



Security

FreeBSD Security Advisories

❑ <http://www.freebsd.org/security/advisories.html>

FreeBSD Security Advisories

This web page contains a list of released FreeBSD Security Advisories. See the [FreeBSD Security Information](#) page for general security information about FreeBSD.

Issues affecting the FreeBSD Ports Collection are covered in [the FreeBSD VuXML document](#).

Date	Advisory name
2010-11-29	FreeBSD-SA-10:10.openssl
2010-11-10	FreeBSD-SA-10:09.pseudofs
2010-09-20	FreeBSD-SA-10:08.bzip2
2010-07-13	FreeBSD-SA-10:07.mbuf

FreeBSD Security Advisories

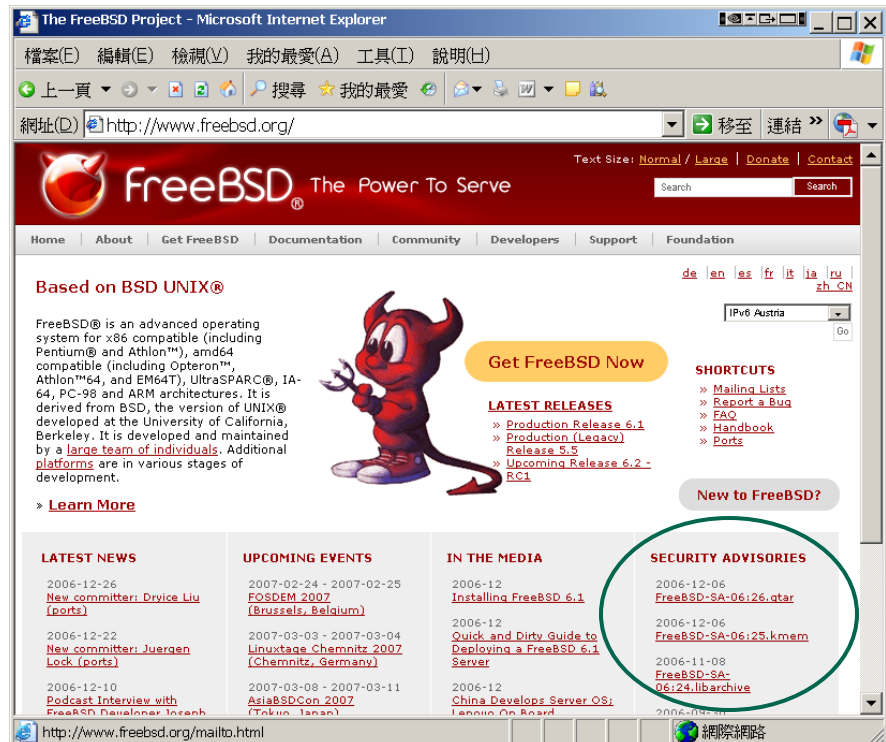
❑ Advisory

- Security information

❑ Where to find it

- Web page (Security Advisories Channel)

➤ <http://www.freebsd.org>



The screenshot shows the FreeBSD Project website in Microsoft Internet Explorer. The browser title is "The FreeBSD Project - Microsoft Internet Explorer". The address bar shows "http://www.freebsd.org/". The website header includes the FreeBSD logo and the tagline "The Power To Serve". The navigation menu includes links for Home, About, Get FreeBSD, Documentation, Community, Developers, Support, and Foundation. The main content area features a "Based on BSD UNIX®" section, a "Get FreeBSD Now" button, and a "LATEST RELEASES" section. A "Security Advisories" section is circled in green, listing several advisories:

LATEST NEWS	UPCOMING EVENTS	IN THE MEDIA	SECURITY ADVISORIES
<p>2006-12-26 New committer: Dvije Liu (ports)</p> <p>2006-12-22 New committer: Juergen Lock (ports)</p> <p>2006-12-10 Podcast Interview with FreeBSD Developer Joseph</p>	<p>2007-02-24 - 2007-02-25 FOSDEM 2007 (Brussels, Belgium)</p> <p>2007-03-03 - 2007-03-04 Linuxtage Chemnitz 2007 (Chemnitz, Germany)</p> <p>2007-03-08 - 2007-03-11 AsiaBSDCon 2007 (Tokyo, Japan)</p>	<p>2006-12 Installing FreeBSD 6.1</p> <p>2006-12 Quick and Dirty Guide to Deploying a FreeBSD 6.1 Server</p> <p>2006-12 China Develops Server OS; Linux OS Road</p>	<p>2006-12-06 FreeBSD-SA-06:26.gtar</p> <p>2006-12-06 FreeBSD-SA-06:25.kmem</p> <p>2006-11-08 FreeBSD-SA-06:24.libarchive</p>

