Oracle® CODASYL DBMS

Installation Guide

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Release 7.2 for OpenVMS Alpha and
HP OpenVMS Industry Standard 64 for Integrity Servers

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Oracle CODASYL DBMS Installation Guide, Release 7.2 for OpenVMS Alpha and OpenVMS I64

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You can send comments to us in the following ways:

- Electronic mail — nedc-doc_us@oracle.com
- FAX — 603.897.3825 Attn: Oracle CODASYL DBMS Documentation
- Postal service

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```

If you like, you can use the following questionnaire to give us feedback. (Print the installation guide file, extract a copy of this questionnaire, and send it to us.)

Name _____ Title _____

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- Did you find any errors?
- Is the information clearly presented?
- Do you need more information? If so, where?

- Are the examples correct? Do you need more examples?
- What features did you like most about this manual?

If you find any errors or have any other suggestions for improvement, please indicate the chapter, section, and page number (if available).

Preface

This guide describes how to install Oracle CODASYL DBMS release 7.2.

Beginning with this release, Oracle CODASYL DBMS provides full support for HP OpenVMS Industry Standard 64 for Integrity Servers (OpenVMS I64). There are two separate and complete kits available:

- Oracle CODASYL DBMS for OpenVMS Alpha
- Oracle CODASYL DBMS for OpenVMS I64

Unless explicitly stated otherwise, the directions for installing either kit are the same.

Intended Audience

This document is intended for anyone responsible for installing and maintaining Oracle CODASYL DBMS. To install Oracle CODASYL DBMS, you must have access to the SYSTEM account or an account with SYSTEM privileges.

Operating System Information

To install and run Oracle CODASYL DBMS release 7.2 software, you must have one of the following operating systems:

- OpenVMS Alpha version 8.2 or later
- OpenVMS I64 version 8.2-1 or later

For information on the compatibility of other software products with this release of Oracle CODASYL DBMS, and to verify which versions of your operating system are compatible with this release of Oracle CODASYL DBMS, contact your local Oracle support center.

If you have access to the World Wide Web, you can find a table of the compatible product and operating system information at

```
http://www.oracle.com/technology/products/rdb/htdocs/rdb7
     /rdb_product_matrix_a.html
```

Document Structure

This guide contains three chapters and two appendixes:

Chapter 1	Describes the operating system parameters that you must set and disk space requirements.
Chapter 2	Describes the final preparations for installation and the installation procedure.
Chapter 3	Describes the postinstallation procedures.
Appendix A	Shows sample output of a multiversion 7.2 installation on OpenVMS Alpha.
Appendix B	Shows sample output of a standard 7.2 installation on OpenVMS I64.

Associated Documents

The other manuals referred to in this guide are:

- *Oracle Rdb7 and Oracle CODASYL DBMS: Guide to Hot Standby Databases*
- *HP Datatrieve Installation documentation*
- *Using Oracle CDD/Repository on OpenVMS Systems*
- *Installing Oracle CDD/Repository for OpenVMS VAX Systems*
- OpenVMS documentation

Conventions

The following conventions are also used in this guide:

word	A lowercase word in a format example indicates a syntax element that you supply.
[ ]	Brackets enclose optional clauses from which you can choose one or none.
{ }	Braces enclose clauses from which you must choose one alternative.

Ctrl/x	This symbol tells you to press the Ctrl (control) key and hold it down while pressing a letter key.
. . .	Horizontal ellipsis points mean you can repeat the previous item.
. . .	Vertical ellipsis points in an example mean that information not directly related to the example has been omitted.

References to Products

The Oracle CODASYL DBMS documentation set to which this guide belongs often refers to related products by their abbreviated names:

- Oracle CODASYL DBMS is often referred to as DBMS.
- OpenVMS I64 refers to HP OpenVMS Industry Standard 64 for Integrity Servers.
- OpenVMS refers to the OpenVMS Alpha and OpenVMS I64 operating systems.
- Oracle CDD/Repository software is referred to as CDD/Repository or the dictionary. (Previous to Version 5.0, CDD/Repository was called CDD/Plus.)
- Hewlett-Packard Company is referred to as HP.
- HP DATATRIEVE software is referred to as DATATRIEVE.
- HP Language-Sensitive Editor for OpenVMS software is referred to as LSE.
- HP ACMS for OpenVMS is referred to as ACMS.

1
Preparing to Install Oracle CODASYL DBMS

This chapter discusses the preparations and requirements necessary for installing Oracle CODASYL DBMS release 7.2.

Oracle CODASYL DBMS provides release notes in the installation kit and online through MetaLink:

```
Top Tech Docs\Database\Rdb\CODASYL DBMS\Documentation tab
```

Oracle strongly recommends that you read the release notes before proceeding. For information on accessing the online release notes, see Section 2.1.1.

Converting DBMS databases

After installing this kit, you will be required to convert all DBMS databases that you wish to access using this version.

Starting with this release, the minimum database version that can be converted is version 7.0. Database versions 7.0 and 7.1 can be converted directly to version 7.2. Attempts to convert databases with a version prior to 7.0 will result in the following error:

```
$ DBO/CONVERT PARTS
%DBO-F-CVRTUNS, The minimum database version that can be converted
  is version 70
```

To convert databases created prior to release 7.0, you must install a 7.0 or 7.1 version of Oracle CODASYL DBMS, convert the database to that version, then install this kit and convert to V7.2.

1.1 Oracle CODASYL DBMS Installation Options

The following sections describe the installation options for DBMS.

1.1.1 Multiversion Environment for DBMS

Beginning with DBMS release 6.1, multiple releases (also called versions) of the DBMS software can coexist on the same system. In prior releases, this function was available only during the field test period.

Multiversioning is implemented through the installation and use of varianted files (for example, DBMSHR72.EXE and DBO72.EXE). Nonvarianted DBMS files (like DBMSHR.EXE and DBO.EXE) are associated with the standard version.

Standard and multiversioning can coexist on the same system as long as they represent different releases of DBMS. Only one instance per release of DBMS (either standard or multiversion) can exist on the system at one time.

With multiversioning, you can have many versions installed simultaneously, however, only one standard version can be installed at any given time.

The multiversioning option is selected during the installation process. At that time, the installer is asked to choose between the standard and multiversion option. If standard is chosen, the nonvarianted files are supplied, replacing any current DBMS standard version. This is exactly the same behavior as in previous installations.

If the multiversion option is chosen, the varianted files are installed without modifying or deleting any existing previous version, including any standard version. At the end of the installation, you will have two or more separate and distinct DBMS environments and the ability to switch back and forth between them.

A multiversion environment is useful in those situations where you need to test your applications against a newer release of DBMS while maintaining the existing production environment. You could convert a copy of your production database to run under the multiversion environment while production continues on the standard environment. Refer to Section 3.4 for details on accessing multiple versions of DBMS.

Note

A database is tied to a specific version of DBMS. Even with multiple versions of DBMS installed, a database can be accessed by only one version. Refer to the DBO/CONVERT/NOCOMMIT command in the *Oracle CODASYL DBMS Database Administration Reference Manual* for a description of how to convert a database while maintaining the ability to roll back to a prior version.

1.1.2 Hot Standby

This installation procedure will optionally install the DBMS Hot Standby option.

DBMS release 7.0 introduced the Oracle Hot Standby option, a discrete, separately purchased product, that physically duplicates a database and its environment at a geographically remote standby site. In the event of a node or cluster failure, the replicated standby database can be used as the new master database. This product automates the AIJ backup and rollforward operations to provide a nonintrusive, high-performance solution to database availability.

Note

Neither the master database nor the standby database is affected by a failure of the other; a system failure of the master database is isolated from the standby database and vice versa.

Contact your Oracle representative about this separately licensed option.

1.2 Required System Components

This section discusses the software you must have installed on your system before installing Oracle CODASYL DBMS. This section also includes information about software that you can use with DBMS. Information about compatible products and their required version numbers is available at the following URL:

`http://www.oracle.com/technology/products/rdb/index.html`

1.2.1 OpenVMS Alpha Operating System

DBMS release 7.2 requires one of the following OpenVMS environments:

- OpenVMS Alpha version 8.2 or later
- OpenVMS I64 version 8.2-1 or later

The installation requires approximately 110,000 blocks for OpenVMS Alpha systems.

The installation requires approximately 280,000 blocks for OpenVMS I64 systems.

To see which version of OpenVMS Alpha is currently installed, enter the following command:

```
$ WRITE SYS$OUTPUT F$GETSYI("VERSION")
V8.2-1
```

In this example, OpenVMS Version 8.2-1 is running on your system.

1.2.2 EPC$SHR.EXE Shared Image

DBMS requires that SYS$LIBRARY:EPC$SHR.EXE be installed as a sharable, protected image. This image is included with all OpenVMS installations, as well as with Oracle Trace, and should already be installed correctly. The DBMS installation procedure and startup procedure (MONSTART.COM) will verify that this image is installed correctly.

If SYS$LIBRARY:EPC$SHR.EXE is not found on your system, the installation will fail.

To check that EPC$SHR.EXE is installed correctly, issue the following command:

```
$ INSTALL LIST SYS$LIBRARY:EPC$SHR.EXE
```

This should produce output similar to the following.

```
DISK:<SYSCOMMON.SYSLIB>.EXE
       EPC$SHR;3        Open Hdr Shar     Prot Lnkbl
```

1.3 Optional Software for DBMS

This section discusses the optional software you can install on your system:

- Oracle CDD/Repository

  Beginning with release 5.0, DBMS supports optional dictionary usage for many tasks. Oracle CDD/Repository is still required for running DATATRIEVE procedures or compiling HP COBOL DML programs. For more information, see the *Oracle CODASYL DBMS Database Administration Reference Manual*.

  To use Oracle CDD/Respository with DBMS:

  - On OpenVMS Alpha, Oracle CDD/Repository release 5.3 or later is required
  - On OpenVMS I64, Oracle CDD/Repository release 7.2 or later is required

Use the Common Dictionary Operator (CDO) utility to see if the correct version of Oracle CDD/Repository is installed on your system:

```
$ mcr cdo
CDO> show version
Installed version of Oracle CDD/Repository is V7.2
```

- Oracle Trace

  DBMS release 7.2 requires Oracle Trace release 7.2 or later. If you wish to collect TRACE statistics on a DBMS database:

  - On OpenVMS Alpha, Oracle Trace release 2.4-1 or later is required
  - On OpenVMS I64, Oracle Trace release 7.2 or later is required

  If Oracle Trace is installed, you can check the version by issuing this command:

```
$ COLLECT SHOW VERSION
Oracle Trace Version V7.2
```

- LSE

  For OpenVMS Alpha or OpenVMS I64, DBMS is compatible with LSE version 4.7 or later. During the installation, DBMS provides templates for DBO/LOAD and DBO/UNLOAD operations as well as DBQ and DDL.

Oracle CODASYL DBMS release 7.2 is compatible with other HP software products, including ACMS and DATATRIEVE.

1.4 MACRO-32 Compiler for OpenVMS I64

For OpenVMS I64 only, a MACRO-32 Compiler for OpenVMS I64 is required to compile any DBMS application compiled through the DML interface.

When compiling a host language DBMS module, the DML command automatically generates and compiles VAX MACRO code and appends the object module to the object module of the host language.

On OpenVMS I64, you can specify the DML /NODELETE qualifier to review macro generated for a module. To obtain the same results when using FORTRAN/DML, define the logical DBM$FDML_NODELETE to any value.

1.5 License Registration

License registration is no longer required through the OpenVMS License Management Facility (LMF), however, a valid license for Oracle CODASYL DBMS should be acquired from Oracle Corporation before you install this product.

1.5.1 License for Hot Standby Component

This installation procedure can install the files and images necessary to use the Hot Standby capability, which enables you to replicate an Oracle CODASYL DBMS database at a remote standby site. If you intend to install the Hot Standby component, this option is separately licensed. It is provided as a component of the Oracle CODASYL DBMS 7.2 kit, but a license specific to that option should be acquired by contacting your Oracle representative.

1.6 Preinstallation Requirements

Oracle CODASYL DBMS has some special requirements before installation. The following sections describe the requirements you must meet before installing DBMS release 7.2.

1.6.1 Recovering Your DBMS Databases

Before installing DBMS, you must eliminate all obsolete recovery-unit journal (.RUJ) files. The before-image journaling facility is release specific; if you do not recover your database before installing a new release, you will not be able to access the database using that new release.

Use the DIRECTORY command with the following syntax on each disk device to see if any .RUJ files remain:

```
DIRECTORY <disk-name>:[000000...]*.RUJ;*
```

For each .RUJ file associated with an DBMS database, you must locate the corresponding database root file and bind to that database. You can use the DBO/DUMP/RECOVER command to identify the corresponding .ROO file for each .RUJ file. (Note that if you are also using Oracle Rdb, some of the .RUJ files you encounter may be associated with that product.)

For example, if the BILLMAT database is located in the directory DB$DISK:[MATERIAL], you can recover the database and eliminate all .RUJ files associated with the database as follows:

```
$ RUN SYS$SYSTEM:DBQ
dbq> BIND DEFAULT_SUBSCHEMA FOR DB$DISK:[MATERIAL]BILLMAT
dbq> EXIT
```

The database is now recovered. The previous example assumes that the BILLMAT database has the default subschema provided by the DDL compiler. If your database does not have the default subschema, use the DBO/DUMP command with the /SUBSCHEMAS qualifier to see the valid subschema names for your database. See the *Oracle CODASYL DBMS Database Administration Reference Manual* for more information on the DBO/DUMP command.

