جامعة القاهرة الجديدة
التكنولوجية

Fall 2021

(2)

Linux Essentials

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Agenda

- Linux Distributions.
- Ubuntu.
- Graphical Desktop Environments.
- GNU Nano text editor.

Linux

Linux

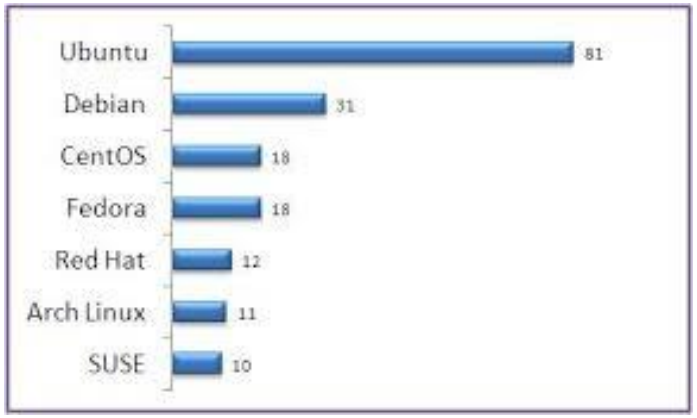
- Linux is an operating system that was first started out of curiosity by **Linus Torvalds,** but then took on a life of its own—in the meantime, hundreds of developers (not just students and hobbyists, but also **professionals at companies such as IBM, Red Hat, or Oracle) are developing it further.**
- **Linux was inspired by Unix**, an operating system developed in the **1970s** at AT&T Bell Laboratories and geared towards “small” computers.
- Unix soon became the preferred system for research and technology. **For the most part, Linux uses the same concepts and basic ideas as Unix,** and it is easy to get Unix software to run on Linux, but Linux itself does not contain Unix code, but is an independent project.

Linux

Linux

- Unlike Windows and OS X, Linux isn't backed by an **individual** company whose economic success hinges on the success of Linux. Linux is "freely available" and can be used by anyone—even commercially—who subscribes to the rules of the game (as outlined in the next chapter). This together with the fact that by now Linux no longer runs just on PCs, but in substantially identical form on platforms ranging from telephones (the most **popular smartphone operating system, Android, is a Linux offshoot**) to the largest mainframes (the ten fastest computers in the world are all running Linux) makes Linux the most versatile operating system in the history of modern computing.

Popular Linux



Linux Distributions

- Strictly speaking **“Linux” is just the operating system kernel**, i. e., **the program that handles the allocation of resources to applications and utilities.**
- Since an **operating system without applications isn’t all that useful**, one usually installs a Linux distribution, which is to say a package consisting of “Linux” proper and a selection of applications, utilities, documentation and other useful stuff. The nice thing is that, like Linux itself, most Linux distributions are **“freely available”** and hence available free of charge or at very low cost.
- This makes it possible to equip a computer with software whose equivalents for Windows or OS X would run into thousands of dollars, and you do not run the risk of falling foul of licensing restrictions just because you installed your Linux distribution on all your computers as well as Aunt Millie’s and those of your buddies Susan and Bob.

More Differences And Similarities

- Actually, the three big operating **systems—Linux, Windows, and OS X**—differ only in detail in what they present to the users.
- All three offer a **Graphical User Interface (GUI)** which allows even casual users to manage their files through simple gestures like **“drag and drop”.**
- Many popular applications are available for all three operating systems, so which one you are using at the end of the day becomes almost immaterial as long as you are spending most of your time inside the **web browser, office package, or e-mail program.**
- This is an advantage because it enables a “gradual” migration from one system to the other.

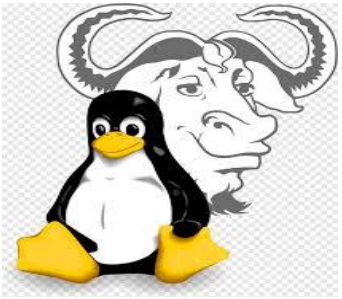
More Differences And Similarities

- Besides the graphical interface, all three systems also offer away to use **a "command line"** to input textual commands which the system then executes.
- With Windows and OS X, this feature is mostly used by **system administrators**, while "normal" users tend to shun it—a question of culture. **With Linux**, on the other hand, the command line is much less ostracized, which may have to do with its descent from the **scientific/technical** Unix philosophy. As a matter of fact, **many tasks are performed more conveniently and efficiently from the command line**, especially with the powerful tools that Linux (and really also OS X) provide.
- As a budding Linux user, you do well to open up to the command line and learn about its strengths and weaknesses, just as you should learn about the strengths and weaknesses of the GUI. A combination of both will give you the greatest versatility.

Important Linux Distributions

- Linux, the operating system kernel, but a complete software environment based on Linux. This normally includes the **shell (bash) and command-line tools from the GNU project**, the X.org graphics server and a graphical desktop environment such as **KDE or GNOME**, productivity tools like **LibreOffice, Firefox** or The GIMP and lots of other useful software from the previous section.
- Of course it is possible to assemble all these **tools** from their original sources on the Internet, but most Linux users prefer a pre-made software collection or “Linux distribution”.

GNU project



- The name **“GNU”** was chosen because it met a few requirements; first, it was a recursive acronym for **“GNU's Not Unix”.**
- **GNU is a Unix-like operating system. That means it is a collection of many programs: applications, libraries, developer tools, even games.**
- The project to develop the GNU system is called the “GNU Project”. The GNU Project was conceived in **1983** as a way of bringing back the cooperative spirit that prevailed in the computing community in earlier days—to make cooperation possible once again by removing the obstacles to cooperation imposed by the owners of proprietary software.
- https://www.gnu.org/

Linux Desktop Environments

- More so than other modern operating systems, Linux (like Unix) is based on the idea of entering **textual commands via the keyboard.** This may sound **old-fashioned** to some, especially if one is used to systems like Windows, who have been trying for more than 20 years or so to brainwash their audience into thinking that graphical user interfaces are the be-all and end-all.
- For many people who come to Linux from **Windows**, the comparative prominence of the command line interface is at first a **"culture shock"** like that suffered by a 21-century person if they suddenly got transported to King Arthur's court – no cellular coverage, bad table manners, and dreadful dentists!

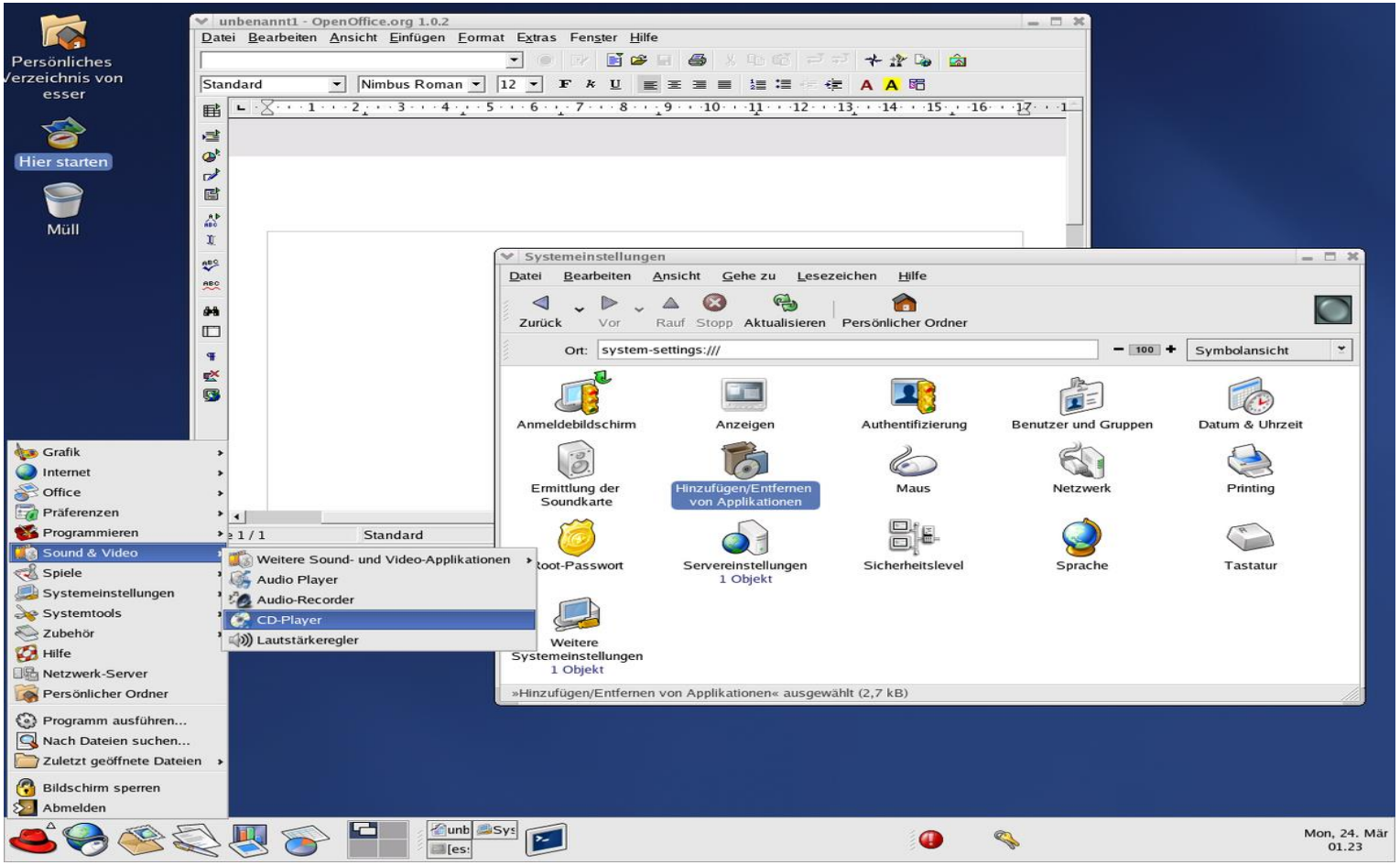
Terminals and Shells

- Even within a graphical Linux environment it is often convenient to access a **“terminal window”** where you can enter textual commands in a **“shell”.**
- Fortunately, on most Linux desktop environments a terminal window is only a few mouse clicks away. In KDE on Debian GNU/Linux, for example, there is an entry called **“Konsole (Terminal)”** within the start menu under “System”, which will open a convenient program running a shell that will **accept and execute textual commands**.

