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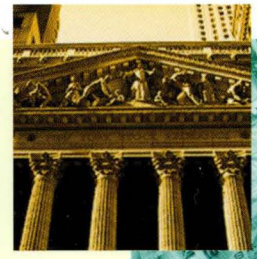
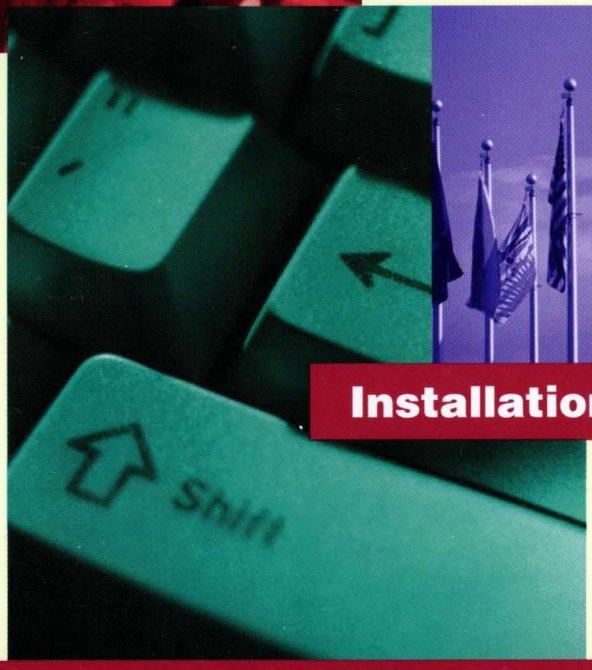
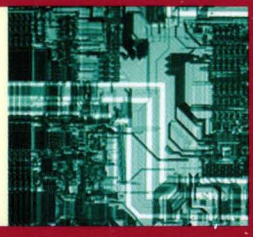
DIGITAL InfoServer Client for DIGITAL UNIX





Installation & User's Guide



DIGITAL InfoServer Client for DIGITAL UNIX

Installation and User's Guide

Part Number: AA–R40XA–TE

April 1997

This document explains how to install DIGITAL InfoServer Client for DIGITAL UNIX software on the DIGITAL UNIX operating system and how to access and manage InfoServer virtual device services.

Revision/Update Information:	This is a new manual.
Operating System and Version:	DIGITAL UNIX V3.2g or V4.0b
Software Version:	DIGITAL InfoServer Client for DIGITAL UNIX Version 1.0

Digital Equipment Corporation
Maynard, Massachusetts

April 1997

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Preface

Purpose of This Guide

This guide explains how to install DIGITAL InfoServer Client for DIGITAL UNIX software on Alpha processors that are running the DIGITAL UNIX operating system. The guide also explains how to access and manage virtual device services offered by InfoServer systems on a local area network (LAN).

The installation procedure creates DIGITAL InfoServer Client for DIGITAL UNIX file systems subordinate to the `/usr/opt` directory and loads DIGITAL InfoServer Client for DIGITAL UNIX software subsets.

Keep this document with your distribution kit. You will need it to install maintenance updates or to reinstall DIGITAL InfoServer Client for DIGITAL UNIX for any other reason.

Intended Audience

This guide addresses the system manager who installs and manages DIGITAL InfoServer Client for DIGITAL UNIX software on an Alpha system as follows:

- A system manager who manages a node-specific system
- A Diskless Management Services (DMS) manager who manages a DMS server area
- A Remote Installation Services (RIS) manager who manages a RIS server area
- A system manager who expects to install InfoServer Client for DIGITAL UNIX software from the RIS server area of a remote system

Document Structure

This guide is organized as follows:

- Chapter 1 introduces InfoServer and DIGITAL InfoServer Client for DIGITAL UNIX functions.
- Chapter 2 describes the operating system and hardware requirements for DIGITAL InfoServer Client for DIGITAL UNIX installation and related procedures that you complete before installing DIGITAL InfoServer Client for DIGITAL UNIX software.
- Chapter 3 describes the installation procedures for local and server installations.
- Chapter 4 describes the Installation Verification Procedure (IVP) and any post-installation procedures that you must complete in order to use DIGITAL InfoServer Client for DIGITAL UNIX.
- Chapter 5 explains how to create and manage DIGITAL InfoServer Client for DIGITAL UNIX virtual device services.
- Chapter 6 describes DIGITAL InfoServer Client for DIGITAL UNIX utilities.
- Appendix A describes the hierarchy and contents of DIGITAL InfoServer Client for DIGITAL UNIX directories.
- Appendix B contains sample listings generated by DIGITAL InfoServer Client for DIGITAL UNIX installation procedures.

Related Documents

The following documents provide information about the InfoServer system:

- *InfoServer System Operations Guide*
- *InfoServer 1000 Installation and Owner's Guide*

Conventions

The following conventions are used in this guide:

Convention	Description
UPPERCASE and lowercase	The DIGITAL UNIX system differentiates between lowercase and uppercase characters. Literal strings that appear in text, examples, syntax descriptions, and function descriptions must be typed exactly as shown.
`user input`	This bold typeface is used in interactive examples to indicate typed user input. In text, this typeface is used to introduce new terms.
`system output`	This typeface is used in interactive and code examples to indicate system output. In text, this typeface is used to indicate the exact name of a command, option, partition, pathname, directory, or file.
%	The default user prompt is your system name followed by a right angle bracket (>). In this manual, a percent sign (%) is used to represent this prompt.
#	A number sign is the default superuser prompt.
Ctrl/X	In procedures, a sequence such as Ctrl/X indicates that you must hold down the key labeled Ctrl while you press another key (X) or a pointing device button.

1
InfoServer and DIGITAL InfoServer Client for DIGITAL UNIX

This chapter presents an overview of InfoServer and DIGITAL InfoServer Client for DIGITAL UNIX functions.

1.1 InfoServer Functions

The InfoServer system is an Ethernet-based, high-performance, virtual device server. It can serve physical device media and sets of logical disk blocks to the network. Host systems running the appropriate client software can connect to virtual devices served by the InfoServer system and use them as though they are locally attached devices.

Unlike a file server, the InfoServer system does not impose a file system on the virtual devices that it serves. This means that the InfoServer system can serve a disk with any type of on-disk file structure. The host client system itself interprets the on-disk structure, allowing each client system to use its own native file system. Multiple on-disk structures can be served by and accessed on a single InfoServer system at the same time.

The InfoServer system can perform the following functions:

- **Make compact discs available to clients on the network**

  The InfoServer system serves compact discs automatically, using their volume label as the service name when the server is booted or when compact discs are inserted into InfoServer drives. You do not have to perform any management action. Client systems simply bind to and mount the compact discs under their volume labels.

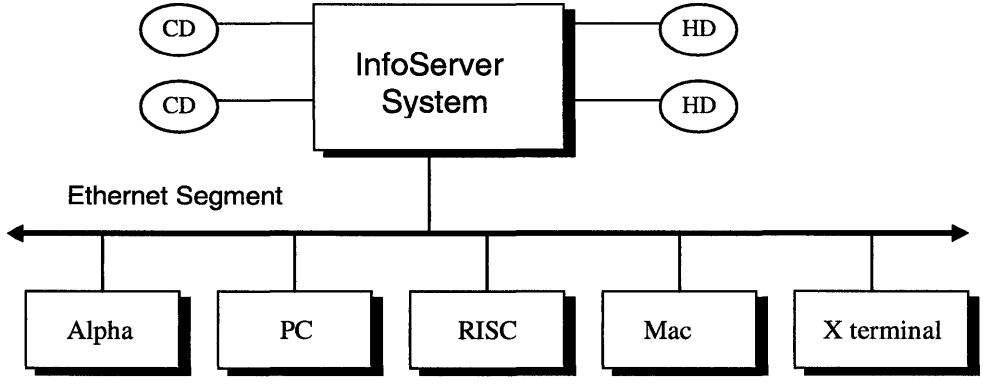
  The InfoServer system can automatically serve compact discs that are in ODS-2 and ISO 9660 format. Other media types, such as DIGITAL UNIX media, can be served manually through the InfoServer management interface (see Section 5.1.2).

- **Serve read/write disk partitions**

  A partition is a logical subset of a read/write disk. A single disk can be subdivided into several partitions, each of which can be served to the network independently. To remote client systems, these partitions appear to be whole disks. For example, a client system using DIGITAL InfoServer Client for DIGITAL UNIX software can access InfoServer partitions and use them as though they are local hard disks.

Figure 1-1 shows the relationship of the InfoServer system to several possible client systems. In this figure, the four compact disc drives connected to the server appear to the client systems as local devices. The Alpha system and the personal computer (PC) might be using one or two of the compact discs for software distribution and online documentation, while the Macintosh system might be referencing a disk partition on the InfoServer system. The X terminal boots from the InfoServer system and uses InfoServer disks for page, font, and customization files.

Figure 1-1 InfoServer System Serving Clients



You can simply connect the InfoServer system to your Ethernet local area network and turn it on. After the server is initialized, or bootstrapped, the server software automatically makes available, or serves, to client systems the device media connected to it. For example, if you insert a compact disc into a server drive, the server detects this new device and automatically serves it to client systems by using the volume label as the service name.

The server bootstraps from its internal RZ read/write disk drive, on which the InfoServer software is preinstalled. Any future InfoServer software updates will be distributed on compact discs. As these new releases become available, you can install the software onto the internal RZ disk for subsequent booting.

You might want to customize server features. You can control InfoServer functions by logging into the server and entering server commands, described in the *InfoServer System Operations Guide*.

1.2 DIGITAL InfoServer Client for DIGITAL UNIX Functions

DIGITAL InfoServer Client for DIGITAL UNIX software enables clients running the DIGITAL UNIX operating system to access virtual device services offered by InfoServer systems on a local area network.

DIGITAL InfoServer Client for DIGITAL UNIX software components include the following:

- LASTport driver

  The LASTport driver provides reliable data transfer services for its clients. It interacts with the Data Link driver and the LASTport/Disk client driver as an efficient transport for a virtual device service. The LASTport driver can support other applications, such as a primitive data queuing service.

- LASTport/Disk client driver

  The LASTport/Disk client driver presents a standard block device interface to the system. The DIGITAL UNIX file system interacts with the LASTport/Disk client as if the LASTport/Disk client is a local disk driver. The LASTport/Disk client driver supports both raw and buffered interfaces.

