CSCE 231/2303 Fall 2018

Assignment 6: Loading Second and Third Stage Boot Loaders

Assigned: Sunday, October 28th in Class

Due: Wednesday, November 7th at 5:00 pm

Delayed submission with penalty until Friday, November 9th at mid-night.

Goals

This assignment is an individual assignment and you will work on it on your own. The goal of this to write the necessary x86 assembly code that will load the sectors that contains the code of the second and the third stage boot loaders. Of course the second and third boot loader code does not fully exists using the BIOS interrupts. Loading the sectors that will eventually contain the second and the third stage boot loaders code will not change. Upon finishing this assignment, you will not need to access the boot disk any more and all the code you need should be in memory.

Details

First of all make sure that the modifications that you have performed in assignment 5 in boot_hello.asm be applied to first_stage.asm in our code skeleton tree. Other than that first_stage.asm will not really need to be touched. A bunch of asm files are included from within first_stage.asm, and all of them are located under sources/include/first_stage within your skeleton code tree. You job is to add the necessary code in those files such that when you run your boot loader from within Qemu the second stage boot loader greeting screen eventually appears.

You have the privilege of using and borrowing the code presented in the slides and explained in class to complete you mission, but again as the slides stated, it is very important to understand the code the you are going to borrow from the slides as it will build up and missing the basic concepts at this level will make it difficult in the next stages to build the needed functionality.

In addition t the above your boot loader should be able to boot for a virtual floppy as well as a virtual hard drive. You will need to be able to detect the type of device you have booted from, and you need to read the device parameters if you are booting from a hard drive.

You will need to traverse all the files under the sources/includes/first_stage folder and add the necessary code whenever you find a comment that read **" ; This function need to be written by you."** .

What to submit

1. Your full in-line documented first stage assembly code for all code added to the code tree. **It is ever important to highlight that that you are not allowed to copy the code documentation presented in the slides, you need to explain the code in your own words. If you copy the documentation you will get ZERO in the assignment.**
2. You need to include the skeleton code try including your code amendments.
3. A PDF report that includes:
    a. A detailed description of your any assumptions you have made.
    b. List all findings that you have came up from doing this assignment.
    c. The steps needed to run your code.
4. A read me file indicating how to compile and test your code.

How to submit:

Compress all your work: source code, report, readme file, and any extra information into a zip archive. You should name your archive in the specific format <Student_ID>_<Name>_Assignment6.zip. Finally, upload your code to blackboard.

Grade

This assignment is worth 5% of the overall course grade. The assignment will be graded on a 100% grade scale, and then will be scaled down to the 5% its worth. The grading of the assignment will be broken down as follows:

1. 10 % for just submitting a meaningful assignment before or on the due date. This 10% does not account for the correctness of your assignment but submitting an empty assignment without code will definitely results in loosing this 10% and consequently the whole grade of this assignment.
2. 65 % for the correctness and the quality of your code.
3. 25 % for the quality of your inline documentation, the report, and the readme file.

Delays

You have up to 2 working days of delay, after which the assignment will not be accepted and your grade in that case will be ZERO. For every day (of the 2 allowed days), a penalty of 10% will be deducted from the grade. And of course you will lose the 10% mentioned in point 1 above under the “Grade” section.