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Linux Essentials in a Nutshell

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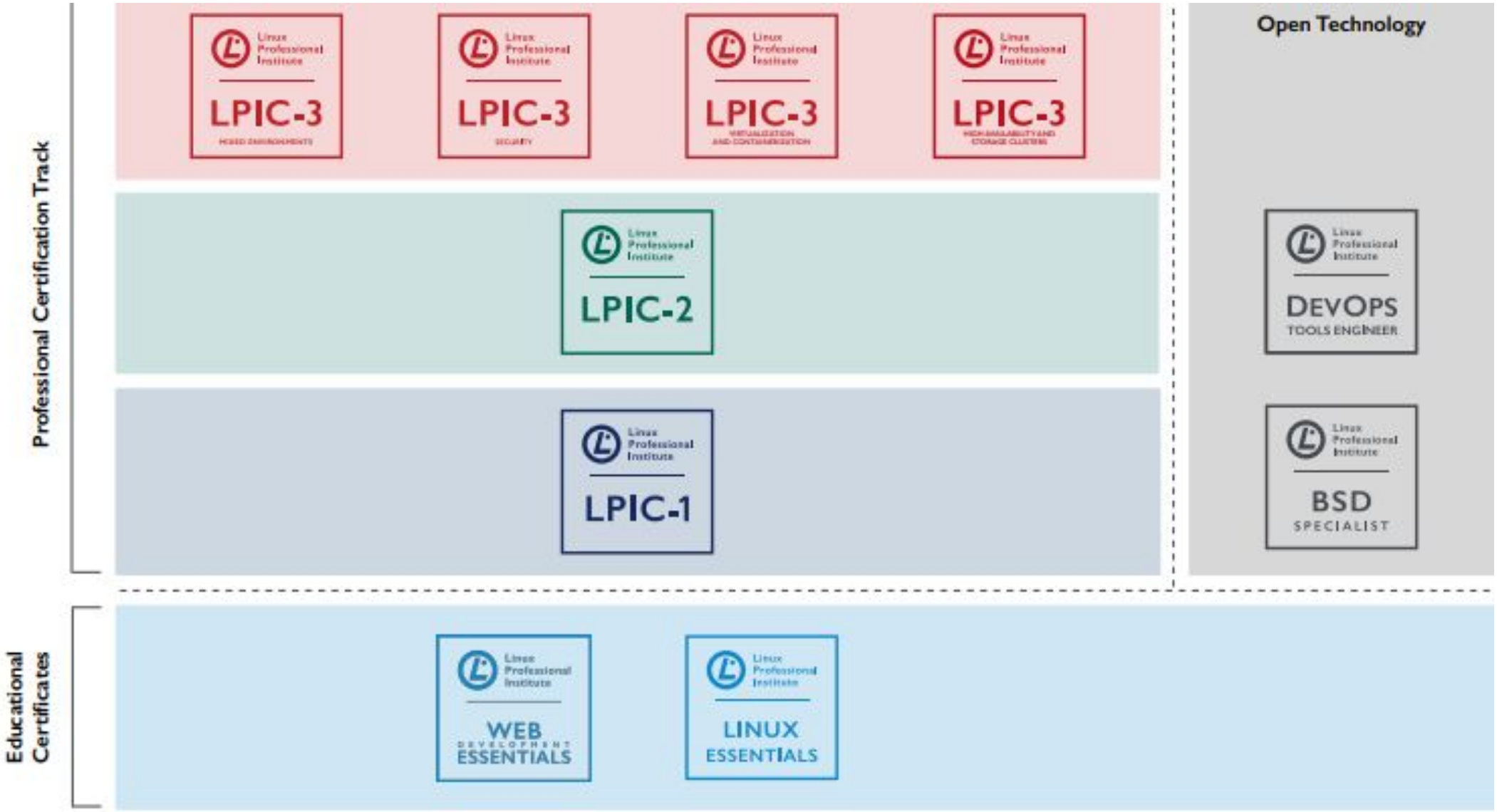

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Linux Essentials Exam

Current version is 1.6 (Exam code 010-160)

40 questions for 60 minutes

No prerequisites

Lifetime validity

Linux Essentials Topics

The Linux Community and a Career in Open Source

Finding Your Way on a Linux System

The Power of the Command Line

The Linux Operating System

Security and File Permissions

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Part I

The Linux Community and a Career in Open Source

What's Linux?

