

XENIX[®] System V

Operating System

Installation Guide

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Contents

1 Introduction

- 1.1 Overview 1-1
- 1.2 Using This Guide 1-1

2 Installation Procedure

- 2.1 Overview 2-1
- 2.2 XENIX System Distribution 2-1
- 2.3 How To Use This Guide 2-2
- 2.4 Before You Start 2-3
- 2.5 Planning Your Disk Layout 2-3
- 2.6 Installation Procedure 2-10
- 2.7 Troubleshooting 2-41

3 Reinstalling and Updating Your System

- 3.1 Introduction 3-1
- 3.2 Shut Down the System 3-3
- 3.3 Back-up the System 3-4
- 3.4 Reinstallation Procedure 3-6
- 3.5 Reinstall Packages and Applications 3-17
- 3.6 Relink the Kernel 3-17
- 3.7 Prepare Preserved Filesystems for Use 3-17
- 3.8 Restore Your Backups 3-18
- 3.9 Reestablish Your Second Hard Disk 3-18
- 3.10 Updates: Merge New Versions of Configurable Files 3-20

4 Installation Glossary

- 4.1 Terms Used During Installation 4-1

Chapter 1

Introduction

1.1 Overview 1-1

1.2 Using This Guide 1-1

1.1 Overview

This is a guide to installing XENIX on your personal computer.

Topics covered in this guide include:

- How the system is distributed in three packages and what each contains.
- Responding to system prompts in the installation procedure.
- What you need to get started.
- Starting the system for the first time.
- Preparing the hard disk for XENIX.
- Starting the system from the hard disk.
- Setting up user accounts.
- Using a second operating system (DOS) with XENIX.
- Adding device drivers to your system.

1.2 Using This Guide

This guide contains the following sections:

Chapter 1: Introduction

An introduction and overview of topics covered in this guide.

Chapter 2: Installation Procedure

A step by step guide to installing XENIX on your computer. Starting XENIX for the first time, initializing the hard disk, and setting up user accounts are among the topics discussed.

Chapter 3: Reinstalling and Updating Your System

Instructions that are specific to reinstallations and updates, including how to preserve filesystems.

Chapter 4: Installation Glossary

Definitions for the terms used in this guide.

Chapter 2

Installation Procedure

- 2.1 Overview 2-1
- 2.2 XENIX System Distribution 2-1
 - 2.2.1 48tpi Versus 96tpi Versus 135tpi Distributions 2-1
- 2.3 How To Use This Guide 2-2
- 2.4 Before You Start 2-3
- 2.5 Planning Your Disk Layout 2-3
 - 2.5.1 Determining Swap Space Allocation 2-4
 - 2.5.2 Deciding Whether to Have a Separate (/u) Filesystem 2-6
 - 2.5.3 Disk Layout Worksheets 2-8
- 2.6 Installation Procedure 2-10
 - 2.6.1 Outline 2-10
 - 2.6.2 What You Need 2-11
 - 2.6.3 Starting XENIX From The Boot Floppy Set 2-12
 - 2.6.4 Preparing The Hard Disk 2-15
 - 2.6.5 Starting XENIX On the Hard Disk 2-27
 - 2.6.6 Setting the root Password 2-31
 - 2.6.7 Establishing the Time Zone 2-32
 - 2.6.8 Installing the XENIX Distribution and Applications 2-36
 - 2.6.9 System Administration Startup Tasks 2-39
 - 2.6.10 Routine System Operation 2-41
- 2.7 Troubleshooting 2-41

2.1 Overview

This guide explains how to install the XENIX system on a personal computer. The XENIX Operating System is a powerful system of programs that gives your computer the same multi-user, multi-tasking capabilities as many large and expensive computers.

When you install the system, you:

- Initialize the hard disk, then;
- Copy the XENIX utilities from the XENIX distribution media to the initialized hard disk.

2.2 XENIX System Distribution

The complete XENIX System consists of the following three distribution sets:

- The Operating System
- The Development System (optional)
- The Text Processing System (optional)

The Operating System contains the XENIX programs you need to create multiple user accounts, manage file systems, create and manage files and perform system maintenance tasks.

The Development System contains the XENIX programs you need to create, compile, and debug assembly and high-level language programs.

The Text Processing System contains the XENIX programs you need to create, edit, and typeset documents.

2.2.1 48tpi Versus 96tpi Versus 135tpi Distributions

The installation instructions in this chapter are for all distributions (48, 96 and 135tpi). Most of the steps are exactly the same regardless of the distribution you have.

However, there are some differences. These are marked with headings (48tpi, 96tpi, or 135tpi) that indicate a special step that applies to a specific distribution. Read the installation instructions carefully.

XENIX Installation Guide

2.3 How To Use This Guide

Read through this guide thoroughly before beginning the installation procedure so that you become familiar with the various steps and terminology used in each section. If you run into difficulties during the installation, call the Support Center listed on the support information card included with the software.

2

Always follow these rules:

During the installation you use the keyboard to enter information:

- Begin each command after a prompt (often a \$, % or # symbol). During the installation process, the prompt can be “<Installation>,” under certain conditions.
- Enter all requested names and numbers exactly as shown.
- Complete a line by pressing the <RETURN> key.

NOTE: The <RETURN> key is sometimes denoted on the keyboard by a “down-left” arrow, or referred to as the ENTER key.

If you make an error while entering information, you can erase the character:

- By using the backspace key,

OR

- By pressing Ctrl-h.
- To delete everything you have entered on a line, press Ctrl-u.

NOTE: Press the Ctrl key and the other key at the same time. This is the same action as using the Shift key.

In addition:

- (y/n)? is asking “yes or no?”, and always requires a response from you (enter y or n and press the <RETURN> key).
- Commands referred to in text are shown in **boldface** with the reference manual section next to the command in parentheses (for example **cat(C)**). Refer to the preface of the *XENIX User's Reference* for a guide to the various reference sections.

2.4 Before You Start

Before you begin the installation procedure, make sure your computer is fully assembled (and operational) and you are familiar with its operation. In particular you should know:

- How to turn the computer off and on.
- How to insert floppies into the floppy drive.
- How to reset the computer.

If you have just assembled your computer for the first time or are unsure about the items listed above, briefly review the hardware manuals provided with your computer and hard disk. The hard disk must be connected to your computer according to manufacturer's specifications. Also, we suggest you run a system self-test as described in the computer's *Operator's Guide* in order to detect possible hardware problems.

Note

If you plan to partition the hard disk for use with DOS in addition to XENIX, you must install DOS first. Refer to "Using DOS and XENIX on the same Hard Disk" in the *System Administrator's Guide* for details.

2.5 Planning Your Disk Layout

If you anticipate a large number of users, heavy development usage or if you plan to use a database program, it is advisable to plan the layout of your hard disk. Systems under heavy use require decisions that will affect performance. This planning section discusses two segments of your hard disk (/u filesystems and the swap area) in relation to the XENIX root filesystem (the DOS partition is mentioned here because it affects available disk space):

1. *Swap space*: The swap space is a part of your disk that acts as an extension of your physical memory (RAM). Programs (or parts of programs) that are in active use but currently in a waiting state can be shifted to this area (swapped out) so that others can run in RAM.

XENIX Installation Guide

The swap space must be large if there are many users or large applications.

2. *Separate (mountable) filesystems (/u)*: A large hard disk (70 MB+) with many users can be slowed down by a large root filesystem. Creating a separate (usually called /u) filesystem for user accounts improves performance, makes backups easier, and helps protect the root filesystem from corruption during a system crash. This filesystem is typically used for user accounts and files.
3. *DOS partition*: Those who wish to have XENIX and DOS share the hard disk must consult the "Using DOS and XENIX on the Same Hard Disk" chapter of the *System Administrator's Guide* and load DOS on their disk first. The presence of a DOS partition makes it essential to plan your disk resources well, since it is necessary to reinstall XENIX to alter the layout of your hard disk. Read this section and plan your layout before installing DOS.

A series of simple worksheets is provided at the end of this section for calculating the size of your disk divisions. Although these calculations may look intimidating, they are entirely mechanical and only require the insertion of simple values.

2.5.1 Determining Swap Space Allocation

Sometimes physical memory (RAM) is not large enough to contain all the active processes in the system. Swapping is used by the XENIX Operating System under such conditions. The Operating System reserves an area on the hard disk called the "swap space." The swap space should be at least as large as memory. Swap space is allocated during operating system installation. The following are two methods for calculating the swap space size.

Letting divvy(ADM) decide for you

If the system is used under typical multiuser operation (no large applications or development system), you can use the default swap space recommended during the installation procedure.

After **badtrk**(ADM) has run, you will be prompted to choose the amount of space to allocate for the swap space. **divvy** calculates the minimum and maximum size based on the size of the hard disk. The following formulas are used (where blocks are 1024 bytes, i.e. 1K):

$$\begin{aligned}\text{Minimum} &= 1000 \text{ blocks or } (\text{size of disk})/6, \text{ whichever is less} \\ \text{Maximum} &= 2000 \text{ blocks or } (\text{size of disk})/6, \text{ whichever is more} \\ \text{Default} &= ((3 \times \text{Minimum}) + \text{Maximum}) / 4\end{aligned}$$

2

If you plan to install the XENIX System V Development System, enter a swap space size that is at least 500 blocks larger than the default. This is especially important if you are planning to use large applications like databases, spreadsheet programs, or make programs memory resident for performance reasons.

Calculating the swap space yourself

Systems using major applications (a large relational database, for example) should allocate the swap space according to the following formula. (Use the worksheet provided at the end of this section to perform your calculations.)

1. Multiply the number of users on the machine by the size of the largest process (running program) normally run on the machine, in 1K bytes. If no unusual processes apply, use 512K per user.
2. Take the amount of memory installed in your machine and add 256K. Compare this result with the result from step 1. Use whichever number is larger as your swap space size.
3. Adjust the number upward if multiple users are running different large applications. Try adding 512K per different large application. (Consider the Development System to be a large application.)

For example, the calculations for an 8-user machine with 4Mb of memory and a typical mix of spreadsheet, database, word processor, and graphics package:

1. 8 users x 512K = 4096K.
2. 4096K memory installed + 256K = 4352K, which is greater than the number calculated in step 1.
3. There are 4 users using different large applications. 4 x 512K = 2048K. Add this to the greater amount from steps 1 and 2 to obtain a reasonable calculation of swap space: 4352K + 2048K = 6400K. Since the operating system uses a block size of 1K bytes, this means that a swap space allocation of 6400K translates simply to 6400 blocks.

