Mastering Linux

Introduction

A Brief History of Linux

- Linus Torvalds released version 1.0 of the Linux Kernel (1994)

- Later, the GNU open-source software movement would also make many contributions to Linux.

- Richard Stallman: "When you are talking about Linux as a OS, you should refer to it as GNU/Linux. Linux is just the kernel. All the tools that make Linux an OS has been contributed by GNU movement and hence the name GNU/Linux."

- Today, Linux is a prime example of the success of open-source, community-developed software.

- Many *distributions* of Linux exist. Linux also contributed to the development of new systems such as Google Chrome and Android, among others.

Linux Versions

- Ubuntu—"Ubuntu" means "humanity" in Zulu. Ubuntu Linux started as a version of the popular Debian GNU/Linux. All versions of Ubuntu Linux are free, and there is no charge for mailing a CD to you. Ubuntu supports the GNOME Desktop environment, while another version, *Kubuntu*, uses the KDE Desktop. Ubuntu is easy to install and very user friendly, which has quickly made it the most popular version of Linux. Ubuntu is sponsored by the U.K.-based Canonical Ltd., owned by South African entrepreneur Mark Shuttleworth.

- Red Hat Enterprise Linux—The original *Red Hat Linux* started in 1994 and was discontinued by Red Hat Inc. in 2004. The company now focuses on *Red Hat Enterprise Linux* (RHEL) for business environments and on *Fedora* as a

community-supported software project for home, personal, and educational use.

- CentOS—RHEL largely consists of free and open-source software, but the executables are made available only to paying subscribers. CentOS (Community ENTerprise Operating System) is a completely free version of RHEL (minus the Red Hat logos) made available to users as new versions of RHEL are released.

- Fedora—Fedora is a Linux distribution where features and improvements are tested before being included in RHEL/CentOS.

- openSUSE—This is a major retail Linux distribution supported worldwide by Novell. Novell acquired the SuSE Linux (a German translation of the original *Slackware Linux*) in 2004. In the following year, Novel decided to make the SUSE Professional series more open as a community-developed, open-source software and to rename it *openSUSE*.

- Debian—Debian Linux consists entirely of free and open-source software. Its primary form, Debian GNU/Linux, is a popular and influential Linux distribution. Debian is known for an abundance of options. Recent releases include over 26,000 software packages for all major computer architectures. Ubuntu is a derivative of Debian.

The UNIX/Linux Philosophy: *Small is Beautiful*

- Keep programs small—Write a program to do one well-defined task; do it efficiently, and do it well.

- Avoid verbosity—Perform no unessential output from any programs; use short names for commands and command options.

- Make programs modular—Build small, independent, and self-sufficient program parts, with each serving a specific function. These program parts can be combined flexibly to form larger programs. This principle is reflected in the small kernel (core of the operating system) cooperating with a large set of small commands which work well together.

- Compose programs through interfaces—Write programs that

are easy to interface with other programs. The famous UNIX pipe, which interfaces the output of a program to the input of another, is a primary example of this philosophy.

Linux Features

- *Multi-user and multi-processing*

- *Graphical user interface*

- *Package management*

- *Shells*

- *Hierarchical file system*

- *File access control*

- *Compatible file, device, and inter-process I/O*

- *Concurrent processes*

- *Networking and Web Hosting*

- *Utilities*

Elements of Linux

Other Programs
kernel
hardware
bash
gedit
vim
cpp
grep
as
ls
gcc
ld
ssh
a.out
sftp
chmod
X11
Desktop GUI