System Administration 101 (Linux)

University of Stavanger

Goal

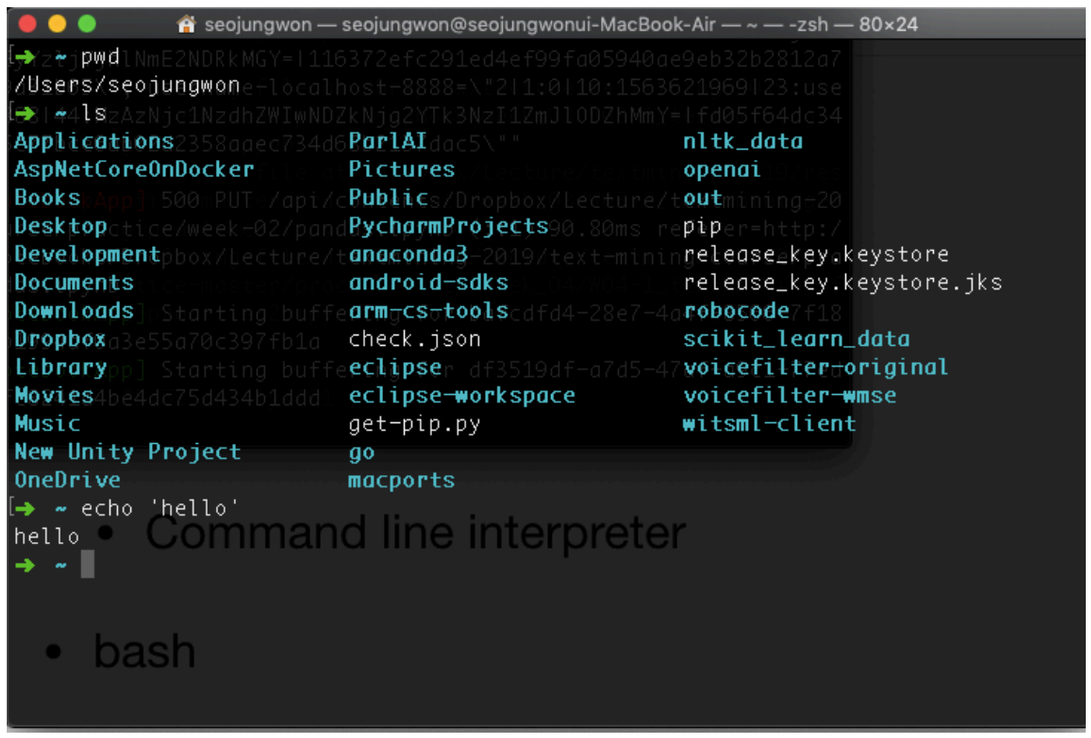
- Reviewing the basic term in the Linux environment.
- Reviewing the common Linux command.
- Quiz
- Tasks

Terms

- shell
- terminal
- bash
- server
- host
- port
- directory
- folder
- file
- path
- resource
- memory
- cpu
- disk
- core
- permission
- root
- sudo

Shell, Terminal, Bash

- **Terminal**
  - Text input/output environment
- **Shell**
  - Command line interpreter
- **Bash**
  - One types of shell
  - The most common shell in modern linux systems



e.g.,
“Open your terminal,
and generate the file using a bash script”

Server, Host, Port

- ‘Server’ and ‘Host’ are often used interchangeably.

- **Host** is a computer or another device that connects to the network while a **server** is a software or a hardware device that provides services to other programs or devices in the network.
    - e.g., *“A web host (or web hosting company) maintains multiple web servers and provides web hosting services for clients.”*

- Port
    - A port is an **addressable network location** implemented in an operating system to help differentiate traffic destined for different services or applications.

*** source: https://techterms.com/definition/host**
**** source: https://pediaa.com/difference-between-host-and-server/**
***** source: http://www.linuxandubuntu.com/home/what-are-ports-how-to-find-open-ports-in-linux**

Path, Directory, Folder, File

- **Path:** the general form of the name of a file or directory, specifies a unique location in a file system.

    - **Absolute path**: full path from root directory
      e.g., : C:\Users\Desktop

    - **Relative path**: way to specify the directory from another
      e.g., : ../, ../../, ../Users

- **Directory** = Folder

    - A directory is a **file system cataloging structure** which contains references to other computer files, and possibly other directories.

- **File**: *“In Linux, everything is a File”*

    - A file is an object on a computer that stores data, information, settings, or commands used with a computer program.

*** source: https://www.tecmint.com/explanation-of-everything-is-a-file-and-types-of-files-in-linux/**

**** source: https://www.computerhope.com/jargon/f/file.htm**

Resource, memory, disk, core

- **Resource** is any physical or virtual component of limited availability within a computer system.
- **Memory** mainly means the size of RAM.
- **Disk** means disk space (HDD, SSD).
- **Core** means each processor in CPU.

