VXT Software

On SCO ODT Systems

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VXT Software
On SCO ODT Systems

January, 1994

This section describes VXT software installation and system management tasks on the SCO ODT operating system.

Internet Address for Reader Comments

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Operating System & Version: SCO ODT Version 1.1
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Digital Equipment Corporation
Maynard, Massachusetts

Related Documents

For information on...	Refer to...
SCO ODT systems	*Open Desktop Administrators Guide*
VXT software and VXT 2000 windowing terminals	*VXT Software Version 2.1 Release Notes*
	VXT 2000+/VXT 2000 Windowing Terminal Installing and Getting Started
	VXT 2000+/VXT 2000 Windowing Terminal User Information
	VXT 2000+/VXT 2000 Windowing Terminal Release Notes

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1

Installing VXT Software on an SCO ODT System

This chapter provides instructions for installing VXT software on computers that are running the SCO ODT operating system. Read the chapter before starting the installation procedure.

1.1 Preparing for the Installation

This section discusses the preparations and requirements for installing VXT software on an SCO ODT system.

Your bill of materials (BOM) specifies the number and contents of your media. Be sure to verify the contents of your kit with this information. If you find missing or damaged parts in your kit, contact your local Digital representative.

Checking the Media Software Distribution Kit

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

The kit includes this installation guide and one of the following:

- A QIC 24 tape cartridge, labeled VXT Software V2.1, for systems with QIC 24 tape drives
- A 9-track magnetic tape (MT9), labeled VXT Software V2.1, for systems with magnetic tape drives

Using the Release Notes

The software kit provides release notes. The documentation kit also provides a hardcopy of the release notes. Digital strongly recommends that you read the release notes before proceeding with the installation.

Operating Environment

VXT Version 2.1 software requires SCO ODT Version 1.1 or later software.

1.2 Installation Procedure Requirements

This section includes VXT software installation requirements.

Installation Time

The installation takes 20 to 30 minutes, depending on the type of media and your system configuration. Loading fonts generally requires the most time for installation.

Privileges Needed for Installation

You must log in as a superuser on the system where you are installing the software.

1.2.1 Prerequisite Hardware

To perform the installation you need the following hardware:

- Software distribution device (if installing from media)

  You need a distribution device that corresponds with the software distribution media. For example, if you have a QIC 24 tape software kit, you need a QIC 24 tape drive. You must know how to load the media supplied with the software distribution kit on the appropriate drive. The documentation for the tape or disk drive that you are using explains how to load the media.

- Terminal or console workstation

  You can use a video terminal, hardcopy terminal, or terminal emulator running on a workstation to communicate with the operating system and respond to prompts from the installation procedure for the software.

1.2.2 Prerequisite Software

Table 1–1 describes the prerequisite software you must use with VXT software.

Table 1–1 Prerequisite Software—UNIX Systems

Prerequisite Products	Purpose
SCO ODT Version 1.1 or later	Provides base system and installation support.
C compiler and SCO ODT program development kit	Required for some of the header files and subsets.

Your system must be running SCO ODT Version 1.1 or later before you try to install VXT Version 2.1 software, or the installation will fail. See your system's documentation for instructions on how to install SCO ODT Version 1.1 software.

1.2.3 Determining Which Subsets to Load

Use Table 1–2 to choose the software subsets you want to load:

Table 1–2 VXT Software Subsets—SCO ODT Systems

Subset	Description	Recommendation
System images	The load images for supporting network booting by host terminals.	Install on a system designated to provide network booting support (BOOTP) for host terminals.
BOOTP daemon	A BOOTP daemon to provide network service using BOOTP/TFTP.	Install on a system designated to provide network booting (BOOTP) support for host terminals. Do not install on a host system that provides a BOOTP daemon. BOOTP daemons can have different formats for their configuration files.
Application launcher	A mechanism that lets terminal users display remote X applications. The launcher supports an `rexec` function used with the `f.exec` function in the local window manager.	Install on any system that needs to support remote X applications.
Printer support utilities	Utilities that support printing from a host to the terminal's attached printer, using the TCP /IP network transport for communication.	Install on any system that wants to use the TCP/IP transport to send printing jobs to a terminal's attached printer.
X font utilities	A BDF-to-PCF font compiler and supporting tools to compile custom fonts and man pages for these utilities. The `xbdfdump` utility retrieves BDF files from any X server.	Install on any system that needs to compile BDF fonts for use by the terminal. (You must have X developers' .h files.) See Chapter 2 for information on using these utilities.
Compiled fonts	Compiled DECwindows and MIT fonts (merged set of all unique fonts). The subset allows you to select 75 dots/in., 100 dots/in., and miscellaneous fonts.	Install on a system designated to provide compiled fonts for terminals and systems that do not already have these fonts.

Notes on Installing Fonts

- If your system already has some or all of the compiled fonts, make sure they are the correct resolution required by the terminal. If not, you need to install the font subsets. Even if you have the compiled fonts, you may want to install the X font utilities supplied in the VXT kit, which make compiling and installing fonts easier.
- If you are installing the compiled fonts provided, they must be installed into a new or empty directory. If you are upgrading from an earlier VXT software version, use the `rm-vxt-kit` script supplied with the earlier version to remove the previous installation files.

1.2.4 Determining Which Images to Install

Use Table 1–3 to select the images you want to install.

Table 1–3 VXT System Images

File	Description	Features, Uses, and Memory Requirements
vxt	VXT software	**Features:** • All VXT software features • VXT local clients • X image extension (XIE) **Uses:** • All VXT 2000 windowing terminals (color, gray scale, and monochrome) **Terminal memory requirements (minimum):** • 10 MB
vxtex	VXT EX software	**Features:** • Clientless version of VXT software • Simple user interface for making X connections to hosts **Uses:** • All VXT 2000 windowing terminals (color, gray scale, and monochrome) **Terminal memory requirements:** • 4 MB
vxtldr	VXT loader	**Features:** • Loads server-based terminals from an InfoServer system. • Installed as one file, but available under two names (vxtldr and vxtldr1). **Uses:** Not needed, unless you are loading terminals from an InfoServer system on a different Ethernet segment. In this case, install the VXT loader on a host in the same segment as the terminals.

1.2.5 Determining Disk Space Requirements

This section describes the disk space requirements for the disks that you load the software subsets on.

Table 1–4 lists the disk space requirements for loading the software subsets on SCO ODT software for SCO ODT computer systems. The table specifies disk space requirements by subset.

Table 1–4 Worksheet for Subset Sizes on SCO ODT Systems

Subset Name	Transient Size (K bytes/Blocks)	Installed Size (K bytes/Blocks)
VXT software images		
VXT software	6,200/12,400	5,100/10,200
VXT EX software	2,400/ 4,800	1,200/ 2,400
VXT loader	800/ 1,600	400/ 800
Application launcher	700/ 1,400	350/ 700
VXT printer support utilities	400/ 800	200/ 400
X font utilities	1,200/ 2,400	600/ 1,200
Compiled fonts		
75 dots/in	10,120/20,240	5,060/10,120
100 dots/in	19,000/38,000	9,500/19,000
Miscellaneous	12,000/24,000	6,000/12,000
Individual totals:	~52,720/~105,440	~28,060/~56,120

Transient Space

The transient space must be available in the file system containing the installation's working directory. The installed space must be available where the product will reside. These locations might be distributed across multiple file systems.

Add Up Subsets

Using Table 1–4, add up the total values for the subsets you plan to load in each file system. Use this sum to determine the disk space requirement for your installation.

Compare the space required for the subsets with the free space currently on the file systems where the software files will reside.

