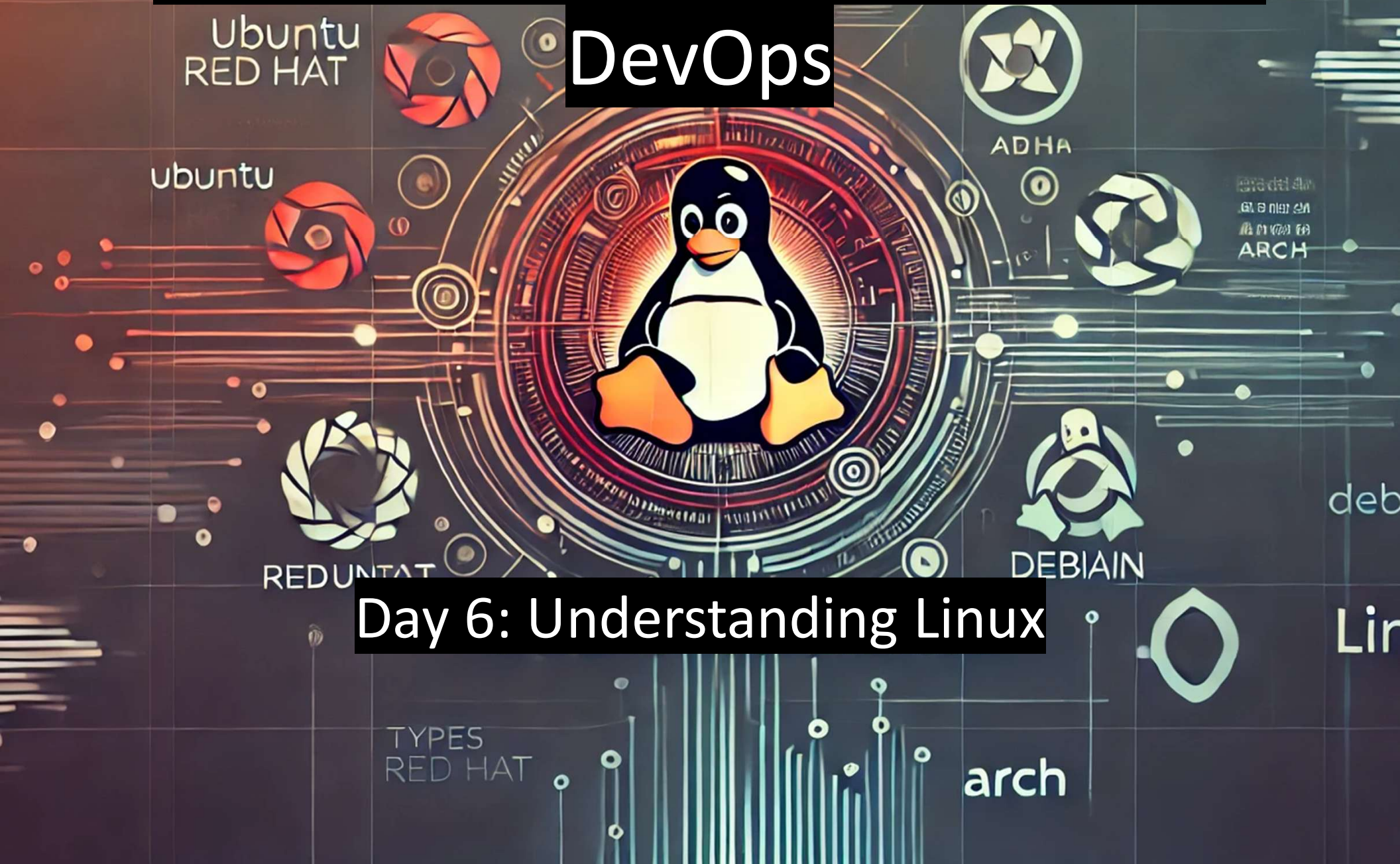


# Linux Basics and Commands for DevOps



Day 6: Understanding Linux

# What is Linux?

- Linux is a Unix-like OS kernel developed by Linus Torvalds in 1991.

