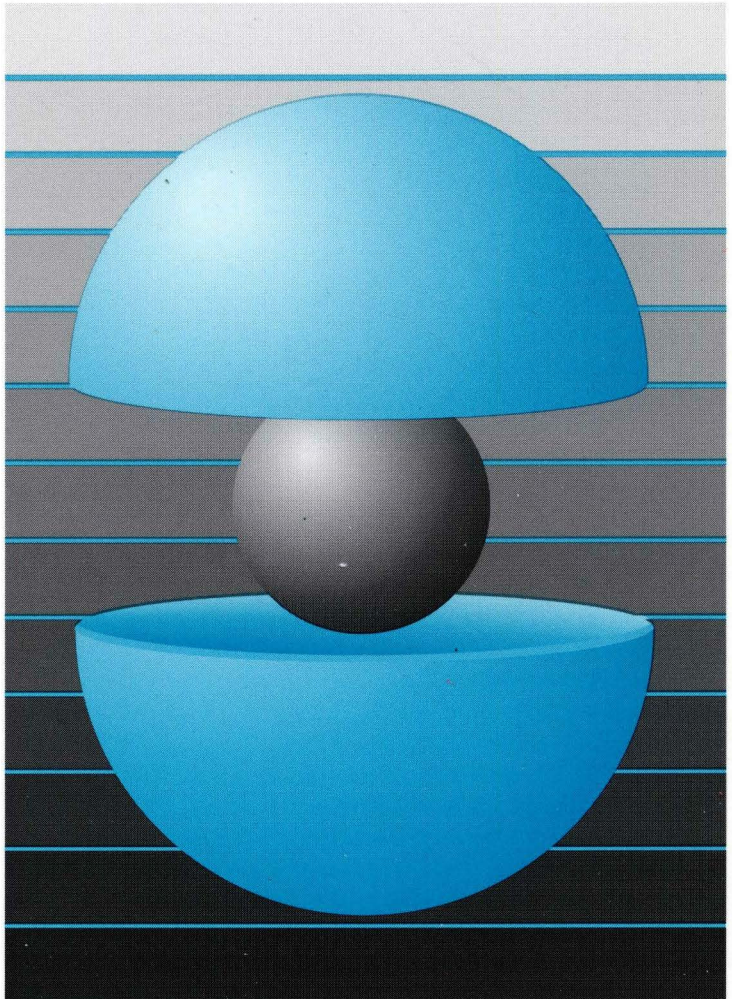


DEC OSF/1

digital

Release Notes



Part Number: AA-PS2BD-TE

DEC OSF/1

Release Notes

Order Number: AA-PS2BD-TE

August 1994

Product Version: DEC OSF/1 Version 3.0

This book contains notes on software and documentation restrictions for DEC OSF/1 Version 3.0 and the bundled layered products that ship on the same CD-ROM.

This book also describes significant new and changed features in this version of the DEC OSF/1 operating system and lists features and interfaces scheduled for retirement in future releases.

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About This Manual

This manual contains release notes for DEC OSF/1 Version 3.0. The release notes are available in both hardcopy and Bookreader versions. For the complete set of release notes, see the hardcopy version.

This manual also describes significant new and changed features in this version of the DEC OSF/1 operating system and lists features and interfaces scheduled for retirement in future releases.

Audience

These release notes are for the person who installs the product and for anyone using the product following installation.

Organization

This manual contains the following chapters:

- Chapter 1 Contains an overview of new and changed features. This chapter is also part of the Bookreader book *New and Changed Features*.
- Chapter 2 Contains installation notes and subset sizes for DEC OSF/1 Version 3.0.
- Chapter 3 Contains processor-specific information.
- Chapter 4 Contains information about the base operating system software.
- Chapter 5 Contains information about the window system software.
- Chapter 6 Contains information about the DEC OSF/1 Version 3.0 documentation.
- Chapter 7 Contains information about features scheduled for removal in future versions of DEC OSF/1. This chapter is also part of the Bookreader book *New and Changed Features*.

Related Documents

You should have the following documentation available:

- The hardware documentation for your system

- The online reference pages
- The Bookreader book files that are provided on the DEC OSF/1 Version 3.0 CD-ROM

The printed version of the DEC OSF/1 documentation set is color coded to help specific audiences quickly find the books that meet their needs. (You can order the printed documentation from Digital.) This color coding is reinforced with the use of an icon on the spines of books. The following list describes this convention:

Audience	Icon	Color Code
General Users	G	Teal
System Administrators	S	Red
Network Administrators	N	Yellow
Programmers	P	Blue
Reference Page Users	R	Black

Some books in the documentation set help meet the needs of several audiences. For example, the information in some system books is also used by programmers. Keep this in mind when searching for information on specific topics.

The *Documentation Overview* provides information on all of the books in the DEC OSF/1 documentation set.

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If you have suggestions for improving particular sections or find any errors, please indicate the manual title, order number, and section numbers. Digital also welcomes general comments.

Conventions

The following conventions are used in this guide:

<code>%</code>	A percent sign represents the C shell system prompt. A dollar sign represents the system prompt for the Bourne and Korn shells.
<code>\$</code>	
<code>#</code>	A number sign represents the superuser prompt.
<code>% cat</code>	Boldface type in interactive examples indicates typed user input.
<i>file</i>	Italic (slanted) type indicates variable values, placeholders, and function argument names.
<code>[]</code>	In syntax definitions, brackets indicate items that are optional and braces indicate items that are required. Vertical bars separating items inside brackets or braces indicate that you choose one item from among those listed.
<code>{ }</code>	
<code>...</code>	In syntax definitions, a horizontal ellipsis indicates that the preceding item can be repeated one or more times.
<code>cat(1)</code>	A cross-reference to a reference page includes the appropriate section number in parentheses. For example, <code>cat(1)</code> indicates that you can find information on the <code>cat</code> command in Section 1 of the reference pages.
<code>Ctrl/x</code>	This symbol indicates that you hold down the first named key while pressing the key or mouse button that follows the slash. In examples, this key combination is enclosed in a box (for example, <code>Ctrl/C</code>).

New and Changed Features **1**

This chapter provides brief descriptions of features that are new to the DEC OSF/1 system in this release or have changed significantly from previous releases. You should also refer to Chapter 7, which describes features and interfaces scheduled to be retired in future versions.

This chapter is also part of the Bookreader book *New and Changed Features*, which is available on the distribution CD-ROM.

1.1 Symmetric Multiprocessing

The DEC OSF/1 Version 3.0 release provides Symmetric Multiprocessing (SMP) support for all AXP systems with multiple processors (CPUs). With SMP, systems containing two or more processors execute the same copy of the operating system and access common memory, and can execute instructions simultaneously. This fully exploits the additional compute capabilities of the multiple processors. In addition, multiple threads from the same or different tasks can run concurrently on different processors. For those circumstances that warrant binding a process to a specific processor, processor affinity is also supported.

1.2 Single Set of Kernel Binaries

DEC OSF/1 Version 3.0 uses a single set of kernel binaries to build kernels for both uniprocessor and multiprocessor systems. This set of kernel binaries also supports Realtime preemption on both systems. This means that the `/usr/sys/BINARY.rt` directory and its files that were part of the DEC OSF/1 Version 2.0 release are not included in the DEC OSF/1 Version 3.0 release.

1.3 No Write Access to the /usr File System

In previous releases of DEC OSF/1, application software had both read and write access to the `/usr` file system. In DEC OSF/1 3.0, applications are not permitted to write into `/usr`. Programs that were designed to write into `/usr` should use `/var` instead.

1.4 Replacement of `cpio` and `tar` Commands

The `cpio` and `tar` commands have been replaced by links to the `pax` utility. The usage of these commands should be the same as in previous releases. If users would like to access the old versions of these commands, they are available in `/usr/opt/sterling/usr/bin` when the OSFOBSOLETE300 subset is installed.

1.5 Security

The DEC OSF/1 Version 3.0 release provides an optional enhanced security mode. The following new features were added to enhanced security in this release:

- Network Information Service (NIS) support for enhanced passwords. See Section 4.2.9 and the *Security* manual for more information.
- The DEC OSF/1 audit subsystem now displays reports generated from audit data collected on ULTRIX systems. See `audit_tool(8)` for more information.

1.6 Kernel Subsystem Configuration Changes

The kernel subsystem configuration process has been enhanced to enable you to change kernel subsystem parameters, either at configuration time or dynamically, and have these changes take effect immediately. You no longer have to rebuild the kernel after changing supported kernel subsystem parameters.

Developers writing new kernel subsystems can also choose to make their subsystems loadable. This means that to add or delete the subsystem, it is not necessary to rebuild the kernel. See the *Programmer's Guide* and `kloadsrv(8)` for more information on loadable kernel subsystems.

1.7 DEC C Compiler

The `cc` command with the `-migrate` switch is an implementation of DEC C for DEC OSF/1 that is packaged in the OSFDECC subset. DEC C works with all the usual development tools, for example, `cord`, `prof`, and `dbx`. See `cc(1)` for a description of the DEC C compiler switches and for differences between it and the default DEC OSF/1 C compiler.

1.8 Performance Monitoring

The DEC OSF/1 Version 3.0 release provides tools and a pseudodevice interface to help monitor system performance. The following tools are available:

- `uprofile` – Profiles user code with the performance counters. See `uprofile(1)` for information on this command.
- `kprofile` – Profiles the kernel with the performance counters. See `kprofile(1)` for information command.

In addition, the performance counter pseudodevice (`pfm`) is the interface to the CPU on-chip performance counters used by `uprofile` and `kprofile`. See `pfm(7)` for information on this interface.

1.9 Loadable Device Drivers

The DEC OSF/1 Version 3.0 release provides support for dynamically loading TURBOchannel, EISA, ISA, and PCI device drivers after the system has booted. This allows drivers to be added to the system without requiring a kernel rebuild and reboot. See *Writing Device Drivers: Tutorial* for information on how to write a loadable device driver.

The DEC OSF/1 Version 3.0 release does not support loadable network device drivers.

1.10 Support for BSD and SVR4 Terminal Devices

Both BSD- and SVR4-style terminal devices are supported in DEC OSF/1 Version 3.0. All base commands, shells, and utilities recognize both name spaces. You set up the BSD-style devices and SVR4-style devices during installation. See Section 4.4.1 for information on switching between SVR4 and BSD `pty` name space.

Support for the BSD `tty` name space will be removed in a future release. See Section 7.2 for more information.

1.11 File System Changes

With the DEC OSF/1 Version 3.0 release, the `mount`, `file`, and `vnode` tables are now file system data structures that are allocated and deallocated dynamically. Users can access information in these structures using the `kdbx` extensions `mount`, `file`, and `vnode`. See *Kernel Debugging* for more information.

1.12 Printer Support

Support for the following printers has been added to the DEC OSF/1 Version 3.0 release:

DEC Laser 5100 (LN09)	IBM Proprinter
NEC Silentwriter Model 290	Epson FX-80
Epson FX-1050	HP LaserJet Model IIP
HP LaserJet Model IIIP	HP LaserJet Model IIID
HP LaserJet Model IV	HP LaserJet Model 4M

See the *System Administration* manual for the print filter location and names, and printer abbreviations.

1.13 Development Environment Enhancements

The following notes describe enhancements to the DEC OSF/1 development environment.

1.13.1 Thread Support

Threads are supported in `dbx`, `prof`, `gprof`, `pixie`, and `ladebug`. This allows users to compile, debug, and profile threaded applications.

1.13.2 Compiler Enhancements

The following list describes the compiler enhancements:

- Support for 128-bit floating point values (Real*16) is provided in the compiler tool suite for FORTRAN applications. In addition, the `printf` and `scanf` libc routines are enhanced to support the 128-bit floating point values.
- Support for 32-bit pointers is provided by the `-xtaso` option. See the *Programmer's Guide* for more information about this option.
- Support for multibyte character sets. See Section 4.4.7 for more information.

1.14 ATOM Advanced Developer's Kit

The Analysis Tools with Object Modification (ATOM) Advanced Developer's Kit is included as an optional subset of the DEC OSF/1 Version 3.0 base operating system, ATMBASE300. ATOM enables software engineers to perform standard program and performance analysis, for example procedure tracing, instruction profiling, and data address tracing. PostScript documentation for the ATOM program analysis tools is contained

in the `/usr/lib/atom/doc` directory and `atom(1)` and `atomtools(5)`.

1.15 Logical Storage Manager (LSM)

The Logical Storage Manager (LSM) was provided for DEC OSF/1 Version 2.0 as a layered product. The basic LSM concatenation function has been included as an optional subset in the DEC OSF/1 Version 3.0 base operating system. Additional functions like data mirroring, data striping, and the graphical storage administration tool require a separate LSM license.

1.16 Internationalization Enhancements

In previous releases of DEC OSF/1, systems with graphics consoles provided support for international keymapping only in the console and in the X server. In DEC OSF/1 Version 3.0, these systems support international keymapping in the kernel. Any language defined in the *Alpha System Reference Manual* can be set at the console and passed to the kernel at boot time, effectively extending international keymapping support to include single-user mode.

1.17 POLYCENTER Common Agent

The POLYCENTER Common Agent is an optional subset, OSFCOMAGENT, of the DEC OSF/1 Version 3.0 base operating system. In addition, the default SNMP agent is `/usr/sbin/snmpd`. See Section 2.1.11 for installation instructions.

1.18 Realtime Changes

The DEC OSF/1 Version 3.0 system's use of semaphore functions and clock functions conforms to POSIX P1003.4 Draft 14 (POSIX 1003.1b). Draft 14 functions cannot coexist with the obsolete Draft 11 functions formerly used. If you use the DEC OSF/1 Version 3.0 realtime interfaces, you can modify your application code to replace the obsolete functions with their current counterparts or you can define the feature test macro `POSIX_4D11` before compiling your application. This support will be retired in a future release. See Section 7.8 for more information.

The DEC OSF/1 system also provides POSIX P1003.4 Draft 14 message queue functions in addition to System V messages.

1.19 POLYCENTER Advanced File System

The POLYCENTER Advanced File System (AdvFS) has the following features and enhancements:

- Users can now select AdvFS as the `root`, `/usr`, or `/var` file system. Boot support from an AdvFS domain or fileset is also provided. See Section 2.1.5 and the *Installation Guide* for more information.
- Network File System Version 3 support
- Property Lists (vfs+)

1.20 Networks and Communications

The following sections describe significant changes to the DEC OSF/1 system's networking features.

1.20.1 Network File System

The DEC OSF/1 Version 3.0 release supports both the Network File System (NFS) Version 2 and Version 3 protocols. The Version 3 protocol has the following features:

- Supports 64-bit remote file access, allowing access to files up to 2^{63} bytes in length. Previously, the maximum file size was 2^{31} bytes.
- Improves performance through support for safe asynchronous writes, better client caching, and reduced RPC calls. This results in reduced client response latency and server I/O loading.
- Enhances security by providing an access check to be done on the server.

The binding to a particular NFS version is done at mount time and is invisible to the user. An NFS client uses Version 3 by default, if the NFS server supports it. See the *Technical Overview* for more information.

1.20.2 Network Information Service (NIS)

The DEC OSF/1 Version 3.0 release contains enhanced NIS security features that are compatible with the system's C2 security. When the maps are created, two versions of each NIS database map are created: a protected version and a nonprotected version. Only privileged users (superuser) are allowed read access to protected versions of the maps; nonprivileged users are allowed read access only to the non-protected versions, which are abridged or sanitized versions of the protected maps. See Section 4.2.9 for more information.

1.20.3 Local Area Transport (LAT) Protocol

The following are new LAT features for Version 3.0:

- The implementation of LAT is a STREAMS-based implementation that replaces the clist-based implementation, which existed in earlier versions of DEC OSF/1.
- The LAT control device `/dev/lat` is now `/dev/streams/lat`.
- Support for SVR4 tty name space.

