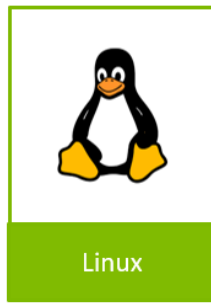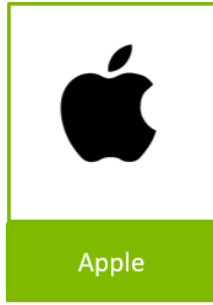OPERATING SYSTEM

Install Linux Operating System & Application Software
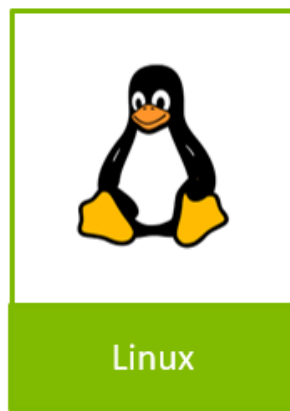
Session: Install Linux Operating System & Application Software

Activity: Connect with correct one

Android   Apple   Linux   Windows

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Operating Systems

Windows   Linux

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Kernel

Supports a large number of networking protocols

- Transport Level Protocol (TCP/IP)
- Extension for high-speed networking

Supports protocols

- Stream Control Transmission Protocol (SCTP)

Dynamically loadable Kernel modules

- Boot when required
- At any time

Kernel is respons

Remains in memory

Central component of an OS

Kernel is responsible for low level tasks such as disk management etc.

Remains in memory until the computer is shutdown

Kernel is the first program that is loaded after the boot loader

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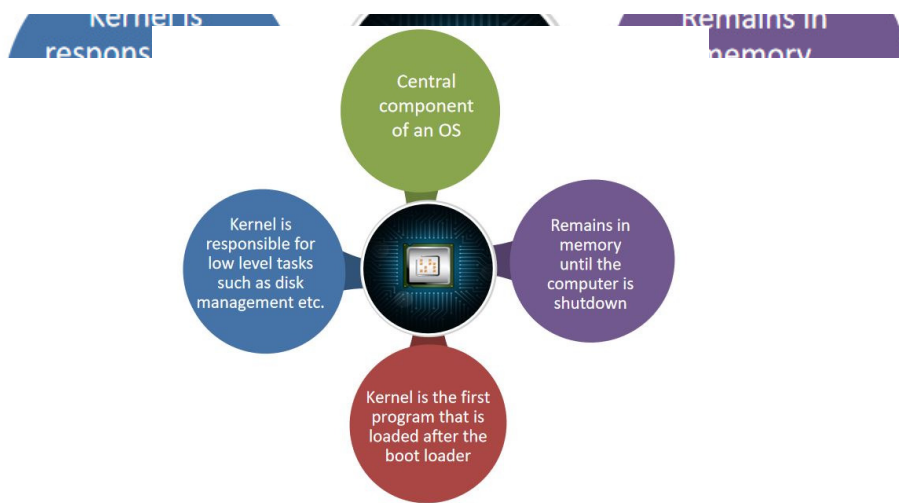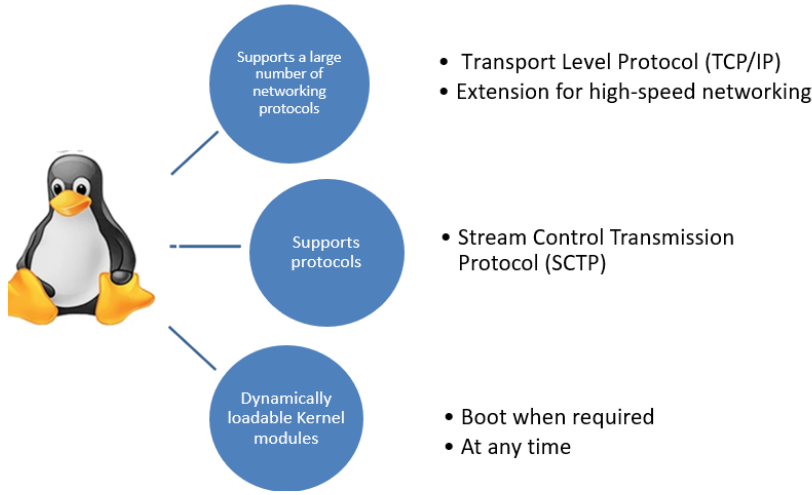
Functions of The Kernel

Access Computer Resource	Can access various computer resources like the CPU, I/O devices etc.
Resource Management	Allows resources to be shared uniformly among various processes
Memory Management	Every process needs memory space, Memory Management is done by a Kernel
Device Management	The devices connected to the system are used by the processes. Allocation is managed by the Kernel.

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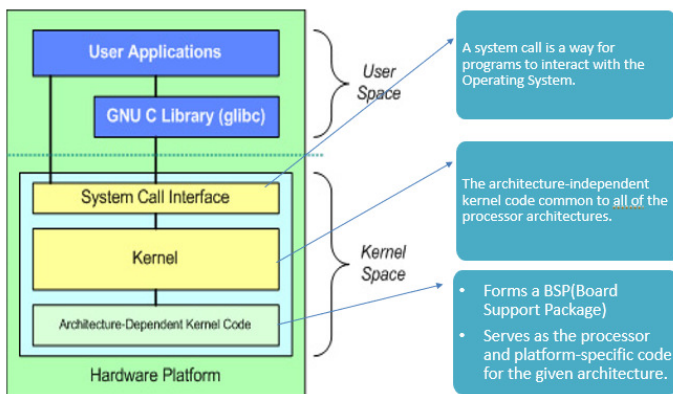_____

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Types of Kernel

Microkernel	• Microkernel offers the bare essentials to get a system operating • Microkernel systems have small kernel spaces and large user spaces
Monolithic Kernel	• Monolithic systems have large kernel spaces, and Linux kernel comes under this category
Hybrid Kernel	• Hybrid Kernel lies on the boundary between Monolithic Kernels and Micro Kernels.

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Architecture of a Kernel
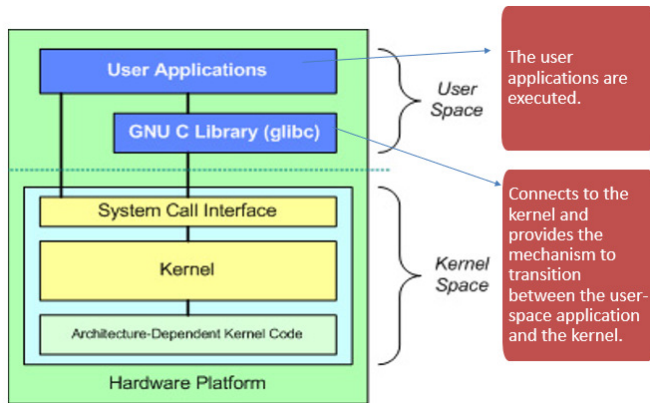
Architecture of a Kernel

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Architecture of a Kernel

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Inner-Process Communication

Types of Inter-process Communication

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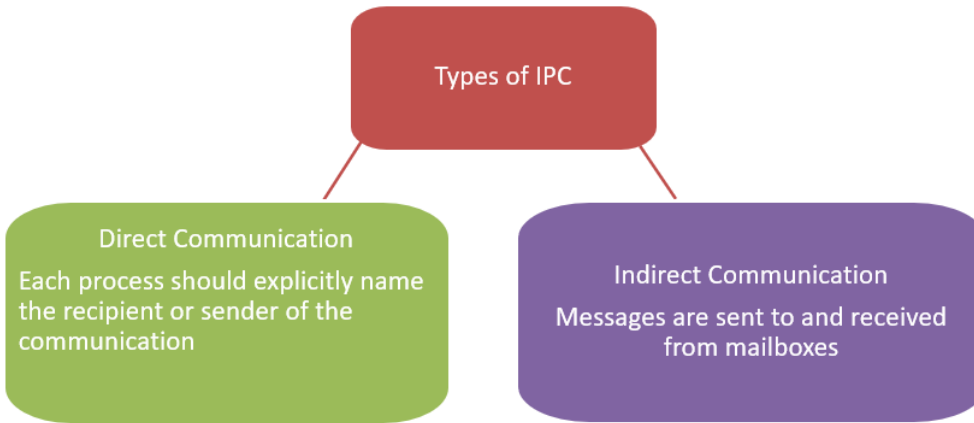
Activity: State whether the following statements are True or False

Kernel is a central component of an operating system which manages various operations of a computer and hardware.