Red Hat

- **Red Hat (http://www.redhat.com/)** was established in **1993** as “ACC Corporation”, a distribution company for Linux and Unix accessories.
- In 1995, the company founder, Bob Young, bought the business of Marc Ewing, who in 1994 had published a Linux distribution called “Red Hat Linux”, and changed the name of his corporation to “Red Hat Software”.
- In 1999, Red Hat went public and is by now probably the largest corporation solely based on Linux and open-source software.
- It is part of the “Standard & Poor’s 500”, a stock index which serves as an indicator for the US economy.

Red Hat


unbenannt1 - OpenOffice.org 1.0.2
Datei Bearbeiten Ansicht Einfügen Format Extras Fenster Hilfe
Persönliches Verzeichnis von esser
Hier starten
Müll
Systemeinstellungen
Datei Bearbeiten Ansicht Gehe zu Lesezeichen Hilfe
Zurück Vor Rauf Stopp Aktualisieren Persönlicher Ordner
Ort: system-settings:///
Symbolansicht
Anmeldebildschirm
Anzeigen
Authentifizierung
Benutzer und Gruppen
Datum & Uhrzeit
Ermittlung der Soundkarte
Hinzufügen/Entfernen von Applikationen
Maus
Netzwerk
Printing
Root-Passwort
Servereinstellungen 1 Objekt
Sicherheitslevel
Sprache
Tastatur
Weitere Systemeinstellungen 1 Objekt
»Hinzufügen/Entfernen von Applikationen« ausgewählt (2,7 kB)
Grafik
Internet
Office
Präferenzen
Programmieren
Sound & Video
Spiele
Systemeinstellungen
Systemtools
Zubehör
Hilfe
Netzwerk-Server
Persönlicher Ordner
Programm ausführen...
Nach Dateien suchen...
Zuletzt geöffnete Dateien
Bildschirm sperren
Abmelden
Weitere Sound- und Video-Applikationen
Audio Player
Audio-Recorder
CD-Player
Lautstärkeregler
Mon, 24. Mär
01.23

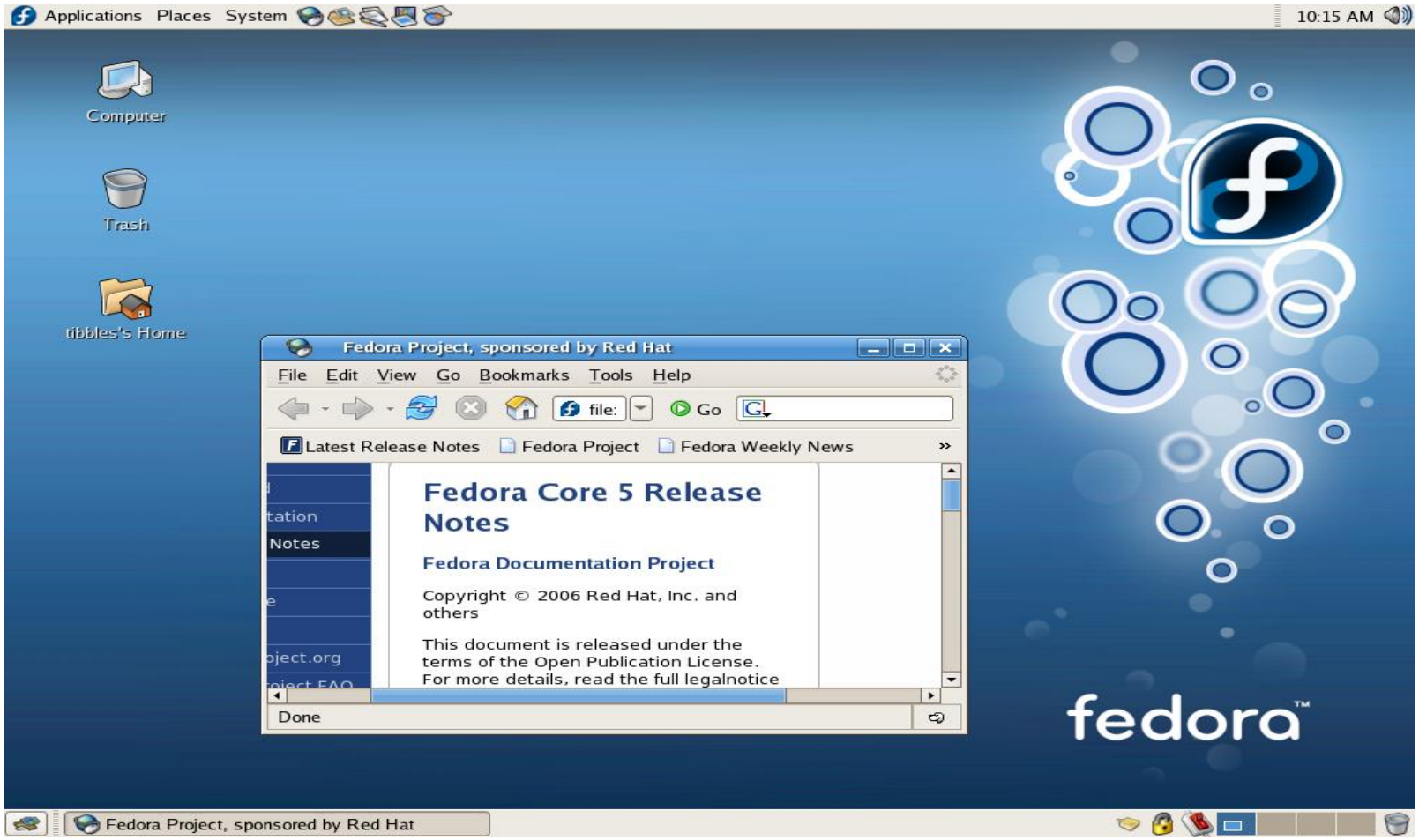
Red Hat

- Red Hat has withdrawn from its original individual-customer business (the last “Red Hat Linux” was published in April, 2004) and now markets a distribution for the professional use by companies under the name of **“Red Hat Enterprise Linux” (RHEL).**
- RHEL is licensed per server, although you do not pay for the software—which is furnished under the GPL and similar FOSS licenses—but for access to timely updates and support in the case of problems.
- RHEL is mostly geared towards **data centers** and, among other things, supports (with appropriate additional tools) the construction of fault-tolerant **“clusters”.**

Fedora

- **“Fedora” (http://www.fedoraproject.org/)** is a distribution, **mostly controlled by Red Hat,** which serves as a **“test bed” for RHEL.**
- **New software and ideas are trialed in Fedora first**, and whatever proves useful may show up in RHEL sooner or later.
- Unlike RHEL, **Fedora is not sold but made available for free download instead;** the project is governed by a committee whose members are partly elected by the developer community and partly nominated by Red Hat. (The committee chair is nominated by Red Hat and has veto powers.) For many Fedora users, the focus on current software and new ideas is part of the attraction of the distribution, even though this implies frequent updates. **Fedora is less suitable for beginners and the use on servers which are supposed to be reliable.**

