



Introduction to Linux & Ubuntu Desktop



Objective



- Explain the nature of open source software, origins of Linux, Linux Distributions.
- Ubuntu Editions, features, environment, package management.
- Standard applications
- Basic networking & Remote access.
- File and print sharing.
- Miscellaneous applications & tools

Classroom Facilities



- Ubuntu 16.04 has been installed in all the PCs.
- All the PCs are connected to Internet – 1Gbps NKN.
- WiFi access will be given during lunch and tea break.
- Ubuntu can be installed from Pen drive/Network, for those who are interested in.

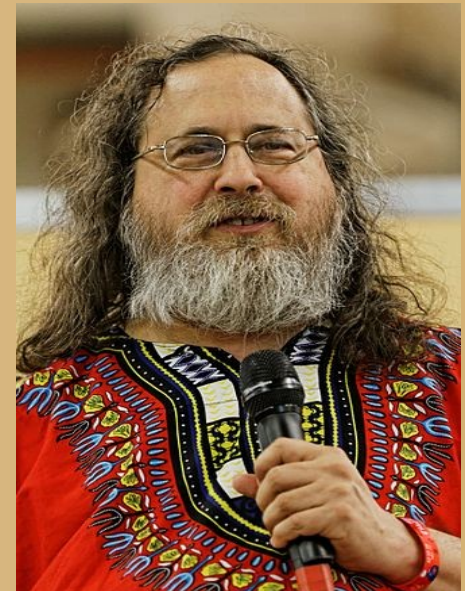
Open Source Software



- Open source: software and source code available to all
 - The freedom to distribute software and source code
 - The ability to modify and create derived works
 - Integrity of author's code
- The Free Software Foundation and the Four Freedoms

Linux Origins

- Linux is a Unix clone
- 1984: The GNU Project and the Free Software Foundation – By Richard Stallman
 - Creates open source version of UNIX utilities
 - Creates the General Public License (GPL)
 - Software license enforcing open source principles
- 1991: Linus Torvalds
 - Creates open source, UNIX-like kernel, released under the GPL
 - Ports some GNU utilities, solicits assistance online
- Today:
 - Linux kernel + GNU utilities = complete, open source, UNIX-like operating system
 - Packaged for targeted audiences as distributions



Exercise 1



- Visit the following websites
 - <http://www.gnu.org>
 - <http://www.kernel.org>

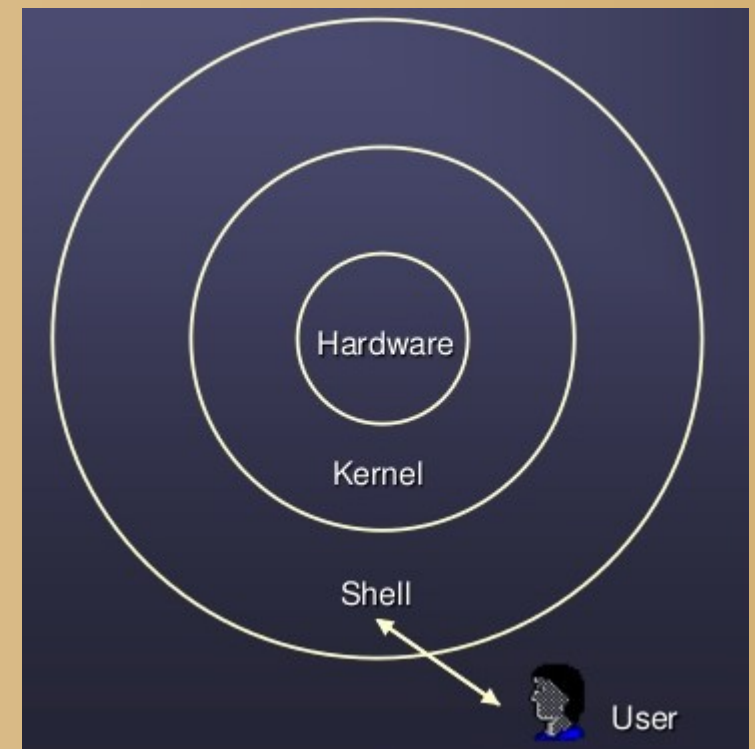
Unix design philosophy



- Small is beautiful
- Make each program do one thing well
 - Do not make your code do too many things
 - Factor into smaller units
- Prototype early, release often
 - Real world feedback is really important
- Portability is more important than efficiency
 - Computers are fast enough

Unix design

- Kernel
 - Minimum OS
 - Provides abstractions over hardware and software
- Userspace
 - Everything else



Basic interaction



- The Unix shell
 - What people generally think of as “Unix”
 - Fundamental interface to any Unix system
- Multiple options:
 - Default shell is bash
 - csh, dash, ksh, zsh are other commonly used shells.