Hybrid Kernel have large kernel spaces, where the Linux comes under this category.

A system call is a way for programs to interact with the Operating System

Applications on Linux

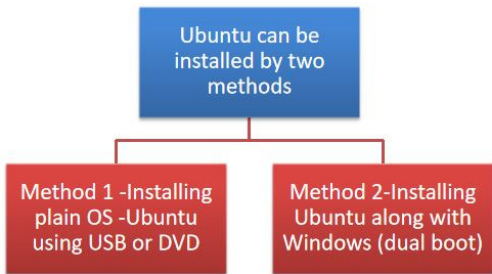| Geary	An email client for sending and receiving mails
Lollypop Music Player	Media player used for music, videos etc.
Google Chrome	Google Chrome is a Web Browser. Typically used to surf the internet
Gimp	Gimp is used for image editing, free form drawing and more specialized tasks
Kden	Kden is a video editing software

Applications on Linux

Telegram	Telegram is an instant messaging software
Tillix	Tilix is a terminal emulator, which allows you to split your terminal window into multiple panes
Libre Office	Libre office is productivity software suite, an equivalent to Microsoft Office
VLC	VLC media player is a free media player software

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Minimum System Requirements To Install Ubuntu Linux OS

Minimum 2.0 Ghz Processor

4 GB RAM

At least 30 GB free space for installation

A USB or DVD ROM

Good Internet Connection

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Install Ubuntu Linux Operating System

Ubuntu can be installed by two methods

Method 1 -Installing plain OS -Ubuntu using USB or DVD

Method 2-Installing Ubuntu along with Windows (dual boot)

Method 1-Installing Ubuntu using USB or DVD

1. Go to **https://ubuntu.com/#download** and download the software as shown in the image
2. Make pen drive as live bootable and place the ISO file in USB.
3. Copy the ISO file into DVD
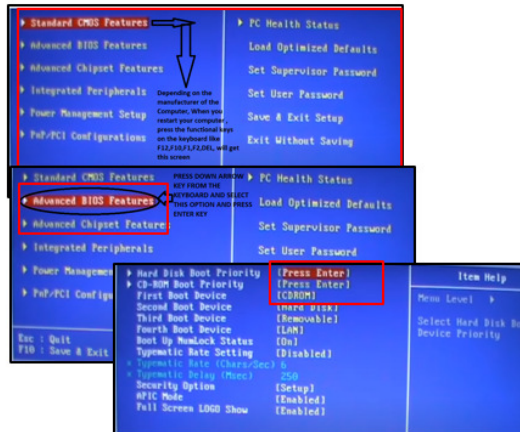4. Go to BIOS settings and restart the System
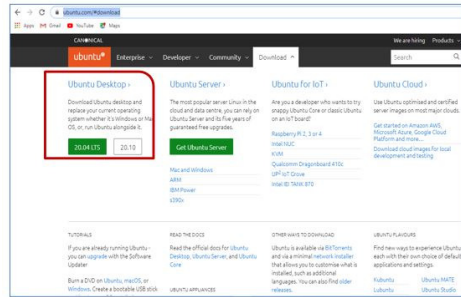
Install using a pen drive   Install using a DVD

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Steps to change Bootable Options based on the Device (CD/DVD/USB)

1. Press functional keys like **F12/F10/ F1/ F2/DEL**.
2. Select the option **Advanced BIOS Features**.
3. Press **Enter** key
4. Choose **Hard Disk** for installing using CD/DVD and choose **Removable** to install
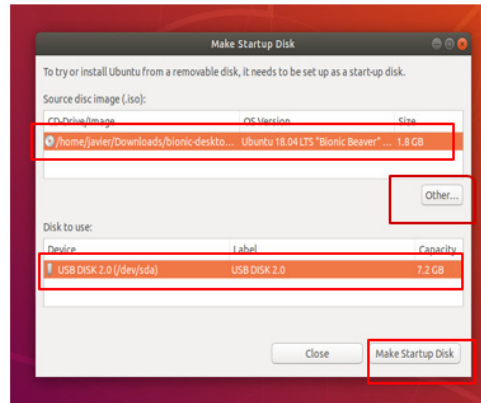

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Launch start up

1. Insert USB stick
2. Open 'Show Applications'
3. Search **Startup Disk Creator**
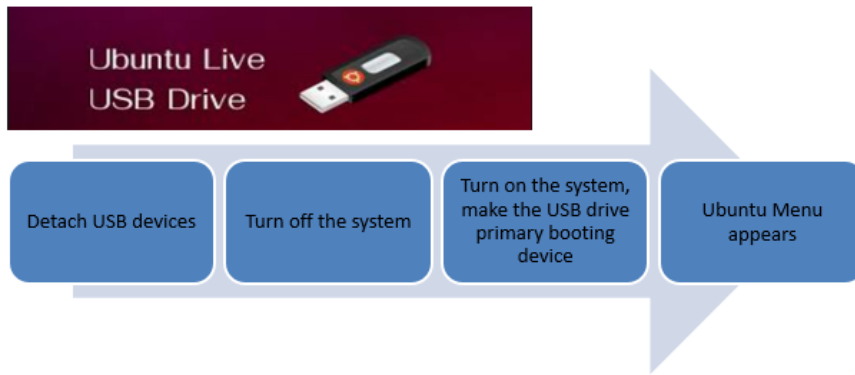4. Select Startup Disk Creator from the results

1. Click on 'Other' to locate ISO
2. Click Make Startup Disk

Formatted: Left

ISO and USB Selection

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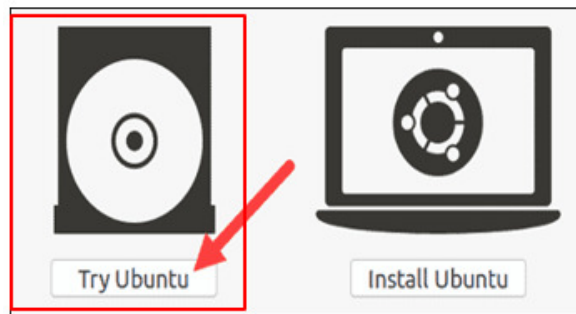_____
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Confirm USB Drive

1. Confirm the USB device
2. This is important because any data currently stored on this device will be deleted.
3. Write process will start and a progress bar appears

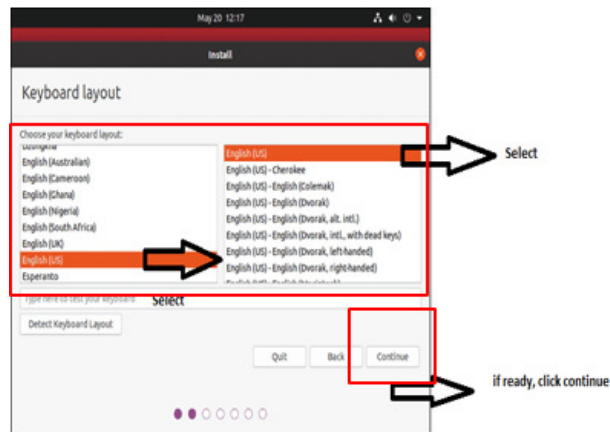**Beginner or Experienced User Selection**

