Sun386*i* Installing Sun386i SunOS 4.0.1

Sun386*i* SunOS Release 4.0.1

Read and follow the steps in this document if you are upgrading a Sun386i™ network or individual Sun386i systems.

Contents

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Problems?

If you encounter problems not covered in the Sun386i documents you have received, please call: **(800) USA-4SUN**. Outside the U.S., call your local Sun Microsystems service office.

Questions and Answers about Upgrading

The following are commonly asked questions about the Sun386i upgrade procedure:

Q. What does Sun386i SunOS 4.0.1 contain?

A. Sun386i SunOS™ 4.0.1 is a new and enhanced release of the software that was originally shipped with your Sun386i workstation. See page 5 for a detailed summary of its new features and bug fixes.

Q. What systems should I upgrade?

A. On an all-Sun386i network, you should upgrade all systems. On a network with a Sun-3™ or Sun-4™ Yellow Pages master, you can upgrade individual systems as needed, but you should plan on eventually upgrading all Sun386i systems.

See page 28 if you are upgrading Sun386i systems that are served by a Sun-3 or Sun-4 YP master.

See page 12 if:

- You are upgrading a standalone system
- You are upgrading a network comprised solely of Sun386i systems
- You are upgrading a group of systems with a Sun386i YP master

Q. Can I test my applications under the new release without upgrading every system?

A. Yes. On a Sun386i system served by a Sun-3 or Sun-4 master, simply upgrade individual Sun386i systems as appropriate. See page 28.

On a Sun386i network you must upgrade all systems in order for SNAP, Automatic System Installation, and New User Accounts to work properly. If you want to upgrade a single system on the network in order to evaluate Sun386i SunOS 4.0.1, see the instructions on page 31.

Note that the procedure on page 31 requires that you reinstall Sun386i SunOS 4.0.1 on the system again when you upgrade the entire network.

Q. What do I need before I start?

A. You should have:

- The four-book Sun386i Owner's Set of manuals that came with your system (May 1988 editions)
- *Sun386i Owner's Supplement* including *Sun386i Advanced Administration* (required only for some procedures)
- *Owner's Bulletin for SunOS 4.0.1*
- *Administrator's and Developers Notes for SunOS 4.0.1* (required only for some procedures)
- A working printer, available to all systems you are upgrading
- Enough tapes or diskettes to back up all user data from the systems you're upgrading.

If you are backing up onto diskettes, you must format each diskette using the `/usr/etc/fdformat` command. (See page 43 of *Sun386i System Setup and Maintenance* for further information on formatting diskettes.)

Q. How long should the upgrade take?

A. This depends on how many systems you're upgrading, how much data you have to back up, and how many system files you have customized. The time required to actually load the Sun386i SunOS 4.0.1 software is approximately one hour per system, with administrative tasks generally requiring an additional hour per system.

If you are upgrading an entire network, plan on doing the upgrade on a day when users will not need access to their systems.

Q. Can I use SNAP to back up and restore my files?

A. No—you should use the 4.0.1 version of the `bar` command instead. The `bar` command can now back up files larger than the available space in `/tmp`, and offers better support for directory symbolic links. As part of the upgrade procedure, this document provides step-by-step instructions on loading and using this new version of the `bar` command.

Q. Do I need to back up my expansion units?

A. As always, you should make sure you have a recent backup of the data on any expansion unit disks. However, if you are not installing software directly on the expansion unit disk, then you do not need to make a back up of it as part of this procedure. If you are planning to install SunOS 4.0.1 software on the disk in an expansion unit, you should back up all data on the expansion unit.

Q. When would I install SunOS software on the expansion unit disk?

A. Even if you have an expansion unit disk on a system, there are only two cases when you should be planning to install the new Sun386i SunOS software on that disk:

1. The expansion unit disk is the only disk on the system (there is no system unit disk).
2. You are an expert user, and you wish to boot from the expansion unit disk even though it is your second disk. This configuration is not recommended.

Q. What if I have a 4.0.0 Hardware Upgrade Kit

If you have software release 4.0.0 Rev. B (Hardware Upgrade Kit) do not install these diskettes on top of your new 4.0.1 software. All of the fixes from the Hardware Upgrade Kit are included as part of 4.0.1.

Q. What if I am upgrading from a beta version of Sun386i SunOS 4.0 or 4.0.1?

A. If you are upgrading from a beta version of the software, contact your support representative for special instructions.

Q. How do I tell what version I have?

A. Type the following from a Commands window:

```
{system:1} cat /usr/VERSION
```

The system will display the internal release version, and a date. If the line begins with BL8H, then you have standard Sun386i SunOS 4.0 software. If the line begins with BL7 or a lower number, then you are running a beta version of the software.

Summary of Changes

The Sun386i 4.0.1 software release contains performance and quality enhancements, new DOS Windows™ features, and support for new hardware. It is intended to replace the 4.0 software release. Upgrading to 4.0.1 is highly recommended to take advantage of significant improvements in this release.

For detailed information about new features, see *Owner's Bulletin for Sun386i SunOS 4.0.1* and *Administrator's & Developer's Notes for Sun386i SunOS 4.0.1.*

Key new features in 4.0.1 include:

Major performance improvements – In Sun386i 4.0.1, system performance has been improved by reducing paging activity (the transferring of data between disk and main memory) and by optimizing critical code segments. As a result, 4.0.1 provides:

- Faster user login
- Faster screen display and repaint
- Faster startup for Mail, Sun Organizer™, Help Viewer, and DOS Windows applications

Performance improvements in DOS Windows provide:

- Improved DOS keyboard and mouse responsiveness
- Better DOS interrupt responsiveness for AT board support

Enhancements to the SunOS system software include:

- Reduced overhead in the handling of display fonts
- Dynamic allocation of some operating system data structures
- Enhanced processing of symbolic links

Support for 4-Mbyte diskful systems – As a result of performance enhancements in 4.0.1, the minimum memory requirement for a Sun386i system with a disk has been reduced from 8 to 4 Mbytes.

Improved Automatic System Installation, New User Accounts, and SNAP – These features, which were beta quality in Release 4.0, are now production quality.

Improvements to Automatic System Installation include:

- Support for upgrading a standalone system to a master server
- Better checking of configuration information during installation
- Interim messages reporting progress during installation
- Restriction to single master server per network is enforced
- New, more robust mechanism for updating Yellow Pages database

Improvements to New User Accounts include:

- Script for administrators to disable or enable the full-screen login application, and to select a screenblank utility
- Better error-handling and reporting

Improvements to SNAP (System and Network Administration Program) include:

- Support for Hewlett-Packard LaserJet™ II printers
- Extensive changes to improve SNAP operation when some administrative updates are made "manually" (not through SNAP)

- New mechanism for assigning user identification numbers provides basis for improved security
- New method for assigning user and group identification numbers
- Better error messages and error-recovery

Sun-3 and Sun-4 server support for diskless Sun386i systems – With Sun386i 4.0.1, system software can be installed from tape on a Sun-3 or Sun-4 system so it can be a server for diskless Sun386i systems. With 4.0, only a Sun386i system could serve diskless Sun386i systems. See *Administrator's and Developer's Notes for Sun386i SunOS 4.0.1* for information about setting up a Sun-3 or Sun-4 server. No special procedure is required for Sun386i servers, because they already have the capability of serving diskless systems.