User basics



- Two categories of users:
 - root
 - root is the prime administrative user account
 - Normal usage MUST NEVER be done as root
 - The root user prompt is usually a #
 - root has ALWAYS the uid 0.
 - All users with uid 0 have root privileges.
 - Everyone else
 - This is what you use for daily activities
 - Normal users get \$ as a prompt for their shell

Exercise 2



- Invoke terminal by pressing
 - Ctrl+Alt+t
 - Note the \$ symbol in the command prompt
 - Run
 - whoami
 - Run
 - sudo su -
 - whoami
 - uname -r
 - Ctrl+d or logout or exit twice

Files



- Everything is a file
 - Mostly
- Files are contained in filesystems.
 - Filesystems are an abstraction/organisation layer on raw storage
- Files are organised in a tree structure
- The directory separator is '/'
- '/' is also used for the root of the tree

Home Directory



- Every standard user has a home directory, usually at `/home/username`
- The user has full control over it
 - `$HOME`
 - `~`
- `/root` – The home directory for root user

File Permissions



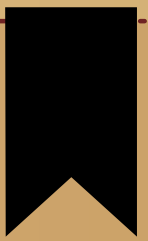
- Standard permissions
 - Read
 - Write
 - Execute
- For
 - Owner
 - Group
 - Others

Exercise 3



- Invoke the terminal - Ctrl+Alt+t
 - Run
 - pwd
 - ls
 - As instructed, open file explorer (nautilus)
 - See the permissions, preferences etc.
 - Create a folder on the Desktop
 - Navigate between various folders
 - Copy files

Linux Distributions



- An operating system made from a software collection, which is based upon the Linux kernel and, often, a package management system.
- A typical Linux distribution comprises
 - A Linux kernel
 - GNU tools and libraries
 - Additional software
 - Documentation
 - A window system (the most common being the X Window System)
 - A window manager, and
 - A desktop environment.

Some Linux Distributions



Debian

- Knoppix
- Linux Mint
Debian Edition
- Ubuntu
 - Kubuntu
 - Linux Mint
 - Trisquel
 - Elementary OS

Fedora

- RHEL
 - CentOS
 - Oracle Linux
 - Scientific
Linux

Mandriva Linux

- Mageia
- PCLinuxOS
- ROSA Linux

openSUSE

- SUSE Linux
Enterprise

Arch Linux

- Manjaro Linux

Gentoo

- Chrome OS
 - Chromium OS

Slackware

Ubuntu



- An open source operating system for computers.
- Linux distribution based on the Debian architecture.
- Usually run on personal computers, and is also popular on network servers.
- Runs on the most popular architectures, including Intel, AMD, and ARM-based machines.
- Also available for tablets and smartphones, with the Ubuntu Touch edition.
- Is the most popular operating system running in hosted environments, so-called "clouds".

Canonical Ltd.



- Development of Ubuntu is led by UK-based Canonical Ltd.
- A company founded by South African entrepreneur **Mark Shuttleworth**.
- Canonical Ltd. offers commercial support.
- It is based on free software and named after the Southern African philosophy of ubuntu (literally, 'human-ness'), which Canonical Ltd. suggests can be loosely translated as "**humanity to others**" or "**I am what I am because of who we all are**"

Official Ubuntu Flavours



- Ubuntu Unity (default Ubuntu flavor)
- Xubuntu
- Lubuntu
- Xubuntu
- Ubuntu GNOME
- Ubuntu Mate
- Ubuntu Kylin
- UbuntuStudio
- Mythubuntu
- Edubuntu
- Ubuntu Budgie

These flavors are
endorsed by Canonical
Ltd.



Ubuntu Core



Ubuntu Core allows you to install apps on your board in just a few clicks.

