descriptions and release numbers for products that are available for installation. Some of the described products are automatically installed with other products. Refer to the release notes for your platform for updates on component availability.

The list format is as follows:

1. Product and release

Description

For more information, refer to...

Product Descriptions

1. Oracle Diagnostics Pack release 9.0.1

The Oracle Diagnostics Pack extends Oracle Enterprise Manager to enable the monitoring, diagnosing, and capacity planning of the multi-tiered Oracle server environment. The Diagnostics Pack provides discovery and graphical representation of targets, such as databases or nodes, automated collection of performance and resource usage data, and central monitoring and administration of remote systems using intelligent agents.

For more information, refer to *Getting Started with the Oracle Diagnostics Pack.*

2. Oracle Standard Management Pack release 9.0.1

The Oracle Standard Management Pack combines the diagnostic, tuning, and change management functions of the Oracle Enterprise Manager Management Packs into one pack for smaller business enterprises that use the standard edition of the database, such as Oracle8*i* or Oracle9*i*. This pack monitors and diagnoses problems, tunes high impact indexes and tracks, and compares changes in the Oracle software environment. The Oracle Standard Management Pack includes the following applications: Oracle Performance Manager, Oracle Index Tuning Wizard, Oracle Create Baseline, Oracle Compare Database Objects, and Oracle Advanced Database and Node Events.

For more information, refer to *Getting Started with the Oracle Standard Management Pack.*

3. **Oracle Management Pack for Oracle Applications** release 9.0.1

    The Oracle Management Pack for Oracle Applications extends Oracle Enterprise Manager to enable administrators to correlate all tiers of their Oracle Applications deployment. This deployment extends from Oracle Applications-specific Concurrent Processing down through the middle tier to the database and node.

    For more information, refer to *Getting Started with the Oracle Management Pack for Oracle Applications.*

4. **Oracle Tuning Pack** release 9.0.1

    The Oracle Tuning Pack provides advanced tools that focus on tuning the highest impact database performance areas, such as application SQL, indexing strategies, instance parameters controlling I/O, SGA performance and object sizing, placement, and reorganization. The applications that are included in the Oracle Tuning Pack are Oracle SQL Analyze, Oracle Expert, Outline Editor, Outline Management, Oracle Index, Tuning Wizard, Reorg Wizard, and the Tablespace Map.

    For more information, refer to *Database Tuning with the Oracle Tuning Pack.*

5. **Oracle Enterprise Manager Quick Tours** release 9.0.1

    These quick tours are HTML-based training tools for learning Oracle Enterprise Manager products.

    For more information, refer to *Oracle Enterprise Manager Administrator's Guide.*

6. **Oracle HTTP Server Powered By Apache** release 1.3.12.0.3a

    Oracle HTTP Server Powered by Apache provides a pre configured, ready-to-use listener.

    > **Note:** Oracle HTTP Server replaces Oracle Application Server Listener.

    For more information, refer to Apache documentation.

7. **Oracle Integration Server** release 9.2.0.2.0

   Oracle Integration Server is a suite of installable components that Oracle Corporation designed to transform traditional businesses into e-businesses. It integrates and facilitates communication among the various applications (including CRM, ERP, business-to-business internet marketplaces, and auction sites) that form an e-business. Oracle Integration Server consists of the following components:

   - Advanced Replication

   - Oracle Advanced Security

   - Oracle9*i* database (with Advanced Queuing and Oracle9*i* JVM)

   - Partitioning

   For information on Oracle Applications InterConnect (OAI), refer to the Oracle generic documentation

8. **Oracle Intelligent Agent** release 9.2.0.2.0

   Oracle Intelligent Agent monitors targets on a managed node for registered events and scheduled jobs that are sent by the Console.

   Oracle Intelligent Agent also collects statistical data for Capacity Planner and Performance Manager, which are data-collecting applications in the Oracle Diagnostics Pack.

   For more information, refer to *Oracle Intelligent Agent User's Guide.*

9. **Oracle *inter*Media Image** release 9.2.0.2.0 (Installed with Oracle *inter*Media, formerly Oracle Image Cartridge)

   Oracle *inter*Media Image provides for the storage, retrieval and processing of two-dimensional, static bitmapped images. Images are stored efficiently using popular compression schemes in industry-standard desktop publishing image interchange formats.

   For more information, refer to *Oracle9i interMedia Audio, Image, and Video User's Guide and Reference.*

10. **Oracle Java Database Connectivity (JDBC) Drivers** release 9.2.0.2.0

    Oracle JDBC Drivers are a standard set of Java classes, specified by JavaSoft, that provide vendor-independent access to relational data.

    For more information, refer to *Oracle9i JDBC Developer's Guide and Reference.*

11. **Oracle Java Tools** release 9.2.0.2.0

    Oracle Java Tools provides tools to build and deploy Java stored procedures with Oracle Java Virtual Machine.

    For more information, refer to *Oracle9i SQLJ Developer's Guide and Reference.*

12. **Oracle Locale Builder** release 9.0.1

    Oracle Locale Builder simplifies manipulation of National Language Support locale data definitions. It provides a graphical user interface for viewing, modifying, and defining locale-specific data.

    For more information, refer to *Oracle Globalization Support Guide.*

13. **Oracle Locator** release 9.2.0.2.0 (Installed with Oracle *inter*Media)

    Oracle Locator enables Oracle9*i* to support online Internet-based geocoding facilities for locator applications and proximity queries.

    For more information, refer to *Oracle9i Spatial User's Guide and Reference.*

14. **Oracle Management Server** release 9.0.1

    Oracle Management Server is the middle tier of Oracle Enterprise Manager. It provides centralized intelligence and distribution control between clients and managed nodes. The Oracle Management Server relies on a database repository that maintains system data, application data, and the state of the managed targets that are distributed throughout the environment.

    For more information, refer to *Oracle Enterprise Manager Administrator's Guide.*

15. **Oracle Names** release 9.2.0.2.0

    Oracle Names is a distributed naming service developed for Oracle environments to help simplify the setup and administration of global, client/server computing networks. It establishes and maintains an integrated system of Names servers.

    Oracle Names servers work like a directory service, storing addresses for all the database services on a network and making them available to clients that want to make a connection.

    For more information, refer to *Oracle Net Administrator's Guide.*

16. **Oracle Net** release 9.2.0.2.0

    Oracle Net provides products that enable client connections to databases across a network. A client-side application sends a request to Oracle Net to be transported across the network to the server.

    Oracle Net (not Oracle Universal Installer) installs TCP/IP and Named Pipes.

    For more information, refer to *Oracle Net Administrator's Guide.*

17. **Oracle Net Listener** release 9.2.0.2.0

    Oracle Net Listener accepts connections (through a protocol) from client applications on the network.

    > **Note:** Oracle Net Listener is not installable through any Oracle9*i* Client installation types.

    Oracle Net clients communicate with Oracle servers through net service names. Oracle Net resolves net service names using the following naming methods:

    - Directory Names
    - Host Names
    - Local Names
    - Oracle Names

    For more information, refer to *Oracle Net Administrator's Guide.*

18. **Oracle Partitioning** release 9.2.0.2.0

Oracle Partitioning provides more control in managing tables and indexes by directing all maintenance operations to individual partitions rather than to tables and index names.

> **Note:** This product requires a separate license.

For more information, refer to *Oracle9i Concepts* and *Oracle9i Data Warehousing Guide.*

19. **Oracle PL/SQL Gateway** release 9.2.0.2.0

The PL/SQL Gateway provides support for building and deploying PL/SQL-based applications on the web. PL/SQL stored procedures retrieve data from database tables and generate HTTP responses. You can deploy the gateway in the following manner:

- `mod_plsql`: This configuration supports running in a stateless mode in which each HTTP request maps to a new database session. This is the recommended configuration if you want to develop stateless PL/SQL-based web applications.

For more information, refer to *Oracle Internet Application Server Release: Using mod_plsql* and to *Oracle9i Administrator's Reference Release 2 (9.2.0.2) for HP OpenVMS Alpha*

20. **Oracle Real Application Clusters** release 9.0.1

Oracle Real Application Clusters is an option that enables the database to run in clustered systems. Oracle instances in the nodes of the cluster provide shared access to the single database. A clustered database enhances scalability and high availability for all types of applications.

> **Note:** This product requires a separate license.

