

Enhanced Printer Drivers for UNIX[®] Systems



Installation and User's Guide

For use with:

**Compaq Tru64 UNIX and
Digital UNIX Systems**

HP-UX Systems

IBM AIX/6000 Systems

NCR MP-RAS Systems

**Caldera eDesktop, RedHat
Linux, SuSE Linux, and
TurboLinux**

SCO OpenServer Systems

SCO UnixWare Systems

SGI IRIX Systems

Sun Solaris Systems

Sun Solaris X86 Systems

Edition: December 2001

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Preface

This book is written for UNIX system administrators. To complete these tasks successfully, you should have a working knowledge of your network hardware and software, as well as your UNIX system.

This book tells you how to install, set up, and troubleshoot the Enhanced Printer Drivers package. It contains:

- Introductory information including versions of UNIX operating systems and types of network print servers supported by Enhanced Printer Drivers
- An overview of some of the features in Enhanced Printer Drivers
- Step-by-step instructions for installing Enhanced Printer Drivers
- Step-by-step configuration instructions
- A Troubleshooting section that includes solutions to common problems and explanations of error messages

Terms used in this book

In this book, the term:

- *Internal print server* refers to the card installed inside the printer that attaches the printer to the network.
- *External print server* refers to a hardware device external to the printer that attaches the printer to the network.
- *Enhanced Printer Drivers* refers to a set of utilities that runs on a UNIX workstation to create, modify, and remove print queues.

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For more information

For more information on Enhanced Printer Drivers, consult the Readme.txt file located in:

`/usr/markvision/docs`

Getting started with Enhanced Printer Drivers

Chapter 1

Overview

Enhanced Printer Drivers for UNIX Systems provides many features that help ease the task of the system administrator and help end-users be more productive. The following sections provide an overview of each Enhanced Printer Drivers feature. For specific information on configuring these features, see “Configuring Enhanced Printer Drivers” on page 54.

Features

Enhanced Printer Drivers provide the following features:

- Integration into the native UNIX print subsystem (lpsched or lpd), which allows end-users to use print queues in the standard manner they are already accustomed to.
- System administrators can create queues with the most-frequently-used options as the default, such as duplex or no-banner-page, so end-users need not specify those options.
- Multiple queues, each pointing to the same printer, can be created with different defaults; for example providing a duplex queue and a landscape queue for the same printer.
- End-users can override per-queue defaults by specifying options on the lp or lpr command line.
- Reliable end-to-end network delivery, which provides true job status and end-of-job notification that are not available when using network print protocols such as lpr.
- Methods are provided for bypassing the native UNIX print subsystem by directly sending data to special network devices or by using special transport utilities.
- The database of printer capabilities (called PDDs) contains every possible feature (input and output trays, and so on) for each model of supported printer, but system administrators can edit these PDDs to more closely match the features in the printers at their site.
- Support for generic PostScript and PCL (including plain text) printers.
- Enhanced security which allows queue setup to be performed by anyone in a designated UNIX group-id.

UNIX versions supported

Enhanced Printer Drivers supports the operating systems and versions listed in the table below. Specific supported operating systems versions appear in the file Supported_Platforms.txt. This file is located on the CD, and can also be found in /usr/markvision/docs after installation. Make sure you're running on one of these systems before you install Enhanced Printer Drivers.

Operating system	Hardware	Go to page...
IBM AIX	IBM RISC System/6000	16
Compaq Tru64 UNIX and Digital UNIX	Digital Alpha	10
HP-UX	Hewlett-Packard 9000/700 and 9000/800	12
NCR MP RAS	Intel (IA32)	18
Caldera eDesktop; RedHat Linux; SuSE Linux; and TurboLinux	Intel (IA32)	19
SCO OpenServer	Intel (IA32)	19
SCO UnixWare	Intel (IA32)	24
SCO UnixWare	Intel (IA32)	26
SGI IRIX	SGI (MIPS)	27
Sun Solaris x86	Intel (IA32)	30
Sun Solaris SPARC	Sun SPARC and UltraSPARC	34

Note: For operating systems without a CD-ROM drive, see “Workstations without a CD-ROM drive” on page 38.

Enhanced Printer Drivers components

There are two separate, installable components associated with Enhanced Printer Drivers. The following sections describe each component as well as how and where to install them.

Component	Where to install it
IBMMVfonts (optional)	<ul style="list-style-type: none">• With the IBMMVprint component
Enhanced Printer Drivers (IBMMVprint)	<ul style="list-style-type: none">• On any host

Screen Fonts (IBMMVfonts)

The screen fonts component contains all the fonts you need to run Enhanced Printer Drivers. The fonts are packaged separately for easy installation in various X server configurations.

Note: If Enhanced Printer Drivers displays the output on a workstation that supports the Common Desktop Environment (CDE), Enhanced Printer Drivers, by default, uses the CDE fonts. If the workstation does not have CDE, we recommend installing the screen fonts component.

Where to install it

The fonts are used by your X server software to display Enhanced Printer Drivers correctly. You must install the fonts on the same workstation as your X server. If you are using a network font server, then the component must be installed on the workstation with the font server.

If you are using an X server with an operating system other than UNIX (for example, Windows), install the font component on a convenient UNIX workstation and copy the fonts to your computer. Check your X server documentation for instructions about adding fonts.

Additional information on installing the MarkVision screen fonts may be found in the `readme_fonts.txt` file located in the `/usr/markvision/docs/` directory after the Enhanced Printer Drivers component is installed. The screen fonts component is necessary for the correct display of the screens. When executing the fonts setup script, enter the absolute path, where `<install_directory>` is the directory where it was installed:

```
/<install_directory>/fonts/setup
```

Enhanced Printer Drivers (IBMMVprint)

Enhanced Printer Drivers is a stand-alone package designed to handle the print job formatting, (such as, orientation, duplex, and so on) and reliable network delivery. Enhanced Printer Drivers lets the user customize printing by creating specialized queues that attach to virtual devices.

Where to install it

The Enhanced Printer Drivers component can be installed on any UNIX workstation.

For more information see “Setting up and delivering output” on page 57.

Network print servers supported

Enhanced Printer Drivers is designed to work with MarkNet™ internal and external print servers. The options available with Enhanced Printer Drivers may vary depending on the kind of print server and its firmware level.

See Appendix B: Verifying print server configuration on page 79 for more information.

Using Enhanced Printer Drivers with CDE

Enhanced Printer Drivers can be integrated into the Common Desktop Environment (CDE). Integrating Enhanced Printer Drivers into CDE installs CDE icons, actions, and online help. See “Installing Enhanced Printer Drivers into CDE” on page 49.

Using Enhanced Printer Drivers with KDE

Enhanced Printer Drivers can be integrated into the K Desktop Environment (KDE). Integrating Enhanced Printer Drivers into KDE installs KDE icons, actions, and online help. See “Installing Enhanced Printer Drivers into KDE” on page 50.

Using Enhanced Printer Drivers with GNOME

Enhanced Printer Drivers can be integrated into the GNU Network Object Model Environment (GNOME). Integrating Enhanced Printer Drivers into GNOME installs GNOME icons, actions, and online help. See “Installing Enhanced Printer Drivers into GNOME” on page 51.

Installing Enhanced Printer Drivers

Chapter 2

Before you install

This chapter explains how to install the various Enhanced Printer Drivers packages. Do the following before you install Enhanced Printer Drivers:

- 1** Read “Getting started with Enhanced Printer Drivers” on page 1 for an overview of Enhanced Printer Drivers.
- 2** Make sure you’re logged on with root user authority.
- 3** Make sure you have enough disk space available for a complete installation. See the Readme file located in the `/usr/markvision/docs` directory.
- 4** Set up an administrative user group.

During the installation Enhanced Printer Drivers you will be asked if you want to change the administrative user group for Enhanced Printer Drivers. The default user group is either *bin* (System V and OSF) or *printq* (AIX).

If you have an administrative group on your host, you might want to use that group as the Enhanced Printer Drivers administrative group. Non-administrative users cannot create, modify or remove print queues. See “Changing the administrative group” on page 53.

5 Decide where to install the Enhanced Printer Drivers package.

The Enhanced Printer Drivers package can be installed in various arrangements. You can install Enhanced Printer Drivers on:

- Each workstation you want to run Enhanced Printer Drivers.
- One host and other workstations can NFS mount the Enhanced Printer Drivers package files.

Note: If you are using print clients and print servers on Solaris 2.6 or 7, install Enhanced Printer Drivers *on the print server* to take advantage of the Enhanced Printer Drivers management features.

What to install

To successfully install the Enhanced Printer Drivers package, you must also install the following components:

- IBMMVprint component
- IBMMVfonts component (optional)

Note: Compaq Tru64 UNIX and Digital UNIX systems use a different package naming convention. The respective package name is IBMMVPRINT460.

Compaq Tru64 UNIX or Digital UNIX

The following instructions use the `setld` command to install Enhanced Printer Drivers on your workstation. The `setld` command copies files into directories and sets the owner groups and permissions. It also establishes symbolic links to the Enhanced Printer Drivers package.

- 1** Read “Before you install” on page 8.
- 2** Make sure you have enough disk space in `/opt` to install Enhanced Printer Drivers. If you need more space, see “Finding space to install Enhanced Printer Drivers” on page 52.

- 3** Mount the CD. For example, if the path to the CD-ROM drive is `/dev/rz4c`, the command is:

```
mount -r -t cdfs -o rrip /dev/rz4c /cdrom
```

Note: Make sure that the `/cdrom` directory exists.

- 4** Check the Readme file in the root directory of the CD. This Readme file may contain last-minute information about installing Enhanced Printer Drivers that was not available when this guide was published.
- 5** Start the package installation program. Type the following on the command line:

```
setld -l /cdrom/packages/drivers-tru64unix
```

6 Select the packages you want to install.

- If you want to install all the packages, type the number representing all packages, and press Enter.

Note: Packages only appear in the available package list if they are newer than currently installed packages.

- If you want to install individual packages, type each package number separated by a comma, then press Enter. For example:

1, 2, 3

Note: You must install *all* the packages in the same location.