> Hello everybody out there using minix -
> I'm doing a (free) operating system (just a hobby, won't be big and professional like gnu) for 386(486) AT clones. This has been brewing since april, and is starting to get ready. I'd like any feedback on things people like/dislike in minix, as my OS resembles it somewhat (same physical layout of the file-system (due to practical reasons) among other things).
> I've currently ported bash(1.08) and gcc(1.40), and things seem to work. This implies that I'll get something practical within a few months, and I'd like to know what features most people would want. Any suggestions are welcome, but I won't promise I'll implement them :-)
> Linus (torvalds [at] kruuna.helsinki.fi)
>
> PS. Yes – it's free of any minix code, and it has a multi-threaded fs. It is NOT portable (uses 386 task switching etc), and it probably never will support anything other than AT-harddisks, as that's all I have :-(.
>
> —Linus Torvalds

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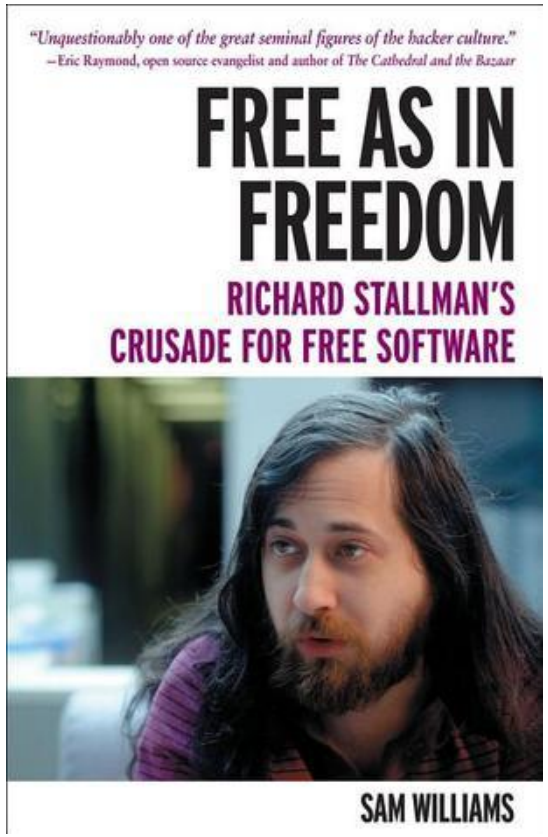
What's GNU?



GNU

GNU

NOT

Unix

The Four Freedoms

0. Run the program as you wish, for any purpose

1. Study how the program works and change it as you wish

2. Redistribute copies so you can help others

3. Distribute copies of your modified versions to others

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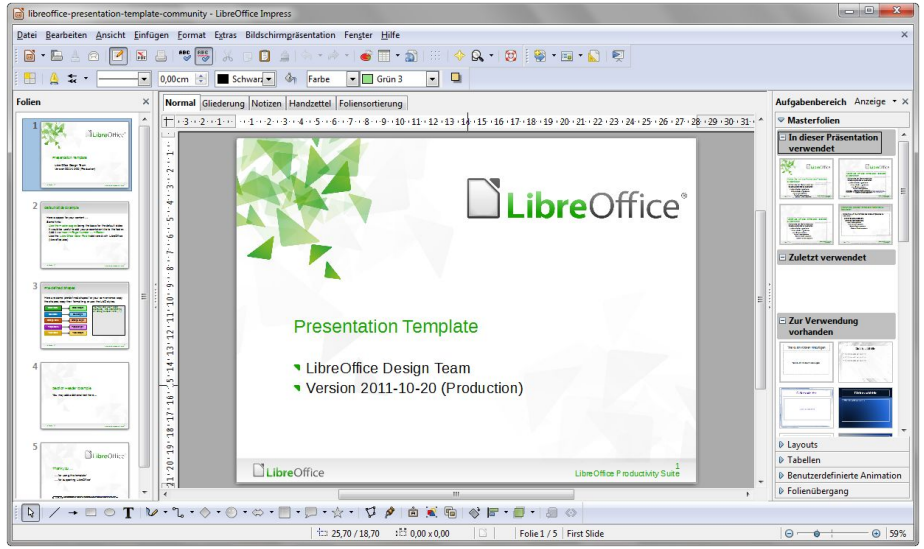
Distributions