Determine Free Space

To determine the current amount of free space for a directory path, log in to the system where you plan to install the software and enter the `df` command. For example:

```
% df -v Return
Mount  Dir  Filesystem        blocks      used     free   %used
/           /dev/root         413676     406344    7332    98%
/u          /dev/u             65536       5414   60122     8%
```

A file system must have enough free space to meet the space requirements.

If you have insufficient disk space, you can perform an NFS mount from a server that has sufficient space. For example:

```
% su
# mount -t nfs server:/usr/free_disk /usr/tftpboot
```

Table 1–5 shows the default locations for each subset.

Table 1–5 Default Locations of Individual Subsets—SCO ODT Systems

Subset Name	Default Location
VXT software images	/usr/tftpboot/vxt/images
VXT BOOTP daemon	/etc/bootpd
VXT application launcher	Images and scripts in /usr/local/bin Man pages in /usr/local/man/man1
VXT printer support utilities	Images and scripts /usr/local/bin Documents in /usr/tftpboot/vxt Man pages in /usr/local/man/man1
X font utilities	Images and scripts in /usr/local/bin Man pages in /usr/local/man/man1
Compiled fonts	/usr/tftpboot/vxt/fonts/75dpi /usr/tftpboot/vxt/fonts/100dpi /usr/tftpboot/vxt/fonts/misc

1.2.6 Backing Up Your System Disk

Digital recommends that you back up your system disk before installing any software. Use the backup procedures established at your site.

1.3 Starting the Installation

This section provides step-by-step instructions for installing VXT software on an SCO ODT system.

The installation procedure consists of a series of questions requiring user responses, as well as informational messages. See Section 1.5 for a sample installation session.

To end the installation procedure at any time, press Ctrl C. When you press Ctrl C, the installation procedure saves the files it has already installed, deletes working directories, and exits the process.

Appendix B lists the possible files and directories created during the installation. After your complete the installation, you can check the install.flist file for the list of files actually installed.

There are three ways to start the VXT software installation:

- From a QIC 24 tape or 9-track magnetic tape on a local drive
- From a tar file on a local disk drive
- From a tar file on a remote disk drive, using TCP/IP

The following sections describe each method. In each case, the installation procedure loads the software files onto a disk that belongs to the system you are performing the installation for.

1.3.1 Installing from Local QIC 24 Tape or Magnetic Tape Distribution Media

To start the installation:

1. Mount the media on the appropriate tape drive. Use a non-rewinding tape device for the installation. For example: `/dev/nrct0`.
2. Log in as a superuser (login name root) on the system that you are installing the software on.
3. Choose a convenient empty work directory from which to do the installation. Use the `cd` command to move to that directory. If you do not have an empty work directory, you might choose to create a new directory. Make sure there is sufficient transient work space.

   For example:

   ```
   # mkdir /usr/vxt/      #this may already exist
   # mkdir /usr/vxt/kit   #this may already exist
   # cd /usr/vxt/kit
   ```

4. Use the `tar` command to access the kit media in a local tape drive:

   ```
   # tar -xf /dev/nrct0
   ```

   /dev/nrct0 is the device name of the source drive that holds the distribution tape. The device name might be different on your system. To determine the name, check the `/etc/default/tar` or `/etc/default/tape` file.

5. Execute the shell script with the Bourne shell command `sh`, specifying how to access the installation kit:

   ```
   # sh install.sh /dev/nrct0
   ```

To continue the installation, go to Section 1.4.

1.3.2 Installing from Local tar Files

VXT Version 2.1 software uses two `tar` files. Previous versions used one file. You may need to extract the two `tar` files from the media to files, to allow electronic access by another system.

1. Log in as a superuser (login name root) on the system that you are installing the software on.
2. Choose a convenient empty work directory from which to do the installation. Use the `cd` command to move to that directory. If you do not have an empty work directory, you might choose to create a new directory. Make sure there is sufficient transient work space.

   For example:

   ```
   # mkdir /usr/vxt         #this may already exist
   # mkdir /usr/vxt/kit     #this may already exist
   # cd /usr/vxt/kit
   ```

3. Use the following two dd commands to extract the two tar files. In this example, the media device is nrct0:

```
# dd if=/dev/nrct0 of=/usr/vxt/VXT-2.1.tar1 ibs=10k
# dd if=/dev/nrct0 of=/usr/vxt/VXT-2.1.tar2 ibs=10k
```

VXT-2.1.tar1 is the first extracted file and contains the installation scripts.

VXT-2.1.tar2 is the second extracted file and contains the files to be installed.

You can specify different file names if desired.

To start the installation:

4. Use the tar command to access the first local tar file, which contains the installation script:

```
# tar -xf /usr/vxt/VXT-2.1.tar1
```

5. Execute the shell script with the Bourne shell command sh, specifying how to access the installation kit in the second local tar file:

```
# sh install.sh /usr/vxt/VXT-2.1.tar2
```

To continue the installation, go to Section 1.4.

1.3.3 Installing from Remote tar Files, Using TCP/IP

VXT Version 2.1 software uses two tar files.You may need to extract the two tar files from the media to files, to allow electronic access by another system.

Use the following two dd commands to extract the two tar files. In this example, the media device is nrct0:

```
# dd if=/dev/nrct0 of=/usr/vxt/VXT-2.1.tar1 ibs=10k
# dd if=/dev/nrct0 of=/usr/vxt/VXT-2.1.tar2 ibs=10k
```

VXT-2.1.tar1 is the first extracted file and contains the installation scripts.

VXT-2.1.tar2 is the second extracted file and contains the files to be installed.

You can specify different file names if desired.

To start the installation:

1. Log in as a superuser (login name root) on the system that you are installing the software on.
2. Choose a convenient empty work directory from which to do the installation. Use the cd command to move to that directory. If you do not have an empty work directory, you might choose to create a new directory. Make sure there is sufficient transient work space.

   For example:

```
# mkdir /usr/vxt/kit
# cd /usr/vxt/kit
```

3. Use the rcmd command to access the first remote tar file, which contains the installation script:

   ```
   # rcmd ip_nodename cat /usr/vxt/VXT-2.1.tar1 | tar -xf -
   ```

   ip_nodename is the name of the remote node where the tar file is retrieved.

   To use the rcmd command, you need appropriate access to the remote machine.

4. Execute the shell script with the Bourne shell command sh, specifying how to access the installation kit in the second tar file:

   ```
   # sh install.sh rcmd ip_nodename cat /usr/vxt/VXT-2.1.tar2
   ```

To continue the installation, go to Section 1.4.

1.4 Responding to Script Prompts

After you enter the sh install.sh command for local or remote (node-specific) installations, the installation script begins. See the sample installation script (Section 1.5).

- Choose the SCO ODT operating environment.
- Choose the subsets that you want to load.
- Respond to the questions for each selected subset.

At each point, you have the option to exit the installation.

After you answer all questions, the script performs the installation. You do not have to be present while the installation is in progress.

1.4.1 Error Recovery

If errors occur during the installation, the system displays failure messages. Errors can occur during the installation if any of the following conditions exist:

- Incorrect operating system version
- Incorrect version of prerequisite software
- Incorrect or missing .h or C compiler files for font utilities, bootpd, and printer utilities
- Insufficient superuser privileges for a successful installation
- Insufficient quotas for a successful installation
- Insufficient disk space
- Device used was a rewinding device
- Incorrect file accessed using install.sh (VXT-2.1.tar1 script was accessed instead of VXT2.1.tar2 kit.)

