NAME

INSTALL — Installation procedure for NetBSD/hp700.

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DESCRIPTION

About this Document

This document describes the installation procedure for NetBSD 3.0.3 on the *hp700* 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 UNIX -like operating system derived from the University of California, Berkeley Networking Release 2 (Net/2), 4.4BSD-Lite, and 4.4BSD-Lite2 sources. NetBSD runs on fifty four different system architectures (ports), featuring seventeen machine architectures across fifteen distinct CPU families, and is being ported to more. The NetBSD 3.0.3 release contains complete binary releases for many different system architectures. (A few ports 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, firewall software 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 Between The NetBSD 3.0.2 and 3.0.3 updates

The NetBSD 3.0.3 update is the third security/critical update of the NetBSD 3.0 release branch. This represents a selected subset of fixes deemed critical in nature for stability or security reasons.

These fixes will also appear in future releases (NetBSD 3.2 etc), together with other less-critical fixes and feature enhancements.

Specific updates are as follows:

Supported devices

- wd(4): fix broken Seagate drives ST3160021A and ST3160811A.

Kernel

- Don't accept a compressed vnd(4) image with block size 0 to avoid a kernel panic.

Networking

- Fix get-lease-hostnames option in dhcpd.conf(5) to make dhcpd(8) use the DNS hostname as the DHCP hostname given to the client.
- Fix TCP window scaling in ipfilter(4).
- Update BIND to version 9.3.2.

File system

- Prevent a kernel panic when creating snapshots on filesystems which use quota's.
- Fix a coredump in dump(8) when using -X (filesystem internal snapshots).
- Fix a panic when one user has 65536 active vnodes on a quota-enabled file system.

Security

- Fix a buffer overflow in glob(3), which affected ftpd(8) and possibly other programs (SA2006-027).
- X11: fix an integer overflow in the Render and DBE extensions (SA2007-002).
- BIND: fix multiple Denial of Service vulnerabilities (SA2007-003).
- Fix a buffer overflow in iso(4) which could potentially lead to a local root compromise (SA2007-004).
- Fix an integer underflow in file(1) which could lead to an exploitable heap overflow.
- X11: fix a number of possible memory corruptions due to integer overflows (CVE 2007-1003, 1351, 1352, 1667).
- Fix a denial of service vulnerability in racoon(8) which could allow an attacker to disrupt a connection between IPSec peers.
- Disable processing or routing header type 0 (RH0) IPv6 packets since they can be used for DoS attacks (CVE-2007-2242). Provide a sysctl (net.inet6.ip6.rht0) to re-enable them. Note: the sysctl may be removed completely in future NetBSD releases.
- Two veriexec(4) flaws have been fixed: users can no longer rename a file to a veriexec protected file or run unfingerprinted files at strict level two or above.
- file(1) has been updated to version 4.21, including and integer underflow and an integer overflow fix (CVE-2007-1536 and CVE-2007-2799).

Miscellaneous

- Fix some problems with `etcupdate`(8) for upgrading.
- Update time zoneinfo to tzdata2007f.
- Set /etc/postfix/post-install mode 555 (executable) instead of 444.
- `passwd`(1): display a message indicating who's password is being changed, to avoid confusion after `su`(1).
- The /etc/daily, weekly, monthly and security scripts now use $TMPDIR instead of /tmp.

alpha specific

- Fix alignment problems causing regular panics on NetBSD/alpha and NetBSD/sparc.

mac68k specific

- Avoid a kernel panic before reboot.

sparc specific

- Fix alignment problems causing regular panics on NetBSD/alpha and NetBSD/sparc.

Changes Between The NetBSD 3.0.1 and 3.0.2 updates

The NetBSD 3.0.2 update is the second security/critical update of the NetBSD 3.0 release branch. This represents a selected subset of fixes deemed critical in nature for stability or security reasons.

These fixes will also appear in future releases (NetBSD 3.1 etc), together with other less-critical fixes and feature enhancements.

Specific updates are as follows:

Kernel

- Avoid a panic in page fault handling that could occer under low-memory conditions.

Networking

- Changed the default `sshd_config`(8) to enable SSH version 2 only.
- Don't accept TCP connections to broadcast addresses.

File system

- Fixed race condition in NFS renaming that could cause the renamed file to be deleted.

Libraries

- When a user is created, initialize the string of secondary groups to avoid it containing garbage when none is added.

