OS Lab Project Minix: Problem Set 1
Introduction to Minix Project

Overview

This is the first lab exercise in which you are required to get familiar with the *Minix* operating system. This assignment has 2 phases, the first phase of installation will be a lab session with the TA and all students individually or in groups will do the installation in one lab session; for the second phase they will satisfy the remaining set of requirements, which they have to execute individually. The lab is primarily intended so that students do not consume a lot of time trying to figure out how to install the OS, setting the environment variables etc. This saves a lot of time by which students can execute projects that are time consuming with more ease. An introduction to Minix, what is minix; its history; administration etc. There is a minix presentation on the webpage, which describes about the internal architecture and the control flow among the process in the OS. The lab focuses on how to install and configure minix. How you can do simple jobs minix like adding, deleting users, password verification etc. Each student should get familiar with the proper installation and working of the OS.

Project Requirements

These are the project requirements for the preparation lab. Students are needed to execute this assignment individually.

Requirement 1: [10 points]

Installing minix (Every student will install the OS individually)

Requirement 2: [10 points]

- Add 3 -4 users to the system with different groups.
- Add files, edit files, change permission of files and delete files.
- Change/Revoke permissions for the users.
- Listing files for the particular user/groups.
- Playing around with the basic unix commands.

Useful Websites:

- Minix Distribution (http://www.minix-vmd.org)
- Minix Operating System Group (http://www.minix.org)
- Minix Information Sheet – Official Solaris Minix Site
- (http://www.cs.vu.nl/~ast/minix.html)

OS Lab Project Minix: Problem Set 2
Compiling Programs in Minix

Overview

This is the second lab exercise in which you are required to get familiar with the *Minix* operating system. This assignment is intended to help each and every student to get used to minix. In this lab session, students will write sample C programs, compile, execute and successfully run in the minix environment. This will be a startup lab session for students, which helps them to successfully execute the main projects for the course. This will also be a lab session and the TA will be helping out each and every student for compiling and administration of the programs. An introduction to Minix, what is minix; its history; administration etc. There is a minix presentation on the webpage, which describes about the internal architecture and the control flow among the process in the OS. Each student should get familiar with the proper compiling and administration and working of the OS.

Project Requirements

These are the project requirements for the preparation lab. Students are needed to execute this assignment individually.

Requirement 1: [20 points]

Write a simple user level program that will search for a string in a file, count the number of characters and spaces in the file. They should develop the program C and in /src/commands/simple directory. Once compiled successfully. You will need to use *sunread* to write the application in Solaris Minix.

Documents:

- **Solaris Minix Installation Guide** (PDF) or (PS)
- **Minix Help File**

OS Lab Project Minix: Problem Set 3
Set- UID Implementation Project

Overview

This project is intended to help students understand the concept of the SetUID mechanism, which has been taught in the class. Set-UID is an important security feature in Unix operating system; it is also a good example to show how privileges are managed in a system, and what problems a system could have if privileges are not handled properly. Programs can be written using setuid such that they can assume the user ID of any process on the system. This project will help students become familiar with the Set-UID concept, its implementation, and potential problems

Project Requirements

These are the project requirements for the Set-UID lab. Please refer to the class notes on Set-UID programs and why they are said to be so crucial. This tasks will be done as a group.

Requirement 1: [20 points]

1. Figure out why "passwd", "chsh", and "su" commands need to be Set-UID programs. What will happen if they are not? If you are not familiar with these programs, you should first learn what they can do.

Requirement 2: [20 points]

Read the OS source codes of Minix, and figure out how Set-UID is implemented in the system. You are required to answer the below questions, and also identify the corresponding codes.

1. How does the operating system recognize whether a file is a Set-UID?
2. What are the procedures the OS performs when it recognizes the Set-UID file?
3. How does Set-UID affects the access control (i.e., when a Set-UID process tries to access a file, how does the OS check whether the process can access the file or not?).

Requirement 3: [20 points]

1. Modify the OS source code to disable the Set-UID mechanism (note: be creative to think of ways how you can demonstrate that you have successfully disabled Set-UID)

** Assignment Sources: Syracuse_University_OS_Course