New DOS Windows features – New DOS Windows features in 4.0.1 include:

- Microsoft® MS-Windows® driver. With this driver, Microsoft MS-Windows applications can take advantage of the full Sun386i monitor screen.
- 9600 baud serial communication under DOS. DOS applications can use the Sun386i serial port and AT bus serial communication boards to transmit data at speeds up to 9600 baud. In Release 4.0, the maximum speed was 4800 baud.
- Lotus®-Intel®-Microsoft (LIM) Version 4.0 expanded memory. DOS Windows supports LIM expanded memory up to 32 Mbytes per application.
- DOS file-sharing. DOS Windows supports file sharing on a per-drive basis using the `EXTEND` command.
- Network programming libraries and facilities. The PC-NFS™ Programmer's Toolkit, which programmers can use to write distributed network applications for PCs and Sun386i DOS Windows, has been added to the Sun386i Developer's Toolkit.

Problem fixes – Problems discovered in Release 4.0 have been fixed. See the section "Problems Fixed" below.

Support for external 5.25-inch diskette drive – In addition to the internal Sun386i 3.5-inch diskette drive, Sun386i 4.0.1 supports a specific third-party external 5.25-inch drive for reading and writing 5.25-inch diskettes.

Support for Dynamic Memory boards – 4.0.1 software includes support for Sun386i Dynamic Memory boards. Under 4.0, installing a Dynamic Memory board required adding a driver to the system software; this is not required in 4.0.1.

Support for 15-inch monochrome monitor – 4.0.1 software supports a Sun386i 15-inch monochrome monitor.

Additional on-screen help handbooks – A tutorial called "Sun386i Getting Started" and a guide to improving productivity called "Desktop Productivity Tips" have been added.

New keyboard driver – In 4.0.1, the keyboard driver delivers character codes internally with 8 bits instead of 7 bits. Tables in this driver can be modified to allow support for Western European keyboard layouts that use the ISO Latin-1 character set. Tables for Canadian French, Danish, Italian, Netherlands Dutch, Norwegian, Portuguese, Spanish, and Swedish-Finnish keyboards have been added. These keyboards are not supported under DOS Windows in the current release. They are for use primarily by developers. Application programs that use local language keyboards are not yet available.

"Num Lock" key – With 4.0.1,"Num Lock" is enabled for the right keypad in all SunOS windows. Under 4.0, "Num Lock" was enabled only in DOS Windows and in some third-party UNIX® applications, but not in other SunOS windows.

Security enhancements – Security flaws in two background administration programs (`sendmail` and `fingerd`) are eliminated in 4.0.1. These flaws in UNIX BSD systems were exposed recently by a widely-publicized "virus" program that affected some systems on the Department of Defense Internet.

Diagnostics – Error-handling and stability of the diagnostic program System Exerciser is improved.

Problems Fixed

Problems in 4.0 that have been reported by customers or discovered by Sun have been fixed in Sun386i 4.0.1.

Significant problems fixed include:

Automatic System Installation:

- Installing Sun386i systems in an existing network with a Yellow Pages database could fail under Release 4.0 because of inadequate error-checking. This has been fixed in 4.0.1. The installation program ensures that user-entered names and addresses match database entries and also prevents errors such as duplication of a network address already in use.
- More than one diskful system can be installed simultaneously in 4.0.1.
- A problem with database updates that caused installation to fail with the message "unknown failure mode" is fixed in 4.0.1.
- Under 4.0, Automatic System Installation ignored a limit to the number of diskless clients per server set through SNAP. This is fixed in 4.0.1. A user-specified limit is enforced during Automatic System Installation.

New User Accounts:

- Under 4.0, no record of errors was produced when automatic new user account creation failed. This is fixed under 4.0.1. An error message explaining why the account creation failed is placed in `/var/adm/messages` on the local system or on the home directory server.
- Entering a space character in a password when creating a new account caused the New User Accounts program to fail under 4.0. This is fixed in 4.0.1.

SNAP:

- Some SNAP error messages under 4.0 were hard to understand. In 4.0.1, error messages are significantly improved. A layered set of messages explain a problem and how to correct it.
- Under 4.0, SNAP could fail if an administrator edited a file used by SNAP and introduced an inconsistency or format error. This problem was hard to diagnose because SNAP did not report the error and responded by making the SNAP category unavailable. This has been fixed in 4.0.1. SNAP now gives detailed error messages, helps to isolate the bad entry, and continues to make the category available.
- Under 4.0, SNAP ignored updates to system files dealing with group membership unless the updates were made by SNAP. In 4.0.1, this is fixed. Updates made by "manually" editing files are correctly displayed by SNAP.
- The SNAP user and group tasks could fail under 4.0 when handling entries in the file `/etc/yp.aliases` that have been "manually" edited. This is fixed in 4.0.1.
- SNAP was unable to create new groups in 4.0. This is fixed in 4.0.1.

- A problem that caused Yellow Pages entries for a primary group to overflow the maximum size has been fixed.
- Under 4.0, the SNAP user task could fail if a home directory was set up without using SNAP. This has been fixed in 4.0.1.
- SNAP did not set up public key entries (used for security) for new user accounts under 4.0. This has been fixed in 4.0.1.
- SNAP did not display some standard SunOS user accounts and groups (such as `bin` and `kmem`) under 4.0. In 4.0.1, it displays them (but does not let you modify them).
- Under 4.0, the SNAP backup program followed symbolic links to back up files, but could not restore them as links. A new function modifier to the `bar` command in 4.0.1 allows SNAP to back up and restore files and directories located by links.
- The SNAP backup program failed in 4.0 when it attempted to back up a file larger than the directory `/tmp`. This is fixed in 4.0.1.
- For security reasons, `root` has access only to the backup and restore options of SNAP. This restriction is strictly enforced in 4.0.1.
- Under 4.0, the lower panel of SNAP's backup category did not indicate that a backup was currently running. Now the message `Running` indicates that a backup is running.

Networks:

- Under 4.0, Sun386i systems could not connect directly to a network that uses the Berkeley Internet Name Domain (BIND) Server protocol for naming. This is corrected in 4.0.1.
- Several NFS-related problems involving the automounter (a service that mounts NFS file systems on demand) have been fixed in 4.0.1.
- Under 4.0.1, Sun386i systems correctly use the Yellow Pages `netmasks.byaddr` map to set up subnet masks.
- The restriction limiting a system name to lower-case letters is enforced in 4.0.1.
- A print-spooling problem in 4.0 prevented systems with PC-NFS from using a printer connected to a Sun386i. This is fixed in 4.0.1.

DOS Windows:

- Some number-handling programs received incorrect values in 4.0 if the result of an operation exceeded 32767. This is corrected in 4.0.1.
- Under 4.0, database programs that attempt to truncate files receive incorrect return values from DOS. This could cause them to behave as though invalid data were present in the database. The problem is fixed in 4.0.1.
- Interrupt latency, DMA support, and I/O port support are more robust in 4.0.1.
- Programs that made nested searches into directory trees in 4.0 were incorrectly informed that there were no more matching files, terminating searching prematurely. This does not occur in 4.0.1.
- The Device menu has been rearranged in 4.0.1 to make attaching and detaching a device more convenient.
- DOS no longer attempts to boot off a non-bootable diskette that is left in the drive by accident. In 4.0, this could cause the DOS window to quit immediately (and mysteriously).
- An operating system problem that sometimes caused DOS Windows to disappear under heavy load has been fixed in 4.0.1.

- Performance problems with DMA channels 4 to 7 have been corrected. The symptom in 4.0 was an error message beginning "`pw_dma..`"
- Under 4.0, interrupt levels 3 and 9 were not available for AT boards. This is fixed in 4.0.1.
- For drives D through S (representing SunOS file systems), DOS did not set the date and time correctly under 4.0. This is fixed in 4.0.1.
- When an EGA card was installed on the AT bus under 4.0, printing was routed to the EGA port regardless of the user's LPT1 setting. In 4.0.1, printing is directed according to the LPT1 setting.
- Under 4.0, the built-in serial port could not be used as COM2. This is fixed in 4.0.1.
- The maximum port number for an AT board has been increased from 3FF (hexadecimal) in 4.0 to FFFF (hexadecimal) in 4.0.1.

