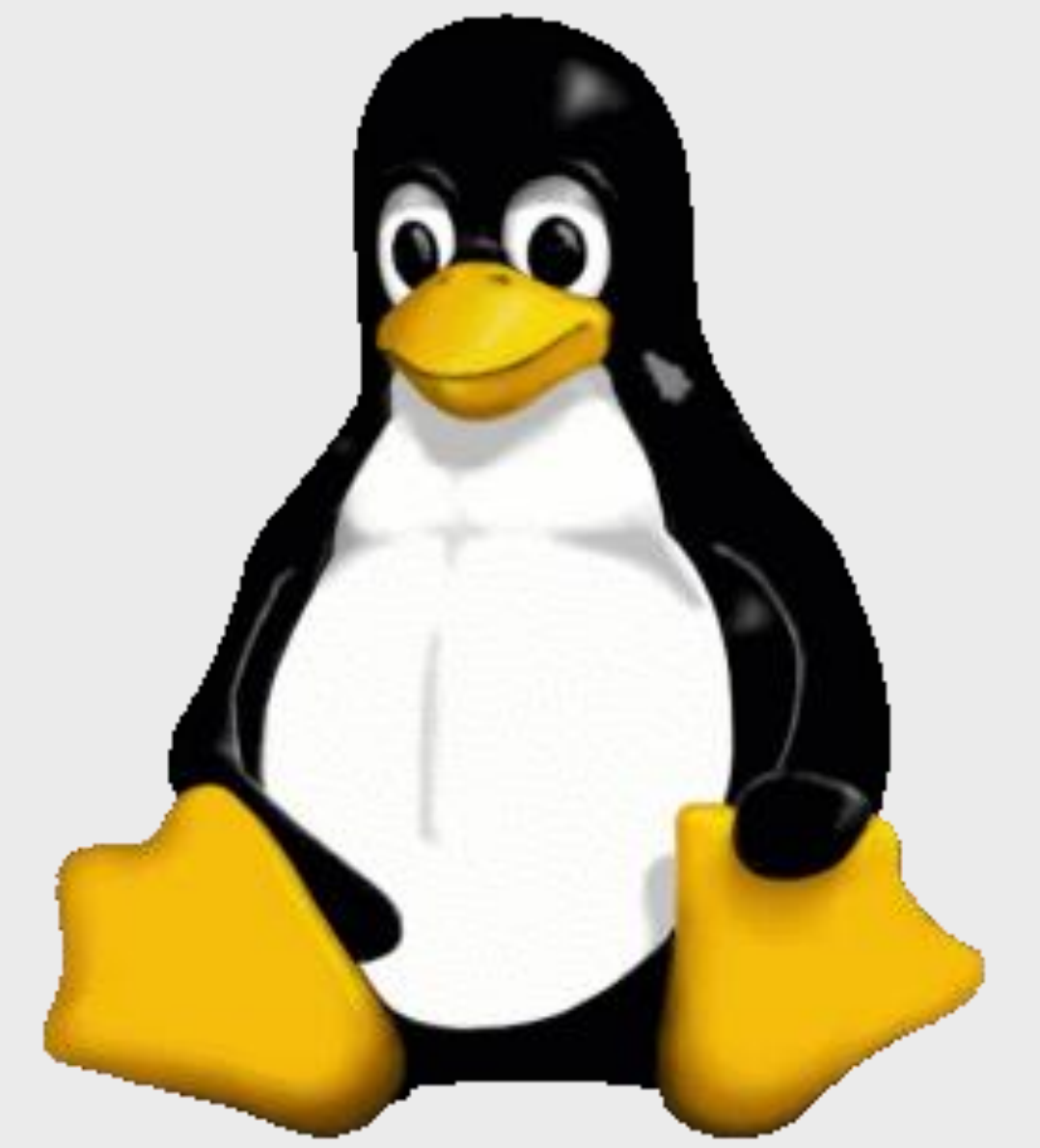


# The Eudryptula Challenge

A series of self-paced programming exercises administered by the Linux kernel maintainers. Participants learn to work in several subsystems and contribute patches to the mainline kernel.



```
[ 589.088891] device: 'lo': device_add
[ 589.089000] PM: Adding info for No Bus:lo
[ 589.089266] device: 'sit0': device_add
[ 589.089408] PM: Adding info for No Bus:sit0
[ 619.569003] PM: Removing info for No Bus:sit0
[ 619.578922] PM: Removing info for No Bus:lo
[ 765.315324] hello: loading out-of-tree module taints kernel.
[ 765.316326] Hello 88 keys, I mean hello
[ 765.316423] bus: 'usb': add driver hello-keyboard-hotplug
[ 765.316916] usbcore: registered new interface driver hello-keyboard-hotplug
[ 782.226982] usb 1-2: new high-speed USB device number 4 using xhci_hcd
[ 782.362890] usb 1-2: New USB device found, idVendor=05ac, idProduct=1006, bcdDevice=96.15
[ 782.362910] usb 1-2: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 782.362922] usb 1-2: Product: Keyboard Hub
[ 782.362935] usb 1-2: Manufacturer: Apple, Inc.
[ 782.362947] usb 1-2: SerialNumber: 000000000000
[ 782.362976] device: '1-2': device_add
[ 782.363306] bus: 'usb': add device 1-2
[ 782.363423] PM: Adding info for usb:1-2
[ 782.366193] bus: 'usb': driver_probe_device: matched device 1-2 with driver usb
[ 782.366226] bus: 'usb': really_probe: probing driver usb with device 1-2
[ 782.366284] devices_kset: Moving 1-2 to end of list
[ 782.367744] device: '1-2:1.0': device_add
[ 782.367945] bus: 'usb': add device 1-2:1.0
[ 782.368073] PM: Adding info for usb:1-2:1.0
[ 782.368341] bus: 'usb': driver_probe_device: matched device 1-2:1.0 with driver hub
[ 782.368347] bus: 'usb': really_probe: probing driver hub with device 1-2:1.0
[ 782.368357] devices_kset: Moving 1-2:1.0 to end of list
