

HP-UX installation guide version 1.3

Rainer Többicke

December 9, 1991

1 General

*This is a living document, expected to change frequently. An up-to-date PostScript version of this document is available via anonymous FTP from **hp-osf1** under the name **hpux.ps**.*

1.1 hp-osf1 server

The hp-osf1 server appearing in several places throughout the document is currently still a station used for real work. It cannot therefore be guaranteed to provide the mentioned services at all times. A replacement is on order. Until then, in case of problems, contact rtb@cernapo.

In several places throughout this document the term *anonymous FTP to hp-osf1* is used. This means

1. you invoke `ftp hp-osf1`
2. when prompted for a userid you specify `anonymous`
3. when prompted for a password you specify your electronic mail address
4. from there on you use the command `'dir'` to find out what the server offers and the command `'get'` to copy a file to your station

1.2 Instant ignition

HP-UX systems should have been ordered with *instant ignition*, i.e. the system already pre-configured on the hard disk.

Where this is not the case, HP engineers will install a system during the installation. The system may subsequently have to be updated to the newest release following the procedure below.

In cases where even this did not happen, diskless boot from a central server may be possible. Contact R.Többicke (rtb@cernapo) for details.

1.3 TCP/IP address

The TCP/IP address and a TCP/IP host name must be allocated at least one day before the installation. Failure to do so will result in HP-Vue not starting up correctly when the name-server service is activated, since the name-server tables do not yet contain the system's own identification. In case this has not been followed correctly, the system can be used in *no-windows-mode* but HP-Vue will only work as of the next day.

1.4 Managing the HP9000 Series 700 from a non-HP machine

Managing HP-UX normally involves using SAM which requires an HP terminal or the *hpterm* X-Windows application. When not in front of the HP-UX system itself, e.g. from an Apollo, use the following procedure: (*snake* == HP-UX system, *apollo* == your Apollo)

```
/usr/bin/X11/xhost +snake
telnet snake
... log in as root
/usr/bin/X11/hpterm -fn 9x15 -display apollo:0
```

An *hpterm* window will appear with the required functionality for using SAM.

1.5 editing files

Get used to *vi*! When running as *root*, files are edited **read-only**, you have to use the form `:wq!` (i.e. with the exclamation mark).

2 Initial startup

2.1 Setting up the central name servers

Create a file named `/etc/resolv.conf` with the following contents:

```
domain cern.ch
nameserver 128.141.200.5
nameserver 128.141.200.6
```

2.2 TCP/IP setup

Upon the first boot after installation, the system prompts for the TCP/IP name and TCP/IP address.

A TCP/IP gateway must be defined if access to other networks than the current Ethernet is required. Use *either* of the following two methods

1. Invoke `sam`, select **Networks** then **LAN** then **ARPA** then **Default gateway**, and fill in `ext-gw-01.cern.ch` and `128.141.200.10`
2. edit the `/etc/netlinkrc`, find the line containing a comment about "add your own routes" and add:

```
/etc/route add default 128.141.200.10 200
```

2.3 Time zone

Select MET as the time zone at CERN when the system boots up. The `/etc/src.sh` file should contain

```
TZ=MET-1METDST,M3.5.0,M9.5.0 export TZ
```

Additionally, edit the file `/usr/lib/X11/vue/Vuelogin/Xconfig` and set the variable `Vuelogin*timeZone:` `MET-1METDST,M3.5.0,M9.5.0`

2.4 root and user accounts

By default root has no password, i.e. everybody can log into the machine as supervisor. This should be changed immediately using 'passwd'.

User accounts should be installed with the uid/gid numbers (*user identification, group identification*) corresponding to the numbers recorded in the Computer Centre database! The *phone* command on Apollo or Ultrix or the *WHO* command on VM can be used to display a user's uid/gid numbers. If the user is not registered in the CCDB, he should sign the necessary forms (available from the UCO) and obtain an account.

