



**SCO OpenServer Release 6
Upgrading from SCO OpenServer Release 5
Revision 1.4**

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1 Overview

This guide explains how to migrate SCO® OpenServer™ Release 5 system data to the Release 6 platform. Because these platforms differ significantly, migration is accomplished by a set of detailed procedures rather than a single upgrade process. While SCO OpenServer Release 6 contains many new and updated features and subsystems, much of the data from your SCO OpenServer Release 5 system can be used under Release 6 with little or no modification.

System files subject to migration fall into two categories:

- Some data files, such as Domain Name Service (DNS) files, can simply be copied over to the SCO OpenServer Release 6 system using procedures included in this guide.
- Certain configuration files do not work on Release 6 and must be revised or merged. In such cases, this guide describes how to save your configuration and provides links to additional information.

NOTE: Check the following web site regularly for updates to this and other OpenServer Release 6 documents: <http://www.sco.com/support/docs/openserver>

1.1 How to use this guide

This guide includes three procedural chapters that should be followed in the order presented:

[Migrating your hardware configuration](#)

Explains what hardware is detected and configured automatically on Release 6 and the interfaces to be used when manual configuration is necessary.

[Migrating your filesystems and user data](#)

Details archiving user accounts, presents several methods for copying filesystems over to Release 6, and explains how to restore backups created with the Release 5 **Backup Manager**.

[Migrating your networking configuration](#)

Explains which configuration files can be copied over to Release 6 for all network subsystems and protocols, and those that require relocation and/or merging with their Release 6 counterparts. Also documents key differences and additional considerations related to new features. This chapter covers the migration of sendmail and MMDf configurations as well.

The chapter on "[System software and command differences](#)" is a reference to orient the administrator in the SCO OpenServer Release 6 environment, with detailed explanations of how it differs from Release 5.

1.2 About Installing SCO OpenServer Release 6

After creating your backups and printing out or recording your system configuration, consult the SCO OpenServer Release 6 *Getting Started Guide* and **Late News** on the SCO web site before beginning your installation (see **NOTE** above).

2 Migrating your hardware configuration

For the most part, your hardware devices will be configured automatically when you install SCO OpenServer Release 6. If an adapter, bus card, data port, or peripheral is not recognized after the installation, use the information in this chapter to configure your hardware.

NOTE: Most SCO OpenServer Release 5 devices and drivers are supported under Release 6, but you should verify this with the hardware compatibility web page: <http://www.sco.com/chwp>. Specialized devices (such as multiport serial cards) require drivers written by the hardware vendor. You may need to obtain new drivers for Release 6 from the vendor.

2.1 Configuration interfaces

SCO OpenServer Release 6 provides a set of SCOadmin managers similar to those available on Release 5. For differences between Release 6 configuration interfaces and those provided with SCO OpenServer Release 5, see "[System software and command differences](#)."

Most hardware is automatically detected and configured. Some hardware requires configuration using **mkdev** scripts that can be run from the command line (the `/usr/lib/mkdev` directory) or with the SCOAdmin **Hardware/Kernel Manager**. The UnixWare Device Configuration Utility (DCU) has been added to SCOadmin, but it is intended to resolve conflicts with older hardware that cannot be detected and configured automatically.

For more information, consult the "Hardware" topic in the SCO OpenServer Release 6 online documentation.

2.2 Sound cards

The SCOAdmin **Audio Manager** has been removed. Sound cards are detected and configured automatically at install time. Currently, only the Intel ICH4 and prior chipsets that comply with the AC'97 standard are supported. A new driver will be made available that extends support to include newer chipsets.

2.3 Printers

It is not possible to migrate your print system configuration – simply use the SCOadmin **Printer Manager** to re-create your setup. Note that [CUPS](#) is also supported in SCO OpenServer Release 6.

2.4 Network adapters

Use the **Network Configuration Manager** to configure LAN network adapter drivers, and LAN and WAN protocols. Note the configuration details of the network adapter hardware (IRQ, I/O address range, memory address range, DMA channel) in your system so that you can configure your SCO OpenServer Release 6 system with these values. For SCO OpenServer Release 5, note the details displayed by the **Network Configuration Manager**.

For more information, see "Configuring network hardware" in the SCO OpenServer Release 6 online documentation.

2.5 Modems

Use the **Modem Configuration Manager** to:

- add serial and ISDN modems to your system
- configure WAN protocols including PPP

For more information, see “Configuring modems” in the SCO OpenServer Release 6 online documentation.

NOTE: PC Card (PCMCIA) modems must be configured using the [Device Configuration Utility](#) (DCU). ISDN modems are configured with the **Modem Configuration Manager**. ISDN bus adapters are configured with the **Network Configuration Manager**.

2.6 Serial ports

You no longer need to run the **Serial Manager** to add, modify, or delete serial boards. These devices are automatically configured at boot-time. However, you do need to run the **Serial Manager** to configure the ports attached to the boards and set up the *inittab* entries. Simply starting the manager is sufficient to configure the ports; they are configured automatically and you can exit.

2.7 Mass storage devices

Use the Device Configuration Utility (DCU) to add support for tape, CD-ROM, and hard disk drives that were not auto-detected during the installation process.

2.8 Tape backup

Most tape drives supported on SCO OpenServer Release 5 can be used on SCO OpenServer Release 6, but some floppy-tape (QIC-80) devices may not be supported.

For more information, see “Adding tape drives” in the SCO OpenServer Release 6 online documentation.

NOTE: The SCO OpenServer Release 5 **Backup Manager** is not supported in SCO OpenServer Release 6. You can read and restore backup tapes from your SCO OpenServer Release 5 system as described in [“Restoring SCO OpenServer Release 5 backups”](#).

2.9 Video adapters

During the SCO OpenServer Release 6 installation, you can select to have your video adapter automatically configured. The **Video Configuration Manager** interface has been replaced with the X.Org configuration tool and can be run by entering **scoadmin video**.

For more information, refer to the X.Org documentation under “Graphical Environment” in the online documentation.

3 Migrating your filesystems and user data

This chapter explains how to:

- [Archive user account information](#)
- [Load user accounts on Release 6](#)
- [Copy Release 5 filesystems over to Release 6](#)
- [Restore data from Release 5 backups](#)

3.1 Archiving accounts on your SCO OpenServer Release 5 system

The **ap** (account profile) utility is supported on both platforms. Should you need to gather accounts from multiple systems or routinely copy accounts across platforms, you can do it more simply using **ap(ADM)**. **ap** gathers account information from the `/etc/passwd` file and the Protected Password database. Irrelevant information about the user (including unsuccessful login attempts, unsuccessful password changes, and the location and time of the last login) is not included in the profile.

To create a complete archive of your present users, log in as *root* and enter this command:

```
ap -d -g -v > profile.acct
```

To archive a subset of accounts, simply include a list as in this example:

```
ap -d -g -v nathanb mavrac sergeo renard > profile.acct
```

You can also ignore the group membership information for each account by dropping the **-g** (with either of the above commands).

3.2 Loading accounts onto your SCO OpenServer Release 6 system

Using the *profile.acct* file saved from your SCO OpenServer Release 5 system, you can later load the accounts on your SCO OpenServer Release 6 system with the restore option of the **ap** command.