[Install on a Raspberry Pi 2 or 3 ›](#)



Ubuntu Core works on minimal setups, embed and go!

[Install on a Raspberry Pi Compute Module 3 ›](#)



Ubuntu Core also runs on the AllWinner H2 SoC used on Orange PI boards.

[Install on an Orange PI Zero ›](#)



Ubuntu Core helps you harness the power of boards tailored for the IoT ecosystem.

[Install on a Qualcomm DragonBoard 410c ›](#)



Ubuntu Core can be easily installed on other architectures like Intel® 64 bits.

[Install on an Intel NUC ›](#)



Ubuntu Core lets you interact and control complex hardware and modules.

[Install on an Intel Joule ›](#)



Ubuntu Core runs smoothly on both small and large footprint boards.

[Install on a Samsung Artik 5 or 10 ›](#)



Develop on target or on your Linux desktop, run Ubuntu Core in a virtual environment.

[Install on a KVM ›](#)



Build snaps using the UP² IoT Grove development kit running Ubuntu Server.

[Install on an UP² IoT Grove ›](#)

Ubuntu Desktop



This is the operating system which can be used by regular users.

This comes pre-built with software that help the users perform usual basic activities.

Operations such as browsing, email and multimedia are also available in this edition.

The latest stable version as of October 2018 is Ubuntu 18.04 LTS

The latest version as of October 2018 is Ubuntu 18.10

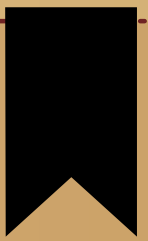
Features



- The desktop version of Ubuntu supports all the normal software on Windows such as Firefox, Chrome, VLC, etc.
- It supports the office suite called LibreOffice.
- Ubuntu has an in-built email software called Thunderbird
- There are a host of free applications for users to view and edit photos.
- There are also applications to manage videos and it also allows the users to share videos.
- It is easy to find content on Ubuntu with the smart searching facility.
- The best feature is, it is a free operating system and is backed by a huge open source community.



Release Cycle of Ubuntu



- Every year there are 2 releases of Ubuntu, one in April and one in October, from Canonical.
- The version number normally denotes the year in which the software was released.
- For example, version 14.04 specifies that it was released in the year 2014 and in the month of April.
- Similarly, the version 16.04 specifies that it was released in the year 2016 and in the month of April.
- The April build every year is the more stable build, while the October build does a lot of experimentation on new features.

Minimum Hardware requirements for 18.04 LTS



- 2 GHz dual core processor or better
- 2 GB system memory
- 25 GB of free hard drive space
- Either a DVD drive or a USB port for the installer media
- Internet access is helpful
- *LTS stands for long-term support — which means five years, until April 2023, of free security and maintenance updates, guaranteed.*
- *Download Ubuntu from: <https://www.ubuntu.com/download/desktop>*

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Exercise4



- https://en.wikipedia.org/wiki/List_of_Linux_distributions
- Visit the site <https://www.ubuntu.com/>
- <https://www.ubuntu.com/download/flavours>

Installation



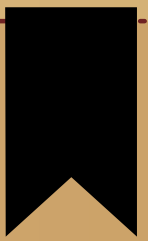
- The installer is a ISO image which can be mounted on a DVD drive or USB stick.
- Once the image is booted on the machine, there is a series of steps for installation.
- Try Ubuntu – The live mode
- Along with Windows
- Occupying full Hard Disk

Logging in



- Graphical Login
 - Automatic login
 - With a username and password
 - Selecting the environment
 - Selecting language
 - Guest login
 - Logging in as root – never do
- Text Login in virtual console
 - ctrl+alt+f1-f6

Default File Permission in Ubuntu Desktop



Unlike other linux systems, in ubuntu, every users can see other user's files.

- According to Mark Shuttleworth,

"The majority of users of Ubuntu systems either have exclusive use of the machine (personal laptop) or are sharing with friends and relatives. We assume that the people who share the machine are either trusted, or in a position to hack the machine (boot from USB!) trivially. As a result, there is little to no benefit".. from removing those permissions.

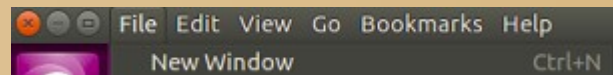
The (Unity)Environment



- The Launcher (Control Panel)

- on the left-hand side of the screen.
- has shortcuts for all of the most used applications.