For more information, refer to *Oracle9i Real Application Clusters Installation and Configuration.*

21. **Oracle Real Application Clusters Guard** release 9.0.1

    Oracle Real Application Clusters Guard is an optional feature that provides enhanced high availability for clusters. Oracle Real Applications Clusters Guard supports a primary or secondary configuration with rapid failover and minimal overhead.

    For more information, refer to *Oracle Real Application Clusters Guard Administration and Reference Guide.*

22. **Oracle Spatial** release 9.2.0.2.0

    Oracle Spatial provides data management for location data, including information regarding addresses, road networks. and sales territories. Oracle Spatial provides powerful spatial type management, indexing methods. and spatial operators for the deployment of location-based services. and it extends the capabilities of existing Oracle-based applications.

    > **Note:**   This product requires a separate license.

    For more information, refer to *Oracle9i Spatial User's Guide and Reference.*

23. **Oracle Spatial Index Advisor** release 9.0.1 (installed with Oracle Enterprise Manager Integrated Applications)

    This component helps to analyze and tune spatial indexes on data. Use it to determine if indexes are properly defined for optimum query performance. You can also use it to visually inspect the distribution of the data.

    For more information, refer to *Oracle Enterprise Manager Concepts Guide.*

24. **Oracle SQLJ** release 9.2.0.2.0

    Oracle SQLJ provides a standard method to embed SQL statements in Java programs. Oracle SQLJ consists of the following components:

    a. **Oracle SQLJ Runtime** release 9.2.0.2.0 (Installed with SQLJ)

       Oracle SQLJ Runtime is a thin layer of pure Java code that runs above the JDBC driver. When Oracle SQLJ translates your SQLJ source code using standard SQLJ code generation, embedded SQL commands in your Java application are replaced by calls to the SQLJ runtime. When you run the application, the SQLJ runtime acts as an intermediary, reading information about your SQL operations from your profile and passing instructions along to the JDBC driver.

    b. **Oracle SQLJ Translator** release 9.0.1 (Installed with SQLJ)

       Oracle SQLJ Translator is a preprocessor for Java programs that contain embedded SQL statements. It converts the SQL statements to JDBC calls.

    For more information, refer to *Oracle9i SQLJ Developer's Guide and Reference.*

25. **Oracle Text** release 9.2.0.2.0 (formerly Oracle *inter*Media Text)

    Oracle Text uses standard SQL to index, to search, and to analyze text and documents that are stored in the Oracle database, in files, and on the Web. Oracle Text analyzes document themes and gists, and it searches text using various search strategies. It also renders search results in several formats, and it analyzes and indexes most document formats with over 150 document filters. Oracle Text supports approximately 39 languages. It bulk loads documents in the database with SQL*Loader.

    For more information, refer to *Oracle9i Text Reference* and *Oracle Text Application Developer's Guide.*

26. **Oracle Text Manager** release 9.0.1 (Installed with Oracle Enterprise Manager Integrated Applications)

    OracleText Manager is an application for managing Oracle Text functionality.

    For more information, refer to *Oracle Enterprise Manager Concepts Guide.*

27. **Oracle Universal Installer (OUI)** release 2.0.1.4.0

    Oracle Universal Installer is a Java-based application that lets you quickly install, update, and remove Oracle products.

    For more information, refer to *Oracle9i Installation Guide* and *Oracle Universal Installer Concepts Guide.*

28. **Oracle Utilities** release 9.2.0.2.0

   Oracle Utilities consists of the following products for database administration:

   - Export Utility
   - Import Utility
   - Migration Utility
   - OCOPY
   - ORADIM
   - Password Utility Recovery Manager
   - SQL*Loader

   For more information, refer to *Oracle9i Utilities.*

29. **Oracle Wallet Manager** release 9.0.1

   Oracle Wallet Manager stores and manages public-key security credentials for clients and servers. It generates a public-private key pair and creates a certificate request for submission to a certificate authority.

   For more information, refer to *Oracle Advanced Security Administrator's Guide.*

30. **Oracle XML Developer's Kit** release 9.2.0.2.0

   This kit consists of a set of APIs for parsing and generating XML data. These interfaces have been written for Java, C, and PL/SQL. This kit consists of the following components:

   - XML Parser for Java
   - XML Parser for C
   - XML Parser for PL/SQL
   - XML Class Generator for Java

   For more information, refer to *Oracle9i Application Developer's Guide - XML* and *Oracle9i XML Reference.*

31. **Oracle9*i* Advanced Analytic Services — Data Mining** release 9.0.1

   Oracle9*i* Advanced Analytic Services — Data Mining, which is embedded in the Oracle9*i* database, enables you to build integrated business intelligence applications with complete programmatic control of data mining functions that deliver powerful, scalable modeling and real-time scoring. All model-building and scoring functions are accessible through a Java-based API. Data Mining enables e-businesses to incorporate predictions and classifications throughout all customer interactions and business processes.

   For more information, refer to *Oracle9i Advanced Analytic Services — Data Mining Administrator's Guide* and *Oracle9i Advanced Analytic Services — Data Mining Concepts.*

32. **Oracle9*i* JVM Enterprise Edition** release 9.2.0.2.0

   The Oracle9*i* JVM includes Oracle Java Virtual Machine, CORBA 2.0 Object Request Broker, Machine, embedded JDBC drivers, SQLJ translator.

   For more information, refer to *Oracle9i Java Developer's Guide.*

33. **Oracle9*i* Server** release 9.2.0.2.0

   Oracle9*i* Server is the database component of Oracle9*i*.

   For more information, refer to *Getting to K Now Oracle9i.*

34. **Pro*C/C++** release 9.2.0.2.0

   Pro*C/C++ takes SQL statements that are embedded in C and C++ programs and converts them to standard C code. When you precompile this code, the result is a C or C++ program that you can compile and use to build applications that access an Oracle database.

   > **Note:** This product requires a separate license as a part of Oracle Programmer.

   For more information, refer to *Pro*C/C++ Precompiler Programmer's Guide.*

35. **Pro*COBOL** release 1.8.76 and release 9.0.1

   Pro*COBOL takes SQL statements that are embedded in a COBOL program and converts them to standard COBOL code. When you precompile this code, the result is a COBOL program that you can compile and use to build applications that access an Oracle database.

   > **Note:** This product requires a separate license as a part of Oracle Programmer.

   For more information, refer to *Pro*COBOL Precompiler Programmer's Guide.*

36. **Pro*FORTRAN** release 1.8.76 and release 9.0.1

   Pro*FORTRAN takes SQL statements that are embedded in a FORTRAN program and converts them to standard FORTRAN code. When you precompile this code, the result is a FORTRAN program that you can compile and use to build applications that access an Oracle database.

   > **Note:** This product requires a separate license as a part of Oracle Programmer.

   For more information, refer to *Pro*Fortran Supplement to the Oracle Precompilers Guide.*

37. **SQL*Module Ada** release 9.2.0.2.0

   SQL*Module Ada takes SQL statements that are embedded in an Ada program and converts them to standard Ada code. When you precompile this code, the result is an Ada program that you can compile and use to build applications that access an Oracle database.

   > **Note:** This product requires a separate license as a part of Oracle Programmer.

   For more information, refer to *SQL*Module for Ada Programmer's Guide.*

38. SQL*Plus release 9.2.0.2.0

SQL*Plus is a command line interface that enables you to use SQL and PL/SQL database languages with an Oracle database.

For more information, refer to *SQL*Plus User's Guide and Reference.*

39. SQL*Plus Worksheet release 9.0.1 (Installed with Oracle Enterprise Manager)

SQL*Plus Worksheet is a graphical user interface for manually entering SQL, PL/SQL and DBA commands or for running stored scripts.

For more information, refer to *Oracle Enterprise Manager Administrator's Guide.*

40. TCP/IP Protocol Support release 9.2.0.2.0

TCP/IP Protocol Support enables client/server conversation over a network using TCP/IP and Oracle Net.   This combination of Oracle products enables an Oracle application on a client to communicate with remote Oracle databases through TCP/IP (if the Oracle database is running on a host system that supports network communication using TCP/IP).

Multi-Threaded Server (MTS) Support is available in TCP/IP networks.

Connection Pooling is available only with MTS on TCP/IP networks.

For more information, refer to *Oracle Net Administrator's Guide.*

41. XML Development Kit   (an Oracle version) release 9.2.0.2.0

XML Development Kit is required for integrating and running XML applications with the database.

No applicable reference is available.