Commands:

- The `bar` command (for backing up and restoring files) has improved file ownership and protection handling. A new modifier to the `bar` command allows SNAP to back up and restore symbolic links.
- The `bar` command failed in 4.0 when it attempted to back up a file larger than the directory `/tmp`. This is fixed in 4.0.1.

Operating System:

- Under 4.0, initialization of a diskless system could fail with the message "panic: page fault" due to broadcast activity elsewhere on the Ethernet. This is fixed in 4.0.1.
- A problem that sometimes caused a system to hang under very heavy load conditions is fixed.
- Under 4.0, turning off the power to certain types of printers on the parallel port caused the system to fail with the message "Watchdog reset." This is fixed in 4.0.1.
- An incorrect byte count was reported when reading a tape under 4.0. This is fixed in 4.0.1.
- Large DMA transfers on a busy system (usually involving heavy disk and Ethernet traffic) could cause a system to fail under 4.0. This is fixed in 4.0.1.
- A problem that caused system failure with the message "double trap" has been fixed.
- Under 4.0, a disk could not be labelled with the `format` command. This is fixed in 4.0.1.

Drivers:

- In 4.0.1, problem fixes and tuning have markedly improved the performance of the serial driver, resulting in faster throughput.
- Under 4.0, a serial driver problem caused characters to be dropped in some circumstances. This has been fixed in 4.0.1.

Diagnostics:

- The System Exerciser sometimes produced "`vmem`" compare errors under 4.0. This has been corrected in 4.0.1.
- Under 4.0, running the System Exerciser floppy test could dump core or produce compare errors. This has been corrected in 4.0.1.
- A problem that sometimes caused the System Exerciser to run out of swap space under 4.0 has been fixed in 4.0.1.

Compatibility

Sun386i SunOS 4.0.1 software runs on Sun386i systems. It does not run on Sun-2™, Sun-3, or Sun-4 systems. Because Sun386i 4.0.1 contains significant improvements and changes, there are some compatibility issues with previous Sun386i software releases.

On a network, you *must* upgrade all Sun386i systems to 4.0.1. If you want to upgrade a single Sun386i system to 4.0.1 for evaluation purposes, see the section "Upgrading Individual Systems on a Sun386i Network" of this document.

Binary code – All binary code developed on a Sun386i under Sun386i SunOS 4.0 runs unmodified under 4.0.1 with the following exceptions:

- Under 4.0.1, some DOS applications (primarily games) running on an external monitor—that is, a monitor connected to a board on the AT bus—fail to display the mouse cursor on the external monitor.
- SunLink™ DNI 6.0, which allows Sun386i systems to communicate with systems using the DECnet protocol, requires a patch to work with 4.0.1.
- UNIX applications with special code to enable the "Num Lock" key under 4.0 require use of the `disablenumlock` command under 4.0.1. "Num Lock" is enabled by default in 4.0.1, causing an incompatibility with 4.0 UNIX applications that enable it on their own. DOS applications are not affected. See the section "Sun386i Keyboard" in the *Owner's Bulletin for Sun386i SunOS 4.0.1*.

Source code – All source code developed on a Sun386i under Sun386i SunOS 4.0 can be compiled under 4.0.1 and run under 4.0.1 with the following exception:

- Two system calls used by programs that reinterpret the keyboard (for example, to change the location of the shift keys) have been modified to support 8-bit character codes. This has no effect on binary code that runs under 4.0; application binaries continue to run under 4.0.1. But it does affect source code recompiled under 4.0.1. Programmers should see "Keyboard Software Changes" in *Administrator's and Developer's Notes for Sun386i SunOS 4.0.1*.

"Setkeys" command – The `setkeys` command is no longer supported. It has been replaced in 4.0.1 by the commands `loadkeys` and `dumpkeys`.

SNAP, Automatic System Installation, and New User Accounts – 4.0.1 software includes a large number of enhancements to SNAP, Automatic System Installation, and New User Accounts. As a result, the 4.0.1 version of these features is not compatible with the 4.0 version. These features can fail and cause problems if used on a network that has some Sun386i systems with 4.0 software and others with 4.0.1 software.

Hostname restriction – In 4.0.1, a restriction limiting the name (hostname) of a Sun386i system to lower-case letters is strictly enforced. Under 4.0, documentation stated the restriction but it was not enforced. If a system has a name with upper-case letters, it must be renamed when 4.0.1 software is installed.

Organizer setup file – To improve performance, Sun Organizer uses a new version of the setup file (`.orgrc`) to create its default environment in 4.0.1. As a result, Organizer will not work correctly if some systems on a network are running Release 4.0 and other have been upgraded to 4.0.1. In this situation, the 4.0.1 version of the Organizer detects an incompatible setup file, but the 4.0 version does not.

Organizer access restriction – In 4.0.1, `root` and `superuser` have no access to Organizer. Under 4.0, a user logged in as `root` or `superuser` could run the Organizer application. In 4.0.1, this is not allowed.

On-screen help handbooks – Since there are two new on-screen help handbooks, the table of contents in the Help Viewer is different in 4.0.1. Using hypertext links to

move from the table of contents to specific handbooks will not work if the table of contents and handbooks are located on systems with different releases of the software.

"Delete" key – In a DOS window, the key marked "Delete" (located above the backspace key) now backspaces instead of deleting. This is more consistent with the way the key is used in SunOS windows. It is no longer equivalent to the numeric keypad "Del" key.

Rebooting DOS – When you reboot a DOS window under 4.0.1, the working directory is your home directory, or the directory from which the DOS Window was started. Under 4.0, the working directory remained the same as it was in the DOS Window before rebooting.

Desktop default appearance – To improve performance, some changes were made to the way the desktop screen appears by default for new users in 4.0.1. See the chapter "Sun386i User's Guide" in the *Owner's Bulletin for Sun386i SunOS 4.0.1.*

Default characteristics – Some characteristics that were set up for users by default are now optional; they can be invoked with a command called `extras`. See the section "General Notes" in the *Owner's Bulletin for Sun386i SunOS 4.0.1.*

Upgrading Standalones or Networks with a Sun386i Master

Read this section to upgrade a single Sun386i system (a "standalone"), or any group of Sun386i systems served by a Sun386i master. If you are upgrading a Sun386i system on a network served by Sun-3 or Sun-4 systems, skip to page 28.

The upgrade procedure for an all-Sun386i network requires these steps:

- Stopping work on the entire network
- Backing up user files, applications, and important system files
- Installing 4.0.1 software on all Sun386i systems
- Setting up user accounts and other network-related information
- Restoring your data

These instructions assume that you have "operator" and "networks" group privileges. To confirm or change group privileges, see *Sun386i SNAP Administration.*

Note: You cannot upgrade a Sun386i network incrementally using these instructions. These instructions require that all systems on the network be upgraded. See page 31 for notes on how to temporarily upgrade a single system on a Sun386i network.

Stop User and Mail Activity

These steps help ensure that mailboxes and other user files don't change after you've backed them up.

1 Disconnect external mail links

Disconnect modems or other external mail links, so that systems do not continue to receive mail while you are backing up systems.

2 Unschedule SNAP backups

If users have backups scheduled on their machines, instruct them to "unschedule" the backups using SNAP. This is a precaution to prevent user backups from starting at the same time you are preparing to back up their data.

