Linux Administration

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whoamI

Linux
System Administration
ANSIBLE
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CI/CD

Linux course objectives

- What is Linux OS?
- Linux administration AdminI and AdminII

Linux course Agenda

- File and Dir management
- User and group management
- Process management & env variables
- Linux file system & string processing & compression & Archiving & Transfer files & searching
- Package mang & service management & scheduling & storage mang
- Network mang

What is Linux?

- OS objectives:
  - HW management
  - Basics of any application.

- Linux is an open-source operating system under the GNU/GPL license.

- Linux advantages
  - Linux is open source.
  - Linux is secure and virus free.
  - Linux is perfect for programmers.
  - Linux has a better community support.
  - Linux is reliable.
  - Linux has better performance

Linux and unix distribution

- Unix distributions:
  - Oracle: Solaris
  - IBM:HIX
  - HP:HP/UX
  - Silicon Graphics:IRIX
- Linux distributions:
  - Redhat: Redhat server(updated each 18 months), Centos(free), Fedora(updated each 6 months)[testing], Rocky
  - Ubuntu: Debian[stable], Ubuntu[testing], Kali
  - Novell: SUSE[stable], OpenSUSE[testing]
  - Minit

Linux components

- **Kernel**
  - Is the core of the operating system.
  - Contains components like device drivers.
  - It loads into RAM when the machine boots and stays resident in RAM until the machine powers off.
- **Shell**
  - Provides an interface by which the user can communicate with the kernel.
  - The shell parses commands entered by the user and translates them into logical segments to be executed by the kernel or other utilities.
  - There are lot of shells as :
    - Bourn Shell (sh)
    - Korn Shell (ksh)
    - C Shell (csh)
    - Bourn Again Shell (bash) ➔ is the most commonly used shell on Linux
  - They have different features that will be discussed later
- **Terminal and GUI(default shell)**
  - Gives the shell a place to accept typed commands and to display their results.

Linux filesystem tree

- /

- etc tmp home root dev bin sbin usr var

- Some important files under these directories:
  - /etc/passwd
  - /etc/group
  - /etc/shadow
  - /usr/bin
  - /usr/sbin
  - /var/spool/mail
  - /var/log

Linux paths

Absolute path

Is the full path from / to the place where you need.

Relative path

Is the path from your current place to the place where you need

Note:

. => means current directory

..=> means parent directory

Linux Command syntax

- command
- command -<option>
- command -<option> <argument>
- command -<option> <file>

- Make sure from
  - Spelling
  - Case
  - Spaces
  - Syntax

Linux installation labguide

Linux basic commands

- Print system info
  - #uname → print your operating system
  - #uname –n → print your hostname
  - #uname –a → print all info (OS, hostname, kernel)
- Display a calendar
  - #cal
  - #cal [month] [year]
  - #cal [year]
- Print or set the system date and time
  - #date
  - #date +%B → to print only the current month
- Print effective user
  - #whoami → print the effective user who access now

Directories

- **Changing directories**
  - #cd /home/user1/work
  - #cd ..
  - #cd ~
  - #cd – (to undo to my last place)
- **Listing directory contents**
  - #ls
  - #ls -l
  - #ls -ld
  - #ls –i
  - #ls -R
  - #ls -a
  - #dir --color
- **Printing current directory**
  - #pwd
- **Directory creation**
  - #mkdir
  - #mkdir -p

Files

- **File naming**
  - File names may be up to 255 characters.
  - There are no extensions in Linux.
  - Avoid special characters as >< ? * # '.
  - File names are case sensitive.
- **File creation**
  - #touch
- **Viewing File content**
  - #cat fname
  - #more fname
  - #head -n fname
  - #tail -n fname
  - #tail –f
  - #wc [wc -l, wc -w, wc -c]

vi text editor

- Vi editor (visual editor) is the default editor for Unix and Linux OS.
- Vi is used to manage file content.
- Vi is an interactive editor that you can use to create and modify test files.
- Usually, the only editor available in emergency mode.
- vi in Linux is usually vim (vi improved):
  - Syntax highlighting.
  - Arrow keys, Del, BS work in insert mode.
  - Mouse support.
- An advantages of this editor is that we can manipulate text without using a mouse. We can only need the keyboard.
- Vi has **3 basic modes**
  - command mode (Default mode, Perform commands to delete, copy, ...)
  - Edit (insert) mode➔ Enter text into the file
  - Last line mode ➔ To access it, enter a colon (:) while in the command mode

vi text editor operations

- The syntax of vi command:
  - #vi <filename>
- To recover a file
  - #vi -r filename
- Viewing files in Read-only mode:
  - #view filename
  - Perform the :q command exit.
- Inserting and appending text:
  - i ➔Inserts text before the cursor.
  - o ➔Opens a new blank line below the cursor.
  - a ➔Appends text after the cursor.
  - A ➔append text at the end of the line.
  - I ➔insert text at the beginning of the line.
  - O ➔opens a new line above the cursor.
  - After editing Press esc to enter command mode.
- Moving the cursor within the vi
  - e ➔ to the end of the current word.
  - 0 ➔ to the beginning of the line.
  - $ ➔ to the end of the line
  - G ➔ to the last line in the file
  - 1G ➔ to first line in the file

