

# MIPS on OpenBSD



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# MIPS on OpenBSD

- Why should I care?
- Where can I get some?
- History
- Current world
- Future

# About Me

- OpenBSD dev, mostly doing ports.
- But I am not a computer scientist/tech person by trade.
- Interested in MIPS support.
- My start with MIPS ports: I wanted to play a game.

# About Me

My current MIPS inventory:

- SGI O2
- 2x Lemote Yeeloong
- Lemote Fuloong
- Loongson-1B development board

Why MIPS?

# Why MIPS?

- According to a 2011 Forbes article, 500 million MIPS CPUs are shipped each year.
- At least some of them end up in general-purpose devices.
- We should aim to support those devices!

# Why MIPS?

- “Shut up and hack!”
- Help expose bugs.
- MIPS is not going away.
- Be the coolest person you know 8-)
- It's just fun!

SGI

# SGI

- History
- Recent (2012) improvements

# SGI

- IP20: Indigo
- IP22: Indy, Indigo2
- IP27: Origin
- IP28: POWER Indigo2
- IP30: Octane, Octane 2
- IP32: O2, O2+
- IP35: Fuel, Tezro, Origin 3000, Onyx 4

# SGI



# SGI

- What works?
- What doesn't?
- Where can I get one?

Loongson

# Loongson

- China's homegrown CPU, from the Chinese Academy of Sciences (ICT)
- *Little-endian* MIPS
- Chinese technology independence?

# Loongson

- Loongson-1: 1A, 1B
- Loongson-2: 2B, 2C, 2E, 2F, 2G, 2H
- Loongson-3: 3A/2GQ, 3B, 3C
- Loongson-T: T

# Loongson

- Loongson-1: 1A, 1B
- Loongson-2: 2B, 2C, 2E, 2F, ~~2G, 2H~~
- Loongson-3: 2G, 2H, 3A/2GQ, 3B, 3C
- Loongson-T: T

# Loongson

- 2F machines:  
Fuloong, Lynloong, Yeeloong

# Loongson



# Loongson

- Yeeloong
- History on OpenBSD

My workflow

Terminal

File Edit View Terminal Tabs Help

```
$ uname -a
OpenBSD midi 5.3 GENERIC#0 loongson
$ scrot
```



OpenBSD

**Language: en** [\[teams\]](#)  
[cs](#) [de](#) [fr](#) [it](#) [nl](#)

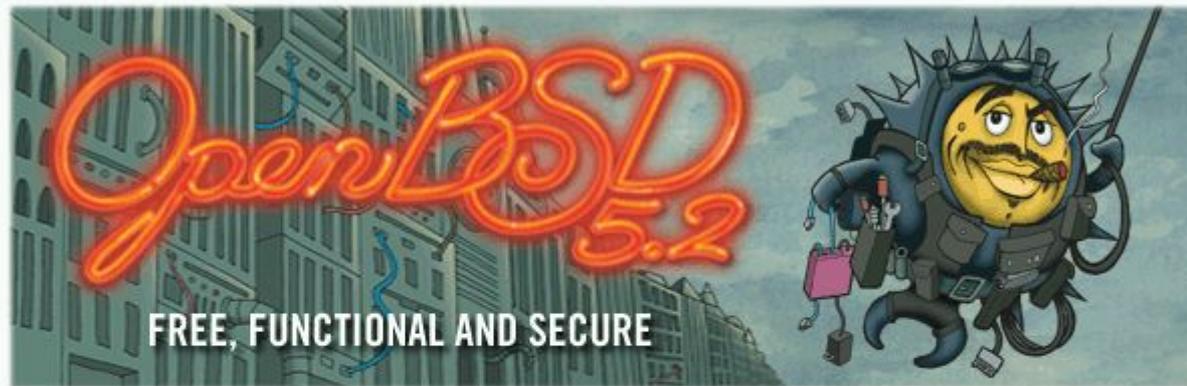
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**Only two remote holes in the default install, in a heck of a long time!**

The OpenBSD project produces a **FREE**, multi-platform 4.4BSD-based UNIX-like operating system. Our efforts emphasize portability, standardization, correctness, [proactive security](#) and [integrated cryptography](#).

OpenBSD is freely available from our FTP sites, and also available in an inexpensive 3-CD set.

The current release is [OpenBSD 5.2](#) which was released Nov 1, 2012.

As well, pre-orders for the upcoming [OpenBSD 5.3](#) release are enabled at our [order site](#).

# *The Concept and Method of Cultural Ecology*

## **OBJECTIVES IN ECOLOGICAL STUDIES**

At the risk of adding further confusion to an already obscure term, this chapter undertakes to develop the concept of ecology in relation to human beings as an heuristic device for understanding the effect of environment upon culture. In order to distinguish the present purpose and method from those implied in the concepts of biological