B

Oracle9*i* 64-bit Feature

This appendix introduces the 64-bit feature or Very Large Memory (VLM) and makes setting and other recommendations for this feature.

Topics covered in this appendix are:

- Introduction to the Oracle9i 64-bit Feature
- Suggested Parameter Settings
- Other Recommendations

> **Attention:** The 64-bit feature is a standard feature of Oracle9*i* for HP OpenVMS Alpha and cannot be de-installed. 64-bit feature tuning is under constant revision. Therefore, this information will be updated as further tuning suggestions are realized.

Introduction to the Oracle9*i* 64-bit Feature

This section includes the following information:

- Introducing the Oracle9i 64-bit Feature
- Benefits of the Oracle9i 64-bit Feature
- Implementation of the Oracle 64-bit Feature on HP OpenVMS Alpha

Introducing the Oracle9*i* 64-bit Feature

The Oracle 64-bit feature provides the ability to support Very Large Memory (VLM) system configurations with large amounts of RAM.

Benefits of the Oracle9*i* 64-bit Feature

The primary benefit of the 64-bit feature is "performance", because many operations can now run at memory speed instead of disk speed. With larger amounts of data in memory, the database issues fewer calls to disk, thus eliminating the delay of disk I/O.

Oracle's 64-bit feature also provides the advantage of "scalability", to support larger number of users and larger amounts of data. The system does not need to swap data in and out of memory to process all of the transaction requests and can more effectively accommodate requests for larger amounts of data.

The 64-bit feature can benefit both query-intensive (DSS) and read-write (OLTP) transactions. For DSS, the database feature provides particular advantage for index builds, full table scans, ad hoc queries, and multi-way joins. For OLTP, the feature provides the ability to support very large tables, large amounts of data, and large numbers of users.

Implementation of the Oracle 64-bit Feature on HP OpenVMS Alpha

Starting with release 7.3.2.3.2, HP OpenVMS Alpha supported the Very Large Memory (VLM) 64-bit feature. The HP OpenVMS Alpha operating system has native 64-bit memory addressing, which allows Oracle9*i* to implement the 64-bit feature. The need to estimate the maximum System Global Area (SGA) at installation time is now eliminated and process startup times are faster. The Server no longer includes an SGAPAD.

By default, SGA creation uses the support which first appeared in the HP OpenVMS Alpha version 7.1 operating system that allows the creation of global

sections that are not backed by any file. These global sections are not pageable and do not require a backing file.

Suggested Parameter Settings

1. Big Oracle Blocks (BOB) provide the ability to support larger I/O transfers between memory and disk. BOB complements large SGA configurations, because BOB allows the system to move data faster between memory and disk. With VLM configurations, system performance depends directly on the ability of the system to move database blocks into the SGA as efficiently as possible. Without the benefits of improved data transfer, performance can decline.

   For a pure decision support system (DSS) application, you may wish to choose a large value (such as 32K) for DB_BLOCK_SIZE. For an OLTP type of application, choose a lower value (such as, 2K or 4K). The larger the DB_BLOCK_SIZE, the more serious the impact on single-row lookups.

2. Configure the size of the Oracle buffer cache such that it will provide the best possible cache hit ratio without affecting memory requirements of other Oracle and system processes.

   For example, for a 3 GB buffer cache, with DB_BLOCK_SIZE=8192, set DB_BLOCK_BUFFERS=400000.

3. To enable Cost Based Optimizer (CBO), set:

   ```
   optimizer_mode = choose
   ```
   To use CBO, make sure all the tables and indexes are analyzed so that the statistics are up-to-date. Use the SQL*Plus commands "analyze ...estimate" for large tables and "analyze index ... compute statistics" for indexes.

   > **Note:** When no statistics are gathered or available, the Rule-based Optimizer (RBO) is used.

   > **Note:** Ensure the query does not use the rule hint (/*+ rule */). Otherwise the CBO will be disabled.

4. Set the SORT_AREA_SIZE parameter with care. SORT_AREA_SIZE is the space used in Program Global Area (PGA) for each sort executed by each Oracle process. If the value is too high, the PGA will use excessive memory when sorting. The default value (512 K) is usually sufficient.

Check statistics, such as V$SYSSTAT, to see if the number of sorts to disk is high compared to in-memory sorts. If it is, then increase the value of SORT_AREA_SIZE.

Other Recommendations

Check the size in number of rows of the tables involved in the query, and translate this size into total number of blocks. Based on the query, try to fit as many of the hard hit table blocks in DB_BLOCK_BUFFERS.

For example, if there are four tables involved in the query, but columns from one of the tables are used repeatedly in the "where" clause in joins, "in", etc.; try to fit as many blocks from this table as possible into the cache to see if DB_BLOCK_BUFFERS can be increased. To ensure the hard hit tables are cached and stay in the most recently used (MRU) end of the cache, perform either of the following steps:

- Type (using SQLPLUS),

  ```
  alter table <tablename> cache
  ```

  or

- At the time of creation,

  ```
  create table <tablename> ... cache
  ```

If there are enough buffers to accommodate all blocks from all tables involved in the query, use the alter command to cache all the blocks. The purpose is to cache most blocks into memory to ensure that I/O to disks is eliminated or remains low.

C

Oracle Transparent Gateway

This chapter describes how to install the gateway software from the distribution CD-ROM. The following topics are included:

- System Requirements for Oracle Transparent Gateway

- Installing Oracle Transparent Gateway

- Removing Oracle Transparent Gateway

System Requirements for Oracle Transparent Gateway

Review your system hardware and software to ensure that it meets requirements, and then determine gateway configuration before you install the gateway. Gateway components can be located on one platform or distributed over several platforms.

Oracle Corporation supports the software configurations that are described in this section as long as the underlying system software products are supported by their respective vendors. Verify the latest support status with your system software vendors.

These gateways are shippped on the server CD-ROM and are built with Oracle libraries. The operating system requirements for the gateways are therefore the same as that for the Oracle database. Refer to Chapter 1, "Oracle9i Installation Planning" and Chapter 2, "Release Information" for the database requirements.

The requirements for Oracle networking on the gateway computer are Oracle Net Server release 9.2.0. The requirements for Oracle networking on the Oracle database server computer are Oracle Net Client release 9.2.0.

The requirements for RMS are RMS release *xxxxx*, where *xxxxx* is the complete version of OpenVMS that is listed as the supported version for the gateway.

Use the installation worksheet that is provided for your configuration to ensure that you have all required information before beginning installation.

The following sections describe system requirements for gateway configuration and provide worksheets to use during the installation:

- "RDB Gateway Requirements"

- "RMS Gateway Requirements"

- "Tested Gateway Configurations"

- "Gateway Installation Worksheets"

Reference Documents

Oracle Transparent Gateway for Rdb Administrator's Guide Release 9.0.1 on Alpha OpenVMS

Oracle Transparent Gateway for RMS Administrator's Guide Release 9.0.1 on Alpha OpenVMS

RDB Gateway Requirements

Table C–1 describes the hardware and software requirements for an RDB gateway. Use it to ensure that your system meets requirements to create a gateway for RDB.

Table C–1   RDB Gateway Requirements

Hardware/ Software	Requirements
Processor	A HP Alpha workstation running the required version of OpenVMS
Memory	26 MB of real memory is recommended to support the gateway. The total real memory requirement for the concurrent use of the gateway depends on the following factors: ■ The SQL statement issued by the user ■ The number of cursors currently opened against RDB ■ The number of columns in the table being accessed
CD-ROM Drive	An internal or external CD-ROM drive
Disk Space	200 MB
Operating System	HP OpenVMS 7.3
Operating System Patch	Use the latest patch kit from Hewlett-Packard. Hewlett-Packard provides patch information at: http://www.compaq.com/support
Oracle Net Requirements	Oracle Net on HP OpenVMS is developed and certified using Hewlett-Packard TCP/IP Services for OpenVMS (UCX). If you wish to use the TCP/IP protocol adapter for Oracle Net, you should have version 5.1 ECO 4 or higher of TCP/IP Services for HP OpenVMS Alpha installed. TCP/IP protocol stacks from other vendors may work with Oracle, but customers use these products at their own risk. Any TCP/IP problems that cannot be reproduced using TCP/IP Services for HP OpenVMS Alpha will be referred to the TCP/IP vendor. Vendor-provided protocol services are usually upward compatible, so that existing applications will continue to work without modification. Thus, later releases of TCP/IP are upward compatible with Oracle Net, provided that the vendor-specified Application Programming Interface (API) does not change with new releases.
Oracle Database Server	Oracle9*i* Enterprise Edition server release 2 (9.2.0.2.0) Oracle database server can reside on any supported platform.