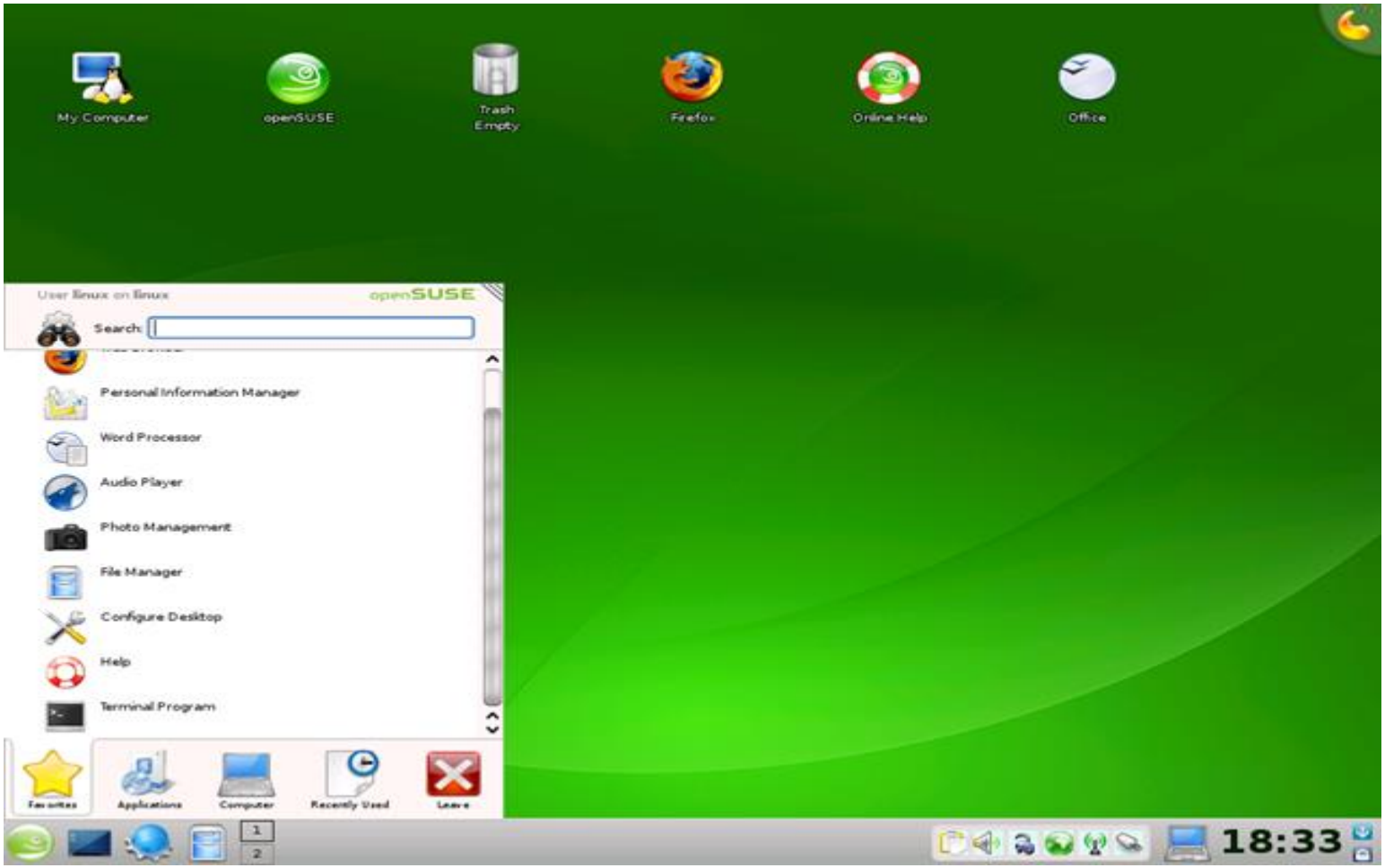
Fedora


Applications Places System
10:15 AM
Computer
Trash
tibbles's Home
Fedora Project, sponsored by Red Hat
File Edit View Go Bookmarks Tools Help
file:
Go
Latest Release Notes
Fedora Project
Fedora Weekly News
Fedora Core 5 Release Notes
Fedora Documentation Project
Copyright © 2006 Red Hat, Inc. and others
This document is released under the terms of the Open Publication License. For more details, read the full legalnotice
Done
fedora™
Fedora Project, sponsored by Red Hat

SUSE

- The **German company** SUSE was first incorporated 1992 as a Unix consultancy under the name of “Gesellschaft für **Software- und System-Entwicklung”** and accordingly spelled itself **“S.u.S.E.”.**
- One of its products was a German version of Patrick Volkerding’s Linux distribution, Slackware, which in turn was derived from the first complete Linux distribution, Softlanding Linux System or SLS. S.u.S.E. Linux 1.0 appeared 1994 and slowly diverged from Slackware by taking on features from Red Hat Linux, **like RPM package management** or the /etc/sysconfig file.
- The first version of S.u.S.E. Linux that no longer looked like Slackware was version 4.2 of 1996. SuSE (the dots had disappeared at some point) soon became the leading German-language Linux distribution and published SuSE Linux as a “boxed set” in two flavors, **“Personal” and “Professional”—**the latter was noticeably more expensive and contained, among other things, more server-oriented software.

SUSE


My Computer
openSUSE
Trash
Empty
Firefox
Online Help
Office
openSUSE
Search
Personal Information Manager
Word Processor
Audio Player
Photo Management
File Manager
Configure Desktop
Help
Terminal Program
Favorites
Applications
Computer
Recently Used
Leave
18:33

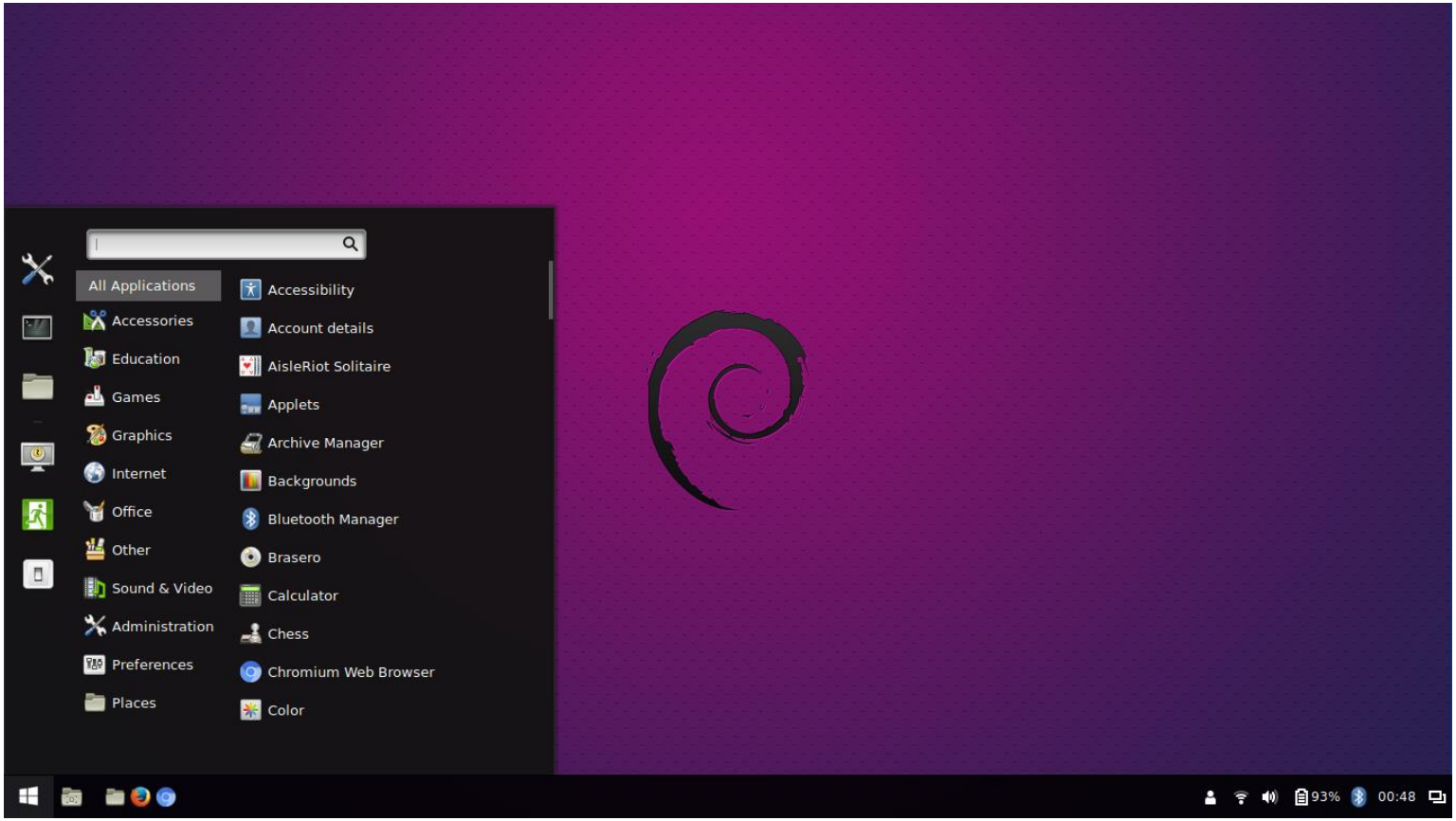
SUSE

- Like Red Hat, SUSE offers an “enterprise Linux”, the SUSE Linux Enterprise Server (SLES, http://www.suse.com/products/server/), which resembles RHEL in that it is published fairly infrequently and promises a long life cycle of 7–10 years.
- In addition, there is **SUSE Linux Enterprise Desktop (SLED),** a distribution which is intended to be used on desktop workstations.
- SLES and SLED differ in the choice of **packages** included; with SLES, the focus is on server software, while SLED is geared more towards interactive software.

