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VAX Rdb/VMS

Installation Guide

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This manual describes how to install VAX Rdb/VMS Version 4.0.

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Preface

The VAX Rdb/VMS software, often referred to as Rdb/VMS in this manual, is a general purpose database management system based on the relational data model. Rdb/VMS software now includes SQL and SQL/Services.

Purpose of This Manual

This manual describes how to install VAX Rdb/VMS Version 4.0, also referred to as Rdb/VMS V4.0. This installation guide and the *VAX Rdb/VMS Release Notes* are the only manuals you need to install the Rdb/VMS software.

SQL and SQL/Services (Rdb/VMS components) are installed with the Rdb/VMS software. There are no separate installation guides for SQL or SQL/Services. However, there are separate appendixes that present the installation for the SQL/Services client Application Programming Interface (API) software. SQL/Services is a client/server product in which client application programs usually (but not necessarily) run on different systems than the server process on the VMS system.

You *do not* have to install a previous version of Rdb/VMS before installing Rdb/VMS V4.0.

Intended Audience

Read this manual if you are responsible for:

- Planning the installation of Rdb/VMS and preparing your system (see Chapter 1)
- Installing Rdb/VMS (see Chapter 2)
- Changing your system by adjusting parameters, startup and shutdown files, and privileges required for running Rdb/VMS (see Chapter 3)

To install the software, you must:

- Be familiar with VMSINSTAL, the command procedure used to install software products in the VMS environment. To locate the description of VMSINSTAL, see the master index of the VMS documentation set.
- Have access to the SYSTEM account on your machine or to an account with the user privilege SETPRV.

Product Compatibility

For information on the compatibility of other software products with this version of Rdb/VMS, refer to the System Support Addendum (SSA) that comes with the Software Product Description (SPD). You can use the SPD/SSA to verify which versions of your operating system are compatible with this version of Rdb/VMS.

Operating System Information

To run Rdb/VMS V4.0 software on a VAX system, that system must be running Version 5.3 or higher of the VMS operating system. For users to run the two-phase commit protocol, the system must be running VMS Version 5.4 or higher.

Structure

This manual has three chapters and six appendixes:

Chapter 1	Explains how to plan the installation and prepare your system.
Chapter 2	Explains how to install the Rdb/VMS software and run the Installation Verification Procedure (IVP).
Chapter 3	Explains procedures to follow after the installation of Rdb/VMS completes successfully.
Appendix A	Discusses the correlation between VMS and Rdb/VMS security.
Appendix B	Shows how to install the VMS API for SQL/Services.
Appendix C	Shows how to install the MS-DOS API for SQL/Services.
Appendix D	Shows how to install the ULTRIX API for SQL/Services.
Appendix E	Shows how to install the OS/2 API for SQL/Services.
Appendix G	Shows a sample full development license option installation session.

Related Manuals

The VMS documentation set contains detailed information and guidelines for installing software on your VMS system and for learning about related system management tasks.

The *VAX Rdb/VMS Release Notes* might contain information needed to install Rdb/VMS. Read that document before starting the Rdb/VMS installation.

Conventions

In examples, an implied carriage return occurs at the end of each line, unless otherwise noted. You must press the RETURN key at the end of a line of input.

Often in examples the prompts are not shown. Generally, they are shown where it is important to depict an interactive sequence exactly; otherwise, they are omitted in order to focus full attention on the statements or commands themselves.

This section explains the conventions used in this manual:

. . .	A vertical ellipsis in an example means that information not directly related to the example has been omitted.
. . .	A horizontal ellipsis in statements or commands means that parts of the statement or command not directly related to the example have been omitted.
Color	In printed manuals, color in examples shows user input.
< >	Angle brackets enclose user-supplied names.
$	The dollar sign represents the DIGITAL Command Language prompt. This symbol indicates that the DCL interpreter is ready for input.

References to Products

The Rdb/VMS documentation to which this document belongs often refers to the following products by their abbreviated names:

- DEC RdbExpert for VMS software is referred to as RdbExpert.
- DECnet–VAX system is referred to as DECnet.
- DECtrace for VMS software is referred to as DECtrace.
- VAX ACMS software is referred to as ACMS.
- VAX CDD/Plus software is referred to as CDD/Plus.
- VAX Data Distributor software is referred to as Data Distributor.

- VAX DATATRIEVE software is referred to as DATATRIEVE.
- VAX RALLY software is referred to as RALLY.
- VAX Rdb/VMS software is referred to as Rdb/VMS. Version 4.0 of VAX Rdb/VMS software is often referred to as Rdb/VMS V4.0.
- VAX TDMS software is referred to as TDMS.
- VAX TEAMDATA software is referred to as TEAMDATA.
- VIDA software is referred to as VIDA.

1

Preparing to Install Rdb/VMS

This chapter discusses the preparations and requirements necessary for installing Rdb/VMS. This Digital relational database management system performs on the VAX series of computers that run the VMS operating system. When you install the full development or interactive kit for Rdb/VMS, you automatically install:

- SQL as the primary user interface component to your Rdb/VMS databases. SQL is the Digital implementation of the structured query language, an ANSI/ISO standard interface to relational database products. It is one of several supplied interfaces to Rdb/VMS.
- SQL/Services as the client/server component of Rdb/VMS. SQL/Services allows client application programs running on various types of remote computers to access Rdb/VMS and VIDA databases on a VMS server system. The appendix provides instructions on installing SQL/Services client Application Programming Interface (API) software on remote Macintosh, MS-DOS, OS/2, ULTRIX, ULTRIX for RISC, and VMS operating systems.

Different sites require different capabilities from an Rdb/VMS database. For your convenience, Rdb/VMS provides the three kit options. Table 1–1 shows the Rdb/VMS components contained within each kit. The kit options are:

- **Rdb/VMS Full Development Kit**

  The Rdb/VMS full development kit lets you create and modify databases, create programs that use databases, and run programs that use databases. The full development kit is necessary if you will be accessing Rdb/VMS using programs written in standard programming languages (3GLs, that is, third-generation languages). The full development kit includes SQL module language and precompiler. It also includes SQL/Services APIs, which are used by the client to access the server.

- **Rdb/VMS Interactive Kit**

  The Rdb/VMS interactive kit lets you use existing Rdb/VMS databases and build new Rdb/VMS databases using the same full-function SQL and RDO interactive interfaces that are supplied with the full development kit. It also contains the SQL/Services server component. However, it does not let you preprocess data manipulation language (DML) programs; it does not include any precompilers or SQL module language, so you cannot develop programs.

- **Rdb/VMS Run-Time Kit**

  The Rdb/VMS run-time kit lets you use the Rdb/VMS database built with the full development kit or interactive kit. It also contains the SQL/Services server component. However, it does not let you create new databases, modify data definitions of existing databases, or preprocess DML programs. The run-time kit is useful if you use prepared application solutions based on Rdb/VMS, or if you access Rdb/VMS databases from TEAMDATA, DATATRIEVE, or RALLY applications.

Table 1–1 Rdb/VMS Product Kits

Component	Run-Time	Interactive	Development
Base database software	Y	Y	Y
RMU Maintenance Utility	Y	Y	Y
Interactive SQL Utility	N	Y	Y
SQL precompiler and module language, RDML, RDBPRE	N	N	Y
Dynamic SQL engine	Y	Y	Y
RDO Utility	Y[1]	Y	Y
SQL/Services server	Y	Y	Y
SQL/Services client APIs	N	N	Y

[1]Only data manipulation RDO statements are available in the run-time option.

Your bill of materials (BOM) and indented bills report (BIL) specify the number and contents of your media. Be sure to verify the contents of your kit with this information. If your kit is damaged or if you find that parts of it are missing, contact your Digital representative.

Rdb/VMS provides online and printed release notes. For Version 4.0, the printed version was prepared after the online version; thus, information in the printed version is more up-to-date. Digital recommends that you read the release notes before proceeding with the installation.

1.1 Required Operating System Components

VMS arranges all files into classes and subclasses. This lets customers remove and add parts of VMS by function rather than by file. Each layered product requires certain VMS classes or subclasses in order to provide full capability.

Rdb/VMS requires a minimum of the following VMS classes:

- Files required for VMS to boot on all systems (BASE)
- Network Support (NET)
- Programming Support (PROG)
- Secure User's Environment (USER)
- Utilities (UTIL)

1.2 Prerequisite and Optional Software

This section discusses the software you must have installed on your system before installing Rdb/VMS. The section also includes information about software that you can use together with Rdb/VMS. Please refer to the System Software Addendum (SSA) for a complete list of compatible products and their required version numbers. The SSA is part of the Software Product Description (SPD).

1.2.1 Prerequisite Software

The VMS operating system Version 5.3 or higher must be installed on your VAX system for Rdb/VMS V4.0 to install and run properly.

1.2.2 Optional Software

If you will be using the distributed transaction functionality of DECdtm, you must install VMS Version 5.4 or higher.

Rdb/VMS V4.0 is compatible with many Digital software products. These include ACMS, CDD/Plus, VAX Data Distributor, DATATRIEVE, DECtrace, RdbExpert, TEAMDATA, RALLY, VIDA, other products compliant with the DIGITAL Standard Relational Interface (DSRI), and various standard programming languages that support the VAX procedure calling standard. Unless specifically mentioned, Rdb/VMS works with any supported version of these products.

Take special note of the following points affecting optional software:

- CDD/Plus

  Rdb/VMS V4.0 and VMS Version 5.3 require that Version 4.2 or higher of CDD/Plus be installed for Rdb/VMS V4.0 to use CDD/Plus. VMS Version 5.4 or higher requires CDD/Plus Version 4.2A.

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

```
$ DICTIONARY OPERATOR
Welcome to CDO V1.2
The CDD/Plus V4.2 User Interface
Type HELP for help
CDO> EXIT
```

- PL/I

  Rdb/VMS is compatible with VAX PL/I Version 3.0 or higher.

- DECnet

  To run SQL/Services, you must install DECnet on client and server systems. SQL/Services uses DECnet to download files from the VMS server system to various client systems.

- LSE

  If you want to have VAX Language-Sensitive Editor (LSE) template support for SQL statements, install LSE before installing Rdb/VMS. Rdb/VMS V4.0 requires LSE Version 2.2 or higher.

For a complete list of compatible products, refer to the SSA.

1.3 Prerequisite Hardware

You can install Rdb/VMS only when your system meets or exceeds the minimum hardware requirements as shown in the SPD. Table 1–2 in Section 1.5.4 lists the approximate system disk storage required for the installation and running of Rdb/VMS. The required system disk storage is not system dependent, but does depend on the Rdb/VMS license option you are installing. Your system may require additional mass storage for backup and restore operations.

1.4 VMS License Management Facility

The VMS License Management Facility (LMF) is available with Version 5.0 of the VMS operating system. Because Rdb/VMS requires VMS Version 5.3, you must register your software license (unless you are installing the run-time kit). If you are installing Rdb/VMS in a VAXcluster environment, you must register your software license on the boot node. After the installation, you must load the license on appropriate satellite nodes of the VAXcluster system.

During the installation, you are asked if you have registered the Rdb/VMS license and loaded the appropriate authorization key. You must register and load your license for Rdb/VMS *before* you start the installation in order to run the Installation Verification Procedure (IVP) and use the software.

The license registration information you need is contained in the Product Authorization Key (PAK) that is shipped with Rdb/VMS. The PAK is a certificate that contains information about the license you have to run a particular piece of software.

To register a license under the VMS Version 5.3 operating system, first log in to the system manager's account, SYSTEM. You then have a choice of two ways to perform the registration:

- Invoke the SYS$UPDATE:VMSLICENSE.COM procedure. The VMSLICENSE.COM procedure is a menu-driven command procedure that will prompt you for data obtainable from your PAK. After you enter all required information, the VMSLICENSE.COM procedure displays the supplied information for your approval. To invoke this procedure, enter the following command:

  ```
  $  @SYS$UPDATE:VMSLICENSE
  ```

- Issue the LICENSE REGISTER DCL command with the appropriate qualifiers that correspond to information on the PAK, and activate it with the LICENSE LOAD command.

For complete information on using LMF, see the *VMS License Management Utility Manual* in the VMS documentation set.

1.5 Requirements for Installing Rdb/VMS V4.0

The following sections discuss the steps you must take and the requirements you must meet before installing Rdb/VMS V4.0.

1.5.1 Installing over Previous Version of Rdb/VMS

If you install Rdb/VMS over a previous version of Rdb/VMS, you must ensure that the previous version is Rdb/VMS Version 3.0 or higher. Otherwise, you will be unable to convert existing databases to the Version 4.0 format after you install.

1.5.2 Recover All Rdb/VMS Databases

Before installing Rdb/VMS, 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 following command on each disk device to see if any RUJ files remain:

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

For each RUJ file associated with an Rdb/VMS database, you must locate the corresponding RDB file and invoke the database. If the REVENUE.RDB database resides in the directory 222DUA7:[ACCTMGR], you can recover the database and eliminate all corresponding RUJ files by invoking the database as follows:

```
$  Run SYS$SYSTEM:SQL$
SQL>  DECLARE SCHEMA FILENAME $222$DUA7:[ACCTMGR]REVENUE;
```

The database is now recovered.

1.5.3 Backup All Existing Rdb/VMS Databases

As a safety precaution, Rdb/VMS recommends that you backup any Rdb/VMS databases, including DECtrace and CDD/Plus databases, with the RMU/BACKUP command before installing Rdb/VMS V4.0.

After the installation ends successfully, you must convert the internal data structures for all databases of earlier versions. Convert data structures by running the RMU/CONVERT command with SYSPRV. Converted databases can then be used with Rdb/VMS V4.0 software. For more information on the RMU/CONVERT command see Chapter 3 or the *VAX Rdb/VMS RDO and RMU Reference Manual*.

1.5.4 Disk Space Required to Install Rdb/VMS

Installing Rdb/VMS requires a certain amount of available disk storage space during the installation. Once Rdb/VMS is installed, less storage space is required. Table 1–2 summarizes the storage requirements for Rdb/VMS.

Table 1–2 Disk Space Requirements

Rdb/VMS V4.0 Kit	Blocks During Installation	Blocks After Installation
Full Development	40,000	30,000
Interactive	25,000	20,000
Run-Time	25,000	18,000

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

```
$  SHOW DEVICE SYS$SYSDEVICE
```

1.5.5 Check for the RDB$REMOTE Account

You must have the RDB$REMOTE account *and* object number 35 (RDBSERVER.EXE) in the Network Control Program (NCP) database for proper functioning of Rdb/VMS remote features. Use the VMS Authorize utility (AUTHORIZE) to determine if the RDB$REMOTE account exists on your system. You must have the system user identification code (UIC) or the SYSPRV privilege to run AUTHORIZE. For example:

```
$  SET DEFAULT SYS$SYSTEM
$  RUN AUTHORIZE
UAF>  SHOW RDB$REMOTE /BRIEF
Owner      Username       UIC    Account  Privs  Pri  Directory

         RDB$REMOTE    [373,7]          Normal   4  SYS$COMMON:[RDB$REMOTE]
UAF>  EXIT
```

Note the UIC for the RDB$REMOTE account; the installation procedure prompts you for this value later.

If the RDB$REMOTE account does not exist on your system, continue with the installation. The installation procedure will create the RDB$REMOTE account and insert object number 35 into the NCP database. No further action is necessary prior to installing Rdb/VMS.

Note

If the remote database test fails, type out the log from the failed IVP when you run the Installation Verification Procedure (IVP):

```
$  TYPE SYS$UPDATE:RDBIVP_REMOTE.LOG
%RDB-F-IO_ERROR, input or output error
-SYSTEM-F-INVLOGIN, login information invalid at remote node
%RDO-F-INVNOTDON, no DATABASE invoked yet, please issue a DATABASE command
```

If you get the error shown in the preceding example, it is likely that the RDB$REMOTE account is set up with the DISUSER flag. VMS sets up the default account with the DISUSER flag enabled. Due to security considerations, you will have to manually disable the DISUSER flag as shown in the following example:

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

UAF>  SHOW RDB$REMOTE

Username: RDB$REMOTE                       Owner:
Account:                                   UIC:    [377,101] ([RDB$REMOTE])
CLI:      DCL                              Tables: DCLTABLES
Default:  SYS$COMMON:[RDB$REMOTE]
LGICMD:   SYS$SYSTEM:RDB$REMOTE_LOGIN.COM
Login Flags:  Disctly Defcli Lockpwd Disuser Dismail Disreconnect
   .
   .
   .
```

```
UAF>  MODIFY RDB$REMOTE/FLAG=NODISUSER
UAF-I-MDFYMSG, user record(s) updated
UAF>  SHOW RDB$REMOTE

Username: RDB$REMOTE                        Owner:
Account:                                    UIC:    [377,101] ([RDB$REMOTE])
CLI:      DCL                               Tables: DCLTABLES
Default:  SYS$COMMON:[RDB$REMOTE]
LGICMD:   SYS$SYSTEM:RDB$REMOTE_LOGIN.COM
Login Flags:  Disctly Defcli Lockpwd Dismail Disreconnect
    .
    .
    .
```

Once you disable the DISUSER flag in the RDB$REMOTE account, you can rerun the IVP. The IVP failure in this case does not indicate an installation error. The DISUSER flag must remain disabled for the RDB$REMOTE account to work.

If the RDB$REMOTE account does exist on your system, you must determine if object number 35 (RDBSERVER.EXE) is present in the NCP database. Run the NCP utility and enter the following commands:

```
$  SET DEFAULT SYS$SYSTEM
$  RUN NCP
NCP>  SHOW OBJECT RDBSERVER

Object Volatile Summary as of  2-MAY-1988 09:44:18

Object   Number  File/PID                  User Id         Password

RDBSERVER     35  RDBSERVER.EXE             RDB$REMOTE       SECRET

NCP>  EXIT
```

If the object number 35 does exist, continue with the installation. No further action is necessary.

If the object number 35 does not exist, you must run AUTHORIZE to remove the RDB$REMOTE account. For example:

```
$  SET DEFAULT SYS$SYSTEM
$  RUN AUTHORIZE
UAF>  REMOVE RDB$REMOTE
UAF>  EXIT
```

The installation procedure for Rdb/VMS inserts object number 35 (RDBSERVER.EXE) into the NCP database only when it has created the RDB$REMOTE account as part of the installation. Therefore, sites that have the RDB$REMOTE account on their systems without an object number 35 (RDBSERVER.EXE) in the NCP database can ensure that the Rdb/VMS remote feature functions properly if they delete the RDB$REMOTE account. The installation procedure will then create an RDB$REMOTE account and insert object number 35 into the NCP database.

1.5.6 CDD/Plus Considerations

Because the CDD/Plus V4.2 installation procedure installs the VAX Rdb/VMS Run-Time License option of Rdb/VMS (if not already installed), you can install CDD/Plus before or after installing Rdb/VMS. If you plan to install both products, installing Rdb/VMS first can save some time. The CDD/Plus installation does not have to install the run-time license option when Rdb/VMS is already installed, and you do not have to back up dictionary databases.

If CDD/Plus is installed on your system, it must be started up prior to installing Rdb/VMS. If you install Rdb/VMS while CDD/Plus is shut down, you will get errors in the IVP.

1.5.7 Shut Down the Rdb/VMS Monitor

The installation procedure terminates if the Rdb/VMS monitor is running. Before starting the installation, ensure that there are no active Rdb/VMS users by shutting down the Rdb/VMS monitor.

Note *If you have DECtrace installed on your system, you must turn DECtrace off* before *you attempt to shut down the Rdb/VMS monitor. Turn DECtrace off using the following command:*

```
$ COLLECT STOP SYSTEM/ABORT
```

Alternatively, you could also stop both DECtrace and the Rdb/VMS monitor using the RMU/MONITOR STOP/ABORT=DELPRC command.

Run the RMONSTOP.COM procedure from SYS$STARTUP to shut down the monitor on all nodes in a VAXcluster system. For example:

```
$  RUN SYS$SYSTEM:SYSMAN
SYSMAN>  SET ENVIRONMENT/CLUSTER
SYSMAN>  @SYS$STARTUP:RMONSTOP
SYSMAN>  EXIT
```

If you want to stop the Rdb/VMS monitor on only one node, enter the following command on that node:

```
$  @SYS$STARTUP:RMONSTOP
```

1.5.8 VMS Privileges Required to Install Rdb/VMS

VMSINSTAL is located in SYS$UPDATE, which is a restricted directory. To install Rdb/VMS, you must use an account that has SETPRV privilege. As one of its first actions, the VMSINSTAL command procedure grants all privileges except BYPASS to the process that invokes it. The VMSINSTAL command succeeds only if the account has SETPRV privilege.

To check the default privileges of the installing account, log in and enter this DCL command:

```
$  SHOW PROCESS/PRIVILEGES
```

If the account lacks the SETPRV privilege, you cannot install Rdb/VMS. You have two options:

- Ask your system manager to use AUTHORIZE to modify the default privileges of the account to include the SETPRV privilege.
- Run AUTHORIZE and make the changes yourself, if your account has the SYSPRV privilege:

  ```
  $  SET DEFAULT SYS$SYSTEM
  $  RUN AUTHORIZE
  UAF>  MODIFY account-name/PRIVILEGES=(SETPRV)
  UAF>  EXIT
  ```

  To activate the change in privileges, you must log out and in again.

(Note that the VMSINSTAL procedure turns off the BYPASS privilege at the start of the installation.)

1.5.9 Process Account Quotas Required to Install Rdb/VMS

The account you use to install Rdb/VMS must have sufficient quotas to enable you to perform the installation. Table 1–3 summarizes the minimum process quotas required to install Rdb/VMS.

Table 1–3 Process Account Quotas for the Installing Account

Account Quota	Value
ASTLM	24
BIOLM	18
BYTLM	20,480
DIOLM	18
ENQLM	2000
FILLM	50
PGFLQUO	20,000

User account quotas are stored in the file SYSUAF.DAT. You use AUTHORIZE to verify and change user account quotas. First set your directory to SYS$SYSTEM and then run AUTHORIZE:

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

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

```
UAF>  SHOW SYSTEM
```

To change a quota, use the MODIFY command at the UAF> prompt. The MODIFY command has the following syntax:

MODIFY account-name /quota-name=NNN

The following example changes the FILLM quota for the SYSTEM account and then exits from AUTHORIZE:

```
UAF>  MODIFY SYSTEM /FILLM=50
UAF>  EXIT
```

After you exit from the utility, the VMS system displays messages that indicate whether or not changes were made. Once the changes have been made, you must log out and log in again for the new quotas to take effect.

For more information on modifying account quotas, see the description of AUTHORIZE in the VMS documentation set.

1.5.10 System Parameter Values Required to Install Rdb/VMS

Installing Rdb/VMS requires certain system parameter settings. Table 1–4 lists the minimum required system parameter values for the installation. Depending on the kinds of programs and applications running at your site, you might need higher values for some settings.

Table 1–4 Required Minimum System Parameter Values

System Parameter	Value
CHANNELCNT	A number larger than the largest FILLM used on the system
CLISYMTBL[1]	250 pages
GBLPAGES[2]	2078 available pages
GBLSECTIONS[2]	80 available sections

[1]The CLISYMTBL dynamic system parameter must be set to a minimum value of 250 during the installation procedure. If the current CLISYMTBL setting is less than 250, you can lower the setting to its original value once the installation is finished.

[2]For systems where you are performing a re-installation, this number is the current value of GBLSECTIONS or GBLPAGES when the RMONSTOP command file or the RMU/MONITOR STOP command has been executed.

(continued on next page)

Table 1–4 (Cont.) Required Minimum System Parameter Values

System Parameter	Value
LOCKIDTBL_MAX[3]	2048 entries
PROCSECTCNT	32 sections
RESHASHTBL	512 entries
SRPCOUNT	1024 packets
SRPCOUNTV	2048 packets
VIRTUALPAGECNT	20,000 (a number larger than largest PGFLQUOTA used on the system)

[3]This dynamic system parameter must be set permanently to a value equal to or greater than the value listed. Do not lower this value after the installation.

The following sections show you how to check system parameter values, calculate values for the GBLPAGES and GBLSECTIONS system parameters, and change parameter values with the VMS AUTOGEN command procedure.

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

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

At the SYSGEN prompt (SYSGEN>), enter the SHOW command to display the value of a system parameter. The values displayed should equal or exceed the value of each parameter listed in Table 1–4. The following command displays the value for the LOCKIDTBL_MAX system parameter:

```
SYSGEN>  SHOW LOCKIDTBL_MAX
Parameter Name     Current   Default   Minimum   Maximum Unit  Dynamic
-------------      -------   -------   -------   ------- ----  -------
LOCKIDTBL_MAX      65535     65535       200     65535 Entries     D
```

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

1.5.10.2 Calculating the Values for GBLPAGES and GBLSECTIONS To install and run Rdb/VMS, you must set the correct values for the GBLPAGES and GBLSECTIONS system parameters.

The 2078 value for GBLPAGES and the 80 value for GBLSECTIONS in Table 1–4 indicate that you must have at least 2078 unused pages and 80 unused sections available on your system for the installation to proceed successfully.

To see how many unused global pages and global sections your system has, enter the following DCL commands:

```
$  WRITE SYS$OUTPUT F$GETSYI ("FREE_GBLPAGES")
8900
$  WRITE SYS$OUTPUT F$GETSYI ("FREE_GBLSECTS")
90
```

Section 1.5.10.3 describes the procedures for increasing these values as well as those of other system parameters. Refer to the VMS documentation on system management and operations for more information.

1.5.10.3 Changing System Parameter Values with AUTOGEN You use the AUTOGEN command procedure to change system parameters. The AUTOGEN procedure automatically adjusts values for parameters that are associated with the ones you set manually. To change system parameters with AUTOGEN, you must edit the SYS$SYSTEM:MODPARAMS.DAT file.

Use an editor to access the file. If you need to change a parameter value that is already in the SYS$SYSTEM:MODPARAMS.DAT file, simply delete the current value associated with that parameter and enter the new value.

To add a new value, add a line to the MODPARAMS.DAT file. The line contains the name of the parameter and its value. For example:

```
LOCKIDTBL_MAX = 2048
```

You can also modify incremental parameters in the MODPARAMS.DAT file. The following example increases the global page setting by 2000:

```
ADD_GBLPAGES = 2000
```

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

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

AUTOGEN automatically adjusts some of the SYSGEN 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 parameter at the end of the AUTOGEN command line. The AUTOGEN procedure performs an automatic system shutdown and reboots when it has finished. Rebooting your system makes the new parameter values active.

For more information about using AUTOGEN, see the instructions on modifying system parameters in the VMS documentation on system management and operations.

1.5.10.4 Setting Dynamic System Parameters

You can use SYSGEN to change the values for dynamic system parameters. The following example demonstrates this process for the CLISYMTBL system parameter. (After the installation is complete, you can reset CLISYMTBL to its previous setting or let it be reset automatically when you reboot your system.)

```
$  RUN SYS$SYSTEM:SYSGEN
SYSGEN>  USE ACTIVE
SYSGEN>  SET CLISYMTBL 250
SYSGEN>  WRITE ACTIVE
SYSGEN>  EXIT
```

Dynamic parameters changed with the SYSGEN WRITE ACTIVE command become active immediately without any need to reboot your system. In fact, rebooting returns dynamic system parameter values to their previous settings. Once you set values for dynamic parameters, you should complete the installation before rebooting the system.

The values for other dynamic parameters, such as LOCKIDTBL_MAX, must remain at the same level or higher than the values specified in Table 1–4.

1.5.11 Back Up Your System Disk

At the beginning of the installation, the VMSINSTAL command procedure asks if you have backed up your system disk. Digital recommends that you backup your system disk before installing any software on top of the operating system.

This precaution protects your system software. A system failure at a critical point in the installation procedure could leave unusable files. You also protect an existing version of the product, which may, if you request it, be deleted during the installation.

Use the backup procedures that have been established at your site. For details on backing up system disk, see the section on the VMS Backup utility in the VMS documentation set.

1.5.12 Avoid Giving Users Access to HELP

When the installation inserts the Rdb/VMS help modules into the VMS Help library, it must have sole access to the VMS Help library. If anyone uses the HELP command when the installation tries to insert the Rdb/VMS help module, the installation fails. You can prevent other users from using HELP during the installation by either of the following methods:

- Running the installation when no one else is logged in
- Limiting access to the help library SYS$HELP:HELPLIB.HLB to the SYSTEM account:

  ```
  $  SET PROTECTION = (S:RWED, O, G, W) SYS$HELP:HELPLIB.HLB
  ```

Remember to note the original protection on the library. After the installation, return the protection on the help library to the original setting. Instructions are provided in Section 3.11.

1.5.13 Prevent Interactive Users from Gaining Access to the System

If the installation fails for an indeterminable reason, Digital recommends that you install Rdb/VMS again, keeping all interactive users off the system during the installation procedure. You might also choose to keep interactive users off the system if you will be changing any system parameter values with the AUTOGEN utility. Use the DCL REPLY command to inform users of the schedule for the installation. Prevent other users from logging in by issuing the DCL SET LOGIN command:

```
$  REPLY/USER "Installation of Rdb/VMS starting in 5 minutes. Please
log out."
$  SET LOGIN/INTERACTIVE=0
```

Both of these commands require the OPER privilege.

If any batch or device jobs are running, you have two options:

- Wait until the last one finishes.
- Use the DCL DELETE/ENTRY command to stop any job still running.

1.5.14 Time Required to Install Rdb/VMS

The installation takes approximately 80 minutes on a VAX 8350 system. This time may vary depending on your type of media, your system configuration, whether or not CDD/Plus is installed, and whether or not you need to reboot your system.

1.6 Summation of Installation Requirements

The following sections summarize the items checked by VMSINSTAL and by the Rdb/VMS installation procedure. You can use this section as a checklist to determine if you are ready to begin the installation.

1.6.1 VMSINSTAL Requirements

When you invoke VMSINSTAL, it checks the following:

- If you have set your default device and directory to SYS$UPDATE
- If you are logged in to a privileged account
- If you have adequate quotas for installation
- If DECnet is up and running
- If any users are logged in to the system

If VMSINSTAL detects any problems during the installation, it notifies you of the problem and asks if you want to continue the installation. In some instances, you can enter YES to continue. To stop the installation process and correct the situation, enter NO or press RETURN. Then correct the problem and start the installation again.

1.6.2 Rdb/VMS Requirements

The Rdb/VMS installation procedure checks the following items:

- If you have registered your license and loaded the appropriate authorization key
- If Rdb/VMS is already installed on your system
- Status of the Rdb/VMS monitor
- Version of VMS
- Current value of process quotas
- Current value of system parameters
- Amount of available space on the system disk

If there is no RDB$REMOTE account on your system, the installation procedure will prompt you for a UIC and password for the RDB$REMOTE account. It will also prompt you for the UIC and device that SQL/Services uses for the default SQLSRV$SRV account.

2 Installing Rdb/VMS

This chapter describes how to install Rdb/VMS. Section 2.2 contains a step-by-step description of the installation procedure. Section 2.3 presents common installation errors and their solutions.

2.1 Accessing the Online Release Notes

Rdb/VMS provides online release notes. You must specify OPTIONS N when you invoke the VMSINSTAL command procedure to see the question about online release notes. This question comes near the beginning of the installation.

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 Rdb/VMS has been installed, the release notes are located in SYS$HELP:RDBVMS040.RELEASE_NOTES.

Online help also directs you to the release notes file. After the installation, you can enter the following command to find the location of the release notes:

```
$  HELP RDBVMS RELEASE_NOTES
```

Note that hardcopy release notes are included with the documentation set for Rdb/VMS.

2.2 Installation Procedure

The Rdb/VMS installation process consists of a series of questions and informational messages.

2.2.1 Invoking VMSINSTAL

To start the installation, invoke the VMSINSTAL command procedure from a privileged account, such as the SYSTEM account. The VMSINSTAL procedure is in the SYS$UPDATE directory. You use the following syntax to invoke VMSINSTAL:

@SYS$UPDATE:VMSINSTAL product-name device-name OPTIONS N

The rest of this section presents the parameters for the VMSINSTAL command line.

product-name
The installation name for the product. For Rdb/VMS, provide this parameter as follows:

RDBVMStypnnn

The *typ* represents the type of kit (DEV for the full development kit, RTO for the run-time kit, and INT for the interactive kit). The *nnn* represents the version number. For example, to install the full development kit for Version 4.0 of Rdb/VMS, enter the following parameter:

```
RDBVMSDEV040
```

device-name
The name of the device on which you plan to mount the media. For example, MTA0: and MUA0: are device names for tape drive. It is not necessary to use the console drive for this installation. However, if you do use the console drive, you should replace any media you removed once the installation is complete.

OPTIONS N
An optional parameter that indicates you want to review the release notes question. If you include OPTIONS N, VMSINSTAL displays a menu that lets you choose between printing the release notes or displaying them on your terminal. You should always review the release notes before proceeding in case they contain new information about the installation. If you do not include the OPTIONS N parameter, VMSINSTAL does not ask you about the release notes. However, the release notes are automatically copied to SYS$HELP.

Note that there are several other options you can select when you invoke VMSINSTAL. See the VMS documentation on software installation for information on these options.

The following example displays the command to invoke VMSINSTAL to install Rdb/VMS from tape drive MTA0 and shows the system response. This example uses the OPTIONS N release note parameter.

```
$  @SYS$UPDATE:VMSINSTAL RDBVMSDEV040 MTA0: OPTIONS N

      VAX/VMS Software Product Installation Procedure V5.3


It is 14-SEP-1990 at 14::00.
Enter a question mark (?) at any time for help.
```

If you do not supply either the product name or the device name, VMSINSTAL prompts you for this information later on in the installation procedure.

2.2.2 Steps of the Installation Procedure

This section discusses the installation process itself, presenting all the questions that appear during the installation. Appendix G contains a sample installation procedure.

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

1 System backup

The VMSINSTAL procedure 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 the RETURN key. Otherwise, enter NO to discontinue the installation. After you back up your system disk, you can start the installation again.

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

2 Mounting the media

You should now mount the first distribution volume on the device you specified when you invoked VMSINSTAL. The device name appears in the line preceding the question. The VMSINSTAL procedure 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 Rdb/VMS has been mounted on the specified device and that the installation has begun. For example:

```
* Where will the distribution volumes be mounted:  MTA0:

Enter the products to be processed from the first distribution volume set.
* Products:  RDBVMSDEV
* Options:  N
The following products will be processed:
  RDBVMSDEV V4.0

    Beginning installation of RDBVMSDEV V4.0 at 14:00

%VMSINSTAL-I-RESTORE, Restoring product saveset A...
```

If you entered the wrong device name when you invoked VMSINSTAL and need to start the installation again, enter NO when asked if you are ready to install.

3 Additional media volumes

If your installation kit contains more than one volume, VMSINSTAL prompts you to insert the additional volumes and then asks you to indicate that you are ready for the installation to proceed.

```
%BACKUP-I-READYREAD, mount volume 2 on _MTA0: for reading

Enter "YES" when ready:
```

4 Release notes

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.

```
    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]:  2
```

The release notes are automatically copied to SYS$HELP no matter which option you choose, and whether or not you specified OPTIONS N.

The *VAX Rdb/VMS Release Notes* are long; you might wish to simply print them by selecting option 2.

5 Continuing the installation

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

```
* Do you want to continue the installation [N]?:  YES
%VMSINSTAL-I-RELMOVED, The product's release notes have been
successfully moved to SYS$HELP.
```

The release notes are located in the following file:

```
SYS$HELP:RDBVMS040.RELEASE_NOTES
```

Note *The name of the release notes file installed by VMSINSTAL consists of the current product name and version number. Digital recomments that you keep the release notes for previous versions of Rdb/VMS.*

6 Replacing existing Rdb/VMS software

If you are installing Version 4.0 on top of another version of Rdb/VMS, a message similar to this appears:

```
*************************************************************
The currently installed version:
    "Rdb/VMS V3.1-0"
will be replaced by this installation.
*************************************************************
```

You are asked if you want to proceed with the installation:

```
* Do you want to proceed [NO]:  Y
```

When you continue the installation, the following message is displayed:

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

Before You Install Rdb/VMS Software

    The on-disk structure of Rdb/VMS database files has changed.
    As a result, databases created under previous versions of
    Rdb/VMS are incompatible with this software.
    To use this software with a current Rdb/VMS database
    perform the following tasks:

    o Before installing VAX Rdb/VMS V4.0-0:

      - As a precaution, backup each database with the RMU Backup
        Utility.

    o After installing VAX Rdb/VMS V4.0-0:

      - For any databases, including CDD/Plus dictionaries,
        created with a version of Rdb/VMS software earlier
        than V4.0, use RMU/CONVERT.

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

The installation asks if you want to proceed with this installation.

```
* Do you want to proceed with this installation [NO]: y
```

7 Continuing the installation

When you continue the installation, the following message is displayed:

```
    Installation procedures for: "VAX Rdb/VMS Version 4.0-0"


Be sure you have read the section entitled

"Preparing your System and the Installing Account"

in the installation guide before continuing with the installation.


Checking system requirements ...
```

8 License registration

The installation procedure displays license information about your product and then asks if you have registered and loaded your authorization key for Rdb/VMS. For example:

```
Product:       RDB
Producer:      DEC
Version:       4.0
Release Date:  01-JUL-1990

* Does this product have an authorization key registered and loaded?
```

If you have not registered and loaded your authorization key, you must answer NO to this question. The installation procedure stops if you answer NO. If you answer YES when installing the full development or interactive kits, but have not registered and loaded your authorization key, the installation will fail.

You have to register and load your product authorization key to successfully complete the installation. If you have not done so, you should stop the installation, register and load your product authorization key, and then start the installation again.

9 Entering a UIC and password for the RDB$REMOTE account

The installation procedure now prints a message regarding the creation of the RDB$REMOTE account. You must choose a User Identification Code (UIC) and password for this account. The installation procedure first prompts you to enter a UIC for the RDB$REMOTE account.

```
* Please enter UIC to be used for the RDB$REMOTE account (e.g. [ggg,mmm]]:)
[300,475]
```

The installation procedure then prompts you to supply a password for the RDB$REMOTE account. Your password for the RDB$REMOTE account and the network object RDBSERVER.EXE must be exactly the same. The password you supply for the RDB$REMOTE account will be used for the network object as well if the account is created by this installation. The password must be at least six characters. Your input will not appear on the terminal.

```
* Please enter PASSWORD to be used for RDB$REMOTE account:
```

For verification, you will be asked to enter the password a second time.

```
* Please verify the PASSWORD entered for RDB$REMOTE:
```

10 Entering a UIC and device for the SQL/Services SQLSRV$SRV account

The installation procedure prints a message about choosing a UIC for the SQLSRV$SRV account. SQL/Services creates the account in order to run the communication server, which handles API requests for the VMS server system. During the installation, the account is used to run the IVP. You must choose a UIC for the SQLSRV$SRV account at the following prompt:

```
* Please enter UIC to be used for the SQLSRV$SRV account (e.g. [ggg,mmm]:)
[200,425]
```

Another message prompts you for the device on which to place the SQLSRV$SRV account. You must choose a device or accept the SYS$SYSDEVICE default. Enter the device at the following prompt:

```
* Please enter a default device for the SQLSRV$SRV account [SYS$SYSDEVICE]:
```

11 Obsolete Rdb/VMS and SQL files

The installation asks if you want to delete obsolete files from previous versions of Rdb/VMS. The first question refers to the version of RMONSTART.COM that resided in SYS$MANAGER. You must be using the new version of RMONSTART.COM located in SYS$STARTUP in order for users to be able to attach to Rdb/VMS databases. The old version of RMONSTART will not work with Rdb/VMS V4.0. Digital recommends that you answer YES to this question to avoid possible confusion:

```
* Do you want to delete SYS$MANAGER:RMONSTART.COM [NO]:  Y
```

The installation also asks if you want to delete RMUCONVERT.EXE. This executable image, shipped with previous versions of Rdb/VMS, is no longer provided. This functionality is now included in RMU.EXE. Previous versions of RMUCONVERT.EXE are no longer needed and should be deleted.

```
* Do you want to delete SYS$COMMON:[SYSEXE]RMUCONVERT.EXE [NO]:
Y
```

The installation also asks you about deleting the old version of the Rdb/VMS online demonstration and the old online sample files. These files will take space on your system that you could use in other ways. However, they are not harmful.

```
* Do you want to delete obsolete demo and sample files [NO]:  Y
```

The installation procedure then asks a final question about deleting obsolete SQL files. The files cannot harm your system, only occupy unnecessary disk space. Either delete obsolete SQL files by entering YES and pressing the RETURN key, or retain obsolete files by pressing the RETURN key in response to the following question:

```
* Do you want to delete obsolete SQL files [NO]:  Y
```

Digital recommends that you delete obsolete files.

12 Choosing to run the Installation Verification Procedure (IVP)

The Installation Verification Procedure (IVP) for Rdb/VMS verifies the installation. The installation asks if you want to run the IVP as part of the installation. If you respond YES, VMSINSTAL runs the IVP following the installation. It is recommended that you run the IVP to be sure that Rdb/VMS is installed correctly.

As part of the IVP, Rdb/VMS creates the Personnel sample database in the directory specified by the logical RDM$DEMO.

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

After Rdb/VMS is installed, you can run the IVP independently to verify that the software is available on your system. You might also want to run the IVP after a system failure to be sure that users can access Rdb/VMS. Online help contains instructions for running the IVP independently. You can also find instructions in Chapter 3.

13 Choosing to purge files

You have the option to purge files from previous versions of Rdb/VMS 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]?
```

14 Informational messages

At this point, the installation procedure displays a number of informational messages that report on the progress of the installation. There are no further questions. If the installation procedure has been successful up to this point, VMSINSTAL moves the new or modified files to their target directories, updates help files, and updates DCL tables, if necessary. If you asked for files to be purged, that work is done now. The following messages are displayed:

```
There are no more questions.  The installation takes approximately
80 minutes on a standalone VAX 11/8350.


Beginning installation ...


Installing under VMS V5.3     - 14-SEP-1990 14:10

%VMSINSTAL-I-RESTORE, Restoring product saveset B ...
%VMSINSTAL-I-RESTORE, Restoring product saveset C ...
%VMSINSTAL-I-RESTORE, Restoring product saveset D ...
%VMSINSTAL-I-RESTORE, Restoring product saveset E ...
%VMSINSTAL-I-RESTORE, Restoring product saveset F ...
%VMSINSTAL-I-RESTORE, Restoring product saveset G ...
   .
   .
   .
%VMSINSTAL-I-MOVEFILES, files will now be moved to their target
directories . . .
```

15 Running the IVP

If you chose to run the IVP, VMSINSTAL runs it now. When the IVP runs successfully, you see the following display:

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

VAX Rdb/VMS V4.0-0

Development

IVP COMPLETED SUCCESSFULLY

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

2.2.3 Completing the Installation Procedure

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

```
Installation of RDBVMSDEV V4.0 completed at 14:45

VMSINSTAL procedure done at 14:45
```

You can now log out of the privileged account:

```
$  LOGOUT
SYSTEM     logged out at 14-SEP-1990 14:45:00.0
```

Note that 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 Errors That Cause the Installation to Fail

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

```
%VMSINSTAL-E-INSFAIL, The installation of RDBVMSDEV V4.0 has failed.
```

If the IVP fails, you see these messages:

```
The RDBVMSDEV V4.0 Installation Verification Procedure failed.
```

```
%VMSINSTAL-E-IVPFAIL, The IVP for RDBVMSDEV V4.0 has failed.
```

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

- Incorrect operating system version

  Unless you have the VMS Version 5.3 or higher operating system installed, the installation will fail.

- Incorrect optional software version

  Unless you have Version 3.0 or later of VAX PL/I, the PL/I test in the IVP fails, which causes the entire IVP to fail. If DECnet is not running, the remote database test of the IVP will not be run. SQL/Services cannot be used without DECnet.

- Insufficient privileges

  The account you use to install Rdb/VMS must have the SETPRV privilege. See Section 1.5.8 about privileges.

- Insufficient disk space on system disk

  If the system disk does not have enough blocks available to install Rdb/VMS, purge or delete unnecessary files according to the policies of your site. When you have enough disk space, you are ready to continue the installation procedure.

  See Section 1.5.4 for disk space requirements.

- Insufficient system parameter values for successful installation

  You must have the necessary minimum settings for system parameters on the installing account. See Section 1.5.10 for more system parameter information.

- Insufficient quotas for successful installation

You must have the necessary minimum account quotas set. See Section 1.5.9 about process account quotas.

- VMS Help Library currently in use

  The installation must have sole access to the VMS Help Library when it tries to insert the Rdb/VMS help module into the library. See Section 1.5.12 for more information about the VMS Help Library.

- Product license not registered and loaded

  Register and load your product license and start the installation again. See Section 1.4 about the VMS License Management Facility.

- RDB$REMOTE account has DISUSER flag set.

  If the RDB$REMOTE account has been disabled, the remote database test in the IVP will fail. See Section 1.5.5 for information on how to set up the RDB$REMOTE account properly.

- CDD/Plus installed but not started up prior to Rdb/VMS installation

  If Cdd/Plus is installed on your system but not started up, the IVP will commonly fail in the COBOL precompiler tests. If this occurs, start up CDD/Plus and rerun the IVP. Use the following command to start up CDD/Plus:

  ```
  $  @SYS$STARTUP:CDDSTRTUP
  ```

3 After Installing Rdb/VMS

After installing Rdb/VMS, you need to perform the following tasks:

- Edit the system startup and shutdown files.
- Optionally modify system parameter settings.
- Optionally reboot the system.
- Adapt Rdb/VMS for use in a VAXcluster environment.
- Check user account requirements.
- Convert existing Rdb/VMS databases.
- Optionally install RMU with privileges.
- Tailor your system.
- Make adjustments to enhance Rdb/VMS performance.
- Return the system to original settings.