7 Follow the instructions on the screen.

If you want other hosts to NFS mount Enhanced Printer Drivers, see “NFS mounting Enhanced Printer Drivers” on page 45. Otherwise, go to Chapter 3.

HP-UX

- 1** Read “Before you install” on page 8.
- 2** Make sure you have enough disk space in /opt to install Enhanced Printer Drivers. If you need more space, see “Finding space to install Enhanced Printer Drivers” on page 52.
- 3** Mount the CD. For example, if the path to the CD-ROM drive is /dev/c0t5d0, the command is:

```
pfs_mount /dev/rdisk/c0t5d0 /cdrom
```

Note: The pfs_mountd and pfsd daemons must be running before using the pfs_mount command.

- 4** Check the Readme file in the root directory of the CD. This Readme file may contain last-minute information about installing Enhanced Printer Drivers that was not available when this guide was published.
- 5** Start the *System Administration Manager* by typing:

```
/usr/sbin/sam &
```

- 6** On the *Sam areas* screen, click *Software Management*.
- 7** Click *Install Software to Local Host*.

First, the *SD Install - Software Selection* screen appears, then the *Specify Source* dialog box appears.

If these dialog boxes do not appear, on the *Actions* menu click *Change Source* to open the dialog box.

- 8** Make sure that the hostname of the computer you are installing on appears in the *Source Host Name* text box. If it doesn't, type the hostname or select it from the list.

- 9** In the *Source Depot Path* field, type the following to specify the full path to the HP-UX package file:

```
/cdrom/packages/drivers-hpux1x.pkg
```

- 10** Make sure the *Change Software View* is set to *All Bundles*.
If it is not:
 - a** Click the *Change Software View* button.
 - b** On the *Software View* screen, click *All Bundles*.
 - c** Click *OK*.
- 11** On the *Specify Source* screen, click *OK*.
- 12** Select the bundles you want to install. You can mark the packages two ways.
 - To install all the Enhanced Printer Drivers packages at once:
 - a** Click the *IbmDrivers* bundle.
 - b** On the *Actions* menu, click *Mark for Install*. This marks all the Enhanced Printer Drivers packages for install.
 - c** Skip to the next step.
 - To install individual packages:
 - a** Double-click the *IbmDrivers* bundle. This displays the server and client packages.
 - b** Double-click each package bundle to view its contents.
 - c** For each package that you want to install, click the package.
 - d** On the *Actions* menu, click *Mark for Install*. This puts a *yes* beside the packages you want to install.
- 13** On the *Actions* menu, click *Install (analysis)*.
- 14** When the *OK* button is available, click it. A confirmation message appears.
- 15** Click *Yes* to start the installation.

Note: If the HOME variable was not set for root when you started SAM, an error message appears. Ignore the message and click *OK*.

16 During installation, select *Logfile* to view the installation log.

Important: Make sure that there are no errors or warnings during installation.

Note: If there is not enough disk space in /opt/ibm to install, see “Finding space to install Enhanced Printer Drivers” on page 52.

17 When installation is finished, select *Done*. This returns you to the *SD Install-Software Selection* screen.

18 Click *File* and then click *Exit* to return to the *Software Management* screen.

19 Type the following on the command line and answer any questions that appear:

```
/opt/ibm/setup.print
```

This file creates required symbolic links and prompts you for information you should provide after installation.

If you want other hosts to NFS mount Enhanced Printer Drivers, see “NFS mounting Enhanced Printer Drivers” on page 45. Otherwise, go to Chapter 3.

IBM AIX

- 1** Read “Before you install” on page 8.
- 2** Make sure you have enough disk space in `/opt` to install Enhanced Printer Drivers. If you need more space, see “Finding space to install Enhanced Printer Drivers” on page 52.
- 3** Mount the CD. For example, if the path to the CD-ROM drive is `/dev/cd0`, the command is:

```
mount -o ro -v cdrfs /dev/cd0 /cdrom
```

Note: Make sure that the `/cdrom` directory exists.

- 4** Type the following on the command line and then press Enter:

```
smit install_latest
```

- 5** When prompted to enter the input device/directory for software, type one of the following:

```
/cdrom/packages/drivers-aix4.pkg
```

- 6** If you want, select which packages to install. All packages are installed by default.
 - a** On the *SOFTWARE to install* option, choose *List*.
 - b** Select the packages you want to install.
 - c** Choose *Do*.

- 7** Specify any other install options, such as COMMIT.
- 8** Choose *Do* to begin installing Enhanced Printer Drivers. You will receive a message when the installation is finished.
- 9** Type the following on the command line and answer any questions that appear:

```
/usr/lpp/ibm_markvision/setup.print
```

and

```
/usr/lpp/ibm_markvision/colon_files/install_pkg.4x
```

This file creates required symbolic links and prompts you for information you must provide after installation.

If you want other workstations to NFS mount Enhanced Printer Drivers, see “NFS mounting Enhanced Printer Drivers” on page 45. Otherwise, go to Chapter 3.

NCR MP-RAS

- 1** Read “Before you install” on page 8.
- 2** **Mount the CD.** For example, if the path to the CD-ROM drive is `/dev/dsk/c0t5d0s0`, the command is:

```
mount -F cdfs /dev/dsk/c0t5d0s0 /cdrom
```

Note: Make sure that the `/cdrom` directory exists.

- 3** **Check the Readme file in the root directory of the CD.** This Readme file may contain last-minute information about installing Enhanced Printer Drivers that was not available when this guide was published.

- 4** **Type the following on the command line and then press Enter:**

```
pkgadd -d /cdrom/packages/drivers-ncr.pkg
```

- 5** **Follow the prompts and answer any questions that appear on the screen.**

- To accept the defaults, press Enter.
- To answer yes/no questions, type *y*, *n*, or *?*, and then press Enter.
- When a message appears telling you the installation was successful, type *q* to quit.

Note: You must install *all* the packages in the same location.

If you want other systems to NFS mount Enhanced Printer Drivers, see “NFS mounting Enhanced Printer Drivers” on page 45. Otherwise, go to Chapter 3.

Caldera eDesktop; RedHat Linux; SuSE Linux; and TurboLinux

1 Mount the CD.

During a default install of RedHat, the CD-ROM, regardless of type, will be symlinked as `/dev/cdrom`.

Using that default, the command would be:

```
mount -t iso9660 -r /dev/cdrom /mnt/cdrom
```

Note: If you do not have `/dev/cdrom`, see the *CDROM-HOW TO* documentation which ships with the Linux OS, to setup the linux kernel and CD-ROM device.

2 Change your default directory to the CD-ROM root:

```
cd /mnt/cdrom/
```

3 Check the `Readme.txt` file for last-minute information about installing Enhanced Printer Drivers.

4 There are two ways to install the Enhanced Printer Drivers package; the command line method and the graphical Linux installation kit (`glint`) method.

- **Command-line install method:**

- a Change your default directory to the Linux package directory:**

```
cd /mnt/cdrom/packages/  
drivers-linux-glibc2-x86
```

- b To install all Enhanced Printer Drivers components, issue the command:**

```
rpm -ivh *.rpm
```

- C** To selectively install individual Enhanced Printer Drivers components, specify the filename of the Enhanced Printer Drivers component which you want to install. For example, to install Enhanced Printer Drivers, issue the command:

```
rpm -ivh drivers-IBMMVprint-4.6-1.i386.rpm
```

- **glint install method:**
 - a** Invoke the glint command and look under the utilities/printing folder.
 - b** Click *Configure* and enter the path:


```
/mnt/cdrom/packages/linux-glib2c-x86
```
 - c** Click *Available* and for each component to be installed, highlight the component, and click *Install*.

Uninstall

There are two methods for uninstall, command-line and glint:

1 Command line uninstall.

- List the components with the command:


```
rpm -qa |grep -e drivers
```
- For each MarkVision component you want to uninstall, issue the command:


```
rpm -e drivers-IBMMVprint-4.6
```

2 glint uninstall method:

- Invoke the glint command and look under the utilities/printing folder.
- For each component to be uninstalled, highlight the component and click *Uninstall*.

SCO OpenServer

- 1** Read “Before you install” on page 8.
- 2** **Mount the CD.** For example, if the path to the CD-ROM drive is `/dev/cd1`, the command is:

```
mount -f HS -r /dev/cd1 /cdrom
```

Note: Make sure that the `/cdrom` directory exists.

If you get an error that HS is an unknown filesystem format:

- a** **Add the HS file system to the operating system by typing the following on the command line:**

```
mkdev high-sierra
```

- b** Follow the instructions on the screen.
 - c** Restart the computer after the new kernel is made.
- 3** **Check the Readme file in the root directory of the CD.** This Readme file may contain last-minute information about installing Enhanced Printer Drivers that was not available when this guide was published.
 - 4** **Before installing Enhanced Printer Drivers, make sure the UnixWare/OpenServer Development Kit (UDK) Compatibility Module is installed. Type the following command:**

```
pkginfo |grep OSRcompat
```

- If OSRcompat is listed, the UDK Compatibility Module is installed. Skip to Step 8.

- If the UDK Compatibility Module is not installed, install it before installing Enhanced Printer Drivers. The UDK Compatibility Module is provided and supported by SCO. This module allows applications developed on SCO UnixWare 7 to run on SCO OpenServer systems. To begin installing the UDK Compatibility Module, type the following command, and then press Enter:

```
pkgadd -d /cdrom/packages/sco5-OSRcompat.pkg
```

5 When a list of available packages appears:

- If you want to install all the packages type the following on the command line, then press Enter:

```
all
```

- If you want to install individual packages, on the command line type each package number separated by a comma, and then press Enter. For example:

```
1, 2, 3
```

6 Follow the prompts and answer any questions that appear on the screen.

- To accept the defaults, press Enter.
- To answer yes/no questions, type *y*, *n*, or *?*, then press Enter.