First create the user's group with SAM. The group's name does not really matter, best is to take the CCDB's name which appears after the '\$' in the user's account on *phone* or *WHO*. Unfortunately, SAM does not let you specify the group's number, so after creating the group edit (e.g. with *vi*) the file `/etc/group`. A typical entry in the file reads

```
xv:*:1158:
```

where the number 1158 is the group number.

2.5 Swap space

Swap space is disk space used to store pages of main memory freed by the system for other purposes. The total amount of storage used by processes running in the system cannot exceed the amount of available main memory (typically 16 or 32 Megabytes) plus the amount of swap space. Disk space being normally cheaper than main memory it makes sense to allocate more disk space for swapping than main memory is available, and let the system page data and programs between main storage and the swap area as they are needed.

Swap space can be allocated using two methods: a reserved area on disk and special blocks within the file system. By default, the system only pages/swaps to the reserved disk area on disk, established when the root file system was built.

It often makes sense to allocate 2-3 times the amount of main memory available as reserved disk space for swapping. If the system has several disks, system performance benefits from distributing the swap space over all of them. See *man newfs* and *man disktab* on how to allocate a disk swap area on a virgin disk.

When running many big programs, though, it may happen that the reserved swap space is exhausted. The system would refuse to create additional processes in that case. It may even turn out that you cannot kill an already running process in order to make space for a more important one, since the *kill* command itself is a process which needs a minimal amount of memory/swap space.

For this reason it makes sense to define additional swap space within the file system. This space is managed in a less efficient way than dedicated swap space. But it has the advantage to grow and shrink as the system requires and therefore does not induce a permanent waste of disk space. In any case the system will use it only when the more efficient disk swap space is exhausted.

Swap space is best defined through entries in `/etc/checklist`. A reasonable example is

```
/dev/dsk/5s0 /default swap
default /swap swapfs min=0,res=100,pri=2
```

This assumes that the machine has an additional disk at SCSI address 5 (for the first entry) which contains a reserved swap area, and that the `/swap` directory exists in the root filesystem for file system swap (2nd entry).

3 Software upgrade

Use the *update* command to install additional software. Most software should be available from the */etc/update* server called *hp-osf1*. Available software includes a current release of the operating system, C, FORTRAN and PASCAL.

The minimum system requirements for most of the software is currently HP-UX 8.05. For systems on a lower level (see `uname -r`) a system upgrade (see below) has to be performed before installing anything else.

3.1 Installing software using */etc/update*

The */etc/update* command is used to upgrade the HP-UX system.

We currently only support HP-UX Version 8.05 or later software distribution. Due to incompatibilities in the software distribution the /etc/update program to be used must be of a certain level. If the current system level is lower than HP-UX 8.05 the /etc/update program has to be copied by hand:

1. *ftp hp-osf1, log in as anonymous, password your mail address*
2. *binary*
3. *get update /tmp/update*
4. *quit*
5. *chmod 755 /tmp/update*

Using the */etc/update* command

1. log in as root, invoke */etc/update* (or */tmp/update* for pre HP-UX 8.05)
2. select *Change Source* then *Netdist Server* then server *hp-osf1*, port *2106*, system *700*, and press *done*
3. select *View Partitions and Filesets*; the *partition* screen appears
4. a complete partition can be selected by typing a **y** in front of the line
5. filesets within the partition can be viewed/selected by positioning the cursor on the line containing the partition in question and pressing the **F6** key (*View Filesets*); a *fileset* screen appears
6. after selection, if in a *fileset* screen, go back to the partition screen by pressing **F8** (*Partit'n Screen*)
7. when all selections are done and the *partition* screen is active, press **F4** (*Start Loading*)
8. follow the instructions

3.2 System upgrade

To upgrade the system, install using `/etc/update` (*see above*):

1. all filesets starting with OS-...
2. the complete NETWORKING partition or at least the LAN, BSDIPC, NETIPC and NFS-RUN filesets
3. the PROG-MIN fileset from the PROG-LANGUAGES partition

3.3 Fortran compiler

To install the FORTRAN compiler, use `/etc/update` (*see above*) to install the filesets DEBUGGERS, FORTRAN-DOC, FORTRAN-PRG from the PROG-LANGUAGES partition.

