NAME

INSTALL – Installation procedure for NetBSD/hp300

DESCRIPTION

About this Document

This document describes the installation procedure for NetBSD 1.4.1 on the *hp300* platform. It is available in four different formats titled `INSTALL.`*ext*, where *ext* is one of `.ps`, `.html`, `.more`, or `.txt`.

`.ps` PostScript.

`.html` Standard internet HTML.

`.more` The enhanced text format used on Unix-like systems by the `more`(1) and `less`(1) pager utility programs. This is the format in which the on-line *man* pages are generally presented.

`.txt` Plain old ASCII.

You are reading the *PostScript* version.

What is NetBSD?

The NetBSD Operating System is a fully functional Open Source UN*X-like operating system derived from the Berkeley Networking Release 2 (Net/2), 4.4BSD-Lite, and 4.4BSD-Lite2 sources. NetBSD runs on twenty different system architectures featuring eight distinct families of CPUs, and is being ported to more. The NetBSD 1.4.1 release contains complete binary releases for fourteen different machine types. (The six remaining are not fully supported at this time and are thus not part of the binary distribution. For information on them, please see the NetBSD web site at **http://www.netbsd.org/**)

NetBSD is a completely integrated system. In addition to its highly portable, high performance kernel, NetBSD features a complete set of user utilities, compilers for several languages, The X Window System, and numerous other tools, all accompanied by full source code.

NetBSD is a creation of the members of the Internet community. Without the unique cooperation and coordination the net makes possible, it's likely that NetBSD wouldn't exist.

Changes Since The Last Release

The NetBSD 1.4.1 release is a substantial improvement over its predecessors. We have provided numerous significant functional enhancements, including support for many new devices, integration of hundreds of bug fixes, new and updated kernel subsystems, and many userland enhancements. The results of these improvements is a stable operating system fit for production use that rivals most commercially available systems.

It is impossible to completely summarize the nearly two years of development that went into the NetBSD 1.4.1 release. Some highlights include:

- Substantial improvements in the TCP/IP implementation, including numerous performance enhancements and bug fixes by Jason Thorpe and others.
- A new, high efficiency kernel memory pool allocator by Paul Kranenburg. This has been integrated into most kernel subsystems.
- A new, totally rewritten virtual memory subsystem, UVM, created by Chuck Cranor, which is substantially cleaner and better performing than the old Mach derived VM subsystem.
- Improved POSIX and XPG standards compliance.

- Completion of the integration of all remaining 4.4BSD Lite-2 kernel improvements and bug fixes that had not been previously integrated. (Integration of all userland components was completed before NetBSD 1.3)
- Several new ports, including macppc, bebox, sparc64, next68k, and others, have been integrated into the source tree.
- The system compilers have been upgraded to egcs 1.1.1, and the system compiler toolchain now (mostly) uses the latest versions of GNU binutils instead of the obsolete versions left over from 4.4BSD Lite.
- Everyone's favorite `ftp`(1) client has been improved even further. See the man page for details.
- A new architecture independent console driver, `wscons`(4), has been integrated into many ports.
- Numerous improvements have been made to the audio subsystem support, including support for MIDI device drivers.
- Linux compatibility support has been improved.
- A number of scheduler enhancements have yielded dramatic improvements in interactive performance and better control of background tasks.
- Several network tunneling protocols, including GRE and IP in IP, have been implemented.
- Kernel support for the CODA distributed file system has been added.
- Manuel Bouyer completed major changes to the IDE support. It is now architecture independent. Major changes have been made to the IDE code for better error handling, improved ATAPI support, 32 bit data I/O support and bus-master DMA support on PCI IDE controllers.
- Lennart Augustsson has added full USB support, permitting the use of a wide variety of Universal Serial Bus peripherals. The drivers should easily port to any future platforms that support the PCI bus. See `usb`(4) for an overview.
- RAIDframe, version 1.1, from the Parallel Data Laboratory at Carnegie Mellon University, has been integrated. Supports RAID levels 0, 1, 4, 5, and more.
- Luke Mewburn added `nsswitch.conf`(5) functionality to the system to specify the search order for system databases.
- `syslogd`(8) now supports listening on multiple sockets, to make the chrooting of servers easier.
- Most third party packages have been updated to the latest stable release.

As has been noted, there have also been innumerable bug fixes.

Kernel interfaces have continued to be refined, and more subsystems and device drivers are shared among the different ports. You can look for this trend to continue.

This is the third public release of NetBSD for the HP 9000/300 series of computers.

The Future of NetBSD

The NetBSD Foundation has been incorporated as a non-profit organization. Its purpose is to encourage, foster and promote the free exchange of computer software, namely the NetBSD Operating System. The foundation will allow for many things to be handled more smoothly than could be done with our previous informal organization. In particular, it provides the framework to deal with other parties that wish to become involved in the NetBSD Project.

The NetBSD Foundation will help improve the quality of NetBSD by:

- providing better organization to keep track of development efforts, including co-ordination with groups working in related fields.
- providing a framework to receive donations of goods and services and to own the resources necessary to run the NetBSD Project.
- providing a better position from which to undertake promotional activities.
- periodically organizing workshops for developers and other interested people to discuss ongoing work.

We intend to begin narrowing the time delay between releases. Our ambition is to provide a full release every six to eight months.

We hope to support even *more* hardware in the future, and we have a rather large number of other ideas about what can be done to improve NetBSD.

We intend to continue our current practice of making the NetBSD-current development source available on a daily basis. In addition, we intend to provide Anonymous CVS access to the NetBSD source tree in the near future, so that anyone on the internet can examine the full NetBSD source code repository.