For descriptions of error messages generated by these conditions, see the SCO ODT system documentation on system messages, recovery procedures, and SCO ODT software installation. If you are notified that any of these conditions exist, you should take the

appropriate action described in the message. For information on installation requirements, see Section 1.2.2.

See Appendix C for descriptions of subset error messages, user error messages, and other generic error messages.

1.4.2 Installation Procedure Is Complete

See Chapter 2 for startup requirements, procedures, and system management tasks.

After the installation, the following seven relevant files are in your working directory:

File	Description
install.flist	The list of all files installed on your system as part of the VXT software installation.
install.log	the installation log file.
rm-vxt-kit	A script that lets you remove VXT software from your system. This is useful for removing the files for *this version* when you next upgrade VXT software. Move this script to a safe place for possible future use.
RelNotes.txt	VXT Version 2.1 release notes in text format.
vxtivp	Installation verification procedure
vxtpostinstall	Postinstallation checklist
isrd	Utility used by `vxtivp`

1.4.3 Determining and Reporting Problems

Software Errors

If you encounter a problem while using VXT software, report> Digital. Depending on the nature of the problem and the type of support you have, you can take one of the following actions:

- Call Digital if your software contract or warranty agreement entitles you to telephone support.
- Submit a Software Performance Report (SPR).

Documentation Errors

If you find an error in the VXT documentation, fill out and submit the Reader's Comments form at the back of the document. Please include the section and page number where the error occurred.

You can also send your comments by electronic mail to the Internet address listed on the title page and Reader's Comments form.

1.5 Sample Installation Session for SCO ODT Systems

This section contains a sample installation from a local file, including all options.

```
% su Return
Password:
# cd /usr/vxt/kit  Return
# tar -xf /usr/vxt/VXT-2.1.tar1 Return
# sh install.sh  /usr/vxt/VXT-2.1.tar2     Return

(c) Digital Equipment Corporation  1992, 1993
DIGITAL VXT Software, Version 2.1

This is the installation script for the
        DIGITAL VXT Software
        Version V2.1
installation kit. The kit contains several subsets.  You can choose which
subsets you want to install.  Each selected subset is
extracted into a temporary work area in the current working directory
before final installation.  Unless you request otherwise, all work
areas will be removed after the product is installed.

The installation occurs in two stages.  In the first stage, you answer questions
on images and subsets.  The second stage performs the actual installation
of the system images and subsets that you select. You do not need to be
present during the second stage.

This script refers you to sections of the VXT Software Version 2.1 Installation
and System Management manual for more information on some topics.

Please answer all questions.  Default answers are
displayed in square brackets ([]).  Press Return to choose the default answer.
For yes/no answers enter y or n.


Select your system environment or exit the installation.

        0.  Exit without completing installation
        1.  Digital ULTRIX
        2.  SunOS
        3.  Hewlett-Packard HP-UX
        4.  IBM AIX
        5.  SCO ODT
        6.  DEC OSF/1 AXP

Which environment are you using [5]? : Return

environment is: SCO ODT
is this correct [y]? :    Return

installing in the SCO ODT environment

Select the subsets to install or exit the installation.

If you select subset 2, 3, 4, or the font compiler utilities
in 5, you need a C compiler and program development header files
on your host system.

If you specify more than one number, separate each number with a
space or a comma.
```

```
        0.  Exit without installing subsets
        1.  VXT Software Images
        2.  VXT BOOTP Daemon
        3.  VXT Host Application Launcher
        4.  VXT Printer Support Utilities
        5.  X Font Utilities (font compiler, etc.)
        6.  Compiled Fonts
        7.  Converting Sun Fonts for the VXT

You do not need to install the Compiled Fonts if you have already installed
them from a VXT Version 2.0 kit.

Which subsets do you want to install [1 2 3 4 5 6]? : Return

selecting subsets: images bootpd app-launch vxtlpd font-utils fonts
is this correct [y]? : Return

selected subsets: images bootpd app-launch vxtlpd font-utils fonts

Now you will answer questions for the subsets you have chosen.

This is the installation script for the
        VXT Software Load Images
installation kit.  You can select which VXT images to install, and
you have the option to specify where you would like the images installed.

See Table 1-3 in the Installing VXT Software on a DEC OSF/1 AXP System chapter
for a description of the images.

Select the VXT images to install or exit the installation.

        0.   Exit without completing installation
        1.   VXT loader
        2.   VXT
        3.   VXT EX

Install the VXT loader on this system only if you want to support
terminals in server-based mode from an InfoServer on another Ethernet
segment.

Which images do you want to install [2 3]? : Return

selecting subsets: VXT VXT_EX
is this correct [y]? : Return

selected subsets: VXT VXT_EX

Where do you want to install the VXT Software Load images?
Enter the absolute pathname of the destination
directory or enter 'q' to quit this subset
[/usr/tftpboot/vxt/images]? :  Return

not a directory: /usr/tftpboot/vxt/images
do you want to create it [y]? : Return

created: /usr/tftpboot/vxt/images

Where do you want to install the VXT Configuration File Template?
Enter the absolute pathname of the destination
directory or enter 'q' to quit this subset
[/usr/tftpboot/vxt/config]? :  Return

not a directory: /usr/tftpboot/vxt/config
do you want to create it [y]? : Return

created: /usr/tftpboot/vxt/config
```

```
This is the installation script for the
        VXT BOOTP Daemon
installation kit.  You can specify where to install the bootpd daemon.

Where do you want to install the VXT BOOTP Daemon:
Enter the absolute pathname of the destination
directory or enter 'q' to quit this subset
[/usr/local/etc]?:  Return

not a directory: /usr/local/etc
do you want to create it [y]? :  Return

created: /usr/local/etc

This is the installation script for the
        Application Launcher installation kit.  You can
specify where to install the Application Launcher image and man pages.
See the System Management Overview and System Management Tasks chapters
for more information on Application Launcher.

Where do you want to install the Application Launcher image?
Enter the absolute pathname of the destination
directory or enter 'q' to quit this subset
[/usr/local/bin]? :  Return

not a directory: /usr/local/bin
do you want to create it [y]? :  Return

created: /usr/local/bin

Where do you want to install the Application Launcher man pages?
Enter the absolute pathname of the destination
directory or enter 'q' to quit this subset
directory [/usr/local/man/man1]? :  Return

not a directory: /usr/local/man/man1
do you want to create it [y]? :  Return

created: /usr/local/man/man1

This is the installation script for the
        VXT Printer Support Utilities
installation kit. You can specify where to install the
VXT Printer Support Utilities images and man pages.

Where do you want to install the VXT Printer Support Utilities documents?
Enter the absolute pathname of the destination
directory or enter 'q' to quit this subset
[/usr/tftpboot/vxt]? :  Return

destination directory: /usr/tftpboot/vxt
is this correct [y]? :  Return


Where do you want to install the VXT Printer Support Utilities images?
Enter the absolute pathname of the destination
directory or enter 'q' to quit this subset
[/usr/local/bin]? :  Return

destination directory: /usr/local/bin
is this correct [y]? :  Return
```

```
Where do you want to install the VXT Printer Support Utilities man pages?
Enter the absolute pathname of the destination
directory or enter 'q' to quit this subset
[/usr/local/man/man1]? :  Return

destination directory: /usr/local/man/man1
is this correct [y]? : Return


This is the installation script for the
        VXT Font Utilities
installation kit.  You can select which utilities to install.
The font compiler utilities include the font compiler and mkfontdir. These
are not needed for ULTRIX systems with DECwindows installed, but are needed
to compile fonts on other systems. The font installation utilities make
installing fonts easier on all systems.
You can specify where to install the utilities and manpages.

Select the subsets to install or exit the installation.

        0.   Exit without completing installation
        1.   Font compiler utilities
        2.   Font installation utilities

Which utilities do you want to install [1 2]? : Return

selecting subsets: compiler_utilities install_utilities
is this correct [y]? : Return

selected subsets: compiler_utilities install_utilities

Where do you want to install the VXT Font Utilities images?
Enter the absolute pathname of the destination
directory or enter 'q' to quit this subset
[/usr/local/bin]? :  Return

destination directory: /usr/local/bin
is this correct [y]? : Return


Where do you want to install the VXT Font Utilities man pages?
Enter the absolute pathname of the destination
directory or enter 'q' to quit this subset
[/usr/local/man/man1]? :  Return

destination directory: /usr/local/man/man1
is this correct [y]? : Return


This is the installation script for the
        Compiled Fonts
installation kit.  You can install 100dpi fonts, 75dpi
fonts, and miscellaneous fonts. You can specify where to install the
fonts.

Select font sets or exit the installation.

        0.   Exit without completing installation
        1.   100 dpi fonts
        2.   75 dpi fonts
        3.   Miscellaneous fonts

Which font sets do you want to install [1 2 3]? : Return

selecting subsets: 100dpi_fonts 75dpi_fonts misc_fonts
is this correct [y]? : Return
```

```
selected subsets: 100dpi_fonts 75dpi_fonts misc_fonts


Where do you want to install the Compiled Fonts?
Enter the absolute pathname of the destination
directory or enter 'q' to quit this subset
[/usr/tftpboot/vxt/fonts]? :  Return

destination directory: /usr/tftpboot/vxt/fonts
is this correct [y]? : Return

created: /usr/tftpboot/vxt/fonts

What do you want to do with the temporary working directories?

        1.   Remove if successful; save if an error occurred (default)
        2.   Save working directories
        3.   Remove working directories

Which option do you want? [1]? :  Return

selecting save_on_error working directories
is this correct [y]? : Return

You have the option of printing or displaying a postinstallation
checklist and running an Installation Verification Program to
ensure the installation completed successfully.

Should the postinstallation checklist be printed [n]? : y  Return

print postinstallation checklist; is that correct [y]? : Return

What printer would you like the postinstallation checklist
to be printed on [default printer]? : Return

Should the postinstallation checklist be displayed
on the terminal (using more) [n]? : Return

do not display postinstallation checklist; is that correct [y]? : Return

Do you want the Installation Verification Procedure (IVP)
to be run after installation [n]? : Return

do not run the IVP; is that correct [y]? : Return

If the installation encounters errors from the tar utility: See your ULTRIX
system documentation for an explanation of the error and the appropriate
action to take.

If the installation process fails: Look in the install.log file in the working
directory to find information to help you diagnose the problem.

The installation will take approximately 5 minutes to 20 minutes if you do not
install compiled fonts, and from 10 minutes to 60 minutes if you do install the
compiled fonts.  The exact time depends on your system and installation media.

No more questions will be asked.  The installation is in progress.

Extracting from media source:  /dev/nrct0

installing images


installing VXT Software Load Images in
        /usr/tftpboot/vxt/images
```

```
VXT Software Load Images installation process completed
status: successful installation

installing bootpd

building VXT BOOTP Daemon for SCO ODT

installing VXT BOOTP Daemon in
        /usr/local/etc


VXT BOOTP Daemon installation process completed
status: successful installation


installing app-launch


building Application Launcher for DEC OSF/1 AXP

installing Application Launcher in
        /usr/local/bin

installing Application Launcher man pages in
        /usr/local/man/man1


Application Launcher installation process completed
status: successful installation


installing vxtlpd


building VXT Printer Support Utilities for SCO ODT

installing VXT Printer Support Utilities documents in
        /usr/tftpboot/vxt

installing VXT Printer Support Utilities documents in
        /usr/local/bin

installing VXT Printer Support Utilities documents in
        /usr/local/man/man1


VXT Printer Support Utilities installation process completed
status: successful installation


installing font-utils


building VXT Font Utilities for SCO ODT

installing VXT Font Utilities documents in
        /usr/local/bin

installing VXT Font Utilities documents in
        /usr/local/man/man1


VXT Font Utilities installation process completed
status: successful installation
```

```
installing fonts


installing Compiled Fonts in
        /usr/tftpboot/vxt/fonts


Compiled Fonts installation process completed
status: successful installation


Removing temporary working directories.
removing temporary directory images
removing temporary directory bootpd
removing temporary directory app-launch
removing temporary directory vxtlpd
removing temporary directory font-utils
removing temporary directory fonts
Printing postinstallation checklist on default printer

The list of all files installed on your system is in
        /work/kit/install.flist

A script to remove the
        DIGITAL VXT Software
from your system is in
        /work/kit/rm-vxt-kit
You should move this script to a safe place for possible future use.

A postinstallation checklist is in
        /work/kit/vxtpostinstall

The release notes are in
        RelNotes.txt

The installation verification procedure is in
        /work/kit/vxtivp and isrd
You may want to move these scripts to a safe place for possible future use.
To run the installation verification procedure, execute
        /work/kit/vxtivp

The installation log is in
        /work/kit/install.log

DIGITAL VXT Software installation process completed
status: successful installation

#
```