- LASTport and LASTport/Disk client utilities

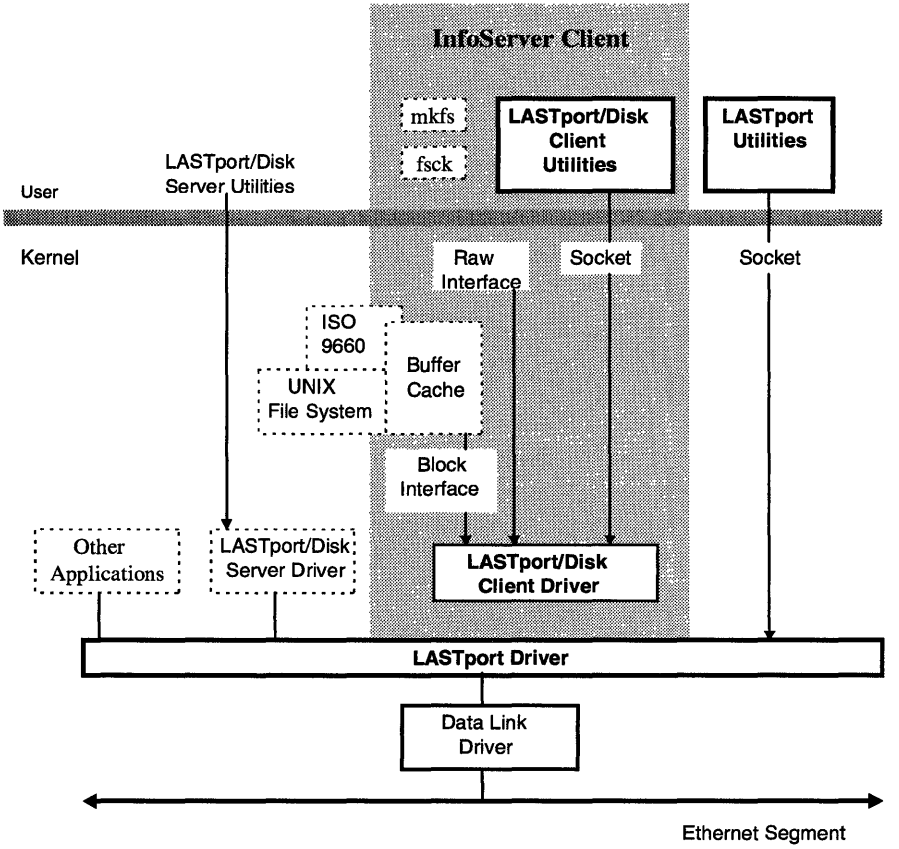
  A set of utilities running in user mode allows the system manager to perform the following operations:

  – Enable and disable the LASTport transport and LASTport/Disk virtual device services

- Bind remote device services to local LASTport/Disk client device units
- Show status and counters
- Configure and maintain LASTport and LASTport/Disk client services

Chapter 6 describes these utilities. Figure 1-2 shows the configuration of DIGITAL InfoServer Client for DIGITAL UNIX components.

Figure 1-2 DIGITAL InfoServer Client for DIGITAL UNIX Components



2
Preparing for the Installation

Before starting the installation procedures described in Chapter 3, you should complete the preparation requirements outlined in this chapter. It provides the information necessary to make your installation run smoothly, including your installation options. Read this chapter to determine the following:

- Whether you need to read the Release Notes
- Whether you are installing DIGITAL InfoServer Client for DIGITAL UNIX software from distribution media or using the DIGITAL UNIX Remote Installation Service (RIS)
- Whether you are installing DIGITAL InfoServer Client for DIGITAL UNIX locally or into a Diskless Management Services (DMS) server area for diskless clients
- If installing DIGITAL InfoServer Client for DIGITAL UNIX software from media, whether your distribution kit includes all the components listed on the Bill of Materials (BOM)
- Whether you need superuser privileges for the system on which you will be installing DIGITAL InfoServer Client for DIGITAL UNIX software
- If the system on which you will install DIGITAL InfoServer Client for DIGITAL UNIX software meets the DIGITAL InfoServer Client for DIGITAL UNIX hardware, software, and disk space requirements
- Which optional DIGITAL InfoServer Client for DIGITAL UNIX subsets you should install
- How much disk space you will need
- Whether you have to back up your system disk

2.1 Release Notes

The DIGITAL InfoServer Client for DIGITAL UNIX distribution kit includes hardcopy release notes. DIGITAL strongly recommends that you read the release notes before using the product.

2.2 Using RIS for Client Installations

If you expect to use DIGITAL InfoServer Client for DIGITAL UNIX subsets from a Remote Installation Services (RIS) server area of a remote system for installation on your local system, first check the following with your site system administrator:

- A DIGITAL InfoServer Client for DIGITAL UNIX kit is installed in the RIS server area and is available for use
- Your system is registered as a RIS client

If DIGITAL InfoServer Client for DIGITAL UNIX subsets are available to you on a RIS server system, you will need the name of that system to start the installation procedure described in this guide.

2.3 Installing into a RIS Server Area

If you manage a RIS server area and intend to install DIGITAL InfoServer Client for DIGITAL UNIX software into your server area, read the following sections of this guide:

- Section 2.5 for information about contents of the media kit
- Section 2.6.3 and Section 2.6.4 for hardware and software requirements, for the names and numbers of software subsets, and for disk space requirements
- Sections 3.1.2.1 and 3.1.2.2 explain the displays and prompts that are specific to DIGITAL InfoServer Client for DIGITAL UNIX installations

To start the installation procedure, do not use the setld command. Use the `ris` utility (see Section 3.2).

2.4 Installing into a DMS Server Area

If you manage a DMS server area and want to install DIGITAL InfoServer Client for DIGITAL UNIX software into a DMS server area, read the following sections of this guide:

- Section 2.5 for information about contents of the media kit
- Section 2.6.3 and Section 2.6.4 for hardware and software requirements, the names and numbers of software subsets, and for disk space requirements
- Sections 3.1.2.1 and 3.1.2.2 explain the displays and prompts that are specific to DIGITAL InfoServer Client for DIGITAL UNIX installations

To start the installation procedure, do not use the `setld` command. Use the `dms` utility (see Section 3.2).

In a local (node-specific) installation, the system on which you are installing DIGITAL InfoServer Client for DIGITAL UNIX software will use its own disks when DIGITAL InfoServer Client for DIGITAL UNIX software is run. A local (node-specific) installation procedure loads DIGITAL InfoServer Client for DIGITAL UNIX files on the disks that belong to the system on which you perform the installation. When DIGITAL InfoServer Client for DIGITAL UNIX software is run, its executable files are mapped into memory on the same system.

In a diskless client environment, the system on which you are installing DIGITAL InfoServer Client for DIGITAL UNIX software is a server for Diskless Management Services and provides the disks for client systems running DIGITAL InfoServer Client for DIGITAL UNIX software. This installation environment is referred to as "diskless" because the system uses DIGITAL InfoServer Client for DIGITAL UNIX software accessed through the network by Network File System (NFS) software. When DIGITAL InfoServer Client for DIGITAL UNIX software is run by users logged into a client system, DIGITAL InfoServer Client for DIGITAL UNIX executables are mapped into memory on the client system rather than the server system. From the perspective of the client node, DIGITAL InfoServer Client for DIGITAL UNIX installation is handled entirely by the manager of the DMS server area.

Note

The diskless server area does not provide DIGITAL InfoServer Client for DIGITAL UNIX software to users logged in to the server system itself. Installing DIGITAL InfoServer Client for DIGITAL UNIX software into the diskless environment provides DIGITAL InfoServer Client for DIGITAL UNIX software only to client systems. Therefore, if users at your site need to use DIGITAL InfoServer Client for DIGITAL UNIX software when logged in to the local server system, you must perform a local (node-specific) installation of DIGITAL InfoServer Client for DIGITAL UNIX software in addition to the diskless installation.

2.4.1 ISO 9660 Compact Disk File System

The ISO 9660 Compact Disk File System (CDFS) kernel option must be compiled into the kernel before accessing ISO 9660 CD-ROMs served by the InfoServer. Refer to the DIGITAL UNIX System Administration and Installation Guide for information about configuring the kernel with the CDFS option.

2.5 Checking the Media Software Distribution Kit

For installations from media, use the BOM to check the contents of your software distribution kit.

The kit includes this installation guide and the CD-ROM optical disk for systems with RRD optical disk drives.

2.6 Installation Procedure Requirements

This section discusses various requirements for installing DIGITAL InfoServer Client for DIGITAL UNIX software.

2.6.1 Time Required for Installation

A local server, DMS server, or RIS server installation takes from 10 minutes to 2 hours, depending on your type of media and your system configuration. A RIS client installation might take longer because it is dependent on network activity at the time you do the installation. If the network is not active, you should expect an installation time roughly equal to a local installation with the Installation Verification Procedure (IVP).

2.6.2 Checking Login Privileges

You must be able to log in as superuser on the system on which you are installing DIGITAL InfoServer Client for DIGITAL UNIX software. Only when you are logged in as superuser, do you have sufficient privileges to install the DIGITAL InfoServer Client for DIGITAL UNIX software.

2.6.3 Hardware Requirements

To perform the installation, you need the following hardware:

- Software distribution device (if installing from media)

  You need a distribution device that corresponds with the software distribution media. You must know how to load the media supplied with the software distribution kit on the appropriate drive. The documentation for the tape or disk drive that you are using explains how to load media.

- Terminal

  You can use a terminal to communicate with the operating system and respond to prompts from the installation procedure for DIGITAL InfoServer Client for DIGITAL UNIX software.

2.6.4 Software Requirements

DIGITAL InfoServer Client for DIGITAL UNIX software requires DIGITAL UNIX V3.2g or V4.0b to be installed. In addition, DIGITAL InfoServer Client for DIGITAL UNIX software requires the following DIGITAL UNIX software subsets to be loaded on the system on which you install DIGITAL InfoServer Client for DIGITAL UNIX software:

- OSFBASE350[1]
- OSFINET350

To install the optional DIGITAL InfoServer Client for DIGITAL UNIX reference pages (manual pages), the following DIGITAL UNIX software subset must be installed on the system on which you install DIGITAL InfoServer Client for DIGITAL UNIX software:

- OSFMANOS350, which is named "Reference Pages Administrator/User".

---

[1] The version number (350) in the OSFBASE350 subset applies to DIGITAL UNIX V3.2 only. Use OSFBASE410 for DIGITAL UNIX V4.0b.

If you are installing DIGITAL InfoServer Client for DIGITAL UNIX software in a local (node-specific) environment, perform the following steps to determine whether the preceding DIGITAL UNIX subsets are loaded:

1. Log in to the system on which you plan to install DIGITAL InfoServer Client for DIGITAL UNIX software .
2. Enter the following commands:

```
# setld -i | grep BASE350
# setld -i | grep INET350
# setld -i | grep MANOS350
```

Check the displayed rows for the relevant subset names and for any related patch names. The word `installed` appears in a row after the subset identifier code when a subset is loaded. If the word `installed` does not appear (the second column in a row is blank), the subset or patch is not loaded. In this case, you must load the missing DIGITAL UNIX software before installing DIGITAL InfoServer Client for DIGITAL UNIX software.

2.6.5 Determining Which Subsets to Load

You must choose the DIGITAL InfoServer Client for DIGITAL UNIX subsets you want to load. Table 2-1 lists the product subsets.

Table 2-1 DIGITAL InfoServer Client for DIGITAL UNIX Subsets

Machine	Subset	Name	Description
Alpha	`LPABASE100`	InfoServer Client Drivers	Includes software for the driver and utilities
Alpha	`LPAMAN100`	InfoServer Client Manuals	Includes software for the reference pages

2.6.6 Determining Disk Space Requirements

The disk space requirements discussed in this section apply to the disks on which you load the InfoServer Client for DIGITAL UNIX subsets.