Table C–1   RDB Gateway Requirements (Cont.)

Hardware/ Software	Requirements
Oracle Networking	On gateway machine: - Oracle Net Server release 9.2 - Oracle Adapter for Named Pipes or TCP/IP The following are required on the Oracle database server machine: - Oracle Net Client release 9.2 - Oracle Adapter for Named Pipes or TCP/IP Oracle Net products are included on the distribution CD-ROM. Oracle Net or Oracle Net Client and the Oracle Adapter must be installed on the machine where the Oracle database server is installed. Oracle Net Server and the Oracle Adapter must be installed on the machine where the gateway is installed.
RDB	RDB release 9.2.0.2.0

RMS Gateway Requirements

Table C–2 describes the hardware and software requirements for an RMS gateway. Use it to ensure that your system meets requirements to create a gateway for the Oracle Transparent Gateway for RMS.

Table C–2   RMS Gateway Requirements

Hardware/ Software	Requirements
Processor	A HP Alpha workstation running the required version of OpenVMS
Memory	26 MB of real memory is recommended to support the gateway. The total real memory requirement for the concurrent use of the gateway depends on the following factors: - The SQL statement issued by the user - The number of cursors currently opened against RMS - The number of columns in the table that is being accessed
CD-ROM Drive	An internal or external CD-ROM drive
Disk Space	200 MB

Table C–2   RMS Gateway Requirements (Cont.)

Hardware/ Software	Requirements
Operating System	HP OpenVMS 7.3
Operating System Patch	Use the latest patch kit from Hewlett-Packard. Hewlett-Packard provides patch information at: http://www.compaq.com/support
Oracle Net Requirements	Oracle Net on HP OpenVMS is developed and certified using Hewlett-Packard TCP/IP Services for OpenVMS (UCX). If you wish to use the TCP/IP protocol adapter for Oracle Net, then you should have version 5.1 ECO 4 or higher of TCP/IP Services for HP OpenVMS Alpha installed. TCP/IP protocol stacks from other vendors may work with Oracle software, but customers use these products at their own risk. Any TCP/IP problems that cannot be reproduced using TCP/IP Services for HP OpenVMS Alpha will be referred to the TCP/IP vendor.
	Vendor-provided protocol services are usually upward compatible, so that existing applications will continue to work without modification. Thus, later releases of TCP/IP are upward compatible with Oracle Net, provided that the vendor-specified Application Programming Interface (API) does not change with new releases.
Oracle Database Server	Oracle9*i* Enterprise Edition server release 2 (9.2.0.2.0)
	Oracle database server can reside on any supported platform.
Oracle Networking	On gateway machine:
	■ Oracle Net Server release 9.2
	■ Oracle Adapter for Named Pipes or TCP/IP
	The following are required on the Oracle database server machine:
	■ Oracle Net Client release 9.2
	■ Oracle Adapter for Named Pipes or TCP/IP
	Oracle Net products are included on the distribution CD-ROM.
	Oracle Net or Oracle Net Client and the Oracle Adapter must be installed on the machine where the Oracle database server is installed. Oracle Net Server and the Oracle Adapter must be installed on the machine where the gateway is installed.
RMS	RMS release 9.2.0.2.0

Tested Gateway Configurations

The following gateway configurations have been tested by Oracle Corporation at the time of this document release. Oracle Corporation continues to provide support for the most recent releases of Oracle and non-Oracle systems in a timely manner.

Format: Database: Gateway and Operating System

RDB release 9.2.0.2.0:   tg4rdb release 9.2 running on HP OpenVMS Alpha

RMS release 9.2.0.2.0:   tg4rms release 9.2 running on HP OpenVMS Alpha

> **See Also:** Oracle Corporation continually updates supported gateway configurations. For the latest supported configuration information, either contact Oracle Support Services or visit the following web site:
>
> http://www.oracle.com/gateways

Gateway Installation Worksheets

Select the worksheet in one of the following tables that is appropriate for your system. Use the values (that you enter) as a reference during the configuration process:

- "RDB Gateway Worksheet"
- "RMS Gateway Worksheet"

RDB Gateway Worksheet

Enter your system values in the following Table C–3 to prepare for an RDB gateway configuration.

Table C–3 RDB Gateway Installation Worksheet

Description	Value
Oracle database server machine name	
Oracle database server platform (OS and its version number)	
$ORACLE_HOME of Oracle database server (full path name)	
Gateway machine name	
Gateway machine platform (OS and its version number)	
$ORACLE_HOME of the gateway (full path name)	
Location of RDB database to which the gateway will connect	

RMS Gateway Worksheet

Enter your system values in the following Table C–4 to prepare for an RMS gateway configuration.

Table C–4 RMS Gateway Installation Worksheet

Description	Value
Oracle database server machine name	
Oracle database server platform (OS and its version number)	
$ORACLE_HOME of Oracle database server (full path name)	
Gateway machine name	
Gateway machine platform (OS and its version number)	
$ORACLE_HOME of the gateway (full path name)	

Installing Oracle Transparent Gateway

Use the following procedures and tables to install Oracle Transparent Gateway.

Mounting Transparent Gateway from the CD-ROM

Install the gateway software from the CD-ROM as follows:

1. Start the Oracle Universal Installer.

> **Note:** Complete instructions for mounting and running the Oracle Universal Installer are not presented here. Review Chapter 4, "Installation" to find complete mounting and starting instructions for your platform.

2. Install the gateway by responding to installation prompts as indicated for your platform in "Installation Prompts for Transparent Gateway".

Installation Prompts for Transparent Gateway

The Oracle Universal Installer screens and the sequence in which they appear depend on your platform. Select the installation prompt section that corresponds to the gateway that you wish to install.

- "Installation Prompts for RDB Gateway"
- "Installation Prompts for RMS Gateway"

Installation Prompts for RDB Gateway

Use the following pattern (Screen: Response) as a guide during your gateway installation:

>   Location of RDB database: Enter the complete path for RDB database.

Follow the instructions in the Response column for each entry in the Screen column. When you have completed the responses, follow the instructions in section "Completing RDB Gateway Installation" on page C-9.

Completing RDB Gateway Installation

When the **Summary** screen appears, click **Install**.

Verify that the installation was successful after the Oracle Universal Installer confirms that the installation has been completed. Check the contents of the **installActions.log** file located in the **orainventory_location:[logs]** directory.

Installation Prompts for RMS Gateway

There are no installation prompts for the RMS gateway.

Removing Oracle Transparent Gateway

Remove the gateway as follows:

1. Start the Oracle Universal Installer.

2. Click the **De-install Products** button on the **Welcome** window or the **Installed Products ...** button that is available on any Oracle Universal Installer window. The **Inventory** window appears and displays a list of installed products.

3. Click to select the gateway product in the **Inventory** window and click **Remove**.

   Only the files that were copied into the ORACLE_HOME directory during the gateway installation are automatically removed. You must manually remove all other related files.

D

Apache Server Installation/Configuration

This appendix lists the procedure and steps to install and configure Apache Server for HP OpenVMS Alpha. The following topics are included:

- Post-Installation Checklist on page D-2

- Test the Installation on page D-3

- Running the Oracle HTTP Server on OpenVMS on page D-4

- Security Information on page D-27

- Open Source Licenses on page D-29

- Apache on page D-29

Post-Installation Checklist

After you configure the Oracle HTTP Server, perform the following tasks to ensure a successful startup:

- Run AUTOGEN
- Check Disk Quota
- Check for SET TERMINAL/INQUIRE

Each of these tasks is explained below. Once you have completed them, you can test the installation by starting the Oracle HTTP Server.

Run AUTOGEN

After the installation, run SYS$UPDATE:AUTOGEN.COM (AUTOGEN) to evaluate your system parameters and make adjustments based on your hardware configuration and system workload. On the Oracle HTTP Server for OpenVMS, AUTOGEN will probably increase the page file size and the number of swap file pages.

