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
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.