Beginner or Experienced User Selection:
1. Select 'Try Ubuntu' for beginners
2. Select 'Install Ubuntu' for experienced users

Choosing Keyboard Layout

1. Choose the keyboard Layout
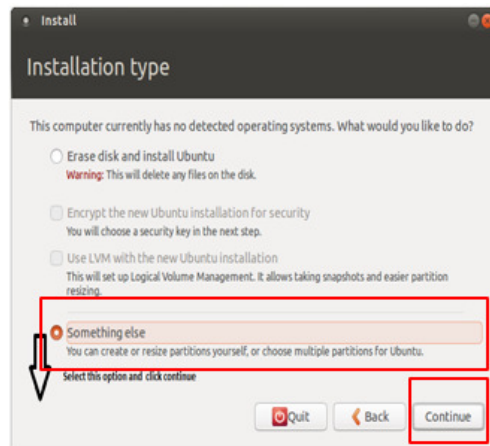2. By default it takes English
3. Click continue

Choosing Applications

1. Select Normal Installation for a full Ubuntu experience
2. Select Minimal Installation to install basic utilities

Partitioning the Drive (HDD)

1. Select ' Something else' to resize partitions or choose multiple partitions
2. Click on continue

Partitioning the Drive (HDD)

1. Select ' Something else' to resize partitions or choose multiple partitions
2. Click on continue

Install
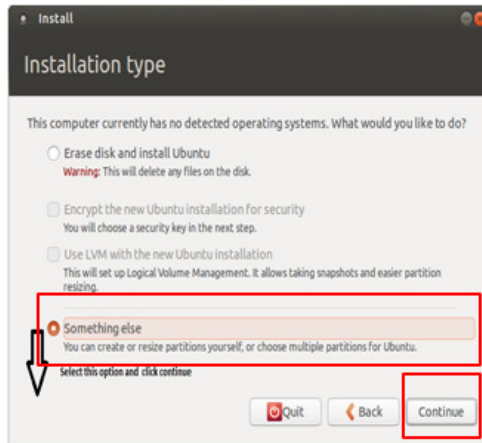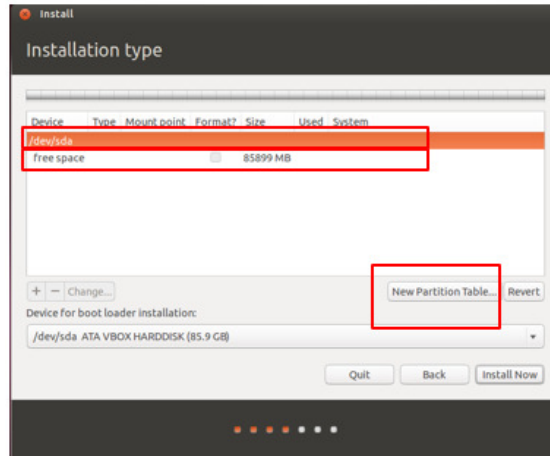
Installation type

This computer currently has no detected operating systems. What would you like to do?

○ Erase disk and install Ubuntu
   Warning: This will delete any files on the disk.

☐ Encrypt the new Ubuntu installation for security
   You will choose a security key in the next step.

☐ Use LVM with the new Ubuntu installation
   This will set up Logical Volume Management. It allows taking snapshots and easier partition resizing.

● Something else
   You can create or resize partitions yourself, or choose multiple partitions for Ubuntu.

Select this option and click continue

[Quit]   [Back]   [Continue]

**Partitioning the Drive (HDD)**

1. Disk will appear as   /dev/sda
2. Click on New Partition Table
3. Free space will be displayed

Install

Installation type

Device	Type	Mount point	Format?	Size	Used	System
/dev/sda						
free space			☐	85899 MB		

[+] [−] [Change...]   [New Partition Table...] [Revert]

Device for boot loader installation:

/dev/sda ATA VBOX HARDDISK (85.9 GB)   ▼

[Quit]   [Back]   [Install Now]

Partitioning the Drive (HDD)

14

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Create Partition for swap

1. Create partition for swap
2. Swap is the partition for keeping unneeded memory pages, like Windows swap.
   It can be used for hibernation (Recommended)

1. Set parameters like on the image shown on this slide

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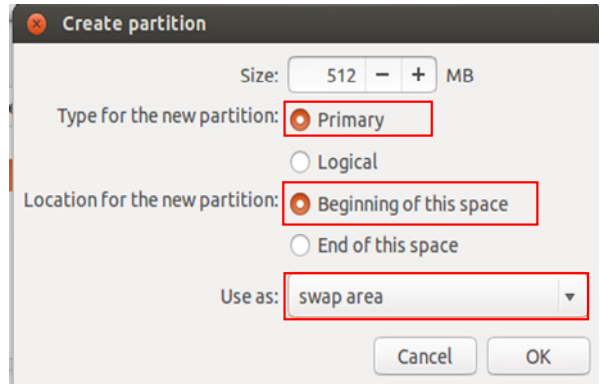
Create Partition for /(root/fs)

1. Create partition for / (root fs)
2. Root/fs is a file system that contains your kernel, boot files, system files etc.
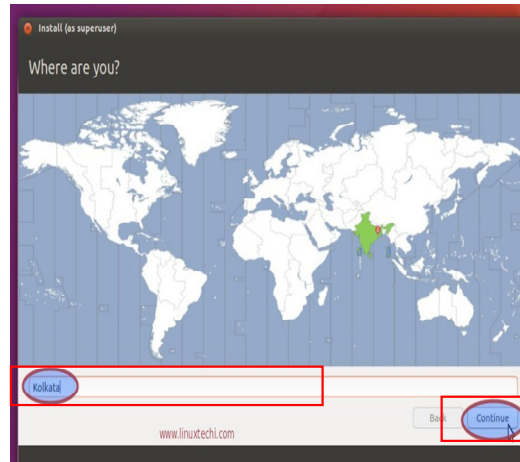3. Set parameters like on the image shown on this slide
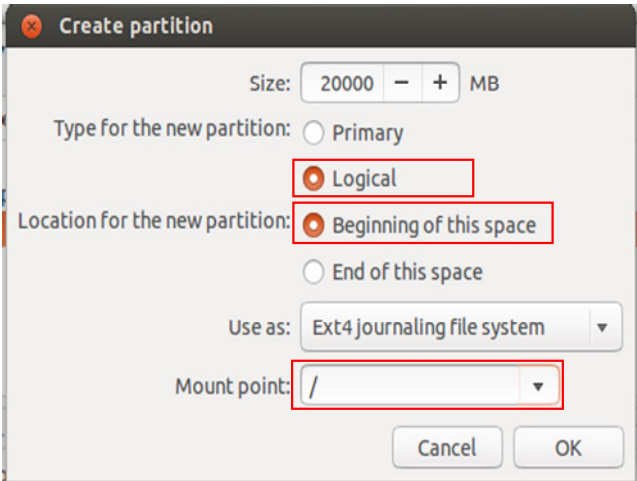
Create Partition for /home

1. Create partition for/home; this partition is the file system for user files
2. Select checkbox ext4
3. Click ' Install Now'
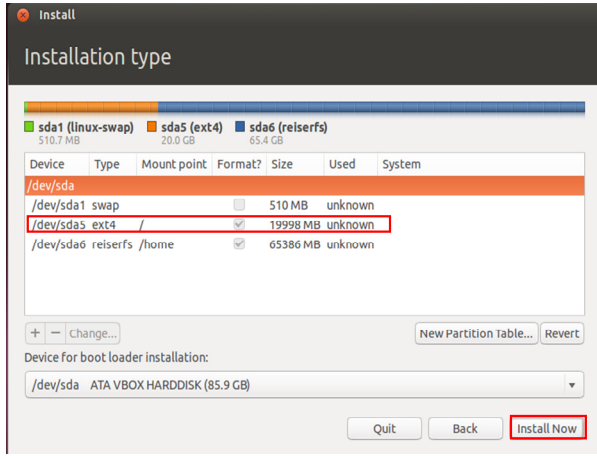
Selecting Time Zone