7 To begin installing Enhanced Printer Drivers, type the following on the command line, and then press Enter:

```
pkgadd -d /cdrom/packages/drivers-sco5.pkg
```

8 When a list of available packages appears:

- If you want to install all the packages, type the following on the command line, and then press Enter:

```
all
```

- If you want to install individual packages, on the command line type each package number separated by a comma, and then press Enter. For example:

1, 2, 3

9 Follow the prompts and answer any questions that appear on the screen.

- To accept the defaults, press Enter.
- To answer yes/no questions, type *y*, *n*, or *?*, and then press Enter.
- When a message appears telling you the installation was successful, type *q* to quit.

If you want other systems to NFS mount Enhanced Printer Drivers, see “NFS mounting Enhanced Printer Drivers” on page 45. Otherwise, go to Chapter 3.

SCO UnixWare 2

- 1 Read “Before you install” on page 8.
- 2 **Mount the CD.** For example, if the path to the CD-ROM drive is `/dev/cdrom/c0b0t210`, the command is:

```
mount -o ro -f cdfs /dev/cdrom/c0b0t210 /cdrom
```

Note: Make sure that the `/cdrom` directory exists.

- 3 **Before installing Enhanced Printer Drivers, make sure the UnixWare/OpenServer Development Kit (UDK) Compatibility Module for UnixWare 2.1.x is installed. Type the following command:**

```
pkginfo |grep UW2compat
```

- If UW2compat is listed, the UDK Compatibility Module is installed. Skip to Step 6.
- If the UDK Compatibility Module is not installed, install it before installing Enhanced Printer Drivers. The UDK Compatibility Module is provided and supported by SCO. This module allows applications developed on SCO UnixWare 7 to run on SCO UnixWare 2.1.x systems. To begin installing the UDK Compatibility Module, type the following command, and then press Enter:

```
pkgadd -d /cdrom/packages/  
unixware2-UW2compat.pkg
```

- 4 **When a list of available packages appears:**
 - If you want to install all the packages type the following on the command line, then press Enter:

```
all
```

- If you want to install individual packages, on the command line type each package number separated by a comma, and then press Enter. For example:

```
1,2,3
```

5 Follow the prompts and answer any questions that appear on the screen.

- To accept the defaults, press Enter.
- To answer yes/no questions, type *y*, *n*, or *?*, then press Enter.
- When a message appears telling you the installation was successful, type *q* to quit.

Note: You must install *all* the packages in the same location.

6 Type the following on the command line, and then press Enter:

```
pkgadd -d/cdrom/packages/drivers-unixware.pkg
```

7 When a list of available packages appears:

- If you want to install all the packages type the following on the command line, and then press Enter:

```
all
```

- If you want to install individual packages, on the command line type each package number separated by a comma, then press Enter. For example:

```
1, 2, 3
```

8 Follow the prompts and answer any questions that appear on the screen.

- To accept the defaults, press Enter.
- To answer yes/no questions, type *y*, *n*, or *?*, and then press Enter.
- When a message appears telling you the installation was successful, type *q* to quit.

Note: You must install *all* the packages in the same location.

If you want other systems to NFS mount Enhanced Printer Drivers, see “To NFS mount Enhanced Printer Drivers:” on page 45. Otherwise, go to Chapter 3.

SCO UnixWare 7

- 1 Read “Before you install” on page 8.
- 2 **Mount the CD.** For example, if the path to the CD-ROM drive is `/dev/cdrom/c0b0t210`, the command is:

```
mount -o ro -f cdfs /dev/cdrom/c0b0t210 /cdrom
```

Note: Make sure that the `/cdrom` directory exists.

- 3 **Type the following on the command line, and then press Enter:**

```
pkgadd -d /cdrom/packages/drivers-unixware.pkg
```

- 4 **When a list of available packages appears:**
 - If you want to install all the packages type the following on the command line, and then press Enter:
`all`
 - If you want to install individual packages, on the command line type each package number separated by a comma, then press Enter. For example:
`1, 2, 3`
- 5 **Follow the prompts and answer any questions that appear on the screen.**

- To accept the defaults, press Enter.
- To answer yes/no questions, type *y*, *n*, or *?*, and then press Enter.
- When a message appears telling you the installation was successful, type *q* to quit.

Note: You must install *all* the packages in the same location.

If you want other systems to NFS mount Enhanced Printer Drivers, see “NFS mounting Enhanced Printer Drivers” on page 45. Otherwise, go to Chapter 3.

SGI IRIX

1 Read “Before you install” on page 8.

2 Mount the CD.

If your workstation is configured to automatically mount CDs, simply insert the CD now. It is automatically mounted on /CDROM.

Use the /CDROM directory when referencing the package files.

Note: Make sure the /CDROM directory exists. Use the mount command to verify that the /CDROM directory is in the list of the mounted file systems.

If your workstation does not automatically mount CDs, you’ll need to mount the CD manually. See “Mounting the CD manually” on page 28.

3 Check the README file in the root directory of the CD. This README file may contain last-minute information about installing Enhanced Printer Drivers that was not available when this guide was published.

4 On the desktop *System* menu, click *Software Manager*.

5 In the *Available Software* field, type:

```
/CDROM/packages/drivers-irix/
```

6 Click the *Customize Installation* button.

7 Wait for the *Log* panel to display this message:

```
Ready to select products for installation or  
removal
```

- 8** Select the packages you want to install.
 - To install the entire product, click beside the product.
 - To install individual packages:
 - a** Click the folder icon.
 - b** Click next to the packages that you want to install.
- 9** Make sure you have enough disk space in `/opt/ibm` to install the selected packages. If the display graphic contains a red slice, there is not enough space to install the selected packages in `/opt`. See “Finding space to install Enhanced Printer Drivers” on page 52.

When you have enough space, return to the *Software Manager* window and click *Customize Installation* to recalculate available space. If the red slice on the graph still appears, restart *Software Manager*.

- 10** Click *Start* to begin installation.

During installation, the *Status* dialog box shows the package installation progress. The *Log* pane displays messages about the installation.

- 11** Click *OK* on the pop-up window that appears when installation is finished.
- 12** Run the following script to complete the installation:

```
/opt/ibm/setup.print
```

If you want other systems to NFS mount Enhanced Printer Drivers, see “NFS mounting Enhanced Printer Drivers” on page 45. Otherwise, go to Chapter 3.

Mounting the CD manually

- 1** Make sure that `mediad` is not running. To stop `mediad` from running as root, type:

```
mediad -k
```

- 2** Make sure that the `/cdrom` directory exists.
- 3** Mount the CD. For example, if the path to the SCSI device is `/dev/scsi/sc0d710`, type the following on the command line:

```
mount -t iso9660 /dev/scsi/sc0d710 /cdrom
```

For more information, see your operating system documentation.

Note: In the string `sc0d710` the `l` is the lowercase letter “l”.

Sun Solaris x86

- 1** Read “Before you install” on page 8.
- 2** Set the `NONABI_SCRIPTS` environment variable to `TRUE`. For example in the Korn and Bourne shells, type the following:

```
NONABI_SCRIPTS=TRUE
export NONABI_SCRIPTS
```

- 3** Make sure the `OPENWINHOME` environment variable is set. To check, type the following on the command line:

```
env | grep OPENWINHOME
```

If you get no response, you must set the `OPENWINHOME` environment variable to the `openwin` directory. For example, in the Korn and Bourne shells if your `openwin` directory is `/usr/openwin`, type the following on the command line:

```
OPENWINHOME=/usr/openwin
export OPENWINHOME
```

- 4** Check to see if you are running Volume Manager. To find out, type the following on the command line, and then press Enter:

```
ps -ef | grep vold
```

If you get a response that indicates the `vold` process is running, Volume Manager is running. See “Installing Enhanced Printer Drivers on Solaris x86 systems with Volume Manager running” on page 31 to continue installing.

If there is no response, Volume Manager is not running. See “Installing Enhanced Printer Drivers on Solaris x86 systems without Volume Manager running” on page 32 to continue installing.

Installing Enhanced Printer Drivers on Solaris x86 systems with Volume Manager running

If you are running Volume Manager, the CD is automatically mounted.

- 1 Check the Readme file in the root directory of the CD.** This Readme file may contain last-minute information about installing Enhanced Printer Drivers that was not available when this guide was published.

- 2 Start the package installation program.**

```
pkgadd -d /cdrom/cdrom0/packages/  
drivers-solaris2-x86.pkg
```

- 3 When a list of available packages appears:**

- If you want to install all the packages, type the following on the command line, and then press Enter:

```
all
```

- If you want to install individual packages, on the command line type each package number separated by a comma, then press Enter. For example:

```
1, 2, 3
```

- 4 Follow the prompts and answer any questions that appear on the screen:**

- To accept the defaults, press Enter.
- To answer yes/no questions, type *y*, *n*, or *?*, and then press Enter.
- When a message appears telling you the installation was successful, type *q* to quit.

Note: You must install *all* the packages in the same location.

If you want other workstations to NFS mount Enhanced Printer Drivers, see “NFS mounting Enhanced Printer Drivers” on page 45. Otherwise, go on to Chapter 3.

Installing Enhanced Printer Drivers on Solaris x86 systems without Volume Manager running

- 1** Make sure that the `/cdrom` directory exists.
- 2** **Mount the CD.** For example, if the path to the CD-ROM drive is `/dev/dsk/c1t5d0s2`, the command is:

```
mount -F hsfs -o ro /dev/dsk/c1t5d0s2 /cdrom
```

- 3** **Check the Readme file in the root directory of the CD.** This Readme file may contain last-minute information about installing Enhanced Printer Drivers that was not available when this guide was published.

- 4** **Start the package installation program.**

```
pkgadd -d /cdrom/packages/drivers-solaris2-x86.pkg
```

- 5** **When a list of available packages appears:**

- If you want to install all the packages type the following on the command line, and then press Enter:

```
all
```

- If you want to install individual packages, on the command line type each package number separated by a comma, and then press Enter. For example:

```
1,2,3
```

6 Follow the prompts and answer any questions that appear on the screen:

- To accept the defaults, press Enter.
- To answer yes/no questions, type *y*, *n*, or *?*, and then press Enter.
- When a message appears telling you the installation was successful, type *q* to quit.

