NAME

INSTALL – Installation procedure for NetBSD/atari

DESCRIPTION

About this Document

This document describes the installation procedure for NetBSD 1.4.2 on the *atari* 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 1.4.2 release contains complete binary releases for fifteen different machine types. (The remaining ones 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.

Upgrade path to NetBSD 1.4.2

If you are not installing your system "from scratch" but instead are going to upgrade an existing system already running NetBSD you need to know which versions you can upgrade with NetBSD 1.4.2.

NetBSD 1.4.2 is an upgrade of NetBSD 1.4.1, NetBSD 1.4 and earlier releases of NetBSD such as versions 1.3.3, 1.2 etc.

The intermediate development versions of code available on the main trunk in our CVS repository (also known as "NetBSD-current") from *after* the point where the release cycle for 1.4 was started are designated by version identifiers such as 1.4A, 1.4B, 1.4P etc. These identifiers do not designate releases, but indicate major changes in internal kernel APIs. Note that the kernel from NetBSD 1.4.2 can *not* be used to upgrade a system running one of those intermediate development versions. Trying to use the NetBSD 1.4.2 kernel on such a system *will* in all probability result in problems.

Please also note that it is not possible to do a direct "version" comparison between any of the intermediate development versions mentioned above and 1.4.2 to determine if a given feature is present or absent in 1.4.2. The development of 1.4, 1.4.1 and 1.4.2 is done on a separate branch in the CVS repository which was created when the release cylcle for 1.4 was started, and during the release cycles for all these versions selective fixes (with minor impact on the stability of the code on the release branch) have been imported from the main development trunk. So, there are features in 1.4.2 which were not in e.g. 1.4H, but the reverse is also true.

Major Changes Between 1.4.1 and 1.4.2

The complete list of changes between NetBSD 1.4.1 and 1.4.2 can be found in the file CHANGES-1.4.2 in the top directory of the source tree. The following are the highlights only.

- A driver for the Alteon Gigabit Ethernet cards has been added, see `ti`(4).
- A driver for the Realtek 8129/8239 Fast Ethernet PCI cards have been added, see `rl`(4).
- A driver for the DPT SmartCache and SmartRAID III or IV SCSI adapters has been added, see `dpt`(4).
- A driver for the BOCA IOAT66 6-port ISA serial adapter has been added, see `ioat`(4).
- Support for the X-surf Amiga board has been added.
- Support has been added for ext2fs revision 1, with read-only support for the "sparse super" and the "filetype" options.
- BIND has been upgraded to version 8.2.2-P5.
- The IPF packet filtering software has been updated to version 3.3.5.
- Tcpdump now does hex/ascii dumps of packet contents if asked to do so.
- An implementation of the System V user management utilities has been added.
- The name "errno" is now always a macro which expands to a function call. This is done to ease the integration of thread libraries with the code in both system and third-party libraries. Please include <errno.h> to access the correct definition of "errno".
- A utility for making temporary files for shell scripts has been added, see `mktemp`(1).
- The automounter utility `amd`(8) has been updated to fix a security problem.
- A security problem in procfs has been fixed. Procfs is not used by default in NetBSD.
- The floating point emulation on the ports using the m68k CPU has been reverted to the version in NetBSD 1.4 (the version in 1.4.1 had problems).
- Several subsystems have received substantial work, such as RAIDframe, LFS, and the package tools.

In addition, many, many bugs have been fixed -- more than 100 problems reported through our problem tracking system have been fixed, and many other non-reported problems have also been found and fixed. See the CHANGES-1.4.2 file for the complete list.

Known caveats with 1.4.2

The following are the major known issues with NetBSD 1.4.2.

- The upgrade of `ipf`(8) caused a change of the kernel API. Thus, if you are using `ipf`(8) you need to upgrade both the kernel and the user-land utilities to control that feature in order for it to work.
- As part of fixing a kernel bug, "struct vfsnode" needed to change size. This will unfortunately, and contrary to tradition for patch releases, cause incompatibilities for users of file system LKMs compiled for 1.4 and 1.4.1.
- Although LFS has been improved between 1.4.1 and 1.4.2, it can probably still be characterized as being of "beta test" quality, e.g. filling the file system still gives "interesting" effects. It should probably not be used to store critical data quite yet.
- The version of the IPF packet filtering software in NetBSD 1.4.2 must be enabled with "ipf -E" before filtering or NAT rules can be set. Failure to do so may result in a panic.