Security

- Fixed a buffer overflow in the in-kernel PPP code share by ISDN PPP interfaces `ippp`(4) and `pppoe`(4) (SA2006-019).
- X11: fixed an integer overflow in FreeType (SA2006-020).
- Fixed a potential DoS attack with `sendmail`(8) (SA2006-017).
- Fixed a DoS vulnerability in BIND (SA2006-022).

- Fixed a RSA signature forgery in `openssl`(1) (SA2006-023).
- X11: fixed a vulnerability in Adobe Type 1 font handling (SA2006-021).
- Fixed a number of DoS vulnerabilities in `openssl`(1) (SA in preparation, CVE entries: 2006-2937, 2940, 3738 and 4343).
- Fixed a number of DoS vulnerabilities in `sshd`(8) (SA in preparation, CVE entries: 2006-4924 and 5051).

Miscellaneous

- Fixed cross-building from GCC 4.x hosts.

amd64 specific

- Make sure that the system reboots after a panic instead of halting.

sparc specific

- Disabled threading in `named`(8) on sparc and sparc64 to avoid a crash.

mac68k specific

- sysinst now newfs'es and mounts the target filesystem(s).

Changes Between The NetBSD 3.0 release and 3.0.1 update

The NetBSD 3.0.1 update is the first security/critical update of the NetBSD 3.0 release branch. This represents a selected subset of fixes deemed critical in nature for stability or security reasons.

These fixes will also appear in future releases (NetBSD 3.1 etc), together with other less-critical fixes and feature enhancements.

Specific updates are as follows:

Kernel

- Hold kernel_lock while calling systrace_exit().
- In systrace_make_msg(), sleep uninterruptibly while waiting for the response from the systrace daemon, so that the message protocol between the kernel and the daemon doesn't get out of sync.
- RAIDframe: mark used spares as failed if they encounter IO errors.
- `wdc`(4): after a reset don't wait for drives to come ready if there are no drives (fixes a 30s hang after resume).
- Fix support in `wd`(4) for 1 and 2TB disks.
- Fix a bug in the fragment cache which could cause kernel panics (SA2006-004).
- Fix a crash caused by `azalia`(4) when a connection list has invalid NIDs.
- `aic`(4): work around an rbus resource allocation problem so cards work again.
- RAIDframe was erroneously re-initializing the Parity Stripe Status pool each time a new array was configured. This causes grief with things like 'vmstat -m' by causing it to loop. Make RAIDframe only initialize PSS bits once.
- `twe`(4): fix a memory leak in the TWEIO_GET_PARAM ioctl.
- Prevent system crashes caused by malformed ELF interpreters (SA2006-008).

- usb(4): Allow a NULL pointer as argument to usb_get_next_event(), and don't allocate a "struct usb_event" on stack in usb_add_event().
- Check the "oldlen" argument to sysctl(2) before passing it to vslock(9). This prevents a local DOS (SA2006-013).
- Use a pmatch(9) expression which should catch all present and future seagate drives larger than 200GB for the WD_QUIRK_FORCE_LBA48 quirks.
- Fix the 'audioctl of death' problem (SA2006-014).
- Limit the size of any kernel buffers allocated by the VOP_READDIR routines to MAXBSIZE.

Networking

- Make sure all bridge(4) structs are initialized to 0.
- Fix a memory disclosure in bridge(4) (SA2006-005).
- Use sigaction(2) to setup automatic disposal of child processes after daemonizing rpc.statd(8). This is more portable and avoids zombie rpc.statd(8) processes after an NFS client running e.g. Mac OS X shuts down.
- Prevent system crash when attempting to gather information about a non-existing alias of a network interface via the SIOCGIFALIAS ioctl (SA2006-012).
- Fix a panic caused by insufficient validation when parsing IPv6 socket options (SA2006-016).

File system

- Change union_unmount() to not play with the fs root vnode explicitly. Let it get recycled along with all of the others. This is important as if the root vnode has already been reclaimed, then we get a panic when we try to vget it.

Libraries

- xdr_rec.c missing a bugfix for an improper security check. The correct way to check for a zero record length is to check for it without the LAST_FRAG marker in it, since it's legal to send a LAST_FRAG marker with 0 bytes of data.
- pam_nologin(8): use the class of the user, not then default class, when checking for nologin and ignorelogin login.conf(5) capabilities.
- pam_unix(8): fix an uninitialized variable, and remove some unreachable code.
- Make PAM work on NetBSD ports without shared library support.
- Make password aging work again.
- Fix a bug in signal handling which could e.g get the MySQL daemon stuck in a tight loop after receiving a HUP signal.

