

---

# Recover OpenServer 5 root filesystem after crash if backups, boot/root exist.

---

## Keywords

v5 5.0.0 openserver5 disk generic crash recovery boot root backup cpio quick major minor emergency mknod **tape** device floppy quick filesystem restore swap divvy increase unmountable mkdev hd scan stand boot upgrade fresh 5.0.2 5.0.4 5.0.5

## Release

SCO OpenServer Release 5.0.0, 5.0.2, 5.0.4, 5.0.5

## Problem

I need a quick recovery method to recover from a system crash in which the root file system is unmountable.

## Solution

The solution is divided into three parts.

The first section, Preparation, describes the steps to take before a crash. The second section, Recovery, describes the steps to take if you are already in a crash situation and need to recover. The third section, Replacing the Boot Sectors describes an extra step to take if the root **drive** was destructively scanned during recovery. The fourth section is a Alternate Restore procedure should the backup of root and boot filesystem have been made to a single **tape**.

+-----+

### I. Preparation

1. Immediately following installation of your operating system, configure the **tape** device with which you intend to do your full system backup and recovery. Test the **tape drive** and verify the names you use for the **tape** devices. (xct0 and rct0 are common and will be used in all examples. Be sure to substitute your actual device names.)

2. Run `mkdev fd` and create one root and one boot floppy disk. You may create either the system specific or generic boot floppy. Be sure to label the system specific boot floppy carefully, as it can only be used to boot the machine it was made on.

3. Verify that the devices used to do your backups are identical on the root floppy disk and the root hard **drive**. To do this:

a. Use the `l` command to list your **tape** devices:

```
# l /dev/rct0 /dev/xct0
```

Your output should look something like the example below. The important information to gather from the listings are the major and minor numbers of the **tape** devices. In this example, `/dev/rct0` has major 46 and minor 0, and `/dev/xct0` has major 46 and minor 128.

```
# l /dev/rct0 /dev/xct0
crw-rw-rw-  1 root   other    46,  0 May 23 1995 /dev/rct0
crw-r--r--  1 root   other    46,128 May 23 1995 /dev/xct0
                ^^,^^^
                major, minor
```

b. Compare these values with the values on your root floppy. Because the root filesystem on the SCO OpenServer root floppy is contained in a compressed ramdisk, you must shut down the system and boot off the boot/root set in order to check the device nodes. To do this:

(1) Shut down the system with the shutdown command:

```
# shutdown -g0 -y
```

(2) At the safe to power off message, insert the boot floppy in the **drive**, and press <Enter>.

(3) Insert the root floppy when prompted.

(4) After the system loads and displays the # prompt, list the **tape** device nodes as in step 3a above.

```
# l /dev/rct0 /dev/xct0
```

Compare the major and minor numbers from the listing obtained in 3a with the output on the screen.

If the major and minor numbers are the same, proceed to step 5.

Here is an example where the root floppy major and minor values do not match. The example includes the steps to take to correct the discrepancy.

```
# l /dev/rct0 /dev/xct0
crw-rw-rw-  1 root    other    10,  0 May 23 1995 /dev/rct0
crw-r--r--  1 root    other   10,128 May 23 1995 /dev/xct0
```

```
# rm /dev/rct0 /dev/xct0
# mknod /dev/rct0  c <rct0 major> <rct0 minor>
# mknod /dev/xct0  c <xct0 major> <xct0 minor>
```

Where <rct0 major>, <rct0 minor>, <xct0 major>, and <xct0 minor> are the values from the device nodes on the hard **drive**. (refer to the output captured in step 3a)

(5) Enter the command `/etc/haltsys` to halt the system. At the 'Safe to power off...' prompt, remove the root floppy from the **drive** and press any key to reboot.

4. Run **divvy(ADM)** with the `-P` and `-N` options and write down the type of filesystem and the beginning and ending locations of each divvy division.

The syntax and output of this divvy command are:

```
# divvy -P -N
0          0          14999  boot    EAFS
1          15000      39574  swap   NON FS
2          39575      346775 root    HTFS
3          346776     1022965 u       HTFS
6          1022966    1022975 recover NON FS
7          0          1023983 hd0a    WHOLE DISK
```

5. If you have other fdisk divisions, run `fdisk -p` and write down the beginning and ending locations of each fdisk partition. Be sure to note which partition is currently active.

The syntax and output of this fdisk command are:

```
# fdisk -p
1 1 63999 63999 UNIX Active
```

6. Make separate relative cpio backups of all file systems on the root **drive**.

If this was a fresh install, you will have at least a `/stand` and `/` (root) filesystem to back up. You may also have a `/u` filesystem as well (refer to the divvy `-P -N` output captured above).

If this was an in-place upgrade from an earlier SCO release, there will be

no /stand filesystem. A /u filesystem may still exist.

Use the scoadmin Backup Manager to create unscheduled backups of all of the filesystems on the root **drive** -- this is a preferred method of performing the backups as it will identify all of the filesystems you need to back up, as well as allowing you to archive defaults for blocking factor (cpio's -C option), volume size (-K option), and **tape** device.

You may also run backups from the command line as in earlier releases.

To do this, place a usable **tape** in the **tape** drive and issue the following commands while logged in as root:

```
/stand (Fresh install only):
=====
# cd /stand
# find . -print | cpio -ocv -0 <tape backup device>

/ (root) (Fresh and Upgrade Installs):
=====

# cd /
# find . -mount -print | \
cpio -ocv -C 10240 -K <tape size> -0 <tape backup device>
```

Where:

<tape size> is the size of the **tape** volume in kilobytes  
(a 525 megabyte **tape** would be specified as 524000)

<tape backup device> is your usual backup device as determined  
above

(Note: this command has been 'folded' at the "\". It is  
not necessary to type the "\" when actually running the command.)

```
/u (or equivalent) (Fresh and Upgrade installs):
=====
```

```
# cd /u
# find . -print | \
cpio -ocv -C 10240 -K <tape size> -0 <tape backup device>
```

+-----+

## II. Recovery

Once a crash occurs from which you cannot recover:

1. Boot your computer from the emergency boot floppy.
2. At the Boot: prompt, press <Enter>.

3. Insert the root floppy when requested and press <Enter>.

4. At the # prompt, run the command `mkdev hd`. This command will allow you to initialize your root hard **drive** as if you were installing for the first time.

