## NAME

**INSTALL** — Installation procedure for NetBSD/landisk.

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## DESCRIPTION

### About this Document

This document describes the installation procedure for NetBSD 7.0 on the *landisk* 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 many different different system architectures (ports) across a variety of distinct CPU families, and is being ported to more. The NetBSD 7.0 release contains complete binary releases for most of these

system architectures, with preliminary support for the others included in source form. Please see the NetBSD website at **http://www.NetBSD.org/** for information on them.)

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, NetBSD would not exist.

**Changes Between The NetBSD 6.0 and 7.0 Releases**

The NetBSD 7.0 release provides many significant changes, including support for many new devices, hundreds of bug fixes, new and updated kernel subsystems, and numerous userland enhancements. The result 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 massive development that went into the NetBSD 7.0 release. See

**http://www.NetBSD.org/releases/formal-7/NetBSD-7.0.html**

for some of the more noteworthy changes in this release.

A more extensive list of changes can be found in the CHANGES:

**http://ftp.NetBSD.org/pub/NetBSD/NetBSD-7.0/CHANGES**

and CHANGES-7.0:

**http://ftp.NetBSD.org/pub/NetBSD/NetBSD-7.0/CHANGES-7.0**

files in the top level directory of the NetBSD 7.0 release tree.

**Features to be removed in a later release**

The following features are to be removed from NetBSD in the future:

- `dhclient`(8) and `rtsol`(8) in favor of `dhcpcd`(8).
- `groff`(1). Man pages are now handled with `mandoc`(1), and `groff`(1) can still be found in pkgsrc as `textproc/groff`.
- `rtsol`(8) and `rtsold`(8).

**The NetBSD Foundation**

The NetBSD Foundation is a tax exempt, not-for-profit 501(c)(3) corporation that devotes itself to the traditional goals and Spirit of the NetBSD Project and owns the trademark of the word "NetBSD". It supports the design, development, and adoption of NetBSD worldwide. More information on the NetBSD Foundation, its composition, aims, and work can be found at: **http://www.NetBSD.org/foundation/**

**Sources of NetBSD**

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

**NetBSD 7.0 Release Contents**

The root directory of the NetBSD 7.0 release is organized as follows:

`.../NetBSD-7.0/`

| | |
|---|---|
| `CHANGES` | Changes between the 6.0 and 7.0 releases. |
| `CHANGES-7.0` | Changes between the initial 7.0 branch and the final release of 7.0. |
| `CHANGES.prev` | Changes in previous NetBSD releases. |

`LAST_MINUTE` Last minute changes and notes about the release.

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

`images/` Images (ISO 9660 or USB) for installing NetBSD. Depending on your system, these may be bootable.

`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 7.0 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.

**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.

**src** This set contains all of the base NetBSD 7.0 sources which are not in **gnusrc**, **sharesrc**, or **syssrc**.

**syssrc** This set contains the sources to the NetBSD 7.0 kernel for all architectures as well as the `config`(1) utility.

**xsrc** This set contains the sources to the X Window System.

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:

`MD5` MD5 digests in the format produced by the command:
**cksum -a MD5** *file*.

`SHA512` SHA512 digests in the format produced by the command:
**cksum -a SHA512** *file*.

The SHA512 digest is safer, but MD5 checksums are provided so that a wider range of operating systems can check the integrity of the release files.