We intend to integrate free, positive changes from whatever sources submit them, providing that they are well thought-out and increase the usability of the system.

Above all, we hope to create a stable and accessible system, and to be responsive to the needs and desires of NetBSD users, because it is for and because of them that NetBSD exists.

Sources of NetBSD

NetBSD Mirror Site List

The following sites mirror NetBSD as of April 03, 1999.

If you wish to become a distribution site for NetBSD, contact `mirrors@netbsd.org`.

FTP mirrors

Australia

ftp.au.netbsd.org
RMIT University, Melbourne
ftp://ftp.au.netbsd.org/pub/NetBSD/

ftp2.au.netbsd.org
University of Queensland, Brisbane
ftp://ftp2.au.netbsd.org/pub/NetBSD/

Austria

ftp.at.netbsd.org
University of Technology, Vienna
ftp://ftp.at.netbsd.org/pub/NetBSD/

Brazil

ftp.ravel.ufrj.br
Cidade Universitaria
ftp://ftp.ravel.ufrj.br/pub/NetBSD/

Denmark

ftp.dk.netbsd.org
Aalborg University
ftp://ftp.dk.netbsd.org/pub/NetBSD/

Finland

ftp.fi.netbsd.org
The Finnish University and Research Network, Espoo
ftp://ftp.fi.netbsd.org/pub/NetBSD/

France

ftp.fr.netbsd.org
Paris University
ftp://ftp.fr.netbsd.org/pub/NetBSD/

Germany

ftp.de.netbsd.org
University of Trier
ftp://ftp.de.netbsd.org/pub/NetBSD/

ftp2.de.netbsd.org
University of Erlangen-Nuremberg
ftp://ftp2.de.netbsd.org/pub/NetBSD/

ftp.uni-regensburg.de
University of Regensburg
ftp://ftp.uni-regensburg.de/pub/comp/os/NetBSD/

Japan

ftp.jp.netbsd.org
Internet Research Institute Inc., Tokyo
ftp://ftp.jp.netbsd.org/pub/NetBSD/

core.ring.gr.jp
Electrotechnical Laboratory
ftp://core.ring.gr.jp/pub/NetBSD/

ftp.dti.ad.jp
Dream Train Internet Inc., Tokyo
ftp://ftp.dti.ad.jp/pub/NetBSD/

mirror.nucba.ac.jp
Nagoya University of Commerce and Business
ftp://mirror.nucba.ac.jp/mirror/NetBSD/

netbsd.tohoku.ac.jp
Tohoku University, Sendai
ftp://netbsd.tohoku.ac.jp/NetBSD/

ring.asahi-net.or.jp
ASAHI Net
ftp://ring.asahi-net.or.jp/pub/NetBSD/

Netherlands

ftp.nl.netbsd.org
University of Amsterdam

ftp://ftp.nl.netbsd.org/pub/NetBSD/

Norway

ftp.no.netbsd.org
Bergen IT Consult AS
ftp://ftp.no.netbsd.org/pub/NetBSD/

ftp.ntnu.no
Norwegian University of Science and Technology
ftp://ftp.ntnu.no/pub/NetBSD/

Russia

ftp.ru.netbsd.org
Landau Institute for Theoretical Physics, Chernogolovka
ftp://ftp.ru.netbsd.org/pub/NetBSD/

Sweden

ftp.stacken.kth.se
Royal Institute of Technology, Stockholm
ftp://ftp.stacken.kth.se/pub/OS/NetBSD/

ftp.sunet.se
Swedish University NETwork, Uppsala
ftp://ftp.sunet.se/pub/os/NetBSD/

UK

ftp.uk.netbsd.org
Domino, London
ftp://ftp.uk.netbsd.org/pub/NetBSD/

sunsite.org.uk
ftp://sunsite.org.uk/packages/netbsd/

USA

ftp.netbsd.org
Silicon Valley, California
ftp://ftp.netbsd.org/pub/NetBSD/

ftp.cs.umn.edu
University of Minnesota
ftp://ftp.cs.umn.edu/pub/NetBSD

ftp.eecs.umich.edu
University of Michigan, Ann Arbor
ftp://ftp.eecs.umich.edu/pub/NetBSD/

ftp.iastate.edu
Iowa State University
ftp://ftp.iastate.edu/pub/netbsd/

ftp.op.net
ftp://ftp.op.net/pub/NetBSD/

AFS mirrors

Sweden

ftp.stacken.kth.se
Royal Institute of Technology, Stockholm
AFS path: /afs/stacken.kth.se/ftp/pub/OS/NetBSD

USA

ftp.iastate.edu
Iowa State University
AFS path: /afs/iastate.edu/public/ftp/pub/netbsd

NFS mirrors

UK

sunsite.org.uk
Instructions: mount -o ro sunsite.org.uk:/public/packages/netbsd /mnt

SUP mirrors

Australia

sup.au.netbsd.org
RMIT University, Melbourne
Instructions: ftp://sup.au.netbsd.org/pub/NetBSD/sup/README.sup

France

sup.fr.netbsd.org
Paris University
Instructions: Similar to sup.netbsd.org

Germany

sup.de.netbsd.org
University of Trier
Instructions: ftp://sup.de.netbsd.org/pub/NetBSD/sup/supfile.example

Japan

sup.jp.netbsd.org
Internet Research Institute Inc., Tokyo
Instructions: ftp://sup.jp.netbsd.org/pub/NetBSD/sup/README.sup

Norway

sup.no.netbsd.org
Norwegian University of Science and Technology
Instructions: See /usr/src/share/examples/supfiles/sup.no.netbsd.org

UK

sup.uk.netbsd.org
Domino, London
Instructions: See ftp://ftp.netbsd.org/pub/NetBSD/sup/README.sup