Note: You must install *all* the packages in the same location.

If you want other workstations to NFS mount Enhanced Printer Drivers, see “NFS mounting Enhanced Printer Drivers” on page 45. Otherwise, go on to Chapter 3.

Sun Solaris SPARC

- 1** Read “Before you install” on page 8.
- 2** Set the `NONABI_SCRIPTS` environment variable to `TRUE`. For example in the Korn and Bourne shells, type the following:

```
NONABI_SCRIPTS=TRUE
export NONABI_SCRIPTS
```

- 3** Make sure the `OPENWINHOME` environment variable is set. To check, type the following on the command line:

```
env | grep OPENWINHOME
```

If you get no response, you must set the `OPENWINHOME` environment variable to the `openwin` directory. For example, in the Korn and Bourne shells if your `openwin` directory is `/usr/openwin`, type the following on the command line:

```
OPENWINHOME=/usr/openwin
export OPENWINHOME
```

- 4** Check to see if you are running Volume Manager. To find out, type the following on the command line, and then press Enter:

```
ps -ef | grep vold
```

If you get a response that indicates the `vold` process is running, Volume Manager is running. See “Installing Enhanced Printer Drivers on Solaris SPARC systems with Volume Manager running” on page 35 to continue installing.

If there is no response, Volume Manager is not running. See “Installing Enhanced Printer Drivers on Solaris SPARC systems without Volume Manager running” on page 36 to continue installing.

Installing Enhanced Printer Drivers on Solaris SPARC systems with Volume Manager running

If you are running Volume Manager, the CD is automatically mounted.

- 1 Check the Readme file in the root directory of the CD.** This Readme file may contain last-minute information about installing Enhanced Printer Drivers that was not available when this guide was published.

- 2 Start the package installation program.**

```
pkgadd -d /cdrom/cdrom0/packages/  
drivers-solaris2-sparc.pkg
```

- 3 When a list of available packages appears:**

- If you want to install all the packages type the following, and then press Enter:

```
all
```

- If you want to install individual packages, type each package number separated by a comma, and then press Enter. For example:

```
1, 2, 3
```

- 4 Follow the prompts and answer any questions that appear on the screen:**

- To accept the defaults, press Enter.
- To answer yes/no questions, type *y*, *n*, or *?*, and then press Enter.
- When a message appears telling you the installation was successful, type *q* to quit.

Note: You must install *all* the packages in the same location.

If you want other workstations to NFS mount Enhanced Printer Drivers, see “NFS mounting Enhanced Printer Drivers” on page 45. Otherwise, go to Chapter 3.

Installing Enhanced Printer Drivers on Solaris SPARC systems without Volume Manager running

- 1** Make sure that the `/cdrom` directory exists.
- 2** **Mount the CD.** For example, if the path to the CD-ROM drive is `/dev/dsk/c0t6d0s2`, the command is:

```
mount -F hsfs -o ro /dev/dsk/c0t6d0s2 /cdrom
```

- 3** **Check the Readme file in the root directory of the CD.** This Readme file may contain last-minute information about installing Enhanced Printer Drivers that was not available when this guide was published.

- 4** **Start the package installation program.**

```
pkgadd -d /cdrom/packages/  
drivers-solaris2-sparc.pkg
```

- 5** **When a list of available packages appears:**
 - **If you want to install all the packages, type the following, and then press Enter:**

```
all
```
 - **If you want to install individual packages, type each package number separated by a comma, and then press Enter.** For example:

```
1, 2, 3
```

6 Follow the prompts and answer any questions that appear on the screen:

- To accept the defaults, press Enter.
- To answer yes/no questions, type *y*, *n*, or *?*, and then press Enter.
- When a message appears telling you the installation was successful, type *q* to quit.

Note: You must install *all* the packages in the same location.

If you want other workstations to NFS mount Enhanced Printer Drivers, see “NFS mounting Enhanced Printer Drivers” on page 45. Otherwise, go to Chapter 3.

Workstations without a CD-ROM drive

There are two ways to install Enhanced Printer Drivers on a workstation without a CD-ROM drive using NFS and using FTP.

Using NFS

1 On the workstation *with* the CD-ROM drive:

a Mount the CD.

For help, see “Installing Enhanced Printer Drivers” on page 8. Find the operating system and workstation that you’re using and follow the instructions in that section for mounting the CD.

b Export the CD filesystem. If you need help, refer to your operating system documentation.

2 On the workstation *without* the CD-ROM drive, mount the CD filesystem on `/cdrom`.

For help, see “Installing Enhanced Printer Drivers” on page 8. Find the section that pertains to your workstation and operating system. Follow those instructions to install Enhanced Printer Drivers. Ignore the part that tells you how to mount the CD.

Using FTP (except Compaq Tru64 UNIX, Digital UNIX and IRIX)

If you are using Compaq Tru64 UNIX or Digital UNIX, go to “Using FTP (Compaq Tru64 UNIX or Digital UNIX)” on page 41. If you are using SGI IRIX, go to “Using FTP (IRIX)” on page 43.

1 On the workstation *with* the CD-ROM drive, mount the CD.

For help, see “Installing Enhanced Printer Drivers” on page 8. Find the operating system and workstation that you’re using and follow the instructions in that section for mounting the CD.

2 On the workstation *without* the CD-ROM drive:

a Change directory to `/tmp`.

b Make sure you have enough disk space available. Type the following on the command line:

```
df -k .
```

c Type the following, substituting the directory name of your operating system for `os_type`. For example, substitute `os_type` with `sco` on SCO systems.

```
ftp hostname
bin
cd /cdrom/packages
get drivers-os_type.pkg
quit
```

Note: On Solaris systems running Volume Manager, substitute `/cdrom/cdrom0` for `/cdrom`. The ‘0’ in `cdrom0` is a zero.

- 3** Go to “Installing Enhanced Printer Drivers” on page 8. Follow the instructions that pertain to your workstation and operating system to install. Ignore the part that tells you how to mount the CD.

When you normally type this filename:

```
/cdrom/packages/drivers-os_type.pkg
```

Replace it with:

```
/tmp/drivers-os_type.pkg
```

Using FTP (Compaq Tru64 UNIX or Digital UNIX)

1 On the workstation *with* the CD-ROM drive:

a Mount the CD. For help, see “Installing Enhanced Printer Drivers” on page 8. Find the operating system that you’re using and follow the instructions in that section for mounting the CD.

b Make sure you have enough disk space available in the /tmp directory. Type the following on the command line:

```
df -k /tmp
```

c Change directory to /cdrom/packages/tru64unix

d Create a tar file of the /cdrom/packages/tru64unix directory in the /tmp directory. This tar file is created in the /tmp directory. Type the following on the command line:

```
tar -cvf /tmp/drivers-tru64unix.pkg.tar  
tru64unix/
```

2 On the workstation *without* the CD-ROM drive:

a Make sure you have enough disk space available in the /tmp directory. Type the following on the command line:

```
df -k /tmp
```

b Make a directory called markvision in the /tmp directory by typing the following on the command line:

```
cd /tmp  
mkdir drivers
```

c Change the directory to /tmp/drivers

d Type:

```
ftp hostname
bin
cd /tmp
get drivers-digital.pkg.tar.
quit
```

e Extract the contents of the tar file to a temporary directory.

For example, if you want to use `/tmp/drivers` as the temporary directory, the command is:

```
tar -xvf drivers-tru64unix.tar
```

The tar command creates a subdirectory named “output” in the temporary directory.

f Start the package installation program. For example, if you used `/tmp/drivers` as the temporary directory when you extracted the tar file, type the following on the command line:

```
setld -l /tmp/drivers/tru64unix
```

g Go to “Compaq Tru64 UNIX or Digital UNIX” on page 10.

Follow the instructions to install. Ignore the part that tells you how to mount the CD and start the package installation program.

Using FTP (IRIX)

1 On the workstation with the CD-ROM drive:

a Mount the CD. For help see “Installing Enhanced Printer Drivers” on page 8. Find the operating system and workstation that you are using and follow the instructions in that section for mounting the CD.

b Make sure you have enough disk space available in the /tmp directory. Type the following on the command line:

```
df -k /tmp
```

c Change the directory to /CDROM/packages

d Create a tar file of the /CDROM/packages/irix directory. This tar file will be created in the /tmp directory. Type the following on the command line:

```
tar -cvf /tmp/drivers-irix.pkg.tar irix/
```

2 On the workstation *without* the CD-ROM drive:

a Make sure you have enough disk space available in the /tmp directory. Type the following on the command line:

```
df -k /tmp
```

b Make a directory called drivers in the /tmp directory by typing the following on the command line:

```
cd /tmp
mkdir drivers
```

c Change the directory to /tmp/drivers.

d Type:

```
ftp hostname
bin
cd /tmp
get drivers-irix.pkg.tar
quit
```

- e** **Extract the contents of the tar file to a temporary directory.** For example, if you want to use `/tmp/drivers` as the temporary directory, the command is:

```
tar -xvf drivers-irix.pkg.tar
```

The tar command creates a subdirectory named “irix” in the `/tmp/drivers` directory.

- f** **Go to “SGI IRIX” on page 27.** Follow the instructions to install. Ignore the part that tells you how to mount the CD, and in the *Available Software* field, type `/tmp/irix` instead of `/CDROM/packages/irix`.

NFS mounting Enhanced Printer Drivers

You can install Enhanced Printer Drivers on one host and export the filesystem to other hosts for mounting. Using NFS eliminates the need to perform individual installations at each workstation and conserves disk space.

Important: The NFS server and client workstations *must* use the same operating system.

To NFS mount Enhanced Printer Drivers:

- 1** **Configure the server.**
 - a** Make sure you're logged on with root user authority.
 - b** Install Enhanced Printer Drivers. Follow the directions for the operating system you're using. See "Installing Enhanced Printer Drivers" on page 8.
 - c** Export the directory where you installed the Enhanced Printer Drivers Client (for example, `/opt/ibm/` or `/usr/local/ibm`). If you need help, refer to your operating system documentation.