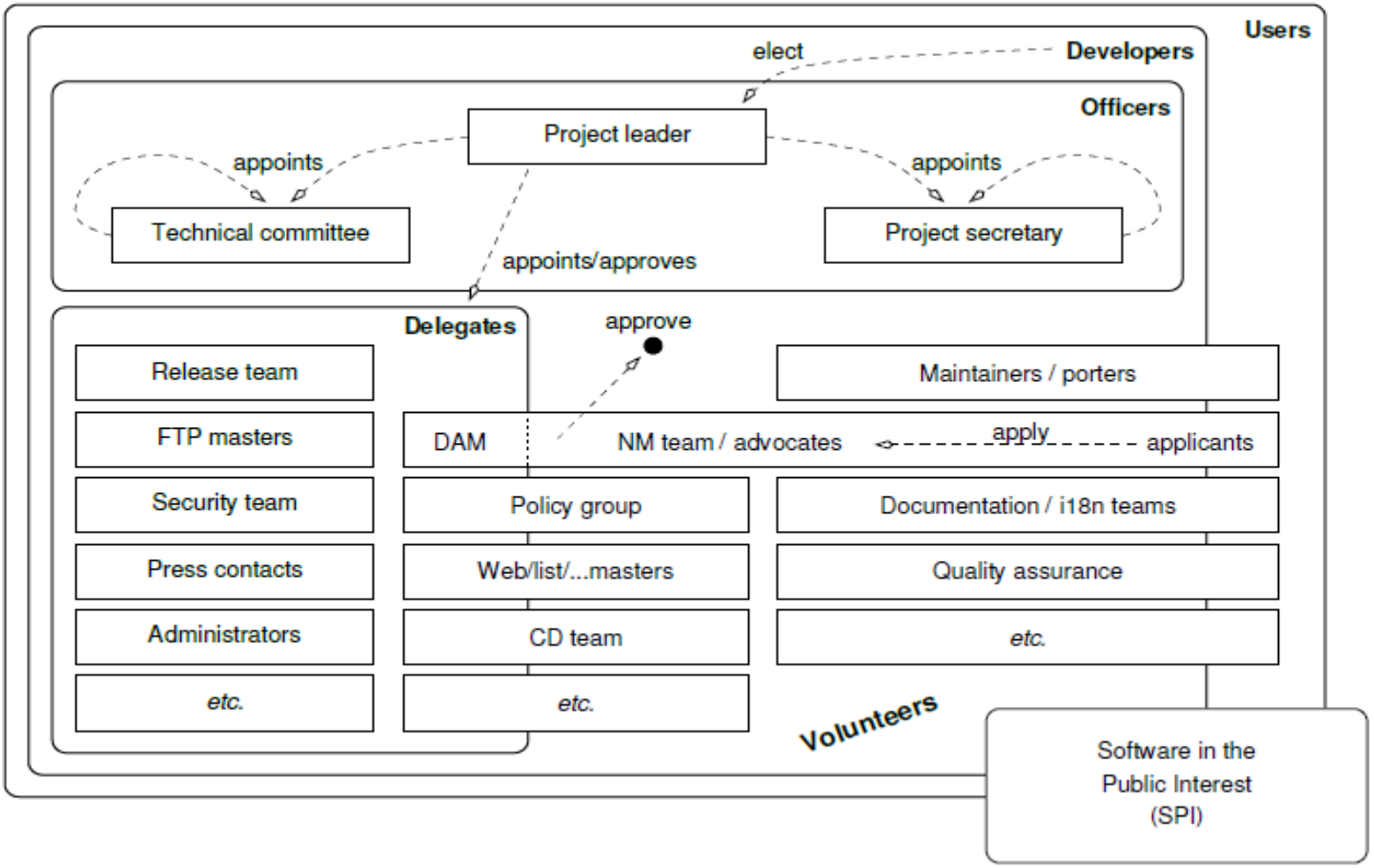
Debian

- Unlike the two big Linux distribution companies Red Hat and Novell/SUSE, the Debian project **(http://www.debian.org/)** is a collaboration of volunteers whose goal is to make available a **high-quality Linux distribution** called "Debian GNU/Linux".
- The Debian project was announced on 16 August 1993 by Ian Murdock; the name is a contraction of his first name with that of his then-girlfriend (now ex-wife) Debra (and is hence pronounced **"debb-ian"**). By now the project includes more than 1000 volunteers.
- Debian is based on three documents:
  - The **Debian Free Software Guidelines (DFSG)** define which software the project considers "free". This is important, since only DFSG-free software can be part of the Debian GNU/Linux distribution proper. The project also distributes non-free software, which is strictly separated from the DFSG-free-software on the distribution's servers: The latter is in a subdirectory called main, the former in non- free. (There is an intermediate area called contrib; this contains software that by itself would be DFSG-free but does not work without other, non-free, components.)
  - The Social Contract describes the project's goals.
  - The Debian Constitution describes the project's organization.

Debian


All Applications
Accessories
Education
Games
Graphics
Internet
Office
Other
Sound & Video
Administration
Preferences
Places
Accessibility
Account details
AisleRiot Solitaire
Applets
Archive Manager
Backgrounds
Bluetooth Manager
Brasero
Calculator
Chess
Chromium Web Browser
Color
93%
00:48

Organizational structure of the Debian project



Kali Linux

- Home of Kali Linux, an Advanced Penetration Testing Linux distribution used for Penetration Testing, Ethical Hacking and network security assessments.
- Hackers commonly use Kali Linux because it has security analysis, security auditing, and penetration testing.
- On the low end, you can set up Kali Linux as a **basic Secure Shell (SSH)** server with no desktop, using as little as 128 MB of RAM (512 MB recommended) and 2 GB of disk space.
- The name was inspired by the Hindu goddess Kali. Kali Linux is based on the Debian Testing branch. Most packages Kali uses are imported from the Debian repositories.
- These tools can be used for a number of purposes, most of which involve exploiting a victim network or application, performing network discovery, or scanning a target IP address.

Kali Linux


Untitled 2 - Mousepad
root@kali: ~
root - File Manager
07:39 PM
File System
Home
Trash
root - File Manager
File Edit View Go Help
/root/
DEVICES
File System
21 GB Encrypted
256 MB Volume
PLACES
root
Desktop
Trash
NETWORK
Browse Network
Desktop
Documents
Downloads
Music
Pictures
Public
Templates
Videos
8 items, Free space: 7.4 GiB
CPU Usage
Disk Usage
Memory Usage
Temperatures
Network Usage
Total RX: 80.6 MB
RX/s: 0.0 B/s
Total TX: 656.6 KB
TX/s: 0.0 B/s
Count Command
1 gotop
1 mousepad
2 qterminal
1 xfdesktop
1 xfwm4
1 Thunar
1 kworker/2...
1 ksmd
1 kswapd0
1 kworker/u...
1 migration...
1 kthrotld
1 NetworkMa...
1 kworker/5...
1 netns
root@kali
OS: Kali GNU/Linux Rolling x86_64
Host: VirtualBox 1.2
Kernel: 5.3.0-kali2-amd64
Uptime: 29 mins
Packages: 2147 (dpkg)
Shell: bash 5.0.3
Resolution: 1920×1080
DE: Xfce
WM: Xfwm4
WM Theme: Kali-Dark
Theme: Kali-Dark [GTK2], Kali-X [GTK3]
Icons: Flat-Remix-Blue-Dark [GTK2], Vibr
Terminal: qterminal
Terminal Font: Fira Code 10
CPU: AMD Ryzen 5 1600X (6) @ 3.999GHz
GPU: VirtualBox Graphics Adapter
Memory: 1115MiB / 16017MiB

Kali Linux

- When you boot the Kali Live image, you get a **Gnome desktop** with all of the special Kali goodies (security tools and applications) integrated in the Gnome menu. From here you can work normally, as with any Linux Live system, or you can go to System Tools/Install Kali Linux to permanently install to a hard disk. Kali actually uses the Debian installer (duh, it's derived from **Debian GNU/Linux**), so that all proceeds smoothly.
- **nmap Usage Example**
- Scan in verbose mode (-v), enable OS detection, version detection, script scanning, and traceroute (-A), with version detection (-sV) against the target IP (192.168.1.1):

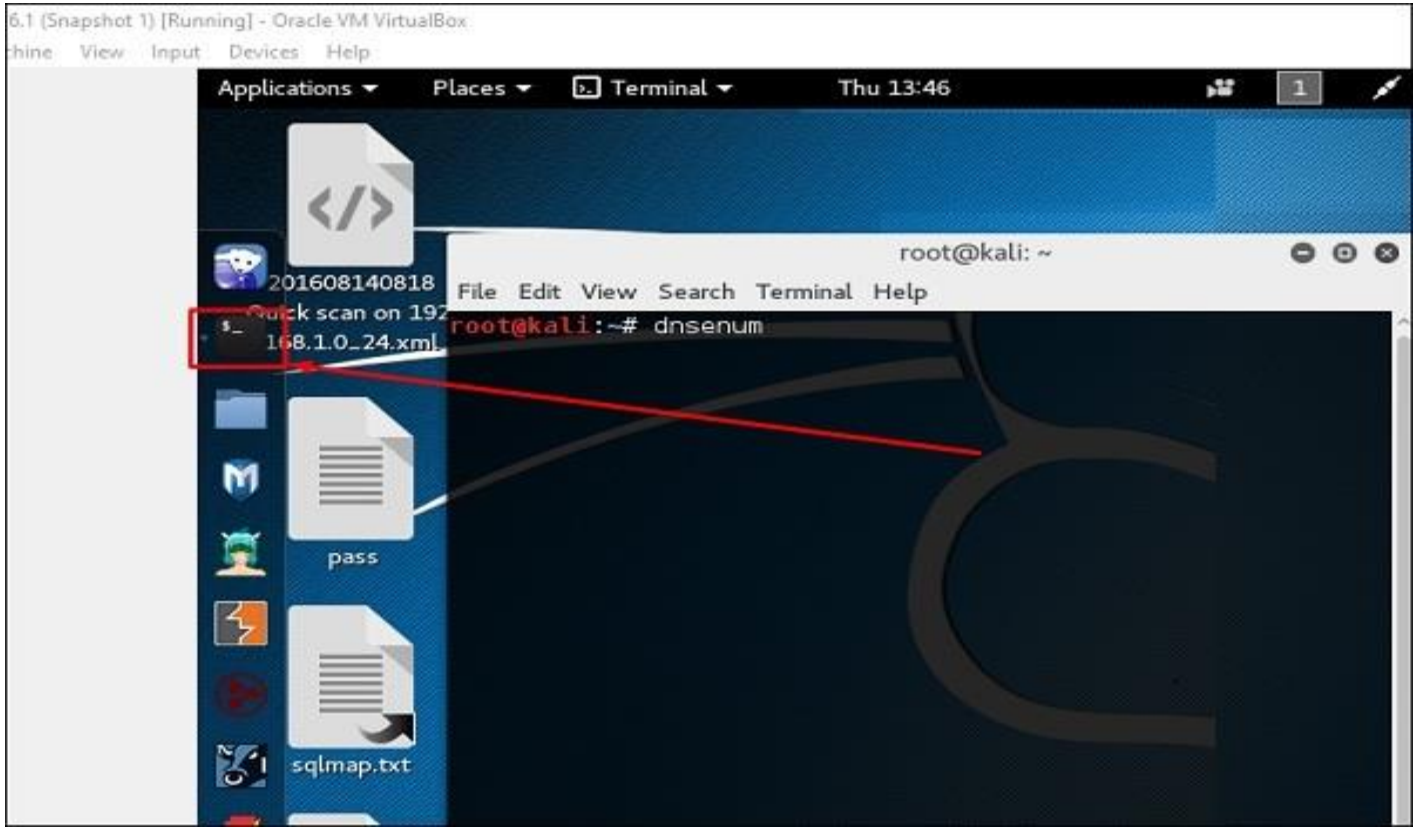
Kali Linux

- **root@kali:~# nmap -v -A -sV 192.168.1.1**

- Starting Nmap 6.45 (http://nmap.org) at 2014-05-13 18:40 MDT
- NSE: Loaded 118 scripts for scanning.
- NSE: Script Pre-scanning.
- Initiating ARP Ping Scan at 18:40
- Scanning 192.168.1.1 [1 port]
- Completed ARP Ping Scan at 18:40, 0.06s elapsed (1 total hosts)
- Initiating Parallel DNS resolution of 1 host. at 18:40
- Completed Parallel DNS resolution of 1 host. at 18:40, 0.00s elapsed
- Initiating SYN Stealth Scan at 18:40
- Scanning router.localdomain (192.168.1.1) [1000 ports]
- Discovered open port 53/tcp on 192.168.1.1
- Discovered open port 22/tcp on 192.168.1.1
- Discovered open port 80/tcp on 192.168.1.1
- Discovered open port 3001/tcp on 192.168.1.1