Security

- Improve rnd(4) code probing for the Intel hardware RNG to avoid false detections (SA2006-009).
- mail(1) creates record file with insecure umask (SA2006-007).
- Fix a remote code execution vulnerability in sendmail (SA2006-010).
- A vulnerability was found in the fast_ipsec(4) stack that renders the IPSec anti-replay service ineffective under certain circumstances (SA2006-011).

- Fix a number of small security problems with the games.
- Fix an FPU Information leak on i386/amd64/Xen platforms with AMD CPUs (SA2006-015).
- Fix several integer overflows and NULL-pointer dereferences in freetype2.
- Fix a denial of service vulnerability in sendmail when handling malformed multipart MIME messages (SA2006-017).

Miscellaneous

- Sync the Nvidia drivers with XFree86's sources as of December 24th, 2005. These changes fix lots of problems (i.e. freezes) with the latest cards (such as a GeForce 6600GT).
- Give systrace its own version of realpath() that does what it wants, call it intercept_realpath(). Unbreaks systrace.
- `login`(1), `pam_securetty`(8): don't issue a different message for root login on an insecure terminal.
- Fix some unpaired sigblocks which possibly leave a process with all signals blocked (esp. apparant under Gnome).
- Fix a NULL pointer dereference in `ftp`(1).
- Make `sh`(1) expand "$@" correctly again.

acorn26 specific

- Avoid panics under NetBSD/acorn26 whenever a process exits.
- Stop NetBSD/acorn26 from allocating eight times as much pool memory as it needs, leading to a rapid exhaustion of physical memory. NetBSD/acorn26 now boots multi-user again.

amiga specific

- Installer: don't ask for the root device before the user had a chance to identify how it's called under NetBSD.

hp300 specific

- Fix the bootloader so it doesn't print garbage to the bitmap console.
- Fix a huge number of pkgsrc build problems.
- Fix boot failure problem on HP400t with fb console.
- Fix a problem with the probe of SCSI disks in the installer.

i386 specific

- Update pciide at pnpbios to work with the last changes to `wdc`(4), especially the deferral of drive probe.

m68k specific

- Fix a huge number of pkgsrc build problems.

mips specific

- Avoid kernel panics caused by binaries compiled with "-mips2" or better.
- Update FPE trapsignal functions for new siginfo.

powerpc specific

- Avoid pthreads program crashes.

sparc specific

- For GCC3 and later, use the __builtin_va* constructs. Avoids a build problem with Firefox.

xen specific

- Avoid dom0 kernel crash when destroying a domain with active I/O going.
- Fix the FPU problems detected by paranoia on a NetBSD/Xen guest.
- Check the destination ethernet address when not in promiscous mode. Fix a problem where packets would be duplicated, possibly looping, when a domU is doing IP routing.
- Avoid panics under high system load.

This is the second major release of NetBSD for the HP 9000/700 series of computers.

The Future of NetBSD

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

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

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

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

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

We intend to continue our current practice of making the NetBSD-current development source available on a daily basis.

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

Refer to .: **http://www.NetBSD.org/mirrors/**

NetBSD 3.0.3 Release Contents

The root directory of the NetBSD 3.0.3 release is organized as follows:

`.../NetBSD-3.0.3/`

`CHANGES`	Changes since earlier NetBSD releases.
`LAST_MINUTE`	Last minute changes.
`MIRRORS`	A list of sites that mirror the NetBSD 3.0.3 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 3.0.3 has a binary distribution.

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:

gnusrc This set contains the "gnu" sources, including the source for the compiler, assembler, groff, and the other GNU utilities in the binary distribution sets.
79 MB gzipped, 367 MB uncompressed

pkgsrc This set contains the "pkgsrc" sources, which contain the infrastructure to build third-party packages.
24 MB gzipped, 200 MB uncompressed

sharesrc 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.
5 MB gzipped, 20 MB uncompressed

src This set contains all of the base NetBSD 3.0.3 sources which are not in **gnusrc**, **sharesrc**, or **syssrc**.
37 MB gzipped, 176 MB uncompressed

syssrc This set contains the sources to the NetBSD 3.0.3 kernel for all architectures; `config`(8); and `dbsym`(8).
26 MB gzipped, 140 MB uncompressed

xsrc This set contains the sources to the X Window System.
84 MB gzipped, 450 MB uncompressed

All the above source sets are located in the `source/sets` subdirectory of the distribution tree.