- Debian, Ubuntu (LTS), Linux Mint
- Fedora, CentOS, Red Hat
- openSUSE (Tumbleweed, Leap)
- Arch, Slackware, Gentoo

Explore more at **http://distrowatch.com**

Aplications

- OpenOffice, LibreOffice
- Thunderbird, Firefox
- GIMP, Krita, Inkscape
- Apache HTTPD, NGINX
- MySQL, PostgreSQL, MongoDB
- NFS, Samba
- C, Java, Perl, shell, Python, PHP
- dpkg, apt-get, rpm, yum, zypper



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Part 2

Finding Your Way on a Linux System

Command Line Basics

Shell 101

- Pick up a Shell
- Shell Prompt
- Command Types

Commands

- Command Types
- Command Structure

Environment Variables

- General Rules
- echo
- export

Using the Command Line to Get Help

Built-in Commands

- help *command*

Built-in Help

- *command* --help
- *command* -h

Find Files

- locate *(and updatedb)*
- find

Man and Info Pages

- man
- info

Additional Documentation

- /usr/share/doc/*

Using Directories and Listing Files

Files and Directories

- Hidden objects (starts with **.**)
- Home directories
- Home shortcut (**~**)

Absolute vs Relative Path

- Absolute always starts with (*/*)
- **pwd**

Exploring and Navigating

- Explore with **ls**
- Navigate with **cd**

Creating, Moving and Deleting Files

Basic Commands

- touch
- cp, mv, rm
- mkdir, rmdir

Work with Multiple File Objects

- Use *, ?, and [] for globbing

Warning

File and folder names are case-sensitive!

file <> File <> FILE

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Part 3

The Power of the Command Line

Archiving and Compressing

- tar
- zip, unzip
- gzip, gunzip
- bzip2, bunzip2
- xz, unxz

Searching and Extracting Data from Files

Explore Files and Extract Data

- grep
- more, less
- cat, tac
- head, tail
- sort, uniq
- cut, paste, join
- wc, nl

Basic Regular Expressions

- Work with **. * ? [ ]**

Manage Data Flow

- Link commands via pipes (|)
- Use stream redirection (**>**, **<**, **>>**)

Turning Commands into a Script

Bash Scripts Building Blocks

- Script signature
- Variables
- Arguments
- Exit status

Scripts Control Structures

- Loops (**for**, **while**, **until**)
- Control flow (**if**, **case**)

Text Editors

- vim
- nano

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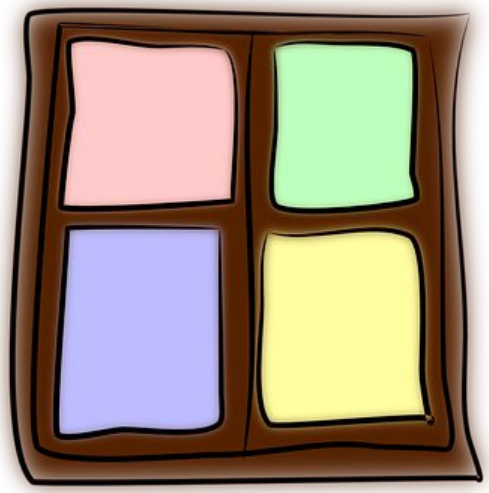
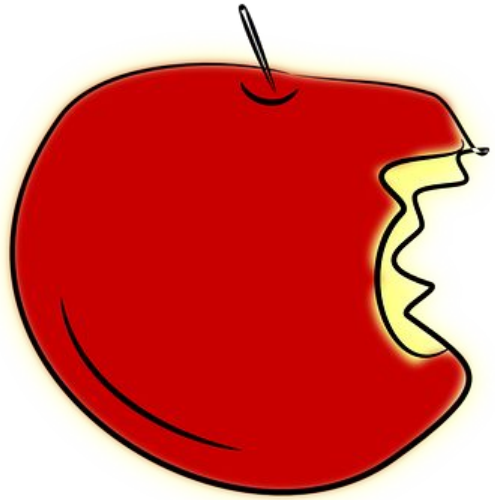
Part 4