FreeBSD Security Advisories

❑ Where to find it

- freebsd-security-notifications Mailing list
 - <http://lists.freebsd.org/mailman/listinfo/freebsd-security-notifications>

Subscribing to freebsd-security-notifications

Subscribe to freebsd-security-notifications by filling out the following form. You will be sent email requesting confirmation, to prevent others from gratuitously subscribing you. This is a hidden list, which means that the list of members is available only to the list administrator.

Your email address:

Your name (optional):

You may enter a privacy password below. This provides only mild security, but should prevent others from messing with your subscription. **Do not use a valuable password** as it will occasionally be emailed back to you in cleartext.

If you choose not to enter a password, one will be automatically generated for you, and it will be sent to you once you've confirmed your subscription. You can always request a mail-back of your password when you edit your personal options.

Pick a password:

Reenter password to confirm:

Which language do you prefer to display your messages?

English (USA)

Would you like to receive list mail batched in a daily digest?

No Yes

Subscribe

FreeBSD Security Advisories

❑ Example

- openssl

FreeBSD-SA-10:10.openssl

Security Advisory
The FreeBSD Project

Topic: OpenSSL multiple vulnerabilities

Category: contrib

Module: openssl

Announced: 2010-11-29

Credits: Georgi Guninski, Rob Hulswit

Affects: FreeBSD 7.0 and later

Corrected: 2010-11-26 22:50:58 UTC (RELENG_8, 8.1-STABLE)
2010-11-29 20:43:06 UTC (RELENG_8_1, 8.1-RELEASE-p2)
2010-11-29 20:43:06 UTC (RELENG_8_0, 8.0-RELEASE-p6)
2010-11-28 13:45:51 UTC (RELENG_7, 7.3-STABLE)
2010-11-29 20:43:06 UTC (RELENG_7_3, 7.3-RELEASE-p4)
2010-11-29 20:43:06 UTC (RELENG_7_1, 7.1-RELEASE-p16)

CVE Name: CVE-2010-2939, CVE-2010-3864

FreeBSD Security Advisories

❑ CVE-2010-3864

- <http://web.nvd.nist.gov/view/vuln/detail?vulnId=CVE-2010-3864>

National Cyber-Alert System

Vulnerability Summary for CVE-2010-3864

Original release date: 11/17/2010

Last revised: 12/10/2010

Source: US-CERT/NIST

Overview

Multiple race conditions in ssl/t1_lib.c in OpenSSL 0.9.8f through 0.9.8o, 1.0.0, and 1.0.0a, when multi-threading and internal caching are enabled on a TLS server, might allow remote attackers to execute arbitrary code via client data that triggers a heap-based buffer overflow, related to (1) the TLS server name extension and (2) elliptic curve cryptography.

Impact

CVSS Severity (version 2.0):

CVSS v2 Base Score: 7.6 (HIGH) (AV:N/AC:H/Au:N/C:C/I:C/A:C) (legend)

Impact Subscore: 10.0

Exploitability Subscore: 4.9

FreeBSD Security Advisories

❑ Example

- Problem Description

- I. Background

FreeBSD includes software from the OpenSSL Project. The OpenSSL Project is a collaborative effort to develop a robust, commercial-grade, full-featured Open Source toolkit implementing the Secure Sockets Layer (SSL v2/v3) and Transport Layer Security (TLS v1) protocols as well as a full-strength general purpose cryptography library.

- II. Problem Description

A race condition exists in the OpenSSL TLS server extension code parsing when used in a multi-threaded application, which uses OpenSSL's internal caching mechanism. The race condition can lead to a buffer overflow. [CVE-2010-3864]

A double free exists in the SSL client ECDH handling code, when processing specially crafted public keys with invalid prime numbers. [CVE-2010-2939]

FreeBSD Security Advisories

❑ Example

- Workaround

III. Impact

For affected server applications, an attacker may be able to utilize the buffer overflow to crash the application or potentially run arbitrary code with the privileges of the application. [CVE-2010-3864].

