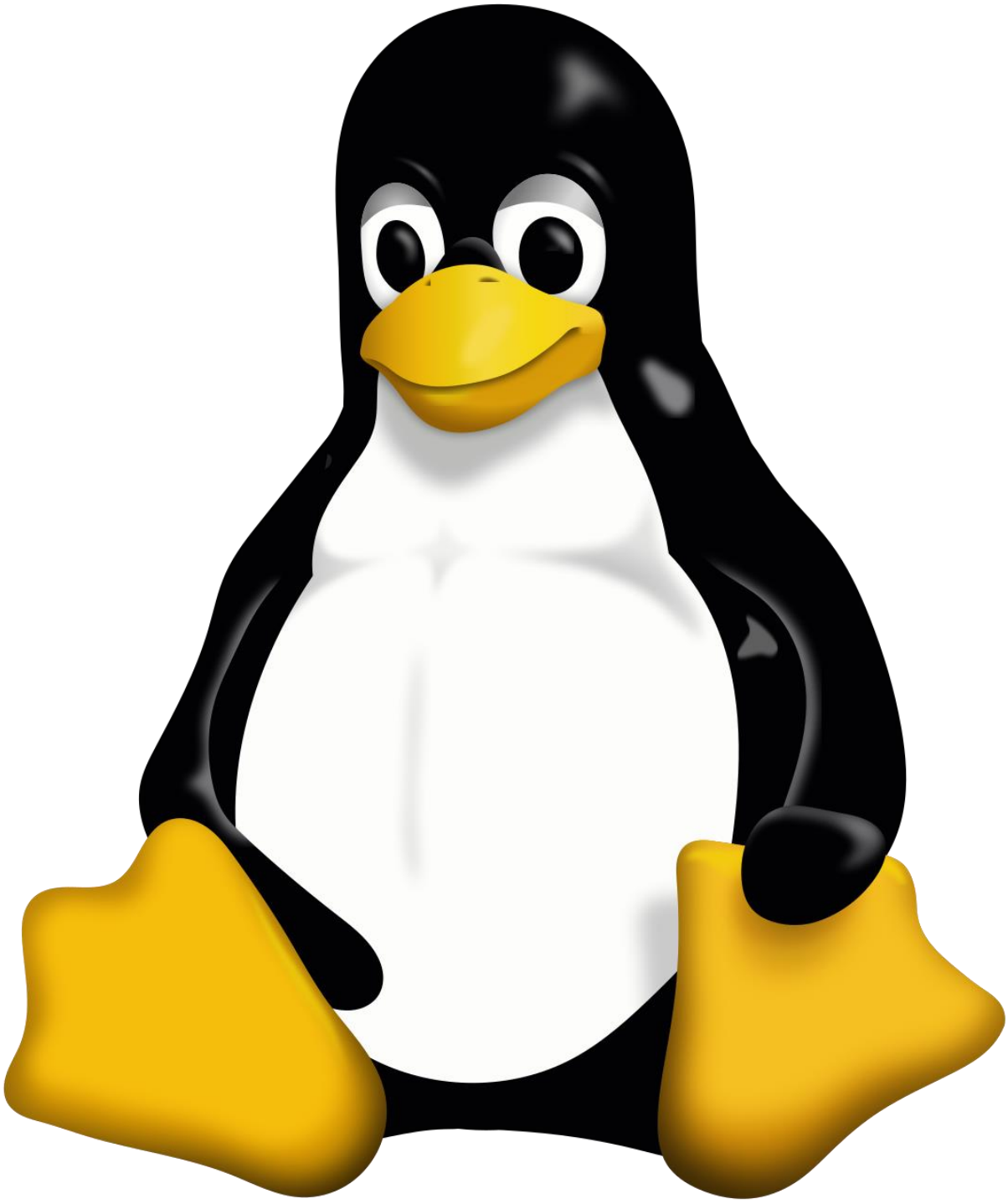


# Basic Linux LAB for DevOps

## 1. BASIC COMMANDS

- ls Listing the file and directory
  syn: # ls <options> <Destination directory>
  example: # ls –l
- man Help
  example: # man ls
- pwd Present working directory
  # pwd
- mkdir Creating Directory
  # mkdir murali
- cd Changing the directory
  # cd murali

### To Create a file

- There are four type file creation

- Cat
- Touch
- Vi editor
- Gedit

### Cat Command

it's used to one of the file creation and right now give some content.