- Used in servers, embedded systems, and desktops.

- Known for stability, security, and flexibility.

**Linux**  
WHAT IS LINUX

Dark-themed

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# Key Features of Linux

- Open Source: Free to use, modify, and distribute.
- Multiuser: Supports multiple users.
- Multitasking: Runs multiple processes.
- Portability: Works on various hardware.
- Security: Built-in authentication and permissions.
- Shell: Command-line interface for system interaction.



# Types of Linux Distributions

Linux distributions can be broadly classified into the following types based on their origin and package management system:

- Debian-Based
- Red Hat-Based
- Arch-Based
- Gentoo-Based
- Slackware-Based
- Independent

TYPES OF LINUX

arch

# Comparison of Major Linux Flavors

Type	Popular Distros	Package Manager	Target Audience
Debian	Ubuntu, Mint, Kali, MX Linux	apt, dpkg	Desktop, Server, Security
Red Hat	RHEL, CentOS, Fedora, Rocky	yum, dnf, rpm	Enterprise, Servers
Arch	Arch, Manjaro, EndeavourOS	pacman	Advanced users, Customization
Gentoo	Gentoo, Calculate, Sabayon	emerge	Power users, Custom builds
Slackware	Slackware, Salix, Zenwalk	slackpkg	Minimalist, Unix-like
Independent	Alpine, Clear, Solus, NixOS	Varies	Various specialized use cases



# Linux Directory Structure

/	Root directory. All files and directories start here.
/bin	Essential binaries and commands.
/boot	Boot loader files.
/dev	Device files (e.g., disk drives, USB).
/etc	Configuration files and scripts.
/home	User home directories.
/lib	Shared libraries and kernel modules.
/mnt	Temporary mount point for filesystems.
/opt	Optional software packages.
/proc	Kernel and process files.
/root	Home directory of the root user.
/sbin	System administration binaries.
/tmp	Temporary files.
/usr	User-related programs and data.
/var	Variable data files (e.g., logs, cache).



# Basic Linux Commands

- pwd - Print working directory.
- ls - List files and directories.
- cd - Change directory.
- mkdir - Create directory.
- rm - Remove files and directories.
- cp - Copy files and directories.
- mv - Move or rename files.





# File Permissions & Ownership

- `ls -l` - View file permissions.
- `chmod` - Change file permissions.
- `chown` - Change file ownership.



# Process & System Monitoring

- `ps aux` - List running processes.
- `top` - Real-time process monitoring.
- `kill <PID>` - Terminate a process.
- `df -h` - Show disk usage.
- `du -sh` - Show directory size.



# Networking & Connectivity

- `ifconfig / ip addr` - Show network info.
- `ping google.com` - Check connectivity.
- `netstat -tuln` - View open ports.



# Package Management

The background of the slide is a detailed, artistic rendering of a computer circuit board. It features intricate patterns of blue and white lines representing the traces on a dark substrate. A prominent square integrated circuit (chip) is visible in the lower right quadrant, with a small blue light emanating from it. In the upper left, there is a circular inset containing the Tux penguin mascot. To the right of the penguin, the word 'Ubuntu' is partially visible in a white, sans-serif font.

- Ubuntu/Debian: `sudo apt install <package>`.
- Red Hat/CentOS: `sudo yum install <package>`.
- `dpkg -l` - List installed packages.



# Archiving & Compression

- `tar -cvf archive.tar /path` - Create archive.
- `tar -xvf archive.tar` - Extract archive.
- `tar -czvf archive.tar.gz /path` - Compress files.



The background of the slide is a detailed, artistic rendering of a computer circuit board. It features intricate patterns of blue and white lines representing traces and components. In the upper left, there is a circular inset showing the Tux penguin mascot. To the right of the title, the word 'ubuntu' is partially visible in its characteristic white font. The overall aesthetic is high-tech and digital.

# System Information

- `uname -r` - Display kernel version.
- `cat /etc/os-release` - Show OS info.
- `uptime` - Display system uptime.