Permission, Root, Sudo

- Each file and process is owned by different users.
- We do not have ‘**permission**’ to manipulate others’.
- However, the **root** account has permission for everything.
- When we run a command as a root account in Linux, we start the command with **sudo**.

Linux commands

- File and directory commands
- Archives related commands
- Network related commands
- Other useful commands

File and directory commands

- **cd**: move to the certain directory
- **pwd**: show the current path
- **ls**: display the files in the specified directory
- **touch**: create a new file
- **rm**: remove the file
- **cp**: copy the file to others
- **mv**: move (rename) the file.
- **cat**: display the contents of file
- **less**: browse through a text file
- **head**: display the first n-lines of a file
- **tail**: display the last n-lines of a file
- **find**: find files in the specified directory

Archive related commands

- **tar**
  - **(compress)** tar cf archive.tar directory
  - (**extract)** tar xf archive.tar
  - **(compress)** tar czf archive.tar.gz directory
  - **(extract)** tar xzf archive.tar.gz
  - **(compress)** tar cjf archive.tar.bz2 directory
  - **(extract)** tar xjf archive.tar.bz2
- **zip**
  - **(compress)** zip archive.zip directory
  - **(extract)** unzip archive.zip

Network related commands

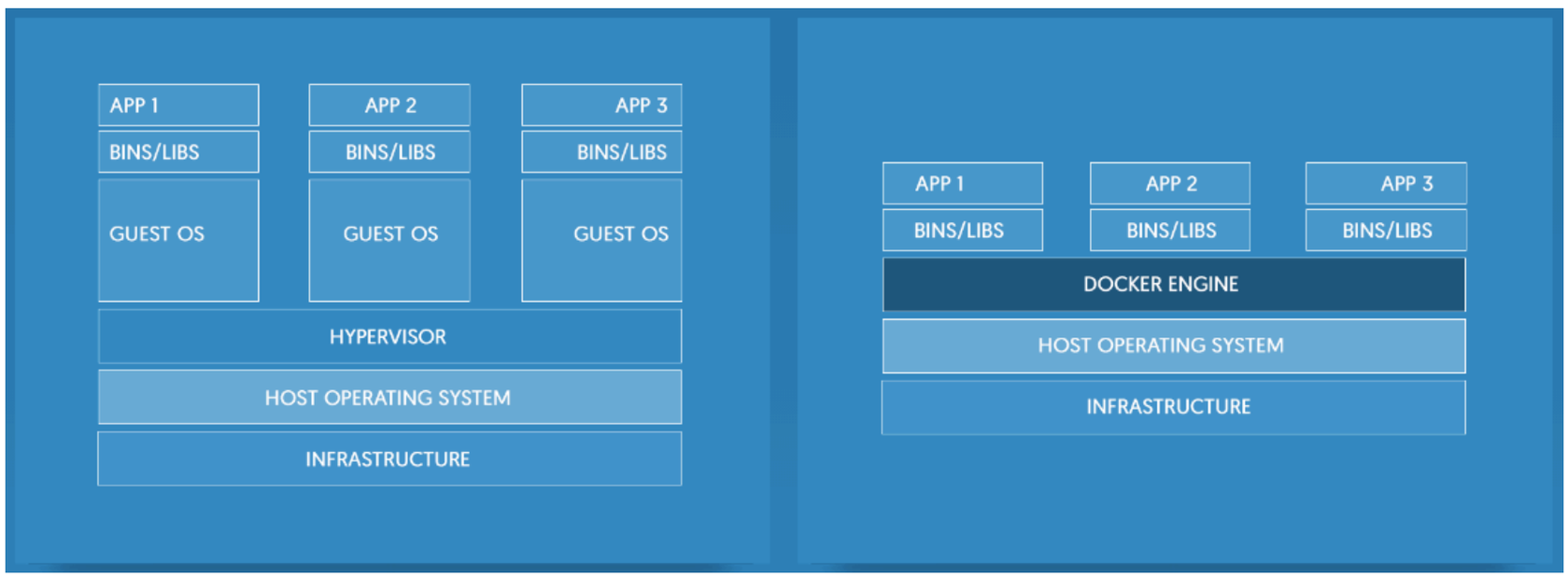
- **ssh:** connect to host using port
  - ssh -p port user@host
- **scp:** secure copy to/from host from/to local
  - (to server) scp file host:/path
  - (from server) scp host:/path/file /localpath
- **wget / curl:** download the file
  - wget host/file.txt
  - curl host/file.txt --output some.file
- **ping:** send echo request to host
  - ping **www.google.com**

Other useful commands

- **top (htop)**: display and manage the top processes
- **df -h (-i)**: show free and used space (inodes) on mounted filesystems
- **kill pid**: kill process with process ID of pid
- **chmod**: change the permission of a file
- **chown**: change the ownership of a file

Virtualization

- How can we set up linux environment in our local machine? (when we use Windows or Mac)
  - Option #1: VirtualBox or VMware
  - Option #2: Docker



Virtual Machine **Docker**

Quiz

Tasks