
SPP-UX Scratch Installation for Exemplar Systems



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Exemplar Software Distribution Notice

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SPP-UX scratch installation

This document contains instructions for performing a scratch installation of SPP-UX in the event that the working copy of your operating system is damaged or destroyed.

Caution

Do not perform a scratch installation without first reading all of the instructions in this document. Failure to follow these instructions can result in the irrecoverable loss of data on your root file system.

Scratch installation prerequisites

This installation procedure requires that the following conditions be met:

- Your Exemplar system must have at least one properly functioning hard disk drive installed. For a full root scratch installation, this disk must have a capacity of at least 1.8 GB if it is unlabeled; if the disk is labeled, it must have at least 800 MB of free space. The scratch installation program will provide you with a list of disk drives on your system that meet these requirements.

The scratch installation program refers to the hard disk on which you install the working copy of SPP-UX as the *root device*.

- You need a copy of the Exemplar Scratch Installation DAT cartridge.

Preinstallation tasks

Perform the following tasks before starting the scratch installation procedure:

- Step 1** Set the CTI cache size to zero. Log in to the Exemplar test station as `sppuser` and enter the following commands:

```
sppuser> ccmu
```

```
ccmu> up
```

```
ccmu> get usecachesize (remember this value; you need
to reset the cache size later)
```

```
ccmu> put usecachesize 0
```

```
ccmu> down
```

```
ccmu> push
```

```
ccmu> quit
```

```
sppuser> do_reset
```

Check the Open Boot banner to make sure that the CTI cache is set to zero. The banner should look like the following:

```
Exemplar SPP1000/XA, OBP Release 1.3.2 Version 2
created 95/05/23 8 CPUs, 1024 MB memory
installed, 0 MB CTI cache, SIOP2 installed.
Complex Serial Number: 65654, Node Serial Number:
2010082. Network address 0:0:0:0:0:0, Internet#
0.0.0.0.
```

Step 2 If your system has an SIOP2 board with more than 3 Sbus controllers attached, limit the number of Sbus controllers that will be probed during boot. This will limit the number of drives to those attached to the Sbus controller in the probe list. Enter the following command at the Open Boot prompt:

```
[0:3] ok setenv sbus-probe-list U0SB0
```

```
sbus-probe-list      U0SB0
```

This is an optional step for other Exemplar systems. Performing this step simplifies later steps by limiting the number of drives that are listed in the scratch installation procedure's menus.

Step 3 Make sure that the rmt0 device is aliased to the Exemplar DAT drive. Use the devalias command to see the current setting of the alias:

```
[0:3] ok devalias
```

```
rmt0
```

```
  /mbus@0/ffec0000/sbus@f,fcffff00/Convex,afws
@1,10000/st@0,0
```

If this alias is not set or is not correct, use the show-map command to get the device path you need to alias the device to rmt0:

```
[0:3] ok show-map
```

```
  /mbus@0/ffec0000/sbus@f,fcffff00/Convex,afws@1,
10000/st@0,0
```

Copy this value to your X windows text buffer, then enter the following commands at the Open Boot prompt, pasting the value in the text buffer after `rmt0`:

```
[0:3] ok nvalias rmt0
/mbus@0/ffac0000/sbus@f,fcffff00/Convex,afws@1,
10000/st@0,0
```

Step 4 Reset the system:

```
[0:3] ok reset
```

Step 5 Perform this step only if your root disk is unusable and has to be replaced. Move the new root disk into SCSI ID 0x2. First, power off the peripheral chassis. Remove the bad disk from SCSI ID 0x2 and replace it with the new disk. Restore power to the peripheral chassis.

Step 6 Insert the Exemplar Scratch Installation DAT cartridge into your Exemplar system's DAT drive.

Step 7 When a new Exemplar System Console window appears on the test station, enter the following command in the console window at the Open Boot `ok` prompt:

```
[0:3] ok boot rmt0
```

Step 8 The scratch installation program displays some information in the console window, followed by the following menu:

```
Are you ready to begin the installation?
```

- 0. No
- 1. Yes
- 2. Exit

```
Choice (default is 1):
```

Enter 1 at the prompt and press the Return key to continue the installation procedure.

