Oracle CODASYL DBMS™

Installation Guide

Release 7.0

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Installation Guide

Release 7.0

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Preface

This guide describes how to install Oracle CODASYL DBMS Version 7.0 The installation procedure uses the VMSINSTAL command procedure.

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 run Oracle CODASYL DBMS Version 7.0 software on an OpenVMS VAX system, that system must be running Version 5.5 or higher of the OpenVMS operating system.

To run Oracle CODASYL DBMS Version 7.0 software on an OpenVMS Alpha system, that system must be running OpenVMS Alpha Version 6.1.

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

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

`http://www.oracle.com/products/servers/rdb/html/Matrix.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 hardcopy terminal output of a full development installation on an OpenVMS VAX system.
Appendix B	Shows sample hardcopy terminal output of a full development installation on an OpenVMS Alpha system.

Related Documents

The other manuals in the Oracle CODASYL DBMS documentation set are:

- *Introduction to Oracle CODASYL DBMS*
- *Oracle CODASYL DBMS Database Load/Unload Guide*
- *Oracle CODASYL DBMS Database Design Guide*
- *Oracle CODASYL DBMS Database Maintenance and Performance Guide*
- *Oracle CODASYL DBMS Database Administration Reference Manual*
- *Oracle CODASYL DBMS Database Security Guide*
- *Oracle CODASYL DBMS Programming Guide*
- *Oracle CODASYL DBMS Programming Reference Manual*
- *Oracle CODASYL DBMS Quick Reference Guide*
- *Oracle CODASYL DBMS Release Notes*

To Order Documentation:

For shipments to customers in the United States, call 1-800-252-0303. Customers outside the United States should contact Oracle Support and Documentation Sales.

Please refer to the *Oracle CODASYL DBMS Release Notes*, Chapter 1, for more detailed information about available documentation and how to order it.

Associated Documents

The other manuals referred to in this guide are:

- *Oracle Rdb7 and Oracle CODASYL DBMS: Guide to Hot Standby Databases*
- *DEC Datatrieve Installation documentation*
- *Rdb Transparent Gateway to Oracle CODASYL DBMS: Accessing Oracle CODASYL DBMS Data with SQL*
- *Rdb Transparent Gateway to Custom Drivers/Rdb Transparent Gateway to RMS Installation Guide*
- *Using Oracle CDD/Repository on OpenVMS Systems*
- *Installing Oracle CDD/Repository for OpenVMS VAX Systems*
- OpenVMS documentation

Conventions

In this guide, OpenVMS refers to both the OpenVMS VAX and OpenVMS Alpha operating systems.

The following conventions are used to identify information specific to OpenVMS VAX or to OpenVMS Alpha:

The VAX icon denotes the beginning of information specific to OpenVMS VAX.

The Alpha icon denotes the beginning of information specific to OpenVMS Alpha.

♦

The diamond symbol denotes the end of a section of information specific to OpenVMS Alpha or to OpenVMS VAX.

Discussions that refer to VMScluster environments apply to both VAXcluster systems that include only VAX nodes and VMScluster systems that include at least one Alpha node, unless indicated otherwise. When the behavior differs significantly between a VAXcluster and VMScluster system, that behavior is described in text and marked with the Alpha or VAX icon, as appropriate.

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:

- Rdb Transparent Gateway to Oracle CODASYL DBMS software may be referred to as the DBMS gateway.
- Oracle CDD/Repository software is referred to as CDD/Repository or the dictionary. (Previous to Version 5.0, CDD/Repository was called VAX CDD/Plus.)
- DEC DATATRIEVE software is referred to as DATATRIEVE.
- VAX Language-Sensitive Editor software is referred to as LSE.

1

Preparing to Install Oracle CODASYL DBMS

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

Oracle CODASYL DBMS provides online release notes in SYS$HELP on the kit. Oracle strongly recommends that you read the release notes before proceeding with the installation. For information on accessing the online release notes, see Section 2.1.2.

1.1 Required Operating System Components

OpenVMS VAX

On OpenVMS VAX, Oracle CODASYL DBMS Version 7.0 requires OpenVMS Version 5.5 or higher installed on your system.

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

```
$ WRITE SYS$OUTPUT F$GETSYI("VERSION")
V5.5-2
```

In this example, OpenVMS Version 5.5-2 is running on your system.

The OpenVMS VAX operating system comes with a variety of support options, or classes. Classes include such features as networking and OpenVMS RMS journaling.

For more information on using classes, see the OpenVMS documentation on Version 5.5 Upgrade and Installation. ♦

OpenVMS Alpha

To run Oracle CODASYL DBMS Version 7.0 software on an OpenVMS Alpha system, that system must be running OpenVMS Alpha Version 6.1. ♦

1.1.1 Required OpenVMS Kit

If your VAX system is running OpenVMS Versions 5.5-2, 6.0, or 6.1 you must install an OpenVMS kit provided on the Oracle CODASYL DBMS Version 7.0 distribution media. This OpenVMS kit is required to correct a problem with the internal memory space allocated for DBO commands. This OpenVMS kit replaces and installs SYS$SYSTEM:CDU.EXE on your system. For more information please read the OpenVMS kit cover letter (VAXCDU01_061_CVRLET.TXT) located on the distribution media.

OpenVMS Alpha

On OpenVMS Alpha, Oracle CODASYL DBMS Version 7.0 requires OpenVMS Alpha Version 6.1 be installed on your system. ♦

1.2 Prerequisite and Optional Software for Oracle CODASYL DBMS

This section discusses the software you must install on your system before installing Oracle CODASYL DBMS.

OpenVMS VAX

To run Oracle CODASYL DBMS Version 7.0 software on an OpenVMS VAX system, that system must be running Version 5.5 or higher of the OpenVMS operating system.

Before you use Oracle CODASYL DBMS on OpenVMS VAX, you must execute the SYS$STARTUP:CRT$STARTUP.COM command procedure. To ensure that the procedure executes when the system reboots, add the command procedure to your system startup files.

For Oracle CODASYL DBMS Version 7.0 for OpenVMS VAX, the DEC C/C++ Run-Time Components Version 6.0 for OpenVMS VAX kit might need to be installed if the target installation system is running OpenVMS VAX Version 5.5 or Version 6.0. The DEC C/C++ Run-Time Components kit must be installed prior to the Oracle CODASYL DBMS Version 7.0 installation.

The save set containing the DEC C/C++ Run-Time Components kit is in the file: AACRT060.A, and is included with the Oracle CODASYL DBMS Version 7.0 for OpenVMS VAX kit. This kit is installed using the VMSINSTAL utility. The Oracle CODASYL DBMS Version 7.0 for OpenVMS VAX installation fails if the DEC C/C++ Run-Time Components kit is not already installed.