XENIX Installation Guide

2.5.2 Deciding Whether to Have a Separate (/u) Filesystem

2 If you are installing XENIX on a hard disk (or partition) which is larger than 20MB (Megabytes), you will be asked to decide whether to divide the XENIX partition into two separate filesystems. This other filesystem is typically called “/u”; however, it can be named anything you like except “root”. The /u filesystem is typically used for user accounts and files. There are certain advantages and disadvantages to using a /u filesystems.

There is no need to create a /u if your system is a runtime system (none or very few operating system packages installed) with a single dedicated application or with little user file storage.

Advantages of a /u filesystem

There are several advantages to separate filesystems:

- *System backups are easier.* In a typical system, user files can change often while XENIX utilities and system files usually remain unchanged once they have been installed. Most users create and modify files in their home accounts frequently, so user accounts should be backed up often, while the root filesystem should only require an occasional backup. With separate filesystems, less media (e.g. fewer floppies, fewer tapes, smaller tape size, etc.) is required to make backups of individual filesystems.
- *Smaller filesystems are faster.* File access is faster because the Operating System has fewer inodes (file identifiers) and data blocks (filesystem subdivisions) to search. Each filesystem has its own inode and data block areas. Another reason is when a system is shut down improperly (“crashes”), all filesystems are checked and cleaned using `fsck(ADM)`. It takes less time to clean two smaller filesystems than one large filesystem.
- *During a system crash, a less active filesystem will usually sustain less damage than an active filesystem.* Therefore, by decreasing activity in the root filesystem there is less chance of damage. The /u filesystem can be recreated easily by remaking it and restoring it from backups.

Disadvantages of a /u filesystem

There are two disadvantages, both relating to administration rather than performance.

- *Once a division is made, it is impossible or very time consuming to change the size of or delete a filesystem.* In order to do this the entire XENIX partition must be backed up, and the filesystem sizes changed using the **divvy**(ADM) utility, then the entire system must be restored from backups. This should only be done by an experienced system administrator. It is often easier to simply reinstall from scratch.
- *There is a degree of additional Operating System complexity introduced by an extra filesystem.* This can make system administration too complicated for novice XENIX users. This can include such mundane concerns as remembering to mount other filesystems if they are not mounted automatically at boot time.

2

Determining space for a /u filesystem

To determine if there is sufficient room on your hard disk for a /u filesystem, perform the calculations described in the following steps: (This formula is lengthy; review it here and use the worksheet at the end of this section.)

1. Add together the sizes of all the Operating System packages that you intend to install on your system. Package sizes (in 512 byte blocks) are found in the *Release Notes* "Operating System Packages."
2. Calculate the size for the */tmp* directory. */tmp* is used by many XENIX programs as a temporary storage area. Allow at least half a megabyte per user. Add another half a megabyte per user to this number if there will be some who will be using large databases, editing large files or working on software development.
3. Be sure to include the disk size requirements for any applications on the root filesystem. Most applications usually list disk space requirements in their *Release Notes*.
4. Add the results of steps 1, 2 and 3. This represents the size of a completely full root filesystem.
5. In addition, 10-20% of the size of the root filesystem must be kept as free space after all the software is installed. Take 20% of the

2

root filesystem size obtained in the previous step and add it to that number. As an example, let's assume the root filesystem is 8 Mbytes in size. In order to keep approximately 20% of it free, we would add 2 Mbytes to the root filesystem size, for a total of 10 Mbytes. When a filesystem becomes filled beyond this point, an inordinate amount of time is spent by the Operating System finding free space when needed, causing performance to suffer.

- 6. Subtract the requirements for the root file system (as calculated in Step 5) from the size of your XENIX partition (or size of your hard disk if XENIX is the sole occupant). You should have more than 5-10 Mbytes left on your hard disk before considering adding a /u filesystem.
- 7. Calculate the requirements for the /u filesystem. Allow at least 1.5 Mbytes of disk space per user on the /u filesystem. Add in the requirements for any databases in the /u filesystem. Database requirements will depend upon the maximum size the files will reach, how many users will be using the database and what files if any will be shared among the users of a database. Also add the size of any applications that will reside in the /u filesystem. If the space needed for the /u filesystem is less than the number calculated in Step 5 then you can safely add a /u filesystem.
- 8. Multiply the size in Megabytes of the /u filesystem by 1000 to get the number of 1K blocks to allocate to the /u filesystem.

2.5.3 Disk Layout Worksheets

Use the following worksheets to perform the calculations discussed in the preceding sections.

Swap Space Allocation			
1. Number of users:	_____	x 512K	= _____
2. Amount of RAM installed:	_____	+ 256K	= _____
3. Greater of (1) and (2):			= _____
4. Number of large Applications:	_____	x 512K	= _____
5. Sum of (3) and (4):			= _____

/u Filesystem Allocation		
Instructions	Calculation	Result
1. Sum of OS packages to be installed (converting 512 byte blocks to Mbytes)	_____ / 2000	= _____
2. Number of users times ½MB per user	_____ x .5 MB	= _____
3. Number of users using database or DS times ½MB per user	_____ x .5 MB	= _____
4. Add (2) and (3) for size of /tmp	= _____
5. Disk requirements for applications	= _____
6. Size of root filesystem: add (1) thru (5) plus 20%	_____ x 1.2	= _____
7. Subtract size of root filesystem (6) from XENIX partition (or whole disk)	_____ - _____	= _____
8. If (7) is greater than or equal to 5-10 MB, continue, else no /u filesystem
9. Number of users times 1½MB per user	_____ x 1.5 MB	= _____
10. Size of applications to reside in /u	= _____
11. Size of any database files to reside in /u	= _____
12. Add (9) thru (11) for size of /u filesystem	= _____
13. If /u (12) is less than (7), continue, else no /u
14. Convert /u (12) size to blocks	_____ x 1000	= _____

Sizes of Disk Divisions	
DOS partition:	_____
XENIX partition:	_____
Swap space:	_____
/u filesystem:	_____

2.6 Installation Procedure

2.6.1 Outline

The installation procedure has seven steps:

1. Start XENIX from the BOOT Floppy (volume N1).
2. Initialize the hard disk with the **mkdev(ADM)** program and, if desired, modify the hard disk partition table to share space with the DOS operating system.
3. Re-start the system from the newly initialized hard disk.
4. Copy the XENIX utilities onto the hard disk.
5. Create the super-user password.
6. Establish your time zone.
7. Perform startup system administration tasks.

The following sections describe each step. After you complete the installation, be sure to store this guide and the distribution floppies in a safe place. You will need them again if you wish to reinstall the system for any reason.

2.6.2 What You Need

To install the XENIX System you need:

- A computer with an appropriate amount of memory. Check the *Release Notes* to find the amount of memory needed with your system, plus any additional requirements.
- One hard disk with at least 20 megabytes of storage.
- One double-sided floppy drive.
- The XENIX System distribution floppy disks.
- A Serial Number (an alphanumeric code printed on the Serialization Card).
- An activation key (an alphabetic code printed on the Serialization Card).

2

The XENIX System distribution set contains these floppies:

- The XENIX Operating System floppies. The *Release Notes* delivered with this guide contain a list of the number of floppies in each set and the software packages contained in the Operating System.
- Optional: Development System floppies. The *Release Notes* delivered with the *Programmer's Guide I* contain a list of the software packages contained in the Development System.
- Optional: Text Processing System floppies. The *Release Notes* delivered with the *Text Processing Guide* contain a list of the software packages contained in the Text Processing System.

2.6.3 Starting XENIX From The Boot Floppy Set

2

Note

If you wish to partition the disk so that you can use another operating system in addition to XENIX, stop immediately. If you intend to use DOS on the same system, you must install DOS first. If you do not, you may render your XENIX partition unbootable. Proceed to "Using DOS and XENIX on the Same Disk" in the *System Administrator's Guide* and refer to **fdisk**(ADM) manual page in the *XENIX System Administrator's Guide*. Note that DOS **fdisk** reports disk size in cylinders, XENIX **fdisk** reports disk size in tracks.

If you are only using XENIX on your hard disk, continue with the following steps.

48tpi and 135tpi Distributions

You are ready to start the actual installation process. Find the distribution disks labeled "BOOT" (N1) and "FILESYSTEM" (N2).

96tpi Distributions

If your XENIX distribution is on high density, 96tpi floppies, there is only one BOOT/FILESYSTEM floppy. Throughout the installation procedure, all references to the BOOT and FILESYSTEM floppies refer to the single BOOT/FILESYSTEM floppy.

Follow these steps, remembering to press <RETURN> after you enter your responses on the keyboard.

1. Insert the BOOT (N1) floppy into the drive. If you have more than one floppy drive, use the primary drive (sometimes called the boot drive). Check your computer hardware manual if you are not sure which drive is the primary drive.
2. Turn on your computer and the hard disk.

The computer loads the XENIX **bootstrap** program from the floppy disk and executes it. In the upper left corner of the screen, the computer may display the total amount of memory installed. Next, you see:

```
XENIX System V
Boot
:
```

2

Press **<RETURN>** to boot from the floppy drive.

3. **If you are using 48tpi floppies**, you see this message:

```
fd(4) xenix root=fd(4) swap=ram(0) pipe=ram(1) swaplo=0 nswap=1000 ronly
```

4. **If you are using 96tpi floppies**, you see this message:

```
fd(64) xenix root=fd(64) swap=ram(0) pipe=ram(1) swaplo=0 nswap=1000 ronly
```

5. **If you are using 3.5 inch 135tpi floppies**, you see this message:

```
fd(64) xenix root=fd(64) swap=ram(0) pipe=ram(1) swaplo=0 nswap=1000 ronly
```

6. **If you are using 48tpi or 135tpi floppies**, you see the prompt:

```
Insert Filesystem volume and press <RETURN>
```

Remove the BOOT floppy (N1) and insert the FILESYSTEM floppy (N2).

7. **If you are using 96tpi floppies**, leave the BOOT/FILESYSTEM floppy in the drive.
8. After XENIX is loaded in memory, the system displays information about how memory is allocated and other system information.

Then the system performs a self-check to determine if there are any problems with the hardware. The letters A-Z appear in succession. Note that the letters overwrite each other as they are displayed.

XENIX Installation Guide

9. After the letter Z is displayed, the following message appears:

```
No single-user login present
Entering System Maintenance Mode
```

2

If the letters stop displaying before the letter “Z” is reached, run hardware diagnostics as explained in your computer manual, correct any identified problems and start the installation procedure again from the beginning. If the letters stop again, call the Support Center listed on the support information card and be prepared to tell them at what letter the display ended.