1.6 File Names Installed on Your System

Appendix B lists the possible files installed on your system by the installation procedure. The `install.flist` file lists the files actually installed during your installation.

2

SCO ODT System Management Tasks

Chapter Overview

This chapter describes system management tasks for using VXT software with the SCO ODT operating system.

The details for performing some procedures on your host system may differ slightly from the procedures described here. In that case, use the procedures in this chapter as a guideline and refer to your operating system documentation for specific instructions.

2.1 System Administration Checklist

The SCO ODT operating system is a supported boot host for VXT 2000 windowing terminals. Before you use a SCO ODT system as a boot host for these terminals, you must perform some minor reconfiguration steps on the host system.

Host and Terminals in the Same Subnet

To download VXT software successfully, the boot host and the VXT 2000 windowing terminal must be in the same subnet.

Checklist

Use the following checklist to ensure that you complete the system management tasks:

☐ **Booting and Downloading**

☐ **VXT system images**	Install the VXT system images before starting with system management tasks (Chapter 1).
☐ **Directory structure**	Configure the system so that the VXT system images and fonts are not on the root file system. You may use symbolic links to other file systems. See Section 2.3.
☐ **IP addresses**	Contact your network administrator to obtain a unique Internet protocol (IP) address for each VXT 2000 windowing terminal that you plan to boot from your SCO ODT system. Add these addresses to the `/etc/hosts` file on your system; if necessary, update the name server on your network.
☐ **Network services**	Your host system must provide the boot protocol/trivial file transfer protocol (BOOTP/TFTP).

SCO ODT System Management Tasks
2.1 System Administration Checklist

☐ **Boot setup**

- **Loading VXT software with IP (BOOTP/TFTP)**
  To download VXT software with an IP boot sequence, the host system needs a resident `bootp` daemon, configured correctly in the `/etc/inetd.conf` file. You also need a corresponding `bootptab` configuration file.

  Section 2.4 includes a sample `bootptab` file. Use the sample to set up a `bootptab` entry in the `/etc/bootptab` file.

  After you configure the system for IP (BOOTP/TFTP) booting, restart the Internet daemon to initialize the changes you made.

☐ **Fonts** — VXT software provides fonts in the portable compiled font (PCF) format. If you need to use custom fonts, compile and install fonts in the PCF format. See Sections 2.5 to 2.8.

☐ **NFS Access** — If you use the NFS transport to access fonts or resource files, those file systems must be exported.