It may be possible to cause a DoS or potentially execute arbitrary in the context of the user connection to a malicious SSL server. [CVE-2010-2939]

IV. Workaround

No workaround is available, but CVE-2010-3864 only affects FreeBSD 8.0 and later.

It should also be noted that CVE-2010-3864 affects neither the Apache HTTP server nor Stunnel.

FreeBSD Security Advisories

□ Example

- Solution
 - Upgrade to
 - Source code patch
 - Binary patch

V. Solution

Perform one of the following:

1) Upgrade your vulnerable system to 7-STABLE or 8-STABLE, or to the RELENG_8_1, RELENG_8_0, RELENG_7_3, or RELENG_7_1 security branch dated after the correction date.

2) To update your vulnerable system via a source code patch:

The following patches have been verified to apply to FreeBSD 7.1, 7.3, 8.0 and 8.1 systems.

a) Download the relevant patch from the location below, and verify the detached PGP signature using your PGP utility.

```
[FreeBSD 7.x]
# fetch http://security.FreeBSD.org/patches/SA-10:10/openssl17.patch
# fetch http://security.FreeBSD.org/patches/SA-10:10/openssl17.patch.asc
```

```
[FreeBSD 8.x]
# fetch http://security.FreeBSD.org/patches/SA-10:10/openssl1.patch
# fetch http://security.FreeBSD.org/patches/SA-10:10/openssl1.patch.asc
```

b) Execute the following commands as root:

```
# cd /usr/src
# patch < /path/to/patch
# cd /usr/src/secure/lib/libssl
# make obj && make depend && make && make install
```

NOTE: On the amd64 platform, the above procedure will not update the lib32 (i386 compatibility) libraries. On amd64 systems where the i386 compatibility libraries are used, the operating system should instead be recompiled as described in <http://www.FreeBSD.org/handbook/makeworld.html>

3) To update your vulnerable system via a binary patch:

Systems running 7.1-RELEASE, 7.3-RELEASE, 8.0-RELEASE or 8.1-RELEASE on the i386 or amd64 platforms can be updated via the freebsd-update(8) utility:

```
# freebsd-update fetch
# freebsd-update install
```

Common Security Problems

- ❑ Unreliable wetware
 - Phishing site
- ❑ Software bugs
 - FreeBSD security advisor
 - portaudit (ports-mgmt/portaudit)
- ❑ Open doors
 - Account password
 - Disk share with the world

Pkg audit

❑ Pkg audit

- Audit installed packages against known vulnerabilities.

❑ Security Output

mysql56-client-5.6.30 is vulnerable:

Remote-Code-Execution vulnerability in mysql and its variants CVE 2016-6662

WWW: <https://vuxml.FreeBSD.org/freebsd/dc596a17-7a9e-11e6-b034-f0def167eeea.html>

vim-7.4.1832 is vulnerable:

vim -- arbitrary command execution

CVE: CVE-2016-1248

WWW: <https://vuxml.FreeBSD.org/freebsd/c11629d3-c8ad-11e6-ae1b-002590263bf5.html>

curl-7.50.1 is vulnerable:

cURL -- multiple vulnerabilities

CVE: CVE-2016-8625

CVE: CVE-2016-8624

CVE: CVE-2016-8623

CVE: CVE-2016-8622

Common trick

❑ Tricks

- ssh scan and hack
 - ssh guard
 - sshit
 - ...
- Phishing
- XSS & sql injection
- ...

❑ Objective

- Spam
- Jump gateway
- File sharing
- ...