Major Changes Between 1.4 and 1.4.1

The complete list of changes between NetBSD 1.4 and 1.4.1 can be found in the file CHANGES-1.4.1 in the top directory of the source tree.

- The NetBSD/alpha port's compatibility for Digital UNIX executables has been greatly improved.
- Many bug fixes and improvements of the installation tools and utilities.
- Support for more PCI serial/parallel cards has been added.
- It is now possible to boot NetBSD/i386 on systems with 1GB of RAM.
- The floating point emulation on the ports using the m68k CPU has been upgraded.
- A fatal problem with /dev/random has been found and fixed.
- Support for Alpha 21264 ev6 based systems has been added to NetBSD/alpha.

Major Changes Between 1.3 and 1.4

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.

The Atari release stepped in in March 1995. The first official release was NetBSD 1.1. About a year later, NetBSD 1.2 was released for the Atari. This release fixed a large number of bugs and made the Atari-port a stable member of the NetBSD family. The saga continued with the NetBSD 1.3 release. In this release, support was added for the Medusa Hades, Riebl ethernet and Falcon IDE support. And now, yet another release is emerging!

New on the NetBSD 1.4 release (atari specific):

- Crazy Dots VME et4000 graphics adapter
- Circad Leonardo 24-bit VME graphics adapter
- VME BVME410 ethernet
- ATAPI support on IDE
- Hades PCI-devices
  - Adaptec 2940U
- Hades ISA-devices
  - Teles 16.3 card (Requires isdn4bsd package).

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, Anonymous CVS access to the NetBSD source tree has been added since NetBSD 1.4.1; see
http://www.netbsd.org/Changes/#anoncvs-available
We have also added a browsable CVS repository on the web at
http://cvsweb.netbsd.org/cgi-bin/cvsweb.cgi/

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

Please refer to **http://www.netbsd.org/Sites/net.html**.

NetBSD 1.4.2 Release Contents

The root directory of the NetBSD 1.4.2 release is organized as follows:

`.../NetBSD-1.4.2/`

`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 1.4.2 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 1.4.2 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 NetBSD project maintains a web page at

http://www.NetBSD.ORG/Misc/crypto-export.html

which should contain up-to-date information on this issue.

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, 84.3M uncompressed

syssrc.tgz: This set contains the sources to the NetBSD 1.4.2 kernel, config(8), and dbsym(8).
13.9M gzipped, 68.3M 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 1.4.2 sources which are not mentioned above.
14.4M gzipped, 67.4M 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 may only be available 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. Again, see
http://www.NetBSD.ORG/Misc/crypto-export.html
for updated information on this issue.)

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/atari Subdirectory Structure

The atari-specific portion of the NetBSD 1.4.2 release is found in the `atari` subdirectory of the distribution:

`.../NetBSD-1.4.2/atari/`

`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/` atari binary distribution sets; see below.
- `security/` atari security distribution; see below.

`installation/`

Binary Distribution Sets

The NetBSD atari binary distribution sets contain the binaries which comprise the NetBSD 1.4.2 release for the atari. There are eight binary distribution sets and the *security* distribution set. The binary distribution sets can be found in the `atari/binary/sets` subdirectory of the NetBSD 1.4.2 distribution tree, and are as follows:

base The NetBSD 1.4.2 atari **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, 29.0M 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.
8.1M gzipped, 27.2M 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.)
56K gzipped, 330K uncompressed

games This set includes the games and their manual pages.
2.8M gzipped, 7M uncompressed

netbsd.*.gz The NetBSD/atari 1.4.2 kernel binary. You should install the appropriate kernel for your system.
Approx. 500K gzipped, 1M 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.
4M gzipped, 15.9M 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, 4.5M uncompressed

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

`atari/binary/security`

subdirectory of the NetBSD 1.4.2 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. See

http://www.NetBSD.ORG/Misc/crypto-export.html

for updated information on this issue.