This chapter also explains how to run the Installation Verification Procedure (IVP) independently after the software has been installed.

3.1 Editing the System Files

You must edit the system startup and shutdown files to provide for automatic startup and shutdown of Rdb/VMS and to initialize SQL and SQL/Services when your system is rebooted. You need the SYSPRV privilege for this task.

Add the command line that starts Rdb/VMS to the system startup file, SYS$MANAGER.SYSTARTUP_V5.COM. You must position this new command line *after* the line that invokes the network startup command procedure. The following example shows the network startup command line followed by the startup command line for Rdb/VMS:

```
$ @SYS$MANAGER:STARTNET.COM
      .
      .
      .
$ @SYS$STARTUP:RMONSTART.COM
```

The Rdb/VMS startup command file, RMONSTART.COM, automatically starts up SQL by calling the command file SYS$STARTUP:SQL$STARTUP.COM. However, if you wish to start up SQL/Services, you must edit SYS$STARTUP:SQL$STARTUP.COM and remove the comment character (!) from the following line:

```
$ !@SYS$STARTUP:SQLSRV$STARTUP.COM
```

Note *In the following cases, you should remove from the SYSTARTUP_V5.COM procedure references to the SQL and/or SQL/Services startup command procedure:*

- *VAX SQL*

  If you have been running Rdb/VMS Versions 3.0, 3.0A, or 3.0B, or if you have been running VAX SQL Versions 1.0, 1.1 or 2.0, you should remove the following line from your SYS$MANAGER:SYSTARTUP_V5.COM file:

  ```
  $ @SYS$MANAGER:SQL$STARTUP
  ```

  Otherwise, SQL will be started up twice. (In previous versions of VAX SQL, SQL$STARTUP was located in SYS$MANAGER.)

- *VAX SQL/Services*

  Similarly, if you have been running VAX SQL/Services Version 1.0 (before bundling with Rdb/VMS), you should remove the following line from your SYS$MANAGER:SYSTARTUP_V5.COM file:

  ```
  $ @SYS$MANAGER:SQLSRV$STARTUP
  ```

  Otherwise, SQL/Services will be started up twice. (In previous versions of VAX SQL/Services, SQLSRV$STARTUP was located in SYS$MANAGER.)

To invoke the RMONSTART procedure, you need the user privilege SETPRV or the privileges CMKRNL, ALTPRI, DETACH, PSWAPM, PRMMBX, SYSGBL, SYSNAM, and WORLD.

You also need to add the following command line to the system shutdown file, SYS$MANAGER:SYSHUTDWN.COM, in order to shut down Rdb/VMS when the system is shut down:

```
$ @SYS$MANAGER:RMONSTOP.COM
```

To invoke the RMONSTOP procedure, you need the user privilege SETPRV or the privileges CMKRNL, SYSNAM, and WORLD. The RMONSTOP.COM procedure also includes the RMU/MONITOR STOP/WAIT command to stop the Rdb/VMS monitor.

If you want SQL/Services shut down when Rdb/VMS and the system is shut down, edit the SQL$STARTUP.COM command procedure and remove the comment character (!) from the following command line:

```
$ ! @SYS$STARTUP:SQLSRV$SHUTDOWN
```

3.1.1 Defining LNK$LIBRARY to Ease Program Linking

When users link SQL programs, they must specify the SQL user library SYS$LIBRARY:SQL$USER.OLB. If you define the logical name LNK$LIBRARY as the SQL user library, users will not have to explicitly specify that library each time they link their embedded SQL programs.

To define LNK$LIBRARY, issue this command:

```
$  DEFINE/SYSTEM/EXECUTIVE/NOLOG LNK$LIBRARY SYS$LIBRARY:SQL$USER.OLB
```

To make sure LNK$LIBRARY is defined each time the system starts up, edit the command file SYS$STARTUP:SQL$STARTUP.COM and remove the comment character (!) in front of the LNK$LIBRARY definition.

You must also check to see that the system logical name LNK$LIBRARY is not already being used. Your site or other products may have already defined the LNK$LIBRARY logical name. If so, you should add a numeric suffix to the LNK$LIBRARY definition you create and to the definition in SYS$STARTUP:SQL$STARTUP.COM.

First, check to see if any system startup procedure defines the name by searching the SYS$STARTUP directory with the SEARCH command at the DCL prompt:

```
$  SEARCH SYS$STARTUP:*.COM "LNK$LIBRARY"
```

If the search shows that SQL$STARTUP.COM is the only procedure that defines LNK$LIBRARY, there is no conflict with the logical name, and you do not need to modify SYS$STARTUP:SQL$STARTUP.COM. (Note that process, group, or system logical names defined in directories other than SYS$STARTUP may specify a conflicting LNK$LIBRARY that the search will not detect.)

However, if other procedures define LNK$LIBRARY, you should edit SYS$STARTUP:SQL$STARTUP.COM and modify the line that defines LNK$LIBRARY. Change the LNK$LIBRARY name to the form LNK$LIBRARY_*n*, where *n* is one greater than values from other definitions shown in the SEARCH command.

For instance, if the SEARCH command showed that LNK$LIBRARY and LNK$LIBRARY_1 were already defined by other procedures at system startup, change the line in SYS$STARTUP:SQL$STARTUP.COM to define LINK$LIBRARY_2:

```
$  DEFINE/EXECUTIVE/SYSTEM/NOLOG LNK$LIBRARY_2 SYS$LIBRARY:SQL$USER.OLB
```

If you do not define LNK$LIBRARY to specify the SQL user library, users must explicitly name it when they link programs with embedded SQL statements. For example:

```
$  LINK my_prog SYS$LIBRARY:SQL$USER/LIBRARY
```

See the VMS documentation set for more information about the LINK command.

3.1.2 Running RMONSTART.COM Manually or by Running the Installation Verification Procedure (IVP)

If you chose not to run the IVP as part of the installation, you will have to run the RMONSTART.COM command procedure manually to start the Rdb/VMS monitor and perform other related tasks such as installing shareable images and defining necessary logical names. RMONSTART.COM is located in SYS$STARTUP. (If you have edited RMONSTART.COM to define LNK$LIBRARY, you will have to run the IVP on the boot node as well as on the VAXcluster satellite nodes.)

Simply running the system startup command procedure SYSTARTUP_V5.COM or the RMU/MONITOR START command does not perform all of the tasks that the RMONSTART.COM procedure does and that Rdb/VMS requires.

3.2 Modifying System Parameters

You may have to adjust system parameters to improve Rdb/VMS performance. The values appropriate for your system might differ substantially from those values specified in Chapter 1. You might have to adjust some parameters depending on the other layered products installed on your system. In addition, you might have to add the values you estimate for Rdb/VMS applications to the values calculated for other layered products. Refer to the appropriate manual in the VMS documentation set for additional information.

The following system parameters are important in optimizing Rdb/VMS performance:

- CHANNELCNT
- LOCKIDTBL_MAX
- PROCSECTCNT
- RESHASHTBL
- SPRCOUNT
- SPRCOUNTV

- NPAGEDYN
- NPAGEVIR
- IRPCOUNT
- IRPCOUNTV
- MAXBUF
- VIRTUALPAGECNT

Table 1–4 lists the minimum system parameter values required to install Rdb/VMS. These are also the values that should result in satisfactory performance for the average number of Rdb/VMS users. If you are using these values and still have Rdb/VMS performance problems, see the *VAX Rdb/VMS Guide to Database Maintenance and Performance*.

3.3 Rebooting the System

You can reboot your system after you have installed Rdb/VMS, edited the system startup and shutdown files, and set the system parameters (if necessary). A system reboot verifies that Rdb/VMS is ready for use (that is, if you have added RMONSTART.COM to the system startup file), ensures that the edits to the system startup command file are correct, and establishes any new parameter settings. Note, however, that rebooting is optional.

3.4 VAXcluster Considerations

If the processor on which you installed Rdb/VMS is a member of a VAXcluster environment, you need to take the following steps to make Rdb/VMS, SQL, and SQL/Services available to other cluster members:

1. Load your license on each node in the VAXcluster system that will use Rdb/VMS. See Section 3.4.1 about loading licenses on satellite nodes.
2. Remove the comment character (!) that prefixes the SQL/Services startup command procedure in the SQL SQL$STARTUP.COM startup procedure. Refer to Section 3.1 for details.
3. Edit the system startup and shutdown files of the cluster members on which you want to run Rdb/VMS so they invoke the Rdb/VMS startup and shutdown procedures. (You may omit this step if you have already made these changes in a command file which is invoked for all VAXcluster systems.) See Section 3.1 about editing the system files.
4. Run the Rdb/VMS startup command procedure, RMONSTART.COM, on each node in the cluster. The installation procedure ran this startup procedure on the processor on which you installed Rdb/VMS, so it is not necessary to rerun it from that CPU node. See Section 3.4.1 about running startup procedures on satellite nodes.

5. After running the startup file, run the IVP on all satellite nodes to verify that Rdb/VMS is accessible from each node. See Section 3.4.1 about running the IVP on satellite nodes.
6. Run RDBSERVER_NCP.COM to assign a password to the RDBSERVER object on each node in a VAXcluster system to enable remote database access on these nodes. See Section 3.4.2 about executing RDBSERVER_NCP.COM in VAXclusters environments.

3.4.1 Using SYSMAN to Load Licenses, Run Startup Procedures and Run the IVP on Each Node

You can use the VMS SYSMAN utility to load licenses and run the Rdb/VMS startup procedure and the IVP on each node of your VAXcluster environment. Perform the following steps if you have installed the full development license and want to perform these operations on all nodes of a cluster.

```
$  RUN SYS$SYSTEM:SYSMAN
SYSMAN>  SET ENVIRONMENT /CLUSTER /USERNAME=SYSTEM
Remote Password: (supply SYSTEM password here)
SYSMAN>  DO LICENSE LOAD RDB
SYSMAN>  DO @SYS$STARTUP:RMONSTART
SYSMAN>  DO @SYS$TEST:RDBIVP DEV
SYSMAN>  EXIT
```

If you have installed the interactive license, use the initials INT in place of DEV when running the IVP.

If you want to perform these operations on only certain nodes of a cluster, substitute the /CLUSTER qualifier in the preceding example with the names of the nodes on which you want to perform the operations.

3.4.2 Executing RDBSERVER_NCP.COM in a VAXcluster Environment

Log into each node and run the RDBSERVER_NCP.COM procedure to insert the RDBSERVER.EXE object into a node's permanent DECnet object database. It only needs to be executed once per VAXcluster node. You do not have to execute the RDBSERVER_NCP.COM procedure on the node from which the installation took place. The installation procedure that executes on that node performs the RDBSERVER.EXE insertion.

The RDBSERVER_NCP.COM procedure prompts for the password to assign to the RDBSERVER.EXE object. For remote database access to work, you must assign the same password as entered for the RDB$REMOTE account during the installation procedure. For example, if XBIG_SECRETZ was the password you assigned to the RDB$REMOTE account during the installation procedure on VAXcluster node NODE1 and if the VAXcluster system also includes nodes NODE2 and NODE3, you must log in to nodes NODE2 and NODE3 and enter:

```
$  SET DEFAULT SYS$COMMON:[SYSMGR]
$  @RDBSERVER_NCP

Please enter the password for object name RDBSERVER:  XBIG_SECRETZ

Please verify password:  XBIG_SECRETZ
```

Note *The password shown is used for example purposes only. Do not use this password on your system.*

As with the DCL SET PASSWORD command, your password does not appear on the terminal. To protect against typing errors that are not seen when you enter the password, you must enter the password twice. If you are not able to verify the password correctly after three attempts, the RDBSERVER_NCP.COM procedure fails and the RDBSERVER.EXE object is not inserted into the node's DECnet object database.

3.5 User Account Requirements

To work with Rdb/VMS, user accounts on your system must have certain privileges and quotas. This section contains information on these requirements.

To use Rdb/VMS, each account must have at least the TMPMBX and NETMBX privileges. Use the VMS Authorize utility (AUTHORIZE) to determine if users have the privileges they require. You must have system privileges to use AUTHORIZE.

To grant privileges to user SMITH, perform the following steps:

```
$  SET DEFAULT SYS$SYSTEM
$  RUN AUTHORIZE
UAF>  MODIFY SMITH /PRIVILEGE=(TMPMBX,NETMBX) -
/DEFPRIV=(TMPMBX,NETMBX)
```

You must make sure that the appropriate user accounts have sufficient quotas to be able to use Rdb/VMS. The values suggested are minimum settings; the settings required by users on your system might differ substantially. The suggested values are specific only to the use of Rdb/VMS. You should add the values required for other VMS layered products to the value you choose to use for Rdb/VMS and modify the values for each user as needed. Table 3–1 summarizes the required user account quotas.

Table 3–1 User Account Quotas for Using Rdb/VMS

Account Quota	Value
ASTLM	DIOLM + 2
BIOLM	-[1]
BYTLM	20,480
DIOLM	-[1]
ENQLM	600[2]
FILLM	50
PGFLQUO[3]	20,000
PRCLM	1[4]

[1]This value should be equal to or greater than the value for the defined number of database buffers. Use the RMU/DUMP command to display this value.

[2]This value should be raised to 2000 if CDD/Plus is used.

[3]The maximum value that can be set for the RDM$BIND_BUFFERS logical or the NUMBER OF BUFFERS clause in the CREATE SCHEMA or DEFINE DATABASE statements, depends on a sufficiently high value being set for the PGFLQUO parameter. If the PGFLQUO parameter is not sufficiently high, and RDM$BIND_BUFFERS has been assigned a large value, then defining any database would produce an exception. Data Distributor users should be aware that Data Distributor uses Rdb/VMS to create the transfer database. The creation of the transfer database will generate a bugcheck dump if PGFLQUO is not set high enough. Table 1–4 specifies a minimum value of 20,000 for the PGFLQUO parameter which is large enough to handle most situations.

[4]This value should be at least 1 if any precompilers will be used. SQLMOD, SQL$PRE, and RDBPRE all spawn subprocesses to do language processing. Some RMU commands also spawn subprocesses. Thus you must allow for at least 1 process on your system.

You use AUTHORIZE to verify and change user account quotas. At the AUTHORIZE prompt (UAF>), enter the SHOW command with an account name to check that particular account. For example:

```
UAF>  SHOW SMITH
```

To change a quota, use the MODIFY command at the UAF prompt. The MODIFY command has the following syntax:

MODIFY account-name /quota-name=NNN

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

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

After you exit from the utility, the VMS system displays messages that indicates whether or not changes were made. Once you have finished making the changes, the users must log out and log in again for the new quotas to take effect.

For more information on modifying account quotas, see the description of the VMS Authorize utility in the VMS documentation set.

3.6 Converting Existing Databases

You must use the Rdb/VMS Management Utility (RMU) to convert existing Rdb/VMS databases to a format compatible with Rdb/VMS V4.0 software. You can convert V3.0, V3.0A, V3.0B, V3.1, V3.1A, and V3.1B databases using RMU/CONVERT. The VMS SYSPRV privilege is required to convert databases unless RMU has been installed with SYSPRV.

The RMU/CONVERT command accepts the database file name(s) you enter, updates all metadata, and creates new metadata for Rdb/VMS V4.0. You can use a list of specific database names which may include wildcards. You can also specify a data dictionary path name using the /PATH qualifier. However, wildcards are not allowed for data dictionary path names. The command can convert databases created with Rdb/VMS Versions 3.0, 3.0A, 3.0B, 3.1, 3.1A, and 3.1B.

To convert a database, enter the following command at the DCL command level:

```
$  RMU/CONVERT db-filename
```

By default, the RMU will commit the conversion unless you specify /NOCOMMIT on the command line. The /NOCOMMIT qualifier lets you postpone either commiting the conversion or rolling it back. If you have specified /NOCOMMIT, RMU/CONVERT will leave two versions of the metadata in your database. You will be able to use the database with the newer version of Rdb/VMS. However, you will not be able to perform DDL operations to that database until after you commit the conversion. If you specify the /COMMIT qualifier, RMU will create a new version of your metadata, and delete the old version.

You can also specify the /ROLLBACK qualifier with the RMU/CONVERT command. The /ROLLBACK qualifier specifies that the database should be rolled back to the old version. For example:

```
$  RMU/CONVERT/ROLLBACK PERSONNEL
Are you satisfied with your backup of DISK2:[USER]PERSONNEL.RDB;1 [N]?
```

```
Y
After-image journaling will be disabled if the RMU/CONVERT of
DISK2:[USER]PERSONNEL.RDB;1 continues.  Do you wish to proceed [N]?  Y
%RMU-I-LOGCONVRT, database root converted to current structure level
%RMU-I-CVTROLSUC, CONVERT rolled-back for DISK2:[USER]PERSONNEL.RDB;1 to
version V3.1
%RMU-I-LOGCREAIJ, created after-image journal file DISK2:[USER]PERSJL.AIJ;4
```

Note *Once you have committed the conversion of a database file, you can no longer use that database file with a previous version of Rdb/VMS.*

Users trying to access unconverted databases with Version 4.0 software will receive the following fatal error messages:

```
%RDB-F-WRONG_ODS, the on-disk structure of database filename is not supported
by version of facility being used
-RDMS-F-ROOTMAJVER, database format is not compatible with software version
%RDO-F-BACKCONV, Please backup your database and use the RMU/CONVERT command.
```

The RMU/CONVERT command copies all metadata in the system relations. Therefore, the time needed to convert a database depends upon the size of the system relations. If you have made many metadata changes, your system relations may be larger than if your metadata has been stable. If your database has very large system relations, it might be more efficient to use EXPORT/IMPORT to convert the database. An EXPORT/IMPORT operation involves only the latest version of the metadata; it does not make an exact copy of the system relations.

The RMU/CONVERT command displays a question about the backup of your database. For example:

```
Are you satisfied with your backup of DISK$1:[RDB.DB]SHIPPING.RDB;48?
```

The RMU/CONVERT command can disable after-image journaling during the conversion. If the database to be converted has after-image journaling enabled, RMU prompts you to determine if you want after-image journaling disabled so that the conversion can continue. If you reply N (for NO), the RMU/CONVERT operation aborts and returns you to DCL command level.

```
$  RMU/CONVERT/NOCOMMIT PERSONNEL
Are you satisfied with your backup of DISK2:[USER]PERSONNEL.RDB;1 [N]?  Y
After-image journaling will be disabled if the RMU/CONVERT of
DISK2:[USER]PERSONNEL.RDB;1 continues.  Do you wish to proceed [N]?  N
$
```

If you reply Y (for YES), RMU disables after-image journaling, converts the database, and then re-enables after-image journaling with an AIJ file of the same name and next higher version number:

```
$  RMU/CONVERT/NOCOMMIT PERSONNEL
Are you satisfied with your backup of DISK2:[USER]PERSONNEL.RDB;1 [N]?
```

```
Y
After-image journaling will be disabled if the RMU/CONVERT of
DISK2:[USER]
PERSONNEL.RDB;1 continues.  Do you wish to proceed [N]?  Y
%RMU-I-LOGCONVRT, database root converted to current structure level
%RMU-S-CVTDBSUC, database DISK2:[USER]PERSONNEL.RDB;1 successfully
converted from version V3.1 to V4.0
%RMU-I-LOGCREAIJ, created after-image journal file
DISK2:[USER]PERSJL.AIJ;3
```

If you have already disabled after-image journaling, this prompt does not appear.

After you have answered the conversion questions, and the conversion is complete, the RMU/CONVERT command returns you to DCL command level.

If an error occurs when you use the RMU/CONVERT command, restore the database (using the IMPORT statement) from the EXPORT version that was created before the installation (as described in Chapter 1).

If the system crashes during the initial convert operation, simply re-enter the RMU/CONVERT command.

For more information about RMU/CONVERT, see the *VAX Rdb/VMS RDO and RMU Reference Manual*.

3.7 Installing RMU with Privileges

After the installation, you should install RMU.EXE with the VMS SYSPRV privilege. Doing so will make it possible for the RMU image to check for applicable Rdb/VMS privileges whenever a user enters RMU commands. If you do not install RMU.EXE with SYSPRV, users will need VMS SYSPRV to execute most RMU commands.

To install RMU with SYSPRV, enter the following command:

```
$  INSTALL
INSTALL>  ADD SYS$SYSTEM:RMU.EXE /OPEN/HEADER/PRIV=(SYSPRV)
```

This particular VMS INSTALL command requires the VMS CMKRNL privilege because the RMU image is being installed with privileges.

If you have previously used the VMS INSTALL utility to install RMU.EXE, you should use the REPLACE command instead of the ADD command on the INSTALL command line.

Because RMU references the following images, they will also need to be installed:

```
$ INSTALL ADD SYS$COMMON:[SYSMSG]RDMSMSG.EXE/SHARE
$ INSTALL ADD SYS$COMMON:[SYSMSG]RMUMSG.EXE/SHARE
```

See Appendix A for information concerning privileges required to use RMU. See the *VAX Rdb/VMS RDO and RMU Reference Manual* for more information about the RMU utility. See the *VMS Install Utility Manual* for more information about the VMS INSTALL utility.

3.8 Tailoring Your System

This section provides information about special system arrangements and cleanup procedures that you can perform after installing Rdb/VMS.

3.8.1 Setting up DECtrace

If you have DECtrace for VMS installed on your system, you must manually restart DECtrace by running the EPC$STARTUP procedure. Enter the following command:

```
$  @SYS$STARTUP:EPC$STARTUP
```

The installation procedure inserts the Rdb/VMS facility definition into a library file called EPC$FACILITY.TLB. To be able to collect Rdb/VMS event-data using DECtrace, you must move this facility definition into the DECtrace administration database. Perform the following steps:

1. Extract the definition from the facility library to a file (in this case, RDBVMS.EPC$DEF.)

   ```
   $  LIBRARY /TEXT /EXTRACT=RDBVMSV4.0-0 /OUT=RDBVMS.EPC$DEF -
   _$  SYS$SHARE:EPC$FACILITY.TLB
   ```

2. Insert the facility definition into the DECtrace administration database.

   ```
   $  COLLECT INSERT RDBVMS.EPC$DEF /REPLACE
   ```

3.8.2 Using the RDB$REMOTE Account for Remote Access

The Rdb/VMS installation creates the RDB$REMOTE account specifically for remote access. This account can be used by any program accessing any remote DSRI-compliant database. Programs that execute on remote nodes and access Rdb/VMS databases on your node through DECnet can log on to your system through the RDB$REMOTE account.

The Rdb/VMS V4.0 installation procedure defines RDB$REMOTE as the default DECnet account for the RDBSERVER.EXE object. This definition supersedes any previous assignment you may have made in the Network Control Program (NCP) for the RDBSERVER.EXE object. The RDB$REMOTE account includes a password that you assigned during the installation procedure. The password you provided is used for the RDB$REMOTE account and in the DECnet NCP object database on your VAX node. This means that the RDB$REMOTE password and the password assigned to the RDBSERVER.EXE image will be the same. However, in a VAXcluster environment, the installation procedure assigns the same password to the

RDB$REMOTE account and the RDBSERVER.EXE image only on the node from which the installation took place. Be sure to make the proper assignments on each node that shares the common root directory (as described in Section 3.4.2).