1. Installer will ask 'Where are ¥you?'
2. Type the nearest large city, from where your located, into the box
3. Click Continue

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Create User Account

1. **Name:** Enter name
2. **Computer name:** This is the hostname or network name.
3. **Username:** The user account name you want to use
4. **Password:** Enter and confirm a strong password
5. **Log in automatically:** This is not recommended for publicly accessible servers
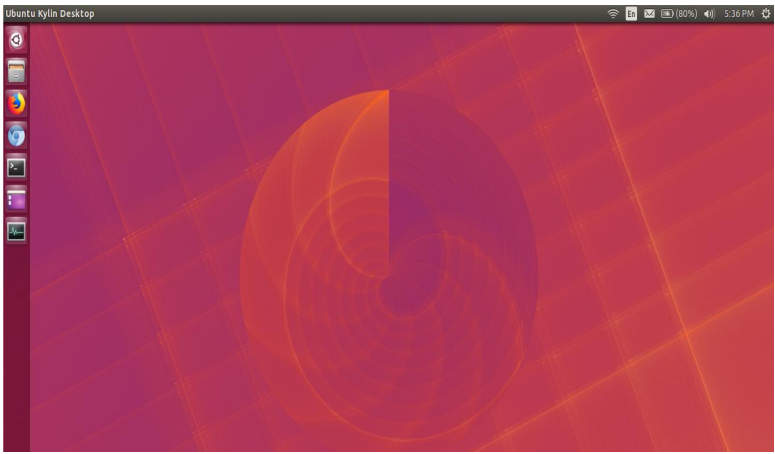6. **Require my password to log in:** This is recommended for publicly accessible servers

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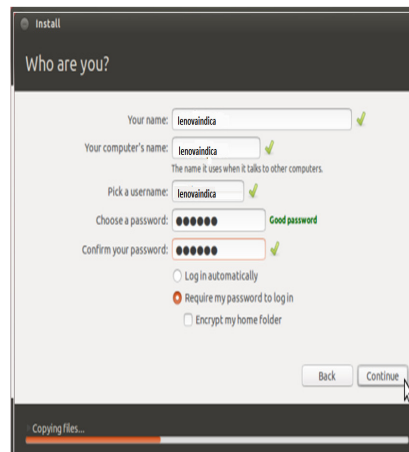
Create User Account

1. Files are being copied to the system
2. Final setup screen will appear
3. Click System Restart

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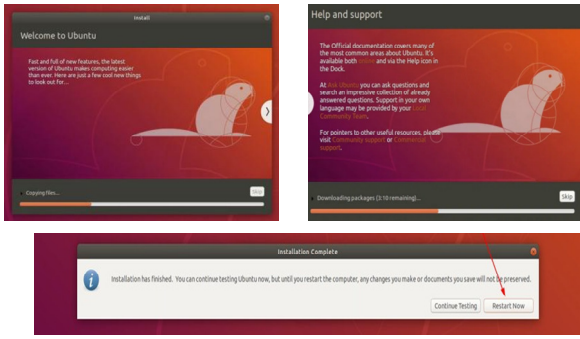
Ubuntu Home Screen

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Method 2- Installing Ubuntu along with Windows

- Dual boot setup allows you to have multiple Operating Systems on a single hard drive

- Each Operating System will have its own software and drivers

- During the boot process, you can select the OS ~~they~~ you would like to boot

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Minimum System Requirements To Install Ubuntu With Windows

A bootable USB or Bootable DVD

Fast and stable internet

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Creating partition on Windows

1. Access the "Device Manager" in Windows to create a new partition
2. Open ~~r~~Run by pressing Windows Key + R
3. Type diskmgmt.msc and hit ENTER
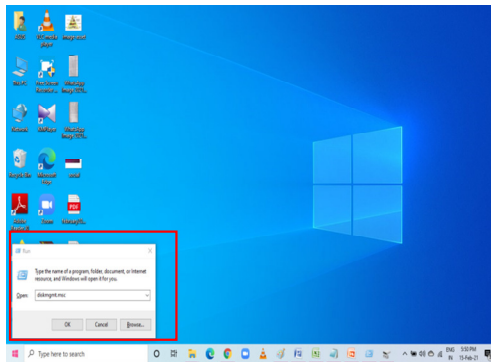
Creating partition on Windows

1. Disk management window displays all the disks attached to the PC and partitioned volumes
2. To create a separate partition for Ubuntu, right click on the volume and select shrink as shown in the image
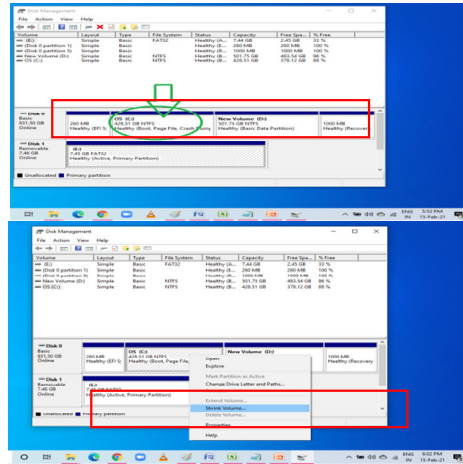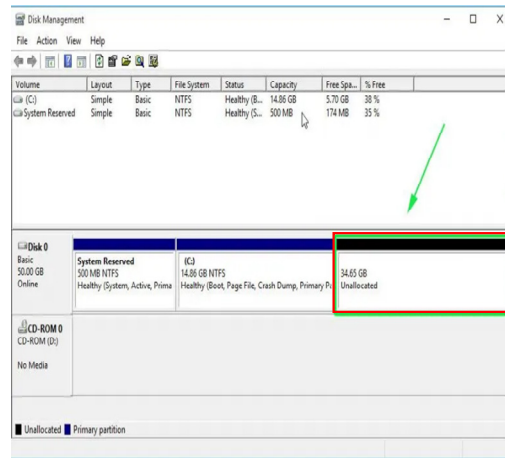

Creating partition on Windows

1. Change the amount of space to '35480 MB' as show in the image
2. Click on shrink
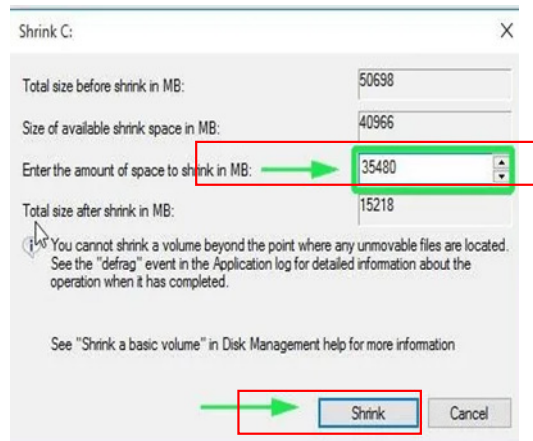
Creating partition on Windows

1. After completion, the partition will be displayed as shown in the image
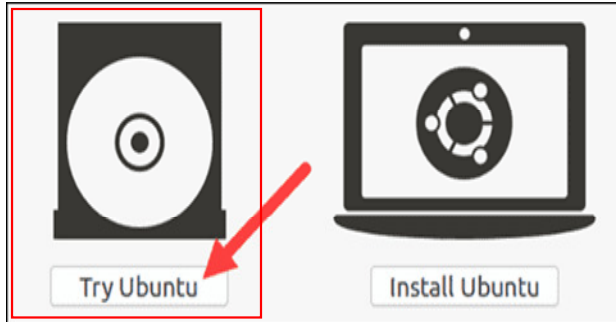2. This is the partition, that we are going to install Ubuntu