- The Menu Bar



- When we launch any application, we will get the associated menu bar at the top of the application, which will have the different menu options for that application.
- We can choose to close the entire window or resize the window, if required.

The environment...

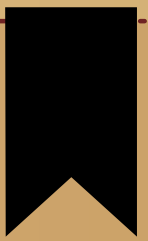


- Taskbar



- On the right-hand side of the screen.
- Allows to choose:
 - volume settings
 - status of your internet connect
 - change your language and other settings
 - view the battery status while working on a laptop.

Adding/Removing Menu Item



- Type menu in search (Dash)
- Drag and drop to launcher
- Create shortcut/link
- Moving the launcher to bottom
 - gsettings set com.canonical.Unity.Launcher launcher-position Bottom
 - Unity Tweak Tool

Device Drivers – System Settings



- Has drivers for the mouse, keyboard, audio and video drivers.
- Settings options on the left-hand side control panel.
- Hardware section
 - display monitor
 - Keyboard
 - mouse, etc.
- To install any additional drivers, we need to go to the respective driver website and download the necessary distribution for the particular device driver. Then, use the Software Center to install the required device driver.

Package Management (Installing/Removing Software)



- Ubuntu Software Center
 - Designed to search the Internet for available software which can be downloaded and installed.
 - Installing /Removing /Updating
- Synaptic Package Manager
- apt
- dpkg



Exercise 5



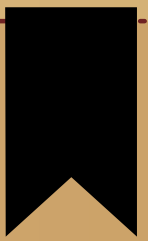
- Users
 - Add a new user
 - Login as the new user
 - Logout
 - Login to Text Terminal
 - Switch back to Graphical terminal
- Install an application, eg. Gnome-chess
- Install google chrome browser

Browsers



- Mozilla Firefox - The default browser.
- See the Icon on the lefthand side.
 - Browsing Sites
 - Installing Add-ons
- Chromium
- Google Chrome

Email



- Mozilla Thunderbird - The default email client
 - Configuration
 - Sending mail
- Addons/Calendar/Tasks

RSS Reader



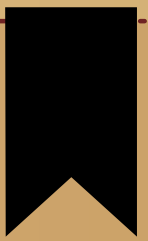
- RSS (Rich Site Summary; originally RDF Site Summary; often called Really Simple Syndication) is a type of web feed which allows users to access updates to online content in a standardized, computer-readable format.
- liferea
 - <http://ddnews.gov.in/rss-feeds>
 - <https://lifelifehacker.com/rss>

Messaging



- Pidgin
- Skype
 - Need to be installed
 - Distributed by Microsoft.
 - <https://www.skype.com/en/get-skype/>

Photo Viewer/Editor



- Shotwell
- GIMP



Media Players/Editors



- Rhythmbox
- VLC
- Audacity
- OpenShot



User Management



- Creating Users
- Enabling the User Account
- Managing User Permissions and Groups
 - *sudo apt-get install gnome-system-tools*
 - *Provides additional option of Users and Groups.*

Files and Folders



- Files option in the software launcher.
- Creating a Folder.
- Renaming a Folder
- Seeing the Properties of a File

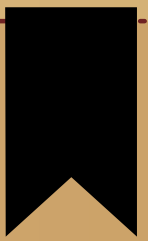


Adding Fonts



- Get fonts
- Install new fonts in Ubuntu
- Install several fonts at once in Linux
 - Create .fonts directory, if it doesn't exist already, in your Home directory.
 - Extract or copy paste all those TTF or OTF files in this directory.
- Font Manager
 - `sudo apt-get install font-manager`

Command Line & Commands



Gnome Terminal

- Starting off
 - ls
 - cd
 - mkdir
 - touch
 - rmdir
 - rm
 - pwd
- Getting Help
 - man
 - info
 - pinfo
 - whatis
 - whereis
 - which
- System Status
 - w
 - who
 - uptime
 - last
 - top
 - ps

Networking



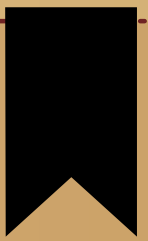
- Setting Hostname
- Configuring IP address, Subnet Mask, Gateway & DNS
 - Check connectivity with *ping*
- Configuring Wireless (in laptops)