Table 2-2 lists the disk space requirements for loading DIGITAL InfoServer Client for DIGITAL UNIX software subsets on Alpha systems. This table specifies disk space requirements for the convenience of those doing installations on systems on which these file systems are mount points for different disk partitions.

Note

Table 2-2 notes disk space occupied by files after installation. If you are extracting files from media using the `ris` utility only, the DIGITAL InfoServer Client for DIGITAL UNIX files are compressed during the extraction process and require only the following amount of space to be available in the RIS server area:
Distribution files for installing DIGITAL InfoServer Client for DIGITAL UNIX software on Alpha systems require 1835 Kb.

Table 2-2 Subset Sizes (Kilobytes Required) on Alpha Systems

Subset Title	Subset Name	Kilobytes
InfoServer Client Drivers	`LPABASE100`	1800
InfoServer Client Manuals	`LPAMAN100`	35

Using the disk space requirements listed in Table 2-2 for an Alpha system that applies to your system, total the values for the subsets that you plan to load in each file system.

Compare the space required for subsets with the free space currently on the disks on which DIGITAL InfoServer Client for DIGITAL UNIX files will reside.

To determine the current amount of free space for a directory path, log in to the system on which you plan to install DIGITAL InfoServer Client for DIGITAL UNIX software and check the amount of space available in the /usr/opt directory using the DIGITAL UNIX `df` utility:

```
# df -k /usr/opt

Filesystem    Total     kbytes    kbytes    %
node          kbytes    used      free      used  Mounted on
/dev/rd0g     122598    54447     55892     49%   /usr
```

The previous display indicates that 55892 Kb are free. This free space must accommodate subset requirements listed in Table 2-2.

2.6.6.1 Checking Disk Space for Installation into a Diskless Environment

For DIGITAL InfoServer Client for DIGITAL UNIX installations into the diskless environment, the disks on which DIGITAL InfoServer Client for DIGITAL UNIX subsets reside are on a server system. Therefore, for installations into diskless environments, log in to the server system to check disk space requirements.

Inspect the free space in the environment(s) that you want to install the client. For example, if you have only one diskless installation environment set up on your system, it is found on the path `/var/adm/dms/dms0.alpha`.

This free space must be large enough to hold the subset requirements listed in Table 2-1. Consult the DIGITAL UNIX document entitled, *Sharing Software on a Local Area Network*, for more information on sizing disk space necessary for a DMS installation.

2.6.7 Configuring the Network

The network must be configured for the installation to work properly. If the network is not configured, the installation script will attempt to use the ln0 device as the default when executing the `loadlast` and `startlast` commands. If the default device does not actually exist on the system, error messages will be displayed during the installation as follows:

```
Enabling LAD on network interface "ln0"
loadlast: ioctl (SIOCPHYSADDR): No such device or address
loadlast: illegal node id or device name:  No such device or address
startlast:  LAiocPORTLOAD:  No such device or address
startlast:  Cannot add LAST to the ifnet family
loadladc: setsockopt (LASTPROTO_LADC, LADC_LOAD)
failed:  No such device or address
```

Should this occur, you must either de-install the DIGITAL InfoServer Client for DIGITAL UNIX, set up the network, then perform a re-install or enable the Client manually as described in Section 5.3.5.

Use `grep` to perform a quick check to determine if a network device is configured on your system. If the NETDEV_0 variable is not assigned, then the network needs to be configured. In this case, the NETDEV_0 variable is assigned to the "tu0" device, indicating that the network was configured at one point in time.

```
# grep NETDEV_ /etc/rc.config
# NETDEV_n -- network device name for network devices currently
#             for example, NETDEV_0="ln0"
   NETDEV_0="tu0"
   NETDEV_1=
   NETDEV_2=
   NETDEV_3=
   NETDEV_4=
   NETDEV_5=
   NETDEV_6=
   NETDEV_7=
export NETDEV_0 NETDEV_1 NETDEV_2 NETDEV_3 NETDEV_4 NETDEV_5
NETDEV_6 NETDEV_7
```

Consult the DIGITAL UNIX System Administration documentation for more information on configuring the network under your specific version of the operating system.

2.7 Backing Up Your System Disk

You should back up your system disk before installing any software. Use the backup procedures established at your site. For details on performing a system disk backup, see your DIGITAL UNIX documentation.

2.8 Stopping the Installation

You can stop the installation procedure at any time by using Ctrl/C. However, files created up to that point are not deleted. You must delete these files interactively. Appendix A lists the files and directories created during the installation procedure.

2.9 Error Recovery

If errors occur during the installation, the system displays failure messages. If the installation fails because of insufficient disk space, the installation procedure displays the following messages for Alpha systems:

```
There is not enough file system space for subset LPABASE100.
InfoServer Client Drivers (LPABASE100) will not be loaded.
```

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

- The operating system version is incorrect.
- The prerequisite software version is incorrect.
- The system parameter values for successful installation are insufficient.

For descriptions of error messages generated by these conditions, see the DIGITAL UNIX documentation on system messages, recovery procedures, and DIGITAL UNIX software installation. If you are notified that any of these conditions exist, take the appropriate action described in the message. For information on system requirements, see Section 2.6.4.

3. Installing DIGITAL InfoServer Client for DIGITAL UNIX

This chapter describes the procedures for installing DIGITAL InfoServer Client for DIGITAL UNIX software. Before you start, read Chapter 2, which describes the general options and requirements that apply to installing DIGITAL InfoServer Client for DIGITAL UNIX software.

DIGITAL InfoServer Client for DIGITAL UNIX software can be installed in a number of ways:

- Locally from CD-ROM. Section 3.1 explains how to do a local installation.
- Remotely into a Diskless Management Services (DMS) or RIS server area for future client use. Before you use these installation procedures, you must create your server environment and be ready to add DIGITAL InfoServer Client for DIGITAL UNIX to it. Section 3.2 explains how to do a DMS and RIS server installation.

3.1 Installing Locally

This installation procedure loads DIGITAL InfoServer Client for DIGITAL UNIX files on a disk that belongs to the system on which you perform the installation. When DIGITAL InfoServer Client for DIGITAL UNIX is run, its executable images are mapped into memory on this system.

This section explains how to start a local installation procedure and how to respond to installation procedure prompts.

3.1.1 Starting the Installation Procedure

If you are installing DIGITAL InfoServer Client for DIGITAL UNIX from disk, start with Section 3.1.1.1.

If you are installing DIGITAL InfoServer Client for DIGITAL UNIX on a client system using a RIS kit, start with Section 3.1.1.2

3.1.1.1 Using CD-ROM Consolidated Distribution Media

If you are installing DIGITAL InfoServer Client for DIGITAL UNIX software from disk, start the installation procedure as follows:

1. Insert the media into the appropriate CD-ROM disk drive.
2. Log in as superuser (login name root) to the system on which you are installing DIGITAL InfoServer Client for DIGITAL UNIX.
3. Make sure that you are at the root (`/`) directory by entering the following command:

   ```
   # cd /
   ```

4. Specify the `/mnt` directory to be the mount point for the distribution file system on the drive. If your drive is `ra1`, enter the following command:

   ```
   # mount -r /dev/ra1c /mnt
   ```

5. Enter a `setld` command that requests the load function and identifies the directory in the mounted file system on which DIGITAL InfoServer Client for DIGITAL UNIX subsets are located. For example:

   ```
   # setld -l /mnt/LAD100
   ```

See Section 3.1.2 to continue the installation.

3.1.1.2 Installing from a RIS Server

To install DIGITAL InfoServer Client for DIGITAL UNIX software from a Remote Installation Services (RIS) server to a RIS client, you must first install DIGITAL InfoServer Client for DIGITAL UNIX software in your RIS server environment. See your RIS manager if DIGITAL InfoServer Client for DIGITAL UNIX software is not already installed in the RIS server.

To install DIGITAL InfoServer Client for DIGITAL UNIX subsets that reside in a `/var/adm/ris` distribution area on a remote system, start the installation procedure as follows:

1. Log in as superuser (login name root) to the system on which you are installing DIGITAL InfoServer Client for DIGITAL UNIX.
2. Make sure that you are at the root (`/`) directory by entering the following command:

   ```
   # cd /
   ```

3. Enter a `setld` command that requests the load function and identifies the system on which DIGITAL InfoServer Client for DIGITAL UNIX subsets are located. For example, if you are loading DIGITAL InfoServer Client for DIGITAL UNIX subsets from a RIS distribution area on node bigsys, enter the following command:

   ```
   # setld -l bigsys:
   ```

If you receive an error, verify that you correctly followed the preparation steps in Section 2.2.

See Section 3.1.2 to continue the installation.

3.1.2 Responding to Installation Procedure Prompts

This section explains the installation procedure prompts and displays.

3.1.2.1 Selecting Subsets

After you enter the `setld` command for local (node-specific) installations or after you start the `dms` or `ris` utility for server installations, the installation procedure displays the names of DIGITAL InfoServer Client for DIGITAL UNIX subsets and asks you to specify the subsets that you want to load:

```
*** Enter Subset Selections ***

The subsets listed below are optional:

There may be more optional subsets than can be presented on a
single screen. If this is the case, you can choose subsets screen
by screen, or all at once on the last screen. All of the choices
you make will be collected for your confirmation before any subsets
are installed.

  1) InfoServer Client Drivers
  2) InfoServer Client Manuals
```

```
Or you may choose one of the following options:

  3) All of the Above
  4) Cancel selections and redisplay menus
  5) Exit without installing any subsets

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6): 3
```

When installing from a RIS server, note that the subset numbers may vary depending on what products are available in the RIS area.

If you specify more than one number at the prompt, separate each number with a space, not a comma.

Next, the script lets you verify your choice. For example, if you enter 3 in response to the previous prompt, you will see the following display:

```
You are installing the following optionalsubsets:

      InfoServer Client Drivers
      InfoServer Client Manuals

Is this correct? (y/n):
```

- If the displayed subsets are not the ones you intended to choose, enter `n`. In this case, the subset selection menu is again displayed, and you can correct your choice of optional subsets.
- If the displayed subsets are the ones you want to load, enter `y`.

3.1.2.2 Monitoring Displays During the Subset Loading Process

The procedure displays a message that the installation is starting.

Chapter 4 discusses the post-installation requirements specified in final informational messages from the procedure.

If, during the course of the installation, you encounter errors from the `setld` utility, see the Diagnostics section of the setld(8) reference page for an explanation of the error and the appropriate action to take.

If the verification process fails, you can look in the file `/usr/var/adm/fverify` to find information that can help you diagnose the problem.

3.2 Installing into a Server Environment

This section explains how to start the installation procedure and load software subsets when you are installing DIGITAL InfoServer Client for DIGITAL UNIX into an environment controlled by DMS or RIS.