`fdisk(ADM)` will be run and you may partition the **drive** as captured in section I, step 5. If only the root file system is corrupted, it is not necessary to repartition the **drive**. If you do not need to repartition, type 'q' to quit `fdisk`.

`badtrk(ADM)` will be run next. You may choose quick or thorough and destructive or non-destructive scans. Note that if you destructively scan the disk, you will overwrite the boot sectors of the **drive**. See section III, Replacing the Boot Sectors.

If you do not scan the **drive**, do not change the default size of the badtrack table -- this will destroy all of the remaining filesystem divisions on the **drive**.

`divvy(ADM)` will be called to allow you to sub-divide the active partition into filesystem divisions.

You will be prompted to supply sizes for the /stand and / filesystems, specify a swap space allocation, and asked if you wish to create a /u filesystem.

You should give sizes that match the output from the `divvy -P -N` command run during section I, Preparation. If you want to change the sizes, make sure you create divisions that are at least as large as before.

If a valid division table exists on the hard **drive**, you will be given the option of preserving non-root filesystems.

5. After installing the division table, restore the filesystems. Either perform steps 5a), if the system was originally fresh installed, or steps 5b), if the system was originally an (in-place) upgrade install.

**NOTE:** if secondary filesystem(s) were mounted and were backed up along with the root filesystem, you should include a pattern to the `cpio` restore command to exclude (defer) restoring of the secondary filesystem. (The /u filesystem could be later restored in system maintenance mode--at that time use the `cpio` pattern 'u/\*'.) For example, say that the /dev/u filesystem was mounted to /u when the `cpio` relative pathname backup was done. To exclude restoring the /u data from a "root" backup, the `cpio` line would be:

```
# cpio -iBudvcm -I <backup_tape_device> '!u/*'
```

5a. Fresh Install

=====

Note: The following assumes that the /dev/root and the /dev/boot filesystems are on separate **tapes**. If this is not the case, please see section IV) Alternate Restore.

**put cpio tape of /stand filesystem in drive**

```
# mount /dev/boot /mnt
# cd /mnt
# cpio -iBudvcm -I <backup_tape_device> (usually /dev/rct0)
# cd /
# umount /mnt
```

**put cpio tape of root filesystem in the drive**

```
# mount /dev/hd0root /mnt
# cd /mnt
# cpio -iBudvcm -I <backup_tape_device> (usually /dev/rct0)
# mkdir stand
# cd /
# umount /mnt
# /etc/haltsys
```

**Press any key to reboot and restore /u filesystem, if necessary, from normal boot.**

```
5b. Upgrade Install
=====
```

**put cpio tape of root filesystem in the drive**

```
# mount /dev/boot /mnt
# cd /mnt
# cpio -iBudvcm -I <backup_tape_device> (usually /dev/rct0)
# cd /
# umount /mnt
# /etc/haltsys
```

**Press any key to reboot and restore /u filesystem, if necessary, from normal boot.**

```
+-----+
```

**III. Replacing the Boot Sectors**

If you destructively scan the **drive** in section II, step 4, you may get the error 'NO OS' after the first reboot. If this is the case:

1. Power off the machine, and reboot with the emergency boot floppy in the floppy drive.
2. Press <Enter> at the Boot: prompt and insert the root floppy when prompted.

3. At the '#' prompt replace masterboot by typing the command:

```
# /bin/dparam -w
```

4. Replace hdboot0 and hdboot1 with these commands:

```
# /bin/dd if=/etc/hdboot0 of=/dev/hd0a
# /bin/dd if=/etc/hdboot1 of=/dev/hd0a bs=1k seek=1
```

**NOTE:** If the above procedures are not successful, reinstall the operating system using "restart" at the boot: prompt. Once you can boot off your hard disk, enter single user mode and restore from your cpio backup of the root filesystem.

+-----+

#### IV. Alternate Restore

This section is an alternative to the restore procedure for the case that the the backup of /dev/root and /dev/boot were combined on one **tape** using a command similar to: `find / -print | cpio -ocvB > /dev/tapedev` (do not type in!)

Put cpio **tape** of root and boot filesystems in **drive**

```
# mount /dev/hd0root /mnt
# mkdir /mnt/stand
# mount /dev/boot /mnt/stand
# cd /mnt
# cpio -iABudvcm -I<backup_tape_device>
# cd /
# umount /mnt/stand
# umount /mnt
# /etc/haltsys
```

**Note:** the <backup\_tape\_device is usually /dev/rct0.

Press any key to reboot and restore /u filesystem, if necessary, from normal boot.

---

TA104767 created on 28 June 1995 , last updated on 22 February 2000  
 SSL #: 482582 IT #: os2582

Please click this box if this article solved your problem

---

[Previous](#) [Search](#) [Next](#) [TA Home](#)

Suggestions for improving the content of this article.

[Comments](#)

We appreciate your continued interest in improving the quality of SCO's technical library and welcome your input regarding this technical article. Suggestions submitted from this form will be forwarded to the Documentation department. If you are looking for technical help beyond that provided in the current article, please contact [SCO Support Services](#).

**Copyright** © 1996-1998 The Santa Cruz Operation, Inc.

All Rights Reserved.