4 Disks and Filesystems

This chapter explains how to add a disk to your system. It supposes that you have found the right SCSI cable to connect the disk drive (if it's external) and that you know its SCSI ID. For non-HP disks (e.g. WREN7), a new entry has to be created in `/etc/disktab` that describes the characteristics of the disk. This entry should be supplied by the manufacturer of the disk, or can be copied from someone who has got it working on a similar Unix system. Typical examples are:

```
Wren7|WREN7:\
      :No swap or boot:ns#35:nt#15:nc#1931:\
      :s0#1013775:b0#8192:f0#1024:\
      :se#512:rm#3600:
```

More detailed information can be found in the *Installing Peripherals* manual.

4.1 Disk initialisation

- create the SCSI device files if they do not already exist, for a disk on SCSI address **S** check that `/dev/dsk/Ss0` and `/dev/rdisk/Ss0` exist; if not, see the *Installing Peripherals* manual

The designation Ss0 for a disk on address S (e.g. 5s0 on SCSI address 5) is only a convention! An 'ls -l' reveals the major/minor device numbers which lead to the SCSI address as described in the above mentioned manual.

- find corresponding entry in `/etc/disktab` or create a new one (in case your disk is non-HP). The `disktab` entry describes the disk's characteristics and the amount of swap space reserved. A typical example for a system with 32 MB and a 400 MB disk would be `QUANTUM_PD425S_90MB`.
- For HP disks, use `sam` to create a file system: `sam` then *File Systems* then *Add ...*
- for non-HP disks, use `/etc/newfs -v /dev/rdisk/Ss0 disktab-entry`, where **S** is the SCSI ID
- `/etc/mkdir /directory`

- `/etc/mount /dev/dsk/5s0 /directory`
- `/etc/mount -p`
- add the line concerning the new disk to `/etc/checklist`, so the disk will always be re-mounted after boot

4.2 Dumping and restoring

See the man pages for `fbackup/frecover`, or use `Omniback`.

4.3 Copying a whole disk

Here is how to copy a whole filesystem *olddisk* into another *newdisk*:

```
cd /newdisk dump 0f - /olddisk | restore rvf -
```

If the new disk is to replace the old one, simply swap the entries for `/olddisk` and `/newdisk` in `/etc/checklist` and reboot the system.

4.4 NFS mounts

Using SAM you can mount file systems from other machines just about where it you pleases and in numbers probably beyond practical limits. The following should however be observed:

- including an NFS mounted directory in your default command search path can make life *very* difficult should for any reason the NFS server be temporarily unreachable: commands not specified with a full pathname may cause the shell to hang. Better NFS-mount the foreign filesystem into the `/Net` tree (see below) and define symbolic links (`→ln -s`) for the commands you need in your `/bin` or `/usr/local/bin` directory.
- Don't let your disk get clobbered with NFS mount points all over the place, which could make copying directories with `cp -r . . .` or backing them up with `tar` a nightmare. Where possible, mount foreign filesystems in `/Net/hostname/...` and create a symbolic link to the file/directory if needed in a specific place.

5 printers

SAM is used to define printers. The majority of printers are currently available via spooling through the **springer** print server.

1. find out the name of the printer you want to use. Easiest is still through 'find printers' on VM
2. get your station authorised for printer access in **springer**: contact J.-L.Vosdey or R.Töbicke (e-mail to `printsp@springer.cern.ch`)
3. invoke `sam`, select *Peripheral Devices* then *Printers & Plotters* then *Add a Remote Printer*
4. define your printer *under the same name* as the remote printer; specify **springer** as the remote host; make sure you specify a BSD system!

HP-UX does not allow a dash "-" to be used in a printer name. Replace dashes "-" by underscore "_" in local and remote printer names

6 Online documentation

Online documentation is available through the server `hp-osf1`. The HP Laserrom/UX software has to be installed:

1. NFS-mount `hp-osf1:/cdrom` on `/cdrom`; if you choose to mount it somewhere else, change the `dbloc=` entry in `/usr/laserrom/.laserromrc` accordingly after installing the software
2. Invoke `/etc/update` and select source *tape*, replacing `/dev/update.src` with `/cdrom/UXINSTAL/LASER800.8`
3. Install the `LASERROM_SW` fileset from the `LASERROM` product
4. invoke `laserrom`

The software is on a CD ROM which may not always be mounted. In case of problems check with R.Többsicke (4911).