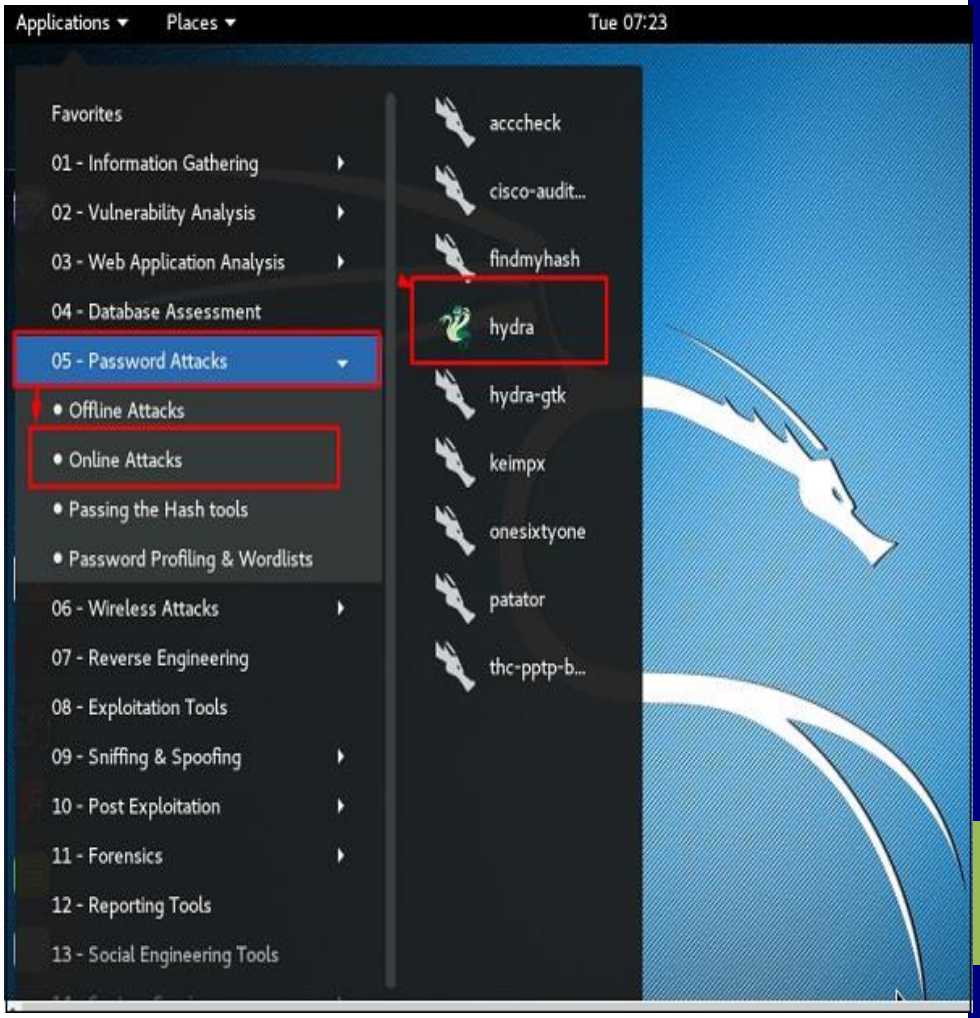
Kali Linux

- Kali has some tools that can be used to exploit Cisco router. One such tool is **Cisco-torch** which is used for mass scanning, fingerprinting, and exploitation.



Kali Linux

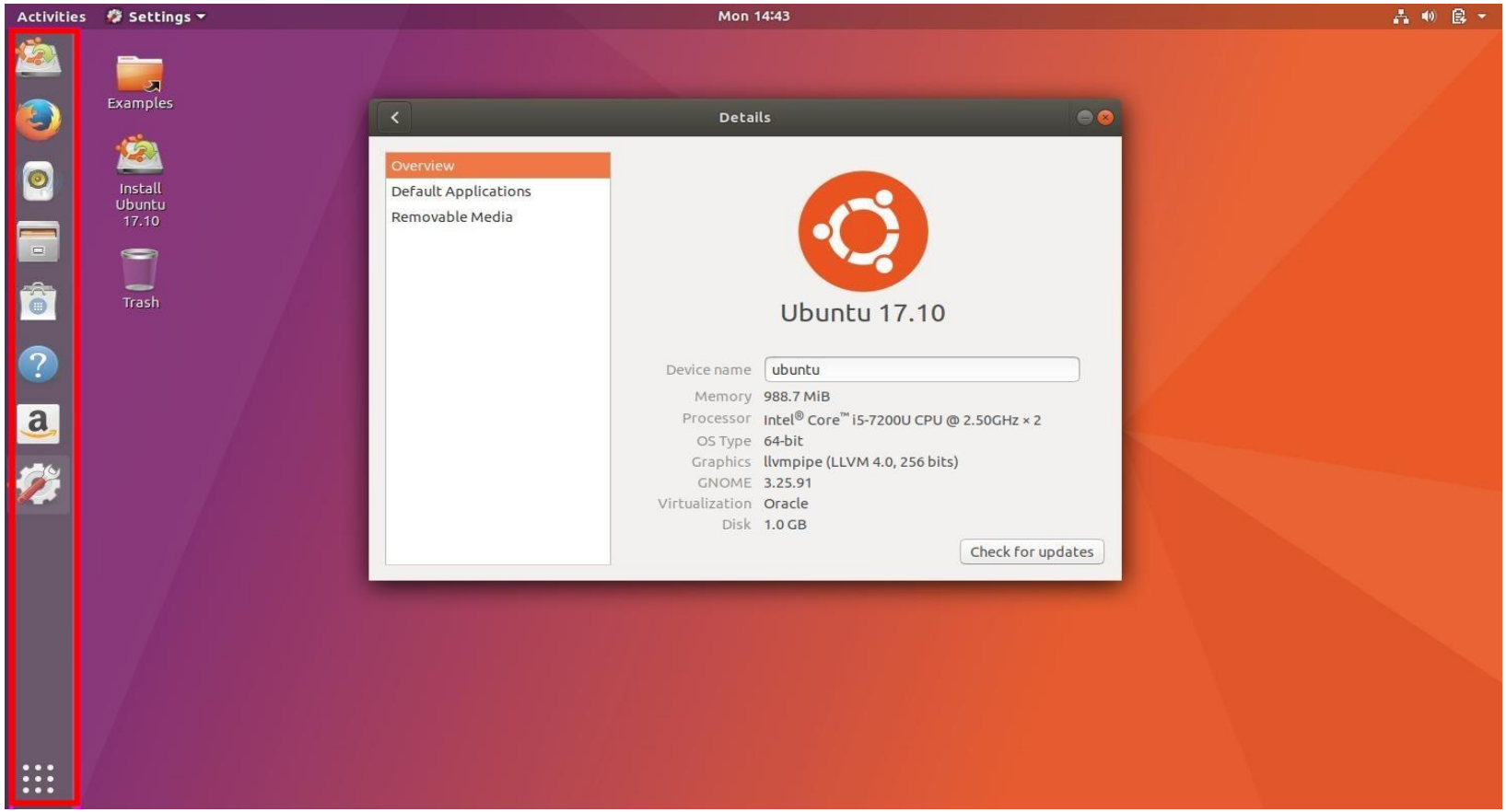
- **Hydra** is a login cracker that supports many protocols to attack (Cisco AAA, Cisco auth, Cisco enable, CVS, FTP, HTTP(S)-FORM-GET, HTTP(S)-FORM-POST, HTTP(S)-GET, HTTP(S)-HEAD, HTTP-Proxy, ICQ, IMAP, IRC, LDAP, MS-SQL, MySQL, NNTP, Oracle Listener, Oracle SID, PC-Anywhere, PC-NFS, POP3, PostgreSQL, RDP, Rexec, Rlogin, Rsh, SIP, SMB(NT), SMTP, SMTP Enum, SNMP v1+v2+v3, SOCKS5, SSH (v1 and v2), SSHKEY, Subversion, Teamspeak (TS2), Telnet, VMware-Auth, VNC and XMPP).



Ubuntu

- One of the most popular **Debian** derivatives is Ubuntu, which is provided by the **British company**, Canonical Ltd., founded by the South African entrepreneur Mark Shuttleworth. ("Ubuntu" is a word from the Zulu language and roughly means "humanity towards others".)
- The Ubuntu goals of Ubuntu is to offer, **based on Debian GNU/Linux, a current, capable, and easy-to-understand Linux** which is updated at regular intervals.
- This is facilitated, for example, by Ubuntu being offered on only three computer architectures as opposed to Debian's ten or so, and by restricting itself to a subset of the software offered by Debian GNU/Linux.
- If you are able to download a file with a **. deb extension**, this is the software package format Ubuntu prefers.

Ubuntu


Activities
Settings
Mon 14:43
Examples
Install Ubuntu 17.10
Trash
Details
Overview
Default Applications
Removable Media
Ubuntu 17.10
Device name ubuntu
Memory 988.7 MiB
Processor Intel® Core™ i5-7200U CPU @ 2.50GHz × 2
OS Type 64-bit
Graphics llvmpipe (LLVM 4.0, 256 bits)
GNOME 3.25.91
Virtualization Oracle
Disk 1.0 GB
Check for updates

Ubuntu

- Ubuntu is based on the unstable branch of Debian GNU/Linux and uses, for the most part, the same tools for software distribution, but **Debian and Ubuntu software packages are not necessarily mutually compatible.**
- Ubuntu is published on a fairy reliable **six-month cycle**, and every two years there is an “LTS” or “long-term support” version for which Canonical promises five years’ worth of updates.