Step 9 The scratch installation program lists the devices installed on the Exemplar system that can be used to install the Exemplar Scratch Tape:

```
Searching for install devices .....
```

```
Select an Install Device
```

```
-----
```

- 0. rmt0
- 1. Other user specified device
- 2. Help

3. Exit

Enter 0 to select the DAT drive attached to node 0 (rmt 0).

Step 10 The scratch installation program displays a list of choices for the type of scratch installation you can perform:

Select an Installation Type

1. Minimum bootable root file system
2. Full root file system
3. Other user specified device
4. Help
5. Exit

Choice (default is 2):

Select the type of scratch installation you wish to perform. Select 1 to perform a mini-root installation; select 2 to perform a full root installation. The following sections describe the mini-root and full root installation procedures.

Mini-root scratch installation

This procedure installs a minimal root file system on the disk partition that you specify. Use this procedure if you intend to recover your old root file system and reinstall it. If your old root file system is irrecoverable, you need to perform a full root installation.

After you select option 1 in Step 10 above, the scratch installation program prints a message instructing you to insert the installation media into the installation device you have selected if you have not done so already. Make sure that the Exemplar Scratch Installation DAT cartridge is inserted into the device you have selected, then press the Return key to continue.

Step 1 The scratch installation program displays a list of devices that can be used as a root device for the installation. The list may look like the following:

Searching for root devices

Select a new Root Device to Install

-
- | | | | | |
|-----|-----------------------------|----------|--------------------------|---|
| 0. | sd0a | 819200K | Root and /usr filesystem | |
| 1. | sd0b | 1048576K | Default Pager Partition | D |
| 2. | sd0c | 40960K | Crashdump Partition | C |
| 3. | sd0d | 2048000K | <No Description> | |
| 4. | sd6a | 20480K | <No Description> | |
| 5. | sd6b | 1048576K | Default Pager Partition | D |
| 6. | sd6c | 40960K | Crashdump Partition | C |
| 7. | sd3a | 2048000K | <No Description> | |
| 8. | sd3b | 2048000K | <No Description> | |
| 9. | Other user specified device | | | |
| 10. | Help | | | |
| 11. | Exit | | | |

Choice: 6

Select a crashdump partition from the list of available disk partitions, or any other partition containing at least 20MB that can be destroyed. Enter the number corresponding to the device on which you wish to install the SPP-UX mini-root and press the Return key.

Step 2 The scratch installation program displays the install device and the root device you have selected, and prompts you to verify that these are the devices you want to use.

You have selected the root device:

Description: sd6c

Hardware Path:

/mbus@0,ffec0000/sbus@f,fcffff00/Convex,afws@1,10000/sd@3,0:silent,c

is this ok?

- 0. No
- 1. Yes
- 2. Exit

If this information is correct, type 1 and press the Return key. If the information is not correct, enter 0 and press the Return key.

Remember the Hardware Path that is returned; you will need this information to boot the mini-root file system.

The scratch installation again prompts you to verify the install device and the root device. Select 1 and press Return if this information is correct.

- Step 3** The scratch installation program copies a mini-root SPP-UX image and creates a mini-root file system on the partition. The program prints a message each time one MB of disk space has been formatted and written. This operation is finished when the program prints the following message:

```
19 Megabytes read, 19 Megabytes written
159+1 records in
159+1 records out
```

This step takes less than one minute.

- Step 4** Reset the CTI cache to its original value. From an sppdsh window, enter the following commands:

```
sppuser> ccmu
ccmu> up
ccmu> get usecachesize (the value should be zero)
ccmu> put usecachesize old_cache_size
ccmu> down
ccmu> push
ccmu> quit
sppuser> do_reset
```

- Step 5** Reset the Sbus probe list to the default value. Enter the following commands from the Open Boot prompt:

```
[0:3] ok set-default sbus-probe-list
[0:3] ok reset
```

- Step 6** Use the OBP `show-devs` command to find the device path for the mini-root partition that you just created. From the OBP window, enter the following command:

```
[0:3] ok show-devs
```

The device path for the mini-root partition is displayed as follows:

```
. . . .
/mbus@0, ffec0000/sbus@f, fcffff00/Convex, afws@1, 10000/sd
. . . .
```

Step 7 Boot the Exemplar system by typing the following sequence of commands in the Exemplar System Console window at the Open Boot ok prompt:

```
[0:3] ok boot device_path -root partition
```

In the example above, you would enter:

```
[0:3] ok boot /mbus@0,ffec0000/sbus@f,fcffff00/Convex,afws@1,10000/sd@3,0:c  
-root sd6c
```

Step 8 You now have a read/write file system and a working subset of SPP-UX. You can now attempt to recover your old root file system. The most common utilities for doing this are:

- fsck
- frecover
- restore

For examples of these utilities, see the "Mini-root troubleshooting procedures" section on page 11.

