



# Intro to Linux

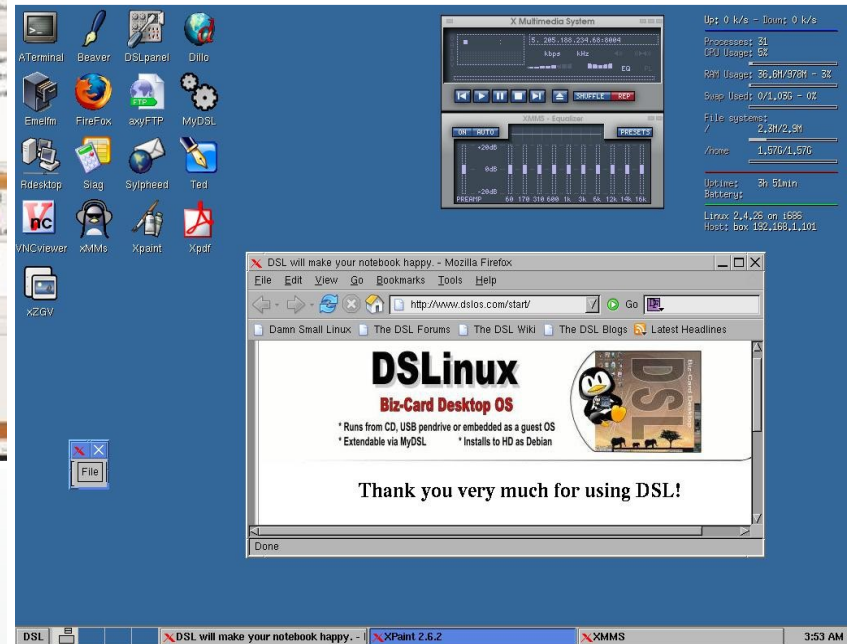
# Welcome

## A Basic Introduction to Linux

stan reichardt

[stanr@sluug.org](mailto:stanr@sluug.org)

# Linux Basics



An Introduction

# Preview

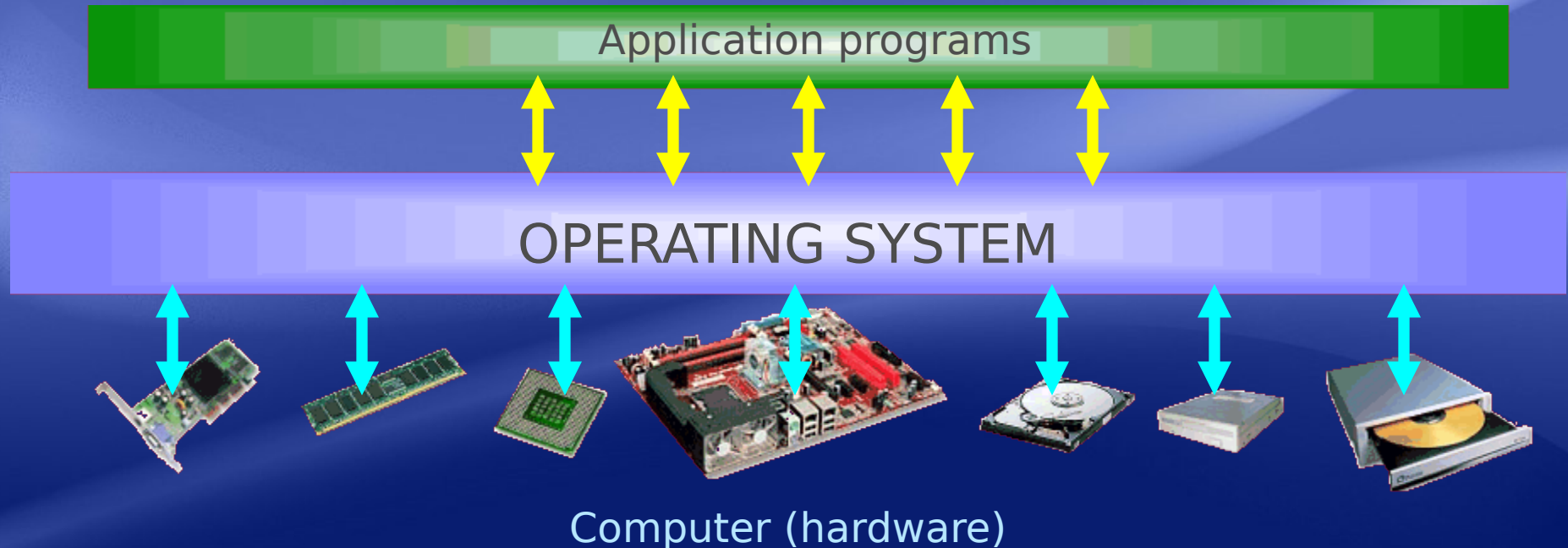
- Like DOS, MS Windows, or Mac OS-X, Linux is an **Operating System**.
- There are more than 200 forms of Linux available. More than 100 are active.



- **Tux** is the Linux mascot and official trade mark.
- DistroWatch tracks top 100 versions
- <http://www.distrowatch.com/>
- Linus Torvolds holds the Linux™ (Trademark).