- 2** **Configure Enhanced Printer Drivers on the local workstation.**
 - a** **Make sure you're logged on with root user authority.**
 - b** **NFS mount the IBMMVprint directory from the server.** Refer to your operating system documentation for mounting instructions.
 - c** **Run the install script in the mounted IBMMVprint directory.** The script creates symbolic links to this directory in
/usr/IBMMVprint. The following example uses /mnt as the mount point.

```
cd /mnt/drivers  
./IBMMVprint.link
```

Uninstall and unmount Enhanced Printer Drivers:

- 1** **Run the uninstall script, which removes the symbolic links to the mounted directory from /usr/IBMMVprint.**

./IBMMVprint.unlink
- 2** **Unmount the MVprint directory.** Refer to your operating system documentation for unmounting instructions.

Removing Enhanced Printer Drivers packages

As root, you can remove Enhanced Printer Drivers using the utilities listed in this table.

Depending on the utility on your system, either mark the Enhanced Printer Drivers packages for removal after you start the program or provide the names of the Enhanced Printer Drivers packages you want to remove on the command line. See your operating system documentation for more information.

Operating system	Package removal tool
Compaq Tru64 UNIX or Digital UNIX	<code>setld -d</code>
HP-UX	<code>sam</code>
IBM AIX	<code>smit</code>
NCR MP RAS	<code>pkgrm</code>
Caledera eDesktop, RedHat Linux, SuSE Linux, and TurboLinux	<code>rpm -e</code>
SCO OpenServer	<code>pkgrm</code>
SGI IRIX	<code>swmgr</code>
Sun Solaris x86	<code>pkgrm</code>
Sun Solaris SPARC	<code>pkgrm</code>
SCO UnixWare	<code>pkgrm</code>

Removing remaining directories

Package removal utilities usually do not remove directories shared by more than one package. Therefore, after removing all the Enhanced Printer Drivers packages, some directories may need to be removed manually.

To see if any directories remain after removing all the Enhanced Printer Drivers packages, check the directory where you installed Enhanced Printer Drivers. By default, Enhanced Printer Drivers installs in either `/opt/ibm` or `/usr/local/ibm`.

Installing Enhanced Printer Drivers into CDE

You can integrate Enhanced Printer Drivers into the Common Desktop Environment (CDE). Integrating Enhanced Printer Drivers into CDE installs CDE icons and actions.

To integrate Enhanced Printer Drivers into the CDE:

- 1** Make sure you have root user authority.
- 2** Type the following on the command line;

```
/usr/bin/mark2cde
```

Note: On some CDE systems, the Enhanced Printer Drivers CDE icons may not appear after installing the Enhanced Printer Drivers CDE snap-in. The icons should appear after logging off and logging in again.

Removing the CDE snap-in

When removing the Enhanced Printer Drivers package, you must manually remove the CDE snap-in.

To uninstall the CDE snap-in, as root, type the following on the command line:

```
# /usr/bin/mark2cde -d
```

Installing Enhanced Printer Drivers into KDE

You can integrate Enhanced Printer Drivers into the K Desktop Environment (KDE). Integrating Enhanced Printer Drivers into KDE installs KDE icons and actions.

To integrate Enhanced Printer Drivers into the KDE:

- 1** Make sure you have root user authority.
- 2** Type the following on the command line;

```
/usr/bin/mark2kde
```

Note: On some KDE systems, the Enhanced Printer Drivers KDE icons may not appear after installing the Enhanced Printer Drivers KDE snap-in. The icons should appear after logging off and logging in again or restarting KDE.

Removing the KDE snap-in

When removing the Enhanced Printer Drivers package, you must manually remove the KDE snap-in.

To uninstall the KDE snap-in, as root, type the following on the command line:

```
# /usr/bin/mark2kde -d
```

Installing Enhanced Printer Drivers into GNOME

You can integrate Enhanced Printer Drivers into the GNU Network Object Model Environment (GNOME). Integrating Enhanced Printer Drivers into GNOME installs GNOME icons and actions.

To integrate Enhanced Printer Drivers into the GNOME:

- 1 Make sure you have root user authority.**
- 2 Type the following on the command line;**

```
/usr/bin/mark2gnome
```

Note: On some GNOME systems, the Enhanced Printer Drivers GNOME icons may not appear after installing the Enhanced Printer Drivers GNOME snap-in. The icons should appear after logging off and logging in again or restarting GNOME.

Removing the GNOME snap-in

When removing the Enhanced Printer Drivers package, you must manually remove the GNOME snap-in.

To uninstall the GNOME snap-in, as root, type the following on the command line:

```
# /usr/bin/mark2gnome -d
```

Removing Enhanced Printer Drivers from the CDE

Follow the instructions below, to remove Enhanced Printer Drivers icons, actions, and online Help from the CDE.

On the command line

- 1** Make sure you have root user authority.
- 2** Type the following on the command line;

```
/usr/markvision/bin/mark2cde -d
```

Finding space to install Enhanced Printer Drivers

Some operating systems require you to install Enhanced Printer Drivers in a particular directory. If the filesystem containing that directory is full, you can create a symbolic link that points to a directory in another filesystem. The symbolic link appears to be a real directory, but the files are actually installed in the location the link points to.

For example, to appear to install Enhanced Printer Drivers in `/opt/ibm` but actually install Enhanced Printer Drivers in `/disk2/ibm`, do the following:

- 1** Create a directory in the location where you want the packages to actually be installed. For example, to install in the `/disk2` filesystem:

```
mkdir /disk2/ibm
```

- 2** Create a symbolic link pointing to the directory you created. For example:

```
ln -s /disk2/ibm /opt/ibm
```

Changing the administrative group

Enhanced Printer Drivers uses UNIX groups to implement administrator and user levels of access. Users in the same group as the IBMMVprint package have administrative privileges.

When you install Enhanced Printer Drivers, you are prompted to provide an administrative group name. The default administrative group is *bin* on all systems except AIX. The default administrative group on AIX is *printq*.

For example, to change the administrative group to *adm*, as root, type the following on the command line:

```
cd /usr/markvision/bin
chgrp adm *
```

Configuring Enhanced Printer Drivers

Chapter 3

Before you start

Follow these steps to configure Enhanced Printer Drivers and to gain a basic understanding of how to use Enhanced Printer Drivers.

For instructions about installing Enhanced Printer Drivers on your operating system, see the appropriate section in Chapter 2: “Installing Enhanced Printer Drivers” beginning on page 8.

Before you begin this section, check the Readme files that were installed with Enhanced Printer Drivers. These files, located in the path: `/usr/markvision/docs`, may contain information that was not available when this guide was published.

Starting Enhanced Printer Drivers

You can use the Enhanced Printer Drivers with a graphical interface, a character interface, or directly from the command line.

With a graphical user interface

If your workstation supports it, you can use Enhanced Printer Drivers with the X Window System. To use Enhanced Printer Drivers with X, you must set the display variable.

1 Set the DISPLAY environment variable:

- **Korn (ksh) and Bourne (sh) shell users type the following:**

```
DISPLAY=hostname:0.0
export DISPLAY
```

where hostname is the name of your workstation.

- **C shell users type the following:**

```
setenv DISPLAY disphost:0.0
```

2 If you are running Enhanced Printer Drivers on a different host than your X server, make sure the remote host has permission to access your display. For example, if the Enhanced Printer Drivers is running on the host flora, type the following on the command line:

```
xhost + flora
```


- 3 Type the following on the command line, and then press Enter:

```
lexprt
```

With a character interface

You can also use Enhanced Printer Drivers with a character-based terminal. Make sure the display and terminal variables are set correctly for use with a character interface. If the DISPLAY variable is not set, Enhanced Printer Drivers runs in character mode by default.

You can run many of the Enhanced Printer Drivers programs with a character interface. For example, to run the `lexprt` program with a character interface, type the following on the command line:

```
lexprt -C
```

From the command line

You may also access Enhanced Printer Drivers features directly from the command line. See Appendix C: "Using utilities on the command line" on page 82 or view the man pages on your system for more information.

Setting up and delivering output

You can send data to a printer three ways using Enhanced Printer Drivers:

- Through the native UNIX print subsystem
- Directly to a Network Printer Device
- By invoking a transport utility

Native UNIX print subsystem

The system administrator must use the `lexprt` command to set up printing through the native UNIX print subsystem. Two steps are required: creating a virtual device and creating a queue.

Creating a virtual device (systems other than AIX)

Enhanced Printer Drivers for UNIX Systems manages printing by creating specialized queues that attach to virtual devices. Virtual devices contain information about the printer the virtual device represents. Enhanced Printer Driver queues use the information from the virtual device to properly prepare data for the printer and transport the data to the printer.

You can create a virtual device from either Lexprt GUI or the command line. The following information tells you how to create a virtual device for all systems except AIX. If you are using AIX, see “Creating queues and devices (AIX)” on page 59.

Important: You *must* create a virtual device before you can create a print queue.

- 1** Start the Lexprt main screen by typing `lexprt` from a command prompt.
- 2** Click *Create a Virtual Device*.
- 3** Enter a device name.

- 4** Choose a transport option from the following list:
 - *Serial*
 - *Parallel*
 - *Network*
 - *Network connection with End-of-job notification*
- 5** Answer the questions on the remaining screens. The questions vary depending upon your transport options.

Creating a print queue (systems other than AIX)

The following sections explains how to create a print queue using Enhanced Printer Drivers.

Important: Before you create a print queue, you must create a virtual device to which you can assign the queue. See “Creating a virtual device (systems other than AIX)” on page 57.

- 1** Start the Lexp`prt` main screen by typing `lexprt` from a command prompt.
- 2** Click *Create a Queue*.
- 3** Enter a queue name.
- 4** Choose a virtual device for the print queue to connect to. You must create a virtual device before you can create a print queue. See “Creating a virtual device (systems other than AIX)” on page 57.
- 5** Choose a printer type from the list of printers provided. Select the printer type in the list that most closely matches the physical printer attached to the virtual device.
- 6** Answer the questions on the remaining screens to choose print queue characteristics such as emulation and paper size.

