



OpenNTPD is a free, easy to use implementation of the Network Time Protocol.  
OpenNTPD is freely usable under BSD license.  
For more information visit:

<http://www.OpenNTPD.org/>



OpenCVS is a free implementation of the Concurrent Versions System. It can be used as server and client.  
The new implementation was started because of many security issues with the existing implementation.  
OpenCVS is freely usable under BSD license.  
For more information visit:

<http://www.OpenCVS.org/>



OpenBGPD is a free implementation of the Border Gateway Protocol Version 4 (BGP4). It has a companion, OpenOSFD, that adds support for the OSPF protocol suite.

Both are freely usable under BSD licence  
For more information visit:

<http://www.OpenBGPD.org/>

# OpenBSD

OpenBSD is based in Calgary, Canada and is developed by volunteers worldwide.

For more information visit

<http://www.openbsd.org/>

CDs and merchandising-products are available online for Europe at

<https://https.openbsd.org/cgi-bin/order.eu>

(shipped from Belgium)

In Switzerland you can order CDs at

<http://www.msyz.ch/obsd/>

allBSD  
push it, don't hype

## allBSD?

### Yet another BSD derivate?

No, allBSD is a new projekt, which aims to do marketing for BSD. The intention is to make BSD more visible towards commercial users. The slogan is "push it, don't hype!"

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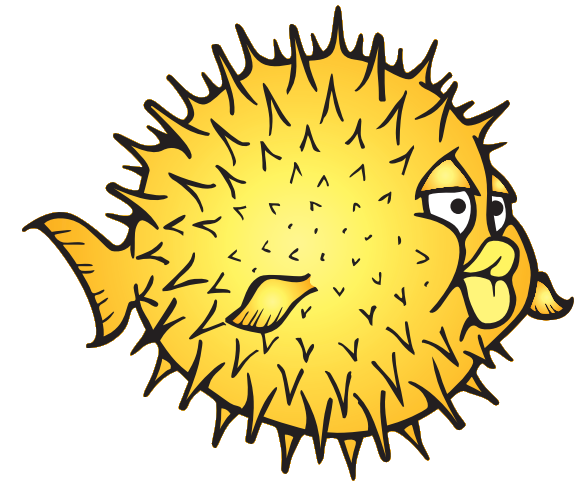
## Sources

This paper is based on the mentioned websites.

<http://www.openbsd.org/>

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# OpenBSD

## The OpenBSD Project

The OpenBSD project produces a free, multi-platform 4.4BSD-based UNIX-like operating system since 1995.

The efforts emphasize portability, standardization, correctness, proactive security and integrated cryptography.

OpenBSD is available under BSD license, that makes commercial spin-offs possible and the project strives to make their software robust and secure and encourages companies to use whichever pieces they want to.

The OpenBSD project has some associated projects.

**OpenSSH** – Secure Shell  
**OpenNTPD** – Network Time  
**OpenCVS** – Version control system  
**OpenBGPD/OpenOSPF** – IP Routing

All projects have Puffy, a blowfish, as mascot.



## History

The OpenBSD-Projekt started October 18th 1995. The first release was OpenBSD 2.0 in October 1996. Since then every 6 months a new release will be produced. OpenBSD 3.9 will be released in May 2006.

## Exploit Mitigation Techniques

OpenBSD integrates several technologies to help protect the operating system from attacks such as buffer overflows or integer overflows.

OpenBSD uses the ProPolice extension of the GNU-C-Compiler by default.

Many bugs are exploitable because the address space has memory that is both writeable and executable (permissions = W | X) In OpenBSD a page may be either writeable or executable, but not both: W^X (write xor execute).

This makes exploit authoring very difficult and the performance doesn't slow down.

Another feature is to randomize memory allocations, which give a program different address space behaviour every time you run it.

Attacks on setuid programs or daemons are supposed to escalate privilege. OpenBSD reduces the privileges that privileged programs have by making modifications to the programs called Privilege Revocation and Privilege Separation for setuid programs or daemons.

These methods help finding bugs in the phase of integration of software into the project and make OpenBSD versions of the software less susceptible to attacks, or even more reliable.

## CARP: Load balancing and redundancy

Starting 2003 OpenBSD has developed a free protocol which allows multiple hosts on the same local network to share a set of IP addresses called Common Address Redundancy Protocol or short CARP.

The main purpose is to provide failover redundancy. It is used together with pfsync to build redundant firewalls, but it can also be configured to provide load balancing functionality, for example for web servers.

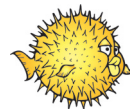
## PF: stateful packet filter

PF is OpenBSD's stateful packet filter since OpenBSD 3.0. PF has grown quickly and comes with Network Address Translation (NAT) and Quality of Service (QoS). It's possible to do policy filtering and normalize packets. With Authpf a user shell for authenticating gateway can easily be setup.

## Multi-Platform

OpenBSD runs on many different platforms, new servers based on i386, amd64 or sparc64 CPUs, embedded systems like cats and Sharp Zaurus and many legacy platforms.

There are practical benefits to keeping OpenBSD Multi-Platform: when new platforms come out, the code tree is relatively free of portability-breaking bugs and design flaws. The OpenBSD platforms include 32 bit and 64 bit processors, big and small endian machines, and many different designs. And yes, supporting "unusual" platforms has helped producing a higher-quality code base for more "common" platforms.



## OpenSSH

OpenSSH is a free version of the SSH protocol suite of network connectivity tools.

## Task

OpenSSH encrypts all traffic (including passwords) to effectively eliminate eavesdropping, connection hijacking, and other network-level attacks. Additionally, OpenSSH provides a many secure tunneling capabilities, as well as a variety of authentication methods.

## Development for OpenBSD

Managing the distribution of OpenSSH is split into two teams. One team does strictly OpenBSD-based development, aiming to produce code that is as clean, simple, and secure as possible.

## Development for others

The other team then takes the clean version and makes it portable, by adding the portability "goop" so that it will run on many operating systems (these are known as the p releases, and named like "OpenSSH 4.3p2").

Other operating systems include AIX, HP-UX, Irix, Linux, NeXT, SCO, SNI/Reliant Unix, Solaris, Digital Unix/Tru64/OSF, Mac OS X, Cygwin.

For more information visit:

<http://www.OpenSSH.com/>