NAME

INSTALL – Installation procedure for NetBSD/amiga

DESCRIPTION

About this Document

This document describes the installation procedure for NetBSD 1.4 on the *amiga* 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 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 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 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.

$NetBSD: whatis,v 1.8.2.4 1999/04/19 21:01:10 perry Exp $

This is the fifth public release of NetBSD for the Amiga and DraCo line of computers.

New port-specific features include: Support for the Cyberstorm Mk.3/ Cyberstorm PPC SCSI board, ATAPI devices on the internal IDE port, more audio formats supported by the Amiga custom chip audio driver, serial ports on the HyperCom 3+ and 4+ Zorro-bus boards, and a spanish keyboard map for the text console driver.

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 Release Contents

The root directory of the NetBSD 1.4 release is organized as follows:

`.../NetBSD-1.4/`

`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 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 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 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 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/amiga Subdirectory Structure

The amiga-specific portion of the NetBSD 1.4 release is found in the `amiga` subdirectory of the distribution:

`.../NetBSD-1.4/amiga/`

`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/` amiga binary distribution sets; see below.
  - `Split/` .tgz files split for loading onto floppies.
- `kernel/` The GENERIC kernel.
- `security/` amiga security distribution; see below.

`installation/`

- `miniroot/` amiga miniroot file system image; see below.
- `misc/` Miscellaneous amiga installation utilities; see installation section, below.

Miniroot file system

The Amiga now uses a single miniroot filesystem for both an initial installation and for an upgrade. A gzipped version is available, for easier downloading. (The gzipped version has the **.gz** extension added to their names.)

`miniroot.fs` This file contains a BSD root file system setup to help you install the rest of NetBSD or to upgrade a previous version of NetBSD. This includes formatting and mounting your root and /usr partitions and getting ready to extract (and possibly first fetching) the distribution sets. There is enough on this file system to allow you to make a SLIP or PPP connection, configure an Ethernet, mount an NFS file system or ftp. You can also load distribution sets from a SCSI tape or from one of your existing AmigaDOS partitions.

Binary Distribution Sets

The NetBSD amiga binary distribution sets contain the binaries which comprise the NetBSD 1.4 release for the amiga. There are eight binary distribution sets and the *security* distribution set. The binary distribution sets can be found in the `amiga/binary/sets` subdirectory of the NetBSD 1.4 distribution tree, and are as follows:

base The NetBSD 1.4 amiga **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.
10.3M gzipped, 28.9M uncompressed

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.
8.3M gzipped, 28.5M uncompressed

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.)
57K gzipped, 330K uncompressed

games This set includes the games and their manual pages.
2.8M gzipped, 7.1M uncompressed

kern This set contains a NetBSD/amiga 1.4 GENERIC kernel, named `/netbsd`. You *must* install this distribution set.
894k gzipped, 1.9M uncompressed

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.
4.2M gzipped, 17M uncompressed

misc This set includes the (rather large) system dictionaries, the typesettable document set, and other files from `/usr/share`.
2.2M gzipped, 8.4M uncompressed

text This set includes NetBSD's text processing tools, including `groff`(1), all related programs, and their manual pages.
1.3M gzipped, 4.6M uncompressed

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

    amiga/binary/security

subdirectory of the NetBSD 1.4 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. The sets are:

xbase The basic files needed for a complete X client environment. This does not include the X servers.
2.4M gzipped 7.7M uncompressed

xcomp The extra libraries and include files needed to compile X source code.
1.6M gzipped, 6.8M uncompressed

xcontrib Programs that were contributed to X.
179k gzipped, 670k uncompressed

xfont Fonts needed by X.
5.7M gzipped, 7.0M uncompressed

The amiga 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 /.

Note Each directory in the amiga 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/amiga System Requirements and Supported Devices

NetBSD 1.4 runs on any Amiga that has a 68020 or better CPU with some form of MMU, and on 68060 DraCos.

For 68020 and 68030 systems, a FPU is recommended but not required for the system utilities. 68LC040, 68040V and 68LC060 systems don't work correctly at the moment.

The minimal configuration requires 6M of RAM (not including CHIPMEM!) and about 75M of disk space. To install the entire system requires much more disk space, and to run X or compile the system, more RAM is recommended. (6M of RAM will actually allow you to compile, however it won't be speedy. X really isn't usable on a 6M system.)