1.6.2 Backing Up Your DBMS Database

Oracle recommends that you perform a full backup of your databases before installing a new release of DBMS. See the *Oracle CODASYL DBMS Database Maintenance and Performance Guide* and the DBO/BACKUP/MULTITHREAD command in the *Oracle CODASYL DBMS Database Administration Reference Manual*.

If you are using DBO/RESTORE or DBO/RESTORE/MULTITHREAD to convert your database to the current structure level after installing the DBMS software, you cannot roll forward an after-image journal file from the previous release of DBMS, nor can you apply an incremental backup to the restored full backup. Make sure you take a full, offline backup of each DBMS database before upgrading your software.

1.6.3 Ensuring Adequate Physical Memory

Before you install DBMS, be sure that there is adequate physical memory on your system. Additional memory is often required by applications with many locks. Insufficient memory will cause thrashing.

On OpenVMS Alpha systems, memory page size is hardware dependent: an Alpha page can be 8 kilobytes, 16 kilobytes, 32 kilobytes, or 64 kilobytes. In this guide, a value of 512 bytes of memory is referred to as a "pagelet".

On OpenVMS Alpha systems, DBMS requires at least 64 megabytes of physical memory.

The following example shows a display on an OpenVMS Alpha system:

```
$ SHOW MEMORY/PHYSICAL_MEMORY
             System Memory Resources on 22-SEP-1992 13:34:07.73

Physical Memory Usage (pages):     Total     Free      In Use    Modified
  Main Memory (256.00Mb)           32768    28830        3815         623

Of the physical pages in use, 1215 pages are permanently allocated to VMS.
```

In this example, the system has 256 megabytes of memory.

1.6.4 Checking DECnet Object Numbers for DBMSERVER

Before installing DBMS, check that no user-created object exists in the DECnet for OpenVMS database with the number 52. Object number 52 is reserved for the exclusive use of DBMSERVER, which implements the DBMS remote database access capability.

The DBMS installation procedure displays an error message if number 52 is assigned to an object other than DBMSERVER, or if an existing DBMSERVER is assigned a number other than 52. Use the Network Control Program (NCP) to confirm that 52 is not being used by any object except DBMSERVER:

```
$ RUN SYS$SYSTEM:NCP
NCP> SHOW KNOWN OBJECTS SUMMARY

Known Object Volatile Summary as of  4-AUG-2001 11:11:01
   Object   Number  File/PID           User Id    Password

  $MOM           0
  $NICONFIG      0
  CDD$REMOTE     0  SYS$SYSTEM:CDD$REMOTE.COM
  SMISERVER      0  2020010C
  SQLSRV         0  SYS$SYSTEM:SQLSRV$.EXE
  FAL           17  FAL.EXE
  HLD           18
  NML           19  NML.EXE
  REMACP        23  20200122
  MIRROR        25
  EVL           26  20200120
  MAIL          27  MAIL_SERVER.EXE
  NOTES         33  NOTES$SERVER.EXE          NOTES$SERVER
  CTERM         42  20200122
  VPM           51  VPM.EXE
  TESTER        52  TESTER.EXE
  DTR           63
  DQS           66  DQS$SERVER.EXE
```

In this example, a user created the image TESTER.EXE and assigned the number 52. If the object number was defined in the TESTER source code, edit the source code and use a different number. Compaq Corporation reserves the numbers 128 to 255 for users' objects in the DECnet for OpenVMS database. Select any number between 128 and 255 that is currently unused. Recompile and relink any program that has the object number defined in the source code. Then use NCP again to define an entry for the new TESTER.EXE. First remove the current entry for TESTER:

```
NCP> PURGE OBJECT TESTER ALL
```

Next, change the object number assigned to TESTER in the permanent DECnet for OpenVMS database:

```
NCP> DEFINE OBJECT TESTER NUMBER 128
NCP> DEFINE OBJECT TESTER FILE TESTER.EXE
```

Finally, use the values from the permanent database to affect the current, volatile database and exit the NCP:

```
NCP> SET OBJECT TESTER ALL
NCP> EXIT
```

Note

Remote database access using DECnet is not related to DBMS operation in a VMScluster environment. See the *Oracle CODASYL DBMS Database Maintenance and Performance Guide* for information on using DBMS in a VMScluster environment.

1.6.5 Stopping the DBMS Monitor

You need to stop the DBMS monitor for any prior DBMS release (version) that will be replaced or deleted by this installation. For example, you will need to stop the monitor, if you are installing:

- a standard version, and any standard version currently exists.
- either a standard or multiversion version, and the same version (either standard or multiversion) currently exists.

If the monitor is not stopped before installation, the installation procedure will abort on the node where the installation is taking place.

DBMS provides a command procedure for stopping the DBMS monitor and de-installing its sharable images.

To stop the standard monitor, enter the following command:

```
$ @SYS$STARTUP:MONSTOP.COM
```

In a multiversion environment, you will first need to set your environment to the version you wish to stop. Then execute the varianted shutdown procedure. For example, to stop a DBMS release 7.2 multiversion monitor:

```
$ @SYS$LIBRARY:DBMSETVER 72
$ @SYS$STARTUP:MONSTOP72.COM
```

In a VMScluster environment, the monitor may run on each node that boots from the common root directory. You will need to stop the monitor on each node before you begin the installation. The installation procedure does not check for the existence of monitors on nodes other than the installation node.

Note

If you need to shut down a standard monitor in a environment where multiple versions of DBMS are installed, make sure that your current DBMS environment is set to the standard version prior to executing the shutdown procedure. Failure to do so may cause the wrong monitor to be shut down.

For more information about setting your DBMS environment, refer to Section 3.4 for details on accessing multiple versions of DBMS.

1.6.6 Installing in a VMScluster Environment

When installed on a common root directory, layered products such as DBMS are installed in the SYS$COMMON directory. The VMSINSTAL command procedure does not allow layered products to be installed in the SYS$SPECIFIC portion of a common root directory.

You cannot use the alternate root option of VMSINSTAL to install layered products in the SYS$SPECIFIC portion. If you try this, VMSINSTAL installs the layered product in SYS$COMMON. Therefore, you cannot install multiple versions of the standard DBMS kit on a VMScluster system with a single, common root directory. Refer to Section 3.4 for installing a multiversion DBMS kit.

1.7 Installation Procedure Requirements

The following sections discuss various requirements for installing DBMS. If certain requirements are not met, the installation will abort. Review this section to make sure that you have enough resources to perform the installation.

1.7.1 Time

The DBMS installation takes from 2 to 5 minutes, depending on the system configuration. The Installation Verification Procedure (IVP), which Oracle recommends you run to be sure DBMS is installed properly, takes an additional 2 to 5 minutes.

1.7.2 Process Quotas, Privileges, and Identifiers

The account from which you install and verify DBMS must have sufficient quotas and privileges to enable you to perform the installation.

1.7.2.1 Quotas

VMSINSTAL requires that the installation account have a minimum of quotas, as listed in Table 1–1. In general, the required quotas are similar for both OpenVMS Alpha and OpenVMS I64.

Table 1–1 Process Quotas

Process Quota	Value
ASTLM	24
BIOLM	18
BYTLM	18,000
DIOLM	18
ENQLM	256
FILLM	20

If disk quotas are enabled for your account, be sure that you have EXQUOTA privilege or the blocks of quota remaining exceed the value required in Table 1–2.

1.7.2.2 Privileges

VMSINSTAL requires you to be logged in to an account that has SETPRV or the following privileges:

- CMKRNL
- WORLD

Note

VMSINSTAL turns off BYPASS privilege at the start of the installation.

1.7.2.3 Rights Identifiers

If you have DECnet/OSI on your system, you will need to have the NET$MANAGE rights identifier in order for the installation to configure the NCL objects that are created.

1.7.2.4 Modifying User Accounts

User account quotas and privileges are stored in the SYSUAF.DAT file. Rights identifiers are stored in RIGHTSLIST.DAT. Normally these files are stored SYS$COMMON:[SYSEXE], but may be stored elsewhere, in which case there would be system logical names, SYSUAF and RIGHTSLIST, respectively, pointing to the files.

Use the OpenVMS Authorize utility (AUTHORIZE) to verify and change user account settings. If the SYSUAF and RIGHTSLIST logical names are not defined, you should first set your default directory to SYS$COMMON:[SYSEXE] and then run AUTHORIZE:

```
$ SET DEFAULT SYS$COMMON:[SYSEXE]
$ RUN AUTHORIZE
UAF>
```

otherwise:

```
$ RUN AUTHORIZE
UAF>
```

At the UAF> prompt, use the SHOW command with an account name to check a particular account. For example:

```
UAF> SHOW SMITH
```

To change a quota or add a privilege, use the MODIFY command. MODIFY has the following format:

MODIFY account-name /quota-name=nnn /privilege=priv-name

The following example changes the FILLM quota, adds SETPRV for the SMITH account, and then exits from the utility:

```
UAF> MODIFY SMITH /FILLM=50/PRIVILEGE=SETPRV
UAF> EXIT
```

To grant the NET$MANAGER rights identifier, use the GRANT command. GRANT has the following format:

GRANT/IDENTIFIER account-name identifier-name

For example:

```
UAF> GRANT/IDENTIFIER SMITH NET$MANAGE
UAF> EXIT
```

After you exit from the utility, the system displays messages indicating whether or not changes were made. If changes were made to the account that you are currently logged into, you must log out and log in again before the changes can take effect.

For more information on modifying user accounts, see the description of AUTHORIZE in the OpenVMS system management documentation.

1.7.3 Disk Space

The amount of space required for a database depends on many factors including the complexity and size of the database, overhead, and the number of users.

1.7.3.1 DBMS Disk Requirements

DBMS requires a certain amount of free disk storage space during installation. After DBMS is installed, less storage space is required.

Table 1–2 summarizes the storage requirements for OpenVMS Alpha operating systems.

Table 1–2 Maximum Disk Space Requirements for OpenVMS Alpha Operating Systems

DBMS Kit	Blocks During Installation	Blocks After Installation
OpenVMS Alpha	130,000	106,000
OpenVMS I64	250,000	210,000

To determine the number of free disk blocks on the current system disk, enter the following command at the DCL prompt:

```
$ SHOW DEVICE SYS$SYSDEVICE

Device          Device        Error    Volume         Free  Trans Mnt
 Name           Status        Count     Label        Blocks Count Cnt

DUA0:           Mounted       0        SYSTEM       277575   240  10
```

In this example there are 277,575 free disk blocks.

1.7.3.2 Limiting System Blocks Required During Installation

Use the VMSINSTAL Alternative Working Directory (AWD) option to limit system blocks required during installation. The AWD option specifies an alternative working directory into which temporary files are written. If you run the IVP, the Oracle CDD/Repository is also created in the working directory.

Specify the AWD option according to the following format:

```
OPTIONS AWD=device:[directory]
```

The following example specifies DISK$ as the alternative working device and TEMP as the alternative working directory:

```
$ @SYS$UPDATE:VMSINSTAL dbma071 CDROM: OPTIONS AWD=DISK$:[TEMP]
```

1.7.4 System Parameters

Installing DBMS requires certain system parameter settings. This section lists minimum settings and describes how to check and change parameter values. Depending on the kinds of programs and applications running at your site, you might need higher values for some settings.

1.7.4.1 System Parameter Setting

Before you install DBMS, make sure that certain system parameter values are set correctly. The parameters and their recommended values are:

- VIRTUALPAGECNT (maximum number of virtual pages)

  VIRTUALPAGECNT sets the maximum number of virtual pages that any one process can map. Take into account the total number of databases in use at any given time when you allocate VIRTUALPAGECNT. Allocate at least 2000 virtual pages for each database root file. The need for virtual pages varies according to the number of users and the size of the schema, but 2000 pages should be sufficient for most applications.

- LOCKIDTBL (initial size of lock ID table)

  LOCKIDTBL establishes the number of entries in the system lock ID table, which limits the number of locks in the system. The OpenVMS lock ID table expands as needed (provided nonpaged memory is available) in increments of the LOCKIDTBL value, up to the limit set by the LOCKIDTBL_MAX parameter. The recommended minimum value is 2048.

- RESHASHTBL (resource hash table)

  RESHASHTBL defines the number of entries in the lock management resource name hash table. Each entry requires 4 bytes. As a general guideline, there should be one resource hash table entry for every four locks in the system. Therefore, RESHASHTBL should be set to one-quarter the value of LOCKIDTBL_MAX, rounded to the closest power of 2.

- SRPCOUNT and SRPCOUNTV (size of small request packets)

  SRPCOUNT sets the number of preallocated small request packets. SRPCOUNTV establishes the upper limit to which SRPCOUNT can be increased. Resources and locks are allocated with small request packets (SRPs), if possible. If the system is out of SRPs, the nonpaged memory pool is used.

Set SRPCOUNT less than or equal to SRPCOUNTV. A typical setting is one half of SRPCOUNTV. The recommended minimum value for SRPCOUNTV is 1000.

Set SRPCOUNTV equal to LOCKIDTBL + *r*, where *r* is the number of system resources available to the system. Generally, *r* can be set to 5 percent of the value you assigned to LOCKIDTBL.

See the OpenVMS system management documentation for more information about system resources.

- CHANNELCNT (channel count)

  CHANNELCNT defines the maximum number of I/O channels any process can handle concurrently. CHANNELCNT should be set to a number larger than the largest file limit (FILLM) in the database environment.