Installing the DEC C/C++ Run-Time Components kit might have some implications for customer sites that run OpenVMS Version 5.5-x and develop their own applications written in C or C++. The DEC C/C++ Run-Time Components kit contains shareable image run-time components. When the DEC C/C++ Run-Time Components kit is installed on OpenVMS VAX Version 5.5, 5.5-1, or 5.5-2 systems, some of the shareable image run-time components

replace older versions of existing OpenVMS components. This makes the installation of the DEC C/C++ Run-Time Components kit similar to an OpenVMS upgrade for sites that develop or distribute software for OpenVMS VAX Version 5.5, 5.5-1, or 5.5-2 systems.

Please read the release notes that are supplied with the DEC C/C++ Run-Time Components kit prior to installation to fully understand these implications before installing Oracle CODASYL DBMS Version 7.0 for OpenVMS VAX. ♦

On OpenVMS VAX, Oracle CODASYL DBMS Version 7.0 requires Oracle CDD/Repository Version 5.3 or higher for running DEC DATATRIEVE procedures or compiling DEC COBOL DML programs.♦

OpenVMS Alpha

On OpenVMS Alpha, Oracle CODASYL DBMS Version 7.0 requires Oracle CDD/Repository Version 5.3 or higher for running DEC DATATRIEVE procedures or compiling DEC COBOL DML programs.♦

To see which version of the dictionary is currently installed on your system, enter the following CDO command:

```
$ DICTIONARY OPERATOR
Welcome to CDO V2.3
The CDD/Repository V5.3 User Interface
Type HELP for help
CDO> EXIT
```

In this example, Oracle CDD/Repository Version 5.3 is running on your system.

Beginning with Version 5.0, Oracle CODASYL DBMS supports optional dictionary usage for many tasks. For more information, see the *Oracle CODASYL DBMS Database Administration Reference Manual*.

Oracle CODASYL DBMS Version 7.0 can also be used with DATATRIEVE Version 6.1 or higher. If DATATRIEVE is installed on your system before you install Oracle CODASYL DBMS, you do not have to reinstall DATATRIEVE.

1.3 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.

1.3.1 License for Hot Standby Component

This option installs 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 Version 7.0 kit, but a license specific to that option should be acquired by contacting your Oracle representative.

1.4 Preinstallation Requirements

Oracle CODASYL DBMS has some special requirements before installation. The following sections describe the requirements you must meet before installing Oracle CODASYL DBMS Version 7.0.

1.4.1 Recovering Your Oracle CODASYL DBMS Databases

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

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 Oracle CODASYL 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.

1.4.2 Backing Up Your Oracle CODASYL DBMS Database

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

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

1.4.3 Ensuring Adequate Physical Memory

OpenVMS Alpha and OpenVMS VAX systems allocate and deallocate memory differently. On OpenVMS VAX systems, a memory page is 512 bytes. On OpenVMS Alpha systems, however, 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 "page" on OpenVMS VAX systems and as a "pagelet" on OpenVMS Alpha systems. Values that represent memory pages on either system are referred to as "CPU-specific pages".

Before you install Oracle CODASYL 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.

OpenVMS VAX

On OpenVMS VAX systems, Oracle CODASYL DBMS requires at least 4 megabytes of physical memory.

To find out how many megabytes of physical memory you have on your system, enter the SHOW MEMORY command at the DCL prompt. The following example shows a display on an OpenVMS VAX system:

```
$ SHOW MEMORY/PHYSICAL_MEMORY
             System Memory Resources on 30-JUL-1993 10:04:45.97

Physical Memory Usage (pages):     Total    Free    In Use   Modified
  Main Memory (256.00Mb)          524288  262822    247252   14214

Of the physical pages in use, 92135 pages are permanently allocated to VMS.
```

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

OpenVMS Alpha

On OpenVMS Alpha systems, Oracle CODASYL 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. ♦

1.4.4 Checking DECnet Object Numbers for DBMSERVER

Before installing Oracle CODASYL 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 Oracle CODASYL DBMS remote database access capability.

The Oracle CODASYL 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-JAN-1990 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. Digital Equipment 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 Oracle CODASYL DBMS operation in a VMScluster environment. See the *Oracle CODASYL DBMS Database Maintenance and Performance Guide* for information on using Oracle CODASYL DBMS in a VMScluster environment.

1.4.5 Executing DBMSERVER_NCL.COM in a DECnet/OSI Environment

If you have DECnet/OSI on your system, you will need either the NET$MANAGE rights identifier or BYPASS privilege to run the DBMSERVER_NCL.COM procedure. DBMSERVER_NCL.COM is automatically executed from MONSTART.COM.

Log in to each node and run the DBMSERVER_NCL.COM procedure to configure the DBMSERVER object with the DECnet/OSI database. DBMSERVER_NCL.COM needs to be executed only once per VAXcluster or VMScluster node. You do not have to execute the DBMSERVER_NCL.COM procedure on the node from which the installation took place. MONSTART calls DBMSERVER_NCL.COM to configure DBMSERVER.

If the installation procedure is on VAXcluster or VMScluster node NODE1 and if the VAXcluster or VMScluster system also includes nodes NODE2 and NODE3, you must log into nodes NODE2 and NODE3 and enter the following:

```
$ SET DEFAULT SYS$MANAGER
$ @DBMSERVER_NCL
```

1.4.6 Executing DBMAIJSERVER_NCL.COM

The MONSTART.COM procedure for Oracle CODASYL DBMS V7.0 has been updated to execute the DBMAIJSERVER_NCL and DBMAIJSERVER_NCP command files to configure the DBMAIJSERVER if the Hot Standby option is installed. Refer to the *Oracle Rdb7 and Oracle CODASYL DBMS: Guide to Hot Standby Databases* for more information.

1.4.7 Stopping the Oracle CODASYL DBMS Monitor

You must stop the Oracle CODASYL DBMS monitor before installing a new version of Oracle CODASYL DBMS. In a VMScluster environment, the monitor runs on each node that boots from the common root directory. You should stop the monitor on each node.

To stop the monitor, enter the following command:

```
$ DBO/MONITOR STOP
```

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

1.4.8 Installing in a VMScluster Environment

When installed on a common root directory, layered products such as Oracle CODASYL 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 Oracle CODASYL DBMS kit on a VMScluster system with a single, common root directory. Refer to Section 3.9 for installing a multiversion Oracle CODASYL DBMS kit.

1.5 Installation Procedure Requirements

The following sections discuss various requirements for installing Oracle CODASYL 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.