Optional System Management Tasks

☐ **X Services** — If you plan to use IP X sessions on terminals, make sure your host system supports the X display manager control protocol (XDMCP). If needed, install XDMCP and customize its associated files. See Section 2.9.

☐ **Character Cell Services** — If you plan to use terminal windows, make sure your host system is configured for Telnet or DECnet access .

☐ **Terminal and Group Settings** — You can use the terminal's configuration manager or your own host-based resource files to configure and manage terminals. See the *Managing Terminals and Work Groups* section in this guide.

☐ **Printing**

☐ **Printer Ports** — Your host system can use the TCP/IP transport to access a serial or parallel printer connected to a VXT 2000 windowing terminal. To set up a printer port, see Section 2.10.

☐ **Printer Names** — Select `ptys` and corresponding printer names for each VXT. Add a line in the `/etc/vxtlpdtab` file for each printer.

☐ **VXT Application launcher** — VXT Version 2.1 software provides an application launcher that lets terminal users send commands to a host to display host X applications on the terminal. For setup procedures, see the Application Launcher section in this chapter.

Booting and Downloading

This section describes the VXT system images, how to create directory structures, and how to download the VXT software using BOOTP/TFTP or MOP protocols.

2.2 VXT System Images

VXT Version 2.1 software provides the following system image files:

Table 2–1 VXT System Images

Install this image . . .	If you want . . .
vxt	VXT software with local clients. This image can run on color, gray scale, and monochrome VXT 2000 windowing terminals with 10 megabytes of terminal memory.
vxtex	VXT EX software without local clients. This image can run on color, gray scale and monochrome VXT 2000 windowing terminals with only 4 megabytes of terminal memory.
vxtldr	To support terminals in server-based mode from an InfoServer system on another Ethernet segment.

VXT BOOTP Daemon

You need a daemon to load the system images from a SCO ODT system. The VXT installation kit provides a BOOTP daemon, if your system does not have one.

2.3 Creating Directory Structures

You must log in as the superuser to perform all procedures in this chapter.

Use the following commands to create the directory structure that will contain the VXT system images for IP loading:

```
# mkdir /usr/tftpboot                # may already exist
# ln -s /usr/tftpboot /tftpboot      # may already exist
```

You can use an alternate location for `/usr/tftpboot`, such as `/var/tftpboot`.

2.4 Loading VXT Software with IP—Host System Setup

Perform the following steps to boot the VXT 2000 windowing terminal using IP:

Step 1. Edit the /etc /inetd.conf file.

Find the bootp and tftp command lines in the /etc/inetd.conf file. Your inetd.conf may vary depending on your configuration. If you installed the BOOTP daemon in the VXT installation kit, the installation created the daemon file /usr/local/etc/bootpd in Berkley format. You can also use the SCO BOOTP daemon in Carnegie Mellon University (CMU) format daemon. Modify these command lines to look like one of the following examples.

Examples

SCO bootpd

```
❶ bootps   dgram   udp  wait root   /etc/bootpd  bootpd  [-d]
```

VXT bootpd

```
❶ bootp   dgram   udp  wait root    /usr/local/etc/bootpd  bootpd  [-i]
❷ tftp    dgram   udp  wait daemon  /etc/tftpd  tftpd -s /tftpboot
```

Explanation of Examples

Make sure to remove the # comment character from the beginning of the bootp and tftp lines.

❶ The bootp command line causes /etc/inetd to start the bootpd when the system receives a request for BOOTP services.

- The -d option enables the bootp daemon to write messages into the syslog file if logging is enabled on your system.
- The -i option allows the bootp daemon to run under the inet daemon.

Check the syslog Daemon

You may need to manually create the /usr/adm/syslog file. Verify that the syslog daemon is running. The syslog file should be stored in /usr/adm/syslog. Check the /etc/syslog.conf configuration file for the location of the syslog file.

To view the most recent log entries, enter the following command and substitute the name of your syslog file:

```
# tail /usr/adm/syslog
```

❷ The tftp command line causes the /etc/inetd process to start the tftp daemon when the system receives a request for TFTP services.

- The -s option starts tftpd in restricted or secure mode. This limits the ability of tftpd to access the system file structure to the specified directory tree. In the sample lines, access is limited to the subtree starting from /tftpboot. To set up the path to the load file, refer to step 2 on editing the /etc /bootptab file.

Symbolic Links in Restricted Mode

When `tftp` is running in restricted mode, any symbolic links from **inside** the specified subtree to **outside** that subtree do not work. Symbolic links **within** the subtree do work. The `tftpd` daemon performs a `chroot` (change root) command to the specified subtree, preventing the subtree from accessing the remainder of your file system.

Step 2. Edit the /etc/bootptab file.

For each terminal, create an entry in the `/etc/bootptab` file. If the file does not exist, you must create it. Be sure to maintain the format of the example file. Using the existing entries as examples, create an entry for your terminal.

The Internet protocol host name used in the `/etc/bootptab` file must be the same as the official host name used in other files that refer to the terminal's IP address. These other files include the `/etc/hosts` name server database. See your system administration manuals for more details.

loadfile Path Name

The loadfile path name specified in the `/etc/bootptab` file is relative to any restrictions on `tftpd`. See step 1.

Examples

The following two examples show typical `bootptab` entries in Berkley and CMU format. Each example has two entries. The first entry is for a terminal named `vxtf`, running VXT full-function software. The second entry is for a terminal named `vxte`, running VXT EX software.

The VXT `bootpd` does not support defaults and relative pathnames in `bootptab`.

Sample VXT /etc/bootptab Entries—Berkley Format

```
#@(#)bootptab.example
# /etc/bootptab:  database for bootp server (/etc/bootp)
#
# Blank lines and lines beginning with '#' are ignored.
#
# home directory

/

# default bootfile

nosuchfile

# end of first section

%%
# The remainder of this file contains one line per client interface
# with the information shown by the table headings below.
# The 'host' name is also tried as a suffix for the 'bootfile'
# when searching the home directory.  (e.g., bootfile.host)
#
# host  htype haddr              iaddr          bootfile
#

vxtf  1 08:00:2b:25:3e:c6 12.122.128.27 /vxt/images/vxt
vxte  1 08:00:2b:25:3e:c7 12.122.128.28 /vxt/images/vxtex
```

Sample SCO /etc/bootptab Entries—CMU Format

```
#      @(#)bootptab 4.3 Lachman System V STREAMS TCP  source
#      SCCS IDENTIFICATION
# /etc/bootptab: database for bootp server (/etc/bootpd)
# Blank lines and lines beginning with '#' are ignored.
#
# Legend:
#
# first field -- hostname
#   (may be full domain name and probably should be)
#
# hd -- home directory
# bf -- bootfile
# cs -- cookie servers
# ds -- domain name servers
# gw -- gateways
# ha -- hardware address
# ht -- hardware type
# im -- impress servers
# ip -- host IP address
# lg -- log servers
# lp -- LPR servers
# ns -- IEN-116 name servers
# rl -- resource location protocol servers
# sm -- subnet mask
# tc -- template host (points to similar host entry)
# to -- time offset (seconds)
# ts -- time servers
#
# Be careful about including backslashes where they're needed.
# Weird (bad) things can happen when a backslash is omitted
# where one is intended.
#

sanhol.dgg.dec.com:\
 ht=ethernet: ha=08002b2b7f71: ip=12.123.123.11:\
 hd=/tftpboot:   bf=vxt/images/vxt:

sanhol.dgg.dec.com:\
        ht=ethernet: ha=08002b2b7f72: ip=12.123.123.12:\
        hd=/tftpboot:   bf=vxt/images/vxtex:
```

Step 3. Modify /etc/services file.