*NetBSD/landisk subdirectory structure*

The landisk-specific portion of the NetBSD 7.0 release is found in the `landisk` subdirectory of the distribution: `.../NetBSD-7.0/landisk/`. 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 sup-
                                ported in this release.
                sets/   landisk binary distribution sets; see below.
installation/
                misc/       Miscellaneous landisk installation utilities; see installation section below.
```

*Binary distribution sets*

The NetBSD landisk binary distribution sets contain the binaries which comprise the NetBSD 7.0 release for landisk. The binary distribution sets can be found in the `landisk/binary/sets` subdirectory of the NetBSD 7.0 distribution tree, and are as follows:

**base** The NetBSD 7.0 landisk **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.

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

**etc** This distribution set contains the system configuration files that reside in `/etc` and in several other places. This set *must* be installed if you are installing the system from scratch, but should *not* be used if you are upgrading.

**games** This set includes the games and their manual pages.

**kern-GENERIC**
This set contains a NetBSD/landisk 7.0 `GENERIC` kernel, named `/netbsd`. You *must* install this distribution set.

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

**misc** This set includes the system dictionaries, the typesettable document set, and other files from `/usr/share`.

**modules** This set includes kernel modules to add functionality to a running system.

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

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 X.Org. 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.

**xcomp** The extra libraries and include files needed to compile X source code.

**xfont** Fonts needed by the X server and by X clients.

**xetc** Configuration files for X which could be locally modified.

**xserver** The X server.

The landisk 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 -xzpf`** command from the root directory ( `/` ) of your system.

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

**NetBSD/landisk System Requirements and Supported Devices**

NetBSD/landisk supports Hitachi SH-4 based machines that use SH IPL+g firmware.

*Supported machines*

- I-O DATA
  - HDL-U, HDL-AV, HDL-W and HDLM-U series
  - SuperTank LAN Tank (SOTO-HDLWU)
  - UHDL-160U and UHDL-300U
  - USL-5P
- Plextor
  - PX-EH16L, PX-EH25L and PX-EH40L

I-O DATA HDL-G Giga LANDISK and other newer models are ARM based and are supported by NetBSD/evbarm port.

*Supported devices*

- CPUs
  - SH-4 SH7751R
- Console devices
  - serial port

Serial console in NAS appliances from I-O DATA and Plextor does *not* have an external connector. You will have to buy or make yourself a special cable to access it.

On-board PCI devices and USB attached devices are supported by machine-independent drivers.

**Getting the NetBSD System on to Useful Media**

Installation is supported from several media types, including:

- CD-ROM / DVD
- FTP
- Remote NFS partition
- Tape
- Existing NetBSD partitions, if performing an upgrade

The steps necessary to prepare the distribution sets for installation depend upon which installation medium you choose. The steps for the various media are outlined below.

*CD-ROM / DVD* Find out where the distribution set files are on the CD-ROM or DVD. Likely locations are `binary/sets` and `landisk/binary/sets`.

Proceed to the instructions on installation.

*FTP* The preparations for this installation/upgrade method are easy; all you need to do is make sure that there's an FTP site from which you can retrieve the NetBSD distribution when you're about to install or upgrade. If you don't have DHCP available on your network,

you will need to know the numeric IP address of that site, and, if it's not on a network directly connected to the machine on which you're installing or upgrading NetBSD, you need to know the numeric IP address of the router closest to the NetBSD machine. Finally, you need to know the numeric IP address of the NetBSD machine itself.

Once you have this information, you can proceed to the next step in the installation or upgrade process. If you're installing NetBSD from scratch, go to the section on preparing your hard disk, below. If you're upgrading an existing installation, go directly to the section on upgrading.

*NFS*

Place the NetBSD distribution sets you wish to install into a directory on an NFS server, and make that directory mountable by the machine on which you are installing or upgrading NetBSD. This will probably require modifying the `/etc/exports` file on the NFS server and resetting its mount daemon (mountd). (Both of these actions will probably require superuser privileges on the server.)

You need to know the numeric IP address of the NFS server, and, if you don't have DHCP available on your network and the server is not on a network directly connected to the machine on which you're installing or upgrading NetBSD, you need to know the numeric IP address of the router closest to the NetBSD machine. Finally, you need to know the numeric IP address of the NetBSD machine itself.

Once the NFS server is set up properly and you have the information mentioned above, you can proceed to the next step in the installation or upgrade process. If you're installing NetBSD from scratch, go to the section on preparing your hard disk, below. If you're upgrading an existing installation, go directly to the section on upgrading.

*Tape*

To install NetBSD from a tape, you need to make a tape that contains the distribution set files, in 'tar' format.

If you're making the tape on a UNIX-like system, the easiest way to do so is probably something like:

```
# tar -cf tape_device dist_sets
```

where *tape_device* is the name of the tape device that represents the tape drive you're using. This might be `/dev/rst0`, or something similar, but it will vary from system to system. In the above example, *dist_sets* is a list of filenames corresponding to the distribution sets that you wish to place on the tape. For instance, to put the **kern-GENERIC, base,** and **etc** distributions on tape (the absolute minimum required for installation), you would do the following:

```
# cd .../NetBSD-7.0
# cd landisk/binary
# tar -cf tape_device kern-GENERIC.tgz base.tgz etc.tgz
```

*Note:* You still need to fill in *tape_device* in the example.

Once you have the files on the tape, you can proceed to the next step in the installation or upgrade process. If you're installing NetBSD from scratch, go to the section on preparing your hard disk, below. If you're upgrading an existing installation, go directly to the section on upgrading.

**Preparing your System for NetBSD installation**

Landisk NAS appliances come preinstalled with Linux on the internal hard disk or, in case of USL-5P that has no dedicated storage, Compact Flash card. NetBSD installation will erase Linux, so if you want to be able to return to using Linux, it's a good idea to make a backup of the Linux installation first.

As SH IPL+g firmware doesn't provide a way to boot off of an external media or over network you will have to disassemble the machine to take the hard drive out and attach it to some other computer to transfer installation kernel or to perform an off-line installation directly on another machine.

**Installing the NetBSD System**

Installation mechanism that uses **sysinst** is yet to be provided.

**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. The most important steps are described below.

1. Before all else, read postinstall(8).

2. Configuring /etc/rc.conf

   If you or the installation software haven't done any configuration of /etc/rc.conf (**sysinst** normally 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).

   When you have finished editing /etc/rc.conf, type **exit** at the prompt to leave the single-user shell and continue with the multi-user boot.

   Other values that may need to be set in /etc/rc.conf for a networked environment are *hostname* and possibly *defaultroute*. You may also need to add an *ifconfig_int* for your ⟨int⟩ network interface, along the lines of

   ```
   ifconfig_re0="inet 192.0.2.123 netmask 255.255.255.0"
   ```

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

   ```
   ifconfig_re0="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 networking, DHCP can be used by setting `dhcpcd=YES` in `/etc/rc.conf`.

3. Logging in

   After reboot, you can log in as `root` at the login prompt. If you didn't set a password in **sysinst**, there is no initial password. 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.

4. 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.

5. The X Window System

   If you installed the X Window System, you may want to read the chapter about X in the NetBSD Guide:
   **http://www.NetBSD.org/docs/guide/en/chap-x.html**

6. 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, pkgsrc. pkgsrc automatically handles any changes necessary to make the software run on NetBSD. This includes the retrieval and installation of any other packages the software may depend upon.

   - More information on the package system is available at
     **http://www.NetBSD.org/docs/software/packages.html**
   - A list of available packages suitable for browsing is at
     **ftp://ftp.NetBSD.org/pub/pkgsrc/current/pkgsrc/README.html**
   - Precompiled binaries can be found at
     **ftp://ftp.NetBSD.org/pub/pkgsrc/packages/NetBSD/**
     usually in the `landisk/7.0/All` subdir. If you installed `pkgin`(1) in the **sysinst** post-installation configuration menu, you can use it to automatically install binary packages over the network. Assuming that `/usr/pkg/etc/pkgin/repositories.conf` is correctly configured, you can install them with the following commands:

     ```
     # pkgin install tcsh
     # pkgin install bash
     # pkgin install perl
     # pkgin install apache
     # pkgin install kde
     # pkgin install firefox
     ...
     ```

     *Note:* Some mirror sites don't mirror the `/pub/pkgsrc` directory.

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

   - If you did not install it from the **sysinst** post-installation configuration menu, the `pkgsrc`(7) framework for compiling packages can be obtained by retrieving the file
     **ftp://ftp.NetBSD.org/pub/pkgsrc/pkgsrc.tar.gz**.
     It is typically extracted into `/usr/pkgsrc` (though other locations work fine) with the commands:

```
# cd /usr
# tar -zxpf pkgsrc.tar.gz
```

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

7. Misc

   - Edit `/etc/mail/aliases` to forward root mail to the right place. Don't forget to run `newaliases`(1) afterwards.
   - 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**

The easiest way to upgrade to NetBSD 7.0 is with binaries, and that is the method documented here.