The source sets are distributed as compressed tar files. Except for the **pkgsrc** set, which is traditionally unpacked into `/usr/pkgsrc`, all sets may be unpacked into `/usr/src` with the command:

```
# ( cd / ; tar -zxpf - )  set_name.tgz
```

In each of the source distribution set directories, there are files which contain the checksums of the files in the directory:

`BSDSUM` Historic BSD checksums for the various files in that directory, in the format produced by the command:
cksum -o 1 *file*.

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

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

`SYSVSUM` Historic ATT 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/hp700 subdirectory structure

The hp700-specific portion of the NetBSD 3.0.3 release is found in the `hp700` subdirectory of the distribution: `.../NetBSD-3.0.3/hp700/`. It contains the following files and directories:

`INSTALL.html`
`INSTALL.ps`
`INSTALL.txt`
`INSTALL.more` Installation notes in various file formats, including this file. The `.more` file contains underlined text using the `more`(1) conventions for indicating italic and bold display.

`binary/`
`kernel/`
`netbsd-GENERIC.gz`
A gzipped NetBSD kernel containing code for everything supported in this release.
`sets/` hp700 binary distribution sets; see below.

`installation/`
`misc/`

Binary distribution sets

The NetBSD hp700 binary distribution sets contain the binaries which comprise the NetBSD 3.0.3 release for the hp700. The binary distribution sets can be found in the `hp700/binary/sets` subdirectory of the NetBSD 3.0.3 distribution tree, and are as follows:

base The NetBSD 3.0.3 hp700 **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.
20 MB gzipped, 67 . MB 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.
9 MB gzipped, 42 . MB 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.

1 MB gzipped, 1 MB uncompressed

games This set includes the games and their manual pages.
-unknown- MB gzipped, -unknown- MB uncompressed

kern-GENERIC
This set contains a NetBSD/hp700 3.0.3 `GENERIC` kernel, named `/netbsd`. You *must* install this distribution set.
-unset- MB gzipped, -unset- MB 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.
8 MB gzipped, 30 MB uncompressed

misc This set includes the (rather large) system dictionaries, the typesettable document set, and other files from `/usr/share`.
3 MB gzipped, 9 MB uncompressed

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

NetBSD maintains its own set of sources for the X Window System in order to assure tight integration and compatibility. NetBSD/hp700 currently does not ship with an X server or X clients. 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.
-unknown- MB gzipped, -unknown- MB uncompressed

xcomp The extra libraries and include files needed to compile X source code.
-unknown- MB gzipped, -unknown- MB uncompressed

xfont Fonts needed by X.
-unknown- MB gzipped, -unknown- MB uncompressed

xetc Configuration files for X which could be locally modified.
0.03 MB gzipped, 0.17 MB uncompressed

xserver The X server.
-unknown- MB gzipped, -unknown- MB uncompressed

The hp700 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 filenames stored in the sets are relative and therefore the files are extracted *below the current directory*. Therefore, if you want to extract the binaries into your system, i.e. replace the system binaries with them, you have to run the **`tar -xpf`** command from the root directory (`/`) of your system. This utility is used only in a Traditional method installation.

Note: Each directory in the hp700 binary distribution also has its own checksum files, just as the source distribution does.

NetBSD/hp700 System Requirements and Supported Devices

Since NetBSD/hp700 is an experimental port, the hardware support is in a constant state of flux. Check the `port-hp700@NetBSD.org` mailing list and the NetBSD/hp700 port homepage for an up-to-date list of known supported hardware. **http://www.NetBSD.org/Ports/hp700/**

NetBSD/hp700 3.0.3 does not have any local disk support, so you must netboot and run diskless.

Supported hardware

Unknown.

Unsupported hardware

Unknown.

Getting the NetBSD System on to Useful Media

Because NetBSD/hp700 must run diskless, the distribution must be installed to a remote machine that NFS exports to the hp700 machine. As a result, there is no automated install procedure. Begin by retrieving the NetBSD set files onto the serving machine. These can be found at ftp.NetBSD.org. You may want to keep the following information handy:

```
IP Address: ftp.NetBSD.org
Login: anonymous
Password: your e-mail address
Server path: /pub/NetBSD/NetBSD-3.0.3/hp700/binary/sets
```

Preparing your System for NetBSD installation

Get to the Boot Administration prompt

All hp700 workstations have a Boot Administration command line utility in their Boot ROM which lets you configure various settings. For example, you can set whether the system automatically boots an OS, which device to try booting from first, determine the ethernet MAC address, set up a serial console, and possibly do some low level hardware access.