You need to modify two lines to match the following example.

The service name should correspond to the service name in `inetd.conf` file.

Examples

Add the following two lines to `/etc/services`, if not already present. Make sure there is not a # comment character at the beginning of the lines.

SCO bootp

```
bootps          67/udp          # Provide bootp service.
```

VXT bootp

```
bootp           67/udp          # Provide bootp service.
tftp            69/udp          # Provide tftp service.
```

Step 4. Restart the Internet daemon.

Restart the Internet daemon to initialize the changes you made to the `/etc/inetd.conf` and `/etc/bootptab` files.

Note

Users cannot connect to the system or load from the system during the short time required to restart the daemon.

Examples

1. You must supply the process ID (PID) of the daemon in the restart command. To display the PID of the `inetd` daemon, use the following command:

   ```
   # ps -ef | grep inetd | sed '/grep/d'
   ```

   Here is a typical system response to the `ps -ef` command:

   ```
   5426 ?  I     0:02 /etc/inetd
   ```

   In this example, 5426 is the PID of the `inetd` process.

2. To restart the `inetd` daemon using this PID, enter the following command:

   ```
   # kill -9 5426 ; /etc/inetd
   ```

Step 5. Load the terminal.

After you complete these procedures, you can load the terminal from the newly configured system. Turn on the terminal, then quickly press and release the halt button on the rear of the terminal to display the >>> prompt. At the >>> prompt, enter the following boot command:

```
>>> b/10000  Return
```

Fonts

2.5 Font Access

This section describes font paths. The VXT 2000 windowing terminal can access fonts by using the TFTP or NFS transport.

2.5.1 TFTP Font Paths

The TFTP font paths used by the VXT 2000 windowing terminal depend on the system setup of the `tftp` daemon.

2.5.2 Unrestricted tftp

If your system is configured for unrestricted `tftp`, the VXT 2000 user must specify the full path to the fonts they plan to access. For example, if you choose the default directory locations for VXT fonts when installing the VXT host software, you can use the following paths:

```
/tftpboot/vxt/fonts/100dpi/fonts.dir
/tftpboot/vxt/fonts/75dpi/fonts.dir
/tftpboot/vxt/fonts/misc/fonts.dir
```

The previous example assumes a symbolic link from `/tftpboot` to `/usr/tftpboot`. If you do not use symbolic links, the paths are

```
/usr/tftpboot/vxt/fonts/100dpi/fonts.dir
/usr/tftpboot/vxt/fonts/75dpi/fonts.dir
/usr/tftpboot/vxt/fonts/misc/fonts.dir
```

2.5.3 Restricted tftp

If your system is configured for restricted `tftp`, the font path is relative to the root `tftp` directory as specified in the `/etc/inetd.conf` file. Here is a sample SCO ODT `tftp` daemon in restricted mode:

```
tftp    dgram   udp  wait daemon  /etc/tftpd  tftpd [-s] /tftpboot
```

The `-s` option is for restricted mode. See step 1 in Section 2.4 for examples of the `-s` option.

The `/tftpboot` directory indicates the root directory for `tftp`.

In this case, the font paths specified by the user are relative to `/tftpboot`. For example, if you choose the default directory locations for VXT fonts when installing the VXT host software, you can use the following paths:

```
/vxt/fonts/100dpi/fonts.dir
/vxt/fonts/75dpi/fonts.dir
/vxt/fonts/misc/fonts.dir
```

2.5.4 NFS Font Paths

If you use the NFS transport to access fonts or host-based resource files, the file system containing the fonts and resource files must be exported to allow NFS access. Modify the `/etc/exports` file to list the file system, access privileges, and clients allowed access. Here are examples of exported file systems:

```
/usr/bin                    # export to the world
/usr    -ro                 # export as read-only to the world
/usr/local  -ro vxtc vxtm   # export as read-only to clients
                            # vxtc and vxtm
```

2.6 PCF Font Format for VXT 2000 Windowing Terminals

The terminal requires fonts in the portable compiled font (PCF) format. VXT software can access fonts in big endian and little endian format. If you have existing PCF fonts, you do not need to recompile to use them with the VXT 2000 windowing terminal.

2.6.1 UNIX Fonts

VXT software relies on the `fonts.dir` file located in each font directory.

mkfontdir

If you make any changes in the directories where the fonts are stored, you must update the `fonts.dir` file using the `mkfontdir` utility.

Use `mkfontdir` to create a new or updated `fonts.dir` file.

Enter the font paths in the Customize Font Path dialog box, accessed from the Terminal Manager window's Customize menu. See *VXT 2000+/VXT 2000 Windowing Terminal User Information* for instructions.

2.7 Compiling Fonts for SCO ODT TFTP Systems

This section describes font utilities and how to compile and install custom fonts.

2.7.1 Font Utilities

The VXT software kit for UNIX systems includes font utilities. Use these utilities to compile custom fonts for the terminal. Make sure to include the directory where you installed the utilities in your PATH variable; the default location is `/usr/local/bin`. The default location for the man pages is `/usr/local/man/man1`. See your host system documentation for information about using man pages.

2.7.2 Compiling and Installing Custom Fonts for SCO ODT Systems

If you have fonts that are not in the PCF format, you can compile fonts and create the `fonts.dir` file with the font utilities supplied. To compile a font, the source font must be in bitmap distribution format (BDF). BDF is the standard source format for fonts used with the X Window System.

First determine the directory to contain the compiled PCF fonts. You must place all fonts that you want to use in the same directory. Create this directory if it does not exist. This directory must contain PCF fonts only, if the font utilities are to work properly.

To compile the fonts:

1. Use the `cd` command to go to the directory containing the source .bdf fonts.

   Check for Duplicate File Names

   Make sure the directory does not contain any .pcf files with the same name as the .bdf files your are compiling, or the .pcf files will be overwritten.

mkvxtfonts

2. Compile the fonts from BDF to PCF, using the `mkvxtfonts` utility:

   ```
   # sh /usr/local/bin/mkvxtfonts *.bdf
   ```

   This example assumes that `mkvxtfonts` was installed in this default directory. If `mkvxtfonts` was not installed in `/usr/local/bin`, specify the complete path to `mkvxtfonts`.

instvxtfonts

3. Move the fonts to the destination directory by using the `instvxtfonts` utility:

   Check for Duplicate File Names

   Make sure there are not any .pcf files in the destination directory with the same name as the files to be copied, or they will be overwritten.

   ```
   # sh /usr/local/bin/instvxtfonts [-c] path-to-pcf-directory
   ```

   path-to-pcf-directory is the path to the directory you want the .pcf files to be placed in. You must specify the path. If you do not specify the .pcf files, the default is *.pcf.

   This command moves the specified .pcf files from the current directory to the target directory. The command also creates a `fonts.dir` file in the target directory, listing all .pcf fonts (new and existing) in the directory.

   The `-c` option lets you copy the `.pcf` files to the destination directory instead of moving them.

   These examples assumes that `instvxtfonts` was installed in this default directory.

Repeat this procedure for each directory containing BDF fonts you want to use.

2.8 Managing Fonts

VXT Version 2.1 software implements the X Version 11 Release 5 (X11R5) server, so you can access fonts from multiple systems, using different transports. If you serve fonts from multiple systems, refer to the *System Management Overview* chapter for requirements.

2.8.1 Alias Names and XLFD Names

fonts.alias

Most systems have a `fonts.alias` file that allows fonts to have multiple names. VXT Version 1.2 and later supports the `fonts.alias` file mechanism, so an understanding of the file may be useful. Each line in the file lists two names — an alias name, followed by the actual name of the font to use when the alias is requested.

