

Linux Kernel and Device Driver Programming

Assignment 5 Spring 2013

Technical Document

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Setup

Required Hardware

A standard bi-directional parallel port, DB-25
A device which causes 112 and 59 to be read on address+1 and address+1 respectively when a key is turned

Required Software

Linux kernel 3.2.x preferred
GCC
patch binary
git [optional]

Installation

Download the patch against kernel 3.2. From the kernel 3.2 source directory type
`wget https://raw.githubusercontent.com/martinkbrown/lkddp-assignment5/master/cheesey.patch`

Apply the patch. From the kernel 3.2 source directory type

```
patch < cheesey.patch
```

Configure the linux kernel. From the kernel 3.2 source directory type

```
make menuconfig
```

Warning: Be sure to fill out the USB Key Serial found in Drivers > USB

Build and install your kernel. From the kernel 3.2 source directory, as root, type

```
make && make modules_install && make install
```

You may need to update your bootloader, as root type

```
update-grub
```

Reboot and ensure the new kernel is selected in grub (it likely will be by default)

Functionality

Allows a user to add a configurable additional “what you have” layer of authentication by requiring a USB key to continue boot to the INIT process startup. Allows 3 maximum attempts or a configurable timeout.

If this process is not completed correctly, the user has a configurable amount of time to use a custom-made control device to abort a self-destruct sequence. If the user fails to do so, a control signal is sent to a solid-state relay to enable power to a device. This device could (a) alert administrators with an alarm or similar, (b) physically destroy the harddrive, or anything else which can be triggered by electronic relay.

Tests

Test configuration by varying the serial of the USB key and the number of seconds allowed to enter the key and to abort self-destruct.

Test the key by inserting the wrong one three times and by inserting the correct one before the three-time limit.

Test the self-destruct by allowing the countdown to reach 0.

Test the self-destruct abort device by causing ADDRESS+1 and ADDRESS+2 for the parallel port to read 112 and 59 respectively.