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

```
partition:      advise, with X, needed, with X
root (/)        20M     20M     15M     15M
user (/usr)     110M    135M    90M     115M
swap            ----- 2M for every M ram -----
local (/usr/local)      up to you
```

As you may note the recommended size of /usr is 20M greater than needed. This is to leave room for a kernel source and compile tree as you will probably want to compile your own kernel. GENERIC is large and bulky to accommodate all people. For example, most peoples machines have an FPU, so you do not need the bulky FPU_EMULATE option.

Preconfigured or precompiled packages are installed below /usr/pkg per default. You should either make /usr larger (if you intend to install a lot of them), make /usr/pkg an additional partiton, use the -p option to pkg_add to install them in a different place or link /usr/pkg to some different place.

If you only have less than 8M of fast memory, you should make your swap partition larger, as your system will be doing much more swapping. Especially: do NOT place it onto a old small (and normally slow) disk!

Supported devices include:

```
A4000/A1200 IDE controller, including ATAPI devices.
SCSI host adapters:
        33c93 based boards: A2091, A3000 builtin, A3000 builtin
            modified for Apollo accellerator board, and GVP series II.
        53c80 based boards: 12 Gauge, IVS, Wordsync/Bytesync and
            Emplant.*)
        53c710 based boards: A4091, Magnum, Warp Engine, Zeus
            and DraCo builtin.
        FAS216 based SCSI boards: FastLane Z3, Blizzard I and II,
            Blizzard IV, Blizzard 2060, CyberSCSI Mk I and II.
        53c770 based SCSI baords: Cyberstorm Mk III SCSI, Cyberstorm
            PPC SCSI.
Video controllers:
        ECS, AGA and A2024 built in on various Amigas.
        Retina Z2*****, Retina Z3 and Altais.
        Cirrus CL GD 54xx based boards:
            GVP Spectrum,
            Picasso II, II+ and IV,
            Piccolo and Piccolo SD64.
        Tseng ET4000 based boards:
            Domino and Domino16M proto,
            oMniBus,
            Merlin.
        A2410*****.
        Cybervision 64.
        Cybervision 64/3D.

Audio I/O:
        Amiga builtin
        Melody Mpeg-audio layer 2 board

Ethernet controllers:
        A2065 Ethernet
        Hydra Ethernet
        ASDG Ethernet
        A4066 Ethernet
        Ariadne Ethernet
        Ariadne II Ethernet
        Quicknet Ethernet
ARCnet controllers:
        A2060 ARCnet
Tape drives:
```

```
        Most SCSI tape drives, including
                Archive Viper, Cipher SCSI-2 ST150.
Scanners:
        SCSI-2 scanners behaving as SCSI-2 scanner devices,
        HP Scanjet II, Mustek SCSI scanner.***)
CD-ROM drives:
        Most SCSI CD-ROM drives
Serial cards:
        HyperCom 3Z, HyperCom 4, HyperCom 3+ and 4+ (serial ports only)
        MultiFaceCard II and III
        A2232 (normal and clockdoubled)
Amiga floppy drives with Amiga (880/1760kB) and
        IBM (720/1440kB) encoding. ****)
Amiga parallel port.
Amiga serial port.
Amiga mouse.
DraCo serial port, including serial mouse.
DraCo parallel printer port.
Real-time clocks:
        A2000, A3000, A4000 builtin (r/w),
        DraCo builtin (r/o).
```

If its not on the above lists, there is no support for it in this release. Especially (but this is an incomplete list), there are no drivers for: Blizzard III SCSI option, Ferret SCSI, Oktagon SCSI.

Footnotes: Known problems with some hardware:

* the Emplant SCSI adapter has been reported by a party to hang after doing part of the installation without problems.

** SCSI scanner support is machine independent, so it should work, but hasn't been tested yet on most Amiga configurations. There are reports that the Mustek and HP Scanjet hang if accessed from the A3000. This might apply to other 33C93-Adapters, too.

**** Our floppy driver doesn't notice when mounted floppies are write-protected at the moment. Your floppy will stay unchanged, but you might not notice that you didn't write anything due to the buffer cache. Also note that HD floppy drives only get detected as such if a HD floppy is inserted at boot time.