XLFD

Many applications use the X logical font description (XLFD) naming convention for fonts. The MIT X Window System documentation describes this convention. Fonts with the same XLFD name should be interchangeable. They may look slightly different, but there should be no important differences. Here is an example of an XLFD name:

```
-adobe-new century schoolbook-bold-r-normal--10-100-75-75-p-66-iso8859-1
```

Generally, aliases are short names for XLFD names, such as `fixed`, `8x13`, and `times_bold14`. In most cases, substituting one font with a similar font does not cause problems. Applications that are particular about their fonts (such as WYSIWYG editors) generally use XLFD names.

X Services

Before you can create IP X sessions on a VXT 2000 windowing terminal, the host system must support the X display manager control protocol (XDMCP). The MIT X11R4 and X11R5 distributions provide the `xdm` (X display manager) utility.

The SCO ODT system provides its own version of XDMCP support, `scologin`. Refer to the man pages for additional information.

Section 2.9 describes the purpose of each file and how to customize it.

2.9 Customizing Configuration Files for XDMCP Support

This section describes some files associated with XDMCP support and how to customize them.

2.9.1 Xservers

The `Xservers` file contains a list of X window displays managed by the host `xdm` process. These are displays that do not use XDMCP to communicate with the host `xdm`. Examples are local workstation displays and older (pre-X11R4) X terminals that do not support XDMCP.

XDMCP Recommended

The VXT 2000 windowing terminal can communicate with the host `xdm` using XDMCP, or the host `xdm` can manage the terminal without XDMCP. Digital recommends using XDMCP, because the VXT 2000 windowing terminal will give more reliable initiation, termination, and reinitiation of `xdm` sessions. XDMCP involves less loading of the host. Allowing the host to manage the terminal is less reliable; this option is provided for backward compatibility and user convenience, but is not recommended.

Creating the Xservers File

The `Xservers` file must exist, whether or not the host `xdm` manages the VXT 2000 windowing terminal. If the terminal communicates with the host `xdm` using XDMCP and the `Xservers` file does not exist, create an empty file with the `touch` command:

```
# touch /usr/lib/X11/xdm/Xservers
```

2.9.2 xdm-pid

The `xdm-pid` file contains the process ID of the `xdm` parent process. This file is maintained by `xdm`.

2.9.3 xdm-errors

The `xdm-errors` file contains a list of errors reported by `xdm`. If this file does not exist, create an empty version as follows:

```
# touch /usr/lib/X11/xdm/xdm-errors
```

2.9.4 xdm-config

The `xdm-config` file controls the operation of `xdm`. The file is read when `xdm` is first started. If you change this file, you must restart `xdm` for the changes to take effect.

Example

```
DisplayManager.servers:         /usr/lib/X11/xdm/Xservers
DisplayManager.errorLogFile:    /usr/lib/X11/xdm/xdm-errors
DisplayManager.pidFile:         /usr/lib/X11/xdm/xdm-pid
DisplayManager*resources:       /usr/lib/X11/xdm/Xresources
DisplayManager*session:         /usr/lib/X11/xdm/Xsession
DisplayManager.0.authorize:     true
DisplayManager*authorize:       false
```

2.9.5 Xresources

This file specifies the resources used when displaying the login box. The file also specifies the failsafe client option.

Example

```
xlogin*login.translations: #override\
     <Key>F1: set-session-argument(failsafe) finish-field()\n\
     <Key>Return: set-session-argument() finish-field()
xlogin*borderWidth: 3
#ifdef COLOR
xlogin*greetColor: #f63
xlogin*failColor: red
xlogin*Foreground: black
xlogin*Background: #fdc
#else
xlogin*Foreground: black
xlogin*Background: white
#endif
```

2.9.6 Xstartup

The `Xstartup` file is executed by `xdm` after the user has successfully logged in. Be careful when adding commands to this file, because it is executed with superuser privileges. This file is normally empty.

Example

```
#!/bin/sh
#
# Xstartup
#
# This program is run as root after the user is verified
#
```

2.9.7 Xsession

The `Xsession` file runs after `Xstartup`. Commands in this file are executed with the user's default login privileges.

Example

```
#!/bin/sh
#
# Xsession
#
# This is the program run as the client
# for the display manager.  This example is
# quite friendly as it attempts to run a per-user
# .xsession file instead of forcing a particular
# session layout. The .xsession should be executable.
#    chmod a+x .xsession
#
```

```
case $# in
1)
        case $1 in
        failsafe)
                exec xterm -geometry 80x24-0-0 -ls
                ;;
        esac
esac

startup=$HOME/.xsession
resources=$HOME/.Xresources

if [ -f $startup ]; then
        exec $startup
        exec /bin/sh $startup
else
        if [ -f $resources ]; then
                xrdb -load $resources
        fi
        twm &
        exec xterm -geometry 80x24+10+10 -ls
fi
```

2.9.8 Xreset

The `Xreset` file runs after the user logs out. Like `Xstartup`, `Xreset` runs at superuser level. Be careful when adding commands to this file. This file is normally empty.

Example

```
#!/bin/sh
#
# Xreset
#
# This program is run as root after the session terminates, but
# before the display is closed
#
```

2.9.9 Hints for Configuring

The following hints can help you customize your applications for XDMCP support:

Use the /var file when the /usr file is read-only.

In some systems `/usr` is read-only. To use `xdm` in such systems, create a directory under the root `/var` as follows:

```
# mkdir /var/X11/xdm
```

This step avoids the need for `xdm` to have write access to `/usr`. When you make this change, ensure that the `xdm` configuration file `xdm-config` has correct pointers to the other `xdm` files. For example, if you intend to use the root `/var`, change `/usr/lib/X11/xdm/xdm-config` as follows:

```
DisplayManager.errorLogFile: /var/X11/xdm/xdm-errors
DisplayManager.pidFile:  /var/X11/xdm/xdm-pid
DisplayManager.remoteAuthDir: /var/X11/xdm
```

X Services

Modify the xlogin dialog.

On SCO ODT systems, you can change the appearance of the `xlogin` dialog to be more consistent with VXT and ULTRIX conventions by appending the following lines to the `/usr/lib/X11/xdm/Xresources` file:

```
xlogin.Login.width: 512
xlogin.Login.height: 192
xlogin.Login.*Font: -*-Menu-*-*-*--*-120-*-*-*-*-ISO8859-1
xlogin.Login.greeting: IP X Session
xlogin.Login.unsecureGreeting: unsecure IP X Session
xlogin.Login.fail: Login incorrect
```

Modify the /usr/lib/X11/Xsession file to start a remote session manager.

On some host systems, a session manager provides the way to start remote X window applications. You can customize `Xsession` to start the session manager instead of the window manager and terminal emulator.

Find these two lines in the file:

```
twm &
exec xterm -geometry 80x24+10+10 -ls
```

Replace those two lines with this line:

```
exec dxsession
```

To start xdm each time the host system is rebooted:

Append the following lines to the `/etc/rc.local` file:

```
 [ -f /usr/bin/X11/xdm ] && {
        /usr/bin/X11/xdm & echo -n ' xdm'          >/dev/console
}
```

To start xdm manually:

Enter the following command:

```
# /usr/bin/X11/xdm
```

Character Cell Terminal Services—Telnet

To configure your system for Telnet access, see your host system documentation.

You must log in as the superuser.