Programs that execute on remote nodes and access an Rdb/VMS database on your node through DECnet can access your system through the RDB$REMOTE account. For example, to access an Rdb/VMS database on node TRIXIE from node NODE1, define a logical on node NODE1, enter SQL, and invoke the database:

```
$! On node NODE1:
$  DEFINE MYDB "TRIXIE::WORK$:[USER.DBS]PERSONNEL"
$ !                    ^
$ !                    |
$ ! Note there is no need for an access control string.
$ !
$  SQL
SQL>  DECLARE SCHEMA FILENAME MYDB;
```

Because RDB$REMOTE is defined as the account used by RDBSERVER.EXE on node TRIXIE, it is not necessary (unless you specifically want the server to run under a different account) to include an access control string such as the following:

```
$  DEFINE MYDB "TRIXIE""RDB$REMOTE""::WORK$:[USER.DBS]PERSONNEL"
                     ^             ^
                     |_____________|
                           |
                     Not necessary
```

The RDB$REMOTE account is assigned the proper process quotas and privileges to work with Rdb/VMS. Some users have encountered problems with remote database access because they rely on the default DECnet account, which commonly does not have sufficient process quotas. See Table 3–1 for information about user account quotas.

The RDB$REMOTE account is a captive account. Captive accounts, like noncaptive accounts, do not require a SYS$MANAGER:SYLOGIN.COM procedure. However, if you encounter any errors with the use of the RDB$REMOTE account, check that the SYS$SYLOGIN logical name (if defined) points to a working SYLOGIN.COM procedure.

As a captive account, RDB$REMOTE does require a login procedure. The login procedure for RDB$REMOTE is RDB$REMOTE_LOGIN.COM and is written to SYS$COMMON:[SYSEXE]. This login procedure includes security checks that ensure the user is running the RDBSERVER.EXE image (DECnet object number 35). If you want product-specific files to be run during the RDB$REMOTE account login step, you must edit the RDB$REMOTE_LOGIN.COM file in the SYS$COMMON:[SYSEXE] directory and insert the appropriate DCL commands.

3.8.3 Moving Rdb/VMS Demonstration and Sample Database Files to Another Directory

The installation procedures store the Rdb/VMS demonstration and sample database files in the directory:

SYS$COMMON:[SYSHLP.EXAMPLES.RDBVMS]

If this directory does not exist, the installation procedure creates it. The file SYS$STARTUP:RMONSTART.COM defines a logical name RDM$DEMO to refer to SYS$COMMON:[SYSHLP.EXAMPLES.RDBVMS]. The logical name SQL$SAMPLE also refers to this directory. If you need to move the Rdb/VMS sample database and demonstration files to another directory, redefine the RDM$DEMO and SQL$SAMPLE system logical names to point to that directory.

3.8.4 Logical Names Created by the Installation Procedure

The SQL/Services startup procedure creates systemwide logical names for client API software directories. These logical names, listed in Table 3–2, are used when installing the API software on client systems.

Table 3–2 SQL/Services Logical Names

Name	Description
SQLSRV$VMS	VMS API software
SQLSRV$MSDOS	MS-DOS API software
SQLSRV$ULTRIX	ULTRIX API software
SQLSRV$OS2	OS/2 API software

Client API software for VMS, MS-DOS, ULTRIX, and OS/2 and associated logical names are available only with the Rdb/VMS full development kit.

3.8.5 List of Files Installed by Rdb/VMS

A file is written to your system that identifies all the Rdb/VMS files installed on your system. To obtain this list after the installation ends, print (DCL PRINT) or display (DCL TYPE) a copy of the following file:

```
SYS$COMMON:[SYSMGR.VAXINFO$PRODUCTS]RDBVMS040_FILES.DAT
```

Note *In Rdb/VMS Version 2.2, the file was placed in SYS$COMMON:[SYSEXE]. The new location was created to help prevent the inadvertent deletion of the file. The Rdb/VMS V4.0 installation automatically deletes the SYS$SYSTEM:RDBVMS022_FILES.DAT file, if one exists.*

3.8.6 Modifying the SQL/Services Configuration File

The installation procedure stores the SQL/Services SQLSRV$CONFIG.DAT configuration file on your system in the SYS$STARTUP directory. At Rdb/VMS system startup, the SQL/Services communication server reads the configuration file and creates a pool of processes to execute client API requests. If the process pool that the communication server initially creates does not meet your client application requirements, you might have to modify the configuration file to reconfigure the process pool.

To make the decision either way, refer to the *VAX Rdb/VMS Guide to Using SQL/Services*. It describes the initial configuration file, the process pool created from it, and how to modify the configuration file if necessary. Modification of the configuration file does require that you manually shut down SQL/Services, edit the configuration file, and restart SQL/Services. No Rdb/VMS shutdown is required.

3.9 Enhancing Rdb/VMS Performance

This section includes information on system tuning and explains how to install Rdb/VMS as a shared image. Installing Rdb/VMS as a shared image can enhance performance.

3.9.1 Tuning Your System

After you install Rdb/VMS, you might want to adjust your system to enhance performance or lower the use of some system resources. Information about tuning your system is included in the *VAX Rdb/VMS Guide to Database Maintenance and Performance*. See Section 1.5.10 for suggested initial system parameter values.

3.9.2 Installing Rdb/VMS Images as Shared

If you expect Rdb/VMS to be used extensively on your system, you can reduce the system overhead and memory requirements by installing images as shared. When images are not installed as shared, multiple users who access the images at the same time must each have their own copy of those images in memory. When the images are installed as shared, everyone maps to the same copy of the image, eliminating duplicate copies of the same image, and thus improving performance.

The installation procedure automatically installs RDMSHRP.EXE, RDMSHR.EXE, and RDMPRV.EXE as shared images for all license options. Other images are not installed as shared on your system.

To install SQL and SQL/Services images as shared, follow these steps:

- Edit the file SYS$STARTUP:SQL$STARTUP.COM to enable the portion of the file that invokes INSTALL to install the images as shared when the system starts up and to remove the images when it shuts down.

The command file SYS$STARTUP:SQL$STARTUP.COM contains two GOTO commands that branch around the part of the file that invokes INSTALL to install SQL images as shared.

To enable that part of the file, edit it and delete the first two occurrences of the command GOTO EXIT_PROC.

Both occurrences of the command GOTO EXIT_PROC that you need to delete are preceded by comments noting they should be deleted if you want SQL images installed or removed on system startup or shutdown.

The first GOTO EXIT_PROC branches around commands that invoke INSTALL to remove SQL images when the system shuts down. The second GOTO EXIT_PROC branches around commands that invoke INSTALL to install the images as shared when the system starts up.

- Edit the SQL/Services startup file SYS$STARTUP:SQLSRV$STARTUP.COM to install the following SQL/Services images as shared at system startup:

```
$!      install add sys$share:sqlsrv$api.exe   /share/open/header
$!      install add sys$share:sqlsrv$.exe      /share/open/header
$!      install add sys$share:sqlsrv$exe.exe   /share/open/header
$!      install add sys$share:sqlsrv$msg.exe   /share/open/header
$!      install add sys$share:sqlsrv$mod.exe   /share/open/header
```

  Remove the comment characters (!) to have SQL/Services images installed as shared.

- Check the current values for the global pages and global sections system parameters, and increase if necessary. See Section 1.5.10.2 and Section 1.5.10.3 for information on checking and modifying these parameter values. Table 3–3 shows the approximate values required by SQL and SQL/Services for global pages and global sections.

Table 3–3 SQL and SQL/Services Images

License Option	Image Name	Global Pages[1]	Global Sections[1]
Full development	SYS$SHARE:SQL$INT.EXE	6	1
	SYS$MESSAGE:SQL$MSG.EXE	208	1
	SYS$SYSTEM:SQL$.EXE	892	2
	SYS$SYSTEM:SQL$PRE.EXE	860	2
	SYS$SYSTEM:SQL$MOD.EXE	736	2
	SYS$SYSTEM:SQLSRV$.EXE	0	0

[1]Values supplied are approximate.

(continued on next page)

Table 3–3 (Cont.) SQL and SQL/Services Images

License Option	Image Name	Global Pages[1]	Global Sections[1]
	SYS$LIBRARY:SQLSRV$API.EXE	176	2
	SYS$LIBRARY:SQLSRV$MOD.EXE	18	2
	SYS$MESSAGE:SQLSRV$MSG.EXE	12	1
	SYS$SHARE:SQLSRV$APIG.EXE	178	2
	SYS$SYSTEM:SQLSRV$UTL.EXE	4	1
Interactive	SYS$SHARE:SQL$INT.EXE	6	1
	SYS$MESSAGE:SQL$MSG.EXE	208	1
	SYS$SYSTEM:SQL$.EXE	892	2
	SYS$SYSTEM:SQLSRV$.EXE	62	1
	SYS$LIBRARY:SQLSRV$MOD.EXE	18	2
	SYS$MESSAGE:SQLSRV$MSG.EXE	12	1
	SYS$SYSTEM:SQLSRV$UTL.EXE	4	1
Run-time only	SYS$SHARE:SQL$INT.EXE	6	1
	SYS$MESSAGE:SQL$MSG.EXE	208	1
	SYS$SYSTEM:SQLSRV$.EXE	62	1
	SYS$LIBRARY:SQLSRV$MOD.EXE	18	2
	SYS$MESSAGE:SQLSRV$MSG.EXE	12	1
	SYS$SYSTEM:SQLSRV$UTL.EXE	4	1

[1]Values supplied are approximate.

- Execute SQL$STARTUP.COM on each node of your VAXcluster system. If necessary, reboot the system to make new values (if any) for global pages and global sections take effect.

The SQL/Services SYS$STARTUP:SQLSRV$SHUTDOWN.COM command procedure always removes shared images during SQL/Services system shutdown.

To install other Rdb/VMS images as shared, follow these steps:

- Edit the file SYS$COMMON:[SYS$STARTUP]RMONSTART.COM. Just below the label INSTALL_IMAGES, you will find symbol definitions to simplify the installation of images, followed by the commands that actually install the images:

```
$ INSTALL_IMAGES:
$ !     INSTALL := $SYS$SYSTEM:INSTALL/COMMAND_MODE
$       DEFX    = "DEFINE/NOLOG X"
$       ADDX    = -
           "IF .NOT. F$FILE_ATTRIBUTES(""X"",""KNOWN"") THEN INSTALL ADD X":
$       REMOVEX = -
           "IF F$FILE_ATTRIBUTES(""X"",""KNOWN"") THEN INSTALL REMOVE X"
$ !
$       DEFX SYS$COMMON:[SYSLIB]RDMPRV.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD/PROT
.
.
.
```

- Add the corresponding commands for every optional image that you wish to install. The following example shows the commands that you may use. These commands do not already reside in RMONSTART.COM; you will have to add them yourself.

```
$ !
$ ! The file RDBSHR.EXE is used by everyone who accesses Rdb/VMS.  It is
$ ! already installed by RMONSTART, but you can improve system performance
$ ! by installing it /SHARED as shown.  This will have the largest effect
$ ! on system performance.
$ !
$       DEFX SYS$COMMON:[SYSLIB]RDBSHR.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD
$ !
$ ! The following images are used by the RMU utility.  If RMU is installed
$ ! with privileges, as shown in the example, it may be accessed by
$ ! nonprivileged users, in addition to having better performance.
$ !
$       DEFX SYS$COMMON:[SYSEXE]RMU.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD/PRIV=(SYSPRV)
$       DEFX SYS$COMMON:[SYSMSG]RMUMSG.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD
$       DEFX SYS$COMMON:[SYSMSG]RDMSMSG.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD
$ !
$ ! The following images are used by RDBPRE.  Installing them improves
$ ! performance of the RDBPRE compiler, but does not affect the runtime
$ ! performance of images that are produced by RDBPRE.
$ !
$       DEFX SYS$COMMON:[SYSEXE]RDBPRE.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD
$       DEFX SYS$COMMON:[SYSMSG]RDOMSG.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD
```

```
$       DEFX SYS$COMMON:[SYSMSG]RDMSMSG.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD
$ !
$ ! The following images are used by RDML.  Installing them improves
$ ! performance of the RDML compiler, but does not affect the runtime
$ ! performance of images that are produced by RDML.
$ !
$       DEFX SYS$COMMON:[SYSEXE]RDML.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD
$       DEFX SYS$COMMON:[SYSMSG]RDMLMSG.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD
$       DEFX SYS$COMMON:[SYSMSG]RDMSMSG.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD
$ !
$ ! The following images are used by interactive RDO.  Installing them
$ ! improves the performance of this interactive utility.
$ !
$       DEFX SYS$COMMON:[SYSEXE]RDO.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD
$       DEFX SYS$COMMON:[SYSMSG]RDOMSG.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD
$       DEFX SYS$COMMON:[SYSMSG]RDMSMSG.EXE
$               REMOVEX
$               ADDX /OPEN/SHARE/HEAD
```

- If you install some or all of these images as shared, you must verify that you have enough global pages and global sections to accommodate the shared images. Table 3–4 also lists the approximate number of global pages and global sections required for each Rdb/VMS image that is installed as shared. See Section 1.5.10.2 and Section 1.5.10.3 for information on how to verify and change the settings for the GBLSECTIONS and GBLPAGES parameters.

Table 3–4 Rdb/VMS Images

License Option	Image Name	Global Pages[1]	Global Sections[1]
Full development	SYS$SYSROOT:[SYSEXE]RDBPRE.EXE	614	3
	SYS$SYSROOT:[SYSEXE]RDML.EXE	568	3

[1]Values supplied are approximate.

(continued on next page)

Table 3–4 (Cont.) Rdb/VMS Images

License Option	Image Name	Global Pages[1]	Global Sections[1]
	SYS$SYSROOT:[SYSMSG]RDMLMSG.EXE	22	1
	SYS$SYSROOT:[SYSEXE]RDO.EXE	768	2
	SYS$SYSROOT:[SYSMSG]RDMSMSG.EXE	88	1
	SYS$SYSROOT:[SYSMSG]RDOMSG.EXE	120	1
	SYS$SYSROOT:[SYSEXE]RMU.EXE	1332	2
	SYS$SYSROOT:[SYSMSG]RMUMSG.EXE	152	1
Interactive	SYS$SYSROOT:[SYSEXE]RDO.EXE	768	2
	SYS$SYSROOT:[SYSMSG]RDMSMSG.EXE	88	1
	SYS$SYSROOT:[SYSMSG]RDOMSG.EXE	120	1
	SYS$SYSROOT:[SYSEXE]RMU.EXE	1332	2
	SYS$SYSROOT:[SYSMSG]RMUMSG.EXE	152	1
Run-time	SYS$SYSROOT:[SYSEXE]RDO.EXE	768	2
	SYS$SYSROOT:[SYSMSG]RDMSMSG.EXE	88	1
	SYS$SYSROOT:[SYSMSG]RDOMSG.EXE	120	1
	SYS$SYSROOT:[SYSEXE]RMU.EXE	1332	2
	SYS$SYSROOT:[SYSMSG]RMUMSG.EXE	152	1

[1]Values supplied are approximate.

During an orderly shutdown of a VMS system, the file SYS$COMMON:[SYSMGR]RMONSTOP.CO removes the images which are installed by RMONSTART.COM, namely RDMPRV, RDMSHR, and RDMSHRP. Edit this file and follow the example of these 3 images to remove any images which you installed above.

3.10 Running the Rdb/VMS IVP as a Standalone Procedure

The Rdb/VMS IVP procedure can be run at any time after the successful installation of Rdb/VMS. For example, if Rdb/VMS does not appear to be running properly, you may want to verify that the correct Rdb/VMS distribution kit files are present on your system.

The account you use to run the IVP must have the TMPMBX and SYSPRV privileges. If the data dictionary is installed on the system, the account must also have BYPASS privilege or the CDD EXTEND privilege at the CDD$TOP dictionary directory. Also, the quotas for the account you use must be sufficient to run Rdb/VMS.

To run the Rdb/VMS IVP after the installation of Rdb/VMS:

1. Set the default to the following directory:

```
$  SET DEFAULT SYS$COMMON:[SYSTEST]
```

2. The command you enter to invoke the IVP depends on whether or not you have installed the VAX Rdb/VMS Full Development, Interactive, or Run-Time kit license option:

```
$  @RDBIVP DEV    ! Executes full development kit IVP
$  @RDBIVP INT    ! Executes interactive kit IVP
$  @RDBIVP RTO    ! Executes run-time kit IVP
```

The standalone IVP procedure runs in the same manner as the VMSINSTAL IVP procedure. If the IVP fails, it creates a log file, SYS$UPDATE:RDBIVP.LOG, of the failed portion of the test.

3.11 Returning the System to Original Settings

If you have set interactive logins to 0 or changed the protection on the Help library, you must reverse these actions.

- To restore interactive logins, enter the following command:

```
$  SET LOGIN/INTERACTIVE= value
```

- To change the protection on the Help library, enter the following commands:

```
$  SET DEFAULT SYS$HELP
$  SET PROTECTION=(S:RWED,O:RWED,G:RWED,W:RE) HELPLIB.HLB
```

- If the system parameter CLISYMTBL was less than 250 before the installation, you can now set it to the original setting. See Section 1.5.10.4 for more information.

3.12 Determining and Reporting Problems

If an error occurs while Rdb/VMS is being used and you believe that the error is caused by a problem with Rdb/VMS, take one of the following actions:

- If you have a BASIC or DECsupport Software Agreement, you should call your Customer Support Center. With these services, you receive telephone support that provides high-level advisory assistance.
- If you have a Self-Maintenance Software Agreement, you can submit a Software Performance Report (SPR).
- If you purchased Rdb/VMS within the past 90 days and you think the problem is caused by a software error, you can submit a Software Performance Report (SPR).

See the *VAX Rdb/VMS Guide to Database Maintenance and Performance* for information on how to submit an SPR.

If you find an error in the Rdb/VMS documentation, you should fill out and submit the Reader's Comments form at the back of the document in which the error occurred. Include the section and page number where the error occurred.

A

VMS Security and Rdb/VMS

This appendix discusses the use of VMS security features by Rdb/VMS.

A.1 VMS Privileges Used to Install Rdb/VMS

Rdb/VMS must be installed from a privileged account. Usually, the SYSTEM account is used. The VMSINSTAL procedure is located in SYS$UPDATE, which is a restricted directory. The VMS SETPRV privilege is required in order to run VMSINSTAL. The VMSINSTAL procedure will then grant all privileges other than BYPASS. (The VMSINSTAL procedure will also turn off BYPASS at the start of the installation.)

A.2 VMS Privileges Required for RMU Commands

An Rdb/VMS database is protected by a combination of Rdb/VMS and VMS privileges. VMS privileges are not necessary to use data manipulation or data definition statements. However, some database maintenance operations still do require VMS privileges. These operations are not dependent on declaring the database, and hence cannot be enforced using Rdb/VMS privileges. Table A–1 lists the maintenance operations and indicates which of these require VMS privileges.

Table A–1 Security Controls Required to Use RMU Functions

RMU[1] Function	VMS Privileges
Convert database	

[1]RMU is the Rdb/VMS Management Utility.

(continued on next page)

Table A–1 (Cont.) Security Controls Required to Use RMU Functions

RMU[1] Function	VMS Privileges
Restore database	SYSPRV
Recover database	SYSPRV
Dump database	SYSPRV
Close database	SYSPRV
Start database monitor[2]	SETPRV
Reopen database monitor log	WORLD
Stop database monitor	WORLD
RMU/SHOW with no database specified RMU/SHOW SYSTEM RMU/SHOW USERS	WORLD
Dump journals or backup file	SYSPRV
Use RMU/ALTER to repair database	SYSPRV
Resolve hung transactions	SYSPRV

[1]RMU is the Rdb/VMS Management Utility.

[2]Start the monitor from the SYSTEM account that has the SETPRV privilege. The process starting the monitor attempts to give the monitor all privileges; in particular the privileges required are as follows: ALTPRI, CMKRNL, DETACH, PSWAPM, SETPRV, SYSGBL, SYSNAM, and WORLD.

RMU functions are likely to require VMS privileges when the function:

- Operates across multiple databases (such as the monitor-related commands)
- Operates on a corrupt or otherwise non-functional database where Rdb/VMS privileges can not be checked
- Performs highly critical and sensitive operations

Most RMU functions require the VMS SYSPRV privilege when RMU has *not* been installed with SYSPRV. See Section 3.7 for more information.

A.3 VMS Privileges That Override Rdb/VMS Protection

Certain VMS privileges can override Rdb/VMS protection. Therefore, you must be very careful assigning VMS privileges. The distinction between Rdb/VMS and VMS privileges is that VMS privileges are systemwide, while Rdb/VMS privileges are associated with a particular database or database object. Table A–2 indicates which Rdb/VMS privileges can be bypassed by users possessing certain VMS privileges.

Table A–2 VMS Privileges That Override Rdb/VMS Privileges

VMS Privilege	Overriden Rdb/VMS Privileges
BYPASS	All privileges *except* DBADM, OPERATOR, SECURITY, and DBCTRL
READALL	SELECT schema/table privilege
SYSPRV	All privileges except OPERATOR and SECURITY
OPER	SELECT schema privilege and OPERATOR schema privilege
SECURITY	SELECT schema privilege and SECURITY schema privilege and DBCTRL

The *VAX Rdb/VMS Guide to Database Design and Definition* includes a table indicating which actions can be performed with which VMS and Rdb/VMS privileges.

Note *Certain sites might want to restrict the ability of users to create their own databases. These sites would have to define the RDBVMS$CREATE_DB logical. When you use this logical name, other installed Digital and third party products will not be able to use Rdb/VMS to create Rdb/VMS databases. Therefore, you must deassign this logical whenever users of such products need to create an Rdb/VMS database. More information on the use of this logical name can be found in the* VAX Rdb/VMS Guide to Database Design and Definition.

A.4 VMS Protection of Rdb/VMS Files

Rdb/VMS sets the following VMS default protection for all database files:

```
SYSTEM:READ,WRITE,EXECUTE,DELETE; OWNER:READ; GROUP: , WORLD:
```

This affects the following files:

- Database root (RDB)
- Recovery-unit journal (RUJ)

- After-image journal (AIJ)
- Snapshot (SNP)
- Storage area (RDA)

These restrictions protect the database from applications or processes not using Rdb/VMS. Rdb/VMS uses the VMS SYSPRV privilege to open database files, then checks that user's user identification code (UIC) against the Rdb/VMS access privilege set to determine access to database objects. Section A.5 discusses protection specific to Rdb/VMS.

A.5 Rdb/VMS Internal Protection

Internal Rdb/VMS protection depends on the use of access privilege sets (APSs) that connect database subjects and objects with certain privileges. Rdb/VMS uses the standard VMS identifiers to identify database users (subjects).