Because long passwords are supported in different ways in SCO OpenServer Release 5 and SCO OpenServer Release 6, there are two ways that you can create a user account from the profile depending on how you want to handle user accounts that have long passwords.

The first method truncates long passwords to 8 characters. Enter the following command:

```
ap -r -f profile.acct usernames
```

If you do not specify any *usernames*, all accounts stored in *profile.acct* are copied to the system.

The new accounts should now be in place and ready for use. The **ap** command will warn you if any passwords had to be truncated. Instruct these users to only enter the first 8 characters of their password when they first log in. They will also be required to change their password at this time.

The second method allows you to specify a password using the **-p** option:

```
ap -r -f profile.acct -p password usernames
```

(Again, *usernames* is optional.) All user accounts with passwords longer than 8 characters will be assigned the same password. These users are prompted to change their password when they first log in. For example, if the users *nathanb* and *mavrac* both had passwords longer than 8 characters, the following command would set their login password to "Global1":

ap -r -f profile.acct -p Global1

Other accounts present in the file with short passwords are unaffected.

If you want users to have different initial passwords, invoke one command for each user.

3.3 Migrating Release 5 filesystem data to Release 6

There are a number of methods for migrating data from a Release 5 system to a Release 6 installation, including:

- [Network copy](#)
- Mounting legacy filesystems on Release 6
- [Filesystem copy using an external USB hard disk drive](#)
- [Dual boot configuration](#)
- [Backup/restore using MicroLite Backup Edge](#)

The method or combination of methods you choose will depend upon your needs. We suggest that you keep the following considerations in mind:

- Transferring applications with corresponding data takes careful planning. Be sure to allow adequate time for bringing up the applications on the new system.
- Copying your data over to Release 6 allows the filesystems to be reorganized with VxFS and enables you to take advantage of Large File Support (LFS).
- The best method is one that copies the data and leaves the original system intact. This allows you return to the original system should problems arise with the new system during the transition period.
- Will you need to switch the workload quickly and frequently between the old Release 5 system and the new Release 6 systems? A requirement of this type might arise if production must continue on the Release 5 system during business hours, but you wish to run tests with Release 6 during off-hours (until you are ready to switch permanently to Release 6).
- Do you have the necessary hardware on hand for the method(s) you have chosen (network gear, disk and tape drives, or tape media)?
- Are you prepared for hardware failures? Reconfiguring internal hardware can be problematic; network, USB or hot add SCSI disks are preferred.
- Any method involving transferring data with **cpio** will not preserve the creation time on files or the creation/modification time on directories. Normally, this is not a problem unless your applications have special needs.

3.3.1 Mounting legacy filesystems on Release 6

The simplest method of migrating data from a SCO OpenServer Release 5 system is to create backups and restore them after installing SCO OpenServer Release 6.

Another method is it to add an existing Release 5 disk (5.0.6 or later) to an SCO OpenServer Release 6 system, mount the filesystems, and then copy all of the files from the Release 5 disk to filesystems on a Release 6 disk. Both methods allow you to take advantage of the **vxfs** filesystem and large file support.

If the **wd** supplement was never installed on your Release 5 system, you must install it before bringing any drives over to Release 6.

Disks from systems previous to Release 5.0.6 are not supported. You must use backups to move data to Release 6 if this is the case.

To add a disk created on SCO OpenServer 5.0.6 or 5.0.7 to an SCO OpenServer Release 6 system, follow these steps:

1. Power-down your Release 6 system and connect the Release 5 drive.
2. Power-up the system. During the boot process, SCO OpenServer Release 6 discovers the new disk and displays a message to that effect, and immediately reboots -- this is normal. As the system is coming back up, the new drive(s) are listed along with the previously existing devices.
3. When the boot process completes, log in as **root** and run the **Filesystem Manager (scoadmin filesystem)**. Select **Mount⇒Add Mount Configuration⇒Local**.
4. When the **Add Mount Configuration** screen appears, click on the **Device File** pulldown list to get a complete list of mountable filesystems. Click on the **Filesystem Type** field to reveal the type.
5. Enter a mount point for the filesystem and select the desired mount options. Click on **OK** and exit the **Filesystem Manager**.

You can now copy data from the Release 5 disk to filesystems on a Release 6 disk.

3.3.2 Network Copy

Many systems are already connected to a network but not directly connected to an archival storage device, making network transfer of the data very convenient.

Arrange for a short and (if possible) isolated network. Attaching both systems to a switching hub is ideal, as it protects the rest of the network from the high traffic load and protects the transfer from network problems.

For best results, reassign the host name and IP address of the old (Release 5) system to a temporary name/address, so that the new system can be installed with the original name and address.

Add the Release 5 system to the `./rhosts` file on the Release 6 system, for example:

```
old_system.mygroup.mydoman.net root
```

Make sure that `./rhosts` has permission 0600 on the Release 6 system:

```
chmod 0600 ./rhosts
```

On the Release 5 system, use a command of the following form to transfer each filesystem in turn:

```
cd /fs  
find . | cpio -oc | rcmd new_system 'cd /fs; cpio -icdm'
```

3.3.3 Filesystem copy using an external USB hard disk drive

A high capacity external USB 2.0 drive is an ideal tool for moving filesystem data. Such drives can be purchased at reasonable prices in sizes up to a terabyte. Typically, all of the data on a Release 5 system can be accommodated on a single drive and used to copy the data over to your Release 6 system.

WARNING: You must have Maintenance Pack 3 installed on your Release 5.0.7 system before you begin this process.

1. Make certain that your external hard drive and the port on your computer are both USB 2.0. Check your system BIOS and ensure that USB 2.0 support is enabled (Hi-Speed mode). If

you are using a USB 1.x port or disk (or USB 2.0 mode is disabled in the BIOS), the data transfer speeds will be far too slow to be useful.

2. Make note of the filesystems (and sizes) that you plan to copy over to the external drive before you begin.
3. Attach the USB disk device to your Release 5.0.7 system and run **mkdev hd** as described in ["Configuring a USB hard disk"](#) in your Release 5 online documentation.
4. See ["Installing a hard disk"](#) in your Release 5 online documentation for more detailed information on running **mkdev hd** the second time to create filesystems. You can make a set of filesystems that duplicate those present on your current Release 5 disk(s).
5. Add the desired filesystem(s) to your mount configuration by starting the **Filesystem Manager**. Select **Add Mount Configuration** from the **Mount** menu, then select **Local**.
6. Enter a temporary mount point (for example, **/fs_copy**, **/home_copy**, and so on) for each filesystem and be sure to de-select the option "When to Mount: At System Startup."
7. When your settings are complete, click on **OK** and exit the **Filesystem Manager**.
8. Copy the data in each filesystem as shown in this example for a filesystem named **fs**:

```
cd /fs
find . | cpio -pdm /fs_copy
```

9. Unmount the filesystems, unplug the USB disk, and attach it to your Release 6 system.
10. Log in as *root* and issue the following command to find your filesystems:

```
getlclfsdev
```

For example, you might find that your filesystems show up on devices `/dev/dsk/c2b0t0d0p3s0` through `/dev/dsk/c2b0t0d0p3s3`:

```
/dev/boot EAFS MOUNTED
/dev/boot vxfs MOUNTED
/dev/dsk/c2b0t0d0p3s0 HTFS NOT-MOUNTED
/dev/dsk/c2b0t0d0p3s1 HTFS NOT-MOUNTED
/dev/dsk/c2b0t0d0p3s2 HTFS NOT-MOUNTED
/dev/dsk/c2b0t0d0p3s3 HTFS NOT-MOUNTED
```

In this example, the filesystems show up as four slices (s0 through s3) on partition number 3 (p3). This combined partition and slice notation is new to Release 6 – see ["Hard disk nodes"](#) for more information (including compatibility with traditional OpenServer device nodes).