To get to the `BOOT_ADMIN` prompt, you must press the `ESCAPE` key before it tries to boot an OS. Since these machines often take a long time between powering on and the brief window of time where you can hit the `ESCAPE` key, you must pay attention. Depending on how much RAM your system has, it may take over a minute after pressing the power button before anything will show up on screen.

Once you have escaped out of the `Selecting a system to boot` and `Searching for Potential Boot Devices` you need to type the 'a' key to get to the `BOOT_ADMIN` prompt. Now, use the online help with the **`help`** command.

Write down the ethernet address. You will need this later to configure the netboot server for your NetBSD/hp700 system.

```
Selecting a system to boot.
To stop selection process, press and hold the ESCAPE key.
ESC
Booting from:     scsi.6.0     SEAGATE ST3600N

Selection process stopped.

Searching for Potential Boot Devices.
To terminate search, press and hold the ESCAPE key.

Device Selection      Device Path              Device Type
```

```
------------------------------------------------------------------------------

P0                    scsi.6.0                SEAGATE ST3600N
ESC
Search terminated.


b)    Boot from specified device
s)    Search for bootable devices
a)    Enter Boot Administration mode
x)    Exit and continue boot sequence
?)    Help

Select from menu: a
BOOT_ADMIN lan_addr
LAN Station Address:  080009-123456
BOOT_ADMIN help
```

Change the configuration parameters to netboot

The command syntax is different on the various models. Use the **help path**, **help lan**, and **help autoselect** commands to learn about how to configure your system. On a 735/99, you would type:

```
BOOT_ADMIN path primary lan
BOOT_ADMIN autoselect on
BOOT_ADMIN reset
```

The first command sets the primary boot device to be the network interface, and the second command sets the system to always try booting from the primary boot path when it is reset or powered on. The last command stores the new settings and resets the machine.

To return to using the SCSI disk at ID 6 as your primary boot device, you would use something like the following command:

```
BOOT_ADMIN path primary scsi.6.0
```

Determine netboot method

Most older Series 700 workstations (with PA-7000 (PCXS), PA-7100 (PCXT), or PA-7150 (PCXT)) use the RMP (Remote Maintenance Protocol) to netboot. Specifically, they retrieve their boot program from an `rbootd`(8) server. The following list of RMP-only Series 700 workstations is probably complete, but has not been tested:

- 705
- 710
- 715/33, 715/50, 715/75
- 720
- 725/50, 725/75
- 730
- 735
- 745i
- 747i
- 750
- 755

Newer Series 700 workstations retrieve their boot program from a server running `dhcpd`(8) in `bootpd`(8) compatible mode and `tftpd`(8). The following list of BOOTP-only Series 700 workstations is probably

complete, but has not been tested:

- 712
- 715/64, 715/80, 715/100, 715/100XC
- 725/64, 725/100
- newer models, such as the B, C, and J class systems

Installing the NetBSD System

1. Introduction

   To netboot a hp700, you must configure one or more servers to provide information and files to your hp700 (the 'client).' If you are using NetBSD (any architecture) on your netboot server(s), the information provided here should be sufficient to configure everything. Additionally, you may wish to look at the `diskless`(8) manual page and the manual pages for each daemon you'll be configuring. If the server(s) are another operating system, you should consult the NetBSD Diskless HOW-TO, which will walk you through the steps necessary to configure the netboot services on a variety of platforms.

   http://www.NetBSD.org/Documentation/network/netboot/

   Briefly, the netboot process involves discovery, bootstrap, kernel and file system stages. In the first stage, the client discovers information about where to find the bootstrap program. Next, it downloads and executes the bootstrap program. The server contains one large file (a LIF file system) with the bootloader and the kernel. The bootstrap program simply loads the kernel from the LIF image. Once the kernel is loaded, it starts executing. The kernel tries to mount the NFS share that had the kernel and starts executing `init`(8). Early hp700 systems use HP's proprietary RMP (the `rbootd`(8) daemon) for the discovery stage, bootstrap download, and kernel download stages. Later hp700 systems use BOOTP for the discovery stage and TFTP for the bootstrap and kernel download.

   We will use '`CC:CC:CC:CC:CC:CC`' as the MAC address (ethernet hardware address) of your netboot client machine. You should have determined this address in an earlier stage. In this example, we will use '`192.168.1.10`' as the IP address of your client and '`client.test.net`' as its name. We will assume you're providing all of your netboot services on one machine called '`server.test.net`' with the client's files exported from the directory `/export/client/root`. You should, of course, replace all of these with the names, addresses, and paths appropriate to your environment.

