sun®
microsystems

Installing the SunOS™

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Documentation Conventions

Use of Fonts

Various fonts are used in this manual to distinguish what you type from what the system types at you, and to identify those items for which either you or the system must substitute a variable. Our conventions are:

SMALL CAPS
: Names spelled with all capital letters (such as, UNIX and FORTRAN) are printed in small caps for readability.

`bold listing font`
: This font indicates things that you should type at your workstation.

italic font
: This font is used as a place holder for words, numbers, or expressions that you define. Examples of these are: file names, function arguments, variables, and field names. Italics are also used in the conventional manner to emphasize important words and phrases.

`listing font`
: This font indicates what the system types back at you. It also indicates literal values such as program names, function names, procedure names, variable names, field types, file listings, and session output.

Naming Scheme for Reference Manual Pages

References to commands and utilities from the *Commands Reference Manual for the Sun Workstation* and the *System Interface Manual for the Sun Workstation* use the notation:

```
passwd(1)
```

to indicate the `passwd` page in Section 1 of the manual pages. There are a total of eight sections: Sections 1, 6, 7, and 8 appear in the Commands Reference Manual; sections 2, 3, 4, and 5 appear in the *System Interface Manual*. Thus, `passwd`(5) means refer to the `passwd` manual page in the Section 5 pages of the *System Interface Manual*. The notation `spline`(1G) means that this is a Graphics command in the Section 1 pages — you'll also see the addended letter to indicate other subsections, like `title`(3M) for a page in the Math Library subsection of the Section 3 pages, or `title`(3N) for a page in the Network Library subsection.

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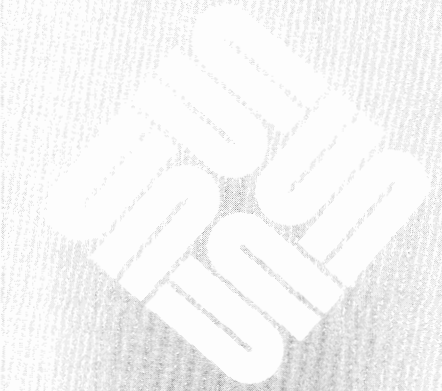
Installing the SunOS™



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Installing the SunOS™

This manual is designed to help you install Sun's operating system onto your Sun workstation. Our goal is to help you to take your workstation from initial hardware power-up through the SunOS™ installation

A major portion of this document is devoted to *suninstall*, the Sun software installation tool. *suninstall* is a terminal based interface that provides you with a friendly, intelligent editor that allows you to do the following:

- Install a new system
- Re-install an existing system
- Upgrade to new future releases
- Add new hardware

Before you begin, it is best to read through the major sections of this manual and familiarize yourself with the terminology in Chapter 2. We use several conventions to make the directions clear and consistent. Some of these conventions are UNIX† conventions, such as device names; others are simply Sun documentation conventions.

Be sure to install your workstation hardware according to the procedures in the Sun *Hardware Installation Manual*. This will be critical for the installation of the operating system onto your workstation.

1.1. The Filesystem Reorganization

Two major new features of Release 4.0 are the elimination of the Network Disk System partitioning and the reorganization of the filesystem. This new filesystem layout makes it easier for a single server to support many clients of different architectures, while still maintaining most of the familiar filesystem layout.

The Sun Network File System (NFS) allows a computer with a local disk to act as a server by exporting its filesystems to clients on a network. The client computers may themselves be servers of other, local filesystems. A software architecture is defined by the hardware architecture that it supports and by its software release level. When a client and server have the same architecture they can share executables.

† UNIX is a registered trademark of AT&T.

The New Layout

The Sun operating system has a lot of history built into the filesystem. There are numerous programs, shell scripts and makefiles that have built-in pathnames. In changing the layout of the filesystem, the basic goals of the rearrangement were:

- Provide easier maintenance of servers and clients.
- Allow easier mixing of remote and local filesystems
- Provide cleaner support of multiple architectures.
- Minimize disruption to existing programs from moving things around.
- Minimize symbolic link confusion.
- The directories `/usr/adm`, `/usr/spool`, and `/usr/tmp` have been moved into `/var` and symbolic links point from the old names to the new location. For example, `/usr/adm` is now a symbolic link to `/var/adm`. The files `/usr/lib/crontab` and `/usr/lib/sendmail.cf` have been moved to `/etc` and `cron` and `sendmail` have been fixed to look for them there. The `sendmail.cf` file tells `sendmail` where to look for aliases files and this has been fixed so that aliases are also in `/etc`.
- The executables in `/bin` have been moved to `/usr/bin` and `/bin` is now a symbolic link to `/usr/bin`. Similarly, the `/lib` files have been moved to `/usr/lib` and `/lib` is now a symbolic link to `/usr/lib`.
- The executables in `/etc` have been moved to `/usr/etc` with symbolic links were left in place for commonly used programs. The end of this chapter contains a list of the executables that were moved.
- A new directory, `/usr/share`, was added for files that can be shared across all architectures. It currently holds the manual pages (moved from `/usr/man`), the kernel object modules (moved from `/usr/sys`), the SunView Programmers' Source, and a few other files. Symbolic links were left behind in the original locations of most files and directories moved into `/usr/share`.
- The mount points for home directories in the old filesystem layout were generally sub-directories of `/usr`. We have moved them to a new directory, `/home`, so that the `/usr` filesystem can be mounted read-only, if desired, and so that a system administrator can export a `/home` directory that contains all of the mount points for a whole network of servers' exported home directories. This allows the owner of a client machine to either have a local `/home` directory which she maintains or to mount the standard `/home` directory which is updated by an administrator.
- A server which supports multiple architectures will have multiple copies of the `/usr` filesystem, one for each supported architecture. These are kept in the `/export/exec` directory and named according to the architecture supported. For example, the directory which contains executables for a Sun-2 running release 4.0 is called `/export/exec/sun2`. When a server is sharing executables with one or more of its clients the `/export/exec` entry for the shared executables will be a symbolic link to `/usr`.

There are a few rules to follow when writing or modifying programs that use the new filesystem layout.

- In general, `/usr` should be considered read-only and shared. It should contain only executables and libraries for a particular architecture.
- The directory `/etc` contains the identity of a particular machine. You can think of it as the home directory of the machine. It contains all of the text files that make up the administrative databases of the machine. It also contains directories that are used for per-machine files.
- There are two directories that are used for temporary files: `/tmp` and `/var/tmp`. The `/tmp` directory should be used for small files and quick access. These files are removed when the machine is rebooted. The `/var/tmp` directory should be used for larger and longer-lived files.

1.2. SunOS 4.0 and 3.X Directory Structures

For a clearer picture of the file system changes between 4.0 and 3.X, compare the following directory trees. Wherever a string of arrows (>>>>>) appears after a directory name, this indicates a symbolic link to the directory following the arrows (eg.: `/bin >>>>> usr/bin`).

Figure 1-1 *SunOS 4.0* `root` *Filesystem Directory*

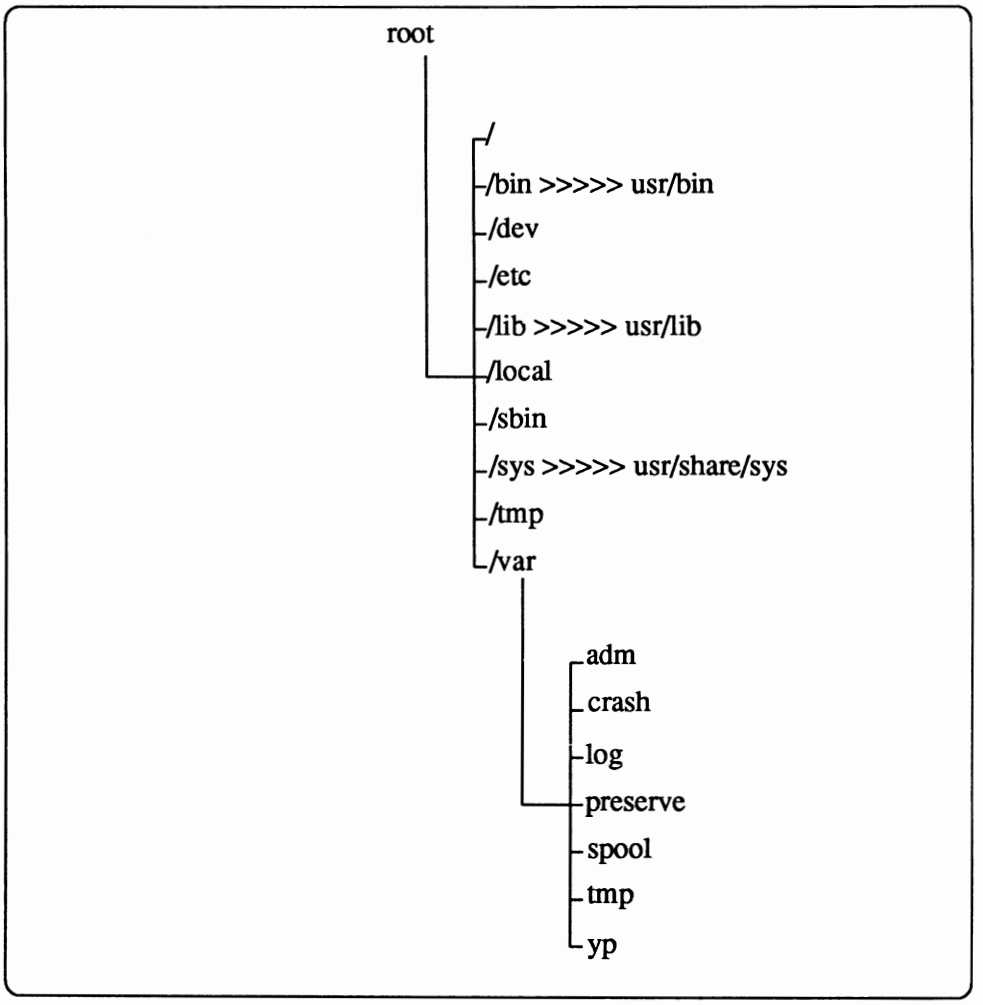


Figure 1-2 *SunOS 4.0* `/usr/` *Filesystem Directory*

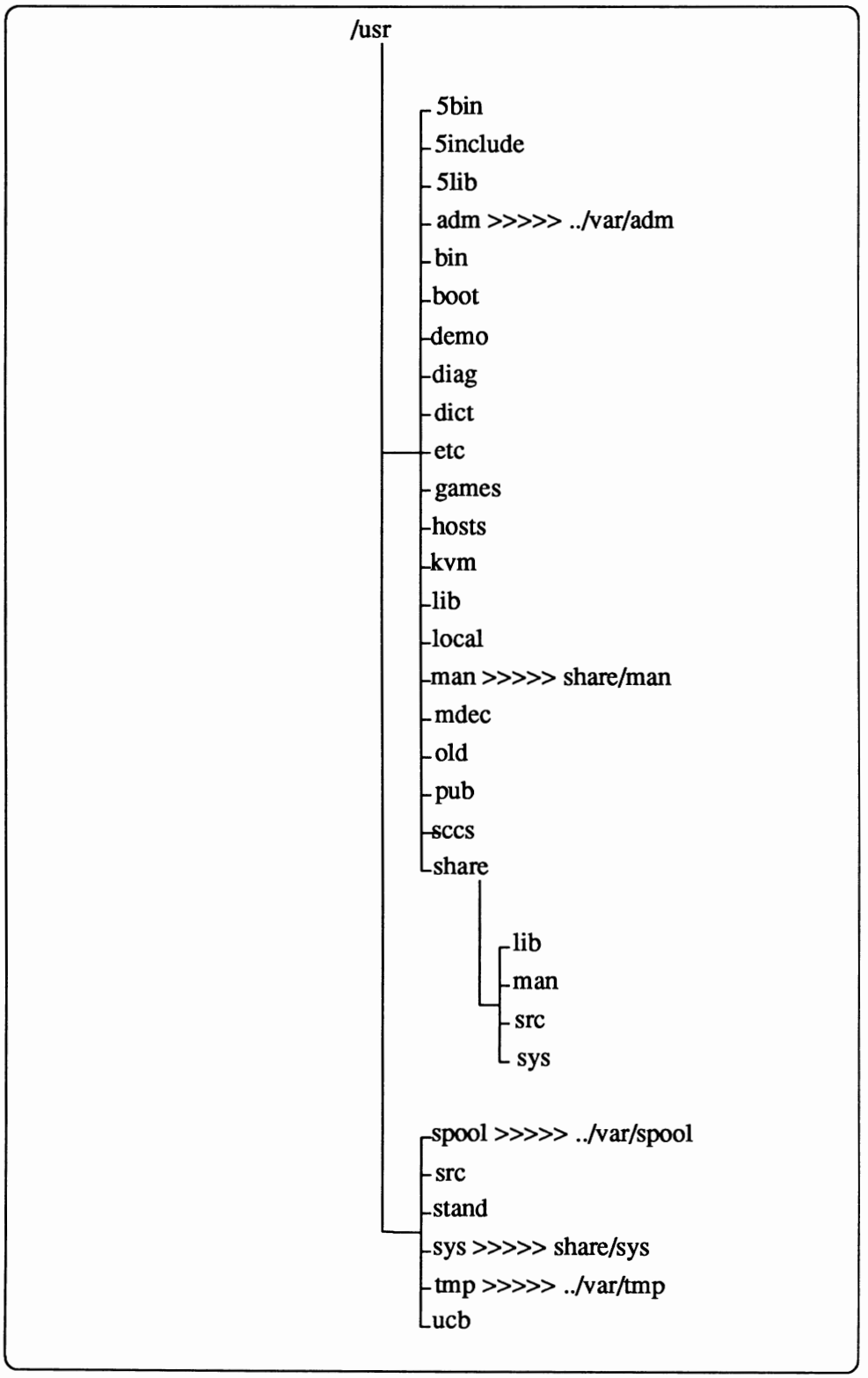
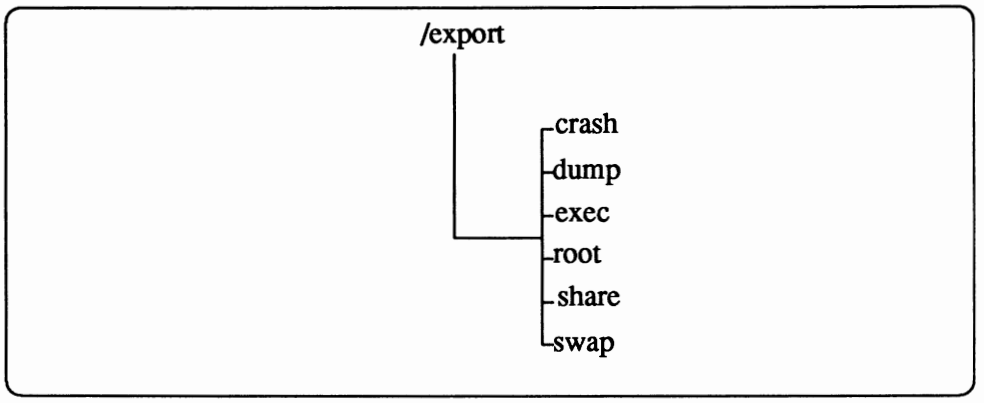


Figure 1-3 *SunOS 4.0* `/export` *Filesystem Directory for Servers*



SunOS 3.X Directory Structure

Figure 1-4 *SunOS 3.X* `root` *Directory*

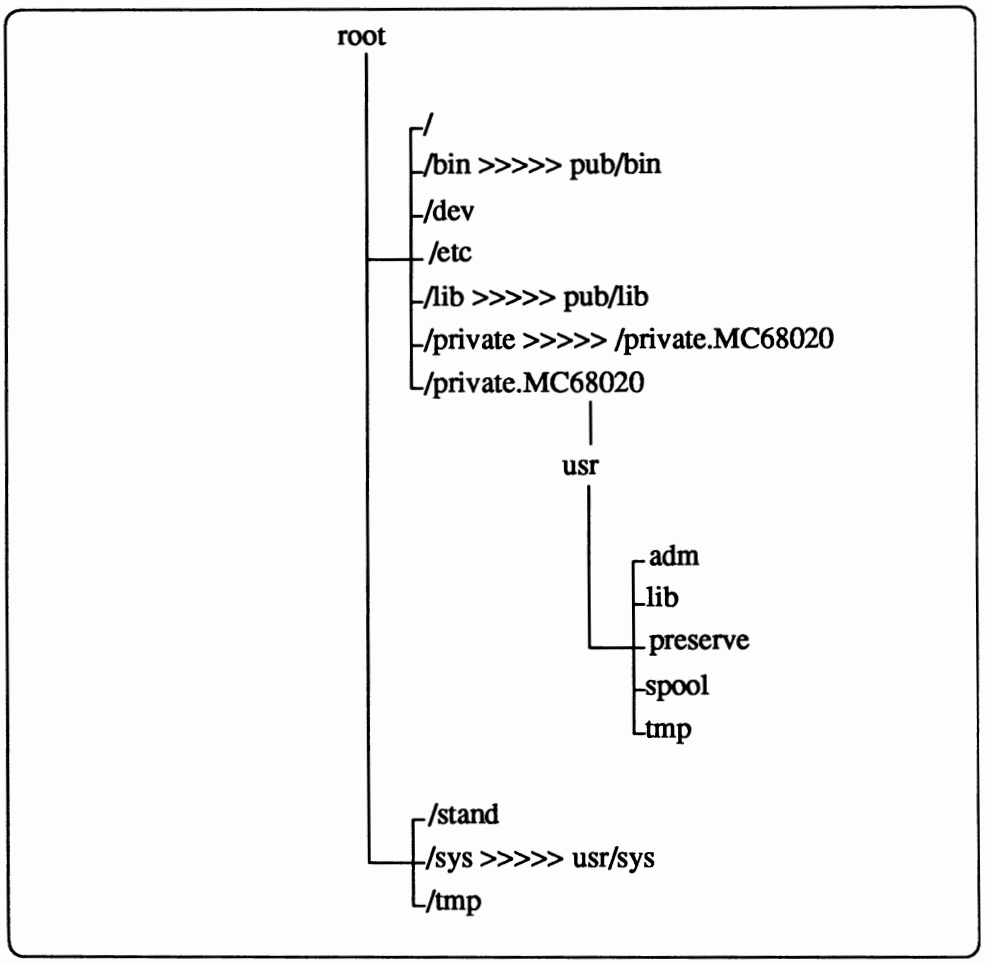


Figure 1-5 *SunOS 3.X* `/pub` *Directory*

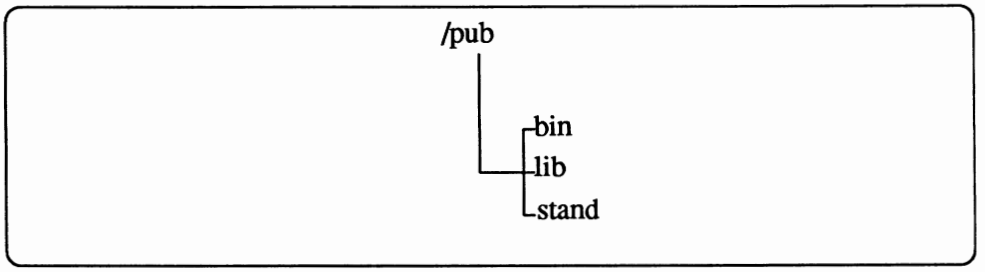
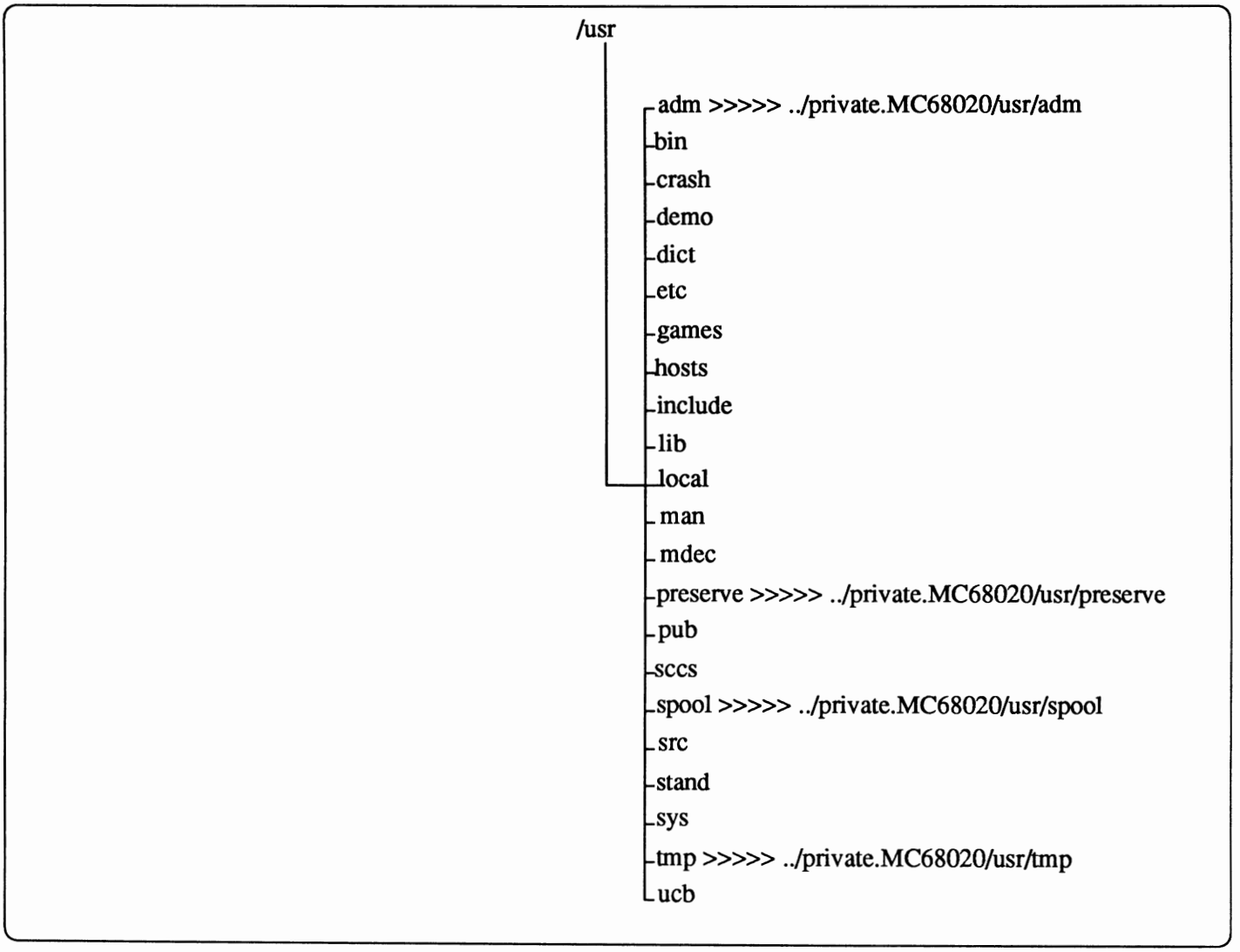


Figure 1-6 *SunOS 3.X* `/usr` *Directory*



Booting Issues

With the new filesystem layout, the executable that used to be on the root have been moved to `/usr`. This makes it necessary to change the way that booting single-user is done.

