



Welcome to this session: Introduction to Linux

The session will start shortly...

Questions? Drop them in the chat.
We'll have dedicated moderators
answering questions.



Skills Bootcamp Full Stack Software Development

- The use of disrespectful language is prohibited in the questions, this is a supportive, learning environment for all - please engage accordingly. **(Fundamental British Values: Mutual Respect and Tolerance)**
- No question is daft or silly - **ask them!**
- There are **Q&A sessions** midway and at the end of the session, should you wish to ask any follow-up questions. Moderators are going to be answering questions as the session progresses as well.
- If you have any questions outside of this lecture, or that are not answered during this lecture, please do submit these for upcoming Academic Sessions. You can submit these questions here: **Questions**

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- For all **non-academic questions**, please submit a query:
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What is the core component of Linux that manages hardware and software interactions?

- A. Desktop environment
- B. Kernel
- C. Terminal
- D. Command Line

What is the default interface for Linux?

- A. Command Line Interface (CLI)
- B. Graphical User Interface
- C. Touch Interface
- D. Voice Interface

Learning Outcomes

- Describe Linux and the role it plays in software development
- Understand the basic command line operations that can be used to carry out day to day tasks
- Implement basic UNIX commands.

Lecture Overview

- Introduction to Linux
- Linux as a developer
- Setting up an Linux environment
- Navigating the Linux command line

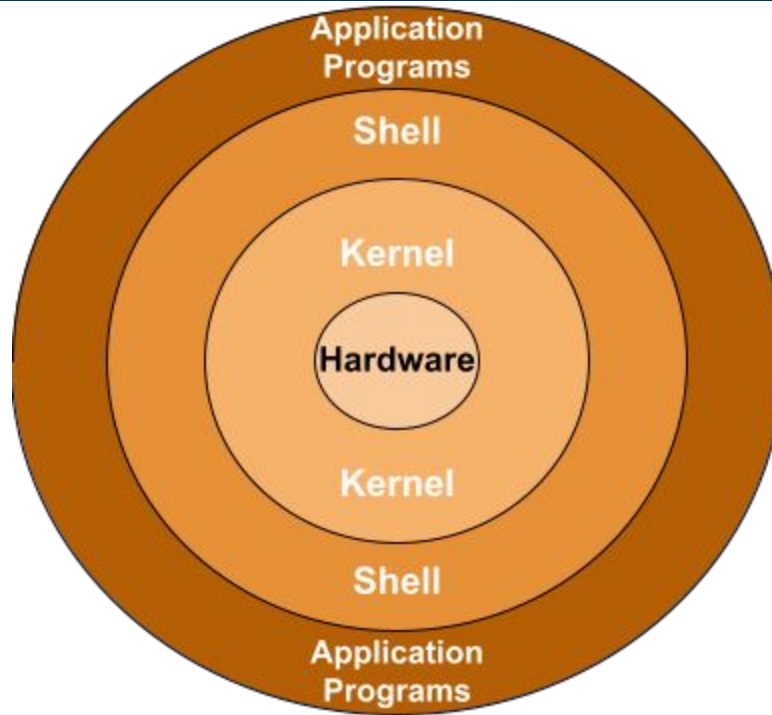
UNIX STRUCTURE

- **The Kernel (Brain)**
 - Core of the OS; runs at the highest privilege level.
 - Handles memory allocation, device communication, I/O operations, and process scheduling.
 - Monolithic kernel example: Linux Kernel, which relies on systemd (init daemon).
- **The Shell (Messenger/Nervous System)**
 - Interface between user/applications and kernel.
 - Interprets commands (e.g., `cp yes.txt indeed.txt`) and instructs the kernel.
 - Types: Bash, Zsh, GNOME Shell

Unix Structure cont.

- **The Userland (Skeleton/Skin)**
 - Separate from kernel space.
 - Houses libraries and applications for user interaction with the kernel.
 - Ensures process isolation with dedicated memory spaces.

Unix Structure



Introduction to Linux

❖ **Basic Linux concepts for developers:**

- Setting up and connecting to a Linux system
- Navigating the terminal
- File management
- Installing and managing tools and dependencies
- Running applications and services.