1.5.1 Time

The Oracle CODASYL DBMS installation takes approximately 10 minutes, depending on the type of media and system configuration. The Installation Verification Procedure (IVP), which Oracle recommends you run to be sure Oracle CODASYL DBMS is installed properly, takes an additional 10 minutes.

1.5.2 Process Quotas and Privileges

The account you use to install and verify Oracle CODASYL DBMS must have sufficient quotas and privileges to enable you to perform the installation. VMSINSTAL requires that the installation account have a minimum of quotas, as listed in Table 1–1.

Table 1–1 Process Quotas

Process Quota	Value
ASTLM	24
BIOLM	18
BYTLM	18,000

(continued on next page)

Table 1–1 (Cont.) Process Quotas

Process Quota	Value
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.

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

- CMKRNL
- WORLD

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

User account quotas and privileges are stored in the file SYSUAF.DAT. Use the OpenVMS Authorize utility (AUTHORIZE) to verify and change user account quotas and privileges. First set your directory to SYS$SYSTEM and then run AUTHORIZE:

```
$ SET DEFAULT SYS$SYSTEM
$ 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
```

After you exit from the utility, the system displays messages indicating whether or not changes were made. Once the changes are made, you must log out and log in again before the new quotas can take effect.

For more information on modifying account quotas and privileges, see the description of AUTHORIZE in the OpenVMS system management documentation.

1.5.3 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.

1.5.3.1 Oracle CODASYL DBMS Disk Requirements

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

OpenVMS VAX

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

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

Oracle CODASYL DBMS Kit	Blocks During Installation	Blocks After Installation
Full development	55,000	30,000

♦

OpenVMS Alpha

Table 1–3 summarizes the storage requirements for OpenVMS Alpha operating systems.

Table 1–3 Maximum Disk Space Requirements for OpenVMS Alpha Operating Systems

Oracle CODASYL DBMS Kit	Blocks During Installation	Blocks After Installation
Full development	90,000	60,000

♦

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.

1.5.3.2 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$UPDATE:VMSINSTAL dbmv061 MTA0: OPTIONS AWD=DISK$:[TEMP]
```

1.5.4 System Parameters

Installing Oracle CODASYL 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.

1.5.4.1 System Parameter Setting

Before you install Oracle CODASYL 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.

1.5.4.2 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 1.5.4.1. 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.

1.5.4.3 Settings for Global Pages and Global Sections

To install and run Oracle CODASYL 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. Shareable 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 Oracle CODASYL DBMS global buffering feature is used.

OpenVMS VAX

The image names and the global sections and global pages required on OpenVMS VAX systems are listed in Table 1–4.

Table 1–4 VAX Global Section and Page Requirements for Mandatory Images

Image File Name	Global Sections	Global Pages
SYS$LIBRARY:CRFSHR.EXE[1]	2	10
SYS$LIBRARY:DBMPRV.EXE	4	20
SYS$LIBRARY:DBMSHR.EXE	14	870
SYS$LIBRARY:LBRSHR.EXE[1]	2	70
SYS$SYSTEM:DBMSERVER.EXE	2	70
TOTAL	24	1040 ♦

[1]CRFSHR.EXE and LBRSHR.EXE are supplied with the OpenVMS operating system. They must be installed for the proper execution of DBO.

OpenVMS Alpha

The image names and the global sections and global pages required on OpenVMS Alpha systems are listed in Table 1–5.

Table 1–5 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 ♦

OpenVMS VAX

There are several images you can install optionally. All these images use global sections and global pages. Table 1–6 shows these optional images on an OpenVMS VAX system.

Table 1–6 VAX Global Section and Page Requirements for Optional Images

Image File Name	Global Sections	Global Pages
SYS$SYSTEM:DBMDBR.EXE	2	440
SYS$SYSTEM:DBQ.EXE	2	330
SYS$SYSTEM:DDL.EXE[1]	2	860
SYS$SYSTEM:DML.EXE[1]	2	620
SYS$SYSTEM:FORDML.EXE[1]	2	760 ♦

OpenVMS Alpha

Table 1–7 shows optional images on an OpenVMS Alpha system.

Table 1–7 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$SYSTEM:DDL.EXE[1]	1	1800
SYS$SYSTEM:DML.EXE[1]	1	1150
SYS$SYSTEM:FORDML.EXE[1]	1	1380 ♦

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

Oracle CDD/Repository also requires global sections. See *Installing Oracle CDD/Repository for OpenVMS VAX Systems* for required global pages and global sections.

If you plan to use DATATRIEVE to access Oracle CODASYL DBMS databases, see the DEC DATATRIEVE documentation on installation for required global pages and global sections.

1.5.4.4 Checking Values for Global Pages and Global Sections

If you are currently running another version of Oracle CODASYL DBMS on your system, run the @SYS$MANAGER:MONSTOP procedure to shut down the monitor so that the GBLPAGES and GBLSECTIONS values associated with that version are not calculated into the net values required for your new installation.

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 1.5.4.3, 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 1.5.4.3, you must increase the system parameter settings.

Section 1.5.4.5 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.

1.5.4.5 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.

1.5.4.6 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.

Oracle CODASYL 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 Oracle CODASYL 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
```

1.5.5 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.

1.5.6 Logging Off Active Users

For best results, have all users log off the system before you install Oracle CODASYL DBMS. If this is impractical, make sure no process uses Oracle CODASYL DBMS or DCL Help during the installation. (The Oracle CODASYL DBMS installation updates the help file.) All Oracle CODASYL 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 not enough global sections and global pages available.

2.1 General Information

This section includes information about the following topics:

- Retaining modifications to MONSTART.COM
- Accessing the online release notes
- Verifying the installation
- Stopping the installation

2.1.1 Retaining Modifications to MONSTART.COM

Previous to Oracle CODASYL DBMS Version 4.1, the installation procedure placed the MONSTART.COM command procedure in the SYS$MANAGER directory. Beginning with Oracle CODASYL DBMS Version 4.1, the installation procedure places MONSTART.COM in SYS$STARTUP and deletes the version of MONSTART.COM in SYS$MANAGER. If you want to retain a version of the MONSTART.COM that you have modified, copy MONSTART.COM to another directory before installing Oracle CODASYL DBMS. After the installation, merge your modifications with the version of MONSTART.COM in SYS$STARTUP.

For Version 7.0, if you install the multiversion environment, a variant version of the startup procedure is provided. The MONSTART70.COM procedure is placed in SYS$STARTUP during the installation. The nonvariant, previously installed version of the procedure is not deleted if you install the multiversion kit.

2.1.2 Accessing the Online Release Notes

Oracle CODASYL DBMS provides online release notes. You must specify OPTIONS N when you invoke VMSINSTAL to see the question about the Oracle CODASYL 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.