The LAT SVR4 ttys reside in the new `/dev/lat` directory and the associated minor numbers range from 620 to the maximum allowable DEC OSF/1 minor number. In the Version 3.0 release, the LAT tty name must match the minor number. For example, the LAT tty name `/dev/lat/621` must have a minor number of 621.

Note

Digital recommends using SVR4 tty names for LAT as the BSD tty name space will be retired in the future.

- LAT supports password protection for host-initiated connections.

See Section 7.2, Section 4.3.6, *Technical Overview*, and `lat_intro(7)` for additional information.

1.20.4 Data Link Bridge

The Data Link Bridge (dlb) supports 802.2 class 1 service, including SNAP support, in addition to the Ethernet service.

The following primitives are supported:

<code>DL_INFO_REQ</code>	<code>DL_INFO_ACK</code>	<code>DL_SUBS_BIND_REQ</code>
<code>DL_SUBS_BIND_ACK</code>	<code>DL_SUBS_UNBIND_REQ</code>	<code>DL_ERROR_ACK</code>
<code>DL_UDERROR_IND</code>	<code>DL_TEST_REQ</code>	<code>DL_TEST_IND</code>
<code>DL_TEST_RES</code>	<code>DL_TEST_CON</code>	<code>DL_XID_REQ</code>
<code>DL_XID_IND</code>	<code>DL_XID_RES</code>	<code>DL_XID_CON</code>

1.21 Workstations

The following sections describe significant changes to the DEC OSF/1 system's workstation features.

1.21.1 X Server Extensions

The following list summarizes the features and enhancements in the X server extensions:

- X Input Extension – Dynamically loadable, user written input device libraries that support nonstandard X input sources such as tablets and dial-and-button boxes.
- X Image Extension (XIE) Version 5.0 – Allows for high-performance image manipulation. Documentation for XIE consists of compressed PostScript files contained in the `/usr/doc/xie_v5` directory. See the `README` file in that directory for a description of the files.
- X Synchronization Extension - Allows clients to synchronize with the server and one another, using the X Server as a common time reference. Also, enables smooth animation by allowing animation to synchronize with the vertical synchronization of the display.
- X Screen Saver Extension – Allows user-written animated screen savers and auto-lock mechanisms.
- Access X - Provides features to help people with different disabilities interact with Digital workstations running DEC OSF/1 Version 3.0. These features can make it easier for people to use the standard workstation input devices: the keyboard and the mouse. See `accessx(1X)` and *DECwindows User's Guide*.

1.21.2 Other Changes

- Keymap File Changes – DEC OSF/1 uses `xmodmap` files, which use text strings to represent keyboard symbols, as keymap files. This makes it easier to read and customize keymaps. These keymaps are loaded by `xdm` using `xmodmap` in the `Xsetup_0` script.

The old Digital style keymap (`*.decw_keymap`) files will not be shipped. See Section 5.2.3 for information on using a customized keymap (`*.decw_keymap`) file.

- LK411 Support – LK411 is an LK401-style keyboard for use on systems with PC keyboard interfaces, such as DEC 2000 Model 300.
- Display PostScript (DPS) level 2.
- `-nice` X server option – Controls server priority. See the `xserver(1X)` for more information.
- Location of X server libraries changed from `/usr/shlib/Xserver` to `/usr/shlib/X11`.
- Support for dataless systems. Location of all writable or customizable files changed from `/usr/lib/X11` to `/var/X11`.

- Support for XDM-AUTHORIZATION-1 X client-server authorization mechanism.
- Dynamically loadable font renderers in the fontserver and the X server.

The notes in this chapter discuss the following topics:

- General information about installation
- Layered product considerations
- Full installation
- Update installation
- RIS installation
- DMS installation
- Disk space requirements

Note

Do not attempt to install DEC OSF/1 Version 3.0 without first reading in Chapter 3 the notes appropriate to your processor. Failure to read these notes can result in serious installation problems.

2.1 General Information About Installation

The following notes apply to the installation in general.

Caution

Do not use the `setld -l` command to update from DEC OSF/1 Version 2.0, 2.0B, 2.1, and 2.1B to DEC OSF/1 Version 3.0. The only method of updating your system other than performing a full installation is to use the `/sbin/installupdate` command. See Section 2.4, and refer to the *Installation Guide* for more information on using `/sbin/installupdate`.

2.1.1 No Console Messages Display on a VGA Monitor

If you are using a VGA monitor as your console and no power-up messages display when the system is powered up, press the Return key to display the console prompt, and enter the following command:

```
>>> set console graphics
```

Turn the system off and on; the console power-up messages should be displayed.

2.1.2 Firmware Revision

The distribution kit for this release includes an additional firmware upgrade kit. Please upgrade your firmware using the documentation supplied, prior to installing the DEC OSF/1 Version 3.0 software.

For Digital 2100 Server Model A500MP/A600MP systems, you must check the firmware revision for the Adaptec AHA1742A and AHA1740A SCSI EISA cards. The firmware level for these cards must be G.2 or higher. To determine the Adaptec firmware revision level from the OSF SRM console, see the instructions in the hardware documentation that comes with your system. If you have an earlier version, the system panics. You must install the correct firmware before installing the DEC OSF/1 software.

2.1.3 Base Operating System LMF PAK Information

For the DEC OSF/1 Version 3.0 release, you must register the License Management Facility (LMF) Product Authorization Keys (PAKs) for the following Base Operating System PAKs:

- OSF-BASE – Required to allow two nonroot users to log in to the system. Nonroot users cannot log in until the OSF-BASE PAK has been registered into the License Database and loaded into the kernel cache.
- OSF-DEV – Required for the development environment software.
- OSF-USR – Required if you want to authorize additional nonroot users.
- OSF-SVR – Required for Remote Installation Service (RIS) and Dataless Management Services (DMS).

2.1.4 Use of Kernel Configuration Files From Earlier Variants of DEC OSF/1

The kernel configuration file syntax for certain SCSI devices has changed. You cannot use the kernel configuration file from DEC OSF/1 Version 2.0, 2.0B, 2.1, or 2.1B on a DEC OSF/1 Version 3.0 system. To create a new kernel configuration file, boot the generic kernel and run the `doconfig` utility.

2.1.5 AdvFS Option for Advanced Installations

With the DEC OSF/1 Version 3.0 release, you can choose “advfs” (Advanced File System) as the `root`, `/usr`, or `/var` file system when you select the system disk during an advanced full installation. See the *Installation Guide* for more information.

For basic full installations, the default file system is still “ufs” (UNIX File System).

2.1.6 Installing onto a SCSI RAID Device

If you are installing the software onto a SCSI RAID device, only LUN 0 can be used for the installation’s target device. The RAID device’s LUN 0 must be configured as desired before you attempt to install the software onto it.

2.1.7 UUCP Suite Problems and Restrictions

Because of problems in `uucpsetup`, you must make the following manual edits:

- If you define an incoming UUCP system and your system uses NIS, you must move the entry from the end of your system’s `/etc/passwd` file to above the line containing the wildcard (`+`).
- If you define an outgoing TCP system, you must then edit the `/etc/uucp/Systems` file to provide correct information if the `host.domain` portion of that system’s fully qualified name is greater than 14 characters in length.

If a Hayes-compatible modem (AT command set) is used with the `tip` utility, the built-in dialer must be used. Thus, if the entry in the `/etc/remote` file specifies `hayes-V`, the `hayes-V` lines of the `/etc/acucap` file must be commented out.

If a `uucp` entry is included in the `/etc/inittab` file, it must end with a terminal type. The value `vt100` is recommended. The entry is similar to the following example:

```
u3:23:respawn:/usr/lib/uucp/uucp -r -t 30 ttyd0 9600 vt100
```

In addition, only RS232 lines (not printer or console lines) should have the `uucp` command run on them.

The presence of the `uucp` entry on a line prevents the `cu` command from working. To share lines, use the `tip` command for outgoing calls; the `tip` command must also be used on direct line connections.

UUCP/TCP connections do not work when connecting to another system that is running DEC OSF/1 Version 1.3, 1.3A, or 1.3B, 2.0, 2.0B, 2.1, 2.1B, or DEC OSF/1 Version 3.0. Although there is no direct workaround for this

problem, the capabilities are available in `rcp` and `ftp`.

2.1.8 Security Must Be Set to BASE Before Deleting Security Subsets

If the enhanced security subsets have been installed and configured, and you subsequently want to delete the subsets, run the `/usr/sbin/secsetup` script to return to BASE security before deleting the subsets. Failure to do so will prevent the system from booting for multiuser operation.

If you inadvertently delete the subsets without returning to BASE security, you can use the following commands to correct the error:

```
# cd /etc/sia
# ln -sf bsd_matrix.conf matrix.conf
# /usr/sbin/rcmgr set SECURITY BASE
```

After executing these commands, reboot the system.

2.1.9 Certain Graphic Adapters Require Open3D

Workstation configurations that contain the DENALI (PEXGA) graphic adapter require the additional installation of DEC Open3D Version 2.4 or higher after new installations of DEC OSF/1 Version 3.0. Without the DEC Open3D software, the X Window System will not start on these systems. All other graphic adapters are supported by DEC OSF/1 Version 3.0.

2.1.10 DXmPrint Widget Requires an Optional Subset

If your applications use the `DXmPrint` widget, you must install the `OSFDECW300` optional subset, which contains a User Interface Definition (UID) file required by the print widget. If you invoke the print widget through an application interface and this subset is not installed, the application will fail.

2.1.11 Installing the POLYCENTER Common Agent

If you use the POLYCENTER Common Agent Toolkit and need the POLYCENTER Common Agent, install the `OSFCOMAGENT300` subset and run the `/usr/sbin/snmpsetup` script. The setup script lets you choose the POLYCENTER Common Agent as the default SNMP agent.

2.1.12 Worldwide Support

With the DEC OSF/1 Version 3.0 release, Worldwide Support no longer requires you to register LMF PAKs before you start the installation.

In addition, the original `install` command under the `WORLDWIDE` directory has been replaced by the `winstall` command. When you invoke this command, you to select the countries that you want to support. Then, the command invokes the `setld` command to select the appropriate subsets for the supported countries. See the *DEC OSF/1 Worldwide Support Installation Guide* for more information.

2.1.13 DECladebug Requires DEC C++ Runtime Libraries

If you are installing the DECladebug Version 3.0.9 symbolic source-level debugger, you must also install the `CXXSHRDA201` subset (DEC C++ Runtime Libraries) that is contained on the DEC OSF/1 Version 3.0 CD-ROM distribution media.

2.1.14 LAT Installation Notes

The following notes apply to installing Local Area Transport (LAT):

- When the LAT subset is installed, LAT is configured to start by default when the system is booted.
- When the LAT subset (`OSFLAT300`) is selected during installation, the `Data Link Bridge (DLPI V2.0 Service Class1)` kernel option is made a mandatory option by the installation process. The `Data Link Bridge` option is necessary for LAT to function.
- If LAT is enabled manually by adding `options LAT` into the kernel configuration file, the following option must also be added:

```
options DLB
```

2.2 Layered Product Considerations

This section discusses compatibility problems and concerns related to Digital layered products.

2.2.1 DECsafe Available Server

Do not attempt to install Version 1.0 of the DECsafe Available Server product on a DEC OSF/1 Version 3.0 system.

If you are performing an update installation and have the DECsafe Available Server product installed, you must first delete the entire DECsafe Available Server subset and any subsets that require this product prior to performing the update installation for DEC OSF/1 Version 3.0. The DECsafe Available Server Version 1.1 product, which is compatible with DEC OSF/1 Version 3.0, is on the DEC OSF/1 Complementary Products CD.

2.2.2 DECnet/OSI

If you are going to install DECnet/OSI for DEC OSF/1 on your system, Digital recommends that you choose the Advanced Installation option when installing DEC OSF/1. Then, during the installation, select the X/Open Transport Interface option as a desired kernel option. This allows DECnet/OSI to load its kernel modules dynamically; you do not have to rebuild the kernel and reboot.

Do not attempt to install Version 1.1 or Version V2.0 DECnet/OSI kit on a DEC OSF/1 Version 3.0 system.

If you are performing an update installation and have DECnet/OSI installed, you must first delete the entire DECnet/OSI kit and any kits that require DECnet/OSI prior to performing the update installation for DEC OSF/1 Version 3.0.

2.2.3 Digital Standard MUMPS (DSM)

Due to changes introduced in the `libcurses.a` library, the following released DSM products are not compatible with DEC OSF/1 Version 3.0:

Product	Revisions Affected
DSM V1.0 for DEC OSF/1	DSM Version 1.0-000 DSM Version 1.0-001 DSM Version 1.0-002 DSM Version 1.0-003 DSM Version 1.0-004 DSM Version 1.0-005
DSM V1.0A for DEC OSF/1	DSM Version 1.0A-006 DSM Version 1.0A-xxx

A Maintenance Update release of DSM (Version 1.1) is being developed that will be compatible with DEC OSF/1 Version 3.0. The revision number will be greater than 006.

2.2.4 Multimedia Services

Version 1.0a of Digital's Multimedia Services is not compatible with DEC OSF/1 Version 3.0. A new release of Multimedia Services, Version 1.3, will be compatible with DEC OSF/1 Version 3.0.

2.3 Full Installation

A full installation will overwrite any customization on your system.

Note

If you have already installed DEC OSF/1 Version 2.0, 2.0B, 2.1, or 2.1B, you should do an update installation. See Section 2.4.

2.4 Update Installation

The following notes apply to the Update Installation procedure.

2.4.1 Prerequisites

The DEC OSF/1 Version 3.0 software can be installed as an update only if you are running DEC OSF/1 Version 2.0, 2.0B, 2.1, or 2.1B or an earlier variant of DEC OSF/1 Version 3.0. If you are not running one of these versions, you can either upgrade to Version 2.0 and then perform an update installation or do a full DEC OSF/1 Version 3.0 installation.

2.4.2 Logical Volume Manager Requires a Kernel Rebuild

If updating from DEC OSF/1 Version 2.0 with Logical Volume Manager (LVM) installed to DEC OSF/1 Version 3.0 with LVM, you must build a new kernel by using the `doconfig` utility after the update installation completes. This is because the LVM kernel option is optional for DEC OSF/1 Version 3.0. To rebuild the kernel, run the `doconfig` utility and select the Logical Volume Manager option from the `KERNEL OPTION SELECTION` menu. After the kernel build completes, copy the new kernel to `/vmunix` and reboot your system.

2.5 RIS Installation

The following notes apply to installations using Remote Installation Services.

2.5.1 RIS Client Booting over the Network

Booting a RIS client over an FDDI network is not supported by the DEFZA firmware.

2.5.2 ULTRIX Server or DEC OSF/1 Server Running Older Software

If you are using an ULTRIX system as a RIS server for DEC OSF/1 Version 3.0, you must perform some extra tasks before clients can boot the software. Use the RIS install software option to extract or link to the Version DEC OSF/1 Version 3.0 kit. Then enter the following commands, where *n* is the number of the appropriate directory:

```
# cd risn.mips
# restore xf */ROOT ./RisFiles
# /usr/bin/sh5 RisFiles Extract */ROOT
```

If your RIS server is running ULTRIX or DEC OSF/1 Version 1.2, 1.2A, 1.3, 1.3A, 1.3B, 2.0, 2.0B, 2.1, or 2.1B software, the following extra step is needed before you can install DEC OSF/1 Version 3.0 on your clients. Because the Version 3.0 client systems access part of the kit from the server using NFS, NFS server capabilities must be enabled on the server. (See the `nfsssetup(8)` reference page.)

Before installing clients, you must add a line to the `/etc/exports` file for each RIS area that your ULTRIX server is serving to DEC OSF/1 clients. The `/etc/exports` entry includes a path name to the kit directory in the RIS area; there must be no symbolic links in this path name. Entries in the `/etc/exports` file can have either of the following formats:

- If your server's `var` area is separate from the `usr` area, there will be a symbolic link to it at `/usr/var`. In this case, add a line similar to the following to the `/etc/exports` file:

```
/var/adm/ris/ris2.mips/kit -r=0 -o
```
- If your `var` area is part of your `usr` area, add a line similar to the following to the `/etc/exports` file:

```
/usr/var/adm/ris/ris2.mips/kit -r=0 -o
```

After you make the entries in the `/etc/export` file, your ULTRIX server will be able to register clients for the DEC OSF/1 product.