USA

sup.netbsd.org
Silicon Valley, California
Instructions: See ftp://ftp.netbsd.org/pub/NetBSD/sup/README.sup

ftp.cs.umn.edu
University of Minnesota
Instructions: hostbase=/ftp/ftp/packages/NetBSD, collections are the same as on sup.NetBSD.ORG

WWW mirrors

Australia

www.au.netbsd.org
RMIT University, Melbourne
http://www.au.netbsd.org/

Austria

www.at.netbsd.org
University of Technology, Vienna
http://www.at.netbsd.org/

Finland

www.fi.netbsd.org
Global Wire Oy, Lappeenranta
http://www.fi.netbsd.org/

France

www.fr.netbsd.org
Paris University
http://www.fr.netbsd.org/

Germany

www.de.netbsd.org
http://www.de.netbsd.org/

Japan

www.jp.netbsd.org
Internet Research Institute Inc., Tokyo
http://www.jp.netbsd.org/

Norway

www.no.netbsd.org
Bergen IT Consult AS
http://www.no.netbsd.org/

USA

www.netbsd.org
Western Washington State University
http://www.netbsd.org/

www2.us.netbsd.org
New York
http://www.us.netbsd.org/

NetBSD 1.4.1 Release Contents

The root directory of the NetBSD 1.4.1 release is organized as follows:

`.../NetBSD-1.4.1/`

`BUGS` Known bugs list (somewhat incomplete and out of date).

`CHANGES` Changes since earlier NetBSD releases.

`LAST_MINUTE` Last minute changes.

`MIRRORS` A list of sites that mirror the NetBSD 1.4.1 distribution.

`README.files`
README describing the distribution's contents.

`TODO` NetBSD's todo list (also somewhat incomplete and out of date).

`patches/` Post-release source code patches.

`source/` Source distribution sets; see below.

In addition to the files and directories listed above, there is one directory per architecture, for each of the architectures for which NetBSD 1.4.1 has a binary distribution. There are also 'README.export-control' files sprinkled liberally throughout the distribution tree, which point out that there are some portions of the distribution (i.e. the 'domestic' portion) that may be subject to export regulations of the United States. It is your responsibility to determine whether or not it is legal for you to export these portions and to act accordingly.

The source distribution sets can be found in subdirectories of the "source" subdirectory of the distribution tree. They contain the complete sources to the system. The source distribution sets are as follows:

secrsrc.tgz: This set contains the "domestic" sources. These sources may be subject to United States export regulations.
421K gzipped, 2M uncompressed

gnusrc.tgz: This set contains the "gnu" sources, including the source for the compiler, assembler, groff, and the other GNU utilities in the binary distribution sets.
19M gzipped, 84.2M uncompressed

syssrc.tgz: This set contains the sources to the NetBSD 1.4.1 kernel, config(8), and dbsym(8).
13.5M gzipped, 66.7M uncompressed

sharesrc.tgz: This set contains the "share" sources, which include the sources for the man pages not associated with any particular program, the sources for the typesettable document set, the dictionaries, and more.
3M gzipped, 11.9M uncompressed

src.tgz: This set contains all of the NetBSD 1.4.1 sources which are not mentioned above.
16.1M gzipped, 73.6M uncompressed

Most of the above source sets are located in the `source/sets` subdirectory of the distribution tree. The secrsrc.tgz set is contained in the `source/security` subdirectory. This set, which is available only to users in the United States and Canada, contains the sources normally found in `/usr/src/domestic` – primarily kerberos and other cryptographic security related software. (Remember, because of United States law, it may not be legal to distribute this set to locations outside of the United States and Canada.)

The source sets are distributed as compressed tar files. They may be unpacked into /usr/src with the command:

cat set_name.tgz | gunzip | (cd /; tar xpf -)

The sets/Split/ and security/Split/ subdirectories contain split versions of the source sets for those users who need to load the source sets from floppy or otherwise need a split distribution. The split sets are are named "set_name.xx" where "set_name" is the distribution set name, and "xx" is the sequence number of the file, starting with "aa" for the first file in the distribution set, then "ab" for the next, and so on. All of these files except the last one of each set should be exactly 240,640 bytes long. (The last file is just long enough to contain the remainder of the data for that distribution set.)

The split distributions may be reassembled and extracted with **cat** as follows:

cat set_name.?? | gunzip | (cd /; tar xpf -)

In each of the source distribution set directories, there is a file named CKSUMS which contains the checksums of the files in that directory, as generated by the cksum(1) utility. You can use cksum to check the integrity of the archives, if you suspect that one of the files is corrupt and have access to a cksum binary. Checksums based on other algorithms may also be present – see the release(7) man page for details.

NetBSD/hp300 Subdirectory Structure

The hp300-specific portion of the NetBSD 1.4.1 release is found in the hp300 subdirectory of the distribution: .../NetBSD-1.4.1/hp300/

INSTALL.html
INSTALL.ps
INSTALL.txt
INSTALL.more Installation notes; this file. The .more file contains underlined text using the more(1) conventions for indicating italic and bold display.

binary/
- sets/ hp300 binary distribution sets; see below.
- security/ hp300 security distribution; see below.

installation/
- miniroot/ hp300 miniroot images; see below.
- misc/ Miscellaneous hp300 installation helper utilities; see installation section below.