3 Have all users log out

Instruct users to save their work and log out of their systems. Log off of your system, too.

4 Flush mail queues

You can use the rlogin command to log into each system, or you can physically go to each system and log in.

Log into each system as root, and type the following command:

```
{system:SUPERUSER:1}  /usr/lib/sendmail -q -v
```

This procedure sends any mail that may have been awaiting delivery. Do this for all systems before continuing.

Stop Mail Delivery

Once you have flushed the mail queues, do the following on each system. Be sure you are logged in as root.

1 Stop mail delivery

Type the following command to halt mail delivery services:

```
{system:SUPERUSER:2}  zap sendmail
```

(If the `zap` command is not available, use the `ps` and `kill -9` commands. See pages 40 and 41 of *Sun386i Advanced Skills* for details.)

2 Log out

Log out of each system as soon as you halt the mail delivery services on it.

Turn to the next page when you have stopped mail delivery on all systems.

Note: If you are upgrading a network, it is possible that some mail messages will not be delivered as a result of the upgrade procedure. Once the upgrade is complete, you should instruct users to verify that important mail messages were delivered.

Note Setup Information

Perform these steps from the master server.
(To find out which system is the master server, type **`ypwhich -m netid.byname`**)

(If you have a standalone system, complete these steps for your single system.)

1 Log in as yourself

Log in using your user name.

2 Note information on user accounts

Bring up the Users category in SNAP and note all information shown for each user. Make special note of the home directory server for each user—you'll need this list to back up and reinstall user files.

(If you encounter any problems getting user group information through SNAP, see page 32.)

3 Note information on systems

Bring up the Systems category in SNAP. Select each system and write down all the information that appears on the screen. You will need this information when you reinstall the network. Also note which system is the master server so you'll know this when you reinstall the network.

(If you encounter any problems getting system information through SNAP, see page 33.)

4 Note information on groups

If you have set up more than one group for users, note the names and home directories of these groups by bringing up the Groups category in SNAP.

If you encounter any problems getting group information through SNAP, type the following command to print a listing of groups:

```
{system:1} ypcat group | lpr
```

5 Log out

Turn to the next page when done.

Note System Information

Complete the following steps for each Sun386i system.

1 Log in as root

Logging into the system as root ensures that you'll be able to examine and print any pertinent files.

2 Print configuration information

If for any reason you customized a system, you should print the related configuration files so that you'll later be able to reapply your original entries.

If you have customized the files in `/export/home/users/users` (or other group account setup directories), you should make note of your changes and reapply them manually once installation is complete.

If you have added printers by editing the `/etc/ypprintcap` or `/etc/printcap` files, or if you have made entries in `/etc/dos/defaults/boards.pc` to add boards for DOS, also print a copy of these files.

Also print out any other relevant system files that you may have changed.

3 Print a list of optional clusters

Type the following command to print a list of optional command clusters that may be loaded on this system.

```
{system:2} loadc | lpr
```

You will refer to this list later when you are reinstalling SunOS software.

4 Note information on expansion units, if needed

If a secondary disk is installed in the system's expansion unit, type the following commands to print lists of symbolic links (this example assumes you've set up the expansion unit partition as `/files1`):

```
{system:3} ls -lR /export | grep files1 | lpr
```

```
{system:4} ls -lR /etc/where | grep files1 | lpr
```

(Don't worry if these lists are blank: If you haven't set up special links for the expansion unit, nothing will be printed.)

Label this list: EXPANSION UNIT LINKS and include the system name on this list.

You should also print the `/etc/fstab` and `/etc/exports` files so that you can quickly set up the expansion unit again. Label these printouts with the file name and system name.

5 Log out

Log out of this system when you have completed steps 1–4.

6 Any more systems?

Return to step 1 on this page if there are additional systems for which you will need to note information.

Turn to the next page when you have noted this information for each system.

Back Up Data from Each System

Before you begin this procedure, make certain you have enough tapes or formatted diskettes to back up home directories, installed applications, and relevant system files. (You may need to read over this section to gauge how many tapes or diskettes you'll need.)

Note: As a general precaution, it is recommended that you make two backup copies of any files that are critical to your work.

If you have a second disk (housed in your expansion unit), you do not need to make a special backup of it unless you are planning to install SunOS on it. (See the note on page 18.)

Perform these steps for each system, including (on a network) the master server. Complete these steps for diskless clients first.

1 Log in as root

To back up system data, you'll need to log in as root from the login screen. See *Sun386i SNAP Administration* for information on root and the root password.

Once you have loaded the new bar command on one system, you can copy it to other systems on the network if you are familiar with the rcp command. Otherwise, simply load the command onto each system from diskette or tape.

2 Load the new bar command

A new version of the `bar` command is provided with Sun386i SunOS 4.0.1.Complete the following procedures to load this new software.

Note: If the Application SunOS 4.0.1 release was delivered to you on both diskette and tape, load the new command from diskette—it's much faster.

2a Load bar (from diskette, if possible)

To load from diskette, insert Application SunOS diskette #6 into the diskette drive, and type the following commands:

```
{system:SUPERUSER:3} cd /tmp
{system:SUPERUSER:4} bar xvfpZT /dev/rfd0c ./bin/bar
```

This loading procedure takes about a minute. When it's complete, the `SUPERUSER` prompt will appear. At that point, skip to step 2b.

To load from tape:

If the new software release was delivered only on tape, insert the Application SunOS 4.0.1 tape into the tape drive, and type the following commands:

```
{system:SUPERUSER:5} cd /tmp
{system:SUPERUSER:6} mt -f /dev/rst8 rew
```

(The tape has been rewound when the SUPERUSER prompt again appears.)

```
{system:SUPERUSER:7} mt -f /dev/nrst8 fsf 22
```

(The command takes about 5 minutes to complete.)

```
{system:SUPERUSER:8} cpio -icvdmu bin/bar < /dev/rst8
```

After about ten minutes, the words `bin/bar` will appear on the screen. When you see `bin/bar`, the command has been loaded and you can type Control-C to rewind the tape. When the tape finishes rewinding, you can remove it.

Because the new bar command is being stored in a temporary directory, you'll have to reload it if you turn off or reboot the system before finishing your backups

2b Move and rename the bar command

Type the following command:

```
{system:SUPERUSER:9} mv /tmp/bin/bar /tmp/newbar
```

This command renames the new `bar` to make it more convenient to use in later steps.

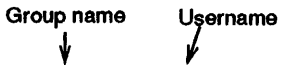
3 Back up home directories (skip for diskless clients)

Refer to the list of user information that you made earlier. If the system is listed as the "home directory server" for any user, you'll need to back up that user's home directory from this machine. Some systems may contain several home directories.

The /tmp/newbar command follows the same syntax as bar. For more information, see the entry for bar(1) in the *SunOS Reference Manual.*

To back up a home directory, change to the directory `/files/home/`*`group/name`*, where *group* is the primary group to which the user belongs, and *name* is the username. (By default, all users are placed in a group called `users`). Then use the `/tmp/newbar` command.

For example, here are the commands to back up (onto diskette) all files and directories in user `mtravis`'s home directory:




```
{system:SUPERUSER:1} cd /files/home/users/mtravis
{system:SUPERUSER:2} /tmp/newbar cvpfZ /dev/rfd0c .
```

(To back up to a tape, use `/tmp/newbar cvpfZ /dev/rst8 .`)

In some cases, one or more home directories may be on a second disk that is housed in the expansion unit. These directories are generally stored under /files1 instead of /files. You do not need to make special backups of these /files1 home directories unless you're planning to install SunOS on the second disk.

Back up each home directory onto its own tape or set of diskettes; you will need to restore home directories separately in a later step. Number each tape or set of diskettes and label it as a home directory backup. Include the user name, directory, system name, and date.