Setting up a Linux Environment

- ❖ Before setting anything up, it's important to know which flavour suits your needs.
- ❖ Some of the most popular flavours include:
 - **Ubuntu** - Desktop, servers, cloud computing
 - **Debian** - Servers, development environments
 - **Fedora** - Development, enterprise computing, workstations
 - **Arch Linux** - Enthusiasts, development
 - **Red Hat Enterprise Linux** - Enterprise Servers, Cloud computing
 - **Kali Linux** - Security research, Penetration testing, Hacking
 - **OpenSUSE** - Servers, Professional workstations

Setting up a Linux Environment

❖ Approaches

- Running on desktop as main OS
- Windows Sub System for Linux (WSL)
- Local Virtual machine
 - VirtualBox
 - VMWare
- Cloud Virtual Machine
 - Azure
 - AWS
 - DigitalOcean

Package Managers

- ❖ Package managers allow us to
 - **Install software** - Get packages from a trusted source
 - **Update software** - Get the latest versions of installed software
 - **Resolve dependencies** - Ensures all required libraries are installed
 - **Remove software** - Do clean uninstallations of packages
 - **Verify integrity** - Ensure downloaded software is authentic and secure.

Package Managers

- ❖ To install a package, we can use the **apt install** **<package-name>** command.
- ❖ Some packages will require additional steps to install correctly. It's important to go through the steps listed out in the documentation of the tool that you're trying to setup in order to get it running correctly.

Navigating the Linux Terminal

- ❖ Home (/)
 - Top most directory in the Linux file system
 - Used to reference any file/folder in the system
- ❖ Root (~)
 - The root directory for the current user
 - Used to reference any file/folder within a specific users root directory
- ❖ Current Directory(.)
 - References the current directory and it's contents
- ❖ Parent Directory (..)
 - References the parent directory for the the current directory.

Navigating the Linux Terminal

- ❖ Basic navigation and information
 - **pwd** - Shows the full path to the current directory
 - **ls** - Lists the files and folders in a directory
 - **ls -a** - Includes hidden files and .files in the output
 - **ls -l** - Shows additional information about the files and folders.
 - **cd <directory>** - changes directories to another directory
 - **cd /** - Goes to the home directory from any directory
 - **cd ~** - Goes to the root directory from any directory
 - You can build from the root/home path to any directory you want

Navigating the Linux Terminal

❖ Managing files

- **mkdir <dir-name>** - Creates a new folder
- **touch <file-name>** - Create a new file
- **rm <file-name>** - Removes a file
 - **rm -r <dir-name>** - Removes a directory and all of its content recursively
- **mv <existing-file-name> <existing-dir-name>** - Moves a file/folder into another existing directory
 - **mv <existing-file-name> <new-file-name>** - Changes the name of a file
- **cp <existing-file> <file>** - Copies the content of a file
- **cp -r <existing-dir> <dir>** - Copies all of the content from one directory into another.

Navigating the Linux Terminal

- ❖ Working with files
 - **cat <file-name>** - Print the content of the file in the console
 - **echo "text" > <file-name>** - Write values to a file
 - **echo "text" >> <file-name>** - Append to a file
 - **nano <file-name>** - Open the nano editor for editing files
 - **vim <file-name>** - Open the Vim editor to edit file

Navigating the Linux Terminal

- ❖ Archiving and compression
 - **tar -cvf archive.tar <file/folder>** - Create a .tar file with the different files specified
 - **tar -xvf archive.tar <file/folder>** - Extract the data that is in a .tar file
 - **gzip <file/folder>** - Compresses a file and create a .zip file
 - **gunzip <file/folder>.zip** - Unzips a .zip file

Navigating the Linux Terminal

❖ Basic Networking

- **scp** **<local-file>** **<ssh-location>** - Moves the files from a local machine to a remote machine using SSH
- **curl** **<url>** - Make HTTP requests
- **wget** **<url>** - Make HTTP requests, allows recursive downloads

Navigating the Linux Terminal

❖ System Information

- **whoami** - Check the currently logged in user
- **which <package-name>** - Get the path to a specific CLI tool
- **df -h** - Show the disk by applications
- **free -h** - Show available storage on the system
- **top** - Show running process and resource usage
- **htop** - Show running process and resource usage with a nicer interface
- **kill PID** - Kill a running processes using its PID



What can we use to move files from one machine to another?

- A. apt
- B. SCP with SSH
- C. cURL with SSH
- D. cURL



Which command would we use to delete a directory and all of its content (including sub-directories)

- A. `rm <dir-name>`
- B. `rm -r <dir-name>`
- C. `rm *`
- D. `cp <dir-name>`



Questions and Answers



Thank you for attending



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