

# An Analysis of Linux Operating System

<sup>1</sup>Nandhini.U, <sup>2</sup>Nivetha.B and <sup>3</sup>Shobana.D  
<sup>1,2</sup>Scholar, <sup>3</sup>Assistant Professor,

Department of Information Technology, Sri Krishna Arts and Science College, Coimbatore, India

**Abstract:** Linux is an operating system for Intel 386/456/ Pentium based IBM PCs and congenial. A world wide group of enthusiastic volunteers has join forces in developing many aspects of Linux on the INTERNET. Linux can run the powerful set of compilers and programming tools of free software foundation and X-free 86 ,a port of the X windows system from MIT. One useful feature of Linux is its ability to coexist with other operating system. Thus a user who has made an investment in DOS/MS windows software may continue running these applications on machine and install.

**Keywords:** Linux, Operating system, Distributions, Software, Kernel, Process.

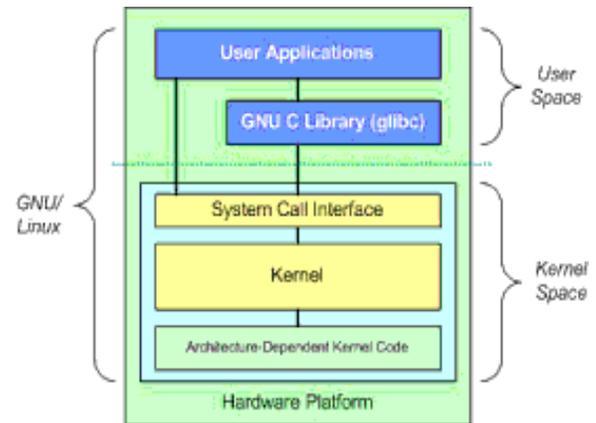
## I. INTRODUCTION

Linux is a UNIX – like and mostly POSIX non resistant computer operating system. Linux kernel was first released on 5 October 1991 by Linus Torvald, a graduate Technology in Finland. Since it was written from scratch, it does not contain any behavior code. It is assembled under the model of free and open source software development and distributes. Linux is an leading operating system on server and other big systems such as mainframe computers and fastest super computer. It also runs on the coordinated system which devices having OS is typically built into a microcode, it includes smart phones, tablets running android, Linux derivatives, network routers, televisions, video games and smart watches. The source code may be used, modified and distributed with respective license as GNU general public license. Some of the popular Linux distributions are DEBIAN, UBUNTU, LINUX MINT, FEDORA, ARCH LINUX, RED HAT and SUSE Linux organization server.

## II. KERNEL ARCHITECTURE

Modules or sub-systems that provide the operating system functions. It is an core of a operating system. It is written by C.

**1. USER MANNER:** The user manner is the space in memory user processes run. This memory is above the kernel. It includes the rest of the accessible memory. The space is covert. The system prevents one process from interfacing with another process .Only kernel processes can approach a user process. [2]



**2. KERNEL MANNER:** The kernel space is the space in memory where all kernel servers are provided via kernel process. The user has access to it only through the system call. A user process becomes a kernel process when it executes a system call.

### A. Kernel Structural

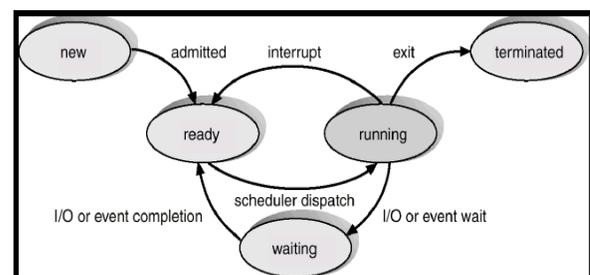
#### 1. File system

It is trustworthy for storing data on disk and acquires updating this information. The file system is accessed through system calls such as: open, read, and write. Example: FAT16, FAT32, NTFS ext2, ext3.

#### 2. Process management

The Unix OS is a time-sharing system. Every process is regular to run for a period of time (time slice). Kernel creates, Succeed and deletes processes. [2]

### B. Types of Processes



**1. Running:** The process is either running or it is ready to run.

2. Waiting: The process is waiting for an event or for a beginning.
3. Stopped: The process has been obstructed usually by obtain a signal.
4. Zombie: This is unfit process which for some reason still has a task affected data structure in 26 the task vector.

### C. Device Driver

Related with each physical driver or essential driver is a piece of code called Device Driver, which carry off the device hardware. The main functions of driver: Setting up hardware on data formatting. Bringing the connected devices into and out services. Receiving data from hardware and passing it back to the kernel. Sending data from the kernel to the device. Detecting and manipulating device errors.

### D. Memory Management

Physical memory is divided into portion of equal size called Pages. Types of memory management are:

- Physical memory.
- Virtual memory.
- Swap memory.