Run **divvy** on the partition node for the USB disk, as in this example using the information obtained from **getlclfsdev**:

```
divvy /dev/rdisk/c2b0t0d0p3
```

For each filesystem division, use the **divvy** "name" (**n**) option to name your filesystems and create device nodes. For example, if you name a filesystem "fs," then **/dev/fs** and **/dev/rfs** are created.

Use the **Filesystem Manager** to mount the filesystems you created. This also adds the proper entries to `/etc/default/filesys`.

3.3.4 Dual Boot Configuration

If you need to switch back and forth between Release 5 and Release 6, you can create a dual boot configuration as described in this section.

WARNING: To protect your existing data, we recommend that you install a new disk for loading Release 6, and power down or disconnect all existing disks during the Release 6 installation. After Release 6 is installed, power up or reconnect all of the disks.

The recommended way to switch between boot targets is to using the system BIOS to select the desired boot disk. Release 6 is capable of booting even if the disk target number has changed from the time of installation.

1. Once Release 6 is up and running with all the disks powered on, you can find the pre-existing filesystems using this command:

getlclfsdev

This utility lists all the filesystems discovered by the system and whether or not they are mounted. For example, you might find that your filesystems show up on devices `/dev/dsk/c2b0t0d0p3s0` through `/dev/dsk/c2b0t0d0p3s3`:

```
/dev/boot  EAFS  MOUNTED
/dev/boot  vxfs  MOUNTED
/dev/dsk/c2b0t0d0p3s0  HTFS  NOT-MOUNTED
/dev/dsk/c2b0t0d0p3s1  HTFS  NOT-MOUNTED
/dev/dsk/c2b0t0d0p3s2  HTFS  NOT-MOUNTED
/dev/dsk/c2b0t0d0p3s3  HTFS  NOT-MOUNTED
```

2. Run **divvy** for each pre-existing partition you have found, as in this example:

divvy /dev/rdisk/c2b0t0d0p3

Note that the partition numbering in Release 6 is in the opposite order from Release 5. However, the divisions do appear in the same logical order.

3. For each filesystem division, use the **divvy** “name” (n) option to name your filesystems and create device nodes. For example, if you name a filesystem **fs**, then **/dev/fs** and **/dev/rfs** are created.
4. Use the **Filesystem Manager** to mount the filesystems you created. This will also add the proper entries in `/etc/default/filesys`.
5. Repeat this procedure for each disk and each partition you have found.

3.3.5 Backup/restore using Backup Edge from MicroLite

This procedure will be added when the new version of Backup Edge for SCO OpenServer Release 6 becomes available.

3.4 Restoring SCO OpenServer Release 5 backups

You can use the **cpio(C)** command line to restore archives created with the **Backup Manager** under SCO OpenServer Release 5.

To restore an SCO OpenServer Release 5 backup on SCO OpenServer Release 6 using **cpio**:

1. Log in as *root*.
2. To list the backup contents, enter this command:

```
cpio -itv -l/dev/ctape1
```

3. To restore the entire backup, enter the command:

```
cpio -iAmudB -l/dev/ctape1
```

where `/dev/ctape1` is the path to your tape device.

You can select specific files and directories by adding them to the end of the command. If, for example, you wanted to restore the `/tmp/hold/time` file, you would enter:

```
cpio -iAmudB -l/dev/ctape1 tmp/hold/time
```

Should you want to restore an entire directory, for example, `/tmp/hold` you would enter:

```
cpio -iAmudB -l/dev/ctape1 "tmp/hold/*"
```

NOTE: The root “/” slash must be omitted – take care when entering these commands.

3.5 Reinstalling SCO OpenServer Release 6

Note that if you re-install OpenServer 6, there is no installation option that preserves your existing filesystem configuration. Any filesystems that you have created or modified from their installation defaults will need to be created again when you re-install. For example, if you create a separate `/u` filesystem on OSR6 and then re-install, you will need to re-create the separate `/u` filesystem during the re-install.

4 Migrating your networking configuration

There are several key differences in networking for SCO OpenServer Release 6:

- Network Configuration Manager / netconfig(ADM)
 - The Loopback interface is not displayed anymore, but the Loopback configuration still exists.
 - The Add New WAN Connection option on the Hardware menu has been removed. You can no longer configure PPP or SLIP connections using netconfig(ADM).
- **exportfs**(NADM) has been updated to look in both */etc/dfs/dfstab* and */etc/exports* for remote resource information. Two new options modify this behavior:
 - The **-e** option specifies to look for export options only in */etc/exports*
 - The **-d** option specifies to look for export options only in */etc/dfs/dfstab*
- SCO PPP is no longer provided or supported. It has been replaced by SCO PPP from Morning Star.
- SLIP is no longer supported.
- The NetWare and IPX/SPX products are no longer provided or supported.

The following networking subsystems and protocols are discussed in this chapter:

- [TCP/IP](#)
- [Routing](#)
- [DNS](#)
- [NIS](#)
- [UUCP](#)
- [FTP](#)
- [NFS](#)
- [NTP](#)
- [PPP](#)
- [Mail and messaging](#)

4.1 Migrating TCP/IP

In SCO OpenServer Release 6, TCP/IP can be configured over a network interface at installation time, or later using the **Network Configuration Manager**. You should note the hostname, domain name, IP address, netmask, broadcast address and frame type of the existing network interfaces so that you can configure these on your SCO OpenServer Release 6 system. To obtain these values, run the **Network Configuration Manager** on your Release 5 system or execute **netstat -rn**.

4.2 Files to migrate

The configuration files are as follows:

<i>/etc/hosts</i>	hostnames and IP addresses
<i>/etc/default/tcp</i>	TCP/IP configuration file
<i>/etc/tcp</i>	TCP/IP configuration file
<i>/etc/inetd.conf</i>	services available through the inetd daemon

NOTE: You should merge the information from your old */etc/hosts* file to avoid accidentally removing the newly-created *localhost* entry.

4.2.1 Migrating DHCP or AAS from SCO OpenServer Release 5.0.4

If you configured the Dynamic Host Configuration Protocol (DHCP) or the Address Allocation Server (AAS) on your Release 5 system, you can copy over the daemon configuration files to SCO OpenServer Release 6:

/etc/dhcpd.conf

/etc/aasd.conf

Both will work without additional modification.

NOTE: DHCP and AAS were not available previous to SCO OpenServer Release 5.0.4.

4.3 Migrating routing

This section discusses differences between SCO OpenServer Release 6 and Release 5, and what files must be copied, merged, or converted for use on the new system.

4.3.1 Differences

SCO OpenServer Release 6 contains updated **gated** and **routed** daemons and an updated **route** command.

gated in SCO OpenServer Release 6 supports BGPv4.