Caution

Before you allow clients to use the new RIS area to perform update installations, read the *Release Notes* and the *Installation Guide*. Failure to carefully follow the directions for update installations can result in loss or corruption of data.

2.5.3 Problem Extracting Worldwide Support Subsets From ULTRIX Server

When extracting subsets from the `/ALPHA/WORLDWIDE/FONT` or `/ALPHA/WORLDWIDE/SRCS` directories on an ULTRIX Version 4.4 RIS server, if you do not choose the first subset in the list, the product name of those subsets is not shown in the RIS area. To work around this problem, edit the product name file `/usr/var/adm/ris/ris(n).alpha/ProdNames` and add the following product names:

- DEC OSF/1 Worldwide Support [Fonts] V3.0 (rev. 22)
- DEC OSF/1 Worldwide Support [Public Source] V3.0 (rev. 22)

Before you edit the product name file, check the revision number of the Worldwide Support product in the `/ALPHA/WORLDWIDE/BASE` directory.

2.5.4 RIS Client Booting Across a Router

If you have registered a client on a RIS server and the client and server are on different networks, complete the following steps:

1. Edit the `/etc/bootptab` file on the RIS server and find the line that begins with the name of the client.
2. Search for the `gw` field. This field will be set to an IP address. Verify that this IP address is the IP address of the router interface connected to the client's subnet. If it is not, replace it with the correct IP address.
3. Add a subnet mask field immediately after the `gw` field and before the `ha` field. The subnet mask field format is as follows:

```
sm=subnet-mask
```

For example, if you have a router IP address of 16.69.144.30, a subnet mask of 255.255.255.0, and a client named `mozart`, the line in `/etc/bootptab` file would appear as follows:

```
mozart:tc=.ris0.alpha:ht=ethernet:gw=16.69.224.222:\  
ha=08002b000000:ip=16.69.224.169
```

After editing, the line would appear as follows:

```
mozart:tc=.ris0.alpha:ht=ethernet:gw=16.69.144.30:\  
sm=255.255.255.0:ha=08002b000000:ip=16.69.224.169
```

After you edit the `/etc/bootptab` file, you can boot the client across the router.

2.5.5 Installation CD-ROM Contains a “Dirty” File System

The DEC OSF/1 Version 3.0 installation CD-ROM contains a “dirty” file system. To mount the CD-ROM on an ULTRIX system so that you can load the software for RIS use, you must specify the `-o force` flag for the `mount` command. For example:

```
# mount -o force -r /dev/rz4c /cdrom
```

To mount the CD-ROM on a DEC OSF/1 system older than Version 2.0, use the following command:

```
# mount -dr /dev/rz4c /cdrom
```

2.6 DMS Installation

When a DMS client is first booted from a DMS server, the client configures the installed subsets. If a Worldwide subset is installed, the following message appears:

```
New Worldwide Support kernel objects have been installed.  
Do you want to configure them into the kernel ? [y]
```

Enter `n` in response to the question. After the DMS client is booted, you can build the Asian kernel with the following command:

```
# wwconfig -a -N
```

If you reply `y` to the question, the system will be in an unusable state. To recover from the problem, do the following:

1. Boot the DMS client to single user mode.
2. Enter the following commands:

```
# bcheckrc  
# wwconfig -a -N
```

3. Reboot the DMS client.

2.7 Disk Space Requirements

The following sections provide the disk space requirements for the various forms of installations.

2.7.1 Full Installation

In Table 2-1, disk space is defined in terms of the 512-byte blocks required to install each DEC OSF/1 subset. The figures for each group of files within a subset (listed as being in `root`, `/usr`, and `/var`) have been rounded up to the next higher 512-byte increment; this means that the total space requirements listed are slightly greater than the space that the software actually requires.

For information on the contents of each subset, see the *Installation Guide*. If you want to add optional subsets after you install DEC OSF/1 Version 3.0, use the `df` command to determine free disk space in blocks.

Table 2-1: DEC OSF/1 Version 3.0 Subset Names and Sizes (512-Byte Blocks)

DEC Ada Runtime Library				
Subset	root	/usr	/var	Total
ADALIB321	—	1531.25	—	1531.25
Total	—	1531.25	—	1531.25
ATOM Program Analysis Tools				
Subset	root	/usr	/var	Total
ATMBASE300	—	7717.05	—	7717.05
Total	—	7717.05	—	7717.05
DEC OSF/1 Version 3.0 Alpha AXP Operating System				
Subset	root	/usr	/var	Total
OSFACCT300	9.67	1063.31	31.03	1104.01
OSFADVFS300	5822.00	8194.02	—	14016.02
OSFADVFSBIN300	—	6890.45	—	6890.45
OSFAFM300	—	1952.15	—	1952.15
OSFBASE300	30188.80	78073.70	294.43	108556.93
OSFBIN300	—	34693.50	—	34693.50
OSFBINCOM300	6.06	19372.30	—	19378.36
OSFC2SEC300	1099.77	2407.39	926.00	4433.16
OSFCDAPGMR300	—	7029.69	—	7029.69
OSFCLINET300	2399.53	7685.38	7.00	10091.91
OSFCMPLRS300	—	33126.70	—	33126.70
OSFCOMAGENT300	167.79	4165.80	—	4333.59
OSFCTABLOC300	34.25	367.35	—	401.60
OSFDCMT300	—	1267.18	—	1267.18

DEC OSF/1 Version 3.0 Alpha AXP Operating System

Subset	root	/usr	/var	Total
OSFDCMTEXT300	—	3030.61	—	3030.61
OSFDECC300	—	7491.00	—	7491.00
OSFDECW300	—	12728.80	—	12728.80
OSFDMS300	—	630.04	43.00	673.04
OSFDPSFONT300	—	5050.78	—	5050.78
OSFEMACS300	—	29605.80	—	29605.80
OSFEURLOC300	—	2147.44	—	2147.44
OSFEXER300	—	2827.00	—	2827.00
OSFFONT15300	—	3539.43	—	3539.43
OSFFONT300	—	2809.47	—	2809.47
OSFHWBASE300	16254.00	1941.23	34.40	18229.63
OSFHWBIN300	—	23252.30	—	23252.30
OSFHWBINCOM300	—	807.89	—	807.89
OSFINET300	763.01	4213.23	428.59	5404.83
OSFKTOOLS300	—	1078.19	8027.52	9105.71
OSFLAT300	35.70	1271.28	—	1306.98
OSFLEARN300	—	2997.39	—	2997.39
OSFLSMBASE300	9889.94	3340.11	—	13230.05
OSFLSMBIN300	—	1052.03	—	1052.03
OSFLSMBINCOM300	—	440.41	—	440.41
OSFLSMPGMR300	—	287.59	—	287.59
OSFLSMX11300	—	2421.18	—	2421.18
OSFLVM300	—	7541.42	—	7541.42
OSFMANOP300	—	11053.50	—	11053.50
OSFMANOS300	—	17699.00	—	17699.00
OSFMANRT300	—	407.13	—	407.13
OSFMANWOP300	—	11343.50	—	11343.50
OSFMANWOS300	—	2546.27	—	2546.27
OSFMH300	—	14545.10	—	14545.10
OSFMITFONT300	—	16249.50	29.01	16278.51
OSFMOTDEM300	—	6144.80	—	6144.80
OSFNFS300	48.30	1267.37	—	1315.67
OSFOBSOLETE300	—	2031.00	—	2031.00
OSFPGMR300	—	33715.70	—	33715.70
OSFPRINT300	64.04	5725.20	4.00	5793.24
OSFRCS300	—	1947.54	—	1947.54
OSFRIS300	—	74.05	78.00	152.05
OSFRTDEV300	—	625.90	—	625.90
OSFSCCS300	—	1561.45	—	1561.45
OSFSER300	—	39277.90	34.36	39312.26
OSFSVID2300	31.59	654.32	—	685.91
OSFUUCP300	85.82	9303.52	56.00	9445.34
OSFVET300	—	13312.40	—	13312.40
OSFX11300	—	57671.70	143.48	57815.18
OSFXC2SEC300	—	2506.50	18.60	2525.10
OSFXCDADEV300	—	1298.12	—	1298.12

DEC OSF/1 Version 3.0 Alpha AXP Operating System

Subset	root	/usr	/var	Total
OSFXDEV300	—	48257.10	—	48257.10
OSFXIEDOC300	—	2235.59	—	2235.59
OSFXMAIL300	—	1617.51	—	1617.51
OSFXMIT300	—	4681.87	—	4681.87
OSFXOEM300	—	0.00	788.25	788.25
OSFXVET300	—	790.64	—	790.64
Total	66900.28	635337.71	10943.67	713181.67

Development Enhancements for DEC OSF/1 AXP Systems

Subset	root	/usr	/var	Total
CMPDEVENH300	—	3682.75	—	3682.75
Total	—	3682.75	—	3682.75

DECLdebug for DEC OSF/1 AXP Systems, Version 3.0-9

Subset	root	/usr	/var	Total
LDBBASE309	—	8407.39	—	8407.39
LDBSRV309	—	159.90	—	159.90
Total	—	8567.28	—	8567.28

DEC C++ RTL for DEC OSF/1 AXP Systems, Version 1.3

Subset	root	/usr	/var	Total
CXXSHRDA201	—	2776.16	—	2776.16
Total	—	2776.16	—	2776.16

DEC Cobol Run Time Support Library for DEC OSF/1 AXP Systems

Subset	root	/usr	/var	Total
DCARTL210	—	3655.63	—	3655.63
O2ABASE210	—	2734.36	—	2734.36
Total	—	6389.99	—	6389.99

DEC Fortran for DEC OSF/1 AXP Runtime Support

Subset	root	/usr	/var	Total
DFARTL353	—	5546.79	—	5546.79
Total	—	5546.79	—	5546.79

DEC Pascal for DEC OSF/1 AXP Runtime Support

Subset	root	/usr	/var	Total
DPORTL513	—	1929.11	—	1929.11
Total	—	1929.11	—	1929.11

Free Software Foundation GNU Source

Subset	root	/usr	/var	Total
FSFEMACSSRC300	—	16383.30	—	16383.30
FSFGAWKSRC300	—	1207.38	—	1207.38
FSFRCSSRC300	—	1806.79	—	1806.79
Total	—	19397.47	—	19397.47

Sort Runtime Library

Subset	root	/usr	/var	Total
SORLIB201	—	651.84	—	651.84
Total	—	651.84	—	651.84

DEC OSF/1 Worldwide Support [Base System] Version 3.0

Subset	root	/usr	/var	Total
IOSAACMENU300	—	0.00	—	—
IOSCSDECW300	—	4312.06	—	4312.06
IOSCSX11300	—	7051.33	—	7051.33
IOSCSXCDA300	—	281.35	—	281.35
IOSCSXDEV300	—	196.76	—	196.76
IOSCSXMAIL300	—	331.22	—	331.22
IOSDEDECW300	—	4379.52	—	4379.52
IOSDEX11300	—	6952.02	—	6952.02
IOSDEXCDA300	—	291.54	—	291.54
IOSDEXDEV300	—	196.88	—	196.88
IOSDEXMAIL300	—	385.19	—	385.19
IOSELDECW300	—	121.95	—	121.95
IOSELFONT15300	—	1974.12	—	1974.12
IOSELFONT300	—	1672.99	—	1672.99

DEC OSF/1 Worldwide Support [Base System] Version 3.0

Subset	root	/usr	/var	Total
IOSELX11300	—	441.00	—	441.00
IOSELXMAIL300	—	68.32	—	68.32
IOSEDECW300	—	4386.39	—	4386.39
IOSESX11300	—	6657.34	—	6657.34
IOSESXCDA300	—	280.79	—	280.79
IOESXDEV300	—	197.23	—	197.23
IOESXMAIL300	—	342.43	—	342.43
IOSFRDECW300	—	4352.44	—	4352.44
IOSFRX11300	—	6665.53	—	6665.53
IOSFRXCDA300	—	281.97	—	281.97
IOSFRXDEV300	—	196.98	—	196.98
IOSFRXMAIL300	—	358.75	—	358.75
IOSHUDECW300	—	4369.43	—	4369.43
IOSHUX11300	—	6871.49	—	6871.49
IOSHUXCDA300	—	283.17	—	283.17
IOSHUXDEV300	—	196.85	—	196.85
IOSHUXMAIL300	—	342.45	—	342.45
IOSITDECW300	—	4385.94	—	4385.94
IOSITX11300	—	6740.75	—	6740.75
IOSITXCDA300	—	287.76	—	287.76
IOSITXDEV300	—	197.01	—	197.01
IOSITXMAIL300	—	359.48	—	359.48
IOSIWBASE300	—	205.30	—	205.30
IOSIWFONT15300	—	2829.08	—	2829.08
IOSIWFONT300	—	2358.61	—	2358.61
IOSIWX11300	—	1764.67	—	1764.67
IOSIWXDEV300	—	958.83	—	958.83
IOSJPABASE300	—	4880.40	—	4880.40
IOSJPAMANOS300	—	187.12	—	187.12
IOSJPAMANOSSJIS300	—	187.12	—	187.12
IOSJPBASE300	—	15278.90	—	15278.90
IOSJPDECW300	—	6814.79	—	6814.79
IOSJPFONT15300	—	23040.10	—	23040.10
IOSJPFONT300	—	28654.60	—	28654.60
IOSJPMANOS300	—	5225.91	—	5225.91
IOSJPMANOSSJIS300	—	5222.88	—	5222.88
IOSJPMANWOS300	—	964.42	—	964.42
IOSJPMMSG300	—	1581.94	—	1581.94
IOSJPMMSGJIS300	—	527.27	—	527.27
IOSJPNEMACS300	76.00	22921.70	—	22997.70
IOSJPPGMR300	—	3969.80	—	3969.80
IOSJPWNN300	108.59	20598.50	—	20707.09
IOSJPWNNPGMR300	—	2458.34	—	2458.34
IOSJPX11300	—	7326.52	—	7326.52
IOSJPXCDA300	—	406.14	—	406.14
IOSJPXDEV300	—	314.91	—	314.91

DEC OSF/1 Worldwide Support [Base System] Version 3.0

Subset	root	/usr	/var	Total
IOSJPMAIL300	—	744.96	—	744.96
IOSKOBASE300	—	1672.08	—	1672.08
IOSKODECW300	—	2394.52	—	2394.52
IOSKOFONT2300	—	9166.83	—	9166.83
IOSKOFONT300	—	3603.20	—	3603.20
IOSKOX11300	—	5062.98	—	5062.98
IOSKOXCDA300	—	179.00	—	179.00
IOSKOXDEV300	—	214.17	—	214.17
IOSKOXMAIL300	—	76.15	—	76.15
IOSPLDECW300	—	4306.93	—	4306.93
IOSPLX11300	—	7089.78	—	7089.78
IOSPLXCDA300	—	279.48	—	279.48
IOSPLXDEV300	—	196.85	—	196.85
IOSPLXMAIL300	—	348.01	—	348.01
IOSRUDECW300	—	4392.57	—	4392.57
IOSRUX11300	—	6922.39	—	6922.39
IOSRUXCDA300	—	283.45	—	283.45
IOSRUXDEV300	—	196.88	—	196.88
IOSRUXMAIL300	—	333.59	—	333.59
IOSSKDECW300	—	4241.10	—	4241.10
IOSSKX11300	—	6482.54	—	6482.54
IOSSKXCDA300	—	276.54	—	276.54
IOSSKXDEV300	—	196.63	—	196.63
IOSSKXMAIL300	—	321.57	—	321.57
IOSSVDECW300	—	4102.24	—	4102.24
IOSSVX11300	—	6290.29	—	6290.29
IOSSVXCDA300	—	274.53	—	274.53
IOSSVXDEV300	—	196.66	—	196.66
IOSSVXMAIL300	—	321.98	—	321.98
IOSTHBASE300	—	486.81	—	486.81
IOSTHBIN300	—	274.86	—	274.86
IOSTHDECW300	—	2116.16	—	2116.16
IOSTHFONT300	—	105.02	—	105.02
IOSTHPRINT300	—	178.93	—	178.93
IOSTHX11300	—	5567.81	—	5567.81
IOSTHXCDA300	—	147.00	—	147.00
IOSTHXDEV300	—	238.99	—	238.99
IOSTHXMAIL300	—	73.94	—	73.94
IOSTRDECW300	—	121.95	—	121.95
IOSTRFONT15300	—	4804.21	—	4804.21
IOSTRFONT300	—	4032.01	—	4032.01
IOSTRX11300	—	478.93	—	478.93
IOSTRXMAIL300	—	68.32	—	68.32
IOSWWBASE300	185.35	2445.08	—	2630.43
IOSWWBIN300	17.32	1631.56	—	1648.88
IOSWWBINCOM300	—	608.82	—	608.82