The UIC of the process owner is used by Rdb/VMS to identify the individual who is accessing the database. No separate user identifiers are supported by Rdb/VMS, and no separate authentication of users is performed.

Database administrators can choose between ACL-style and ANSI/ISO-style protection when using the SQL interface to Rdb/VMS.

In ACL-style protection, three types of VMS identifiers can be used:

- User identification codes (UICs)

  The following are all valid UIC identifiers:

  ```
  [SYSTEMS,JONES]
  K_JONES
  [354,567]
  [250,*]
  ```

- General identifiers that specify a user or set of users

  For example:

  ```
  DATAENTRY
  PROGRAMMERS
  MANAGERS
  SECRETARIES
  ```

- System-defined identifiers

  For example:

  ```
  BATCH
  NETWORK
  INTERACTIVE
  LOCAL
  DIALUP
  REMOTE
  ```

Each identifier is associated with a set of access privileges to specify what operations that user or user group can perform on the database or database table, view, or column.

In ANSI/ISO-style protection, only a specific UIC can be used. Wildcards are permitted only to specify public access, as in [*,*].

Database objects (schema, table, view, or column) are associated with an APS that indicates which operations certain users can perform on that object. The owner or creator of a database owns the database files and has the ability to GRANT or REVOKE privileges for that database's subjects and objects.

For more information on other aspects of Rdb/VMS security, see *VAX Rdb/VMS Guide to Database Design and Definition*.

A.6 Auditing

Rdb/VMS employs a security auditing system that closely models that of the VMS system. A database is maintained that describes the Rdb/VMS audit events that are enabled. Such events are enabled on a per schema basis so that each schema can be audited differently. The Rdb/VMS Management Utility (RMU) includes a SET AUDIT and a SHOW AUDIT command to modify and display the event auditing characteristics. As with the VMS system, Rdb/VMS has its own audit analysis command (RMU/LOAD/AUDIT) to assist in reviewing the audit trail. To accomplish security auditing, Rdb/VMS communicates with the VMS AUDIT_SERVER process, which stores security audit records in the security audit journal and relays security alarm messages to the appropriate display process. Thus, Rdb/VMS audit information can coexist with VMS audit information, if desired, so that all the system audit records can be retrieved from one location by the VMS security administrator using a single VMS audit analysis tool. For more information on Rdb/VMS auditing capabilities, see the *VAX Rdb/VMS Guide to Database Maintenance and Performance*. For more information on VMS auditing capabilities, see the *Guide to VMS System Security*.

B

Installing the SQL/Services VMS API

This appendix discusses the installation of the SQL/Services VMS client Application Programming Interface (API) software on remote VAX systems.

Note *If your VAX system is running the Full Development License option of Rdb/VMS Version 4.0 or higher, the SQL/Services VMS API already has been installed and is ready to use. In that case, do not perform the procedure described in this appendix. You need to follow the procedures in this appendix only if you have remote VMS systems on which you want to install the SQL/Services VMS API.*

B.1 Preparing to Install the SQL/Services VMS API

This section discusses the preparations and requirements necessary for installing the SQL/Services VMS API on remote systems.

B.1.1 Prerequisite Software

You must install the DECnet–VAX product before you can install the SQL/Services VMS API.

The System Support Addendum (SSA) contains a complete list of the products that are compatible with this version of Rdb/VMS. The SSA is part of the Software Product Description (SPD) for Rdb/VMS.

B.1.2 Requirements for Installing SQL/Services VMS API

The following sections discuss the requirements for installing the SQL/Services VMS API.

B.1.2.1 Time

Installing the SQL/Services VMS API and running the Installation Verification Procedure (IVP) takes approximately 25 minutes, depending on your system and network configurations.

B.1.2.2 Privileges

To install the SQL/Services VMS API, you must be logged in to an account that has SETPRV or at least the following privileges:

- CMKRNL
- WORLD
- SYSPRV
- OPER

B.1.2.3 Disk Space

Installing the SQL/Services VMS API requires a certain amount of available storage space during the installation. Once the API is installed, less storage space is required. Table B–1 summarizes the storage requirements for SQL/Services.

Table B–1 VMS API Disk Space Requirements

Software	Blocks During Installation	Blocks After Installation
SQL/Services VMS API	927	600

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

```
$  SHOW DEVICE SYS$SYSDEVICE
```

B.1.2.4 VMSINSTAL Requirements

When you invoke the VMSINSTAL command procedure, it checks the following:

- If you have set your default device and directory to SYS$UPDATE
- If you are logged in to a privileged account
- If you have adequate quotas for installation
- If DECnet is up and running
- If any users are logged in to the system

If VMSINSTAL detects any problems during the installation, it notifies you and asks if you want to continue the installation. In some instances, you can enter YES to continue. To stop the installation process and correct the situation, enter NO or press the RETURN key. Then correct the problem and start the installation again.

B.1.2.5 Backing Up Your System Disk

At the beginning of the installation, VMSINSTAL asks if you have backed up your system disk. Digital recommends that you back up your system disk before installing any software on top of the operating system.

This precaution protects your system software. A system failure at a critical point in the installation procedure could leave unusable files. You also protect an existing version of the product, which may, if you request it, be deleted during the installation.

Use the backup procedures that have been established at your site. For details on backing up a system disk, see the information about the VMS Backup utility in the VMS documentation set.

B.2 Installing the SQL/Services VMS API

This section describes how to install the SQL/Services VMS API on remote systems.

B.2.1 Accessing the Distribution Kit

The SQL/Services VMS API distribution kit can be found on any system on which the Rdb/VMS Full Development License option has been installed. There are two ways to access the kit:

- Copy the save-set over the network to your client system. In the following example, you would replace *nodename* with the name of the system on which the Rdb/VMS kit has been installed and *source* with the name of a directory on the client system:

  ```
  $  COPY/LOG nodename::SQLSRV$VMS:SQLSRVAPI040.A source:
  ```

- Install the kit over the network. On the VMSINSTAL command line, supply a remote file specification as the source. Section B.2.2 demonstrates how to install the kit using a remote file specification.

Whichever method you choose, make sure that there is *only one* SQL/Services VMS API save-set in the source directory. If the system that contains the distribution kit at installation time had previous versions of SQL/Services installed on it, there may be more than one save-set file in the SQLSRV$VMS directory.

Note *Be sure to delete all previous versions of the save-set before you run the installation procedure.*

B.2.2 Installation Procedure

The SQL/Services VMS API installation procedure consists of a series of questions and informational messages. The following steps describe this process and provide examples of the questions and messages you will encounter during the installation.

Each question in the installation is marked with an asterisk (*) at the beginning of the line. Some questions show the default response in brackets, for example, [YES]. If you want to give the default response, press the RETURN key.

To abort 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 begin the installation again.

Step 1: Log in to the system manager's account.

```
Username:  SYSTEM
Password:
      Welcome to VAX/VMS V5.4
```

Step 2: Invoke VMSINSTAL.

Enter the following command to invoke the VMSINSTAL command procedure. This example shows how to install the kit over the network and uses the OPTIONS N parameter for printing or displaying release notes.

```
$  @SYS$UPDATE:VMSINSTAL SQLSRVAPI nodename::SQLSRV$VMS: OPTIONS N
```

Replace *nodename* with the name of a system on which the Rdb/VMS Full Development License option has been installed. The VMSINSTAL procedure provides several options; for more information, see the VMS documentation on software installation. The installation procedure displays the following information after you have successfully executed the VMSINSTAL command procedure:

```
       VAX/VMS Software Product Installation Procedure V5.4

It is 1-AUG-1990 at 14:52.
Enter a question mark (?) at any time for help.
```

If the initial transfer of the client installation file fails, ensure that your default DECnet account is correctly configured for default file access. In addition, use the Network Control Program (NCP) to ensure that the server node allows non-privileged access. For example, your system manager can allow such access with the following command:

```
>  NCP SET EXEC NONPRIV USER DECNET PASSWORD password
```

`password` The DECnet password for the server system

Step 3: Respond to warning messages and to backup question.

The VMSINSTAL procedure issues warning messages that ask if you want to continue.

```
%VMSINSTAL-W-DECNET, Your DECnet network is up and running.
%VMSINSTAL-W-ACTIVE, The following processes are still active:
      .
      .
      .
* Do you want to continue anyway [NO]?  YES
```

Note *Leave your DECnet network up and running for this installation. If your network is down, the installation procedure will add or modify all of the necessary files but the SQL/Services IVP will fail.*

Correct any problems before continuing the installation procedure. If you continue without correcting a problem, Digital may not support the resulting installation, with the exception as noted.

The VMSINSTAL procedure asks you if you are satisfied with the backup of your system disk:

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

If you have not backed up your system disk, do not continue with the installation until you do so. If you must back up the system disk, type N. The VMSINSTAL procedure exits and returns you to the DCL prompt. Back up your system disk, and then invoke VMSINSTAL again.

If you have already backed up the system disk, type Y and press the RETURN key, or simply press the RETURN key.

```
The following products will be processed:

  SQLSRVAPI V4.0

        Beginning installation of SQLSRVAPI V4.0 at 14:54

%VMSINSTAL-I-RESTORE, Restoring product saveset A...

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

Step 4: Select release notes option.

If you specified OPTIONS N on the VMSINSTAL command line, the installation procedure displays the following menu:

```
    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]:  2
```

If you are installing the SQL/Services VMS API for the first time and have not previously reviewed the release notes, select option 2.

If you have already reviewed the release notes, select option 4. Regardless of the option or the version number of VMS, namely VMS Version 5.4 or higher, the installation procedure automatically copies the release notes to SYS$HELP.

An explanation of the options follows:

- Option 1

  VMSINSTAL immediately displays the release notes on the console terminal. You can terminate the display at any time by pressing CTRL/C.

- Option 2

  VMSINSTAL prompts you for the name of the print queue that you want to use:

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

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

- Option 3

  VMSINSTAL immediately displays the release notes on the console terminal. It then prompts you for a queue name and prints the release notes on the output print device you selected.

- Option 4

  VMSINSTAL neither displays nor prints a copy of the release notes.

The installation procedure then asks if you want to continue the installation.

```
* Do you want to continue the installation?  Y
%VMSINSTAL-I-RELMOVED, The product's release notes have
 been successfully moved to SYS$HELP.
```

Step 5: Select installation options.

The installation procedure then asks two questions:

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

The installation procedure does not automatically purge files that it supersedes during the installation. To conserve disk space, you should purge the files. Press the RETURN key to direct the installation procedure to purge files it replaces.

The IVP runs a series of tests to check that the installation procedure was successful. If you do not want to run the IVP, type NO in response to the prompt. If you want to run the IVP, press the RETURN key.

Step 6: Supply information for the IVP.

The IVP must establish a remote connection and thus requires a node name, user name, and password. Supply the node name of your SQL/Services server system and a user name and password that are valid on that system.

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

    You will be prompted for a NODE_NAME, USERNAME and PASSWORD.

    The client IVP uses these arguments when connecting to
           the remote server.

    The IVP fails without this information
```

```
    ***********************************************************
* Please enter the NODENAME :  abcdef
* Is the current node name correct <ABCDEF>  [YES]?
* Please enter the USERNAME :  system
* Is the current user name correct <SYSTEM>  [YES]?
* Please enter the PASSWORD :  password
* Please verify the PASSWORD :  password
```

Step 7: Continue or stop the installation.

The installation procedure displays the following messages and asks if you want to continue the installation:

```
    To complete the installation on a standalone VAX 11/780
    will take approximately:

        20 minutes to install
        5 minutes to run the IVP

    All required questions have been asked.
    You can terminate the installation procedure at this time.

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

If you want to stop the installation for any reason, type NO in response to the prompt. If you choose to continue, VMSINSTAL moves the new or modified files to their target directories. If you asked for files to be purged, that work is done now. The installation procedure displays a number of messages about its progress:

```
%VMSINSTAL-I-SYSDIR, This product creates system disk directory
 VMI$ROOT:[SYSTEST.SQLSRV].
    ***********************************************************

    The SQLSRV Installation Verification Procedure (IVP) has
    been provided in SYS$COMMON:[SYSTEST].  It is invoked
    while inside the above directory using the commands:

              $ SET DEFAULT SYS$COMMON:[SYSTEST]
              $ @SQLSRVAPI$IVP FULL

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

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

Step 8: Check for successful execution of the IVP.

If you chose to run the IVP in step 5, the installation procedure displays the following messages:

```
Executing IVP for: SQLSRV V4.0
*****************************************
        Linking the D_FLOAT IVP executable
*****************************************
*********************************************************
          Executing D_FLOAT portion of the IVP
*********************************************************
SQL/Services IVP succeeded
    ***************************************************
    VAX SQL/Services
    D_FLOAT PORTION OF THE IVP COMPLETED SUCCESSFULLY
    ***************************************************
*********************************************
        Linking the IVP G_FLOAT executable
*********************************************
*********************************************************
          Executing the G_FLOAT portion of the IVP
*********************************************************
SQL/Services IVP succeeded
    ***************************************************
    VAX SQL/Services
    G_FLOAT PORTION OF THE IVP COMPLETED SUCCESSFULLY
    ****************************************************
    *************************************
    *************************************
    VAX SQL/Services
    IVP COMPLETED SUCCESSFULLY
    *************************************
    *************************************
IVP complete for: SQLSRV V4.0
```

Blank lines were removed from the example for clarity.

Step 9: End the installation procedure.

The installation procedure ends automatically with the following message:

```
Installation of SQLSRVAPI V4.0 completed at 15:04
```

```
VMSINSTAL procedure done at 15:04
```

VMSINSTAL deletes or changes your DCL symbols during the installation. Therefore, if you are going to continue using the same account and you want to restore the symbols, type:

```
$  @SYS$LOGIN:LOGIN
```

B.2.3 Recovering from Errors

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

- The server SQLSRV$VMS directory is protected against read access.
- The server node does not have DECnet functioning correctly.
- The server node is unavailable.
- The server node name is invalid.
- The server node is not running Rdb/VMS.
- The server node has not invoked RMONSTART.COM.
- The server software is not installed or is improperly installed.
- The server IVP failed.
- The client node has insufficient disk space.
- The client account has insufficient privileges.
- The client node does not have DECnet functioning correctly.

B.3 After Installing the SQL/Services VMS API

This section includes information about accessing release notes and learning which files are added to your system. The section also describes how to run the IVP after the software has been installed.

B.3.1 Accessing the Online Release Notes

Printed release notes for the SQL/Services component of Rdb/VMS Version 4.0 are included in the *VAX Rdb/VMS Release Notes*. After the SQL/Services VMS API has been installed, the release notes specific to SQL/Services are located in SYS$HELP:SQLSRV$040.RELEASE_NOTES.

B.3.2 Files Added to the System

All C language header files (.h) and source files (.c) listed in Table B–2 are copied to the client node during the installation of the SQL/Services VMS API. The remaining files in the table are created on the client node during the installation.

Table B–2 Files Created on or Copied to VMS

VMI$ROOT	Name	Description
[SYSHLP]	SQLSRV040.RELEASE_NOTES	Online release notes
[SYSHLP.EXAMPLES]	SQLSRV$DRIVER.C	Sample application driver module
[SYSHLP.EXAMPLES]	SQLSRV$DYNAMIC.C	Sample application dynamic execution module
[SYSLIB]	SQLSRV$API.EXE	API library for local I/O
[SYSLIB]	SQLSRV$API.OPT	Link options file for API library (D_FLOAT)
[SYSLIB]	SQLSRV$APIG.EXE	API library (G_FLOAT)
[SYSLIB]	SQLSRV$APIG.OPT	Link options file for API library (G_FLOAT)
[SYSLIB]	SQLSRV$MOD.EXE	Dynamic SQL interface module
[SYSLIB]	SQLSRV.H	C declarations for SQL/Services structures and constants
[SYSLIB]	SQLSRVCA.H	C declaration for the SQLCA structure
[SYSLIB]	SQLSRVDA.H	C declaration for the SQLDA structure
[SYSMSG]	SQLSRV$MSG.EXE	Error message module
[SYSTEST]	SQLSRVAPI$IVP.COM	Installation verification command procedure
[SYSTEST.SQLSRV]	SQLSRVAPI$IVP.EXE	IVP executable (D_FLOAT)
[SYSTEST.SQLSRV]	SQLSRVAPI$IVP.OBJ	IVP object module (D_FLOAT)
[SYSTEST.SQLSRV]	SQLSRVAPI$IVPG.EXE	IVP executable (G_FLOAT)
[SYSTEST.SQLSRV]	SQLSRVAPI$IVPG.OBJ	IVP object module (G_FLOAT)

B.3.3 Running the IVP

After the SQL/Services VMS API is installed, you can run the IVP independently to verify that the software is available on your system. You might also want to run the IVP after a system failure to be sure that users can access SQL/Services. Should you want to run the IVP again without installing SQL/Services, enter the following commands:

```
$  SET DEFAULT SYS$COMMON:[SYSTEST]
$  @SQLSRVAPI$IVP FULL
    *************************************************************

    You will be prompted for a NODE_NAME, USERNAME and PASSWORD.

    The client IVP uses these arguments when connecting to
           the remote server.

    The IVP fails without this information

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

* Please enter the NODENAME :  abcdef
* Is the current node name correct <ABCDEF>  [YES]?  YES
* Please enter the USERNAME :  system
* Is the current user name correct <SYSTEM>  [YES]?  YES
* Please enter the PASSWORD :  password
* Please verify the PASSWORD :  password

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

        Linking the D_FLOAT IVP executable

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

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

          Executing D_FLOAT portion of the IVP

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

SQL/Services IVP succeeded

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

    VAX SQL/Services

    D_FLOAT PORTION OF THE IVP COMPLETED SUCCESSFULLY

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

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

        Linking the IVP G_FLOAT executable

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

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

          Executing the G_FLOAT portion of the IVP

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

SQL/Services IVP succeeded
```

```
**************************************************
VAX SQL/Services
G_FLOAT PORTION OF THE IVP COMPLETED SUCCESSFULLY
***************************************************
*************************************
*************************************
VAX SQL/Services
IVP COMPLETED SUCCESSFULLY
*************************************
*************************************
```

B.4 Sample Installation

```
Username:  SYSTEM
Password:
        Welcome to VAX/VMS version V5.4

$  @SYS$UPDATE:VMSINSTAL SQLSRVAPI SYS$UPDATE: OPTIONS N

        VAX/VMS Software Product Installation Procedure V5.4

It is 1-AUG-1990 at 14:52.

Enter a question mark (?) at any time for help.
%VMSINSTAL-W-DECNET, Your DECnet network is up and running.
* Do you want to continue anyway [NO]?  YES
* Are you satisfied with the backup of your system disk [YES]?  YES

The following products will be processed:
  SQLSRVAPI V4.0

        Beginning installation of SQLSRVAPI V4.0 at 14:54

%VMSINSTAL-I-RESTORE, Restoring product saveset 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]:  2

* Queue name [SYS$PRINT]:  SYS$PRINT
Job SQLSRV$040 (queue SYS$PRINT, entry 738) started on SYS$PRINT
* Do you want to continue the installation?  YES
%VMSINSTAL-I-RELMOVED , The product's release notes have been
successfully moved to SYS$HELP.
* Do you want to purge files replaced by this installation [YES]?  YES
* Do you want to run the IVP after the installation [YES]?  YES
    *************************************************************
```

```
    You will be prompted for a NODE_NAME, USERNAME and PASSWORD.

    The client IVP uses these arguments when connecting to
           the remote server.

    The IVP fails without this information

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

* Please enter the NODENAME :  abcdef
* Is the current node name correct <ABCDEF>  [YES]?  YES
* Please enter the USERNAME :  system
* Is the current user name correct <SYSTEM>  [YES]?  YES
* Please enter the PASSWORD :  password
* Please verify the PASSWORD :  password

    To complete the installation on a standalone VAX 11/780
    will take approximately:

        20 minutes to install
         5 minutes to run the IVP

    All required questions have been asked.
    You can terminate the installation procedure at this time.

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

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

    The SQLSRVAPI Installation Verification Procedure (IVP) has
    been provided in SYS$COMMON:[SYSTEST].  It is invoked
    while inside the above directory using the commands:

              $ SET DEFAULT SYS$COMMON:[SYSTEST]
              $ @SQLSRVAPI$IVP FULL

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

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

Executing IVP for: SQLSRV V4.0

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

        Linking the D_FLOAT IVP executable

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


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

          Executing D_FLOAT portion of the IVP

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


SQL/Services IVP succeeded

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

    VAX SQL/Services
```

```
    D_FLOAT PORTION OF THE IVP COMPLETED SUCCESSFULLY
    ***************************************************


*********************************************
        Linking the IVP G_FLOAT executable
*********************************************

*********************************************************
          Executing the G_FLOAT portion of the IVP
*********************************************************
SQL/Services IVP succeeded

    ***************************************************
    VAX SQL/Services
    G_FLOAT PORTION OF THE IVP COMPLETED SUCCESSFULLY
    ****************************************************


    *************************************
    *************************************
    VAX SQL/Services
    IVP COMPLETED SUCCESSFULLY
    *************************************
    *************************************


IVP complete for: SQLSRV V4.0
        Installation of SQLSRVAPI V4.0 completed at 15:04

        VMSINSTAL procedure done at 15:04
```

C

Installing the SQL/Services MS-DOS API

This appendix discusses the installation of the SQL/Services MS-DOS client Application Programming Interface (API) software.

C.1 Preparing to Install the MS-DOS API

This section discusses the preparations and requirements necessary for installing the SQL/Services MS-DOS API.

C.1.1 Prerequisite Software

The following products are required on your system for the SQL/Services MS-DOS API installation:

- PCSA Version 3.0 or higher (The DECnet-DOS software is a component of PCSA.)
- A compiler (preferably Microsoft C) that can access objects compiled by Microsoft C Version 5.0 or higher
- A C run-time library that is compatible with Microsoft C
- An assembler that is compatible with Microsoft C

Before installing the SQL/Services MS-DOS API, you must have DECnet network access to a VAX system running Rdb/VMS Version 4.0 or higher.

C.1.2 Installation Procedure Requirements

The following sections discuss the requirements for installing SQL/Services.

C.1.2.1 Time

Installing the SQL/Services MS-DOS API and running the Installation Verification Procedure (IVP) on a standalone personal computer with a hard disk takes approximately 10 minutes, depending on hardware configuration and the network connection.

C.1.2.2 Disk Space

Installing the SQL/Services MS-DOS API requires approximately 295,000 bytes of available storage space.

To determine the number of available disk bytes on the current system disk, enter the following command at the MS-DOS prompt:

```
>   CHKDSK
```

If there are no problems with your disk structure, the CHKDSK utility prints information on disk usage, similar to the following:

```
29943808 bytes total disk space
  221184 bytes in 66 directories
27889664 bytes in 3329 user files
 1832960 bytes available on disk

  655360 bytes total memory
  200560 bytes free
```

If the CHKDSK utility prompts for input instead of printing information, there is a problem with your disk structure. Respond NO to any CHKDSK prompts and read the CHKDSK instructions in your MS-DOS documentation.