Note: Only use Enhanced Printer Driver utilities to add and remove queues created with Enhanced Printer Driver utilities.

Creating queues and devices (AIX)

To configure queues and devices for an AIX UNIX client:

- 1** Start the Lexpmt main screen by typing `lexpmt` from a command prompt.
- 2** Click *Add a Print Queue*.
- 3** Select the MarkNet print server that most closely matches your network print server.
- 4** Follow the instructions on the screen. Both the print queue and virtual printer are created.

Note: You may select End-of-job notification on the print queue configuration screen and the Enhanced Printer Driver mails a notice to users upon completion of their print job.

Overriding queue settings (systems other than Linux and Digital)

Occasionally, end users may want to use all but one or two settings for a queue, but they don't want to (or don't have permission to) create an entirely new queue. End users can override any queue setting from the command line using the override option for the `lp` or `lpr` program.

End-users can obtain a list of all queue options and their current settings for an Enhanced Printer Driver queue using the `dsports` program. See the `dsports` man page and "Overriding queue settings (Linux and Digital)" on page 60.

The following example prints the file, `file.ps`, to the queue `optra_n`, and overrides the queue settings so that paper is pulled from the manual envelope feeder rather than the current paper source. The command is:

```
lp -d optra_n -o paper_tray>manual_env file.ps
```

Note: The `lp` program on Linux and Digital does not support the override (`-o`) option.

Overriding queue settings (Linux and Digital)

You can override any queue setting from the command line using the override option for the `lpr` program.

The following example prints the file, `readme.ps`, to the queue `optra_c` and overrides the queue settings so that paper is pulled from the manual envelope feeder rather than the current paper source. The command is:

```
lpr -P optra_c -C lexopts:paper_tray>manual_env readme.ps
```

Displaying queue settings

You can display the current settings for an Enhanced Printer Driver queue using the `dsports` program. It is useful to display the settings for a queue when deciding which queue to send a print job to. You may want to use a paging program, such as `more` with `dsports`, since the output can be quite long.

For example, to display the settings for the Enhanced Printer Driver queue, `optra_n`, and page the output using `more`, type the following on the command line:

```
dsports -P optra_n | more
```

For more information, see the `dsports` man page.

Creating custom banner pages

You can write a custom banner page program that generates customized banner pages from your print queues. Creating custom banner pages doesn't automate any printer administration tasks, but it sure can make it easier to find your print jobs at the printer.

You can create custom banner pages for your queues by simply writing a program that takes six positional arguments and prints the banner page on the standard out (stdout). The six banner program arguments are:

- file
- user
- host
- queue
- message
- paper

All the arguments are strings, and should be enclosed in double quotes ("") if they contain spaces. The paper argument only accepts the values *letter*, *A4*, or *legal*.

The data output by your banner program should be readable by the selected printer emulation. For example, PCL banner programs should output valid PCL data.

To view MarkVision default PCL banner programs, see the directory:

```
/usr/markvision/etc/banners/banners-pcl
```

You can view most of the default banner programs in your favorite text editor.

Using your banner program

Once you've written your custom banner program, you need to configure your queues to use it. For each queue you want to use your custom banner program, perform the following steps with administrator authority:

- 1 Start chlexque.** On the command line, type:

```
chlexque
```
- 2 Click the queue you want to change.**
- 3 Click *language options*.** The available language options vary depending upon the printer emulations for the queue.
- 4 Click the emulation options button for the emulation, such as PCL, you want to use your custom banner.**
- 5 Click *Banner page options*.**
- 6 In the Banner file absolute path text box, type the full path to your custom banner program.**

Note: Your custom banner program must have executable permissions set. See the `chmod` man page for more information on setting permissions.
- 7 Double-click *Accept*.**
- 8 Click *Done*.**

Making A4 the default paper size

If you want to use A4 as the default paper size for a print queue, run the `pdadm` utility. Choose the first option: ***Install support for A4 paper size***. AIX users should use SMIT instead.

Customizing Printer Definition Databases (PDD)

Printer Definition Database (PDD) files contain information about options available on individual printers. Lexprt uses the PDDs to display printer configuration settings appropriate for the selected printer type. For example, Lexprt does not display color options for a monochrome printer.

Administrators can create PDD files that more closely match installed printer options at their site. Administrators can then compile the PDD text file into a binary format using the MarkVision digest compiler. Once compiled, the binary PDD is a valid printer type in Lexprt.

For more information on writing and compiling PDDs, refer to the `digest` and `pddadm` man pages.

Network printer devices

Some applications insist on printing to a real device in `/dev` such as `lp0`. This is impossible to do with network attached printers in a regular UNIX system. Enhanced Printer Drivers provide network devices for this situation.

Note: Do not confuse network devices with the virtual devices that Enhanced Printer Drivers provides for native UNIX print subsystem queues.

Because network printer devices are rarely needed, creating a virtual device and queue in the native UNIX print subsystem does not automatically create a network printer device. Use the procedures in the following sections to create network devices using a separate utility.

On AIX systems

1 Set the printer timeout period on the printer operator panel. Between 5 and 15 seconds is the recommended setting.

2 As root, type the following on the command line:

```
/usr/markvision/bin/add_net_device
```

You are prompted for a printer name, a printer IP address or hostname, a print server port, and a device name.

The `/etc/rc.tcpip` file is modified by `add_net_device`.

3 Restart your system to activate the network devices.

You can now print to these devices using a command such as:

```
cat filename > /dev/device
```

On all other systems

- 1** Copy the `/usr/markvision/etc/lexprinters` file to the `/etc` directory.
- 2** Edit the file. For example:

```
vi /etc/lexprinters
```

This file has one line entry per network device that has the following format:

```
# Device name IP/Hostname Printer name  
pubprt 192.168.10.111 Pub_printer  
laser1 netprt.pub.com Laser_printer_1
```

where *Device name* is the name of the device, *IP/Hostname* is the IP address or hostname of the printer, and *Printer name* is the name returned during printer intervention.

- 3** Restart your system to activate the network devices.

You can now print to these devices using a command such as:

```
cat filename > /dev/device
```

Transport programs

Enhanced Printer Drivers also provide utilities to deliver output directly to parallel, serial, or network-attached printers, thus bypassing the native UNIX print subsystem. Without defining a virtual device, queue, or network printer device, these utilities work for ad-hoc delivery to any printer on a network. Files sent directly to the transport agent are carried to the printer unchanged.

Transport agent programs vary depending on how the printer is connected to your workstation. For example, if your printer is connected to the parallel port, you would use the `cat_parallel` transport agent.

Printer connection	Transport agent
Parallel port	<code>cat_parallel</code>
Serial port	<code>cat_serial</code>
Network	<code>cat_network</code>

To manually send a file to a transport agent, simply use the `cat` program to pipe the file to the appropriate transport agent. For example, to send the file, `sock.ps`, to a parallel device `/dev/lp1`, the command is:

```
cat sock.ps | cat_parallel -d /dev/lp1
```

For more information, see the man pages for each transport agent.

Formatting jobs for network printer devices and transport programs

You can use the Enhanced Printer Drivers `formatter` program to select printing options before delivery. The `formatter` program starts by taking default options from an existing queue definition; you may then add any overriding options. For example, to print the file `report.ps`, using the default settings from the queue, `optra_s`, and then using an override option for duplexing and sending it to the printer at IP address `3.51.82.111`, use the following command:

```
formatter -q optra_s -f report.ps -p  
duplex=duplex_long_side | cat_network 3.51.82.111
```

For more information, see the `formatter` man page.

Troubleshooting

Chapter 4

Diagnosing problems

The following table lists some common Enhanced Printer Drivers problems and solutions.

Symptom	Solution
Enhanced Printer Drivers seems unable to find the network printer.	<ul style="list-style-type: none">• Make sure the printer is turned On (I) and is ready.• Make sure the LAN cable is plugged into both the print server and into the LAN and is working properly.• If you are using an internal print server:<ul style="list-style-type: none">- Make sure the print server is properly installed and enabled. To check, print a setup page for the printer. Refer to your print server documentation for instructions. The print server should appear in the list of attachments on the setup page.- If a network-related message appears on the operator panel, go to “Before calling technical support” on page 77.- Make sure TCP/IP on the print server is activated. The protocol must be active for the print server and Enhanced Printer Drivers to work. You can do this from the printer operator panel. See “Before calling technical support” on page 77 for instructions.

Symptom	Solution
<p>Enhanced Printer Drivers seems unable to find the network printer. (continued)</p>	<p>If you're using an external print server:</p> <ul style="list-style-type: none"> • Check the print server lights. Refer to your print server documentation for instructions. • Print a setup page from the print server. Refer to your print server documentation for instructions. • Make sure the SNMP community name you supplied to Enhanced Printer Drivers is the same as the one set in the print server. • PING the print server. <ul style="list-style-type: none"> - If PING works, check the IP address, netmask, and gateway to make sure they are correct. Turn printer off and PING again to check for duplicate IP addresses. - If PING does not work, check the setup page you printed to be sure IP is enabled. - If TCP/IP is enabled, check the IP address, netmask, and gateway to be sure they are correct. - Make sure bridges and routers are functioning correctly. - Make sure all the physical connections among the print server, the printer, and the network are working. • Turn the printer and print server off and back on. You should turn the printer back on first so that when you turn on the print server, it can determine whether the printer is enabled for NPA.
<p>Lexpmt and other print management programs are disabled on Solaris 2.6 and 2.7 Print Clients.</p>	<p>Solaris 2.6 and 2.7 Print Clients send print jobs to Solaris 2.6 and 7 Print Servers rather than process print jobs locally. Therefore, all print management must be performed on a Solaris 2.6 Print Server rather than on the Print Client.</p> <p>Enhanced Printer Drivers print management features are disabled on Solaris 2.6 and 7 Print Clients since the printing features that Enhanced Printer Drivers manages are located on the Print Server and do not exist locally on the Print Client.</p>