1.7.4.2 Checking System Parameter Values

To check the values of your system parameters, enter the following command at the DCL prompt to invoke the System Generation (SYSGEN) utility:

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN>
```

At the SYSGEN> prompt, use the SHOW command to display the value of a system parameter. The values displayed should be equal to or exceed the values of each parameter listed in Section 1.7.4.1. The following example displays the value for the LOCKIDTBL system parameter:

```
SYSGEN> SHOW LOCKIDTBL

Parameter Name  Current  Default  Minimum   Maximum Unit    Dynamic
--------------  -------  -------  -------   ------- ----    -------
LOCKIDTBL           357      200       40     65535 Entries

SYSGEN>
```

In this example, the current value for LOCKIDTBL is 357.

After checking the parameters with the SHOW command, you can enter the EXIT command at the SYSGEN> prompt to return to DCL level.

You can check the actual number of locks your system is using with the DCL MONITOR LOCK command:

```
$ MONITOR LOCK
```

This command displays the maximum number of locks outstanding during the monitor period. You can use this value to fine tune the LOCKIDTBL, LOCKIDTBL_MAX, and RESHASHTBL parameters.

1.7.4.3 Settings for Global Pages and Global Sections

To install and run DBMS, you must have sufficient free global pages (GBLPAGES) and global sections (GBLSECTIONS). You must first find out how many free global pages and sections you have on your system. The installation procedure will abort if there are insufficient GBLPAGES and GBLSECTIONS.

Each active database requires three global sections: one for the schema, one for the subschema, and one for the root file. Some images use global sections and global pages. Sharable images also use global sections. The number of global pages required depends on the size of the database root file and on whether or not the DBMS global buffering feature is used.

The image names and the global sections and global pages required on OpenVMS Alpha systems are listed in Table 1–3.

Table 1–3 Alpha Global Section and Page Requirements for Mandatory Images

Image File Name	Global Sections	Global Pages
SYS$LIBRARY:CRFSHR.EXE	1	20
SYS$LIBRARY:DBMPRV.EXE	2	30
SYS$LIBRARY:DBMSHR.EXE	11	2110
SYS$LIBRARY:LBRSHR.EXE	1	180
SYS$SYSTEM:DBMSERVER.EXE	1	120
TOTAL	16	2460

There are several images you can install optionally. All these images use global sections and global pages. Table 1–4 shows these optional images on an OpenVMS Alpha system.

Table 1–4 Alpha Global Section and Page Requirements for Optional Images

Image File Name	Global Sections	Global Pages
SYS$SYSTEM:DBMDBR.EXE	1	830
SYS$SYSTEM:DBQ.EXE	1	850
SYS$SYSTEM:DDL.EXE	1	1800

(continued on next page)

Table 1–4 (Cont.) Alpha Global Section and Page Requirements for Optional Images

Image File Name	Global Sections	Global Pages
SYS$SYSTEM:DML.EXE	1	1150
SYS$SYSTEM:FORDML.EXE	1	1380

If you run the IVP, you need 3 additional global sections and 50 global pages.

1.7.4.4 Checking Values for Global Pages and Global Sections

If this installation will be replacing a currently installed release of DBMS, you should first stop the monitor so that the GBLPAGES and GBLSECTIONS values associated with that release are not calculated into the net values required for your new installation. Refer to Section 1.6.5 for details on stopping the DBMS monitor.

Then use the WRITE command with the F$GETSYI lexical function to find the number of free global pages and global sections. The following example shows how to get this information at your terminal (the default for SYS$OUTPUT):

```
$ WRITE SYS$OUTPUT F$GETSYI("FREE_GBLPAGES")
15848
$ WRITE SYS$OUTPUT F$GETSYI("FREE_GBLSECTS")
24
```

In this example there are 15,848 free global pages and 24 free global sections.

If the values displayed by the system are greater than the values calculated in Section 1.7.4.3, you do not need to increase the values for these parameters. If the value of free global pages or global sections is less than the values calculated in Section 1.7.4.3, you must increase the system parameter settings.

Section 1.7.4.5 describes the procedures for increasing these values using the AUTOGEN utility. Refer to the OpenVMS system management manuals for information on using the AUTOGEN utility.

1.7.4.5 Changing System Parameter Values

Use the AUTOGEN utility to change system parameters. AUTOGEN automatically adjusts values for parameters that are associated with the values you reset manually. To change system parameters with AUTOGEN, edit the following file:

```
SYS$SYSTEM:MODPARAMS.DAT
```

To change a parameter value that is already listed in this file, delete the current value associated with that parameter and enter the new value.

To add a new parameter, add a line to the file that includes both the name of the parameter and its value. For example:

```
LOCKIDTBL = 2048
```

To modify incremental parameters such as GBLPAGES and GBLSECTIONS, use ADD_. The following example increases the global page setting by 2000:

```
ADD_GBLPAGES = 2000
```

After you have made all your changes, exit from the editor and run the AUTOGEN procedure to recalculate your system parameters. Enter the following command at the DCL prompt:

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

When you specify REBOOT, AUTOGEN performs an automatic system shutdown and reboots the system when it has finished. Any users logged on to the system are immediately disconnected during the shutdown. The automatic reboot puts the new parameter values into effect.

The AUTOGEN utility automatically adjusts some of the system parameters based on the consumption of resources since the last reboot. If you do not want to take advantage of this automatic adjustment, include the /NOFEEDBACK qualifier on the AUTOGEN command line.

For more information about using AUTOGEN, see the OpenVMS system management documentation.

1.7.4.6 Setting Dynamic System Parameter Values

Use the SYSGEN utility to set dynamic parameters. Dynamic parameters changed with the SYSGEN WRITE ACTIVE command become active immediately without rebooting your system. In fact, rebooting returns dynamic system parameter values to their previous settings.

Once you change dynamic parameter values, you should complete the installation before rebooting the system. After you finish with the installation, you can reset the dynamic parameters to their previous value or let them be reset automatically when you next reboot your system.

DBMS requires the following dynamic parameter values:

- MAXBUF (maximum buffer size)

  MAXBUF sets the maximum size of buffered I/O transfer (card readers, console floppy diskettes, line printers, mailboxes, and terminals). The system default of 1024 bytes for MAXBUF is sufficient for most applications. A lower setting will not be adequate; a higher setting is generally not necessary.

- LOCKIDTBL_MAX (maximum size of lock ID table)

  LOCKIDTBL_MAX specifies an upper limit for the size of the lock ID table. Its default setting is 800 entries, but this value is not high enough for systems running DBMS. The maximum size for an OpenVMS operating system lock table is 65,535 entries. The recommended minimum value is 8192.

  You can compute the system's expected *maximum number* of locks by estimating the greatest expected workload (in terms of facilities using the lock manager) and then allocate that number of locks.

  The lock ID table occupies 4 bytes of memory per lock entry. For each active lock on your system, 96 additional bytes of memory are allocated to hold information about the active lock. Therefore, you must be aware of the size of the lock ID table, as well as the potential for a high percentage of memory to be occupied by the locks themselves if LOCKIDTBL_MAX is set too high. The DCL SHOW MEMORY command can help in estimating safe values for LOCKIDTBL_MAX.

  Set a LOCKIDTBL_MAX value greater than the total number of locks you anticipate will occur at any one time on your system. However, this value should not be so high that the lock ID table and the locks occupy too much space in memory. You can check locks with the OpenVMS MONITOR LOCKS command.

- DEADLOCK_WAIT (time for deadlock wait)

  DEADLOCK_WAIT defines the number of seconds a lock request must wait before the system initiates a deadlock search on behalf of that lock. The recommended minimum value is 3. See the OpenVMS documentation on system management and operations for optimally setting this parameter. Because DEADLOCK_WAIT is dynamic, you can set it, watch the transaction rates, and then adjust as necessary.

If the dynamic parameter values on your system are less than the values previously listed, use the following series of commands to change the values. This example changes the MAXBUF value to 1584:

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> USE ACTIVE
SYSGEN> SET MAXBUF 1584
SYSGEN> WRITE ACTIVE
SYSGEN> EXIT
```

1.7.5 Backing Up Your System Disk

At the beginning of the installation, VMSINSTAL asks if you have backed up your system disk. Oracle recommends that you back up your system before installing any software. Use the backup procedures that are established at your site. For details on backing up your system disk, see the section on the Backup utility in the OpenVMS system management documentation.

1.7.6 Logging Off Active Users

For best results, have all users log off the system before you install DBMS. If this is impractical, make sure no process uses DBMS or DCL Help during the installation. (The DBMS installation updates the help file.) All DBMS databases must be closed before you begin the installation.

2
Installing Oracle CODASYL DBMS

This chapter describes how to install Oracle CODASYL DBMS. Section 2.2 contains a step-by-step description of the installation procedure. The installation procedure stops if there are insufficient system resources.

2.1 General Information

This section includes information about the following topics:

- Accessing the online release notes
- Verifying the installation
- Stopping the installation

2.1.1 Accessing the Online Release Notes

DBMS provides release notes that describe the new features and product fixes that are available in this release. You should review the release notes in case they contain any information about changes in the installation procedure.

The release notes are distributed in both PostScript and text format and can be found:

- at installation time
- on MetaLink in Acrobat format:

  ```
  Top Tech Docs\Database\Rdb\CODASYL DBMS\Documentation tab
  ```

You must specify OPTIONS N when you invoke VMSINSTAL to see the question about the DBMS online release notes. This question comes near the beginning of the installation and gives you the option of displaying them on the console terminal or sending the file to a print device.

Once DBMS has been installed, the release notes are located in:

```
SYS$HELP:DBM072.RELEASE_NOTES    (Text version)
SYS$HELP:DBM072_RELEASE_NOTES.PS (PostScript version)
```

Online help also directs you to the release notes file. After the installation, you can enter the following command to locate the release notes through the Help utility:

```
$ HELP DBMS RELEASE_NOTES
```

2.1.2 Verifying the Installation

Running the Installation Verification Procedures (IVP) for DBMS verifies that the product installed properly. During the installation, you are asked if you want to run the IVP as part of the installation. If you respond YES, VMSINSTAL runs the IVP at the end of the installation. Oracle recommends that you run the IVP to make sure that the product is installed correctly.

After the installation, you can run the IVP independently to verify that the software is available on your system. You might need to run the IVP after a system failure to make sure users can access DBMS. To run the IVP independently of the installation, see Section 3.14.

The system disk directory, SYS$COMMON:[SYSTEST.DBM], contains all files pertaining to the standard DBMS IVP. In a multiversion environment, the directory name has the release (or version) number appended to it. For example: SYS$COMMON:[SYSTEST.DBM72]. The installation procedure creates this directory if it does not already exist on the system disk.

2.1.3 Stopping the Installation

To stop the installation procedure at any time, press Ctrl/Y. When you press Ctrl/Y, the installation procedure deletes all files it has created up to that point and exits. You can then start the installation again.

If any problems are detected during the installation, the procedure is aborted and all temporary files and directories are deleted. Some or all DBMS functions may be unavailable until the deficiency is corrected.

2.2 Installation Procedure

The DBMS installation procedure consists of a series of questions and informational messages.

Although the installation procedure is generic, there will be some variation in every installation, due to the specific characteristics of each system.

For example, if your system does not have the HP Language-Sensitive Editor or Oracle Trace installed, the informational messages displayed reflect that. Therefore, your installation may vary slightly from the samples shown in this guide.

2.2.1 Invoking VMSINSTAL

To start the installation, invoke the VMSINSTAL command procedure. VMSINSTAL is in the SYS$UPDATE directory. Use the following format to invoke VMSINSTAL:

```
@SYS$UPDATE:VMSINSTAL save-set-name device-name OPTIONS N
```

save set name
Enter one of the following save set names to install DBMS release 7.2-0 software:

- DBM072A072 if you are installing on OpenVMS Alpha
- DBM072I072 if you are installing on OpenVMS I64

device-name
Enter the directory specification where the save sets are located.

OPTIONS N
This is an optional parameter that indicates you want to see the release notes question. You should review the release notes before proceeding with the installation in case they contain new information about the installation.

There are several other options you can select when you invoke VMSINSTAL. See the OpenVMS documentation for VMSINSTAL information on these options. If you specify more than one option, separate the options with commas (OPTIONS A,N).

The following example uses the OPTIONS N release note parameter:

```
$ @SYS$UPDATE:VMSINSTAL DBM072A072 DISK1:[ALPHA_KIT] OPTIONS N

      OpenVMS ALPHA Software Product Installation Procedure V7.2-0

It is 1-AUG-2005 at 22:11.
Enter a question mark (?) at any time for help.
```

If you do not supply any parameters, VMSINSTAL prompts you for the information later in the installation procedure.

2.2.2 Installation Questions

This section discusses the questions and messages you see during the installation. If this is a reinstallation, some of the questions will not appear. The examples in this section assume that you have selected the multiversion option.

See Appendix A and Appendix B for sample output from multiversion and standard installations of DBMS release 7.2.

Each installation question is marked with an asterisk (*) at the beginning of the line. Some questions show the default response in brackets, for example [YES]. To use the default response, press the Return key.