# What is an “Operating System”?

An operating system (“OS” for short) is a computer’s *master control program*.



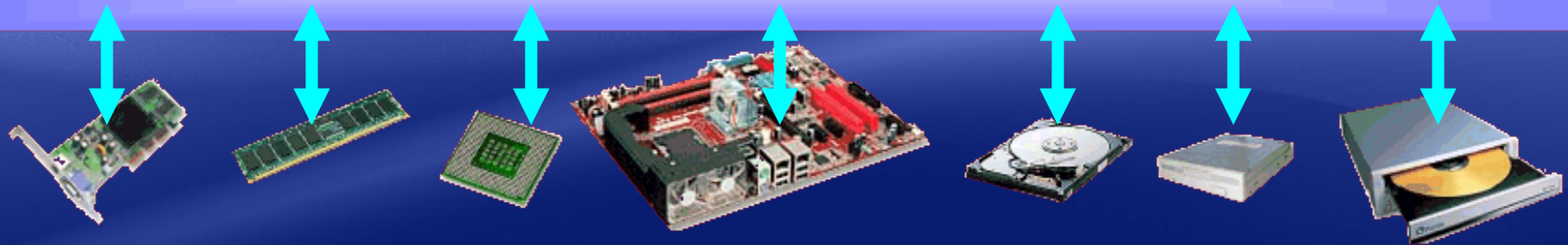
- It manages internal functions.
- It controls the computer's operations.
- It gives resources to other running programs.

# Why do we need an OS?

- Without an operating system, each program installed in a computer would have to control all of the computer's hardware on its own.

All Other Application Programs **BLOCKED**

ONE Application Program Running



Computer (hardware)

- Programs would fight one another for hardware control, making “multi-tasking” impossible.

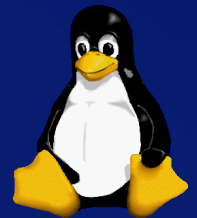


# How would we pick an OS?

- OS Compatibility
  - with your computer hardware
  - with other systems (i.e. networking)
  - with specific application software
- OS Features
  - Standard Features
  - Special Features
- OS Cost
  - Purchase price, availability of updates
  - License issues

# Open Source Software

- <http://www.opensource.org/>
- Key Points of Open Source:
  - **Free** Acquisition & Redistribution
  - **Source Code** (must be included or available)
  - **Derived Works** (must allow modifications)
  - **Integrity of Source Code** (credit to authors)
  - **No Discrimination** (of persons, groups or use)
  - **Distribution of License** (can not be restricted)



# How do we use an OS?

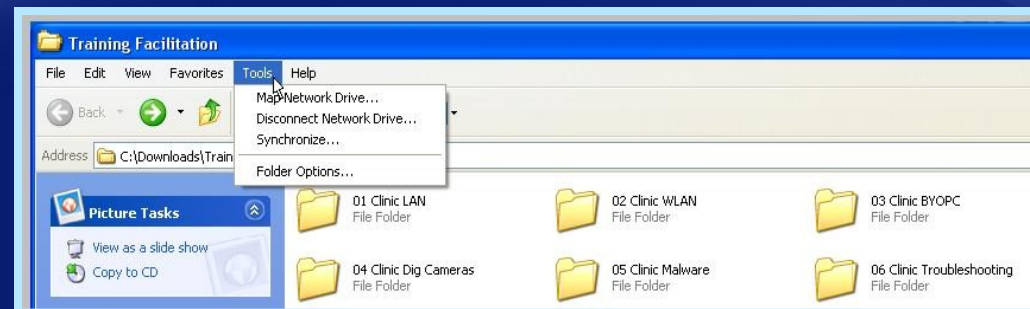
- An operating system has a “user interface” to accept commands.
- It can be *text-based*...

```
C:\>dir /w
Volume in drive C has no label.
Volume Serial Number is XXXX-XXXX

Directory of C:\

[AACON]          [ATI]          AUTOEXEC.BAT
[Backup]         CONFIG.SYS     [Documents and Settings]
[Downloads]      [drivers]      hpfr6500.log
[PowerSpec]     [Program Files] [SWSETUP]
[temp]          txt.txt        [WINDOWS]

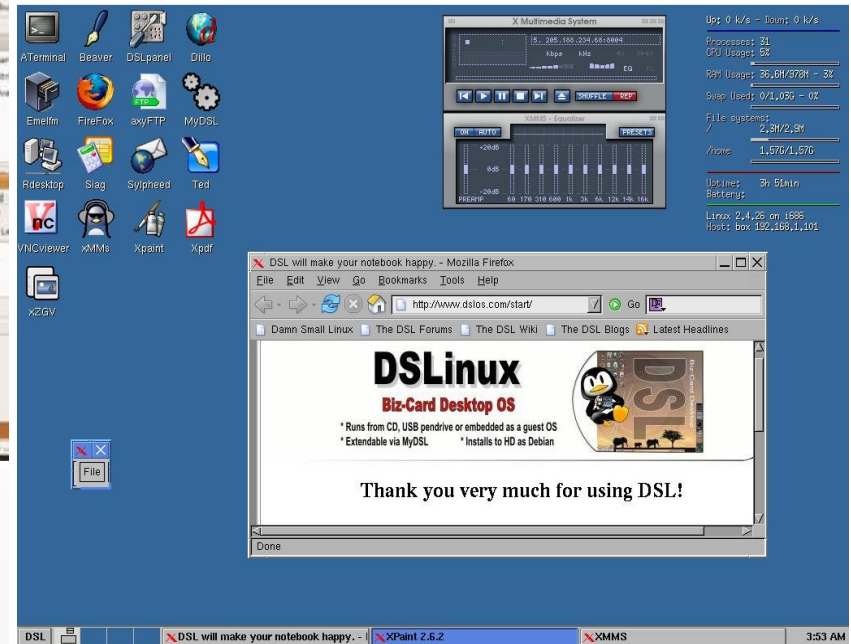
           4 File(s)          13 412 bytes
          11 Dir(s)  464 501 514 240 bytes free
```



