Module 3: Linux Administration

This module you will be able to:

- Discuss system utility commands in Linux.

- Describe the different examples of system monitoring commands.

- Explain the root password recovery process.

- Outline the examples of standard text editors that are available on most Linux systems.
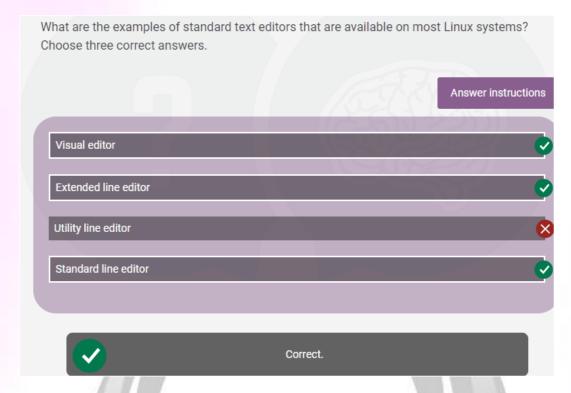
Linux File Editor

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)

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

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What are the examples of standard text editors that are available on most Linux systems? Choose three correct answers.

Answer instructions

Visual editor ✓

Extended line editor ✓

Utility line editor ✗

Standard line editor ✓

✓ Correct.

User account management

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
```

Make First C program on Linux

https://vitux.com/how-to-write-and-run-a-c-program-in-linux/

sudo apt install build-essential

gedit sampleProgram.c

gcc [programName].c -o programName

./programName

Which one of these is not an example of user account management commands? Choose one correct answer.

Answer instructions

Groupadd ✗

Useradd ✗

Groupmod ✓

Userdel ✗

✓ Correct.

Switch users and sudo access

Switch Users and sudo Access

Commands
• su – username
• sudo command
• visudo

File
• /etc/sudoers

Sudo fdisk –l: to detect the disk consumption size.

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Which command will you run first if you don't have root privileges in the Linux machine? Drag the correct answer into the space provided.

Answer instructions

Sudo command ✓

Root command

Visudo command

Su – username command

✓ Correct.

System utility command

System Utility Commands

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

```
[Kirollos_Gerges@localhost ~]$ which pwd
/usr/bin/pwd
```

Cal:calender   Bc:binary calculator

```
[Kirollos_Gerges@localhost ~]$ uptime
 22:53:29 up 21 min,  4 users,  load average: 0.20, 0.14, 0.26
```

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Process and jobs

Processes and Jobs

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

Shell scripts or Commands are list of instructions e.g. adduser, cd, pwd etc.

Process / Services Commands

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

```
erges@localhost ~]$ systemctl stop ntp
top ntp.service: Unit ntp.service not loaded.
erges@localhost ~]$ systemctl restart ntp
estart ntp.service: Unit not found.
```

Top=Task manager in windows.

Ntpd

Which one of these refers to something written in a file and packaged in a way that it will execute? Choose one correct answer.

Answer instructions

Application	✗
Script	✓
Daemon	✗
Process	✗

Process management

nohup sleep 75 &

- 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`.

By: Imran Afzal

```
t@localhost ~]# nice -n 5 sleep 10
```

Done   nohup sleep 75

Which command allows you to bring a process that you had put in the background live again on your console? Drag the correct answer into the space provided.

Answer instructions

Fg ✓

Bg

Ctrl –z

pkill

<u>**System monitoring commands**</u>

System Monitoring

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

Free: gives a physical memory.

Df : display information about file system disk.

Top: to show Linux process.

Dmesg: examine the kernel ring buffer and print the message .

<u>**System Log monitoring**</u>

Cron is a system that helps Linux users to schedule any task.

Log Monitoring

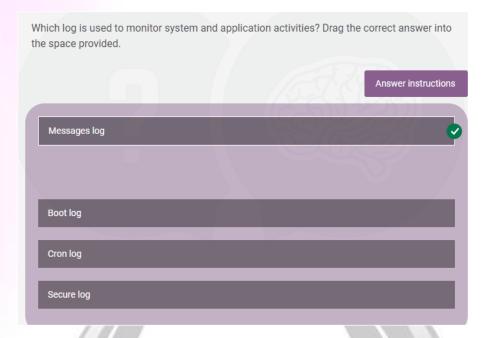Another and most important way of system administration is log monitor

Log Directory = **/var/log**
- boot
- chronyd = NTP
- cron
- maillog
- secure
- messages
- httpd

00:35

HTTPd stands for Hypertext Transfer Protocol daemon.

chronyd is a daemon process that runs in the background.

Which log is used to monitor system and application activities? Drag the correct answer into the space provided.

Answer instructions

Messages log ✓

Boot log

Cron log

Secure log

System maintenance commands

System Maintenance Commands

- shutdown
- init XXX 0-6
- reboot
- halt

Changing Hostname

```
[root@localhost ~]# hostnamectl set-hostname CODER
[root@localhost ~]# hostname
coder
```

Changing System Hostname

- hostnamectl - set-hostname newhostname

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

Finding system information

 Dmidecode 3.0 command requires you to be logged in as root to access system information

Finding System Information

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

System architecture

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 Commands

Terminal commandscommand

```
[root@coder ~]# script logfile-activity.log
Script started, file is logfile-activity.log
```

Script command stores terminal activities in a log file that can be named by a user

- **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

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Terminal control Keys

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).

Recover Root Password

Recover Root Password

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

```
rw init=/sysroot/bin/sh
ctrl x
chroot /sysroot
passwd root
exit
reboot
```

Summary

In this module you learned:

- A text editor is a program that enables you to create and manipulate data in a Linux file.

- The difference between the 32-bit and 64-bit processors are the number of calculations per second that they can perform.

- Multiple cores allow for an increased number of calculations per second that can be performed, which can increase the processing power.

- The script command stores terminal activities in a log file that can be named by a user.

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- The "usermod" command modifies user attributes such as the home directory, user group, and user identification number.

- Adding a user in Linux using the "useradd" command, the user account gets created in a locked state and creating a password for that user unlocks it.

- The "-f" argument is used to define the number of days after a password expires. By default, the password expiry is set to -1 to ensure that it doesn't expire.

- Text editors often require "memorizing" commands in order to perform editing tasks.

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