Welcome To:
Module 5

Linux System Administration

Linux File Editor

- A text editor is a program which enables you to create and manipulate data (text) in a Linux file

- There are several standard text editors available on most Linux systems
  - **vi - Visual editor**
  - **ed - Standard line editor**
  - **ex - Extended line editor**
  - **emacs - A full screen editor**
  - **pico - Beginner's editor**
  - **vim - Advance version of vi**

- Our editor = vi (available in almost every Linux distribution)

“sed” Command

- Replace a string in a file with a newstring
- Find and delete a line
- Remove empty lines
- Remove the first or n lines in a file
- To replace tabs with spaces
- Show defined lines from a file
- Substitute within vi editor
- And much more…

Introduction to vi Editor

- vi supplies commands for:
  - Inserting and deleting text
  - Replacing text
  - Moving around the file
  - Finding and substituting strings
  - Cutting and pasting text

- Most common keys:
  - **`i – insert`**
  - **`Esc – Escape out of any mode`**
  - **`r – replace`**
  - **`d – delete`**
  - **`:q! – quit without saving`**
  - **`:wq! – quit and save`**

User Account Management

Commands

- useradd
- groupadd
- userdel
- groupdel
- usermod

Files

- /etc/passwd
- /etc/group
- /etc/shadow

Example:

```
useradd -g superheros -s /bin/bash -c “user description” -m -d
/home/spiderman spiderman
```

Switch Users and sudo Access

Commands

- su - username
- sudo command
- visudo

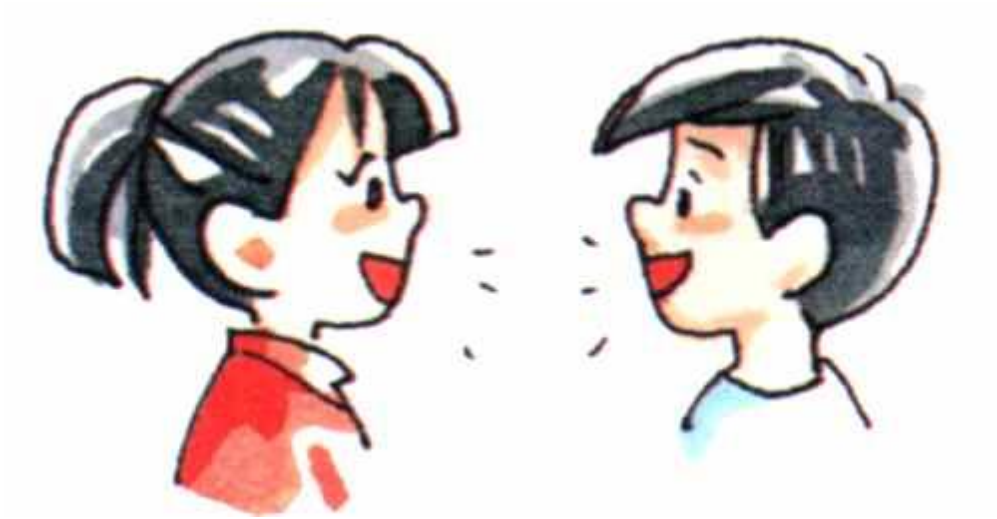
File

- /etc/sudoers

Monitor Users

- `who`
- `last`
- `w`
- `finger`
- `id`

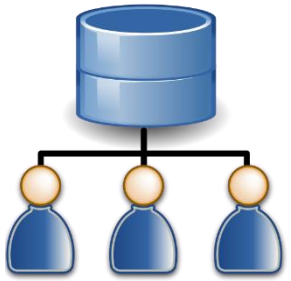
Talking to Users

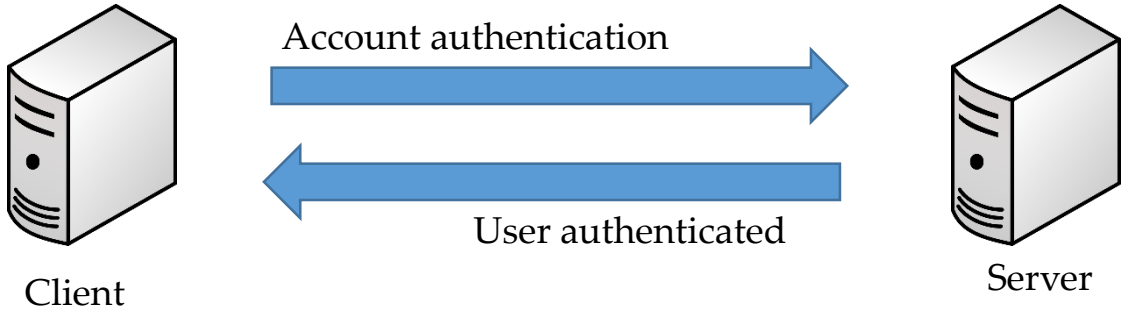


- users
- wall
- write

Linux Account Authentication

- Types of Accounts
  - Local accounts
  - Domain/Directory accounts





- Windows = Active Directory
- Linux = LDAP?