DEC OSF/1 Worldwide Support [Base System] Version 3.0

Subset	root	/usr	/var	Total
IOSWWDECW300	—	2980.85	—	2980.85
IOSWWFONT300	—	824.02	—	824.02
IOSWWLAT2FONT15300	—	5547.00	—	5547.00
IOSWWLAT2FONT300	—	4575.24	—	4575.24
IOSWWLATCFONT15300	—	3580.94	—	3580.94
IOSWWLATCFONT300	—	3016.54	—	3016.54
IOSWWMANOS300	—	1205.77	—	1205.77
IOSWWMH300	—	16765.20	—	16765.20
IOSWWPHRASE300	—	1039.25	—	1039.25
IOSWWPRINT300	69.90	4415.51	—	4485.41
IOSWWUDCOS300	—	2267.27	—	2267.27
IOSWWUDCWOS300	—	100.45	—	100.45
IOSWWX11300	—	15975.90	—	15975.90
IOSWWXDEV300	—	2727.37	—	2727.37
IOSWWXMAIL300	—	1383.37	—	1383.37
IOSZHBASE300	—	230.56	—	230.56
IOSZHBIG5300	—	1288.33	—	1288.33
IOSZHCBASE300	—	830.05	—	830.05
IOSZHCNLOC300	—	1132.78	—	1132.78
IOSZHCONV300	—	983.03	—	983.03
IOSZHEUCTW300	—	632.48	—	632.48
IOSZHHANYU300	—	617.59	—	617.59
IOSZHHANZI300	—	240.29	—	240.29
IOSZHHKBASE300	—	7407.88	—	7407.88
IOSZHMTELEX300	—	974.27	—	974.27
IOSZHSDECW300	—	2250.95	—	2250.95
IOSZHSFONT2300	—	26867.20	—	26867.20
IOSZHSFONT300	—	3169.28	—	3169.28
IOSZHSX11300	—	3455.13	—	3455.13
IOSZHSXCDA300	—	155.00	—	155.00
IOSZHSXDEV300	—	432.24	—	432.24
IOSZHSXMAIL300	—	74.84	—	74.84
IOSZHTDECW300	—	6510.27	—	6510.27
IOSZHTFONT2300	—	18978.40	—	18978.40
IOSZHTFONT300	—	8544.73	—	8544.73
IOSZHTWBASE300	—	6594.46	—	6594.46
IOSZHTWLOC300	—	9541.73	—	9541.73
IOSZHTX11300	—	8585.17	—	8585.17
IOSZHTXCDA300	—	449.00	—	449.00
IOSZHTXDEV300	—	2220.37	—	2220.37
IOSZHTXMAIL300	—	232.47	—	232.47
IOSZHX11300	—	8911.76	—	8911.76
Total	457.16	516351.51	—	516808.67

DEC OSF/1 Worldwide Support [Fonts] Version 3.0

Subset	root	/usr	/var	Total
IOSELOLFONT300	—	1942.50	—	1942.50
IOSIWOLFONT300	—	1836.15	—	1836.15
IOSKOOLFONT300	—	5841.90	—	5841.90
IOSTHOLFONT300	—	7216.12	—	7216.12
IOSTROLFONT300	—	5351.00	—	5351.00
IOSWWLAT2OLFONT300	—	5476.05	—	5476.05
IOSWWLATCOLFONT300	—	3567.33	—	3567.33
IOSZHSOLFONT300	—	14465.00	—	14465.00
IOSZHTOLFONT300	—	27073.20	—	27073.20
Total	—	72769.25	—	72769.25

DEC OSF/1 Worldwide Support [Public Source] Version 3.0

Subset	root	/usr	/var	Total
IOSJPNEMACSSRC300	—	10440.20	—	10440.20
IOSJPWNSRC300	—	10983.80	—	10983.80
Total	—	21424.00	—	21424.00

Grand Totals	root	/usr	/var	Total
	67357.44	1304072.16	10943.67	1382373.28

2.7.2 Update Installation

For update installations, the `installupdate` script automatically computes and reports the difference between the amount of disk space used and that required. Depending on the software currently installed on the system and how the disk partitions are defined, the Update Installation procedure from DEC OSF/1 Version 2.0 to DEC OSF/1 Version 3.0 requires the following minimum amounts of disk space (in 512-byte blocks, rounded upward):

- Disk space needed to update only the Version 2.0 mandatory subsets to Version 3.0:

<code>root</code>	17762
<code>usr</code>	-66330
<code>var</code>	1442
<code>Total</code>	-47126

- Disk space needed to update a full Version 2.0 installation to Version 3.0:

root	14540
usr	-229404
var	2526
Total	-212338

Note

The size of the /usr area has decreased from Version 2.0 to Version 3.0. This results in reduced disk space needs for an Update Installation from Version 2.0 to Version 3.0, and is the reason for using negative numbers in the preceding tables.

Systems that have more subsets installed than those included by a Basic Installation, but fewer subsets than a Full Installation, will have varying minimum disk space requirements for an update installation.

2.7.3 RIS Area

The RIS area for DEC OSF/1 Version 3.0 requires approximately 387 MB of disk space. The space requirements are further broken down as follows:

Product Area	512-Byte Blocks
./ALPHA/ADA	1552
./ALPHA/ATOM	3402
./ALPHA/BASE	415176
./ALPHA/COMPILERS	1788
./ALPHA/DECLADEBUG	4188
./ALPHA/DEC_C++_RTL	1264
./ALPHA/DEC_Cobol_RTL	2560
./ALPHA/DEC_Fortran_RTL	2408
./ALPHA/DEC_Pascal_RTL	820
./ALPHA/GNUSRC	7530
./ALPHA/SORT	332
./ALPHA/WORLDWIDE	332098

2.7.4 Documentation

The documentation (Bookreader files) for DEC OSF/1 Version 3.0 requires approximately 119 MB of disk space if moved from the CD-ROM onto a local disk.

This chapter contains notes that apply to the following DEC OSF/1 Version 3.0 processors:

- DEC 2000
- DEC 3000
- DEC 4000
- DEC 7000
- DEC 10000
- Digital 2100 Server

3.1 DEC 2000 Processors

The following notes apply to the DEC 2000 series processors.

3.1.1 DEC 2000 Model 300 Uses Polling Mode for Printing

The parallel port driver in DEC OSF/1 Version 3.0 operates by polling instead of by responding to device interrupts. While the overall performance impact of running in polled mode is small, it might affect some performance-critical applications.

3.1.2 Network Adapter Support

The EISA Tulip Ethernet controller (DE425) and the EISA Token Ring controller (DW300) are now supported on the DEC 2000 processors. The DW300 represents both the newer and older versions of the Proteon ProNET-4/16 p1990 series of Network Interface Cards. Both controller options require a new version of the EISA Configuration Utility. Service Update Contract customers will receive the new utility automatically. Other customers must order the EISA Configuration Kit (order number QA-MT4AJ-H8).

3.2 DEC 3000 Processors

Fast SCSI is now supported for DEC 3000 Model 600 and 600S, DEC 3000 Model 800 and 800S, and PMAZC-AA TURBOchannel SCSI controllers. To select between 5Mb/second or 10Mb/second operation on an individual bus basis, use the hardware console commands shown here.

To specify the characteristics for the baseboard SCSI controllers, use the following commands:

```
setenv fast_scsi_a on      Set 10Mb/second on the internal SCSI bus
setenv fast_scsi_a off    Set 5Mb/second on the internal SCSI bus
setenv fast_scsi_b on      Set 10Mb/second on the external SCSI bus
setenv fast_scsi_b off    Set 5Mb/second on the external SCSI bus
```

For the PMAZC-AA option, use the following commands, where *n* is the TURBOchannel slot number:

```
t tcn setid s s           Set both the a bus and b bus to 5Mb/second
t tcn setid f s           Set the a bus to 10Mb/second and the b bus to
                           5Mb/second
t tcn setid s f           Set the a bus to 5Mb/second and the b bus to
                           10Mb/second
t tcn setid f f           Set both the a bus and b bus to 10Mb/second
```

Note that the maximum cable length is 3 meters for SCSI buses with fast operation enabled.

3.3 DEC 4000 Processors

The following notes apply to the DEC 4000 series processors.

3.3.1 Do Not Set the Date Using the DEC 4000 Console date Command

DEC OSF/1 Version 3.0 and the DEC 4000 console firmware store different date representations in the system watch chip. As a result, dates set with the DEC OSF/1 Version 3.0 `date` command are always displayed as a date in the year 1970 on the DEC 4000 console, and dates set using the DEC 4000 console `date` command cause DEC OSF/1 Version 3.0 to report that the clock gained approximately 22 years.

Therefore, do not set the date using the DEC 4000 console `date` command, and ignore the date presented on the DEC 4000 console in the full-screen system power-up display.

When rebooting DEC OSF/1 Version 3.0 after running another version of the operating system, or when using a different DEC OSF/1 Version 3.0 root partition, check the date and reset it if necessary.

3.4 DEC 7000 and 10000 Processors

The KDM70 disk controller is not supported when more than one gigabyte of memory is installed.

3.5 Digital 2100 Server Processors

The following notes apply to the Digital 2100 Server series processors.

3.5.1 No EISA TULIP DE425 Support

The EISA Tulip Ethernet controller (DE425) is not supported on the Digital 2100 Server Model A500MP and A600MP systems.

3.5.2 Maximum Memory Support

For DEC OSF/1 Version 3.0, Digital 2100 Server Model A500MP and A600MP systems support up to one gigabyte of memory.

3.5.3 RZ26 Device Revision

RZ26 devices must be at revision 392 or higher.

3.5.4 GRAPHICS Console Setting

For the Version 3.0 kit, you must run your Digital 2100 Server Model A500MP and A600MP system with the console set to GRAPHICS (VGA). If, for some reason, your console becomes set to a different mode, be sure to reset it. Use the following command at the console prompt:

```
>>> set console graphics
```

3.5.5 SWXCR RAID Controller

The following notes apply to the SWXCR RAID controller that is supplied with the Digital 2100 Server Model A500MP and A600MP system. Be sure to read the cover letter for the SWXCR RAID controller for specific controller operation notes.

3.5.5.1 Installing and Configuring the SWXCR RAID Controller

You must install and configure the SWXCR RAID controller on your Digital 2100 Server Model A500MP and A600MP system before you install the DEC OSF/1 Version 3.0 operating software.

See the *StorageWorks RAID Array 200 Subsystem Family Installation and Configuration Guide* for information.

3.5.5.2 SWXCR Firmware Revision Requirements

Your Digital 2100 Server Model A500MP and A600MP system must be running Firmware Version 1.98 or higher. You need to run the Standalone RAID configuration utilities to determine if your system has the correct firmware version installed. This version number appears at the top of the menu screens for the configuration utilities. For information on how to run the utilities, see the chapter on the Standalone RAID configuration utilities in the *StorageWorks RAID Array 200 Subsystem Family Installation and Configuration Guide*.

This chapter contains notes about issues and known problems with the base operating system and, whenever possible, provides solutions or workarounds to those problems.

The following topics are discussed in this chapter:

- Commands and utilities
- System administration
- Network and communications
- The programming environment
- File systems
- Binary compatibility

4.1 Commands and Utilities

The following notes apply to commands and utilities.

4.1.1 tar Command Syntax Changes

The syntax of the `tar` command has changed. The minus sign (`-`) at the beginning of a flag set is no longer optional. If the `tar` utility detects a minus sign in front of a flag that requires an argument, `tar` expects the argument to follow the flag immediately. To use the original `tar` command syntax in existing scripts, you must remove the minus sign if more than one flag requiring an argument is given. For example, the following command violates the new syntax rules:

```
tar -xbfp 20 /dev/rmt1h
```

To make the preceding command conform to the new syntax rules, make either of the following changes to the command:

```
tar xbfp 20 /dev/rmt1h
```

```
tar -xpb 20 -f /dev/rmt1h
```

In addition, the following flags might not work in every situation: `B`, `i`, `L`, `#`, `e`, `C`, and `S`.

4.1.2 tar Command Restrictions

For this release, the `tar` command has the following restrictions:

- The `u` option is the same as the `r` option.
- The `p` option does not preserve the mode of the symbolic links.
- The `n` option is not implemented.

4.1.3 Multiple Versions of the awk Commands

The DEC OSF/1 system also provides three versions of the `awk` command, with differences in features among versions:

- `awk(1)`
Formerly named `nawk` in DEC OSF/1 Version 2.0. The default version that offers the functionality found in the X/Open CAE Specification, Commands and Utilities, Issue, 4 for `awk`. Similar in functionality to `gawk`. Described in the `awk(1)` reference page.
- `gawk(1)`
From the Free Software Foundation. Similar in functionality to `awk(1)`. Described in the `gawk(1)` reference page
- `oawk(1)`
Formerly named `awk` in DEC OSF/1 Version 2.0. Described in the `oawk(1)` reference page. This is included in the “Obsolete Commands and Utilities (System Administration)” subset.

Refer to the respective reference pages for further information.

4.1.4 vmh Command

The `vmh` command in the `/usr/bin/mh` suite is not supported in this release.

4.1.5 Treatment of .exrc and EXINIT by ex and vi Editors Has Changed

Users with both a `.exrc` file and an `EXINIT` environment variable will find that the `ex` editor no longer reads the `.exrc` file. This change was made to meet the specifications of XPG4.

The standard provides for an approximation of the old behavior. A new variable, named `exrc`, is defined. When this variable is set by the commands in the `EXINIT` environment variable, the editor reads the `.exrc`

file in the current directory for additional startup commands. For example:

```
setenv EXINIT 'set ai terse magic bf wm=1 exrc'
```

This note also applies to the `vi` editor and the other three names under which this command is installed:

```
/usr/bin/edit  
/usr/bin/vedit  
/usr/bin/view
```

Additionally, the editors refuse to read the `.exrc` file if its mode grants write permission to anyone other than the owner; this restriction prevents certain security breaches. No overt indication is given when such a refusal occurs.

4.1.6 nm Command Changes

The `nm` command is changed to be in compliance with the XPG4 standard, and compatible with the OSF/1 version. Because of this change, the System V format is no longer the default. Use the `-S` option to specify the System V format. In addition, the definition and use of various options have changed to conform to the standard.

To ensure backward compatibility with previous versions of the command, the following options are supported:

- The `-b` option specifies octal numeric output, but only when using the Berkeley format.
- The `-o` option prepends file names to symbols, but only when using the Berkeley format. When used with other formats, the `-o` option specifies octal numeric output, as required by XPG4 and POSIX.

See `nm(1)` for information on the options.

4.1.7 Possible Problem When Using the nm Command With -a Flag

When using the `nm` command with the `-a` (System V debug) flag on a large archive library (such as `libc.a`), the command might produce a segmentation fault and core dump. The command operates properly for shared libraries, other objects, and executables, and for all other output formats.