If installing from media, mount the distribution kit as follows:

For the CD-ROM media kit, mount the media on the appropriate device on the server node. Then use the `mount` command to identify the special file for the device on which you mounted the consolidated media. For example, if you mount the disk on drive ra1, enter the following command:

```
# mount -r /dev/ra1c /mnt
```

Section 3.2.1 explains how to install DIGITAL InfoServer Client for DIGITAL UNIX into a DMS server environment. Section 3.2.2 explains how to install DIGITAL InfoServer Client for DIGITAL UNIX into a RIS server environment.

3.2.1 DMS Server Installation

The following procedure lets you install DIGITAL InfoServer Client for DIGITAL UNIX with the `dms` utility into the diskless server area. The examples in this section show how to install the subsets to `/var/adm/dms/dms0.alpha`.

1. Log in and become the superuser.
2. To invoke the `dms` utility, enter the following command:

```
# dmu
```

3. Select the Install Software option from the following menu by typing **i**:

```
*** DMU Main Menu ***

  a -  ADD a client
  c -  CONFIGURE software environments
  d -  DELETE software environments
  i -  INSTALL software environments
  l -  LIST registered clients
  m -  MODIFY a client
  r -  REMOVE a client
  s -  SHOW software environments
  x -  Exit

Enter your choice: i
```

4. Choose option 2 in the following menu:

```
DMU Software Installatin Menu:

  1) Install software into a new area
  2) Add software into an existing area
  3) Perform configuration phase on an existing area
  4) Return to previous menu

Enter your choice: 2
```

5. The following message lists the available installation directories:

```
You have chosen to install a product into an existing
environment.  The existing environment is
/var/adm/dms/dms0.alpha.
```

   If there is more than one installed `dms0.alpha` directory in the dataless server area, choose the appropriate directory from the menu that lists existing `dms0.alpha` directories. For example:

   Select the remote dataless environment:

```
1. /var/adm/dms/dms0.alpha
   'Digital Operating System (Rev 106)'

2. /var/adm/dms/dms1.alpha
   'Digital Operating System (Rev 106)'
   'Sort Runtime Library'

Enter your choice: 1
```

6. You are next prompted for an input device name or directory path where the software is located.

```
Enter the device special file name or path of the directory
where the software is located (for example, /mnt/ALPHA/BASE):
/mnt/LPA100
```

7. If you want all registered clients to automatically have access to DIGITAL InfoServer Client for DIGITAL UNIX, enter y to the following question:

```
The product software will automatically be propagated to every
registered client. Is this all right? (y/n):  y
```

   If you answer `n`, DMS returns you to the main menu.

8. Select the software subsets from the DIGITAL InfoServer Client for DIGITAL UNIX that you want to install. See Section 3.1.2.1 to specify the subsets you want to load. See Section 3.1.2.2 to monitor the displays during the subset load process and to complete the installation procedure.

Repeat these installation procedures for each `dmsn.alpha` area you plan to set up.

The `dms` main menu appears for your next selection.

3.2.2 RIS Server Installations

The following sample session describes how to add the DIGITAL InfoServer Client for DIGITAL UNIX product to the `ris0.alpha` area:

1. Log in and become the superuser.
2. Invoke the `ris` utility by entering the following command:

```
# ris
```

3. Select the INSTALL Software option from the Remote Installation Services (RIS) main menu by typing **i**:

```
Checking accessibility of RIS areas .... done

*** RIS Utility Main Menu ***
a -  ADD a client
d -  DELETE software products
i -  INSTALL software products
l -  LIST registered clients
m -  MODIFY a client
r -  REMOVE a client
s -  SHOW software products in remote installation environments
x -  Exit

Enter your choice: i
```

4. Choose option 2 from the RIS Software Installation Menu:

```
RIS Software Installation Menu:

    1  Install Software to a New Area.
    2  Add Software to an Existing Area.
    3  Return to Previous Menu

Enter your choice: 2
```

5. A list of available environments appears from which you might select `ris0.alpha`:

```
You have chosen to add a new product into an existing
environment.

Select the remote installation environment:

1  /usr/var/adm/ris/ris0.alpha
   'DEC C++ Class Libraries Version 4.0 for Digital UNIX'

2  /usr/var/adm/ris/ris1.alpha
   'Free Software Foundation GNU Source for Digital UNIX'

Enter your choice or press RETURN to quit: 2
```

6. You are next prompted for an input device name:

```
Enter the device special file name or the path of the directory
where the software is located, for example, /mnt/ALPHA/BASE:
/mnt/ALPHA/LPA100

Choose one of the following options:

1)  Extract software from /mnt/ALPHA/LPA100

2)  Create symbolic link to /mnt/ALPHA/LPA100

Enter your choice: 1
```

7. The next message lists the software subsets you select for automatic installation. See Section 3.1.2.1 to specify the subsets you want to load. See Section 3.1.2.2 to monitor the displays during the subset load process and to complete the installation procedure.

8. Repeat the following steps a through f for each RIS client allowed to install DIGITAL InfoServer Client for DIGITAL UNIX. You may be asked for more information than is displayed here based on your client's configutation, RIS setup, and the software products you want to make available for installation.

   a. The `ris` main menu appears for your next selection. Select the MODIFY a client option from the Remote Installation Services (RIS) menu by typing **m**:

```
*** RIS Utility Main Menu ***
a -  ADD a client
d -  DELETE software products
i -  INSTALL software products
l -  LIST registered clients
m -  MODIFY a client
r -  REMOVE a client
s -  SHOW software products in remote installation
environments
x -  Exit

Enter your choice: m
```

   b. Enter the name of the client to be modified from the list of available clients:

```
The following clients are available to modify:

clienta clientb

Enter the client processor's hostname or press RETURN to
quit:  clienta
```

   c. Choose the environment to which you want to add the client. If there is only one environment, RIS will skip this prompt.

```
Select the remote installation environment:

1  /usr/var/adm/ris/ris0.alpha
   'DEC C++ Class Libraries Version 4.0 for Digital UNIX'
```

```
    'InfoServer Client for Digital UNIX'

2   /usr/var/adm/ris/ris1.alpha
    'Free Software Foundation GNU Source for Digital UNIX'

Enter your choice or press RETURN to quit:  1
```

d. The system shows you the environment(s) and products that the client can already access. At the prompt, enter the products you would like this client to be able to install including the DIGITAL InfoServer Client for DIGITAL UNIX software. Separate each choice with a space.

```
Client clienta currently can install the following products
from /usr/var/adm/ris/ris0.alpha:

'DEC C++ Class Libraries Version 4.0 for Digital UNIX'
Select one or more products for the client to install
from/usr/var/adm/ris/ris0.alpha:

    Product   Description

       1      'DEC C++ Class Libraries Version 4.0 for
               Digital UNIX'
       2      'InfoServer Client for DIGITAL UNIX '

Enter one or more choices as a space separated list
(for example, 1 2 3) or "all" for all products [all]: all
```

e. Confirm your choice of products for this client.

```
You chose the following products:

   1    'DEC C++ Class Libraries Version 4.0 for
         Digital UNIX'
   2    'InfoServer Client for DIGITAL UNIX '

Is that correct? (Y/N) [Y]: Y
```

f. Select your network type.

```
Network type:
      1) Ethernet or FDDI
      2) Token Ring

Enter your choice: 1

Client clienta has been modified.
```

4
Completing the Installation

This chapter explains what you must do following the installation to make DIGITAL InfoServer Client for DIGITAL UNIX software ready for use.

4.1 Running the IVP

You should run the Installation Verification Procedure (IVP) to be sure that DIGITAL InfoServer Client for DIGITAL UNIX is correctly installed. The installation subset control program prompts you for automatic verification of the DIGITAL InfoServer Client for DIGITAL UNIX software. You can invoke automatic verification of the DIGITAL InfoServer Client for DIGITAL UNIX software installation by answering y to the prompt.

After installing InfoServer Client for Digital UNIX, you can run the IVP independently to verify that the software is available on your system. You might also want to run the IVP after a system failure to be sure that users can access DIGITAL InfoServer Client for DIGITAL UNIX.

To run the IVP after an installation, enter a command in the following format:

```
# setld -v subsetname
```

For Alpha systems, use `LPABASE100` as the subsetname.

The following is an example of the DIGITAL InfoServer Client for DIGITAL UNIX Installation Verification Procedure:

```
# setld -v LPABASE100

InfoServer Client Drivers  (LPABASE100)

****
**** InfoServer Client for DIGITAL UNIX Driver Subset control program
**** Subset:  LPABASE100
**** Phase:   Verify
**** Action:  Verify
**** Directory:  /

Beginning the Installation Verification Procedure

  0 verification errors encountered.
  0 corrections performed.

End of the Installation Verification Procedure
```

5
Managing InfoServer Device Services

This chapter explains how to prepare an InfoServer system for client access and how to make InfoServer virtual device services available to users on DIGITAL UNIX client systems. Topics include the following:

- Preparing an InfoServer system for client access
- Enabling your system as an InfoServer client for DMS
- Making InfoServer services available to users
- Displaying InfoServer services
- Temporarily disabling your system as an InfoServer client
- Deinstalling the InfoServer client

5.1 Preparing an InfoServer System for Client Access

To ensure that clients can access InfoServer systems after installing DIGITAL InfoServer Client for DIGITAL UNIX software, you must verify the following:

- The InfoServer work group matches the client group code.
- One or more services in the DIGITAL UNIX service class are available on the InfoServer system.

Section 5.1.1 and Section 5.1.2 discuss these requirements.

5.1.1 Verifying InfoServer Work Group and Client Group Code

Because both the InfoServer work group and the client group code are set to 0 by default, you normally need take no action. You can use the InfoServer command SHOW SERVER to show the InfoServer work group. If the work group is not 0, you can specify a matching client group code when you enable your system as an InfoServer client (see Example 5-5).

Alternatively, you can change the InfoServer work group to 0 using the InfoServer command SET WORK GROUP (see the *InfoServer System Operations Guide*).

5.1.2 Creating InfoServer Services for DIGITAL UNIX Clients

DIGITAL UNIX clients can access InfoServer device services in DIGITAL UNIX and (if you have configured CDFS into the kernel) ISO _9660 service classes. You must specify one of these service classes when you create names for services, and before you bind and mount the devices on DIGITAL UNIX clients, as described in Section 5.3.

To determine whether DIGITAL UNIX or ISO_9660 class services are available, log in to the InfoServer system and enter the following command: .

```
InfoServer> SHOW SERVICES

Service Name        Service Class       Disk:Partition
------------        -------------       --------------

PROGLIB             [V2.0]              DK3:[  2 connections]
CONDIST1            [ODS_2]             DK9:[ 12 connections]
```

In this example, the PROGLIB service in the V2.0 service class is available to DOS clients, and the CONDIST1 service in the ODS_2 service class is available to Alpha clients, but no DIGITAL UNIX or ISO 9660 services are available.

