



# Welcome to the CoGrammar

## Introduction to Linux

**The session will start shortly...**

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

## Cyber Security Session Housekeeping

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- 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.
- 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](#)

## Cyber Security Session Housekeeping cont.

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- For all **non-academic questions**, please submit a query: [www.hyperiondev.com/support](http://www.hyperiondev.com/support)
- We would love your **feedback** on lectures: [Feedback on Lectures](#)
- Find all the lecture **content** in you [Lecture Backpack](#) on GitHub.
- If you are hearing impaired, please kindly use your computer's function through Google chrome to enable captions.

# Safeguarding & Welfare

We are committed to all our students and staff feeling safe and happy; we want to make sure there is always someone you can turn to if you are worried about anything.

If you are feeling upset or unsafe, are worried about a friend, student or family member, or you feel like something isn't right, speak to our safeguarding team:



Ian Wyles  
Designated Safeguarding  
Lead



Simone Botes



Nurhaan Snyman



Rafiq Manan



Ronald Munodawafa



Tevin Pitts

Scan to report a  
safeguarding concern



or email the Designated  
Safeguarding Lead:  
Ian Wyles

[safeguarding@hyperiondev.com](mailto:safeguarding@hyperiondev.com)

# ***Stay Safe Series:***

Mastering Online Safety One week at a Time

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While the digital world can be a wonderful place to make education and learning accessible to all, it is unfortunately also a space where harmful threats like online radicalization, extremist propaganda, phishing scams, online blackmail and hackers can flourish.

As a component of this BootCamp the ***Stay Safe Series*** will guide you through essential measures in order to protect yourself & your community from online dangers, whether they target your privacy, personal information or even attempt to manipulate your beliefs.

## Security Tip

Think Twice Before Using Public Wi-Fi While free Wi-Fi can be tempting, especially on campus or in coffee shops, it can put your personal information at risk. To stay safe:

1. Avoid Sensitive Transactions.
2. Use a VPN: A Virtual Private Network (VPN) encrypts your data, protecting it from hackers on public networks.
3. Forget the Network: After using public Wi-Fi, forget the network to avoid automatically reconnecting in the future.
4. Turn Off Sharing: Disable file sharing on your device to reduce exposure to potential threats.

Stay connected, but stay protected!



# CoGrammar

## Introduction to Linux.

November 2024

# Learning Objectives & Outcomes

**By the end of the lecture, everyone should be able to:**

- Identify basic Linux commands such as `ls`, `pwd`, `cd`, `mkdir`, and `rm`.
- Recall the structure of the Linux file system, including key directories like `/home`, `/bin`, and `/etc`.
- Define key concepts of file permissions (read, write, execute) and their representation.



# Polls

Please have a look at the poll notification and select an option.

Which of the following commands would you use to list all files, including hidden files, in a directory

- A. `cd`
- B. `Ls -a`
- C. `pwd`
- D. `rm -rf`

# Polls

Please have a look at the poll notification and select an option.

In the linux file system, which directory typically contains user-specific files and folders?