To do the upgrade, you must have one form of boot media available. You must also have at least the **base** and **kern** binary distribution sets available. Finally, you must have sufficient disk space available to install the new binaries. Since files already installed on the system are overwritten in place, you only need additional free space for files which weren't previously installed or to account for growth of the sets between releases.

Since upgrading involves replacing the kernel, boot blocks, and most of the system binaries, it has the potential to cause data loss. You are strongly advised to *back up* any important data on the NetBSD partition or on another operating system's partition on your disk before beginning the upgrade process.

The upgrade procedure is similar to an installation, but without the hard disk partitioning.

Fetching the binary sets is done in the same manner as the installation procedure; refer to the installation part of the document for help. File systems are checked before unpacking the sets.

After a new kernel has been copied to your hard disk, your machine is a complete NetBSD 7.0 system. However, that doesn't mean that you're finished with the upgrade process. You will probably want to update the set of device nodes you have in `/dev`. If you've changed the contents of `/dev` by hand, you will need to be careful about this, but if not, you can just cd into `/dev`, and run the command:

```
# sh MAKEDEV all
```

**sysinst** will attempt to merge the settings stored in your `/etc` directory with the new version of NetBSD using the `postinstall`(8) utility. However, `postinstall`(8) is only able to deal with changes that are easily automated. It is recommended that you use the `etcupdate`(8) tool to merge any remaining configuration changes.

**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 7.0.

Note that **sysinst** will automatically invoke

```
postinstall fix
```

and thus all issues that are fixed by **postinstall** by default will be handled.

A number of things have been removed from the NetBSD 7.0 release. See the "Components removed from NetBSD" section near the beginning of this document for a list.

*Issues affecting an upgrade from NetBSD 5.x releases*

See the section below on upgrading from NetBSD 6.x as well.

The following users need to be created:

- _mdnsd
- _tests
- _tcpdump
- _tss

The following groups need to be created:

- _mdnsd
- _tests
- _tcpdump
- _tss

The implementation of SHA2-HMAC in KAME_IPSEC as used in NetBSD 5.0 and before did not comply with current standards. FAST_IPSEC does, with the result that old and new systems cannot communicate over IPSEC if one of the affected authentication algorithms (hmac_sha256, hmac_sha384, hmac_sha512) is used.

*Issues affecting an upgrade from NetBSD 6.x releases*

The following user needs to be created:

- _rtadvd

The following groups need to be created:

- _gpio
- _rtadvd

**Using online NetBSD documentation**

Documentation is available if you installed 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. See **http://www.NetBSD.org/mailinglists/** for details.

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.

Bugs also can be submitted and queried with the web interface at
**http://www.NetBSD.org/support/send-pr.html**

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 NetBSD, and have an idea as to how you could be useful, send us mail or subscribe to: netbsd-users@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. If you'd rather not do that, mail the list saying you'll send the data to those who want it.

**Thanks go to**

- The former members of UCB's Computer Systems Research Group, including (but not limited to):

  Keith Bostic
  Ralph Campbell
  Mike Karels
  Marshall Kirk McKusick

  for their work on BSD systems, support, and encouragement.
- The Internet Systems Consortium, Inc. for hosting the NetBSD FTP, CVS, AnonCVS, mail, mail archive, GNATS, SUP, Rsync and WWW servers.
- The Internet Research Institute in Japan for hosting the server which runs the CVSweb interface to the NetBSD source tree.
- The Columbia University Computer Science Department for hosting the build cluster.
- The many organizations that provide NetBSD mirror sites.
- Without CVS, this project would be impossible to manage, so our hats go off to Brian Berliner, Jeff Polk, and the various other people who've had a hand in making CVS a useful tool.
- We list the individuals and organizations that have made donations or loans of hardware and/or money, to support NetBSD development, and deserve credit for it at **http://www.NetBSD.org/donations/** (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 be mentioned, tell us!)

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