To work around this problem, use the `odump` command with the `-tv` flags, which provides the same information as the `nm -a` command, but in a different format.

4.1.8 dump Command Restriction

If you invoke the `/sbin/dump`, `/usr/sbin/dump`, or `/usr/sbin/rdump` command from the `cron` program (or another application), the `dump` program terminates in error because it cannot access standard input. In addition, the `dump` program also terminates `cron`, the parent program.

To work around this problem, have the `cron` program start a script that invokes the `dump` program.

Note

Successive unattended dumps to the no-rewind device might be compromised by an the `mt status` command. This will cause a rewind, resulting in subsequent dumps overwriting past dumps.

4.2 System Administration

The following notes apply to system administration.

4.2.1 Possible Kernel Build Failure on DEC 7000 and 10000 Systems With No SCSI Controller

If you remove the SCSI controller on DEC 7000 or DEC 10000 systems and run the `doconfig` program, the kernel build will fail because of unresolved references. To work around this problem, you must add at least one `scsi` controller entry and one `scsi` bus entry to the configuration file. You can add these entries either when you run the `doconfig` program or by editing the configuration file separately.

4.2.2 Kernel Configuration File Syntax Has Changed

Because of changes in the kernel configuration file syntax for certain devices, you cannot use the kernel configuration file from earlier variants of DEC OSF/1. See Section 2.1.4 for information on building a new configuration file.

4.2.3 Usage Note For Adding Swap Devices

Do not add swap devices to a heavily loaded symmetric multiprocessing (SMP) machine by using the `swapon /dev/rzxx` command. Instead, add the device to the `/etc/fstab` file and reboot the system.

4.2.4 Building a Generic Kernel Requires Specific Subsets

To build a kernel using the `GENERIC` configuration file supplied on the DEC OSF/1 Version 3.0 kit, all of the kernel binary subsets (both mandatory and optional) must be installed. The following is a list of the optional kernel subsystems:

- `OSFADVFSBIN300` – POLYCENTER Advanced File System Kernel Objects (Kernel Build Environment)
- `OSFLSMBIN300` – Logical Storage Manager Kernel Objects (Kernel Build Environment)
- `OSFLSMBINCOM300` – Logical Storage Manager Kernel Header and Common Files (Kernel Build Environment)

4.2.5 Enabling Dumping to a NonRoot Device on DEC 7000 Systems

To enable dumping to a nonroot device on DEC 7000 systems, enter the following commands at the console prompt:

```
>>> set dump_dev DKA400
>>> set mode_advance
>>> config kzmsa*
>>> set boot_reset off
>>> boot
```

In this example, `DKA400` and `kzmsa*` represent the dump device and the disk containing the dump device, respectively.

4.2.6 Changes in the `sysconfigtab` File

The `sysconfigtab` file has been enhanced to enable you to configure the amount of memory in the unified system buffercache (UBC), the allocation and deallocation of `vnodes`, and other system parameters. See the *System Tuning and Performance Management* manual for more information.

4.2.7 Archives With Extended Attributes Not Backward Compatible

Archives created with extended attributes might not be read or extracted by using DEC OSF/1 Version 2.0 versions of the `tar` command and cannot be read by DEC OSF/1 Version 2.0 versions of the `cpio` command. The following table describes the results on restoring archived files and directories using the various commands:

If you are restoring:	Using:	Result
Archived directory that has extended attributes	Version 2.0 <code>tar</code>	Fails. The directory and its files are lost.
Archived directory that does not have extended attributes	Version 2.0 <code>tar</code>	Succeeds. If the entire archive does not have a single directory with extended attributes, it can be successfully restored in its entirety.
Archived files with extended attributes	Version 2.0 <code>tar</code>	Fails.
Archived files without extended attributes	Version 2.0 <code>tar</code>	Succeeds.
Archive directory with extended attributes	Version 2.0 <code>cpio</code>	Fails. The extended attributes are restored as a regular file that cannot be overwritten; the original directory cannot be recreated. In addition, the <code>cpio</code> command restores the archived files containing extended attributes as regular files. When the <code>cpio</code> command restores the original file with the extended attributes, the command fails with <code>errno:20</code> .
Archived files with extended attributes	Version 2.0 <code>cpio</code>	Fails.
Archived files without extended attributes	Version 2.0 <code>cpio</code>	Succeeds.

Any archives created with the new `pax` utility and having `cpio` format, can only be restored using the new `cpio` or `pax` commands even if none of the archived files have extended attributes.

Therefore, to achieve backward compatibility of archive files, use the following suggestions:

- Using the DEC OSF/1 Version 3.0 `pax` or `tar` command, invoke the new `V` flag, which disables the archiving of extended attributes altogether.
- Archive only files that do not have extended attributes and do not use `cpio` formats.
- For the `tar` command, do not archive directories that have extended attributes.
- Use the old `tar` or `cpio` commands in the `/usr/opt/sterling/bin` directory.

4.2.8 Possible Process Hang During File I/O

Processes can hang while reading or writing to a file if the file is being removed or truncated during the read or write operation. A process exhibiting this particular hang will have stack traces with `thread_block()` called from `ubc_invalidate()`, `ubc_msync()`, or `ubc_flush_dirty()`.

To work around this problem, do either of the following:

- Add the following entry to the `/etc/sysconfigtab` file:

```
ubc-wait-for-io=1
```

Then reboot your system.
- Invoke the `dbx` command on the the running kernel as follows:

```
# dbx -k /vmunix
```

Then enter the following at the `dbx` prompt:

```
assign wait_for_io = 1
```

4.2.9 Enhanced Security

The following notes apply to enhanced security.

4.2.9.1 Using `secsetup` and `/etc/passwd` Local Overrides

The `secsetup` script does not detect the overrides in the `/etc/passwd` file. Using the `secsetup` script when local overrides are present may corrupt the authorization database without giving any indication that the database is corrupted. The `/etc/passwd` file may also be corrupted if users change to enhanced security and then attempt to change back to base security.

If you use NIS (Network Information Service) to distribute the password database and you have local overrides in the `/etc/passwd` file, do not attempt to change to enhanced security without first removing all use of local overrides.

4.2.9.2 Using `passwd` in Single-User Mode

The `passwd` command cannot be used when the system is in single-user mode and is running enhanced security. The following are the work-arounds for this situation:

- Passwords for nonroot users can be set while in multiuser mode.
- If the root password is unknown and must be changed, use the following steps:

1. Remove the password entry from the `/tcb/files/auth/r/root` file.
2. While in single-user mode, login as root (no password required).
3. Use the `passwd` command to change the root password.

4.2.10 Known Problems With Executables on the FREEWARE CD-ROM

The FREEWARE CD-ROM provided with the DEC OSF/1 release contains public domain software that has been compiled to run on DEC OSF/1 Alpha AXP systems and is provided to you free of charge.

The following executables in `/usr/freeware/binmx`, which is linked to `/freeware/BINMX`, are known to have problems:

Calculator	Cube	bdftops
fisheye	font2c	ghostview
gs	gsbj	gsdj
gslj	gslp	gsnd
miniformsedit	protoize	showheap
showthread	sps	teachjove
tetris	tex	texinfo
transfig		

You can rebuild these executables from sources contained on the FREEWARE CD-ROM. Before you rebuild any executable, be sure to read the documentation for the executable. See the *Freeware for AXP Systems* manual for information on accessing documentation.

4.3 Network and Communications

The following notes apply to network and communications software.

4.3.1 Support Restricted for Certain Network Devices

Only the indicated firmware versions or higher are supported for the following devices:

Device	Supported Firmware Revision
DEFEA	Version 1.1
DEFTA	Version 1.1
CRE DEFTA	Single-attach station (PMAF-FS): Version 2.2 Dual-attach station (PMAF-FD): Version 2.2 Unshielded twisted-pair board (PMAF-FU): Version 2.2
PMAD	Version 5.3E
DETRA (Token Ring)	Version 2.1 ^a

Table Note:

- a. The booting support provided by this version is limited to bootp only.

4.3.2 Changes in Network Thread Configuration

In DEC OSF/1 Version 2.0, the value of the `netthreads` pseudodevice in the `/usr/sys/conf/NAME` configuration files is 2 and cannot be changed. In DEC OSF/1 Version 3.0, the `netthreads` pseudodevice in the configuration files has been removed. The default number of network threads configured is based on the number of processors in your system and is calculated at boot time. You can change the default value by using the dynamically configurable `netisrthreads` attribute, as described in *System Tuning and Performance Management*.

4.3.3 Change in screend Program Behavior

The `screend` program now operates in accordance with its documentation. The term “host any” in a configuration file is equivalent to “any.” If you have a `screend` configuration file that currently uses the terms “host any,” “network any,” or “subnet any,” be sure that you are not relying on the old, incorrect behavior.

4.3.4 Data Link Provider Interface (DLPI) Kernel Option Change

The Data Link Provider Interface kernel option, DLPI, has been changed to DLB, Data Link Bridge.

4.3.5 ONC RPC System Header Files Support ANSI and C++

The system include files for the ONC RPC programming interface contain support for strict ANSI C programming guidelines and the C++ programming environment.

4.3.6 Local Area Transport

The following notes apply to Local Area Transport (LAT).

4.3.6.1 LAT Changes

The following changes have been made to LAT for the DEC OSF/1 Version 3.0 release:

- The `latcp` command is enhanced to provide the ability to bind and unbind particular ports (ttys) to a service, the ability to connect to a remote service that is password-protected over an application port, and an improved display for the `latcp -d` command. See `latcp(8)` for more information.
- The `latsetup` utility supports the creation and removal of SVR4 ttys and ensures that tty names match the minor numbers.
- LAT provides a default behavior when no default service is defined. When getty processes are spawned and no LAT default service has been defined, the getty processes will fail with `errno 6` displayed on the console.
- LAT customization is supported by the `/etc/latstartup.conf` file. In previous releases, LAT customization was supported in the `/sbin/init.d/lat` file. Now, to customize a LAT host node, include the appropriate `latcp` commands in the `/etc/latstartup.conf` file. This file is created and owned by the user. See the *Network Configuration* manual for more information on LAT setup.
- Maximum number of LAT services you can create is determined by the length of the Service Announcement Message. In previous releases, the maximum number of services supported was eight. To increase the number of LAT services you can create, set the size of the service names and service identification as small as possible.

4.3.6.2 BSD tty Names Are Not Case Sensitive

BSD ttys associated with a bound LAT service are not case sensitive (LAT converts all tty names to uppercase). For example, if `tty0c` is bound to a LAT service, `tty0C` cannot be used for a different LAT service. Both `tty0c` and `tty0C` are converted to `TTY0C`. Therefore, since `tty0c` is bound to a LAT service, `tty0C` cannot be bound to a LAT service. This restriction is imposed by the LAT architecture.

To work around this problem, either use SVR4 ttys when binding ttys to LAT services or use tty names of the same case (`tty0c`, `tty0d`, ...).

4.3.6.3 Restriction on Using SVR4 Device Names for Non-LAT Devices

The use of LAT SVR4 device names for non-LAT devices can cause problems when using the `latsetup` utility. Digital recommends that you not use SVR4 device names for non-LAT devices in the `/dev/lat` directory.

4.3.6.4 Halting LAT From a LAT Session Causes a LAT Startup to Hang

When LAT is halted from a LAT session (that is, from a terminal server), the session and all of its processes are killed. If LAT is started again, the `latcp -s` command hangs. To work around this problem, reboot the system.

To avoid the problem entirely, halt LAT from a non-LAT session (system console).

4.3.6.5 Modified Terminal Server Port and Session Characteristics Not Updated on LAT Host

When the terminal server port or session characteristics are modified, the updated port or session characteristics do not appear on the LAT host.

4.3.6.6 Minor Number Allocation

When the `/dev/streams/lat` control device is opened, a minor number is chosen and assigned by the LAT driver. The driver searches for an unused minor number, starting at the highest supported minor number. The `/usr/sbin/latcp` and `/usr/sbin/latsetup` programs use `/dev/streams/lat` to perform requested functions. This causes certain LAT minor numbers to be unavailable. To work around this problem, create LAT devices with minor numbers in the lower range (for example, 620, 621) of the total range of minor numbers.

4.3.6.7 Deleting LAT inittab getty Entry Disconnects Active LAT Sessions

If a LAT entry in the `/etc/inittab` file is deleted (or commented out) and the `init q` command is invoked, the LAT session that is logged in on that tty will be disconnected. This is expected behavior of the `init` command.

4.4 Programming Environment

The following notes apply to the programming environment.

4.4.1 Pseudoterminal Name Space

Both BSD- and SVR4-style pseudoterminal name (pty) space devices coexist in the DEC OSF/1 system. For the Version 3.0 release, all base commands, utilities, shells, and applications recognize both name spaces. You set up the BSD-style devices and SVR4-style devices during installation.

When the BSD tty name space is exhausted, the system switches to the SVR4 tty name space automatically (assuming the SVR4 tty device name exists). This occurs primarily with LAT, which allows a maximum of 620 BSD tty names.

To use the only SVR4 pty name space, execute the following commands as root:

```
% cd /dev
% ./SYSV_PTY
```

To switch back to the BSD pty name space, change to the /dev directory and remake the pty devices by issuing either of the following commands as root:

```
% ./MAKEDEV pty0 pty1 pty2 ...
% ./MAKEDEV PTY_1 PTY_2
```

Each pty parameter creates 16 pty devices, while each PTY_ parameter creates 384 pty devices.

4.4.2 Changes to Signal Behavior in Multithreaded Programs

In DEC OSF/1 Version 3.0, the following changes have been made to the behavior of signals in multithreaded programs:

- Multithreaded programs that link against the `libpthreads.a` static library must be relinked before running on Version 3.0.
- The previous restrictions regarding using the `sigwait()` system call for the `SIGINFO` signal have been removed.
- The mask of blocked signals (signal mask) is no longer shared by all threads in a process. Instead, each thread has its own mask. This could affect multithreaded programs that directly manipulate the signal mask.

The original signal mask for a thread is inherited from the creator of the thread. For the main thread of the program, this is the mask of the thread that called the `fork()` system call. For subordinate threads, the mask is inherited from the caller of the `pthread_create()` system call.

This change means that under certain circumstances, signals that previously were blocked/unblocked may be now found to be unblocked/blocked. The following statements point out the possible changes in program behavior:

- Each thread's signal mask is completely independent from another's. Nothing one thread can do can affect the signal mask of another thread.
- Asynchronous signals (posted using the `kill()` system call) can be delivered only to the main thread (the thread executing the program's main function).
- The main thread's signal mask has sole control over which asynchronous signals the process (and the main thread itself) can receive.
- Subordinate threads can control only the blocking of synchronous (exception) signals for themselves (the result of blocking such a signal is undefined).

These changes were made in preparation for further modifications in signal behavior. In a future release, the limitation of delivering asynchronous signals only to the main thread will likely be removed. Under these circumstances, each thread must be able to control directly which signals it will and will not receive.

4.4.3 Large I/O Operations Over Adaptec 1740 Might Hang

If you start a large I/O operation (1 to 4 MB) over the Adaptec 1740 controller, the operation might fail because of problems mapping large I/O buffers. The I/O requests will remain on an internal CAM I/O queue, causing the process to hang until a timeout occurs. The system may then panic and display the following message:

```
panic: closef: f_count not 1
```

4.4.4 Configuration Manager Reserves Names for Certain Parameters

The configuration manager reserves certain names for method-specific parameters. You cannot use these names for subsystem attributes. Method-specific parameters are used by the methods and are not declared in the attribute table as subsystem attributes. Subsystem attributes that are declared in a subsystem's attribute table cannot begin with the characters `method_`.

4.4.5 Problem Assembling Modules That Use Structured Exception Handling

If a C program uses structured exception handling (the `try/except` keywords), the output of `cc -S` command cannot be correctly assembled by the assembler. The output in these cases uses the `.lab` directive, which the assembler ignores. To work around this problem, apply the following `sed`

script to the `.s` file:

```
% sed -e 's/^I.lab^I)/1:/' file.s
```

The `^I` represents a tab character.