If you have trouble invoking the CHKDSK utility, use the PATH command to make sure that it is in your directory search path.

```
>   PATH
```

C.1.2.3 Installation Program Requirements

SQL/Services provides an installation program named INSTALL to facilitate the MS-DOS API installation. Before you invoke the INSTALL program, you must have the following:

- The DECnet node name for the VAX system on which the server is installed
- The DECnet-DOS software directory in your directory search path
- A disk and directory in which to install the SQL/Services MS-DOS API
- Sufficient disk space to install the SQL/Services MS-DOS API

C.2 Installing the MS-DOS API

Installing the SQL/Services MS-DOS API consists of the following steps:

- Creating the DECnet-DOS Programming Interface Library (if not already created)
- Creating a directory for the API files
- Copying the executable installation program to the API directory
- Running the executable installation program
- Running the IVP

To abort the installation procedure at any time, press CTRL/C.

This sections describes how to create DECnet-DOS Programming Interface Library (if not already available on your MS-DOS system), install the SQL/Services MS-DOS client Application Programming Interface, and verify that programmers can build applications.

C.2.1 Creating the DECnet-DOS Programming Interface Library

Note *If you have already created the DECnet-DOS Programming Interface Library on your system, go to Section C.2.2.*

To interface with the DECnet-DOS network process and thereby allow client API application access to the server system, your application programs must be linked with the DECnet-DOS Programming Interface Library. (Refer to the *DECnet-DOS Programmer's Reference Manual* for detailed instructions and programming considerations.) This section describes how to create the DECnet-DOS Programming Interface Library that you need to enable MS-DOS API application development at your site.

Step 1: Set the device.

Choose the disk device on which to create a directory for building the DECnet-DOS Programming Interface Library. Set your device location with a command in the following format:

```
>   device:
```

`device`	The disk device on which to create the directory for building the DECnet-DOS library

For example, you might want to set your disk device to C:

```
>   C:
```

Step 2: Create the DECnet-DOS library directory.

Create a directory in which to build the DECnet-DOS Programming Interface Library and change to it. Use the following format:

```
>   MKDIR device:\directory
>   CD device:\directory
```

`device`	The disk device on which to create the directory for building the DECnet-DOS library
`directory`	The directory in which to build the DECnet-DOS library

For example, to create a directory called SSDECNET and change to it, enter:

```
>   MKDIR C:\SSDECNET
>   CD C:\SSDECNET
```

Step 3: Copy the MAKE file from the server system.

If you have the MAKE utility on your system, you can use the DECNET.MAK file provided with SQL/Services to build the library. Otherwise, you must use your C language compiler and assembler to process the source files, then build a library from the object modules.

To use the DECNET.MAK file provided with SQL/Services, invoke the DECnet-DOS file transfer utility NFT to copy the file into the directory you created in Step 2. For example:

```
>   NFT COPY node::SQLSRV$MSDOS:DECNET.MAK DECNET.MAK
```

`node`	The DECnet node name for the server system

Step 4: Build the DECnet-DOS library.

Follow the lettered steps to build the PCSA DECnet-DOS Version 3.0 (or higher) library:

a Use the BREAKSRC utility to break the DNETLIB.SRC file into separate source files. Enter the utility command and its arguments in the following format:

```
> device1:\DECNET\SOURCE\BREAKSRC
   device2:\DECNET\SOURCE\DNETLIB.SRC
   device3:\directory
```

`device1`	The device on which the BREAKSRC utility resides
`device2`	The device on which the DNETLIB.SRC source file resides

`device3`	The device on which you created the directory (in Step 2) to contain the files for building the DECnet-DOS Programming Interface Library
`directory`	The directory you created in Step 2 to contain the file for building the DECnet-DOS Programming Interface Library

Suppose the BREAKSRC utility resides on device D:, the DNETLIB.SRC file resides on device E:, and the SSDECNET directory you created for building the library resides on device F:, enter the following command line to separate DNETLIB.SRC into separate files:

```
> D:\DECNET\SOURCE\BREAKSRC
   E:\DECNET\SOURCE\DNETLIB.SRC
   F:\SSDECNET
```

b If you are using the medium or large memory model (the small memory model is used by default), make the following change to the DECNET.MAK file (if used). Find the line that defines the memory model, as shown:

```
    .
    .
    .
MODEL=S
    .
    .
    .
```

Change the letter S to the appropriate letter (M or L).

c Build the library using the DECNET.MAK file provided with SQL/Services. Type the make command in the following format:

```
> MAKE device:\directory\DECNET.MAK
```

`directory`	The directory you created in Step 2 to contain the files for building the PCSA DECnet-DOS Programming Interface Library

To build the DECnet-DOS Programming Interface Library in the SSDECNET directory on device F:, enter:

```
> MAKE F:\SSDECNET\DECNET.MAK
```

Note *Ignore the warning messages displayed during the library build. They indicate that the C source programs from the DNETLIB.SRC file are newer than their object files in the library and must be rebuilt and replaced.*

If you do not use the MAKE utility, use your C language compiler and assembler to process the source files, then build a library from the object modules.

C.2.2 Copying and Running the Installation Program

To install the MS-DOS API, you must choose a disk device on your MS-DOS system, create a directory on the device for the installation files, copy the installation program from the server system to the created directory, and run the INSTALL program to perform the MS-DOS API installation.

Step 1: Set the installation device.

Choose the disk device on which to create a directory for storing the the installation program. Set your device location with a command in the following format:

```
>   device:
```

`device`	The disk device for storing the installation program

For example, you might want to set your disk device to A:

```
>   A:
```

Step 2: Create the installation directory.

Create a directory named SQLSRV to contain the SQL/Services MS-DOS API files and change to it. Create a directory to contain the SQL/Services MS-DOS API installation files and change to it. Use the following format:

```
>   MKDIR device:\directory
>   CD device:\directory
```

`device`	The disk device containing the directory for storing the installation program
`directory`	The directory to which the installation program is copied

For example, to create a directory called SSINSTALL and change to it, enter:

```
>   MKDIR C:\SSINSTALL
>   CD C:\SSINSTALL
```

Step 3: Copy the installation program to the API directory.

Invoke the DECnet-DOS file transfer utility NFT to copy the installation program into the directory you just created. For example:

```
> NFT COPY /IMAGE node::SQLSRV$MSDOS:INSTALL.EXE INSTALL.EXE
```

`node`	The DECnet node name for the server system

If the initial transfer of the client installation program fails, ensure that your default DECnet account is correctly configured for default file access. In addition, use the Network Control Program (NCP) to ensure that the server node allows non-privileged access. For example, your system manager can allow such access with the following command:

```
>  NCP SET EXEC NONPRIV USER DECNET PASSWORD password
```

`password` The DECnet password for the server system

Step 4: Run the installation program.

The INSTALL program performs the remainder of the installation for you. To invoke it, type the name of the program, as follows:

```
>   INSTALL
Terminate each response by pressing the enter key.
To halt the installation process, respond by pressing Ctrl-Z
then Enter.
```

Step 5: Respond to the installation program questions.

Some questions that appear when you run the installation program show the default response in brackets, for example: [YES]. To use the default response, press the ENTER key.

a The INSTALL program asks you to specify the DECnet node name of the system on which the server was installed. You must supply a name and verify the name; there is no default response to this question.

```
* Please enter the NODENAME ?  ABCDEF
* Is the current NODENAME correct <ABCDEF> [YES] ?
```

b The INSTALL program asks if you want to run the IVP. If you want the INSTALL program to run the IVP for you, respond YES.

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

When you have answered all questions, the INSTALL program copies the API software to your client system:

```
Copying file: ABCDEF::...LOADER.BAT . . .

C:\SQLSRV>echo off
******* Copying API software from server *******
Copying file: ABCDEF:: . . .
       .
       .
       .
Copying file: ABCDEF:: . . .
```

If you chose to run the IVP, the installation procedure executes it now. When the IVP runs successfully, you see the following display:

```
******* Running the IVP *******

SQL/Services IVP succeeded

******* INSTALLATION COMPLETE *******

NOTE: Although the test program ran successfully, the IVP cannot
      verify that you can build application programs. Refer to the
      "Verifying the Installation" section in the Installation Guide.
```

C.2.3 Verifying the Installation

The note displayed at the end of the IVP means that although the executable test program was able to successfully create, manipulate, and delete a schema on the server system, the IVP cannot verify that you are able to build SQL/Services application programs because it has no knowledge of your local software development environment. Thus, it is recommended that you compile, link, and run the source code for the IVP test program to verify your ability to build applications.

The API software includes a MAKE file and a batch file for the test program. You may have to modify one or both of these files according to your own software development environment. When that is done, enter one of the following commands:

If you have the MAKE utility on your system:

```
> MAKE SQSIVP.MAK
      .
      .
      .
```

If you do not have the MAKE utility on your system, type:

```
> cl -c -u -FPa -Zep -Os sqsivp.c
> link sqsivp,/stack:4000,,sqsapis+decnets+slibce/NOD/NOE
```

If the fatal "cannot open include file" error message is displayed during compilation, change the INCLUDE environment variable to point to the SQL/Services installation directory where the SQL/Services C language header files are located.

To run the IVP, enter the following command:

```
>  SQSIVP
```

The IVP asks the same questions that you answered when you ran the INSTALL program:

```
* Please enter the NODENAME ? ABCDEF
* Is the current NODENAME correct <ABCDEF> [YES] ?
```

Enter the same node, account, and password information that you used before. The following messages will appear:

```
******* Running the IVP *******

SQL/Services IVP succeeded
```

The installation procedure is now complete and verified. At this point, you may find it useful to build and run the the sample application described in the *VAX Rdb/VMS Guide to Using SQL/Services*.

C.2.4 Recovering from Errors

If errors occur during the installation, the INSTALL program displays failure messages and deletes all files when you again install the SQL/Services MS-DOS API.

If errors occur when the IVP is running, the following message is displayed:

```
******** IVP FAILED ********
```

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

- The server SQLSRV$MSDOS directory is protected against read access.
- The server node does not have DECnet functioning correctly.
- The server node is unavailable.
- The server node name is invalid.
- The server node is not running Rdb/VMS.
- The server node has not invoked RMONSTART.COM.
- The server software is not installed or is improperly installed.
- The server IVP failed.
- The client node does not have DECnet functioning correctly.
- The client node does not have DECnet in the directory search path.
- The client node has insufficient disk space.

C.3 After Installing the MS-DOS API

This section includes information about determining the files added to your system and running the IVP.

C.3.1 Files Added to the System

All C language header files (.h) and source files (.c) listed in Table C–1 are copied to the client node during the installation of the SQL/Services MS-DOS API. The remaining files in the table are created on the client node during the installation.

Table C–1 Files Created on or Copied to MS-DOS

File name	Description
DECNET.MAK	Sample MAKE file for DECnet-DOS source code
INSTALL.EXE	Bootstrap installation program
LOADER.BAT	Bootstrap installation batch file
SQS040.RN	Online release notes
SQLSRV.H	ASSOCIATE_STR data structure definition
SQLSRVCA.H	SQLCA data structure definition and error messages
SQLSRVDA.H	SQLDA data structure definition and data type literals
SQSAPIL.LIB	API library for large model systems
SQSAPIM.LIB	API library for medium model systems
SQSAPIS.LIB	API library for small model systems
SQSDRV.C	Sample application driver module
SQSDYN.C	Sample application statement execution module
SQSDYN.MAK	Sample application MAKE file
SQSIVP.BAT	Installation Verification Procedure batch file
SQSIVP.C	Installation Verification Procedure source code
SQSIVP.EXE	Installation Verification Procedure executable file
SQSIVP.MAK	Installation Verification Procedure MAKE file

C.3.2 Running the IVP

After the MS-DOS API is installed, you can run the IVP independently to verify that the software is available on your system. You might also want to run the IVP after a system failure to ensure that the API is working properly. Follow the instructions in Section C.2.3.

C.4 Sample Installation

```
Terminate each response by pressing the enter key.
To halt the installation process, respond by pressing Ctrl-Z then Enter.

* Please enter the NODENAME ?  ABCDEF
* Is the current NODENAME correct <ABCDEF> [YES] ?  YES
* Do you want to run the IVP after the installation [YES] ?  YES

Copying file: abcdef::SYS$COMMON:[SQLSRV.MSDOSAPI]LOADER.BAT;1
to C:\SQLSRV\loader.bat  [2973 bytes at 11011 bytes/second]

C:\SQLSRV>Echo off
******* Copying API software from server *******
Copying file: abcdef::SYS$COMMON:[SQLSRV.MSDOSAPI]SQSAPIS.LIB;1
to C:\SQLSRV\SQSAPIS.LIB  [35456 bytes at 21619 bytes/second]
Copying file: abcdef::SYS$COMMON:[SQLSRV.MSDOSAPI]SQSAPIM.LIB;1
to C:\SQLSRV\SQSAPIM.LIB  [36480 bytes at 24648 bytes/second]
Copying file: abcdef::SYS$COMMON:[SQLSRV.MSDOSAPI]SQSAPIL.LIB;1
to C:\SQLSRV\SQSAPIL.LIB  [40576 bytes at 25519 bytes/second]
Copying file: abcdef::SYS$COMMON:[SYSLIB]SQLSRV.H;2
to C:\SQLSRV\sqlsrv.h  [7398 bytes at 16813 bytes/second]
Copying file: abcdef::SYS$COMMON:[SYSLIB]SQLSRVCA.H;1
to C:\SQLSRV\sqlsrvca.h  [5487 bytes at 14069 bytes/second]
Copying file: abcdef::SYS$COMMON:[SYSLIB]SQLSRVDA.H;1
to C:\SQLSRV\SQLSRVDA.H  [2679 bytes at 12177 bytes/second]
Copying file: abcdef::SYS$COMMON:[SQLSRV.MSDOSAPI]SQSDRV.C;1
to C:\SQLSRV\SQSDRV.C  [5447 bytes at 16506 bytes/second]
Copying file: abcdef::SYS$COMMON:[SQLSRV.MSDOSAPI]SQSDYN.C;1
to C:\SQLSRV\SQSDYN.C  [24360 bytes at 22145 bytes/second]
Copying file: abcdef::SYS$COMMON:[SQLSRV.MSDOSAPI]SQSDYN.MAK;1
to C:\SQLSRV\SQSDYN.MAK  [427 bytes at 3881 bytes/second]
Copying file: abcdef::SYS$COMMON:[SQLSRV.MSDOSAPI]SQSIVP.EXE;1
to C:\SQLSRV\SQSIVP.EXE  [71552 bytes at 21358 bytes/second]
Copying file: abcdef::SYS$COMMON:[SQLSRV.MSDOSAPI]SQSIVP.C;1
to C:\SQLSRV\SQSIVP.C  [28587 bytes at 16335 bytes/second]
Copying file: abcdef::SYS$COMMON:[SQLSRV.MSDOSAPI]SQSIVP.BAT;1
to C:\SQLSRV\SQSIVP.BAT  [94 bytes at 1566 bytes/second]
Copying file: abcdef::SYS$COMMON:[SQLSRV.MSDOSAPI]SQSIVP.MAK;1
to C:\SQLSRV\SQSIVP.MAK  [381 bytes at 2381 bytes/second]
Copying file: abcdef::SYS$COMMON:[SQLSRV.MSDOSAPI]DECNET.MAK;1
to C:\SQLSRV\DECNET.MAK  [4386 bytes at 13290 bytes/second]
Copying file: abcdef::SYS$COMMON:[SYSHLP]SQLSRV$040.RELEASE_NOTES;36
to C:\SQLSRV\SQS040.RN  [52 bytes at 472 bytes/second]
******* Running the IVP *******

SQL/Services IVP succeeded

******* INSTALLATION COMPLETE *******
NOTE: Although the test program ran successfully, the IVP cannot
      verify that you can build application programs. Refer to the
      "Verifying the Installation" section in the Installation Guide.
```

D

Installing the SQL/Services ULTRIX API

This appendix discusses the installation of the SQL/Services ULTRIX client Application Programming Interface (API) software.

D.1 Preparing to Install the ULTRIX API

This section discusses the preparations and requirements necessary for installing the SQL/Services ULTRIX API.

D.1.1 Prerequisite Software

The following products are required on your client system for the SQL/Services ULTRIX API installation:

- DECnet-ULTRIX Version 2.2 or higher
- Portable C

Before installing the SQL/Services ULTRIX API, you must have DECnet network access to a VMS system running Rdb/VMS Version 4.0 or higher.

D.1.2 Installation Procedure Requirements

The following sections discuss the requirements for installing the SQL/Services ULTRIX API.

D.1.2.1 Time Installing the SQL/Services ULTRIX API and running the Installation Verification Procedure (IVP) takes approximately 10 minutes, depending on your hardware and network configurations.

D.1.2.2 Superuser Privileges

You must have superuser privileges to install the SQL/Services ULTRIX API. To obtain these privileges, enter the **su** command and supply the root password. For example:

```
%  su
Password:
#
```

Superuser privileges provide the SQL/Services ULTRIX API installation procedure with write access to the /usr/include and /usr/lib directories.

D.1.2.3 Disk Space

Installing the SQL/Services ULTRIX API requires approximately 240,000 bytes of available storage space during the installation.

To determine the number of available disk bytes on the current system disk, enter the following command at the shell (#) prompt:

```
#  /bin/df
```

The **df** command prints information on disk usage, similar to the following:

```
File system    total    kbytes  kbytes  percent
   node       kbytes    used    free   used    Mounted on
/dev/ra1a       7429    2085    4602    31%    /tmp
/dev/ra0e      30519   14817   12651    54%    /usr/spool
/dev/ra0h     313233  122858  159052    44%    /usr/staff1
```

D.1.2.4 Installation Program Requirements

SQL/Services provides an installation program named **installu** to facilitate the ULTRIX API installation. Before you invoke the program, you must have the following:

- The DECnet node name for the system on which the server is installed
- The DECnet-ULTRIX software directory in your directory search path
- A disk and directory in which to install the SQL/Services ULTRIX API
- Sufficient disk space to install the SQL/Services ULTRIX API

D.2 Installing the ULTRIX API

This section describes how to install the SQL/Services ULTRIX client API software.

D.2.1 Installation Procedure

Installing the SQL/Services ULTRIX API consists of the following steps:

- Creating a directory for the API files
- Changing to the new directory location
- Copying the installation program source to the API directory
- Compiling and linking the installation program

- Running the installation program
- Running the IVP

Step 1: Create the API directory.

Create a directory to contain the SQL/Services ULTRIX API files. For example:

```
# mkdir sqlsrv
```

Step 2: Change to the API directory.

Change your directory location to the one created in step 1. For example:

```
# cd sqlsrv
```

Step 3: Copy the installation program to the API directory.

Invoke the DECnet-ULTRIX file transfer utility to copy the installation program into the directory you just created. For example:

```
# dcp node::'sqlsrv$ultrix:installu.c' installu.c
```

`node`	The DECnet node name for the server system

If the initial transfer of the client installation program fails, ensure that your default DECnet account is correctly configured for default file access. In addition, use the Network Control Program (NCP) to ensure that the server node allows non-privileged access. For example, your system manager can allow such access with the following command:

```
> NCP SET EXEC NONPRIV USER DECNET PASSWORD password
```

`password`	The DECnet password for the server system

Step 4: Compile the installation program.

Invoke the C compiler to compile and link the installation program. For example:

```
# cc installu.c -o installu
```

Step 5: Run the installation program.

The installation program performs the remainder of the installation for you. To invoke it, type the name of the program, as follows:

```
# installu
```

To abort the installation program, press CTRL/Y.

Step 6: Respond to the installation program questions.

Some questions that appear when you run the installation program show the default response in brackets, for example: [YES]. To use the default response, press the RETURN key or type YES (using all uppercase letters).

a The installation program asks you to specify the DECnet node name of the system on which the server was installed. You must supply a name and verify the name; there is no default response to this question.

```
* Please enter the NODENAME ?  abcdef
* Is the current NODENAME correct <abcdef> [YES] ?
```

b If you want the installation program to run the IVP for you, enter YES.

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

When you have answered all of the questions, the installation program copies the API software to your client system and displays the following messages:

```
++++++ Installing SQL/Services API ++++++
++++++ Copying libsqs.a to /usr/lib ++++++
++++++ Copying include files to /usr/include ++++++
++++++ SQL/Services API Installed ++++++
```

If you chose to run the IVP, the installation procedure executes it now. When the IVP runs successfully, you see the following display:

```
++++++ Running IVP ++++++

******* SQL/Services IVP succeeded *******
```

The installation procedure is now complete. At this point, you may find it useful to build and run the the sample application described in the *VAX Rdb/VMS Guide to Using SQL/Services*.

D.2.2 Recovering from Errors

If errors occur during the installation, the installation program displays failure messages and deletes all files when you again install the SQL/Services ULTRIX API.

If errors occur when the IVP is running, the following message is displayed:

```
******** IVP FAILED ********
```

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

- The server SQLSRV$ULTRIX directory is protected against read access.
- The server node does not have DECnet functioning correctly.
- The server node is unavailable.
- The server node name is invalid.

- The server node is not running Rdb/VMS.
- The server node has not invoked RMONSTART.COM.
- The server software is not installed or is improperly installed.
- The server IVP failed.
- The client node does not have DECnet functioning correctly.
- The client node does not have DECnet in the directory search path.
- The client node has insufficient disk space.
- The client account has insufficient privileges.

D.3 After Installing the ULTRIX API

This section includes information about determining the files added to your system and running the IVP.

D.3.1 Files Added to the System

All C language header files (.h) and source files (.c) listed in Table D–1 are copied to the client node during the installation of the SQL/Services ULTRIX API. The remaining files in the table are created on the client node during the installation.

Table D–1 Files Created on ULTRIX

File name	Description
installu	Installation program executable
installu.c	Installation program source code
installu.o	Installation program object
loader.csh	Installation C shell script
sqs040u.rn	Online release notes
sqlsrv.h	ASSOCIATE_STR data structure definition
sqlsrvca.h	SQLCA data structure definition and error messages
sqlsrvda.h	SQLDA data structure definition and data type literals
sqsapi.a	API library
sqsdrvu.c	Sample application driver module
sqsdynu.c	Sample application statement execution module

(continued on next page)

Table D–1 (Cont.) Files Created on ULTRIX

File name	Description
sqsdynu.mak	Sample application *make* file
sqsivpu	Installation Verification Procedure executable
sqsivpu.c	Installation Verification Procedure source code
sqsivpu.o	Installation Verification Procedure object
sqsivpu.mak	Installation Verification Procedure *make* file

D.3.2 Running the Installation Verification Procedure (IVP)

After the ULTRIX API is installed, you can run the IVP independently to verify that the software is available on your system. You might also want to run the IVP after a system failure to ensure that the API is working properly.