You can confirm that files were backed up onto diskette by typing:

```
{system:SUPERUSER:10}  /tmp/newbar tvf /dev/rfd0c
```

This command will display a list of the files you backed up. For tape, the command is `/tmp/newbar tvf /dev/rst8`

4 Remember application software (skip for diskless clients)

When possible, you should plan on completely reinstalling software applications once the upgrade to Sun386i SunOS release 4.0.1 is complete.

However, you may have software applications, shell scripts, and other programs that cannot be easily reinstalled from their original distribution tapes or diskettes. If this is the case, back up these programs now. You'll also need to back up any special setup files associated with the application.

To back up several applications' files or directories at once, provide a list of directories. For example, if you have directories on a system under `/files/vol` and `/usr/local`, you back them up onto diskette by typing:

```
{system:SUPERUSER:11} cd /
{system:SUPERUSER:12} /tmp/newbar cvpfZ /dev/rfd0c ./files/vol ./usr/local
```

(When backing up files in this way, always change to the root directory (`cd /`) and use a relative path name, using a period as shown.)

Number each tape or set of diskettes and label it with the application name, system name, and date.

5 Back up local files and directories

Back up the following files or directories from the system, as appropriate. You must use `/tmp/newbar` to back up these files.

- Any new directories users have added (usually these are under `/files`)
- Any system files you have customized (files that you didn't print earlier)
- The `/var/spool/cron/crontabs` directory (contains SNAP backup settings and other time-related commands)
- Files in `/var/spool/uucp/sys` and any customized files in `/usr/lib/uucp` (only required if you have UUCP set up on this system).
- Any custom system administration tools or scripts in `/var/adm`.
- User's mailbox files (only if they are in `/var/spool/mail`)

Note that mail is normally stored under a user's home directory—and was thus backed up in step 3—unless you changed policy settings. You can check the mail_delivery setting in the `/etc/policies` file on the master server to see where mail is delivered.

Clearly number and label each tape or set of diskettes. Include the contents, system name, and date.

6 Back up /etc files

As a precaution, you should also back up all files in the `/etc` directory. These files will probably fit on one diskette:

```
{system:SUPERUSER:13} cd /
{system:SUPERUSER:14} /tmp/newbar cvpfZ /dev/rfd0c ./etc
```

(To back up to a tape, use `/tmp/newbar cvpfZ /dev/rst8 ./etc`)

Label this tape or diskette: OLD /etc FILES and include the system name. You will not normally need to restore any of the files on this diskette—backing them up is simply recommended in case you later wish to refer to the information in these files.

7 Back up second disk, if necessary

If you plan to load the new SunOS 4.0.1 software onto a second disk housed in your expansion unit, you should back up all data on this disk. (In most cases, however, you should not be planning to install SunOS software on this disk. See the note on page 18 for details.)

8 Shut down the system

If the system serves a diskless client that has not yet been backed up, then do not shut down this system until you have backed up and shut down the diskless client.

If this system has a disk, type the following command to shut it down:

```
{system:SUPERUSER:15} fasthalt
```

9 Any more systems?

Return to step 1 on page 15 if there are additional systems to back up.

Continue to the next page when you have backed up all systems.

Installing 4.0.1 Software with Diskette or Tape

Follow this procedure for each system with a disk. You can start with any system.

This procedure requires you to restart the system and insert diskettes as instructed. If the system has a tape drive, simply insert the cartridge tape instead of the diskette. For further information on loading software, see pages 60–65 of *Sun386i System Setup and Maintenance.*

1 Turn off the power to your system, insert Application SunOS diskette #1 in the disk drive, and turn on the power

The startup procedure takes several minutes.

If you are loading from tape, you'll see an "unknown tape drive" message which you can ignore. If you see the message "unrecognized boot block," however, you should turn off the system, wait ten seconds, and then turn it back on with the tape still in the drive.

If you are loading from diskette, you'll see the following prompt:

```
Insert Application SunOS diskette 2, confirm (y/n):
```

Insert the second diskette. Then type **y** and press [Return]. The system displays additional information that does not require a response.

2 Choose the loading option

After approximately one minute, this message appears:

```
Initializing ram disk [from tape/diskette]: done
```

Then you'll see this menu on the screen:

```
1 - install SunOS
2 - install an upgrade kit
3 - enter expert mode
4 - shutdown
```

Select option 1

Choose option 1 to install the SunOS software.

Note on expansion unit disks: If you are installing SunOS 4.0.1 software on a system that has two disks (one disk in the Sun386i system unit and one in an optional Sun386i expansion unit), you'll see the following menu during installation:

```
Which disk do you want to be your system disk?
1 - the one in the system unit (sd2)
2 - the one in the expansion unit (sd0)
3 - shutdown
 Enter [1 - 3]:
```

Select option 1

In almost all cases, you should choose option 1.

Note to expert users: You should only choose option 2 if you are thoroughly familiar with the procedure for explicitly booting from the `sd0` drive. Once you have booted from `sd0` you will need to remove the SunOS system software from the `sd2` drive using the `newfs` command. This prevents the system from booting from `sd2` on subsequent startups.

If you want to use your expansion unit disk in this way, make sure your expansion unit disk has been completely backed up. Note that this is not a recommended configuration.

---

3 Confirm that you want to begin

Next, a message such as the following will appear:

```
WARNING: All files on the disk in the system unit (sd2) will be destroyed.
Do you really want to do this? (y/n)
```

Type **y** and press Return to indicate that you want to load the software.

Follow the instructions and prompts that appear.

(If you have a cartridge-tape-based system, you will not have to insert additional media to restore the core system. The necessary files are all contained on the cartridge tape that is already in the tape drive.)

If you are loading from diskette, you'll see the following prompt near the end of the installation process:

```
Do you want to load an upgrade diskette? (y/n)
```

There is no upgrade diskette with this SunOS release. Type **n** and press Return.

4 Load optional clusters

Additional prompts will appear asking if you want to load optional clusters. Refer to the list of optional clusters that you printed earlier for this system, and load the optional clusters as required.

5 Remove the tape or last diskette from the drive

After you have installed the 4.0.1 software, wait for the following to appear on the screen:

```
Installation complete
Remove the tape/diskette from the drive and power cycle the system.
Writing all file system information to the disks (syncing)...done
SunOS halted
>
```

Then, remove the last diskette or tape from the drive.

6 Turn off the system, and leave it off.

Do not turn the power on again until you're instructed to do so in later instructions. (Leaving the system turned off ensures that it does not try to rejoin the network until you've finished upgrading other systems.)

7 Any more systems?

Return to step 1 on page 18 if there are more systems to upgrade.

Continue to the next page once all systems have been upgraded.

Restarting a Standalone System

Complete these steps only if you are upgrading a standalone system. Otherwise, turn to page 22 for instructions on restarting your Sun386i network.

1 Power up the system

For instructions see pages 33–34 of *Sun386i System Setup and Maintenance.*

2 Add a user account – Do not log in as root

From the initial login screen, recreate your user account by pressing the Help key and following the prompts that appear.

Shortly after the user account is created, the Sun386i Desktop will appear.

3 Reenable expansion unit

If there is a second disk on your system, perform steps 3a–3g.

3a Become superuser

Use the `su` command to become superuser.

3b Set up any symbolic links

Recreate the symbolic links from the EXPANSION UNIT LINKS list that you printed earlier. (See Chapter 4 of *Sun386i SNAP Administration* and the *Sun386i Owner's Bulletin* for guidance in setting up these symbolic links.)