Check Disk Quota

If the disk quota is too low, the Oracle HTTP Server will not start. Either raise the disk quota for the user account ORACLE, or grant the account the EXQUOTA privilege, thus allowing it to bypass disk quota restrictions. Use the following commands:

```
$ SHOW QUOTA/USER=[server-uic]/DISK=device-name
$ SET PROCESS/PRIVILEGES=EXQUOTA node-name::ORACLE
```

Check for SET TERMINAL/INQUIRE

When the Oracle HTTP Server for OpenVMS is started, the following login files are executed:

- SYLOGIN.COM (system login file)
- LOGIN.COM (login file for ORACLE)

Check these files to make sure that any SET TERMINAL/INQUIRE statements are executed only in INTERACTIVE mode. For example:

```
$ IF F$MODE() .eqs "INTERACTIVE" then $ SET TERMINAL/INQUIRE
```

Failure to do so might result in ill-formed HTML intermittently being returned to clients.   This problem might also appear when executing CGI scripts.

Test the Installation

Now you will manually start the Oracle HTTP Server to verify the installation and configuration of the server.   Enter the following command:

$APACHECTL START

Browser Test

You can test the installation using your web browser.   Replace host.domain in the following URL with the information for the Oracle HTTP Server you just installed:

```
HTTP://host.domain:<port>
```

If this is a new installation, the browser should display the standard introductory page with the following bold text at the top:

```
"If you see this, it means that the installation of the Apache web server
software on this system successful."
```

The Apache logo is displayed at the bottom.

TELNET Test

You can also use TELNET on the local host to test the installation.   Use the following procedure:

1. Enter the following command:

    ```
    $ TELNET 0 80
    ```

    The following text is displayed:

    ```
    %TELNET-I-TRYING, Trying ... 127.0.0.1
    %TELNET-I-SESSION, Session 01, host localhost, port 80
    -TELNET-I-ESCAPE, Escape character is ^]
    ```

2. Press ENTER and enter the following HTTP command:

    ```
    HEAD / HTTP/1.0
    ```

3. Press ENTER twice.

    Text similar to the following is displayed:

```
HTTP/1.1 200 OK
Date: Tue, 23 May 2000 17:05:05 GMT
Server: Apache/1.3.12 (OpenVMS)
Last-Modified: Mon, 22 May 2000 15:33:27 GMT
ETag: "33dfec-681-39295347"
Accept-Ranges: bytes
Content-Length: 1665
Connection: close
Content-Type: text/html
%TELNET-S-REMCLOSED, Remote connection closed
-TELNET-I-SESSION, Session 01, host localhost, port 80
```

Troubleshooting

If you do not receive a response from the Oracle HTTP Server, check the following:

- Look in your SYLOGIN.COM file and make sure there is no SET TERMINAL/INQUIRE statement for NETWORK processes.

- Look for the following files:

  ```
  APACHE$ROOT:[000000]APACHE$SERVER.LOG
  APACHE$ROOT:[LOGS]ERROR_LOG
  ```

Running the Oracle HTTP Server on OpenVMS

Starting and Stopping the Server

To startup the Oracle HTTP Server, enter the following command:

```
$ APACHECTL startup
```

To stop the Oracle HTTP Server, enter the following command:

```
$ APACHECTL stop
```

Server Log File

The server log file for APACHE$WWW is written to:

```
APACHE$SPECIFIC:[000000]APACHE$SERVER.LOG
```

Performance Considerations

You should have prior experience tuning the performance of the OpenVMS operating system. For general information on OpenVMS performance, see the OpenVMS Performance Management Manual at the following URL:

`http://www.openvms.compaq.com:8000/73final/6491/6491pro.html`

Recommendations for improving performance on a Oracle HTTP Server are provided below and in the Release Notes:

Limits and Quotas

The following table shows sample values for the ORACLE Account from a working and exercised Oracle HTTP Server with a light to moderate load. These values are presented as an example of a system performing well within its context. If you should experience performance difficulties, refer to this table for guidelines in making adjustments. For heavier loads, we point out which values, in our experience, need to be increased as load increases. Keep in mind that no one set of values will be appropriate for all situations.

Table D–1   Sample Values for the ORACLE Account

Parameter	Default	On Hewlett-Packard Web Server
ASTLM (NonPooled) Total number of asynchronous system trap (AST) operations and scheduled wake-up requests the user can have queued at one time	250	610 Or BIOLM + DIOLM + 10
BIOLM (NonPooled) Number of outstanding buffered I/O operations permitted for a user's process	150	300 You might also need to increase the SYSGEN parameter CHANNELCNT because it limits BIOLM,DIOLM, and FILLM.
BYTLM (Pooled) Amount of buffer space a user's process can use	64000	200000 Increase this value for a heavy load.
CHANNELCNT	256	FILLM and CHANNELCNT should be increased to match each other.

Table D–1 Sample Values for the ORACLE Account (Cont.)

Parameter	Default	On Hewlett-Packard Web Server
DIOLM (NonPooled) Number of outstanding direct I/O operations permitted to a user's process	150	300 You might also need to increase the SYSGEN parameter CHANNELCNT because it limits BIOLM,DIOLM, and FILLM.
ENGLM (Pooled) Specifies the lock queue limit	2000	2000
FILLM (Pooled) Number of files a user's process can have opened at one time. Includes the number of network logical links that can be active at the same time	100	300 Increase this value for a heavy load. You might also need to increase the SYSGEN parameter CHANNELCNT because it limits BIOLM,DIOLM, and FILLM.
JTQUOTA (Pooled) Byte quota for the job-wide logical name table	4096	8192
PGFLQUO (Pooled) Number of pages the user's process can use in the system page file	50000	250000 If you increase PGFLQUO, you should monitor the free size of the system page and swap files; they may need to be increased.
PRNumber of subprocesses a user's process can createCLM (Pooled)	8	20 You should increase this value for a heavy load.
TQELM (Pooled) Number of entries a user's process can have in the timer queue or the number of temporary common event flag clusters a user's process can have	10	610 Or BIOLM + DIOLM + 10

To change the quotas for the Oracle Account SYSUAF, use the system manager account and run the AUTHORIZE utility. For example:

```
$ SET DEFAULT SYS$SYSTEM
$ RUN AUTHORIZE
UAF> SHOW ORACLE
```

```
Username: ORACLE Owner: APACHE WEBSERVER
...
Maxjobs: 0 Fillm: 100 Bytlm: 64000
Maxacctjobs: 0 Shrfillm: 0 Pbytlm: 0
Prclm: 8 DIOlm: 150 WSdef: 2000
...
UAF> MODIFY ORACLE/FILLM=300/PRCLM=20
%UAF-I-MDFYMSG, user record(s) updated
UAF> EXIT
$
```

Server Experiencing Medium to High Usage

After you install the server and have been running it, look in the log file for errors of the "cannot open" variety. Errors of this type often indicate you need to modify system parameters. Try the following:

- Set FILLM to limit the number of files a user process can have open.

- Set the SYSGEN parameter CHANNELCNT to 1024 (unless it is already set to a higher value).

> **Note:** Whenever you change system parameters, you must reboot the system to enable the new settings.

Global Pages and Global Sections

If a browser installation stalls, then this could be an indication that the number of global pages or global sections is too low. Run AUTOGEN to evaluate the number of global pages and global sections that you need. Some browsers might need more.

Excessive File Build Up

A large number of .LOG and .PID files can amass over time in the directories **APACHE$ROOT:[0000000]** and **APACHE$ROOT:[LOGS]**. Purging these files can become a burden on application or system managers.

System managers should manually use explicit SET DIRECTORY/VERSION commands on these two directories.

Apache Server Installation/Configuration   **D-7**

Customizing the Server Environment

The installation procedure creates a file named **HTTPD.CONF** and places it in **APACHE$ROOT:[CONF].** The **HTTPD.CONF** file stores information that the Oracle HTTP Server uses to set up the server environment. **HTTPD.CONF** has been tailored to use OpenVMS syntax, but its overall functionality is essentially identical to **HTTPD.CONF** on the UNIX platform.

HTTPD.CONF contains an explanation for each line that it can execute. You can refer to these explanations when customizing the file for your environment. You can also refer to any generally available Apache documentation on **HTTPD.CONF.**

Note the following about **HTTPD.CONF** on OpenVMS:

- MOD_OSUSCRIPT has been added to enable CGI scripts that were originally written for the OSU server.

- UNIX-style path names are recognized by OpenVMS. You can use either UNIX-style or OpenVMS-style path names in the configuration file. However, you cannot intermix the two styles within a specification.