In the old layout the root contained most of the executables that an administrator might need to repair a damaged system. This included programs like `fsck`, `dump` and `restore` for patching filesystems, and also included the C compiler and C library. The idea was to keep the root small (usually about 8 Megabytes) so that the chances of it getting corrupted are small, yet put enough utilities on it so that a corrupted machine can be rebuilt.

Originally, the operating system executables were small so most everything needed could be put on the root and still have space left over for `/tmp`. In recent years, however, executables have grown in size due to the increased size of libraries that are linked in. This has made it difficult to keep all of the useful executables on the root.

By moving all of the executables to `/usr` and mounting `/usr` automatically at boot time we solve the problem of choosing which executables should be available in single-user mode. They all are.

Unfortunately, to mount the `/usr` filesystem we need to have some executables on the root. The `/sbin` directory holds only those executables needed to mount `/usr` at boot time. The `rc.boot` shell script, which is executed at boot time by `init`, mounts the `/usr` filesystem, then checks both the root and `/usr` filesystems.

Table 1-1 *Executables Moved From* `/etc` *to* `/usr/etc`

Original name	*New name*	*Type*	*Symbolic link*
/etc/arp	/usr/etc/arp	file	yes
/etc/biod	/usr/etc/biod	file	no
/etc/chown	/usr/etc/chown	file	yes
/etc/clri	/usr/etc/clri	file	yes
/etc/chroot	/usr/etc/chroot	file	yes
/etc/cron	/usr/etc/cron	file	yes
/etc/dkinfo	/usr/etc/dkinfo	file	yes
/etc/dmesg	/usr/etc/dmesg	file	yes
/etc/dump	/usr/etc/dump	file	yes
/etc/fastboot	/usr/etc/fastboot	file	yes
/etc/fasthalt	/usr/etc/fasthalt	file	yes
/etc/fsck	/usr/etc/fsck	file	yes
/etc/fsirand	/usr/etc/fsirand	file	no
/etc/getty	/usr/etc/getty	file	no
/etc/halt	/usr/etc/halt	file	yes
/etc/ifconfig	/usr/etc/ifconfig	file	yes
/etc/in.rlogind	/usr/etc/in.rlogind	file	no
/etc/in.routed	/usr/etc/in.routed	file	no
/etc/in.rshd	/usr/etc/in.rshd	file	no
/etc/inetd	/usr/etc/inetd	file	no
/etc/init	/usr/etc/init	file	no
/etc/in.rexecd	/usr/etc/in.rexecd	file	no
/etc/link	/usr/etc/link	file	yes
/etc/mkfs	/usr/etc/mkfs	file	yes
/etc/mknod	/usr/etc/mknod	file	yes
/etc/mount	/usr/etc/mount	file	yes
/etc/ncheck	/usr/etc/ncheck	file	yes
/etc/newfs	/usr/etc/newfs	file	yes
/etc/nfsd	/usr/etc/nfsd	file	no
/etc/portmap	/usr/etc/portmap	file	no
/etc/pstat	/usr/etc/pstat	file	yes
/etc/reboot	/usr/etc/reboot	file	yes
/etc/renice	/usr/etc/renice	file	yes
/etc/restore	/usr/etc/restore	file	yes
/etc/rpc.lockd	/usr/etc/rpc.lockd	file	no
/etc/rpc.statd	/usr/etc/rpc.statd	file	no
/etc/shutdown	/usr/etc/shutdown	file	yes
/etc/umount	/usr/etc/umount	file	yes
/etc/update	/usr/etc/update	file	yes
/etc/unlink	/usr/etc/unlink	file	yes
/etc/ypbind	/usr/etc/ypbind	file	no
/etc/ypserv	/usr/etc/ypserv	file	no

Table 1-2 *Other Files and Directories*

Original name	*New name*	*Type*	*Symbolic link*
`/usr/adm`	`/var/adm`	directory	yes
`/usr/preserve`	`/var/preserve`	directory	no
`/usr/tmp`	`/var/tmp`	directory	yes
`/usr/spool`	`/var/spool`	directory	yes
`/usr/lib/sendmail.cf`	`/etc/sendmail.cf`	file	no
`/usr/lib/aliases`	`/etc/aliases`	file	no
`/usr/lib/crontab`	`/etc/spool/cron/crontabs/root`	file	no

2

Getting Started

2

Getting Started

2.1. Introduction

This chapter and the following one are devoted to helping ready your workstation for the installation of Release 4.0. It is very important to read through this chapter and the Chapter 3 before you proceed. In this chapter you will be given instructions for loading a mini version of the operating system, formatting your disk and generally getting ready to use the new installation facility, *suninstall*. Chapter 3 is a complete explanation of how to use *suninstall*. You will need this information in order to use the Walkthroughs in Chapters 4 and 5 effectively.

Release 4.0 is quite different from previous Sun releases. ND partitioning has been eliminated and the file system has been reorganized. With this new layout, you will be able to use the Sun Network File System (NFS) exclusively to support different architectures.

The following information will make it easier for you to understand the installation procedures in this release.

2.2. Terminology and Context

The following subsections describe terms used in the installation procedures, and provide necessary background information.

Machine Types

Standalone
: A standalone workstation has a complete root file system and user file system on its disk; and does not require another machine to boot UNIX. It must have its own disk; it may or may not be attached to an Ethernet; and it may or may not have a local tape drive. But it does not rely on any other machines for storage.

Server
: A server workstation on a local network provides resources like network services and disk storage for other machines, which are called "clients". For installation purposes, the term "server" means "network file server" that is, a machine which provides disk storage for its clients. Normally, a server uses the NFS ("Network File System" — see `nfs`(4P)) protocols to exchange files with its clients.

Diskless Client
: A client workstation on a local network relies on a server for disk storage. **To 'install' a diskless client workstation, complete installation on its server and then simply power it on.** The only things you need to know

about the client for server installation are its name, hardware Ethernet address (see *Networking Terminology*, below), Internet address (see below), yellow pages type, pathname of the root directory, pathname of swap, path name of the dump directory, pathname of the home directory, pathname of executables of client architecture type and disk space reserved for client for swap.

Dataless Client
: A dataless client workstation on a local network relies on a server for resources, such as files, but has its own disk storage. A dataless client can actually boot the operating system from its local disk but requires the user filesystem from a remote machine to come up single user and multi-user. In other words, some of its files are local, and others are remote. The remote files can be obtained from any machine running NFS.

Networking Terminology

If you are installing several machines linked by a local network, part of installation includes basic network configuration.

Hardware configuration must be completed first: each machine must have Ethernet controller hardware, and be 'plugged in' via a transceiver to a common Ethernet cable. For Ethernet hardware configuration instructions see the *Hardware Installation* manual for your machine model.

Before proceeding with the installation, you must obtain basic information about the system's place in the network. Some of the information items, like machine name, are arbitrary, and others are determined by hardware.

For additional information on networking and tuning your configuration, see the Sun *System Administration and Networking* manual.

Before proceeding with the installation, obtain, decide on, and write down all the items in the following list:

Hostname
: (Also called "machine name"). Name the workstation. Although hostnames may contain up to 32 alpha/numeric characters, it is best to keep them brief. All alphabetical characters in a hostname **must be lower case**. Avoid the use of special characters. Assign each machine in your network a hostname.

Ethernet Address
: Refers to the address which is permanently assigned to each workstation, and is used by the Ethernet software to decide which packets to deliver to that machine. The Ethernet address resides in the ID PROM on the Sun CPU Board. This address is a 6-byte hexadecimal value with each byte separated by a colon. A typical Ethernet address is ''8:0:20:0:14:76".

To find a machine's Ethernet address, power it on. You will see the Sun logo, and a message like:

```
Self Test completed successfully.

Sun Workstation, model_type, keyboard_type
ROM Rev N, some_number_MB memory installed
Serial #some_number, Ethernet address xx:xx:xx:xx:xx:xx.sp
Auto-boot in progress . . .

abort using the appropriate abort sequence here

Abort at some address
>
```

If you do not intend to connect to a wider area network, you may use Sun's default network number: **192.9.200**. This number MUST be written with periods between the numbers.

Internet Address
: A machine's Internet address consists of two parts: the network number followed by the host number. For example, "192.9.200.45" is a typical Internet address consisting of Sun's default network number, "192.9.200", followed by the host number "45". See *inet*(3) man page for classification of networks.

Domain Name
: The domain name identifies a group of workstations on a single local network that share some of the administrative files like `/etc/passwd` and `/etc/hosts`. Note that you only need a domain name if you want to link two local networks, and hostnames on the two nets are not unique — two hosts with the same machine name are distinguished by their domain names. You *must* have a domain name if you plan to use the yellow pages. Without one the yellow pages will not work properly. Note also that this domain name has absolutely nothing to do with the domain name used by the `sendmail`(8) program for mail routing on the ARPA Internet.

Tapehost
: A tapehost is a machine which has the tape drive that is used during a remote installation.

Target Machine
: Durng a remote installation, the target machine is the machine you are installing.

Operating System Terminology

SunOS™
: SunOS™ is Sun's UNIX based operating system incorporating Berkeley 4.2 and System V. It will be referred to in this manual as the SunOS™ or the operating system.

miniroot
: The miniroot is a very small version of the operating system loaded into the swap partition. The miniroot gives you just enough memory to install the overall operating system.

`format`

`format` is a SunOS™ utility that enables you to format, label, repair and analyze disks on your Sun system. For more information, see *Chapter 11* of the *System Administration and Networking on the Sun Workstation*

`MUNIX`

`MUNIX` is a version of the operating system which is loaded from tape or over the network and does not require root or swap space on a disk. It is a useful tool when your local system disk is either corrupted or has never been formatted before.

Abort Procedure

As you proceed through this manual, there may be a need to abort certain procedures. Listed below are "abort sequences" for Sun workstations. Familiarize yourself with the one that pertains to your workstation.

To return to the PROM monitor at any time during installation, you can type what we call an **abort sequence** on your keyboard. The abort sequence usually consists of two keys typed in sequence; the first key is **held down** while the second key is typed. The keys vary with Sun Workstation model and keyboard type:

- If your Sun-1 keyboard has a [SET-UP] key, the abort sequence is [SET-UP]a (hold down the [SET-UP] key while typing 'a').
- If your Sun-1 has an [ERASE-EOF] key, the abort sequence is [ERASE-EOF]a (hold down the [ERASE-EOF] key while typing 'a').
- On a Sun-2 keyboard, type [L1-a.] (hold down the [L1] key in the uppermost left-hand corner while typing 'a').
- On a Sun-3 keyboard, type [L1-a.] (This is the same as the Sun-2 keyboard.)
- On a standard terminal (if it is the console) the [BREAK] key generates an abort.

2.3. SunOS Device Names

The operating system has its own set of names for devices. These names are fairly arbitrary, but are often based on abbreviations for the controllers used to drive the devices. When the operating system boots up, it probes the system for the device and controller configuration and reports what it finds there. Since you will be using these names during installation and in most of your administrative dealings with the system it's a good idea to identify your system's devices at this point, and to remember their operating system device names:

Table 2-1 *Tape Devices*

Devices	*Description*
ar	Archive quarter-inch tape cartridge
mt	Nine-track magnetic 1/2" tape-Tapemaster controller
st	SCSI tape controller cartridge
xt	Nine-track magnetic 1/2" tape-Xylogics 472 controller

Table 2-2 *Disk Devices*

Devices	*Description*
xy	Xylogics 450/451 SMD disk controller
sd	SCSI disk controller
xd	Xylogics 7053 disk controller

Table 2-3 *Ethernet Types*

Type	*Description*
ec	3COM ethernet controller
ie	Sun-2, Sun-3/75, Sun-3/100, Sun-3/200 and Sun-4 ethernet controller
le	Sun-3/50, Sun-3/60 and Sun-3/Eurocard ethernet controller

In the walkthrough of the installation, when we ask you to type in your *tape*, *disk*, or *ethernet* name, you should type in the device name for the appropriate device.

2.4. Determining Network Information

NOTE **The procedures in this section apply only to systems with Ethernet. If you do not have Ethernet, skip to the next section,** *Loading the Bootstrap Program.*

If you have an existing network that you do not intend to upgrade, you might need to make it compatible with the new network software. In any case, complete the steps given below for any machines you are installing or upgrading, and when you are finished, read the section How to Make Current Networks Compatible With Older Networks *in the Sun System Administration Manual.*

Before beginning actual installation, you must know:

1) The full Internet address (network number followed by unique host number) for each workstation you are setting up — whether it is a server or a client,

2) The hardware Ethernet address of each client machine if you are installing a server/clients configuration of machines, and

3) The yellow pages domain name of the workstation or group of workstations you are installing.

These items will be requested later during installation, but must be obtained now.

Please remember that:

- You can use Sun Microsystems' default network number (192.9.200) if you have not been assigned a network number by ARPA, or if you are not connected to a higher level network.
- You must have all sets of distribution tapes if you are installing a heterogeneous server. If you want this server to support Sun-2 Sun-3, and Sun-4 hardware, you must also have Sun-2, Sun-3, and Sun-4 distribution tapes before you start.
- You need a domain name if you are running the yellow pages, and there are duplicated hostnames or user id's (the domain name simply distinguishes network nodes). If you have only one */etc/passwd* file and one */etc/hosts* file for your organization (if there is a single unique user id and machine name space), the domain name is still necessary if you are running the yellow pages.
- Obtain each client's machine hardware Ethernet address by powering up the workstation, and checking the six-byte hexadecimal address displayed in the monitor power-up banner. When you turn the machine on, you'll see the Sun logo, and a message like the one in the example below. Abort immediately when the machine begins to auto-boot:

```
Self Test completed successfully.

Sun Workstation, model_type, keyboard_type
ROM Rev N, some_number_MBytes memory installed
Serial #some_number, Ethernet address xx:xx:xx:xx:xx:xx

Auto-boot in progress . . .

abort by typing the appropriate abort sequence here

Abort at some address
>
```

You will need the entire six bytes of the displayed Ethernet address later; copy them down.

2.5. Loading the Bootstrap Program

This section covers the first set of steps of actual installation: loading the distribution tape on your tape drive, and using the PROM Monitor to load the bootstrap program from tape. The bootstrap program is used to load other programs from tape into memory.

What is on the distribution tape?

The software needed to load the operating system is contained either on three half-inch magnetic tape reels, or on four quarter-inch tape cartridges. See the READ THIS FIRST for a complete listing of the files on the distribution tape.

In order to help you with these steps, we have put the basic commands for a simple walkthrough installation in the left hand margins of the following sections. However, these are only the basic commands. We recommend that you read this chapter in order to determine the type of system you are installing **before** using these commands since they may not meet your specific installation needs.

Step 1: Loading the Tape

1. Turn on the Sun Workstation which you are installing.

Almost immediately, the PROM monitor displays its power-up banner, which looks something like the example below, and then the machine begins to auto-boot. Stop the auto-boot immediately by typing the appropriate abort sequence for your machine (abort sequences are described in Section 2.2 of this chapter). When you abort the auto-boot, you return control to the monitor, and it displays its prompt (>):

```
Sun Workstation, model_type, keyboard_type
ROM Rev N, some_number_MBytes memory installed
Serial #some_number, Ethernet address xx:xx:xx:xx:xx:xx
Auto-boot in progress . . .
abort by typing the abort sequence for your machine here
Abort at some_address
>
```

NOTE *If you are re-installing an existing system, you will need to halt the system. To do this become super-user and type the command:* `/etc/halt`. *Remember to halt all diskless clients if the system is a server. Full dump is strongly recommended before you halt the system.*

2. Load the tape.

If you have any questions about your tape drive, see the subsystems chapter in the *Hardware Installation* manual for your machine.

Step 2: Loading the Bootstrap Program

If you are installing using a local tape drive, boot the general purpose bootstrap program from the tape by typing a **b** (for **b**oot), followed by the two character device abbreviation for your tape drive type, followed by open parenthese, zero, comma, zero, comma, 0 and closed parenthese. For example:

```
>b tape(0,0,0)
```

In the following, please remember to substitute the proper device abbreviation for your tape controller for *tape*: **ar** for Archive 1/4'' Tape Controller, **st** for SCSI Tape Controller, **mt** for a 1/2'' tape controlled by a Tapemaster Controller, or **xt** for a 1/2'' tape controlled by a Xylogics 472 Tape Controller. For more information on device abbreviations or conventions used in these procedures, see the table at the beginning of this chapter under General Information, Device Names.

When you type the command, the monitor echoes it back to you, with the parameters filled in. For example, loading the boot program from device `xt`:

```
>b xt(0,0,0)
Boot:
```

2.6. Using *format* during System Installation

NOTE **The procedures described in this section are to be followed with extreme caution. Running format on your disk causes all the data on it to be erased. Before proceeding:**

Make at least one backup of the disk you intend to format, preferably two, since one of the tapes may be faulty.

Make sure you have four megabytes of main CPU memory, as `MUNIX` requires that much to run.

You may want to run memory diagnostics, just to be sure.

It is sometimes necessary to run the `format` program when you install your system. In particular, if your target system disk has been corrupted or was purchased from a third-party vendor, you will have to format and label the drive before you install the SunOS. If the disk was purchased from Sun this is not absolutely required, as all disks sold by Sun are formatted and labelled at the factory. However, with brand new drives straight from the factory, it is recommended that you reformat the entire drive anyway, as this insures that any head movement that occurred during shipment will not affect the performance of your new disk. Also, if you wish to partition your new disk differently than the Sun default partitions, you need to create a partition table and relabel the disk before proceeding with the installation. This section shows you how to use `format` to prepare your system disk in such situations.

Before proceeding with examples, a note about `MUNIX` is in order. `MUNIX` is a version of the SunOS that is loaded from tape or over the network and resides entirely in memory. It does not require a disk from which to load or swap and is therefore a very useful tool if your local disks are unformatted or corrupted. Running `format` under `MUNIX` is about the same as running it under the SunOS, with a couple of exceptions. First, before running `format` under `MUNIX`, you must create the proper entries for your device in the `/dev` directory or

`format` will not be able to access your disk. The `/dev` entries are not premade for you because there is no way to know exactly which devices you will need ahead of time. For this reason, you must boot `MUNIX` with the `-asw` flags so as to be able to create the entries. If you wish to modify and save files, you must perform the additional step of saving the files to a scratch tape, as `MUNIX` stores all its "files" in volatile storage (i.e. ramdisk). The following example shows you how to run `format` in the `MUNIX` environment.

In this example, you are installing `xd0` as your system disk. We will assume that the target disk is a Fujitsu 2333, that it was originally formatted by a Xylogics 451 SMD controller, that you are upgrading to a Xylogics 7053, and that this is the only disk in the system. Such a situation requires `MUNIX`, because the two controllers are not format compatible, so the target disk must be reformatted before anything can be loaded onto it.

To load `MUNIX` type the following. Note that tape device `st1` is used to initialize the ram disk. If your tape was in QIC-11 format (the tape label will tell you this), you would initialize from `st0`.

```
Boot:tape()
Boot:tape(0,0,4) -asw
     .
     .
     .
root filesystem type (spec 4.2 nfs):4.2
root device (rd%[a-h]:rd0a
init ram disk from [st1, st0]:tape1
Tape file number? 5
Swap filesystem type (Spec 4.2 nfs):spec
Swap device (ns%d[a-h]):ns0a
#
```

Next, enter `format` and select the disk you wish to work on:

```
# cd /dev
# MAKEDEV xy0
# format
Searching for disks...done


AVAILABLE DISK SELECTIONS:
    0. xy0 at xyc0 slave 0
    xy0: <Fujitsu-M2333 cyl 821 alt 2 hd 10 sec 67>
Specify disk (enter its number): 0
selecting xy0 <Fujitsu-M2333> [disk formatted,
    defect list found]

    disk        - select a disk
    type        - select (define) a disk type
    partition   - select (define) a partition table
    current     - describe the current disk
    format      - format the disk
    repair      - repair a defective sector
    show        - show a disk address
    label       - label the disk
    analyze     - surface analysis
    defect      - defect list management
    backup      - search for backup labels
    quit
format>
```

At this point, note that the disk is already formatted and a defect list is present on it. This should ALWAYS be the case with disks shipped from Sun. If you do not see this message, something is wrong and you should immediately exit `format` and use diagnostics to locate the problem.