The self-check using letters A-Z occurs every time you bring up your XENIX system.

10. Once the system begins to run, the following menu is displayed:

```
Keyboard Selection
```

1. American
2. British
3. French
4. German
5. Italian
6. Spanish

```
Use the Numeric Keypad if present, using <NUM LOCK> if necessary,
to select one of the above options:
```

Select the option that corresponds to your keyboard.

11. The following message is displayed:

```
XENIX System V Hard Disk Initialisation
```

When you see this message, you are ready to proceed with “Preparing The Hard Disk.”

2.6.4 Preparing The Hard Disk

The following steps describe how to initialize the hard disk. This includes mapping bad spots (bad tracks) on the disk that are avoided by the operating system, dividing the disk into partitions (separate areas occupied by different operating systems) and filesystems (separate areas or directories under the same operating system).

2

1. You see the message:

```
During installation you may choose to overwrite all  
or part of the present contents of your hard disk.  
Do you wish to continue? (y/n)
```

If you do not have any files you want to save, enter **y** and press **<RETURN>**.

Note

If you have files on the hard disk that you wish to save before installing XENIX, respond **n** and the installation will be aborted and the system shut down automatically. You should then reboot your existing operating system, back up any files you want to save, and restart the XENIX installation procedure from the beginning.

Back up files that reside on partitions that you are going to overwrite. Creating a new partition on an unused portion of the hard disk will not overwrite files on another partition; it is not necessary to back up files that reside on an existing partition you are not changing.

XENIX Installation Guide

2. The **mkdev** program now invokes **dkinit**, which sets the parameters for the hard disk. You see information about your hard disk and this menu:

```
2
Hard Disk Drive 0 Configuration

    1. Display current disk parameters
    2. Modify current disk parameters
    3. Select default disk parameters

Enter an option or 'q' to quit:
```

dkinit is primarily for unusual or non-standard disks. If you have a standard hard disk, one that is supported by your computer hardware or special motherboard ROM, enter **q** followed by <RETURN> to continue the installation.

Entering **q** at this point selects the default parameters for your hard disk. Unless you know that your disk is non-standard, assume that it is standard and enter **q** to continue your installation with **fdisk(ADM)**. Skip to step 5.

If your disk is non-standard, you must enter in information that overrides the ROM disk configuration information, replacing it with the new information. If you are unsure of what parameters to enter for your non-standard disk, contact your disk manufacturer for this information. The **dkinit** program (called during installation) uses parameters as defined in the "Fixed Disk BIOS Parameter Table" in Section 5 of the IBM Technical Reference (AT). This data may vary with different computers.

3. If your disk is non-standard, **dkinit** operates as follows...

If you enter “1” or “2”, you see the following display:

<u>Disk Parameters</u>	<u>Values</u>
1. Cylinders	value
2. Heads	value
3. Write Reduce	value
4. Write Precomp	value
5. Ecc	value
6. Control	value
7. Landing Zone	value
8. Sectors/track	value

2

In the actual display, *value* is replaced with the default value for that variable.

Note

The “Cylinders” value refers to the number of cylinders on the entire hard disk and should not to be confused with the number of cylinders you allocated (or intend to allocate) to a given partition.

If you entered a “1”, you now see the first menu again. If you entered a “2”, you are now prompted:

Enter a parameter to modify or 'q' to return to the main menu:

Enter any of “1” - “8” to change the disk parameters, or **q** to return to the previous menu.

Enter the new value or <RETURN> to use the existing value:

If you wish to change the value, enter a new value now or press <RETURN> to use the existing value.

XENIX Installation Guide

2

4. After you finish changing the disk parameters, enter **q** to return to the main menu. Next, enter **q** again to save the changes you made. Exiting from **dkinit** by entering **q** overwrites any parameters you have changed with the new values. If you wish to restore the default parameters after making modifications, enter "3" from the first menu.
5. The installation program next runs the **fdisk(ADM)** utility to partition the hard disk. You can partition your disk to support both DOS and XENIX on the same hard disk (if you have DOS already installed), or you can allow XENIX to use the whole disk.

After a moment, the **fdisk** menu appears on the screen. You see this option list:

```
1. Display Partition Table
2. Use Entire Disk for XENIX
3. Create XENIX Partition
4. Activate Partition
5. Delete Partition

Enter your choice or 'q' to quit:
```

Select option "1" and press <RETURN>.

If you have never installed an operating system on your disk, you see a table similar to this:

```
Current Hard Disk Drive: /dev/rhd00
```

Partition	Status	Type	Start	End	Size

```
Total disk size: 1220 tracks (5 reserved for masterboot
and diagnostics)
Press <RETURN> to continue
```

If you have previously installed an operating system on your disk the **fdisk** table will be filled in.

6. Press <RETURN> to return to the main **fdisk** menu. If you would like XENIX to occupy the whole disk, select option "2". If any other operating systems were previously installed on your system, you will also see the following warning message:

```
Warning! All data on your disk will be lost!  
Do you wish to continue? (y/n)
```

2

Enter y and press <RETURN> only if you want XENIX to occupy the whole disk. This ensures that **fdisk** partitions the whole disk for XENIX.

Note

Most computers have diagnostic programs that write to the last cylinder of the hard disk. This means that the last cylinder should not be allocated to a partition. The last cylinder is not allocated when you choose option 2 from the **fdisk** menu. If you choose option 3, you should not allocate the last cylinder of the hard disk to the XENIX partition.

-
7. Press <RETURN>, and you see the main **fdisk** menu. You have now set up the partition(s) to use XENIX on your hard disk. To continue with the next step in the installation procedure, enter **q** and press <RETURN>.
 8. Now you see a menu from the program **badtrk(ADM)**. With the **badtrk** program, you can scan your hard disk for defective tracks. The program maps any flawed locations to good tracks elsewhere on the disk. It also creates a bad track table, which is a list of all the bad tracks on your hard disk.

XENIX Installation Guide

2

The main **badtrk** menu looks like this:

```
1. Print Current Bad Track Table
2. Scan Disk (You may choose Read-Only or Destructive later)
3. Add Entries to Current Bad Track Table by Cylinder/Head Number
4. Add Entries to Current Bad Track Table by Sector Number
5. Delete Entries Individually from Current Bad Track Table
6. Delete All Entries from Bad Track Table

Please enter your choice or 'q' to quit:
```

Enter "2", then press <RETURN>.

9. You see the following submenu:

```
1. Scan entire XENIX partition
2. Scan a specified range of tracks
3. Scan a specified filesystem
```

Select option "1".

10. After you select the area you want scanned, you are given the choice:

```
1. Quick scan (approximately 7 megabytes/min)
2. Thorough scan (approximately 1 megabyte/min)
```

Select option "2".

11. You are prompted:

```
Do you want this to be a destructive scan? (y/n)
```

Enter **y**. You are warned:

```
This will destroy the present contents of the region you are
scanning.
Do you wish to continue? (y/n)
```

2

Enter **y** and press **<RETURN>**. You see the following message:

```
Scanning in progress, press 'q' to interrupt at any time.
```

12. After you respond to the above prompts, the program scans the active partition of the new disk for flaws. The larger your disk, the longer the scanning process takes, so a very large disk may take a while.

As **badtrk** scans the disk, it displays the number of each track it examines, and the percentage of the disk already scanned. Pressing the **q** key at any time interrupts the scan. If you press **q** to interrupt the scan you do not need to press **<RETURN>**. You are then prompted to continue scanning or to return to the main menu.

Whenever **badtrk** finds a defective track, it lists the location of that track using both the sector number and cylinder/head conventions. Defective track information is entered into the table and displayed on the screen. An example bad track might be:

```
wd: ERROR : on fixed disk ctrlr=0 dev=0/47 block=31434 cmd=00000020
status=00005180, sector = 62899, cylinder/head = 483/4
```

XENIX Installation Guide

13. When the scan is complete, the menu reappears. Select option "1" to see the results of the scan. Your bad track table might look like this:

Defective Tracks

	Cylinder	Head	Sector Number(s)
1.	190	3	12971-12987

Press <RETURN> to continue

Press <RETURN> to return to the main menu.

Note

If there is a flaw in the first few tracks of the XENIX partition, you are returned to the **fdisk** utility (see the previous installation step). Repartition the disk with **fdisk** so that the XENIX partition no longer includes the defective tracks. You will have to experiment to determine how many tracks to exclude. Leave these defective tracks unassigned to any operating system. When you leave **fdisk**, **badtrk** will be run again and you should scan the disk for further flaws.

This process will continue until **badtrk** finds no flaws in the first few tracks.

-
14. **If your disk comes with a flaw map**, you should enter any flaws from it into the bad track table.

Because most disk flaws are marginal or intermittent, your disk's flaw map will probably list more bad tracks than the scanning process reveals. If so, you should now add these defective tracks to the bad track table.

Select either option "3" or option "4" depending upon the format of the flaw map furnished with your disk. Enter the defective tracks, one per line. If you make a mistake, enter **q** and press **<RETURN>**. When you see the main **badtrk** menu, select option "5" to delete a track.

15. **If your disk is not furnished with a flaw map, or you are finished making changes to the bad track table, enter q and press <RETURN>.**
16. You are next prompted for the number of tracks to allocate as replacements for those tracks that are flawed. You should allocate at least as many as the recommended number. Enter the number or just press **<RETURN>** to use the recommended number that is displayed:

Enter the number of bad tracks to allocate space for
(or press return to use the recommended value of n):

If you press **<RETURN>** and do not enter an alternate value, **badtrk** allocates the recommended number of tracks as replacements. This number is based on the number of bad tracks currently in the table, plus an allowance for tracks that may go bad in the future. If you ever exceed the number of allocated bad tracks, you must reinstall XENIX.

17. Next, **badtrk** prompts:

Do you want to update this device with the new table? (y/n)

XENIX Installation Guide

Enter **y** and press **<RETURN>** to save the changes. To correct any mistakes or otherwise alter the bad track table, enter **n**. Modify the bad track table to contain the desired entries, enter **q** at the main menu to return to the prompt displayed above, then enter **y** to update the device with the new table.

2

18. Next, you see:

```
Do you want to attempt to salvage any valid data
on the bad tracks? [may take a long time] (y/n)
```

Enter **n** and press **<RETURN>**.