- Active user status

  VMSINSTAL displays a list of all active processes. It then asks if you want to continue the installation.

  ```
  * Do you want to continue anyway [NO]?
  ```

- System backup

  VMSINSTAL asks if you are satisfied with your system backup. You should always back up your system disk before performing an installation. If you are satisfied with the backup of your system disk, press Return. Otherwise, enter NO and press Return to discontinue the installation. After you back up your system disk, you can restart the installation:

  ```
  * Are you satisfied with the backup of your system disk [YES]?
  ```

- Media mounting

  The installation procedure now tries to locate the save set in the given location. If successful, the following message is displayed:

  ```
  The following products will be processed:
    DBM0720A V7.2

      Beginning installation of DBM0720A V7.2 at 13:55

  %VMSINSTAL-I-RESTORE, Restoring product save set A...
  ```

  If you entered the wrong save set or device name when you invoked VMSINSTAL, the installation will terminate:

  ```
  %VMSINSTAL-E-NOPRODS, None of the specified products were found.
  ```

- Release notes options

  If you specified OPTIONS N when you invoked VMSINSTAL, you are now asked to choose one of the four options for reviewing the release notes for DBMS:

  ```
  Release notes included with this kit are always copied to SYS$HELP.

  Additional Release Notes Options:

          1. Display release notes
          2. Print release notes
          3. Both 1 and 2
          4. None of the above
  ```

```
* Select option [2]:
```

If you select option 1, VMSINSTAL displays the release notes immediately. You can terminate the display at any time by pressing Ctrl/C.

If you select option 2, VMSINSTAL prompts you for the name of the print queue that you want to use:

```
* Queue name [SYS$PRINT]:
```

You can press Return to send the file to the default output print device or you can enter another queue name.

If you select option 3, VMSINSTAL displays the release notes immediately on the console terminal and then prompts you for a queue name for the printed version.

If you select option 4, the release notes are neither printed nor displayed. Select option 4 if you have already reviewed the release notes and are restarting the installation.

The installation procedure now asks if you want to continue the installation. To continue, enter YES. Otherwise, press Return. In either case, the release notes are copied to the SYS$HELP directory. For example:

```
* Do you want to continue the installation [NO]?: YES
%VMSINSTAL-I-RELMOVED, Product's release notes have been moved to SYS$HELP.
```

The release notes are moved to:

```
SYS$HELP:DBM07200.RELEASE_NOTES
SYS$HELP:DBM07200_RELEASE_NOTES.PS
```

Note

The names of the release notes files installed by VMSINSTAL consist of the abbreviation of the product name and release number. Do not delete release notes for previous releases of DBMS.

- Choosing the standard or multiversion kit

  Refer to Section 1.1.1 for an explanation of DBMS standard and multiversion options.

```
************************************************************
This installation will allow you to install either the STANDARD
(nonvariant) kit or the MULTIVERSION (variant) kit

Answer YES  to install the MULTIVERSION kit.
Answer NO   to install the STANDARD kit.
```

```
    ****************************************************************

* Do you wish to install the Oracle CODASYL DBMS MULTIVERSION kit [YES]? YES
    ****************************************************************
```

- Choosing to install Hot Standby option

  The installation procedure allows you to install the Hot Standby Option of DBMS. This option requires a separate license from Oracle Corporation. If you have purchased this license and wish to install the software, answer YES when prompted. Refer to Section 1.1.2 for more information about the Hot Standby option.

```
    ****************************************************************

    HOT STANDBY (aka AIJ Log Shipping or ALS) is a separately
    licensed component of Oracle CODASYL DBMS

    If you have obtained the proper license, you can install
    this software

    ****************************************************************

* Do you wish to install this component [NO]? YES
    ************************************************************
```

- Compaq Language-Sensitive Editor verification

  DBMS checks to see if the Compaq Language-Sensitive Editor (LSE) is installed on your system. If LSE is installed, it will be updated with the DBMS LSE environment files:

  If LSE is not installed, the installation procedure asks if you want to continue:

```
This product is NOT being installed with VAX Language-Sensitive
Editor support because the Editor is not installed on your system
If you want the VAX Language-Sensitive Editor support, do the
following:

1. Install the VAX Language-Sensitive Editor (V3.0 or higher)
2. Reinstall this product

* Do you want to continue the installation [YES]? YES
```

  If you want to stop the installation and install LSE, answer NO to this question. Otherwise, answer YES.

- Choosing the UIC and password for the remote access account

  This installation creates the account DBM$REMOTE72 (DBM$REMOTE, for the standard version), and a network object, DBMSERVER, if they do not already exist. If necessary, you will be prompted for a UIC and password for the new account.

The account is used to allow DBMS applications access to remote DBMS databases through the DBMSERVER network object.

Choose a user identification code (UIC) that is not a system UIC. The installation procedure will not continue until you enter a valid UIC. For example, you can enter the UIC [100,100] in response to the question. See the OpenVMS documentation on system management for more information on UICs and passwords.

The password that you specify will be applied to both the account and the DECnet network object.

You will be given three chances to verify your password. Your input will not appear on a terminal. The password must have at least eight characters:

```
* Enter UIC used for DBM$REMOTE72 account:

* Enter PASSWORD for DBM$REMOTE72 account:

* Verify the PASSWORD entered for DBM$REMOTE72:
```

Note

The autoanswer feature of VMSINSTAL is disabled during password prompting and verification.

- Choosing the UIC for the Hot Standby account

  If you elected to install the Hot Standby option, this procedure will create an account and a network object, DBMAIJ72 (DBMAIJ for the standard version), if they do not already exist.

  If the account does not already exist, you will be prompted to provide a valid user identification code (UIC). The installation procedure will not proceed until you enter a valid UIC. A password will automatically be generated for this account. The account password will be also be associated with the DECnet network object.

```
    ************************************************************

    This installation requires the creation of the DBMAIJ72
    account.  The installation procedure will not proceed until you
    enter a valid user identification code (UIC) for the DBMAIJ72
    account.  The UIC must be unique.  Format [ggg,mmm].

    ************************************************************

* Enter UIC to be used for DBMAIJ72 account: [12,101]
```

- Choosing the UIC for the remote statistics account

In order to support the collection of clusterwide database statistics from the DBO/SHOW STATISTICS command, the installation creates an account and a network object, DBMSTT72 (DBMSTT, for the standard version), if they do not already exist.

If the account does not already exist, you will be prompted to provide a valid user identification code (UIC). The installation procedure will not proceed until you enter a valid UIC. A password will automatically be generated for this account. The account password will be also be associated with the DECnet network object.

```
    ************************************************************

    This installation requires the creation of the DBMSTT72
    account.  The installation procedure will not proceed until you
    enter a valid user identification code (UIC) for the DBMSTT72
    account.  The UIC must be unique.  Format [ggg,mmm].

    ************************************************************

* Enter UIC to be used for DBMSTT72 account: [12,102]
```

- Confirmation

  The release (version) to be installed, as well as any release to be replaced or deleted will be identified. You will asked if you wish to continue with the installation. The default answer NO will abort the installation.

```
    ************************************************************

    Installing: Oracle CODASYL DBMS MULTIVERSION V7.2-0

    No other installed version of DBMS will be affected by this
    installation.

    After this MULTIVERSION installation, the default DBMS
    user environment will remain the standard version.  See the
    Oracle CODASYL DBMS Installation Guide for information about
    activating the multiversion software.

    Following this installation there will be discrete environments
    for each installed version, each with approximately the same
    system resource requirements.

    DBMS databases to be used with Oracle CODASYL DBMS V7.2-0 must
    be converted. Use the DBO/CONVERT command to convert your
    databases.

    You must have BYPASS privilege to convert the databases. See
    the Oracle CODASYL DBMS Installation Guide for information on
    converting databases.

    ONCE A DATABASE HAS BEEN CONVERTED TO Oracle CODASYL DBMS V7.2-0,
    IT CANNOT BE ACCESSED BY OTHER INSTALLED VERSIONS of DBMS.

    ************************************************************

* Do you want to continue the installation [NO]? yes
```

- Installation Verification Procedure selection

  The installation procedure now asks if you want to run the Installation Verification Procedure (IVP). The IVP verifies that the installation of DBMS was successful. Oracle recommends that you answer this question YES.

```
* Do you want to run the IVP after the installation [YES]?
```

- File purge option

  You have the option to purge files from previous releases of DBMS that are superseded by this installation. Purging is recommended; however, if you need to keep files from the previous release, enter NO in response to the question:

```
* Do you want to purge files replaced by this installation [YES]?
```

2.2.3 Informational Messages

There are no more questions. The following messages will be displayed:

```
    There are no more questions.

    Installation takes approximately 10 minutes on a standalone
    DEC/3000.  If you run the Installation Verification Procedure,
    it will take about 9 additional minutes to complete.

Beginning installation...1-AUG-2005 13:56:24.78
```

At this point, the procedure begins install DBMS. As the installation progresses, some or all of the following messages may be displayed:

```
%VMSINSTAL-I-RESTORE, Restoring product save set B ...
%VMSINSTAL-I-RESTORE, Restoring product save set D ...
%VMSINSTAL-I-RESTORE, Restoring product save set E ...

%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBM$REMOTE72.
%UAF-I-ADDMSG, user record successfully added
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBM$REMOTE72.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBM$REMOTE72.
%UAF-I-MDFYMSG, user record(s) updated

%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBMAIJ72.
%UAF-I-ADDMSG, user record successfully added
%UAF-I-RDBADDMSGU, identifier DBMAIJ72 value [000012,000103] added to
rights database
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBMAIJ72.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-SYSDIR, This product creates system disk directory
VMI$ROOT:[DBMAIJ72].

%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBMSTT72.
%UAF-I-ADDMSG, user record successfully added
%UAF-I-RDBADDMSGU, identifier DBMSTT72 value [000012,000104] added to
rights database
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBMSTT72.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-SYSDIR, This product creates system disk directory
VMI$ROOT:[DBMSTT72].

    ************************************************************

        SYSTEM MANAGER:

        If your DECnet object database is not configured to be in
        the cluster common directory, then you will need to perform
        the following:

        In order to have remote access on another node that shares
        this cluster common root directory, you must insert
        DBMSERVER into that node's DECnet object database by:
```

```
            a) Logging into that node, and
            b) Invoking SYS$COMMON:[SYSMGR]DBMSERVER_NCP.COM.

        This command procedure inserts DBMSERVER into the node's
        permanent DECnet object database. This procedure only needs
        to be executed ONCE per node.

        This command procedure will prompt for a password for the
        object DBMSERVER. This password must match the password
        established for the account.

    ************************************************************

    DBMSERVER has been placed in the DECnet object database as number 52.

    ************************************************************

    Oracle Trace has not been installed. Now storing the DBMS facility
    definition into sys$share:epc$facility.tlb. After installing Oracle Trace,
    the facility definition may be placed in the Oracle Trace administration
    database Please refer to the Oracle Trace User's guide for instructions on
    how to insert binary facility definitions into the Oracle Trace
    administration database.

    ************************************************************

    The installed version of the VAX Language Sensitive Editor
    will be updated with the new Oracle CODASYL DBMS LSE environment files

    ************************************************************

%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...
```

2.2.4 Running the Installation Verification Procedures

If you chose to run the IVP, VMSINSTAL runs it now. If the procedure is successful, a message indicates that the IVP has completed successfully. If there is an error in the IVP, a message indicates that the procedure failed. See Section 2.3 for information about error recovery.

A successful IVP for the DBMS full development kit displays the following messages:

```
                                Oracle CODASYL DBMS

                            Installation Verification Procedure


     The Oracle CODASYL DBMS Installation Verification Procedure
     -----------------------------------------------------------
  Executing IVP for Oracle CODASYL DBMS V7.2 at 1-AUG-2005 15:37:05.66

Checking the environment...
    Check was successful
    IVP files will be created in $1$DUA0:[SYS0.SYSUPD.DBMA072]
```

```
Deleting databases and schema...
    Delete was successful
    Temporary CDD/Plus dictionary will be created at
    $1$DUA0:[SYS0.SYSUPD.DBMA072.CDDPLUS].

Compiling the PARTS DDL files...
    Compiles were successful

Creating the PARTS database files...
...using CDD path $1$DUA0:[SYSUPD.DBMA072.CDDPLUS]
    Create was successful

Loading the PARTS database (with after image journaling)...
    Load was successful

Reloading the PARTS database (DBO /RECOVER)...
    Reload was successful

Executing a DBQ script...

    DBQ was successful

Running BASIC DML program
    BASIC DML was successful

Running COBOL DML program...
    COBOL DML was successful

Running C DML program...
    C DML was successful

Running FORTRAN DML program...
    FORTRAN DML was successful

Running PASCAL DML program...
    PASCAL DML was successful

Running PLI DML program...
    PLI DML was successful
    ****************************************

    Oracle CODASYL DBMS V7.2

    Development

    IVP COMPLETED SUCCESSFULLY

    ****************************************
```

2.2.5 Completing the Installation Procedure

The following messages indicate that the entire installation procedure is complete:

```
IVP completed successfully for Oracle CODASYL DBMS V7.2 at 01-AUG-2005 22:28

        Installation of DBM0720A V7.2 completed at 22:28

    Adding history entry in VMI$ROOT:[SYSUPD]VMSINSTAL.HISTORY

    Creating installation data file: VMI$ROOT:[SYSUPD]DBM0720A072.VMI_DATA

        VMSINSTAL procedure done at 22:28
```

VMSINSTAL deletes or changes entries in the process symbol tables during the installation. Therefore, if you are going to continue using the system manager's account and you want to restore these symbols, you should log out and log in again.

```
$ LOGOUT
SYSTEM     logged out at 1-AUG-2005 22:28:59.45
```

2.3 Error Recovery

If errors occur during the installation or the IVP, VMSINSTAL displays failure messages. If the DBMS installation fails, you see the following message:

```
VMSINSTAL-E-INSFAIL, The installation of Oracle CODASYL DBMS 7.2 has failed.
```

Errors can occur during the installation if any of the following conditions exists:

- The operating system version is incorrect.
- A prerequisite software version is incorrect.
- Quotas necessary for successful installation are insufficient.
- System parameter values for successful installation are insufficient.
- The OpenVMS Help library is currently in use.