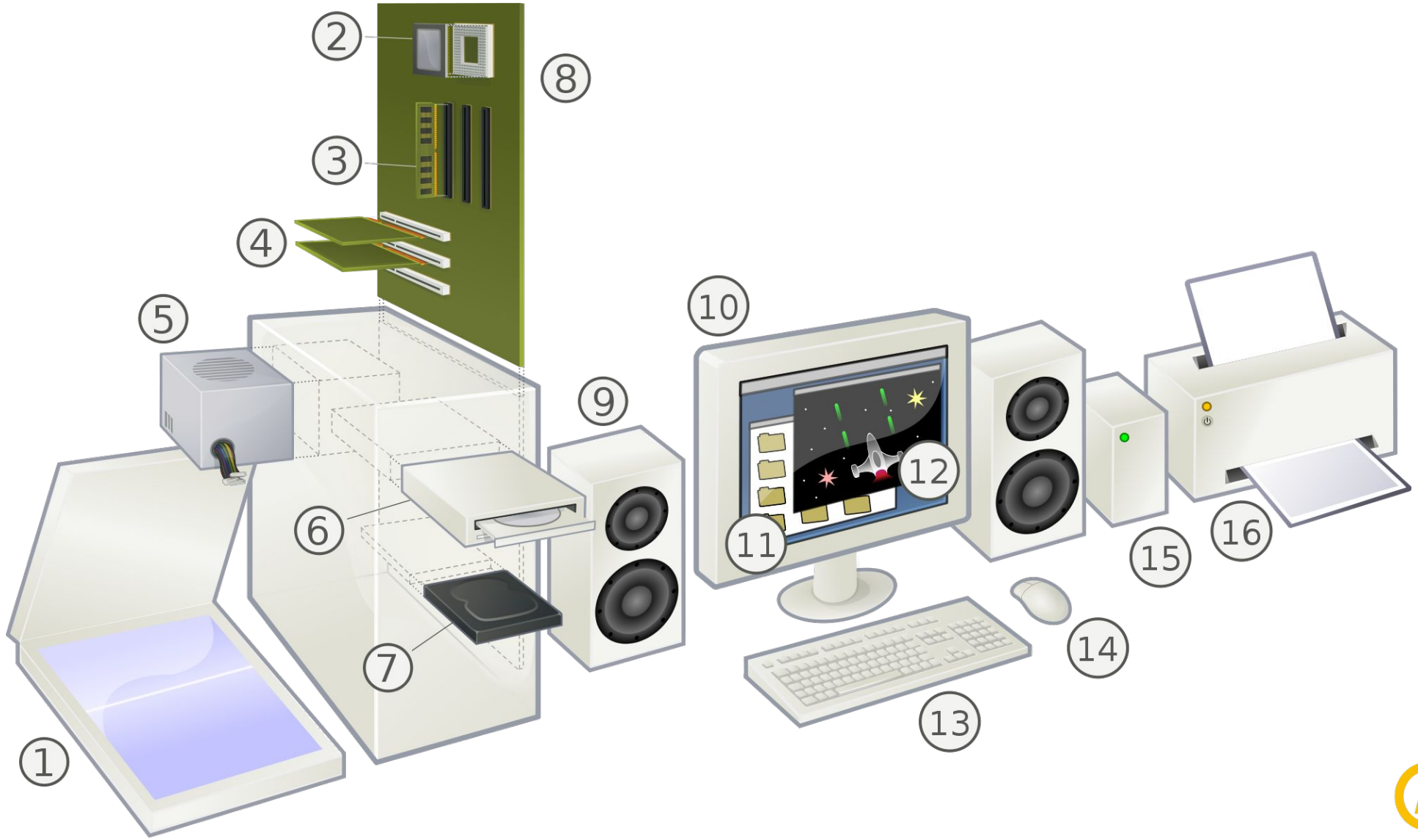
The Linux Operating System

Choosing an Operating System





Understanding Computer Hardware



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Where Data is Stored

Configurations

- /etc/*
- /boot/*

Process and Resources

- ps, top
- free, df

Events and Logs Exploration

- /var/log/*
- journalctl
- dmesg

Special Folders

- /proc/*
- /sys/*
- /dev/*

Your Computer on the Network

Main Topics

- Network, interface, gateway
- IPv4 and IPv6 addresses
- DNS

Network Configuration

- route, ip route show
- ifconfig, ip address show

Monitoring and Troubleshooting

- netstat, ss
- ping
- host

Notable Files

- /etc/resolv.conf
- /etc/hosts

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Part 5

Security and File Permissions

Basic Security and Identifying User Types

User Types

- Super user
- System users
- Regular users

Notable Files

- /etc/passwd
- /etc/shadow
- /etc/group

Helpful Commands

- id, last, who, w
- sudo, su

Creating Users and Groups

User Management

- useradd
- usermod
- userdel

Group Management

- groupadd
- groupmod
- groupdel

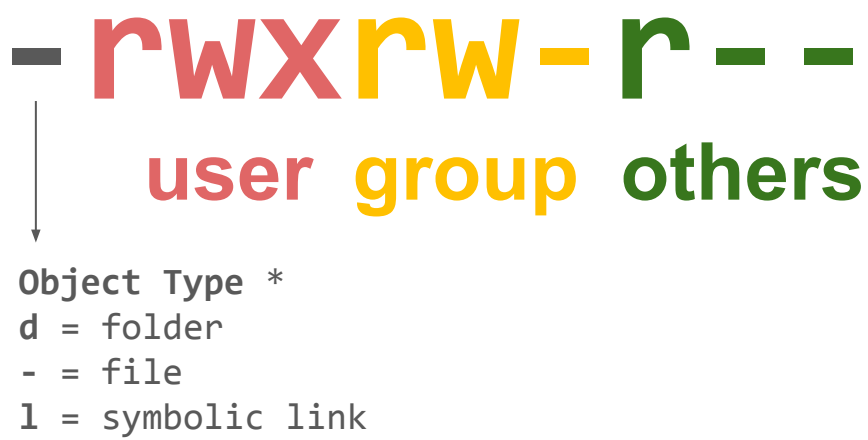
Password Management

- passwd
- chpasswd

Alternative Commands

- adduser
- deluser

Managing File Permissions and Ownership



Permissions Meaning

- r = Read
- w = Write
- x = Execute

Explore Permissions

- Long listing with **ls -l**

Manage Permissions & Ownership

- chmod
- chown
- chgrp

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Special Directories and Files

Special Directories

- /tmp
- /var/tmp
- /run

Symbolic and Hard Links

- Difference
- Working with **ln**

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Is This All?

Nooo! There is Much More!

Go deeper with topics like

- Users and groups management
- Permissions (incl. special ones) and ownership management
- Special folders and files
- Bash building blocks (if, case, and loop structures)
- Package management

Explore the detailed objectives at
https://wiki.lpi.org/wiki/Linux_Essentials_Objectives_V1.6

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Where Can I Study What is Missing?

Start with
https://learning.lpi.org/pdfstore/LPI-Learning-Material-010-160-en.pdf

Continue other materials available at
https://learning.lpi.org

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Questions?

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Demo

https://github.com/shekeriev/linux-essentials

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Thank you!

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