Man pages are not available on the mini-root file system. Use an sppuser window on the test station to view the man page for the utility you are using for more information.

Step 9 When you have recovered your old root file system, you can boot the old file system from the Open Boot prompt by entering the following command:

```
[0:3] ok boot
```

Full root installation

This procedure installs a working copy of SPP-UX, a new root file system, and, if the target disk is unlabeled, a 1-GB paging space. Use this procedure if your old root file system is not recoverable, or if you want to perform recovery operations using a larger portion of SPP-UX than is allowed with the mini-root system.

First perform all of the steps in the "Preinstallation tasks" section on page 2. After you complete those steps, the scratch installation program prints a message instructing you to insert the installation media into the installation device you have selected if you have not done so already. Make sure that the Exemplar Scratch Installation DAT cartridge is inserted into the device you have selected, then press the Return key to continue.

Step 1 The scratch installation program displays a list of choices for the type of scratch installation you can perform:

```
Select an Installation Type
```

- ```

1. Minimum bootable root file system
```

2. Full root file system
3. Other user specified device
4. Help
5. Exit

Choice (default is 2):

Select 2 and press Return to perform a full root installation.

At this point, the scratch installation program prints the options you have selected and prompts you to enter 1 if you wish to continue with these options.

Next, the scratch installation program prints a message instructing you to insert the installation media into the installation device you have selected if you have not done so already. Make sure that the Exemplar Scratch Installation DAT cartridge is inserted into the device you have selected, then press the Return key to continue.

- Step 2** The scratch installation program displays a list of devices that can be used as a root device for the installation. The list may look like the following:

Searching for root devices .....

Select a new Root Device to Install

-----

- 0. sd6a                    20480K        <No Description>
- 1. sd6b                    1048576K     Default Pager Partition        D
- 2. sd6c                    40960K        Crashdump Partition            C
- 3. sd3a                    2048000K     <No Description>
- 4. sd3b                    2048000K     <No Description>
- 5. Other user specified device
- 6. Help
- 7. Exit

Choice:

Enter the number corresponding to the device on which you wish to install SPP-UX and press the Return key. The disk you choose will be relabeled and partitioned; all data on the disk will be lost.

The scratch installation program displays the root device you have selected, and prompts you to verify that this is the device you want to use. If this information is correct, type 1 and press the Return key.

You have selected the root device:

Description:    sd3a

Hardware Path:

/mbus@0,ffec0000/sbus@f,fcffff00/Convex,afws@1,10000/sd@2,0:silent,a

SCSI ID 2 ^^^^^^

is this ok?

- 0.    No
- 1.    Yes
- 2.    Exit

---

## Caution

---

Make sure that the hardware path information is correct before continuing, if you have installed a new root disk in SCSI ID 0x2, the hardware path should contain the information shown above. Failure to verify the hardware path can result in the loss of all data on a disk.

- Step 3** The scratch installation program formats the root device, copies SPP-UX to the root device, creates a root file system on the device, and creates a paging space and a crashdump partition on the device. The program prints a message each time one MB of disk space has been formatted and written. This operation is finished when the program prints the following message:

```
799 Megabytes read, 799 Megabytes written
```

This step takes approximately 45 minutes.

- Step 4** If your root device is unlabeled, the scratch installation program prompts you to enter a logical device name for the device. Enter the device name and press the Return key, or press the Return key to accept the default device name (sd0).

---

## Caution

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If you select a non-standard device name, the device will not be usable unless you modify `/etc/checklist`, `/dev/root`, and possibly other system files. Since this is not possible unless you have another working copy of SPP-UX, you are strongly encouraged to use the default device name.

