FreeBSD ports

Case study: managing a worldwide open source project: FreeBSD port manager
FreeBSD ports

Me

- user since 2000
- submitter since 2002
- committer since 2003
- portmgr secretary since 2004
- portmgr since 2005
FreeBSD ports

FreeBSD

- Open Source OS under BSD licence
  - derived work need not be open source
- BSD Unix derived
- Used by ISPs: Y!, ISC
- Appliance/product foundation: Juniper JunOS, OS X
Default installation gives a "base system"

Kernel:
• Hardware drivers
• Packetfilterse: ipfw(4), pf(4), ipf(4)
• Networking: ppp(4), tunnel (gif(4), gre(4), tun(4))
• Software RAID

Userland:
• sh(1), tcsh(1)
• OpenSSH, inetd(8), ntpd(8), named(8), sendmail(8)
• make(1), gcc(1)
• vi(1), ee(1)
FreeBSD ports

Release cycle

7.0-CURRENT
6-STABLE
6.1-RELEASE
6.0-RELEASE
5-STABLE
FreeBSD ports

Communication

- mostly online
- 40 active mailinglists
- mostly public
- IRC channels
- Wiki
- Conferences
  - USENIX
  - BSDCon
  - BSDCan
  - EuroBSDCon
  - AsiaBSDCon
  - devsummits
FreeBSD ports

Development

- used VCS from day 1
- GNATS as bugtracking software
  - Send-pr(1)
  - http://bugs.freebsd.org/

CVS repository in 3 parts
- src - kernel, userland
- doc - books, articles, website
- ports - 3rd party software
FreeBSD ports

Submitter
Anyone who sends bug reports and/or patches

Committer
• Someone with write access to CVS
• Significant code contributions
• Long term commitment
• Mentor proposes and voted on by relevant authority
FreeBSD ports

Committers – random statistics

- 216 src
- 177 ports
- 84 doc

- 370 total

(note: overlap)
Committers – random statistics

Where
• 34 countries
• 6 continents

Age
• Oldest: 1948
• Youngest: 1989
FreeBSD ports

Organization

Core team:
• 9 members
• Elections for core every 2 years from and by active committers
• Project direction
• Rules
• Conflict resolution
• Delegated ports to portmgr, doc to doceng
Other teams
- Release engeneering
- Security officer / security team
- Admins
- GNOME/ KDE/ java/ ...
FreeBSD ports

**Ports**

Ports are small pieces of code to integrate 3rd party software

Written in BSD make(1) and sh(1)

~ 16,000 ports

**Packages**
FreeBSD ports

Ports

• bsd.ports.mk
• ~ 6000 lines
• bsd.apache.mk, bsd.java.mk, bsd.kde.mk, bsd.gnome.mk, bsd.ruby.mk, etc.
• Small Makefile
  • Where to fetch sources
  • Description
  • How to build, install and deinstall
  • FreeBSD specific patches
  • Startup scripts
• Porters handbook
Submitter
Anyone who sends a patch

MAINTAINER
A person or group that actively maintains a port and has to approve any changes

Committer
A person with write access to the ports part of CVS
FreeBSD ports

More random statistics

- 1439 maintainers
- 177 committers
- many, many submitters
- > 100 commits per day
FreeBSD ports

Portmgr

- 6 persons
- appointed by core
- core oversight
- charter
- policies
- QA
- new committers
- conflict resolution
- secretary
- monthly reports
FreeBSD ports

Quality assurance

• pointyhat cluster
• Gohans
• ”krismails”
• korean ports cluster
• Portsmon
• Package building (ftp/release cd)
• 4 branches
• 3 major architectures (i386, amd64, sparc64)
FreeBSD package building statistics

as of Sat Oct 28 13:15:00 UTC 2006

<table>
<thead>
<tr>
<th></th>
<th>cvs date</th>
<th>latest log</th>
<th>INDEX</th>
<th>packages</th>
<th>errors</th>
<th>skipped</th>
<th>missing</th>
<th>done?</th>
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</thead>
<tbody>
<tr>
<td>amd64-5</td>
<td>Oct 4</td>
<td>Oct 9</td>
<td>15828</td>
<td>13569</td>
<td>243</td>
<td>1185</td>
<td>831</td>
<td>Y</td>
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<td>amd64-6</td>
<td>Oct 27</td>
<td>Oct 28</td>
<td>15917</td>
<td>13963</td>
<td>20</td>
<td>1170</td>
<td>764</td>
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<tr>
<td>amd64-7</td>
<td>Oct 12</td>
<td>Oct 16</td>
<td>15887</td>
<td>13512</td>
<td>105</td>
<td>1230</td>
<td>1040</td>
<td>N</td>
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</tbody>
</table>