For descriptions of the error messages generated by these conditions, see the OpenVMS documentation on system messages, recovery procedures, and OpenVMS software installation. If you are notified that any of these conditions exists, you should take the appropriate action as described in the message. (You might need to change a system parameter or increase an authorized quota value.) For information on installation requirements, see Chapter 1.

If the DBMS IVP fails, you see these messages:

```
**********************************

     Oracle CODASYL DBMS 7.2

     Development

     IVP FAILED
     See SYS$UPDATE:DBMIVP

**********************************
```

Examine the log file, SYS$UPDATE:DBMIVP.LOG, to determine why the IVP failed. Your first step might be to check the installation requirements in Chapter 1.

3
After Installing DBMS

This chapter discusses the tasks you need to perform after installing DBMS. It also explains how to run the Installation Verification Procedure (IVP) for the product independently of the installation.

The specific commands and procedures necessary to interact with DBMS may depend on whether the standard or multiversion kit was installing. Refer to Section 1.1.1 for an explanation of standard versus multiversioning.

Note

This chapter may display references to DBMS files containing the DBMS release number in brackets, for example, MONSTART[72].COM. This shorthand notation is used to convey the idea that the file name has two possible formats:

- varianted (that is, MONSTART72.COM)
- nonvarianted (that is, MONSTART.COM).

The actual file that exists on your system will depend on whether the standard or multiversion option was selected during the installation procedure (refer to Section 1.1.1 for further details on this option).

3.1 Converting Databases

With each new release, you must convert each database using the DBO /CONVERT/[NO]COMMIT command before you can bind to it with the new release. The conversion performs the necessary changes to allow a database to run under the new release of DBMS. The BYPASS privilege is required to execute the command.

Starting with this release, the minimum database version that can be converted is version 7.0. Database versions 7.0 and 7.2 can be converted directly to version 7.2. Attempts to convert databases with a version prior to 7.0 will result in the following error:

```
$ DBO/CONVERT PARTS
%DBO-F-CVRTUNS, The minimum database version that can be converted is version 70
```

To convert a pre-V70 database created before version 7.0, you must install a 7.0 or 7.2 version of Oracle CODASYL DBMS, convert the database to that version, then install this kit and convert to version 7.2.

With a multiversion environment, databases can be converted independently and can coexist on your system. However, concurrent access to a database from different versions of the software is not allowed.

The /COMMIT qualifier to the DBO/CONVERT command is the default. The database is converted to the current structure level and no rollback is possible. Once converted to the new version, a database cannot be accessed by previously installed versions.

With the /NOCOMMIT qualifier, the database is also converted to the current structure level, however, a rollback to the structure level at the time of conversion is later possible, by using the DBO/CONVERT/ROLLBACK command.

The /ROLLBACK qualifier is used to return a database that has been converted, but not committed, to the version level of the database at the time of the DBO/CONVERT/NOCOMMIT command. The rollback command is issued from the version level of the existing database, not at the prior version level.

The DBO/CONVERT command converts the root file only. Database areas, .AIJ files, and snapshot files do not have to be converted. Execution time for the DBO/CONVERT command therefore is very brief.

After-image journaling is disabled by the DBO/CONVERT/ROLLBACK command. A DBO-I-CANTENAAIJ message is displayed if journaling was previously enabled, indicating that journaling must be manually restarted with the DBO/MODIFY/AFTER_JOURNAL command.

Note

Oracle strongly recommends that a full backup of the database be taken prior to any DBO/CONVERT command.

If you have problems converting your database, use the DBO/RESTORE command to restore the backup you made before installation, as instructed in Section 1.6.2. The DBO/RESTORE command automatically converts the root file to the version of DBMS current for your process.

For further information on the DBO/CONVERT and DBO/RESTORE commands, refer to the *Oracle CODASYL DBMS Database Administration Reference Manual*.

3.2 Starting and Stopping DBMS

DBMS provides routines for starting and stopping DBMS on the node from which the procedure is executed.

The DBMS startup procedure, SYS$STARTUP:MONSTART[72].COM installs the images necessary to run DBMS and starts the DBMS monitor process (DBMS_MONITOR[72]. Additionally, the startup procedure may configure some of the network objects that DBMS uses.

The DBMS shutdown procedure, SYS$STARTUP:MONSTOP[72].COM stops the DBMS monitor process and deinstalls those DBMS-specific images installed by the startup procedure.

Note

You must have both WORLD and CMKRNL privileges enabled in order to execute these procedures.

3.2.1 DBMS Manual Startup

Do the following to execute the *multiversion* DBMS startup procedure interactively:

```
$ @SYS$STARTUP:MONSTART72.COM
```

Do the following to execute the *standard* DBMS startup procedure interactively:

```
$ @SYS$STARTUP:MONSTART.COM
```

3.2.2 DBMS Manual Shutdown

Do the following to execute the *multiversion* DBMS shutdown procedure interactively:

```
$ @SYS$STARTUP:MONSTOP72.COM
```

Do the following to execute the *standard* DBMS shutdown procedure interactively:

```
$ @SYS$STARTUP:MONSTOP.COM
```

3.2.3 Editing the System Files

You must edit the system startup and shutdown files to provide for automatic startup and shutdown of DBMS when your system is rebooted.

3.2.3.1 Automatic Startup Procedures

To automatically start DBMS at system reboot, you should invoke the DBMS startup procedure during the execution of the system startup file (SYS$STARTUP:SYSTARTUP_VMS.COM).

For the multiversion DBMS environment, add the following line to the system startup file:

```
$! Startup DBMS
$ @SYS$STARTUP:MONSTART72.COM
```

For the standard DBMS environment, add the following line to the system startup file:

```
$! Startup DBMS
$ @SYS$STARTUP:MONSTART.COM
```

You must position the new command after the lines that invoke the network startup command procedure and after the Oracle CDD/Repository startup file, CDDSTRTUP.COM. If you are using Oracle CDD/Repository, the CDDSTRTUP.COM file is produced by the Oracle CDD/Repository installation.

3.2.3.2 Automatic Shutdown Procedures

To automatically stop DBMS at system shutdown, you should invoke the DBMS shutdown procedure during the execution of the system shutdown file (SYS$STARTUP:SYSHUTDWN.COM). The DBMS shutdown procedure stops the DBMS monitor process and deinstalls known DBMS images.

For the multiversion DBMS environment, add the following line to the system shutdown file:

```
$! shutdown DBMS
$ @SYS$STARTUP:MONSTOP72.COM
```

For the standard DBMS environment, add the following line to the system shutdown file:

```
$! shutdown DBMS
$ @SYS$STARTUP:MONSTOP.COM
```

3.2.3.3 Files installed by the DBMS Startup Procedure

The MONSTART[72].COM procedure installs several images. These images and the qualifiers used are shown in Table 3–1. Images are installed by MONSTART.COM only if they are not already installed.

Table 3–1 Installed Images

Image File Name	Qualifiers
SYS$SYSTEM:DBMSERVER[72].EXE	/OPEN/SHARE/HEADER_RES
SYS$SYSTEM:DBO[72].EXE	/OPEN/HEADER_RES/PROT/PRIV=(PSWARM, SETPRV,CMKRNL,SYSNAN,PRMGBL, DETACH,SYSPRV,SYSGBL,TMPMBX)
SYS$LIBRARY:DBMSHR[72].EXE	/OPEN/SHARE/HEADER_RES/PROT
SYS$LIBRARY:DBMPRV[72].EXE	/OPEN/SHARE/HEADER_RES/PROT
SYS$MESSAGE:DBMMSG[72].EXE	/OPEN
SYS$MESSAGE:DBQMSG[72].EXE	/OPEN
SYS$MESSAGE:DBOMSG[72].EXE	/OPEN
SYS$MESSAGE:DDLMSG[72].EXE	/OPEN
SYS$MESSAGE:DMLMSG[72].EXE	/OPEN
SYS$LIBRARY:LBRSHR.EXE	/OPEN
SYS$LIBRARY:CRFSHR.EXE	/OPEN
SYS$SHARE:LIBRTL.EXE	/OPEN
SYS$SHARE:LIBRTL2_D56_ TV.EXE‡	/OPEN
SYS$SHARE:DEC$FORRTL.EXE‡	/OPEN
SYS$SHARE:EPC$SHR.EXE	/OPEN/SHARE/HEADER_RES/PROT
SYS$SHARE:EPC$MSG.EXE	/OPEN/SHARE/HEADER_RES

‡OpenVMS Alpha-specific information

3.3 Starting DBMS in a Cluster Environment

In a VMScluster system environment, DBMS must be started on all nodes from which it will be run. This can be done one of two ways. For each cluster member, do either the first *or* the second of the following:

- Reboot
- Perform the following steps:
  1. Replace the system DCLTABLE.EXE.
  2. Start the DBMS monitor.
  3. Replace each active user's command table.

3.3.1 Reboot

One way to update DBMS on other nodes in the cluster is to reboot each node. The startup file added in Section 3.2.3.1 will automatically start the monitor process.

3.3.2 Running the Startup Command Procedures

On each other node, you should:

1. Replace the DCLTABLES.EXE, with

   ```
   $ INSTALL REPLACE SYS$LIBRARY:DCLTABLES.EXE
   ```

2. Run the DBMS startup procedure as shown in Section 3.2.1.
3. Have active users log out and log back in, or replace their own command tables with:

   ```
   $ SET COMMAND/REPLACE/TABLE=SYS$LIBRARY:DCLTABLES
   ```

Note

The installation procedure replaces DCLTABLES.EXE and runs the DBMS startup procedure from the CPU node where the installation was performed, so it is not necessary to redo these steps on that node. However, all active users will need to replace their command tables.

3.4 Using the Multiversion Environment

DBMS 7.2 can be installed in a multiversion environment. This means that the 7.2 release can coexist with another release (or version) of DBMS on the same system or VMScluster. Because release 6.1 was the first multiversion release, it can coexist with only one other previous release. With release 7.2, you can have releases 7.0 and 7.1 installed.

Multiversion capability facilitates the process of upgrading to new releases of the software. You can install the newest release of DBMS, convert a database from a previous release, and test your applications using this converted database. If you need to return to the previous release, you can roll back the conversion.

The multiversion feature is implemented by maintaining a set of variant files. During the installation procedure, you can select to install either a standard kit, or the multiversion kit. Because the standard files are not variant files, the multiversion kit does not write over them. If you install the DBMS release 7.2 standard kit, the existing files are written over and you will not have a multiversion environment.

Note that maintaining multiple releases of DBMS increases system requirements:

- The disk space required can be estimated by adding the required space documented for each release.
- Each release has its own monitor process.
- Shared images require more global pages. In general, multiply the values specified in Section 1.7.4 by the number of releases of DBMS installed.

3.4.1 Setting the Multiversion Environment

After installing the multiversion kit, you can select between any of the currently installed releases (also called versions) of DBMS by using the DBMSETVER.COM procedure located in SYS$LIBRARY.

Use this command file to specify which release of DBMS you want to run. The command takes one parameter, the desired release number:

```
@SYS$COMMON:[SYSLIB]DBMSETVER.COM n.n
```

n.n
Specify the release of DBMS you want to run. For example, specify 7.2 to run DBMS 7.2 or 7.0 to run DBMS release 7.0.

3.4.2 Linking DBMS Applications Under Multiversioning

The installation procedure writes a new copy of DBMDML.OPT or DBMDML72.OPT to SYS$COMMON:[SYSLIB]. DBMS database programmers link the options file with their DML programs.

In DBMS release 7.0.4, a change was made to this options file so that applications, linked on multiversion installations of DBMS, were not tied to the multivariant DBMSHR image.

Previously, the DBMDML<VAR>.OPT file contained an explicit pointer to the DBMS sharable image, for example:

- The standard version 7.0, DBMSHR.OPT would contain the entry: sys$common:[syslib]dbmshr/share.
- The multiversion 7.0, DBMSHR70.OPT would contain the entry: sys$common:[syslib]dbmshr70/share.

Starting with DBMS release 7.0.4, the reference is generic and is the same for both standard and multiversion environments:

```
dbmshr/share
```

In the release 7.2 multiversion environment, DBMSHR will be defined to be SYS$COMMON:[SYSLIB]DBMSHR72.EXE after executing:

```
$ @SYS$LIBRARY:DBMSETVER.COM 72
```

If you are in a standard environment, then DBMSHR will be undefined and the linker will apply default file specifications, and link against SYS$COMMON:[SYSLIB]DBMSHR.EXE.

There should be no change to the linking or executing of an Oracle CODASYL DBMS application linked with this new options file.

Note

If you had altered previous versions of the file to suit specific needs of your database programs, you will need to make sure that you transfer these changes to the new version.

3.5 Determining the Files Added to the System

To get a list of the files that are added to your system when you install the multiversion DBMS 7.2, type or print the following file:

```
SYS$COMMON:[SYSMGR.VAXINFO$PRODUCTS]DBM072_MV_FILES.DAT
```

For the standard DBMS environment, type or print the following file:

```
SYS$COMMON:[SYSMGR.VAXINFO$PRODUCTS]DBM072_STD_FILES.DAT
```

You should not delete this file. It is required should you ever need to deinstall this release of DBMS. Refer to Section 3.13 for information on how to remove a release of DBMS.