[ 782.368365] hub 1-2:1.0: USB hub found
[ 782.368402] hub 1-2:1.0: 3 ports detected
[ 782.368485] device: '1-2-port1': device_add
[ 782.368528] PM: Adding info for No Bus:1-2-port1
[ 782.368571] device: '1-2-port2': device_add
```

The userspace hotplug system loads my driver when it detects a USB event (plugging in a keyboard). My driver then prints a silly message to the kernel log, which is highlighted in red here.

```
ewk@athena ~ % ls /sys/kernel/debug/eudryptula
foo id jiffies
ewk@athena ~ % cat /sys/kernel/debug/eudryptula/id
7c0532179f32
ewk@athena ~ % cat /sys/kernel/debug/eudryptula/jiffies
42965497%
ewk@athena ~ % su
Password:
[root@athena ewk]# echo "Hello Benny" > /sys/kernel/debug/eudryptula/foo
[root@athena ewk]# exit
exit
ewk@athena ~ % cat /sys/kernel/debug/eudryptula/foo
Hello Benny
ewk@athena ~ % █
```

Using debugfs to pass data between userspace and the kernel. Userspace can read the hex string defined in the driver as well as the current value of the jiffies timer in the kernel. Root can also write data back to the kernel through the `foo` file.



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## HIGHLIGHTS

- Start with a "Hello world" device driver.
- Learn to build custom kernels for your own hardware.
- Build and run the linux-next integration testing tree.
- Use sysfs and debugfs to copy data between userspace and the kernel.
- Add a syscall to the kernel.
- Modify existing file systems.
- Monitor network traffic from the kernel.
- Manage thread pools and linked lists.
- Use static analysis tools to go bug hunting.
- Contribute patches to the mainline kernel, improving Linux for everyone who uses it.

I am the 135th developer to finish

More than 19,000 developers signed up.

[edkovsky.org/projects](http://edkovsky.org/projects)

[eudryptula-challenge.org](http://eudryptula-challenge.org)