You should review the release notes in case they contain any information about changes in the installation procedure. If you are starting the installation over again and have already reviewed the release notes, you do not need to specify OPTIONS N.

Once Oracle CODASYL DBMS has been installed, the release notes are located in the following file:

```
SYS$HELP:DBM070.RELEASE_NOTES    (Text version)
SYS$HELP:DBM070_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
```

2.1.3 Verifying the Installation

Running the Installation Verification Procedures (IVP) for Oracle CODASYL 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 Oracle CODASYL DBMS. To run the IVP independently of the installation, see Section 3.10.

The system disk directory, SYS$COMMON:[SYSTEST.DBM], contains all files pertaining to the standard Oracle CODASYL DBMS IVP. In a multiversion environment, the directory name has the version number appended to it. For example: SYS$COMMON:[SYSTEST.DBM70]. The installation procedure creates this directory if it does not already exist on the system disk.

2.1.4 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 Oracle CODASYL DBMS functions may be unavailable until the deficiency is corrected.

2.2 Installation Procedure

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

The installation procedure behaves the same on both OpenVMS VAX and OpenVMS Alpha operating systems. However, there is some variation in every installation, regardless of operating system, due to the specific characteristics of each system. For example, if your system does not have the VAX Language-Sensitive Editor 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

OpenVMS VAX

On OpenVMS VAX operating systems, enter DBMV070 to install Oracle CODASYL DBMS Version 7.0 software. ♦

OpenVMS Alpha

On OpenVMS Alpha operating systems, enter DBMA070 to install Oracle CODASYL DBMS Version 7.0 software. ♦

device-name

Enter the name of the device on which you plan to mount the media. For example, MTA0: is the device name for a tape drive. If you are installing from a CD–ROM, you must specify a device name and a directory name. The directory name should be the same as the saveset name, with a .KIT subdirectory, as shown in the examples that follow.

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).

OpenVMS VAX

The following example invokes VMSINSTAL to install Oracle CODASYL DBMS from a CD–ROM device on an OpenVMS VAX system and shows the system response. This example uses the OPTIONS N release note parameter:

```
$ @SYS$UPDATE:VMSINSTAL DBMV070 CDROM:[VAX_KIT] OPTIONS N

      VAX/VMS Software Product Installation Procedure V5.5-2

It is 1-SEP-1996 at 22:09.
Enter a question mark (?) at any time for help. ♦
```

OpenVMS Alpha

The following example invokes VMSINSTAL to install Oracle CODASYL DBMS from a CD–ROM device on an OpenVMS Alpha system and shows the system response. This example uses the OPTIONS N release note parameter:

```
$ @SYS$UPDATE:VMSINSTAL DBMA070 CDROM:[ALPHA_KIT] OPTIONS N

      OpenVMS ALPHA Software Product Installation Procedure V7.0-0

It is 1-SEP-1996 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.

See Appendix A for sample output of a full development installation of Oracle CODASYL DBMS Version 7.0 on an OpenVMS VAX system.

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

  You should now mount the distribution volume on the device you specified when you invoked VMSINSTAL. The device name appears in the line preceding the question. VMSINSTAL then asks you if you are ready to continue with the installation.

  If you respond YES to indicate that you are ready, VMSINSTAL displays a message that the media containing Oracle CODASYL DBMS has been mounted on the specified device and that the installation has begun:

  ```
  Please mount the first volume of the set on MTA0:
  * Are you ready? YES

  %MOUNT-I-MOUNTED, DBMV061 MOUNTED ON _$$MTA0:

  The following products will be processed:
    DBMV V7.0

      Beginning installation of DBMV V7.0 at 22:09

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

  If you respond NO to the question, the instructions and question are repeated. If you entered the wrong device name when you invoked VMSINSTAL and need to restart the installation, stop the installation by pressing Ctrl/Y.

- 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 Oracle CODASYL 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 located in the following files:

```
SYS$HELP:DBM070.RELEASE_NOTES
SYS$HELP:DBM070_RELEASE_NOTES.PS
```

Note

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

- Choosing to install Hot Standby option

The installation procedure allows you to install the HOT STANDBY option of Oracle CODASYL 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.

The Hot Standby software uses an account named DBMAIJSERVER. This account will be created by the installation if it does not already exist. You will be prompted to provide a valid user identification code (UIC) for this account. If the DBMAIJSERVER account does already exist, you will not be prompted for a UIC.

The installation procedure creates the directory:

```
SYS$COMMON:[DBMAIJSERVER]
```

The procedure then creates the following file in this directory:

```
DBMAIJSERVER_LOGIN.COM
```

The directory and file are used by the DBMAIJSERVER account and should not be deleted. (Note that once this directory and account have been created by an installation, these questions and messages do not appear in subsequent installation logs.)

If you are not running DECnet/OSI, Network Control Program (NCP) object number 0 is associated with the DBMAIJSERVER account.

```
        Oracle CODASYL DBMS V7.0-00 Installation

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

    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

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

    DBMAIJSRV object found but DBMAIJSERVER account is not found.
    To be sure the password for the DBMAIJSERVER account matches
    the password for the DBMAIJSRV object, this installation will:

           1. First delete the DBMAIJSRV object from the network
              database
           2. Create a new DBMAIJSERVER account and insert a new
              DBMAIJSRV object into the network database

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

```
* Please enter carriage return to continue:
    ************************************************************

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

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

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

- Choosing the standard or multiversion kit

  A multiversion environment is implemented by maintaining a set of variant files. You can select to install either a standard kit, or the multiversion kit with variant file names. Because the standard files (and in fact, any files from a release prior to Version 6.1) are not variant, the multiversion kit does not write over them. If you choose to install the Oracle CODASYL DBMS Version 7.0 standard kit, the existing files will be written over and you will not have a multiversion environment.

```
    ****************************************************************
    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 MULTIVERSION ORACLE CODASYL DBMS kit [YES]? YES
    ****************************************************************
```

- VAX Language-Sensitive Editor verification

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

```
The installed version of the VAX Language-Sensitive Editor
will be updated with the new 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 version is of prior to V3.0.
If you want the VAX Language-Sensitive Editor support you must
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.

- Two Oracle CODASYL DBMS environments

  If you are installing multiversion Oracle CODASYL DBMS Version 7.0 on a system that already has Oracle CODASYL DBMS installed, you will have two separate Oracle CODASYL DBMS environments on your system. The following message is displayed:

```
This procedure installs Oracle CODASYL DBMS V7.0 without
purging or otherwise affecting the released version of
Oracle CODASYL DBMS being used for production.