Binary Distribution Sets

The NetBSD hp300 binary distribution sets contain the binaries which comprise the NetBSD 1.4.1 release for the hp300. There are eight binary distribution sets and the *security* distribution set. The binary distribution sets can be found in the hp300/binary/sets subdirectory of the NetBSD 1.4.1 distribution tree, and are as follows:

base The NetBSD 1.4.1 hp300 **base** binary distribution. You *must* install this distribution set. It contains the base NetBSD utilities that are necessary for the system to run and be minimally functional. It includes shared library support, and excludes everything described below.

comp Things needed for compiling programs. This set includes the system include files (/usr/include) and the various system libraries (except the shared libraries, which are included as part of the **base** set). This set also includes the manual pages for all of the utilities it contains, as well as the system call and library manual pages.

etc This distribution set contains the system configuration files that reside in /etc and in several other places. This set *must* be installed if you are installing the system from scratch, but should *not* be used if you are upgrading. (If you are upgrading, it's recommended that you get a copy of this set and *carefully* upgrade your configuration files by hand.)

games This set includes the games and their manual pages.

kern This set contains a NetBSD/hp300 1.4.1 GENERIC kernel, named `/netbsd`. You *must* install this distribution set.

man This set includes all of the manual pages for the binaries and other software contained in the **base** set. Note that it does not include any of the manual pages that are included in the other sets.

misc This set includes the (rather large) system dictionaries, the typesettable document set, and other files from `/usr/share`.

text This set includes NetBSD's text processing tools, including `groff`(1), all related programs, and their manual pages.

The hp300 security distribution set is named **secr** and can be found in the

`hp300/binary/security`

subdirectory of the NetBSD 1.4.1 distribution tree. It contains security-related binaries which depend on cryptographic source code. You do not need this distribution set to use encrypted passwords in your password file; the **base** distribution includes a crypt library which can perform only the one-way encryption function. The security distribution includes a version of the Kerberos IV network security system, and a Kerberized version of `telnet`(1) program. The **secr** distribution set can be found only on those sites which carry the complete NetBSD distribution and which can legally obtain it. Because of United States law, it may not be legal to distribute this set to locations outside of the United States and Canada.

NetBSD maintains its own set of sources for the X Window System in order to assure tight integration and compatibility. These sources are based on XFree86, and tightly track XFree86 releases. They are currently equivalent to XFree86 3.3.3.1. Binary sets for the X Window system are distributed with NetBSD. Unfortunately there is no R6.3 Xserver for NetBSD/hp300 yet, so we can only distribute the X clients this time. The sets are:

xbase The basic files needed for a complete X client environment. This does not include the X servers.
2.5M gzipped, 7.6M uncompressed

xcomp The extra libraries and include files needed to compile X source code.
1.7M gzipped, 7.1M uncompressed

xcontrib Programs that were contributed to X.
183k gzipped, 686k uncompressed

xfont Fonts needed by X.

The hp300 binary distribution sets are distributed as gzipped tar files named with the extension **.tgz**, e.g. `base.tgz`.

The instructions given for extracting the source sets work equally well for the binary sets, but it is worth noting that if you use that method, the files are /-relative and therefore are extracted *below* the current directory. That is, if you want to extract the binaries into your system, i.e. replace the system binaries with them, you have to run the **`tar xfp`** command from /.

The following are included in the `hp300/installation` directory:

`miniroot/`

miniroot.fs.gz A copy of the miniroot filesystem.

`misc/`

`HP-IB.geometry` A file containing geometry for some HB-IB disk drives.

`SYS_INST.gz` A gzipped copy of the SYS_INST miniroot installation program.

`SYS_UBOOT.gz` A gzipped copy of the universal boot block. Supports Network, tape and disk booting. This is useful if you are installing a diskless NetBSD/hp300 system.

`rbootd.tgz` Source code for the rbootd program included with NetBSD. It requires that the server has a Berkeley Packet Filter (bpf). You will need to compile this version of rbootd if server system does not have this utility already.

The following are included in the `hp300/binary/kernel` directory:

`netbsd.gdb.gz` A gzipped GENERIC kernel with debugging symbols.

`netbsd.gz` A gzipped GENERIC kernel.

Note Each directory in the hp300 binary distribution also has its own checksum files, just as the source distribution does:

All BSDSUM files are historic BSD checksums for the various files in that directory, in the format produced by the command: **cksum -o 1** *file*

All CKSUM files are POSIX checksums for the various files in that directory, in the format produced by the command: **cksum** *file*.

All MD5 files are MD5 digests for the various files in that directory, in the format produced by the command: **cksum -m** *file*.

All SYSVSUM files are historic AT&T System V UNIX checksums for the various files in that directory, in the format produced by the command: **cksum -o 2** *file*.

The MD5 digest is the safest checksum, followed by the POSIX checksum. The other two checksums are provided only to ensure that the widest possible range of system can check the integrity of the release files.

NetBSD/hp300 System Requirements and Supported Devices

NetBSD/hp300 1.4.1 will run on most HP 9000/300- and 400-series machines. The smallest amount of RAM that has been tested is 4M. If you wish to run X, more RAM is recommended.

Here is a table of recommended HD partition sizes for a full install:

```
partition:     advise          needed
root (/)       25M             15M
user (/usr)    150M           100M
swap           (2 or 3 * RAM)   6M     (see note below)
Anything else is up to you!
```

Note: The hp300 installation procedure uses a 'miniroot' filesystem which is placed into the swap area of the disk. The swap partition must be large enough to hold this miniroot image.

The following HP hardware is supported:

CPUs:

- 68020-based: 318, 319, 320, 330, and 350.

- 68030-based: 340, 345, 360, 370, 375, and 400(*).
- 68040-based: 380, 425(*), and 433(*).

Disks:

- HP-IB/CS80: 7912, 7914, 7933, 7936, 7937, 7945, 7957, 7958, 7959, 2200, and 2203.
- SCSI-I(**), including magneto-optical and CD-ROM.