Process file system - procfs

```
last pid: 8103; load averages: 0.00, 0.03, 0.04
102 processes: 1 starting, 1 running, 100 sleeping
CPU states: 0.2% user, 0.0% nice, 1.7% system, 0.7% interrupt, 97.4% idle
Mem: 305M Active, 1402M Inact, 215M Wired, 81M Cache, 112M Buf, 3016K Free
Swap: 4096M Total, 352K Used, 4096M Free
```

PID	USERNAME	THR	PRI	NICE	SIZE	RES	STATE	C	TIME	WCPU	COMMAND
4576	tyhsieh	1	76	0	1964K	1652K	select	1	56:05	0.00%	httpd
4566	tyhsieh	1	76	0	1672K	1360K	select	0	6:13	0.00%	httpd
4584	tyhsieh	1	76	0	1996K	1052K	select	0	1:24	0.00%	httpd

❑ Procfs

- A view of the system process table
- Normally mount on /proc
- `mount -t procfs proc /proc`

```
hsec[/proc/4566] -chiahung- ls -al
total 0
dr-xr-xr-x  1 tyhsieh  hsec   0 Jan  3 13:53 ./
dr-xr-xr-x  1 root    wheel  0 Jan  3 13:53 ../
-r--r--r--  1 tyhsieh  hsec   0 Jan  3 13:53 cmdline
--w-----  1 tyhsieh  hsec   0 Jan  3 13:53 ctl
-r--r--r--  1 tyhsieh  hsec   0 Jan  3 13:53 etype
lr--r--r--  1 tyhsieh  hsec   0 Jan  3 13:53 file@ -> /home/tyhsieh/.etcdir/.etcvar/.etcexec/.etcvar/httpd
-r--r--r--  1 tyhsieh  hsec   0 Jan  3 13:53 map
-r--r--r--  1 tyhsieh  hsec   0 Jan  3 13:53 rlimit
-r--r--r--  1 tyhsieh  hsec   0 Jan  3 13:53 status
```

setuid program

❑ passwd

```
zfs[~] -chiahung- ls -al /usr/bin/passwd
-r-sr-xr-x  2 root  wheel  8224 Dec  5 22:00 /usr/bin/passwd
```

- /etc/master.passwd is of mode 600 (-rw-----) !

❑ Setuid shell scripts are especially apt to cause security problems

- Minimize the number of setuid programs

```
/usr/bin/find / -user root -perm -4000 -print |
/bin/mail -s "Setuid root files" username
```

- Disable the setuid execution on individual filesystems
 - **-o nosuid**

Why not su nor sudo?

❑ Becoming other users

- A pseudo-user for services, sometimes shared by multiple users

```
User_Alias newsTA=wangyr  
Runas_Alias NEWSADM=news  
newsTA ALL=(NEWSADM) ALL
```

- `sudo -u news -s` (?) **Too dirty!**
- `/etc/inetd.conf`
 - `login stream tcp nowait root /usr/libexec/rlogind rlogind`
- `~notftpadm/.rhosts`
 - `localhost wangyr`
- `rlogin -l news localhost`

Security tools

- nmap
- john, crack
- PGP
- CA
- ...

- Firewall
- TCP Wrapper
- ...

TCP Wrapper

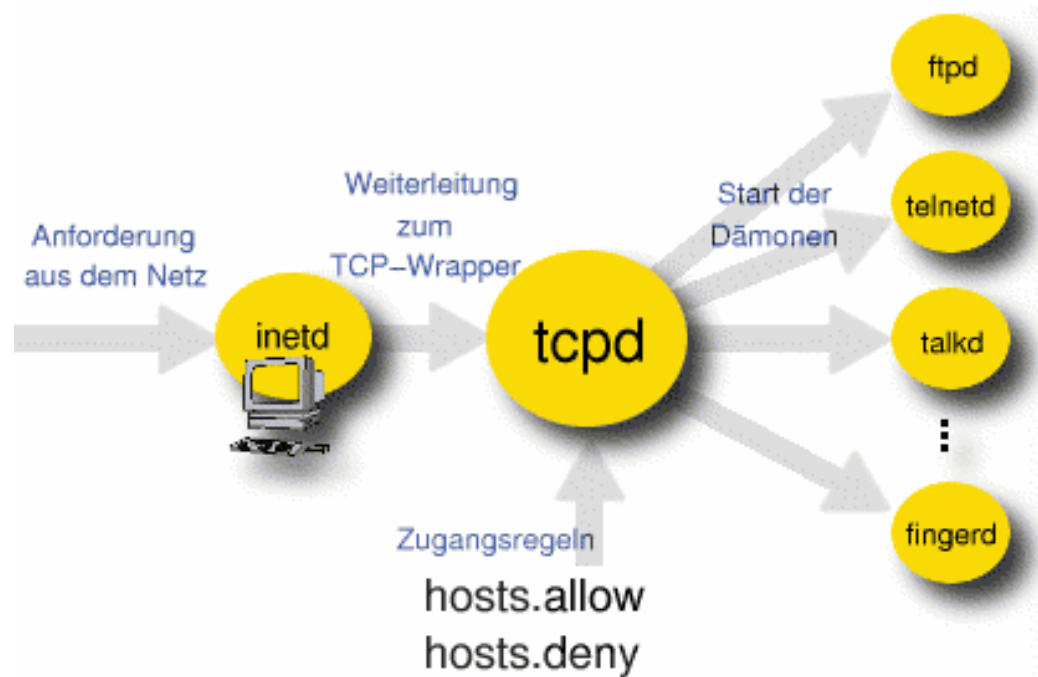
- ❑ There are something that a firewall will not handle
 - Sending text back to the source