   You should set up each netboot stage in order (i.e. discovery, bootstrap, kernel, and then file system) so that you can test them as you proceed.

   If your system uses RMP to netboot, you must set up `rbootd`(8) but can skip `dhcpd`(8) and `tftpd`(8). If your system uses BOOTP to netboot, then you must set up `dhcpd`(8) and `tftpd`(8) but can skip `rbootd`(8).

2. `rbootd`(8)

   Get `SYSNBSD` from the `installation/misc` directory of the distribution.

   ```
   # mkdir -p /usr/mdec/rbootd
   # cp SYSNBSD /usr/mdec/rbootd
   # chmod -R a+rX /usr/mdec/rbootd
   ```

   Create `/etc/rbootd.conf` with the following line:

   ```
   CC:CC:CC:CC:CC:CC SYSNBSD
   ```

   You will need to start the **`rbootd`**. If it's already running, you will need to restart it to force it to reread its configuration file. If the server is running NetBSD, you can achieve this with:

```
# /etc/rc.d/rbootd restart
```

3. dhcpd(8) in bootpd(8) compatible mode

   Put the following lines in your /etc/dhcpd.conf (see dhcpd.conf(5) and dhcp-options(5) for more information):

```
ddns-update-style none;
                # Do not use any dynamic DNS features
                #
allow bootp;    # Allow bootp requests, thus the dhcp server
                # will act as a bootp server.
                #
authoritative;  # master DHCP server for this subnet
                #
subnet 192.168.1.0 netmask 255.255.255.0 {
                # Which network interface to listen on.
                # The zeros indicate the range of addresses
                # that are allowed to connect.
}
group {
                # Set of parameters common to all clients
                # in this "group".
                #
        option broadcast-address        192.168.1.255;
        option domain-name              "test.net";
        option domain-name-servers      dns.test.net;
        option routers                  router.test.net;
        option subnet-mask              255.255.255.0;
                #
                # An individual client.
                #
        host client.test.net {
                hardware ethernet       CC:CC:CC:CC:CC:CC;
                fixed-address           192.168.1.10;
                #
                # Name of the host (if the fixed address
                # doesn't resolve to a simple name).
                #
                option host-name        "client";
                #
                # Name of the bootloader or kernel
                # to download via tftp.
#
                filename                "SYSNBSD";

                #
                # The path on the NFS server.
                #
                option root-path "/export/client/root";

                #
                # If your DHCP server is not your NFS server, supply the
```

```
                    # address of the NFS server. Since we assume you run everythi
                    # on one server, this is not needed.
                    #
                    # next-server server.test.net;
            }
        #you may paste another "host" entry here for additional
        #clients on this network
    }
```

You will need to make sure that the `dhcpd.leases` file exists.

```
# touch /var/db/dhcpd.leases
```

You will need to start the **dhcpd**. If it's already running, you will need to restart it to force it to re-read its configuration file. If the server is running NetBSD, you can achieve this with:

```
# /etc/rc.d/dhcpd restart
```

4. `tftpd`(8)

   The default configuration of the TFTP server is to run in a `chroot`(8) environment in the `/tftpboot` directory. Thus, the first order of business is to create this directory:

   ```
   # mkdir -p /tftpboot
   ```

   Next, edit `/etc/inetd.conf` and uncomment the line with the TFTP daemon:

   ```
   tftp  dgram  udp  wait  root  /usr/libexec/tftpd tftpd -l -s /tftpboot
   ```

   Now, restart `inetd`(8). If the server is running NetBSD, you can achieve this with:

   ```
   # /etc/rc.d/inetd restart
   ```

   Now, you need to copy the bootloader for your hp700 machine to `/tftpboot`. Get `SYSNBSD` from the `installation` directory of the distribution.

   ```
   # cp SYSNBSD /tftpboot
   ```

   Just to be sure, let's make everything readable.

   ```
   # chmod -R a+rX /tftpboot
   ```

   Sometimes, the `arp`(8) table gets messed up, and the TFTP server can't communicate with the client. In this case, it will write a log message (via `syslogd`(8)) to `/var/log/messages` saying: '`tftpd: write: Host is down`'. If this is the case, you may need to force the server to map your client's ethernet address to its IP address:

   ```
   # arp -s client CC:CC:CC:CC:CC:CC
   ```

5. `nfsd`(8), `mountd`(8), and `rpcbind`(8)

   Now your system should be able to load the bootstrap program and start looking for the kernel. Let's set up the NFS server. Create the directory you are exporting for the netboot client:

   ```
   # mkdir -p /export/client/root
   ```

   Put the following line in `/etc/exports` to enable NFS sharing:

   ```
   /export/client/root -maproot=root client.test.net
   ```

   If your server is currently running an NFS server, you only need to restart `mountd`(8). Otherwise, you need to start `rpcbind`(8) and `nfsd`(8). If the server is running NetBSD, you can achieve this with:

```
# /etc/rc.d/rpcbind start
# /etc/rc.d/nfsd start
# /etc/rc.d/mountd restart
```

6. NetBSD kernel

   You do not need to place a kernel in `/export/client/root` since the kernel is contained inside `SYSNBSD`.

