

FreeBSD Experiences With Google Summer of Code

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FreeBSD[®]

What is GSoC

- * Global Program
- * Offers stipends to students who develop code for open source projects
 - * \$500 at inception
 - * \$2000 at mid summer
 - * \$2000 at end of program

GSoC Project Participation

- * Project Admins apply to participate
 - * Brooks Davis, Tim Kientzle, Robert Watson
- * Accepted projects provide projects pages
 - * <http://www.freebsd.org/projects/>
- * Sign up mentors
 - * 37 FreeBSD Mentors
- * \$500 per accepted student project at end

GSoC 2009

- * Global Program
 - * 150 projects
 - * 1000 students
 - * 85% success rate
- * FreeBSD GSoC
 - * 50 applications
 - * 20 accepted
 - * 17 successful



FreeBSD GSoC Students



Successful GSoC Projects

- Network (5)
 - Marta Carbone, Tatsiana Elavaya, Ana Kukec, Zachariah Riggle, Fang Wang
- Ports/Packages (3)
 - David Forsythe, Gabor Kovesdan, Alejandro Pulver
- Storage/FS (4)
 - Fabio Checconi, Gleb Kurtsov, Tatsiana Severyna, Aditya Sarawgi
- Security (1)
 - Ilias Marinos
- Other Kernel (4)
 - Sylvestre Gallon, Edward Napierala, Gabor Pali, Zhao Shuai

IPFW and DummyNet Improvements

Marta Carbone

Mentor: Luigi Rizzo

Project URL:

<http://wiki.freebsd.org/MartaCarbone>

Affiliation: University of Pisa (2010)

Key Results:

- * Code cleanup and refactoring
- * Improved processing performance
- * Optional “strict” rule set parsing



Geom-based Disk Schedulers

Fabio Checconi

Mentor: Luigi Rizzo

Project URL:

<http://wiki.freebsd.org/MartaCarbone>

Affiliation: Scuola Superiore S. Anna, Pisa,
Italy (December 2009)

Key Results:

- * Hot insertion mechanism for GEOM classes
- * Bio classification interface
- * Proportional share scheduling algorithm



Package Tools Rewrite via libpkg

David Forsythe

Mentor: Tim Kientzle

Project URL:

<http://code.google.com/p/libpkg/>

Affiliation: University of Maryland (May 2009)

Key Results:

- * Working, but incomplete skeleton



USB Improvements

Sylvestre Gallon

Mentor: Philip Paeps

Project URL:

<http://wiki.freebsd.org/SOC2009SylvestreGallon>

Affiliation: University of Maryland (May 2009)

Key Results:

- * Initial board support package of at91sam9261ek
- * OpenMoko USB DCI driver s3c24xxdci
- * Support for libusb-1.0 support
- * DCI support refactoring

BSD-licensed libiconv

Gabor Kovesdan

Mentor: Xin LI

Project URL:

<http://wiki.freebsd.org/GáborSoC2009>

Affiliation: Technical and Economical University of
Budapest (2010)

Key Results:

- * Shared library version written
- * Nearly all forward encodings complete and correct



IPv6 SEcure Neighbor Discovery

Ana Kukec

Mentor: Bjoern Zeeb

Project URL:

<http://wiki.freebsd.org/SOC2009AnaKukec>

Affiliation: University of Zagreb (2010)

Key Results:

- * Native SEND implementation using user space cryptographic validation complete



Stackable Cryptographic Filesystem

Gleb Kurtsov

Mentor: Stanislav Sedov

Project URL: <http://blogs.freebsdish.org/gleb/>

Affiliation: European Humanities University (2013)

Key Results:

- * File encryption with no per-file metadata
- * Per-directory keys

Application-Specific Audit Trails

Ilias Marinos

Mentor: Robert Watson

Project URL:

<http://wiki.freebsd.org/SOC2009IliasMarinos>

Affiliation: University of Patras, GREECE (209)

Key Results:

- * Multiple audit “slices” supported
- * Proof of concept userland tools for slice manipulation and record submission