On OpenVMS Alpha systems, the DBM0720A072.VMI_DATA file is created in SYS$UPDATE during installation. On OpenVMS I64 systems, the DBM0720I072.VMI_DATA file is created. This file shows statistics about the installation, files deleted, accounts updated, and files added.

3.6 Setting User Account Requirements

This section describes the disk space, quotas, and limits needed by DBMS users. The values suggested in this section are minimum settings; *the settings required by users on your system might differ substantially.* The suggested values are specific only for DBMS. You should add the values required for other layered products to the value you use for DBMS and modify the values for each user as needed.

3.6.1 Disk Requirements

Each active user application needs at least 1000 blocks of scratch space for the recovery-unit journal file and error dumps. The size of the scratch space varies with the number of changes and the length of transactions.

3.6.2 User Account Quotas

Each active user requires certain parameter settings. See the OpenVMS system management documentation information on using the Authorize utility. The following are pertinent parameters:

- ASTLM (asynchronous trap limit) A limit on the number of outstanding asynchronous traps (ASTs) for a process.

  For a single stream, set the ASTLM to the number of database page buffers you specify for the database using the /BUFFERS qualifier on the DBO/CREATE and DBO/MODIFY commands. For multiple streams, the ASTLM value should be based on the stream that has the largest number of buffers. The database buffers are written back to the database

in parallel. Therefore, there might be an outstanding AST for each buffer. Locking activity might also require a higher AST limit. The recommended minimum value is 24.

- BYTLM (byte limit) A buffered I/O limit of at least 10,240 bytes. Each additional stream requires an additional 1600 bytes.
- DIOLM (direct I/O limit) The number of outstanding disk I/O requests. You should set DIOLM to a value 2 less than ASTLM.
- ENQLM (enqueue limit) A limit on the maximum number of locks that a process can use at any one time.

  For each user, choose an ENQLM value sufficient to enable that user to run the utilities needed. A process that attempts to use Oracle CDD/Repository without a sufficiently high enqueue limit receives a quota exceeded error message. Raise the ENQLM of processes that receive this message.

  Although the OpenVMS system default ENQLM is 10, most DBMS users should have an ENQLM of at least 250. Users who compile large schemas (greater than 100 record types) or have transactions that lock large numbers of records might need a still larger ENQLM.

  Compute the number of locks needed using the following guidelines:

  - 10 to 50 general database locks (depending on configuration and journaling options)
  - 2 locks per area readied
  - 1 lock per page in the buffer pool (default is 50)
  - 1 lock per currency indicator in the program
  - 1 lock per record in a keeplist

  If you have enough runtime locks, you usually have enough compile-time locks.

  Note

  The number of locks needed by an DBMS user is application-dependent, with multi-user databases requiring proportionally more locks than single-user databases. The number of locks needed is based on the actual level of contention. However, the OpenVMS default will rarely be sufficient.

- FILLM (open file quota) A limit on the number of files a user can have open at any given time.

You should set the FILLM value according to Table 3–2.

Table 3–2 Estimating the Appropriate Value for FILLM

File	File Extension	Open Files
Root	.ROO	1
Storage area	.DBS	1 for each area readied by the run unit
Snapshot	.SNP	1 for each area readied by the run unit (only if snapshots are enabled for that area)
Recovery-unit journal	.RUJ	1 if database updates have been performed by the run unit
After-image journal	.AIJ	1 if database has after-image journaling enabled and the run unit has updated the database

Add the numbers shown in Table 3–2 to the numbers for the executable and sharable images. Certain operations, such as restoring a database when it is necessary to reinsert a schema into Oracle CDD/Repository, require more files.

- WSQUOTA (working set quota)

  Working set requirements vary greatly for different DBMS components. In general, components that interface with Oracle CDD/Repository, such as DBO/REPORT, DBO/INTEGRATE, DDL, DML, and FDML, require a working set of 4000 pages or more to avoid high page faulting rates. Check the process working set values and modify as needed. Larger working sets require larger ASTLM, BYTLM, ENQLM, and PGFQUOTA quotas, so modify accordingly.

Be sure the AUTOGEN parameter LOCKIDTBL_MAX is also set high enough. See Section 1.7.4.1 for information on selecting LOCKIDTBL and LOCKIDTBL_MAX values.

3.6.3 Special Privileges

Users who need to stop and start the DBMS monitor process must have WORLD privilege. System managers and database administrators should have WORLD privilege. However, in most situations, application programmers and end users should not have WORLD privilege.

To execute the DBMS startup procedure as described in Section 3.2.1, or to install additional images such as those listed in Table 3–3, you must have CMKRNL privilege.

3.7 Enhancing Product Performance

The following three sections describe methods that might enhance DBMS performance for those users developing DBMS programs.

3.7.1 Installing Images

By installing certain images, DBMS performance might be enhanced. Install the images using the install qualifiers shown in Table 3–3.

Table 3–3 Qualifiers for Optional Images

Image File Name	Qualifiers
SYS$SYSTEM:DBMDBR[72].EXE[1]	/OPEN/SHARE/HEADER_RES
SYS$SYSTEM:DBQ[72].EXE	/OPEN/SHARE/HEADER_RES
SYS$SYSTEM:DDL[72].EXE	/OPEN/SHARE/HEADER_RES
SYS$SYSTEM:DML[72].EXE	/OPEN/SHARE/HEADER_RES
SYS$SYSTEM:FORDML[72].EXE	/OPEN/SHARE/HEADER_RES

[1]Installing the DBMDBR[72].EXE file might improve the performance of database recovery after a cluster failover or a system failure. DBMDBR[72].EXE is not used to roll forward (DBO /RECOVER).

Use the INSTALL utility on each CPU node on the cluster to install these additional images interactively. In addition, include these commands in a site-specific system startup command procedure to be effective when nodes are rebooted.

Installing images requires additional GBLPAGES and GBLSECTIONS. See the OpenVMS system management documentation for more information about using the INSTALL utility.

3.7.2 Setting GBLPAGFIL and GBLPAGES

Setting the SYSGEN parameters, GBLPAGFIL and GBLPAGES, is important if any database is to use global buffers. Using global buffers can increase DBMS performance because I/O is reduced and memory is better utilized.

The GBLPAGFIL parameter defines the maximum number of systemwide pages allowed for global page-file sections. Determining a value for GBLPAGFIL depends on many factors, including the number of databases, the number of run units, the number and size of each global buffer, and the overhead of global buffer data structures.

An example of how you might calculate the requirement for the GBLPAGFIL quota for one database using global buffers follows:

```
(# of database global buffers * size of each global buffer) * 2
```

The GBLPAGES parameter sets the number of global page table entries allocated at boot time. Every open database that uses global buffers will consume global pages.

An example of how you might calculate the requirement for the GBLPAGES quota for one database using global buffers follows:

```
(# of database global buffers * size of each global buffer) * 1.2
```

Your calculations will vary because the number of data structures associated with global buffering is rounded up to the power of two for performance reasons.

The following procedure, using the PARTS sample database, is an example of how to determine the number of global pages used by global buffering:

```
$ DBO/OPEN PARTS
$ INSTALL LIST/GLOBAL/SUMMARY

    Summary of Local Memory Global Sections

    399 Global Sections Used,  50990/22210 Global Pages Used/Unused

$ DBO/CLOSE PARTS
$ DBO/MODIFY/GLOBAL_BUFFERS=(ENABLED,BUFFERS=100)/LENGTH_BUFFER=10 PARTS
$ DBO/OPEN PARTS
$ INSTALL LIST/GLOBAL/SUMMARY

    Summary of Local Memory Global Sections

    399 Global Sections Used,  52178/21022 Global Pages Used/Unused
```

In this example, 1188 (52178 minus 50990) global pages are used to support the specified global buffer parameters. Notice the number of global sections used is the same whether or not you use global buffers because global buffering expands the existing root file global section rather than creating a new global section.

If you use more than one database at a time, the need for each database should be calculated. The GBLPAGFIL and GBLPAGES parameters are nondynamic. Once you have set the parameters, you must reboot the system before the new values take effect. Refer to the OpenVMS documentation on system management utilities for more information on the GBLPAGFIL and GBLPAGES parameters.

3.7.3 Setting LOCKDIRWT

Setting the SYSGEN parameter, LOCKDIRWT, is important to ensure optimum database performance following cluster-state transitions. After a cluster-state transition, database locks could be remastered from a more powerful to a less powerful node, causing poor database performance.

If LOCKDIRWT is set greater than 0 on a node, it makes that node more likely to master locks. If LOCKDIRWT is set to 0, it makes that node less likely to master locks. For example, to establish the priority of Computer Interconnect (CI) nodes over Network Interconnect (NI) nodes, give the CI nodes a LOCKDIRWT value of 1 and the NI nodes a LOCKDIRWT value of 0.

When a node with LOCKDIRWT of 0 joins a cluster, the lock database is not rebuilt, provided there are already at least two nodes with LOCKDIRWT greater than 0 in the cluster. In addition, when a node with LOCKDIRWT of 0 leaves a cluster, a full lock rebuild is avoided if at least two nodes with LOCKDIRWT greater than 0 remain. This will speed cluster-state transitions. If a full lock rebuild is avoided, no lock mastering changes occur except for those resources mastered on a node being removed from the cluster.

The LOCKDIRWT parameter is nondynamic. Once you have set the parameter, you must reboot the system before LOCKDIRWT takes effect.

3.8 Installing DBMS Images as Resident

On OpenVMS Alpha systems, you may improve the performance of applications using DBMS by installing certain product images as resident with the OpenVMS Install utility (INSTALL). Installing images as resident allows them to take advantage of the OpenVMS Alpha image-slicing features.

The code sections of an image installed as resident reside in huge pages called granularity hint regions (GHRs) in memory. The OpenVMS Alpha hardware can consider a set of pages as a single GHR. This GHR can be mapped by a single page table entry (PTE) in the translation buffer (TB). The result is a reduction in TB miss rates. For more information on slicing sharable images, see the OpenVMS documentation set.

Furthermore, OpenVMS versions starting with V7.2-1H1 support resource affinity domains (RADs). When RAD support is enabled, OpenVMS can replicate /RESIDENT installed image data on each RAD. The advantage to this replication is that any CPU access to the image memory will always be in the same RAD.

To take advantage of this capability, the image must be installed in the system startup procedure before the end of SYSTARTUP_VMS.COM. The easiest way to accomplish this for the DBMS images is to execute the DBMS startup command procedure, SYS$STARTUP:MONSTART[72].COM, from SYS$STARTUP:SYSTARTUP_VMS.COM (the site-specific system startup procedure).

To install DBMS images as resident, use a text editor to modify the DBMS startup command procedure. Remove the comment character (!) from the line RESIDENT = "/RESIDENT" and then DBO and DBMSHR images will be installed as /RESIDENT.

If you use many resident images, you may need to modify the GH_RES_CODE system parameter to add approximately 2048 additional pages. The System Dump Analyzer (SDA) command CLUE MEMORY/GH/FULL can be used to display the contents and free space within the Resident Image Code Region.

3.9 Oracle CODASYL DBMS Support for Compaq Galaxy Software Architecture

OpenVMS Galaxy is a software architecture for the OpenVMS Alpha operating system from Compaq Computer Corporation that enables multiple instances of OpenVMS to execute cooperatively in a single computer. An instance refers to a copy of the OpenVMS Alpha operating system. Introduced with OpenVMS Version 7.2, the Galaxy architecture delivers greater scalability and highly available computing with flexible operating features. Features include managing your workload by reassigning CPU resources between instances and *galactic* shared memory that acts as a cluster interconnect within the system.

As an extension of the existing OpenVMS cluster support, Oracle CODASYL DBMS introduces support for databases opened on multiple instances (or nodes) within a Galaxy system to share, in memory, database structures including global buffers, row caches, and root file objects. This sharing permits applications running with Oracle CODASYL DBMS to scale beyond the traditional limitations of 8 to10 CPUs in an OpenVMS symmetric multiprocessing (SMP) environment, while retaining the flexibilities of the OpenVMS cluster configuration. This sharing between instances in a Galaxy configuration can also reduce disk I/O and locking, which can lead to significant performance improvements.