Before we can reformat the target drive, we need to save its defect list to a safe place, since the 7053 cannot read the defect list off a drive formatted by a 451. Note that if your disk was purchased from a third-party or is missing its defect list for some other reason, you can use the extract command, which examines the disk and builds the defect list for it, based on which defects have been repaired. If you have a third-party disk that's brand new, you can use the original command to read the manufacturer's defect list that comes with all SMD drives. These commands are explained fully in chapter 10 of the *System and Network Administration* manual. Since you are going to have to switch off the power to install the new controller, you must save the defect list on non-volatile storage. In our example situation, we have to save the defect list to tape, since there is no other disk. The easiest and most reliable way to do this is the `tar` utility. Before saving the defect list, you should compare it to the hard copy of the manufacturer's defect list. It should contain all the defects on the hard copy list. It may also contain some defects that were found at the Sun factory. If any of the defects are missing, you should use the add command to add them to the defect list before proceeding.

```
format> defect
    <CR>
    <CR>
DEFECT MENU:

    restore  - set working list = current list
    original - extract manufacturer's list from disk
    extract  - extract working list from disk
    add      - add defects to working list
    delete   - delete a defect from working list
    print    - display working list
    dump     - dump working list to file
    load     - load working list from file
    commit   - set current list = working list
    quit
defect> print
    num     cyl     hd     bfi     len     sec
    1       11      6    31858      4
    2       21      4    14820      4
    3      106      7    27403      4
             .
             .
             .
    41     811       0    27738      6
    42     820       4     4502      3
total of 42 defects.
defect> dump
Enter name of defect file: 2333_defs.033537
defect file updated, total of 42 defects.
defect> q
format> q
# tar cvf /dev/rst0 2333_defs.033537
# <L1-A>
```

Note that we have put the serial number and model of the disk in the name of the defect file. This is always a good idea, as it lets you match up the defect file with the correct disk easily. If the serial number of the disk is not readily available, use some other unique identifier.

Now that you have saved the defect list on tape, power off the system and install your new controller as per the instructions in the hardware installation manual. Then boot `MUNIX` in the same manner as before. Using `tar`, read the defect list back in. After making the appropriate entries in /dev, start up `format`. Note that we have to specify the *disk type* because the 7053 can't read the label of a 451 formatted drive.

```
# tar xvf /dev/rst0 2333_defs.033537
# cd /dev
# MAKEDEV xd0
# cd /
# format
Searching for disks...done
    <CR>
    <CR>
AVAILABLE DISK SELECTION:
    0. xd0 at xdc0 slave 0
Specify disk (enter its number): 0
selecting xy0 <type unknown>

    disk        - select a disk
    type        - select (define) a disk type
    partition   - select (define) a partition table
    current     - describe the current disk
    format      - format the disk
    repair      - repair a defective sector
    show        - show a disk address
    label       - label the disk
    analyze     - surface analysis
    defect      - defect list management
    backup      - search for backup labels
    quit

format> type
    0. Fujitsu-2351 Eagle
    1. Fujitsu-M2333
    2. Fujitsu-2361 Eagle
    3. CMD EMD 9720
    4. Other
Specify disk type (enter its number): 1
selecting xd0 <Fujitsu-M2333>
[disk formatted, no defect list found]
```

Now you must load in the defect list and commit it (i.e. make it the *current* defect list) and you will be ready to format the disk with the new controller.

```
format> defect

DEFECT MENU:
    restore  - set working list = current list
    original - extract manufacturer's list from disk
    extract  - extract working list from disk
    add      - add defects to working list
    delete   - delete a defect from working list
    print    - display working list
    dump     - dump working list to file
    load     - load working list from file
    commit   - set current list = working list
    quit
defect> load
Enter name of defect file: 2333_defs.033537
ready to update working list, continue? y
working list updated, total of 42 defects.
defect> commit
ready to update Current Defect List, continue? y
Current Defect List updated, total of 42 defects.
Disk must be reformatted for changes to take effect.
defect> q
```

Now we are finally ready to format the *current disk*. The default values for the bounds of the `format` command will cause the entire drive to be reformatted. Also, by leaving the surface analysis parameters in their default state, 2 passes of analysis will automatically be run on the disk when `format` completes. It is recommended that you allow this analysis to complete, in order to verify the integrity of the media. After the format operation has finished, make sure you relabel the disk with the label command.

```
format> format
Enter starting block number [0, 0/0/0]: <cr>
Enter ending block number [551409, 822/9/66]: <cr>
Ready to format. Formatting cannot be interrupted
and takes a long while. Continue? y
Beginning format. The current time is
    Wed Sep  2 16:58:05 1987

Formatting...
Format succeeded.
Verifying media.
    pass 0 - pattern = 0xc6dec6de
    pass 1 - pattern = 0x6db6db6d
Total of 0 defective blocks repaired.
format> label
Ready to label disk, continue? y
format> q
```

If any defects are found during surface analysis, they will be automatically repaired if possible. If the automatic repair did not succeed, you need to repair them manually. See the section on "Repairing a Defective Sector" in chapter 10 of the *System and Network Administration* manual for step–by–step instructions.

If you are happy with the default partitioning of the disk, you are now done with `format`, and can continue your installation. If you wish to change the partitioning of the disk, use the commands in the *partition* menu to create a table, making sure to run the `label` command afterwards to label the *current disk*.

2.7. Loading the miniroot

If you are using a local tape drive, boot the standalone *copy* program from tape, and use it to copy the miniroot from the distribution tape to your disk.

```
>b tape(0,0,0)
Boot:tape(0,0,2)
Size:some_number+some_number+some_number bytes
Standalone Copy
From:tape(0,0,3)
To:disk(0,0,1)
```

Copying in the miniroot takes about four minutes using a half-inch tape, and about nine minutes using a quarter-inch cartridge. At the end of the copy, the *copy* program returns control to the bootstrap program:

```
Copy completed   some_number bytes
Boot:
```

2.8. Booting the Miniroot

Now that there is an operable miniroot on the disk, the bootstrap program can boot the miniroot from the disk. Because this boot is single user, you must specify the **–a** (for ask me) option on the boot command, and also the **–s** (come up single user) option. This is because the miniroot uses the swap partition. If you do not use **–a**, the system will not ask you if you want the swap partition and as a result you will not be able to load the miniroot. Because the default for loading the miniroot is read only you must specify **–w** in order to make the miniroot writable to the swap. Boot the system as follows:

```
Boot: disk(0,0,1)vmunix -asw
Size: some_number+some_number+some_number bytes
Sun UNIX 4.0 (GENERIC) #1: Sat Jul 23 10:30:42 PDT 1988
Copyright (c) 1987 by Sun Microsystems, Inc.

[ ...about twenty lines of configuration messages... ]
```

2. As the miniroot comes up, it displays some messages about the configuration of the system on which it is running, and finally queries you, asking for its root file system. The root file system type at this stage is "4.2", which has a special meaning to the miniroot.

```
root filesystem type (spec 4.2nfs):4.2
root device (disk%d[a-h]):disk0b
swap filesystem type (spec 4.2 nfs): spec
swap device (disk%[a-h]:disk0b
Swapping on root device? y
#
```

Now you are ready to invoke *suninstall*. Go to the next chapter for a complete explanation of *suninstall* Read Chapter 3 carefully before you proceed to the individual walkthroughs in Chapter 4.

3

suninstall

3

suninstall

3.1. Introduction

suninstall is the replacement for *Setup*, Sun Microsystems system installation tool for 3.x releases. *suninstall* is a tool that will help you install and maintain the 4.0 Operating System on Sun Workstations. It not only maintains all the existing functionalities of *Setup* but it also includes some new features besides fixing the problems in *Setup*. The new features are :

- on-line help

  There is a new on-line help screen that you can invoke any where in *suninstall* for quick reference.

- repainting the screen

  By using CR-\ the screen will refresh itself.

- re-entrance

  You no longer need to re-enter all the information if you exit from the program. By restarting *suninstall*, all the information saved before exiting from the program will be displayed for you and you may change it as you wish.

- installation-interrupt

  If for any reason you need to stop the installation or change the information you entered, you can type Ctrl-C and restart *suninstall*. The information you entered will be displayed in front of you.

- mixed types of distribution tapes.

  suninstall allows you to install any combination of distribution tapes. For example, you can build a heterogeneous server with a set of 1/2 inch Sun-2 tapes, a set of 1/4 inch Sun-3 tapes and a set of 1/2 inch Sun-4 tapes. This makes the installation procedures more flexible and convenient.

- dataless configuration

  suninstall builds not only a standalone configuration, homogeneous server and heterogeneous server but it also builds dataless configuration. The definitions of these system configurations are in Section 2.2.

- mixed architectures

  Now you can install as many architecture types as disk space allows. In 3.x SunOS releases, a heterogeneous server is allowed to support only Sun-2 and Sun-3 architectures. In 4.0 SunOS, a heterogeneous server can support Sun-2, Sun-3, Sun-4 and Sun386i if there is enough disk space available for the executables of all these architectures.

- standalone/server conversion

  You can now turn a 4.0 standalone system into a 4.0 server without taking down or rebuilding the system. By running the command `setup_client`, you can create a diskless client while the system is running in multiuser mode. You can also remove a client while the system is running in multiuser mode by running the command `setup_client`.

- standalone & homogeneous server conversion

  You can now turn a 4.0 standalone system or a 4.0 homogeneous server into a 4.0 heterogeneous server while the system is up and running in multiuser mode. By running the command `setup_exec`, the executables of the architecture specified will be loaded onto the system and the clients of that architecture can be created by running the command `setup_client`.

3.2. Overview

suninstall is broken into two stages: the first stage is information gathering and the second stage is the installation. *suninstall* presents you with five different forms. Each asks you for information pertaining to a specific aspect of system configuration. When *suninstall* starts, it prompts for the system's terminal type, and will put you in the information gathering stage by displaying the main menu on the screen. It is recommended that you edit the forms in the order in which they are listed in the main menu. When you have entered all of the information needed by *suninstall* select `[start the installation]`, from the main menu, to begin the installation.

suninstall's on-line forms are very similar to paper forms or questionnaires; they are composed of items that ask for a particular piece of information. There are two item types: Text and Choice.

- Text items prompt you to type in information such as a name. In other words, "fill in the blanks".
- Choice items present you with a list of choices and ask you to select one element from the list. This is the equivalent of "Check the appropriate box".

  When each form on the main menu starts, you will see three regions on the screen: the top region consists of the title of the form and help guides for Text items; the middle region consists of the prompts; the bottom region consists of the message `Are you finished with this form? [y/n]`. Depending on what you choose you will either exit the form or continue and revisit the other choice items on it. When you start *suninstall*, it will prompt you for the local time zone. (See Appendix B of this manual for

a complete listing of world time zones.) Fill in the correct time zone. It will then display the Day of the Week, Month, Date, Hour, Minutes, Seconds, Time zone and ask you if this correct. Fill `y` if it is. If not, answer `n` and fill in the correct time based on the examples below.

In this example: `dd/mm/yy`:

`dd` stands for day of the month, `mm` stands for the month, `yy` stand for the year.

In this example: `hh:mm:ss am/pm`:

`hh` stands for hour, `mm` stands for minutes, `ss` stands for seconds, and am/pm stands for morning or afternoon.

Now the system will display the new corrected date/time. If it is correct, answer `y`. If not answer `n` and repeat the procedure.

After you have set the date you will be prompted for your terminal type.

```
# suninstall

Enter the local time zone name:
 >>

Is this the correct date/time [y/n]:
  Day of the Week, Month, Date, Hour, Minutes, Seconds, Timezone
 >>

Enter the current date and local time (e.g. 09/03/88 12:20:30);
the date may be in one of the following formats:
          dd/mm/yy
          dd/mm/yyyy
         dd.mm.yyyy
         dd-mm-yyyy
         dd-mm-yy
         month dd, yyyy
         dd month yyyy
 and the time may be in one of the following formats:
         hh am/pm
         hh:mm am/pm
         hh.mm
         hh:mm am/pm
         hh.mm
         hh:mm:ss am/pm
         hh:mm:ss
         hh.mm.ss am/pm
         hh.mm.ss
 >> 09/03/88 12:20:30 (For example)

 Is this the correct date/time [y/n]:
    Wed Mar  9 12:20:30 PST 1988 (For example)
 >> y
Select your terminal type:
    1) Televideo 925
    2) Wyse Model 50
    3) Sun Workstation
    4) Other
 >>
```

If you select "Other", the name of the terminal must correspond to a name in the termcap database.

```
Enter the terminal type (your terminal type must be in /etc/termcap)>>
```

SET NOGLOB
EVAL `TSET -S TERM-TYPE` (VT100)
UNSET NOGLOB

3.3. Main Menu

The main menu is displayed on the screen, putting you in the information gathering stage of *suninstall*. Below is an illustration of the main menu, as well as explanations of the items in the form.

```
                Sun Microsystems System Installation Tool

                              Main Menu

                ( Please use x or X to select your choice )
                   ( + means the data file(s) exist(s) )

                        [ assign host information     ]

                        [ assign disk information     ]

                        [ assign software information ]

                        [ assign client information   ]

                        [ on-line help information    ]

                        [ start the installation      ]

                        [ exit from suninstall        ]


    [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

PROMPTS	EXPLANATIONS
assign host information	Gather system specific information. The Host Form will be displayed if you select this choice. A "+" will be displayed in front of this item if the data file(s) required by this form already exist. This usually occurs when you revisit the form.
assign disk information	Gather partition sizes for specified attached disk device(s). The Disk Form will be displayed if you select this choice. A "+" will be displayed in front of this item if the data file(s) required by this form already exist. This usually occurs when you revisit the form.
assign software information	Gather software categories to be extracted for the architecture type specified. If you are installing a dataless configuration, you will not be allowed to select any software since the system will be sharing `/usr` with the server and only required software categories will be loaded for installation purposes. A "+" will be displayed in front of this item if the data file(s) required by this form already exist. This usually occurs when you revisit the form.

assign client information

Gather client information. The Client form will be selected if you select this Choice. If you are NOT installing a server, you will NOT edit this form. A "+" will be displayed in front of this item if the data file(s) required by form already exist. This usually occurs when you revisit the form.

start the installation

Start installation.

on-line help information

produces the following help screen:

```
ON-LINE HELP

          KEYS                          PURPOSE

          CONTROL F                     move cursor forward
          CONTROL N                     move cursor forward
          CONTROL B                     move cursor backward
          CONTROL P                     move cursor backward
          CONTROL U                     erase word
          <DELETE>                      erase one character
          CONTROL \                     repaint screen
          CONTROL C                     abort
          <RETURN>                      end of input string


Are you finished with this form [y/n] ?
```

exit from suninstall

Exit from *suninstall*. When you exit *suninstall* you return to the directory where you loaded *suninstall*, usually `/usr/etc/install`.

When you exit from *suninstall*, it saves a copy of everything you have completed up to that point. Later when you re-invoke *suninstall* you will start where you left off. You do not have to re-enter previous information.

3.4. Host Form

Below is an illustration of the Host form, as well as explanations of the prompts it contains. This is generally the first form to be filled out.

```
HOST FORM        [DEL=erase one char of input data] [RET=end of input data]
 ------------------------------------------------------------------------
 Workstation Information :
      Name :
      Type :  [standalone]  [server]  [dataless]
      Server Name :
      Server Internet Address :
      Path of the executables on server:

 Network Information :
      Ethernet Interface :  [none]  [interface0]  [interface1]
      Internet Address 0 :
      Internet Address 1 :
      YP Type            :  [none]  [master]  [slave]  [client]
      Domain name        :

 Misc Information :
      Operation type         :  [install]  [upgrade]
      Reboot after completed :  [y]  [n]



 Are you finished with this form [y/n] ?
    [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

PROMPTS	EXPLANATIONS
Name	Hostname of the system.
Type	Refer to Chapter 2 if you are not familiar with the differences between listed types.
Server Name	Name of the system that will be serving `/usr` to this system. This prompt will be displayed only when installing a DATALESS configuration.
Server Internet Address	Internet address of the system that will be serving `/usr` to the dataless system.
Path of the executables on server	For DATALESS configurations, this is the path for the executables on the server.
Ethernet Interface	Select [*none*] is you do not want the system to be on the network. If you want the system to be on the network, you should go through all the Ethernet interfaces and assign the appropriate Internet addresses for each interface.

Internet Address 0	Internet address of the first Ethernet interface if there is an Ethernet interface.
Internet Address 1	Internet address of the second Ethernet interface if there is second Ethernet interface. This will only appear on the screen when there is more than one.
YP Type	YP master server, yp slave server, yp client or not using yp.
Domain name	YP domain name
Operation type	Full installation to a major release or an upgrade of a minor release (4.0 and post 4.0 releases only).
Reboot after completed	Y means the system will be rebooted after installation is completed. n means the system will remain in the miniroot environment after installation is completed.
Are you finished with this form [y/n] ?	Entering y will save the entered information and return you to the Main menu. Entering n will return you to the top of the form.

3.5. Disk Form

Below is an illustration of the Disk form, as well as explanations of the prompts it contains.

```
DISK FORM      [DEL=erase one char of input data] [RET=end of input data]
 ------------------------------------------------------------------------
 Attached Disk Devices :
    [disk0] [disk ]     [disk ].......


 Disk Label:  [default]  [existing]  [label in data file]
 Free Hog Disk Partition :  [a]  [d]  [e]  [f] [g]  [h]
 Display Unit            : [Mbytes]  [Kbytes]  [bytes]  [blocks]  [cylinders]

 PARTITION START_CYL BLOCKS    SIZE     MOUNT PT            PRESERVE(Y/N)
 ========================================================================
     a      0         15884    7        /                       n
     b      XX        33440    16
     c      0         140624   68
     d      0         0        0
     e      0         0        0
     f      0         0        0
     g      XX        91256    44       /usr                    n
     h      0         0        0


 Ok to use this partition table [y/n]  ?
 Are you finished with this form [y/n] ?
    [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

PROMPTS	EXPLANATIONS
Attached Disk Devices	Attached disk devices will be displayed in this area.
Disk Label	[default]= default partition table [existing]= existing label on the disk. If you select this, there is no preservation of the file system mount points. [label in the data file]= information saved from the previous edit.
Free Hog Disk Partition	Select the partition that has enough extra space to give to other partitions. Also, this partition is where extra space is stored if you free up disk space in *suninstall* as well as where it will be taken from when you increase a partition size.
Display Unit	All numbers under SIZE column will be converted and displayed with the unit specified.
PARTITION	This choice item is where you actually partition your disk. There are some fundamental concepts you need to consider when using this form.

The basic unit of the disk is the sector. Sun disk sectors contain 512 bytes of data space. Sectors radiate outwards from the center of the disk. The data space is further separated into concentric circles, called tracks, which pass through all the sectors on the disk. On drives with multiple disks, tracks which occupy the same location on two or more disks are referred to as cylinders.

Each disk has a maximum of eight hard partitions, by convention, labelled "a" through "h". These hard partitions create separate physical sections on the disk. Note that disks do not have to use all of the available hard partitions.

Each hard partition has an offset and a size. Hard partition offsets must be in cylinders, but their sizes may be in either cylinders or sectors. For performance reasons, hard partition sizes are usually also in cylinders. Overlapping hard partitions cannot be used by Unix simultaneously and so are not allowed by *suninstall*.

The configuration of the hard partition is encoded within the disk label. The label is written to special locations on the disk by `format`(8) programs and can be changed by *suninstall*. The label is read from the disk by the SunOS at boot time to determine the disk configuration. You can see the existing label by using `format`'s `verify` command, or the command `dkinfo`(8) in the OS.

Creating or changing disk labels should be done with caution. If the disk label needs to be changed after Unix is installed, all of the information on the disk should be saved before modifying the label. Changing a hard partition's size or offset effectively destroys all of the information contained on that partition, and possibly other partitions as well.

The first three partitions must be labelled using the `format` program.

a: system's root/root partition for the server
b: swap space (where the miniroot is loaded)
c: the whole disk

The partitions ''d'' through ''h'' are free space and can be labelled and have their sizes changed using *suninstall*.

START_CYL — The starting cylinder for each partition.

BLOCKS — The system automatically fills in this information.

SIZE — The user fills in the size and then the system changes the BLOCK size automatically.

MOUNT PT — File system mount point.

PRESERVE (Y/N) — Entering y will save the disk partition and install the software on top of the existing files. Entering n will clean up the partition before installation.

Ok to use this partition table [y/n] ?	The data will be saved and used to label the disk.
Are you finished with this form [y/n] ?	Exit from this form.

3.6. Software Form

The Software form is illustrated below, along with explanations of the prompts displayed in it. This form is required for all system configurations. As you work your way through these categories if you have not allocated enough space, `suninstall` automatically goes to the freehog space, taking what it needs to load your software choices. Thus this decreases the freehog space, and increases the partition you have chosen for the software. You will notice that there are considerable pauses between categories.

NOTE *Be sure to choose the* `install` *optional software if you are planning to convert your standalone system to a server later, or planning to add clients. The* `install` *software includes utilities you will need for adding clients.*

```
SOFTWARE FORM    [DEL=erase one char of input data] [RET=end of input data]
 ------------------------------------------------------------------------
 Architecture Information :
      Type          :  [sun2]   [sun3]   [sun4]    [Sun386i]
      Path where executables reside :

 Tape Information :
      Device Type :  [ar0]  [ar8]  [st0]  [st8]  [mt0]  [xt0]
      Drive Type  :  [local]  [remote]
      Tapehost    :
      Tapehost's Internet Address :

 Choice            :  [all]   [default]   [own choice]   [required]   [quit]


                CATEGORY      NAME                BYTES   AVAIL BYTES Y/N
                ==========================================================




 Are you finished with this form [y/n] ?
    [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

PROMPTS	EXPLANATIONS
Type	Architecture type of the executables.
Path where executables reside	Directory where the executables reside (e.g. if `path` is specied, `path/sun2` will be the directory of the Sun-2 executables). `path` must start with a `/`.
Device Type	Tape device

Drive Type	Tape drive type
Tapehost	System with the tape drive
Tapehost's Internet Address	Internet address of the tapehost
Choice	[all] means load all of the software categories from the distribution tape(s). [default] means load all of the common software categories the distribution tape(s). [own choice] means load all of the required software categories onto the distribution tape(s), and then it prompts you for the optional software categories. [required] means load only the required software categories onto the distribution tape(s). [quit] means exit from the form. If you are installing a heterogeneous server, you will be prompted to change types for various architectures. Then you will have to go back through and answer the questions that pertain to the architectures you have selected.
CATEGORY, NAME, BYTES, AVAILABLE BYTES, Y/N	Each software category will be displayed in this area. All required categories will have **y** under Y/N and required under CATEGORY. If the category is optional, the word desirable will appear under CATEGORY instead. You will have to answer **y** or **n** under Y/N for these optional categories. When you select a category, its size is automatically filled in under BYTES. AVAILABLE BYTES will also fill in what free space you have left. If you run out of available space, *suninstall* will automatically increasse the size of the partition by taking space from the freehog partition. You will see "from freehog" under the field AVAIL BYTES. When you have selected all the optional software you want, *suninstall* will list what you have selected and ask you if it is correct.
Are you finished with this form? y/n	Entering **y** returns you to the main menu. Entering **n** leaves you in the current form.