- ...or *graphics-based*.



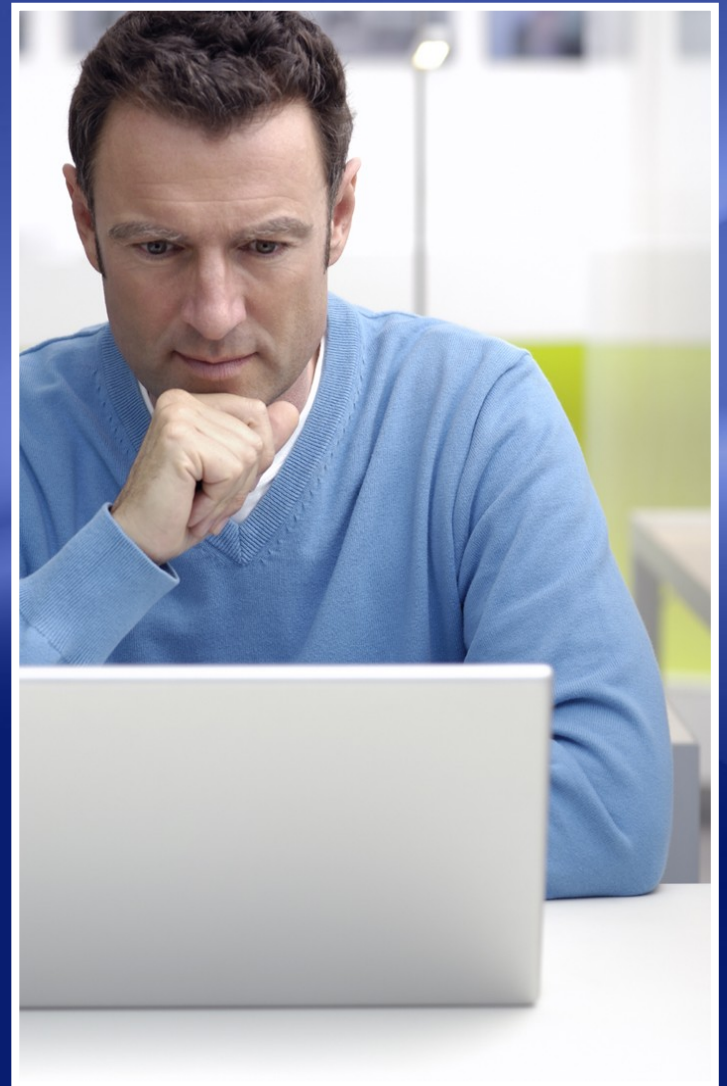
# Linux Distributions



01/13/15 11:02

# Variety Is The Spice Of Linux

- There are more than 200 different forms of Linux.
- Linux distributions, known as “**distros**” are based on one of several “core” versions.
- Compare distros at <http://www.distrowatch.com/>
- Special features and more applications may be added to distros.



# D@#% Small Linux

The screenshot displays the DSL Linux desktop environment. On the left, a grid of application icons includes ATerminal, Beaver, DSLpanel, Dillo, Emelfm, FireFox, axyFTP, MyDSL, Rdesktop, Slag, Sylpheed, Ted, VNCviewer, xMMs, Xpaint, Xpdf, and xZGV. In the center, the X Multimedia System window shows playback controls and an XMMS Equalizer. On the right, a system status panel provides real-time data: Uptime: 0 k/s - Down: 0 k/s, Processes: 31, CPU Usage: 5%, RAM Usage: 36.6M/978M - 3%, Swap Used: 0/1.03G - 0%, File systems: / (2.3M/2.9M) and /home (1.57G/1.57G), Uptime: 3h 51min, Battery: (full), and System Info: Linux 2.4.26 on i686, Host: box.192.168.1.101. A Mozilla Firefox browser window is open to <http://www.dslos.com/start/>, displaying the DSL Linux Biz-Card Desktop OS logo and a penguin mascot. The browser window also lists navigation links: Damn Small Linux, The DSL Forums, The DSL Wiki, The DSL Blogs, and Latest Headlines. The desktop background features a 'File' icon. The taskbar at the bottom shows the DSL logo, the browser window, XPaint 2.6.2, XMMS, and the system clock at 3:53 AM.