A new support command, **rtquery**, allows you to query routing daemons in the manner of **ripquery**. Additionally, it provides additional control over **routed**, by allowing you to raise or lower the trace level for debugging.

4.3.2 Configuring routing

SCO OpenServer Release 6 does not provide a graphical manager for configuring routing. However, the **Network Client Manager** does include support for the **traceroute** and **ping**. You can use the **Network Configuration Manager** to configure a default router.

4.3.3 Files to migrate

In SCO OpenServer Release 6, the routing configuration files are located in */etc/inet* instead of */etc* as in Release 5.

The Release 5 configuration files are as follows:

<i>/etc/gated.conf</i>	gated configuration
<i>/etc/gateways</i>	routed configuration

4.3.4 Migrating gated and routed files to SCO OpenServer Release 6

The **gdc checkconf** command is useful for checking the integrity of the *gated.conf* file. It should be run in multi-user mode (that is, with networking running). Otherwise, it will be unable to pick up valid network interfaces to use.

For **routed**, the */etc/inet/gateways* configuration file supports many more command keywords. In particular, the **no_rdisc** keyword can be used to disable router discovery (enabled by default). See **routed(ADMN)** for details.

The **gdc** and **rtquery** commands provide the ability to dump a snapshot of the routing daemon's routing table and interface list to a log file for debugging purposes.

The files */var/adm/syslog* and */var/adm/log/osmlog* are used to log messages by default.

4.4 Migrating DNS

SCO OpenServer Release 6 is shipped with BIND 8.4.4, which that includes a number of bug fixes, security fixes, and new features over the versions shipped with earlier releases of SCO OpenServer.

4.4.1 Configuring DNS

DNS can be configured using the **DNS Manager**.

4.4.2 Migrating DNS files

1. The following files should be copied from your Release 5 system:

- named.conf**
- resolv.conf**

2. Next, configure any zones that the system serves as a primary name server. Use the **ndc restart** command to restart **named**. Check the contents of */var/adm/syslog* and */var/adm/log/osmlog* for any named errors. You may notice that hostnames containing an underbar ("_") character are logged as this is an illegal character for an Internet hostname. You should rename these hosts if possible.
3. Finally, configure any zones that the system serves as a secondary or stub name server and restart **named**. Check the logs again and check that the zone data has been written to the correct files.

4.5 Migrating NIS

The version of NIS in SCO OpenServer Release 6 is based on the implementation shipped with SCO OpenServer 5.0.7.

4.5.1 Configuring NIS in SCO OpenServer Release 6

NIS is configured using **ypinit**.

4.5.2 Migrating NIS files to SCO OpenServer Release 6

NIS master and slave servers should set up */etc/passwd* and */etc/group* files using the **Account Manager** as normal but the copies of these files that are used to generate the corresponding NIS maps can be located elsewhere if the **DIR** variable is redefined in */etc/yp/Makefile*.

Run **ypinit** with the appropriate option on all systems that need to use NIS:

-m	Configure a master server.
-s master	Configure a slave server specifying the <i>master</i> .
-c master	Configure as a copy-only server.
-C	Configure a client.

Finally, on NIS clients, add escapes (+:) to files such as */etc/passwd.yp* and */etc/group.yp* so that they can access the corresponding NIS maps.

4.6 Migrating UUCP

The SCO OpenServer Release 5 modem dialers (based on **atdialer**) have been carried forward to SCO OpenServer Release 6. This allows for the configuration of over 900 different modems.

4.6.1 Configuring UUCP

To configure entries for modems and ISDN adapters in the */etc/uucp/Devices* file, use the **Hardware** menu under the WAN view of the **Network Configuration Manager**.

4.6.2 Files to migrate

The Release 5 UUCP configuration files can be copied over and should not need modification:

```
/usr/lib/uucp/Devices
/usr/lib/uucp/Permissions
/usr/lib/uucp/Poll
/usr/lib/uucp/Systems
```

4.7 Migrating an ftp server

The **ftp** servers in Release 5 and Release 6 are based on the Washington University **ftp** server, **wu-ftpd** and conform to RFC 959 and RFC 1123. The Release 6 version is based on version 2.4 and includes new features and many bug fixes compared to the Release 5 version.

4.7.1 Configuring the SCO OpenServer Release 6 ftp server

The **ftp** server in SCO OpenServer Release 6 can be configured using the SCOAdmin **Ftp Server Manager**.

4.7.2 Files to migrate

The following files need to be migrated from SCO OpenServer Release 5:

```
/etc/ftpusers
/etc/shells
/etc/ftpaccess
/etc/ftpconv
```

4.7.3 Procedure for migrating ftp files

1. Any user names added to the SCO OpenServer Release 5 */etc/ftpusers* file should be added to the SCO OpenServer Release 6 */etc/ftpusers* file to continue to deny access to those users.
2. Any shells added to the SCO OpenServer Release 5 */etc/shells* file should be added to the SCO OpenServer Release 6 */etc/shells* file to continue to allow access to a user who has one

of those shells as their login shell. The pathnames of some entries may need changing to match the location of the shell in the filesystem hierarchy of SCO OpenServer Release 6.

- Any conversions added to the SCO OpenServer Release 5 */etc/ftpconv* file should be added to the SCO OpenServer Release 6 */etc/ftpconv* file, changing the pathname of the conversion utility where appropriate.

4.8 Migrating NFS

SCO OpenServer Release 5.0.7 uses NFS Version 2 (NFSv2); Release 6 is based on NFS Version 3 (NFSv3). Configuration of NFS and the automounter in Release 6 is substantially different from Release 5.

The **automount** command in Release 5 automatically consults the NIS *auto.master* map unless the **-m** option is specified on the command line. It does not consult the */etc/auto.master* file unless this is also specified using the **-f** option. **automount** in Release 6 reads the */etc/auto.master* file unless you override the pathname using the **-f** option. It does not consult the NIS *auto.master* map unless the following line is included in the */etc/auto.master* file on the client:

```
+auto.master
```

NOTE: The Release 5 NFS-related **mount** options **tcp** and **spongy** are not supported in Release 6.

4.8.1 Configuring NFS in SCO OpenServer Release 6

Just as under Release 5, you can make filesystems available for mounting by NFS clients using the **Filesystem Manager**.

4.8.2 Files to migrate

The following table shows approximate equivalences between NFS configuration files in Release 5 and Release 6:

SCO OpenServer Release 5	SCO OpenServer Release 6	Description
<i>/etc/default/filesys</i>	<i>/etc/default/filesys</i> (linked to <i>/etc/vfstab</i>)	Used by client to define filesystem to be mounted
<i>/etc/exports</i>	<i>/etc/exports</i>	Used by server to define filesystems that clients can mount
<i>/etc/auto.master</i>	<i>/etc/auto.master</i>	Lists initial automount configuration. The information can also be obtained as a map from an NIS server
<i>/etc/auto.direct</i> <i>/etc/auto.indirect</i>	<i>/etc/auto.direct</i> <i>/etc/auto.indirect</i>	List direct and indirect automount configuration. The information can also be obtained as map(s) from an NIS server

You can use the information in the configuration files to configure your SCO OpenServer Release 6 system. Do not simply copy the */etc/default/filesys* and */etc/exports* files as the specific device names, divisions and filesystem types will differ on Release 6.

