

# fusd HOWTO

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## **Abstract**

This documentation provides the necessary steps to build a 2.4.x Linux kernel with devfs support on an x86 machine, and to compile and test the fusb module with user-space driver examples. The Redhat 9.0 (shrike) distribution is used for testing.

# 1 fusr HOWTO

## 1.1 Step 1

Download a stock Linux-2.4.21 Linux kernel [4] to /usr/src from:

```
http://www.kernel.org/pub/linux/kernel/v2.4/
```

## 1.2 Step 2

Extract the kernel sources:

```
cd /usr/src
tar xjvf linux-2.4.21.tar.bz2
```

## 1.3 Step 3

Choose the following kernel options for devfs and compile the kernel:

```
CONFIG_EXPERIMENTAL=y
CONFIG_DEVFS_FS=y

make clean
make dep
make bzImage
make modules
make modules_install
cp arch/i386/boot/bzImage /boot/vmlinuz-2.4.21
mkinitrd /boot/initrd-2.4.21.img 2.4.21
```

## 1.4 Step 4

Update the boot-loader:

Lilo was used and an entry for the new kernel is added to /etc/lilo.conf:

```
image=/boot/vmlinuz-2.4.21
  label=linux-fusr
  initrd=/boot/initrd-2.4.21.img
  read-only
  append="root=/dev/hda1 devfs=nomount "
```

Run /sbin/lilo to update the lilo. If using grub, just add an entry for vmlinuz and initrd in /boot/grub/menu.lst.

devfs cannot understand root=LABEL= directives in the bootloader. Hence, don't use such conventions in the bootloader or in /etc/fstab. By default, we don't want devfs to mount on boot-up, hence passing devfs=nomount will not mount it during boot.

## 1.5 Step 5

Install devfsd.

devfsd is a daemon that needs to be installed. We used the devfsd-2.4.3-12.i386.rpm file.

```
rpm -ivh devfsd-2.4.3-12.i386.rpm
```

## 1.6 Step 6

Remove any /dev/pts entry in /etc/fstab.

devfs will handle /dev/pts so any existing entry in /etc/fstab needs to be removed.

## 1.7 Step 7

Reboot!

Reboot into the new Linux-fusd kernel. If everything looks good, the system will boot. If you missed out on any of the above options, your system will be mounted as a read-only filesystem and might drop you to a console shell or may reboot.

## 1.8 Step 8

Compile fusc-1.10:

Download fusc-1.10 package to say /root, from:

```
http://www.circlemud.org/pub/jelson/fusc/
```

su to root and extract the sources:

```
cd /root
tar xzvf fusc-1.10.tar.gz
```

Change the kernel source path in the Makefile. Compile the fusc package which will build kfusc.o, libfusc.a and code examples:

```
cd fusc-1.10
make
```

If compilation is done cleanly, install it:

```
make install
```

## 1.9 Step 9

Mount devfs and start devfsd:

```
mount -n -t devfs none /dev
devfsd /dev
```

## 1.10 Step 10

Load the kfsud.o module

The kfsud.o module is present in the objs.i686-linux/ directory in the fud sources. Load the module:

```
insmod objs.i686-linux/kfsud.o
```

## 1.11 Step 11

Test the helloworld example:

```
objs.i686-linux/helloworld &
cat /dev/hello-world
```

## 2 Bibliography

**Doug** . Doug Glibert. 2001. Devfs and SCSI. [http://sg.torque.net/sg/devfs\\_scsi.html](http://sg.torque.net/sg/devfs_scsi.html).

**Jeremy** . Jeremy Elson. 2003. FUSD - a Linux Framework for User-Space Devices. <http://www.circlemud.org/~jelson/software/fud/>.

**Richard** . Richard Gooch. 2002. Linux Devfs (Device File System) FAQ. <http://www.atnf.csiro.au/people/rgooch/linux/docs/devfs.html>.

**LinuxKernel** . <http://www.kernel.org/pub/linux/kernel/v2.4/>