Introducing

OpenBSD's new httpd

AsiaBSDCon 2015

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OpenBSD 5.7

www.openbsd.org/57.html

Search

OpenBSD

OpenBSD 5.7

Released May 1, 2015
Copyright 1997-2015, Theo de Raadt.
ISBN 978-0-9881561-5-9
5.7 Song: "XXX"

- Order a CDROM from our ordering system.
- See the information on the FTP page for a list of mirror machines.
- Go to the pub/OpenBSD/5.7/ directory on one of the mirror sites.
- Have a look at the 5.7 errata page for a list of bugs and workarounds.
- See a detailed log of changes between the 5.6 and 5.7 releases.

- signify(1) pubkeys for this release:

```
base: RWSvUZXnw9gUb70PdeSNnpSmodCyIPJEGN1wWr+6Time1eP7KiWJ5eAM
fw:   RWSuRBL44FVkb2QuvtlwOJmzS9UJtbKZd7GEYcol8HPXu4On/Ct1LoZr
pkg:  RWTJ1iHLn/zcvJJSbxJIEU9ChlfAlU16XoLLxmxciliOFWfTLyOv0vQs
```

All applicable copyrights and credits can be found in the applicable file sources found in the files src.tar.gz, sys.tar.gz, xenocara.tar.gz, or in the files fetched via ports.tar.gz. The distribution files used to build packages from the ports.tar.gz file are not included on the CDROM because of lack of space.

What's New

This is a partial list of new features and systems included in OpenBSD 5.7. For a comprehensive list, see the changelog leading to 5.7.

Why do we need a web server in base?

- Serve the OpenBSD page.

Why do we need a web server in base?

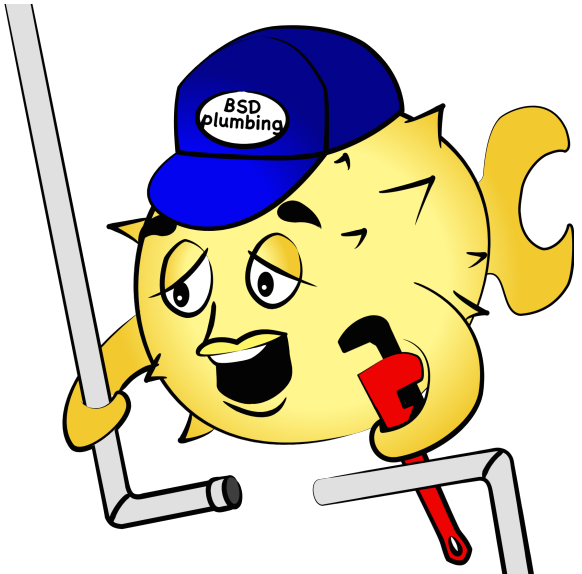
- Serve our own kitten pages – securely.

Why do we need a web server in base?

- Many people use it for simple CGIs (eg. bgplg).

OpenBSD's

HISTORY OF WEBSERVERS



Webserver Timeline

March 1998
OpenBSD 2.3 includes Apache 1.3

September 2011
nginx imported for OpenBSD 5.1

March 2014
Apache removed from OpenBSD

August 2014, g2k14 Hackathon
OpenBSD's new httpd shows up

November 2015
httpd in 5.6, nginx removed after 5.6.

Heads Up: Nginx Removed From Base - OpenBSD Journal
undeadly.org/cgi?action=article&sid=20140827065755
Aug 27, 2014 - I believe 1.4.4 is the version of **nginx** of **OpenBSD base** in 5.5. So upgrading to 5.6 in next November means getting **nginx** 1.6.0 from **base** or ...

Heads Up: Apache Removed from Base - OpenBSD Journal
undeadly.org/cgi?action=article&sid=20140314080734
Mar 14, 2014 - Consider using **nginx**(8) for your http serving needs, but note that **nginx** is not a drop-in replacement. For people who need the old httpd(8) and ...

Following -current - OpenBSD
www.**openbsd**.org/faq/current.html
Caution: as the **nginx** package is using the same rc.d script that was used by the **base** system it is mandatory to remove the old **nginx** rc.d script to avoid ...

OpenBSD nginx is going into base - DaemonForums
daemonforums.org/showthread.php?t=6360
Sep 23, 2011 - 2 posts - 1 author
FYI. Some may be interested in the following commit made today: http://marc.info/ ?l=**openbsd**-cvs&m=131673440721777&w=2. There has ...

httpd in **OpenBSD** 5.6	9 posts	2 Nov 2014
OpenBSD nginx will be removed from **base** in **OpenBSD**-5.7	3 posts	27 Aug 2014
is **nginx** going to be default **OpenBSD** httpd?	5 posts	6 Jan 2013
openbsd 5.1 and **nginx**	3 posts	1 Oct 2012

More results from daemonforums.org

“Security Shokunin”

- We constantly improve our code base for better security & quality
  - Aiming for perfection.
- #heartbleed, #shellshock, and many other issues happened in 2014
  - As one response to #heartbleed, OpenBSD forked LibreSSL
- We also introduced new safer APIs like reallocarray()
- I wrote a big diff for nginx to adopt reallocarray() other such techniques
  - And it got rejected.
  - Too big to maintain in OpenBSD, not suitable for upstream.