Remote Access/Login



- Remote login – Secure shell
 - ssh – to connect to other Linux machines
 - putty - from Windows/Linux to Linux
- Remote Graphical login
 - Remmina
 - X :1 -query - from linux
 - Xming – from windows
- Desktop Sharing
 - Desktop Sharing & vnc
 - Remote Desktop Viewer
- Diskless Workstations
 - LTSP (Linux Terminal Server Project)

File Sharing



- With other Linux machines
- With Windows machines
- Accessing shared folders

Exercise 6



- Create a folder in your Desktop
- Share it
- Access the shared folder from another PC.

Printer configuraion



- Adding
- Configuring
- Sharing
- Connecting to shared printers
- Connecting to Network Printers

Connecting to Internet



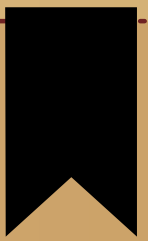
- Connecting through Gateway in LAN
 - Set the Gateway and DNS
 - May access through proxy server
- Using USB Dongle 3G/4G
- Sharing the Internet to the LAN

Other Desktop environments



- Gnome 3
 - `sudo apt install gnome-shell`
- Gnome 2
 - `sudo apt install gnome-session-flashback`
- Xfce
 - `sudo apt install xfce4`
- LXDE
 - `sudo apt install -y lubuntu-desktop`

Backup & Restore



- zip
- tar
- System Settings -> Backup
- Clonezilla

Task Scheduling



- cron
- at



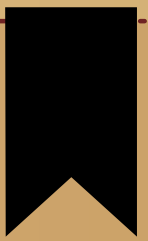
Using external media



- USB Pen drives
- CD/DVD
- Memory cards
- Additional Hard Disks



Exercise 7



- Copy files to/from your pen drive
- Setting up IP address, Network mask and Default Gateway.
- Check Internet connectivity
 - ping www.google.com

Miscellaneous tools



- PDF viewer
- Screen capture
- Calculator
- gedit
- DVD Writer



Startup Applications/Services



- bum
- systemctl – start/restart/enable/disable
- Startup Applications

We are using Ubuntu



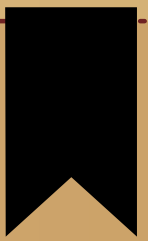
- As a few Desktop OS'
- As Servers – for BigData & Artificial Intelligence Courses
- Projects - KLA & Muziris Heritage Project.

Version Update



- Backup important files
- Upgrade to next higher version (sometimes may not work)
 - `sudo apt-get update`
 - `sudo apt-get upgrade`
 - `sudo apt-get dist-upgrade`
 - `sudo apt-get install update-manager-core`
 - `sudo do-release-upgrade`

Repositories vs PPA



- Repositories
 - On systems like Ubuntu, most software is packaged in nice .deb files which contain the programs and libraries you need.
 - These files can be downloaded or come in CDs.
 - Repositories are in **servers** which contain sets of packages
- Personal Package Archives (PPA)
 - Allow you to upload Ubuntu source packages to be built and published as an apt repository by **Launchpad**.
 - Example:
 - `sudo add-apt-repository ppa:vineetha/test-ppa`
 - `sudo apt-get update`

launchpad



- <https://launchpad.net/>
- Launchpad is a software collaboration platform that provides:
 - Bug tracking
 - Code hosting using Bazaar
 - Code reviews
 - Ubuntu package building and hosting
 - Translations
 - Mailing lists
 - Answer tracking and FAQs
 - Specification tracking

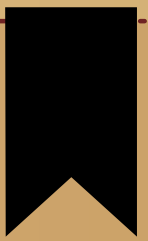


Exercise 9



- Visit the site <https://launchpad.net/>

Ubuntu Advantage - commercial support



- Ubuntu Advantage
 - Professional support for the Ubuntu deployments, from the experts at Canonical.
 - Ubuntu Advantage for Desktop
 - \$150.00 USD per year
 - Minimum Order: 50 Desktops
 - <https://buy.ubuntu.com/collections/ubuntu-advantage-for-desktop>