Following installation there will be two
discrete Oracle CODASYL DBMS environments available on your system,
each with approximately the same system resource requirements.
To run both versions, approximately double the usual system
resources for Oracle CODASYL DBMS are required.

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

CONCURRENT ACCESS TO A DATABASE FROM DIFFERENT VERSIONS OF
ORACLE CODASYL DBMS IS IMPOSSIBLE. ONCE CONVERTED A DATABASE CANNOT
BE ACCESSED BY PREVIOUS VERSIONS OF THE SOFTWARE.
```

- Remote UIC and password selection

  The installation procedure creates the directory SYS$COMMON:[DBM$REMOTE] for use by the DBM$REMOTE account. (Note that once this directory and account have been created by an installation, these questions and messages do not appear in subsequent installation logs.) Database recovery-unit journal (.RUJ) files for the remote access process are directed to SYS$COMMON:[DBM$REMOTE]. The login.com file for DBM$REMOTE is located in SYS$COMMON:[SYSEXE]:DBM$REMOTE_LOGIN.COM.

  If you are not running DECnet/OSI, Network Control Program (NCP) object number 52 is associated with the DBM$REMOTE account. Oracle CODASYL DBMS no longer relies on the default DECnet account for remote database access.

Use the DBM$REMOTE account and the associated password to access remote databases using the Oracle CODASYL DBMS Version 7.0 DBMSERVER.

Choose a user identification code (UIC) that is not a system UIC. The installation procedure will not proceed until you enter a valid UIC:

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

For example, you can enter the UIC [100,100] in response to the previous question. See the OpenVMS documentation on system management for more information on UICs and passwords.

The password for DBM$REMOTE and the network object DBMSERVER must be the same. The password you supply for the DBM$REMOTE account will also be used for the network object.

The entire installation will fail if you do not enter a valid password for the DBM$REMOTE account. 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 PASSWORD for DBM$REMOTE account:
* Verify the PASSWORD entered for DBM$REMOTE:
```

Note

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

- Remote statistics UIC selection

  In order to support the collection of remote cluster database statistics from the DBO/SHOW STATISTICS command, the installation creates an account, DBMSTT, and a directory, SYS$COMMON:[DBMSTT]. The installation procedure will prompt for a unique UIC:

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

  The installation procedure will not proceed until you enter a valid UIC. A password will automatically be generated for this account.

- Installation Verification Procedure selection

  The installation procedure now asks if you want to run the Installation Verification Procedure (IVP).

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

The IVP for Oracle CODASYL DBMS checks to be sure that the installation is successful. Oracle recommends that you run the IVP.

The IVP installs the PARTS database provided with Oracle CODASYL DBMS. The IVP for the Oracle CODASYL DBMS kit compiles the metadata, creates the database, loads Oracle CDD/Repository, executes a DBQ script, and compiles and runs up to five database programs (depending on which programming languages are installed on your system).

- File purge option

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

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

2.2.3 Informational Messages

At this point, the installation procedure produces a number of informational messages that report on the progress of the installation.

The Oracle CODASYL DBMS installation procedure validates the current DECnet or DECnet/OSI database.

In a DECnet environment, if object number 52 is defined for an object other than DBMSERVER or if DBMSERVER is defined to map to another object number, an error occurs. The DECnet database is not altered if it is found to be in error. The installation will continue even if this error occurs. After the product is installed, you must use NCP to correct the permanent DECnet for OpenVMS database. See Section 1.4.4 for information on correcting the permanent DECnet for OpenVMS database. If no problems are encountered, the installation continues.

There are no further questions. If the installation procedure is successful up to this point, VMSINSTAL moves the new or modified files to their target directories, updates the help files, and updates the DCL tables, if necessary. If you chose to purge files, they are purged now. If there is an error in the installation, a message indicates that the procedure failed. See Section 2.3 for information about error recovery. See Appendix A for a log of the remaining messages.

OpenVMS VAX

On OpenVMS VAX systems, the following messages may be displayed after all questions have been asked:

```
    There are no more questions.

    Installation takes approximately 9 minutes on a standalone
    VAX 8800.  If you run the Installation Verification Procedure,
    it will take about 13 additional minutes to complete on a
    standalone VAX 8800.

Beginning installation...1-SEP-1994 12:40:17.02
%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$ROOT:[SYSTEST.DBM70]
%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBM$REMOTE70.
%UAF-I-ADDMSG, user record successfully added
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBM$REMOTE70.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBMAIJSERVER.
%UAF-I-ADDMSG, user record successfully added
%UAF-I-RDBADDMSGU, identifier DBMAIJSERVER value [000012,000101] added to rights
 database
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBMAIJSERVER.
%UAF-I-MDFYMSG, user record(s) updated
   ************************************************************

   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 which 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.

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

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

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

If you are running OpenVMS V6.0 or higher, the installation will also register the DBMSHR and DBMPRV image, if necessary. The following message will appear when the installation procedure performs this task.

```
%REGISTER-I-DUP DBMSHR70, (DBMSHR70, DBMS V7.0-0) already in registry
%REGISTER-I-SUMMARY  images examined: 1, dependent images: 1
%REGISTER-I-DUP DBMPRV70, (DBMPRV70, DBMS V7.0-0) already in registry
%REGISTER-I-SUMMARY  images examined: 1, dependent images: 1
```

OpenVMS Alpha

On OpenVMS Alpha systems, the following messages may be displayed after all questions have been asked:

```
    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-SEP-1996 13:56:24.78

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

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

        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.

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

%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBM$REMOTE.
%UAF-I-ADDMSG, user record successfully added
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBM$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

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

    The installed version of the VAX Language Sensitive Editor will be
    updated with the new 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 installation 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 Oracle CODASYL 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 V7.0 at 1-SEP-1996 15:37:05.66

Checking the environment...
    Check was successful
    IVP files will be created in $1$DUA0:[SYS0.SYSUPD.DBMV070]

Deleting databases and schema...
    Delete was successful
    Temporary CDD/Plus dictionary will be created at
    $1$DUA0:[SYS0.SYSUPD.DBMV070.CDDPLUS].

Compiling the PARTS DDL files...
    Compiles were successful

Creating the PARTS database files...
...using CDD path $1$DUA0:[SYSUPD.DBMV070.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 V7.0
    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 V7.0 at 01-SEP-1996 22:28
        Installation of DBMA V7.0 completed at 22:28
    Adding history entry in VMI$ROOT:[SYSUPD]VMSINSTAL.HISTORY
    Creating installation data file: VMI$ROOT:[SYSUPD]DBMV070.VMI_DATA
        VMSINSTAL procedure done at 22:28
$ LOGOUT
SYSTEM     logged out at 1-SEP-1996 22:28:59.45
```

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.

2.3 Error Recovery

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

```
VMSINSTAL-E-INSFAIL, The installation of Oracle CODASYL DBMS 7.0 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 Oracle CODASYL DBMS IVP fails, you see these messages:

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

     Oracle CODASYL DBMS 7.0

     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 Oracle CODASYL DBMS

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

3.1 Editing the System Files

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

Add the commands that start Oracle CODASYL DBMS to the system startup file.