*****
No X11 server available.

Getting the NetBSD System on to Useful Media

Installation is supported from several media types, including:

- AmigaDOS HD partitions
- Tape
- NFS partitions
- FTP
- NetBSD partitions, if doing an upgrade.

- CD-ROM (SCSI or ATAPI)

The miniroot file system needs to be transferred to the NetBSD swap partition. This can be done from AmigaDOS in the case of a new install or upgrade, or from NetBSD when doing an upgrade. See the "Preparing your System for NetBSD Installation" section for details.

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 an AmigaDOS partition:

  To install NetBSD from an AmigaDOS partition, you need to get the NetBSD distribution sets you wish to install on your system on to an AmigaDOS partition. All of the set_name.xx pieces can be placed in a single directory instead of separate ones for each distribution set. This will also simplify the installation work later on.

  Note where you place the files you will need this later.

  Once you have done this, you can proceed to the next step in the installation process, preparing your hard disk.

- To prepare for installing from CD-ROM:

  To install NetBSD from a CD-ROM drive, make sure it is a SCSI CD-ROM on a SCSI bus currently supported by NetBSD (refer to the supported hardware list) or an ATAPI cd-rom connected to the A1200 or A4000 internal IDE connector. If it is a SCSI CD-ROM on a non-supported SCSI bus like Blizzard-3 SCSI, Apollo SCSI) you must first copy the distribution sets to an AmigaDOS partition like described above.

  If your SCSI CD-ROM is connected to a supported SCSI host adapter, or it is an ATAPI cd-rom connected to the A1200/A4000 internal IDE connector, simply put the CD into the drive before installation.

  Once you have done this, you can proceed to the next step in the installation process, preparing your hard disk.

- To prepare for installing via a tape:

  To install NetBSD from a tape, you need to somehow get the NetBSD file sets you wish to install on your system on to the appropriate kind of tape.

  If you're making the tape on a UN∗X system, the easiest way to do so is:

  ```
  dd if=<first file> of=<tape device>
  dd if=<2nd file> of=<tape device>
  ...
  ```

  where "<tape_device>" is the name of the non-rewinding tape device that describes the tape drive you're using (possibly something like /dev/nrst0, but we make no guarantees 8-). If you can't figure it out, ask your system administrator. "<files>" are the names of the "set_name.tgz" files which you want to be placed on the tape.

  If you have a slow cpu (e.g. 68030 @ 25 MHz) on the target machine, but big tapes, you might want to store the uncompressed installation sets instead. This will help tape streaming when doing the actual installation. E.g, do:

  ```
  gzip -d -c <first file> | dd of=<tape device>
  gzip -d -c <2nd file> | dd of=<tape device>
  ...
  ```

  Once you have done this, you can proceed to the next step in the installation process, preparing your hard disk.

- To prepare for installing via an NFS partition:

  Note: this method of installation is recommended only for those already familiar with using the BSD network-manipulation commands and interfaces. If you aren't, this documentation should help, but is not intended to be all-encompassing.

  Place the NetBSD software you wish to install into a directory on an NFS server, and make that directory mountable by the machine which you will be installing NetBSD on. This will probably require modifying the /etc/exports file of the NFS server and resetting mountd, acts which will require superuser privileges. Note the numeric IP address of the NFS server and of the router closest to the the new NetBSD machine, if the NFS server is not on a network which is directly attached to the NetBSD machine.

  Once you have done this, you can proceed to the next step in the installation process, preparing your hard disk.

- To prepare for installing via FTP:

  Note: this method of installation is recommended only for those already familiar with using the BSD network-manipulation commands and interfaces. If you aren't, this documentation should help, but is not intended to be all-encompassing.

  The preparations for this method of installation are easy: all you have to do is make sure that there's some FTP site from which you can retrieve the NetBSD installation when it's time to do the install. You should know the numeric IP address of that site, the numeric IP address of your nearest router if one is necessary

  Once you have done this, you can proceed to the next step in the installation process, preparing your hard disk.

- If you are upgrading NetBSD, you also have the option of installing NetBSD by putting the new distribution sets somewhere in your existing file system, and using them from there. To do that, you must do the following:

  Place the distribution sets you wish to upgrade somewhere in your current file system tree. At a bare minimum, you must upgrade the "base" binary distribution, and so must put the "base" set somewhere in your file system. If you wish, you can do the other sets, as well, but you should NOT upgrade the "etc" distribution; the "etc" distribution contains system configuration files that you should review and update by hand.