Managing Terminal and Group Settings

When a terminal uses a host-based VXT system image, the terminal stores its customizations in a native resource file in the terminal's nonvolatile memory (NVRAM). You have two options for centrally managing terminals on your network:

- Use your terminal's configuration manager to manage the settings in the native resource file of each terminal.
- Create your own resource files on a host system and configure terminals to access the files.

See the *Managing Terminals and Work Groups* section of this guide for details.

Printing

2.10 Setting Up Access to VXT 2000 Printer Ports

With VXT Version 2.0 or later software, SCO ODT hosts can use the TCP/IP protocol to access a serial or parallel printer connected to a VXT 2000 windowing terminal.

The printer ports are typically used for printers, but you can attach other devices. You can use the serial port to read data from and send data to the attached device. VXT 2000 hardware restricts the parallel port to sending data only.

Software Requirements

You need the VXT printer support utilities subset provided with the VXT software installation kit. This subset provides the `vxtlpd` VXT printer daemon.

`vxtlpd` Printer Daemon

The `vxtlpd` printer daemon works with the UNIX printer daemon and filters to send data to and from the specified terminal printer port. The `lpd` daemon the host communicates with the slave side of a pseudoteletype `pty` as it would to any serial device.

The `vxtlpd` printer daemon reads a configuration file that specifies the `ptys`, the terminal's IP address and port number, and the starting timeout period for retrying a connection. The timeout period doubles each time a connection attempt fails, up to a maximum of 30 minutes.

Configuration File Syntax

You must create the configuration file used with the `vxtlpd` printer daemon. The default name and path for the configuration file is `/etc/vxtlpdtab`. You can use `vxtlpd` to specify a different file. Use the following syntax for configuration file entries:

/dev/ptyqf *ip_address_or_name* 9100 time #optional comment

Examples:

```
/dev/ptyqf 1.2.3.4 9100 60
/dev/ptyqe myvxt 9100 120
```

- Specify the `pty` device used for printing.
- You can specify the terminal's host name or IP address (in dotted decimal notation).
- VXT 2000 windowing terminals use IP port 9100 for the printer.
- The timeout period specifies the time in seconds between retries if the connection to the terminal fails. The maximum timeout period is 30 minutes.

  If you specify 0 seconds, then no retries are done. These retries are only done if the terminal is not reachable. If the terminal is reachable but the printer is not ready or not available, the print job will be lost and must be requeued by the user.

Example: Suppose the starting timeout period is 60 seconds. If a connection is not made after 60 seconds, the timeout period advances to 120 seconds. If a connection is not made after 120 seconds, the timeout period advances to 240 seconds and continues advancing until 30 minutes is reached.

Selecting ptys

Choose the ptys you want to use.

List the ptys. On most systems, you can use the following command to get an alphabetical list:

```
ls /dev/pty*
```

Start with the last pty in the alphabetical list and proceed to earlier ones.

The vxtlpd command connects to the master side of the pty. The slave side of the pty is used by the host's printing system. Put the selected ptys and all other required information in the configuration file for vxtlpd, then start vxtlpd.

Creating Printers

Creating printers for the print subsystem is identical to creating printers directly connected to the system. The procedure differs for each system and each printer type.

In each case, the device for the printer is the slave side of the pty for the corresponding VXT 2000 windowing terminal.

For example, the slave device /dev/ttyqf corresponds to the master device /dev/ptyqf.

If you do not configure the printer correctly, you may get printing errors, displayed errors messages, or no printout. Among possible solutions, Digital recommends that you manually assign protection to ptys and verify that they are not being used by other users.

Setting Up a Printer

Use lpadmin command to set up the ports on supported SCO ODT hosts to access the printer on a VXT 2000 windowing terminal:

lpadmin -p*vxt_printer* -mprinter_model -vdevice

- printer_name is the name assigned to the terminal's printer.
- printer_model is the type of printer. The type of printer attached must be correct or the output will be erroneous.
- device is the slave side of the pty.
  Example:

  /dev/ttyqf

For more information, refer to the man pages for lpadmin, enable, and accept.

Starting `vxtlpd`

If you previously installed `vxtlpd`, kill all the running copies of `vxtlpd`. Note that this action stops any jobs currently printing on VXT 2000 windowing terminals.

Before starting a new version of `vxtlpd`:

1. Enter the following command:

   ```
   # ps -ef | grep vxtlpd | sed '/grep/d'
   ```

2. For each PID, enter the following command:

   ```
   # kill -9 pid
   ```

To automatically restart `vxtlpd` each time the system is rebooted, you must edit the `/etc/rc2.d/S80lp` file. You can also run `vxtlpd` from the command line.

To run `vxtlpd` from the command line, use the following syntax:

vxtlpd [-c *file*] [-l *file*] &

- The `-c` *file* option lets you specify the configuration file. The default file is `/etc/vxtlpdtab`.
- The `-l` *file* option lets you specify a log file for error messages and other messages. If you omit this option, no messages are generated.
- Comments begin with the # character and can continue to the end of the line.

To automatically start `vxtlpd` when the system is rebooted, add the following lines to `/etc/rc2.d/S80lp` file:

```
[ -x /usr/localbin/vxtlpd ] && {
 /usr/local/bin/vxtlpd [-c config_file ] [-l log_file] > /dev/console
}
```

Use the correct path to `vxtlpd` if you installed it in a different location. Specify the `-c` and `-l` options if desired.

Customizing the Printer Port Settings

You must customize the printer port settings on the terminal to match the port and printer in use. For more information, see *VXT 2000+/VXT 2000 Windowing Terminal User Information*.

2.10.1 Printing from the SCO ODT Host

To submit a printing job from the SCO ODT host to the terminal's printer, use the `lp` command.

Syntax

Enter `lp` commands as follows:

lp -d*vxt_printer printfile*

- *vxt_printer* is the name of the printer connected to the terminal. Use the name that was assigned when setting up the printer with the `lpadmin` command.
- *printfile* is the file to print.

Application Launcher

Overview

VXT Version 2.1 software provides an application launcher that lets users enter commands from a host session to display remote X applications on the terminal.

The host passes remote launching commands to the terminal's local window manager. Users can enter the commands through the VXT Terminal Manager window. Advanced users can use the local window manager to bind commands to mouse buttons, keyboard keys, or terminal menus; this method allows users to start remote X applications without running the terminal manager or a remote session manager.

Installation

The application launcher is part of the VXT software kit. See Chapter 1 for installation instructions.

The host system must have a C compiler and X Window System link libraries to build the application launcher.

Security

Users must be authorized to access the terminal from the host system. You can enter authorized hosts and users in the Customize Security dialog box of the Terminal Manger window. You can centrally manage these security settings by using the terminal's configuration manager or a host-based resource file. See the *Managing Terminals and Work Groups* section.

Setup and Use

The VXT installation procedure automatically builds the executable application launcher file named `vxtlaunch`. By default, the file is placed in the `/usr/local/bin` directory. Notify users of the launcher's name and location.

To launch an application, a terminal user must

1. Log in to the host.
2. Run the application launcher.
3. Enter a command to launch the desired remote application.

See *VXT 2000+/VXT 2000 Windowing Terminal User Information* for details on running the application launcher and entering commands.

Running the Application Launcher

After logging in to the host, the user must start the application launcher. There are several methods to start the launcher:

- Interactively
- In the user's .login file
- In the .xsession file

If a user starts the launcher from a login file, the launcher will run each time the user logs in and consume process space.

Entering Remote Launching Commands

Users can enter launch commands from the Terminal Manager window (Create dialog box). Advanced users can use the local window manager to bind commands to buttons, keys, or menus (Workspace: Customize Resource Configuration dialog box).

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