7. Client file system

   You need to extract and set up the client's installation of NetBSD. The Diskless HOW-TO describes how to provide better security and save space on the NFS server over the procedure listed here.

   http://www.NetBSD.org/Documentation/network/netboot/nfs.html

   - Extracting distribution sets

     ```
     # cd /export/client/root
     # tar -xpzf /path/to/files/base.tgz
     # tar -xpzf /path/to/files/etc.tgz
     ```

     Continue with the other non-essential distribution sets if desired.

   - Set up swap

     ```
     # mkdir /export/client/root/swap
     # dd if=/dev/zero of=/export/client/swap bs=4k count=4k
     # echo '/export/client/swap -maproot=root:wheel client.test.net' | cat  /et
     # /etc/rc.d/mountd restart
     ```

     This creates a 16 MB swap file and exports it to the client.

   - Create device nodes

     ```
     # cd /export/client/root/dev
     # ./MAKEDEV all
     ```

     This procedure only works on NetBSD hosts.

   - Set up the client's `fstab`(5)

     Create a file in `/export/client/root/etc/fstab` with the following lines:

     ```
     server:/export/client/swap   none  swap  sw,nfsmntpt=/swap
     server:/export/client/root   /     nfs   rw 0 0
     ```

   - Set up the client's `rc.conf`(5)

     Edit `/export/client/root/etc/rc.conf`

     ```
     rc_configured=YES
     hostname="client"
     defaultroute="192.168.1.1"
     nfs_client=YES
     auto_ifconfig=NO
     net_interfaces=""
     ```

     Make sure rc does not reconfigure the network device since it will lose its connection to the NFS server with your root file system.

   - Set up the client's `hosts`(5) file.

Edit /export/client/root/etc/hosts

```
::1                     localhost
127.0.0.1               localhost
192.168.1.10 client.test.net client
192.168.1.5  server.test.net server
```

8. Setting up the server daemons

   You need these services to start up every time you boot your server, make sure the following lines are present in your /etc/rc.conf:

```
rbootd=YES        rbootd_flags=""
dhcpd=YES         dhcpd_flags="-q"
nfs_server=YES          # enable server daemons
mountd=YES
rpcbind=YES       rpcbind_flags="-l"    # -l logs libwrap
```

   Also, you'll need to make sure the tftpd line in /etc/inetd.conf remains uncommented.

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 properly configured state, with the most important ones described below.

1. Configuring /etc/rc.conf

   If you or the installation software haven't done any configuration of /etc/rc.conf (**sysinst** usually will), 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 file system (/) mounted read-only. When the system asks you to choose a shell, simply press RETURN to get to a /bin/sh prompt. If you are asked for a terminal type, respond with **vt220** (or whatever is appropriate for your terminal type) and press RETURN. You may need to type one of the following commands to get your delete key to work properly, depending on your keyboard:

```
# stty erase '^h'
# stty erase '^?'
```

   At this point, you need to configure at least one file in the /etc directory. You will need to mount your root file system read/write with:

```
# /sbin/mount -u -w /
```

   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. Default values for the various programs can be found in /etc/defaults/rc.conf, where some in-line documentation may be found. More complete documentation can be found in rc.conf(5).

   If your /usr directory is on a separate partition and you do not know how to use **ed**, you will have to mount your /usr partition to gain access to **ex** or **vi**. Do the following:

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

   If you have /var on a separate 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 ⟨int⟩ network interface,

along the lines of

```
ifconfig_ie0="inet 123.45.67.89 netmask 255.255.255.0"
```