- To Create a file
  # cat >murali
  welcome to
  accel it academy
  ^D
- To add a Content
  # cat >>murali
  Vadapalani
  ^D
- To view the content in a file
  # cat murali
  welcome to
  Accel it academy
  Vadapalani
  #

### Touch Command

- it's used to Empty file creation.

```
# touch murali
# touch a1 a2 a3        (many files at same time)
```

## Gedit Command

- It's file create and modify in X Windows Terminal

```
#gedit
   or
# gedit <filename>
# gedit murali
```

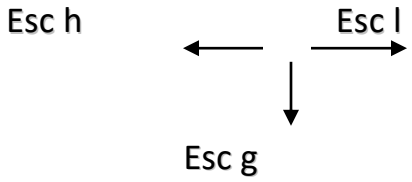
## Vi editor

- This type of file create and modify in CUI and GUI terminal mode.
- It's a editing tool.
- We can worked on three modes
    - ESC mode
    - Insert mode
    - Command mode

Syntax : # vi <Filename>
Example : # vi murali

- Esc a – Curser move the next position switch to insert mode.
- Esc i – Curser move to the beginning of the line and switch to insert mode.
- Esc A – Curser move to the end of the line and switch to insert mode.
- Esc o – Insert the new line below the curser position and switch to insert mode.
- Esc O – Insert the new line above the curser position and switch to insert mode.
- Esc r – Replace the single character.
- Esc R – Replace the enter line after the curser position
- Esc s – Deleted current character and switch to insert mode.
- Esc S – Deleted the enter line
- Esc x – To delete a character.

Esc k




- Esc gg – Move the curser to beginning of the first line.
- Esc GG – Move the curser to the beginning of the lost line.

- Esc w – Move the curser to beginning of the next word.
- Esc d – Move the curser to the beginning of previous word.
- Esc dd – Delete the current line's.
- Esc dw –delete the current word's.
- Esc yy – Copy the current line.
- Esc yw – Copy the current word.
- Esc p – Paste the line and words.
- Esc u –Undo.
- Esc + Ctr + r – Redo.
- Esc : set nu – To display enter line with numbering.
- Esc : q – Quite without save file.
- Esc : q! – Force quite without save file.
- Esc : wq – To save and Quit.
- Esc : wq! – To force save and quit.

- rmdir - To remove the directory
- rm –r - To remove the directory
- rm - To remove the file.
- type cat - To find out the location of the command
- file murali - To view the type of file
- wc - To view the no, of lines (l) , no, of word (w), no, of characters (c) in file
- mv - To move the file
- cp - To copy the file and directory
- head - 10 murali – To view the top 10 lines in a file
- tail – 10 murali - To view the bottom 10 lines in a file
- sort murali - To saw the order wise in a file ( numerical(-n) and reverse (-r)
- grep -To search for the string
- aspell –c murali – To check the correct content in a file
- hostname murali – To change the hostname in murali
- exit -To logout M/C
- logout - To logout M/C

- clear - To clear the screen
- who - who logged in to our system currently
- whoami - To show the current user
- tty - To show the current terminals
- echo - To display the typed message
- wall - To send the broadcast message
- Write - To send the message in particular user
- date - To show the date and time
- cal - To show the calendar
- bc - Calculator

## 2.RUN LEVEL AND BOOT LOADER

### The X-Window System

- The heart of Red Hat Linux is the kernel , for many users, the face of the operating system is the graphical environment provided by the X Windows System, also called X.

### Linux Boot Process & Run Level

- POST : (Power on self test )
  If will test what are commanded connected to the mother board and they are properly working or not.

- BSL : (Boot Strap Loader )
  If will search the correct position and the booting file in the secondary storage device, normally it'll search the MBR.

- MBR : (Master Boot Record )
  The Information about the boot loader.

- Boot Loader :
  - GRUB – Grant unified boot loader (default install in Linux)
  - LILO - Linux Loader

  GRUB file path " /etc/grub.conf "
  LILO file Path " /etc/lilo.conf "

### RUN LEVEL

- Init 0 – Halt
- Init 1 – Single-user mode
- Init 2 – Multi-user without Networking (user-definable)
- Init 3 – Full multi-user mode (CUI)
- Init 4 – Not used (use-definable)
- Init 5 – Full multi-user mode (with an x-based screen or GUI )
- Init 6 – Reboot
- To show the current run level
  # runlevel
- To change the run level
  # vi /etc/inittab
  id:3:initdefault

## 3. SINGLE USER MODE (or) CHANGING ROOT PASSWORD

- Enter into command user mode by clicking ctrl+alt+F1
- Reboot system by pressing ctrl+alt+Delete
- When os is booting press Esc key
- And press ‘e’ to edit
- Press down arrow and place the curser in line “kernel…….quiet”
- And press ‘e’ to edit
- Edit line “ quiet<space>1 and press Enter key
- Now press ‘b’ to boot
- Os will boot and stand in Sh-3#

Sh-3#

Sh-3#passwd

Create new password for root

Password:*******

Confirm new password

Confirm Password:*******

The root password was changed automatically

## 4.FILES PERMISSIONS

- To change the permission to file and directory's

**-/- - -/- - - /- - -**

### Types of the Files

- \- Regular file
- d Directory
- b Block device
- l Linking files
- c Character files

### Default permission in file and directory

- File

  \- / r w -/r - - /r - -

- Directory

  d / r w x /r – x /r – x

### File permission can be assign two ways

- Symbolic method.
- Numeric 0r Absolute method.