19. Next, the installation program runs the **divvy(ADM)** utility. This program allocates portions of your partitioned disk for the *root* and *swap* areas. It also allocates a small portion of the disk for a *recover* area that is used during autoboot by the **fsck(ADM)** program. **divvy** first prompts you for the swap space allocation:

```
There are n blocks in the XENIX area.
Between x and y blocks should be reserved for the swap area.
```

```
Please enter the swap space allocation, or press <RETURN>
to get the default allocation of z blocks:
```

The actual numbers in this prompt vary depending upon the size of your disk. If you used the Disk Layout Worksheets, enter the value you calculated, otherwise use the default values shown on your screen. (If you plan to install the Development System, enter a swap-area allocation that is at least 500 blocks larger than the default.) Enter your swap space allocation now or press **<RETURN>** to choose the default values.

If you have enough disk space for a */u* filesystem, you see the prompt:

```
Do you want a separate /u filesystem? (y/n)
```

If you have enough storage for a separate user filesystem, and want to create one, enter **y** and press **<RETURN>**. If you do not wish to have one, respond **n** and proceed to the next step.

Next, you see:

2

```
Enter block allocation for the /u file system.
(min to max)
```

In the display, *min* and *max* are replaced with the minimum and maximum number of blocks that can be allocated for the filesystem. If you used the Disk Layout Worksheets, enter the value you calculated for the */u* filesystem. (See “Planning Your Disk Layout” for more information on the */u* filesystem.)

20. You are now prompted for block-by-block control of the partition:

```
Do you require block-by-block control over
the layout of the XENIX partition? (y/n)
```

Enter **n** and press **<RETURN>**. Block-by-block control means you can choose the exact size of filesystems and the swap area to fit your needs. Most users do not need this kind of precise control, so answering ‘n’ at this prompt causes **divvy** to use default settings based on the size of your hard disk. (The block-by-block procedure is detailed in the “Reinstalling and Updating Your System” in this guide; it is not necessary for those installing XENIX for the first time.)

21. If you have a large root filesystem (40 MB+ on the 80286, or even larger on the 80386) you may be asked if you want to allocate an additional, small portion of the disk as scratch space for **fsck**. This scratch space is needed for temporary storage when checking large filesystems. Respond “y” and press **<RETURN>**. (**autoboot** uses */dev/scratch*, the filesystem created by **divvy**, when it runs **fsck** on the root filesystem. You can also use */dev/scratch* as a scratch filename at other times when **fsck** prompts for one, provided that the filesystem being checked is not larger than the root filesystem.)

XENIX Installation Guide

22. The system now loads a rudimentary XENIX file system onto your hard disk. This takes several minutes. You see the message:

```
Making filesystems
```

23. **If you are using a 96tpi floppy set**, the Restricted Rights Legend is displayed, followed by the message:

```
Operating System Serialization
```

```
Enter your serial number  
and press <RETURN>:
```

Enter your serial number exactly as it is shown on your Serialization Card and press <RETURN>. Then you see the message:

```
Enter your activation key and press <RETURN>:
```

Enter your activation key exactly as it is shown on your Serialization Card and press <RETURN>.

24. When the **mkdev** program is finished, the message is displayed:

```
Hard Disk Initialization procedure complete
```

The system then shuts down and displays instructions on booting the newly initialized hard disk. Make note of these instructions. You then see:

```
** Normal System Shutdown **
**   Safe to Power Off   **
      - or -
** Hit Any Key to Reboot **
```

2

If you want to add a second hard disk, finish the installation procedure first. You will be referred to the proper instructions later in this procedure. You can now proceed to “Starting XENIX on the Hard Disk.”

2.6.5 Starting XENIX On the Hard Disk

This section explains how to start the XENIX system using the hard disk.

1. **If you are using 96tpi floppies**, open the floppy door, but leave the BOOT/FILESYSTEM floppy in the drive.
2. Press any key to reboot the system. You see the following boot prompt:

```
Boot
:
```

3. **If you are using 96tpi floppies**, press <RETURN>. You see the following:

```
hd(40)xenix
```

XENIX Installation Guide

4. **If you are using 48tpi or 135tpi floppies**, insert the BOOT floppy (N1) into the drive and press <RETURN>.

You see the following:

```
fd (64) xenix root=hd(40) swap=hd(41) pipe=hd(40) swaplo=0 nswap=0
```

5. Next, regardless of your floppy type, you see some copyright information, and information about the memory configuration of your system.

Note

Note that this startup procedure applies only to the first time you install XENIX on your hard disk. Hereafter you need only press <RETURN> when you see the Boot prompt, no matter what type of floppies you use for your installation.

As before, the system performs a self-check to determine where any problems exist with the hardware. The letters A-Z appear successively on screen. If the letters displaying stop before the letter "Z" is reached, run hardware diagnostics as explained in your computer manual. Correct any identified problems and start the XENIX installation procedure again.

If the letters stop at this point, call the Support Center listed on the support information card and be prepared to tell them the last letter displayed.

6. Now the installation program runs the **fsck(ADM)** utility. **fsck** checks the filesystem(s) on your hard disk. In this case, it will check only the root filesystem.
7. **If you have 135tpi floppies**, proceed to step 12.
8. **If you have 48tpi floppies**, when **fsck** finishes, you are prompted to make sure the BOOT (N1) floppy is in the drive. You see the following:

```
Verify Operating System (Installation )volume N1 is inserted  
and press <RETURN>
```

9. **If you have 96tpi floppies**, you are prompted to insert floppy B1 at this point.
10. Follow any additional screen prompts for floppies. Note that you may not be prompted to insert all the volumes in your distribution at this time.

If you insert a floppy in the wrong order, you see this prompt:

```
Error: incorrect volume in drive!
```

Remove the floppy from the drive, insert the correct volume, and press **<RETURN>**.

If there is an error with the extraction procedure, you see the message:

```
Extraction error: try again? (y/n)
```

Make sure you are using the correct floppy, make certain the door of the floppy drive is completely closed, then enter **y** and press **<RETURN>**. If the message persists, see “Error reading a floppy” in the “Troubleshooting” section at the end of this chapter.

11. **If you have 96tpi floppies**, skip the next few steps and proceed to “Setting the root Password.”
12. **If you have 48tpi floppies**, when the last of the “N” volumes you are prompted for is read, you see the message:

```
Operating system serialization.
```

```
Enter your serial number  
and press <RETURN>
```

XENIX Installation Guide

Enter the serial number exactly as it is shown on your Serialization Card and press <RETURN>. Then you see the message:

2

```
Enter your activation key
and press <RETURN>
```

Enter the activation key exactly as it is shown on your Serialization Card and press <RETURN>. You are then prompted for the "B" series of floppies. Now skip the next step and proceed to "Setting the root Password."

13. **If you have 135tpi floppies**, you see the following message:

```
Operating system serialization.

Enter your serial number
and press <RETURN>
```

Enter the serial number exactly as it is shown on your Serialization Card and press <RETURN>. Then you see the message:

```
Enter your activation key
and press <RETURN>
```

Enter the activation key exactly as it is shown on your Serialization Card and press <RETURN>.

You see the following message:

```
** Normal System Shutdown **
**   Safe to Power Off   **
      - or -
** Hit Any Key to Reboot **
```

Remove the BOOT floppy, press any key to reboot the system and press <RETURN> at the boot prompt. After the system boots, you are prompted to insert volume N3. Insert N3 and press <RETURN>. You are then prompted for the "B" series of floppies.

2

You are now ready to proceed to the next section, "Setting the root Password."

2.6.6 Setting the root Password

When the last of the "B" floppies is installed, you see:

```
Please assign a password for the super user account, ``root``.  
Enter new password (minimum of 5 characters)  
Please use a combination of upper and lowercase letters and numbers.  
New password:
```

The new password can be any combination of letters, numbers, and punctuation marks, but should be at least 5 characters long. Enter the new password and press <RETURN>.

The system does not display the password as you enter it, so type carefully. After you press <RETURN>, the system displays the message:

```
Re-enter new password:
```

Enter the new password once more and press <RETURN>. Make sure you enter it correctly, otherwise the program prompts you to enter the password again. When you have entered the password correctly, you see some information about XENIX passwords and how to change your super user password in the future.

The super-user password is now in place. From now on, the password is required whenever you attempt to access the system as super-user. The super-user password keeps the system safe from unauthorized use. It is important that you create a super-user password during system installation to ensure maximum protection of the system and prevent unnecessary use of the super-user (also known as "root") account.

XENIX Installation Guide

It is very easy to make errors when logged in as super-user that could destroy files. **Log in as super-user only to install programs and to do system maintenance tasks.** For a complete description of the super-user, see the *XENIX System Administrator's Guide*.

- 2 Do not forget the super-user password. To restore a forgotten super-user password you must reinstall the XENIX system. If necessary, keep a copy of the super-user password in a safe place.

You can now proceed to "Establishing the Time Zone."

2.6.7 Establishing the Time Zone

This procedure is simple if you are in North America. Countries in other areas should read this section carefully and obtain any information needed before continuing.

1. The first thing you see is:

```
Time zone initialization
```

You then see:

```
Are you in North America? (y/n)
```

Installation Procedure

If you are not in North America, enter **n** and proceed to step 3. If you are in North America, enter **y**. You see the following menu:

1. NST - Newfoundland Standard Time
2. AST - Atlantic Standard Time
3. EST - Eastern Standard Time
4. CST - Central Standard Time
5. MST - Mountain Standard Time
6. PST - Pacific Standard Time
7. YST - Yukon Standard Time
8. HST - Hawaiian/Alaskan Standard Time
9. NST - Nome Standard Time

2

Enter the number that represents your timezone:

If, for example, your timezone is Nome Standard time, you would enter the number "9" and press <RETURN>.

2. You see the following:

Does daylight savings time (summer time) apply at your
location? (y/n)

If daylight savings/standard time changes occur in your area, enter "y". If not, enter "n". In either case, next proceed to step 9.

3. You see the following:

What is the abbreviation of your standard time zone?
Enter 1-9 characters or enter q to quit:

Enter the abbreviation of your time zone.

4. You see:

How many hours west of Greenwich Mean Time are you?
Enter hh[:mm:ss] (e.g. 10:30:00 or 10:30, use negative
numbers for locations east of GMT) or enter q to quit:

Enter a number.

XENIX Installation Guide

5. You see:

Does summer time (daylight saving time) apply at your location (y/n)?

2

If summer time does not apply, enter "n". Proceed to the step 9.

If summer time does apply, enter "y". You then see:

What is the summer abbreviation of your time zone?
Enter 1-9 characters or enter q to quit:

Enter the summer abbreviation of your time zone.