OpenVMS Alpha

For OpenVMS Alpha, the startup file is named:
SYS$STARTUP:SYSTARTUP_VMS.COM.♦

OpenVMS VAX

For OpenVMS VAX, the startup file is named:
SYS$STARTUP:SYSTARTUP_V5.COM.♦

You must position the new command line 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.

For a standard environment, add the following command lines to the system startup file:

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

Add the following command lines to the system shutdown file:
SYS$STARTUP:SYSHUTDWN.COM:

```
$! shutdown Oracle CODASYL DBMS
$ @SYS$MANAGER:MONSTOP.COM
```

For a multiversion environment, the startup and shutdown files are variant files with the product version number appended to the file names.

For a multiversion environment, add the following command lines to the system startup file:

```
$! Startup Oracle CODASYL DBMS
$ @SYS$STARTUP:MONSTART70.COM
```

Add the following command lines to the system shutdown file: SYS$STARTUP:SYSHUTDWN.COM:

```
$! shutdown Oracle CODASYL DBMS
$ @SYS$MANAGER:MONSTOP70.COM
```

3.2 Modifying the DBMSTT Account at Installation

The installation procedure creates an account, DBMSTT, for use in the collection of clusterwide database statistics. This account is configured with the default NETMBX and TMPMBX privileges.

Depending on the level of OpenVMS security placed on the database root file, you may need to modify the DBMSTT account to include additional privileges. For example, if the root file only has the privileges automatically set by Oracle CODASYL DBMS, you would need to give the account SYSPRV and SHARE privileges in order to use the clusterwide collection option of the DBO/SHOW STATISTICS utility.

3.3 Determining the Files Added to the System

To get a list of the files that are added to your system when you install the standard Oracle CODASYL DBMS Version 7.0, type or print the following file:

```
SYS$COMMON:[SYSMGR.VAXINFO$PRODUCTS]DBM070_STD_FILES.DAT
```

On a multiversion system, type or print the following file:

```
SYS$COMMON:[SYSMGR.VAXINFO$PRODUCTS]DBM070_MV_FILES.DAT
```

OpenVMS Alpha

On OpenVMS Alpha systems, either DBMA.VMI_DATA or DBMA070.VMI_DATA is created in SYS$UPDATE during installation. This file shows statistics about the installation, files deleted, accounts updated, and files added. ♦

3.4 Meeting VMScluster Considerations

In a VMScluster system environment, Oracle CODASYL DBMS must be started on all nodes from which it will be run. This can be done one of two ways: either reboot; or execute a startup command procedure and replace DCLTABLES.EXE on each of the other nodes on the cluster.

3.4.1 Reboot

One way to update Oracle CODASYL DBMS on other nodes in the cluster is to reboot each node. The startup file added in Section 3.1 will automatically start the monitor process.

3.4.2 Running the Startup Command Procedures

To start Oracle CODASYL DBMS, run the SYS$STARTUP:MONSTART.COM procedure on each of the other nodes in the VMScluster.

The installation procedure ran MONSTART.COM from the CPU node where the installation was performed, so it is not necessary to rerun it from that CPU node.

You must also replace the DCL tables on the other nodes in the cluster. Use the following command:

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

Users currently logged in will not have the new DCL tables available until they either log out and log back in, or they enter the SET COMMAND command:

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

The MONSTART.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$SYSTEM:DBMSERVER.EXE	/OPEN/SHARE/HEADER_RES
SYS$SYSTEM:DBO.EXE	/OPEN/HEADER_RES/PROT/PRIV=(PSWARM, SETPRV,CMKRNL,SYSNAN,PRMGBL, DETACH,SYSPRV,SYSGBL,TMPMBX)
SYS$LIBRARY:DBMSHR.EXE	/OPEN/SHARE/HEADER_RES/PROT
SYS$LIBRARY:DBMPRV.EXE	/OPEN/SHARE/HEADER_RES/PROT
SYS$MESSAGE:DBMMSG.EXE	/OPEN
SYS$MESSAGE:DBQMSG.EXE	/OPEN
SYS$MESSAGE:DBOMSG.EXE	/OPEN
SYS$MESSAGE:DDLMSG.EXE[1]	/OPEN

(continued on next page)

Table 3–1 (Cont.) Installed Images

Image File Name	Qualifiers
SYS$MESSAGE:DMLMSG.EXE[1]	/OPEN
SYS$LIBRARY:LBRSHR.EXE	/OPEN
SYS$LIBRARY:CRFSHR.EXE	/OPEN
SYS$SHARE:LIBRTL.EXE	/OPEN
SYS$SHARE:LIBRTL2.EXE†	/OPEN
SYS$SHARE:LIBRTL2_D56_ TV.EXE‡	/OPEN
SYS$SHARE:FORRTL.EXE†	/OPEN
SYS$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 VAX-specific information
‡OpenVMS Alpha-specific information

If you are running in a DECnet/OSI environment, MONSTART will execute SYS$MANAGER:DBMSERVER_NCL.COM to configure the database object in the DECnet/OSI database. You will need either the NET$MANAGE rights identifier or BYPASS privilege to run the DBMSERVER_NCL.COM procedure.

The command file DBMSERVER_NCP.COM inserts the DBMSERVER.EXE image into the permanent and volatile DECnet for OpenVMS object databases for each node on which it is run. The DBMSERVER.EXE image implements the Oracle CODASYL DBMS remote database access capability (using DECnet for OpenVMS). See the *Oracle CODASYL DBMS Database Design Guide* for more information.

3.4.3 The DBMDML.OPT File

The installation procedure writes a new copy of DBMDML.OPT or DBMDML70.OPT to SYS$COMMON:[SYSLIB]. Note that this is a variant file only for the multiversion kit. Oracle CODASYL DBMS database programmers link the options file with their DML programs. If you alter the file to suit specific needs of your database programs and you have installed Oracle CODASYL DBMS in a VMScluster configuration, be sure to edit the new copy in SYS$COMMON:[SYSLIB] after the installation completes. If an old copy of DBMDML.OPT exists, it might be located in SYS$SPECIFIC:[SYSLIB].