- In an OpenVMS Cluster, you can specify either clusterwide or system-specific files.

How to Configure Apache

Perform the following steps to configure Apache to run while using an account other than the **'oracle'** account:

1. Modify the configuration file HTTPD.CONF to include the following line:

   ```
   User <username>
   ```

2. Modify APACHEUSER.COM to define logical APACHE_USERNAME to the required **username.** Make sure that the **username** is exactly the same as the entry in the **httpd.conf** file.

3. Restart the Apache Server if it is already running.

Modules and Directives

Following is a list of the modules included in the Oracle HTTP Server for OpenVMS distribution kit. The list shows the directives supported in each module. All supported modules and directives function as documented by the Apache Software Foundation at the following web site:

http://www.apache.org/docs

HTTP_CORE.C

AccessConfig

AccessFileName

AllowOverride

AuthName

AuthType

BindAddress

CoreDumpDirectory

DefaultType

<Directory>

<DirectoryMatch>

DocumentRoot

ErrorDocument

ErrorLog

<Files>

<FilesMatch>

HostnameLookups

IdentityCheck

<IfDefine>

<IfModule>

Include

KeepAlive

KeepAliveTimeout

<Limit>

<LimitExcept>

LimitRequestBody

LimitRequestFields

LimitRequestLine

Listen

ListenBacklog

<Location>

<LocationMatch>

LogLevel

MaxClients

MaxKeepAliveRequests

MaxRequestPerChild

MaxSpareServers

MinSpareServers

NameVirtualHost

Options

PidFile

Port

Require

ResourceConfig

RLimitCPU

RLimitMEM

RLimitNPROC

Satisfy

SendBufferSize

ServerAdmin

ServerAlias

ServerName

ServerPath

ServerRoot

ServerSignature

ServerTokens

ServerType

StartServers

TimeOut

UseCanonicalName

User

VirtualHost

MOD_ACCESS.C

allow

deny

order

MOD_ACTIONS.C

Action

Script

MOD_ALIAS.C

Alias

AliasMatch

Redirect

RedirectMatch

RedirectTemp

RedirectPermanent

ScriptAlias

ScriptAliasMatch

MOD_ASIS.C

MOD_AUTH.C

AuthGroupFile

AuthUserFile

MOD_AUTOINDEX.C

AddAlt

AddAltByEncoding

AddAltyByType

AddDescription

AddIcon

AddIconByEncoding

AddIconByType

DefaultIcon

FancyIndexing

HeaderName

IndexIgnore

IndexOptions

IndexOrderDefault

ReadmeName

MOD_CGI.C

ScriptLog

ScriptLogBuffer

ScriptLogLength

MOD_DIR.C

DirectoryIndex

MOD_ENV.C

SetEnv

UnsetEnv

MOD_IMAP.C

ImapBase

ImapDefault

ImapMenu

MOD_INCLUDE.C

MOD_INFO.C

   AddModuleInfo

MOD_LOG_CONFIG.C

   CustomLog

   LogFormat

   TransferLog

MOD_MIME.C

   AddCharset

   AddEncoding

   AddHandler

   AddLanguage

   AddType

   DefaultLanguage

   ForceType

   RemoveHandler

   SetHandler

   TypesConfig

MOD_NEGOTIATION.C

   CacheNegotiatedDocs

   LanguagePriority

MOD_SETENVIF.C

   BrowserMatch

   BrowserMatchNoCase

   SetEnvIf

   SetEnvIfNoCase

MOD_SO.C

   LoadModule

MOD_STATUS.C

ExtendedStatus

MOD_UNIQUE_ID.C

MOD_USERDIR.C

UserDir

Supported and Unsupported Features

The server documentation from the Apache Software Foundation at the following web site:

http://www.apache.org/docs/

provides most of the information needed to run your Oracle HTTP Server for OpenVMS. Information specific to the OpenVMS operating system is provided below.

Modules Not Included

The following modules are not included in this version of the Oracle HTTP Server for OpenVMS kit:

MOD_AUTH_ANON

MOD_AUTH_DB

MOD_AUTH_DBM

MOD_AUTH_DIGEST

MOD_CERN_META

MOD_DIGEST

MOD_EXAMPLE

MOD_EXPIRES

MOD_HEADERS

MOD_ISAPI

MOD_JSERVE

MOD_LOG_AGENT

MOD_LOG_REFERER

MOD_MIME_MAGIC

MOD_MMAP_STATIC

MOD_PEARL

MOD_PROXY

MOD_REWRITE

MOD_SPELING

MOD_SSL

MOD_USERTRACK

MOD_VHOST_ALIAS

Unsupported Directives

The following directives are not supported:

AgentLog

AllowCONNECT

Anonymous

Anonymous_Authoritative

Anonymous_LogEmail

Anonymous_MustGiveEmail

Anonymous_NoUserID

Anonymous_VerifyEmail

AuthDBAuthoritative

AuthDBGroupFile

AuthDBMAuthoritative

AuthDBMGroupFile

AuthDBUserFile

AuthDBMUserFile

AuthDigestFile

CacheDefaultExpire

CacheDirLength

CachedirLevels

CacheForceCompletion

CacheGcInterval

CacheLastModifiedFactor

CacheMaxExpire

CacheRoot

CacheSize

CheckSpelling

CookieExpires

CookieTracking

Example

ExpiresActive

ExpiresByType

ExpiresDefault

Header

Metadir

MetaFiles

MetaSuffix

MimeMagicFile

MMapFile

NoCache

ProxyBlock

ProxyDomain

ProxyPass

ProxyPassReverse

ProxyReceiveBufferSize

ProxyRemote

ProxyRequests

ProxyVia

RefererIgnore

RefererLog

RewriteBase

RewriteCond

RewriteEngine

RewriteLock

RewriteLog

RewriteLogLevel

RewriteMap

RewriteOptions

RewriteRule

ScriptInterpreterSource

VirtualDocumentRoot

VirtualDocumentRootIP

VirtualScriptAlias

VirtualScriptAliasIP

Command Line Options

This section describes the HTTPD command line options supported on the Oracle HTTP Server. Before you can use them you must first define HTTPD as a symbol, as follows:

```
$ HTTPD :== $APACHE$ROOT:[000000]APACHE_HTTPD.EXE_ALPHA
```

Then you can use the following format to enter a command line option:

```
$ HTTPD -option
```

where *-option* is one of the following command line options:

-v: Displays the HTTPD version and its build date.

-"V":   Displays the HTTPD base version, its build date, and a list of compile settings that influence the behavior and performance of the server.

-h: Displays a list of the HTTPD options.

-l: Displays a list of all modules compiled into the server.

"L":   Displays a list of directives with expected arguments and places where the directive is valid.

The following example shows how to enter the `L` option to list the available configuration directives:

```
$ HTTPD -"L"
```

Virtual Host Support

The term virtual host refers to the practice of maintaining a single server to serve pages for multiple virtual hosts. Both IP-based and name-based virtual host support are available on the Oracle HTTP Server for OpenVMS.

> **Note:**   On OpenVMS, the security profile of the running server is the same on all virtual hosts.

For more information, see the Apache Software Foundation documentation at the following web site:

http://www.apache.org/docs/vhosts/index.html

Dynamic Shared Object Support

Dynamic shared object support provides a method to format code so that it will load into the address space of an executable program at run time. This functionality is supported on OpenVMS. For more information, see the Apache Software Foundation documentation at the following web site:

http://www.apache.org/docs/dso.html

File Handlers

The Oracle HTTP Server for OpenVMS supports the ability to use file handlers explicitly. For more information, see the Apache Software Foundation documentation at the following web site:

http://www.apache.org/docs/handler.html

Content Negotiation

The MOD_NEGOTIATION module provides content negotiation. This module lets you specify language variants of HTML files. To specify language variants on OpenVMS, use an underscore instead of a period before the language extension.

For example:

- On UNIX, **`filename.html.fr`** is the French variant of **`filename.html.`**

- On OpenVMS, **`filename.html_fr`** is the French variant of **`filename.html.`**

For more information, see the Apache Software Foundation documentation at the following web site:

http://www.apache.org/docs/content-negotiation.html

Apache API

You can use the standard Apache API to write your own modules that will run on the Oracle HTTP Server for OpenVMS. For more information, see the Apache Software Foundation documentation at the following web site:

http://www.apache.org/docs/misc/API.html

suEXEC Support

The suEXEC feature provides the ability to run CGI programs under user IDs different from the user ID of the calling web server. This is not supported by the Oracle HTTP Server for OpenVMS.