### E. Networking

The first incorporate communication ability in UNIX was formulated for Berkeley UNIX 4.2 based sockets execution. Sockets provide a programming interface for networking.

## III. DEVELOPMENT

The special difference between Linux and other operating system is "Linux kernel". Many Linux distributions are "Distros". It is a far collection of system software and application software packages available for download and installations through a network connection. Distributions use a package executive such as apt, yum, zipper, packman or portage to install, remove and modify all of system's software from one fundamental location.

### Linux Distributions: [1]

Linux distributions are divided into two groups.

- rpm based distributions.
- deb(Debian)based distributions.

In rpm distributions, they include distributions like Red hat Linux and its derivatives, Fedora, Man diva, Cent Os, SUSE. In deb distributions, they include Ubuntu,

KNOPPIX, Damn Small Linux, and Linux Mint these are belonging to second group. The working of the system and the preparation of files for both types of distributions is indistinguishable. Several icons can be seen on the desktop for both of the distributions. Switching between different desktops called Workspaces. It is also possible in all Linux distributions. All distributions have file manager application for managing files, web browser for browsing the Internet, email, applications and several other applications for audio, video operations. [1]

### A. Rpm Based Distributions

RED HAT LINUX: Red hat Linux operating system is the Linux version distributed by Red hat. It was developed in November 3 1994. This operating system can work in different types of computers such as desktops, servers as well as in computers having different subject field and processors. Several applications for office productivity, web browsing, mailing operations and games are installed by default, by installing this type of distributions. Applications for photo and image influence and networking are also available with this operating system. Encryption facility, firewall, multi languages support are the other features available with this of distributions. Red Hat Linux for Real Time is a computing platform for deadline-orientated applications and time-sensitive workloads. Red Hat Linux for Real Time contains the reliability, scalability, and execution of the world's starring Linux horizontal surface. [1] [3]

#### 1. Fedora Linux:

Fedora Linux is an operating system develops under Fedora project against presented by Red hat. This is a robust and matured operating system. The installer of fedora Linux is known as Anaconda. This operating system has several default applications. New versions are released with added features. New release of these distributions comes with different desktop state of affairs namely GNOME, KDE, and LXDE and so on. Support for audio, video and other multimedia files are also available with these distributions. Support for web cams and wireless networking is also available in new interpretation. [1]

#### 2. Mandiva Linux

This distribution was also known as Mandrake Linux. This is also based on Red hat. It is tone of the most common and popular link's Linux distributions. MANDRIVA Linux comes from 100% community-Driven organization that believes in the values of free software & cooperation and whose origination values are Development, Equality, Co-operation, Openness,

Freedom, Group, Achievement, Independence and Solidarity. [1] [6]

### 3. Suse Linux:

SUSE is a commercial Linux version and is very secure. Free versions of these distributions are known as Open SUSE Linux. This is a common and popular operating system is rpm based. It is implanted in 1992. SUSE, now it is part of Micro Focus. It is the original supplier of the project Linux distribution and the most inter operable level for mission-critical computing. Upgrade to these distributions is released day-to-day. Different desktop environments can be designated at the time of installation. The open SUSI wiki is the source of information of the open SUSE project and distribution. The goal is to provide high quality documentation and place for collaboration on all part of the projects. This is done well structured, standardized and easily readable way. Content is created, edited and refined by all community members. [4] [9]

### **B. Deb Based Distributions:**<sup>[1]</sup>

Debian/GNU Linux is a comprehensive and non commercial Linux distribution. Debian is a volunteer based Linux distributions. The package is deb based and the dependency resolver is apt-get. This Linux version supports system of different architecture. It has two desktop environments-Gnu Network Object Model Environment (GNOME) and k Desktop Environment (KDE). Several distributions are derived from Debian. This distribution has regular new releases.

### 1. Ubuntu Linux:

UBUNTU Linux is an easy to use Linux version. UBUNTU operating system has two versions-the desktop versions an the server version. This operating system is derived from DEBIAN LINUX. Two types of graphic user interfaces namely GNOME and KDE are available for UBUNTU. The version in which K Desktop Environment is used is known as KUBUNTU. Open office applications, web browser, messaging applications, text and graphic editor, mail client and games are installed by default. This operating system also provides support for a number of languages. UBUNTU organizes files in a hierarchical tree, where relationships are thought of in terms of children and parent. Directories can contain other directories as well as regular files, which are the “Leaves” of the tree. Any element of the tree can be references by a Path Name. [1] [5]

### 2. Knoppix L Inux:

KNOPPIX Linux is one of the first distributions that came with live CD distributions. Live CD can boot

from itself and operate through RAM. This is one of the most popular Linux distributions. This is a deb based operating system. It can be uploading via Bit Torrent or FTP/HTTP or it can be sequential on CD, DVD or USB flash key. There is also one clear example of the “experience shows”. For computers which cannot boot from USB drives. There is also a “boot-only” CD edition. [1] [8]

### 3. Damn Small Linux:

Damn small Linux is small Linux distribution having a small size of just 50MB.The distribution can also run from CD and from within the windows operating system. To create a live CD, the image file having an extension of .ISO is to be downloading from the web. Damn small Linux or DSL was discharged in 2003 to create a Linux operating system for older hardware. It's based on KNOPPIX/Debian profession. The basic DSL system demands are

- 486 or better business organization
- 8 M memory for the command line program
- 16 M memory for the graphical user program
- The DSL upload is 50 M

## IV. APPLICATIONS DEVELOPMENT IN LINUX

Applications menu in the top panel in the GNOME environment. There are four types of environment to develop applications in Linux.