7 Support

- For system and software installations contact S.Olofsson (`soren@cernapo`, 7114, 13+5564) or M.Vergari (`vnv@cernapo`, 4979, 13+5602)
- Hardware installation (including operating system setup) is normally done by the HP engineer, P.Lachaux (13+5624), M.Barral (13+5625)
- User software and Unix problems are handled by the UCO (4952)
- For system problems R.Többsicke (`rtb@cernapo`)

8 Tips and pitfalls

8.1 Popular directories

Initially, the system comes with an empty `/usr/local/bin` directory. This should receive public utilities of your choice. For utilities that you don't want to copy but are happy with a version somewhere on the network, this may be a convenient place to define a symbolic/soft link to a file in an NFS-mounted directory. The `/usr/local/bin` directory should go into your default command search path (see below on where to define).

Another library, `/usr/local/lib`, may hold software components and configuration files that are not usable as commands.

8.2 Login profiles

When logging in to HP-Vue (the HP window/workspace manager), the `.login` or `.profile` scripts are **not** executed! There are two places where commands commonly appearing in these files can be placed:

- `/.vueprofile` - can be used to set environment variables such as your default command search `PATH`, e.g.

```
PATH=.: /bin:/usr/local/bin:/usr/bin:/bin:/usr/bin/X11
export PATH
```

- */.vue/display/sessionetc* - can contain commands (e.g. opening additional windows) to be executed when the session starts.

8.3 Autologout

If you are using the C-shell (*/bin/csh*) you might have noticed that terminal sessions sometimes disappear: the reason is the shell variable *autologout*, set by default to 60. After that period (in minutes) of inactivity the *hpterm* disappears.

8.4 X resources

HP-Vue does not use the *.Xdefaults* file which so many "pure Unix"¹ users are used to.

- With *resume current session* active (the default setup), HP-Vue saves all your current X resources when you log out and restores them when you log in again.
- With *restore home session* active (selectable through the startup icon in the style manager), only the resources in */.vue/display/home/vue.resources* are loaded.

8.5 Electronic mail

Should you decide that you want to receive and send electronic mail through your HP-UX workstation (which is a good idea), two configuration steps have to be undertaken:

1. obtain a correctly configured *sendmail* configuration file which configures CERN's electronic mail gateway: it is available via anonymous FTP from hp-osf1 as *sendmail.cf* and must be installed as */usr/lib/sendmail.cf*
2. use SAM (\rightarrow *Networks/Communications* \rightarrow *LAN software* \rightarrow *Network mail*) to start sendmail
3. using the so configured mail software will cause your mail to appear to come from your HP-UX workstation, i.e. other users replying to your mail will reply directly to your station. This may not be desirable, perhaps because your station is not always meant to remain powered on or because you already have an electronic mail address well known to other people whom you would not want to confuse. In that case the *host hiding* facility can be used: in the *sendmail.cf* you copied, just find the line containing 'cernapo', uncomment it (removing the '#') and replace 'cernapo' by a host of your choice. Mail you send out will appear to come from that machine and users will reply to that address. This setup assumes that your user names are equal in both systems and that the replacement host forwards mail to your workstation, i.e. that you have a *.forward* file in your home directory on that machine (or a similar forwarding mechanism).

¹I know this is nonsense

9 Local software

9.1 Network news

You are recommended to install a usenet news reader and regularly read at least the `cern....etc...` newsgroups.

Although not an X-windows application, the *nn* news reader is currently probably the best: It has no serious known bugs, very fast and still fairly easy to use. In order to use it, two programs have to be installed and the *nn* news database NFS-mounted from the news server *DXCERN*. Consult the file `nn.readme`, available via anonymous FTP from `hp-osf1`.