  Once you have done this, you can proceed to the next step in the upgrade process, actually upgrading your system.

Preparing your System for NetBSD Installation

You will need an AmigaDOS hard drive prep tool to prepare your hard drives for use with NetBSD/Amiga. HDToolBox is provided with the system software and on floppy installation disks since Release 2.0 of AmigaDOS, so we will provide instructions for its use.

Preparing your hard disk with HDToolBox

A full explanation of HDToolBox can be found with your AmigaDOS manuals and is beyond the scope of this document.

The first time you partition a drive, you need to set its drive type so that you have working geometry parameters. To do this you enter the "Change drive type" menu, and either use "read parameters from drive" or set them manually.

Note you will be modifying your HD's. If you mess something up here you could lose everything on all the drives that you configure. It is therefore advised that you:

1. Write down your current configurations. Do this by examining each partition on the drive and the drives parameters (from Change drive type.)
2. Back up the partitions you are keeping.

What you need to do is partition your drives; creating at least root, swap and /usr partitions and possibly at least one more for /usr/local if you have the space.

This should be done as the HDToolBox manual describes. One thing to note is that if you are not using a Commodore controller you will need to specify the device your SCSI controller uses, e.g. if you have a Warp Engine you would:

from cli,

```
hdtoolbox warpdrive.device
```

from wb set the tooltype,

```
SCSI_DEVICE_NAME=warpdrive.device
```

The important things you need to do above and beyond normal partitioning includes (from Partition Drive section):

1. Marking all NetBSD partitions as non-bootable, with two exceptions: the root partition, if you want to boot NetBSD directly, or the swap partition, if you want to boot the installation miniroot directly.
2. Changing the file system parameters of the partitions to NetBSD ones. This must be done from the partitioning section and 'Advanced options' must be enabled.

To Make the needed changes:

- Click the 'Adv. Options' button
- Click the 'Change file system' button
- Choose 'Custom File System'
- Turn off 'Automount' if on.
- Set the dostype to one of these three choices:

  ```
  root partition  : 0x4e425207
  swap partition  : 0x4e425301
  other partitions: 0x4e425507
  ```

  Here 'other' refers to other partitions you will format for reading and writing under NetBSD (e.g. /usr)

  Make sure you hit the return key to enter this value as some versions of HDToolBox will forget your entry if you don't.
- Turn custom boot code off
- Set Reserved Blocks start and end to 0.
- Click Ok.

On the root (and, for installation, swap) partition, set instead this:

- Turn custom boot code on
- Set Reserved Blocks start and end to 0.
- Set Number of Custom Boot Blocks to 16
- Set Automount This Partition on
- Click Ok.

  Mask and maxtransfer are not used with NetBSD.

Caveat: The swap (for installation) and the root partition (if you plan to use the bootblocks) MUST BE WITHIN THE FIRST 4 gigabytes of the disk! The reason for the former is that xstreamtodev uses trackdisk.device compatible I/O-calls, the reason for the latter is that the bootblock gets a 32bit partition offset from the operating system.

Once this is done NetBSD/Amiga will be able to recognize your disks and which partitions it should use.

Transferring the miniroot file system

The NetBSD/Amiga installation or upgrade now uses a "miniroot" file system which is installed on the partition used by NetBSD for swapping. This removes the requirement of using a floppy disk for the file system used by the installation or upgrade process. It also allows more utilities to be present on the file system than would be available when using an 880K floppy disk.

Once the hard disk has been prepared for NetBSD, the miniroot file system (miniroot.fs) is transferred to the swap partition configured during the hard disk prep (or the existing swap partition in the case of an upgrade). The xstreamtodev utility provided in the "amiga/installation/misc" directory can be used on AmigaDOS to transfer the file system for either a new installation or an upgrade. The file system can also be transferred on an existing NetBSD system for an update by using dd. This should only be done after booting NetBSD into single-user state. It may also be possible to shutdown to single-user, providing that the single-user state processes are not using the swap partition.