3.7. Client Form

Below is an illustration of the Client form, as well as explanations of the prompts it contains. This form is only required when installing the server configuration.

```
CLIENT FORM      [DEL=erase one char of input data] [RET=end of input data]
 ------------------------------------------------------------------------
 Architecture Type :   [sun2]  [sun3]   [sun4]   [Sun386i]
 Choice            :  [create]   [delete]   [display]   [next arch]

 Client(s) :



 Client Information :
        Name                                  :
        Internet Address                      :
        Ethernet Address                      :
        YP Type :    [none]  [master]  [slave] [client]
        Domain name                           :
        Path of Client's Root                 :
        Path of Client's Swap                 :
        Path of Client's Executables          :
        Path of Client's Home                 :
        Swap size (e.g. 8M,8m,8K,8k,8 or 8b) :


 Are you finished with this form [y/n] ?
    [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

PROMPTS	EXPLANATIONS
Architecture Type	Architecture type of the client
Choice	[create] displays default client data and expects you to assign the client hostname and related information. [display] displays information for the specified client or an error message if the client does not exist. [delete] deletes the specified client or displays an error message if the client does not exist.
Client(s)	Client(s) of specified architecture type will be displayed in this area.
Name	Client hostname
Internet Address	Client ip address
Ethernet Address	Client Ethernet address (If you are running YP and have the correct Internet address, you can use a dummy Ethernet address for the client. This is because

	the system is only interested in the host ethernet address.)
YP Type	YP master server, yp slave server, yp client or not using yp. A diskless client usually is never a yp master server.
Domain name	YP domain name.
Path of Client's Root	If path is specified, `/path/clientname` is the root directory of the specified client
Path of Client's Swap	If path is specified, `/path/clientname` is the swap file of the specified client.
Path of Client's Executables	If path is specified, `/path/arch` or `/usr` is the directory where executables will be mounted from the server.
Path of Client's Home	Home directories.
Swap size	Swap reserved for the specified client. These sizes are specified in megabytes, kilobytes, or blocks. The default is megabytes. (e.g. 16M,16m,16000K,16000k,16000000 or 16000000b)
Are you finished with this form? [y/n]	**y** allows you to exit from the form. **n** takes you back to the top of the form.

3.8. Installation

Once you select `[ start the installation ]` in the main menu of *suninstall*, installation begins. You will be prompted when the tape needs to be changed. You can abort the installation any time by using Ctrl-C. Before you restart *suninstall*, you should make sure no disk partitions are mounted. You can reassign information by starting *suninstall* and the information you entered will be displayed for you. You have the option of changing a portion of the information without entering everything all over again, or the option of changing all the information if you wish. Installation will begin once you select `[ start the installation ]` in the main menu of *suninstall* and the system will be built according to the latest information entered by running *suninstall*. You no longer need to abort the system, reload miniroot, and reenter all the information when you need to stop the installation. If you select the reboot option in the Host Form, the system will be rebooted after the installation is completed and the system will be in multiuser mode with the following prompt on the screen when it is ready for use.

```
hostname login:
```

If you do not select the reboot option in the Host Form, the system will remain in the miniroot after installation is completed and the following messages will be displayed on the screen.

```
System Installation Completed.
Reboot your system and configure a kernel for your system.
#
```

You can bring up the system by aborting and then booting the system. Refer to Chapter 2 for the abort sequence.

```
> b
```

If the system is either a yp master server or yp slave server, you need to set up the yp database after the system comes up in multiuser mode. Details of installing and maintaining yp databases are in the *System Administration and Networking* manual.

H 2 "Installing a `root` password"

After you bring up your new system for the very first time, you may want to add a root password. **REMEMBER!!!! ONCE A PASSWORD IS GIVEN TO ROOT, YOU CAN NOT LOGIN AS ROOT AGAIN WITHOUT GIVING THE CORRECT PASSWORD.** To add a password do the following:

```
login: root
# passwd
[The system will prompt you for your new password ]
```

If you are upgrading or reinstalling an existing system, then there is probably already a `root` password in the `/etc/passwd` file. This file will (probably) be restored as part of the upgrade reinstallation. Again, if there isn't one, just do the above after you reboot the system.

4

Walkthroughs

4

Walkthroughs

4.1. Introduction

This chapter offers you a series of walkthroughs for installing various system configurations with a local tape drive. Pick the example that most closely resembles the system you want to install. You do not have to configure your system exactly as shown. These are simply examples to help you design your own system configurations.

- Standalone Configuration
- Homogeneous Server
- Heterogeneous Server
- Dataless Configuration

At the beginning of each system type there is a list of assumptions about the system on which the example walkthrough is based. Pick the example that most closely resembles the system you want to install. You do not have to configure your system exactly as shown. These are simply examples to help you design your own system configurations. Read the example you choose completely BEFORE you proceed to use it to install or modify your system.

At any time during the installation procedures you need help, you can call up the On-Line Help screen by exiting the form you are in using. To do this, simply go the bottom of the form, answer **y** to `Are you finished with this form [y/n] ?`. This brings you back to the Main Menu. Now select `on-line help information`. The following screen will appear:

```
 ON-LINE HELP
-------------------------------------------------------------


-------------------------------------------------------------
          KEYS                          PURPOSE
-------------------------------------------------------------
          CONTROL F                     move cursor forward
          CONTROL N                     move cursor forward
          CONTROL B                     move cursor backward
          CONTROL P                     move cursor backward
          CONTROL U                     erase word
          <DELETE>                      erase one character
          CONTROL \                     repaint screen
          CONTROL C                     abort
          <RETURN>                      end of input string

 Are you finished with this form [y/n] ?
```

When you are finished with this form, simply exit and return to the form you were in previously.

4.2. Standalone Configuration With Local Tape Drive

Assume you have a standalone system with the following descriptions:

hostname: evans
architecture: sun2
ethernet interface: ie0
system type: standalone
internet address : 192.9.90.64
local SCSI tape drive: st0
1 Xylogics eagle disk: xy0
yp client of domain "wseng.sun.com"
software categories: all

1. Become super user and do a full dump of your system.
2. Halt the system by doing the following:

```
evans#/etc/halt
```

3. If you are installing this release on a new disk that does not have a label yet; or if you wish to change the size of the root partition; or reduce the size of the swap partition, load `MUNIX` and run `format` to label your disk. If you do not wish to change the existing disk label, skip this step and go to the next one.

```
>b st()
Boot:st(0,0,4) -asw
     .
     .
     .
root filesystem type (spec 4.2 nfs):4.2
root device (rd%d[a-h]:rd0a
init ram disk from: st0a
tape file number?5
swap filesysystem type (spec 4.2 nfs):spec
swap device (ns%d[a-h]:ns0a
     .
     .
     .
# format

Abort when you are done.
```

4. Load the miniroot:

```
>bst()
Boot: st(0,0,2)
From: st(0,0,3)
To: xy(0,0,1)
          .
          .
Boot:xy(0,0,1)vmunix -asw
root filesystem type ( spec 4.2 nfs):4.2
root device (xy%d[a-h]):xy0b
     .
     .
     .
swap filesystem type (spec 4.2 nfs): spec
swap device (xy%d[a-h]:xy0b
Swapping on root device: y
     .
     .
     .
#
```

5. Start *suninstall*:

```
# cd /usr/etc/install
# suninstall

 Enter the local time zone name:
 >> US/Pacific

 Is this the correct date/time [y/n]:
        Mon Mar 14 08:08:57 PST 1988
 >> n

 Enter the current date and local time (e.g. 09/03/88 12:20:30); the date
 may be in one of the following formats:
         dd/mm/yy
         dd/mm/yyyy
         dd.mm.yyyy
         dd-mm-yyyy
         dd-mm-yy
         month dd, yyyy
         dd month yyyy
 and the time may be in one of the following formats:
         hh am/pm
         hh:mm am/pm
         hh.mm
         hh:mm am/pm
         hh.mm
         hh:mm:ss am/pm
         hh:mm:ss
         hh.mm.ss am/pm
         hh.mm.ss
 >> 09/03/88 12:20:30

 Is this the correct date/time [y/n]:
         Wed Mar  9 12:20:30 PST 1988
 >> y

 Select your terminal type:
         1) Televideo 925
         2) Wyse Model 50
         3) Sun Workstation
         4) Other

>> 3
```

The following menu will now appear:

```
                    Sun Microsystems System Installation Tool

                                  Main Menu

                   ( Please use x or X to select your choice )
                      ( + means the data file(s) exist(s) )

                         [ assign host information     ]

                         [ assign disk information     ]

                         [ assign software information ]

                         [ assign client information   ]

                         [ on-line help information    ]

                         [ start the installation      ]

                         [ exit from suninstall        ]


[x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

6. Assign host information by selecting `[assign host information]` in the Main Menu and the Host Form will be displayed on the screen:

```
HOST FORM      [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Workstation Information :
     Name : evans
     Type : x[standalone]  [server]  [dataless]



Network Information :
     Ethernet Interface :  [none] x[ie0]
     Internet Address 0 :  192.9.90.64

     YP Type            :  [none]  [master]  [slave] x[client]
     Domainname         : wseng.sun.com

Misc Information :
     Operation type          : x[install]  [upgrade]
     Reboot after completed : x[y]  [n]



Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The main menu will be displayed on the screen after you answer "y" to the last prompt of this form: `Are you finished with this form [y/n]?`.

7. Assign disk information by selecting `[assign disk information]` in the Main Menu and the Disk Form will be displayed on the screen:

```
DISK FORM      [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Attached Disk Devices :
  x[ xy0]


Disk Label               :  x[default]  [existing]  [label in data file]
Free Hog Disk Partition  :   [a]  [d]  [e]  [f] x[g]  [h]
Display Unit             : x[Mbytes]  [Kbytes]  [bytes]  [blocks]  [cylinders]

PARTITION START_CYL BLOCKS    SIZE     MOUNT PT              PRESERVE(Y/N)
===============================================================================
    a      0         14336     7        /                       n
    b      XXX       14336     70
    c      0         262729    128
    d      0         0         0
    e      0         0         0
    f      0         0         0
    g      XXX       105024    51       /usr                    n
    h      0         0         0


Ok to use this partition table [y/n]  ? y
Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The numbers under the columns START_CYL, BLOCKS, and SIZE are for this example only. The numbers will be different for each disk and they depend on the existing label on the disk specified. The main menu will be displayed on the screen when you are finished with the form.

8. Assign software information by selecting `[assign software information]` in the Main Menu and the Software Form will be displayed on the screen:

NOTE

If you are planning on converting your standalone system to a server later, select the `install` *optional software. It contains utilities that you will need later to convert your standalone system to a server and add clients.*

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          :x[sun2]   [sun3]   [sun4]    [Sun386i]
     Path where executables reside :/usr

Tape Information :
     Device Type :  [ar0]  [ar8]  x[st0]  [st8]  [mt0]  [xt0]
     Drive Type  : x[local]  [remote]


Choice           : x[all]   [default]   [own choice]   [required]   [quit]

               CATEGORY      NAME          BYTES      AVAIL BYTES    Y/N
               ============================================================
               required      root          XXXX       XXXXX           y
               required      Sys           XXXX       XXXXX           y
               required      user          XXXX       XXXXX           y
               desirable     Networking    XXXX       XXXXX           y
                               .
                               .
                               .
Are you finished with this form [y/n] ?
    [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The list of categories to be extracted for the sun2 architecture will now be displayed and the Software Form will look like the following:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Architecture Information :
     Type          :x[sun2]   [sun3]   [sun4]   [Sun386i]
     Path where executables reside :/usr

Tape Information :
     Device Type :  [ar0]  [ar8]  x[st0]  [st8]  [mt0]  [xt0]
     Drive Type  : x[local]  [remote]



Choice             : x[all]   [default]   [own choice]   [required]   [quit]


           Extract list:

               root
               sys
               user
               Networking
               Debugging
                   .
                   .
                   .
Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The main menu will be displayed on the screen when you are finished with this form.

9. Start the installation by selecting `[ start the installation ]` in the Main Menu and you will be prompted when the tape needs to be changed. If any information is missing, the installation will not start and the Main Menu will be displayed on the screen. You can abort the installation any time by using CTRL-C and either restart it by using existing information or reassign information before restarting the installation. You should see the following messages after the installation begins.

```
System Installation begin :

Label disk(s) :
        xy0

File systems check :
/dev/rxy0a:     140624 sectors in 752 cylinders of 11 tracks, 17 sectors
        72.0Mb in 47 cyl groups (16 c/g, 1.53Mb/g, 640 i/g)
super-block backups (for fsck -b#) at:
 32, 3056, 6080, 9104, 12128, 15152, 18176, 21200, 24224, 27248,
 30272, 33296, 36320, 39344, 42368, 45392, 47904, 50928, 53952, 56976,
 60000, 63024, 66048, 69072, 72096, 75120, 78144, 81168, 84192, 87216,
         .
         .
         .
     a lot of text
         .
         .
         .
** /dev/xy0a
** Currently Mounted on /a/
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl Groups
/dev/rxy0a: 516 files, 2575 used, 4896 free (16 frags, 610 blocks)

Rebooting the system
    .
    .
    .
evans login:
```

10. Configure a kernel for your system. Refer to Appendix A for instructions on how to configure a kernel. If you wish to set a root password, see Chapter 3, *Installing a* `root` *password*.

4.3. Homogeneous Server With a Local Tape Drive

Assume the following system configuration:

hostname: evans
ethernet interface: ie0
architecture: sun2
system type: homogeneous server
sun2 client(s): sofia and frodo
frodo's internet address: 192.9.1.1
frodo's ethernet address: 8:0:20:1:00:00
sofia's internet address: 192.9.1.1
sofia's ethernet address: 8:0:20:1:00:01
internet address : 192.9.1.189
local SCSI tape drive: st0
1 Xylogics eagle disk: xy0
yp slave server of domain "wseng.sun.com"
software categories: required

1. Become superuser and do a full dump of your system.
2. Halt the system by doing the following:

```
evans#/etc/halt
```

3. If you are installing this release on a new disk that does not have a label yet; or if you wish to change the size of the root partition, load `MUNIX` and run `format` to label your disk. If you do not wish to change the existing disk label, skip this step and go to the next one.

```
>b st()
Boot:st(0,0,4) -asw
     .
     .
     .
root filesystem type (spec 4.2 nfs):4.2
root device(rd%d[a-h]:rd0a
init ram disk from: st0a
tape file number?5
swap filesysystem type (spec 4.2 nfs):spec
swap device(ns%d[a-h]:ns0a
     .
     .
     .
#format

Abort when you are done.
```

4. Load the miniroot:

```
>b st()
Boot: st(0,0,2)
From: st(0,0,3)
To: xy(0,0,1)
        .
        .
Boot: xy(0,0,1)vmunix -asw
root filesystem type ( spec 4.2 nfs):4.2
root device (xy%d[a-h]):xy0b
    .
    .
    .
swap filesystem type (spec 4.2 nfs): spec
swap device (xy%d[a-h]:xy0b
Swapping on root device?y
    .
    .
    .
#
```

5. Start suninstall:

```
# cd /usr/etc/install
# suninstall

Enter the local time zone name:
>> US/Pacific

Is this the correct date/time [y/n]:
       Mon Mar 14 08:08:57 PST 1988
>> n

Enter the current date and local time (e.g. 09/03/88 12:20:30); the date
may be in one of the following formats:
        dd/mm/yy
        dd/mm/yyyy
        dd.mm.yyyy
        dd-mm-yyyy
        dd-mm-yy
        month dd, yyyy
        dd month yyyy
and the time may be in one of the following formats:
        hh am/pm
        hh:mm am/pm
        hh.mm
        hh:mm am/pm
        hh.mm
        hh:mm:ss am/pm
        hh:mm:ss
        hh.mm.ss am/pm
        hh.mm.ss
>> 09/03/88 12:20:30

Is this the correct date/time [y/n]:
        Wed Mar  9 12:20:30 PST 1988
>> y

Select your terminal type:
    1) Televideo 925
    2) Wyse Model 50
    3) Sun Workstation
    4) Other
>> 3
```

The following menu will now appear.

```
                 Sun Microsystems System Installation Tool

                               Main Menu

                ( Please use x or X to select your choice )
                   ( + means the data file(s) exist(s) )

                      [ assign host information     ]

                      [ assign disk information     ]

                      [ assign software information ]

                      [ assign client information   ]

                      [ on-line help information    ]

                      [ start the installation      ]

                      [ exit from suninstall        ]


  [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

6. Assign host information by selecting `[assign host information]` in the Main Menu and the Host Form will be displayed on the screen:

```
HOST FORM        [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Workstation Information :
     Name : evans
     Type :  [standalone] x[server]  [dataless]


Network Information :
     Ethernet Interface :  [none] x[ie0]
     Internet Address 0 :  192.9.1.189

     YP Type            :  [none]  [master] x[slave]  [client]
     Domainname      : wseng.sun.com

Misc Information :
     Operation type          : x[install]  [upgrade]
     Reboot after completed :  [y] x[n]



Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The Main Menu will be displayed on the screen when you are finished with this form.

7. Assign disk information by selecting `[assign disk information]` in the Main Menu and the Disk Form will be displayed on the screen:

```
DISK FORM        [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Attached Disk Devices :
  x[ xy0]


Disk Label                :  [default]  [existing]  [label in data file]
Free Hog Disk Partition   :  [a]  [d]  [e]  [f] x[g]  [h]
Display Unit              : x[Mbytes]  [Kbytes]  [bytes]  [blocks]  [cylinders]

PARTITION START_CYL BLOCKS    SIZE     MOUNT PT              PRESERVE(Y/N)
===============================================================================
    a      0         15884     7        /                        n
    b      XXX       33440     16
    c      0         140624    68
    d      XXX       XXX       0        /export/root             n
    e      XXX       XXX       0        /export/swap             n
    f      0         0         0
    g      XXX       91256     44       /export/exec/sun2        n
    h      XXX       XXX       XXX      /home                    n


Ok to use this partition table [y/n]  ? y
Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The numbers under the columns START_CYL, BLOCKS, and SIZE are for this example only. The numbers will be different for each disk and they depend on the existing label on the disk specified. The main menu will be displayed on the screen when you are finished with the form.

8. Assign software information by selecting `[assign software information]` in the Main Menu and the Software Form will be displayed on the screen:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          : x[sun2]   [sun3]   [sun4]   [Sun386i]
     Path where executables reside : /usr

Tape Information :
     Device Type :  [ar0]  [ar8] x[st0]  [st8]  [mt0]  [xt0]
     Drive Type  : x[local]  [remote]


Choice           :  [all]   [default]   [own choice]  x[required]   [quit]

               CATEGORY      NAME            BYTES    AVAIL BYTES    Y/N
               ============================================================
               required      root            XXXX     XXXX            y
               required      Sys             XXXX     XXXX            y
               required      user            XXXX     XXXX            y
               desirable     Networking      XXXX     XXXX            y

Are you finished with this form [y/n] ?
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The Networking software will also be extracted since the system is on a network.

The list of categories to be extracted for the sun2 architecture will now be displayed on the Software Form below:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          : x[sun2]   [sun3]   [sun4]    [Sun386i]
     Path where executables reside : /usr

Tape Information :
     Device Type :  [ar0]  [ar8] x[st0]  [st8]  [mt0]  [xt0]
     Drive Type  : x[local]  [remote]


Choice           :  [all]   [default]   [own choice]  x[required]   [quit]



       Extract list:

                      root
                      sys
                      user
                      Networking

Are you finished with this form [y/n] ?y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The Main Menu will be displayed on the screen when you are finished with this form.

9. Assign client information by selecting `[assign client information]` in the Main Menu and the Client Form will be displayed on the screen.