Within an Oracle CODASYL DBMS Galaxy environment, each instance with an open database has unique:

- DBMS monitor process (MON)
- Database recovery servers (DBRs)

- AIJ buffers, AIJ log server (ALS)

Within an Oracle CODASYL DBMS Galaxy environment, all instances with an open database share:

- Database root objects (for example, TSN blocks and SEQ blocks)
- Global buffers (if enabled)
- Row caches and row cache server (RCS) process (if enabled)

3.9.1 Configuring OpenVMS Galaxy for Oracle CODASYL DBMS

In order to configure a Galaxy system and allow DBMS to share memory between instances, enough galactic shared memory needs to be configured in the Galaxy environment. To do this, take the following steps:

1. Using the DBO/MODIFY/CLUSTER_NODES command, specify the number of cluster members that will access the database.
2. Use the DBO/DUMP/HEADER command to display the sizes of the Oracle CODASYL DBMS shared memory components. For example:

```
$ DBO /DUMP /HEADER PARTS
            . . .
Derived Data...
    - Global section size
              With global buffers disabled is 190450 bytes
              With global buffers enabled is 1021668 bytes
              Large memory global buffers section is 768000 bytes
    - Row Cache RUJ buffers section size is 6502400 bytes
            . . .
Row cache "PARTS"
            . . .
    Cache-size in different sections of memory...
    - Without VLM, process or system memory requirement is 1121792 bytes
    - With VLM enabled (OpenVMS Alpha)...
              - Process or system memory requirement is 90112 bytes
              - Physical memory requirement is 1032000 bytes
              - VLM Virtual memory address space is approximately 102400 bytes
            . . .
Row cache "MY_CACHE"
            . . .
    Cache-size in different sections of memory...
    - Without VLM, process or system memory requirement is 1138176 bytes
    - With VLM enabled (OpenVMS Alpha)...
              - Process or system memory requirement is 78336 bytes
              - Physical memory requirement is 1060000 bytes
              - VLM Virtual memory address space is approximately 102400 bytes
            . . .
Row cache "TEST_CACHE"
            . . .
```

```
Cache-size in different sections of memory...
- Without VLM, process or system memory requirement is 1418240 bytes
- With VLM enabled (OpenVMS Alpha)...
          - Process or system memory requirement is 102400 bytes
          - Physical memory requirement is 1316000 bytes
          - VLM Virtual memory address space is approximately 102400 bytes
```

- If you do not have row cache enabled:

  The amount of galactic shared memory needed is found in the Global section display of the Derived Data section of the header dump output. Use the number of bytes displayed for either global buffers disabled (for example, 190450 bytes) or global buffers enabled (for example, 1021668 bytes).

- If row cache is enabled:

  The amount of galactic shared memory needed is the number of bytes for global buffers (enabled or disabled), plus the number of bytes displayed for Row Cache RUJ buffers, plus the number of bytes displayed for Without VLM for each row cache. For example, using the preceding example and assuming global buffers are disabled and three row caches are defined, you would need to configure galactic shared memory as follows:

  190450 + 6502400 + (1121792 + 1138176 + 1418240) = 10372058 bytes

  Oracle Corporation recommends that you round these numbers up to avoid being too conservative and to avoid having to reboot the entire Galaxy if extra memory is needed in the future.

3.9.2 Enabling OpenVMS Galaxy on DBMS

The /GALAXY=ENABLED qualifier is used to enable Galaxy features on an DBMS database. Use /GALAXY=NOENABLED to disable Galaxy on a DBMS database. The default is /NOENABLED.

Format:

```
DBO/CREATE/GALAXY=[NO]ENABLED root-file-spec
DBO/MODIFY/GALAXY=[NO]ENABLED root-file-spec
```

This command requires exclusive database access (the database cannot be open or be accessed by other users).

3.10 Remote Server Considerations

The following section provides information about using remote servers and DBMS.

3.10.1 DECnet and DECnet/OSI Environment

The SYS$STARTUP:MONSTART[72].COM procedure for DBMS has been updated to execute the SYS$STARTUP:DBMSERVER_NCL.COM (for DECnet/OSI) and SYS$STARTUP:DBMSERVER_NCP.COM (for DECnetIV) command files to configure the DBMSERVER network object.

If necessary, DBMSERVER_NCL.COM or DBMSERVER_NCP.COM can be executed interactively on each cluster member, however, this is not generally required.

3.11 Hot Standby Considerations

Hot Standby for DBMS is a separately licensed product that may be installed during the normal DBMS installation. The following section may be applicable if you have elected to install this option and have obtained the proper license. Refer to Section 1.1.2 for more details.

3.11.1 DECnet and DECnet/OSI Environment

The SYS$STARTUP:MONSTART[72].COM procedure for DBMS has been updated to execute the SYS$STARTUP:DBMAIJSERVER[72]_NCL.COM (for DECnet/OSI) and SYS$STARTUP:DBMAIJSERVER[72]_NCP.COM (for DECnetIV) command files to configure the DBMAIJ[72] network object.

If necessary, DBMAIJSERVER[72]_NCL.COM or DBMAIJSERVER[72]_ NCP.COM can be executed interactively on each cluster member, however, this is not generally required.

3.11.2 TCP/IP Support

The default transport mechanism used to communicate between the master and standby nodes is DECnet; however, the TCP/IP network protocol is also supported.

To enable Hot Standby over a TCP/IP network when a multiversion kit of DBMS release 7.2 is installed, you must perform the following steps on both the master and standby nodes:

1. Define the DBMAIJ72 service:

```
$ TCPIP
TCPIP> set service dbmaij72
    /port=n
    /user_name=dbmaij72
    /process_name=dbmaij72
    /file_name=sys$system:dbmaijserver72.com
    /limit=y
TCPIP> exit
```

where: *n* is an available port number, and *y* is the number of concurrent connections.

Paul - the following lines are Paul Mead's changes to the above sentence

---

where *n* is an available port number, and *y* is the number of connections permitted for the network service. A minimum of two connections is required for each database. In addition, any database recovery process (DBR) that executes on the master database also requires a connection.

2. Enable the service:

```
$ TCPIP enable service dbmaij72
```

3. Define the DBM$BIND_HOT_NETWORK_TRANSPORT logical name:

```
$ DEFINE/SYSTEM DBM$BIND_HOT_NETWORK_TRANSPORT "TCPIP"
```

To switch back to the DECnet transport, simply deassign the DBM$BIND_HOT_NETWORK_TRANSPORT logical name, or define it to be DECnet.

Paul - Paul Mead said last bullet above should be replaced:

Use the Transport qualifier with the RMU Replicate After Start or RMU Replicate Configure command to specify the network transport. The valid values for the Transport qualifier are DECNET and TCPIP.

```
$RMU/REPLICATE AFTER CONFIGURE /TRANSPORT=TCPIP -
_$ /STANDBY=NODE1:::DEV:[DIR]STANDBY_DB M_TESTDB
```

Note

If you have installed the DBMS standard kit, then the service, user_name, and process_name would be DBMAIJ. The file_name would be

SYS$SYSTEM:DBMAIJSERVER.COM

3.11.3 Privileges

For security reasons, the AIJSERVER account (DBMAIJ72) is created with just NETMBX and TMPMBX privileges. In most cases, these privileges are sufficient to start Hot Standby. However, for production Hot Standby systems, these privileges are not adequate to ensure continued replication in all environments and workload situations. Oracle recommends that you provide the following additional privileges for the AIJSERVER account:

- ALTPRI - This privilege allows the AIJSERVER to adjust its own priority to ensure adequate quorum (CPU utilization) for prompt message processing.
- PSWAPM - This privilege allows the AIJSERVER to enable and disable process swapping, which is also necessary to ensure prompt message processing.
- SETPRV - This privilege allows the AIJSERVER to temporarily set any additional privileges it may need to access the standby database or its server processes.
- SYSPRV - This privilege allows the AIJSERVER to access the standby database root file, if necessary.
- WORLD - This privilege allows the AIJSERVER to more accurately detect standby database server process failure and handle network failure more reliably.

3.12 Enabling Clusterwide DBMS Statistic Collection

In DBMS release 7.0, the DBO/SHOW STATISTICS command was enhanced to provide the ability to collect clusterwide statistics using the /CLUSTER qualifier.

3.12.1 Privileges Required by the DBMSTT Account

The installation procedure creates an account, DBMSTT72 (for multiversion) or DBMSTT (for standard), for use in the collection of clusterwide database statistics. This account is configured with only the default NETMBX and TMPMBX privileges.

However, these default privileges may be inadequate to access your DBMS databases. Rather than granting additional privileges to this account, Oracle CODASYL DBMS recommends that, if you plan on using the cluster capability of DBO/SHOW STATISTICS, that you VMS INSTALL the DBMSTT[72].EXE image with the appropriate privileges.

The DBMS startup procedure, SYS$STARTUP:MONSTART[72].COM has been modified to optionally install the DBMSTT[72].EXE image at monitor startup time. To take advantage of this, you will need to edit the command procedure and remove the comment characters from the following lines:

```
$ ! definex sys$common:[sysexe]dbmstt'variant'.exe
$ !     removex
$ !     addx /open/head/prot/priv=(cmkrnl,sysprv,share)
```

3.12.2 DECnet and DECnet/OSI Support

The SYS$STARTUP:MONSTART[72].COM procedure for DBMS has been updated to execute the SYS$STARTUP:DBMSTTSERVER[72]_NCL.COM (for DECnet/OSI) and SYS$STARTUP:DBMSTTSERVER[72]_NCP.COM (for DECnetIV) command files to configure the DBMSTT[72] network object.

If necessary, DBMSTTSERVER[72]_NCL.COM or DBMSTTSERVER[72]_ NCP.COM can be executed interactively on each cluster member, however, this is not generally required.

3.12.3 TCP/IP Support

The default transport mechanism used to communicate with the cluster members is DECnet; however, the TCP/IP network protocol is also supported.

To enable clusterwide statistics over a TCP/IP network when multiversion DBMS release 7.2 is installed, you must perform the following steps:

1. Define the DBMSTT72 service:

```
$ TCPIP
       TCPIP> set service dbmstt72
       /port=n
       /user_name=dbmstt72
       /process_name=dbmstt72
       /file_name=sys$system:dbmsttserver.com
              /limit=y
TCPIP> exit
```

   where: *n* is an available port number, and *y* is the number of concurrent connections.

2. Enable the service on each node where statistics are to be collected:

```
$ TCPIP enable service dbmstt72
```

3. Define DBM$BIND_STT_NETWORK_TRANSPORT on the node where you will execute the DBO/SHOW STATISTICS/CLUSTER command:

```
$ DEFINE/SYSTEM DBM$BIND_STT_NETWORK_TRANSPORT "TCPIP"
```

Note

If you have installed the DBMS standard kit, then the service, user_name, and process_name would be DBMSTT.

To switch back to the DECnet transport, simply deassign the DBM$BIND_STT_NETWORK_TRANSPORT logical name, or define it to be DECnet.

3.13 Deleting Releases of DBMS

DBMS 7.2 provides the ability to remove this or a previously installed release (also referred to as a version) of DBMS.

To deinstall a release of DBMS, execute the command procedure, SYS$STARTUP:DBM$DELETE_VERSION.COM. The procedure will prompt for the release to delete and ask whether it is for standard or multiversion. Prior to any action being taken, you will be given a chance to cancel.

For more help on this procedure, enter a question mark (?) as the first parameter:

```
$ @SYS$STARTUP:DBM$DELETE_VERSION.COM ?
```

The question mark (?) will provide details on the required and optional parameters.

This procedure must have access to the data file that DBMS created during the installation of that release. Refer to Section 3.5 for details on this data file.

If the data file cannot be found, DBM$DELETE_VERSION.COM will terminate.

Note

Generally, it is not necessary to manually delete older releases of DBMS.

3.14 Running the IVP After DBMS Is Installed

You may run or re-run the DBMS Installation Verification Procedure (IVP) at any time after the installation.

Use the following syntax for the DCL command line:

@SYS$COMMON:[SYSTEST]DBMIVP[72].COM [device:directory]

The optional [device:directory] parameter specifies where the files generated by the IVP will be written. If you do not specify a location, the default device and directory will be used. If Oracle CDD/Repository is installed, DBMS writes metadata for the PARTS database to the dictionary defined by the CDD$DEFAULT logical name. If CDD$DEFAULT is not defined, the IVP will create a temporary dictionary to either the default directory or to the specified location.

For example, to execute the IVP for multiversion release 7.2, execute the following:

```
$ @SYS$TEST:DBMIVP72.COM
```

To execute the IVP for standard release 7.2, you could enter:

```
$ @SYS$TEST:DBMIVP.COM
```

If the IVP is successful, a message tells you that it finished successfully. If the IVP is unsuccessful, a message tells you where to look for the failure.