Symptom	Solution
<p>Jobs appear unsent to the specified printer.</p> <p>Jobs in the queue appear to wait for a long time.</p>	<p>The printer is probably busy receiving other jobs. If you are using a MarkNet print server, you may receive a Check the Printer message when this situation occurs.</p> <ol style="list-style-type: none"> 1 Use Enhanced Printer Drivers to check printer status. 2 Check the print queue status. 3 Check the printer to make sure it is working properly.
<p>The hostname does not resolve</p>	<p>Check your name server (DNS Server). Add the hostname to either NIS, DNS or /etc/hosts file.</p>
<p>Print jobs disappear from the print queue but have not printed.</p>	<p>The print job is probably in the buffer of the print server or printer. As soon as the printer is available, the job prints.</p> <ol style="list-style-type: none"> 1 Make sure you are sending print jobs to the correct printer address. 2 Use Enhanced Printer Drivers or lslexprt to check printer status. 3 Check the printer to make sure it is working properly.
<p>Status messages appear lost or delayed</p>	<p>The print job has been sent from the print queue to the printer. While printing the job, the printer has run out of paper or has a similar error. Someone else might have received the error message. Error messages are sent to the user whose job is being transferred to the printer. This user might not be the same person who submitted the job that caused the error.</p> <p>Use Enhanced Printer Drivers or lslexprt to check printer status.</p>

Symptom	Solution
<p>The printer is not receiving print jobs.</p> <p><i>or</i></p> <p>The print queue is down.</p>	<ol style="list-style-type: none"> 1 Make sure the printer is turned On (I) and is ready. 2 Make sure the LAN cable is plugged into both the print server and into the LAN and is working properly. 3 If you are using an internal print server: <ul style="list-style-type: none"> - Make sure the print server is properly installed and enabled. To check, print a setup page for the printer. Refer to your print server documentation for instructions. The print server should appear in the list of attachments on the setup page. - If a network-related message appears on the operator panel, go to “Before calling technical support” on page 77. - Make sure TCP/IP is activated on the print server. The protocol must be active for the print server and Enhanced Printer Drivers to work. You can do this from the printer operator panel. Refer to your print server documentation for instructions. 4 If you’re using an external print server: <ul style="list-style-type: none"> - Check the print server lights. Refer to your print server documentation for instructions. - Print a setup page from the print server. Refer to your print server documentation for instructions.

Symptom	Solution
<p>The printer is not receiving print jobs. <i>or</i> The print queue is down. (continued)</p>	<p>5 PING the print server.</p> <ul style="list-style-type: none"> - If PING works, check the IP address, netmask, and gateway to make sure they are correct. Turn printer off and PING again to check for duplicate IP addresses. - If PING does not work, check the setup page you printed to be sure IP is enabled. - If TCP/IP is enabled, check the IP address, netmask, and gateway to be sure they are correct. - Make sure bridges and routers are functioning correctly. - Make sure all the physical connections among the print server, the printer, and the network are working. <p>6 Use Enhanced Printer Drivers or lsexprt to see if the server can contact the printer.</p> <p>7 Compare the IP address of the print server to the address stored for the network printer in the name server or /etc/hosts file. If the addresses do not match, edit the /etc/hosts file or update the name server to correct the address.</p> <p>Print a setup page from the print server. For instructions on printing a setup page, refer to your print server documentation.</p> <p>If the page prints, then the connection between the print server and the printer is working correctly. If the page does not print, check all the physical connections.</p> <p>8 Make sure you bring the print queue back up after you correct the problem.</p>

Symptom	Solution
<p>Enhanced Printer Drivers fonts appear incorrect</p>	<p>On non-CDE systems, the MarkVision Client relies on the fonts in the MarkVision fonts package. Make sure you install the font package on the system with your X server or font server.</p> <p>Some systems require that you run a setup script after installing the package. The setup script is located in the fonts directory of your install location.</p> <p>See the Readme file located in the fonts directory in /usr/markvision/docs.</p>
<p>Enhanced Printer Drivers starts a graphical display from the AIX SMIT program that is running in character mode.</p>	<p>Before starting SMIT in character mode, make sure your DISPLAY variable is unset if you want Enhanced Printer Drivers to also start in character modes.</p>
<p>You have backspace problems in HP-UX</p>	<p>If you encounter backspace problems using the MarkVision character interface, try setting your TERM environment variable to ansi.</p> <p>For example, in the Korn and Bourne shells, type the following on the command line:</p> <pre>TERM=ansi export TERM</pre>
<p>You have problems viewing the Enhanced Printer Drivers man pages.</p>	<p>If you have trouble viewing the man pages for Enhanced Printer Drivers:</p> <ol style="list-style-type: none"> 1 Make sure your MANPATH environment variable is set to the manual page directory. 2 Rebuild the windex file. <pre>catman-w</pre>

Symptom	Solution
SCO system appears to hang when printing files located on a NFS filesystem.	See "Transport programs" on page 66.

Symptom	Solution
<p>Your terminal fills up with key binding messages or a malloc error occurs when you are trying to start a program using the Motif interface on a Sun system.</p>	<ul style="list-style-type: none"> • Make sure the OPENWINHOME environment variable is set. To check, type the following on the command line: <pre>env grep OPENWINHOME</pre> • If you get no response, you must set the OPENWINHOME environment variable to the openwin directory. For example, in the Korn and Bourne shells if your openwin directory is /usr/openwin, type the following on the command line: <pre>OPENWINHOME=/usr/openwin export OPENWINHOME</pre> • Make sure the LD_LIBRARY_PATH environment variable contains the /usr/openwin/lib and /usr/lib directories. To check, type the following on the command line: <pre>env grep LD_LIBRARY_PATH</pre> • If your OPENWINHOME environment variable is set to a location other than /usr/openwin, make sure the lib subdirectory of the OPENWINHOME directory is included in the LD_LIBRARY_PATH environment variable. <p>To add another value to the path (for example, \$OPENWINHOME/lib) in the Korn and Bourne shells, type the following on the command line:</p> <pre>LD_LIBRARY_PATH=\$LD_LIBRARY_PATH:\$OPENWINHOME/lib export LD_LIBRARY_PATH</pre> • Make sure your XKeysymDB is correct. You may need to append your system XKeysymDB file with the /usr/markvision/etc/XKeysymDB file. For example, if your system XKeysymDB file is located in the directory /usr/openwin/lib/X11, the command is: <pre>cat /usr/markvision/etc/XKeysymDB >> /usr/openwin/lib/X11/XKeysymDB</pre>

Symptom	Solution
<p>You receive prompts to add X libraries when trying to run Enhanced Printer Drivers programs from the command line on systems without X libraries</p>	<ul style="list-style-type: none"> • Install the X libraries • Link the program to the character version of the program rather than the graphical version. For example, if you want to relink the mklexdev program to always use the character interface, type the following on the command line with root user authority: <ol style="list-style-type: none"> 1 Go to the Enhanced Printer Drivers programs directory. <code>cd /usr/markvision/bin</code> 2 Rename the program with a .bak extension. <code>mv mklexdev mklexdev.bak</code> 3 Create a new link to the binary for the character interface. <code>ln -s markvision.Char mklexdev</code> 4 Repeat for each program displaying the error.

Before calling technical support

Read “Diagnosing problems” on page 68 for help with diagnosing problems. If you encounter a problem that requires technical support, you should determine the print server firmware level and the version of Enhanced Printer Drivers *before* you call for service.

To determine the print server firmware level, type the following command on the command line, and then press Enter:

```
finger info@hostname
```

Additional information

Each feature described in this chapter is also explained in a man page. To view a man page, type `man` on the command line followed by the feature name, then press Enter. For example, to view the Enhanced Printer Drivers man page, type the following on the command line:

```
man lexprt
```

Enhanced Printer Drivers also contains online help and Readme files. The Readme files are located in `/usr/markvision/docs`.

If you need more information about print servers or particular printer models, refer to your print server or printer documentation.

Setting IP parameters using DHCP

Appendix A

These instructions do not apply to the MarkNet XL or MarkNet XLe print servers. They apply *only* to the MarkNet S, MarkNet Pro, MarkNet N2000, and MarkNet X2000 print servers.

You can set the IP address, netmask, gateway, hostname, and WINS server using a Dynamic Host Configuration Protocol (DHCP) server. The DHCP server or a forwarding agent must be attached to the same IP subnet as the print server. Make sure the DHCP server has a scope defined for the subnet.

Ensure that the DHCP server provides the following options:

001	Netmask for IP subnet
003	Router IP address (such as 9.10.8.250)
044	WINS/NBNS server IP address of WINS server

If you are using a WINS server, use telnet to set the print server hostname.

Verifying print server configuration

Appendix B

Checking print server configurations

Use the following checklist to verify that the print server is configured properly:

- Is the print server running TCP/IP?** To check, print a setup page. For more information, consult your print server documentation.
- Is the print server configured for the correct network speed (Token-Ring 4 MBps or 16 MBps, Ethernet 10 Mbps or 100 Mbps)?** Consult your print server documentation for the correct speeds.
- Are the IP address, netmask and gateway set?** See “Setting print server configuration” on page 81.
- Have you set the printer hostname in the /etc/hosts file, in the NIS tables, or on the name server?**

Checking print server connections

If there is a problem connecting to your print server, use the following checklists to verify print server connections:

For internal network print servers

- Is the print server installed in the printer?** Instructions for installing the print server are shipped with the printer.
- Is the printer physically connected to the LAN with the appropriate Ethernet or Token-Ring cable?**

Refer to your printer documentation if you need more information.

For external network print servers

- Is the print server physically connected to the LAN with the appropriate Ethernet or Token-Ring cable?**
- Is the network switch on the print server set correctly for use with either a thin (10Base2) or twisted pair (10BaseT) cable?**
- Is the printer properly connected to the print server?**

Refer to your print server documentation for more information.

Setting print server configuration

If you haven't already set the IP address, netmask, and gateway for the print server, do that now. There are many ways to set this information.

- **If you are using an internal network print server, the simplest way to set the information is from the printer operator panel.** For help, refer to your print server documentation.
- **If you are using an external network print server, you can use telnet and either the Address Resolution Protocol (ARP) or the Reverse Address Resolution Protocol (RARP) to set this information.** For help, refer to your print server documentation.