```
 CLIENT FORM     [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Architecture Type :  x[sun2]   [sun3]   [sun4]    [Sun386i]
Choice            :   [create]   [delete]   [display]   [next arch]

Client(s) :
   frodo



Client Information :
       Name                                    : frodo
       Internet Address                        : 192.9.1.1
       Ethernet Address                        : 8:0:20:1:00:00
       YP Type :    [none]  [master]  [slave] x[client]
       Domain name                             : wseng.sun.com
       Path of Client's Root                   : /export/root
       Path of Client's Swap                   : /export/swap
       Path of Client's Executables            : /export/exec/sun2
       Path of Client's Home                   : /home
       Swap size (e.g. 8M,8m,8K,8k,8 or 8b) : 16M


Are you finished with this form [y/n] ? n
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

```
 CLIENT FORM     [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Architecture Type :  x[sun2]   [sun3]   [sun4]    [Sun386i]
Choice            :  x[create]   [delete]   [display]   [next arch]

Client(s) :
   frodo sofia



Client Information :
       Name                                    : sofia
       Internet Address                        : 192.9.1.2
       Ethernet Address                        : 8:0:20:1:00:00
       YP Type :    [none]  [master]  [slave] x[client]
       Domain name                             : wseng.sun.com
       Path of Client's Root                   : /export/root
       Path of Client's Swap                   : /export/swap
       Path of Client's Executables            : /export/exec/sun2/
       Path of Client's Home                   : /home
       Swap size (e.g. 8M,8m,8K,8k,8 or 8b)    : 16M


Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

10. Start the installation by selecting `[start the installation]` and you will be prompted when the tape needs to be changed. If any information is missing, the installation will not start. You can go back and reassign all information and start it again. You should be expecting the following messages after the installation begins.

```
System Installation begin :

Label disk(s) :
        xy0

File systems check :
/dev/rxy0a:     140624 sectors in 752 cylinders of 11 tracks, 17 sectors
        72.0Mb in 47 cyl groups (16 c/g, 1.53Mb/g, 640 i/g)
super-block backups (for fsck -b#) at:
 32, 3056, 6080, 9104, 12128, 15152, 18176, 21200, 24224, 27248,
 30272, 33296, 36320, 39344, 42368, 45392, 47904, 50928, 53952, 56976,
 60000, 63024, 66048, 69072, 72096, 75120, 78144, 81168, 84192, 87216,
         .
         .
         .
    lots of text
         .
         .
         .
** /dev/xy0a
** Currently Mounted on /a/
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl Groups
/dev/rxy0a: 516 files, 2575 used, 4896 free (16 frags, 610 blocks)

System Installation Completed.
Reboot your system and configure a kernel for your system.
#
```

11. Abort the system by using L1-A for Sun monitors or BREAK for Wyse terminals. To boot the system do the following:

```
>b
```

12. Login as root and run ypinit to set up the yp databases. Details of how to setup and maintain `yp` databases are in the *System Administration and Networking* manual.
13. Configure a kernel for your system. Refer to Appendix A for that information. If you wish to set a root password, see Chapter 3, *Installing a* `root` *password*.

4.4. Heterogeneous Server With a Local Tape Drive

Assume the system has the following configuration:

hostname: evans
architecture: sun3
system type:heterogeneous server
supports architecture types: sun2 and sun4
sun2 client: d2
d2's internet address: 192.9.1.1
d2's ethernet address: 8:0:20:1:00:00
sun3 client: frodo
frodo's internet address: 192.9.1.2
frodo's ethernet address: 8:0:20:1:00:01
sun4 client: d3
d3's internet address: 192.9.1.3
d3's ethernet address: 8:0:20:1:00:02
internet address : 192.9.1.189
local tape drive abbreviation: xt0
2 Xylogics eagle disk abbreviation: xy0 and xy1
yp slave with domain "wseng.sun.com"
sun2 software categories: all
sun3 software categories: all
sun4 software categories: all

1. Become super user and do a full dump of your system.
2. Halt the system by doing the following:

```
evans#/etc/halt
```

3. If you are installing this release on a new disk that does not have a label yet; or if you wish to change the size of the root partition, load `MUNIX` and run `format` to label your disk. If you do not wish to change the existing disk label, skip this step and go to next step.

```
>b xt()
Boot:xt(0,0,4) -asw
     .
     .
     .
root filesystem type (spec 4.2 nfs):4.2
root device (rd%d[a-h]):rd0a
init ram disk from: st0a
tape file number?5
swap filesysystem type (spec 4.2 nfs):spec
swap device (ns%d[a-h]):ns0a
     .
     .
     .
# format

Abort when you are done.
```

4. Load the miniroot:

```
>b xt()
Boot: xt(0,0,2)
From: xt(0,0,3)
To: xy(0,0,1)
          .
          .
Boot:xy(0,0,1)vmunix -asw
          .
          .
     .
root filesystem type ( spec 4.2 nfs):4.2
root device (xy%d[a-h]):xy0b
     .
     .
     .
swap filesystem type (spec 4.2 nfs): spec
swap device (xy%d[a-h]):xy0b
Swapping on root device?y
     .
     .
     .
#
```

5. Start `suninstall`:

```
# cd /usr/etc/install
# suninstall

Enter the local time zone name:
>> US/Pacific

Is this the correct date/time [y/n]:
       Mon Mar 14 08:08:57 PST 1988
>> n

Enter the current date and local time (e.g. 09/03/88 12:20:30); the date
may be in one of the following formats:
        dd/mm/yy
        dd/mm/yyyy
        dd.mm.yyyy
        dd-mm-yyyy
        dd-mm-yy
        month dd, yyyy
        dd month yyyy
and the time may be in one of the following formats:
        hh am/pm
        hh:mm am/pm
        hh.mm
        hh:mm am/pm
        hh.mm
        hh:mm:ss am/pm
        hh:mm:ss
        hh.mm.ss am/pm
        hh.mm.ss
>> 09/03/88 12:20:30

Is this the correct date/time [y/n]:
        Wed Mar  9 12:20:30 PST 1988
>> y


Select your terminal type:
    1) Televideo 925
    2) Wyse Model 50
    3) Sun Workstation
    4) Other
>> 3
```

The following menu will now appear.

```
                Sun Microsystems System Installation Tool

                                Main Menu

              ( Please use x or X to select your choice )
                 ( + means the data file(s) exist(s) )

                      [ assign host information     ]

                      [ assign disk information     ]

                      [ assign software information ]

                      [ assign client information   ]

                      [ on-line help information    ]

                      [ start the installation      ]

                      [ exit from suninstall        ]



  [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The Main Menu will be displayed on the screen when you are finished with this form.

6. Assign host information by selecting `[assign host information]` in the Main Menu and the Host Form will be displayed on the screen:

```
HOST FORM        [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Workstation Information :
     Name : evans
     Type :  [standalone] x[server]  [dataless]


Network Information :
     Ethernet Interface :  [none] x[ie0]
     Internet Address 0 :  192.9.1.189

     YP Type             :  [none]  [master] x[slave]  [client]
     Domainname      : wseng.sun.com

Misc Information :
     Operation type          : x[install]  [upgrade]
     Reboot after completed :  [y] x[n]



Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The numbers under the columns START_CYL, BLOCKS, and SIZE are for this example only. The numbers will be different for each disk and they depend on the existing label on the disk specified. The main menu will be displayed on the screen when you are finished with the form.

7. Assign disk information by selecting `[assign disk information]` and the Disk Form will be displayed on the screen:

```
DISK FORM        [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Attached Disk Devices :
  x[ xy0]   [ xy1]


Disk Label                :  x[default]  [existing]  [label in data file]
Free Hog Disk Partition   :   [a]   [d]   [e]   [f] x[g]   [h]
Display Unit              : x[Mbytes]  [Kbytes]  [bytes]  [blocks]  [cylinders]

PARTITION START_CYL BLOCKS     SIZE      MOUNT PT              PRESERVE(Y/N)
===============================================================================
    a      0          15884     7         /                        n
    b      XXX        33440     16
    c      0          140624    68
    d      XXX        XXX       0         /export/root             n
    e      XXX        XXX       XXX       /export/swap             n
    f      0          0         0
    g      XXX        91256     44        /usr                     n
    h      XXX        XXX       XXX       /home                    n


Ok to use this partition table [y/n]  ? y
Are you finished with this form [y/n] ? n
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

If you choose to use the entire disk, partition C, the other partitions will all be 0. The Main Menu will be displayed on the screen when you are finished with this form.

```
DISK FORM       [DEL=erase one char of input data] [RET=end of input data]
------------------------------------------------------------------------------
Attached Disk Devices :
   [ xy0]  x[ xy1]


Disk Label                :  x[default]  [existing]  [label in data file]
Free Hog Disk Partition   :   [a]  [d]  [e]  [f] x[g]  [h]
Display Unit              : x[Mbytes]  [Kbytes]  [bytes]  [blocks]  [cylinders]

PARTITION START_CYL BLOCKS    SIZE     MOUNT PT              PRESERVE(Y/N)
==============================================================================
    a      0          0         0
    b      0          0         0
    c      0          140624    68       /export/exec                n
    d      0          0         0
    e      0          0         0
    f      0          0         0
    g      0          0         0
    h      0          0         0


Ok to use this partition table [y/n]  ? y
Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

8. Assign software information by selecting `[assign software information]` in the Main Menu and the Software Form will be displayed on the screen.

   Select the software for the sun3 architecture:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Architecture Information :
     Type          :  [sun2]  x[sun3]   [sun4]     [Sun386i]
     Path where executables reside : /usr

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  [st8]  [mt0] x[xt0]
     Drive Type  :  x[local]  [remote]

Choice           : x[all]   [default]   [own choice]   [required]   [quit]


               CATEGORY      NAME          BYTES        AVAIL BYTES  Y/N
               ============================================================
               required      root          XXXX           XXXX         y
               required      Sys           XXXX           XXXX         y
               required      user          XXXX           XXXX         y
               desirable     Networking    XXXX           XXXX         y
                   .
                   .
                   .
Are you finished with this form [y/n] ?
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The list of categories to be extracted for the sun3 architecture will now be displayed on the Software Form below:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          : [sun2]  x[sun3]   [sun4]    [Sun386i]
     Path where executables reside :/usr

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  [st8]  [mt0]  x[xt0]
     Drive Type  : x[local]  [remote]


Choice             : x[all]   [default]   [own choice]   [required]   [quit]


               Extract list:

                      root
                      sys
                      user
                      Networking
                      .
                      .
                      .
Are you finished with this form [y/n] ?y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

Select software for the sun2 architecture:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          :  x[sun2]  [sun3]   [sun4]    [Sun386i]
     Path where executables reside : /export/exec/sun2

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  [st8]  [mt0] x[xt0]
     Drive Type  :  x[local]  [remote]

Choice           : x[all]   [default]   [own choice]   [required]   [quit]


               CATEGORY      NAME        BYTES    AVAIL BYTES          Y/N
               ============================================================
               required      Sys         XXXX     XXXX                 y
               required      user        XXXX     XXXX                 y
               desirable     Networking  XXXX     XXXX                 y
                   .
                   .
                   .
Are you finished with this form [y/n] ?
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The list of categories to be extracted for the sun2 architecture are now displayed on the Software Form below:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          : x[sun2]   [sun3]   [sun4]    [Sun386i]
     Path where executables reside :/export/exec/sun2

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  [st8]  [mt0]  x[xt0]
     Drive Type  : x[local]  [remote]



Choice             : x[all]   [default]   [own choice]   [required]   [quit]


               Extract list:

                      sys
                      user
                      Networking
                      .
                      .
                      .
Are you finished with this form [y/n] ?n
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

Select software for the sun4 architecture:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Architecture Information :
     Type          :  [sun2]  [sun3]   x[sun4]   [Sun386i]
     Path where executables reside : /export/exec/sun4

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  [st8]  [mt0] x[xt0]
     Drive Type  :  x[local]  [remote]

Choice           : x[all]   [default]   [own choice]   [required]   [quit]


               CATEGORY      NAME          BYTES    AVAIL BYTES      Y/N
               ============================================================
               required      Sys           XXXX     XXXX               y
               required      user          XXXX     XXXX               y
               desirable     Networking    XXXX     XXXX               y
                   .
                   .
                   .
 Are you finished with this form [y/n] ?
    [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The list of categories to be exacted for the sun4 architecture will now be displayed on the Software Form below:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          :  [sun2]   [sun3]   x[sun4]    [Sun386i]
     Path where executables reside :/export/exec/sun4

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  [st8]  [mt0]  x[xt0]
     Drive Type  : x[local]  [remote]



Choice           : x[all]   [default]   [own choice]   [required]   [quit]


               Extract list:

                     sys
                     user
                     Networking
                     .
                     .
                     .
Are you finished with this form [y/n] ?y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The Main Menu will be displayed on the screen when you are finished with this form.

9. Assign client information for each client by selecting `[assign client information]` in the Main Menu and the Client Form will be displayed on the screen.

```
 CLIENT FORM     [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Architecture Type :  x[sun2]  [sun3]   [sun4]    [Sun386i]
Choice            :  x[create]   [delete]   [display]   [next arch]

Client(s) :
   d2



Client Information :
       Name                                    :d2
       Internet Address                        :192.9.1.1
       Ethernet Address                        :8:0:20:1:00:00
       YP Type :    [none]  [master]  [slave]x[client]
       Domain name                             :wseng.sun.com
       Path of Client's Root                   :/export/root
       Path of Client's Swap                   :/export/swap
       Path of Client's Executables            :/export/exec/sun2/
       Path of Client's Home                   :/home
       Swap size (e.g. 8M,8m,8K,8k,8 or 8b)    :16M


Are you finished with this form [y/n] ?n
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

```
 CLIENT FORM      [DEL=erase one char of input data] [RET=end of input data]
------------------------------------------------------------------------------
Architecture Type :   [sun2]   x[sun3]   [sun4]   [Sun386i]
Choice            :  x[create]   [delete]   [display]   [next arch]

Client(s) :
   frodo


Client Information :
       Name                                    : frodo
       Internet Address                        : 192.9.1.2
       Ethernet Address                        : 8:0:20:1:00:01
       YP Type :    [none]  [master]  [slave] x[client]
       Domain name                             : wseng.sun.com
       Path of Client's Root                   : /export/root
       Path of Client's Swap                   : /export/swap
       Path of Client's Executables            : /export/exec/sun3/
       Path of Client's Home                   : /home
       Swap size (e.g. 8M,8m,8K,8k,8 or 8b)    : 16M


Are you finished with this form [y/n] ?n
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

```
 CLIENT FORM      [DEL=erase one char of input data] [RET=end of input data]
------------------------------------------------------------------------------
Architecture Type :   [sun2]   [sun3]   x[sun4]   [Sun386i]
Choice            :  x[create]   [delete]   [display]   [next arch]

Client(s) :
   d3


Client Information :
       Name                                    : d3
       Internet Address                        : 192.9.1.3
       Ethernet Address                        : 8:0:20:1:00:02
       YP Type :    [none]  [master]  [slave] x[client]
       Domain name                             : wseng.sun.com
       Path of Client's Root                   : /export/root
       Path of Client's Swap                   : /export/swap
       Path of Client's Executables            : /export/exec/sun4/4.0
       Path of Client's Home                   : /home
       Swap size (e.g. 8M,8m,8K,8k,8 or 8b)    : 16M


Are you finished with this form [y/n] ?y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The Main Menu will be displayed on the screen when you are finished with this form.

10. Start the installation by selecting `[start the installation]` in the Main Menu and you will now be prompted when the tape needs to be changed. If any information is missing, the installation will not start and the Main Menu will be displayed on the screen. You can abort the installation any time by using CTRL-C and either restart it by using the existing information or reassign information before restarting the installation. You should be expecting the following messages after the installation begins.

```
System Installation begin :

Label disk(s) :
        xy0 xy1

File systems check :
/dev/rxy0a:     140624 sectors in 752 cylinders of 11 tracks, 17 sectors
        72.0Mb in 47 cyl groups (16 c/g, 1.53Mb/g, 640 i/g)
super-block backups (for fsck -b#) at:
 32, 3056, 6080, 9104, 12128, 15152, 18176, 21200, 24224, 27248,
 30272, 33296, 36320, 39344, 42368, 45392, 47904, 50928, 53952, 56976,
 60000, 63024, 66048, 69072, 72096, 75120, 78144, 81168, 84192, 87216,
 90240, 93264, 95776, 98800, 101824, 104848, 107872, 110896, 113920, 116944,
 119968, 122992, 126016, 129040, 132064, 135088, 138112,
         .
         .
    lots of text
         .
         .
** /dev/xy0a
** Currently Mounted on /a/
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl Groups
/dev/rxy0a: 516 files, 2575 used, 4896 free (16 frags, 610 blocks)

System Installation Completed.
Reboot your system and configure a kernel for your system.
#
```

11. Abort the system since the reboot option is not being selected in the Host Form. Use L1-A for Sun monitors or BREAK on Wyse terminals to abort the system. Boot the system by using the command

```
>b
```

12. Configure a kernel for your system. Refer to Chapter 7 for instructions on how to configure a kernel.

13. Run `ypinit` to set up the `yp` database. See System Administration and Networking on the Sun Workstation for detailed instructions on how to set up and maintain yellow pages. If you wish to set a root password, see Chapter 3, *Installing a* `root` *password*.

4.5. Dataless Configuration With Local Tape Drive

Assume the system has the following configuration:

hostname: evans
architecture: sun4
ethernet interace: ie0
ip address: 192.9.90.64
yp client of domain: "weng.sun.com"
1 SCSI disk: sd0
local SCSI tape drive: st0
sun4 server: godzilla
server ip address: 192.9.90.11

1. Become super user and do a full dump of your system.
2. Halt the system by doing the following:

```
evans#/etc/halt
```

3. If you are installing this release on a new disk that does not have a label yet; or if you wish to change the size of the root partition, load `MUNIX` and run `format` to label your disk. If you do not wish to change the existing disk label, skip this step and go to the next step.

```
>b st(0,0,0)
Boot:st(0,0,4) -asw
     .
     .
     .
root filesystem type (spec 4.2 nfs):4.2
root device (rd%d[a-h]):rd0a
init ram disk from: st0a
tape file number?5
swap filesysystem type (spec 4.2 nfs):spec
swap device(ns%d[a-h]):ns0a
     .
     .
     .
#format

Abort when you are done.
```

4. Load the miniroot:

```
>b st(0,0,0)
Boot: st(0,0,2)
From: st(0,0,3)
To: xy(0,0,1)
        .
        .
Boot:xy(0,0,1)vmunix -asw
        .
        .
root filesystem type ( spec 4.2 nfs):4.2
root device (xy%d[a-h]):xy0b
Swapping on the root device? y
    .
    .
    .
swap filesystem type (spec 4.2 nfs): spec
swap device (xy%d[a-h]):xy0b
    .
    .
    .
#
```

5. Start *suninstall*:

```
# cd /usr/etc/install
# suninstall

 Enter the local time zone name:
 >> US/Pacific

 Is this the correct date/time [y/n]:
        Mon Mar 14 08:08:57 PST 1988
 >> n

 Enter the current date and local time (e.g. 09/03/88 12:20:30); the date
 may be in one of the following formats:
          dd/mm/yy
          dd/mm/yyyy
          dd.mm.yyyy
          dd-mm-yyyy
          dd-mm-yy
          month dd, yyyy
          dd month yyyy
 and the time may be in one of the following formats:
          hh am/pm
          hh:mm am/pm
          hh.mm
          hh:mm am/pm
          hh.mm
          hh:mm:ss am/pm
          hh:mm:ss
          hh.mm.ss am/pm
          hh.mm.ss
 >> 09/03/88 12:20:30

 Is this the correct date/time [y/n]:
          Wed Mar  9 12:20:30 PST 1988
 >> y


Select your terminal type:
    1) Televideo 925
    2) Wyse Model 50
    3) Sun Workstation
    4) Other
>> 3
```

The following menu will now appear.

```
                Sun Microsystems System Installation Tool

                                Main Menu

                ( Please use x or X to select your choice )
                   ( + means the data file(s) exist(s) )

                        [ assign host information     ]

                        [ assign disk information     ]

                        [ assign software information ]

                        [ assign client information   ]

                        [ on-line help information    ]

                        [ start the installation      ]

                        [ exit from suninstall        ]


[x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

6. Assign host information by selecting `[assign host information]` in the main menu and the Host Form will be displayed on the screen:

```
HOST FORM        [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Workstation Information :
     Name : evans
     Type :  [standalone]  [server] x[dataless]
     Server: godzilla
     Server Internet Address: 192.9.90.11
     Path of the executable on server:

Network Information :
     Ethernet Interface :  [none] x[ie0]
     Internet Address 0 :  192.9.90.64

     YP Type             :  [none]  [master]  [slave] x[client]
     Domainname      : wseng.sun.com

Misc Information :
     Operation type          : x[install]  [upgrade]
     Reboot after completed :  [y]  x[n]


Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

7. Assign disk information by selecting `[assign disk information]` in the Main Menu and the Disk Form will be displayed on the screen:

```
DISK FORM       [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Attached Disk Devices :
  x[ sd0]


Disk Label              :  x[default]  [existing]  [label in data file]
Free Hog Disk Partition :   [a]  [d]  [e]  [f] x[g]  [h]
Display Unit            : x[Mbytes]  [Kbytes]  [bytes]  [blocks]  [cylinders]

PARTITION START_CYL BLOCKS    SIZE     MOUNT PT              PRESERVE(Y/N)
===============================================================================
    a      0         15884     7        /                        n
    b      0         33440     16
    c      0         140624    68
    d      0         0         0
    e      0         0         0
    f      0         0         0
    g      0         91256     44
    h      0         0         0


Ok to use this partition table [y/n]  ? y
Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The numbers under the columns START_CYL, BLOCKS, and SIZE are for this example only. The numbers will be different for each disk and they depend on the existing label on the disk specified. The main menu will be displayed on the screen when you are finished with the form.

8. Assign software information by selecting `[assign software information]` in the Main Menu and the Software Form will be displayed on the screen:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          :  [sun2]  x[sun3]   [sun4]   [Sun386i]
     Path where executables reside :/

Tape Information :
     Device Type :  [ar0]  [ar8] x[st0]  [st8]  [mt0]  [xt0]
     Drive Type  : x[local]  [remote]



Choice           :  [all]   [default]   [own choice]  x[required]   [quit]


               CATEGORY      NAME      BYTES     AVAIL BYTES          Y/N
               ============================================================
               required      root      XXXX      XXXX                  y
               required      Sys       XXXX      XXXX                  y
               required      user      XXXX      XXXX                  y


Are you finished with this form [y/n] ?
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

Dataless configuration does not need to select software categories since it is mounting `/usr` from a server but some of the required categories will be loaded for installation purposes.

The list of categories to be extracted will be displayed on the Software Form below:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          :  [sun2]  x[sun3]   [sun4]   [Sun386i]
     Path where executables reside :/


     Device Type :  [ar0]  [ar8] x[st0]  [st8]  [mt0]  [xt0]
     Drive Type  : x[local]  [remote]
     Tapehost    :
     Tapehost's Internet Address :

Choice           :  [all]   [default]   [own choice]  x[required]   [quit]


              Extract list:

                     root
                     sys
                     user

Are you finished with this form [y/n] ?y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

Only part of the `user` category will be extracted for the dataless configuration. The Main Menu will be displayed on the screen when you are finished with this form.

9. Start the installation by selecting `[start the installation]` in the Main Menu and you will be prompted when the tape needs to be changed. If any information is missing, the installation will not start and the Main Menu will be displayed on the screen. You can abort the installation anytime by using CTRL-C and either restart it by using existing information or reassign information before restarting the installation. You should see the following messages after the installation begins.