3c Edit the file /etc/exports

For each symbolic link you created, add a line such as the following to the `/etc/exports` file.

```
/directory -access=domain
```

For */directory*, substitute the name of the symbolic link that points to the expansion unit disk. For example:

```
/export/vol/books -access=domain
```

3d Edit the file /etc/fstab

Assuming your expansion unit disk was set up with a `/files1` partition as shown in *Sun386i SNAP Administration*, make the following entry:

```
/dev/sd0c /files1 4.2 rw 1 3
```

If you have partitioned your expansion unit disk differently, you should add appropriate entries from the `/etc/fstab` file you printed earlier.

3e Mount the disk

Type the following commands to mount the expansion unit directory:

```
{system:SUPERUSER:16} mkdir /files1
{system:SUPERUSER:17} mount /files1
```

(If you have repartitioned your expansion unit disk, you'll need to make directories and mount other partitions in the same way.)

3f Export the expansion unit directories

Type the following command to export the directories you specified in `/etc/exports`:

```
{system:SUPERUSER:18} exportfs -a
```

3g Exit superuser status

Type `exit` to leave superuser status.

4 Recreate group accounts

Certain groups are set up automatically, but you'll need to use SNAP to recreate any groups that are not listed on the SNAP Groups category.

If you originally customized group default files, you should reapply your changes to these before adding user accounts.

5 Recreate other user accounts

If there are other users with accounts on your system, add them using SNAP. Leave the password field blank so that users can later set up their passwords using the `passwd` command.

You must recreate all user accounts before continuing to page 25.

Turn to page 25 when done.

Restarting the Network

Now that each system has been upgraded, you can begin restarting the network. (If you are upgrading a standalone system, follow the steps on the previous pages, and then skip ahead to "Restoring Files" on page 25.)

1 Set up the master server

Follow the instructions on pages 140–145 of *Sun386i SNAP Administration* to set up the master server.

2 Add a user account – Do not log in as root

From the initial login screen, add one of the users whose home directory was previously stored on the master server. You will use this user account to add other users and systems through SNAP.

Shortly after the user account is created, the Sun386i Desktop will appear.

3 Add network clients

Add each workstation (except for slaves and diskless systems) from the list of systems you created earlier.

If you don't mind having new names assigned to your systems, you can use Automatic System Installation—just turn on the network clients and they'll add themselves to the network. (See page 146 of *Sun386i SNAP Administration.*)

If you want to preserve the original system names, add the systems through SNAP. To use SNAP, follow the instructions on pages 160–164 of *Sun386i SNAP Administration,* with the following corrections:

Step 1 – Skip this step

Step 2 – Replace with the following two steps:

2a. Plug the system into a power outlet. Do *not* connect the system to the Ethernet.

2b. Turn on the expansion unit, if there is one, and then the system unit.

Step 3 – Perform as shown

Step 4 – Skip this step for now

Steps 5–11 – Perform as shown

Step 12 (new) – Connect the system to the Ethernet

Step 13 (new) – Perform step 4 as shown on pages 161 and 162

4 Add slave servers, if applicable

If you previously had one or more slave servers, set them up now. You cannot use SNAP to set up a slave server. See pages 146–147 of *Sun386i SNAP Administration* for the procedure, with the following addition:

After following the instructions in *Sun386i SNAP Administration,* log in to the master server, become superuser, and change the following files:

`/etc/bootservers`	copy an existing entry, change the system name on the first line to match the name of the slave server, and make sure the third field reads 0; for example: `oak 3 0 16000 8192 40000 0`
`/etc/systems`	change the role from `network_client` to read `slave_bootserver`

After changing these two files, issue the following command:

```
{system:SUPERUSER:19}  cd /var/yp;make
```

5 Set up diskless clients

If you have diskless systems, install them now.

If you don't mind having new system names assigned, use Automatic System Installation; follow the instructions on pages 147–151 of *Sun386i SNAP Administration* to set a server to accept the diskless clients and to install the clients.

If you want to preserve the original system names, add the systems through SNAP. To use SNAP, follow the instructions on pages 176–177 to set a server to accept diskless clients. Then see pages 160–164 for instructions on adding diskless clients, with the following corrections:

Step 1 – Skip this step

Step 2 – Replace with the following two steps:

2a. Plug the system into a power outlet. Do *not* connect the system to the Ethernet.

2b. Turn on the expansion unit, if there is one, and then the system unit.

Step 3 – Perform as shown

Step 4 – Skip this step

Steps 5–11 – Perform as shown

Step 12 (new) – Connect the system to the Ethernet™

Note: Whether you use SNAP or Automatic System Installation, you should add diskless clients one at a time. Do not attempt to add two or more diskless systems to the network simultaneously.

6 Reenable expansion unit

If there is a second disk on a system, perform steps 6a–6g.

6a Become superuser

Use the `su` command to become superuser.

6b Set up any symbolic links

Recreate the symbolic links from the EXPANSION UNIT LINKS list that you printed earlier. (See Chapter 4 of *Sun386i SNAP Administration* and the *Sun386i Owner's Bulletin* for guidance in setting up these symbolic links.)

6c Edit the file /etc/exports

For each symbolic link you created, add a line such as the following to the `/etc/exports` file.

```
/directory -access=domain
```

For */directory*, substitute the name of the symbolic link that points to the expansion unit disk. For example:

```
/export/vol/books -access=domain
```

6d Edit the file /etc/fstab

Assuming your expansion unit disk is set up with a `/files1` partition as shown in *Sun386i SNAP Administration*, make the following entry:

```
/dev/sd0c /files1 4.2 rw 1 3
```

If you have partitioned your expansion unit disk differently, you should add appropriate entries from the `/etc/fstab` file you printed earlier.

6e Mount the disk

Type the following commands to mount the expansion unit directory:

```
{system:SUPERUSER:20} mkdir /files1
{system:SUPERUSER:21} mount /files1
```

(If you have repartitioned your expansion unit disk, you'll need to make directories and mount other partitions in the same way.)

6f Export the expansion unit directories

Type the following command to export the directories you specified in `/etc/exports`:

```
{system:SUPERUSER:22} exportfs -a
```

6g Exit superuser status

Type `exit` to leave superuser status.

7 Recreate group accounts

Certain groups are set up automatically, but you'll need to use SNAP to recreate any groups that are not listed on the SNAP Groups category.

If you originally customized group default files, you should reapply your changes to these before adding user accounts.

8 Recreate user accounts

Recreate the user accounts using SNAP. Leave the password fields blank so that users can later set up their passwords using the `passwd` command.

You must recreate all user accounts before continuing to the next section.

Continue to the next page when you have recreated all user accounts.

Restoring Files from Diskette or Tape

Follow these steps for each system with a disk.

1 Log in as root

Log into the system as root. (If a user is already logged in on the system, you can use the `su` command instead to become superuser.)

2 Restore home directory files

If this is a home directory server or a standalone system, you should restore the home directory (or directories) that you backed up previously from this system. Change to the appropriate home directory and restore the files using the `bar` command. For example, to restore `mtravis`'s home directory from diskette, you'd type:

```
{system:SUPERUSER:23} cd /files/home/users/mtravis
{system:SUPERUSER:24} bar xvfpZ /dev/rfd0c
```

(For tape the command is `bar xvfpZ /dev/rst8`)

3 Change ownership of home directory files

Because the User IDs of the newly added user accounts differ from the IDs on the diskette or tape, you'll need to use the `chown` command to make the files accessible to the user who "owns" them.