To run the IVP, enter the following command:

```
#  sqsivpu
```

The IVP asks the same questions that you answered when you ran the installation program:

```
* Please enter the NODENAME ? abcdef
* Is the current NODENAME correct <abcdef> [YES] ?
```

Enter the same node information that you used before. One of the following messages will appear:

```
******* SQL/Services IVP succeeded *******
```

```
******** IVP FAILED ********
```

D.4 Sample Installation

```
#  mkdir sqlsrv
#  cd sqlsrv
#  dcp abcdef::'sqlsrv$ultrix:installu.c' installu.c
#  cc installu.c -o installu
#  installu
* Please enter the NODENAME ?  abcdef
* Is the current NODENAME correct <abcdef> [YES] ?
* Do you want to run the IVP after the installation [YES] ?
++++++ Installing SQL/Services API ++++++
++++++ Copying libsqs.a to /usr/lib ++++++
++++++ Copying include files to /usr/include ++++++
++++++ SQL/Services API Installed ++++++
++++++ Running IVP ++++++

******* SQL/Services IVP succeeded *******
```

E
Installing the SQL/Services OS/2 API

This appendix discusses the installation of the SQL/Services OS/2 client Application Programming Interface (API) software.

E.1 Preparing to Install the SQL/Services OS/2 API

This section discusses the preparations and requirements necessary for installing the SQL/Services OS/2 API.

E.1.1 Prerequisite Software

The following products are required on your system for the SQL/Services OS/2 API installation:

- DECnet for OS/2 Version V1.0 or higher
- A compiler (preferably Microsoft C) that can access objects compiled by Microsoft C Version 5.1 or higher
- A C run-time library that is compatible with Microsoft C

Before installing the SQL/Services OS/2 API, you must have DECnet network access to a VAX system running Rdb/VMS Version 4.0 or higher.

E.1.2 Installation Procedure Requirements

The following sections discuss the requirements for installing SQL/Services.

E.1.2.1 Time Installing the SQL/Services OS/2 API and running the Installation Verification Procedure (IVP) on a standalone personal computer with a hard disk takes approximately 10 minutes, depending on hardware configuration and the network connection.

E.1.2.2 Disk Space

Installing the SQL/Services OS/2 API requires approximately 360K bytes of available storage space.

To determine the number of available disk bytes on the current system disk, enter the following command at the OS/2 prompt:

```
>   CHKDSK
```

If there are no problems with your disk structure, the CHKDSK utility prints information on disk usage, similar to the following:

```
29943808 bytes total disk space
  221184 bytes in 66 directories
27889664 bytes in 3329 user files
 1832960 bytes available on disk

  655360 bytes total memory
  200560 bytes free
```

If the CHKDSK utility prompts for input instead of printing information, there is a problem with your disk structure. Respond with NO to any CHKDSK prompts and read the CHKDSK instructions in your OS/2 documentation.

If you have trouble invoking the CHKDSK utility, use the PATH command to make sure that it is in your directory search path.

```
>   PATH
```

By default, the CHKDSK utility is placed in the C:\OS2 directory.

E.1.2.3 Installation Program Requirements

SQL/Services provides an installation command procedure named LOADERO.CMD to facilitate the SQL/Services OS/2 API installation. Before you invoke the procedure, you must have the following:

- The DECnet node name for the VAX system on which the server is installed
- The DECnet for OS/2 software directory in your directory search path
- A disk and directory in which to install the SQL/Services OS/2 API
- Sufficient disk space to install the SQL/Services OS/2 API

E.2 Installing the SQL/Services OS/2 API

This section describes how to install the SQL/Services OS/2 client Application Programming Interface.

E.2.1 Installation Procedure

Installing the SQL/Services OS/2 API consists of the following steps:

- Creating a directory for the API files
- Copying the installation command procedure from the server system to the client system API directory
- Running the installation command procedure

The IVP is automatically run by the installation command procedure.

To abort the installation procedure at any time, press CTRL/PAUSE.

Step 1: Create the API directory.

Create a directory named SQLSRV to contain the SQL/Services OS/2 API files and change to it. For example:

```
>   C:
>   MKDIR C:\SQLSRV
>   CD C:\SQLSRV
```

Step 2: Copy the installation command procedure to the API directory.

Invoke the DECnet for OS/2 file transfer utility NFT to copy the installation command procedure into the directory you just created. For example:

```
> NFT COPY node""::SQLSRV$OS2:LOADERO.CMD LOADERO.CMD
```

`node`	The DECnet node name for the server system

Press the ENTER key to copy the LOADERO.CMD file to your local directory.

If the initial transfer of the client installation file fails, ensure that your default DECnet account is correctly configured for default file access. In addition, use the Network Control Program (NCP) to ensure that the server node allows non-privileged access. For example, your system manager can allow such access with the following command:

```
> NCP SET EXEC NONPRIV USER DECNET PASSWORD password
```

`password`	The DECnet password for the server system

Step 3: Run the installation command procedure.

The installation command procedure performs the remainder of the installation for you. To invoke it, type the name of the program and enter a node name, as follows:

```
>  LOADERO node
```

`node` The DECnet node name for the server system

The installation command procedure copies the API software to your client system and then automatically runs the IVP:

```
Copying file: ABCDEF::...LOADERO.CMD . . .

C:\SQLSRV>echo off
******* Copying API software from server *******
Copying file: ABCDEF:: . . .
      .
      .
      .
Copying file: ABCDEF:: . . .
```

When the IVP runs successfully, you see the following display:

```
******* Running the IVP *******

SQL/Services IVP succeeded

******* INSTALLATION COMPLETE *******

NOTE: Although the test program ran successfully, the IVP cannot
      verify that you can build application programs. Refer to the
      "Verifying the Installation" section in the Installation Guide.
```

E.2.2 Verifying the Installation

The note displayed at the end of the IVP means that although the executable test program was able to successfully create, manipulate, and delete a schema on the server system, the IVP cannot verify that you are able to build SQL/Services application programs because it has no knowledge of your local software development environment. Thus, it is recommended that you compile, link, and run the source code for the IVP test program to verify your ability to build applications.

The API software includes a MAKE file and a batch file for the test program. You may have to modify one or both of these files according to your own software development environment. When that is done, enter one of the following commands:

If you have the MAKE utility on your system:

```
>  MAKE SQSIVPO.MAK
      .
      .
      .
```

If you do not have the MAKE utility on your system:

```
>  cl -c -G2 -W3 -FPc -Zep -AS -Os sqsivpo.c
>  link sqsivpo,sqsivpo/stack:6000,,sqsapios.lib dnetimp.lib
os2.lib+sdnetdll.lib slibce;
```

You can ignore the warning messages displayed during the sqsivpo.c program compilation; however, if the fatal "cannot open include file" error message is displayed during compilation, change the INCLUDE environment variable to point to the SQL/Services installation directory where the SQL/Services C language header files are located.

To run the IVP, enter the following command:

```
>   SQSIVPO
```

The IVP asks the following questions:

```
* Please enter the NODENAME ? ABCDEF
* Is the current NODENAME correct <ABCDEF> [YES] ?
```

Enter the same node information that you used before. The following messages will appear:

```
******* Running the IVP *******

SQL/Services IVP succeeded
```

The installation procedure is now complete and verified. At this point, you may find it useful to build and run the the sample application described in the *VAX Rdb/VMS Guide to Using SQL/Services*.

E.2.3 Recovering from Errors

If errors occur during the installation, the installation command procedure displays failure messages and deletes all files when you again install the SQL/Services OS/2 API.

If errors occur when the IVP is running, the following message is displayed:

```
******** IVP FAILED ********
```

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

- The server SQLSRV$OS2 directory is protected against read access.
- The server node does not have DECnet functioning correctly.
- The server node is unavailable.
- The server node name is invalid.
- The server node is not running Rdb/VMS.
- The server node has not invoked RMONSTART.COM.

- The server software is not installed or is improperly installed.
- The server IVP failed.
- The client node does not have DECnet functioning correctly.
- The client node does not have DECnet in the directory search path.
- The client node has insufficient disk space.
- The client node has insufficient memory.

E.3 After Installing the SQL/Services OS/2 API

This section includes information about determining the files added to your system and running the IVP.

E.3.1 Files Added to the System

All C language header files (.h) and source files (.c) listed in Table E–1 are copied to the client node during the installation of the SQL/Services OS/2 API. The remaining files in the table are created on the client node during the installation.

Table E–1 Files Created on or Copied to OS/2

File name	Description
LOADERO.CMD	Bootstrap installation command procedure
SQS040.RN	Online release notes
SQLSRV.H	ASSOCIATE_STR data structure definition
SQLSRVCA.H	SQLCA data structure definition and error messages
SQLSRVDA.H	SQLDA data structure definition and data type literals
SQSAPIOL.LIB	API library for large model systems
SQSAPIOM.LIB	API library for medium model systems
SQSAPIOS.LIB	API library for small model systems
SQSDRVO.C	Sample application driver module
SQSDYNO.C	Sample application statement execution module
SQSDYNO.MAK	Sample application MAKE file
SQSIVPO.CMD	Installation Verification Procedure batch file

(continued on next page)

Table E–1 (Cont.) Files Created on or Copied to OS/2

File name	Description
SQSIVPO.C	Installation Verification Procedure source code
SQSIVPO.EXE	Installation Verification Procedure executable file
SQSIVPO.MAK	Installation Verification Procedure MAKE file

E.3.2 Running the IVP

After the SQL/Services OS/2 API is installed, you can run the IVP independently to verify that the software is available on your system. You might also want to run the IVP after a system failure to ensure that the API is working properly. Follow the instructions in Section E.2.2.

E.4 Sample Installation

The OS/2 API installation copies the OS/2 API software to your client system and automatically runs the IVP. To invoke the OS/2 installation command procedure, enter the following command, providing the DECnet node name for the server system:

```
> LOADERO node

Copying file: DUO::SYS$COMMON:[SQLSRV.OS2API]LOADERO.CMD;2
        to C:\DUO\loadero.cmd  [4232 bytes at 15114 bytes/second]
```

```
[C:\DUO]Echo off
******* Copying API software from server *******
Copying file: DUO::SYS$COMMON:[SQLSRV.OS2API]SQSAPIOS.LIB;2
        to C:\DUO\SQSAPIOS.LIB  [40576 bytes at 19697 bytes/second]
Copying file: DUO::SYS$COMMON:[SQLSRV.OS2API]SQSAPIOM.LIB;2
        to C:\DUO\SQSAPIOM.LIB  [42112 bytes at 19229 bytes/second]
Copying file: DUO::SYS$COMMON:[SQLSRV.OS2API]SQSAPIOL.LIB;2
        to C:\DUO\SQSAPIOL.LIB  [75904 bytes at 19562 bytes/second]
Copying file: DUO::SYS$COMMON:[SYSLIB]SQLSRV.H;3
        to C:\DUO\sqlsrv.h  [14927 bytes at 18203 bytes/second]
Copying file: DUO::SYS$COMMON:[SYSLIB]SQLSRVCA.H;3
        to C:\DUO\sqlsrvca.h  [2174 bytes at 9881 bytes/second]
Copying file: DUO::SYS$COMMON:[SYSLIB]SQLSRVDA.H;3
        to C:\DUO\SQLSRVDA.H  [2331 bytes at 12268 bytes/second]
Copying file: DUO::SYS$COMMON:[SQLSRV.OS2API]SQSDRVO.C;2
        to C:\DUO\SQSDRVO.C  [5447 bytes at 17570 bytes/second]
Copying file: DUO::SYS$COMMON:[SQLSRV.OS2API]SQSDYNO.C;2
        to C:\DUO\SQSDYNO.C  [24360 bytes at 20470 bytes/second]
Copying file: DUO::SYS$COMMON:[SQLSRV.OS2API]SQSDYNO.MAK;2
        to C:\DUO\SQSDYNO.MAK  [427 bytes at 7116 bytes/second]
Copying file: DUO::SYS$COMMON:[SQLSRV.OS2API]SQSIVPO.EXE;2
        to C:\DUO\SQSIVPO.EXE  [56960 bytes at 17526 bytes/second]
Copying file: DUO::SYS$COMMON:[SQLSRV.OS2API]SQSIVPO.C;2
        to C:\DUO\SQSIVPO.C  [30229 bytes at 16340 bytes/second]
Copying file: DUO::SYS$COMMON:[SQLSRV.OS2API]SQSIVPO.MAK;2
        to C:\DUO\SQSIVPO.MAK  [663 bytes at 5100 bytes/second]
Copying file: DUO::SYS$COMMON:[SYSHLP]SQLSRV$040.RELEASE_NOTES;2
        to C:\DUO\SQS040.RN  [34168 bytes at 19524 bytes/second]
******* Running the IVP *******

SQL/Services IVP succeeded

******* INSTALLATION COMPLETE *******
NOTE: Although the test program ran successfully, the IVP cannot
      verify that you can build application programs. Refer to the
      "Verifying the Installation" section in the Installation Guide.
```

F

Installing the Macintosh API

This appendix describes how to install the SQL/Services Apple Macintosh client Application Programming Interface (API) software.

F.1 Preparing to Install the Macintosh API

This section discusses the preparations and requirements for installing the Macintosh API. Before attempting installation, be sure you are familiar with the following Macintosh components:

- Macintosh Chooser and Control Panel Desk Accessories

  See the Macintosh documentation if you are unfamiliar with these tools.

- Macintosh Programmer's Workshop (MPW)

  Refer to the document entitled *Macintosh Programmer's Workshop Development Environment, Volume 1* for information about MPW.

F.1.1 Prerequisite Software for the Macintosh Client System

The following products are required on your Macintosh system for the Macintosh API installation:

- Macintosh System 6.0.5 or higher
- AppleShare Workstation Software for System 6.0.5 or higher
- Apple's ADSP (Apple Data Stream Protocol) driver Version 1.0.2 or higher
- MPW 3.1 and the MPW 3.1 C compiler (only 3.1 versions work)
- Apple's Communications ToolBox 1.0
- DEC LanWORKS for Macintosh Computers, Version 1.0 or higher

Two components of the Communications Toolbox must be installed on your Macintosh system before the Macintosh API can be installed:

- Run-time support
- MPW include and library files

Before installing the Macintosh API, the MPW development environment and the MPW C compiler must also be installed.

F.1.2 Prerequisite Software for the VMS Server System

Before you can install the Macintosh API, the following requirements must be met on your VMS server system:

- You must have network access to a VAX system running Rdb/VMS Version 4.0 or higher.
- The VAX system must be running AppleTalk for VMS software and the VAXshare File Server, both components of DEC LanWORKS for Macintosh Computers.

The installation procedure uses the VAXshare File Server software to access the installation volume (SQLSRV$Volume). If you did not install this server software when you installed DEC LanWORKS for Macintosh Computers, you must do so now before starting the Macintosh API installation.

In addition, you must install one of two network components on your VAX computer before installing the Macintosh API:

- DECnet for Macintosh

  If you plan to use DECnet to communicate with SQL/Services on the VMS server system, you must install the DECnet for Macintosh software that comes with DEC LanWORKS for Macintosh Computers. The DECnet for Macintosh Tool must be in the Communications Folder (of the System Folder) on your Macintosh system.

- AppleTalk for VMS

  If you plan to use AppleTalk to communicate with SQL/Services on the VMS server system, the AppleTalk for VMS and AppleTalk/DECnet Gateway software must be installed and running on your VAX computer. The AppleTalk-DECnet Tool must be in the Communications Folder (of the System Folder) on your Macintosh system.

You choose either the DECnet or AppleTalk network system during the Macintosh API installation described in Section F.3.

F.1.3 Installation Procedure Requirements

The following sections describe the requirements for installing the Macintosh API.

F.1.3.1 Time Installing the Macintosh API and running the Installation Verification Procedure (IVP) on a standalone personal computer with a hard disk takes approximately 5 minutes; however, the time depends on the hardware configuration and network connection.

F.1.3.2 Disk Space The Macintosh API installation requires approximately 252K bytes of available storage space.

F.1.3.3 Installation Program Requirements SQL/Services provides an installation script (command file) called **Launch Me** that makes installing the Macintosh API easier. Before invoking Launch Me on your Macintosh in Section F.3, be sure to satisfy the following requirements:

- Know the DECnet node name for the VAX system on which SQL/Services is installed.
- Be sure all essential software is installed on the server VAX system and on your client Macintosh system.
- Ensure that sufficient disk space is available to install the Macintosh API.

You can proceed to the Macintosh API installation only after fulfilling each of these requirements.

F.2 Adding the Installation Volume

Before installing the Macintosh API, you must add the SQLSRV$Volume installation volume (as a valid VAXshare file server volume) on the file servers at your site. SQL/Services provides the SQLSRV$ADD_VOLUME command procedure to add the SQLSRV$Volume installation volume on your file server. All files for adding the installation volume were placed on your system during the Rdb/VMS installation.

If your site has more than one file server, you must repeat the following procedure on each file server node:

1. Log in to the SYSTEM account on the file server node.
2. Enter the following command line to create the SQLSRV$Volume installation volume and have the volume added on your file server:

   ```
   $ @SYS$COMMON:[SQLSRV.MACAPI]SQLSRV$ADD_VOLUME.COM
   ```

   The command procedure displays a series of messages to keep you informed of its progress and displays a final message upon successful completion.

After the installation volume is successfully added, you are ready to install the Macintosh API.

F.3 Installing the Macintosh API

Installing the Macintosh API and running the Installation Verification Procedure (IVP) requires you to perform the following tasks on your Macintosh system:

STEP 1. Launch MPW.

⟹ Launch MPW to ensure the proper environment for installing the Macintosh API. If MPW is not installed, install it and launch it before proceeding to STEP 2.

STEP 2. Mount Volume.

⟹ Mount on your Macintosh the VAXshare File Server installation volume called *SQLSRV$Volume*.

During Rdb/VMS installation, the Macintosh API installation files are stored on your VAX system. In Section F.2, you added the SQLSRV$Volume installation volume as a valid VAXshare file server volume on the file servers at your site. For the installation procedure to access the Macintosh API installation files, you must open (mount) the SQLSRV$Volume on your Macintosh system:

- If you **know** how to mount a VAXshare File Server volume, mount the SQLSRV$Volume volume and go to STEP 3.
- If you **do not know** how to mount a VAXshare File Server volume, find complete instructions in the documentation provided by DEC LanWORKS for Macintosh Computers or use the brief instructions provided below. Once the volume is mounted, go to STEP 3.

Brief mount instructions follow:

1. Select the Chooser from the Apple Menu and locate the AppleShare icon through which you access the VAXshare File Server.

   If the AppleShare icon does not appear in the Chooser window, the network server is not running or the AppleShare Workstation Software is not installed. In either case, stop here. If you need to install the AppleShare Workstation Software, do so now and then restart the installation procedure at STEP 2. (Refer to your Macintosh documentation for installation instructions.) If the network server is not running, start it and then restart the installation at STEP 2.

2. Click on the AppleShare icon in the Chooser window to display a list of file servers.

3. Click on the name of the file server to determine which file server contains the SQLSRV$Volume volume.
4. Enter a valid user name and password to display a list of volumes.
5. Click on the SQLSRV$Volume icon to select the volume. If SQLSRV$Volume does not appear, the Macintosh SQL/Services installation volume (SQLSRV$Volume) is not available from that file server. Contact your system administator.
6. Exit the Chooser by clicking on the close box.

For further information about using the VAXshare File Server volume, consult the DEC LanWORKS for Macintosh Computers documentation.

STEP 3. Copy Script.

⟹ Open the SQLSRV$Volume installation volume to display the volume's contents by clicking on the SQLSRV$Volume icon. Open your local disk by clicking on its icon. Click and drag the Launch Me script icon from the SQLSRV$Volume installation volume to your local disk. This operation stores the script locally on your Macintosh system. Now, you can launch the script from your local disk in STEP 4, execute the commands it contains in Step 5, and delete it in STEP 6. Go to STEP 4.

If the initial transfer of the client script fails, ensure that your default DECnet account is correctly configured for default file access. In addition, use the Network Control Program (NCP) to ensure that the server node allows non-privileged access. For example, your system manager can allow such access with the following command:

```
>  NCP SET EXEC NONPRIV USER DECNET PASSWORD password
```

`password`	The DECnet password for the server system

STEP 4. Launch Script.

⟹ Launch (double click on) the script named Launch Me from the SQLSRV$Volume installation volume.

Launch Me is an MPW document, called a *script*, that contains instructions and commands to install the Macintosh API software. Once the script is displayed, you are ready to read the script and install the Macintosh API.

STEP 5. Read/Execute Script.

⟹ Read (scroll through) the instructions in the Launch Me script and execute the embedded commands to install the Macintosh API and to run the Installation Verification Procedure (IVP).

You select a command line for execution by triple clicking on it, followed by pressing the Enter Key. (The command line is highlighted when you have selected the command line properly.) Alert boxes 2 notify you of command success or failure. (When you are executing commands in the script, you are notified of success or failure by Alert boxes in Steps 1 and 4, not in Step 2. Information about the success or failure of the execution in Step 2 is displayed in the MPW Worksheet.) Success in the Alert Box means you can move to the next step; click on the OK Button in the Alert Box to acknowledge the success message. A failure means you must check the MPW Worksheet for the specific error code and take action as the error message indicates.

The script includes the following tasks:

1. Coping (install) files from the VMS server system to your Macintosh computer.
2. Building the Installation Verification Procedure (IVP).
3. Selecting DECnet or AppleTalk (through the AppleTalk-DECnet gateway) to create a network link between the VMS server and the Macintosh client system.
4. Run the IVP.

The Installation Verification Program (IVP) creates a database on the server and performs a few rudimentary functions to ensure that SQL/Services works properly. To run the IVP, you must know the node name of the VAX server system on which SQL/Services is running.

STEP 6. Delete Script

⟹ Click and drag the Launch Me script on your local disk into the Trash Can to remove the script from your system. The script is no longer needed once you have executed its commands.

After the IVP runs successfully, your Macintosh system is ready to create and process SQL/Services API applications.

F.4 Macintosh API Installation Files

Table F–1 contains the list of files copied to or created on your Macintosh system during the Macintosh API installation.

Table F–1 Files Created on or Copied to Your Macintosh System

File name	Description
SQLSRV.H	ASSOCIATE_STR data structure definition
SQLSRVCA.H	SQLCA data structure definition and error messages
SQLSRVDA.H	SQLDA data structure definition and data type literals
SQLSRV.O	API library
SQLSRV Examples	Folder created to hold SQL/Services example application modules
SQLSRV$DRIVER.C	Sample application driver module
SQLSRV$DYNAMIC.C	Sample application statement execution module
MAKEFILE	Sample application *MAKE* file
SQL/SERVICES	Control Panel Document for SQL/Services
SQSIVP.C	Installation Verification Procedure source code
SQSIVP.EXE	Installation Verification Procedure executable file
SQS040.RN	SQL/Services Release Notes

During installation, all C language header files (.h) and source files (.c) listed in Table F–1 are *copied to* the client system. All other files are *created on* the client Macintosh system.