Using utilities on the command line

Appendix C

Enhanced Printer Drivers are a collection of specialized utilities. Administrators can run each one directly from the command line or in a shell script.

Performing an Enhanced Printer Driver feature from the command line is often quicker than using one of the interactive interfaces.

To obtain detailed information about each feature and its command line options, refer to the man pages for the particular feature. For example, to view the man page for `lexprt`, type:

```
man lexprt
```

Note: Not all features are available on all operating systems.

Command	Function
<code>cat_network</code>	Sends data to a TCP/IP network printer.
<code>cat_parallel</code>	Sends data to a printer connected to the parallel port of a workstation.
<code>cat_serial</code>	Sends data to a printer connected to the serial port of a workstation.
<code>catlexbe</code>	Sends data to a TCP/IP network printer on AIX systems.
<code>chlexdev</code>	Changes virtual device settings.
<code>chlexque</code>	Changes print queue settings.
<code>digest</code>	Compiles the printer and device definition data.
<code>dspopts</code>	Displays queue settings.

Command	Function
<code>formatter</code>	Formats print jobs for printing according to queue settings.
<code>lexprt</code>	Opens a menu for other utilities or provide a fast path to SMIT (AIX).
<code>lslexdev</code>	Displays virtual device settings.
<code>lslexque</code>	Displays print queue settings.
<code>mklexdev</code>	Creates a virtual device.
<code>mklexque</code>	Creates a print queue.
<code>npsearch</code>	Finds network printers on a TCP/IP network.
<code>pddadm</code>	Administers the Printer Definition Databases (PDDs).
<code>rmlexdev</code>	Removes an existing virtual device.
<code>rmlexque</code>	Removes an existing print queue.
<code>transport</code>	Generates command-line arguments for other MarkVision transport agents, such as <code>cat_npa</code> .

Note: Not all features are available on all operating systems.

Glossary

A

AIX. IBM's version of the UNIX operating system.

B

bits per second (bps). The speed at which a character can be transmitted.

bps. See *bits per second*.

C

catlexbe. A MarkVision command line program that sends data to a TCP/IP network printer on AIX systems.

cat_network. A MarkVision command line program that sends data to a TCP/IP network printer.

cat_parallel. A MarkVision command line program that sends data to a printer connected to a parallel port.

cat_serial. A MarkVision command line program that sends data to a printer connected to a serial port.

CDE. See *Common Desktop Environment*.

chlexdev. A MarkVision command line program that changes virtual device settings.

chlexque. A MarkVision command line program that changes the print queue settings.

Common Desktop Environment (CDE). A desktop environment for the X Window System available on UNIX systems, such as AIX; DEC UNIX; HP-UX and Solaris.

Compaq Tru64 UNIX (Digital UNIX). Digital Equipment Corporation's (DEC) version of the

UNIX operating system recently purchased by the Compaq Corporation.

D

digest. A MarkVision command line program that compiles the printer and device definition data.

Digital UNIX (Compaq Tru64 UNIX). Digital Equipment Corporation's (DEC) version of the UNIX operating system recently purchased by the Compaq Corporation.

DNS. See *Domain Name System*.

domain. A division within a large network using DNS.

Domain Name System (DNS). Resolves IP addresses to hostnames.

dsports. A MarkVision command that displays print queue settings.

E

Enhanced Printer Drivers A set of utilities that runs on a UNIX workstation, and works with the MarkVision Server to let you monitor and control printers on the network.

Ethernet. A type of network that can use multiple cabling systems, including 10BaseT (*Thicknet*), 100BaseT, 10Base2 (*Thinnet*), and 10Base5 (*AUI*). Ethernet uses 10Mbps and 100Mbps data transfer rates.

external print server. Hardware used to connect printers to a LAN using either a Token-Ring or Ethernet cable (for example, the MarkNet XLe print server).

F

File Transfer Protocol (FTP). A TCP/IP protocol that transfers files from one computer to another. It is usually implemented in application programs. This is considered a better way to send files than Trivial File Transfer Protocol (TFTP) because it uses TCP rather than UDP.

finger. A TCP command that normally displays user information on a host computer.

firmware. Software that resides in the print server; also called microcode.

firmware level. The revision of the firmware.

formatter. A MarkVision command line program that formats print jobs for printing according to queue settings.

FTP. See *file transfer protocol*.

G

gateway. The connection device between the LAN and other equipment such as computers.

H

hardware address. The unique identification number on each print server that identifies it to the network.

hostname. Name used to identify a network printer or computer.

I

internal print server. A card installed inside a printer to connect the printer to the LAN (for example, the MarkNet S print server).

Internet Protocol (IP). A standard protocol that specifies how packets are passed through networks. It identifies the format of the packet and describes how it should be delivered in a seamless manner.

Although it is a separate protocol from TCP, it is often referred to as **TCP/IP** because both **TCP** and **IP** protocols are often used together.

IP. See *Internet Protocol*.

IP address. Number that identifies a network printer.

L

LAA. See *locally administered address*.

LAN. See *local area network*.

LAN segment. Any portion of a LAN that operates independently of, but is connected to, the network by bridges or routers.

lexprt. A MarkVision program that opens a menu for other utilities or provides a fast path to SMIT (AIX).

local area network (LAN). A computer network located on a user's premises within a limited geographical area.

locally administered address (LAA). An address that a network administrator assigns to a network print server on the LAN.

lslexdev. A MarkVision command line program that displays virtual device settings.

lslexque. A MarkVision command line program that displays print queue settings.

M

MarkNet print servers. An internal or external network print server.

Mbps (megabits per second). One million bits per second used as rate of data transfer speed.

microcode. See *firmware*.

mklexdev. A MarkVision command line program that creates a virtual device.

mklexque. A MarkVision command line program that creates a print queue.

N

name server. A DNS server that resolves hostnames to addresses.

netmask. A bit mask that specifies the local network portion of an IP address, allowing you to logically subdivide a network.

network print server. The print server card installed in the printer.

network address. The logical location on the LAN where a device such as a printer is located, typically 12 characters long.

Network File System (NFS). A UNIX networking system that lets administrators export, or share, filesystems for other workstations on the network to mount.

Network Information System (NIS). A UNIX service that lets administrators configure users, groups, hostnames, and other network information for a group of systems, rather than on each individual system.

network printer. A printer with either an internal print server or an external print server connecting it to the LAN.

NFS. See *Network File System*.

nickname. A name that a network administrator gives to the network card. It can have various uses, one of which is to identify the location of the printer.

NIS. See *Network Information System (NIS)*.

NIS tables. Configuration tables. See *Network Information System (NIS)*.

P

Packet InterNet Groper (PING). Software that tests whether an IP destination can be reached by sending it an ICMP echo request and waiting for a reply.

pddadm. A MarkVision command line program that administers the Printer Definition Databases.

PING. See *Packet InterNet Groper*.

pkgrm. The System V software package removal utility.

printq group. An AIX group authority. Members typically have authority to perform functions such as setting up printers, making print queues, and deleting printers.

print queue. The place in the server where print jobs are stored for printing.

print server. Hardware or software (or a combination of hardware and software, such as network printer print servers) that takes information from a print queue and sends it to a printer. See *internal print server* and *external print server*.

protocol. A set of rules governing the communication and the transfer of data between two or more devices in a communication system.

R

RARP. See *Reverse Address Resolution Protocol*.

Reverse Address Resolution Protocol (RARP). A protocol that resolves hardware addresses to IP addresses.

rmfn. The software removal program on HP-UX 9 systems.

rmlexdev. A MarkVision command line program that removes an existing virtual device.

rmlexque. A MarkVision command line program that removes an existing print queue.

S

sam. The system administration utility on HP-UX 10 systems.

server. A device that allows people using LAN workstations to share resources such as printers and plotters on the network.

shell. A program that provides an interface between the user and the operating system kernel. Some common UNIX shells are the Bourne shell (sh), the Korn shell (ksh), and the C shell (csh).

shell script. A collection of shell commands stored in a file as a batch program.

SMIT. See *System Management Interface Tool*.

swmgr. The software management on Silicon Graphics systems.

System Management Interface Tool (SMIT). The administration tool used on the AIX operating system.

T

TCP/IP. (Transmission Control Protocol/Internet Protocol). A network protocol used to connect workstations and hosts, commonly used in UNIX environments.

TFTP. See *Trivial File Transfer Protocol*.

Token-Ring. A network with a ring topology that passes a token from print server to print server and conforms to the IEEE 802.5 standard.

transport. A MarkVision command line program that generates command-line arguments for other MarkVision transport agents, such as `cat_npa`.

Trivial File Transfer Protocol (TFTP). A TCP/IP protocol that transfers files using UDP.

U

UAA. See *universally administered address*.

UDP. See *User Datagram Protocol*.

universally administered address (UAA). The factory-set default address of a print server. The UAA cannot be changed. Network administrators may choose to set a locally administered address (LAA) for the print server so that its address is more meaningful in their workplace.

User Datagram Protocol (UDP). The protocol that allows one computer to send a datagram (unit of data) to another. It uses the **IP protocol** to deliver datagrams. UDP datagrams include a protocol port number so that the sending computer can differentiate among several destinations on the remote computer. UDP uses less overhead than TCP, but cannot guarantee packet delivery.

V

virtual device. Virtual devices contain information about the printer the virtual device represents. MarkVision queues use the information from the virtual device to properly prepare data for

the printer and transport the data to the printer. Virtual devices, however, are not system devices located in the /dev directory, and other applications cannot send information to a printer using a virtual device.

X

X client. A program that runs using the X Window System.

X server. A program that handles displaying graphical X client output on a display as well as distributing input from input devices to X clients.

X Window System. The X Window System is a window system capable of displaying programs over a network. X Window System servers run on workstations connected to a monitor. The X server handles transferring input from keyboards and mouse devices to the X Window System program, called an X client. The X server also accepts output from X clients and displays the graphics on the monitor.

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