6. You see:

1. Week of the year (1-52).
2. Week of a specific month (eg. 1st week of April).
3. Day of the year, ie. Julian date (1-365).

Select the method your time zone uses to convert from standard time to summer time (daylight saving time) or enter q to quit:

Select a method and follow the prompts.

7. You see:

At what time of day is the conversion made (use 24 hour clock)?
Enter hh[:mm:ss] or press <RETURN> for default value of 2 am
or enter q to quit:

Enter a number.

8. Depending upon which method your time zone uses, you see the following prompt:

```
How many hours does your timezone adjust for summer time
(daylight saving time)?
Enter hh[:mm:ss] or press <RETURN> for the default value of 1 hour
or enter q to quit:
```

2

Enter a number or press <RETURN>.

9. The time zone variable, **TZ**, in the file */etc/default/login* is changed accordingly. Your time zone is now set. There is no need to change the *.profile* for a user, unless they call in from a different time zone, and want to override the local standard. You see the message:

```
Setting up system directories
```

10. Next, information about your filesystem(s) is displayed, including the number of blocks currently used. You also see another menu which gives you the option of stopping or continuing with the installation:

```
1. Stop installation
2. Continue installation
```

So far you have installed the minimal XENIX system, or “Run Time” system. If you want to install Operating System packages or applications, select option “2” and press <RETURN>. You can now proceed to the next section, “Installing the XENIX Distribution and Applications.”

2.6.8 Installing the XENIX Distribution and Applications

This stage involves “customizing” your system, adding only those parts of the Operating System distribution that are useful to you. You can also install your applications as well. The installation program **custom(ADM)** is automatically invoked next to install XENIX packages and other products, including applications.

2

Choosing Packages to Install

Refer to “Packages in This Set” in your *Release Notes* for a list of Operating System packages. The only software presently installed on your system is the RTS package, or Run Time System. This represents the minimal software needed to have a functioning operating system. Other packages can be added that suit your needs; if your system is merely a platform for applications such as spreadsheets, word processors or databases, you should install the following packages:

SYSADM	A user-friendly interface for system administration
BACKUP	Utilities used to perform backups
LPR	The line printer spooler
MAIL	Mail program for sending messages to other users

In addition, packages such as BASE, EX, and CSH are useful for those who wish to work in a traditional XENIX environment, using the **ex/vi(C)** file editors, various file utilities and the C-shell (**csH(C)**).

If you have a large hard disk and space is not a problem, you can select ALL and install every package of the Operating System. Note that the entire XENIX distribution, including the Development System and Text Processing System requires more than 10 megabytes of disk space.

Note

If you choose to install the TERMINF package (**terminfo(M)**), you are prompted as to whether you want the **terminfo** database compiled at this time (a lengthy process). If you choose to defer this until later, you are given instructions for doing so.

Installing Your Packages and Applications

1. The main **custom** menu is displayed:

```

1. Operating System
2. Development System
3. Text Processing System
4. Add a supported product
  
```

Select a set to customize or enter q to quit:

If you do not select a system to “customize” by choosing the ‘q’ option, you stop the installation procedure. You will need to invoke **custom** later to add other XENIX packages. To add Operating System Packages, select option “1”.

2. The following messages are displayed:

```
Installing custom data files ...
```

```
Insert Operating System (extended utilities) Volume X1
and press <RETURN> or enter 'q' to quit:
```

Insert the diskette as instructed and press **<RETURN>**.

3. The following submenu is displayed:

```

1. Install one or more packages
2. Remove one or more packages
3. List the available packages
4. List the files in a package
5. Install a single file
6. Select a new set to customize
7. Display current disk usage
8. Help
  
```

Select an option or enter q to quit:

Select option “1”. A list similar to the one in your *Release Notes* is displayed. Enter the name of each package separately, unless you select ALL. When you enter the name of a package, **custom** prompts for the necessary volume numbers. Insert the appropriate floppies and follow the screen prompts.

XENIX Installation Guide

For more information on installing portions of the Operating System, see **custom(ADM)** in the *XENIX System Administrator's Guide*.

2

4. You are instructed again to insert Volume X1. Since this volume is already in the drive, press <RETURN>.
5. If you plan to install device drivers, you should install the Link Kit (LINK) using the "Add a Supported product" option of the main **custom** menu. Some products (SNA, XENIX-NET) also have drivers that require linking into the kernel, so you should install the Link Kit now. Note that you are prompted for your serial number and activation key again. Enter them as you did earlier in the installation.
6. You can install your applications using the "Add a Supported Product" option of the main **custom** menu. You are prompted for various volumes (including parts of your Operating System distribution) just as you were for XENIX packages.
7. When you are finished installing XENIX packages and any products, quit out of **custom** by entering **q** at the main menu. A message is displayed about booting the system. You then see:

```
** Normal System Shutdown **  
  
**   Safe to Power Off   **  
    - or -  
  
** Hit Any Key to Reboot **
```

The system shuts down. Remove any floppy that is in the drive.

8. Press any key to reboot the system and press <RETURN> when the boot prompt appears:

```
Boot  
:
```

The following is displayed:

```
hd(40) xenix
```

The screen clears and you see some self check diagnostics.

2

9. Next, you are prompted to continue the startup or perform system maintenance:

```
Enter CONTROL-d to proceed with normal startup
(or give root password for system maintenance)
```

Because there are some system administration steps you should take now, enter the root password and press <RETURN>.

The next thing you see is the root prompt, also used in system maintenance mode, which is a number sign:

```
#
```

You are ready to perform the system administration tasks covered in “System Administration Startup Tasks.”

2.6.9 System Administration Startup Tasks

The following steps prepare your system for users to log in:

1. **If you created a /u filesystem earlier in the installation**, enter the following command before leaving System Maintenance Mode:

```
mkdev fs /dev/u /u
```

You are prompted for the following:

- ```
1. Always mount /dev/u when entering multiuser mode.
2. Never mount /dev/u when entering multiuser mode.
3. Prompt before mounting /dev/u when entering multiuser mode.
```

```
Select an option:
```

If you want your `/u` filesystem to be mounted automatically at boot time, select “1”.

In addition, you should edit the `/etc/default/mkuser` file. Change the entry which reads “HOME=/usr” to “HOME=/u”. This establishes `/u` as the location for user accounts.

2

2. You can use the `mkuser(ADM)` utility to create user accounts. `mkuser` will prompt for the necessary information and create entries in `/etc/passwd` for you. To run the program, make certain you are still logged-in as `root` and enter:

### `mkuser`

3. It is recommended that you make copies of the `BOOT` and `FILESYSTEM` floppy or floppies as soon as you can, putting the originals in a safe place and using the copies instead. These floppies are write protected, but any floppy can fail with frequent use, so it is best to back-up all your volumes, especially these crucial floppies. You can copy the floppies using the procedure described in “Copying Floppy Disks” in the “Using Floppy Disks and Tape Drives” chapter of the *XENIX System Administrator's Guide*.

---

### Note

If you have received a copy-protected version of the XENIX System, you will not be able to copy the N volume(s) of your distribution.

---

4. If you installed any device drivers or products that have drivers, you must link them into the kernel before you can use them. Proceed to “Adding Device Drivers with the Link Kit” in the *XENIX System Administrator's Guide* and follow the instructions. (For certain installations, it may also be necessary to configure certain kernel parameters; refer to the “Tuning System Performance” chapter in the *XENIX System Administrator's Guide* for details.)
5. You should now create an Emergency Boot Floppy for your system. This floppy allows you to quickly recover your root filesystem when it becomes corrupted and you cannot boot from your hard disk. Proceed to the “Using Floppy Disks and Tape Drives” chapter of the *XENIX System Administrator's Guide* and follow the simple procedure described in “Creating an Emergency Boot Floppy.” This will save you hours that would otherwise be spent reinstalling XENIX from scratch. Note that regular backups should

be made of your filesystems so that, should any corruption occur, you have something to restore.

6. If you wish to add a second hard disk, follow the instructions in “Adding a Second Hard Disk” in the “Using Filesystems” chapter of the *XENIX System Administrator’s Guide*.
7. Now that you have installed your software and created your user accounts, you should now exit maintenance (single-user) mode by pressing **Ctrl-d**. This logs you out and brings the system up in multi-user mode.

2

Your system is now ready for users to log in.

### 2.6.10 Routine System Operation

Refer to the “Starting and Stopping the System” and “Solving System Problems” chapters in the *XENIX System Administrator’s Guide* if you have problems. If you are not familiar with the XENIX Operating System, we recommend that you halt the system and turn to the *XENIX User’s Guide* and the *XENIX System Administrator’s Guide* to learn how to start the system, how to log in, how to run programs and add software to your system.

If you need to halt the system again for any reason, follow these steps:

1. Enter:

```
/etc/shutdown 0
```

and press **<RETURN>**.

2. When you see the shutdown message, it is safe to turn off the power to the computer.

### 2.7 Troubleshooting

Sometimes things can go wrong in the installation procedure. Most often, there is no problem with the software or the procedure itself. Occasionally there is a problem with the hardware, but most are minor, such as improperly connected cables.

During the installation procedure, don’t assume you know what is about to happen, even if you have installed the XENIX system before. Read the documentation closely. Many common problems are discussed in the

## XENIX Installation Guide

“Solving System Problems” chapter of the *XENIX System Administrator’s Guide*.

2

If you have difficulty installing the software, here is a list of some of the most common problems, how to avoid them, and how to fix them if they happen:

- *Some hardware* (for example, a disk drive) *doesn’t seem to work, although it works fine under another operating system.*

Certain hardware configurations do not work with XENIX. Refer to the “Compatible Hardware” section in the *Release Notes* for information on what hardware you can use with XENIX.

- *XENIX is installed after DOS, now both operating systems do not work.*

You may want to back up your DOS files, install DOS and install XENIX. For details, refer to the “Using DOS And XENIX On The Same Disk” chapter of the *XENIX System Administrator’s Guide*.

- *Error reading a floppy.*

Make sure the correct floppy is in the drive and it is inserted correctly (see your owner’s manual if you do not know how insert the floppy correctly).

Make sure the floppy drive door is closed after you insert a floppy.

If you are sure the proper floppy is inserted correctly, and you still have a read error, try tapping the edge of the floppy lightly against a hard surface, such as a table top. This should be done carefully because you can damage the floppy. If the error message persists, call the SoftCare Support Center to get a new floppy.

- *The system does not boot from the BOOT floppy.*

Make sure you insert the BOOT floppy. If you insert another floppy instead, you do not see an error message, but the system still does not boot.