4.9 Migrating NTP

Configuration of NTP servers does not differ substantially in SCO OpenServer Release 6. (The */etc/ntp.conf* configuration file is now located in */etc/inet/ntp.conf*, but is linked to the old location.)

4.10 NTP configuration

NTP servers are configured by editing the file */etc/ntp.conf*. NTP clients can be configured using the **Network Client Manager**.

4.10.1 Files to migrate

The default NTP configuration file is the same for both platforms: */etc/ntp.conf*. In addition, you will need to copy over files containing authentication keys. You should also create any log files such as those used for writing drift measurements and other statistics. The pathnames of these files are defined in the *ntp.conf* file.

4.11 Migrating PPP

SCO PPP has been replaced by SCO Morning Star PPP, so it is not possible to simply copy SCO PPP configuration files over to Release 6. This section includes instructions for migrating either implementation to SCO OpenServer Release 6.

NOTE: The **Internet Manager**, the **PPP Connection Wizard**, and the **PPP Manager** are not available in SCO OpenServer Release 6.

4.11.1 Migrating an SCO PPP configuration

1. To migrate from an SCO TCP/IP PPP configuration to an SCO PPP from Morning Star configuration, save the following files from your Release 5 system for reference:
 - /etc/ppphosts*
 - /etc/pppauth*
2. After installing SCO OpenServer Release 6, configure your modem connection as described in "Configuring modems with the Modem Manager" in the online documentation.
3. For **outbound connections**, you can use the host entries in your saved */etc/ppphosts* file when editing the */usr/lib/mstppp/Systems* file and use the PAP/CHAP information in */etc/pppauth* for the */usr/lib/mstppp/Auth* file.
4. For **inbound connections**, you can use the host entries in your saved */etc/ppphosts* file when editing the */usr/lib/mstppp/Accounts* file and use the PAP/CHAP information in */etc/pppauth* for the */usr/lib/mstppp/Auth* file.

4.11.2 Migrating an SCO Morning Star PPP configuration

Save the following files from your Release 5 system:

- /usr/lib/mstppp/Autostart*
- /usr/lib/mstppp/Accounts*
- /usr/lib/mstppp/Auth*
- /usr/lib/mstppp/Systems*
- /usr/lib/mstppp/Devices*
- /usr/lib/mstppp/Dialers.local*
- /usr/lib/mstppp/exec.in/**
- /usr/lib/mstppp/exec.out/**

After installing SCO OpenServer Release 6, configure your modem connection as described in “Configuring modems with the Modem Manager” in the online documentation and restore these files.

4.12 Migrating Mail and Messaging

SCO OpenServer Release 6 supports the same two mail transport agents used on Release 5: MMDF and **sendmail**.

The following major areas are addressed here:

- [user inboxes](#)
- [MMDF configuration](#)
- [sendmail configuration](#)
- [vacation notifications](#)
- [customized forwarding options](#)

Each of these descriptions assumes that you are starting with a default configuration on SCO OpenServer Release 6 and attempting to modify it to match your previous configuration.

4.12.1 Migrating user inboxes

SCO OpenServer Release 6 user inboxes are located in the same location as in Release 5: */usr/spool/mail*. It is therefore sufficient to copy these files to the new machine without modification.

NOTE: In the case where mailboxes are in user home directories, these must be restored and the INBOX location configured to point there.

Using the **Mail Manager** to change the inbox location to the users' home directories, change the “Users' INBOX Location” setting (within the “Folder Configuration” category) to the appropriate setting.

4.12.2 Migrating an MMDF configuration

To migrate an existing MMDF configuration to SCO OpenServer Release 6, follow these steps:

1. Log in as *root* and copy the following files from the Release 5 system:

```
/usr/mmdf/mmdftailor  
/usr/mmdf/table/*.chn  
/usr/mmdf/table/*.dom  
/usr/mmdf/table/alias.*  
/usr/spool/mmdf/lock/home/q.*
```

Make a note of the ownership and permissions on each file, and use the same ownership and permissions on the target system. Do *not* copy directories or files not in this list.

2. Enter the following commands:

```
su mmdf  
cd /usr/mmdf/table  
./dbmbuild  
exit
```

4.12.3 Migrating a sendmail configuration

To migrate an existing **sendmail** configuration to SCO OpenServer Release 6, you need to merge the contents of the following Release 5 `/usr/lib/sendmail` files into their Release 6 counterparts located in `/etc/mail`:

Release 5	Release 6
<code>/usr/lib/sendmail.d/access</code>	<code>/etc/mail/access</code>
<code>/usr/lib/sendmail.d/aliases</code>	<code>/etc/mail/aliases</code>
<code>/usr/lib/sendmail.d/domains</code>	<code>/etc/mail/domaintable</code>
<code>/usr/lib/sendmail.d/local-host-names</code>	<code>/etc/mail/local-host-names</code>

4.12.4 Preserving vacation notifications

For additional information on the vacation notification features, see “The Vacation Notification Manager” in SCOhelp and the **vacation(C)** and **maildelivery(F)** manual pages.

4.12.4.1 MMDF files

The following Release 5 files (if used) can be copied to Release 6 without modification:

```
~/.maildelivery
~/.alter_egos
~/tripnote
~/triplog
```

4.12.4.2 sendmail files

If users have any of the above files on SCO OpenServer Release 5, they can be loaded directly onto a SCO OpenServer Release 6 system; their functionality is identical

```
~/.forward
~/.vacation.msg
```

4.12.5 Preserving custom forwarding

On Release 5 systems using MMDF as the mail transport agent, users' `~/.maildelivery` files are compatible with Release 6 and can be transferred with no modification.

On Release 5 systems using **sendmail** as the mail transport agent, user `~/.forward` files are also compatible with Release 6 and can be transferred with little or no modification. Users must simply ensure that programs, files, and recipients referenced in their `~/.forward` files are accessible. See also [“Preserving vacation notifications”](#).

5 System software and command differences

This section describes enhancements and changes in the following areas:

- [System startup](#)
- [Desktop environment](#)
- [Console and multiscreen switching](#)
- [Device node naming conventions](#)
- [Large file support and large-file aware commands](#)
- [Command directories and environments](#)
- [Filesystem types](#)
- [Disk configuration and filesystem commands](#)
- [Files and directories](#)
- [System management](#)
- [Process management](#)
- [Performance reporting](#)

5.1 System startup

Two changes have been made to the console boot sequence:

- A [boot] prompt with a twenty-second countdown has replaced the old Boot: prompt
- A graphical SCO OpenServer Release 6 logo is displayed in place of the **hwconfig**-style device listings.

Thereafter, the traditional SCO OpenServer boot sequence proceeds, along with the familiar single-user mode prompt:

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

As in previous releases, this system startup behavior is defined in `/stand/boot` (the **AUTOBOOT** variable) and `/etc/default/boot` (the **MULTIUSER** and **TIMEOUT** variables). See the **boot**(HW) manual page.

5.2 Desktop environment

The default desktop is the legacy **xdt3** environment based on the **pmwm** window manager. To switch to the modern **K Desktop Environment (KDE)**, change the entry in `/etc/default/X11` to:

```
DESKTOP=kde3
```

5.3 Console and multiscreen switching

Please note the following about console and multiscreen behavior in Release 6:

- If, during the installation, you selected to autoconfigure your video adapter and enable **sologin**, you are automatically placed on `tty02` when the system boots into multi-user mode. If the X server is not turned on during the installation, you are instead placed automatically on

the console when the system boots. Note that the console is primarily a place for you to view error messages -- no **getty** process runs on this screen.