Tape drives:

- Low-density HP-IB/CS80 cartridge: 7914, 7946, and 9144.
- High-density HP-IB/CS80 cartridge: 9145.
- HP-IB/CS80 1/2": 7974A, 7978A/B, 7979A, 7980A, and 7980XC.
- SCSI: HP DAT, Exabyte, and SCSI QIC drives such as the Archive Viper.

RS232 interfaces:

- 98644 built-in single port (dca).
- 98642 4-port (dcm).
- 98638 8-port (dcm).

Network interfaces:

- 98643 built-in and add-on LAN cards.

Displays:

- 98544, 98545, and 98547 color and monochrome Topcat.
- 98548, 98549, and 98550 color and monochrome Catseye.
- 98700 and 98710 Gatorbox.
- 98720 and 98721 Renaissance.
- 98730 and 98731 DaVinci.
- A1096A monochrome Hyperion.

Input devices:

- General interface supporting all HIL devices: keyboard, 2 and 3 button mice(***), and ID module.

Miscellaneous:

- Battery-backed real-time clock.
- 98624 built-in HP-IB interface.
- 98625A and 98625B 'fast' HP-IB interface.
- 98658A built-in and add-on SCSI interface.
- Printers and plotters on RS232 and HP-IB.
- SCSI autochanger.

(*) 400-series machines configured for Domain/OS are not fully supported, notably, the keyboard doesn't work and the ROMs must be in 'HP-UX mode'.

(**) SCSI-II drives are known to work, though this may require changing a jumper on some drives. See your disk's documentation for details.

(***) Serial mice connected to a 'HIL to quad' converter are also known to work.

If it's not on this list, there is no official support for it in this release.

Getting the NetBSD System on to Useful Media

Installation is supported from several media types, including:

- Tape
- CD-ROM
- NFS
- FTP

The steps necessary to prepare the distribution sets for installation depend on which method of installation you choose. The various methods are explained below.

To prepare for installing via a tape:

If you wish to load SYS_INST from tape, it must appear on the tape before any other files. To copy this onto tape, use a command like the following:

```
dd if=SYS_INST of=<tape_device> obs=20b conv=osync
```

Note that not all HP BOOTROMs support booting from SCSI tapes.

Copying the miniroot to disk from tape is not currently supported. However, it is planned for a future release.

If you wish to extract binary sets onto your disk from tape, you must first place them on the tape. The easiest way to do this is with the dd(1) command. Make sure you use a 'no-rewind-on-close' tape device. For example:

```
for file in base.tgz etc.tgz; do
        dd if=${file} of=/dev/nrst0
done
```

Note that depending on your tape drive, you may need to explicitly set the EOF marker at the end of each file. It may also be necessary to use the 'conv=osync' argument to dd(1). Note that this argument is incompatible with the 'bs=' argument. Consult the tape-related manual pages on the system where the tapes are created for more details.

To prepare for installing via NFS:

SYS_INST currently requires an NFS server from which to copy the miniroot.

- This filesystem must be exported with root permissions, but may be exported read-only.
- The miniroot image _must_ reside in the 'root' of the mounted filesystem. For example, if the client system mounts 'server:/u', then the miniroot image must reside in /u on the server. This is due to limitations in the file lookup code used in SYS_INST, and may be fixed in a future release.
- If you also wish to install the binary sets from the NFS server, place them in a properly exported filesystem on the server. Note that these files do not suffer from the same placement restrictions as the miniroot.

To prepare for installing via FTP:

It is possible, using the 'install' and 'upgrade' programs in the miniroot, to extract the binary sets directly onto disk from an FTP server. This is by far the easiest installation method, as you may specify to have all sets extracted at once, providing that they are located in the same directory on the server.

All that is required in this case is that you have network access to an FTP server. This may be your account on another system, or may even be ftp.NetBSD.ORG itself. If you wish to use ftp.NetBSD.ORG as your FTP file server, you may want to keep the following information handy:

IP Address: ftp.NetBSD.ORG Login: anonymous Password: <your e-mail address> Server path: /pub/NetBSD/NetBSD-_VER/hp300/binary/sets
Note: if you're not using a nameserver during installation, you might find 204.152.184.75 handy; it's the IP

address of ftp.NetBSD.ORG as of December, 29, 1997.

Preparing your System for NetBSD Installation

Currently, only installing the miniroot from the network is supported. This may change in a future release.

You will need information about your disk's geometry, based on 512-byte sectors. You must have this information before proceeding. The file '.../installation/misc/HP-IB.geometry' has geometry inforomation for several HP-IB disks, but may be incomplete. Geometry may be calculated from an HP-UX '/etc/disktab' entry, but note that HP-UX geometry is based on 1024 byte sectors, while NetBSD's is based on 512 byte sectors.

A quick note about partitions: Since the target disk will become the boot disk for your new NetBSD/hp300 installation, you will need to treat the 'a' and 'c' partitions in a special manner. Due to the size of the NetBSD/hp300 boot program (it spills into the area after the disklabel), it is necessary to offset the 'a' partition one cylinder from the beginning of the disk. Later, the 'c' partition will be marked with the type 'FS_BOOT' and may not be used for a filesystem. (For those unfamiliar with historic BSD partition conventions, the 'c' partition is defined as 'the entire disk', or the 'raw partition'.)