The BOOT floppy is shipped with a write protect tab so that you do not accidentally erase it during the installation process. If you erase or damage the BOOT floppy, and you have not made a backup copy, call the SoftCare Support Center number to arrange for a new BOOT floppy.

- *The system won't boot from the hard disk*

You may see a message such as:

```
PANIC: iinit
```

2

or another kind of error message. Sometimes this happens because you did not run a bad track scan during installation, and the boot block was written on a bad track.

Whatever the reason, you must reinstall the XENIX system. If you didn't enter all the flaws furnished on a flaw map, do so this time.

If XENIX still won't boot, run your system's and disk's hardware diagnostics.

- *You forget to enter more bad tracks from the flaw map that was supplied by the manufacturer of the hard disk.*

You can add more flaw locations to the bad track map any time you are in System Maintenance mode. Follow these steps if you are still in the installation procedure:

- Finish installing the run time system.
- When you are prompted to continue or stop the installation process, select option 2: "Stop the installation process."
- Enter system maintenance mode.
- Run **badtrk** to add the new flaws.
- Salvage any data (when prompted under **badtrk**).
- Run the **custom** utility to finish installing your system.



# Chapter 3

## Reinstalling and Updating Your System

---

- 3.1 Introduction 3-1
  - 3.1.1 Concerning Updates 3-2
- 3.2 Shut Down the System 3-3
- 3.3 Back-up the System 3-4
  - 3.3.1 Backups and Updates 3-5
  - 3.3.2 If You Plan to Preserve Non-root Filesystems 3-5
- 3.4 Reinstallation Procedure 3-6
- 3.5 Reinstall Packages and Applications 3-17
- 3.6 Relink the Kernel 3-17
- 3.7 Prepare Preserved Filesystems for Use 3-17
- 3.8 Restore Your Backups 3-18
- 3.9 Reestablish Your Second Hard Disk 3-18
- 3.10 Updates: Merge New Versions of Configurable Files 3-20



### 3.1 Introduction

The following procedure explains how to reinstall or update your system. It does not apply if you are installing XENIX for the first time.

This chapter contains information used by updates and reinstallations; both operations have procedures in common. In either case it is necessary to perform a safety backup of your system first (if possible) and, when finished with the reinstallation/update, relink your kernel if you are using any special device drivers.

3

There are at least four reasons for performing a reinstallation:

- You must reinstall your present OS in order to enlarge your swap space or increase the size of your bad track table.
- You want to install a new release of the XENIX Operating System (OS) over your existing system without disturbing your non-root filesystems.
- An update has instructed you to reinstall your system.
- You need to reinstall your present OS because your hard disk has become corrupted, will not boot, and you have no Emergency Boot Floppy and no backup tapes to restore.

The reason you should use this chapter rather than the *Installation Procedure* is that the prompts generated during a reinstallation differ from a normal installation (due to existing filesystems).

If you have turned to this chapter because your hard disk will not boot and you have an Emergency Boot Floppy plus complete backups of your system, you should follow the procedure “Restoring a Corrupted Root Filesystem” in the “Solving System Problems” chapter of the *XENIX System Administrator’s Guide*.

If you are planning to enlarge your swap space or increase the size of your bad track table, you can preserve existing non-root filesystems only if they are on a secondary hard disk. You must back up (using `tar(C)`) all filesystems that are on the active XENIX partition. The other partitions will not be affected unless you change the size of the XENIX partition. During installation, you must recreate filesystems at least as large as your backups require and restore them when the reinstallation is complete.

### Note

If you are planning to enlarge one filesystem at the expense of another, you cannot use backup volumes created using **backup(C)** to restore the entire reduced filesystem, even if the filesystem was not full when the backup was made. You can restore individual files from your backups (using the “Restore backed up file(s)” option of **sysadmin(ADM)**) but you will not be able to restore an entire filesystem (as with the “Restore an entire filesystem” option of **sysadmin**). You should keep your backups in case it is necessary to restore individual files and directories, but make **tar** backups as instructed in this chapter and use them.

---

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### 3.1.1 Concerning Updates

Because the installation requirements vary from update to update, the only consistent element is the need to perform a complete backup of your system. Updates frequently replace only those elements that have changed since the previous release, plus the kernel, which then requires relinking with any device drivers you have installed. Some updates may require a reinstallation (due to an incompatibility between releases), but such updates also perform a partial backup to keep your configurable data files intact.

Updates and reinstallations do not affect any other operating systems (or partitions), such as MS-DOS, that currently share the hard disk, unless you choose to change partition sizes. Refer to the “Using DOS and XENIX on the Same Disk” chapter in the *XENIX System Administrator's Guide* if you want to change the size of your XENIX partition.

## Reinstalling and Updating Your System

Follow these steps to reinstall/update your XENIX system:

1. Shut the system down to Single User (System Maintenance) Mode.
2. Make a full backup of your system.
3. Updates only: save particular files from your current system.
4. Perform the reinstallation or update
5. Relink the kernel, if necessary.
6. Updates only: merge any user-configurable files that have changed with your modifications.

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If you have local system modifications to the kernel, such as additional device drivers, you must relink these into the new link kit after you reinstall XENIX. Check with the supplier of the other software and refer to “Adding Device Drivers with the Link Kit” in the *XENIX System Administrator's Guide* for further details.

### 3.2 Shut Down the System

You should be the only person logged in to your computer when you perform the reinstallation/update. Make sure any other users know what you are going to do, and when you are going to do it. They may wish to make their own backups before you bring down the system.

Also, advise users to remove unnecessary files. This makes the whole process faster and requires fewer floppies, if they are your only backup media.

To shut the system down and enter single user (maintenance mode), first login as **root** and enter the following command:

```
/etc/shutdown su
```

Give the users five minutes to log off. When you are prompted to enter <CTL>D or the root password for system maintenance, enter the root password. This puts you into single-user mode, and your prompt is a “#”.

### 3.3 Back-up the System

Before you do anything else, make a full backup of the system. Use the **tar(C)** command. Refer to **tar(C)** in the *XENIX User's Reference*. You cannot use any other filesystem backup utilities.

---

#### Note

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**tar** does not archive empty directories or device files.

---

Depending on the archive device on your system, you would use a command similar to the following, which uses the cartridge tape drive:

```
tar cvf /dev/rct0 .
```

This creates a backup of the entire root file system. In addition, you should make separate backups of all non-root filesystems. (**/u** is an example of a non-root filesystem.) If you are still in single-user mode, you need to mount them first, for example:

```
/etc/mount /dev/u /u
```

This mounts the **/u** filesystem.

You should make a backup immediately before updating/reinstalling so that you have the latest possible version of your system. This is especially important in the case of user files, which can change frequently. Once again, remove any old, unnecessary files. This makes the whole process faster.

You can use any backup media, including floppy and tape drives, to save your files. However, if you use a special driver with your backup device, you cannot use that device immediately after installing the new kernel, since it is not yet linked with the required device driver. This is important, since you can only read information from the default floppy drive until you relink the kernel.

If you are reinstalling XENIX, make certain you have the original distributions of any applications packages you use. You must reinstall those software packages after you reinstall the XENIX system. (Certain updates may also require reinstallation of all applications.)

### 3.3.1 Backups and Updates

Because most updates only replace those parts of the operating system that have changed, it is not usually necessary to back up your non-root filesystems. However, it is advisable to perform a complete backup before any update to protect you from unforeseen problems. At the same time, filesystems may be incompatible from release to release, and certain updates will require a special reinstallation.

Such updates will make the reinstallation process easier by making a limited backup that includes only those parts of the root filesystem that you have changed or customized. These files are usually referred to as “user-configurable;” those files of the XENIX Operating System set that are routinely modified by users or by programs run by users.

Updates requiring this type of backup do so automatically, usually prompting you for your media device. Some of these user-configurable files can change in format or content from release to release (e.g. */etc/termcap*). When this is true, your update *Release Notes* will inform you of any files that apply. In addition, backups of your files will be left in place so that you can merge your modifications with the newer version. Where possible, these changes are made automatically for you during the update. You can find a list of these user-configurable files at the back of your update *Release Notes*.

If you have any non-root filesystems, such as a */u* filesystem, you are required to back up these files manually. Most updates will allow you to preserve non-root filesystems. (Filesystems on hard disks other than the primary hard disk will not be touched by the reinstallation and are dealt with later.) Unless otherwise instructed by the update *Release Notes*, assume that you can preserve your other filesystems as described in the section that follows, “If You Plan to Preserve Non-root Filesystems.”

### 3.3.2 If You Plan to Preserve Non-root Filesystems

If you are performing a reinstallation and your update instructions indicate it is permissible, you can leave your special filesystems on your primary hard disk untouched during the reinstallation. You must follow certain precautions, however. When the root filesystem is created anew, all the device nodes and the mount points are destroyed, but the actual files and divisions are still intact. (The device node is the device name that refers to the filesystem, such as */dev/u*. The mount point is the directory that the device is “mounted” upon, such as */u*.) During the reinstallation, you will be put into the **divvy** “block-by-block” menu and be asked to “name” each of your filesystems over again, which will recreate the device nodes and mount points. You are cautioned to take care not to

## XENIX Installation Guide

obliterate or change the filesystems in any way other than to give them names once again using the “n” option. The “block by block” menu has an “r” (restore) option to undo any changes, but you are warned to take care during this part of the procedure.

### 3.4 Reinstallation Procedure

This section describes how to reinstall your system.

3

1. You should have your complete XENIX distribution, applications, device drivers, etc. on hand before beginning. Make certain you have your serialization codes and activation keys as well.
2. You should have performed a complete safety backup of your system as instructed in “Back-up the System.”
3. If you are increasing your swap space or the size of your bad track table, you will need to recreate your non-root filesystems. If you are preserving any filesystems, you need to rename your non-root filesystems. In order to do either, you must record your present **divvy** table. Enter the following command:

```
/etc/divvy -c 1 -b 1 -p 0
```

Copy the table entries displayed on your screen into the blank table below (you need not copy the *New File System?* column):

#### Primary Hard Disk Filesystems

| Name | New File System? | # | First Block | Last Block |
|------|------------------|---|-------------|------------|
|      |                  |   |             |            |

Enter “q” to quit out of **divvy**, followed by “e” when asked if you want to exit.