File Formats

All file formats are supported. However, the Web browser status bar will not show page loading progress for logical or VFC format files larger than 8 K.

Page loading progress relies on an accurate byte count. Accurate byte count is not readily available for files in logical or VFC format. For files in these formats, the Oracle HTTP Server must count the bytes as the files load. The counting process can slow performance, so it has been turned off in this situation.

File Naming Conventions

In general, users who are running the Oracle HTTP Server for OpenVMS can specify either UNIX-style file names or OpenVMS-style file names. The Oracle HTTP Server usually displays UNIX-style file names.

The ODS-5 volume structure, introduced in HP OpenVMS Alpha Version 7.2-1, supports long file names, allows the use of a wider range of characters within file names, and preserves case within file names. However, the DEC C RTL that is shipped with HP OpenVMS Alpha Version 7.2-1 does not provide full support for extended file names on ODS-5 devices. This lack of full support imposes certain restrictions on users running the Oracle HTTP Server for HP OpenVMS Alpha.

Because mixed UNIX-style and OpenVMS-style extended file names are not yet supported by the DEC C RTL, you might be required to use UNIX-style syntax when interacting with the Oracle HTTP Server. An example would be appending additional directories or a file name to a root.

The following examples illustrate mixed UNIX-style and OpenVMS-style file names that are not supported in HP OpenVMS Alpha Version 7.2-1:

```
doc/foo.bar.bar
./tmp/foo.bar.b^_ar
~foo^.bar
```

You can, however, modify the last example so that it will work as an OpenVMS extended file name that has a tilde (~) as the first character. Precede the leading tilde (~) with the Extended File Specifications escape character (^). For example:

```
^~foo^.bar
```

For more information about using the tilde (~) in OpenVMS extended file names, see the *OpenVMS Guide to Extended File Specifications* at the following web site:

http://caedmon.zko.dec.com/72final/6536/6536pro.html

Mixed UNIX-style and OpenVMS-style file names will be supported in a future release of the DEC C RTL for HP OpenVMS Alpha.

File Transfer Process and Access Control List

When performing a File Transfer Process (FTP) operation, ensure that the Access Control List (ACL) for the target directory on the Oracle HTTP Server allows FTP access, as follows:

When transferring new files:

```
$ SET SECURITY/ACL=(IDENTIFIER=yourFTPname,ACCESS=READ+WRITE) [directory]
```

When replacing existing files:

```
$ SET SECURITY/ACL=(IDENTIFIER=yourFTPname,ACCESS=READ+WRITE) [directory]*.*
```

Logical Names

The Oracle HTTP Server for OpenVMS creates the following logical names, which are listed with their descriptions in table Table D–2.

Table D–2   Oracle HTTP Server Logical Names and Their Descriptions

Logical Name	Description
APACHE$COMMON	Concealed logical name that defines clusterwide files in APACHE$ROOT (device:[APACHE])
APACHE$FIXBG	System executive mode logical name pointing to installed, shareable images. Not intended to be modified by the user.
APACHE$HTTPD_SHR	System executive mode logical name pointing to installed, shareable images. Not intended to be modified by the user.
APACHE$INPUT	Used by CGI programs for PUT/POST methods of reading the input stream.
APACHE$PLV_ENABLE_<username>	System executive mode logical name defined during startup and used to control access to the services provided by the APACHE$PRIVILEGED image. Not intended to be modified by the user.
APACHE$PLV_LOGICAL	System executive mode logical name defined during startup and used to control access to the services provided by the APACHE$PRIVILEGED image. Not intended to be modified by the user.
APACHE$PRIVILEGED	System executive mode logical name pointing to installed, shareable images. Not intended to be modified by the user.
APACHE$ROOT	System executive mode logical name defined during startup that points to the top-level directory. (device:[APACHE], device:[APACHE.SPECIFIC.node-name])

Table D–2 Oracle HTTP Server Logical Names and Their Descriptions

Logical Name	Description
APACHE$SPECIFIC	Concealed logical name that defines system-specific files in APACHE$ROOT (device:[APACHE.SPECIFIC.node-name])
APACHE$CGI_MODE	System logical name that controls how CGI environment logicals are defined in the executing CGI process. There are three different options. Note that only one option is available at a time. **0** Default. Environment logicals are defined as local symbols and are truncated at 970 (limitable with DEC C). **1** Environment logicals are defined as local symbols unless they are greater than 970 characters. If the environment value is greater than 970 characters, it is defined as a multi-item logical. **2** Environment logicals are defined as logicals. If the environment value is greater than 512 characters, it is defined as a multi-item logical.
APACHE$DEBUG_DCL_CGI	If defined, this system logical name enables APACHE$VERIFY_DCL_CGI and APACHE$SHOW_CGI_SYMBOL.
APACHE$VERIFY_DCL_CGI	If defined, this system logical name provides information for troubleshooting DCL command procedure CGIs by forcing a SET VERIFY before executing any DCL CGI. Use with APACHE$DEBUG_DCL_CGI.
APACHE$SHOW_CGI_SYMBOL	If defined, this system logical name provides information for troubleshooting the CGI environment by dumping all of the symbols and logicals (job/process) for a given CGI. Use with APACHE$DEBUG_DCL_CGI.
APACHE$PREFIX_DCL_CGI_SYMBOLS_WWW	If defined, this system logical name prefixes all CGI environment logical symbols with "WWW_". By default no prefix is used.
APACHE$CREATE_SYMBOLS_GLOBAL	If defined, this system logical name causes CGI environment symbols to be defined globally. They are defined locally by default.

Table D–2 Oracle HTTP Server Logical Names and Their Descriptions

Logical Name	Description
APACHE$CGI_USE_DCLCOM_FOR_IMAGES	If defined, this system logical name forces CGI images to execute within a DCL process. The default is to execute CGI images directly. (Note: Direct execution of CGI images in not currently supported.)
APACHE$DL_NO_UPPERCASE_FALLBACK	If defined to be true (1, T, or Y), this system logical name disables case-insensitive symbol name lookups whenever case-sensitive lookups fail. See APACHE$DL_FORCE_UPPERCASE.
APACHE$DL_FORCE_UPPERCASE	If defined to be true (1, T, or Y), this system logical name forces case-sensitive dynamic image activation symbol lookups. By default, symbol lookups are first done in a case-sensitive manner and then, if failed, a second attempt is made using case-insensitive symbol lookups. This fallback behavior can be disabled with APACHE$DL_NO_UPPERCASE_FALLBACK.

OpenVMS Cluster Considerations

An OpenVMS Cluster is a group of OpenVMS systems that work together as one virtual system. The Oracle HTTP Server runs in an OpenVMS Cluster so you can take advantage of the resource sharing that increases the availability of services and data. Keep the following points in mind:

■ The Oracle HTTP Server is supported on OpenVMS Alpha Version 7.1-2 or higher.

■ The Oracle HTTP Server runs in an Alpha or a mixed-architecture cluster.

Individual System versus Clusterwide Definition

To define clusterwide versus individual configuration files, **APACHE$ROOT** uses the following concealed logical names:

■ **APACHE$COMMON** defines clusterwide files.

■ **APACHE$SPECIFIC** defines system-specific files.

When reading a file, the server first looks for a system-specific version of the file in **APACHE$SPECIFIC:[directory].** If it does not find one, then it looks for a clusterwide file in **APACHE$COMMON:[directory].**

To avoid confusion, always use the appropriate concealed logical name to specify the file that you want to edit. For example, to edit a clusterwide version of **HTTPD.CONF,** refer to:

```
$ EDIT APACHE$COMMON:[CONF]HTTPD.CONF
```

If you referred to:

```
$ EDIT APACHE$ROOT:[CONF]HTTPD.CONF
```

then the server would open the clusterwide file but save it as a system-specific version. The latest version of **HTTPD.CONF** would then be visible only to the individual node on which it was saved.

Within **HTTPD.CONF** itself, you should make this distinction whenever you refer to a path or to a file location. This improves performance and ensures that the server will return a complete directory listing. For example, you should specify **APACHE$COMMON** or **APACHE$SPECIFIC** (instead of **APACHE$ROOT**) with Directory directives.