A quick note about disk numbers: While in the SYS_INST program, you may use different unit numbers for the disks than when the NetBSD kernel is running. The unit number for a disk while in SYS_INST is calculated with the following formula:

```
unit = (controller * 8) + slave
```

Controllers are numbered 0, 1, ... starting with the lowest select code. SCSI controllers and HP-IB controllers are counted separately. Therefore, if you had a system with an internal HP-IB interface at select code 7, a fast HP-IB interface at select code 14, and a SCSI interface at select code 16, unit numers might be something like the following:

Location	**Unit**	
HP-IB at 7, slave 2	2	(disk: rd2)
HP-IB at 14, slave 5	13	(disk: rd13)
SCSI at 16, slave 0	0	(disk: sd0)

Miniroot installation via network

Note: Booting sys_inst via the network on early hp300 models *is only possible if your bootrom is* rev. c *or later.* When checking the revision of your BOOTROM, use what it printed on the console during the self-test, not what may be printed on a sticker on the chip itself.

In order to complete this process, you will need the following from the `.../installation/misc` directory of the distribution:

SYS_INST.gz The standalone disklabel and miniroot installation tool. This file must be un-gzipped before using.

And you will need the following from the `.../installation/miniroot` directory of of the distribution:

miniroot.fs.gz A miniroot filesystem image.

To boot SYS_INST via the network, you will need a system capable of handling boot requests for an HP workstation. If you will use this method, see the special note below.

To boot SYS_INST from tape, you need only place SYS_INST on the tape as the first file.

Loading SYS_INST via the network xxxxxxx

If you wish to load the SYS_INST program via the network, you may need the following from the '.../installation/misc' directory in addition to the items listed above:

`rbootd.tgz` Source code for the rbootd program included with NetBSD. It requires that the server has a Berkeley Packet Filter (bpf). You will need to compile this version of rbootd if your server system does not have this utility already.

First of all, configure your rbootd to handle boot requests from the client. NOTE: NetBSD's 'rbootd' is slightly different from HP-UX's. To configure NetBSD's 'rbootd', create a file called '/etc/rbootd.conf' and place in it an entry like the following:

```
08:00:09:04:AA:33 SYS_INST # thunder-egg
```

The first column is the ethernet address of the client's network interface. The second column is the program to send to the client, and anything after the '#' is a comment. Once you have rbootd running, copy the SYS_INST program to the /usr/mdec/rbootd directory on your server. If this directory doesn't exist already, you will need to create it.

For information on configuring rbootd under HP-UX, see the rbootd(1M) manual page on your server system.

Once 'rbootd' is configured and running, you will be ready to continue.

Make sure that the miniroot filesystem image has been un-gzipped, and that it resides in a filesystem what is exported to the client. See the manual pages on your server system if you need more information about exporting filesystems.

You are now ready to SYS_INST. During the client's self-test cycle, press the space bar a few times. Shortly, you should see a menu of possible boot options appear. Select the option corresponding to SYS_INST. SYS_INST will load and prompt you for a command.

If this is a new NetBSD installation, you will need to place a disklabel on the disk.

```
sys_inst> disklabel
```

Note: It may be worth selecting the 'zap' option initially to ensure that the disklabel area is clear. This may be especially important if an HP-UX boot block had been previously installed on the disk.

Select the 'edit' option, and answer the questions about your disk. There may be several questions which you may not be sure of the answers to. Listed below are guidelines for SCSI and HP-IB disks:

Bad sectoring?	NO
Ecc?	NO
Interleave?	1
Trackskew?	0
Cylinderskew?	0
Headswitch?	0
Track-to-track?	0
Drivedata 0-4?	0 (for all Drivedata values)

Next, you will be asked to fill out the partition map. You must provide responses for all 8 partitions. Remember, you must allocate at least 6M for the 'b' partition, or else the miniroot will not fit. Set the size and offset of any unused partition to 0. Note that sizes and offsets are expressed in 'n sectors', assuming 512 byte sectors. Care should be taken to ensure that partitions begin and end on cylinder boundaries (i.e. size and offset is an even multiple of the number of sectors per cylinder). While this is not technically necessary, it is generally encouraged.

Note: When setting the partition type of the 'b' partition, make sure to specify it as an 'ffs' partition so that the miniroot can be mounted (even if this will be a swap partition). You will be given a chance to clean this up later in the installation process.

Once you have edited the label, select the 'show' option to verify that it is correct. If so, select 'write' and 'done'. Otherwise, you may re-edit the label.

The next step is to copy the miniroot image onto the target disk.

```
sys_inst> miniroot
```

You will be prompted for the target disk and the source of the miniroot filesytem image.

Enter the filename of the miniroot image. Note that this file *must* reside in the server directory being mounted. Next you will be asked for the client's IP address, netmask, and default router, the server's IP address, and the directory on the server to mount. Once you have entered this information, SYS_INST will attempt to mount the NFS server and begin copying the miniroot filesystem to the 'b' partition of the target disk.

Is is worth noting that this copy may take a while. It might be worth grabbing a cup of coffee at this point.

Once the miniroot filesystem image has been copied onto the target disk, you may boot from the miniroot filesystem.

```
sys_inst> boot
```

Enter the disk from which to boot. The kernel in the miniroot filesystem will be booted into single-user mode.

Installing the NetBSD System

The miniroot's install program is very simple to use. It will guide you through the entire process, and is well automated. Additional improvements are planned for future releases.

The miniroot's install program will:

- Allow you to place disklabels on additional disks. Note that partition sizes and offsets are expressed in sectors. When you fill out the disklabel, you will need to specify partition types and filesystem parameters. If you're unsure what the these values should be, use the following:

  fstype: 4.2BSD fsize: 1024 bsize: 4096 cpg: 16
  If the partition will be a swap partition, use the following:

  fstype: swap fsize: 0 (or blank) bsize: 0 (or blank) cpg: 0 (or blank)

  You will also need to specify the number of partitions. The number of partitions is determined by the 'index' of the last partition letter, where a == 1, b == 2, etc. Therefore, if the last filled partition is partition 'g', there are 7 partitions. Any partitions with size of 0 may be removed from the list.