Difference between Active Directory, LDAP, IDM, WinBIND, OpenLDAP etc.

- Active Directory = Microsoft
- IDM = Identity Manager
- WinBIND = Used in Linux to communicate with Windows (Samba)
- OpenLDAP (open source)
- IBM Directory Server
- JumpCloud
- LDAP = Lightweight Directory Access Protocol

System Utility Commands

- `date`
- `uptime`
- `hostname`
- `uname`
- `which`
- `cal`
- `bc`

By: Imran Afzal

Processes and Jobs

- Application = Service
- Script
- Process
- Daemon
- Threads
- Job

Process / Services Commands

- systemctl or service
- ps
- top
- kill
- crontab
- at.

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Additional Cron Jobs

- By default there are 4 different types of cronjobs
  - Hourly
  - Daily
  - Weekly
  - Monthly
- All the above crons are setup in
  - **`/etc/cron.___`** (directory)
- The timing for each are set in
  - **`/etc/anacrontab`** -- except hourly
- For hourly
  - **`/etc/cron.d/0hourly`**

By: Imran Afzal

Process Management

- Background = `Ctrl-z, jobs and bg`
- Foreground = `fg`
- Run process even after exit = `nohup process &`

  `OR = nohup process > /dev/null 2>&1 &`
- Kill a process by name = `pkill`
- Process priority = `nice (e.g. nice –n 5 process)`

  The niceness scale goes from –20 to 19. The lower the number more priority that task gets
- Process monitoring = `top`
- List process = `ps .`

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System Monitoring

- `top`
- `df`
- `dmesg`
- `iostat 1`
- `netstat`
- `free`
- `cat /proc/cpuinfo`
- `cat /proc/meminfo`

By: Imran Afzal

Log Monitoring

Another and most important way of system administration is log monitor

Log Directory = **`/var/log`**

- **`boot`**
- **`chronyd = NTP`**
- **`cron`**
- **`maillog`**
- **`secure`**
- **`messages`**
- **`httpd`**

System Maintenance Commands

- `shutdown`
- `init 0-7`
- `reboot`
- `halt`

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Changing System Hostname

- `hostnamectl - set-hostname newhostname`

- `Version 7 = Edit /etc/hostname`
- `Version 6 = Edit /etc/sysconfig/network`

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Finding System Information

- `cat /etc/redhat-release`
- `uname -a`
- `dmidecode`

System Architecture

- **Differences between a 32-bit and 64-bit CPU**

A big difference between 32-bit processors and 64-bit processors is the number of calculations per second they can perform, which affects the speed at which they can complete tasks. 64-bit processors can come in dual core, quad core, six core, and eight core versions for home computing. Multiple cores allow for an increased number of calculations per second that can be performed, which can increase the processing power and help make a computer run faster. Software programs that require many calculations to function smoothly can operate faster and more efficiently on the multi-core 64-bit processors

- **Linux = arch**
- **Windows = My computer → Properties**

Terminal Control Keys

Several key combinations on your keyboard usually have a special effect on the terminal.

These "control" (CTRL) keys are accomplished by holding the CTRL key while typing the second key.
For example, CTRL-c means to hold the CTRL key while you type the letter "c".

The most common control keys are listed below:

- **CTRL-u - erase everything you've typed on the command line**
- **CTRL-c - stop/kill a command**
- **CTRL-z - suspend a command**
- **CTRL-d - exit from an interactive program (signals end of data).**

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Terminal Commands

- **`clear`**

Clears your screen

- **`exit`**

Exit out of the shell, terminal or a user session

- **`script`**

The script command stores terminal activities in a log file that can be named by a user, when a name is not provided by a user, the default file name, typescript is used

Recover Root Password

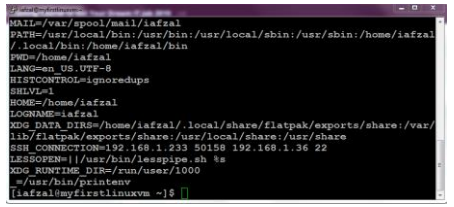
- Restart your computer
- Edit grub
- Change password
- reboot

SOS Report

- What is SOS Report?
  - Collect and package diagnostic and support data
- Package name
  - sos-version
- Command
  - sosreport

Environment Variables

- What are environment variables?
  - An environment variable is a dynamic-named value that can affect the way running processes will behave on a computer. They are part of the environment in which a process runs.
  - In simple words: set of defined rules and values to build an environment
  - E.g.



Environment Variables

- To view all environment variables
  - **printevn OR env**
- To view ONE environment variable
  - **echo $SHELL**
- To set the environment variables
  - **export TEST=1**
  - **echo $TEST**
- To set environment variable permanently
  - **vi .bashrc**
  - **TEST='123'**
  - **export TEST**
- To set global environment variable permanently
  - **vi /etc/profile or /etc/bashrc**
  - **Test='123'**
  - **export TEST**