Creating partition on Windows (Booting The System)

1. After restarting   enter into BIOS settings
2. BIOS can be accessed by pressing F10 / F9 / F12 or by hitting the ESC key
3. Save and exit BIOS settings
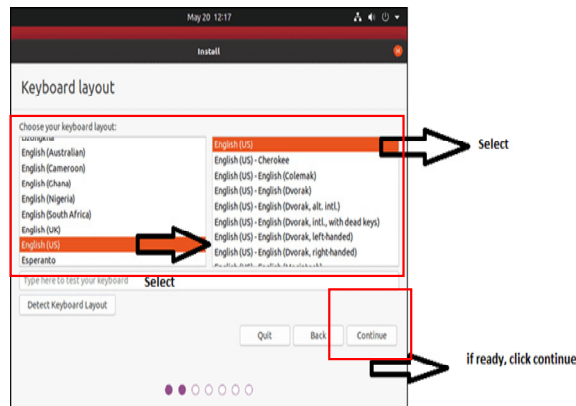4. Ubuntu will scan your hard drive and start performing file system integrity checks
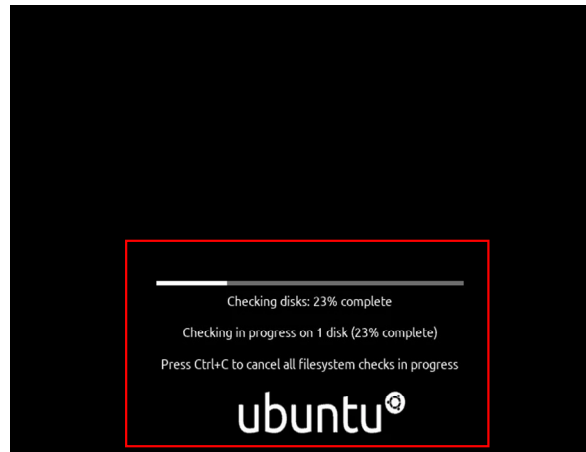
Beginner or Experienced User Selection

1. Select 'Try Ubuntu' for beginners
2. Select 'Install Ubuntu' for experienced users

Choosing Keyboard Layout

1. Choose the keyboard Layout
2. By default, it takes English
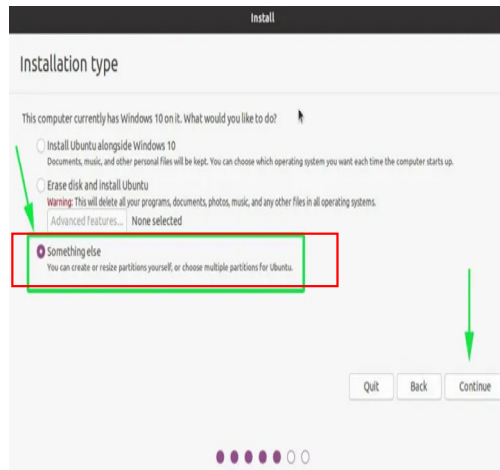3. Click continue

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Choosing Applications

22

1. Select Normal Installation for a full Ubuntu experience
2. Select Minimal Installation to install basic utilities

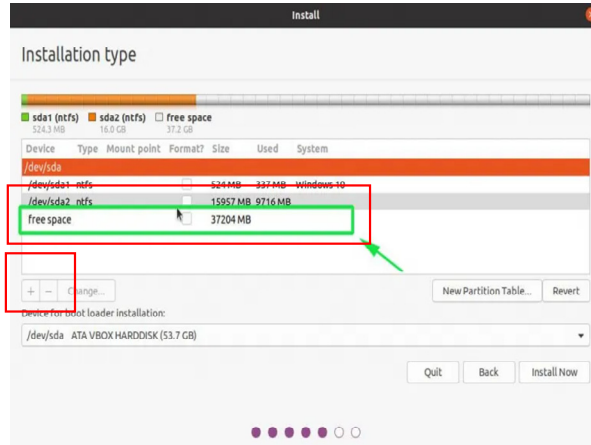_____

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Installation Type

1. The first selection installs the OS automatically
2. Second selection deletes the existing OS
3. Lastly, the 'Something else' option.

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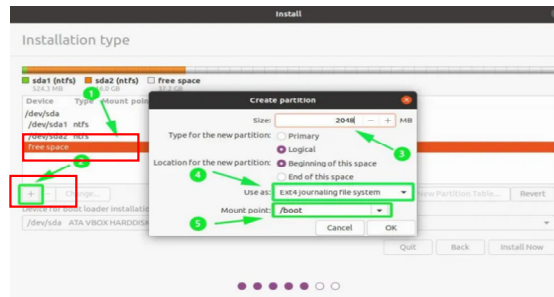**Installation Type**

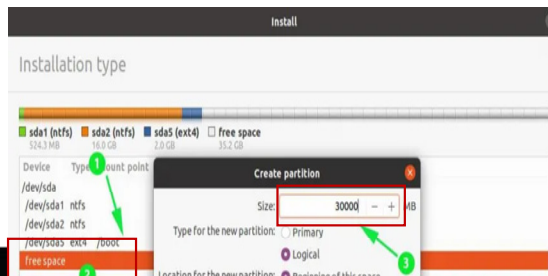1. Select free space
2. Click on the '+' sign

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Installation Type

1. Create the essential following partitions
   a) /boot –2048MB
   b) / –30000MB
   c) Swap –4048MB
2. To create the boot partition, click on the free space partition and click on the '+' sign
3. Select options as shown in the pop up box on the image

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Installation Type

24

1. Create root partition again
2. Click on the remaining free space and click on the plus (+) sign
3. On the pop-up box, type in the size of the **root partition**, (30000MB)
4. Select the '**Ext4 Journaling file system**' and thereafter, select the mount point as / (**forward slash symbol**)

Installation Type

1. To create the swap partition,
2. Select '**swap area**' instead of 'Ext4 Journaling file system'
3. Click Ok.
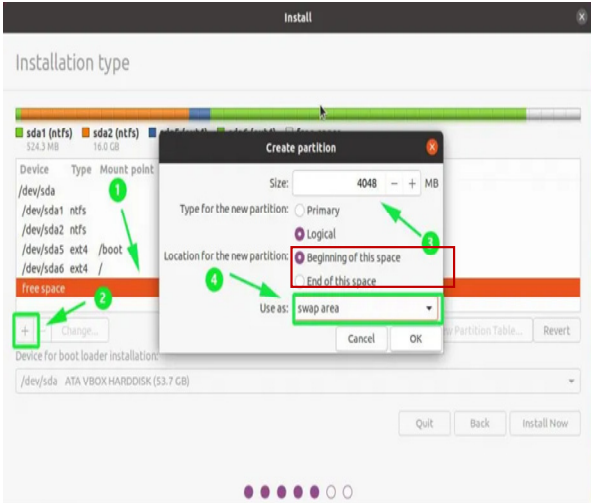
Installation Type

1. The partition table now looks as shown in the image.
2. Notice the presence of both the NTFS file system for Windows and Ext4 for Linux.