```
System Installation begin :

Label disk(s) :
        sd0

File systems check :
/dev/rsd0a:     140624 sectors in 752 cylinders of 11 tracks, 17 sectors
        72.0Mb in 47 cyl groups (16 c/g, 1.53Mb/g, 640 i/g)
super-block backups (for fsck -b#) at:
 32, 3056, 6080, 9104, 12128, 15152, 18176, 21200, 24224, 27248,
 30272, 33296, 36320, 39344, 42368, 45392, 47904, 50928, 53952, 56976,
 60000, 63024, 66048, 69072, 72096, 75120, 78144, 81168, 84192, 87216,
 90240, 93264, 95776, 98800, 101824, 104848, 107872, 110896, 113920, 116944,
 119968, 122992, 126016, 129040, 132064, 135088, 138112,

sun3 Installation Begin :

Extracting "root" files from "/dev/nrst0" release tape.

Extracting "Sys" files from "/dev/nrst0" release tape.

Extracting sun3 executables from "/dev/nrst0" release tape.

Checking filesystems :
** /dev/sd0a
** Currently Mounted on /a/
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl Groups
/dev/rsd0a: 516 files, 2575 used, 4896 free (16 frags, 610 blocks)

System Installation Completed.
Reboot your system and configure a kernel for your system.
#
```

10. Abort the system since the reboot option is not being selected in the Host Form. Use L1-A for Sun monitors or <break> on Wyse terminals to abort the system. Boot the system by using the command

```
>b
```

11. Configure a kernel for your system. Refer to *Appendix A* for instructions on how to configure a kernel.

5

Remote Installations

5

Remote Installations

5.1. Introduction

The chapter provides instructions for remote installations for the following:

- Standalone Configuration with a Remote Tape Drive
- Homogeneous Configuration with a Remote Tape Drive
- Heterogeneous Configuration with a Remote Tape Drive
- Dataless Configuration with a Remote Tape Drive Section

In order to perform a remote installation, you must have SunOS Release 4.0 running on your tapehost. You will configure your target machine as a diskless client of the tapehost. Your tapehost will act as the server for your target machine.

5.2. Installation

Regardless of the configuration you are installing do the following steps first.

On the tapehost do the following:

1. Load the miniroot. Substitute your tape device and number (mt, st, xt, ar) for *tapedevice#* (eg: mt0, mt8, etc) and architecture type (sun2, sun3, or sun4) of the target machine for *ARCH* in the following procedure.

```
tapehost# mt -f /dev/nrtapedevice# rew
tapehost# mt -f /dev/nrtapedevice# fsf 3
tapehost# dd if=/dev/nrtapedevice# of=/export/exec/ARCH/local/miniroot
```

NOTE The above is the recommended place to put the miniroot. However, you can use a different directory. If you do make sure that it is accessible to your target machine and there is enough space. You need a minimum of 6Mbytes of disk.

2. If the tapehost is running yellow pages, the master `/etc/hosts` and master `/etc/ethers` should contain the target machine's addresses. If the tapehost is not running yellow pages, local `/etc/hosts` and `/etc/ethers` should contain the target machine's addresses.
3. Run `setup_client` to create the target machine as a diskless client of the tapehost. See `setup_client(8)` for complete information on how to do this. Make sure the information added to

`etc/bootparams` on the target machine is put on the yp master and then pushed to all users.

Now on the target machine, do the following:

1. Boot from the tapehost. Substitute the proper Ethernet abbreviation (ec, ie, le) for *ethernet*.

```
>bethernet() -a
root filesystem type (spec 4.2 nfs):nfs
root name:<CR>
Boot:vmunix
        .
        .
root filesystem type (spec 4.2 nfs):nfs
root name:<CR>
        .
        .
swap filesystem type (spec 4.2 nfs): nfs
swap name:<CR>
login:root
```

2. Create the disk devices after the system is up. Substitute your disk device (xy, sd, xd) and number for *diskdevice#* (eg:xy0).

```
targetmachine# cd /dev
targetmachine# MAKEDEV diskdevice#
```

3. If you want to change partition sizes, you can now run `format`. Otherwise, go to the next step.
4. Load the miniroot onto the disk.

```
targetmachine# dd if=/usr/local/miniroot of=/dev/rdiskdevice#b
```

NOTE: `/usr/local/miniroot` *is the same as* `/export/exec/`*ARCH*`/local/miniroot` *because the target machine mounts* `/export/exec/`*ARCH on* `/usr`.

5. Boot the miniroot.

```
targetmachine# /etc/halt
> b ethernet() -asw
root filesystem type (spec 4.2 nfs): 4.2
root device :diskdevice#b
Boot: vmunix
        .
        .
root filesystem type (spec 4.2 nfs):4.2
root device :diskdevice#b
        .
        .
swap filesystem type (spec 4.2 nfs): spec
swap device [xy5d[a-h]:diskdevice#b
Swapping on root device? y
        .
        .
#
```

6. When you have completed the installation, you can remove the client partition created for the target machine with `setup_client` using the `remove` option.

Now proceed to the section that pertains to the configuration you wish to install.

- Standalone (Section 5.2)
- Homogeneous (Section 5.3)
- Heterogeneous (Section 5.4)
- Dataless (Section 5.5)

5.3. Standalone Configuration With a Remote Tape Drive

Assume you have a system with the following configuration:

hostname: evans
architecture: sun2
system type: standalone
internet address : 192.9.90.64
remote SCSI tape drive: st0
ethernet interface: ie0
sun2 tape host: godzilla
tape host's internet address: 192.9.90.51
1 Xylogics eagle disk: xy0
yp client of domain "wseng.sun.com"
software categories: all

1. Start *suninstall*:

```
# cd /usr/etc/install
# suninstall

 Enter the local time zone name:
 >> US/Pacific

 Is this the correct date/time [y/n]:
        Mon Mar 14 08:08:57 PST 1988
 >> n

 Enter the current date and local time (e.g. 09/03/88 12:20:30); the date
 may be in one of the following formats:
         dd/mm/yy
         dd/mm/yyyy
         dd.mm.yyyy
         dd-mm-yyyy
         dd-mm-yy
         month dd, yyyy
         dd month yyyy
 and the time may be in one of the following formats:
         hh am/pm
         hh:mm am/pm
         hh.mm
         hh:mm am/pm
         hh.mm
         hh:mm:ss am/pm
         hh:mm:ss
         hh.mm.ss am/pm
         hh.mm.ss
 >> 09/03/88 12:20:30

 Is this the correct date/time [y/n]:
         Wed Mar  9 12:20:30 PST 1988
 >> y



Select your terminal type:
    1) Televideo 925
    2) Wyse Model 50
    3) Sun Workstation
    4) Other
>> 3
```

The following menu will now appear.

```
                Sun Microsystems System Installation Tool

                              Main Menu

              ( Please use x or X to select your choice )
                 ( + means the data file(s) exist(s) )

                      [ assign host information     ]

                      [ assign disk information     ]

                      [ assign software information ]

                      [ assign client information   ]

                      [ on-line help information    ]

                      [ start the installation      ]

                      [ exit from suninstall        ]
[x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

2. Assign host information by selecting `[assign host information]` in the Main Menu and the Host Form will be displayed on the screen:

```
HOST FORM        [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Workstation Information :
     Name : evans
     Type : x[standalone]  [server]  [dataless]


Network Information :
     Ethernet Interface :  [none] x[ie0]
     Internet Address 0 :  192.9.90.64

     YP Type            :  [none]  [master]  [slave] x[client]
     Domainname         : wseng.sun.com

Misc Information :
     Operation type          : x[install]  [upgrade]
     Reboot after completed : x[y]  [n]



Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The main menu will be displayed on the screen when you are finished with the form.

3. Assign disk information by selecting `[assign disk information]` in the Main Menu and the Disk Form will be displayed on the screen:

```
DISK FORM        [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Attached Disk Devices :
  x[ xy0]


Disk Label                :  [default]  [existing]  [label in data file]
Free Hog Disk Partition   :  [a]  [d]  [e]  [f] x[g]  [h]
Display Unit              : x[Mbytes]  [Kbytes]  [bytes]  [blocks]  [cylinders]

PARTITION START_CYL BLOCKS     SIZE      MOUNT PT              PRESERVE(Y/N)
===============================================================================
    a      0          15884     7         /                        n
    b      XXX        33440     16
    c      0          140624    68
    d      0          0         0
    e      0          0         0
    f      0          0         0
    g      XXX        91256     44        /usr                     n
    h      0          0         0


Ok to use this partition table [y/n]  ? y
Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The numbers under the columns START_CYL, BLOCKS, and SIZE are for this example only. The numbers will be different for each disk and they depend on the existing label on the disk specified. The main menu will be displayed on the screen when you are finished with the form.

4. Assign software information by selecting `[assign software information]` in the Main Menu and the Software Form will be displayed on the screen:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          : x[sun2]   [sun3]   [sun4]   [Sun386i]
     Path where executables reside : /usr

Tape Information :
     Device Type :  [ar0]  [ar8]  x[st0]  [st8]  [mt0]  [xt0]
     Drive Type  :  [local]  x[remote]
     Tapehost    :  godzilla
     Tapehost's Internet Address :192.9.90.51

Choice: x[all]   [default]   [own choice]   [required]   [quit]


   CATEGORY      NAME         BYTES    AVAIL BYTES        Y/N
   ============================================================
   required      root         XXXX     XXXX               y
   required      Sys          XXXX     XXXX               y
   required      user         XXXX     XXXX               y
   desirable     Networking   XXXX     XXXX               y
            .
            .
            .
Are you finished with this form [y/n] ?
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The list of categories to be extracted for the sun2 architecture are now displayed on the Software Form below:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          :  x[sun2]   [sun3]   [sun4]    [Sun386i]
     Path where executables reside :/usr

Tape Information :
     Device Type :  [ar0]  [ar8]  x[st0]  [st8]  [mt0]  [xt0]
     Drive Type  :  [local]  x[remote]
     Tapehost    :godzilla
     Tapehost's Internet Address :192.9.90.51

Choice: x[all]   [default]   [own choice]   [required]   [quit]


              Extract list:

                    root
                    sys
                    user
                    Networking
                    Debugging
                        .
                        .
                        .

 Are you finished with this form [y/n] ? y
    [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The main menu will be displayed on the screen when you are finished with the form.

5. Start the installation by selecting `[start the installation]` and you will be prompted when the tape needs to be changed. If any information is missing, the installation will not start. You can go back and reassign all information and start it again. You should be expecting the following messages after the installation begins.

```
System Installation begin :

Label disk(s) :
        xy0

File systems check :
/dev/rxy0a:     140624 sectors in 752 cylinders of 11 tracks, 17 sectors
        72.0Mb in 47 cyl groups (16 c/g, 1.53Mb/g, 640 i/g)
super-block backups (for fsck -b#) at:
 32, 3056, 6080, 9104, 12128, 15152, 18176, 21200, 24224, 27248,
 30272, 33296, 36320, 39344, 42368, 45392, 47904, 50928, 53952, 56976,
 60000, 63024, 66048, 69072, 72096, 75120, 78144, 81168, 84192, 87216,
 90240, 93264, 95776, 98800, 101824, 104848, 107872, 110896, 113920, 116944,
 119968, 122992, 126016, 129040, 132064, 135088, 138112,
        .
        .
    lots of text
        .
        .
        .

Checking filesystems :
** /dev/xy0g
** Currently Mounted on /a/usr
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl Groups
/dev/rxy0a: 516 files, 2575 used, 4896 free (16 frags, 610 blocks)

Rebooting the system
    .
    .
    .
evans login:
```

6. Configure a kernel for your system. See Appendix A for instructions.

5.4. Homogeneous Server With Remote Tape Drive

Assume the system has the following configuration:

hostname: evans
architecture: sun3
system type: homogeneous server
sun3 client(s): sofia and frodo
frodo's internet address: 192.9.90.1
frodo's ethernet address: 8:020:1:00:00
sofia's internet address:192.9.90.2
sofia's ethernet address: 8:0:20:1:00:01
internet address : 192.9.90.64
remote SCSI tape drive: st0
sun3 tape host: godzilla
tape host ip address: 192.9.90.51
1 Xylogics eagle disk: xy0
yp slave of domain "wseng.sun.com"
software categories: required

1. Start *suninstall*:

```
# cd /usr/etc/install
# suninstall

 Enter the local time zone name:
 >> US/Pacific

 Is this the correct date/time [y/n]:
       Mon Mar 14 08:08:57 PST 1988
 >> n

 Enter the current date and local time (e.g. 09/03/88 12:20:30); the date
 may be in one of the following formats:
         dd/mm/yy
         dd/mm/yyyy
         dd.mm.yyyy
         dd-mm-yyyy
         dd-mm-yy
         month dd, yyyy
         dd month yyyy
 and the time may be in one of the following formats:
         hh am/pm
         hh:mm am/pm
         hh.mm
         hh:mm am/pm
         hh.mm
         hh:mm:ss am/pm
         hh:mm:ss
         hh.mm.ss am/pm
         hh.mm.ss
 >> 09/03/88 12:20:30

 Is this the correct date/time [y/n]:
         Wed Mar  9 12:20:30 PST 1988
 >> y

Select your terminal type:
    1) Televideo 925
    2) Wyse Model 50
    3) Sun Workstation
    4) Other
>> 3
```

The following menu will now appear.

```
                Sun Microsystems System Installation Tool

                              Main Menu

                ( Please use x or X to select your choice )
                   ( + means the data file(s) exist(s) )

                        [ assign host information     ]

                        [ assign disk information     ]

                        [ assign software information ]

                        [ assign client information   ]

                        [ on-line help information    ]

                        [ start the installation      ]

                        [ exit from suninstall        ]


[x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

2. Assign host information by selecting `[assign host information]` in the Main Menu and the Host Form will be displayed on the screen:

```
HOST FORM       [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Workstation Information :
     Name : evans
     Type :  [standalone] x[server]  [dataless]


Network Information :
     Ethernet Interface :  [none] x[ie0]
     Internet Address 0 :  192.9.90.64

     YP Type            :  [none]  [master] x[slave]  [client]
     Domainname      : wseng.sun.com

Misc Information :
     Operation type          : x[install]  [upgrade]
     Reboot after completed :  x[y]  [n]



Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The Main Menu will be displayed on the screen when you are finished with this form.

3. Assign disk information by selecting `[assign disk information]` in the Main Menu and the Disk Form will be displayed on the screen:

```
DISK FORM       [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Attached Disk Devices :
  x[ xy0]


Disk Label              :  [default]  [existing]  [label in data file]
Free Hog Disk Partition :  [a]  [d]  [e]  [f] x[g]  [h]
Display Unit            : x[Mbytes]  [Kbytes]  [bytes]  [blocks]  [cylinders]

PARTITION START_CYL BLOCKS    SIZE     MOUNT PT              PRESERVE(Y/N)
=========================================================================
    a      0         15884    7        /                         n
    b      XXX       33440    16
    c      0         140624   68
    d      XXX       XXX      XXX      /export/root              n
    e      0         0        0        /export/swap              n
    f      0         0        0
    g      XXX       91256    44       /usr                      n
    h      XXX       XXX      XXX      /home                     n


Ok to use this partition table [y/n]  ? y
Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The numbers under the columns START_CYL, BLOCKS, and SIZE are for this example only. The numbers will be different for each disk and they depend on the existing label on the disk specified. The main menu will be displayed on the screen when you are finished with the form.

4. Assign software information by selecting `[assign software information]` in the Main Menu and the Software Form will be displayed on the screen:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          :  [sun2]   x[sun3]   [sun4]    [Sun386i]
     Path where executables reside :/usr

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0] x[st8]  [mt0]  [xt0]
     Drive Type  :  [local]  [remote]
     Tapehost    : godzilla
     Tapehost's Internet Address :192.9.90.51

Choice           :  [all]   [default]   [own choice]   x[required]   [quit]


               CATEGORY      NAME         BYTES   AVAIL BYTES          Y/N
               ==========================================================
               required      root         XXXX     XXXX                 y
               required      Sys          XXXX     XXXX                 y
               required      user         XXXX     XXXX                 y
               desirable     Networking   XXXX     XXXX                 y

Are you finished with this form [y/n] ?
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

Networking software will be loaded since the system is on a network.

The list of categories to be extracted for the sun3 architecture will now be displayed on the Software Form below:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Type Information :
     Type          :  [sun2]   x[sun3]   [sun4]    [Sun386i]
     Path where executables reside :/usr

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  x[st8]  [mt0]  [xt0]
     Drive Type  :   [local]  x[remote]
     Tapehost    : godzilla
     Tapehost's Internet Address :192.9.90.51

Choice           :  [all]   [default]   [own choice]   x[required]   [quit]


               Extract list:

               root
               sys
               user
               Networking


Are you finished with this form [y/n] ?
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The Main Menu will be displayed on the screen when you are finished with this form.

5. Assign client information by selecting `[assign client information]` in the Main Menu and the Client Form will be displayed on the screen.

```
 CLIENT FORM     [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Type :   [sun2]   x[sun3]   [sun4]   [Sun386i]
Choice            :   x[create]   [delete]   [display]   [next arch]

Client(s) :
   frodo

Client Information :
       Name                                  : frodo
       Internet Address                      : 192.9.90.1
       Ethernet Address                      : 8:0:20:1:00:00
       YP Type :    [none]  [master]  [slave] x[client]
       Domain name                           : wseng.sun.com
       Path of Client's Root                 : /export/root
       Path of Client's Swap                 : /export/swap
       Path of Client's Executables          : /export/exec/sun3/
       Path of Client's Home                 : /home
       Swap size (e.g. 8M,8m,8K,8k,8 or 8b)  : 16M


Are you finished with this form [y/n] ? n
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The Main Menu will be displayed on the screen when you are finished with the form.

```
 CLIENT FORM     [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Architecture Type :   [sun2]   x[sun3]   [sun4]   [Sun386i]
Choice            :   x[create]   [delete]   [display]   [next arch]

Client(s) :
   frodo sofia



Client Information :
       Name                                    : sofia
       Internet Address                        : 192.9.90.2
       Ethernet Address                        : 8:0:20:1:00:01
       YP Type :    [none]  [master]  [slave] x[client]
       Domain name                             : wseng.sun.com
       Path of Client's Root                   : /export/root
       Path of Client's Swap                   : /export/swap
       Path of Client's Executables            : /export/exec/sun3/
       Path of Client's Home                   : /home
       Swap size (e.g. 8M,8m,8K,8k,8 or 8b) : 16M


Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

6. Start the installation by selecting `[start the installation]` and you will be prompted when the tape needs to be changed. If any information is missing, the installation will not start. You can go back and reassign all information and start it again. You should be expecting the following messages after the installation begins.