Hi NYC\*BUG!



```
Terminal
File Edit View Terminal Tabs Help
Playing Darius Milhaud - La Maousinglade.mp3.
libavformat version 54.59.106 (external)
Audio only file format detected.
Clip info:
  Title: La Maousinglade
  Artist: Darius Milhaud
  Album: Musiques Francaises
  Year: 2012
  Comment:
  Track: 11
  Genre: Classical
Load subtitles in ./
=====
Requested audio codec family [mpg123] (afm=mpg123) not available.
Enable it at compilation.
Opening audio decoder: [ffmpeg] FFmpeg/libavcodec audio decoders
libavcodec version 54.86.100 (external)
AUDIO: 44100 Hz, 2 ch, floatle, 320.1 kbit/11.34% (ratio: 40007->352800)
Selected audio codec: [ffmp3float] afm: ffmpeg (FFmpeg MPEG layer-3 audio)
=====
A0: [sndio] 44100Hz 2ch s16le (2 bytes per sample)
Video: no video
Starting playback...
A: 56.9 (56.9) of 145.0 (02:25.0) 5.4%
```



```
Terminal
File Edit View Terminal Tabs Help
b8> <doctorlinguist> finishing my packing to drive to Sac'to for the monthly meeting.
b9> <@doctorlinguist> @mandydye no, what do you mean, "questioning"? :P
c0> <@doctorlinguist> @mandydye !
c1> <@doctorlinguist> @mandydye fair enough :)
c2> <@doctorlinguist> @mandydye pick the fast guys
c3> <jrick> Alicization Turning. Oh my. Can't say what happened, but oh my.
c4> <@doctorlinguist> @longstride salsa shark!
c5> <doctorlinguist> ok. packed, stuff done. time to eat something and sleep.
c6> <kyleisom> The Art of the Metaobject Protocol and Object Oriented Programming in CL showed up today, two more books to push on the stack. Almost done with the Joy of Clojure, then it's on to Programming Collective Intelligence and Mining the Social Web.
c7> (x1) <&retrogamesev> Arcade@Home Oldenburger Computer Museum http://youtu.be/M20lCr2nnfI
c8> <jrick> This is the best thing I've ever read. zomgwtfbbqaaAAHHHHHHHHH
c9> <@robinapp> @ideadbaby :)
-- your version of Term::ReadLine::TTYtter is up to date (1.4)
-- your version of Texapp is up to date (0.4.3)
-- you are logged in as bcallah
<ed "MIPS on OpenBSD" - come learn about OpenBSD! #OpenBSD <140
d0> <bcallah> Don't forget: if you're in the NYC area tonight, I'm giving at talk at #NYCBUG titled "MIPS on OpenBSD" - come learn about OpenBSD! #OpenBSD
Texapp> <000
```





Clipboard icons: Paste, Copy, Paste with formatting, Undo, Redo, Find, Sum, Function, Sort, Filter, Chart, 100%

Font settings: Sans, 10, Bold, Italic, Underline, Text color, Fill color, Borders, Number, Percent, Decimals, Thousands separator

Shape tools: Text, Circle, Rectangle, Line, Arrow, Checkmark, Eraser, Fill, Stroke, OK, Undo, Redo, Copy, Paste

Formula bar: A1, =

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															



# Loongson

- So where do I get one?

# MIPS & Ports

# MIPS & Ports

Goal:

- Provide as close to the number of packages on amd64/i386 as possible.

# MIPS & Ports

OpenBSD 5.3 packages:

- i386: 7670
- amd64: 7632
- powerpc: 7215
- sparc64: 6756
- **mips64el: 6539**
- **mips64: 6519**
- hppa: 6401
- alpha: 6151
- vax: 2081

# Big Ticket Items We Have

- Gtk+2, Gtk+3
- Python
- Webkit\*
- Mplayer/other audio players
- Abiword/other office apps
- WMs/DEs up to Xfce in complexity

# Big Ticket Items We **Don't** Have

- Mozilla\*
- LibreOffice
- Qt4
- Clang
- gcc > 4.2.1
- Video support (not ports related)

# Common Problems

# Audience participation

# Common Problems

```
# elif if __GNUC__ > 2 || __GNUC__MINOR__ >= 7
```

# Common Problems

- Assuming attributes of target machines.
- General incompatibilities.

# Common Problems

- Sometimes the problem is on our side...
- Usually toolchain related.
- Memory mapping fixing.
- No accelerated X.
- CPU speed...

# Common Problems

- How do we get upstream to care about MIPS?
- How do we get upstream to care about OpenBSD?

# Talking to Upstream

- If you make a port, you notify upstream.
- With few exceptions, if upstream does not **explicitly** mention OpenBSD on their website, we should consider it a bug like any other.
- Most are very happy to add OpenBSD to their list of known working platforms, and thankful for patches.
- But not everyone...

# Talking to Upstream

Hi \${NAME} -

Hi, I'm Brian, an OpenBSD developer. I found \${SOFTWARE} and I really enjoy it. I ported \${SOFTWARE} to OpenBSD. Below are some patches for your consideration that were necessary to get \${SOFTWARE} working on OpenBSD. And for your knowledge, \${SOFTWARE} works on i386/amd64 machines, PowerPC machines, and even Loongson (a MIPS64 CPU) machines! Thanks for the great software!

~Brian

<patches go here>

# Talking to Upstream

Hi \${NAME} -

\${SOFTWARE} just hit the ports tree, so it is available to all OpenBSD users.

<link to cvsweb>

Consider placing a mention to OpenBSD on your website.

Thanks again!

~Brian

# The future of OpenBSD/MIPS

# The future of OpenBSD/MIPS

- Loongson-3 support.
- Improved toolchain
- Fixing bugs
  - ...and fixing bugs
  - ...and fixing bugs :)
- Supporting more devices?

# The future of OpenBSD/MIPS

- What's holding us back?
- ABI support
- Hardware!

Oh... and one last thing...

OpenBSD/octeon

# OpenBSD/octeon

- Targeting the Portwell CAM-0100 and the UBNT EdgeRouter LITE.
- Still in early development.

# OpenBSD/octeon

- History – begins in 2010 with IJ SDK
- EdgeRouter LITE jumpstarts current efforts.

# OpenBSD/octeon

- What works?
- What doesn't?

# OpenBSD/octeon

- How can I help?

Questions/Comments/Flames/Occasional  
encouragement:

[bcallah@openbsd.org](mailto:bcallah@openbsd.org)

ADN: bcallah@

The End