25
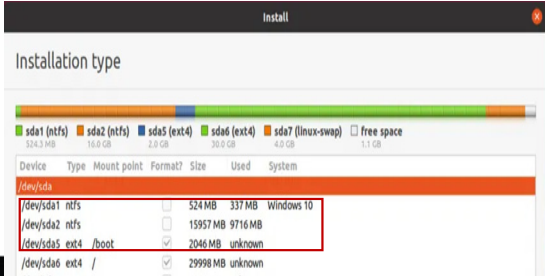
Installation Ubuntu

1. Click continue on the pop-up
2. Once you are done, click on '**Install now**'

Selecting Time Zone

1. Installer will ask 'Where are ¥you?'
2. Type the nearest large city from where your located, into the box
3. Click Continue

26

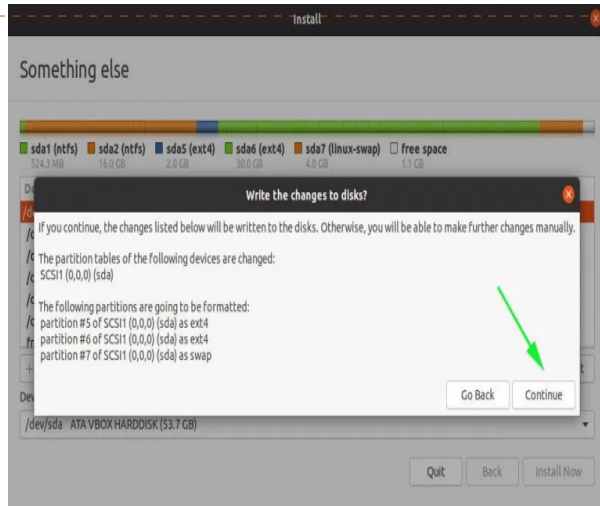**Create User Account**

1. **Name:** Enter name
2. **Computer name:** This is the hostname or network name.
3. **Username:** The user account name you want to use
4. **Password:** Enter and confirm a strong password
5. **Log in automatically:** This is not recommended for publicly accessible servers
6. **Require my password to log in:** This is recommended for publicly accessible servers
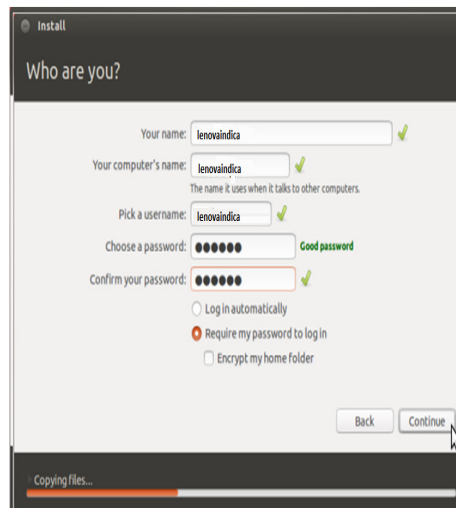
Finishing The Setup

1. Files are being copied to the system
2. Click ┌Restart now

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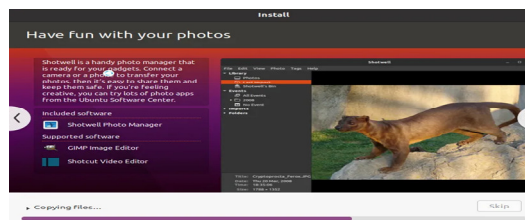
Choosing OS To Boot

1. Choose to boot into either Windows or Ubuntu
2. To boot into Ubuntu select the first option as shown in the image.

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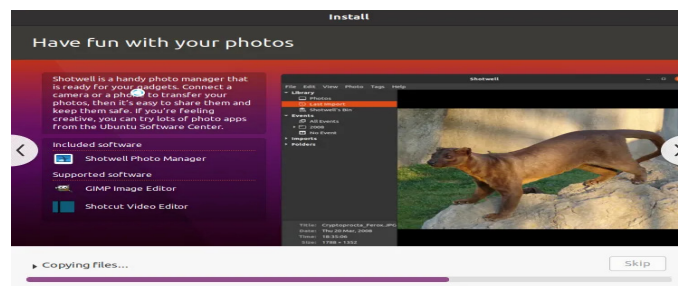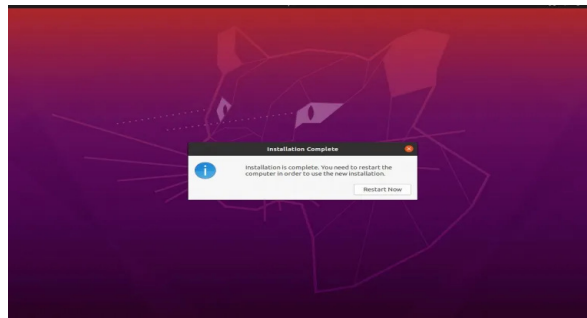
Ubuntu GUI Interface

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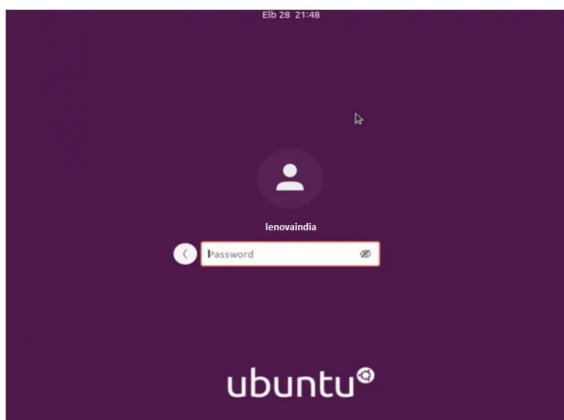
Ubuntu Home Screen

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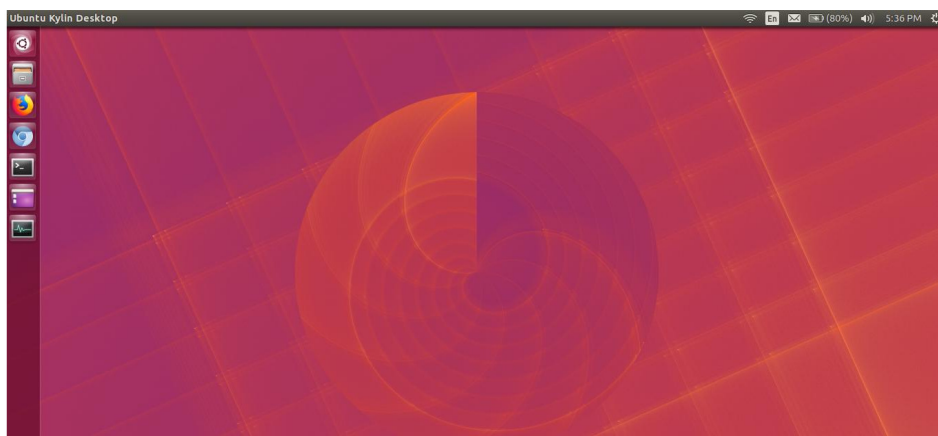
What are the settings I can manage?

1. To open sSettings, click the drop down arrow mark on the right side top corner
2. Select sSettings in the drop down
3. Opens a new window with various options related to system hardware, Wi-Fi, Network etc.

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What are the settings I can manage?