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<th>skipped</th>
<th>missing</th>
<th>done?</th>
</tr>
</thead>
<tbody>
<tr>
<td>i386-4</td>
<td>Oct 6</td>
<td>Oct 10</td>
<td>15847</td>
<td>11612</td>
<td>257</td>
<td>2298</td>
<td>1680</td>
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<tr>
<td>i386-5</td>
<td>Oct 24</td>
<td>Oct 27</td>
<td>15918</td>
<td>15096</td>
<td>88</td>
<td>599</td>
<td>135</td>
<td>Y</td>
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<tr>
<td>i386-6</td>
<td>Oct 27</td>
<td>Oct 28</td>
<td>15918</td>
<td>14695</td>
<td>18</td>
<td>561</td>
<td>644</td>
<td>N</td>
</tr>
<tr>
<td>i386-7</td>
<td>Oct 26</td>
<td>Oct 28</td>
<td>15918</td>
<td>14679</td>
<td>34</td>
<td>620</td>
<td>585</td>
<td>N</td>
</tr>
</tbody>
</table>
# Package building errors

View by [ **port** | **maintainer** | **category** | **error** | **builddate** ]

Timestamp of newest log: Oct 28 03:02:16 2006

"Aff." is number of ports that depend on this one
"[B]" indicates port is marked BROKEN (Note: BROKEN ports are not frequently rebuilt so they may not be listed here)

## Errors

<table>
<thead>
<tr>
<th>Port</th>
<th>Aff.</th>
<th>Size</th>
<th>CVS</th>
<th>Maintainer</th>
<th>Reason</th>
<th>Build date</th>
</tr>
</thead>
<tbody>
<tr>
<td>diablo-idk-1.5.0.07.01</td>
<td>349</td>
<td>4 Kb</td>
<td>java/diablo-idk15</td>
<td><a href="mailto:glewis@FreeBSD.org">glewis@FreeBSD.org</a></td>
<td>fetch</td>
<td>Oct 28 02:33:11 UTC 2006</td>
</tr>
<tr>
<td>diablo-jre-1.5.0.07.01</td>
<td>4</td>
<td>4 Kb</td>
<td>java/diablo-jre15</td>
<td><a href="mailto:glewis@FreeBSD.org">glewis@FreeBSD.org</a></td>
<td>fetch</td>
<td>Oct 28 02:32:55 UTC 2006</td>
</tr>
<tr>
<td>firebird-server-1.5.3</td>
<td>272</td>
<td>272 K</td>
<td>databases/firebird-server</td>
<td><a href="mailto:skv@FreeBSD.org">skv@FreeBSD.org</a></td>
<td>install error</td>
<td>Oct 28 02:33:43 UTC 2006</td>
</tr>
<tr>
<td>flock-0.7.2</td>
<td>4096</td>
<td>4096</td>
<td>www/flock</td>
<td><a href="mailto:gnome@FreeBSD.org">gnome@FreeBSD.org</a></td>
<td>arch</td>
<td>Oct 28 02:36:45 UTC 2006</td>
</tr>
<tr>
<td>gcc-withgciawt-4.2.0_20061014</td>
<td>8</td>
<td>8 Kb</td>
<td>lang/gcc42-withgciawt</td>
<td><a href="mailto:maho@FreeBSD.org">maho@FreeBSD.org</a></td>
<td>patch</td>
<td>Oct 28 02:27:06 UTC 2006</td>
</tr>
<tr>
<td>gforth-0.6.2.1</td>
<td>46</td>
<td>46 K</td>
<td>lang/gforth</td>
<td><a href="mailto:stas@FreeBSD.org">stas@FreeBSD.org</a></td>
<td>coredump</td>
<td>Oct 28 02:26:10 UTC 2006</td>
</tr>
<tr>
<td>inn-stable-20040707</td>
<td>82</td>
<td>82 K</td>
<td>news/inn-stable</td>
<td><a href="mailto:ports@FreeBSD.org">ports@FreeBSD.org</a></td>
<td>mtree</td>
<td>Oct 28 02:26:22 UTC 2006</td>
</tr>
</tbody>
</table>
Policies

- inactive committers
  - 1 year
- inactive maintainers
  - Approval: 2 weeks
  - Reset: 3 months
FreeBSD ports

Policies

"New ports should only be submitted by someone who is actually using the software and will continue to use the port to maintain the software."

- Too much software (CPAN / SF.net)
- Limited resources
  - Committers
  - Cluster
- Common sense
FreeBSD ports

What changes are allowed and when

*bsd.port.mk*

All commits must be regression tested and approved by portmgr
FreeBSD ports

What changes are allowed and when
When the tree is frozen

All changes must be approved by portmgr. In general, only the following will be accepted:

• fixes that would prevent a port from installing, deinstalling or running properly for the upcoming release.
• security problems.
• licensing issues.
FreeBSD ports

What changes are allowed and when
When the tree is thawed

No sweeping changes

- a commit that would affect a non-trivial number of packages
FreeBSD ports

Policies
Supported releases

In general, follows the EOL set by security officer. FreeBSD 4.x has EOL January 31st, 2007

- Package building/regression testing deprioritized
- Infrastructure (bsd.port.mk) supported until EOL date
- Individual ports can be marked broken
- Patches still accepted
- Users encouraged to upgrade
FreeBSD ports

Links

- erwin@FreeBSD.org