Desktop Support



- Include
 - Landscape SaaS Edition
 - Landscape On Premises Server - optional
 - Canonical Livepatch Service: apply critical kernel patches without rebooting
 - Ubuntu Legal Assurance programme
 - Knowledge Base
 - Basic installation and applications
 - Installation, applications and systems administration support
 - Dedicated Service Engineer - optional

Landscape



- Manage thousands of Ubuntu machines as easily as one.
- The cost-effective way to support and monitor large and growing networks of desktops, servers and clouds.
- Reduce your team's efforts required for basic, day-to-day management.
- <https://landscape.canonical.com/landscape-features>

Training & Certification



- Canonical does not provide training for Ubuntu Desktop and Ubuntu Server.
- But provide training for their Cloud platform
 - <https://www.ubuntu.com/cloud/training>
 - LPI had been offering... LPI 199, but the content seems old, as on date.

Certified Hardware



- Ubuntu Desktop certified hardware
 - Many of the world's biggest PC manufacturers certify their desktops for Ubuntu, ensuring it always runs as smoothly as its millions of users expect.
 - <https://certification.ubuntu.com/desktop/>

...and finally the cost of the competitor

Windows 10 Home (Download)

₹ 8,499.00

Add to cart

Windows 10 Pro (Download)

₹ 14,499.00

Add to cart



Office 365 Home

★★★★★

₹ 4,619.00 per year

₹ 460.00 per month

Shop now



Office 365 Personal

★★★★★

₹ 3,629.00 per year

₹ 360.00 per month

Shop now



Office Home & Student 2016 for PC

★★★★★

₹ 6,899.00

Shop now

Cost...

Other Office products for home businesses



Office Home & Business 2016 for PC

★★★★★

₹ 21,299.00

- Fully installed versions of Outlook, Word, Excel, PowerPoint, and OneNote
- For 1 PC
- Store files in the cloud with OneDrive

Compatible with Windows 7 or later
All languages included



Office Home & Business 2016 for Mac

₹ 21,299.00

- For 1 Mac
- Fully installed versions of Outlook, Word, Excel, PowerPoint, and OneNote
- Store files in the cloud with OneDrive

Compatible with Mac OS X 10.10
All languages included



Office Professional 2016

★★★★★

₹ 35,699.00

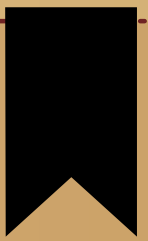
- Fully installed versions of Outlook, Publisher, Access, Word, Excel, PowerPoint, and OneNote
- For 1 PC
- Store files in the cloud with OneDrive

Compatible with Windows 7 or later
All languages included

Conclusion

- Ubuntu is the most popular that is 3rd ranked Operating System in the world after Windows, macOS respectively.
- It is considered as an industry standard for many reasons and also due to its open source nature.
- The following points are to be considered over the advantages of Ubuntu over Microsoft Windows:
 - **Better User Interface, Themeing, Security, Fonts, Centralized Software Repository, UNIX Environment, Command Line, Cost, Minimal Resource usage, Open Source, Runs Without Installing, No Viruses, Customizability.**

Conclusion



- The main points we discussed was:
 - Open Source Software, Linux origins
 - Login/Logout/Shutdown
 - Users, directories, files, permissions
 - Linux Distributions
 - Ubuntu Desktop – Environment
 - Installing and removing applications
 - Standard applications
 - Command line
 - Networking, Remote access and File sharing
 - Printer Configuration
 - Desktop Environments
 - Backup and Restore
 - Task Scheduling

Web links



- <https://www.ubuntu.com/>
- <https://tutorials.ubuntu.com/>



Questions?



Use Linux
&
Spread the message of freedom.

Thank you



Exercise 10



- Create a new user for your colleague and switch to that user, when he wants your PC.
- Install the software “Synaptic Package Manager” in your PC.
- Install a software, for example, **liferea**. Configure this software to read DD News RSS feed.
- Configure Thunerbird Mail client with the given/or your dummy email account. (Never configure Thunderbird with your real email ID in public computers).
- Add **Lightning & Provider for Google Calendar** to Thunderbird. May also add Mail Merge Plugin. Configure Address Book.
- Configure pidgin instant messenger to chat using Gtalk. (Need to set the following in your gmail account: My Account->Sign-in & Security ->Allow less secure apps: OFF)