# D@#% Small Linux

- Used frequently to “boot” Linux directly from a USB flash drive, or a small “business-card” CD.
- Capable of running on “legacy” PCs which may not support newer Windows operating systems.



# Puppy Linux

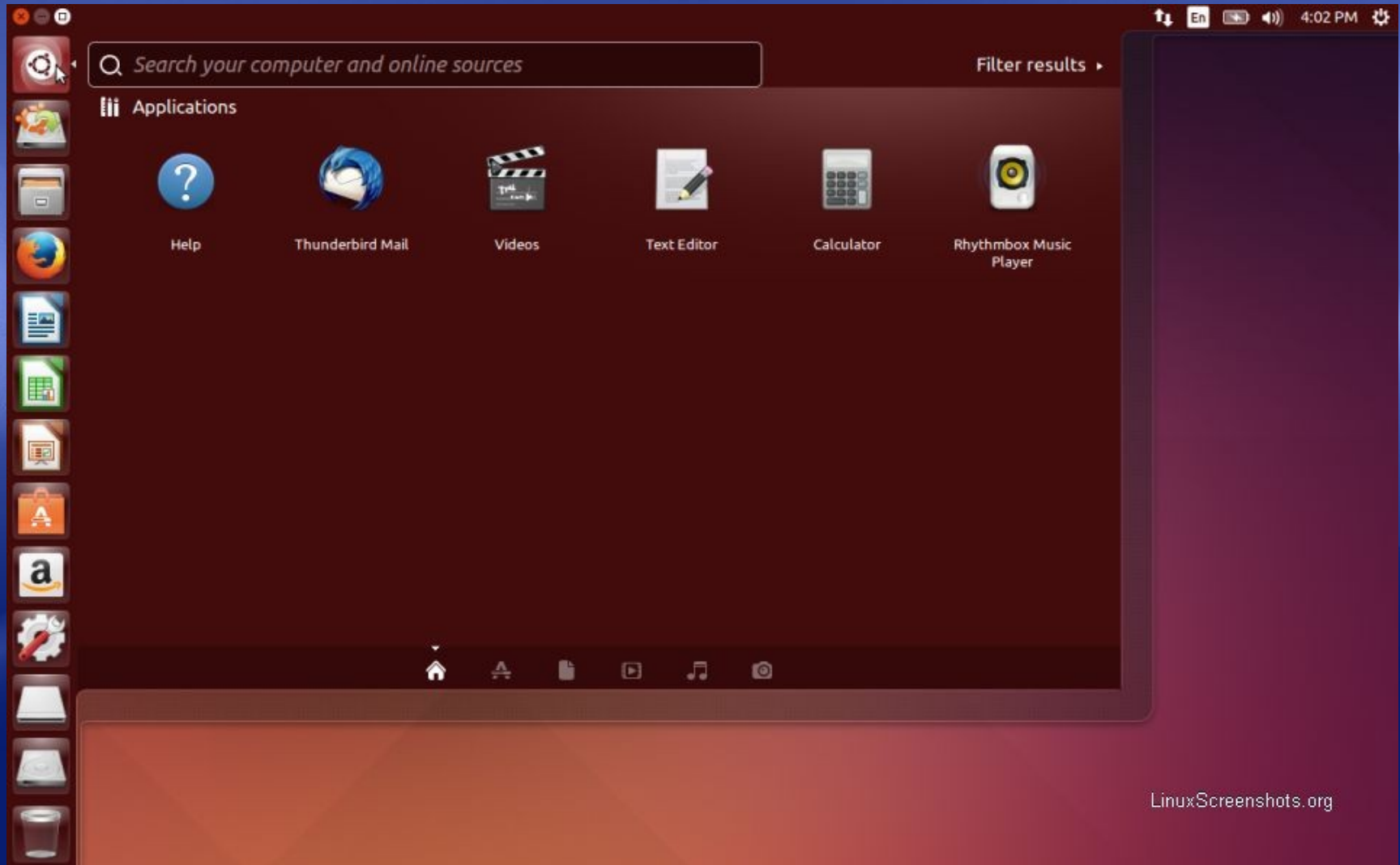




# Puppy Linux

- Puppy Linux uses a traditional “graphical user interface” **desktop** like many popular Linux distros, such as antiX, Knoppix, MEPHIS, openSUSE, PCLinuxOS, or Zorin.
- Users moving from MS Windows to these Linux distros will easily recognize many similarities to the MS Windows “desktop”.