System Settings	
Wifi	Network
Bluetooth	Background
Appearance	nNotifications
sSearch	aApplications
pPrivacy	Online accounts
sSharing	sSound
Power	dDisplay
Mouse and touchpad	

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Various System Settings: WIFI   - Ubuntu
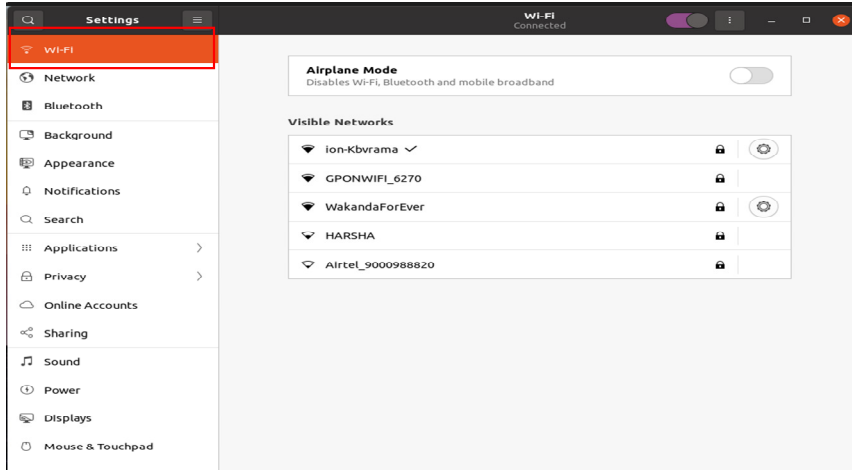
Various System Settings: Network - Ubuntu

1. Network window on system settings
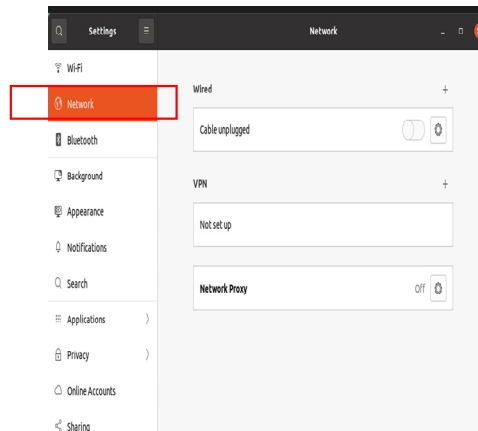
Various System Settings: Bluetooth

1. A **Bluetooth** device **works** by using radio waves
2. **Bluetooth** is a wireless short-range communications technology
3. In this Operating System, it identifies the nearby Bluetooth devices and display's on our system.
4. If the device is known, then it can be paired.
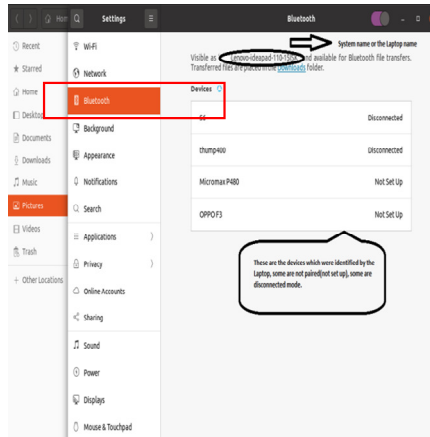
Various System Settings: Appearance

1. Appearance settings ~~has~~ have the following options
2. Window Colors - Light, Standard (default), Dark
3. Dock – It has the following options
4. Auto hide the Dock – it hides when any windows overlap with it.
5. Icon size – the default icon size is 48, if the user requires much bigger size he/she can drag the bar.
6. Show On – it is used for primary display
7. Position on the screen: icon position size will be in left side by default.
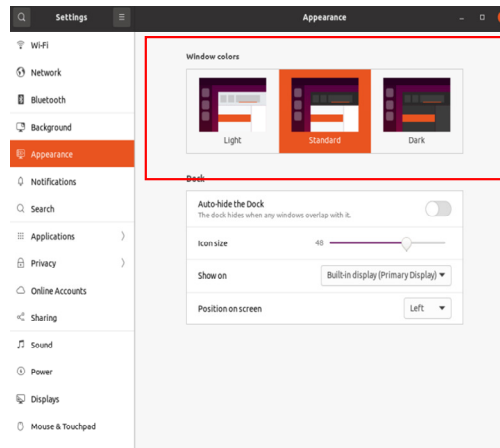
Various System Settings: Notifications

If an application or a system component wants to get your attention, a notification will be shown at the top of the screen, or on your lock screen

This notification Setting contains two options

1. Do not disturb – Selecting this option will stop notification alerts
2. Lock Screen Notification - When your screen is locked, notifications appear on the lock screen

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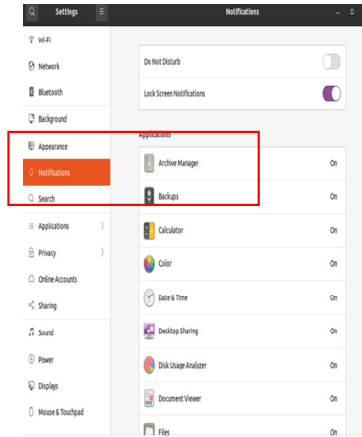
Various System Settings: Search

1. The system search shows results from various applications.
2. On the left-hand side of the search results, you can see icons of applications that provided the search results.
3. Click one of the icons to restart the search
4. Searching from inside the application may give you better search results.
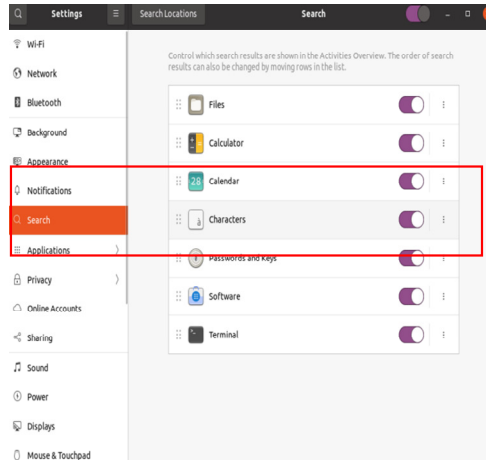
Various System Settings: Applications

1. Applications window gives information about various applications installed
2. User can find default handlers like text file, other files and HTML files
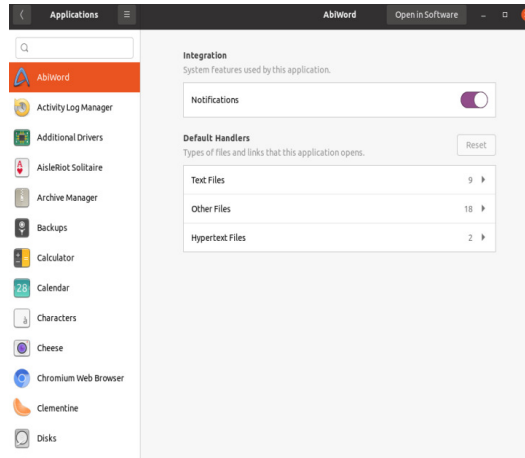
Various System Settings: Online Accounts

1. User can login to various online services like Facebook, gGoogle etc.
2. This allows applications access to online services like email, chat etc.
3. The default account added is the Ubuntu login account
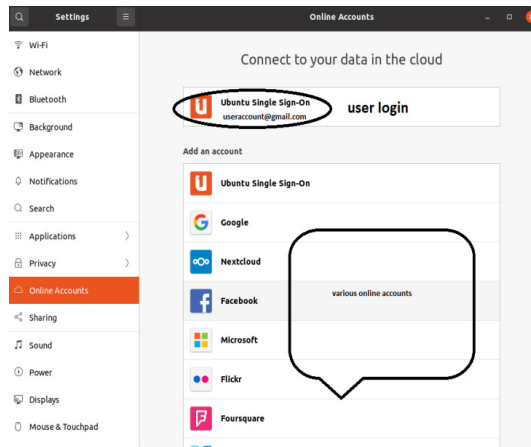
Procedure to Install an Application on Linux OS