Before typing this command, make sure you're still in the user's home directory. Substitute the user's name for *`user`* and the group name for *`group`*:

```
{system:SUPERUSER:25} chown -R user.group ~user/.
```

4 Restore local system files

For each system, restore any needed local files from the diskettes or tapes you made previously. If you need to restore files from `/etc`, change to the `/tmp` directory and restore the old files there. Then, compare the old and new versions of these files, and apply your changes manually. Do not directly replace the new `/etc` files with the older versions.

5 Change ownership of local files

Because users now have new User ID numbers, you'll need to change ownership of any system files you restored, such as those in `/var/spool/cron/crontabs` and `/var/spool/mail`. For each such file, use the `chown` command, substituting the appropriate entries for *`user`*, *`group`* and *`filename`*:

For more information, see the entry for chown(8) in the *SunOS Reference Manual*.

```
{system:SUPERUSER:26} chown user.group filename
```

6 Remember application software

Reinstall or restore applications, as appropriate. Follow the installation instructions in the application manuals.

7 Reinstall driver software

If you originally installed any loadable drivers for use with hardware or software applications on your system, reinstall these drivers now. Follow the installation instructions that came with the hardware or software package you purchased.

8 Restore mail links

Restore any UUCP or other mail links. If you previously backed up these files from `/var/spool/uucp/sys` or `/usr/lib/uucp`, you should restore them to the `/etc/uucp` directory (these files have been moved to `/etc/uucp` in 4.0.1). See Chapter 9 of *Sun386i Advanced Administration* for instructions on mail.

9 Any more systems?

Return to step 1 on this page if there are more systems to restore.

Continue to the next page when you have restored all files on all systems.

Reinstalling Printers, Terminals, and Modems

1 Use SNAP to reinstall any printers, terminals, or modems

Several popular varieties of printers, terminals, and modems are supported by SNAP. You should use SNAP to install these devices whenever possible. Note also that previous problems with support for Epson™ and Hewlett-Packard LaserJet printers have been corrected; you no longer need to hand-administer the files associated with these printers.

2 Edit system files, if necessary

For devices not supported by SNAP—including PostScript® printers and printers not connected to Sun386i systems— you'll need to edit the appropriate system files. For example, to make custom entries for a printer you would add appropriate entries to the `/etc/ypprintcap` and `/etc/printcap` files. Refer to the printouts you made earlier of these configurations files.

If you previously printed the `/etc/dos/defaults/boards.pc` file, refer to your printout and reapply your custom changes to the new `boards.pc` file on the system. See *Sun386i Advanced Skills* for more information on this file.

Updating User Files

Users should perform these steps while logged in under their own user names (not as root).

1 Set up a password

Each user should set up a password using the `passwd` command. Because there is no current password set up, press Return at the "Old password:" prompt. Then, type your new password twice. See page 123 of the *Sun386i User's Guide* for instructions.

2 Copy default files

New versions of the `.defaults`, `.orgrc`, `.cshrc`, `.login`, `.mailrc`, and `.sunview` files exist for Sun386i SunOS 4.0.1., and a command is provided to copy the new versions of these files to your home directory. The original files are saved with `.old` appended to their names (for example, the original `.cshrc` becomes `.cshrc.old`.)

To update your default files, type the following command:

```
{system:5} update_defaults
```

Follow the prompts and instructions that appear on the screen.

If the directory `/home/users/defaults` is not available to your system, you'll be prompted for an alternate directory. Type the following directory name as an alternate:

```
/files/home/users/users/defaults
```

(If you are on a diskless system, this alternate directory probably won't be available to your system; you'll need to temporarily log into a system that has a disk and rerun `update_defaults`.)

3 Edit new default files, if necessary

If a user or application previously made changes to any of these default files (such as updating the `path` setting in the `.cshrc` or `.login` file), the changes need to be reapplied manually to the new versions that you have copied.

Updating DOS

DOS Windows users should perform the following steps to upgrade their drive Cs to the newest level of DOS software. This procedure does not affect any user files on drive C.

1 Start a DOS window

You'll see the following message in the System Messages window:

```
ROM is newer than .quickpc.  Rebooting DOS Window
```

(This message simply indicates that you've upgraded to a new SunOS version without updating DOS. The message won't reappear once you have completed the DOS update.)

2 Preserve 4.0 mouse driver (optional)

If you have been using the Microsoft Mouse®, make a backup copy of the mouse driver before you upgrade the DOS files on drive C:

```
D:\> COPY C:\MOUSE.SYS C:\OLDMOUSE.SYS
```

Preserving the old mouse driver is just a precaution; under most circumstances you'll be using the new, faster version of the mouse driver. However, if you notice mouse cursor display problems while using the new mouse driver on an external monitor, you may be able to correct the problem by switching back to the `OLDMOUSE.SYS` driver.

3 Update DOS files on drive C

Type the following command at the DOS prompt:

```
D:\home\mtravis> REPLACE R:\ETC\DOS\MSDOS\*.* C:\
```

When the DOS prompt reappears, quit the DOS window by typing `quit`.

4 Restart DOS from a Commands window

From a Commands window, type:

```
{system:6} dos -s
```

This updates the DOS "quick-start" (`.quickpc`) file so that DOS windows will open faster. During this procedure, a DOS window will open, display various startup prompts, and then disappear.

5 Update C:\CONFIG.SYS (optional)

Users can add new settings to their `CONFIG.SYS` files on drive C. The following entries can improve DOS performance and ensure better compatibility with certain DOS applications:

```
stacks=0,0
files=20
fcbs=45,45
buffers=5
```

Users who first begin using DOS after this Sun386i software upgrade will have these new settings placed in `C:\CONFIG.SYS` automatically.

Finishing Up

This completes the upgrade procedure for standalone systems or systems on networks with a Sun386i master server. Be sure to review the *Owner's Bulletin for Sun386i SunOS 4.0.1* for additional information about the Sun386i SunOS 4.0.1 software release.

Upgrading Sun386i Systems on non-Sun386i YP Networks

The following pages contain instructions for upgrading Sun386i workstations on a network whose master server is not a Sun386i workstation. For instructions on upgrading standalone systems, or networks with a Sun386i master server, see page 12.

These instructions assume you are experienced in system administration on Sun-3, Sun-4, or mixed networks.

The steps for systems that were set up on an existing YP domain are:

- Backing up data from Sun386i disks
- Installing the Sun386i SunOS 4.0.1 software
- Restoring the data to the Sun386i disks
- Rejoining the network

Note that these instructions do not cover all the customizations you might have done to your system. If you are a sophisticated SunOS user and you have customized your system, you should follow the instructions in this pamphlet and *only then* recustomize the system, if appropriate.

Note: As a general precaution, it is recommended that you make two backup copies of any files that are critical to your work.

If you encounter problems with any of these steps, see page 30.

1 Back up data from each Sun386i workstation

This includes any volumes users have defined, home directories, mail spool areas, and any software or data files which users have stored on their Sun386i hard disks. If you have for any reason customized a system (for example, to install a printer, DOS boards, or a UUCP link), you should print or save this configuration as well. As a precaution, you should also back up all files in the `/etc` directory in case you need to refer to them later (you will not normally need to restore these files).

Make sure you have enough backup media (tapes or formatted diskettes) to hold all the data from each machine.

If you plan to back up files using the `bar` command, log in as root and load the new version of `bar` onto each Sun386i system, following steps 1 and 2 on page 15. Then, see page 16 for examples of how to use the newly loaded `/tmp/newbar` command.

2 Halt each system

Log in as root, and type the following command to halt the systems you are upgrading:

```
{system:SUPERUSER:27} fasthalt
```

3 Install SunOS 4.0.1 software

Follow steps 1–6 beginning on page 18 of these notes.