# Ubuntu Linux

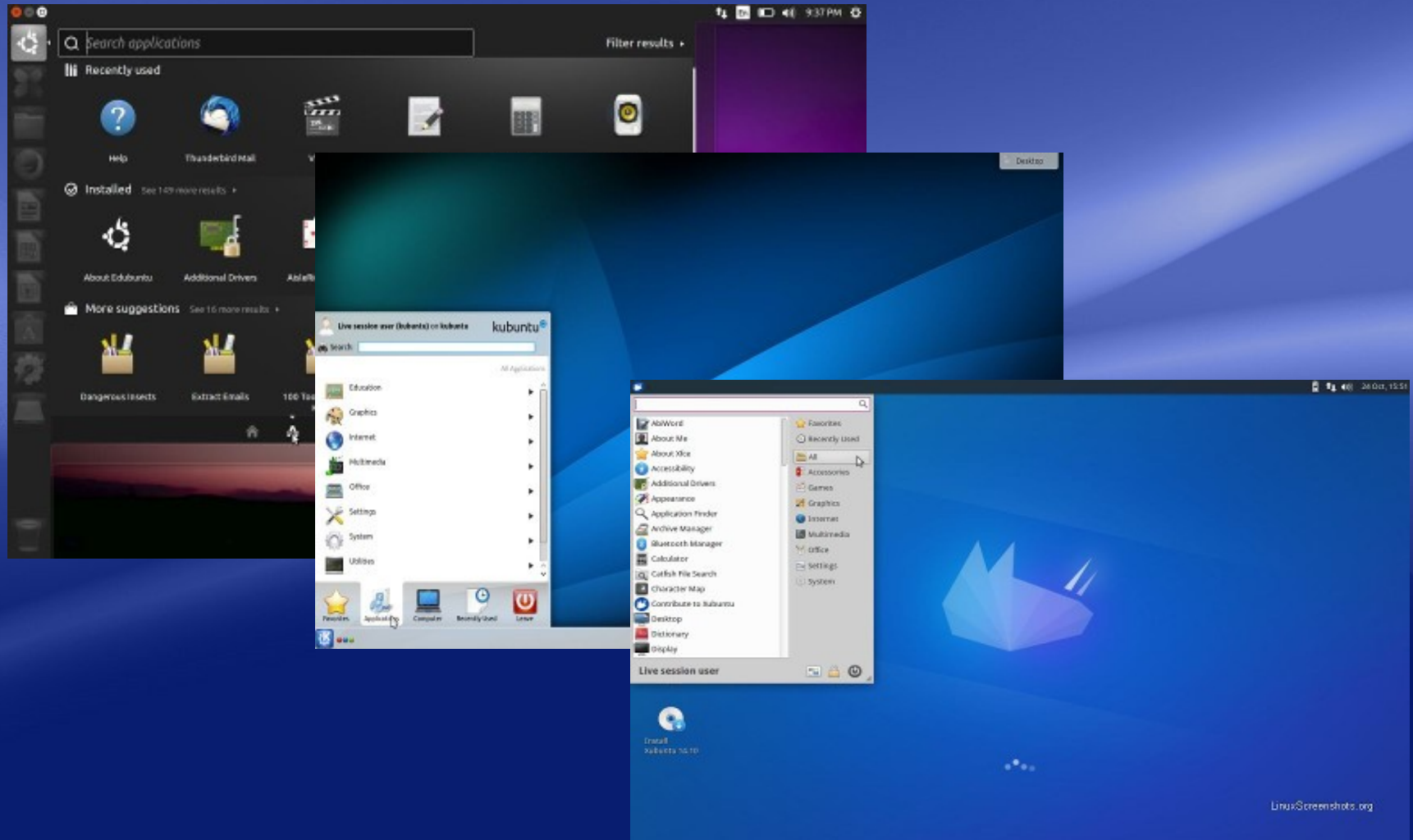


# Ubuntu Linux

- An early Linux variant for both Macintosh or Windows systems.
- Claims to be most popular Linux.
- Once used the traditional GNOME version 2 graphical user interface. It is now fairly similar to that of MacOS X, and shares some of its features, such as selectable “desktop panes”.
- Now uses the **Unity** desktop environment that is geared to newer touch screen hardware.



# Edubuntu Kubuntu Xubuntu



# Edubuntu Kubuntu Xubuntu

- Edubuntu uses the new **GNOME 3** graphical environment instead of Unity. Focus is on educational tools.
- Kubuntu uses the **KDE** graphical environment.
- Xubuntu uses the **XFCE** graphical environment for low power





# LinuxMint Linux

The screenshot displays the LinuxMint desktop environment. The desktop background is a light blue pattern. The left sidebar contains the 'Places' menu with options like Computer, Home Folder, Network, Desktop, and Trash. Below it is the 'System' menu with options like Software Manager, Package Manager, Control Center, Terminal, Lock Screen, Logout, and Quit. The main window is the file manager, showing the contents of the /home/stan directory. The 'Update Manager' window is open in the foreground, displaying a list of updates. The system tray at the bottom shows the date and time as 'Thu Dec 11, 8:03 PM' and the temperature as '32 °F'.