On AmigaDOS, the command:

```
xstreamtodev --input=miniroot.fs --rdb-name=<swap partition>
```

where <swap partition> is the name you gave to the NetBSD partition to be used for swapping. If xstreamtodev is unable to determine the SCSI driver device name or the unit number of the specified partition, you may also need to include the option

```
--device=<driver.name>
```

and/or

```
--unit=<SCSI unit number>
```

To transfer the miniroot using NetBSD, you should be booted up in single user state on the current NetBSD system, or use the "shutdown now" command to shutdown to single-user state. Then copy the miniroot using dd:

```
dd if=miniroot.fs of=/dev/rsd0b
```

where `/dev/rsd0b` should be the device path of the swap partition your system is configured to use. Once the file is copied, reboot back to AmigaDOS to boot the upgrade kernel.

Caveat: Once you have started installation, if you abort it and want to retry you must reinstall the miniroot.fs on the swap partition.

Installing the NetBSD System

Installing NetBSD is a relatively complex process, but, if you have this document in hand and are careful to read and remember the information which is presented to you by the install program, it shouldn't be too much trouble.

Before you begin, you must have already prepared your hard disk as detailed in the section on preparing your system for install.

The following is a walk-through of the steps necessary to get NetBSD installed on your hard disk. If you wish to stop the installation, you may hit Control-C at any prompt, but if you do, you'll have to begin again from scratch.

Transfer the miniroot file system onto the hard disk partition used by NetBSD for swapping, as described in the "Preparing your System for NetBSD Installation" section above.

Booting from AmigaOS, using loadbsd:

You then need to have `ixemul.library` in your `LIBS:` directory on AmigaDOS. You also need to have the **loadbsd** program in your command path. If AmigaDOS complains about loadbsd not being an executable file, be sure that the *Execute* protection bit is set. If not, set it with the command:

```
Protect loadbsd add e
```

Next you need to get yourself into NetBSD by loading the kernel from AmigaDOS with loadbsd like so:

```
loadbsd -b netbsd
```

If you have an AGA machine, and your monitor will handle the dblNTSC mode, you may also include the **-A** option to enable the dblNTSC display mode.

If your machine has a fragmented physical memory space, as, e.g., DraCo machines, you should add the **-n2** option to enable the use of all memory segments.

If you have a M680x0 + PPC board, make sure the PPC cpu is inactive before using loadbsd, else the kernel will hang!

Directly booting NetBSD, with boot blocks installed:

[This description is for V40 (OS 3.1) ROMs. For older ROMs, there might be small differences. Check your AmigaOS documentation to learn about the exact procedure.] Using bootblocks may not work on some systems, and may require a mountable filesystem on others.

Reboot your machine, holding down both mouse buttons if you have a 2-button mouse, the outer mouse buttons if you have a 3-button mouse. On the DraCo, press the left mouse button instead, when the boot screen prompts you for it.

From the boot menu, select **Boot Options**. Select the swap partition with the miniroot, and then **ok**. Select **Boot** now. The machine will boot the bootblock, which will prompt your for a command line. You have a few seconds time to change the default. Entering an empty line will accept the default.

The bootblock uses command lines of the form:

file [*options*]

where *file* is the kernel file name on the partition where the boot block is on, and [options] are the same as with loadbsd. E.g., instead of

```
loadbsd -bsSn2 netbsd
```

use

```
netbsd -bsSn2
```

Once your kernel boots:

You should see the screen clear and some information about your system as the kernel configures the hardware. Note which hard disk device(s) are configured (sd0, sd1, etc). Then you will be prompted for a root device. At this time type **sd0b**, where **sd0** is the device which contains the swap partition you created during the hard disk preparation. When prompted for a dump device, answer 'none' for the install (normally, you would tell it one of the swap devices). When prompted for the root filesystem type, confirm 'generic', which will auto-detect it.

If the system should hang after entering the root device, try again with

```
loadbsd -I ff -b netbsd
```

This disables synchronous transfer on all SCSI devices.

The system should continue to boot. For now ignore WARNING: messages about bad dates in clocks, and a warning about /etc/rc not existing. Eventually you will be be asked to enter the pathname of the shell, just hit return. After a short while, you will be asked to select the type of your keyboard. After you have entered a valid response here, the system asks you if you want to install or upgrade your system. Since you are reading the 'install' section, 'i' would be the proper response here...