vi text editor operations

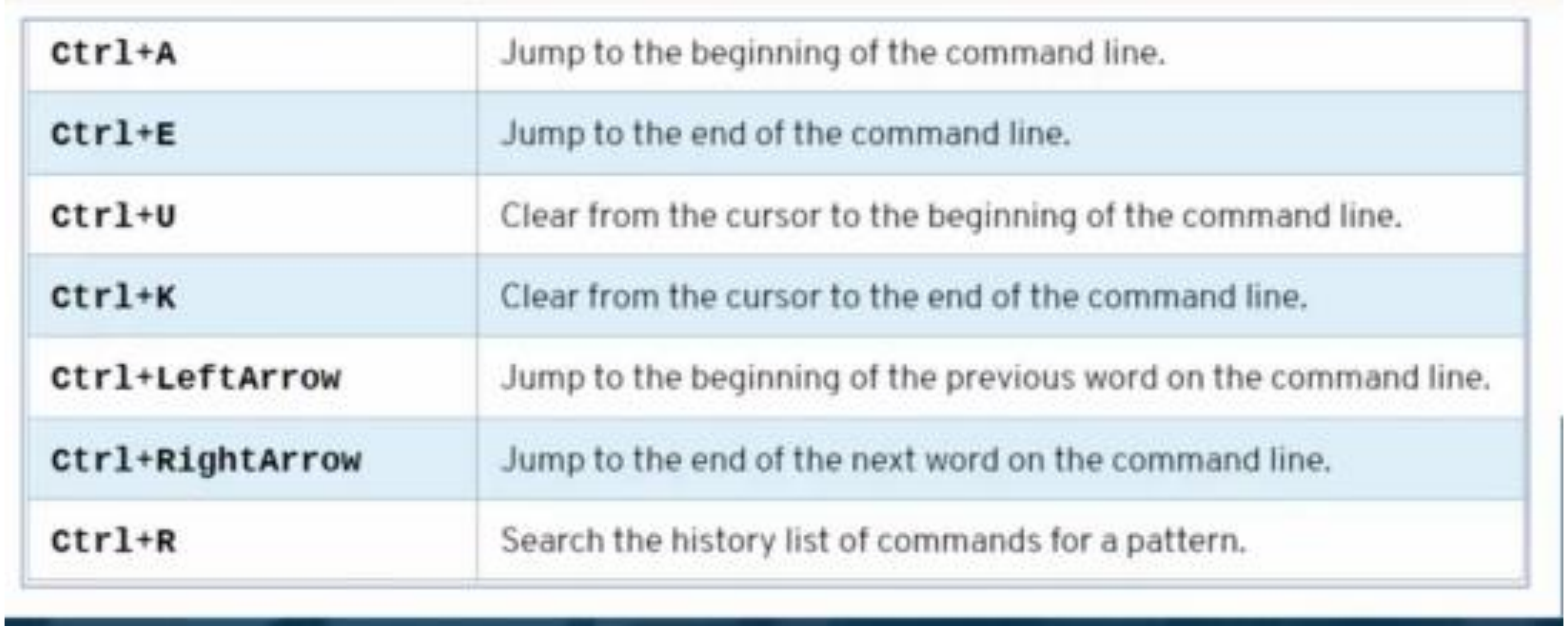
- Save and quit
  - :w ➔ save the file.
  - :w new_file ➔ save as new file.
  - :wq, ➔ save and quit.
  - :q! ➔ quit without saving.
- Search and replace
  - /string ➔ Searches forward for the string.
  - ?string ➔ Searches backward for the string.
  - n ➔ Searches for the next occurrence of the string.
  - N ➔ Searches for the previous occurrence of the string.
  - %s/old/new/g ➔ Searches for the old string and replaces it with the new string globally.
- Customization vi session
  - set nu, :set nonu ➔ show and hide line numbers.

File and dir manibulation

- Copying files and dirs.
  - #cp <source_file> <destination_dir>
  - #cp –r <source_dir> <destination_dir>
  - #cp -i ➔ Prevents you from accidentally overwriting existing files or dirs
  - #scp <source_file> <user>@<remote_host>:<destinamtion_dir>
- Moving and renaming files
  - #mv <source_file> <destination_dir>
- Remove files and dirs.
  - #rm <file_name>
  - #rm –f <file_name>
  - #rmdir
  - #rmdir –p
  - #rm –r
  - #rm -rf

Linux documentation

- Linux has more sections for its documentation
  - Section 1 ➔ to search for user commands
  - Section 5 ➔ to search for configuration files
- Man command
  - #man cat ➔ search about cat in the first section it's exits
  - #man –f passwd ➔ to show passwd exist in which section
  - #man –a passwd➔ to search about passwd in all sections
  - man –s5 passwd➔ search about passwd in section5 only
  - man –k calender➔ search by any keyword



Ctrl+A	Jump to the beginning of the command line.
Ctrl+E	Jump to the end of the command line.
Ctrl+U	Clear from the cursor to the beginning of the command line.
Ctrl+K	Clear from the cursor to the end of the command line.
Ctrl+LeftArrow	Jump to the beginning of the previous word on the command line.
Ctrl+RightArrow	Jump to the end of the next word on the command line.
Ctrl+R	Search the history list of commands for a pattern.

Terminal shortcuts

- TAB completion
- \ ➔ if we have a many lines command