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 3.3.6. 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.
2.5M gzipped 7.9M 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

xserver The Xservers and some programs not shared with the other m68k ports. Please consult the X specific section in the atari FAQ as to which server you should use.
6.3M gzipped, 15.7M uncompressed

The atari 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 /.

Additional kernels to those included in the distribution sets may be found in the `atari/binary/kernel` subdirectory of the NetBSD 1.4.2 distribution tree. These kernels are generally named something like `netbsd.BOOT.gz` or some other suitable name. Please note that these kernels are simply gzipped and are not in tar archives.

There are three atari floppy images to be found in the `atari/installation/floppies` subdirectory of the NetBSD 1.4.2 distribution. One of them is a bootable TOS kernel floppy and the other two are installation floppies. They are described in more detail below. There are gzipped versions of each available, for easier downloading. (The gzipped versions have the `.gz` extension added to their names.)

Bootable Kernel floppy

This TOS disk contains the loadbsd and chg_pid programs and a kernel. It is setup so that you can insert it int your floppy drive, and start the programs from GEM.

For the TT030 and Falcon, the (720KB) floppy is named boot.fs and the kernel supplied is 'BOOT'. For the Hades, you need the hades-boot.fs floppy (1.44MB), the kernel is 'HADES'.

Installation floppy:

This disk contains a BSD root file system setup to help you install the rest 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 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 GEMDOS partitions.

The floppies meant for 720KB disks are named `miniroot.fs.1` and `miniroot.fs.2`. There is also an image for an 1.44MB disk: `miniroot.fs`.

There are also TOS utilities in the `atari/installation/misc` subdirectory, which you will need to get NetBSD/Atari 'up-and-running'.

- The "gzip.ttp" program allows you to uncompress .gz images. The usage is "gzip.ttp -d filename.gz".
- The "rawwrite.ttp" program allows you to create the installation floppy disks from the files in the `atari/floppies` directory.
- The "aptck.ttp" program reads the partition tables present on a given disk and tries to interpret then the same way the NetBSD kernel does. If you have a disk on which GEMDOS and NetBSD are to co-exist, It is a good idea to run this before you begin the NetBSD/Atari installation just to check that the kernel's view of the partition tables agree with GEMDOS's view. If you have more than 3 partitions defined on a disk you will notice that the NetBSD/atari partition starts one sector after the GEMDOS partition. This is to allow space for the auxilliary root for the 4th and subsequent partitions.
- The "loadbsd.ttp" program loads the NetBSD/atari kernel from TOS (or MiNT, MultiTOS, etc.).

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

NetBSD/atari 1.4.2 runs on a TT030, Falcon and Hades. An FPU is not required. The minimum amount of RAM required is 4Mb. On the Hades, only the Tseng PCI VGA cards (et4000/et6000/et6100) are supported in the 1.4.2 release. When an unsupported video card is present, you can use NetBSD with a serial console only.

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)     95M     125M    75M     105M
swap            ----- 2M for every M ram -----
local (/local)  up to you
```

In addition of the rule of thumb for the swap size mentioned below, you probably want to make sure that the size of the swap partition does not drop below 20Mb (30Mb for systems with X). Another item are the add-on packages. You might want 20-30M (or more) in /local (or added to /usr) to store packages from the NetBSD package system. 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, BOOT is small and might not have all the features you want).

Supported devices include:

- The builtin SCSI host adapter
  - Should support most SCSI-drives.
  - Should support most tape drives.
  - Should support most CD-ROM drives.
  - Should support most ZIP/MO drives.
- The builtin video controller
- The builtin (720Kb/1.44Mb) floppydrive
- The serial2/modem2 ports
- The Falcon FX memory expansion
- The atari mouse
- A 3-button mouse (see build description in the FAQ!)
- The parallel printer
- IDE interface on both Falcon and Hades (includes ATAPI support)
- The serial interface on the first 68901 UART (modem1)
- VME-bus devices (TT030/Hades)
  - BVME410 ethernet
  - Circad Leonardo 24-bit VME graphics adapter
  - Crazy Dots VME et4000 graphics adapter

- Riebl (and possibly PAM) ethernet cards on the VME bus.

- PCI-bus devices (Hades only)
  - ET4000/ET6000/ET6100-PCI (VGA console)
  - Adaptec 2940U
- ISA-bus devices (Hades only)
  - Teles S0/16.3-ISA ISDN adapter (with I4B)

This list is incomplete by definition. I can not test all SCSI peripherals, ISA cards or PCI cards... If you have problems with such a peripheral, please contact the port-atari mailing list.

Getting the NetBSD System on to Useful Media

Installation is supported from several media types, including:

- TOS HD partitions
- Tape

No matter what you do, however, you'll need to have three disks handy, on which you will put the install and boot floppy images.

All the images are available from the directory "installation/floppies" under the root of the NetBSD/atari tree at your favorite archive site.

If you are using NetBSD/atari to make the floppies, you should use the command dd(1) to write the raw floppy images (.fs files) to the disk. As an example, to write the first part of the miniroot filesystem onto a 720KB floppy in fd0 use:

```
dd if=miniroot.fs.1 of=/dev/rfd0b bs=9b
```

If you are using TOS to make the floppies, grab the 'rawwrite' utility from the "atari/utils" directory and issue the command:

```
rawwrite boot.fs
```

This will create the boot-floppy on the floppy in drive a. The floppies should be pre-formatted on 720Kb/1.44Mb for both the 'dd' and 'rawwrite' commands to work. Pre-formatting can be best done using the desktop format command. Some other utilities seem to be giving problems.

Since the 1.3 release, it is also possible to use HD-floppies. You should than use the floppy device '/dev/rfd0c' or add the '-H' flag to 'rawwrite'.

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 GEMDOS partition:

  To install NetBSD from an GEMDOS partition, you need to get the NetBSD distribution sets you wish to install on your system on to an GEMDOS partition.

  Note where you placed 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 via a tape:

  To install NetBSD from a tape, you need to somehow get the NetBSD filesets you wish to install on your system on to the appropriate kind of tape. If you make the tape on a UN*X-like system, you can create it as follows:

```
cd .../NetBSD-1.3/atari/binary/sets
T=<tape_device>
mt -f $T rewind
for f in base etc comp games man misc text
        dd if=$f.tgz of=$T conv=sync bs=5k
done
mt -f $T rewind
```

where "<tape_device>" is the name of the (non-rewinding!) tape device that you're using (probably something like /dev/nrst0, but we make no guarantees 8-). If you can't figure it out, ask your system administrator.

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

Preparing your System for NetBSD Installation

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

- Write down your current configurations. Do this by writing down all partition info (especially their sizes).
- *Back up the partitions you are keeping.*

If NetBSD has a disk of it's own, you can delay the partitioning until the installer requests you to do it. This means that you can safely skip the rest of this section.

If NetBSD has to share the disk with another operating system, you must take care of partitioning your harddisk before installing NetBSD; creating space for at least root, swap and /usr partitions and possibly at least one more for /local if you have the space.

Note The AHDI partioning function erases all partions on your harddisk even if they are not changed! I know this is rather stupid, but don't say I didn't warn you.

If you want to use an AHDI partitioning sceme and you want to be able to boot directly into NetBSD, there are some constraints on the partition layout.

As you might know; every hard disk has a "root sector" that contains information about the size of the hard disk and the partitions on the hard disk. The root sector can only contain the neccessary data for four partitions. Nobody thought that this limitation would cause any problems. After all, 640 KByte should be enough. As hard disk grew, it was neccessary to define more than four partitions. In order to be more or less compatible with the old format, a new type of partition entry was defined: XGM partions.

An XGM partition is a "look over there" sign: Another root sector can be found at the start of the XGM partition. This root sector contains the remaining real partitions. And this is the big mystery: Partitions defined in the root sector of the hard disk are called "primary partitions", partitions defined in the root sector of an XGM partition are called "extended partitions".

The bootblock will only work if the first NBD partition is a primary partition. This is not a limitation of NetBSD but a limitation of TOS/AHDI: You can only boot from primary partitions.

If you are creating your partitions with HDX, you'll have to be very careful to fulfill this rule. HDX has some very strange ideas when it comes to extended partitions. Fortunately, you can edit this stuff: The "Edit partition scheme of the unit" dialog box has a button label "expert". This button is inactive unless you have defined more than four partitions. Click on it *after* you have defined the sizes of the partitions.

A new dialog box appears on the screen. The left side contains two blocks of partitions: The upper block always contains the first four partitions, the lower block contains the last three partitions. If you have defined less than 7 partitions, some fields of the lower block will contain the string "unused". Some of the partitions will be displayed in reverse video: These are the extended partitions.

The right side contains six possible ranges for the extended partitions. It is not possible to define your own range, you will have to use one of the schemes offered by HDX. To quote from Ghostbusters: Choose and die. The default scheme used by HDX is the first scheme: Extended partitions start with the second partition and end with the second to last partition. If you have defined 7 partitions, partitions #2 to #5 will be extended partitions, while partitions #1, #6 and #7 will be primary partitions.