- Step 5** Reset the CTI cache to its original value. The system will not boot if you do not perform this step. From an `sppdsh` window, enter the following commands:

```
sppuser> ccmu
ccmu> up
ccmu> get usecachesize (the value should be zero)
ccmu> put usecachesize old_cache_size
ccmu> down
ccmu> push
ccmu> quit
sppuser> do_reset
```

- Step 6** Reset the Sbus probe list to the default value. Enter the following commands from the Open Boot prompt:

```
[0:3] ok set-default sbus-probe-list
 sbus-probe-list = U1SB3 U1SB2 U1SB1 U1SB0 ...
[0:3] ok reset (this takes about 30 seconds)
```

- Step 7** Boot the Exemplar system by typing the following sequence of commands in the Exemplar System Console window at the Open Boot prompt:

```
[0:3] ok boot
```

**Step 8** Since a new root disk has been built, you will have to either reenter the networking configuration *or* recover your old system files from a backup tape. SPP-UX will present the following prompt:

Are you ready to link this system to a network?

Press [y]es, [n]o, or [a]bort, then press [Return] y

Enter y to answer the networking questions with the information specific to your system.

You may now attempt to recover or restore your old file system. See "Full root troubleshooting procedures" section on page 12 for more information.

The Exemplar system is now ready to use. Continue by performing the post-installation tasks described in Chapter 2 of the *SPP-UX System Administration Guide*.

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## File system troubleshooting

This section contains procedures for recovering and restoring a damaged file system.

---

### Mini-root troubleshooting procedures

Once you have installed and booted a mini-root system, you have use of a subset of the SPP-UX utilities. Only a limited number of /dev files are created on mini-root; you can use the `diskutil` utility to create /dev files for disks that do not have them.

#### Using the `diskutil` utility

In order to recover a file system, there must be a device file for the device the file system resides on in the /dev directory. To create a device file if one does not exist, enter the following commands:

```
SPP> diskutil
```

```
Diskutil: show disk
```

```
Diskutil: select disk sdx (xx is a disk for which no
device file exists; xx can be 0-99)
```

```
Diskutil: quit
```

#### Using the `fsck` utility

The first utility you should run to try to restore a damaged file system after booting a mini-root file system is `fsck`. Enter the following command (assuming `sd0a` is the disk partition containing the damaged root file system):

```
SPP> fsck /dev/dsk/sd0a
```

`fsck` presents a dialog that identifies problems with the file system on the disk you are checking, and prompts you as to whether you want `fsck` to try to fix those problems.

If you decide to restore the root file system from a dump or an `fbackup` tape, use the appropriate utility—`restore` or `frecover`.

### Using the restore utility

To restore a root file system from a dump tape, use the following example:

```
SPP> newfs -v -b 8192 -f 1024 /dev/rdisk/sd0a scalios
SPP> mkdir /restore
SPP> mount /dev/dsk/sd0a /restore
SPP> cd /restore
```

Install the dump tape into the Exemplar DAT drive attached to node 0, then enter the following command:

```
SPP> restore r
```

### Using the frecover utility

To restore a root file system from an `fbackup` tape, use the following example:

```
SPP> mkdir /recover
SPP> mount /dev/dsk/sd0a /recover
SPP> /etc/frecover -r -x -f /dev/rmt/0m -i / -I
/recover
```

(A single-CPU system subcomplex is necessary to perform backups and recoveries.)

---

## Full root troubleshooting procedures

Once you have performed a full root scratch installation, you can attempt to restore the old root file system from a dump or an `fbackup` tape. Use the appropriate utility—`restore` or `frecover`.

### Using the restore utility

To restore a root file system from a dump tape, install the dump tape into the Exemplar DAT drive attached to node 0, then enter the following commands:

```
SPP> cd /
```

```
SPP> restore r
```

### **Using the frecover utility**

To restore a root file system from an fbackup tape, install the fbackup tape into the Exemplar DAT drive attached to node 0, then enter the following commands:

```
SPP> cd /
```

```
SPP> /etc/frecover -r -x -f /dev/rmt/0m -i /
```

(A single-CPU system subcomplex is necessary to perform backups and recoveries.)