### Symbolic Method

- \+ To add a Permission
- \- To remove a permission
- = To assign permission to equal
- U User or Owner
- G Group
- O Other's or Public
- a All (user, group, and other's)

### Examples

- To create a file

  # touch murali

# ls –l

-/ r w - / r - - /r - -

- To change the permission

Ex 1: # chmod < Permission> <file or directory>

# chmod g+wx murali

-/ r w -/r w x /r - -

Ex 2: # chmod a=rw murali

- / r w - /r w - /r w –

**Numeric or Absolute Method**

- Permission can be assigned using numeric word.

4 read 4+2 = 6 = read and write

2 write 4+1 = 5 = read and execute

1 Execute 4+2+1= 7 = read ,write and Execute

**Examples**

- Syntax :

#chmod <permission> <File or Directory >

# chmod U G O file or dir

- Example:

#chmod 742 murali

d/ r w x / r - - /- w -

# chmod 312 murali

- / - w x /- - x / - w –

**Advance or Special Permission**

- This file permission assign to a execute file.

( Directory)

Setuid = 4

Setgid = 2

Stickybit = 1

- To assign execute permission user, group, and others means.

Setuid – Set user identify – s

Setgid – Set group identify – s

Stickybit – Other identify – t

- Can ‘t to assign execute permission user, group, and others means.

Setuid – Set user identify – S

Setgid – Set group identify – S

Stickybit – Other identify – T

**Examples**

- / - - S or s /- - S or s /- - T or T

Identify

## 5.FILE COMPRESSION

- To compressing the files.

* gzip :

It's Compressing Linux and Unix based files. It can compress up to 75% of the current files. The Compressed file will be in ".gz" format. Ex:

Ex: "murali.gz"

1. To Compress the file:

Syntax : # gzip <Filename>

Example : # gzip murali

2 To Unzipped the File:

Example : # gunzip murali.gz

3 To View the content in a gzip file :

Example : zcat murali.gz

* bzip2 :

It's Compressing Small based files. It can compress up to 65% of the current files. The Compressed file will be in ".bz2" format. Ex: Ex: "murali.bz2"

1. To Compress the file:

Syntax : # bzip2 <Filename>

Example : # bzip2 murali

2 To Unzipped the File:

Example : # bunzip2 murali.bz2

3 To View the content in a bzip file :

Example : bzcat murali.bz2

**tar compression**

- To compress a folder with keeping the original folder as it is
- It is same as winzip and winrar in Microsoft

**Create a directory and keep files in it**

[~]#mkdir aravind
[~]#cd aravind
[aravind]# touch a1 a2 a3
[aravind]# cd ..

**To view the size and permissions of directory or file**

[~]#ls –ld aravind

**Compress the file using tar**

[~]# tar cvf naveen.tar aravind *naveen.tar is the name that how you want to change the directory name you can save it as also aravind.tar

**To list the all tar files**

[~]# tar tvf naveen.tar aravind
[~]#ls
[~]#rm –rf aravind/
[~]#ls

**To extract files**

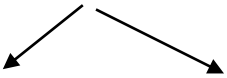
[~]# tar xvf naveen.tar
aravind /a1
aravind /a2
aravind /a3

**To compress, list, extract large folders or gunzip folders / More compression**

[~]# tar cvzf naveen.tar aravind
[~]# tar tvzf naveen.tar aravind
[~]# tar xvzf naveen.tar

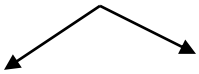
## 6.USERS & GROUPS

**USERS Administration**



Default users (assigned when installing os "root")

Manual users (created by root)



Simple creation

Manual creation

- Linux we can create up to 65535 users.
- Each user will be assign the unique id starting from 0 to 65535.
- User id from 0 to 99 is assigned for build user.
- We can assign the user id from 100 to 65535.
- By default system will assign the user id starting from 500.