To make sure DML programmers link the correct file, delete all obsolete copies from SYS$SPECIFIC:[SYSLIB] after the new version is written to SYS$COMMON:[SYSLIB]. The logical name SYS$LIBRARY translates to SYS$SYSROOT:[SYSLIB]. The logical name SYS$SYSROOT points first to SYS$SPECIFIC and then to SYS$COMMON. If an old version resides in SYS$SPECIFIC:[SYSLIB] and the programmer links with the following command in a VMScluster environment, the wrong DBMDML.OPT file will be used:

```
$ LINK MYPROGRAM.OBJ,SYS$LIBRARY:DBMDML/OPTIONS
```

3.4.4 Configuring the DECnet/OSI Environment

In a DECnet/OSI environment, log in to each node and run the DBMSERVER_NCL.COM procedure to configure the DBMSERVER object with the DECnet/OSI database. You will need either the NET$MANAGE rights identifier or BYPASS privilege to run the DBMSERVER_NCL.COM procedure. DBMSERVER_NCL.COM needs to be executed only once per VAXcluster or VMScluster node.

3.5 Setting User Account Requirements

This section describes the disk space, quotas, and limits needed by Oracle CODASYL 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 Oracle CODASYL DBMS. You should add the values required for other layered products to the value you use for Oracle CODASYL DBMS and modify the values for each user as needed.

3.5.1 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.

3.5.2 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 Oracle CODASYL 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 run-time locks, you usually have enough compile-time locks.

Note

The number of locks needed by an Oracle CODASYL 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 shareable 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 Oracle CODASYL 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 1.5.4.1 for information on selecting LOCKIDTBL and LOCKIDTBL_MAX values.

3.5.3 Special Privileges

Oracle CODASYL DBMS users who need to stop and start the Oracle CODASYL 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 MONSTART.COM, or to install additional images such as those listed in Table 3–3, you must have CMKRNL privilege.

3.6 Enhancing Product Performance

The following three sections describe methods that might enhance Oracle CODASYL DBMS performance if users will be developing Oracle CODASYL DBMS programs.

3.6.1 Installing Images

By installing certain images, Oracle CODASYL 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$SYSTEM:DBMDBR.EXE[1]	/OPEN/SHARE/HEADER_RES
SYS$SYSTEM:DBQ.EXE	/OPEN/SHARE/HEADER_RES
SYS$SYSTEM:DDL.EXE[2]	/OPEN/SHARE/HEADER_RES
SYS$SYSTEM:DML.EXE[2]	/OPEN/SHARE/HEADER_RES
SYS$SYSTEM:FORDML.EXE[2]	/OPEN/SHARE/HEADER_RES

[1]Installing the DBMDBR.EXE file might improve the performance of database recovery after a cluster failover or a system crash. DBMDBR.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.

3.6.2 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 Oracle CODASYL 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.

3.6.3 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.

3.7 Meeting After-Image Journal Requirements

You can enable or disable after-image journaling using the /AFTER_JOURNAL qualifier on the DBO/CREATE and DBO/MODIFY commands. The command DBO/BACKUP/AFTER_JOURNAL spools the existing contents of the disk-resident after-image journal (.AIJ) file to another file, either on disk or tape. This method of handling the .AIJ file means that the disk requirements of your .AIJ file could change, depending on the frequency of the DBO/BACKUP/AFTER_JOURNAL operations.

3.8 Converting Root Files

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

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. Once converted to the new version, a database cannot be accessed by previously installed versions.

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.

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. 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.

To convert a database with /NOCOMMIT, the database must be at least at Version 5.0. Databases at versions prior to Version 5.0 can be converted only with /COMMIT (the default).

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.

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 manual 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 1.4.2. The DBO/RESTORE command automatically converts the root file to the version of Oracle CODASYL 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*.

3.9 Using the Multiversion Environment

Oracle CODASYL DBMS Version 7.0 can be installed in a multiversion environment. This means that Version 7.0 can coexist with another version of Oracle CODASYL DBMS on the same system or VMScluster. Because Version 6.1 was the first multiversion release, it can only coexist with one other previous version. With this version, you can have V6.1 and V7.0 versions installed, but still only one prior to Version 6.1.

The multiversion feature has always been available during field tests. Since Version V6.1, this feature has now been extended to the released software.

Multiversion capability facilitates the process of upgrading to new versions of the software. You can install the newest version of Oracle CODASYL DBMS, convert a database from a previous version, and test your applications using this converted database. If you need to return to the previous version, 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 (and in fact, any files from a pre-Version 6.1 release) are not variant files, the multiversion kit does not write over them. If you install the Oracle CODASYL DBMS Version 7.0 standard kit, the existing files are written over and you will not have a multiversion environment.

After installing the multiversion kit, you can select between the standard files that were already on your system and the new variant files by using the DBMSETVER.COM procedure located in SYS$LIBRARY. Use this command file to specify which version of Oracle CODASYL DBMS you want to run. The command takes one parameter, the desired version number:

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

n.n
Specify the version of Oracle CODASYL DBMS you want to run. For example, specify 7.0 to run Oracle CODASYL DBMS Version 7.0 or 6.1 to run Oracle CODASYL DBMS Version 6.1.

Note that maintaining multiple versions of Oracle CODASYL DBMS increases system requirements:

- The disk space required can be estimated by adding the required space documented for each version.
- Each version has its own monitor process.
- Shared images require more global pages. In general, multiply the values specified in Section 1.5.4 by the number of versions of Oracle CODASYL DBMS installed.

3.10 Running the IVP After Oracle CODASYL DBMS Is Installed

If you chose not to run the Installation Verification Procedures (IVPs) during the installations or if you want to run them again, you can run the IVPs from the command line.

Use the following syntax to run the standard Oracle CODASYL DBMS Version 7.0 IVP from DCL:

```
@SYS$COMMON:[SYSTEST]DBMIVP.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, Oracle CODASYL 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.

The following example shows the command to run the IVP and send the files to the current directory and to directory DBMS_USER1:[DBMS. PUBLIC]:

```
$ @SYS$COMMON:[SYSTEST]DBMIVP.COM
```

If the IVP is successful, a message tells you that it finished successfully. If the IVP is unsuccessful, a message tells you that it failed.

A

Sample for OpenVMS VAX Installation

This appendix lists the terminal output from an installation of the VAX DBMS Version 7.0 kit on OpenVMS VAX Version 5.5.

```
$ @SYS$UPDATE:VMSINSTAL DBMV070 CDROM:[VAX_KIT] OPTIONS N

 OpenVMS VAX Software Product Installation Procedure V7.0

It is 20-AUG-1996 at 14:09.
Enter a question mark (?) at any time for help.