## Reinstalling and Updating Your System

4. If you have a secondary hard disk with existing XENIX filesystems, they will not be touched by the reinstallation, but you must record the filesystems in your present **divvy** table and later rename the divisions after the reinstallation is complete. Enter the following command:

```
/etc/divvy -c 1 -b 1 -p 1
```

Copy the table entries displayed on your screen into the blank table below (you need not copy the *New File System* column):

### Secondary Hard Disk Filesystems

| Name | New File System? | # | First Block | Last Block |
|------|------------------|---|-------------|------------|
|      |                  |   |             |            |

Enter “q” to quit out of **divvy**, followed by “e” when asked if you want to exit.

5. After you have notified users that your system will be down for some time, log in as **root** and use the **shutdown**(ADM) command to halt the system:

```
/etc/shutdown 5
```

6. When the system halts, insert the **BOOT** floppy (N1) into the drive and press any key to reboot the system. The system boots from the floppy and the usual messages are displayed. Insert volumes as instructed and select your keyboard nationality as usual.
7. After the hard disk initialization message is displayed, you see the following:

```
During installation you may choose to overwrite all
or part of the present contents of your hard disk.
Do you wish to continue? (y/n)
```

You must respond “y”.

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## XENIX Installation Guide

8. Unless you have installed a new hard disk, when the “Hard Disk Drive Configuration” menu appears, simply quit out of it.
9. Next, the **fdisk** menu is displayed:

- 
- ```
1. Display Partition Table
2. Use Entire Disk for XENIX
3. Create XENIX Partition
4. Activate Partition
5. Delete Partition
```

Enter your choice or 'q' to quit:

If you have a DOS partition on your hard disk, enter “3” and give the starting and ending blocks of the XENIX partition (be sure not to overlap your DOS partition). Otherwise, enter “2” to use the entire hard disk for XENIX. You have now set up the partition(s) to use XENIX on your hard disk. To continue with the next step in the installation procedure, enter **q** and press **RETURN**.

10. Next, this message is displayed:

```
This device contains a valid division table.  Additional
(non-root) filesystems can be preserved across this reinstallation.
If you wish to be able to preserve these file systems later, you must
not change the current limit of the bad track table, which is
n bad tracks.  Do you wish to leave it unchanged? <y/n>:
```

If you are reinstalling in order to increase the size of your bad track table, you must select **n**. On the other hand, if you intend to preserve existing filesystems, you must respond **y**. Responding “y” ensures that the limit of your bad track table is not increased, which would destroy your filesystem(s). You can still add *entries* to your current bad track table, but you will not be allowed to increase the size of the table itself.

Reinstalling and Updating Your System

The main **badtrk** menu is displayed:

1. Print Current Bad Track Table
2. Scan Disk (You may choose Read-Only or Destructive later)
3. Add Entries to Current Bad Track Table by Cylinder/Head Number
4. Add Entries to Current Bad Track Table by Sector Number
5. Delete Entries Individually from Current Bad Track Table
6. Delete All Entries from Bad Track Table

Please enter your choice or 'q' to quit:

3

Enter "2", then press **RETURN**.

11. You see the following submenu:

1. Scan entire XENIX partition
2. Scan a specified range of tracks
3. Scan a specified filesystem

Select option "1" to scan the whole partition. If you choose option "2" or "3", you are prompted to specify the area you want **badtrk** to scan.

12. After you select the area you want scanned, you are given the choice:

1. Quick scan (approximately 7 megabytes/min)
2. Thorough scan (approximately 1 megabyte/min)

Select option "2".

13. You are prompted:

Do you want this to be a destructive scan? (y/n)

XENIX Installation Guide

Unless you have installed a new hard disk, you must enter **n**. The non-destructive scan reads but does not write to the disk. If you enter **y**, you are warned:

```
This will destroy the present contents of the region you are scanning.  
Do you wish to continue? (y/n)
```

3

When scanning begins, you see this message:

```
Scanning in progress, press 'q' to interrupt at any time.
```

14. After you have responded to the above prompts, the program scans the active partition of the new disk for flaws. The larger your disk, the longer the scanning process takes, so a very large disk may take a while.

As **badtrk** scans the disk, it displays the number of each track it examines, and the percentage of the disk already scanned. Pressing the **q** key at any time interrupts the scan. If you press **q** to interrupt the scan you do not need to press **RETURN**. You are then prompted to continue scanning or to return to the main menu.

Whenever **badtrk** finds a defective track, it lists the location of that track using both the sector number and cylinder/head conventions. Defective track information is entered into the table and displayed on the screen. An example bad track might be:

```
wd: ERROR : on fixed disk ctlr=0 dev=0/47 block=31434 cmd=00000020  
status=00005180, sector = 62899, cylinder/head = 483/4
```

Reinstalling and Updating Your System

- When the scan is complete, the menu reappears. Select option "1" to see the results of the scan. Your bad track table might look like this:

```
Defective Tracks
```

	Cylinder	Head	Sector Number(s)
1.	190	3	12971-12987

```
Press <RETURN> to continue
```

3

Press **RETURN** to return to the main menu.

Note

If there is a flaw in the first few tracks of the XENIX partition, you are returned to the **fdisk** utility (see the previous installation step). Repartition the disk with **fdisk** so that the XENIX partition no longer includes the defective tracks. You will have to experiment to determine how many tracks to exclude. Leave these defective tracks unassigned to any operating system. When you leave **fdisk**, **badtrk** runs again. Scan the disk for flaws.

This process continues until **badtrk** finds no flaws in the first few tracks.

-
- When you are finished making changes to the bad track table, enter **q** and press **RETURN** to return to the main menu.

At the main **badtrk** menu, enter **q** again and press **RETURN**.

XENIX Installation Guide

17. If you specified at Step 10 that you did not want to change the current limit of the bad track table then you are not prompted to enter a new limit; proceed to Step 19. Otherwise, you are next prompted for the number of tracks to allocate as replacements for those tracks that are flawed. You should allocate at least as many as the recommended number. Enter the number or just press **RETURN** to use the recommended number that is displayed:

3

```
Enter the number of bad tracks to allocate space for
(or press return to use the recommended value of n):
```

This number is based on the number of bad tracks currently in the table, plus an allowance for tracks that may go bad in the future.

18. Next, **badtrk** prompts:

```
Do you want to update this device with the new table? (y/n)
```

Enter **y** and press **RETURN** to save the changes. To correct any mistakes or otherwise alter the bad track table, enter **n**. Modify the bad track table to contain the desired entries, enter **q** at the main menu to return to the prompt displayed above, then enter **y** to update the device with the new table.

19. Now you are prompted:

```
Do you want to attempt to salvage any valid data
on the bad tracks? [may take a long time] (y/n)
```

Reinstalling and Updating Your System

Generally you should respond **n** to this prompt. However, if you have not made a backup of needed data on the bad tracks and there is no other way of recovering this information, you may want to respond **y**. Keep in mind that this process may take a long time.

20. If you still have a valid `/u` filesystem, **divvy** will prompt for the option to preserve it across the reinstallation. As discussed in Step 10, this occurs only if you did not increase the maximum number of bad tracks on your hard disk or shrink the size of the XENIX partition using **fdisk**:

```
This device contains a valid disk division table.
Your additional (non-root) filesystems
can be preserved across the reinstallation.
Do you want to preserve your additional filesystems? (y/n)
```

Unless you were instructed by an update not to preserve your filesystems, enter **y**. Next, **divvy** prompts:

```
If you choose block-by-block control, do not change the
bounds of any file system you wish to retain.
Without block-by-block control, your original disk layout
cannot and will not be modified.
Do you require block by block control over the layout
of the XENIX division? (y/n)
```

If you respond **y**, **divvy** will then proceed with the block-by-block procedure; proceed to Step 23.

21. Now **divvy** prompts you for the swap space allocation:

```
There are n blocks in the XENIX area.
Between x and y blocks should be reserved for the swap area.

Please enter the swap-space allocation, or press <RETURN>
to get the default allocation of z blocks:
```

Enter your swap space allocation or press **RETURN** to choose the default value.

XENIX Installation Guide

If you have a large hard disk, you see the prompt:

```
Do you want a separate /u filesystem? (y/n)
```

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We recommend that you have a separate filesystem with disks larger than 40-50Mb, especially if you anticipate having many active users. You should leave at least 15M bytes for the *root* filesystem. Check the "Planning Your Disk Layout" section of the *Installation Procedure* for more information on a /u filesystem.

If you have enough storage for a separate user filesystem, and want to create one, enter **y** and press **RETURN**.

Next, you see:

```
Enter block allocation for the /u file system.  
(min to max)
```

In the display, *min* and *max* are replaced with the minimum and maximum number of blocks that can be allocated for the filesystem.

22. Next, you are prompted for precise control over the layout of your filesystem:

```
Do you require block by block control over the layout  
of the XENIX division? (y/n)
```

If you are preserving or recreating any filesystems, you must respond **y**. If you are not recreating or preserving filesystems, respond "n" and proceed to Step 26.

Reinstalling and Updating Your System

23. A *divvy* division table similar to the one below is displayed, followed by the **divvy** menu:

Name	New File System?	#	First Block	Last Block
root	no, exists	0	0	13754
swap	no, exists	1	13755	15135
	no	2	--	--
	no	3	--	--
	no	4	--	--
	no	5	--	--
d1057all	no	6	0	25546

x blocks for divisions, y blocks reserved for the system

n[ame] Name or rename a division.
c[reate] create a new file system on this division.
p[revent] Prevent a new file system from being created...
s[tart] Start a division on a different block.
e[nd] End a division on a different block.
r[estore] Restore the original partition table.

Please enter your choice or 'q' to quit:

24. If you are preserving your filesystems, refer to the table you recorded on page 3-6. Note that the name column may be conspicuously different from your original table, unless you have only one non-root filesystem called **/u**. Skipping root and swap, you should rename all of your old filesystems (including **/u**), starting with division 2. Enter "n" to begin. You are prompted for the division number (column three):

which division? (0 through 6) --

Enter "2" and respond with the proper name for that division. Repeat for each of your additional filesystems. If you make an error, you can enter "r" (restore) and all your changes will be erased. Do not enter any command other than "n" or "r". When you are finished renaming divisions, proceed to step 25.

3

3

- 25. If you are recreating your filesystems, use most of the data from the table you recorded on page 3-6 to re-create filesystems at least as large as your original ones, so that your backups will fit within the space allocated. To choose a command, enter the first letter of the command, then press RETURN.

With the “s” or “start” command, you can start a division on a different block number. With the “e” or “end” command, you can end a division on a different block number. You can use these two commands to change the size of a partition. Obviously, if you need to increase the size of one division, you must reduce another. If you are increasing the size of your swap space, for example, you could first reduce the **root** filesystem with the “e” command, then enlarge the swap space with the “s” command. You could also reduce another filesystem.