- A. /etc
- B. /home
- C. /var
- D. /bin

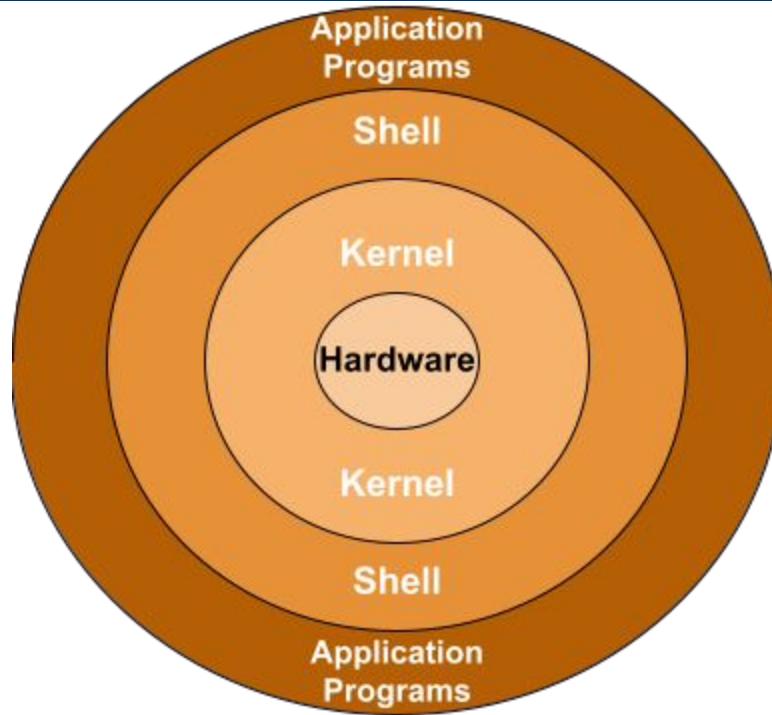
# UNIX STRUCTURE

- **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



# Navigation: Common commands

- General Tools:
  - **man**: Access the manual for installed utilities
  - **ssh**: Remote shell access via SSH server.
- Linux commands cheat sheet:
  - [https://github.com/skills-cogrammar/C9-Lecture-Backpack/tree/main/CyberSecurity%20\(CS\)/Week10/Tutorial/Linux-Bash-Commands](https://github.com/skills-cogrammar/C9-Lecture-Backpack/tree/main/CyberSecurity%20(CS)/Week10/Tutorial/Linux-Bash-Commands)



# Introduction to Files in Unix

- In unix-like systems, everything is treated as a file.
- Important Directories
  - **/var**: Dynamic data(e.g, Config files)
  - **/home**: User data
  - **/etc**: System configuration
  - **/dev**: Device files and pseudo devices

# Special variables

- File variable:
  - `~`: Home Directory
  - `.`: Current directory
  - `..`: Parent directory
  - `/`: Root directory

# Understanding stdin and stdout

## Standard Input (**stdin**)

- **Definition:** The default source of input for a program (usually the keyboard).
- **Key Point:** Programs read data from **stdin**.

```
(walobwad@kali)-[~]  
$ cat  
Hello World  
Hello World
```

# Understanding stdin and stdout

## Standard Output (**stdout**)

- **Definition:** The default destination where a program writes output (usually the terminal).
- **Key Point:** Programs send their results or messages to **stdout**.

```
(walobwad@kali)-[~]  
$ echo "Hello World" > word.txt  
  
(walobwad@kali)-[~]  
$ ls  
Desktop    Downloads  Pictures   Templates  word.txt  
Documents  Music      Public     Videos
```

# Linux Security: File Permissions

- **Matrix Overview:**
  - **r** : Read, **w**: Write, **x**: Execute
- **Example:**
  - **-rw-r- -r- -**
  - User: Read/Write
  - Group: Read-only
  - Others: Read-only
- **To view file permissions, use:**
  - `ls -l`
- **Command to change file permissions.**
  - `$ chmod [options] <permissions> <file>`

# Linux Security: File Permissions

- **chmod calculator:**
  - <https://chmodcommand.com/>



# Linux Security: File Permissions

```
(walobwad@kali)-[~]  
$ ls -l  
total 36  
drwxr-xr-x 2 walobwad walobwad 4096 Nov 21 21:26 Desktop  
drwxr-xr-x 2 walobwad walobwad 4096 Nov 21 21:26 Documents  
drwxr-xr-x 2 walobwad walobwad 4096 Nov 21 21:26 Downloads  
drwxr-xr-x 2 walobwad walobwad 4096 Nov 21 21:26 Music  
drwxr-xr-x 2 walobwad walobwad 4096 Nov 21 21:26 Pictures  
drwxr-xr-x 2 walobwad walobwad 4096 Nov 21 21:26 Public  
drwxr-xr-x 2 walobwad walobwad 4096 Nov 21 21:26 Templates  
drwxr-xr-x 2 walobwad walobwad 4096 Nov 21 21:26 Videos  
-rw-rw-r-- 1 walobwad walobwad 12 Nov 21 21:30 word.txt  
  
(walobwad@kali)-[~]  
$ sudo chmod 400 word.txt  
[sudo] password for walobwad:
```

# Polls

Please have a look at the poll notification and select an option.

If a file has a permissions `-rw-r- -r- -`, what can the group members do with the file?

- A. Read and write
- B. Execute only
- C. Read only
- D. Read, write and execute

# Polls

Please have a look at the poll notification and select an option.

Which of the following commands would you use to give the owner read, write and execute permissions and everyone else only read permission for a file named data.txt?

- A. `Chmod 777 data.txt`
- B. `Chmod 644 data.txt`
- C. `Chmod 755 data.txt`
- D. `Chmod 744 data.txt`

# Questions and Answers



# Thank you for attending



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