Computer Science Capstone Project Proposal: *Leo Linux*, a student-oriented Linux distribution

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Abstract

Our vision for this project is a fully customized Linux operating system built for students and is efficient enough to rival Microsoft’s *Windows*. This Linux distribution (distro) will be mainly geared towards college students majoring in Computer Science, Cybersecurity, or other related field, but will be diverse enough to provide an effective and enjoyable working environment for students of any major or specialization. We plan to get some assistance from looking at other successful Linux distros, as well as consulting the *Linux From Scratch* documentation while creating a stable build that everyone can enjoy.

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Introduction and Objectives

The basic idea for this project is to create a custom Linux distribution (distro) that can easily be used by students of many different majors – while still focusing on Computer Science and Cybersecurity students. The name of our project is not finalized (and thus will be referred to as “our Linux distro” or “our distro” throughout this paper), but the currently planned name is *Leo Linux*.

Our goals and objectives are to create a Linux distro that is lightweight, has an intuitive GUI, a plethora of *useful* tools and programs for students that are Computing majors as well as others, dual boot capabilities, etc. The ultimate goal of this project is to create an operating system good enough to replace, or compete with, *Microsoft Windows* as the number one operating system used by students.

Relevant Research & Resources

This project is a little overly sophisticated, but it is not without hope! Our team has found a few resources that, with enough research into them, will help us to complete our project. We intend to use the *Linux From Scratch* (LFS) documentation to understand what must be done on the OS/kernel level. We created a survey and collected responses during the Fall 2020 semester with the intention of gathering data on what students would actually want from our project. And finally, we intend to look at other similar projects to see where we believe they failed or differed from what our goal is, so that we can avoid making similar mistakes.

Similar Projects

Of course, the Linux distro we are attempting to create is not the first one ever built. What this means, however, is that we have the unique opportunity to see where others made mistakes so that we might avoid doing the same – we also have the opportunity to look at some of these other similar projects as inspiration for our own Linux distro. For example, *Kali Linux* (herein referred to as “Kali”) is one that will be an inspiration for our project due to the enormous number of Cybersecurity tools and programs that it contains. However, Kalialso made mistakes that we would rather avoid; for example, Kali has *too many* tools! A significant amount of storage space in Kali is filled with a large number of tools that no student can be realistically expected to use. We plan to use Kali as inspiration for some of the tools we include in our distro, but we also want to make it lighter and have less excess than Kali (and other similar projects).

Plan of Action

Our plan is fairly simple – using the LFS documentation and other similar research, we are going to work together to create our basic Linux distro. Once we have a stable and working operating system, we will add in all of the programs and features we will choose to implement – drawing inspiration and making decisions based on similar projects, as well as the survey results mentioned earlier. It is our belief that this plan will help us create something extraordinary.

Measures of Success

There are many different ways we could measure the success of our project. A few of the possibilities that are most important to us include: Is our distro a working, stable build? Do we have unique GUI options to set us apart from other projects? Is the distro practical for a working environment? Are the installation files light enough to allow for older hardware to run effectively? Our team will be answering all of these questions and more as we progress through our project, but the ultimate decision is left to Dr. Manh Van Nguyen of Saint Leo University.