**User Account Database**

#vim /etc/shadow

#vim /etc/passwd

**Simple Creation in Terminal**

- Syntax : # useradd <username> or
  # adduser <username>
- Example:
  # useradd murali

by default system create:

Home directory : /murali

User ID : 500

Group ID : 500

Shell : /bin/sh

**Manual Creation in Terminal**

- Syntax : # useradd <options> <username> or
  # adduser <options> <username>
- Example:
  # useradd -u 100 –s /bin/bash murali
- Options :

  -u – To set the user ID.

  -g – To set the group ID.

  -G – To set the secondary group ID.

  -c – Commands.

  -s – To specify the shell (ksh, bash, and t-csh or csh).

  ksh Korn shell

bash Bourne again shell
c-sh Turbo compiler shell

- To modify the user accounts:
  # usermod –u 200 –s /bin/bash murali
  to change the user ID (200) and shell (bash) in murali user.
- To deleting an user's:
  # userdel murali (to delete a without home directory)
  # userdel –r murali (to delete a with home directory)
- To set password the user:
  #passwd murali
  New password : *****
  Retype password: *****
- To set without password the user:
  # passwd –d murali (-d means without password).

**Group Administration in Terminal**

- A group contain similar type of user as it members. ( Collection of users called as group)
- The Group Add :
  Syntax : #groupadd [-g GID ] group name
  Example : #groupadd –g 100 Linux-Admin
- The Group Modify:
  Syntax : # groupmod [ -g new gid ] [ -n new name] group name
  Example : #groupmod –g 109 –n mail-Admin Linux-Admin
- The Delete a Group:
  Example : #groupdel Linux-Admin

**Graphical Mode (User & Group)**

On the GNOME desktop
↓
Main menue button (on panel)
↓
PROGRAMS
↓
SYSTEM
↓
User manager

## 7.Firewall with IP tables

- The Linux kernel contains advanced tools for packet filtering, the process of controlling network packets as they attempt to enter, move through, and exit your system.
- Structure:
  #iptables [-t <table-name>] <command> <chain-name> <parameter-1> <option -1> <parameter –n> <option –n>
- Commands :
  -A – Append the iptables rule to end of the specified chain.
  -D – Deletes a rule in a particular chain by number in a chain.
- INPUT:
  All incoming package are checked against rules in the change.
- OUTPUT:
  All outgoing package are checked against rules in the change.
- Packet Paten :
  -s – All the packet are checked for a specific source IP.
- Block :
  -j – The Packet's is drop , no massage send to the requesting computer.
- Reject :
  The Packet's drop, an error massage send to the requesting computer.

**Lab Steps**

- To set Firewall :
  # iptables –A INPUT –s 10.0.0.18 –j DROP
- To delete the Firewall :
  # iptables –A OUTPUT –s 10.0.0.18 –j DROP
- To set the total down the network in server:
  # ifconfig eth0 down
- To set the total up the network in server :
  # ifconfig eth0 up

## 8. NFS
## ( Network File System )
## NFS

- Introduced by SUN Microsystems, to share the files and binary between UNIX done operating system.
- It needs three protocols :
  rpc.portmapper
  rpc.nfsd
  rpc.mountd
- In NFS we have to export the mount point to be shared and it will be mounted on a client machine.

### Lab Steps

- Source Machine : (10.0.0.9)
  - To check the package
    # rpm –qa nfs*
  - To create a directory
    # mkdir /home/murali
  - To access the all user's in directory
    # chmod 777 /home/murali
  - To Share the directory
    # vi /etc/exports
    /home/murali *(rw,sync)
  - To update the service
    # service nfs restart
- Destinations Machine :
  - To create a directory
    # mkdir /root/shankar
  - To mount the sharing directory
    # mount –t nfs 10.0.0.9:/home/murali /root/shankar
  - To show the sharing directory
    # cd /root/shankar
    # ls –l

## 9. SAMBA

- With samba you can share a Linux file system with windows 95, 98, 2000 or NT.
- You can share a windows 95, 98, or NT FAT file system with Linux.
- You can also share printers connected to either Linux or windows 95, 98, 2000, or NT.
- The samba suite of SMB protocol utilities consists components.
- The smb daemon provides the file and print service to smb clients.

