



The NetBSD Operating System

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Overview

- What is NetBSD?
- NetBSD Project Goals
- NetBSD Project Organization
- NetBSD Features
- NetBSD and Security
- Supported Platforms
- Current and Future Work
- How to get more information
- How to obtain NetBSD



What is NetBSD?

- NetBSD is a freely distributable UNIX-like operating system.
- NetBSD is a solid platform suitable for mission-critical applications and use in commercial products.
- NetBSD is portable, and runs on a wide variety of hardware.
- NetBSD is based on a variety of free software, including 4.4BSD-Lite2 from the University of California, Berkeley.
- NetBSD is developed and supported by a large group of volunteers from all over the world.



NetBSD Project Goals

- Provide a complete, secure, UNIX-like operating system suitable for use by educators, researchers, professionals, and hobbyists
- Port to as many hardware platforms as possible
- Focus on good design and clean implementation
- Avoid restrictive licensing
- Conform to open standards
- Provide documentation on kernel internals



NetBSD Project Organization

- **The NetBSD Foundation, Inc.**
 - Non-profit organization chartered to support the NetBSD Project
- **The Core Group**
 - The acting body for The NetBSD Foundation, Inc.
 - Manages the Project's people and services
 - Performs the role of system architect
- **The Port Masters**
 - Responsible for the various platform-specific portions of the NetBSD operating system
- **The Developers**
 - Catch-all category for everyone else who has access to the NetBSD CVS repository
 - General or specialized development and bug fixing



NetBSD Features

- **Solid and full-featured TCP/IP stack**
 - One of the best behaving TCP implementations available, used by TCP researchers
 - Support for fast IP forwarding
 - Many network utilities have been modified to add enhanced features.
- **Support for high-performance I/O**
 - Built-in support for disk striping
 - Support for FibreChannel-attached disks
 - Support for high-performance networks such as 100 Mbit Ethernet, FDDI, ATM, and HIPPI
- **Flexible emulation framework**
 - i386 - BSD/OS, FreeBSD, iBCS2, Linux, Solaris/SVR4
 - m68k - HP-UX, SunOS
 - SPARC - SunOS, Solaris
 - MIPS - Ultrix



NetBSD Features (continued)

- **Flexible device driver architecture**
 - Modular design makes adding support for new devices easier.
 - Bus access abstractions provide support for writing portable device drivers.
- **New UVM virtual memory system**
 - Better performance under high-load
 - Support for advanced virtual memory features
- **Software package framework**
 - One-stop shopping for third-party software
 - Pre-built packages are available for several platforms.
- **Strong BSD heritage**
 - Supported by 20 years of development and experience by recognized UNIX experts



NetBSD and Security

- **Dedicated security officer and security team**
 - Handles and issues security advisories
 - Periodic code reviews of sensitive programs and libraries
 - Constant exploration of new, innovative ways of solving security problems *before* they happen
- **<http://www.NetBSD.ORG/Security/>**
 - Advisories
 - Patches
 - Links to more information
- **Active participation in other security groups**
 - Many NetBSD developers and users participate in the Internet Engineering Task Force's Security Area working groups.



Supported Platforms

- DEC Alpha (alpha)
- Commodore Amiga (amiga)
- ARM-based platforms (arm32)
- Atari TT, Falcon, Medusa Hades (atari)
- BeBox (bebox)
- HP 9000/300-series (hp300)
- IBM PC and compatibles (i386)
- M680x0-based Macintosh (mac68k)
- Motorola M680x0-based single-board computers (mvme68k)
- MIPS-based Sony News (newsmips)



Supported Platforms (continued)

- PC532 computer (pc532)
- DECstation (pmax)
- Generic OpenFirmware-based PowerPC platforms (powerpc)
- Sun SPARC systems (sparc)
- Sun 3 and Sun 3x (sun3)
- DEC VAX (vax)
- Sharp X680x0 (x68k)
- ...and more are on the way!



Current and Future Work

- **Multi-threaded NetBSD kernel**
 - I/O threads and interrupt scheduling to eliminate livelock and boost I/O performance
 - Kernel scheduling support for user-level threads
- **Symmetric multiprocessor support**
 - Preliminary implementation expected by December, 1998
- **More high-end server support**
 - Built-in disk mirroring
 - Support for storage enclosure services
- **Common console subsystem**
 - Loadable terminal emulations and keyboard maps
 - "Unified" X server
- **Eliminate the need for setuid bits**



Current and Future Work (continued)

- Support for IPv6
- Name service caching daemon and nsswitch
- Support for more high-performance interconnects
 - Better FibreChannel support
 - Gigabit Ethernet
 - IEEE 1394 (Firewire)
- Support for Universal Serial Bus
- Support for Sun UltraSPARC, PowerPC-based Macintosh, PA-RISC, and embedded MIPS platforms



How to get more information

- WWW - <http://www.NetBSD.ORG/>
- Mailing lists at NetBSD.ORG
 - Send mail to majordomo@NetBSD.ORG for help
 - <http://www.NetBSD.ORG/MailingLists/>
- USENET News Groups
 - comp.unix.bsd.netbsd.misc - general discussion
 - comp.unix.bsd.netbsd.announce - announcements



How to obtain NetBSD

- <ftp://ftp.NetBSD.ORG/pub/NetBSD/>
 - Binary and source releases
 - Current development sources
 - Binary snapshots of development sources
- sup.NetBSD.ORG
 - Updates of development sources via the Software Upgrade Protocol
- CD-ROMs - <http://www.NetBSD.COM/>
 - Proceeds help fund NetBSD development