G

Sample Installation: Development Kit

```
ROLLS - Unauthorized Access is Prohibited

Username: SYSTEM
Password:

ROLLS - Property of Digital Equipment Corporation

    Last interactive login on Thursday, 13-SEP-1990 10:52
    Last non-interactive login on Thursday, 13-SEP-1990 10:45
$ @SYS$UPDATE:VMSINSTAL

VAX/VMS Software Product Installation Procedure V5.4


It is 13-SEP-1990 at 10:54.

Enter a question mark (?) at any time for help.
* Are you satisfied with the backup of your system disk [YES]?
* Where will the distribution volumes be mounted: SYS$PUBLIC

Enter the products to be processed from the first distribution volume set.
* Products: RDBVMSDEV
* Enter installation options you wish to use (none): N
The following products will be processed:
  RDBVMSDEV V4.0

Beginning installation of RDBVMSDEV V4.0 at 10:54

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

```
 Installation procedures for: "VAX Rdb/VMS V4.0-0"

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

    The currently installed version:

        "Rdb/VMS V3.1B-0"

    will be replaced by this installation.

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

* Do you want to proceed [NO]: Y

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

             Before You Install Rdb/VMS Software

    The on-disk structure of Rdb/VMS database files has changed.
    As a result, databases created under previous versions of
    Rdb/VMS are incompatible with this software.
    To use this software with a current Rdb/VMS database
    perform the following tasks:

    o Before installing VAX Rdb/VMS V4.0-0:

      - As a precaution, backup each database with the RMU Backup
        Utility.

    o After installing VAX Rdb/VMS V4.0-0:

      - For any databases, including CDD/Plus dictionaries,
        created with a version of Rdb/VMS software earlier
        than V4.0, use RMU/CONVERT.

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


* Do you want to proceed with this installation [NO]: Y


    Be sure you have read the section entitled

     "Preparing Your System and the Installing Account"

    in the installation guide before continuing with the installation.


    Checking system requirements ...


Product:      RDB
Producer:     DEC
Version:      4.0
Release Date: 01-JUL-1990

* Does this product have an authorization key registered and loaded? Y

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

    This installation requires the creation of the SQLSRV$SRV
    account. You MUST choose a UIC for this account.

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

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

    The installation procedure will not proceed until you enter a
    valid user identification code (UIC) and default device for the
    SQLSRV$SRV account.

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

* Enter UIC to be used for SQLSRV$ account (e.g. [300,2]): [300,2]
* Enter the default device for the SQLSRV$SRV account [SYS$SYSDEVICE]:

    There are a number of files from previous versions
    of Rdb/VMS and SQL that are now obsolete.  The
    version of RMONSTART.COM that resided in SYS$MANAGER
    is one of these files and * SHOULD NOT BE USED *.
    It * WILL NOT WORK *.

    The executable file SYS$COMMON:[SYSEXE]RMUCONVERT.EXE
    is no longer provided.  Previous versions of it will
    NOT WORK and should be deleted.   This functionality
    is now included in RMU.EXE

    There are also some demo/sample files and some SQL files
    that should be deleted.

    If you chose not to have these files deleted during the
    installation, you should delete them manually.

* Do you want to delete SYS$MANAGER:RMONSTART.COM [NO]: Y
* Do you want to delete SYS$COMMON[SYSEXE]:RMUCONVERT.EXE [NO]: Y
* Do you want to delete obsolete demo and sample files [NO]: Y
* Do you want to delete obsolete SQL files [NO]: Y
* Do you want to run the IVP after the installation [YES]? Y
* Do you want to purge files replaced by this installation [YES]? Y

    There are no more questions.  The installation takes approximately
    80 minutes on a stand-alone VAX 8350.


    Beginning installation ...

    Installing under VMS V5.4     - 13-SEP-1990 10:57

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

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

    SYSTEM MANAGER:

    The following command line MUST be added to the system startup
    command file SYS$STARTUP:SYSTARTUP_V5.COM for all nodes that will
    be running Rdb/VMS.

        $ @SYS$STARTUP:RMONSTART
```

```
    The following command line should be added to the system
    shutdown command file SYS$MANAGER:SYSHUTDWN.COM for all nodes
    that will be running Rdb/VMS.

        $ @SYS$MANAGER:RMONSTOP

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

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

    The qualifier LGICMD for the RDB$REMOTE account in SYSUAF
    is modified by this installation.

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

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

    The RDBSERVER object automatically uses the RDB$REMOTE
    account created by this installation procedure.

    Invoking a database should look like:

    $DEFINE MYDB "<node>::<dev>:<dir><db-name>"
    $RDO
    RDO> DATABASE FILE MYDB

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

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

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

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

%VMSINSTAL-I-SYSDIR, This product creates system disk directory
VMI$ROOT:[SQLSRV.OS2API].

%VMSINSTAL-I-SYSDIR, This product creates system disk directory
VMI$ROOT:[SQLSRV.MACAPI].

%RDBVMSDEV-I-ACCOUNT, This installation creates an account named SQLSRV$SRV.
%VMSINSTAL-I-SYSDIR, This product creates system disk directory
SYS$SYSDEVICE:[SQLSRV$SERVER].

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

    The Rdb/VMS Installation Verification Procedure (IVP) has
    been provided in SYS$COMMON:[SYSTEST].

    It is invoked using the commands:

        $ SET DEFAULT SYS$COMMON:[SYSTEST]
        $ @RDBIVP DEV

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

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

        The release notes for Rdb/VMS are available in the file
              SYS$HELP:RDBVMS040.RELEASE_NOTES

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

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

Executing IVP for: VAX Rdb/VMS V4.0-0

Rdb/VMS monitor (RDMS_MONITOR) started
SQL: Assigning System-wide SQL Logicals
Building the test database.

%RDO-W-NOCDDUPDAT, database invoked by filename, the CDD will not be updated
Program: Loading EMPLOYEES
Program: EMPLOYEES Loaded. Normal End-of-Job
Program: Loading JOBS
Program: JOBS Loaded. Normal End-of-Job
Program: Loading DEPTS
Program: DEPTS Loaded. Normal End-of-Job
%RDO-W-NOCDDUPDAT, database invoked by filename, the CDD will not be updated

Beginning Installation Verification Tests.


Running the after-image journaling test.
    Test completed successfully

Running the remote database test.
    Test completed successfully

Running the interpreter test.
    Test completed successfully

Running the BASIC precompiler test.
    Test completed successfully

Running the COBOL precompiler test.
    Test completed successfully

Running the FORTRAN precompiler test.
    Test completed successfully

Running the RDML/C preprocessor test.
    Test completed successfully

Running the RDML/PASCAL preprocessor test.
    Test completed successfully

Running the SQL/Services tests.
 Running SQL/Services D_FLOAT test
Assigning System-wide SQLSRV Logicals
Installing SQL Services images
Starting the SQL Services Server


SQL/Services IVP succeeded

    Test completed successfully.
 Running SQL/Services G_FLOAT test
```

```
SQL/Services IVP succeeded

    Test completed successfully.

 SQL/Services tests completed successfully.

Building the SQL test database.

Program: Loading EMPLOYEES
Program: EMPLOYEES Loaded. Normal End-of-Job
Program: Loading JOBS
Program: JOBS Loaded. Normal End-of-Job
Program: Loading DEPTS
Program: DEPTS Loaded. Normal End-of-Job

Running the Interactive SQL test.
    Test completed successfully

Running the Dynamic SQL test.
    Test completed successfully

Running the COBOL precompiler test.
    Test completed successfully

Running the FORTRAN precompiler test.
    Test completed successfully

Running the VAX C precompiler test.
    Test completed successfully

Running the VAX Ada precompiler test.
    Test completed successfully

Running the VAX SQL MODULE LANGUAGE test.
    Test completed successfully

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

    VAX Rdb/VMS V4.0-0

    Development

    IVP COMPLETED SUCCESSFULLY

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


IVP completed for: VAX Rdb/VMS V4.0-0

 Installation of RDBVMSDEV V4.0 completed at 12:27

Enter the products to be processed from the next distribution volume set.
* Products: EXIT
 VMSINSTAL procedure done at 12:28

$ LOGOUT
  SYSTEM       logged out at 13-SEP-1990 12:28:46.28
```

H

Sample Installation: Interactive kit

```
ROLLS - Unauthorized Access is Prohibited

Username: SYSTEM
Password:

ROLLS - Property of Digital Equipment Corporation

    Last interactive login on Wednesday, 12-SEP-1990 10:46
    Last non-interactive login on Wednesday, 12-SEP-1990 11:31
$ @VMSINSTAL

VAX/VMS Software Product Installation Procedure V5.3


It is 12-SEP-1990 at 11:36.

Enter a question mark (?) at any time for help.
* Are you satisfied with the backup of your system disk [YES]?
* Where will the distribution volumes be mounted: SYS$PUBLIC

Enter the products to be processed from the first distribution volume set.
* Products: RDBVMSINT
* Enter installation options you wish to use (none):
The following products will be processed:
  RDBVMSINT V4.0

Beginning installation of RDBVMSINT V4.0 at 11:36

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


 Installation procedures for: "VAX Rdb/VMS V4.0-0"


    Be sure you have read the section entitled

     "Preparing Your System and the Installing Account"

    in the installation guide before continuing with the installation.


    Checking system requirements ...
```

```
Product:      RDB-INTERACTIVE
Producer:     DEC
Version:      4.0
Release Date: 01-JUL-1990
* Does this product have an authorization key registered and loaded? Y

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

    This installation requires the creation of the SQLSRV$SRV
    account. You MUST choose a UIC for this account.

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

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

    The installation procedure will not proceed until you enter a
    valid user identification code (UIC) and default device for the
    SQLSRV$SRV account.

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

* Enter UIC to be used for SQLSRV$ account (e.g. [300,2]): [300,2]
* Enter the default device for the SQLSRV$SRV account [SYS$SYSDEVICE]:

    There are a number of files from previous versions
    of Rdb/VMS and SQL that are now obsolete.  The
    version of RMONSTART.COM that resided in SYS$MANAGER
    is one of these files and * SHOULD NOT BE USED *.
    It * WILL NOT WORK *.

    The executable file SYS$COMMON:[SYSEXE]RMUCONVERT.EXE
    is no longer provided.  Previous versions of it will
    NOT WORK and should be deleted.   This functionality
    is now included in RMU.EXE

    There are also some demo/sample files and some SQL files
    that should be deleted.

    If you chose not to have these files deleted during the
    installation, you should delete them manually.

* Do you want to delete SYS$MANAGER:RMONSTART.COM [NO]: Y
* Do you want to delete SYS$COMMON[SYSEXE]:RMUCONVERT.EXE [NO]: Y
* Do you want to delete obsolete demo and sample files [NO]: Y
* Do you want to delete obsolete SQL files [NO]: Y
* Do you want to run the IVP after the installation [YES]? Y
* Do you want to purge files replaced by this installation [YES]? Y

    There are no more questions.  The installation takes approximately
    45 minutes on a stand-alone VAX 8350.


    Beginning installation ...

    Installing under VMS V5.3     - 12-SEP-1990 11:38

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

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

    SYSTEM MANAGER:
```

```
    The following command line MUST be added to the system startup
    command file SYS$STARTUP:SYSTARTUP_V5.COM for all nodes that will
    be running Rdb/VMS.

        $ @SYS$STARTUP:RMONSTART

    The following command line should be added to the system
    shutdown command file SYS$MANAGER:SYSHUTDWN.COM for all nodes
    that will be running Rdb/VMS.

        $ @SYS$MANAGER:RMONSTOP

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

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

    The qualifier LGICMD for the RDB$REMOTE account in SYSUAF
    is modified by this installation.

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

%RDBVMSINT-I-NOTINSTALLED, VMI$KWD:RDBSERVER.EXE was not installed by this kit
%RDBVMSINT-I-REASON, Image ident version of new file is the same as current file
%RDBVMSINT-I-NOTINSTALLED, VMI$KWD:RDBSHR.EXE was not installed by this kit
%RDBVMSINT-I-REASON, Image ident version of new file is the same as current file
%RDBVMSINT-I-NOTINSTALLED, VMI$KWD:RDBMSGS.EXE was not installed by this kit
%RDBVMSINT-I-REASON, Image ident version of new file is the same as current file
%RDBVMSINT-I-NOTINSTALLED, VMI$KWD:RDBBMSGS.EXE was not installed by this kit
%RDBVMSINT-I-REASON, Image ident version of new file is the same as current file
%RDBVMSINT-I-NOTINSTALLED, VMI$KWD:VIDA_MESSAGE.EXE was not installed by this kit
%RDBVMSINT-I-REASON, Image ident version of new file is the same as current file
%RDBVMSINT-I-NOTINSTALLED, VMI$KWD:RDMSMSG.EXE was not installed by this kit
%RDBVMSINT-I-REASON, Image ident version of new file is the same as current file
%RDBVMSINT-I-NOTINSTALLED, VMI$KWD:RDMMSGSHR.EXE was not installed by this kit
%RDBVMSINT-I-REASON, Image ident version of new file is the same as current file

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

    The RDBSERVER object automatically uses the RDB$REMOTE
    account created by this installation procedure.

    Invoking a database should look like:

    $DEFINE MYDB "<node>::<dev>:<dir><db-name>"
    $RDO
    RDO> DATABASE FILE MYDB

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

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

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

    *************************************************************
%RDBVMSINT-I-ACCOUNT, This installation creates an account named SQLSRV$SRV.

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

```
    The Rdb/VMS Installation Verification Procedure (IVP) has
    been provided in SYS$COMMON:[SYSTEST].

    It is invoked using the commands:

        $ SET DEFAULT SYS$COMMON:[SYSTEST]
        $ @RDBIVP INT

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

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

        The release notes for Rdb/VMS are available in the file
              SYS$HELP:RDBVMS040.RELEASE_NOTES

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

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

Executing IVP for: VAX Rdb/VMS V4.0-0

Rdb/VMS monitor (RDMS_MONITOR) started
SQL: Assigning System-wide SQL Logicals

Restoring the test database.

Running RDO tests
    Test completed successfully

Running the after-image journaling test.
    Test completed successfully

Running the interpreter test.
    Test completed successfully

Running the SQL/Services tests.
Assigning System-wide SQLSRV Logicals
Installing SQL Services images
Starting the SQL Services Server


SQL/Services IVP succeeded

    Test completed successfully.

 SQL/Services tests completed successfully.

Building the SQL test database.

Program: Loading EMPLOYEES
Program: EMPLOYEES Loaded. Normal End-of-Job
Program: Loading JOBS
Program: JOBS Loaded. Normal End-of-Job
Program: Loading DEPTS
Program: DEPTS Loaded. Normal End-of-Job

Running the Interactive SQL test.
    Test completed successfully

Running the Dynamic SQL test.
    Test completed successfully

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

    VAX Rdb/VMS V4.0-0

    Interactive

    IVP COMPLETED SUCCESSFULLY
```

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

IVP completed for: VAX Rdb/VMS V4.0-0

 Installation of RDBVMSINT V4.0 completed at 12:06

Enter the products to be processed from the next distribution volume set.
* Products: EXIT
 VMSINSTAL procedure done at 12:09
$ LOGOUT
     SYSTEM       logged out at 12-SEP-1990 12:09:23.12
```

I

Sample Installation: Run-Time Kit

```
ROLLS - Unauthorized Access is Prohibited

Username: SYSTEM
Password:

ROLLS - Property of Digital Equipment Corporation

    Last interactive login on Wednesday, 12-SEP-1990 10:38
    Last non-interactive login on Wednesday, 12-SEP-1990 10:44
$ @VMSINSTAL

VAX/VMS Software Product Installation Procedure V5.3


It is 12-SEP-1990 at 10:46.

Enter a question mark (?) at any time for help.
* Are you satisfied with the backup of your system disk [YES]?
* Where will the distribution volumes be mounted: SYS$PUBLIC

Enter the products to be processed from the first distribution volume set.
* Products: *RDBVMSRTO
* Enter installation options you wish to use (none):
The following products will be processed:
  RDBVMSRTO V4.0

Beginning installation of RDBVMSRTO V4.0 at 10:47

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


 Installation procedures for: "VAX Rdb/VMS V4.0-0"

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

    The currently installed version:

        "Rdb/VMS V3.1A"

    will be replaced by this installation.

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

* Do you want to proceed [NO]: Y
```

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

         Before You Install Rdb/VMS Software

The on-disk structure of Rdb/VMS database files has changed.
As a result, databases created under previous versions of
Rdb/VMS are incompatible with this software.
To use this software with a current Rdb/VMS database
perform the following tasks:

o Before installing VAX Rdb/VMS V4.0-0:

  - As a precaution, backup each database with the RMU Backup
    Utility.

o After installing VAX Rdb/VMS V4.0-0:

  - For any databases, including CDD/Plus dictionaries,
    created with a version of Rdb/VMS software earlier
    than V4.0, use RMU/CONVERT.

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

* Do you want to proceed with this installation [NO]: Y

    Be sure you have read the section entitled

     "Preparing Your System and the Installing Account"

    in the installation guide before continuing with the installation.

    Checking system requirements ...


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

    RDB$REMOTE account found but RDBSERVER object is not found in
    the network database.  To be sure the password for the RDB$REMOTE
    account matches the password for the RDBSERVER object, this
    installation will:

           1. Prompt you for a new password for the RDB$REMOTE account
           2. Update the RDB$REMOTE account and insert a new
              RDBSERVER object into the network database

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



* Please enter carriage return to continue:


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

    The entire installation will FAIL if you do not enter a valid
    password for the RDB$REMOTE account.  You will be given
    3 chances to verify your password.  This installation
    procedure requires at least 6 characters for the
    RDB$REMOTE password.  Valid characters for a password are:
```

```
    A through Z
    a through z
    0 through 9
    $ (dollar sign)
    _ (underscore)

   As with the DCL SET PASSWORD command, your input will not
   appear on the terminal.  And to protect against typing errors
   that are not seen when entering the password, you must enter
   the password twice.

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

* Please enter PASSWORD to be used for RDB$REMOTE account:

* Please verify the PASSWORD entered for RDB$REMOTE:

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

   This installation requires the creation of the SQLSRV$SRV
   account. You MUST choose a UIC for this account.

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

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

   The installation procedure will not proceed until you enter a
   valid user identification code (UIC) and default device for the
   SQLSRV$SRV account.

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

* Enter UIC to be used for SQLSRV$ account (e.g. [300,2]): [300,2]
* Enter the default device for the SQLSRV$SRV account [SYS$SYSDEVICE]:

   There are a number of files from previous versions
   of Rdb/VMS and SQL that are now obsolete.  The
   version of RMONSTART.COM that resided in SYS$MANAGER
   is one of these files and * SHOULD NOT BE USED *.
   It * WILL NOT WORK *.

   The executable file SYS$COMMON:[SYSEXE]RMUCONVERT.EXE
   is no longer provided.  Previous versions of it will
   NOT WORK and should be deleted.   This functionality
   is now included in RMU.EXE

   There are also some demo/sample files and some SQL files
   that should be deleted.

   If you chose not to have these files deleted during the
   installation, you should delete them manually.

* Do you want to delete SYS$MANAGER:RMONSTART.COM [NO]: Y
* Do you want to delete SYS$COMMON[SYSEXE]:RMUCONVERT.EXE [NO]: Y
* Do you want to delete obsolete demo and sample files [NO]: Y
* Do you want to delete obsolete SQL files [NO]: Y
* Do you want to run the IVP after the installation [YES]? Y
* Do you want to purge files replaced by this installation [YES]? Y

   There are no more questions.  The installation takes approximately
   25 minutes on a stand-alone VAX 8350.


   Beginning installation ...
```

```
    Installing under VMS V5.3     - 12-SEP-1990 10:56

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

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

    SYSTEM MANAGER:

    The following command line MUST be added to the system startup
    command file SYS$STARTUP:SYSTARTUP_V5.COM for all nodes that will
    be running Rdb/VMS.

        $ @SYS$STARTUP:RMONSTART

    The following command line should be added to the system
    shutdown command file SYS$MANAGER:SYSHUTDWN.COM for all nodes
    that will be running Rdb/VMS.

        $ @SYS$MANAGER:RMONSTOP

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

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

    The qualifier LGICMD and PASSWORD for the RDB$REMOTE account
    in SYSUAF is modified by this installation.

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

RDBSERVER has been placed in the DECnet object database as number 35.

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

    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
    RDBSERVER.EXE into that node's DECnet object database by:

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

    This command procedure inserts RDBSERVER 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 RDBSERVER. This password must match the
    password established for the account.

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

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

    The RDBSERVER object automatically uses the RDB$REMOTE
    account created by this installation procedure.

    Invoking a database should look like:
```

```
    $DEFINE MYDB "<node>::<dev>:<dir><db-name>"
    $RDO
    RDO> DATABASE FILE MYDB

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

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

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

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

%VMSINSTAL-I-SYSDIR, This product creates system disk directory
VMI$ROOT:[SQLSRV].

%VMSINSTAL-I-SYSDIR, This product creates system disk directory
VMI$ROOT:[SQLSRV.VMSAPI].

%VMSINSTAL-I-SYSDIR, This product creates system disk directory
VMI$ROOT:[SQLSRV.MSDOSAPI].

%VMSINSTAL-I-SYSDIR, This product creates system disk directory
VMI$ROOT:[SQLSRV.ULTRIXAPI].

%VMSINSTAL-I-SYSDIR, This product creates system disk directory
VMI$ROOT:[SQLSRV.OS2API].

%VMSINSTAL-I-SYSDIR, This product creates system disk directory
VMI$ROOT:[SQLSRV.MACAPI].

%RDBVMSRTO-I-ACCOUNT, This installation creates an account named SQLSRV$SRV.
%VMSINSTAL-I-SYSDIR, This product creates system disk directory
SYS$SYSDEVICE:[SQLSRV$SERVER].

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    The Rdb/VMS Installation Verification Procedure (IVP) has
    been provided in SYS$COMMON:[SYSTEST].

    It is invoked using the commands:

        $ SET DEFAULT SYS$COMMON:[SYSTEST]
        $ @RDBIVP RTO

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        The release notes for Rdb/VMS are available in the file
              SYS$HELP:RDBVMS040.RELEASE_NOTES

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

Executing IVP for: VAX Rdb/VMS V4.0-0

Rdb/VMS monitor (RDMS_MONITOR) started
SQL: Assigning System-wide SQL Logicals

Restoring the test database.
```

```
Running RDO tests
    Test completed successfully

Running the after-image journaling test.
    Test completed successfully

Running the interpreter test.
    Test completed successfully

Running the SQL/Services tests.
Assigning System-wide SQLSRV Logicals
Installing SQL Services images
Starting the SQL Services Server


SQL/Services IVP succeeded

    Test completed successfully.

 SQL/Services tests completed successfully.

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    VAX Rdb/VMS V4.0-0

    Run-Time Only

    IVP COMPLETED SUCCESSFULLY

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IVP completed for: VAX Rdb/VMS V4.0-0

 Installation of RDBVMSRTO V4.0 completed at 11:19

Enter the products to be processed from the next distribution volume set.
* Products: EXIT
 VMSINSTAL procedure done at 11:29
$ LOGOUT
  SYSTEM       logged out at 12-SEP-1990 11:30:11.45
```