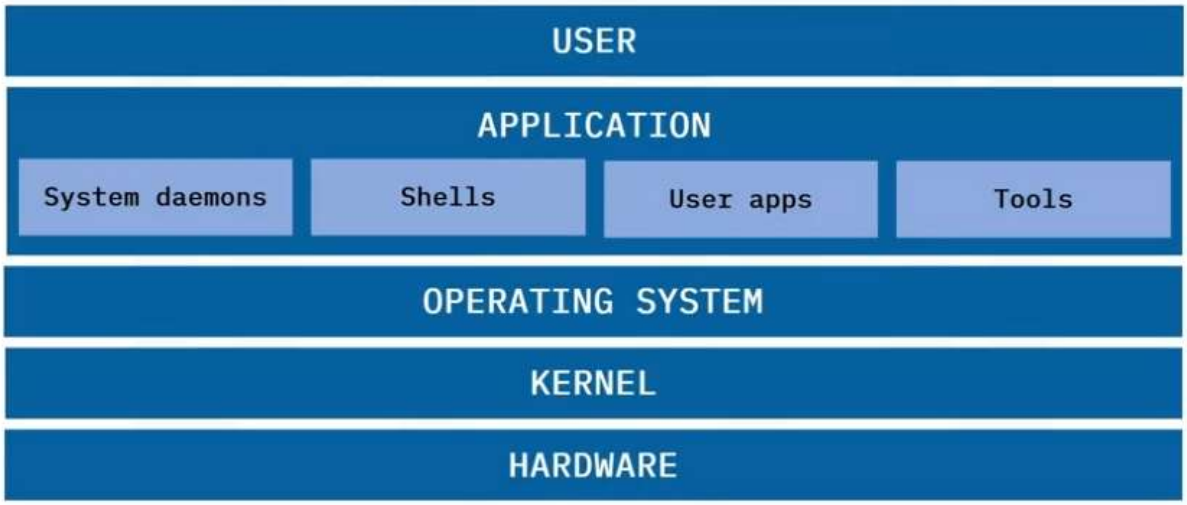
Hands on Linux command and shell script

Summary

- Unix is a family of operating systems dating from the 1960s
- Linux was originally developed in the 1980s as a free, open source alternative to unix
- Linux is multi-user, portable, and supports multitasking
- Linux is widely used to day in mobile devices, supercomputers,cloud server

Linux Architecture



* **Kernel** is the lowest-level software in system and remains in memory, bridge between apps and hardware, perform memory management, process management, device drivers, system calls and security

Linux distribution (distro)

It is a specific flavor of Linux OS that has specific system utilities, GUI, Shell commands…(Debian/Ubuntu, Red Hat Enterprise Linux, SUSE enterprise)

Linux Shell

The shell is an OS-level application that interprets commands:

- Moving and copying files
- Writing to and reading from files
- Extracting and filtering data
- Searching for data

Linux terminal is an application you can use to interact with Linux shell

Special paths:

~ Home directory
/ Root directory
.. Parent of current directory

. Current directory

Linux Terminal Tips - Tab completion (Tab Key)

```
~ $ cd P
```

and press TAB, the shell will autocomplete this to:

```
~ $ cd Pictures/
```

- Command History (Up arrow Key)

Text file modify

*Editor

-Command-line text editors

- GNU nano
- Vi
- Vim
  - Insert mode: press i to enter, ESC to exit
  - Command: sav w q q!

-GUI-based text editors

- Gedit

-Command line or GUI:

- Emacs

Update summary

- .deb and .rpm are distinct file types used by package managers in linux OS
- Deb and RPM formats can be converted from one to the other
- Update Manger and PackageKit are popular GUI-based package managers
- Apt and yum are popular command line package managers used in deb- and RPM-based distros

Hand-on Lab:

- Interact with the Linux Terminal
- Navigate directories on a Linux filesystem and explore their contents
- Install and update packages
- Create and edit files using nano
- Run shell commands and applications from the terminal

Exercise 1 - Navigating Directories

`cd`

In this exercise, you will explore directories on the cloud IDE Linux system using the `cd` command.

Recall the special paths:

Symbol	Stands for
`~`	Home directory
`/`	Root directory
`.`	Current directory
`..`	Parent directory

1.1. Changing working directory to home directory — cd ~
1.2. Changing working directory to parent — cd ..
1.3. Changing working directory to root directory — cd /
1.4. Changing working directory to child (*bin is child of root*) — cd bin
1.5. Changing working directory back to home directory — cd ../home/theia
1.6. Changing working directory back to project directory — cd ../project

Exercise 2 - Browsing Directories

`ls`

In this exercise, you will explore browsing the content of directories using the `ls` command.

`ls` is a special command that the shell knows by default. You will learn about many more of these commands in the future.

2.1. Viewing files in the current working directory — ls
2.2. Viewing files in any directory — ls /

/bin	System libraries
/sbin	Binaries that require root privileges
/usr	User programs and data
/home	Home directory
/media	Removable media device directories

Exercise 3 - Updating and Installing Packages

In your lab environment, we provide access to the `sudo` command. Be careful not to break your system!

3.1 Getting latest packages information
3.2. Updating nano
3.3. Installing vim

Exercise 4 - Creating and Editing Files

For the purpose of this lab, you will be use `nano` to create and edit files.

This is because `nano` is known as simple to use and easy to master.

On the other hand, vim can be harder to learn - though it has many more features.

- Create and edit text files using nano and vi editors.

4.1 Navigating to the project directory	cd /home/project
4.2 Creating and editing a file	nano myprogram.py
4.3 Running the Python file you made	python3 myprogram.py ctrl+x

Summary

- Linux originated in the 1990s when Linus Torvalds developed a free, open source version of the Unix kernel.
- Linux is multi-user, portable, and supports multitasking.
- Linux is widely used today in mobile devices, desktops, supercomputers, data centers, and cloud servers.
- Linux distributions (also known as distros) differ by their UIs, shell, applications, and how the OS is supported and built.
- The design of a distro is catered toward its specific audience and/or use case.
- Popular Linux distributions include Red Hat Enterprise Linux (RHEL), Debian, Ubuntu, Suse (SLES, SLED, OpenSuse), Fedora, Mint, and Arch.
- The Linux system consists of five key layers: user, application, OS, kernel, and hardware.
- The kernel is the lowest-level software and it enables applications to interact with your hardware.
- The shell is an OS-level application for running commands.
- You use a terminal to send commands to the shell.
- You can use the cd command to navigate around your Linux filesystem.
- You can use a variety of command-line or GUI-based text editors such as GNU nano, vim, vi, and gedit.
- Deb and RPM packages contain software updates and installation files.
- You can use GUI-based and command-line package managers to update and install software on Linux systems.