Ubuntu vs. Debian

- Some **Ubuntu developers** are also active participants in the Debian project, which ensures a certain degree of exchange. On the other hand, not all **Debian developers** are enthusiastic about the shortcuts Ubuntu takes every so often in the interest of pragmatism, where Debian might look for more comprehensive solutions even if these require more effort.
- In addition, Ubuntu does not appear to feel as indebted to the idea of **free software** as does Debian; while all of Debian's infrastructure tools (such as the bug management system) are available as free software, this is not always the case for those of Ubuntu.

Ubuntu vs. SUSE/Red Hat

- Ubuntu not only wants to provide an attractive desktop system, but also to take on the more established systems like RHEL or SLES in the server space, by offering **stable distributions** with a long life cycle and good support.
- It is unclear how Canonical Ltd. intends to make money in the long run; for the time being the project is mostly supported out of Mark Shuttleworth's private coffers, which are fairly well-filled since he sold his Internet certificate authority, Thawte, to Verisign.

Comparison of the most important Linux distributions (as of February, 2012)

- There are very many different Linux distributions. The most popular include Red Hat Enterprise Linux and Fedora, SUSE Linux Enterprise Server and openSUSE, Debian GNU/Linux and Ubuntu.

	RHEL	Fedora	SLES	openSUSE	Debian	Ubuntu
Supplier	Red Hat	Red Hat + Comm.	SUSE	SUSE/Comm + Comm.	Debian Project	Canonical +Comm.
Target	Enterp.	Geeks	Enterp.	Private	Ent/Priv	Ent/Priv
Fees due?	yes	no	Support	no	no	no
First pub	2003	2003	2000	2006	1993	2004
Rel cycle	3–4 yrs	≈ 6 mth.	3–4 yrs	8 months	≈ 2 yrs	6 mth
Life cyc	10 yrs	≈ 1 yr	7 yrs.	18 months	3–4 yrs	5 yrs (LTS)
Platforms	6	2	5	2	10	3
Pkges (appr.)	3000	26.000	?	14.650	29.050	37.000
Pkg format	rpm	rpm	rpm	rpm	deb	deb
Live media?	?	yes	no	yes	yes	yes

Graphical Desktop Environments

- **KDE and GNOME are "desktop environments"** which attempt to provide a comprehensive suite of applications with a similar look and feel.
- The goal of KDE and GNOME is to offer a user experience that is comparable or superior to that of proprietary systems.

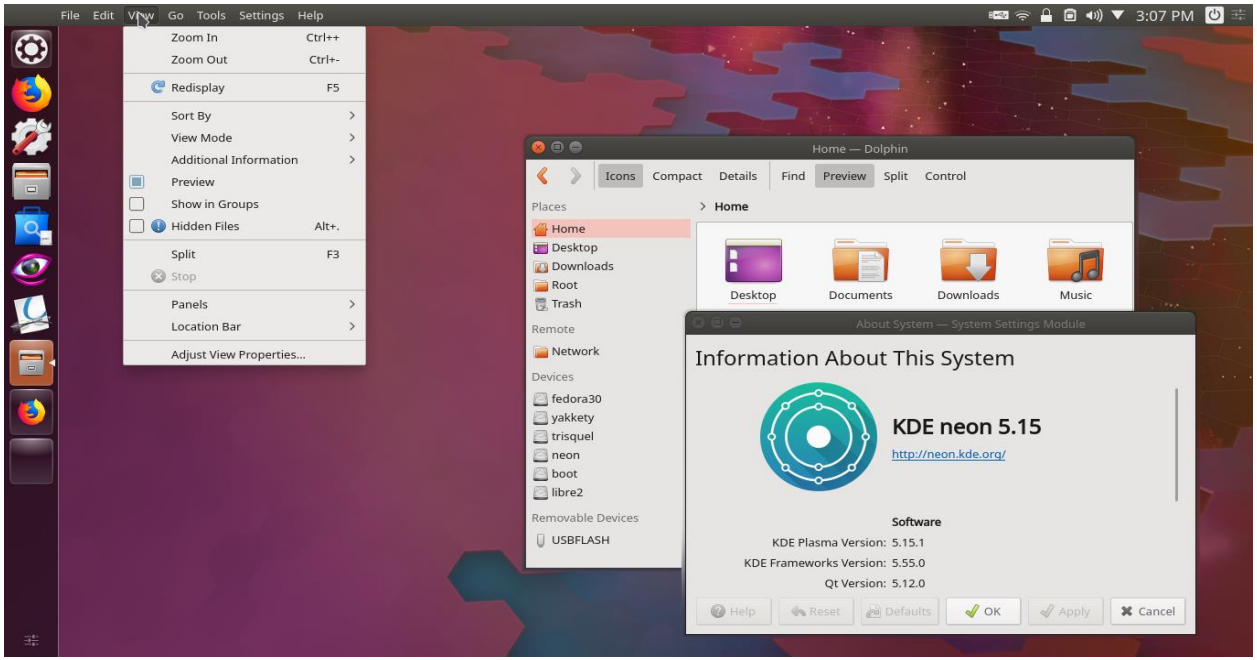
GNOME (**GNU Network Object Model Environment**) is a desktop environment—a graphical user interface that runs on top of a computer operating system—composed entirely of free and open source software.

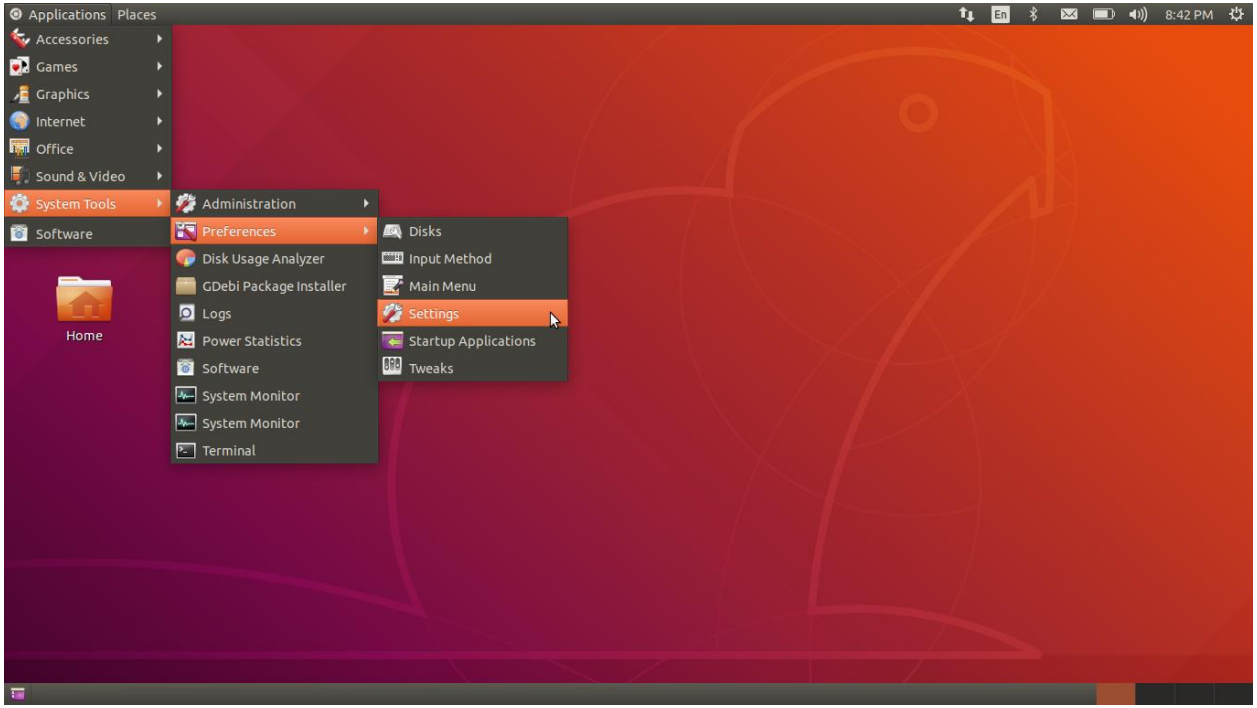
KDE is a desktop environment for an integrated set of **cross-platform applications** designed to run on Linux, FreeBSD, Microsoft Windows, Solaris and Mac OS, designed by the KDE Community.