There are two ways, to install application softwares in Ubuntu

- Ubuntu software
- Command Prompt

_____
_____
_____
_____

Installation of ~~V~~various ~~S~~software~~'~~s in Linux   (Using Ubuntu Software)

```
┌──────────────────┐       ┌──────────────────┐
│  To install using│  ───► │ Type the name of │
│  Ubuntu software │       │ required software│
│                  │       │ in search button │
└──────────────────┘       └──────────────────┘
                                     │
                                     ▼
┌──────────────────┐       ┌──────────────────┐
│  Use the same    │  ◄─── │ After finding the│
│  procedure to    │       │ software, Click  │
│  Uninstall a     │       │ Install          │
│  software        │       │                  │
└──────────────────┘       └──────────────────┘
```
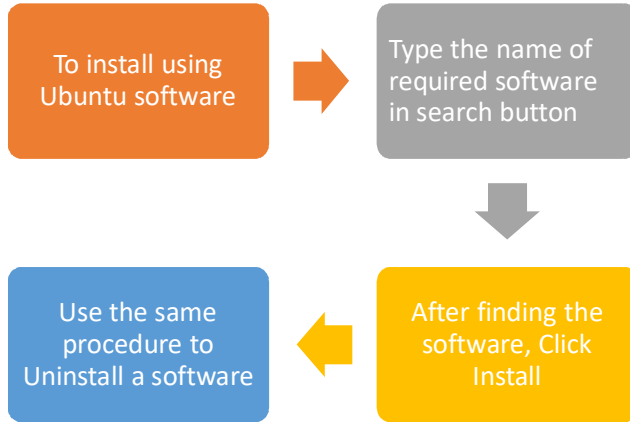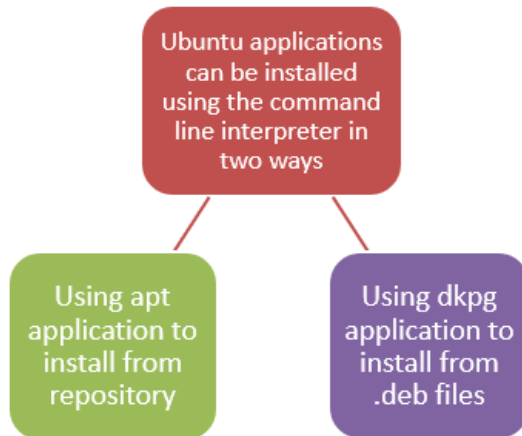
_____
_____
_____

Installation of ~~V~~various ~~S~~software~~'s~~ in Linux (Using Command Line Interpreter or Terminal)

```
          ┌──────────────────────┐
          │ Ubuntu applications  │
          │ can be installed     │
          │ using the command    │
          │ line interpreter in  │
          │ two ways             │
          └──────────────────────┘
           /                    \
┌──────────────────┐   ┌──────────────────┐
│ Using apt        │   │ Using dkpg       │
│ application to   │   │ application to   │
│ install from     │   │ install from     │
│ repository       │   │ .deb files       │
└──────────────────┘   └──────────────────┘
```
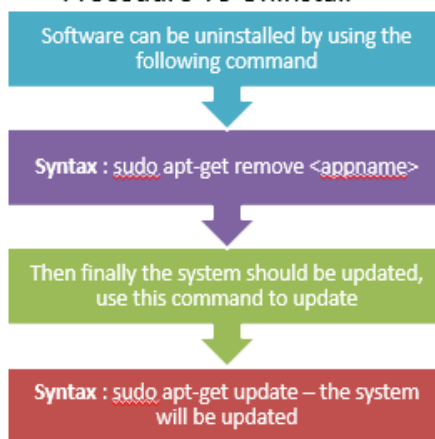
_____
_____
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_____

Installation of ~~V~~various ~~S~~software~~'s~~ in Linux   (Using Command Line Interpreter or Terminal)

Procedure To Install

This software can be installed by using the following command

↓

Syntax : sudo apt-get install <appname>

↓

After typing this command, required software will be installed.

Procedure To Uninstall

Software can be uninstalled by using the following command

↓

Syntax : sudo apt-get remove <appname>

↓

Then finally the system should be updated, use this command to update

↓

Syntax : sudo apt-get update – the system will be updated
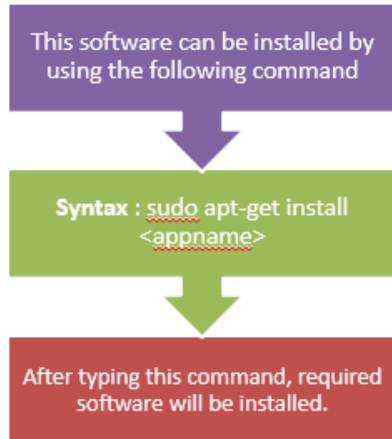
Install Adobe Reader in Linux OS using Ubuntu Ssoftware

Select The Menu

↓

List of software's applications will be opened

↓

Now traverse and find the Ubuntu software application

↓

Select the Ubuntu software, if you know the software to be installed, type and search

↓

List of software's will be displayed, select the appropriate one and click on it to install

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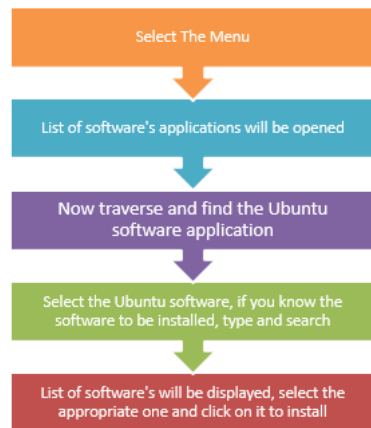
Install VLC Media Player in Linux OS Uusing Ubuntu Ssoftware
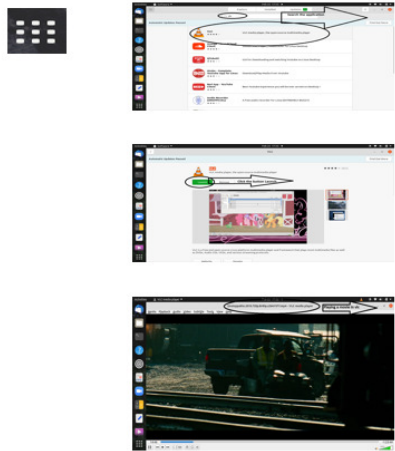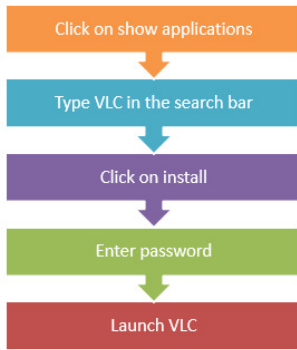
Install LibreOffice in Linux OS using Ubuntu software
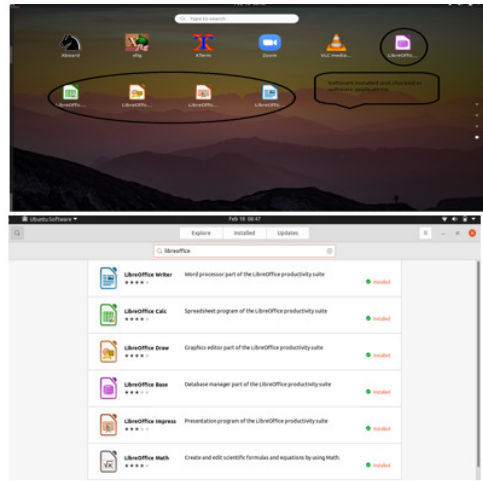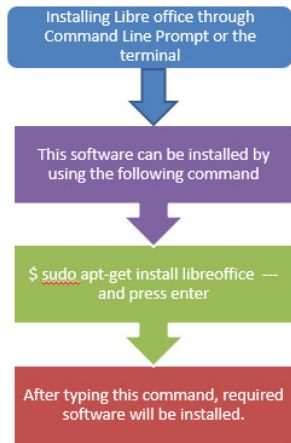
Learning Summary

- Functions of a kernel, Ttypes of a Kernel and Architecture of a Kernel

- The roles of Inter-process communication and System call

- Various applications that can be installed on Linux like Google Chrome, Gimp, Kden Eetc

- Steps to Install Ubuntu Linux Operating System

- Installing Ubuntu along with Windows

- Managing system settings in Linux OS

- Procedure to Iinstall utility applications like Adobe Reader, VLC media player and Libre Office.

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