The installer starts with a nice welcome messages. Read this message carefully, it also informs you of the risks involved in continuing! If you still want to go on, type 'y'. The installer now continues by trying to figure out your disk configuration. When it is done, you will be prompted to select a root device from the list of disks it has found.

You should know at this point that the disks are NOT numbered according to their scsi-id! The NetBSD kernel numbers the scsi drives (and other devices on the scsi bus) sequentially as it finds them. The drive with the lowest scsi id will be called sd0, the next one sd1, etc. Also, any Amiga internal IDE disk drives will be configured as "SCSI" drives, and will be configured before any 'real' SCSI drives (if any are present).

you are now at the point of no return. If you confirm that you want to install NetBSD, your hard drive will be modified, and perhaps its contents scrambled at the whim of the install program. Type Control-C NOW if you don't want this.

At this time, you will need to tell the installer which partition will be associated with the different filesystems.

The install program will now make the the file systems you specified. There should be only one error per file system in this section of the installation. It will look like this:

```
newfs: ioctl (WDINFO): Invalid argument
newfs: /dev/rsd0a: can't rewrite disk label
```

If there are any others, restart from the the beginning of the installation process. This error is ok as the Amiga does not write disklabels currently. You should expect this error whenever using newfs.

The install will now ask you want to configure any network information. It ill ask for the machine's host name, domain name, and other network configuration information.

Since the network configuration might have lead to additional (nfs) filesystem entries, you get another chance to modify your fstab.

You are finally at the point where some real data will be put on your freshly made filesystems. Select the device type you wish to install from and off you go....

Some notes:

- If you want to install from tape, please read the section about how to create such a tape.
- Some tapes (e.g. Archive Viper 150) refuse to operate with the default tape density ("nrst0"). Try "nrst0h", "nrst0m", or "nrst0l" instead.
- Install at least the base and etc sets.
- If you have to specify a path relative to the mount-point and you need the mount-point itself, enter '.'.

Next you will be asked to specify the timezone. Just select the timezone you are in. The installer will make the correct setup on your root filesystem. After the timezone-link is installed, the installer will proceed by creating the device nodes on your root filesystem.

Be patient, this will take a while...

Finally, the installer ask you if you want to install the bootblock code on your root disk. This is a matter of personal choice and can also be done from a running NetBSD system. See the 'installboot(8)' manual page about how to do this.

Once the installer is done, halt the system with the **halt** command (wait for `halted` to be displayed) and reboot. Then again boot NetBSD this time with the command:

```
loadbsd netbsd
```

or select the root partition from the boot menu, and tell it to boot

```
netbsd -s
```

You need to do your final tweaks now. First mount your file systems like so:

```
mount -av
```

Your system is now complete but not completely configured; you should adjust the `/etc/sendmail.cf` file as necessary to suit your site. You should also examine and adjust the settings in `/etc/rc.conf`. You can use `vi`(1) or `ed`(1) to edit the files. If you installed the man pages you can type **man vi** or **man ed** for instructions on how to use these somewhat non-intuitive editors.

Once you are done with the rest of configuration unmount your file systems and halt your system, then reboot:

```
cd /
umount -av
halt
```

Finally you can now boot your system and it will be completely functional:

```
loadbsd -a netbsd
```

When it boots off of the hard drive, you will have a complete NetBSD system! *Congratulations!* (You really deserve them!!!)

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

The upgrade to NetBSD 1.4 is a binary upgrade; it can be quite difficult to advance to a later version by recompiling from source due primarily to interdependencies in the various components.

To do the upgrade, you must have the NetBSD kernel on AmigaDOS and you must transfer the miniroot file system miniroot.fs onto the swap partition of the NetBSD hard disk. You must also have at least the "base" binary distribution set available, so that you can upgrade with it, using one of the upgrade methods described above. Finally, you must have sufficient disk space available to install the new binaries. Since the old binaries are being overwritten in place, you only need space for the new binaries, which weren't previously on the system. If you have a few megabytes free on each of your root and /usr partitions, you should have enough space.

Since upgrading involves replacing the kernel, and most of the system binaries, it has the potential to cause data loss. You are strongly advised to BACK UP ANY IMPORTANT DATA ON YOUR DISK, whether on the NetBSD partition or on another operating system's partition, before beginning the upgrade process.