You can move the extended partition range by clicking on one of the buttons on the right side of the dalog box. Try to find one where your first NetBSD partition is a primary partition. Golden rules:

- If the disk contains no GEMDOS partitions, don't use AHDI. Let NetBSD handle it alone.
- If the disk contains one GEMDOS partition, make it partition #1 and start the extended partition range at partition #3. This allows you to boot from both the GEMDOS and the NetBSD partitions.
- If the disk contains two GEMDOS partitions, use partitions #1 and #2 for GEMDOS, partition #3 for NetBSD-root. Start the extended partition range with partition #4.
- If your disks contains three or more GEMDOS partitions, you are in trouble. Try using partitions #1 and #2 as the first two GEMDOS partitions. Use partition #3 as the first NetBSD partition. Start the extended partition range with partition #4. Put the other NetBSD extended partition range.

Good luck, you'll need it...

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.

1. Booting the miniroot First you need to get yourself into NetBSD. This can be done in a couple ways, both of which currently require GEMDOS. You need either the bootfloppy provided in the distribution or you can copy the loadbsd.ttp program and kernel to a boot floppy disk (1.4M needed) or put them on a TOS partition. Select the loadbsd program and it will ask for parameters, supply: '-b netbsd' (or whatever name you copied the kernel to). You can, of course, also run it from the shell command-line in MiNT:

   ```
   loadbsd -b a:/netbsd
   ```

   You should see the screen clear and some information about your system as the kernel configures the hardware. Then you will be prompted for a root device. At this time remove the GEMDOS kernel boot floppy from the drive if present and insert the BSD install floppy 1. Now type 'md0a' to tell the kernel to load the install filesystem into RAMdisk. While While the kernel is loading, it will show a '.' for each track loaded. After loading 80 tracks, it will ask you to insert the next floppy. At this time, insert the BSD install floppy 2 and hit any key. The kernel continous loading another 40 tracks before it continues to boot.

   Note: If you are using 1.44Mb floppies, you should select 'md1a' instead of 'md0a'.
   The system should continue to boot. For now ignore WARNING: messages about bad dates in clocks. 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...

2. Entering the installer The installer starts with a nice welcome message. 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.

3. Select your root device 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. Where you end up after the selection of the root disk depends on the contents of your disk. If it is already partitioned using AHDI, start reading at item 4a, if this disk has no AHDI partitioning but is blank or used by another non-AHDI system, start at item 4b.

   You are now at the point of no return! The programs in section 4 will modify your harddisk. Type Control-C *now* if you don't want this.

4. Setting AHDI partition id's on your root disk (using edahdi) Because NetBSD imposes a special ordering in disk partitions it uses for root and swap. And because it wants to guard you against an unwanted demolition of partitions used by other systems, you have to tell it what partitions it is allowed to use. You have to mark the partition you want to use as swap 'NBS' or 'SWP' and the other partitions as 'NBD'. Note that all the changes you make to the id's are reversable as long as you remember the original value. In the partition-id editor, the partitions are shown in the order that AHDI created them. When you leave this editor and continue at item 4b, your changes to the id's do have consequences to the partition order! They will show up as follows:

   a – the first NBD partition

   b – the first NBS partition

   d (and up) – the rest of the partitions in AHDI order

5. Labeling your root disk (using edlabel) You are now allowed to change the partitioning of your disk. If your disk is already partitioned with AHDI DON'T change anything unless you are absolutely sure what you are doing! If you are labeling an empty SCSI disk, you can make life easy for yourself by selecting 'standarize geometry'. This allows you to select a 'sectors per track' and 'tracks/cylinder' value and have the (fictious) SCSI geometry changed accordingly. So if you select 64 sect/track and 32 tracks/cylinder, each cylinder is exactly 1Mb in size. Well, go ahead and don't forget to save your work before you quit!

   Note: to make sure that NetBSD can create/mount filesystems on the partitions you defined, make sure the 'type' is entered correctly:

   4.2BSD – filesystems created by NetBSD
   MSDOS – filesystems shared with GEM

6. Label additional disks Now that your root-disk is labeled, you are given the opportunity to label any of the other disks in your system. The procedure is the same as with your root disk.