  If the disk is the boot disk, you _must_ offset the root partition ('a') one cylinder, as the hp300 boot code if large enough to spill past the label area. In this case, the 'c' partition must be fstype 'boot'.

  Anything after a '#' is a comment.

  The following is an example disklabel partition map:

  ```
  7 partitions:
  #        size   offset    fstype   [fsize bsize   cpg]
  a:    30912      448    4.2BSD     1024  8192    16   # (Cyl.    1 - 69)
  b:   130816    31360      swap                        # (Cyl.   70 - 361)
  c:  1296512        0      boot                        # (Cyl.    0 - 2893)
  e:    81984   162176    4.2BSD     1024  8192    16   # (Cyl.  362 - 544)
  f:   102592   244160    4.2BSD     1024  4096    16   # (Cyl.  545 - 773)
  g:   949760   346752    4.2BSD     1024  8192    16   # (Cyl.  774 - 2893)
  ```

- Create filesystems on target partitions.
- Allow you to set up your system's network configuration. Remember to specify host names without the domain name appended to the end. For example use 'foo' instead of 'foo.bar.org'. If, during the process of configuring the network interfaces, you make a mistake, you will be able to re-configure that interface by simply selecting it for configuration again.

- Mount target filesystems. You will be given the opportunity to manually edit the resulting `/etc/fstab`.
- Extract binary sets from the media of your choice.
- Copy configuration information gathered during the installation process to your root filesystem.
- Make device nodes in your root filesystem.
- Copy a new kernel onto your root partition.
- Install a new boot block.
- Check your filesystems for integrity.

First-time installation on a system through a method other than the installation program is possible, but strongly discouraged.

Post installation steps

Once you've got the operating system running, there are a few things you need to do in order to bring the system into a propperly configured state, with the most important ones described below.

1. Configuring `/etc/rc.conf`

   If you haven't done any configuration of `/etc/rc.conf`, the system will drop you into single user mode on first reboot with the message

   ```
   /etc/rc.conf is not configured. Multiuser boot aborted.
   ```

   and with the root filesystem mounted read-write. When the system asks you to choose a shell, simply hit return to get to a prompt. If you are asked for a terminal type, respond with **vt220** (or whatever is appropriate for your terminal type) and hit return. At this point, you need to configure at least one file in the `/etc` directory. Change to the `/etc` directory and take a look at the `/etc/rc.conf` file. Modify it to your tastes, making sure that you set `rc_configured=YES` so that your changes will be enabled and a multi-user boot can proceed. If your `/usr` directory is on a separate partition and you do not know how to use 'ed' or 'ex', you will have to mount your `/usr` partition to gain access to 'vi'. Do the following:

   ```
   mount /usr
   export TERM=vt220
   ```

   If you have `/var` on a seperate partition, you need to repeat that step for it. After that, you can edit `/etc/rc.conf` with `vi`(1). When you have finished, type **exit** at the prompt to leave the single-user shell and continue with the multi-user boot.

   Other values that need to be set in `/etc/rc.conf` for a networked environment are *hostname* and possibly *defaultroute*, furthermore add an *ifconfig_int* for your interface <int>, along the lines of

   ```
   ifconfig_de0="inet 123.45.67.89 netmask 255.255.255.0"
   ```

   or, if you have *myname.my.dom* in `/etc/hosts`:

   ```
   ifconfig_de0="inet myname.my.dom netmask 255.255.255.0"
   ```

   To enable proper hostname resolution, you will also want to add an `/etc/resolv.conf` file or (if you are feeling a little more adventurous) run `named`(8). See `resolv.conf`(5) or `named`(8) for more information.

   Other files in `/etc` that are new to NetBSD 1.4 and may require modification or setting up include `/etc/mailer.conf`, `/etc/nsswitch.conf` and `/etc/wscons.conf`.

2. Logging in

   After reboot, you can log in as `root` at the login prompt. There is no initial password, but if you're using the machine in a networked environment, you should create an account for yourself (see below) and protect it and the "root" account with good passwords.

3. Adding accounts

   Use the `vipw`(8) command to add accounts to your system, *do not* edit `/etc/passwd` directly. See `adduser`(8) for more information on the process of how to add a new user to the system.

4. The X Window System

   If you have installed the X window system, look at the files in `/usr/X11R6/lib/X11/doc` for information.

   Don't forget to add `/usr/X11R6/bin` to your path in your shell's dot file so that you have access to the X binaries.

5. Installing 3rd party packages

   There is a lot of software freely available for Unix-based systems, almost all of which can run on NetBSD. Modifications are usually needed to when transferring programs between different Unix-like systems, so the NetBSD packages collection incorporates any such changes necessary to make that software run on NetBSD, and makes the installation (and deinstallation) of the software packages easy. There's also the option of building a package from source, in case there's no precompiled binary available.

   Precompiled binaries can be found at
   ftp://ftp.netbsd.org/pub/NetBSD/packages/
   Package sources for compiling packages can be obtained by retrieving the file
   ftp://ftp.netbsd.org/pub/NetBSD/NetBSD-current/tar_files/pkgsrc.tar.gz
   and extracting it into `/usr/pkgsrc`. See `/usr/pkgsrc/README` then for more information.

6. Misc

   - To adjust the system to your local timezone, point the `/etc/localtime` symlink to the appropriate file under `/usr/share/zoneinfo`.
   - Edit `/etc/aliases` to forward root mail to the right place (run `newaliases`(1) afterwards.)
   - The `/etc/sendmail.cf` file will almost definitely need to be adjusted; files aiding in this can be found in `/usr/share/sendmail`. See the README file there for more information.
   - Edit `/etc/rc.local` to run any local daemons you use.
   - Many of the `/etc` files are documented in section 5 of the manual; so just invoking
     man *filename*
     is likely to give you more information on these files.

