Project 3: Encrypted Block Device

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Group #39

Abstract

I. Design Plan

Our plan for project 3 is to first get a basic ramdisk block driver up and running on the VM before we begin any encryption. We first read through the chapter on block drivers in Linux Device Drivers which provided a simple block driver called *sbull*. Because this driver was based off an older version of the Linux Kernel, we did a bit more research for ramdisk drivers that might be more recent.

This research led us to a comment on the book which led to a more recent version of the ramdisk driver. In a post by Pat Patterson, we found the ramdisk driver that would work with kernel 2.6.31. Because we are using kernel 3.19, we still weren't sure if this would work. In the comments of the post, which can be found at http://blog.superpat.com/2010/05/04/a-simple-block-dri there was a recent comment by Sarge that updated one line of the code to make it work for kernels 3.15 and later.

With this base code, we were able to compile the kernel and boot the VM. Once in the VM, we were able to run a series of commands that loaded the ramdisk module, made a filesystem, mount the module, and then unmount and remove the module. The commands were:

1) scp (ONID Username)@os2.engr.oregonstate.edu:/scratch/fall2017/39/linux-ramdisk/drivers/block/ramd.ko .
2) insmod ramd.ko
3) fdisk /dev/sbd0
4) Command: n
5) Partition type: p
6) Partition number: 1
7) First sector: [press enter for default value]
8) Last sector: [press enter for default value]
9) Command: w
10) mkfs /dev/sbd0p1
11) mount /dev/sbd0p1 /mnt
12) echo Hi >/mnt/file1
13) cat /mnt/file1
14) ls -l /mnt (just to view the file was created)
15) umount /mnt
16) rmmod ramd.ko

Now that we were able to successfully run an unencrypted ramdisk, our next step was to begin the encryption section.

II. Version Control Log

III. Work Log

Date	Time	Person	Event
November 1, 2017	9:20am	Courtney	Started HW3 LaTeX file
November 2, 2017	7:15pm	Courtney and Isaac	Begin researching Ram Disks
	8:30pm	Courtney	Set up basic block driver
	9:30pm	Isaac	Building and compiling ramd.c
November 3, 2017	9:00am	Courtney	Successfully boot VM and loaded the Ramd.c module, made the filesystem, mounted it, verified it worked, unmounted and removed module
November 5, 2017	1:30pm	Courtney	Began researching Crypto API, focusing on how to use module parameters for the key

IV. Write Up

1) What do you think the main point of this assignment is?

2) How did you personally approach the problem? Design decisions, algorithm, etc.

3) How did you ensure your solution was correct? Testing details, for instance.

4) What did you learn?