There are two methods used to create a service accessible by the DIGITAL Infoserver Client for DIGITAL UNIX:

- The first method to create a service is to simply insert a DIGITAL UNIX or ISO 9660 disk into one of the CD-ROM drives attached to the InfoServer. The InfoServer system software automatically determines the type of file system and creates a service using the label on disk. If the disk has no label, then the InfoServer creates a service using a combination of the InfoServer system name, the word UNIX, and the device name. For example, if the DIGITAL UNIX V4.0b documentation disk was inserted into device DK5:, the services would look like the following:

```
InfoServer> SHOW SERVICES

Service Name        Service Class       Disk:Partition
------------        -------------       --------------
INFOSERVER_UNIX_DK5 [UNIX]              DK5:
PROGLIB             [V2.0]              DK3:[  2 connections]
CONDIST1            [ODS_2]             DK9:[ 12 connections]
```

- The second method to create a service is to create the service manually using the InfoServer console command CREATE SERVICE. This command is necessary when creating services for hard drive partitions or to provide a more meaningful service name to the disk in the CD-ROM drive.

  When creating a service for a removable device such as a compact disk, make sure the disk is inserted in the drive before you enter the CREATE SERVICE command. For example, you can insert the DIGITAL UNIX Online Documentation Library Disk into drive DK5 and then enter commands like the following:

```
InfoServer> CREATE SERVICE UNIXBOOK FOR DK5 WRITERS 0 CLASS UNIX [1]
%ESS-I-CREATED, Create service UNIXBOOK [UNIX].
%ESS-I-CREATED, Create service completed successfully.
InfoServer> SHOW SERVICES

Service Name         Service Class       Disk:Partition
------------         -------------       --------------
UNIXBOOK             [UNIX]              DK5:
INFOSERVER_UNIX_DK5 [UNIX]               DK5:
PROGLIB              [V2.0]              DK3:[  2 connections]
CONDIST1             [ODS_2]             DK9:[ 12 connections]

InfoServer> SAVE
```

Be sure to enter the SAVE command if you want to maintain services across InfoServer reboots.

Note

The InfoServer system reads volume labels on ODS-2, ISO 9660, and High Sierra media and automatically serves the media using the volume label as the service name. However, because DIGITAL UNIX media do not have volume labels, client systems running InfoServer software through Version 2.0 do not serve these media automatically.

[1] If your version of the InfoServer hardware does not understand the parameter UNIX, then use the ULTRIX parameter instead. The ULTRIX parameter works for either ULTRIX or DIGITAL UNIX.

You can also create read/write services for your users . For example, to create a service named UNIX_RW for an RZ57 hard disk in drive DK11, you would enter commands like the following:

```
InfoServer> CREATE SERVICE UNIX_RW FOR DK11 CLASS UNIX
%ESS-I-CREATED, Create service completed successfully.
InfoServer> SAVE
```

Note that before users working on DIGITAL UNIX client systems can access an InfoServer read/write device, the device must be formatted using the DIGITAL UNIX `disklabel` and `newfs` utilities (see Section 5.3.2).

Refer to the *InfoServer System Operations Guide* for complete information on InfoServer commands. Refer to the DIGITAL UNIX documentation set for detailed information on formatting read/write devices.

5.2 Enabling Your System as an InfoServer Client for DMS

For local or RIS installations, your system is automatically enabled during the installation. For DMS client installations, the system is enabled automatically, but some manual setup is required to permit `bind` and `mount` operations.

A DIGITAL UNIX client requires two device special files for each InfoServer device service. One file is used for block access to a service (for instance, to a device for reading files and directories). The other file, which has an `r` prefix, is used for raw access (for instance, to mount a device for formatting with the `newfs` utility).

Using unit numbers 0 through 7, the DIGITAL InfoServer Client for DIGITAL UNIX installation procedure automatically creates eight pairs of these device special files, so that the client can bind to as many as eight InfoServer services for either block or raw access.

For example, the client would use the file `/dev/ladc/unit0c` for block access to the first service and `/dev/ladc/runit0c` for raw access. Similarly, the client would use `/dev/ladc/unit1c` for block access to the second service and `/dev/ladc/runit1c` for raw access.

The device special files are not created for DMS installations. The user must manually create the device special files using the `MAKELADCDEV` script shown in Example 5-1.

Example 5-1 Creating Device Special Files Manually

```
# mkdir /dev/ladc
# cd /dev/ladc
# /usr/opt/LADBASE100/MAKELPACDEV.sh unit0 0
```

The MAKELADCDEV script can determine the block major number and character major number automatically once the system has been enabled as an InfoServer Client. MAKELADCDEV uses the `sysconfig` program to do this as shown in Example 5-2.

Example 5-2 Using sysconfig to Find Major Numbers

```
# sysconfig -q ladc bmajor cmajor
bmajor = 52
cmajor = 64
```

5.3 Making InfoServer Services Available to Users

Once your system is enabled as an InfoServer Client, you can enter the `showladservice` command (see Section 6.2) to display available services. For example:

```
% showladservice

Interrogating network, please wait...
Services offered by node LIBRARY_ESS (LAD V3.0, Address: 08-00-2B-39-21-AB)

Service        Drive (Device)      Rating Users     Mode
-------        --------------      ------ -----     ----
UNIXBOOK       DK2   (RRD42)       65535           0        RO
CONDIST1       DK9   (RRD42)       64002           6        RO
UNIX_RW        DK11  (RZ57)        65007           1        RW
.
.
.
Services offered by node PROGRAMMER (LAD V3.0, Address: 08-00-2B-22-49-BB)

Service        Drive (Device)      Rating Users     Mode
-------        --------------      ------ -----     ----
FORTRAN_ENV    DK2   (RRD42)       65231           1        RO
COBOL_ENV      DK7   (RRD42)       65007           6        RO
```

You make services available to users by performing the following operations:

- Binding device units on your system to InfoServer services
- Mounting remote InfoServer devices on your system

Section 5.3.1 and Section 5.3.2, respectively, describe these operations. Section 5.3.3 explains how to configure your system to access ISO 9660 compact discs on InfoServer systems. Section 5.3.4 describes procedures for unmounting and unbinding devices.

5.3.1 Binding to InfoServer Services

To bind a device unit on your system to an InfoServer service, enter the `bindladcunit` command. For instance, to `bind /dev/ladc/unit0c` to the service UNIXBOOK, you would enter the command shown in Example 5-3. After binding is completed, you can mount a remote InfoServer device on your system (see Section 5.3.2) and treat the device as a local device.

Example 5-3 Binding to an InfoServer Service

```
# bindladcunit 0 -serviceName UNIXBOOK

Unit 0 Bound                        Service UNIXBOOK
/dev/ladc/unit0c                    Server  DOCSERVER

Drive Name          DK2             Service Rating              65007 ❶
Device Class        CD-ROM          Max Read Session            1000
Device Type         RRD42           Max Write Session           0
Device Format       UNIX            Current Read Session        0
Device Size         892500 ❷        Current write session       0

Partition           Sectors         Offset
        a           0               0
        b           0               0
        c           4007800 ❸
        d           0               0
        e           0               0
        f           0               0
        g           0               0
        h           0               0
```

❶ See Table 6-12 for a description of the display fields.

❷ Must be a nonzero value. If the value is 0, check the following:

- You created a service (see Section 5.1.2) for a drive holding a removable device such as a compact disc, and the drive is now empty.
- You created a service for an empty drive.

In both cases, you must unbind the device unit using the `unbindladcunit` command and then bind it again, after you insert the device in the InfoServer drive.

❸ Partition `c` means the entire device.

The `bindladcunit` command invokes the LASTport/Disk client driver with the target device service information and solicits the service. When the first solicit response returns, the client driver binds the responding service to the client unit number you have specified. You can then enter the `showladcbind` command (see Section 6.2) to validate the binding information.

5.3.2 Mounting InfoServer Devices on a DIGITAL UNIX Client

Mounting InfoServer devices on your client system is equivalent to mounting local devices. However, if a remote device is a new read/write device, you must use the DIGITAL UNIX `disklabel` and `newfs` utilities to initialize the file system before mounting the device.

The `disklabel` utility writes a DIGITAL UNIX disk label onto the disk. For example, to label a disk bound to unit 1, enter a command in the following format:

```
# disklabel -wr /dev/ladc/runit1c LAD
```

The `newfs` utility formats a disk partition so that it can be mounted by DIGITAL UNIX. For example, to format a disk bound to unit 1, enter commands in the following format:

```
# newfs /dev/ladc/runit1c
```

To mount a read/write device, you enter a command in the following format:

```
# mount /dev/ladc/unit1c /yourdirectory1
```

To mount a read-only device, you enter a command in the following format: :

```
# mount -r /dev/ladc/unit0c /yourdirectory0
```

Caution

Be sure to specify the `-r` parameter when you mount a read-only device. Otherwise, users will be unable to access it.

Note that you must always mount to partition c of the block (not the raw) device special file; for instance, `/dev/ladc/unit0c, /dev/ladc/unit1c` and so forth.

The `mount` command causes the LASTport/Disk client driver to send a Connect Request message over the network. When a positive Connect Response message returns, users can enter requests for services.

Example 5-4 shows how you would mount `UNIXBOOK`, the DIGITAL UNIX Online Documentation Library Disc you inserted in InfoServer drive DK2. Once the disc is mounted on your system, users can access the online documents by selecting Bookreader from the Session Manager Applications menu or by entering the command `dxbook`.

Example 5-4 Mounting the DIGITAL UNIX Online Documentation Library Disc

```
# mount -r /dev/ladc/unit0c /usr/lib/dxbook❶
# ls /usr/lib/dxbook❷
aa-books-te.decw_book                    aa-ne23a-tk.decw_book
aa-hl84c-te.decw_book                    aa-ng85a-te.decw_book
  .
  .
  .
cdaconverter.decw_bookshelf              decwrite.decw_bookshelf
library.decw_bookshelf                   rsm.decw_bookshelf
  .
  .
  .
# df -k ❸
Filesystem            Total     kbytes     kbytes       %
node                  kbytes    used       free         used   Mounted on
/dev/rz0a              15551     11593       2403        83%    /
/dev/rz0g             271847    214429      30234        88%    /usr
/dev/ladc/unit0c      186957     33324     134938        20%    /usr/lib/dxbook
```

❶ Mount the file system read only because the device is a compact disc.

❷ List the files. Note that `/usr/lib/dxbook` contains online documentation library files for various products.

❸ List the mounted file systems. (`-k` means show file sizes in kilobytes.)

5.3.3 Configuring Your System to Access ISO 9660 Compact Discs

To make an ISO 9660 compact disc available to users on your system, follow these steps:

1. Insert the compact disc in an InfoServer drive. The InfoServer system reads the disc's volume label and automatically creates a service in the ISO 9660 service class using the volume label as the service name. You can enter the InfoServer command SHOW SERVICES to verify the service name.
2. Bind to the service using the `bindladcunit` command. For example:

   ```
   # bindladcunit 3 -serviceClass iso_9660 -serviceName DEC_EXPLORER
   ```

3. Create a directory (for example, `/explorer`) to be the mount point for the compact disc.

4. To mount the disc, enter a command in the following format:

```
# mount -t cdfs -o noversion -r /dev/ladc/unit3c /explorer
```

Once the compact disc is mounted, users can access it as they would a locally attached device. For example, to list the device contents, users would enter the following command:

```
# ls /explorer
```

5.3.4 Unmounting File Systems and Unbinding Device Units

Before unbinding a device unit from an InfoServer service, you must unmount the associated file system using the `umount` command. You can then unbind the device unit from the service using the `unbindladcunit` command.