OpenBSD's new HTTPD

"Today I woke up with sorrow and realized that I committed a web server last night" (reykfloeter@ on twitter)

- The situation of nginx in OpenBSD frustrated me.
  - nginx is not bad, it is some fine software, but it didn't fit for us.
- At the g2k14 General OpenBSD Hackathon, I made an experiment:
  - I used relayd and turned it into a web server.
- At the same day, beck@ and deraadt@ tricked me into importing it.
- Two weeks later, we had httpd with TLS and FastCGI in 5.6.

httpd(8)

DESIGN & IMPLEMENTATION

Simplicity

- httpd is designed to be a simple and secure web server.
- Only the most important features will be supported:
  - Serve static files
  - Support FastCGI
  - Do (proper) TLS
  - Provide “core” features like directory listing, logging, basic auth.
- Current code is about 10,000 lines.
- Avoid “featuritis” in the future, track such feature requests:
  - https://github.com/reyk/httpd/issues?q=label%3Afeaturitis

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Simplicity

```
# wc -l *
       0 CVS
      19 Makefile
     589 config.c
     334 control.c
     253 http.h
     102 httpd.8
    1281 httpd.c
     533 httpd.conf.5
     688 httpd.h
     242 log.c
     312 logger.c
    2062 parse.y
     622 proc.c
    1221 server.c
     729 server_fcgi.c
     469 server_file.c
    1425 server_http.c
   10881 total
```

Features

- Static files: Serves static files and directories via optional auto-indexing.
- FastCGI: Supports asynchronous and direct FastCGI .
- Secure: Non-optional security, chroot'ed and with privsep by default.
- SSL/TLS: Support secure connections via TLS powered by LibreSSL.
- Virtual servers: Flexible, name- and IP-based virtual servers.
- Reconfiguration: Reload the running configuration without interruption.
- Logging: Supports per-server logging via log files or via syslog.
- Blocking: Block, drop, and redirect connections.

Security

- Runs chroot'ed by default.
- Use privilege separation:
  - parent: Load the configuration, open servers sockets, load keys etc.
  - server: One or more processes to handle HTTP connections.
  - logger: Log to local files (or syslog), in our outside of the chroot.
- Don't reinvent APIs, use libc whenever possible.
- Don't pre-allocate large chunks of memory to use our safety belts.
- Don't sacrifice security for performance.

TLS with LibreSSL

- “Safer TLS”
- Better API:
  - LibreSSL provides a new “libtls” API on top of libssl/libcrypto
  - Primarily written by Joel Sing (jsing@)
  - httpd was the reference implementation for the server API
- Use strong defaults:
  - In current, httpd only does TLS 1.2 by default.
  - Only strong ciphers and PFS.

FastCGI

- Florian Obser (fobser@) wrote slowcgi(8) to run CGIs with FastCGI
  - It was used to run bgplg(8) with nginx.
- He implemented the FastCGI server in httpd based on slowcgi.

”I implemented slowcgi because you didn’t stop whining on icb that nginx can’t execute bgplg”. And *”fastcgi in httpd: (Bob) Beck has asked me if I can help you with it”.*

- FastCGI is supported via UNIX or local TCP socket.
- Direct streaming, no buffering to a file.

httpd.conf(5)

CONFIGURATION

```
server "www.example.com" {
    listen on * port 80
}
```

Configuration

```
ext_ip=“10.1.1.1”
server "www.example.com" {
    listen on $ext_ip port 80
}

types {
    include ”/usr/share/mime.types”
}
```

Configuration

```
server "www.example.com" {
        listen on * port 80
        listen on * tls port 443

        # Logging is enabled by default
        #no log

        location "/download/*" {
                directory auto index
                log style combined
        }
        location "/pub/*" {
                    block return 301 \
                    "http://ftp.example.com/\
                    $REQUEST_URI"
        }
        location "*.php" {
                fastcgi socket \
                    "/run/php-fpm.sock"
        }
        location "/cgi-bin/*" {
                fastcgi
                root "/"
        }
        root "/htdocs/www.example.com"
}
```

Conclusion

- httpd is almost finished
  - But it will take many more years to make it perfect
- We’re going to improve security
- And add a few more features,
  - eg. Server Name Indication (SNI)
  - Client certificates.
- More?

Thanks!

OpenBSD 5.7 will be released May 1st, 2015.

...and please keep supporting the OpenBSD project!
http://www.openbsdfoundation.org/campaign2015.html