**Update Manager**

Type	Level	Upgrade	Package	Old version	New version	Size
!	4	<input type="checkbox"/>	dbus Simple interprocess messaging system (X11 deps).	1.6.18-0ubuntu4.2	1.6.18-0ubuntu4.3	501KB
!	4	<input type="checkbox"/>	mesa Generic buffer management API -- runtime.	10.1.3-0ubuntu0.1	10.1.3-0ubuntu0.2	11MB
!	4	<input type="checkbox"/>	plymouth Graphical boot animation and logger - label control.	0.8.8-0ubuntu17	0.8.8-0ubuntu17.1	184KB
!	4	<input type="checkbox"/>	systemd Libudev shared library.	204-5ubuntu20.7	204-5ubuntu20.9	1MB
!	4	<input type="checkbox"/>	xorg-server Nested X server.	2:1.15.1-0ubuntu2.1	2:1.15.1-0ubuntu2.5	1MB
!	4	<input type="checkbox"/>	xserver-xorg-video-intel X.Org X server -- Intel i8xx, i9xx display driver.	2:2.99.910-0ubuntu1.1	2:2.99.910-0ubuntu1.3	590KB
!	5	<input type="checkbox"/>	linux Linux Kernel Headers for development.	3.13.0-39.66	3.13.0-43.72	779KB

Your system is up to date

**Locations**

St. Louis  
8:03 PM CST

December 2014

Sun	Mon	Tue	Wed	Thu	Fri	Sat
49	30	1	2	3	4	5
50	7	8	9	10	11	12
51	14	15	16	17	18	19
52	21	22	23	24	25	26
1	28	29	30	31	1	2
2	4	5	6	7	8	9

# LinuxMint Linux

- Uses the Ubuntu software repositories.
- Uses the **MATE** or **Cinnamon** desktop environment instead of Gnome or Unity. MATE and Cinnamon are more familiar and traditional than the new Ubuntu and its variants.
- Highly recommended for Linux **newcomers**.



LinuxMint

# Installing Linux



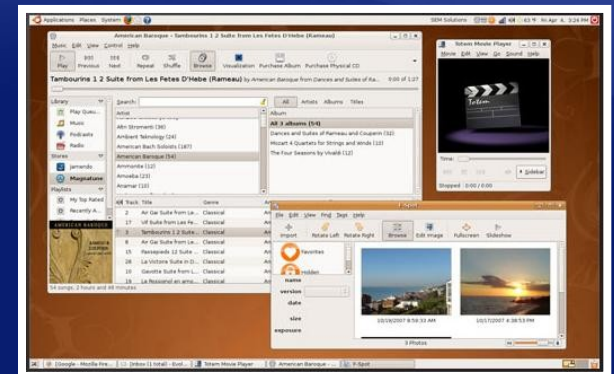


# Systems Pre-Loaded with Linux



- Major vendors infrequently provide Linux pre-loaded
- Examples, such as the **ASUS EeePC** and the **PowerSpec N108**, used different Linux distributions as their default operating system

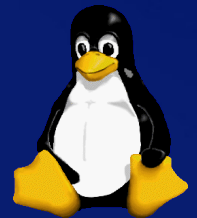
- Some computer vendors that pre-load Linux
  - System76
  - EmperorLinux
  - ZaReason
  - LinuxCertified
  - Los Alamos Computers
  - InaTeX Computers



# The Best Of Both Worlds



- Linux can usually be installed in a "dual boot" mode.
- A startup "boot loader" menu allows the user to either start Linux or the vendor's original OS.





# Disc Or Download



- **Now Available at Micro Center:** Distributions of Linux can be purchased as low-cost “stand-alone” CDs or DVDs.
- Or, order from <http://www.osdisc.com/>

- Linux can also be **downloaded** via a “broadband” Internet service as an ISO disc-image file, and **burned** as a bootable CD, DVD or USBstick.



# Test Drive Linux

- Most Linux distributions use a “Run Live” feature, allowing the user to safely run Linux directly from CD-ROM or other media without making any permanent change.



```
■ INSTALL or UPDATE Linspire on this computer's hard drive
RUN Linspire directly from the CD without installing (LinspireLive!)
ADVANCED Options
```

# *Linux* System Requirements

(example: Ubuntu Linux version 8.x)

- 32- or 64-bit PC with 800 MHz+ CPU  
(including Macintosh G3 or newer)
- 384 MB of RAM recommended  
(256 MB minimum)
- Hard drive with 3 GB free space
- 1024×768 or higher resolution monitor  
(3-D graphics accelerator card for some games, screen savers, etc.)
- CD-ROM or DVD drive
- Keyboard & Mouse
- Sound card and speakers or headphones
- Ethernet card for Internet/LAN connectivity
- 56 Kbps hardware modem (optional)