For example, to unmount the file system and unbind the device unit bound to the service UNIXBOOK, you would enter the following commands:

```
# umount /usr/lib/dxbook
# unbindladcunit 0
```

The `umount` command causes the LASTport/Disk client driver to send a Disconnect Request message to the target server and break the association. The `unbindladcunit` command breaks the binding between device unit `0` and `UNIXBOOK`. This command also causes the LASTport/Disk client driver to deallocate all service-related information. After you unbind a device unit from an InfoServer service, you can use the `bindladcunit` command to bind that unit to another service.

Note

If an InfoServer device is disabled for any reason (for example, a drive fails or is disconnected, a device is removed, or the InfoServer system is rebooted), you must unmount the associated file system and unbind the service. You can later rebind to the service and remount the file system.

5.3.5 Manually Enabling and Disabling the DIGITAL InfoServer Client for DIGITAL UNIX

The DIGITAL InfoServer Client for DIGITAL UNIX installation procedure automatically enables the system as an InfoServer Client regardless of the installation method (RIS, DMS, or local installation). For normal system operation, you should not enable or disable the InfoServer Client. However, there are times where you might want to perform these functions manually. One reason for performing these operations is to solicit on a different Ethernet adapter than that selected during the installation.

To enable the system as an InfoServer Client:

1. Invoke the `sysconfig` utility to link the device driver into the running UNIX kernel.
2. Invoke the `loadlast` utility (see Section 6.1) to enable and configure the LASTport transport, specifying your client system and its Ethernet device. Typically this device is `ln0` or `tu0` for Alpha systems.
3. Invoke the `startlast` utility (see Section 6.1) to connect the LASTport transport to your system's Ethernet device. This utility also enables the client group code.
4. Invoke the loadladc utility (see Section 6.2) to enable LASTport/Disk services on your client system.

Example 5-5 shows the operations for Alpha system mynode.

Example 5-5 Manually Enabling the InfoServer Client

```
# sysconfig -c ladc❶
# loadlast mynode ln0❷

---------- LASTport Driver Loaded ----------
Node Name                   mynode
Node Id                     08-00-2b-10-5c-39
Ethernet device             ln0
# startlast ln0 ❸

---------- LASTport Protocol Started ----------
Ethernet device             ln0
Multicast for ln0           09-00-2b-04-00-00
Group code                  0 ❹
# loadladc ❺
LASTport/Disk Driver Loaded.
```

❶ Invoke the `sysconfig` utility to link the device driver into the running UNIX kernel.

❷ Load the LASTport driver on node `mynode` and specify `ln0` as the Ethernet device.

❸ Start the LASTport protocol on device `ln0`.

❹ The client group code is set to 0 by default. If the work group on the InfoServer system you want to access is not 0, you can specify a matching client group code when you enter the `startlast` command. For example, if the InfoServer work group is 12, you would enter the following command:

```
# startlast ln0 -g 12
```

❺ Load the LASTport/Disk driver.[2]

Your system is normally enabled as an InfoServer Client across reboots by the `/sbin/init.d/ladc` script. If you want to disable this feature, you must rename this script as described in Section 5.4.

Your system is normally enabled as an InfoServer Client across reboots by the `/sbin/init.d/ladc` script. If you want to disable this feature, you must rename this script as described in Section 5.4.

[2] Link the LASTport/Disk driver into the running DIGITAL UNIX kernel.

To disable the InfoServer Client:

1. Invoke the stoplast utility (see Section 6.1) to remove LASTport from the active transport protocol list.
2. Invoke the unloadlast utility (see Section 6.1) to remove the association between the LASTport driver and the operating system.
3. Invoke the sysconfig utility to remove the device driver from the running UNIX kernel.

Example 5-6 shows the operations for Alpha system mynode.

Example 5-6 Manually Disabling the InfoServer Client

```
# stoplast ln0 ❶
# unloadlast ❷
# startlast ln0 ❸
```

❶ Remove the LASTport protocol from the transport list.

❷ Unload the LASTport driver.

❸ Remove the device driver from the running UNIX kernel.

5.4 Temporarily Disabling Your System as an InfoServer Client

In certain circumstances, you might want to temporarily disable your system as an InfoServer client. For example, you might want to reclaim system resources temporarily for other applications, or you might want to configure your system for standalone operations.

To temporarily disable your system as an InfoServer client, follow these steps:

1. `# cd /sbin/init.d`
2. `# mv ladc ladc.bak`
3. `# reboot`

To re-enable your system as an InfoServer client, rename `ladc.bak` to `ladc` and then reboot.

1. `# cd /sbin/init.d`
2. `# mv ladc.bak ladc`
3. `# reboot`

5.5 Deinstalling DIGITAL InfoServer Client for DIGITAL UNIX Software

To deinstall the DIGITAL InfoServer Client for DIGITAL UNIX software, you perform the following operations:

```
# setld -d LPABASE100 LPAMAN100
```

This command removes all DIGITAL InfoServer Client for DIGITAL UNIX files and directories.

Notes

- Make sure that all file systems being served by the InfoServer are unmounted and all logical units are unbound, before deinstalling the DIGITAL InfoServer Client for DIGITAL UNIX.
- You cannot delete subsets from a diskless environment. To remove DIGITAL InfoServer Client for DIGITAL UNIX software from a diskless environment, delete the environment.

6
DIGITAL InfoServer Client for DIGITAL UNIX Utilities

This chapter describes the utilities you use to configure DIGITAL InfoServer Client for DIGITAL UNIX software on your system and to manage product functions.

- Use the LASTport utilities to configure the LASTport transport protocol on your system and to monitor protocol activity.
- Use the LASTport/Disk Client utilities to load the LASTport/Disk driver, to bind to and unbind InfoServer services, and to display service and binding information.

Section 6.1 describes LASTport utilities; Section 6.2 describes LASTport/Disk Client utilities.

6.1 LASTport Utilities

Table 6-1 summarizes LASTport utility functions.

Table 6-1 LASTport Utility Functions

Utility	Function
loadlast	Loads the LASTport transport.
showlastcounters	Shows the LASTport transport counters.
showlaststatus	Shows the LASTport transport status, including transport state, versions, number of clients, and number of servers.
startlast	Starts the LASTport protocol.
stoplast	Stops the LASTport protocol.
unloadlast	Unloads the LASTport transport

loadlast

Loads the LASTport transport.

Access

Superuser required.

Format

```
loadlast  <nodename> <nodedev> [-checksum [y][n]]
```

Description

The `loadlast` command does the following:

- Invokes the specified data link driver to obtain the default data link address for use as the `node id`
- Invokes the LASTport transport with the `node id` to establish the connection between the portable module and the Operating System module.

Table 6-2 describes `loadlast` parameters; Table 6-3 describes loadlast advance parameters.

Table 6-2 loadlast Parameters

Parameter	Data Type	Default	Description
<nodename>	String	Required	Specifies a node name (16 characters maximum).
<nodedev>	String	Required	Specifies which Ethernet device receives the node id.
-checksum	Enumerated type	n	y enables message checksumming on all messages sent and received by the LASTport transport. n disables checksum.

Table 6-3 loadlast Advance Parameters

Parameter	Data Type	Default	Description
-startInterval	Integer	2	Number of seconds between circuit Start message transmissions
-startLimit	Integer	3	Maximum number of circuit Start message transmissions
-progressInter	Integer	600	Number of seconds in circuit keep-alive interval
-checkInterval	Integer	60	Number of seconds between circuit check Solicit message transmissions
-checkLimit	Integer	1	Maximum number of circuit check Solicit message transmissions

Example

```
# loadlast mynode ln0
```

This command loads the LASTport transport on node `mynode` and uses the default address of the data link device `ln0` as the `node id`.

showlastcounters

Shows the LASTport transport counters.

Access

Superuser required when `-c` is requested.

Format

```
showlastcounters  [-port] [-circuit] [-assoc] [-c]
```

Description

By default, only port counters are displayed. Table 6-4 describes `showlastcounters` parameters.

Table 6-4 showlastcounters Parameters

Parameter	Description
-port	All active device counters
-circuit	Circuit counters
-assoc	Association Counters
-c	Clear the counters shown (Superuser required)

Example

```
# showlastcounters -circuit -c
Circuit                 Receive      Send         Parse Failure
Run                     216          102          0
Start                   0            1            0
Stack                   1            0            0
Stop                    0            0            0
Adv                     72           3            0
Solicit                 29           229          0
SolRsp                  44           0            0
C-Adv                   619
C-Sol                   0
C-SolRsp                219
```

This command shows and clears the circuit counters.

showlaststatus

Shows the LASTport transport status, including transport state, versions, number of clients, and number of servers.

Access

Superuser not required.

Format

```
showlaststatus
```

Description

This command displays LASTport status information.

Table 6-5 describes the display fields.

Example

```
% showlaststatus
LAST is loaded
Kit build date:                 Jan 16 1997 10:00
OS Version                      3.2
Portable Version                1.0
Interface Version               1.0
Protocol Version                3.1
Circuit Count                     1
Client Count                      1
Server Count                      0
NDB Count                         1
Client Association Count          1
Server Association Count          0
Pending Transaction Count         0
Acting Transaction Count          0
```

Table 6-5 showlastatus Display Fields

Field	Description
Kit Build Date	Date the kit was created
OS Version	DIGITAL UNIX operating system version
Portable Version	Portable LASTport driver version
Interface Version	Portable LASTport interface version
Protocol Version	LASTport protocol version
Circuit Count	Number of active LASTport circuits
Client Count	Number of client drivers using the LASTport driver
Server Count	Number of server drivers using the LASTport driver
NDB Count	Number of nodes in the LASTport
Client Association Count	Number of active LASTport client associations
Server Association Count	Number of active LASTport server associations
Pending Transaction Count	Number of transactions awaiting service
Acting Transaction Count	Number of transactions being serviced

startlast

Enables data link driver support for the LASTport protocol.

Access

Superuser required.

Format

```
startlast  <devicename> [-g groupCode]
           [-initMsgRate <messages per second>]
           [-msgRateInc <message rate increment>]
           [-maxMsgRate <maximum message rate>]
           [-msgRateDecNum <Numerator>]
           [-msgRateDecDeno <denominator>]
           [-advDelay <Seconds>]
           [-advBurstInterval <Seconds>]
           [-advBurstLimit <number>]
           [-advMsgInterval <Seconds>]
           [-advMsgLimit <Seconds>]
```

Description

The `loadlast` command must be executed before the `startlast` command. The `startlast` command does the following:

- Invokes the data link driver to include the LASTport protocol.
- Converts the group code to a multicast address.
- Invokes the LASTport driver to enable the multicast address.
- Invokes the LASTport driver to provide the LASTport portable module with the Operating System data link port handle and configuration parameters.

After these operations have completed successfully, the LASTport transport is ready to accept a new agent.

Table 6-6 describes `startlast` parameters; Table 6-7 describes `startlast` advance parameters.