4.4.6 Device Driver Example Corrections

The `none100` device driver kit is provided in the `/usr/examples/devdriver/none100` directory. Make the following corrections to the `stanza.loadable` file before using the example:

1. Remove the `Module_Config2` and `Module_Config3` lines. This driver is designed for the `TURBOchannel`, and there should be only one `Module_Config` line in the file and that should be for `TURBOchannel`.
2. Change the `Device_Char_Major` field from “Any” to “ANY.”

In the `/usr/examples/devdriver/cb100` directory, change the `Device_Char_Major` field in the `stanza.loadable` file from “Any” to “ANY.”

4.4.7 Changes in C Compiler for Multibyte Character Sets

For those environments in which programs using multibyte characters are written and compiled, the DEC OSF/1 Version 3.0 system provides an alternative C compiler front end. This ensures that the compiler will correctly process character strings, include file names, and comments as multibyte characters provided the `LANG` environment variable specifies a valid multibyte locale. In contrast, the default C compiler supplied with DEC OSF/1 ignores the locale in effect when processing source files.

To change the C compiler front-end from the default to the locale sensitive one, do the following:

1. Log in as root.
2. Change to the `/usr/ccs/lib/cmplrs/cc` directory.
3. Issue the following command:

```
#ln cfe.shared cfe
```

When the locale-sensitive compiler front-end is in effect, the behavior is unchanged, except when the `-std` or `-std1` flag is supplied and the `LANG` environment variable is set to a valid multibyte locale.

To change the compiler front-end back to the default, do the following:

1. Log in as root.
2. Change to the `/usr/ccs/lib/cmplrs/cc` directory.

3. Issue the following command:

```
#ln cfe.static cfe
```

Note

Any time the C compiler front-end is changed, the effect is system-wide. All users will use the same front-end.

4.4.8 Problem Passing the feedback Flag to the DEC C Compiler

The `-feedback` flag is not passed to the DEC C compiler when you use the `cc -migrate` command. You must explicitly pass it to the compiler on the command line by using the `-wf` flag as follows:

```
-wf,-feedback,Ifile
```

See `cc(1)` for more information on the `-feedback` flag.

4.4.9 Problem Passing the readonly_strings and writable_strings Flags to the Compiler

Because the `-readonly_strings` and `-writable_strings` flags are not passed to the compiler (`cc` command), you must explicitly pass them to the compiler on the command line using the `-wf` flag. To enable read-only strings, include the following flags on the `cc` command line:

```
-wf,-readonly_strings
```

To enable writable strings, include the following flags on the `cc` command line:

```
-wf,-writable_strings
```

See `cc(1)` for more information on the `-readonly_strings` and `-writable_strings` flags.

4.4.10 Changes in cord Utility

With the DEC OSF/1 Version 3.0 release, the `cord` utility operates on both nonshared programs and on shared executables. If you invoke the `cord` or `runcord` utility, you no longer need to link your applications with the `-r`, `-d`, or `-z` flags. In addition, if you specify the `-cord` flag to the compiler you no longer need to specify the `-non_shared` flag.

4.4.11 Possible Lock Hierarchy Violation While Debugging Kernel

While debugging a kernel on a system that is using `lockmode=4`, the following lock hierarchy violation message might appear:

```
lock class name:      pgrphash_lock
class already locked: socklocks.sock_lock
```

To work around this problem, do the following:

1. Edit the `/sys/kern/lockinfo.c` file and search for `pgrphash_lockinfo`. Add the following line immediately after the line containing the `pgrphash_lockinfo` parameter:

```
LI_DISABLE_HIERARCHY_CHECKING(pgrphash_lockinfo);
```

2. Search for `pgrp_lockinfo` and add the following line immediately after the line containing the `pgrp_lockinfo` parameter:

```
ULI_DISABLE_HIERARCHY_CHECKING(pgrp_lockinfo);
```

3. Run `doconfig` to create the new kernel.

4.4.12 Changes in Kernel Debugging using dbx

In order to reduce the size of the operating system, some kernel symbol table information useful for debugging with the `dbx` debugger has been removed. This information is mostly the type information for variables inside the kernel. For example, assume you have the following variable declaration:

```
struct vnodeops procfs_vnodeops;
```

The `dbx` debugger might not know that the `procfs_vnodeops` variable is of the `struct vnodeops` type. Instead, the `dbx` debugger will regard it as an `int`, as follows:

```
(dbx) print procfs_vnodeops
0x12345678
(dbx) whatis procfs_vnodeops
int procfs_vnodeops;
```

To work around this problem, explicitly cast the variable to the correct type. Using the previous variable declaration, issue either of the following `dbx` commands:

```
(dbx) print *(struct vnodeops *)&procfs_vnodeops

(dbx) px &procfs_vnodeops
0xfffffc0000660540
(dbx) print (struct vnodeops)0xfffffc0000660540
```

If the variable is a pointer to a type, cast the pointer and dereference it,

without the & operator. For example:

```
(dbx) print *(struct vnodeops *)procfs_vnodeops
```

Type information can usually be obtained from files in the `/usr/include/sys` directory. To avoid repetitive casting, use `dbx` aliases, either interactively or you can store them in a `.dbxinit` file. For example, the following alias will yield the results shown:

```
(dbx) alias procfs_vnodeops "print *(struct vnodeops *)&procfs_vnodeops"
```

```
(dbx) procfs_vnodeops
struct {
    vn_lookup = 0xfffffc000027f0c0
    vn_create = 0xfffffc000027f0a0
    vn_mknod = 0xfffffc000027f0a0
```

You might find the following two aliases helpful:

```
alias pst(x,y) "print *(struct x *)y"
alias pvst(x,y) "print *(struct x *)&y"
```

The first alias prints the structure of an address or pointer; the second alias prints a variable of a specified structure. For example:

```
(dbx) pst(thread,0xfffffc00002cacb8)
struct {
    links = struct {
        next = 0xd3431d90a21e0018
        prev = 0x23de0040a75e0000
```

```
    .
    .
    .
```

```
(dbx) pvst(vnodeops,procfs_vnodeops)
struct {
    vn_lookup = 0xfffffc000027f0c0
    vn_create = 0xfffffc000027f0a0
    vn_mknod = 0xfffffc000027f0a0
```

```
    .
    .
    .
```

4.4.13 dbx Does Not Release Process System Resources

There might be a limit to the number of times you can rerun, in the same session, a program that takes up a large amount of memory. The `dbx` debugger does not fully release the system resources used by the process until you exit `dbx`. To avoid this problem, use the `-noprocc` flag on the command line (which disables the detach/attach features and some thread control) or exit the `dbx` debugger after you run your program.

4.4.14 Incorrect Behavior in dbx When Detaching From a Process

When you are using the `dbx` debugger and are attached to multiple processes, the attach/detach behavior is not correct. If you detach from the current process, the `dbx` debugger will attach to another process, either the process to which it was previously attached or the first process in the process list, depending on the circumstance. The `dbx` debugger will start the process before the user can interact with it, which is not the desired behavior. To work around this behavior, switch to another process, then detach the desired process by specifying the process id.

4.4.15 Changes in Requirements for Limited Debugging

Complete type information will be accessible by the `dbx` debugger for any symbols defined or referenced in application modules that are built with the `-g` flag. Previously, `dbx` required that all of an application's modules be compiled with the `-g` flag for complete type information to be available. See the *Programmer's Guide* for more information.

4.4.16 `sysconfig` Warnings About Missing Entries in Loadable Subsystem Attribute Tables

When a loadable subsystem is loaded and there are no `sysconfigtab` entries in the loadable subsystem's attribute table, the `sysconfig` utility might issue warnings in the `xconsole` window. To work around this problem, make sure that the loadable subsystem's `sysconfigtab` table matches the same number of attributes in the loadable subsystem's attribute table. Then, if an attribute appears in the `xconsole` it will correctly indicate that an entry could not be properly loaded or parsed.

4.4.17 `prof` Returns Incorrect Error Messages in Some Cases

When using the `prof` command to profile nonshared programs that have a `.fini` section but no `.init` section, the `prof` command might incorrectly issue the following error message:

```
prof: Error: address file <filename> does not match executable.
```

This can occur with C++ programs that do not have a global instance of a class with a constructor function and with C programs with explicit `fini` routines and no `init` routines.

To work around this problem, do any one of the following:

- Link the program with the `-call_shared` flag.
- Pass the undocumented `-oldalg` flag to the profiler.

- Add an explicit `init` routine to your program, as follows:


```
void __init_foo() {}
```
- Include the `iostream.h` header file in one of your program's modules (for C++ programs only).

4.4.18 Functions and System Calls

The following notes apply to functions and system calls.

4.4.18.1 `nlist` Subroutine Has Changed

The algorithm for finding a name in the `nlist` subroutine now searches using both the supplied name and the supplied name without the leading underscore (if any). In previous releases, the `libc` version of `nlist` always skipped the first character and the `libmld` version always skipped a leading underscore. As a result, if an object file has the same symbol both with and without a leading underscore, the new algorithm might find a different symbol.

4.4.18.2 Problem With `malloc` for Dynamically Linked Applications

Dynamically linked applications that iteratively allocate and deallocate buffers might cause the heap to grow larger than necessary. Eventually, these programs might run out of heap space causing the `malloc` function to return a null pointer.

Applications that observe this behavior can work around the problem in either of the following ways:

- Include the following code near the start of your application:

```
extern unsigned long __noshrink;

__noshrink = 1;
```

Setting this flag forces the `malloc` function to avoid shrinking the address space. If you can rebuild your application, this workaround is preferred.

- Increasing the number of map entry resources in the kernel by adding the following line to your configuration file:

```
options MAPENTRIES=1000
```

Then, rebuild your kernel as described in *System Administration*. The actual number of map entries you need depends on your application. The default is 200 per process. If raising the limit to 1000 does not solve the problem, increase the limit.

4.4.18.3 Changes in pipe System Call Behavior

With the DEC OSF/1 Version 3.0 release, the behavior for interrupted read and write calls on a pipe has changed in order to be POSIX compliant. Now, when a read or write on a pipe is interrupted by a signal and no bytes have been transferred, the `read` system call and `write` system call will return -1 with `errno` set to `[EINTR]`. In previous releases, `read` either restarted or returned `[EINTR]`, depending on the setting of the `SA_RESTART` flag for the interrupting signal. Applications must be prepared to handle the `[EINTR]` return value or block any expected signals for the duration of the read or write operation. See `pipe(2)`, `read(2)`, and `write(2)` for more information.

4.4.18.4 Changes in monitor Function

The `monitor` function has been enhanced to include the `monitor_signal` routine. This routine enables you to generate profiling data files for programs that do not terminate, such as daemons. Typically, the profiling data is not written until a program terminates. See `monitor_signal(3)` for more information.

4.4.19 Internationalization Restrictions and Problems

The following notes describe changes and problems in software related to internationalization.

4.4.19.1 `/etc/nls/native_locale.conf` Is Obsolete

The `/etc/nls/native_locale.conf` configuration file is no longer used. This file formerly let you specify the default system-wide locale. That locale is the one the `setlocale()` function uses when a user does not set the internationalization environment variables, such as `LC_ALL`, `LANG`, `LC_COLLATE`, and so on.

You can still set the default system-wide locale for C shell users through the `/etc/csh.login` file and for Bourne and Korn shell users through the `/etc/profile` file. To do this, edit each file and set the `LANG` environment variable to the desired system-wide default locale.

4.4.19.2 Behavior of `setlocale` Function in Statically Linked Programs

When a program is linked statically on DEC OSF/1 Version 3.0, the `setlocale()` function always leaves the program's locale set to the C locale. This behavior occurs even if the user has set one of the internationalization environment variables, such as `LANG`, to a valid locale.

a program is linked dynamically, the `setlocale()` function queries the internationalization environment variables and sets the program's locale

appropriately.

The statically linked behavior is different because the format of locale files has changed. Those files are now shared objects, and shared objects cannot be used by statically linked programs.

4.4.19.3 fnmatch Function Problem When Matching Bracket Expressions

The `fnmatch` function does not match bracket expressions correctly for the following locales: `cs_CZ.ISO8859-2`, `hu_HU.ISO8859-2`, and `sk_SK.ISO8859-2`. To work around this problem, set the `LC_COLLATE` environment variable to another locale, like the C locale.

In addition, if you are building your own locales by using the `localedef` command, your locales will not match bracket expressions correctly. To work around this problem, specify the `a` method file on the `localedef` command line that contains the following entries:

```
METHODS
__mbsstopcs  "__mbsstopcs_sb"
__mbtopc    "__mbtopc_sb"
__pcstombs  "__pcstombs_sb"
__pctomb    "__pctomb_sb"
mblen       "__mblen_sb"
mbstowcs   "__mbstowcs_sb"
mbtowc     "__mbtowc_sb"
wctombs    "__wctombs_sb"
wctomb     "__wctomb_sb"
wcswidth   "__wcswidth_latin"
wcwidth    "__wcwidth_latin"
END METHODS
```

4.4.20 Realtime Problems with Asynchronous I/O and Streaming Devices

When using asynchronous I/O (AIO) with streaming devices, such as tape drives, make sure that you post AIO requests in small numbers; otherwise, the devices will be unable to detect errors, particularly end-of-media errors, in time to prevent further AIO requests to the device. In the case of end-of-media errors, excessive AIO requests can result in the tape running off of its reel. Having two AIO requests outstanding on the device probably provides an adequate balance between efficiency and responsiveness to critical device errors.

4.4.21 Multithreaded Applications Relinking Requirements

Multithreaded applications that are linked against the `libpthread.a` static library must be relinked before running on a multiprocessor system.

4.4.22 Building Loadable Subsystems Requires Additional Steps

The Makefile support provided to build loadable subsystems using the kernel build tree does not operate properly. To build loadable device drivers using the procedure in Section 13.1.4 of the *Writing Device Drivers: Tutorial* manual, add the following steps after step 2C (the `config -s BINARY` command):

1. Edit the `/sys/BINARY/Makefile`, search for the subsystem name that you are building, and change the flags field of the dependency rule from `CCDFLAGS` to `DCC_DFLAG`S.

Note

Proper Makefile syntax requires that the whitespace before the rules are tabs, and not simply blank spaces.

Be aware of module (*.o) name space collision if you also require .o files with the same name in your systems static configuration. Building static kernels with these loadable files will produce unpredictable results in new static kernels.

2. Build the driver load module. The following example builds a load module for `dummy.o`:

```
# cd /sys/BINARY
# make dummy.mod
```

3. Create the loadable module file. The following example is for the “loadable” subsystem:

```
# ld -r -d -o dummy.mod dummy.o
```

You can then continue following the procedure in the *Writing Device Drivers: Tutorial* manual.

4.4.23 DECladebug

This section discusses features, problems, and restrictions of the DECladebug Version 3.0.9 debugging tool.

4.4.23.1 Remote Debug Server Problems

The following are known problems in the DECladdebug Remote Debug Server:

- For remote debugging, commands that make use of signals are not supported; for example:

```
cont <signal>
catch <signal>
ignore <signal>
```
- In remote debugging, you cannot set breakpoints on functions in shared libraries (although you can now debug programs using shared libraries).
- When a remote process exits, the exit code is always returned to the debugger as 0, regardless of the real exit reason.
- When the server is run on a system that is heavily loaded, processes may be left over. These leftover processes must be killed manually.
- Multithreaded application debugging support is not available in the Remote Debug Server.

4.4.23.2 Using DECladdebug Within emacs

You can control your debugger process entirely through the emacs Grand Unified Debugger (GUD) buffer, which is a variant of Shell mode. All the DECladdebug commands are available, and you can use the Shell mode history commands to repeat them.

- DECladdebug Version 3.0.9 supports GNU Emacs Version 19.22 and higher.
- For each emacs session, before you can invoke DECladdebug, you must load the DECladdebug-specific emacs lisp code, as follows:

```
M-x load-file /usr/opt/laddebug/emacs/lisp/decladdebug.el
```

- To start DECladdebug within emacs and specify the name of the target program you want to debug, enter the following:

```
M-x decladdebug [target-program]
```

You can also place a load-file command in your emacs initialization file.

