25 DAYS UNTIL THE SCHEDULED RELEASE OF OPENBSD 4.6!

## INSTALLATION PATCHING UPDATING SECURITY TIPS & TRICKS CONTACT HOME

## PATCHING AND KERNEL BUILDING IN OBSD 4.5

One of the only times you will need to compile and install your own OpenBSD kernel is after applying patches to the kernel.

Unlike compiling a Linux kernel, which seems to be a rite of passage for Linux users, compiling an OpenBSD kernel is not recommended and is actually frowned upon in the OpenBSD community.

- » Patching intro patching simply explained
- » Obtaining source code where to find source code for your system and kernel
- » Where to unpack source files suggested locations for source code
- » Obtaining patch files where to locate patch files
- » Identifying patches some examples distinguish between system and kernel patches
- » Patching the kernel apply all patches to the kernel
- » Building a kernel after patching after all patches have been applied to the kernel source
- » Booting an old kernel booting into an older kernel after the new kernel has problems



## **PATCHING INTRO**

Patch files are text files and by reading the beginning of the patch file you will be able to determine what type of patch you have. If you see the words 'Rebuild your kernel' that will be your clue that the patch you are looking at is for the kernel. Also at the beginning of the patch file will be the instructions explaining how to apply the patch and how to rebuild/install the newly patched code.

#### Patching should be divided into two areas

- Patching programs and servers (in essence the same thing)
- Patching the kernel

#### Patching is a two step process

- Step 1 Apply patch to source code
- Step 2 Rebuild and install patched source code

Patches when they become available can be found here.

### **OBTAINING SOURCE CODE**

In order to do any kind of patching you will need the source code files for the programs. And if you are patching the kernel you will need the kernel source code.

- Source code for the core system (103MB): ftp://ftp.openbsd.org/pub/OpenBSD/4.5/src.tar.gz
- Source code for the kernel (17MB): <u>ftp://ftp.openbsd.org/pub/OpenBSD/4.5/sys.tar.gz</u>

When patching your port system or the Xenocara (X Window) system you will need these sources:

- Source code for the port system (13MB): <a href="http://ftp.openbsd.org/pub/OpenBSD/4.5/ports.tar.gz">ftp://ftp.openbsd.org/pub/OpenBSD/4.5/ports.tar.gz</a>
- Source code for the Xenocara (X Window) system (99MB): <a href="http://ftp.openbsd.org/pub/OpenBSD/4.5/xenocara.tar.gz">http://ftp.openbsd.org/pub/OpenBSD/4.5/xenocara.tar.gz</a>

```
Unpacking the system source files

# mv src.tar.gz /usr/src

# cd /usr/src

# tar -xvzf src.tar.gz
```

Unpacking the kernel source files

<pre># mv sys.tar.gz /usr/src</pre>
# cd /usr/src
# tar -xvzf sys.tar.gz
Unpacking the port system source files
# mv ports.tar.gz /usr
# cd /usr
# tar -xvzf ports.tar.gz
Unpacking the Xenocara (X Window) system source files
# mv xenocara.tar.gz /usr
# cd /usr
<pre># tar -xvzf xenocara.tar.gz</pre>

Unpacking the files will take a while making this a good opportunity to grab yourself a beer.

### WHERE TO UNPACK SOURCE FILES

It really doesn't matter where you unpack and store your sources. Just remember these locations for future patching, building or when keeping your sources up to date with cvsup.

#### Suggested locations for unpacking your source files

- Core system source (src.tar.gz) /usr/src
- Kernel source (sys.tar.gz) /usr/src
- Ports collection source (ports.tar.gz) /usr
- Xenocara (X Window) system source (xenocara.tar.gz) /usr

## **OBTAINING PATCH FILES**

You will want to get your hands on the patch files when they become available.

Patches for OpenBSD 4.5 - ftp://ftp.openbsd.org/pub/OpenBSD/patches/4.5.tar.gz

Now create a /usr/src/patches directory and copy the 4.5.tar.gz file to this directory then unpack.

Make a directory, copy patches and then unpack
<pre># mkdir /usr/src/patches</pre>
<pre># mv 4.5.tar.gz /usr/src/patches</pre>
<pre># cd /usr/src/patches</pre>
# tar -xvzf 4.5.tar.gz

Patch files will be located in the /usr/src/patches/4.5/i386 directory and the /usr/src/patches/4.5/common directory. The i386 directory will normally contain no patches.

### **IDENTIFYING PATCHES - SOME EXAMPLES**

Next we need to identify what type of patch files we have.

Because of the Rebuild your kernel comment we know this is a patch for the kernel.

Below I've picked a patch that will fix an Apache local vulnerability (from OpenBSD 3.6).

Let's take a look at the patch file
# head -n 17 009_httpd.patch
Apply by doing:
cd /usr/src
patch -p0 < 009_httpd.patch
And then rebuild and install httpd and its modules:
cd usr.sbin/httpd
make -f Makefile.bsd-wrapper obj
make -f Makefile.bsd-wrapper cleandir
make -f Makefile.bsd-wrapper depend
make -f Makefile.bsd-wrapper
make -f Makefile.bsd-wrapper install
If httpd had been started, you might want to run
apachectl stop
before running "make install", and
apachectl start afterwards.

This is a patch for the Apache web server, which is a part of the core system.

Following the above instructions there should be no problems installing the patch and rebuilding/installing the patched Apache server (hence the name A PAtCHy server). Geek humor, sorry.

Next is a patch for the Xenocara (X Window) system.

Following the above instructions there should be no problems installing the patch. After patching the Xenocara sources, you will next need to rebuild Xenocara. Information on rebuilding the Xenocara (X Window) system can be found <u>here</u>.

### PATCHING THE KERNEL

Patching a kernel should be treated slightly different than patching programs. First apply **all** kernel patches **then** finally rebuild the kernel.

Using the head command to view patch files
<pre># head 001_st.patch Apply by doing:     cd /usr/src     patch -p0 &lt; 001_st.patch</pre>
Rebuild your kernel.
<pre>Index: sys/scsi/st.c ====================================</pre>

Because of the Rebuild your kernel comment we know this is a patch for the kernel.

Go through each patch file to find all of the kernel patches. Once you have identified all of the kernel patches then start patching the kernel using the above instructions. After applying all patches to the kernel source you will next rebuild the kernel and install.

### **BUILDING A KERNEL AFTER PATCHING**

After applying all kernel patches to the kernel source code the next step will be rebuilding and installing the kernel. The kernel source code will be needed when rebuilding the kernel. Information on obtaining the kernel source code can be found <u>here</u>.

Simply reboot to try out the new kernel.

# **BOOTING AN OLD KERNEL**

If the newly installed kernel will not boot then boot into a previous bootable kernel.

```
When you restart the system wait until you see something similar to the below
Using drive 0, partition 3.
Loading...
probing : pc0 com0 apm mem[634K 319M a20=on]
disk: fd0 hd0+
>> OpenBSD/i386 BOOT 3.01
boot>
```

#### at this point boot into a previous bootable kernel:

```
Using drive 0, partition 3.
Loading...
probing : pc0 com0 apm mem[634K 319M a20=on]
disk: fd0 hd0+
>> OpenBSD/i386 BOOT 3.01
boot> bsd.old
```

If you notice any errors, please let me know.

## **OTHER OPENBSD TUTORIALS**



- <u>Installation</u> demonstration of a FTP installation <u>Security</u> security suggestions
- <u>Tips & Tricks</u> suggestions and configurations
   <u>Updating</u> updating with CVSup

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