Table 6-6 startlast Parameters

Parameter	Data Type	Default	Description
<devname>	String	Required	Specifies the name of the Ethernet device.
-g	Integer	0	Specifies the group code (0 to 1023 inclusive) for the Ethernet device.

Table 6-7 startlast Advance Parameters

Parameter	Data Type	Default	Description
-initMsgRate	Integer	350	Nominal receive message rate (messages per second).
-msgRateInc	Integer	10	Message rate increment when there is no congestion.
-maxMsgRate	Integer	1050	Maximum message rate at which congestion control is disabled.
-msgRateDecNum	Integer	1	Numerator.
-msgRateDecDeno	Integer	2	Denominator. Constant at which message rate should be decreased during congestion. For example: newRate = oldRate * numerator / denominator.
-advDelay	Integer	1	Seconds before first port advertise burst should start.
-advBurstInterval	Integer	0	Seconds between port advertise bursts.
-advBurstLimit	Integer	1	Number of advertise bursts.
-advMsgInterval	Integer	1	Seconds between individual messages of each advertise burst.
-advMsgLimit	Integer	3	Number of individual messages in each advertise burst.

Example

```
# startlast ln0 -g 12
```

This command enables device `ln0` to support the LASTport transport and includes the transport in group 12.

stoplast

Removes the LASTport transport from the active transport protocol list for the specified data link device.

Access

Superuser required.

Format

```
stoplast  <devname>
```

Description

Table 6-8 describes the `stoplast` parameter.

Table 6-8 stoplast Parameter

Parameter	Data Type	Default	Description
<devname>	String	Required	Specifies the name of the Ethernet device.

Example

```
# stoplast ln0
```

This command stops the LASTport transport on device `ln0`.

Note

Make sure that all file systems being served by the InfoServer are unmounted and all logical units unbound, before issuing the `stoplast` command.

unloadlast

Unloads the LASTport transport.

Access

Superuser required.

Format

```
unloadlast
```

Description

You must enter the `stoplast` command before entering the `unloadlast` command.

Example

```
# stoplast ln0
# unloadlast
```

These commands stop and unload the LASTport transport.

6.2 LASTport/Disk Client Utilities

Use the LASTport/Disk Client utilities to configure the LASTport/Disk protocol on DIGITAL UNIX client systems and to perform the following operations:

- Establish bindings to InfoServer device services. Bindings create new virtual device units on the local DIGITAL UNIX system. These device units are also referred to as virtual device units. They represent the local DIGITAL UNIX context for devices that reside on a remote InfoServer system.
- Show services offered by InfoServer systems.
- Remove bindings to InfoServer device services.
- Show client unit binding information.

You can control service access by using a service access password. You can also write-protect InfoServer device services. In this case, local users of the device unit receive an error if they attempt a write operation to the unit.

The LASTport/Disk protocol allows users to access devices on an InfoServer system as though the devices are locally connected to your DIGITAL UNIX system. Because several DIGITAL UNIX clients can share the same devices, there is no need for duplicate drives and media.

Table 6-9 summarizes LASTport/Disk Client utility functions.

Table 6-9 LASTport/Disk Client Utility Functions

Utility	Function
bindladcunit	Binds a virtual device unit to a service.
loadladc	Loads the LASTport/Disk client driver.
showladcbind	Shows current LASTport/Disk binding information.
showladservice	Shows services offered by InfoServer systems on the LAN.
unbindladcunit	Unbinds a virtual device unit from a service and deallocates all the associated memory.

bindladcunit

Binds a virtual device unit to a service.

Access

Superuser required.

Format

```
bindladcunit <unitnumber> [-serviceName <servicename>]
                          [-serverAddr <server physical address>]
                          [-nodeName <server unique name>]
                          [-devName <device name>]
                          [-serviceClass [unix][iso_9660]]
                          [-passwd <password>]
                          [-version [2][3]]
                          [-diskSize <disk size>]
                          [-diskType <type of disk>]
                          [-blockSize <disk block size>]
                          [-resizeEnabled [yes][no]]
```

Description

The `bindladcunit` command binds a virtual device unit to a service and does the following:

- Builds a solicit request descriptor that contains information such as the target service name and device type.
- Invokes the LASTport/Disk client driver to solicit the target service.
- Invokes the LASTport/Disk client driver to receive the solicit response information.
- Binds the first solicit response to the specified device unit number.
- Invokes the LASTport/Disk client driver to flush the solicit information.
- Determines the disk default partition from the solicit response information.
- Calls the LASTport/Disk client driver to set the default partition.

Table 6-10 describes `bindladcunit` parameters.

Table 6-10 blindladcunit Parameters

Parameter	Data Type	Default	Description
<unitnumber>	Integer	Required	Device unit number.
-serviceName	String	Null	Target device service name.
-serverAddr	6-byte	Multicast	Target server data link address. If the data link address is not supplied, the multicast address is used.
-nodeName	String	Null	Target server node name.
-devName	String	Null	Target server device name, for example, RZ56.
-serviceClass	Enumerated type	`unix`	`unix` specifies DIGITAL UNIX UFS on-disk format. iso_9660 specifies `ISO 9660` on-disk format.
-passwd	String	Null	Password for the connect.
-version	Integer	3	LASTport/Disk version (2 or 3).
-diskSize	Integer		Disk size (in blocks); required when version 2 is specified.
-blockSize	Integer	512	Disk block size.
-diskType	String		Type of disk; for example, RZ56.
-resizeEnabled	Boolean	Yes	Enables or disables the auto-resize algorithm used when formatting UNIX partitions in a partition on the InfoServer hard drive. If this switch is set to "no," the `newfs` command may display warning messages indicating that some sectors are unused. "Yes" enables and "no" disables the resize algorithm.

Example

```
# bindladcunit 0 -serviceClass iso_9660 -serviceName DEC_EXPLORER
```

This command binds device unit 0 to the service DEC_EXPLORER in the iso_9660 service class. Note that you must specify the `-serviceClass iso_9660` parameter when binding to services in the iso_9660 service class.

loadladc

Loads the LASTport/Disk client driver.

Access

Superuser required.

Format

```
loadladc
```

Description

You must enter the `loadlast` and `startlast` commands before entering the `loadladc` command.

Example

```
# loadladc
LASTport/Disk Driver loaded successfully.
```

This command loads the LASTport/Disk client driver.

showladcbind

Shows the current LASTport/Disk binding information.

Access

Superuser not required.

Format

```
showladcbind  <unitnumber>
showladcbind  -a
```

Description

Table 6-11 describes `showladcbind` parameters.

Table 6-11 showladcbind Parameters

Parameter	Data Type	Default	Description
<unitnumber>	Integer	Required	Specifies a client device unit number.
-a	Character	Required	Specifies that all device unit binding information be displayed.

Example

```
% showladcbind -a

Unit 0 Connected          Service UNIXBOOK
/dev/ladc/unit0c          Server  DOCSERVER

Drive Name          DK2          Service Rating          65007
Device Class        CD-ROM       Max Read Session        1000
Device Type         RRD42        Max Write Session       0
Device Format       UNIX         Current Read Session    22
Device Size         892500       Current Write Session   0
```

```
Unit 1 Loaded                Service UNIX_RW
/dev/ladc/unit1c             Server  DOCSERVER

Drive Name          DK11          Service Rating          65418
Device Class        Fixed Disk    Max Read Session        1000
Device Type         RZ57          Max Write Session       1
Device Format       UNIX          Current Read Session    0
Device Size         1989250       Current Write Session   0
```

This command shows all device unit binding information. Note that the system shows a unit as Connected if the file system is mounted. Otherwise the unit is shown as Loaded.

The state of the logical unit is displayed just after the unit number in the `showladcbind` output. Each unit may be in any one of five stable states (described in Table 6-12) or in one of two transitive states (described in Table 6-13).

Table 6-12 Stable States of a Logical Unit

State	Description
Unbound	Unit has not been bound to an InfoServer service.
Loaded	Unit has been bound to an InfoServer service.
Connected	Unit is bound to an InfoServer service and mounted as part of the DIGITAL UNIX file system.
Aborted	An unrecoverable I/O error occurred while the unit was in the connected state. The unit is still mounted as part of the DIGITAL UNIX file system.
Discarded	A unit in the aborted state was unmounted from the DIGITAL UNIX file system and is ready to be unbound or mounted once the original problem has been cleared.

Table 6-13 describes the transitive states of a logical unit.

Table 6-13 Transitive States of a Logical Unit

State	Description
Connecting	The DIGITAL UNIX `mount` command was issued, and the unit is in transition between the loaded or discarded states and the connected state.
Disconnecting	The DIGITAL UNIX `umount` command was issued, and the unit is in transition between the connected and loaded states after unmounting the unit.

The state transition diagram (Figure 6-1) shows the various states of a unit and those actions that cause a state transition. During normal operation, the unit begins in the unbound state and is placed in the loaded state once the `bindladcunit` command is issued.

Description of Normal Operations

The unit then moves through the connecting (transitive) state to the connected state after successful completion of a mount request. The unit stays in the connected state as long as I/O requests are completing successfully and the unit is mounted. When the unit is unmounted, it moves from the connected state through the disconnecting (transitive) state, back to the loaded state. At this point, the unit can be either remounted or unbound. If the unit is unbound, it moves from the loaded state to the unbound state from where it started. The `showladcbind` command reports information on those units that are in at least the loaded state and, for this reason, will never report a unit in the unbound state.

Recovering from the Aborted State

If there is a problem a device on the InfoServer becomes unavailable while the unit is in the connected state, the DIGITAL InfoServer Client for DIGITAL UNIX will transition the device into the aborted state. For example, a device becomes unavailable if the disc is ejected from the CD-ROM drive on the InfoServer or if the physical device actually fails. The unit will report "Connection timed out" when input/output activity is requested by the client. To recover from this type of problem, the system manager can follow either one of the strategies:

A. Unmount the file system and unbind the logical unit. Bind the logical unit to the chosen service and mount the file system.

B. Make sure the disc containing the correct service is placed in the exact drive in the InfoServer from which it was previously bound. Unmount the file system to transition the logical unit from the "Aborted" state to the "Discarded" state. Then remount the file system to cause transition to the "Connected" state.

Users should now be able to access the service. The "Discarded" state simply means that the logical unit was previously in the "Aborted" state.