- The Release 6 console driver uses the **at386-ie** TERM type instead of **scoansi**. UNIX applications with “hard wired” scoansi escape sequences will *not* work on the console.
- System error and notification messages no longer appear on the active multiscreen (as they did on Release 5 systems), but now display on the console screen. As usual, these messages are also saved in */usr/adm/syslog*.
- **<Alt><Ctrl><Fn>** (or **<Alt><Fn>**) switches between multiscreens
- The console is now available using **<Alt><Ctrl><F12>**
- *tty01* is accessed by **<Alt><Ctrl><F1>**, *tty02* by **<Alt><Ctrl><F2>**, and so forth.

5.4 Device node naming conventions

In general, both SCO OpenServer Release 5 and System V Release 5 (SVR5) device nodes are supported.

5.4.1 Hard disk nodes

SCO OpenServer Release 6 supports a combination of SCO OpenServer-style device nodes and SVR5-style disk nodes.

Standard raw and block partition nodes are represented as they always have been on SCO OpenServer systems:

```
/dev/[r]hdXY
/dev/dsk/XsY
```

X is the physical disk number (starting from zero) and **Y** is the partition number.

SVR5-style nodes are also supported to access divisions (or “slices”). These nodes are represented as:

<code>/dev/[r]dsk/cXbXtXdXpY</code>	SRV5-style partition nodes
<code>/dev/[r]dsk/cXbXtXdXsZ</code>	SVR5-style slice nodes
<code>/dev/[r]dsk/cXbXtXdXpYsZ</code>	Combined partition/slice nodes (new in Release 6)

X represents the elements of the SCSI address as displayed by the **sdiconfig -l** command in the form:

c:b,t,d

Where **c** is the HBA number, and **b**, **t**, and **d** correspond to the controller, ID, and LUN, respectively. (Note that the SCSI notation is used for all HBA types, including IDE.)

Y represents the partition number and **Z** is the slice number. Release 6 adds the **sXpY** nodes, allowing cross-partition mounts of slices.

5.5 Large file support and large-file aware commands

The SCO OpenServer Release 6 kernel supports the Large File Summit (LFS) API. This standard for large file support allows the use of files larger than 2GB on 32-bit systems.

This support is enabled by default. To check on the status of this support for the *root* filesystem, enter this command:

fsadm /

The following table lists commands that have been modified to work with files that are larger than 2GB. These large-file aware commands are located in `/u95/bin`.

cat	cksum	cpio	ff	ln	mv	pwd	sum	zcat
chgrp	cmp	dd	find	ls	ncheck	rcp	touch	
chmod	compress	df	fsck	mkdir	pathchk	rm	ulimit	
chown	cp	du	fsdb	mkfs	pax	rmdir	uncompress	

NOTE: Among the system utilities not yet updated to work with large files, the most notable omissions are the shells. Consequently, while the utilities listed above are large-file aware and can, for example, create large files, you *cannot* create large files using shell redirection, even on a large-file aware filesystem.

The `/u95/bin/fsck` and `/u95/bin/fsdb` binaries work on VxFS filesystems. The `/etc/fsck` and `/etc/fsdb` commands for HTFS have not been updated to repair large files.

5.6 Command directories and environments

SCO OpenServer Release 6 systems distribute basic system commands in three main directories:

<code>/bin</code>	Commands inherited from SCO OpenServer Release 5.
<code>/u95/bin</code>	Commands that conform to the UNIX95 standard, including commands that support large files (LFS). Release 5 commands that have been enhanced to support Large File Support (LFS), such as cpio and ls , are located here and in <code>/bin</code> .
<code>/udk/bin</code>	Commands from UnixWare 7.

Depending on your needs and expectations, set the **PATH** variable in one of the following ways:

Traditional SCO OpenServer user	set PATH to <code>"/bin"</code>
Traditional SCO OpenServer user who wants to take advantage of large file support	set PATH to <code>"/u95/bin:/bin"</code>
User running UnixWare 7 application(s)	set PATH to <code>"/udk/bin:/u95/bin:/bin"</code>

5.7 Filesystem types

SCO OpenServer Release 6 provides support for the following filesystems:

- [VxFS](#) (default *root* filesystem) (**new**)
- [HTFS](#) (**updated**)
- EAFS ([/stand filesystem](#))
- AFS and S51K/ES51K
- [CDFFS](#) (JOLIET, RCKRDG, ISO9660, and High Sierra) (**updated**)
- [DOSFS](#) (DOS, VFAT, FAT32, FAT16, and FAT12) (**updated**)
- [MEMFS](#) (**new**)

- NFS (**updated** with version 3.0)

NOTE: The DTFS and XENIX filesystem types are no longer supported.

All filesystem types supported on SCO OpenServer Release 6 include the following enhancements:

- support for up to 16 divisions/slices per partition (double that of previous releases)
- encrypted filesystems using the **marry**(ADM) command

5.7.1 The VxFS filesystem

Available for the first time on SCO OpenServer, the VERITAS (*vxfs*) filesystem type is the default Release 6 *root* filesystem, offering high performance, journaling, and large file support.

Highlights of this filesystem include:

- support for greater than 64k inodes
- dynamic inode allocation
- quotas
- file sizes up to 1TB
- extent allocation
- online backup and administration

WARNING: If you create files larger than 2GB in length, you should verify that any backup solution you are using is capable of archiving these files. The SCO OpenServer Release 6 default version of **cpio**(C) can archive large files, but the Release 5 version (*/usr5/usr/bin/cpio*) cannot. See [“Backup and restore”](#) for more details.

5.7.2 The HTFS filesystem

The HTFS driver has been ported to the SVR5 kernel for this release. It also provides support for the EAFS, AFS, S51K, and ES51K filesystem types. Note the following:

HTFS does not support synchronous logging of write data. However, HTFS will synchronously write data to disk if a file is opened with **O_SYNC**, or if the **fsync()** system call is issued.

HTFS does not create filesystem versions, but you can list and access file versions created under prior versions of SCO OpenServer. Because there is no versioning support, the **maxvdepth** and **minvtime** options to **mount**(ADM) are ignored for HTFS filesystems.

While VxFS is the default *root* filesystem, you can select to use the HTFS filesystem type instead. This is particularly important if you want the option to mount the disk from a Release 5 system.

5.7.3 The /stand filesystem

The */stand* filesystem is now always mounted read/write. All of the SCO OpenServer Release 6 **idtools** expect to find */stand* mounted in this manner.

5.7.4 The CDFS filesystem

The *cdfs* filesystem replaces the SCO OpenServer Release 5 High Sierra (HS) filesystem, providing the same support for the underlying ISO9660 format, plus the UNIX RockRidge (RCKRDG) extension. In addition, SCO OpenServer Release 6 now supports the JOLIET extension of Windows 95 (and later Microsoft Windows family operating systems).

New mount options have been added to the **mount(ADM)** command for *cdfs*, including **joliet** and **nojoliet**. By default, **mount** first attempts to mount a CD-ROM with RockRidge extensions. If that fails, it attempts to mount the CD-ROM with JOLIET extensions if they exist on the CD-ROM. See the **mount_cdfs(ADM)** manual page for more information.