- GAMBAS Development Environment.
- ANJUTA Development Environment.
- Qt Environment.
- Bluefish editor. :[1][2]

### A. Advantages of Linux

#### 1. Cost:

The most manifest benefit of using Linux is the fact that it is free to obtain where Microsoft products are available for a powerful and sometimes continual fee. Microsoft licenses typically are only allowed to be installed on a single computer, whereas a Linux distribution can be installed on any number of computers without paying a single deck. [1][7]

#### 2. Security:

The security characteristic of Linux is much stronger than that of Windows. The Linux operating system has been managed to stay secure in the real of widespread viruses, spy ware and ad ware. The simplest benefits of Open source code to establish are increased

security, responsibility and functionality. Because users of Open source are promptly able to identify and correct problems with the program and to refer their own improvement for incorporation into the program.

3. Reliability:

The subject field of Linux is superior to Windows because critical operating system functions are enforced in such a way that batty programs cant cause the computer to become unstable and crash.

4. Capabilities:

In component to the system helpful its tools from the UNIX world, Linux usually comes with the Apache web server, an email server, router/firewall ability and SQL information. Linux is POSIX nonresistant which means that applications developed for Linux can be operated on other POSIX nonresistant UNIX procedure with a minimum of process.

**B. Disadvantages of Linux**

- Non-compatible software
- Unsupported hardware

**C. Comparison of Linux, Windows & Mac Operating System**

QUALITIES	WINDOWS	MAC	LINUX
Profile Picture			
#UnhappyGhost			
Simplicity	Very Much	Indeed	Will easily get along
Beauty	Attractive	Impressive	Pretty
Self-Confidence	Still Working on it	Not bad	Yes, indeed
Strength	Easily backs down	Doesn't give up easily	Never gives up
Power	Pumping up	Got some muscles	Super Strong
Financial Mgmt	Spend thrift	Rich dad's spoilt kid	Not demanding
Trust Issues	A lot	Forgiving	Open-minded
Privacy	Very Intrusive	A little	Non-Intrusive
Hobbies	Error pop-ups, BSOD, Crash without warning	Graphics, Designing, Animation	Easily makes friends, parties while other two act sick!
#UnhappyGhost			
Background Check by CIA (on a funny note...)	- Acts a good host to malwares - Caught dating Justin Bieber - Recently tried plastic surgery but was a disaster (Win 8)	- Pays Taxes n Bills - Behaves a good citizen. - Fined twice for over-speeding	- Black-Belt in 20 different Martial Arts, - Very high IQ - Killer instincts - No criminal records
fb.com/geeksch00l			
Security	Can't count on it	Countable	Nothing like it
Tantrum	Always	Sometimes	Cute indeed!
Heart-Breaker	Big YES	No comments	Will still want it
End Of Day Thought	I don't want to be in this relationship any more	We can work it out honey	I have more than I deserve!
http://unhappyghost.com			

**CONCLUSION**

In this paper we have bestowed the accommodative field surroundings for operating system as a Solution for interdependence hardware beginning amongst multiple operating systems. We have bestowed its subject field and recommended an execution method for the ix86 using Linux as the base OS. We have also characterized areas of relevance. Although the execution communicating has centralized around on the ix86 using Linux, the idea bestowed may be prolonged to other subject field and other base operating system in order to render the same ability. [2]

**References**

[1] Linux – Learning the Essentials written by K.L James.  
 [2] <https://www.sics.se/~amir/files/download/os-lab/linux1.pdf>  
 [3] <https://www.redhat.com/en/technologies/linux-platforms/enterprise-Linux>  
 [4] <https://www.opensuse.org/>  
 [5] <https://help.ubuntu.com/community/LinuxFilesystemTree>.  
 [6] <https://www.openmandriva.org/>  
 [7] [http://www.osnews.com/story/24936/Damn\\_Small\\_Linux\\_Still\\_Damn\\_Fun](http://www.osnews.com/story/24936/Damn_Small_Linux_Still_Damn_Fun)  
 [8] <http://www.zdnet.com/article/hands-on-with-knoppix-linux-7-2-0-a-well-established-and-very-stable-Linux-distribution/>  
 [9] [https://en.opensuse.org/Main\\_Page](https://en.opensuse.org/Main_Page)