Upgrading a previously-installed NetBSD System

It is possible to easily upgrade your existing NetBSD/hp300 system using the upgrade program in the miniroot. If you wish to upgrade your system by this method, simply select the 'upgrade' option once the miniroot has booted. The upgrade program with then guide you through the procedure. The upgrade program will:

- Enable the network based on your system's current network configuration.
- Mount your existing filesystems.
- Extract binary sets from the media of your choice.

- Fixup your system's existing /etc/fstab, changing the occurrences of 'ufs' to 'ffs' and let you edit the resulting file.
- Make new device nodes in your root filesystem.
- Don't forget to extract the 'kern' set from the distribution. NOTE: the existing kernel WILL NOT be backed up; doing so would be pointless, since older kernels may not be capable of running NetBSD _VER executables.
- Install a new boot block.
- Check your filesystems for integrity.

While using the miniroot's upgrade program is the preferred method of upgrading your system, it is possible to upgrade your system manually. To do this, follow the following procedure:

- Place _at least_ the 'base' binary set in a filesystem accessible to the target machine. A local filesystem is preferred, since the NFS subsystem in the NetBSD _VER kernel may be incompatible with your old binaries.
- Back up your pre-existing kernel and copy the _VER kernel into your root partition.
- Reboot with the _VER kernel into single-user mode.
- Check all filesystems:
  `/sbin/fsck -pf`
- Mount all local filesystems:
  `/sbin/mount -a -t nonfs`
- If you keep /usr or /usr/share on an NFS server, you will want to mount those filesystems as well. To do this, you will need to enable the network:
  `sh /etc/netstart`
- Run the update(8) daemon, to ensure that new programs are actually stored on disk.
  `update`
- Make sure you are in the root filesystem and extract the 'base' binary set:

  ```
  cd /
  pax -zrvpe -f /path/to/base.tgz
  ```
- Install a new boot block:
  cd /usr/mdec
  disklabel -B *root disk (e.g. sd0)*
- Sync the filesystems:
  `sync`
- At this point you may extract any other binary sets you may have placed on local filesystems, or you may wish to extract additional sets at a later time. To extract these sets, use the following commands:
  cd /
  pax -zrvpe -f *path_to_set*

NOTE: you SHOULD NOT extract the **etc** set if upgrading. Instead, you should extract that set into another area and carefully merge the changes by hand.

Compatibility Issues With Previous NetBSD Releases

Users upgrading from previous versions of NetBSD may wish to bear the following problems and compatibility issues in mind when upgrading to NetBSD 1.4.1

Note Only issues effecting an upgrade from NetBSD 1.3 or NetBSD 1.3.x are decribed here.

- "machine" directory/link in "/usr/include"

  Description

  Some architecture may fail to install the **comp** set because the

  `/usr/include/machine`

  directory changed to a symbolic link in NetBSD 1.4.

  Fix If this happens, you can use the command

  \# **rm -r /usr/include/machine**

  to remove the old directory and it contents and reinstall the **comp** set.

Using online NetBSD documentation

Documentation is available if you first install the manual distribution set. Traditionally, the "man pages" (documentation) are denoted by "`name(section)`". Some examples of this are

- `intro`(1),
- `man`(1),
- `apropros`(1),
- `passwd`(1), and
- `passwd`(5).

The section numbers group the topics into several categories, but three are of primary interest: user commands are in section 1, file formats are in section 5, and administrative information is in section 8.

The *man* command is used to view the documentation on a topic, and is started by entering **man** [*section*] *topic*. The brackets [] around the section should not be entered, but rather indicate that the section is optional. If you don't ask for a particular section, the topic with the lowest numbered section name will be displayed. For instance, after logging in, enter

man passwd

to read the documentation for `passwd`(1). To view the documentation for `passwd`(5)m enter

man 5 passwd

instead.

If you are unsure of what man page you are looking for, enter **apropos** *subject-word*

where *subject-word* is your topic of interest; a list of possibly related man pages will be displayed.

Administrivia

If you've got something to say, do so! We'd like your input. There are various mailing lists available via the mailing list server at `majordomo@NetBSD.ORG`. To get help on using the mailing list server, send mail to that address with an empty body, and it will reply with instructions.

There are various mailing lists set up to deal with comments and questions about this release. Please send comments to: `netbsd-comments@NetBSD.ORG`.

To report bugs, use the `send-pr`(1) command shipped with NetBSD, and fill in as much information about the problem as you can. Good bug reports include lots of details. Additionally, bug reports can be sent by mail to: `netbsd-bugs@NetBSD.ORG`.

Use of `send-pr(1)` is encouraged, however, because bugs reported with it are entered into the NetBSD bugs database, and thus can't slip through the cracks.

There are also port-specific mailing lists, to discuss aspects of each port of NetBSD. Use majordomo to find their addresses. If you're interested in doing a serious amount of work on a specific port, you probably should contact the "owner" of that port (listed below).

If you'd like to help with this effort, and have an idea as to how you could be useful, send us mail or subscribe to: `netbsd-help@NetBSD.ORG`.

As a favor, please avoid mailing huge documents or files to these mailing lists. Instead, put the material you would have sent up for FTP somewhere, then mail the appropriate list about it, or, if you'd rather not do that, mail the list saying you'll send the data to those who want it.

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(If you're not on that list and should be, tell us! We probably were not able to get in touch with you, to verify that you wanted to be listed.)

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Legal Mumbo-Jumbo

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