- When you start DECladdebug, emacs displays the GUD buffer in which the DECladdebug prompt is displayed. The GUD buffer saves all of the commands you enter and the program output for you to edit.

When you issue the DECladdebug run command in the GUD buffer and hit a breakpoint, emacs displays the source of your program in a second buffer (source buffer) and indicates the current execution line with an arrow (=>).

By default, emacs sets its current working directory to be the directory containing the target program. DECladebug does not do this when invoked directly, so you may need to change the source code search path when using DECladebug from within emacs. To set an alternate source code search path, enter the use command with a directory argument, for example:

```
(decladebug) use usr/prog/test
```

- All emacs editing functions and GUD key bindings are available. For example:
 - You can execute a step command by entering the **C-c C-s** command in the GUD buffer.
 - You can select a line of code in the current source buffer and enter a command to set a breakpoint at that position by entering **C-x SPC**.

For more information on emacs functionality and key bindings, refer to the emacs documentation.

4.5 File Systems

The following notes apply to file system usage.

4.5.1 Mount-Point Length Restriction

Mount points with names greater than 90 characters in length are not fully supported by the `mount`, `umount`, and `df` commands. You can mount file systems on such mount points, but you cannot unmount them because of a verification procedure performed by `umount`. (This verification procedure can be suppressed by using the `-f` flag.) Similar problems arise in using `df` and in displaying mounted file systems with `mount`. If this restriction is a problem, do not use mount points of 90 characters or more.

4.5.2 POLYCENTER Advanced File System

This section discusses features, problems, and restrictions of the POLYCENTER Advanced File System (AdvFS).

4.5.2.1 Enabling AdvFS After Installation Requires Rebuilding the Kernel

If you install AdvFS using the `setld` utility after you originally install the DEC OSF/1 system, you must rebuild the system kernel to enable this functionality.

To rebuild the kernel, run the `doconfig` utility with no command flags. Note that the `doconfig` menu display does not include AdvFS. However, the `doconfig` utility will build a kernel that includes AdvFS.

4.5.2.2 AdvFS Metadata Version Number Change

With the DEC OSF/1 Version 3.0 release, AdvFS offers improved file system performance and disk fragment file deallocation. As a result of these improvements, the AdvFS on-disk structure (metadata) is changed and the version number is changed from 2 to 3. All created filesets will be initialized with metadata version number 3.

When filesets created with earlier versions of AdvFS are mounted on a DEC OSF/1 Version 3.0 system, AdvFS automatically upgrades the metadata version number from 2 to 3. If a domain has filesets that were created or mounted with Version 3.0 of AdvFS, that domain cannot be used on a system running an earlier version of AdvFS.

4.5.2.3 AdvFS Known Problems and Restrictions

The Advanced File System has the following known problems and restrictions:

- On multiprocessor systems, all kernel-related AdvFS activity is restricted to a single processor.
- The `df` command does not display accurate information for clone filesets; other fileset information is correct. Use the `du` command instead.
- The quota files can become inconsistent if the system fails between the time an application unlinks a file and the time it closes the file. For example, consider a program that creates a file, unlinks the file, and then closes the file. If the system fails between the unlink and close, the quotas for this file will not be updated correctly. The quota files will continue to charge the user or group for this file and its blocks.
- Applications that make heavy use of the `mmap` system call to access AdvFS files might cause the system to hang.
- The `vdump` and `vrestore` commands do not support the use of named pipes for the I/O devices as an argument to the `-f` flag.

4.5.2.4 Usage Note on the df Command With AdvFS Systems

With the addition of fileset quotas on AdvFS, the `df` command now displays disk space usage information for each fileset rather than the file domain. The `df` command can now be used to determine the amount of space used by each fileset.

In the `df` command display, the `kbyte` or `512-Blks` column shows the maximum amount of space that a fileset can occupy. However, because metadata consumes space in the file domain, not all of this space is available for use by the data in filesets. Also, if a fileset block quota is set, this column displays the block quota amount. This is still the maximum amount of space that the fileset can occupy, but now it is limited by the quota rather than the size of the file domain.

4.5.2.5 Reusing AdvFS Partitions Requires Manual Intervention

You can reuse a partition that was previously part of an AdvFS domain. However, before you reuse the partition, you must remove the domain on the partition you want to reuse. After the unused domain is removed, you can create a new domain on the partition.

If you have the AdvFS Utilities (contained on the DEC OSF/1 Complementary Products CD-ROM) installed on your system, remove the domain by dismounting the filesets and issuing the `rmfdmn` command.

If you do not have the AdvFS Utilities installed, remove the old domain manually by removing the directory under the `/etc/fdmns` directory that corresponds to the domain no longer in use.

4.5.2.6 Data Element Size Limits for Extended Attributes in AdvFS

Support for extended attributes (`vfs+`) in AdvFS is limited to data elements of 2072 bytes or less. Application programs attempting to set larger attributes will receive an error return value.

4.5.2.7 Clone Filesets Might Hang Under Certain Conditions

Under rarely encountered heavy test conditions, a domain that contains a clone fileset can hang and fail to respond to any subsequent file system system calls. Commands that access any files in the filesets of the affected domain will not complete. However, other AdvFS domains and file systems (UFS) are unaffected.

This problem is more likely to occur on a multiprocessor machine in realtime preemption mode running simultaneous heavy loads to a fileset and its clone fileset. If the system is not running in realtime preemption mode, the probability of this problem occurring is significantly reduced. Further, the problem is unlikely to occur if the file system activity is moderate while the

clone fileset is mounted and accessed (for example, if there is a backup in progress on the clone).

This problem will not occur when the clone fileset is not mounted and accessed.

If this problem occurs, bring down the system and reboot. This problem will not corrupt any data file.

4.5.2.8 Incorrect Disk Space Error Messages

On systems that consist primarily of small files (less than 8KB) and regularly create and delete very large numbers (many hundreds) of these small files, AdvFS can run out of metadata space (inode tables), causing erroneous “out of disk space” errors. Examples of such systems are Internet News servers and mail servers.

To avoid this problem, preallocate the metadata immediately after the fileset is created. This can be done by writing a script that creates and then deletes the estimated number of files that are expected to exist in the AdvFS domain (the files created by the script should be empty). For example, the following ksh script preallocates metadata for 1000 files:

```
integer f=1000

    while ((f > 0))
    do
        touch prealloc_$f
        f=f-1
    done

rm prealloc_*
```

4.5.3 Logical Storage Manager

The following notes describe problems and restrictions of the Logical Storage Manager (LSM).

4.5.3.1 Possible Problem in DxLSM When Analyzing Volume I/O Activity

If you are analyzing volume I/O activity using DxLSM and an LSM configuration is performed at the same time, the following error message

might be displayed:

```
DxLSM can't collect stats for the following volumes: ..
```

To correct this problem, click on Continue; you can start analyzing the volume again.

4.5.3.2 Some LSM Operations Require Prestoserve Buffer Flushing

Before stopping an LSM volume or detaching a mirrored volume's plex, flush the Prestoserve buffers by issuing the following command:

```
# presto -d /lsm
```

In this example, the /lsm is the mount point of the LSM volume.

4.5.3.3 LSM Might Not Start If Disks Are Removed From the System

When you first set up LSM, the `volsetup` utility adds disks used in the initial setup to the `/etc/vol/volboot` file. However, if you add or remove disks to LSM, the `/etc/vol/volboot` file might not be updated. As a result, if a drive is removed from the system, LSM might not be able to start when the system is rebooted. To avoid this problem, verify that the `/etc/vol/volboot` file is updated each time you make any system configuration changes.

For example, if disk `rz3` exists in the `/etc/vol/volboot` file, but has been removed from the `rootdg` disk group, enter the following command:

```
# voldctl rm disk rz3
```

To add a new disk (for example, `rz4`) to the `/etc/vol/volboot` file, enter the following command:

```
# voldctl add disk rz4
```

4.5.3.4 Warning Messages When Detaching a Plex from a fsgen Volume

When a plex is detached from a fsgen volume, a warning message similar to the following might display:

```
fsgen/volplex: Warning: Volume v1: Cannot determine file system type:
    fstyp returned failure
    Volume data may not be flushed to all plexes
```

To work around the problem, do either of the following:

- Install the System V Environment layered product, which includes the `fstyp` command.
- Manually set the `fstype` field by using the `voledit` command. For example, to set a volume to UNIX File System, enter the following

command:

```
# voledit -g rootdg set fstype="ufs" myvol
```

4.5.3.5 Possible Problems Accessing Physical Block 0 With LSM

Physical block 0 on Digital disks is typically write-protected by default. If a disk is added to LSM using the `voldiskadd` utility, physical block 0 is skipped. However, if a partition that includes physical block 0 is encapsulated into LSM using either the `volencap`, `vollvmencap`, or `voladvdomencap` utilities, physical block 0 is not skipped. This is not a problem because the file system already skips block 0 and does not write to it. However, a problem can occur when an LSM volume that contains a write-protected block 0 is dissolved and its disk space is reused for a new purpose. Neither the new application nor LSM know about the write-protected physical disk block 0 and a write failure can occur.

To fix this problem, remove the write-protected physical disk block 0 from the LSM disk before it can be assigned to the new volume by completing the following steps:

1. Remove the LSM disk using the `voldg` command.
2. Use the `voldiskadd` command to add either specific partition of the disk or the entire disk to LSM.

4.6 Binary Compatibility

The following notes apply to binary compatibility.

4.6.1 Network Applications

Several network header files have changed with the addition of Symmetric Multiprocessing (SMP) support in this release. In general, the changes to these header files will not affect the majority of networking applications. However, network monitoring or analysis applications that rely on the format of kernel data structures might need to be recompiled to include the changed dependencies.

The following changed header files and relevant declarations can affect the ability of existing binaries to run correctly:


```

/usr/include/net/if.h
    struct ifnet

/usr/include/sys/socketvar.h
    struct socket

/usr/include/sys/domain.h
    struct domain

/usr/include/netinet/if_ether.h
    struct arpcom

/usr/include/sys/mbuf.h
    struct mstat

```

4.6.2 shmctl and msgctl System Calls

Several header files were changed in DEC OSF/1 Version 2.0 to make the `shmctl` and `msgctl` system calls SVID3 compliant. These changes were not documented. If you have applications that were built on systems running DEC OSF/1 Version 1.3 or earlier variants and that use these system calls or reference these structures, you must recompile your application to operate correctly on DEC OSF/1 Version 3.0.

Structure	Field	Header File
struct <code>shmids</code>	<code>shm_nattch</code>	<code>shm.h</code>
struct <code>msgds</code>	<code>msg_qnum</code>	<code>msg.h</code>
	<code>msg_qbytes</code>	

4.6.3 SCSI/CAM I/O Drivers

The addition of new features and bug fixes to the SCSI/CAM I/O drivers required changes to several CAM data structures. Many of these structures are documented in the manual *Writing Device Drivers for the SCSI/CAM Architecture Interfaces*. These changes might have an impact on non-Digital supplied drivers.

You must recompile all SCSI/CAM drivers to operate correctly on DEC OSF/1 Version 3.0. Drivers written for DEC OSF/1 Version 1.3 or earlier versions, will produce unpredictable results if used on DEC OSF/1 Version 3.0. Some drivers might require coding changes. Driver providers should examine their drivers for use of the following structures or routines. If these structures or routines are used, the new header files should be examined to determine the impact on the driver. If these structures or routines are not used, then a simple recompilation should be sufficient for proper operation with DEC OSF/1 Version 3.0.

Structure/Macro/Define	Header File
struct CCB_SCSIIO	cam.h
struct DISK_SPECIFIC	cam_disk.h
define DEC_AUTO_SENSE_SIZE	dec_cam.h
struct PDRV_WS	pdrv.h
struct PDRV_DEVICE	pdrv.h
define CLEAR_CCB	pdrv.h
define CHK_RELEASE_QUEUE	pdrv.h

This chapter contains notes about issues and known problems with the windowing software and, whenever possible, provides solutions or workarounds to those problems. The following topics are discussed in this chapter:

- X server and window manager
- X clients
- Windows programming
- Binary compatibility and Motif

5.1 X Server and Window Manager

On systems using the PMAGD-AA (HX+) graphics option, when the left-most portion of an X application is positioned off-screen, the X Server incorrectly reports negative Y offsets to X clients. This problem is most apparent in the `dxtterm` application when you are using `vi`, `emacs`, and other `curses` applications that are dependent upon the correct reporting of row locations. The `xterm` application is not affected by this problem.

To work around this problem, either ensure that X applications are displayed with the left-most portion of the application fully visible or use the `xterm` instead of the `dxtterm` application.

5.2 X Clients

The following notes apply to X clients.

5.2.1 Problems With Applications Linked Against Previous Versions of `libbkr.a`

Because of Bookreader (`/usr/bin/x11/dxbook`) modifications to support Motif 1.2, applications linked against `libbkr.a` in DEC OSF/1 Version 2.0 or earlier variants might encounter the following problems when invoking `help`:

- Application fails with a core dump

- Bookreader starts, but UID Version Mismatch errors occur

Note

If Bookreader is already running on the system when the application invokes help, these errors do not occur.

To fix either problem, relink the application using the DEC OSF/1 Version 3.0 Bookreader `libbkr` libraries.

5.2.2 Clipboard Interoperability Problem

A Motif clipboard interoperability problem prevents applications on DEC OSF/1 from exchanging clipboard data with applications on 32-bit architectures like ULTRIX and VAX/VMS. When data is cut or copied to the clipboard (typically via the Edit menu) on one system and then a paste is attempted on the other system (again, typically via the Edit menu), the application being pasted into does not receive the data. Instead, it receives a status from the Motif paste routines indicating that the clipboard is empty.

To work around this problem, use the quick copy function to transfer data. Quick copy is normally performed by selecting the text to be transferred and then clicking MB2 in the paste location.

5.2.3 Using a Customized Keymap File

If you have a customized `*.decw_keymap` keymap file and need to use it, complete the following steps:

1. Create a symbolic link from your keymap file to the `/usr/lib/X11/keymap_default` file as follows:

```
% ln -s map_name.decw_keymap /usr/lib/X11/keymap_default
```
2. Edit the `/var/X11/xdm/Xkeymaps` file and modify the entry for your language and keyboard, removing the keymap name. For example, if your language is English (American) and your keyboard is LK401, change the following line:

```
036      English(American)          us_lk401aa.keymap
```

After the changes, the entry is as follows:

```
036      English(American)
```

3. Remove the symbolic link in the `usr/var/X11/xdm/keymap_default` file, if any.

5.2.4 **dxterm Enhancements**

With the DEC OSF/1 Version 3.0 release, the `dxterm` application has the following new features:

- You can scroll through the `dxterm` display from the keyboard by holding down the Control key and pressing either the arrow keys or the Next Page or Previous Page keys. This is in addition to the scroll bars.
- The Keyboard Options dialog box no longer contains a toggle button for Auto Repeat. You cannot override the autorepeat setting in the Session Manager Customize Keyboard dialog box.
- Support for the crosshair and rubberband-line ReGIS input cursors, in addition to the diamond and rubberband-rectangle cursors.