Note that if any of the divisions overlap, an error message will appear when you try to exit and you will be returned to the **divvy** menu to correct the situation.

Note

You can use the “r” or “restore” command to restore the original partition table if you make a serious mistake and want to start over.

- 26. Enter “q” to quit out of **divvy**. At this point you are given the choice to retain your changes or exit:

```
i[install]   Install the division set-up shown
r[return]   Return to the previous menu
e[exit]     Exit without installing a division table
```

Please enter your choice:

If you wish to keep your changes, enter “i”. If you have made a mistake, enter “r” to return to the main **divvy** menu.

- 27. After you quit from **divvy**, you are prompted for a */dev/scratch* file if your root filesystem is large enough. Depending on your media type, you may also be prompted for operating system serialization. Follow the prompts.

Reinstalling and Updating Your System

28. When the system shuts down, you are instructed to insert one of the distribution volumes before starting XENIX on your reinitialized hard disk. When you reboot the system, the usual copyright and configuration information is displayed, followed by the A-Z self check.
29. Depending on your media type, you may then be prompted for operating serialization (if you were not already asked to do so), and **fsck** checks your filesystems.
30. You are next prompted to insert additional floppies to complete installation of the Run Time System.

3

3.5 Reinstall Packages and Applications

Now that the Run Time System is installed, you should reinstall your packages, applications and device drivers just as you did when you installed them originally. If your update documentation does not require you to reinstall applications, you can proceed with relinking the kernel.

3.6 Relink the Kernel

If you have special device drivers, you need to link them into the XENIX kernel when you are finished installing. In this case, make sure you install the link kit software when you reinstall XENIX. See **custom**(ADM) for information on extracting packages from XENIX System V distributions. See the chapter on “Adding Device Drivers with the Link Kit” in the *System Administrator's Guide* for complete information on drivers and relinking.

When you are finished installing, make sure you are in single-user, or system maintenance mode. Then go to the next section to merge the special files you saved with your new operating system.

3.7 Prepare Preserved Filesystems for Use

In order to use the filesystems you preserved, you must create the directories that they are mounted upon. Use the **mkdev** command to ensure that the filesystems you preserved are correctly set up:

```
/etc/mkdev fs /dev/name /directory
```

XENIX Installation Guide

You will also be asked if you wish to have this filesystem mounted automatically when the system starts up multiuser. You should repeat this command for each of your non-root filesystems you preserved. For example, if you named a filesystem `/u`, you would enter the following:

```
/etc/mkdev fs /dev/u /u
```

In this example, the `/u` directory will be created at the mount point for `/dev/u`, along with a lost-found directory to facilitate cleaning the filesystem.

3

To mount and unmount the filesystem, enter these commands, respectively:

```
mount /dev/name /directory
```

```
umount /dev/name
```

3.8 Restore Your Backups

You should restore your backups while still in single user mode. If some of your backups were created by an update script, use the command line specified in the *Release Notes* to restore them. For example, if your backups are on a cartridge tape drive, you would use this command:

```
tar xvf /dev/rct0
```

Don't forget to mount your non-root filesystems before restoring their respective backups.

3.9 Reestablish Your Second Hard Disk

This section explains how to prepare your second hard disk to function with your reinstalled system:

1. Enter single user mode.
2. Use the **fixperm** utility to create the necessary device nodes:

```
cd /  
fixperm -c -dHD1 /etc/inst.perms
```

If you do not know what **fdisk** partitions your XENIX filesystems are in, run **fdisk**:

```
fdisk -f /dev/rhd10
```

Reinstalling and Updating Your System

Enter "1" at the main **fdisk** menu to display the partition table. Write down the numbers of the partitions that contain XENIX, then exit from **fdisk**.

3. Invoke **divvy** with the following command line:

```
divvy -b 1 -c 1 -p 1 -v partition-number
```

In the above command line, substitute the actual partition numbers that you copied from the **fdisk** table. Follow this **divvy** procedure for all of the possible **fdisk** partitions.

Examine your **divvy** table. You should see a list of **divvy** divisions, which may contain valid filesystems, that do not have names. Only the **divvy** division number and sizes are displayed.

Next, use the table of "Secondary Hard Disk Filesystems" you recorded on page 3-7 to rename each of the divisions to their original names. Use the "n" (name) command. If you make a mistake, use the "r" (restore) command to undo any changes you made. When you have named all of your **divvy** divisions, enter "q" to quit from **divvy**.

4. At this point you are given the choice to retain your changes or exit:

```
i[nstall]   Install the division set-up shown
r[eturn]   Return to the previous menu
e[xit]     Exit without installing a division table
```

Please enter your choice:

If you wish to keep your changes, enter "i". If you have made a mistake, enter "r" to return to the main **divvy** menu.

5. Finally, use the **mkdev** command to prepare your preserved filesystems for use:

```
mkdev fs /dev/name /directory
```

In the above command, substitute the name of the actual device and the mount directory. For example:

```
mkdev fs /dev/u /u
```

3.10 Updates: Merge New Versions of Configurable Files

This section contains instructions for merging user-configurable files with their replacements from a newer release. Listed below are files which typically change from release to release but may contain system-specific information you wish to preserve. Copies of your versions of these files have been left in their corresponding directories, under the name: *filename.--* If you have not made any modifications to a particular file, you need not make any changes to the new version.

3 You will need to use a text editor, such as **vi(C)** or SCO Lyrix, in order to make changes. In order to determine which lines have changed in a file, the utility **diff(C)** is useful. Please be sure to review the following guidelines before making any changes. Some changes are necessary to ensure correct functionality with the new release. If any of the new distribution files are incorrectly modified, unedited versions can be retrieved from the distribution media using **custom**. Add the differences, if they are necessary, to the new files. Do not directly overwrite the new versions with your old files.

/etc/termcap

If you have added any terminal definition sections to your old file, be sure to merge these definitions into the new version. New entries have been added to the new version, and several descriptions have been fixed, so you may want to try the new version before making any modifications.

Chapter 4

Installation Glossary

4.1 Terms Used During Installation 4-1

4.1 Terms Used During Installation

If you are relatively new to XENIX and/or to operating systems in general, the following describes most of the terms used in this guide.

backups	Copies of files from the hard disk saved on floppies or tapes in case of data loss.
bad track	A small section of the hard disk that has lost its ability to store data.
bad track table	A list of known bad tracks on the hard disk, also containing space for tracks that may go bad in the future.
badtrk	A XENIX utility used to scan a hard disk and record bad tracks.
block	Blocks can be confusing because they refer to different quantities depending on the context. For the operating system and the utilities used to divide the hard disk, (as discussed in divvy , for instance) a block is 1024 bytes (1K bytes); for most utilities and discussion of disk space usage, a block is 512 bytes (as used by the custom utility).
block-by-block control	This is provided by the main divvy menu, which is used to exercise precise control over filesystems, usually used when reinstalling or recreating filesystems rather than during installation.
boot	Usually “boot the system,” which means to begin the startup process.
boot floppy	A floppy disk containing the kernel that is capable of “booting” the system from the floppy drive.
bootstrap	The program used to load the kernel into memory.

- custom** A program used to install products and optional packages of the Operating System.
- cylinder** Refers to the same track on each of the platters in a hard disk. For example, if a hard disk has five platters, the first cylinder consists of track one on each platter.
- device driver** A program that allows the kernel to communicate with a particular device. Certain drivers, such as the floppy and hard disk driver are already built into the kernel. Others must be attached or "linked" into the kernel using the link kit.
- divvy** A program used to divide a partition into separate filesystems.
- dkinit** A program that enables XENIX to recognize a hard disk that is not contained in the ROM BIOS.
- driver** See **device drivers**.
- fdisk** The program used to divide a disk into partitions, or different sections of the disk that will be occupied by different operating systems (for example, DOS and XENIX).
- filesystem** A subdivision of a partition that is separate from the area where the operating system and utilities are located. This filesystem can be mounted and unmounted, just like a floppy or other device.
- flaw map** A list of known bad tracks provided by the manufacturer.

fsck	The program used to check and clean a filesystem after a system crash, reconciling various system tables and lists to what is actually on the hard disk.
hard disk	Actually a series of disks, or platters that are scanned by series of heads like those used on a tape recorder.
kernel	The center (thus kernel) of the XENIX operating system, a program that is always in memory and underlies all programs, applications and utilities that run on top of it.
link kit	A set of programs used to “link” or connect a device driver to the XENIX kernel. See also device driver .
mkdev	A program used to create the device file associated with a device. To the system, a device is simply a file that is written to or read from. Thus the primary hard disk is associated the file <i>/dev/hd00</i> .
partition	A division of a disk that contains an entire operating system. If an entire disk is used for XENIX, there is a single partition on the disk.
process	Each program or separate part of program that is running concurrently on a system.
RAM	Random Access Memory. The hardware memory (or primary storage), as opposed to the hard disk (secondary storage). On systems with virtual memory (the 386), the RAM and disk storage are essentially one unit.

XENIX Installation Guide

BIOS	Basic Input/Output Services. The data tables describing the hardware recognized by the system that is hard-coded into the main circuit board of the computer (motherboard).
reboot	The act of bringing a system up after shutting it down.
root	The top-level access account on a XENIX system that has unrestricted access to all files and utilities. This account is used only for system maintenance.
4 root filesystem	The filesystem containing the operating system and its utilities.
run time system	(RTS) The minimal software necessary on a XENIX system to run properly. Other packages outside the RTS can be loaded using custom .
sector	A pie shaped section of a disk.
shutdown	The program used to shut down the system in preparation for switching off or rebooting.
single-user mode	See system maintenance mode .
super-user	Another name for root.
swap space	An area of the hard disk (not a filesystem) that acts as an extension of the hardware memory. Programs that are running but are waiting for input or device access are "swapped out" or moved to the swap space so that other programs can run in memory.

- system maintenance mode** Also known as single-user mode, this is a stage of the startup process where certain maintenance functions are done, when other users are not allowed to log in. Like the root or super-user account, this mode has unrestricted access to the system.
- tpi** Tracks per inch, a measure of floppy disk storage density.
- track** One of the concentric rings that a hard disk is divided into, similar to a groove on a phonograph record.
- utility** A program that is sometimes considered part of the operating system, but is not part of the kernel. It is an independent user program that runs on top of the system like an application. New utilities can be written by users, and are often known as “tools.”

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