Note that all of the SCO OpenServer Release 5 CD-ROM filesystems types can still be used with SCO OpenServer Release 6 filesystem commands.

5.7.5 The DOSFS filesystem

The *dosfs* filesystem replaces the SCO OpenServer Release 5 DOS filesystem. The existing versions of the DOS filesystem type (FAT12 and FAT16) are still supported. Additionally, there is now support for the FAT32 and VFAT ("Extended FAT", offering support for long filenames) filesystem types.

Note the following:

- Recognized filesystem types are DOS and *dosfs*. Filesystem commands work with both.
- When the **/etc/fstyp** command detects a DOS filesystem, it reports it as "DOS" for the FAT and FAT16 types, and as "dosfs" for VFAT and FAT32.
- **/etc/fstyp** can be slow on diskettes because the command invokes each type-specific **/etc/fstyp** command in turn until one reports success.

5.7.6 The memfs filesystem, /tmp, and /var/tmp

In previous releases, */tmp* and */var/tmp* are regular directories, and their content remains there until explicitly deleted (done, by default, once a week by a cron job). In this release, you can select *memfs*, a volatile in-memory filesystem, as the filesystem type for */tmp* and */var/tmp*. While *memfs* provides the highest possible system performance, the volatile nature of *memfs* may not be expected by applications, utilities, or features that depend on a non-volatile */tmp* or */var/tmp*.

For example: the **vi** program crash recovery mechanism relies on memory files existing in */tmp*. If you are editing a file when the machine suddenly reboots (e.g. panic or power failure), your edit buffer is recoverable. If */tmp* is *memfs*, this does not work. As a workaround, individual users can set the "directory" directive in the *.exrc* file -- see the **vi(C)** manual page for details. (Note that a volatile */tmp* does not affect the **vi** preserve mechanism, which preserves the edited version of a file when the user's shell quits unexpectedly.)

5.8 Disk division and slice tables

For each division, SCO OpenServer Release 6 maintains both an OpenServer division table (**divvy**) as well as an SVR5 slice table (**vtoc**). The **divvy** and **vtoc** tables are associated with the partition and a disk can have up to four partitions (as defined by the **fdisk** table).

5.8.1 Disk configuration and filesystem commands

This section describes enhancements that have been made to the following disk configuration and filesystem commands:

Command	Description
badblk(ADM) , badtrk(ADM)	These commands have been removed. All bad block operations are now handled transparently by the system.
crash(ADM)	This command has been updated to improve HTFS filesystem support. Specifically, a new htinode command prints the inode table for the HTFS, EAFS, AFS, and S51K filesystems. Use the -i option, together with the -e option.

	<p>to print inactive inodes. The -e option alone prints only active inodes. Use -I to display the free lists. Specific inodes can be specified by the address in kernel memory, or by inode number. However, if inode number is used, then inodes might be found in more than one filesystem. In that case, all of those found are printed.</p> <p>The inode command is no longer applicable on SCO OpenServer Release 6.</p>
divvy (ADM)	<p>This command now supports up to 16 user-defined divisions on any fdisk(ADM) partition. On the active/boot partition:</p> <ul style="list-style-type: none"> -- Division 0 is the <i>/dev/stand</i> filesystem -- Division 1 is the swap/dump area -- Division 2 is the <i>/dev/root</i> filesystem -- Division 7 is the whole partition -- Division 13 is used by the boot loader <p>To ensure that the divvy table fits on the screen, unused divisions above division 8 are not displayed. The unlisted divisions are, however, available for use. If you plan to allocate more than 8 slices, run divvy in a graphical window so that you can expand the window to display more than 25 lines.</p>
dkconfig (ADM) vdisk (HW)	<p>The Virtual Disk Manager (VDISK) is not provided in SCO OpenServer Release 6. All related commands have been removed from the system.</p>
dparam (ADM), dkinit (ADM)	<p>This command has been removed. All hard disk parameters in use reflect the values used by the system BIOS. In SCO OpenServer Release 6, there is no way to change or override hard disk parameters. To write to the masterboot block, you can use the following fdisk(ADM) option:</p> <pre style="text-align: center;">echo S fdisk -L > /dev/null</pre>
fdisk (ADM)	<p>The -a, -c, -d, -t, and -V options are no longer necessary or supported. The -f option does not need to be specified anymore because the raw device associated with the boot hard disk is automatically specified. Note that the -p option is not available in the Beta but will be functional in the final release.</p>
<i>/dev/string/cfg</i> , hwconfig (C)	<p>The configuration string device <i>/dev/string/cfg</i> does not exist on SCO OpenServer Release 6 systems. The <i>/var/adm/syslog</i> file contains some similar hardware configuration messages but is not an exact replacement for <i>/dev/string/cfg</i>. Some of the information that was available from <i>/dev/string/cfg</i> can be viewed using the sdiconfig -l command.</p>
hw (ADM)	<p>A new version of the hw(ADM) command is provided. It has the same options as the hw command available in earlier releases and serves the same purpose, but produces somewhat different output in a somewhat different format. It also numbers processors from "0", rather than from "1" as in the old version.</p>

5.9 Files and directories

5.9.1 ls(C) command

The **ls** command has been updated, providing additional options and standards conformance. We intend to provide complete compatibility between the SCO OpenServer Release 6 version of **ls** and those from previous releases of SCO OpenServer.

The only known differences are in the spacing long-form columns. Also, there is a new **-S** option that causes the filename sort order to be done according to the collation rules of the active locale; by default, the sort order is done according to the “C” locale.

5.10 System management

5.10.1 SCOadmin managers

The following SCOadmin Managers have been modified in this release:

- Account Manager**
- Filesystem Manager**
- Hardware/Kernel Manager**
- International Settings Manager**
- License Manager**
- Network Configuration Manager**
- Serial Manager**
- System Startup Manager**
- Video Configuration Manager** (now invokes X.Org configuration tool)

The following SCOadmin Managers have been added:

- Ftp Server Manager**
- Hot Plug Manager**

The following SCOadmin Managers have been removed:

- Audio Manager**
- Audit Manager**
- Backup Manager**
- Internet Manager**
- IPX/SPX-related managers**
- ISA PnP Configuration Manager**
- NetWare-related managers**
- PPP Connection Wizard**
- PPP Manager**
- Sysadmsh**
- Virtual Domain User Manager**

5.10.2 Backup and restore

5.10.2.1 Emergency Recovery boot media

Due to insufficient capacity, diskettes are no longer supported as boot or emergency recovery media. SCO OpenServer Release 6 adds support for creating emergency recovery CD-ROMs with the new **emergency_disk**(ADM) command. **emergency_disk** does not burn discs, but creates an ISO image suitable for writing to CD-R/W media by the **cdrecord**(1) utility.

Note that the **Floppy Filesystem Manager** now uses the **emergency_disk** command for the creation of boot media. See **emergency_disk**(ADM) for more information.

5.10.2.2 cpio(C) command

A new version of **cpio**(C) is supplied in SCO OpenServer Release 6. There are some minor differences from the SCO OpenServer Release 5 version of **cpio**:

- The command is now [large-file aware](#) and works with *vxfs* filesystems.
- The default archive format generated by **cpio -c** is now the same as that generated by **-Hnewc**. To generate the old **-c** format, use **-Hodc**.