5.2.5 **xterm Hilite Mouse Tracking Disabled by Default**

Hilite Mouse Tracking is disabled by default because the escape sequence that initiates Hilite Mouse Tracking causes the `xterm` application to hang if there is not a cooperating program to generate the next required escape sequence. To enable Hilite Mouse Tracking, use the `+hi` option or set the value of the `*VT100*hiliteTrackInhibit` resource to be `False`. Setting the resource can be done in a user's `XTerm app-defaults` file or `.Xdefaults` file, or in the system's `/usr/lib/X11/app-defaults/XTerm` file. To enable Hilite Mouse Tracking for all users by default, modify the following line in `/usr/lib/X11/app-defaults/XTerm`:

```
*VT100*hiliteTrackInhibit:      True
```

Change the line to read as follows:

```
*VT100*hiliteTrackInhibit:      False
```

5.2.6 **DEClinks (LinkWorks) and LinkBase Lock Error**

While DEClinks (formerly called LinkWorks) is running, the following error indicates that DEClinks detected a problem with the NFS lock daemons on either your system or the NFS server:

```
LinkBase Lock Error
```

To correct this problem if you have `root` privilege on your system, kill and restart the `rpc.lockd` daemon. If the problem still persists after you kill and restart the `rpc.lockd`, you can do one of the following:

- On your system, define the `LWK_PERSONAL` environment variable to point to a linkbase on a local device.

- Have the system administrator of the NFS server kill and restart the `rpc.lockd` daemon on the NFS server.

5.2.7 Motif Window Manager

The following notes apply to the Motif Window Manager (`mwm`).

5.2.7.1 Icons and ICCCM Compliance

The `mwm` window manager is Inter-Client Communication Conventions Manual (ICCCM) compliant. Therefore, it supports only icon bitmaps, not icon pixmaps. A user can enable `mwm` ICCCM compliance by setting the following resource in the user's `.Mwm` file:

```
Mwm*ICCCMCompliant: True
```

By default, this resource is set to `False`. A `False` setting allows applications not compliant with ICCCM to use color icons.

5.2.7.2 Icon Titles Are Truncated

The text for inactive icons is truncated to the size of icons. There are two methods to view the complete text for an icon:

- Make the icon active.
- Use the Icon Options menu to change the width of the icon.

5.2.7.3 Keyboard Accelerator for Icon's Window Menu

The new accelerator to display the window menu of an icon is `shift-F10`.

5.2.7.4 Customizing Monochrome Monitors

The `mwm` window manager does not support full customization of color-related resources for monochrome monitors in the Options dialog boxes. To change the colors (actually, the shading), you might need to modify the pixmap resources by directly editing the `Mwm_bw` resource file. For example, to change the color of the active window's title background you must change the `Mwm*activeBackgroundPixmap` resource, choosing such values as `25_foreground`, `50_foreground`, `75_foreground`, and `unspecified_pixmap`.

In addition, by default, the title text is created with a white background. To use the same color as the rest of the title, set the `Mwm*cleanText` resource to `FALSE`.

5.2.7.5 Customizing Icon Placement and the Icon Box

If you are using an icon box, the window manager ignores any customized icon placements you specify with the `iconX` and `iconY` resources in applications' resource files.

5.2.7.6 mwm Error Messages

Due to internal errors, the `mwm` error messages and warnings from `f.exec` functions are not displayed in the console window. As a workaround, you can modify the way `mwm` is started from the session manager by following these steps:

1. Choose the Customize Window item from the session manager Options menu.
2. Click on Other from the window manager section.
3. Delete the text next to Other and then click on OK.
4. Choose the Application Definitions item from the session manager Options menu. If a menu item `Mwm` exists, choose Cancel and skip the next two steps.
5. Create the `Mwm Menu` item by first clicking on the box beneath Menu Item and then typing the following line in the activated box:

```
/usr/bin/X11/mwm -multiscreen
```
6. Click on OK to confirm your modifications.
7. Choose the Automatic Startup item from the session manager's Options menu and add `Mwm` to the list of applications to be started automatically.
8. Choose the Save Current Settings item from the session manager's Option menu.
9. End the session.

The `mwm` window manager will then be started like other applications and `mwm` error messages will be displayed to the console window.

5.2.7.7 mwm Help on Multiple-Screen Systems

If you have a system with several screens, `mwm` help might not display properly on some screens.

5.2.8 Motif Version 1.1.3 Clients

All Motif applications included with DEC OSF/1 Version 3.0 except DECwindows Notepad (`dxnotepad`) use the Motif Version 1.2 shared libraries. Notepad and other applications that still use Motif Version 1.1.3

are subject to the following restrictions:

- Concurrent use of the Motif Version 1.1.3 and Version 1.2 shared libraries will cause poor performance on systems with limited memory configurations. There is no workaround for this performance problem.
- Motif Version 1.2 drag and drop capabilities are not supported for applications using Version 1.1.3. To work around this limitation, use the standard clipboard (Cut, Copy, and Paste) or selection operations to transfer text to and from Version 1.1.3 applications.
- Tear-off menus are not supported. There is no workaround for this restriction.

5.2.9 Problems Viewing Certain PostScript Documents on ULTRIX Systems

You might have problems in displaying some PostScript documents, especially those created by VAX DOCUMENT, with `dxvdoc` on a DEC OSF/1 Version 3.0 system when the display is directed to a workstation running ULTRIX Version 4.3. (This problem also occurs when you run `dxvdoc` locally on the ULTRIX system.)

To work around this problem, use `dxpsview` on the ULTRIX system, instead of `dxvdoc`, to display these documents.

5.2.10 Possible Adobe Display PostScript Corrupt Output

Adobe Display PostScript (DPS) occasionally produces corrupt output on the ZLX-M1, ZLX-M2 and PXG series graphics adapters. Typically, this occurs when using the `dxvdoc` program to view PostScript files. Using the “Watch Progress” option in the PostScript “Display Options” menu might alleviate the problem.

The problem might also occur in the DPS programming interface.

5.3 Windows Programming

The following notes apply to windows programming.

5.3.1 Svn Widget Interface Change

The datatype of the tag parameter of the Svn widget functions has been changed from `unsigned int` to `XtPointer`. This change allows the tag item to hold any type of data, and it is upward compatible with current code.

The following functions have been changed:

Function	Description of Change
<code>DXmSvnGetComponentNumber</code>	Tag parameter datatype changed to <code>XtPointer</code>
<code>DXmSvnGetComponentTag</code>	Return value changed to <code>XtPointer</code>
<code>DXmSvnGetEntryTag</code>	Return value changed to <code>XtPointer</code>

5.4 Binary Compatibility and Motif

With the release of Motif Version 1.2, it is necessary for Motif application developers and users to be aware of binary compatibility.

Binary compatibility means that an installed application, built against some set of libraries, will continue to work correctly when newer library versions are installed. There should be no visible difference in application execution or use.

OSF's Motif Version 1.1.3 is offered only as a run-time service in DEC OSF/1 Version 3.0. The GUI development environment is Motif Version 1.2 based. In addition, both Motif Version 1.1.3 and Motif Version 1.2 runtime services are provided. It is possible to provide two noncompatible versions of the Motif toolkit because applications can specify a shareable library by version.

See the OSF Motif Version 1.2 release notes for more information on binary compatibility from the OSF.

This chapter discusses notes that apply to DEC OSF/1 Version 3.0 documentation.

6.1 Release Notes

The DEC OSF/1 Version 3.0 *Release Notes* are available in hardcopy and Bookreader formats. However, to ensure that you have access to the most accurate information, see the hardcopy release notes.

6.2 Software Product Description Shipped on the CD-ROM

With the DEC OSF/1 Version 3.0 release, the Software Product Description is shipped on the DEC OSF/1 Version 3.0 CD-ROM distribution media in both PostScript and text formats. For the PostScript format, change to the *mnt_point*/DOCUMENTATION/POSTSCRIPT directory and print the following files:

```
DEC_OSF1_Operating_System.ps
DEC_OSF1_C_Developers_Extensions.ps
DEC_OSF1_Server_Extensions.ps
```

For text format, change to the *mnt_point*/DOCUMENTATION/TEXT directory and print the following files:

```
DEC_OSF1_Operating_System.txt
DEC_OSF1_C_Developers_Extensions.txt
DEC_OSF1_Server_Extensions.txt
```

6.3 General Documentation Information

The following documents have been added for DEC OSF/1 Version 3.0:

- *Logical Storage Manager*
- *Writing Device Drivers: Advanced Topics*
- *Writing PCI Bus Device Drivers*
- *Writing VMEbus Device Drivers*

- *X Window System Environment*

6.4 Online Documentation to Support OSF/Motif Release 1.2

The DEC OSF/1 distribution includes two online documents based on source files supplied by the Open Software Foundation for OSF/Motif Release 1.2:

- Current list of open OSF/Motif issues
- Release notes relevant for Motif application developers

These documents are located in the following files:

- `/usr/doc/motif/OPENBUGS`
- `/usr/doc/motif/Motif-1.2.2.notes.ps`

The first file is a text file that lists the OSF/Motif issues in reverse order by bug report number with a brief description of the problem and the name of the component. The second file is a PostScript file that contains notes on performance improvements, backward compatibility, as well as summaries of the changes, enhancements, and new features for OSF/Motif Release 1.2. These files are contained in the OSFXDEV200 subset.

6.5 Reference Pages

This section provides information about the DEC OSF/1 Version 3.0 reference pages.

6.5.1 Incorrect Reference in POSIX Realtime Reference Pages

The reference pages for the POSIX realtime functions refer to the P1003.4/D14 standard as the standard defining realtime programming extensions. The reference should be to the IEEE P1003.1b standard.

6.5.2 Incorrect Restriction to `-xtaso_short` Option in `cc(1)` Reference Page

The last sentence of the `-xtaso_short` flag description, which restricts the use of the `-xtaso_short` flag, is incorrect. Use of the `-xtaso_short` flag is not limited solely to the `-xtaso` flag.

6.6 Compact Disc User's Guide

The *Compact Disc User's Guide* is not part of the DEC OSF/1 Version 3.0 documentation set. See the *Read This First Letter* for a description of the DEC OSF/1 Version 3.0 CD-ROM distribution media contents. See the *Installation Guide* for information on using the CD-ROM disk drive.

6.7 Incorrect AdvFS Volume Recommendation In Technical Overview

In Appendix A, the *Technical Overview* incorrectly states the conditions regarding the maximum recommended limits of AdvFS volumes.

The text should state the following:

To decrease the chance of disk errors which may make the entire domain inaccessible, Digital also recommends that you create no more than 8 volumes per domain.

6.8 Incorrect Contents of OSF-USR License in Software License Management

In Section 2.1, the *Software License Management* manual incorrectly states the contents of the OSF-USR license.

The text should state the following:

The license is named the OSF-USER license, and contains the product code OSF-USER and the authorization code OSF-BASE-IMPLICIT-USER.

6.9 Writing Software for the International Market

The *Writing Software for the International Market* manual incorrectly describes how to configure the `sendmail` utility to support 8-bit data. The following are the correct instructions:

1. Add O8 to the end of the `/var/adm/sendmail/sendmail.cf` file.
2. Execute the following command:

```
# /sbin/init.d/sendmail restart
```

6.10 Writing Device Drivers: Tutorial Manual

The *Writing Device Drivers: Tutorial* manual incorrectly states that the `Module_Config1` entry for loadable device drivers in `sysconfigtab` database is optional. The entry is required.

In addition, the `Module_Config1` example entries are incorrect. The examples should show the following:

```
Module_config1 = controller none0 at tc
```

6.11 Logical Volume Manager Mirroring References

References to Logical Volume Manager (LVM) mirroring in the manual *System Administration* and the `lvm(7)` reference page are purely informational because mirroring in LVM is not supported in DEC OSF/1 Version 3.0.

This chapter lists features of DEC OSF/1 Version 3.0 scheduled to be removed from, or changed in, future releases of DEC OSF/1. Users and developers should plan to migrate away from these features in the near future.

This chapter is also part of the Bookreader book *New and Changed Features*, which is available on the distribution CD-ROM.

7.1 Support for the `/bin/echo` Command's `-n` Flag

Support for the `echo` command's `-n` flag is likely to disappear entirely in a future release of DEC OSF/1. The `echo` command currently supports use of the `-n` flag to suppress the newline at the end of the echoed text. This behavior is supplied for backward compatibility, but it is not XPG4 compliant.

If the `CMD_ENV` environment variable is present and set to a value of `xpg4`, the `echo` command treats an argument of `-n` as an ordinary string argument, as required by XPG4. The newline can be suppressed by including a backslash and the letter `c` (`\c`) at the end of the arguments, an implementation that XPG4 permits. If the `CMD_ENV` environment variable is not present or is present but set to any value other than `xpg4`, the `echo` command accepts `-n` as a flag. For example, the following two commands execute identically on DEC OSF/1 Version 3.0 if the `CMD_ENV` environment variable is not set to `xpg4`:

```
/bin/echo -n "Hello world"
```

```
/bin/echo "Hello world\c"
```

For XPG4 compliance, scripts needing special output handling should be written to use the `printf` command.

7.2 BSD tty Name Space Will Be Retired

DEC OSF/1 Version 3.0 supports both the BSD and SVR4 tty name spaces. In a future release, support for the BSD tty name space will be removed from the system. Developers should take steps to convert to the SVR4 tty name space.

7.3 Certain Duplicated Functions Will Be Eliminated

The following functions currently exist in both the `libm` and `libc` libraries:

```
ceil()      modf()  
floor()    nearest()  
frexp()    rint()  
ldexp()    trunc()
```

The official versions of these routines, as documented in their respective reference pages, exist in `libm` and will continue to reside there in future releases of DEC OSF/1. The `libc` versions of these functions will be eliminated in a future release.

7.4 OSF/Motif Version 1.1.3 Will Be Retired

The Motif Version 1.1.3 libraries are provided as a run-time service only. In a future release, these libraries will be removed from the system. Developers should take steps to convert applications to Motif Version 1.2. See also Section 5.4.

7.5 XIE Version 3.0 X Server Extension Will Be Retired

DEC OSF/1 Version 3.0 supports both the X Image Extension (XIE) Version 3.0 and XIE Version 5.0. The XIE Version 3.0 provides compatibility with applications written to use the XIE Version 3.0 extensions. In a future release, XIE Version 3.0 will be removed from the system.

7.6 LVM Interface Retirement

DEC OSF/1 Version 3.0 contains a Logical Volume Manager (LVM) that provides concatenation.

Digital will be replacing this LVM with support in the base operating system for a different implementation of concatenation as part of the LSM. The DEC OSF/1 LSM will also provide data mirroring, data striping, and a comprehensive online data storage management interface, but requires a separate license.

Migration tools are provided with the DEC OSF/1 LSM to enable migration from current LVM interfaces and from UNIX partition devices to DEC OSF/1 LSM volumes.

7.7 POLYCENTER Common Agent Developer's Kit

The POLYCENTER Common Agent Developers Kit, which allows extending the SNMP Version 1 agent to include additional Management Object Modules (MOMs), will be retired when the SNMP Version 2 agent technology is incorporated in a future release of the DEC OSF/1 system.

7.8 Support for Obsolete POSIX Realtime Functions Will Be Removed

DEC OSF/1 Version 3.0 supports the POSIX 1003.1b realtime functions, and provides compatibility with older P1003.4 draft functions by allowing you to define the `POSIX_4D11` feature test macro before compiling your applications. In a future release, support for the obsolete P1003.4 draft functions will be removed from the system. Developers should take steps to convert their applications to use the POSIX 1003.1b realtime functions.

7.9 Ethernet Trailer Encapsulation Will Be Retired

DEC OSF/1 Version 3.0 supports Ethernet trailer encapsulation as a link level option. You specify this option using the `trailers` option to the `ifconfig` command.

In a future release, support for this link level option will be removed from the system. This should not affect system interoperability since trailer encapsulation is negotiated on a per-host basis through the ARP protocol. If a system does not support trailers, packets are sent using the normal encapsulation for the protocol type, which is implemented by default.

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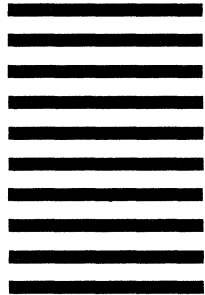


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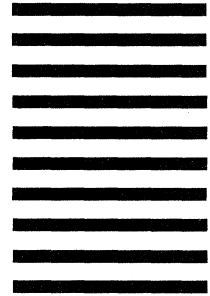
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NASHUA, NH 03062-9987



Do Not Tear - Fold Here

Cut
Along
Dotted
Line



digital