```
System Installation begin :

Label disk(s) :
        xy0

File systems check :
/dev/rxy0a:     140624 sectors in 752 cylinders of 11 tracks, 17 sectors
        72.0Mb in 47 cyl groups (16 c/g, 1.53Mb/g, 640 i/g)
super-block backups (for fsck -b#) at:
 32, 3056, 6080, 9104, 12128, 15152, 18176, 21200, 24224, 27248,
 30272, 33296, 36320, 39344, 42368, 45392, 47904, 50928, 53952, 56976,
 60000, 63024, 66048, 69072, 72096, 75120, 78144, 81168, 84192, 87216,
        .
        .
        .
    lots of text
        .
        .
        .
** /dev/xy0a
** Currently Mounted on /a/
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl Groups
/dev/rxy0a: 516 files, 2575 used, 4896 free (16 frags, 610 blocks)

Rebooting the system
    .
    .
    .
evans login:
```

7. Configure a kernel for your system. Refer to *Appendix A* for instructions on how to configure a kernel.
8. Run `ypinit` to set up the `yp` database. See *System and Network Administration* manual for detailed instructions on how to set up and maintain yellow pages.

5.5. Heterogeneous Server With a Remote Tape Drive

Assume the system has the following configuration:

hostname: evans
architecture: sun3
ethernet interface: ie0
system type:heterogeneous server
supports architecture types: sun2 and sun4
sun2 client: d2
sun3 client: frodo
sun4 client: d3
d2's internet address: 192.9.1.1
d2's ethernet address: 8:0:20:1:00:00
frodo's internet address: 192.9.1.2
frodo's ethernet address: 8:0:20:1:00:01
d3's internet address: 192.9.1.3
d3's ethernet address: 8:0:20:1:00:02
internet address : 192.9.90.64
remote tape drive abbreviation: xt0
tape host: godzilla
tape host's internet address: 192.9.90.51
2 Xylogics eagle disk abbreviation: xy0 and xy1
yp slave with domain "wseng.sun.com"
sun2 software categories: all
sun3 software categories: all
sun4 software categories: all

1. Start suninstall:

```
# cd /usr/etc/install
# suninstall

 Enter the local time zone name:
 >> US/Pacific

 Is this the correct date/time [y/n]:
        Mon Mar 14 08:08:57 PST 1988
 >> n

 Enter the current date and local time (e.g. 09/03/88 12:20:30); the date
 may be in one of the following formats:
         dd/mm/yy
         dd/mm/yyyy
         dd.mm.yyyy
         dd-mm-yyyy
         dd-mm-yy
         month dd, yyyy
         dd month yyyy
 and the time may be in one of the following formats:
         hh am/pm
         hh:mm am/pm
         hh.mm
         hh:mm am/pm
         hh.mm
         hh:mm:ss am/pm
         hh:mm:ss
         hh.mm.ss am/pm
         hh.mm.ss
 >> 09/03/88 12:20:30

 Is this the correct date/time [y/n]:
         Wed Mar  9 12:20:30 PST 1988
 >> y



Select your terminal type:
    1) Televideo 925
    2) Wyse Model 50
    3) Sun Workstation
    4) Other
>> 3
```

The following menu will now appear.

```
                Sun Microsystems System Installation Tool

                                Main Menu

                ( Please use x or X to select your choice )
                   ( + means the data file(s) exist(s) )

                        [ assign host information     ]

                        [ assign disk information     ]

                        [ assign software information ]

                        [ assign client information   ]

                        [ on-line help information    ]

                        [ start the installation      ]

                        [ exit from suninstall        ]


  [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

2. Assign host information by selecting `[assign host information]` in the Main Menu and the Host Form will be displayed on the screen:

```
HOST FORM        [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Workstation Information :
     Name : evans
     Type :  [standalone] x[server]  [dataless]


Network Information :
     Ethernet Interface :  [none] x[ie0]
     Internet Address 0 :  192.9.90.64

     YP Type             :  [none]  [master] x[slave]  [client]
     Domainname      : wseng.sun.com

Misc Information :
     Operation type          : x[install]  [upgrade]
     Reboot after completed :  [y] x[n]


Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

3. Assign disk information by selecting `[assign disk information]` in the Main Menu and the Disk Form will be displayed on the screen:

```
DISK FORM       [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Attached Disk Devices :
  x[ xy0]   [ xyl]


Disk Label               :  x[default]  [existing]  [label in data file]
Free Hog Disk Partition  :   [a]  [d]  [e]  [f] x[g]  [h]
Display Unit             : x[Mbytes]  [Kbytes]  [bytes]  [blocks]  [cylinders]

PARTITION START_CYL BLOCKS     SIZE      MOUNT PT              PRESERVE(Y/N)
===============================================================================
    a      0         15884     7         /                          n
    b      XXX       33440     16
    c      0         140624    68
    d      XXX       XXX       XXX       /export/root               n
    e      XXX       XXX       XXX       /export/swap               n
    f      0         0         0
    g      XXX       91256     44        /usr                       n
    h      XXX       XXX       XXX       /home                      n


Ok to use this partition table [y/n]  ? y
Are you finished with this form [y/n] ? n
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The Main Menu will be displayed on the screen when you are finished with this form.

```
DISK FORM       [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Attached Disk Devices :
   [ xy0]  x[ xy1]


Disk Label               :  x[default]  [existing]  [label in data file]
Free Hog Disk Partition  :   [a]  [d]  [e]  [f] x[g]  [h]
Display Unit             : x[Mbytes]  [Kbytes]  [bytes]  [blocks]  [cylinders]

PARTITION START_CYL BLOCKS    SIZE     MOUNT PT              PRESERVE(Y/N)
===============================================================================
    a      0          0         0
    b      0          0         0
    c      0          140624    68       /export/exec                n
    d      0          0         0
    e      0          0         0
    f      0          0         0
    g      0          0         0
    h      0          0         0


Ok to use this partition table [y/n]  ? y
Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The numbers under column under the columns START_CYL, BLOCKS, and SIZE are for this example only. The numbers will be different for each disk and they depend on the existing label on the disk specified.

4 Assign software information by selecting `[assign software information]` in the Main Menu and the Software Form will be displayed on the screen. Select software for the sun3 architecture.

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          :  [sun2]  x[sun3]   [sun4]    [Sun386i]
     Path where executables reside : /usr

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  [st8]  [mt0] x[xt0]
     Drive Type  :  [local]  x[remote]
     Tapehost    : godzilla
     Tapehost's Internet address: 192.9.90.51
Choice           : x[all]   [default]   [own choice]   [required]   [quit]


              CATEGORY      NAME        BYTES      AVAIL BYTES       Y/N
              ==========================================================
              required      root        XXXX       XXXX               y
              required      Sys         XXXX       XXXX               y
              required      user        XXXX       XXXX               y
              desirable     Networking  XXXX       XXXX               y
                               .
                               .
                               .
Are you finished with this form [y/n] ?
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The Main Menu will be displayed on the screen when you are finished with this form.

The list of categories to be extracted for the sun3 architecture are no displayed on the Software Form below:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          :  [sun2]   x[sun3]   [sun4]   [Sun386i]
     Path where executables reside : /usr

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  [st8]  [mt0] x[xt0]
     Drive Type  :  [local]  x[remote]
     Tapehost    : godzilla
     Tapehost's Internet address: 192.9.90.51

Choice           : x[all]   [default]   [own choice]   [required]   [quit]


               Extract list:

                     root
                     sys
                     user
                     Networking
                          .
                          .

Are you finished with this form [y/n] ?n
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

Select software for the sun2 architecture:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information
     Type          :  x[sun2]  [sun3]   [sun4]   [Sun386i]
     Path where executables reside : /export/exec/sun2

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  [st8]  [mt0] x[xt0]
     Drive Type  :  [local]  x[remote]
     Tapehost    : godzilla
     Tapehost's Internet address: 192.9.90.51

Choice           : x[all]   [default]   [own choice]   [required]   [quit]


               CATEGORY      NAME          BYTES   AVAIL BYTES       Y/N
               ============================================================
               required      Sys           XXXX      XXXX             y
               required      user          XXXX      XXXX             y
               desirable     Networking    XXXX      XXXX             y
                               .
                               .
                               .
Are you finished with this form [y/n] ?
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The list of categories to be extracted for the sun2 architecture are now displayed on the Software Form below:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :

     Type          :  x[sun2]  [sun3]   [sun4]   [Sun386i]
     Path where executables reside : /export/exec/sun2

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  [st8]  [mt0] x[xt0]
     Drive Type  :  [local]  x[remote]
     Tapehost    : godzilla
     Tapehost's Internet address: 192.9.90.51


Choice           : x[all]   [default]   [own choice]   [required]   [quit]


               Extract list:

                     sys
                     user
                     Networking
                          .
                          .
                          .
Are you finished with this form [y/n] ? n
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

Select software for the sun4 architecture:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information
     Type          :  [sun2]  [sun3]   x[sun4]   [Sun386i]
     Path where executables reside : /export/exec/sun4

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  [st8]  [mt0] x[xt0]
     Drive Type  :  [local]  x[remote]
     Tapehost    : godzilla
     Tapehost's Internet address: 192.9.90.51

Choice           : x[all]   [default]   [own choice]   [required]   [quit]


               CATEGORY      NAME        BYTES    AVAIL BYTES          Y/N
               ============================================================
               required      Sys         XXXX     XXXX                  y
               required      user        XXXX     XXXX                  y
               desirable     Networking  XXXX     XXXX                  y
                   .
                   .
                   .
Are you finished with this form [y/n] ?
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The list of categories to be extracted for the sun4 architecture are now displayed on the Software Form below:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :

     Type          :  [sun2]  [sun3]   x[sun4]   [Sun386i]
     Path where executables reside : /export/exec/sun4

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  [st8]  [mt0] x[xt0]
     Drive Type  :  [local]  x[remote]
     Tapehost    : godzilla
     Tapehost's Internet address: 192.9.90.51


Choice           : x[all]   [default]   [own choice]   [required]   [quit]


               Extract list:

                      sys
                      user
                      Networking
                      .
                      .
                      .
Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

5. Assign client information for each client by selecting `[assign client information]` in the Main Menu and the Client Form will be displayed on the screen..

```
 CLIENT FORM     [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Type :   [sun2]  x[sun3]   [sun4]   [Sun386i]
Choice            :  x[create]   [delete]   [display]   [next arch]

Client(s) :
   d2



Client Information :
       Name                                  : d2
       Internet Address                      : 192.9.90.1
       Ethernet Address                      : 8:0:20:1:00:00
       YP Type :    [none]  [master]  [slave] x[client]
       Domain name                           : wseng.sun.com
       Path of Client's Root                 : /export/root
       Path of Client's Swap                 : /export/swap
       Path of Client's Executables          : /export/exec/sun3/
       Path of Client's Home                 : /home
       Swap size (e.g. 8M,8m,8K,8k,8 or 8b)  : 16M


Are you finished with this form [y/n] ?n
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

```
CLIENT FORM     [DEL=erase one char of input data] [RET=end of input data]

-------------------------------------------------------------------------------
 Architecture Type :   [sun2]   [sun3]   x[sun4]   [Sun386i]
 Choice            :  x[create]   [delete]   [display] [next arch]

 Client(s) :
        frodo



 Client Information :
        Name                                    : frodo
        Internet Address                        : 192.9.90.2
        Ethernet Address                        : 8:0:20:1:00:01
        YP Type :    [none]  [master]  [slave] x[client]
        Domain name                             : wseng.sun.com
        Path of Client's Root                   : /export/root
        Path of Client's Swap                   : /export/swap
        Path of Client's Executables            : /export/exec/sun4/
        Path of Client's Home                   : /home
        Swap size (e.g. 8M,8m,8K,8k,8 or 8b)    : 16M


 Are you finished with this form [y/n] ?n
    [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

```
CLIENT FORM     [DEL=erase one char of input data] [RET=end of input data]

-------------------------------------------------------------------------------
 Architecture Type :   [sun2]   [sun3]   x[sun4]   [Sun386i]
       Choice          :  x[create]   [delete]   [display] [next arch]

 Client(s) :
        d3



 Client Information :
        Name                                    : d3
        Internet Address                        : 192.9.90.2
        Ethernet Address                        : 8:0:20:1:00:02
        YP Type :    [none]  [master]  [slave] x[client]
        Domain name                             : wseng.sun.com
        Path of Client's Root                   : /export/root
        Path of Client's Swap                   : /export/swap
        Path of Client's Executables            : /export/exec/sun4
        Path of Client's Home                   : /home
        Swap size (e.g. 8M,8m,8K,8k,8 or 8b)    : 16M


 Are you finished with this form [y/n] ?y
    [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The Main Menu will be displayed on the screen when you are finished with this form.

6. Start the installation by selecting `[start the installation]` in the Main Menu and you will be prompted when the tape needs to be changed. If any information is missing, the installation will not start. You can abort the installation any time by using CTRL-C and either restart it by using existing information or reassign information before restarting the installation. You should be expecting the following messages after the installation begins.

```
System Installation begin :

Label disk(s) :
        xy0 xy1

File systems check :
/dev/rxy0a:     140624 sectors in 752 cylinders of 11 tracks, 17 sectors
        72.0Mb in 47 cyl groups (16 c/g, 1.53Mb/g, 640 i/g)
super-block backups (for fsck -b#) at:
 32, 3056, 6080, 9104, 12128, 15152, 18176, 21200, 24224, 27248,
 30272, 33296, 36320, 39344, 42368, 45392, 47904, 50928, 53952, 56976,
 60000, 63024, 66048, 69072, 72096, 75120, 78144, 81168, 84192, 87216,
 90240, 93264, 95776, 98800, 101824, 104848, 107872, 110896, 113920, 116944,
 119968, 122992, 126016, 129040, 132064, 135088, 138112,
        .
        .
    lots of texts
        .
        .
** /dev/xy0a
** Currently Mounted on /a/
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl Groups
/dev/rxy0a: 516 files, 2575 used, 4896 free (16 frags, 610 blocks)

System Installation Completed.
Reboot your system and configure a kernel for your system.
#
```

7. Abort the system since the reboot option is not being selected in the Host Form. Use [L1-A] for Sun monitors or [BREAK] on Wyse terminals to abort the system. Boot the system by using the command

```
>b
```

8. Configure a kernel for your system. Refer to Chapter 7 for instructions on how to configure a kernel.
9. Run `ypinit` to set up the `yp` database. See System and Network Administration Manual for detailed instructions on how to set up and maintain yellow pages.

5.6. Dataless Configuration With Remote Tape Drive

Assume the system is configured as follows:

hostname: evans
architecture: sun4
ethernet interface: ie0
system type: dataless configuration
ip address: 192.9.90.64
yp client domainname: "wseng.sun.com"
1 SCSI disk: sd0
remote SCSI tape drive abbreviation: st0
sun4 tape host: godzilla
tape host's internet address: 192.9.90.11
sun4 server: godzilla
server ip address: 192.9.90.51

1. Start suninstall:

```
# cd /usr/etc/install
# suninstall

 Enter the local time zone name:
 >> US/Pacific

 Is this the correct date/time [y/n]:
        Mon Mar 14 08:08:57 PST 1988
 >> n

 Enter the current date and local time (e.g. 09/03/88 12:20:30); the date
 may be in one of the following formats:
          dd/mm/yy
          dd/mm/yyyy
          dd.mm.yyyy
          dd-mm-yyyy
          dd-mm-yy
          month dd, yyyy
          dd month yyyy
 and the time may be in one of the following formats:
          hh am/pm
          hh:mm am/pm
          hh.mm
          hh:mm am/pm
          hh.mm
          hh:mm:ss am/pm
          hh:mm:ss
          hh.mm.ss am/pm
          hh.mm.ss
 >> 09/03/88 12:20:30

 Is this the correct date/time [y/n]:
          Wed Mar  9 12:20:30 PST 1988
 >> y


Select your terminal type:
    1) Televideo 925
    2) Wyse Model 50
    3) Sun Workstation
    4) Other
>> 3
```

The following menu will now appear.

```
                Sun Microsystems System Installation Tool

                              Main Menu

                ( Please use x or X to select your choice )
                   ( + means the data file(s) exist(s) )

                        [ assign host information     ]

                        [ assign disk information     ]

                        [ assign software information ]

                        [ assign client information   ]

                        [ on-line help information    ]

                        [ start the installation      ]

                        [ exit from suninstall        ]


   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

2. Assign host information by selecting `[assign host information]` in the main menu and the Host Form will be displayed on the screen:

```
HOST FORM       [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Workstation Information :
     Name : evans
     Type :  [standalone]  [server] x[dataless]
     Server: godzilla
     Server Internet Address: 192.9.90.11
     Path of the executables on server: /export/exec/sun4

Network Information :
     Ethernet Interface :  [none] x[ie0]
     Internet Address 0 :  192.9.90.64
     YP Type            :  [none]  [master]  [slave] x[client]
     Domainname      : wseng.sun.com

Misc Information :
     Operation type          : x[install]  [upgrade]
     Reboot after completed :  [y]  x[n]



Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

3. Assign disk information by selecting `[assign disk information]` in the Main Menu and the Disk Form will be displayed on the screen:

```
DISK FORM        [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------------
Attached Disk Devices :
  x[ sd0]


Disk Label                :  x[default]  [existing]  [label in data file]
Free Hog Disk Partition   :   [a]  [d]  [e]  [f] x[g]  [h]
Display Unit              : x[Mbytes]  [Kbytes]  [bytes]  [blocks]  [cylinders]

PARTITION START_CYL BLOCKS     SIZE      MOUNT PT              PRESERVE(Y/N)
===============================================================================
    a      0          15884     7         /                        n
    b      0          33440     16
    c      0          140624    68
    d      0          0         0
    e      0          0         0
    f      0          0         0
    g      0          91256     44
    h      0          0         0


Ok to use this partition table [y/n]  ? y
Are you finished with this form [y/n] ? y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

The numbers under the columns START_CYL, BLOCKS, and SIZE are for this example only. The numbers will be different for each disk and they depend on the existing label on the disk specified. The main menu will be displayed on the screen when you are finished with the form.

4. Assign software information by selecting `[assign software information]` in the Main Menu and the Software Form will be displayed on the screen:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          :  [sun2]  [sun3]   x[sun4]   [Sun386i]
     Path where executables reside :/

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  x[st8]  [mt0]  [xt0]
     Drive Type  :  [local] x[remote]
     Tapehost    :  godzilla
     Tapehost's Internet Address : 192.9.90.11

Choice           :  [all]   [default]   [own choice]  x[required]   [quit]


               CATEGORY      NAME      BYTES   AVAIL BYTES          Y/N
               ==========================================================
               required      root      XXXX     XXXX                 y
               required      Sys       XXXX     XXXX                 y
               required      user      XXXX     XXXX                 y


Are you finished with this form [y/n] ?
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

Dataless configuration does not need to select software categories since it is mounting `/usr` from the server. Some of the required categories will be loaded for installation purposes.

The list of categories to be extracted for the sun3 architecture will now be displayed on the Software Form below:

```
SOFTWARE FORM   [DEL=erase one char of input data] [RET=end of input data]
-------------------------------------------------------------------------
Architecture Information :
     Type          :  [sun2]   [sun3]   x[sun4]    [Sun386i]
     Path where executables reside :/

Tape Information :
     Device Type :  [ar0]  [ar8]  [st0]  x[st8]  [mt0]  [xt0]
     Drive Type  :  [local]  x[remote]
     Tapehost    : godzilla
     Tapehost's Internet Address : 192.9.97.11

Choice           :  [all]   [default]   [own choice]  x[required]   [quit]


              Extract list:

                    root
                    sys
                    user



Are you finished with this form [y/n] ?y
   [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

Only a portion of the `user` category will be loaded. The Main Menu will be displayed on the screen when you are finished with this form.

5. Start the installation by selecting `[start the installation]` in the Main Menu and you will be prompted when the tape needs to be changed. If any information is missing, the installation will not start and the Main Menu will be displayed on the screen. You can abort the installation anytime by using CTRL-C and either restart it by using existing information or reassign information before restarting the installation. You should be expecting the following messages after the installation begins.

```
System Installation begin :

Label disk(s) :
        sd0

File systems check :
/dev/rsd0a:     140624 sectors in 752 cylinders of 11 tracks, 17 sectors
        72.0Mb in 47 cyl groups (16 c/g, 1.53Mb/g, 640 i/g)
super-block backups (for fsck -b#) at:
 32, 3056, 6080, 9104, 12128, 15152, 18176, 21200, 24224, 27248,
 30272, 33296, 36320, 39344, 42368, 45392, 47904, 50928, 53952, 56976,
 60000, 63024, 66048, 69072, 72096, 75120, 78144, 81168, 84192, 87216,
 90240, 93264, 95776, 98800, 101824, 104848, 107872, 110896, 113920, 116944,
 119968, 122992, 126016, 129040, 132064, 135088, 138112,

sun3 Installation Begin :

Extracting "root" files from "/dev/nrst0" release tape.

Extracting "Sys" files from "/dev/nrst0" release tape.

Extracting sun3 executables from "/dev/nrst0" release tape.

Checking filesystems :
** /dev/sd0a
** Currently Mounted on /a/
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl Groups
/dev/rsd0a: 516 files, 2575 used, 4896 free (16 frags, 610 blocks)

System Installation Completed.
Reboot your system and configure a kernel for your system.
#
```

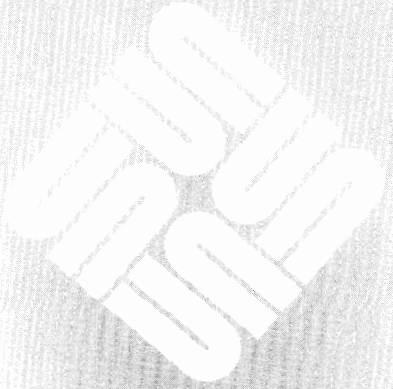
6. Abort the system since the reboot option is not being selected in the Host Form. Use L1-A for Sun monitors or BREAK on Wyse terminals to abort the system. Boot the system by using the command

```
>b
```

7. Configure a kernel for your system. Refer to Appendix A for instructions on how to configure a kernel.

6

Man Pages



6

Man Pages

suninstall has two new utilities, `setup_client`(8) and `setup_exec`(8). The man pages for these utilities are on the following pages.