- **cpio -i -l file1, file2,...** works as expected only if **file1, file2,...** are devices, not regular files. For the same effect with regular files, use:

```
cat file1 file2 ... | cpio -i
```

- The format of the table-of-contents listing that is generated by **cpio -itv** is somewhat different.
- The **-n** option is not supported.

The Release 5 version of **cpio** is included in the `/usr5/usr/bin` directory in case the new command causes problems. Note that the Release 5 version of **cpio** cannot handle files larger than 2GB and is not able to access the 32-bit device nodes used in SCO OpenServer Release 6. This means that the Release 5 version of **cpio** cannot successfully backup and restore the `/dev` directory.

5.10.3 Administering CUPS printing

The Common UNIX Print System (CUPS) is now installed as part of the base operating system. There are two options for administering CUPS:

1. If you want the default system printer to be a CUPS-managed printer, edit `/etc/default/lpd` and change the **PRINT_SYSTEM** value from "SYSV" to "CUPS".
When you make this change, the **Printer Manager** is reconfigured to automatically launch the CUPS web-based administration tool.
2. If you want to use both CUPS and regular System V printing (**lp**):
 - Use the SCOadmin **Printer Manager** to administer **lp**.
 - Use the web-based administration tool to manage CUPS. To run this tool, open any browser and specify the following URL:

```
http://localhost:631
```

When you log into the CUPS administration tool, enter the `root` password.

5.10.4 Hardware/Kernel Manager and mkdev scripts

The **Hardware/Kernel Manager** has been modified to provide access to the **Device Configuration Utility** (DCU), a utility that lists the hardware controllers and device drivers configured on your system and allows you to assign parameter values (IRQ, memory address range, DMA channel, and so forth) for the device driver. See the **dcu(ADM)** manual page for more information.

Because most devices are now autodetected and configured, many of the **mkdev** scripts previously used on SCO OpenServer Release 5 systems are no longer necessary. However, some new **mkdev** scripts have been added:

- Dedicated Memory**
- DCU**
- Kernel Debugger**
- Multi-Path I/O**
- MySQL**
- PostgreSQL**
- Restamper Driver**
- Samba**

The following scripts are obsolete and have been removed:

Asynchronous I/O
Bitpad/Graphic Input Device
Corollary ECC Daemon
Layers Configuration
Mouse/Graphic Input Device
Plug and Play Configuration
Shell Layers
SNMP Host Resources MIB
Terminal Emulation Control
Tricord CD-ROM and WORM
Tricord Hard Disk
Tricord Tape Drive
XENIX Filesystem

The following scripts are obsolete and simply display an informational message:

CD-ROM and WORM
DOS Filesystem
DTFS Filesystem
HTFS Filesystem
High Performance Pipe System
High Sierra/ISO9660/RockRidge Filesystem
LS120 Floppy
Parallel Port
Power Management
SCSI Floptical
SCSI Juke Box
STREAMS
Tape Drive

5.10.5 Serial Manager

Refer to [“Serial ports”](#) for more information.

5.10.6 X Server

The X server has been updated to the **X.org** X server. The configuration files and related utilities used with the SCO X server in previous releases are no longer supported. In particular, note that the `$HOME/.startxrc` and `sys.startxrc` files are not supported by the X.org server. The X.org server is configured for each user using the `$HOME/.xinitrc` file, and for all users using the file `/usr/X11R6/lib/X11/xinit/xinitrc`. Two commands, **startx** and **startxorg**, support the use of the `$HOME/.startxrc` file and will use it for client arguments, if present, instead of the `$HOME/.xinitrc` file.

5.11 Process management

5.11.1 fuser(ADM) command

The **fuser** command no longer reports on remote resources (NFS and NUCFS filesystems).

5.11.2 ps(C) command

A new version of **ps(C)** is provided. Functionality and command output differ in the following ways:

- The **-H** option is no longer supported.

- When specifying the **-t termlist** option, you can only use the device's filename digit identifier shortcut if the digit identifier is numeric (i.e., the *04* in *tty04*). This limitation in the **-t** option will be corrected in a future update.
- Some differences in field names, orders, widths and alignment. (Note that scripts that parse the output of **ps(C)** should rely on space-delimited fields, not the widths of columns in output.)
- Flags in the **F** column and states in the **S** column differ from previous versions of **ps(C)** due to kernel differences. For the same reason, the **C** column will always be zero.
- The **mem** authorization restriction is not currently supported.

5.11.3 Process scheduler control

The **prionctl(ADM)** and **dispadm(ADM)** commands are provided for process scheduler control from the command line.

5.11.4 pstat(C) command

pstat(C) has been removed, use **crash(ADM)** instead.

5.11.5 Kernel profiling

kprf(ADM) and **kprpt(ADM)** have been removed, use **prfstat(ADM)**, **prfsnap(ADM)** and **prfpr(ADM)**.

5.11.6 Multiprocessor commands

Release 6 contains the following changes in the area of multiprocessor commands.

5.11.7 Managing processors on MP systems

SCO OpenServer Release 6 provides two new commands to help manage multi-processor (MP) systems: **psradm(ADM)**, an interface for processor configuration management and **psrinfo(ADM)**, a tool for displaying processor information. The SCO OpenServer Release 5 command, **cpuonoff(ADM)**, also remains available for performing these functions.

There is a difference between these commands in the starting values assigned to processors. **psradm(ADM)** and **psrinfo(ADM)** begin numbering processors with "0", while **cpuonoff(ADM)** uses a starting integer of "1".

5.11.8 Monitoring MP system performance

The new **rtpm(ADM)** command is provided to monitor performance on multi-processing systems.

The performance monitor from earlier releases, **mpstat(ADM)**, is also available. The following updates have been made to the **mpstat** command:

- A DISABLE state has been added.
- The STATIC state, the CPU locking scheme, and the **-c** and **-h** options have been removed.
- Interrupt and trap counts are always shown as zero.

Note that **rtpm** numbers processors starting with "0", while the **mpstat** command numbers processors starting with "1".

5.11.9 Binding processes to a specific processor

Release 6 provides the **pbind(ADM)** command, in addition to the standard **lockpid(ADM)** command. These commands also use different starting values for processors: **pbind** begins numbering processors with "0", while **lockpid** uses a starting integer of "1".

5.12 Performance reporting

Because of the kernel enhancements in SCO OpenServer Release 6, there are some differences in the metrics now supported by the **sar**(ADM) command. Differences include:

- A new option, **-Kudk**, enables SVR5 functionality. When this mode is set, the starting value for processors changes from the default of “1” to “0”.
- The **-B**, **-F**, **-h**, **-l**, **-j**, **-L**, **-n**, **-O**, **-Q**, and **-S** options are no longer supported.
- The **-g** and **-R** options supported by the SCO OpenServer Release 5 version of **sar** are no longer supported. However, when you use the **-Kudk** option, SVR5 variations of the **-g** and **-R** options are enabled. In this mode, **-g** reports on paging activities and **-R** reports raw data values.
- The functionality of **cpusar**(ADM) and **mpsar**(ADM) is now provided directly by **sar**(ADM). For compatibility, **cpusar** and **mpsar** run **sar**.

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