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

```
ifconfig_ie0="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. Instead of manually configuring network and naming service, DHCP can be used by setting `dhclient=YES` in `/etc/rc.conf`.

Other files in `/etc` that 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. Unless you've set a password in **sysinst**, there is no initial password. 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. By default, root login from the network is disabled (even via `ssh`(1)). One way to become root over the network is to log in as a different user that belongs to group "wheel" (see `group`(5)) and use `su`(1) to become root.

   Unless you have connected an unusual terminal device as the console you can just press `RETURN` when it prompts for `Terminal type? [...]`.

3. Adding accounts

   Use the `useradd`(8) command to add accounts to your system. Do not edit `/etc/passwd` directly! See `vipw`(8) and `pwd_mkdb`(8) if you want to edit the password database.

   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.

4. Installing third party packages

   If you wish to install any of the software freely available for UNIX -like systems you are strongly advised to first check the NetBSD package system. This automatically handles any changes necessary to make the software run on NetBSD, retrieval and installation of any other packages on which the software may depend, and simplifies installation (and deinstallation), both from source and precompiled binaries.

   - More information on the package system is at
     http://www.NetBSD.org/Documentation/software/packages.html
   - A list of available packages suitable for browsing is at
     ftp://ftp.NetBSD.org/pub/NetBSD/packages/pkgsrc/README.html
   - Precompiled binaries can be found at *,:*
     ftp://ftp.NetBSD.org/pub/NetBSD/packages/
     usually in the `3.0.3/hp700/All` subdir. You can install them with the following commands under `sh`(1):

     ```
     # PKG_PATH=ftp://ftp.NetBSD.org/pub/NetBSD/packages/3.0.3/hp700/All
     # export PKG_PATH
     # pkg_add -v tcsh
     # pkg_add -v bash
     # pkg_add -v perl
     # pkg_add -v apache
     ```

```
# pkg_add -v kde
# pkg_add -v mozilla
...
```

If you are using `csh`(1) then replace the first two lines with the following:

```
# setenv PKG_PATH ftp://ftp.NetBSD.org/pub/NetBSD/packages/3.0.3/hp700/All
...
```

The above commands will install the Tenex-csh and Bourne Again shell, the Perl programming language, Apache web server, KDE desktop environment and the Mozilla web browser as well as all the packages they depend on.

- Package sources for compiling packages on your own can be obtained by retrieving the file
  ftp://ftp.NetBSD.org/pub/NetBSD/NetBSD-current/tar_files/pkgsrc.tar.gz
  They are typically extracted into `/usr/pkgsrc` (though other locations work fine), with the commands:

  ```
  # mkdir /usr/pkgsrc
  # ( cd /usr/pkgsrc ; tar -zxpf - )  pkgsrc.tar.gz
  ```

  After extracting, see the `README` and `doc/pkgsrc.txt` files in the extraction directory (e.g. `/usr/pkgsrc/README`) for more information.

5. Misc

   - Edit `/etc/mail/aliases` to forward root mail to the right place. Don't forget to run `newaliases`(1) afterwards.
   - The `/etc/mail/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. If you prefer postfix as MTA, adjust `/etc/mailer.conf`.
   - 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 5 filename
     ```

     is likely to give you more information on these files.

Upgrading a previously-installed NetBSD System

NetBSD/hp700 does not currently support an upgrade procedure.

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 3.0.3.

Issues affecting an upgrade from NetBSD 2.1 and older releases.

It is **very important** that you populate the directory `/etc/pam.d` with appropriate configuration files for the Pluggable Authentication Modules (PAM) because you will not be able to login any more otherwise. Using *postinstall* as described below will take care of this. Please refer to
http://www.netbsd.org/guide/en/chap-pam.html
for documentation about PAM.

The following issues can generally be resolved by extracting the **etc** set into a temporary directory and running *postinstall*:

```
postinstall -s /path/to/etc.tgz check
postinstall -s /path/to/etc.tgz fix
```

Issues fixed by *postinstall*:

- Various files in `/etc` need upgrading. These include:
  - `/etc/defaults/*`
  - `/etc/mtree/*`
  - `/etc/pam.d/*`
  - `/etc/daily`
  - `/etc/weekly`
  - `/etc/monthly`
  - `/etc/security`
  - `/etc/rc.subr`
  - `/etc/rc`
  - `/etc/rc.shutdown`
  - `/etc/rc.d/*`

  The following issues need to be resolved manually:

  - The user '_pflogd'
    and the groups '_pflogd' and 'authpf' need to be created.

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),
- `apropos`(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), 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, or visit **http://www.NetBSD.org/MailingLists/**. 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 or WWW 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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The NetBSD Mission
The People's Republic of Ames
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William Gnadt
Worria Affordable Web Hosting
Worria Web Hosting
wwwTrace Traceroute Server Directory
Yusuke Yokota
Zach Metzinger

(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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