# PC Management

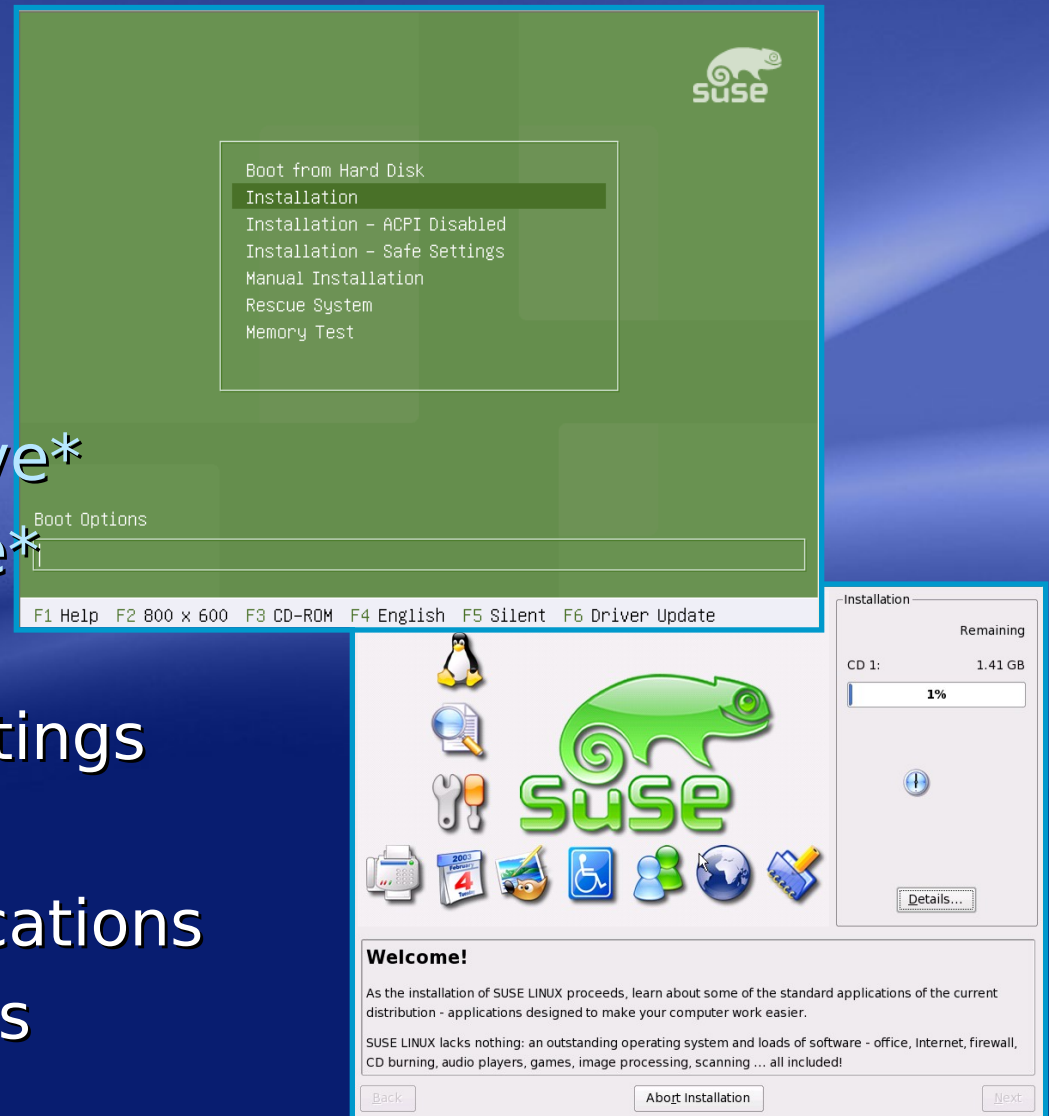
Most Linux distributions are “Plug and Play” Ready. Test “Run Live”.

- New hardware detection
- Wired & wireless networking
- USB and Firewire detection
- Device support includes:
  - Digital Cameras
  - Scanners
  - MP3 Players
  - Flash drives, memory card readers