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

The following products will be processed:

  DBMV V7.0

 Beginning installation of DBMV V7.0 at 14:10

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

    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]: 4

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

%VMSINSTAL-I-RELMOVED, Product's release notes have been moved to SYS$HELP.

         Oracle CODASYL DBMS V7.0-00 Installation

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

    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
```

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

    DBMAIJSRV object found but DBMAIJSERVER account is not found.
    To be sure the password for the DBMAIJSERVER account matches
    the password for the DBMAIJSRV object, this installation will:

           1. First delete the DBMAIJSRV object from the network
              database
           2. Create a new DBMAIJSERVER account and insert a new
              DBMAIJSRV object into the network database

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

* Please enter carriage return to continue:

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

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

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

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

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

    This installation will create the DBM$REMOTE70
    account.  You will be prompted for the UIC and password for
    the account.

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

* Enter UIC for DBM$REMOTE70 account: [12,102]

* Enter PASSWORD for DBM$REMOTE70 account:
* Verify the PASSWORD entered for DBM$REMOTE70:

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

    This procedure installs Oracle CODASYL DBMS V7.0-00 without
    purging or otherwise affecting the released version of the
    DBMS being used for production.

    Following this installation there will be two discrete
    Oracle CODASYL DBMS environments available on your system,
    each with approximately the same system resource requirements.
    To run both versions, approximately double the usual system
    resources for Oracle CODASYL DBMS are required.

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

    CONCURRENT ACCESS TO A DATABASE FROM DIFFERENT VERSIONS OF
    Oracle CODASYL DBMS IS IMPOSSIBLE.  ONCE CONVERTED A DATABASE CANNOT
    BE ACCESSED BY THE INSTALLED RELEASED VERSION

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

* 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 10 minutes on a standalone
    VAX.  If you run the Installation Verification Procedure,
    it will take about  additional minutes to complete.

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


    Beginning installation...20-AUG-1996 14:16:05.48

%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$ROOT:[SYSTEST.DBM70].
%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBM$REMOTE70.
%UAF-I-ADDMSG, user record successfully added
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBM$REMOTE70.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBM$REMOTE70.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBMAIJSERVER.
%UAF-I-MDFYMSG, user record(s) updated
    ************************************************************

    The qualifier LGICMD for the DBMAIJSERVER account in SYSUAF
    is modified by this installation.

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

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

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

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

%REGISTER-I-DUP DBMSHR70, (DBMSHR70, DBMS V7.0-0) already in registry
%REGISTER-I-SUMMARY  images examined: 1, dependent images: 1
%REGISTER-I-DUP DBMPRV70, (DBMPRV70, DBMS V7.0-0) already in registry
%REGISTER-I-SUMMARY  images examined: 1, dependent images: 1
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...

                          Oracle CODASYL DBMS

             Installation Verification Procedure



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

 Executing IVP for Oracle CODASYL DBMS V7.0-0 at 20-AUG-1996 14:39:36.69
```

```
Checking the environment...
 Check was successful
 IVP files will be created in $DKA0:[SYS1.SYSUPD.DBMV070]

Deleting databases and schema...
 Delete was successful
 Temporary CDD/Plus dictionary will be created at $DKA0:[SYS1.SYSUPD.DBMV070.CDDPLUS1].

Compiling the PARTS DDL files...
 Compiles were successful

Creating the PARTS database files...
...using CDD path $DKA0:[SYS1.SYSUPD.DBMV070.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

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

    Oracle CODASYL DBMS V7.0-0

    Development

    IVP COMPLETED SUCCESSFULLY
    ***************************************


IVP completed successfully for Oracle CODASYL DBMS V7.0-0 at 20-AUG-1996 15:07:13.96

 Installation of DBMV V7.0 completed at 15:07

 VMSINSTAL procedure done at 15:07
```

B

Sample for OpenVMS ALPHA Installation

This appendix lists the terminal output from an installation of the DBMS Version 7.0 kit on OpenVMS Alpha Version 6.1.

```
$ @sys$update:vmsinstal dbma070 cdrom:[alpha_kit] OPTIONS N

OpenVMS AXP Software Product Installation Procedure V6.1

It is 16-SEP-1996 at 10:54.

Enter a question mark (?) at any time for help.

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

The following products will be processed:
  DBMA V7.0

 Beginning installation of DBMA V7.0 at 10:54

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

         Oracle CODASYL DBMS V7.0-0 Installation

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

    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]? y

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

    This installation will create the DBM$REMOTE70
    account.  You will be prompted for the UIC and password for
    the account.

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

* Enter UIC for DBM$REMOTE70 account: [12,100]

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

        Specified UIC already exists on this system.
```

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

* Enter PASSWORD for DBM$REMOTE70 account:

* Verify the PASSWORD entered for DBM$REMOTE70:

* Do you want to continue the installation [NO]? y
* 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 9 minutes on a standalone
    DEC/3000. If you run the Installation Verification Procedure,
    it will take about 9 additional minutes to complete.
    ****************************************************************


    Beginning installation...16-SEP-1996 10:57:24.50

%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$ROOT:[SYSTEST.DBM70].
%VMSINSTAL-I-ACCOUNT, This installation creates an ACCOUNT named DBM$REMOTE70.
%UAF-I-ADDMSG, user record successfully added
%UAF-E-RDBADDERRU, unable to add DBM$REMOTE70 value [000012,000100] to rights database
-SYSTEM-F-DUPIDENT, duplicate identifier
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBM$REMOTE70.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBM$REMOTE70.
%UAF-I-MDFYMSG, user record(s) updated
%VMSINSTAL-I-ACCOUNT, This installation updates an ACCOUNT named DBMAIJSERVER.
%UAF-I-MDFYMSG, user record(s) updated
    ************************************************************

    The qualifier LGICMD for the DBMAIJSERVER account in SYSUAF
    is modified by this installation.
    ************************************************************


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

    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...

                            Oracle CODASYL DBMS

              Installation Verification Procedure
```

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

 Executing IVP for Oracle CODASYL DBMS V7.0-07 at 16-SEP-1996 11:05:02.96


Checking the environment...
 Check was successful
 IVP files will be created in RYEBCH$DKA300:[SYS0.SYSUPD.DBMA070]

Deleting databases and schema...
 Delete was successful

Creating the PARTS database files...
...using the metadata file
 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 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 V7.0-0

    Development

    IVP COMPLETED SUCCESSFULLY

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


IVP completed successfully for Oracle CODASYL DBMS V7.0-07
at 16-SEP-1996 11:08:00.42

 Installation of DBMA V7.0 completed at 11:08

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

    Creating installation data file: VMI$ROOT:[SYSUPD]DBMA070.VMI_DATA

 VMSINSTAL procedure done at 11:08
```