Hierarchical Resource Limits

Edward Napierala

Mentor: Brooks Davis

Project URL:

[http://wiki.freebsd.org/
Hierarchical_Resource_Limits](http://wiki.freebsd.org/Hierarchical_Resource_Limits)

Affiliation: University of Zielona Gora (2009)

Key Results:

- * Hierarchical framework complete
- * Many resources handled



Libraries for Subsystem Monitoring

Gabor Pali

Mentor: Oleksandr Tymoshenko

Project URL:

<http://wiki.freebsd.org/PGJSoc2009>

Affiliation: Eötvös Loránd University (2012)

Key Results:

- * Created libnetstat
- * Test tool (nettop) created



Libraries for Subsystem Monitoring

Gabor Pali

```
Very Simple Network Monitor (Press Q to quit)

Active UNIX domain sockets
Address Type Recv-Q Send-Q Inode Conn Refs Nextref Addr
c39a7204 dgram 0 0 c3ac1a78 0 c39a7408 0 /var/run/log
c39a72b0 dgram 0 0 c3ac196c 0 c39a7cc4 0 /var/run/logpr
c39a735c dgram 0 0 0 c39a72b0 0 0
c39a7408 dgram 0 0 0 c39a7204 0 0
c39a78bc dgram 0 0 0 c39a72b0 0 c39a735c
c39a7968 dgram 0 0 0 c39a72b0 0 c39a78bc
c39a7ac0 dgram 0 0 0 c39a72b0 0 c39a7968
c39a7e1c dgram 0 0 0 c39a72b0 0 c39a7ac0
c39a7cc4 dgram 0 0 0 c39a72b0 0 c39a7e1c
c39a7ec8 stream 0 0 c3a55430 0 0 /var/run/devd.
pipe
Active Internet connections (including servers)
Proto Recv-Q Send-Q Local Address Port Foreign Address Port (state)
udp6 0 0 * syslog * *
udp4 0 0 * syslog * *
tcp4 0 0 localhost smtp * * LISTEN
tcp4 0 0 localhost 38657 localhost smtp ESTABLISHE
tcp4 0 0 localhost smtp localhost 38657 ESTABLISHE
tcp4 0 0 192.168.233.128 63223 skunkworks.freebs netvie TIME_WAIT
tcp4 0 0 192.168.233.128 12375 skunkworks.freebs netvie TIME_WAIT
```

Ports License Infrastructure

Alejandro Pulver

Mentor: Erwin Lansing

Project URL:

[http://wiki.freebsd.org/
PortsLicenseInfrastructure](http://wiki.freebsd.org/PortsLicenseInfrastructure)

Affiliation: University of Buenos Aires (2013)

Key Results:

- * Supports license registration
- * May replace many port variables
- * FOSSology committed as ports/fossology



GPL Free ext2fs

Aditya Sarawgi

Mentor: Ulf Lilleengen

Project URL:

[http://wiki.freebsd.org/
SOC2009AdityaSarawgi](http://wiki.freebsd.org/SOC2009AdityaSarawgi)

Affiliation: Sardar Patel Institute of Technology (2009)

Key Results:

- * GPL free ext2fs



FIFO Optimizations

Zhao Shuai

Mentor: John Baldwin

Project URL:

[http://wiki.freebsd.org/
SOC2009ZhaoShuai](http://wiki.freebsd.org/SOC2009ZhaoShuai)

Affiliation: Institute of Software, Chinese Academy of
Sciences (2010)

Key Results:

- * FIFO sub-system based on pipes
- * Awaiting integration



Implement TCP User Timeout Option

Fang Wang

Mentor: Rui Paulo

Project URL:

[http://wiki.freebsd.org/FangWang/
TCPUTO](http://wiki.freebsd.org/FangWang/TCPUTO)

Affiliation: Huazhong University of Science &
Technology, China (2010)

Key Results:

- * Implementation complete and awaiting review



Conclusion

Another successful year of GSoC for FreeBSD

Thanks to Google for this opportunity

http://people.freebsd.org/~brooks/pubs/eurobsdcon2009/FreeBSD_GSoC_2009.pdf