### Lab Steps

- Linux Machines :
  - To check the package
    # rpm –qi samba*
  - To create a directory
    #mkdir /opt/murali
    # chmod 777 /opt/murali
  - To share the directory
    # vi /etc/exports
    /opt/murali *(rw,sync)
  - To config the service file
    #vi /etc/samba/smb.conf
    (go to last line entry the contented )
    [murali]
    path = /opt/murali
    valid users = murali, shankar
    writable = yes
    #
  - To set the samba password
    #smbpasswd –a murali

6. To enable the service
   # service nfs restart
   #service smb restart

### Windows Base

Right click the My Network Places
Select search for computer
Type the Linux (samba) IP address
Select & Login

## 11 APACHE

### Apache Web Server

- The name Apache appeared during the early development of the software because it was
  " a-patchy" server.
- Port Number : 80
- Package Name : httpd
- Daemon Name : httpd
- To Configuration File
  " /etc/httpd/conf/httpd.conf "

### Lab Steps

- To check the package
  # rpm –qa httpd*
- To config the service file
  # vi /etc/httpd/conf/httpd.conf
  1032 line: servername murali.king.com.
- To Create or Put in html file
  # cd /var /www/html
  # vi index.html (don't change the html name)
  <html>
  <head> <title> test </title>
- To update the service
  # service httpd restart

**IN UBUNTU**

sudo apt install apache2
service apache2 status
service apache2 start

Document Root be in
**/etc/apache2/sites-availble/<sitename>.conf/**

**Installing PHP**

**Install PHP:**

**sudo apt-get install php -y**
**Then install common PHP extensions such as GD, MySQL, and so forth.**

**sudo apt-get install -y php-{bcmath,bz2,intl,gd,mbstring,mcrypt,mysql,zip} && sudo apt-get install libapache2-mod-php -y**

## 12 SENDMAIL
### Send mail

- It's used to mail purpose.

Lab Steps:

1. To Check the package
   # rpm –qi sendmail*
2. To modify the access file
   # vi /etc/mail/access
   murali.king.com RELAY
   local host RELAY
   127.0.0.1 RELAY
   10.0.0.9 RELAY

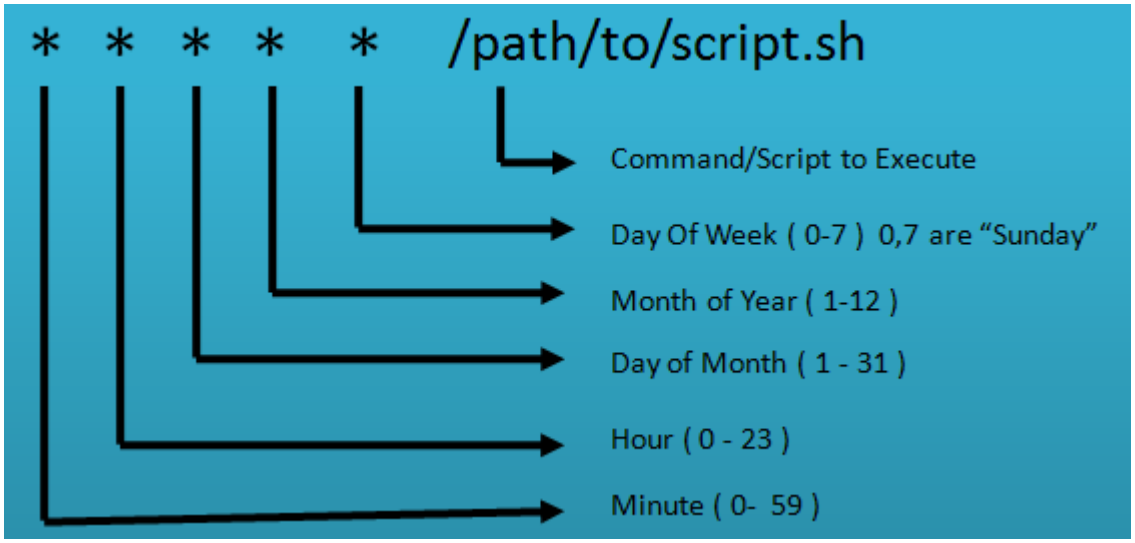
3. To config the service file
   # cd /etc/mail
   #vi sendmail.mc
   line 123 : Local _Domain (' murali.king.com')
4. To change
   # m4 sendmail.mc> /etc/sendmail.cf
5. To check
   # pgrep –l sendmail
6. To config the xinetd file
   #cd /etc/xinetd.d
   # vi imaps
   Disables = yes (u are change ' no ')
   #vi imap
   Disables = yes (u are change ' no ')
   # vi ipop2 and ipop2 and ipops3
   Disables = yes (u are change ' no ')
7. To update the service
   # service sendmail restart
   # service xinted restart

Result :

1. To send the mail to murali
   # mail murali ( murali mean user)
   u are enter the some one test
2. To check the mail so login to murali user
   # mail

## 13.Crontab

crontab –l → To show sheduled jobs running
crontab –e → to edit jobs




CTRL –D to save jobs
Then Check the Jobs.
crontab –l

----------End of the LABS----------