4 Rejoin the network

Turn on the system, and press the Stop key when you see the message "Searching for a Server." When the "Could Not Install" menu appears, choose option 3 to join the network without Automatic System Installation. Then, answer the various questions that appear.

If you require subnets but you are not using YP subnets, create an `/etc/netmasks` file following the instructions in *Sun386i Advanced Administration.*

5 Restore your data

If you backed up files using the bar command, see page 25 for examples of how to restore them.

Log in as root and restore the files you backed up previously. Then, use the chown command to make the files accessible to the user who owns them. (See steps 3 and 5 on page 25 for examples and explanations of changing file ownership.)

If you backed up any files from `/var/spool/uucp/sys` or `/usr/lib/uucp`, you should restore them to the `/etc/uucp` directory (UUCP files moved to `/etc/uucp` in the 4.0.1 release).

Note: If you need to restore files you previously backed up from the `/etc` directory, change to the `/tmp` directory and restore the old files there. Then, compare the old and new versions of these files, and apply your changes manually. Do not directly replace the new `/etc` files with the older versions.

6 Reinstall printers, modems, and other devices

If you had a printer, modem, terminal, or other device installed on this Sun386i workstation, you'll need to reinstall these devices following the instructions in *Sun386i Advanced Administration.*

7 Restart network locking services

If there are Sun-3 or Sun-4 home directory servers on your network, you will need to upgrade the lock daemon software running on these servers. See the *Administrator's & Developer's Notes for Sun386i SunOS 4.0.1* for details.

8 Update user setup and DOS files

Follow the steps shown on pages 26–27 for updating user's files and DOS.

Finishing Up

This completes the upgrade procedure for Sun386i systems on non-Sun386i YP networks. Be sure to review the *Owner's Bulletin for Sun386i SunOS 4.0.1* for additional information about the Sun386i SunOS 4.0.1 software release.

If You Have Problems

If you have problems after upgrading a Sun386i system on a mixed network, check the following areas:

File systems not available – If certain files aren't available when you expect them to be, go to the system where the files reside, become superuser, and type the following command for a list of exported file systems:

```
{system:SUPERUSER:28}  exportfs
```

If directories aren't listed that should be, type the following command to export them:

```
{system:SUPERUSER:29}  exportfs -a
```

For more information on exporting file systems, see *Sun386i Advanced Administration.*

Problems at power-up – If a system takes more than a few minutes to display the log-in screen, it may be because of a problem booting. By default, system boot messages are turned off. You can set a system to display boot messages by doing the following when the system is booting:

1. Simultaneously press the Stop and a keys to stop the system from booting.
2. At the > prompt, type:

```
> q 494 1
> g 0
```

The system will display the message "panic: zero", sync the disks, and begin booting again, displaying traditional UNIX diagnostic messages as it proceeds.

To turn "verbose" mode off again, so that boot messages are not displayed:

1. Quit any work
2. Become superuser and type: **fasthalt**
3. At the > prompt, type:

```
> q 494 0
> g 0
```

The system will display the message "panic: zero", sync the disks, and then reboot.

System messages file – If you have other problems starting up or logging into a system, examine the `/var/adm/messages` file if possible; it may help you determine what's wrong.

Single-user mode – If you have trouble accessing local files in single-user mode, type the following commands:

```
# mount -at 4.2
# mount -at lo
```

These commands mount all local files. Note that you cannot access remote file systems while in single user mode, and that the above commands won't work if the system has mounted the root file system as read-only because of errors.

Restoring configuration settings – If you have problems after custom-installing a Sun386i system, you can restore all setup files to their original state using the `unconfigure` command. Be careful with unconfigure, because it erases local home directories and certain other user files. See the *Administrator's & Developer's Notes* for more information on this command.

Upgrading Individual Systems on a Sun386i Network

These notes are provided so that you can test your applications under Sun386i SunOS 4.0.1 without needing to upgrade the entire network. You can perform this procedure only if all of the following statements are true of the system you want to upgrade:

- The system is not a YP server or a diskless boot server
- The system has a single disk
- There is a single home directory (or no home directory) stored on this system
- There is no printer, terminal, or modem on this system

Note: This is a temporary upgrade to allow you to evaluate application compatibility under Sun386i SunOS 4.0.1. When you upgrade the network, you must upgrade this system again.

Because of software incompatibilities between Sun386i 4.0 and 4.0.1, SNAP and New User Login features will not work from this system until the entire Sun386i network is upgraded. Because of these incompatibilities, this is not a supported procedure.

Below are some general guidelines for upgrading the system.

1 Log in as root

2 Load the new bar command

Complete all applicable parts of step 2 on page 15.

3 Back up files

Use the `/tmp/newbar` command to back up any files or directories you have modified or added to this system. Back up the home directory through `/export/home`, using the `L` option to preserve symbolic links. For example, to back up the home directory for `mtravis`, type:

```
{system:SUPERUSER:30} /tmp/newbar cvpfZL /dev/rfd0c /export/home/users/mtravis
```

4 Back up /etc/exports

Back up the `/etc/exports` file:

```
{system:SUPERUSER:31} /tmp/newbar cvpfZ /dev/rfd0c /etc/exports
```

5 Note configuration files

Note any changes you have made to any configuration files on this system, such as those in the `/etc` directory.

6 Install Sun386i SunOS 4.0.1

Follow steps 1–6 beginning on page 18.

7 Restore files

Turn on the system, log in as root, and restore all files you backed up previously. The command to restore files from diskette is:

```
{system:SUPERUSER:32} bar xvpfZL /dev/rfd0c
```

8 Reboot the system

The system reinstalls itself on the network as soon as it finishes rebooting. Type the following command to reboot the system:

```
{system:SUPERUSER:33} reboot
```

9 Update user files

Log into the system, and update user and DOS files as shown on pages 26 and 27.

Special Notes

The following pages cover special situations that you may encounter while displaying information in SNAP before upgrading to Sun386i SunOS release 4.0.1.

Getting User Group Information

In certain cases, an alert may appear when you try to access user accounts through SNAP. Write down the user name and home directory server listed in the alert message.

Then, type the following command to list the secondary groups to which this user belongs (substitute the actual user name for *user*):

```
{system:7} ypcat group | grep user
```

A list such as the following would appear for user `mtravis`:

```
operator:*:5:users,mtravis,ahinkle

networks:*:12:users,mtravis,dlamont

accounts:*:11:users,mtravis,ahinkle

devices:*:13:users,mtravis,ahinkle
```

In this example, the user belongs to the `operator`, `networks`, `accounts`, and `devices` secondary groups.

Next, type the following command to obtain the Group ID (GID) of the user's primary group:

```
{system:8} ypmatch user passwd

mtravis:a28randasd:100:101:Mal Travis:/home/mtravis:/bin/csh
```

The GID is the number in the fourth field (fields are separated by colons). In this case, the GID is 101.

Finally, type the following command to match the GID number to the name of the user's primary group:

```
{system:9} ypmatch GID group.bygid
```

Write down the names of the primary and secondary groups, so you'll have them when you add the user account during reinstallation.

Getting System Information

In certain cases, an alert window may appear when you try to access system information through SNAP.

If you see such an alert window, use the following command to obtain system information.

To see the network's YP domain name, type:

```
{system:10} domainname
```

To print a list of systems on the network, type:

```
{system:11} ypcat hosts | lpr
```

To print a list of Ethernet addresses, type:

```
{system:12} ypcat ethers | lpr
```

For information on diskless clients, type:

```
{system:13} ypcat bootparams | lpr
```

Each line of the "bootparams" printout has a section such as the following:

... root=*bootserv*:/export/root/*oak* ...

In this example, *bootserv* is the name of the boot server, and *oak* is the name of the diskless client.