To upgrade your system, follow the following instructions:

Transfer the miniroot file system onto the hard disk partition used by NetBSD for swapping, as described in the "Preparing your System for NetBSD Installation" section above.

Now boot up NetBSD using the 1.4 kernel using the loadbsd command:

```
loadbsd -b netbsd
```

If you machine has a split memory space, like, e.g., DraCo machines, use this instead:

```
loadbsd -bn2 netbsd
```

If you have a M680x0 + PPC board, make sure the PPC cpu is inactive before using loadbsd, else the kernel will hang!

Directly booting NetBSD, with boot blocks installed:

Note: This description is for V40 (OS 3.1) ROMs. For older ROMs, there might be small differences. Check your AmigaOS documentation to learn about the exact procedure. Booting using bootblocks doesn't work at all on some systems, and may require a mountable filesystem on others.

Reboot your machine, holding down both mouse buttons if you have a 2-button mouse, the outer mouse buttons if you have a 3-button mouse. On the DraCo, press the left mouse button instead, when the boot screen prompts you for it.

From the boot menu, select **Boot Options**. Select the swap partition with the miniroot, and then **ok**. Select **Boot** now. The machine will boot the bootblock, which will prompt your for a command line. You have a few seconds time to change the default. Entering an empty line will accept the default.

The bootblock uses command lines of the form: `file [options]` where *file* is the kernel file name on the partition where the boot block is on, and *options* are the same as with loadbsd. E.g., instead of

```
loadbsd -bsSn2 netbsd
```

use

```
netbsd -bsSn2
```

Once your kernel boots:

You should see the screen clear and some information about your system as the kernel configures the hardware. Note which hard disk device is configured that contains your root and swap partition. When prompted for the root device, type **sd0b** (replacing **0** with the disk number that NetBSD used for your root/swap device). When prompted for a dump device, answer 'none' for the upgrade. (For a normal boot, you would tell it one of the swap devices). When prompted for the root filesystem type, confirm 'generic', which will autodetect it.

You will be presented with some information about the upgrade process and a warning message, and will be asked if you wish to proceed with the upgrade process. If you answer negatively, the upgrade process will stop, and your disk will not be modified. If you answer affirmatively, the upgrade process will begin, and your disk will be modified. You may hit Control-C to stop the upgrade process at any time. However, if you hit it at an inopportune moment, your system may be left in an inconsistent (and possibly unusable) state.

You will now be greeted and reminded of the fact that this is a potential dangerous procedure and that you should not upgrade the etc-set.

When you decide to proceed, you will be prompted to enter your root disk. After you've done this, it will be checked automatically to make sure that the filesystem is in a sane state before making any modifications. After this is done, you will be asked if you want to configure your network.

You are now allowed to edit your fstab. Normally you don't have to. Note that the upgrade-kit uses it's own copy of the fstab. Whatever you do here *won't* affect your actual fstab. After you are satisfied with your fstab, the upgrade-kit will check all filesystems mentioned in it. When they're ok, they will be mounted.

You will now be asked if your sets are stored on a normally mounted filesystem. You should answer 'y' to this question if you have the sets stored on a filesystem that was present in the fstab. The actions you should take for the set extraction are pretty logical (I think).

After you have extracted the sets, the upgrade kit will proceed with setting the timezone and installing the kernel and bootcode. This is all exactly the same as described in the installation section.

Your system has now been upgraded to NetBSD 1.4.

After a new kernel has been copied to your hard disk, your machine is a complete NetBSD 1.4 system. However, that doesn't mean that you're finished with the upgrade process. There are several things that you should do, or might have to do, to insure that the system works properly.

You will probably want to get the etc distribution, extract it, and compare its contents with those in your /etc directory. You will probably want to replace some of your system configuration files, or incorporate some of the changes in the new versions into yours.

You will want to delete old binaries that were part of the version of NetBSD that you upgraded from and have since been removed from the NetBSD distribution. If upgrading from a NetBSD version older than 1.0, you might also want to recompile any locally-built binaries, to take advantage of the shared libraries. (Note that any new binaries that you build will be dynamically linked, and therefore take advantage of the shared libraries, by default. For information on how to make statically linked binaries, see the cc(1) and ld(1) manual pages.)

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

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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