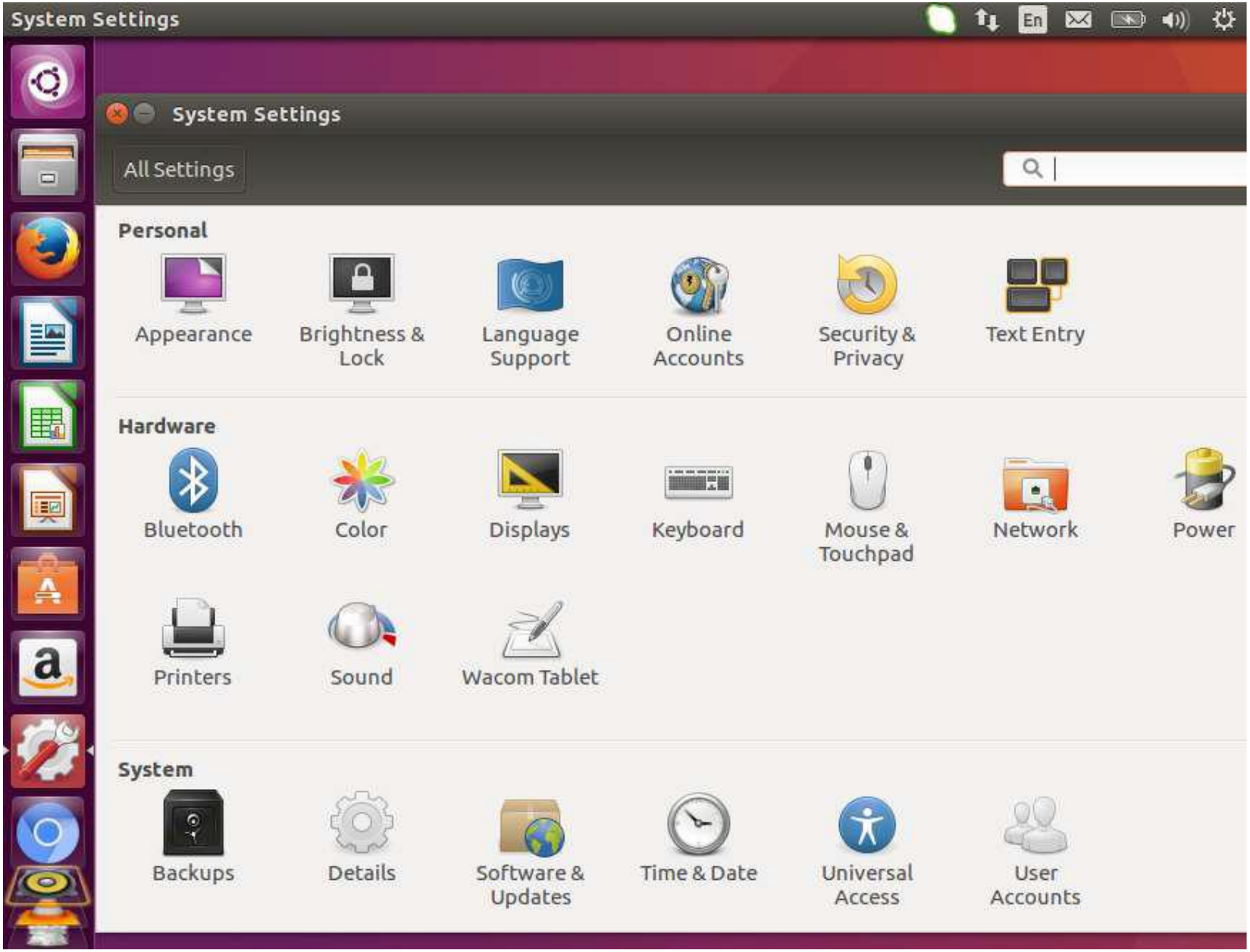
Cross-platform application development is about building a single application that **can run on various operating systems**, instead of developing different app versions for each platform.

Control Bar

- In any event, you control bar are likely to find a control bar (dock, panel, what have you) either at the top or at the bottom of the screen, which allows you to access the most important application programs by means of menu entries, or to log out or shut down the computer.
- **KDE** relies on a **“panel”** that roughly resembles that of Windows, where a “start button” (not actually called that) opens a menu of programs, while the rest of the bar shows icons for the currently running applications alongside little useful helpers like a clock, the network state, and so on.
- **GNOME** does **not use a “start button”,** but **moves the menu bar to the top of the screen;** the most important programs are accessible through pull-down menus on the left-hand side of the screen, while the **right-hand part is reserved for system status icons and the like.**


File Edit View Go Tools Settings Help
3:07 PM
Zoom In Ctrl++
Zoom Out Ctrl+-
Redisplay F5
Sort By
View Mode
Additional Information
Preview
Show in Groups
Hidden Files Alt+.
Split F3
Stop
Panels
Location Bar
Adjust View Properties...
Home — Dolphin
Icons Compact Details Find Preview Split Control
Places
Home
Desktop
Downloads
Root
Trash
Remote
Network
Devices
fedora30
yakkety
trisquel
neon
boot
libre2
Removable Devices
USBFLASH
Home
Desktop
Documents
Downloads
Music
About System — System Settings Module
Information About This System
KDE neon 5.15
http://neon.kde.org/
Software
KDE Plasma Version: 5.15.1
KDE Frameworks Version: 5.55.0
Qt Version: 5.12.0
Help Reset Defaults OK Apply Cancel


Applications Places
8:42 PM
Accessories
Games
Graphics
Internet
Office
Sound & Video
System Tools
Software
Administration
Preferences
Disk Usage Analyzer
GDebi Package Installer
Logs
Power Statistics
Software
System Monitor
System Monitor
Terminal
Disks
Input Method
Main Menu
Settings
Startup Applications
Tweaks
Home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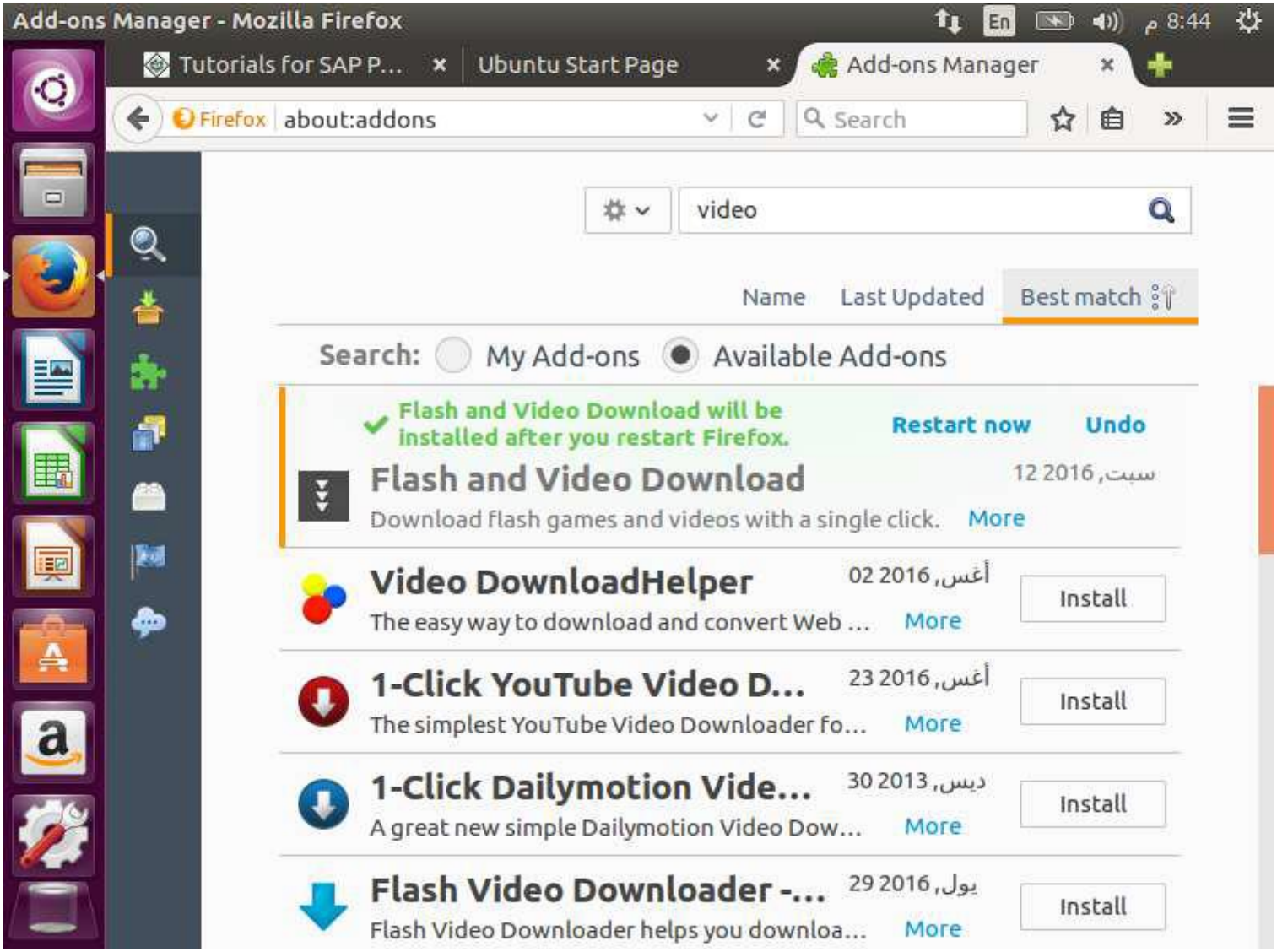
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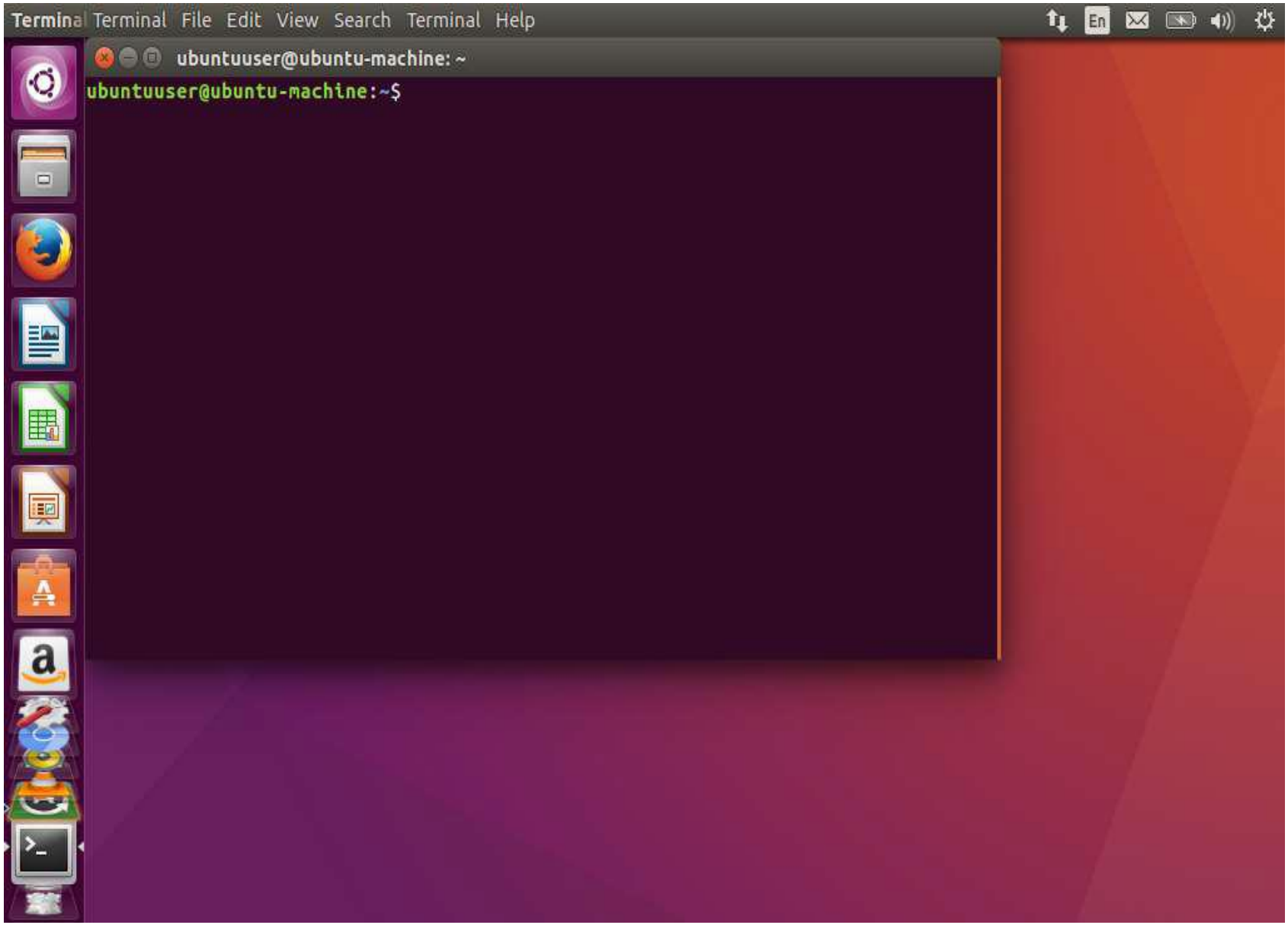
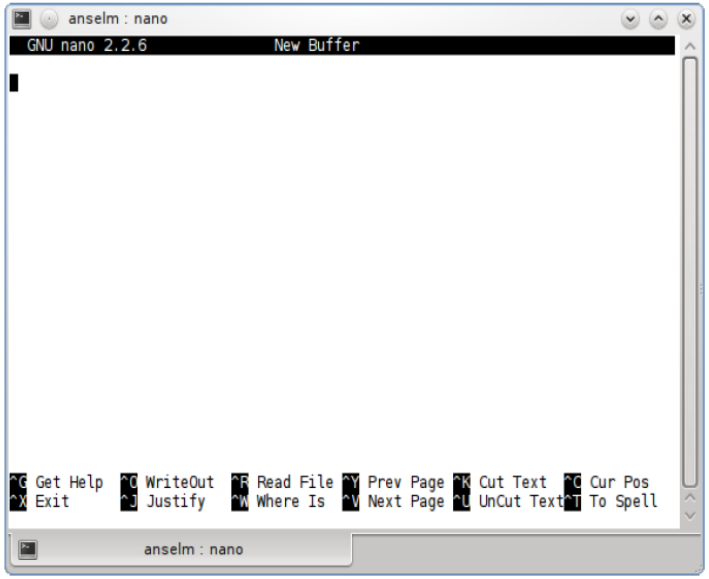