The following extract, from the **HTTPD.CONF** file, refers to **APACHE$COMMON** because the content for the default web page is in the clusterwide directories.

```
DocumentRoot "/apache$common/htdocs"
        ...
    <Directory "/apache$common/htdocs">
        Options Indexes FollowSymLinks Multiviews
        AllowOverride None
        Order allow,deny
        Allow from all
    </Directory>
```

If there were content for one specific node in a cluster, the **APACHE$SPECIFIC** logical name would be used.

Mixed-Architecture Cluster

In a mixed-architecture cluster, do not use a cluster alias IP address with the Oracle HTTP Server. Because the VAX systems will not have the Oracle HTTP Server running, they will not be able to service HTTP requests.

Common Gateway Interface (CGI)

Common Gateway Interface (CGI) programs execute within the DCL shell on the Oracle HTTP Server for OpenVMS. Please note the following OpenVMS specific information.

CGI Environment Logical

By default, an environment logical symbol takes the form that is designated by the name of the environment logical. You can determine how environment logicals are set when the server executes a CGI program.

You can define the **APACHE$PREFIX_DCL_CGI_SYMOBLS_WWW** logical name to prefix all environment logical symbols with **"WWW_"**. By default, no prefix is used.

The **APACHE$CGI_MODE** logical name controls how CGI environment logicals are defined in the executing CGI program, as follows:

```
APACHE$CGI_MODE        option
```

where *option* can have one of the following values at a time:

0   Default. Environment logicals are defined as local symbols and are truncated at 970 (limitable with DEC C).

1   Environment logicals are defined as local symbols unless they are greater than 970 characters. If the environment value is greater than 970 characters, it is defined as a multi-item logical.

2   Environment logicals are defined as logicals. If the environment value is greater than 512 characters, it is defined as a multi--item logical.

APACHE$DCL_ENV is a foreign symbol that lets you define CGI environment logical, as follows:

```
APACHE$DCL_ENV [-c] [-d] [-e env-file]
```

where:

-c   Default. Indicates create environment logicals.

-d   Indicates delete environment logicals.

-e env-file   Specifies an alternate environment file. The environment file does not need to be specified by the caller because the parent derives it (it can be easily determined by default).

The following example deletes the environment and then recreates it:

```
Example: diff_mode_cgi.com
$ APACHE$DCL_ENV -d
$ Define APACHE$PREFIX_DCL_CGI_SYMBOLS_WWW 1
$ APACHE$DCL_ENV -c
```

Referencing Input

CGI scripts that reference input to the Oracle HTTP Server must refer to
APACHE$INPUT.

Executing CGI

On OpenVMS, CGI images execute within a DCL process. You cannot execute CGI
images directly.

Logicals for Debugging CGI Scripts

Use the following logicals to debug CGI scripts:

Logical Name: Description

APACHE$DEBUG_DCL_CGI: If defined, this system logical name enables
APACHE$VERIFY_DCL_CGI and **APACHE$SHOW_CGI_SYMBOL.**

APACHE$VERIFY_DCL_CGI: If defined, this system logical name provides
information for troubleshooting DCL command procedure CGIs by forcing a SET
VERIFY before executing any DCL CGI. Enabled by **APACHE$DEBUG_DCL_CGI.**

APACHE$SHOW_CGI_SYMBOL: If defined, this system logical name provides
information for troubleshooting the CGI environment by dumping all of the
symbols and logicals (job/process) for a given CGI. Enabled by
APACHE$DEBUG_DCL_CGI.

Displaying Graphics with CGI Command Procedures

To display a graphics file with a CGI command procedure, use the
APACHE$DCL_BIN foreign symbol in the following format:

```
APACHE$DCL_BIN [-s bin-size] bin-file
```

where:

-s: **bin-size** specifies the actual or approximate file size in bytes. **Bin-size**
is automatically determined if the image file is larger than 32768 K (default value).
If the image file is smaller than 32768 K, then you can provide an approximate (or
actual) size. This will boost performance.

bin-file: Specifies the file to be displayed.

For example:

```
$ SAY := WRITE SYS$OUTPUT
```

```
$ SAY "Content-type: image/gif"
$ SAY ""
$ APACHE$DCL_BIN APACHE$ROOT:[ICONS]APACHE_PB.GIF
$ EXIT
```

Running the Oracle HTTP Server on OpenVMS 3ñ19

Security Information

The Oracle HTTP Server for OpenVMS is a non-privileged, user-mode, socket-based network application. TMPMBX and NETMBX are the only privilege requirements. The server runs under its own unique UIC and user account (ORACLE).

Process Model

The Oracle HTTP Server runs as a single job which consists of:

- A master process (ORACLE)

  and

- Several subprocesses

  Subprocesses are created to service incoming HTTP requests and to execute CGI scripts.

Because the server runs as a single job, the OpenVMS security profile for each process is identical, and no enhanced mechanism is required for these processes to communicate with one another. Resource utilization is controlled by a single user account (ORACLE) where pooled quotas are defined.

Privileged Images

The Oracle HTTP Server performs three operations that require additional privilege:

- Binding to a port below 1024 (privileged ports).

  By default, the server binds to port 8080 (HTTP).

- Fetching path information for other users.

  The server provides a replacement for the **getpwnam** C RTL routine to allow the server to fetch default path information for other users (required by **MOD_UTIL** and **MOD_USERDIR**).

- Changing the "carriage-control" attribute on socket (BG) devices. The server also enables or disables (or both) the carriage-control attribute on BG (socket) devices for certain stream operations.

Two protected, shareable images are installed at startup to allow the server to perform these functions:

- APACHE$PRIVILEGED.EXE (exec-mode services)
- APACHE$FIXBG.EXE (kernel-mode services)

The APACHE$PRIVILEGED.EXE image provides exec-mode services for binding to privileged sockets and fetching user default path information. Access to these services is limited to processes running under the ORACLE username and is controlled by the APACHEPLV_ENABLE_APACHEWWW logical name. This logical name is defined as:

```
"APACHE$PLV_ENABLE_APACHE$WWW" = "3,80,1023"
```

The "3,80,1023" string represents three parameters where:

- The first parameter (3) is a bit-mask which enables or disables the two services:
    - Bit 0 controls binding to privileged ports.
    - Bit 1 controls fetching user default path information.
- The second and third parameters are the minimum and maximum port that is allowed to be bound.

When a call to either service is made, the service code:

1. Temporarily enables the privileges SYSPRV, OPER, SYSNAM, and NETMBX.
2. Performs the function.
3. Restores the process original privileges.

The APACHE$FIXBG.EXE_ALPHA image provides a kernel-mode service for manipulating the carriage-control attribute for BG devices that are owned by the calling process. No special access control exists on this service. This function can also be performed using a **setsocketopt** C RTL run-time call, but it is not supported by all TCP/IP stack vendors, which is the reason this service exists. This service does not enable privileges, but executes in kernel mode.

Privileges Required to Start and Stop the Server

The Oracle HTTP Server runs under the ORACLE username and UIC and is started as a detached, network process. During startup, protected images are installed and

logical names are placed in the system logical name table. Shutdown is accomplished by sending a **KILL** signal to the master process and its subprocess.

These actions require enhanced privileges (DETACH, SYSNAM, WORLD, and so forth) and are usually performed from a suitably privileged account.

File Ownership and Protection

All of the server files reside under its root directories that are pointed to by the APACHE$ROOT logical name. During installation, file protection is set to (`S:RWED, O:RWED, G, W`). During configuration, all files are set to be owned by ORACLE.

Server Extensions (CGI Scripts)

Server extensions, such as CGI scripts run within the context of the Oracle HTTP Server process or its subprocesses. These extensions have complete control over the server environment. You can configure the server to allow execution of arbitrary user scripts, but standard practice is to limit such activity to scripts that are written by completely trusted users. The Oracle HTTP Server includes directives that allow a web administrator to control script execution and client access. The use of these directives is described in numerous books and is not duplicated here.

suEXEC Not Available for Protecting Script Execution

The Oracle HTTP Server for OpenVMS does not currently support the suEXEC method of executing scripts under the username that owns the script. Many sites use this feature to allow execution of arbitrary, user-written scripts without the fear of compromising the server environment.

Open Source Licenses

This section provides open source license acknowledgments and license references.

Apache

This product includes software developed by the Apache Software Foundation (http://www.apache.org/). You can view the license at the following web site:

```
http://www.openvms.compaq.com/openvms/products/ips/apache/apache_license.txt
```

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