7. Setup the fstab Since all disks you want to use with NetBSD are properly labeled, it is time to tell the installer which partition will be associated with the different filesystems. As mentioned above, it is wise to make at least a separate root and /usr filesystem. Depending on what you are planning to do with your system, you might also consider to make a separate /var, /local or /home. When you tell the installer that all of your filesystems are specified correctly, it starts creating them for you.

8. Configure your network Currently none of the kernels supplied in the distribution has network support builtin. If you compiled your own kernel, network configuration mostly works. [Due to space limitiations, some of the network commands are not present on the install floppy]
9. Edit the fstab - again.... Since the network configuration might have lead to additional (nfs) filesystem entries, you get another chance to modify your fstab.
10. Installing the distribution sets You are finally at the point where some real data will be put on your freshly-made filesystems. Select the device type you whish 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. The tape device name will be "nrst0" for the first tape drive, "nrst1" for the second, etc.
    - 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 '.'.
    - For previous NetBSD users: If you want to install from a GEMDOS filesystem, you don't need to rename the distribution sets as you may have done in previous versions of NetBSD.
11. Timezone selection and device-node building The isn't much to say about this. 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...
12. Installing the kernel Because the kernel didn't fit on the install-disks, the installer asks you about the disk your kernel is on. You can specify the floppy with disk 'fd0' and partition 'b' for 720K disks and partition 'c' for 1.4M disks, or one of the hard disk partitions.
13. Installing the bootstrap Finally, the installer ask you if you want to install the bootblock code on your root disk. This is a matter of personal choise and can also be done from a running NetBSD system. See the 'installboot(8)' manual page about how to do this.
14. You did it! Congratulations, you just installed NetBSD successfully! If you also installed a bootblock, you only have to reboot your atari to enter your freshly build system. If you didn't, get back to section 1 (How to boot the miniroot). Just substitute 'md0a' by your NetBSD root disk.

Some Extra Remarks

If you don't want to use the bootloader. You could use the following setup:

- Reserve a small GEMDOS partition of about 4Mb. This is enough to put in a few kernels. Put the netbsd kernel into this partition. Also, edit your /etc/fstab to always mount this partition, say as /kernels. Now make a symlink from /netbsd to /kernels/netbsd. This sceme is particulary handy when you want to make your own kernel. When compilation is finished, you just copy your kernel to /kernels/netbsd and reboot. It's wise to make sure there is _always_ a 'known to work' kernel image present.

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

Before updating, you probably would want to backup your original filesystems!

The update procedure will not overwrite or remove any files not present in the sets you install. If you've replaced programs present in the distribution, you have to replace them again after you did the update. The etc-set needs special caution. You generally don't want to install this one when upgrading. It is recommended that you get a copy of this set and _carefully_ upgrade your configuration files by hand.

1. Starting the upgrade

   Ok, let's go. Insert the bootfloppy and follow the 'normal' installation procedure until it asks you if you wish to install or upgrade. At this time, select upgrade. 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.

2. Selecting your root disk

   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 can skip this section on NetBSD/Atari for now.

3. Editing the fstab

   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.

4. The actual upgrade

   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). You might want to read the notes in section 9 (Installing the distribution sets) of the installation section.

5. Finishing up

   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.

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 1.4.2

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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Advanced System Products, Inc.
Avalon Computer Systems
Bay Area Internet Solutions
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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.)

- Finally, we thank all of the people who've put sweat and tears into developing NetBSD since its inception in January, 1993. (Obviously, there are a lot more people who deserve thanks here. If you're one of them, and would like to mentioned, tell us!)

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