Terminal Terminal File Edit View Search Terminal Help
En
ubuntuuser@ubuntu-machine: ~
ubuntuuser@ubuntu-machine:~$

GNU Nano text editor

- Of course the common graphical interfaces also support graphical text editors with menus, tool bars, and all sorts of useful goodies—comparable to programs like “Notepad” on Windows (or even better).
- For example, look for **“Kate” on KDE or “gedit” on GNOME**.
- We shall not be looking at these editors in detail here, for two reasons:
- You will not always be in a position to use a graphical interface. You may be working on a **remote computer** using the **“secure shell”,** or standing in front of a **server console** in the basement machine hall, and chances are that you will only have a text screen at your disposal.

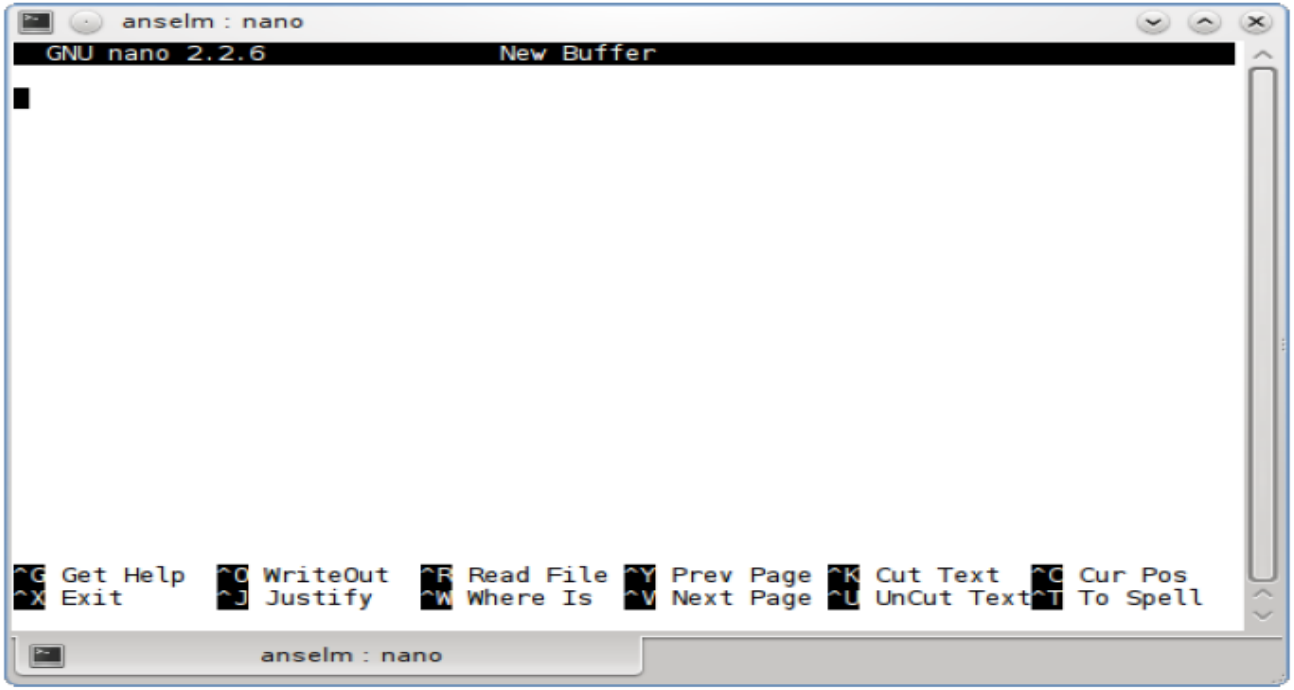
GNU Nano text editor

- Text editors for Linux come in all sizes, shapes, and colors.
- We're taking the easy way out by explaining the most important features of "GNU Nano", a simple, beginner-proof text editor that runs inside a terminal session.
- Starting GNU Nano
- **$ nano myfile**
- The "$ " here is just a stylised abbreviation of the command prompt—which may look somewhat more baroque on your system.



GNU Nano Entering and changing text

- Subsequently you should see something resembling Figure —that is, a mostly empty window with one highlighted line at the top and two “help lines” at the bottom, which list important commands with brief explanations. The line immediately above the help lines is the “status line”, where messages from Nano will appear and where you will be able to enter, e. g., file names when saving data to disk.



Creating and Modifying Text Files

- Saving text: When you are done entering or editing your text, you can **save** it using **Ctrl + o** (hold down Ctrl while pressing o).
- Nano asks you for a name for the file (on the status line), which you can then enter and finish off with ↩
- **Quitting Nano** You can quit Nano using **Ctrl + x** . If your text contains unsaved modifications, Nano asks you whether the text should be saved; answer y to do that (Nano may ask you for a file name) or n to quit Nano immediately.

Creating and Modifying Text Files

- **Loading files** A different (already existing) file can be loaded into your current text using **Ctrl + r** —it will be inserted at the cursor position.
- Nano asks you for **the name of the file**, which you may either enter directly, or alternatively use **Ctrl +t** to open the "file browser", which will offer you an interactive choice of existing files.
- Cutting and pasting You may use the **Ctrl + k** command to remove **("cut")** the line containing the cursor and store it in a buffer (Caution: Nano will always remove all of the line, no matter where inside the line the cursor is actually positioned!). **Ctrl + u** will then insert **("paste")** the content of the buffer again—either in the same place, if you have pressed Ctrl + k inadvertently or simply wanted to copy the line rather than move it, or elsewhere in your text.

Creating and Modifying Text Files

- **Searching** text If you press **Ctrl + w** , Nano uses the status line to ask you for a piece of text. The cursor then jumps to the next occurrence of that piece of text in your document, starting at its current position. This makes it convenient to locate specific places in your text.

Creating and Modifying Text Files

- Start GNU Nano and enter some simple text—something like
- Roses are red,
- Violets are blue,
- Linux is brilliant,
- I know this is true.
- **Save this to a file called roses.txt**

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- https://www.onworks.net/onworkssession.php
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- https://www.onworks.net/os-distributions/ubuntu-based/free-ubuntu-online-gnome
- https://www.onworks.net/runos/create-os.html?os=ubuntu-19.10-desktop-amd64&home=init

Thank You

Linux

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