NAME

setup_client – create or remove an NFS client

SYNOPSIS

/usr/etc/install/script/setup_client *op clientname yp_type swapsize rootpath swappath dumppath homepath execpath arch*

DESCRIPTION

setup_client adds an NFS client to a server, or to removes one. It can only be run by the super-user. It is also used by **suninstall**(8).

The *op* argument indicates which operation to perform; it can be either **add** or **remove**, to indicate whether to add or remove a client. *clientname* is the hostname of the client. *yp_type* indicates the type of Yellow Pages server or service to provide to the client, if any; it can be one of **master**, **slave**, **client** or **none**. *swapsize* is the number of bytes reserved for client's swap file. *rootpath* is the pathname of parent directory in which various client root directories reside; *rootpath/clientname* is the pathname of the client's root directory. *swappath* is the pathname of parent directory in which various client swap files reside; *swappath/clientname* is the pathname of the client's swap file. *dumppath* is the parent pathname in which various client dump files reside; *dumppath/clientname* is the pathname of the client's dump file. *homepath* is the pathname of the (parent) directory in which the various home directories are to reside; it is the pathname of the directory that the client is to mount as **/home**. *execpath* is the full pathname of the directory in which the executables for the architecture specified by the *arch* argument. This is the directory that the client mounts as **/usr**. *arch* specifies the client's architecture (for instance, **sun4**, **sun3**...). **setup_client** with no arguments displays a usage message that includes the proper *arch* argument for each supported architecture.

USAGE

Before you add or remove a client, you must first make sure that the Internet and Ethernet addresses for *clientname* are listed in the YP hosts database (if the server is running the YP), or in the server's **/etc/hosts** and **/etc/ethers** databases, respectively (otherwise). Then, run **setup_client** with the **add** or **remove** operation. When adding a client, you must then bootstrap that client machine.

You cannot add a client to a server that does not support the specified architecture. The executable directory for that client's architecture must be present on the server. If this file is absent, an error results.

setup_client updates the **/etc/bootparams** file. If the server is a YP master, it updates local YP database. It *does not* propagate the local update to other YP servers. To propagate the updates, use the following commands:

```
example# cd /var/yp
example# make
```

If the server is running YP but is not a YP master, **setup_client** issues a warning to indicate that the database is out of date.

When *arch* is given as **sun2**, **suninstall** issues a reminder to run the **/usr/etc/ndbootd** daemon for booting Sun-2 systems.

setup_client creates *swappath/clientname* with the *size*, (number of bytes) you specify. You can append one of **K** or **k** to indicate kilobytes, **M** or **m** to indicate megabytes, or **B** or **b** to indicate 512-byte blocks, to *size*. Otherwise, *size* is taken to indicate an exact byte count.

suninstall updates the **/etc/exports** file to allow root access to each client's root file system. It exports the client's swap and dump partitions only to the client. Note: the system administrator should verify that the **/etc/exports** file contains correct information, and that file systems are exported to the correct users and groups. Refer to **exportfs**(8) for details on exporting file systems.

EXAMPLES

This example shows how to add a Sun-4 system NFS client to a server.

example# setup_client add frodo client 16M /exports/roots /exports/swaps /exports/dumps /home \ /exports/execs/sun4/4.0 sun4

To remove this client, you would merely substitute **remove** for **add** in the above example.

FILES

/etc/hosts
/etc/ethers
/usr/etc/ndbootd
/etc/bootparams
/etc/exports

SEE ALSO

exportfs(8), **setup_exec**(8) **suninstall**(8)

Installing SunOS

DIAGNOSTICS

incorrect number of arguments
Check number and order of the arguments.

must be run as root (super-user).
You must be root to use **setup_client**.

invalid operation type "*xx***".**
Valid operations are **add** and **remove**.

ATTENTION: *xxxxxxxx* -> boot.sun*?* not created.
(Sun-3 systems only.) A symbolic link can not be created because the boot file does not exist.

ATTENTION: *xxxxxxxx*.SUN*?* -> boot.sun*?* not created.
(Other than Sun-3 systems.) A symbolic link can not be created because the boot file does not exist.

ATTENTION: /usr/etc/ndbootd needs to be running on server before bringing up "*client*".
The Sun-2 system boot daemon must be running in order to bootstrap a Sun-2 system.

NAME

setup_exec – install architecture-dependent executables on a heterogeneous file server

SYNOPSIS

/usr/etc/install/setup_exec *arch execpath*

DESCRIPTION

setup_exec installs architecture-dependent executables from either from a local tape drive or a remote host. It is used to convert a standalone system or homogeneous file server to a heterogeneous file server. **setup_exec** is a forms-based utility that can be invoked directly, but it is also used by **suninstall**(8). It can only be invoked by the super-user.

The *arch* argument specifies the machine archictecture to install (for instance, **sun4, sun3**...). When run with no arguments, **setup_exec** displays a usage line that includes the proper format of the *arch* argument for each supported architecture. *execpath* is the full pathname of the directory in which to install the executables. When **setup_exec** is done, the *execpath* directory is ready to mount as **/usr** by the heterogeneous server's NFS clients of the indicated *arch*.

setup_exec also updates the **/etc/exports** file (see **exportfs**(8)) to export the executable directories it has installed. The system administrator should verify this file to make sure that the directory has been exported to the correct groups.

EXAMPLE

This example shows how to install a directory of executables for Sun-4 system clients running 4.0.

```
example# setup_exec sun4 /exports/execs/sun4/4.0
```

FILES

/etc/hosts	hosts database
/etc/ethers	database of hostnames and Ethernet addresses
/etc/exports	database of exported file systems
/usr/etc/install/files/extractlist.*arch*	record of extracted categories for the indicated architecture

SEE ALSO

exportfs(8), **setup_client**(8), **suninstall**(8)

Installing SunOS

DIAGNOSTICS

incorrect number of arguments
Check the number and the order of arguments.

invalid architecture type "*arch***".**
You supplied a value for *arch* that is not supported.

invalid tape drive type "*drive***".**
Valid tape drive types are **local** and **remote**.

invalid tape type "*tape***".**
Valid tape types are **ar**, **st**, **mt**, and **xt**.

can't reach tapehost "*tapehost***".**
The IP address of *tapehost* is not in the hosts database, that is, the hosts YP database if the Yellow Pages are running, or the **/etc/hosts** file otherwise.

Load release tape *n*
Mount the release tape specified on the screen and type RETURN to continue.

7

Converting a Standalone System into a Server

7

Converting a Standalone System into a Server

A 4.0 standalone system can become a 4.0 server by running `setup_exec` and `setup_client`. `setup_exec` is a tool that installs the excutable files for the architecture you specify. You can use it to install as many architectures as you need on the server as long as there is enough disk space available on the disk.

NOTE *You can no longer use* `extract_release` to extract additional software if you do not want to go through `suninstall` after you have installed a system. You must use `setup_exec` to extract software from the same or other architectures or go back into *suninstall.*
For example, if you have a sun2 4.0 standalone system and you wish to turn it into a 4.0 server that supports sun2 and sun3 4.0 clients, run `setup_exec` to install sun3 executable files on the system. You do not have to run `setup_exec` to install sun2 executable files since the system is a sun2 4.0 system already. To see the usage of `setup_exec`, type the following:

```
host#setup_exec
setup_exec: incorrect number of arguments.
usage: setup_exec arch execpath
where:
arch        = "sun2" or "sun3" ....
execpath    = pathname of the directory where exec exists
```

`arch` is the architecture of the executable files you want to install. `execpath` is the location you want the executable files to reside. If you want the executable files to be under `/exec/sun3`, `execpath` is `/exec`.

When the first client is being added to a standalone system it is necessary to add `/usr` and the filesystem which will be the client's "home" to `/etc/exports` and then execute `exportfs -a` or reboot the server.

Also, before the first client is added to a standalone system that has been

converted to a server, it is necessary to start `bootparamd` after running `setup_client` either by executing `/usr/etc/rpc.bootparamd` or by rebooting the server.

The commands for both the local tape drive and the remote tape drive are exactly the same.

```
host# setup_exec sun3 /exec
```

Now you will be prompted for tape drive information in very much the way *suninstall*'s Software Form does. Fill in the necessary information. See the `setup_client` and `setup_exec` man pages in Chapter 6 of this manual for more information.

8

Adding or Deleting a Client

8

Adding or Deleting a Client

Run `setup_client` to create Sun-2, Sun-3 and Sun-4 clients. `setup_client` creates or removes one client at a time. The command is located in `/usr/etc/install/script/setup_client` so it is necessary to `cd /usr/etc/install/script` prior to executing `setup_client`. See the `setup_client` man page in Chapter 6 for complete information.

NOTE *The client must be added to* `/etc/hosts` *and* `/etc/ethers` *on the server or the YP master prior to running* `setup_client`.

To see the usage of `setup_client`, type the following:

```
host#setup_client
setup_client: incorrect number of arguments.
usage:
setup_client op clientname yp_type size rootpath swappath homepath execpath arch
where:
op          = "add" or "remove"
name        = name of the client machine
yp_type       = "master" or "slave" or "client" or "none"
size        = size for swap
        (e.g. 16M or 16m ==> 16 * 1048576 bytes
              16K or 16k ==> 16 * 1000 bytes
              16B or 16b ==> 16 * 512 bytes
              16         ==> 16 bytes )
rootpath  pathpathname of nfsroot
swappath    = pathname of nfsswap
dumppath    = pathname of nfsdump
homepath    = pathname of home
execpath    = pathname of exec directory
arch        = "sun2" or "sun3" ....
```

Options

`op` is add or remove a client from the server.
`name` is the hostname of the client.
`yp` is the `yp` type of the client.
`size` is the size of the swap space in bytes reserved for the client.
`rootpath`, `swappath`, `dumppath`, `homepath` and `execpath` are the locations of the client directories.
`arch` is the client's architecture.

If you are adding a client, `setup_client` sets up client information under the directories you specify. If you are removing a client, `setup_client` removes the client information under the directories you specify.

If you want client's root directory under `/roots/`*clientname*, rootpath is `/roots`. If you want client's swap space under `/swaps/`*clientname*, swappath is `/swaps`. If you want client's dump file under `/dumps/`*clientname*, dumppath is `/dumps`. If you want client's home directory under `/home/`*clientname*, homepath is `/home`. If Sun-2 executable files are under server's `/exec/sun2` and the client is a Sun-2 client, execpath is `/exec`.
`arch` is the client's architecture.

EXAMPLES:

Adding a Sun-2 Client

```
host# setup_client add sofia client 16M /roots /swaps /dumps /home /exec sun2
```

Removing a Sun-3 Client

```
host# setup_client remove sofia client 16 /roots /swaps /dumps /home /exec sun3
```

Adding a Sun-4 Client

```
host# setup_client add sofia client 16K /roots /swaps /dumps /home /exec sun4
```

A

Reconfiguring Your Kernel

A

Reconfiguring Your Kernel

Procedures for Reconfiguring the Kernel

This section contains instructions for reconfiguring the kernel. Remember that before performing these instructions, you must have installed Release 4.0 by using the `suninstall` program. You also must be logged in as superuser. Two sets of instructions follow: one for standalones and one for servers. You should refer to the set that applies to your configuration. Remember that if you are configuring a server, you also need to configure the kernels for your diskless and dataless clients.

Kernel Reconfiguration for Standalone Systems

For standalone machines, proceed as follows.

1. Change the current directory to the following:

```
# cd /usr/share/sys/sun#/conf
```

NOTE *For Sun#, substitute the system type:sun2, sun3, sun4, etc.*

2. Create a kernel configuration file.

   Copy the file *GENERIC* and comment out the lines that don't apply to your system. Call the new file *SYS_NAME*, where *SYS_NAME* represents the name of your system. Also in the `conf` directory are a number of templates for systems, such as "DL 50" for diskless 3/50. You can use these, rather than modifying GENERIC, where appropriate. Here are the commands that you type:

```
# cp GENERIC SYS_NAME
# chmod +w SYS_NAME
```

3. Edit `SYS_NAME` to reflect your system configuration. Refer to the annotated copy of *GENERIC* for your model of Sun workstation provided in the previous section for an explanation of these changes. Make sure you are including the proper device description lines for your system.

4. While still in the `/usr/share/sys/sun#/conf` directory, run `/usr/etc/config`. Then change directory to the new configuration directory, and make the new system as shown below. (Remember to substitute your actual system image name for *SYS_NAME*):

```
# /usr/etc/config SYS_NAME
# cd ../SYS_NAME
# make
[ lots of output ]
```

5. Now you can save your old kernel and install your new one as follows:

```
# mv /vmunix /vmunix.old
# cp vmunix /vmunix
# /usr/etc/shutdown -h now

        The system goes through the halt sequence, then
    the monitor displays its prompt, at which point you
    can boot the system:

> b vmunix
```

6. If the system appears to work, this completes the upgrade procedure. If the new kernel doesn't seem to be functioning properly, boot `/vmunix.old`, copy it back to `/vmunix`, and go about fixing your new kernel as follows:

```
# /usr/etc/shutdown -h now
> b vmunix.old -s
# mv /vmunix /vmunix.oops
# mv /vmunix.old /vmunix
# ^D      [ Brings the system up multi-user ]
```

Kernel Reconfiguration for Servers

For server machines, proceed as follows.

1. Change the current directory to `/usr/share/sys/sun#/conf`:

```
# cd /usr/share/sys/sun#/conf
```

2. Create a kernel configuration file. In the `conf` directory are a number of templates for systems, such as "DL 50" for diskless 3/50. You can use these, rather than modifying GENERIC, where appropriate.

   Copy the file *GENERIC* and comment out the lines that don't apply to your system. We'll call the new file *SYS_NAME* (the name of the system). For example,

```
# cp GENERIC SYS_NAME
# chmod +w SYS_NAME
```

3. Edit *SYS_NAME* to reflect your system configuration.Use the annotated copy of *GENERIC* provided in the next section for an explanation of these changes. Make sure you include the proper device description lines for your system.

4. While still in this directory, run */usr/etc/config*. Then change to the new configuration directory, and make the new system (remember to substitute your actual kernel image name for *SYS_NAME*):

```
# /usr/etc/config SYS_NAME
# cd ../SYS_NAME
# make
[ lots of output ]
```

5. Prepare a kernel for your clients in the same way. In the `conf` directory you will find templates for various configurations. Replace *TEMPLATE_NAME* with the appropriate template for your system. When editing the configuration file (called *CLIENT_KERNEL_NAME* in the following), remember to include the entire set of devices used by all the machines or configure a custom kernel for each client or client configuration:

NOTE *A kernel for Sun-2 clients MUST be built on a Sun-2; Sun-3 kernels on a Sun-3; and Sun-4 kernels on a Sun-4!*

```
# cd /sys/sun#/conf
# cp TEMPLATE_NAME CLIENT_KERNEL_NAME
# chmod +w CLIENT_KERNEL_NAME
[ Edit CLIENT_KERNEL_NAME to reflect all clients' systems.
  Be especially careful with the device description lines. ]
# /usr/etc/config CLIENT_KERNEL_NAME
# cd ../CLIENT_KERNEL_NAME
# make
[ lots of output ]
```

6. Install the appropriate client kernel under each client's root directory. Clients do NOT have to be halted, but they must reboot to run the new kernel. To install each client's kernel, save the original kernel (if there is one), install the new kernel image in `/export/root/client_name`, and then test it out by booting each of the clients. Since clients usually aren't identical configurations, you need to make sure each client boots.

```
# cd /usr/share/sys/sun#/CLIENT_KERNEL_NAME
# mv /export/root/client_name/vmunix /export/root/client_name/vmunix.old
[ or wherever your client kernel is ]
# cp vmunix /export/root/client_name/vmunix
[ On the client machine : ]
>b vmunix
```

NOTE *Executables for the native architecture are in* `/usr`. *Second and third architectures, by default, go in* `/export/exec/sun#`

7. Now position yourself in the directory which has the server's kernel in it. Save your server's old kernel, install your new one, and try everything out:

```
# cd /usr/sys/sun#/SYS_NAME
# mv /vmunix /vmunix.old
# cp vmunix /vmunix
```

8. At this point normal system performance is a highly, but not absolutely, certain indicator of a trouble-free kernel, if your system(s) appears to work you may proceed with some confidence. You have successfully completed installation. Congratulations!

   If, on the other hand, either of the new kernels does not seem to be functioning properly, halt all systems and boot from the original kernel. Move the faulty kernel away and re-install the original in its place. Once you are booted up on the original, you can go about trying to fix the faulty kernel. For example, on the server:

```
# /usr/etc/halt
> b vmunix.old -s
# cd /
# mv vmunix vmunix.bad
# mv vmunix.old vmunix
# ^D              [ Brings the system up multi-user ]
```

For the clients, do the following on the server:

```
# cd /export/root/client_name
# mv vmunix vmunix.bad
# mv vmunix.old vmunix
```

Boot up the clients and allow them to run until a new client kernel is made and ready to install; or if the clients can remain down, build and install a new client kernel now.

For specific Annotated GENERIC files for a Sun-2, Sun-3, or Sun-4 machine, see the *System Administration and Networking* manual.

B

Time Zones

B

Time Zones

TIME ZONE NAME:	TIME ZONE AREA:
North America:	
US/Eastern	Eastern time zone, U.S.A.
US/Central	Central time zone, U.S.A.
US/Mountain	Mountain time zone, U.S.A.
US/Pacific	Pacific time zone, U.S.A.
US/Pacific-New	Pacific time zone, U.S.A., with proposed changes to Daylight Savings Time near election time in Presidential election years
US/Yukon	Yukon time zone, U.S.A.
US/East-Indiana	Eastern time zone, U.S.A., no Daylight Savings Time
US/Arizona	Mountain time zone, U.S.A., no Daylight Savings Time
US/Hawaii	Hawaii
Canada/Newfoundland	Newfoundland
Canada/Atlantic	Atlantic time zone, Canada
Canada/Eastern	Eastern time zone, Canada
Canada/Central	Central time zone, Canada
Canada/East-Saskatchewan	Central time zone, Canada, no Daylight Savings Time
Canada/Mountain	Mountain time zone, Canada
Canada/Pacific	Pacific time zone, Canada
Canada/Yukon	Yukon time zone, Canada
Europe:	
GB-Eire	Great Britain and Eire
WET	Western European time
Iceland	Iceland
MET	Middle European time (also known as Central European time)
Poland	Poland
EET	Eastern European time

Turkey	Turkey
W-SU	Western Soviet Union

Asia (including Australia and New Zealand):

PRC	People's Republic of China
Korea	Republic of Korea
Japan	Japan
Singapore	Singapore
Hongkong	Hong Kong
ROC	Republic of China

Australia/Tasmania	Tasmania, Australia
Australia/Queensland	Queensland, Australia
Australia/North	Northern Territory
Australia/West	Western Australia
Australia/South	South Australia
Australia/Victoria	Victoria, Australia
Australia/NSW	New South Wales, Australia

NZ	New Zealand

Other (if the locale isn't listed above); none of these have Daylight Savings Time:

GMT	Greenwich Mean time
GMT-1	1 hours west of Greenwich Mean Time
GMT-2	2 hours west of Greenwich Mean Time
GMT-3	3 hours west of Greenwich Mean Time
GMT-4	4 hours west of Greenwich Mean Time
GMT-5	5 hours west of Greenwich Mean Time
GMT-6	6 hours west of Greenwich Mean Time
GMT-7	7 hours west of Greenwich Mean Time
GMT-8	8 hours west of Greenwich Mean Time
GMT-9	9 hours west of Greenwich Mean Time
GMT-10	10 hours west of Greenwich Mean Time
GMT-11	11 hours west of Greenwich Mean Time
GMT-12	12 hours west of Greenwich Mean Time
GMT+13	13 hours east of Greenwich Mean Time
GMT+12	12 hours east of Greenwich Mean Time
GMT+11	11 hours east of Greenwich Mean Time
GMT+10	10 hours east of Greenwich Mean Time
GMT+9	9 hours east of Greenwich Mean Time
GMT+8	8 hours east of Greenwich Mean Time
GMT+7	7 hours east of Greenwich Mean Time
GMT+6	6 hours east of Greenwich Mean Time
GMT+5	5 hours east of Greenwich Mean Time
GMT+4	4 hours east of Greenwich Mean Time
GMT+3	3 hours east of Greenwich Mean Time

GMT+2	2 hours east of Greenwich Mean Time
GMT+1	1 hours east of Greenwich Mean Time

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T

U

W

Notes

Notes

8:0:20:6:bf:93 3/280
8:0:20:6:71:EF 3/0-0
8:0:20:2:20:2F 3/6