Figure 6-1 Bind State Diagram

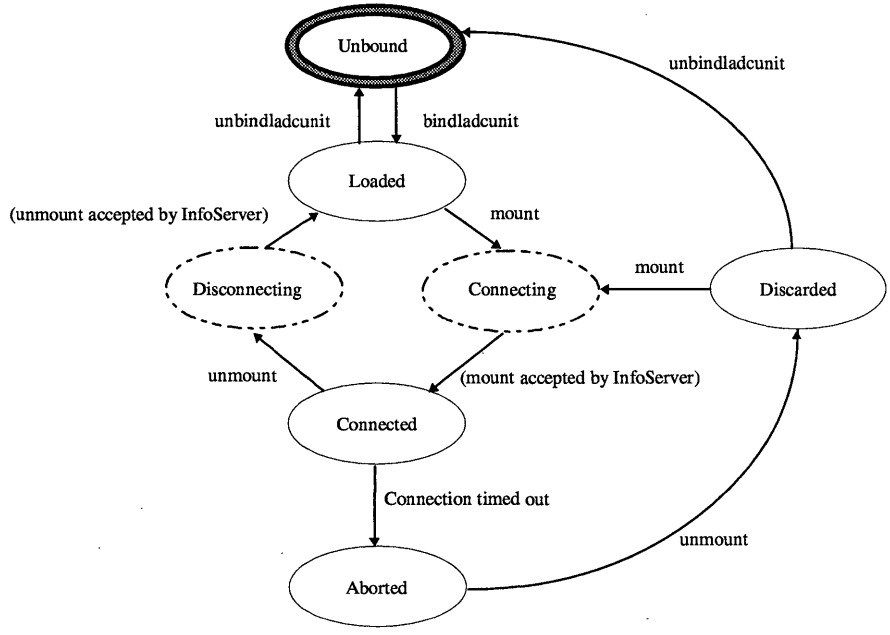


Table 6-14 describes the `showladbind` display fields.

Table 6-14 showladbind Display Fields

Field	Description
Drive Name	The name of the InfoServer device for which the service is being offered.
Device Class	The class of device (fixed disk, CD-ROM, and so forth) attached to the unit.
Device Type	An ASCII string (such as RRD42) that the device returns to identify itself.
Device Format	The on-disk structure of the device.

Field	Description
Device Size	The total number of blocks on the attached device.
Service Rating	The service rating value (from 0 to 65535) currently assigned to the service. A higher value means better service.
Max Read Session	The maximum number of concurrent read sessions allowed for the specified service.
Max Write Session	The maximum number of concurrent write sessions allowed for the specified service.
Current Read Session	The current number of read sessions connected to the specified service.
Current Write Session	The current number of write sessions connected to the specified service.

showladservice

Shows services offered by InfoServer systems on the LAN.

Access

Superuser not required.

Format

```
showladservice  [-maxSkipCount <integer number>]
                [-serviceName <servicename>]
                [-serverAddr <server physical address>]
                [-nodeName <server unique name>]
                [-devName <device name>]
                [-serviceClass [unix][iso_9660][dos][ods_2]]
                [-version [2][3]]
```

Description

This command does the following:

- Builds a Solicit Request message that contains information such as the target service name and device type.
- Invokes the LASTport/Disk client driver to solicit a service.
- Invokes the LASTport/Disk client driver to receive the solicit information.
- Displays the solicit response.
- Invokes the LASTport/Disk client driver to flush the solicit information.

If you do not specify the `-serviceClass` parameter, the `showladservice` command displays `unix` services by default.

Table 6-15 describes the `showladservice` parameters.

Table 6-15 showladservice Parameters

Parameter	Data Type	Default	Description
-maxSkipCount	Integer	999	Maximum instance count for the service.
-serviceName	String	Null	Target device service name.
-serverAddr	6-byte	Multicast	Multicast Target server data link address. If not supplied, the multicast address is used.
-nodeName	String	Null	Target server node name.
-devName	String	Null	Target server device name, for example, RZ56.
-serviceClass	Enumerated type	`unix`	`unix` specifies DIGITAL UNIX UFS on-disk format. `iso_9660` specifies ISO 9660 on-disk format. `ods_2` specifies VMS ODS-2 on-disk format. `dos` specifies MS-DOS on-disk format.
-version	Integer	3	LASTport/Disk version.

Example

This command displays all ISO 9660 services offered by InfoServer systems on the LAN.

```
$ showladservice -serviceClass iso_9660
Interrogating network, please wait...
Services offered by node LIBRARY_ESS (LAD V3.0, Address: 08 00-2B-39-21-AB)

Service              Drive (Device)      Rating       Users        Mode
-------              --------------      ------       -----        ----
DEC_EXPLORER         DK2    (RRD42)      64760          4           RO
TRADEMARKS           DK8    (RRD42)      65007          1           RO

Services offered by node PROGRAMMER (LAD V3.0, Address: 08-00-2B-22-49-BB)

Service              Drive (Device)      Rating       Users        Mode
-------              --------------      ------       -----        ----
WINDOW_WIDGETS       DK2    (RRD42)      65007          7           RO
```

unbindladcunit

Unbinds a virtual device unit from a service and deallocates all the associated memory.

Access

Superuser required.

Format

```
unbindladcunit  <unitnumber>
```

Description

Table 6-16 describes the `unbindladcunit` parameter.

Table 6-16 unbindladcunit Parameter

Parameter	Data Type	Default	Description
<unitnumber>	Integer	Required	Specifies a client device unit number.

Example

```
# unbindladcunit 0
```

This command removes the service information associated with the client device unit 0.

A
Files Installed on Your System

Table A-1 describes the symbolic links installed in various DIGITAL UNIX directories. The actual files are in the `/usr/opt/LPABASE100` (binaries and scripts) and `/usr/opt/LPAMAN100` (manpages) directories.

Table A-1 Installed DIGITAL InfoServer Client for DIGITAL UNIX Files

Directory	File	Description
/dev	MAKELADCDEV	shell script
/mdec	LADboot	boot block
/mdec	lootLAD	boot block
.mdec	bootunit	boot block
.mdec	unitboot	boot block
/sbin/init.d	ladc	startup script
/sbin/rc3.d	s20ladc	startup script
/subsys	ladc.mod	object file
/usr/sbin	bindladcunit	binladcunit utility
/usr/sbin	loadladc	loadladc utility
/usr/sbin	loadlast	loadlast utility
/usr/sbin	showladcbind	showladcbind utility
/usr/sbin	showladservice	showladservice utility
/usr/sbin	showlastcounters	showlastcounter utility
/usr/sbin	showlaststatus	showlaststatus utility
/usr/sbin	startlast	startlast utility
/usr/sbin	stoplast	stoplast utility
/usr/sbin	unbindladc	unbindladc utility
/usr/sbin	unloadlast	unloadlast utility

Table A-1 Installed DIGITAL InfoServer Client for DIGITAL UNIX Files (Cont.)

Directory	File	Description
/usr/share/man/man8	bindladcunit.8	bindladcunit manpage
/usr/share/man/man8	loadlast.8	loadlast manpage
/usr/share/man/man8	showladcbind.8	showladcbind manpage
/usr/share/man/man8	showladservice.8	showladservice manpage
/usr/share/man/man8	showlastcounters	showlastcounters manpage
/usr/share/man/man8	showlaststatus.8	showlaststatus manpage
/usr/share/man/man8	startlast.8	startlast manpage
/usr/share/man/man8	stoplast.8	stoplast manpage
/usr/share/man/man8	unbindladc.8	unbindladc manpage

B
Sample Installation Dialog

B.1 Sample Installation on DIGITAL UNIX Version 3.2

```
# setld -l /mnt/LPA100

Please make sure your installation tape is mounted and on-line.
Are you ready (y/n)? y
Positioning tape

*****
***** InfoServer Client for DIGITAL UNIX Drivers Subset Control Program
***** Subset:        LPABASE100
***** Phase:         SUBSET AVAILABILITY CHECK
***** Action:        CHECK MACHINE TYPE
***** Directory:     /
*****

*****
***** InfoServer Client for DIGITAL UNIX Manuals Subset Control Program
***** Subset:        LPAMAN100
***** Phase:         SUBSET AVAILABILITY CHECK
***** Action:        CHECK MACHINE TYPE
***** Directory:     /
*****
```

```
The subsets listed below are optional:

        There may be more optional subsets than can be presented on a
        single screen. If this is the case, you can choose subsets screen
        by screen or all at once on the last screen. All of the choices you
        make will be collected for your confirmation before any subsets are
        installed.

        1) InfoServer Client Drivers
        2) InfoServer Client Manuals

Or you may choose one of the following options:

        3) ALL of the above
        4) CANCEL selections and redisplay menus
        5) EXIT without installing any subsets

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6): 3

You are installing the following optional subsets:

        InfoServer Client Drivers
        InfoServer Client Manuals

Is this correct? (y/n): y

Checking file system space required to install selected subsets:

File system space checked OK.

2 subset(s) will be installed.

Loading 1 of 2 subset(s)...

*****
***** InfoServer Client for DIGITAL UNIX Drivers Subset Control Program
***** Subset:        LPABASE100
***** Phase:         PRE-LOAD
***** Action:        VERIFY PREREQUESITES
***** Directory:     /
*****
```

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```
InfoServer Client Drivers
   Copying from mnt/LPA100 (disk)
   Verifying

Loading 2 of 2 subset(s)...

*****
***** InfoServer Client for DIGITAL UNIX Manuals Subset Control Program
***** Subset:        LPAMAN100
***** Phase:         PRE-LOAD
***** Action:        VERIFYING PREREQUISITES
***** Directory:     /
*****

InfoServer Client Manuals
   Copying from mnt/LPA100 (disk)
   Verifying

2 of 2 subset(s) installed successfully.

*****
***** InfoServer Client for DIGITAL UNIX Drivers Subset Control Program
***** Subset:        LPABASE100
***** Phase:         POST-LOAD
***** Action:        CONFIGURE
***** Directory:     /
*****
```

```
Enable the driver now (y/n) [y]: y

---------- LASTport Driver Loaded ----------
Node Name             picard
Node Id               08-00-2b-bd-1e-b7
Ethernet Device       ln0
---------- LASTport Protocol Started ----------
Ethernet Device       ln0
Multicast for ln0     09-00-2b-04-00-00
Group Code            0
LASTport/Disk Driver Loaded

Create device special files (y/n) [y]: y

Append major numbers to ./etc/sysconfigtab (y/n) [y]: y
The LAD block device major number is: 52
The LAD character device major number is: 76
Saving these major numbers in ./etc/sysconfigtab
Original file is saved as ./etc/sysconfigtab.sav1

*****
***** InfoServer Client for DIGITAL UNIX Drivers Subset Control Program
***** Subset:        LPABASE100
***** Phase:         POST-LOAD
***** Action:
***** Directory:     /
*****

Configuring "InfoServer Client Drivers" (LPABASE100)

Configuring "InfoServer Client Manuals" (LPAMAN100)
```

Installation is completed.

To run the IVP after an installation, enter a command in the following format:

```
# setld -v subsetname
```

For Alpha systems, use LPABASE100 as the subsetname.

The following is an example of the DIGITAL InfoServer Client forDIGITAL UNIX Installation Verification Procedure:

```
# setld -v LPABASE100

InfoServer Client Drivers  (LPABASE100)

****
**** InfoServer Client for DIGITAL UNIX Driver Subset control program
**** Subset:  LPABASE100
**** Phase:   Verify
**** Action:  Verify
**** Directory:  /

Beginning the Installation Verification Procedure

0 verification errors encountered.
0 corrections performed.

End of the Installation Verification Procedure
```

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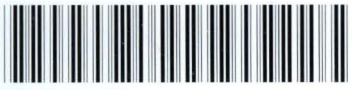

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