- ❑ TCP wrapper
 - Extend the abilities of `inetd`
 - Provide support for every server daemon under its control
 - Logging support
 - Return message
 - Permit a daemon to only accept internal connetions

TCP Wrapper

□ TCP Wrapper

- Provide support for every server daemon under its control



TCP Wrapper

- ❑ To see what daemons are controlled by inetd, see `/etc/inetd.conf`

```
#ftp      stream  tcp      nowait  root    /usr/libexec/ftpd      ftpd -l
#ftp      stream  tcp6     nowait  root    /usr/libexec/ftpd      ftpd -l
#telnet   stream  tcp      nowait  root    /usr/libexec/telnetd   telnetd
#telnet   stream  tcp6     nowait  root    /usr/libexec/telnetd   telnetd
shell     stream  tcp      nowait  root    /usr/libexec/rshd      rshd
#shell    stream  tcp6     nowait  root    /usr/libexec/rshd      rshd
login     stream  tcp      nowait  root    /usr/libexec/rlogind   rlogind
#login    stream  tcp6     nowait  root    /usr/libexec/rlogind   rlogind
```

- ❑ TCP wrapper should not be considered a replacement of a good firewall. Instead, it should be used in conjunction with a firewall or other security tools

TCP Wrapper

❑ To use TCP wrapper

1. inetd daemon must start up with “-Ww” option (default)

Or edit /etc/rc.conf

```
inetd_enable="YES"  
inetd_flags="-wW"
```

- Edit /etc/hosts.allow

➤ Format:

daemon:address:action

- daemon is the daemon name which inetd started
- address can be hostname, IPv4 addr, IPv6 addr
- action can be “allow” or “deny”

- Keyword “ALL” can be used in daemon and address fields to means everything

/etc/hosts.allow

❑ First rule match semantic

- Meaning that the configuration file is scanned in ascending order for a matching rule
- When a match is found, the rule is applied and the search process will stop

❑ example

```
ALL : localhost, loghost @adm_cc_cs : allow
ptelnetd pftpd sshd: @sun_cc_cs, @bsd_cc_cs, @linux_cc_cs : allow
ptelnetd pftpd sshd: zeiss, chbsd, sabsd : allow
identd : ALL : allow
portmap : 140.113.17. ALL : allow
sendmail : ALL : allow
rpc.rstatd : @all_cc_cs 140.113.17.203: allow
rpc.rusersd : @all_cc_cs 140.113.17.203: allow
ALL : ALL : deny
```

/etc/hosts.allow

❑ Advance configuration

- External commands (**twist option**)
 - twist will be called to execute a shell command or script

```
# The rest of the daemons are protected.
telnet : ALL \
        : severity auth.info \
        : twist /bin/echo "You are not welcome to use %d from %h."
```

- External commands (**spawn option**)
 - spawn is like twist, but it will not send a reply back to the client

```
# We do not allow connections from example.com:
ALL : .example.com \
        : spawn (/bin/echo %a from %h attempted to access %d >> \
        /var/log/connections.log) \
        : deny
```

/etc/hosts.allow

- Wildcard (**PARANOID** option)
 - Match any connection that is made from an IP address that differs from its hostname

```
# Block possibly spoofed requests to sendmail:  
sendmail : PARANOID : deny
```

☐ See

- man 5 hosts_access
- man 5 hosts_options

When you perform any change.

□ Philosophy of SA

- Know how things really work.
- Plan it before you do it.
- Make it reversible
- Make changes incrementally.
- Test before you unleash it .