A
Sample Multiversion Installation

This appendix lists the terminal output from an installation of the Oracle CODASYL DBMS multiversion release 7.2-0 kit on OpenVMS Alpha.

```
$ @SYS$UPDATE:VMSINSTAL DBM0720A072 KITS:[SYSTEM]
 OpenVMS  Software Product Installation Procedure V8.2
It is 27-SEP-2005 at 13:14.
Enter a question mark (?) at any time for help.
%VMSINSTAL-W-ACTIVE, The following processes are still active:
       TCPIP$FTP_1
       TCPIP$NTP_1
       _TNA5:
* Do you want to continue anyway [NO]? YES
* Are you satisfied with the backup of your system disk [YES]?

The following products will be processed:
  DBM0720A V7.2
 Beginning installation of DBM0720A V7.2 at 13:14

%VMSINSTAL-I-RESTORE, Restoring product save set A ...
%VMSINSTAL-I-RELMOVED, Product's release notes have been moved to SYS$HELP.

         Oracle CODASYL DBMS V7.2-0 Installation

    ****************************************************************

    This installation will allow you to install either the STANDARD
    (non-varianted) kit or the MULTIVERSION (varianted) kit

    Answer YES  to install the MULTIVERSION kit.
    Answer NO   to install the STANDARD kit.

    ****************************************************************

* Do you wish to install the Oracle CODASYL DBMS MULTIVERSION kit [YES]? YES
    ****************************************************************

    HOT STANDBY (aka AIJ Log Shipping or ALS) is a separately
    licensed component of Oracle CODASYL DBMS

    If you have obtained the proper license, you can install
    this software
```

```
    ****************************************************************

* Do you wish to install this component [NO]? YES

    ****************************************************************

    This installation will create the DBM$REMOTE72
    account.  You will be prompted for the UIC and password for
    the account.

    ****************************************************************

* Enter UIC for DBM$REMOTE72 account: [12,100]

    ****************************************************************
* Do you want to continue the installation [NO]? YES

* Enter PASSWORD for DBM$REMOTE72 account:
=
* Verify the PASSWORD entered for DBM$REMOTE72:

    ************************************************************

    This installation requires the creation of the DBMAIJ72
    account.  The installation procedure will not proceed until you
    enter a valid user identification code (UIC) for the DBMAIJ72
    account.  The UIC must be unique.  Format [ggg,mmm].

    ************************************************************

* Enter UIC to be used for DBMAIJ72 account: [11,111]

    ************************************************************

    This installation requires the creation of the DBMSTT72
    account.  The installation procedure will not proceed until you
    enter a valid user identification code (UIC) for the DBMSTT72
    account.  The UIC must be unique.  Format [ggg,mmm].

    ************************************************************

* Enter UIC to be used for DBMSTT72 account: [11,112]

    ****************************************************************

    Installing: Oracle CODASYL DBMS MULTIVERSION V7.2-0

    No other installed version of DBMS will be affected by this
    installation.

    After this MULTIVERSION installation, the default DBMS
    user environment will remain the standard version.  See the
    Oracle CODASYL DBMS Installation Guide for information about
    activating the multiversion software.

    Following this installation there will be discrete environments
    for each installed version, each with approximately the same
    system resource requirements.
```

```
    DBMS databases to be used with Oracle CODASYL DBMS V7.2-0 must
    be converted. Use the DBO/CONVERT command to convert your
    databases.

    You must have BYPASS privilege to convert the databases. See
    the Oracle CODASYL DBMS Installation Guide for information on
    converting databases.

    ONCE A DATABASE HAS BEEN CONVERTED TO Oracle CODASYL DBMS V7.2-0,
    IT CANNOT BE ACCESSED BY OTHER INSTALLED VERSIONS of DBMS.

    ****************************************************************

* Do you want to continue the installation [NO]? YES
* Do you want to run the IVP after the installation [YES]? YES
* Do you want to purge files replaced by this installation [YES]? YES

    ****************************************************************

    There are no more questions.

    Installation takes approximately 2 minutes on a standalone
    ALPHASERVER. If you run the Installation Verification Procedure,
    it will take about 2 additional minutes to complete.

    ****************************************************************


    Beginning installation...27-SEP-2005 13:15:29.83

%VMSINSTAL-I-RESTORE, Restoring product save set B ...
%VMSINSTAL-I-RESTORE, Restoring product save set D ...
%VMSINSTAL-I-RESTORE, Restoring product save set E ...
%VMSINSTAL-I-SYSDIR, This product creates system disk directory  VMI$ROOT:[SYSTEST.DBM72].
%VMSINSTAL-I-SYSDIR, This product creates system disk directory  VMI$ROOT:[DBM$REMOTE72].
%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBM$REMOTE72.
%UAF-I-ADDMSG, user record successfully added
%UAF-E-RDBADDERRU, unable to add DBM$REMOTE72 value [000012,000100] to rights database
-SYSTEM-F-DUPIDENT, duplicate identifier
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBM$REMOTE72.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBM$REMOTE72.
%UAF-I-MDFYMSG, user record(s) updated

%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBMAIJ72.
%UAF-I-ADDMSG, user record successfully added
%UAF-I-RDBADDMSGU, identifier DBMAIJ72 value [000012,000205] added to rights database
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBMAIJ72.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-SYSDIR, This product creates system disk directory  VMI$ROOT:[DBMAIJ72].

%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBMSTT72.
%UAF-I-ADDMSG, user record successfully added
%UAF-I-RDBADDMSGU, identifier DBMSTT72 value [000012,000206] added to rights database
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBMSTT72.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-SYSDIR, This product creates system disk directory  VMI$ROOT:[DBMSTT72].
```

```
    ***************************************************************

    The installed version of the OpenVMS Language Sensitive Editor
    will be updated with the new Oracle CODASYL DBMS LSE environment files

    ***************************************************************

%REGISTER-I-SUMMARY  images examined: 1, dependent images: 0
%REGISTER-I-DUP DBMPRV72, (DBMPRV72, DBMS V7.2-0) already in registry
%REGISTER-I-SUMMARY  images examined: 1, dependent images: 1
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...
   SYS$K_MULTI_PROCESSING  : (2.0 / 2.0)

                           Oracle CODASYL DBMS

             Installation Verification Procedure


     The Oracle CODASYL DBMS Installation Verification Procedure
     -----------------------------------------------------------

 Executing IVP for Oracle CODASYL DBMS V7.2-0 at 27-SEP-2005 13:19:09.43


Checking the environment...
 Check was successful
 IVP files will be created in $1$DGA70:[SYS8.SYSUPD.DBM0720A072]

Deleting databases and schema...
 Delete was successful

Temporary CDD/Plus dictionary...
 Created at $1$DGA70:[SYS8.SYSUPD.DBM0720A072.CDDPLUS1]
 Create was successful

Compiling the PARTS DDL files...
 Compiles were successful

Creating the PARTS database files...
 ...using CDD path $1$DGA70:[SYS8.SYSUPD.DBM0720A072.CDDPLUS1]
 Create was successful

Loading the PARTS database (with after image journaling)...
 Load was successful

Reloading the PARTS database (DBO /RECOVER)...
 Reload was successful

Executing a DBQ script...
 DBQ was successful

Running BASIC DML program...
 BASIC DML was successful

Running COBOL DML program...
 COBOL DML was successful
```

```
Running C DML program...
 C DML was successful
Running FORTRAN DML program...
 FORTRAN DML was successful
Running PASCAL DML program...
 PASCAL DML was successful
    ************************************
    Oracle CODASYL DBMS V7.2-0
    IVP COMPLETED SUCCESSFULLY
    ************************************

IVP completed successfully for Oracle CODASYL DBMS V7.2-0 at 27-SEP-2005 13:27:32.19
 Installation of DBM0720A V7.2 completed at 13:27
    Adding history entry in VMI$ROOT:[SYSUPD]VMSINSTAL.HISTORY
    Creating installation data file: VMI$ROOT:[SYSUPD]DBM0720A072.VMI_DATA
 VMSINSTAL procedure done at 13:28
```

B

Sample Standard Installation

This appendix lists the terminal output from an installation of the Oracle CODASYL DBMS standard release 7.2-0 kit on OpenVMS I64.

```
$ @SYS$UPDATE:VMSINSTAL DBM0720I072 KITS:[SYSTEM]
 OpenVMS  Software Product Installation Procedure V8.2-1
It is 27-SEP-2005 at 12:55.
Enter a question mark (?) at any time for help.
%VMSINSTAL-W-NOTSYSTEM, You are not logged in to the SYSTEM account.
%VMSINSTAL-W-ACTIVE, The following processes are still active:
       TCPIP$FTP_1
       TCPIP$NTP_1
       PAC-2
       PAC-3
       PAC-1
       EPC$REGISTRAR
* Do you want to continue anyway [NO]? Y
* Are you satisfied with the backup of your system disk [YES]?

The following products will be processed:
  DBM0720I V7.2
 Beginning installation of DBM0720I V7.2 at 12:55

%VMSINSTAL-I-RESTORE, Restoring product save set A ...
%VMSINSTAL-I-RELMOVED, Product's release notes have been moved to SYS$HELP.

         Oracle CODASYL DBMS V7.2-0 Installation

    ****************************************************************

    This installation will allow you to install either the STANDARD
    (non-varianted) kit or the MULTIVERSION (varianted) kit

    Answer YES  to install the MULTIVERSION kit.
    Answer NO   to install the STANDARD kit.

    ****************************************************************

* Do you wish to install the Oracle CODASYL DBMS MULTIVERSION kit [YES]? NO

    ****************************************************************
```

```
    HOT STANDBY (aka AIJ Log Shipping or ALS) is a separately
    licensed component of Oracle CODASYL DBMS

    If you have obtained the proper license, you can install
    this software

    ****************************************************************

* Do you wish to install this component [NO]? YES

    ****************************************************************

    This installation will create the DBM$REMOTE
    account.  You will be prompted for the UIC and password for
    the account.

    ****************************************************************

* Enter UIC for DBM$REMOTE account: [12,100]

    ****************************************************************

        Specified UIC already exists on this system.

    ****************************************************************
* Do you want to continue the installation [NO]? YES

* Enter PASSWORD for DBM$REMOTE account:

* Verify the PASSWORD entered for DBM$REMOTE:

    ************************************************************

    This installation requires the creation of the DBMAIJ
    account.  The installation procedure will not proceed until you
    enter a valid user identification code (UIC) for the DBMAIJ
    account.  The UIC must be unique.  Format [ggg,mmm].

    ************************************************************

* Enter UIC to be used for DBMAIJ account: [11,111]

    ************************************************************

    This installation requires the creation of the DBMSTT
    account.  The installation procedure will not proceed until you
    enter a valid user identification code (UIC) for the DBMSTT
    account.  The UIC must be unique.  Format [ggg,mmm].

    ************************************************************

* Enter UIC to be used for DBMSTT account: [11,112]=

    ****************************************************************

    Installing: Oracle CODASYL DBMS STANDARD V7.2-0

    No other installed version of DBMS will be affected by this
    installation.
```

```
    DBMS databases to be used with Oracle CODASYL DBMS V7.2-0 must
    be converted. Use the DBO/CONVERT command to convert your
    databases.

    You must have BYPASS privilege to convert the databases. See
    the Oracle CODASYL DBMS Installation Guide for information on
    converting databases.

    ONCE A DATABASE HAS BEEN CONVERTED TO Oracle CODASYL DBMS V7.2-0,
    IT CANNOT BE ACCESSED BY OTHER INSTALLED VERSIONS of DBMS.

    ****************************************************************

* Do you want to continue the installation [NO]? YES
* Do you want to run the IVP after the installation [YES]?
* Do you want to purge files replaced by this installation [YES]?

    ****************************************************************

    There are no more questions.

    Installation takes approximately 3 minutes on a standalone
    HP/RX2600. If you run the Installation Verification Procedure,
    it will take about 2 additional minutes to complete.

    ****************************************************************


    Beginning installation...27-SEP-2005 12:56:12.40

%VMSINSTAL-I-RESTORE, Restoring product save set B ...
%VMSINSTAL-I-RESTORE, Restoring product save set C ...
%VMSINSTAL-I-RESTORE, Restoring product save set E ...
%VMSINSTAL-I-SYSDIR, This product creates system disk directory  VMI$ROOT:[SYSTEST.DBM].
%VMSINSTAL-I-SYSDIR, This product creates system disk directory  VMI$ROOT:[DBM$REMOTE].
%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBM$REMOTE.
%UAF-I-ADDMSG, user record successfully added
%UAF-E-RDBADDERRU, unable to add DBM$REMOTE value [000012,000100] to rights database
-SYSTEM-F-DUPIDENT, duplicate identifier
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBM$REMOTE.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBM$REMOTE.
%UAF-I-MDFYMSG, user record(s) updated

%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBMAIJ.
%UAF-I-ADDMSG, user record successfully added
%UAF-I-RDBADDMSGU, identifier DBMAIJ value [000012,000205] added to rights database
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBMAIJ.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-SYSDIR, This product creates system disk directory  VMI$ROOT:[DBMAIJ].

%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBMSTT.
%UAF-I-ADDMSG, user record successfully added
%UAF-I-RDBADDMSGU, identifier DBMSTT value [000012,000206] added to rights database
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBMSTT.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-SYSDIR, This product creates system disk directory  VMI$ROOT:[DBMSTT].
```

```
    ***************************************************************
    The installed version of the OpenVMS Language Sensitive Editor
    will be updated with the new Oracle CODASYL DBMS LSE environment files
    ***************************************************************
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...
                            Oracle CODASYL DBMS
                Installation Verification Procedure


     The Oracle CODASYL DBMS Installation Verification Procedure
     -----------------------------------------------------------

 Executing IVP for Oracle CODASYL DBMS V7.2-0 at 27-SEP-2005 12:57:49.74


Checking the environment...
 Check was successful
 IVP files will be created in VERNE$DKA0:[SYS0.SYSUPD.DBM0720I072]
Deleting databases and schema...
 Delete was successful
Temporary CDD/Plus dictionary...
 Created at VERNE$DKA0:[SYS0.SYSUPD.DBM0720I072.CDDPLUS1]
 Create was successful
Compiling the PARTS DDL files...
 Compiles were successful
Creating the PARTS database files...
 ...using CDD path VERNE$DKA0:[SYS0.SYSUPD.DBM0720I072.CDDPLUS1]
 Create was successful
Loading the PARTS database (with after image journaling)...
 Load was successful
Reloading the PARTS database (DBO /RECOVER)...
 Reload was successful
Executing a DBQ script...
 DBQ was successful
Running BASIC DML program...
 BASIC DML was successful
Running COBOL DML program...
 COBOL DML was successful
Running C DML program...
 C DML was successful
Running FORTRAN DML program...
 FORTRAN DML was successful
```

```
Running PASCAL DML program...
 PASCAL DML was successful
    ************************************
    Oracle CODASYL DBMS V7.2-0
    IVP COMPLETED SUCCESSFULLY
    ************************************

IVP completed successfully for Oracle CODASYL DBMS V7.2-0 at 27-SEP-2005 12:59:19.31
 Installation of DBM0720I V7.2 completed at 12:59
    Adding history entry in VMI$ROOT:[SYSUPD]VMSINSTAL.HISTORY
    Creating installation data file: VMI$ROOT:[SYSUPD]DBM0720I072.VMI_DATA
 VMSINSTAL procedure done at 12:59
```