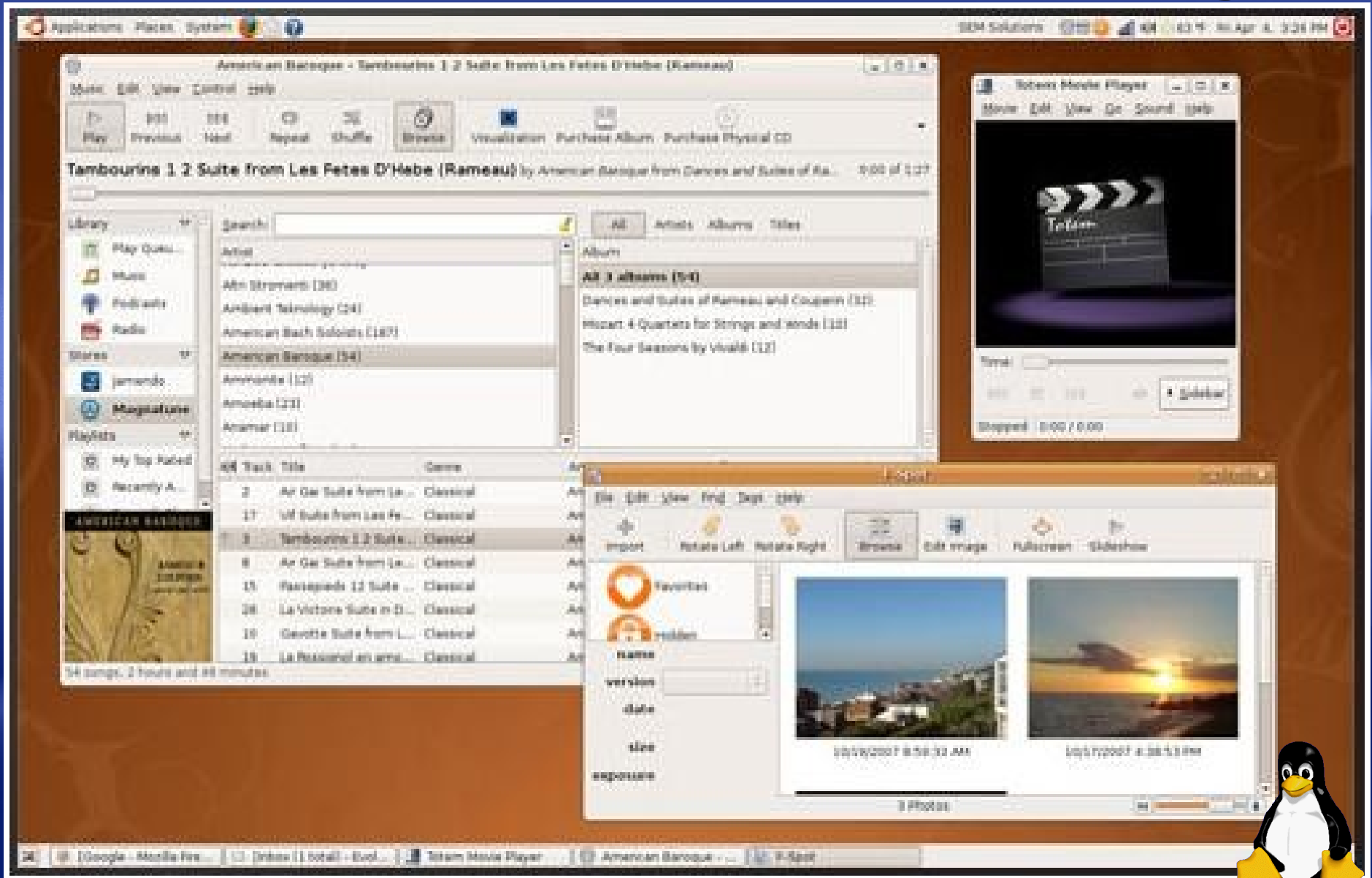
# Install the OS

- Partition the hard drive\*
- Format the hard drive\*
- Copy system files\*
- Configure system settings
- Update drivers
- Install software applications
- Restore your data files





# Linux Installed & Running



# Linux Applications

The screenshot displays a Linux desktop environment with a blue background and a SuSE logo in the top right corner. The desktop features several windows and a taskbar at the bottom. On the left, a blue DNA double helix graphic is visible. The main window is a green-themed audio player with two panes: 'XMMS' and 'Playlist'. The 'XMMS' pane shows playback controls and an 'Equalizer' section with frequency sliders. The 'Playlist' pane lists tracks from the Rochester Philharmonic Orchestra and Alan Sherman. A 'Spectrum analyzer' window is open in the bottom left, showing a bar chart of audio frequencies. The taskbar at the bottom contains icons for the audio player, a 3D cube, a CD-ROM, a globe, and a folder. The system tray on the right shows the time as 06:35 and a battery icon.

**XMMS**  
27. Alan Sherman - Camp Granada (2:43)  
160 KBPS 44 KHZ stereo

**Equalizer**

**Playlist**

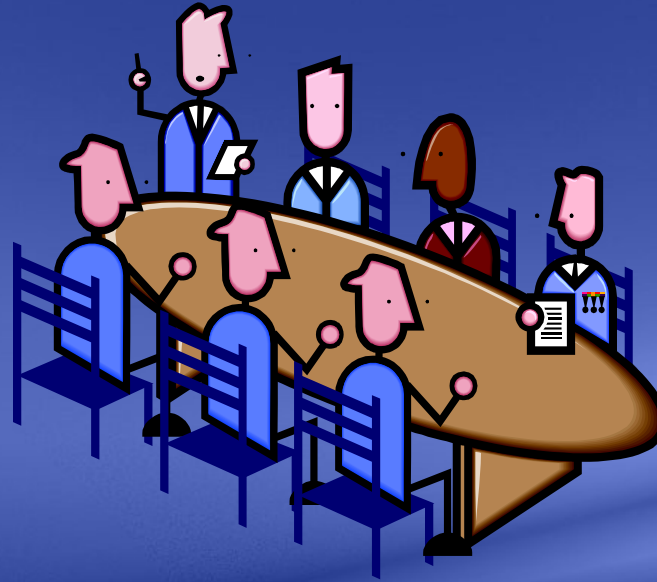
18. Rochester Philharmonic Orchestra - The Sun, ...	3:17
19. Rochester Philharmonic Orchestra - Three little...	1:25
20. Rochester Philharmonic Orchestra - We sail th...	2:14
21. Rochester Philharmonic Orchestra - When Fre...	3:03
22. Rochester Philharmonic Orchestra - When I wa...	2:51
23. Rochester Philharmonic Orchestra - When the ...	4:44
24. Rochester Philharmonic Orchestra - With cat li...	2:45
25. (James Bond Soundtrack - Tina Turner) -- Gold...	3:30
26. Ennio Morricone - The Good, The Bad, and Th...	2:42
27. Alan Sherman - Camp Granada	2:43

**Spectrum analyzer**

**Taskbar:** XMMS - 27. Alan Sherman - C...  
OpenGL Spectrum analyzer  
Spectrum analyzer

**System Tray:** 06:35

# Free Open Source



- The same community development model used to create distributions of Linux is also used to make application software to run on Linux systems.

# Works Well With Others

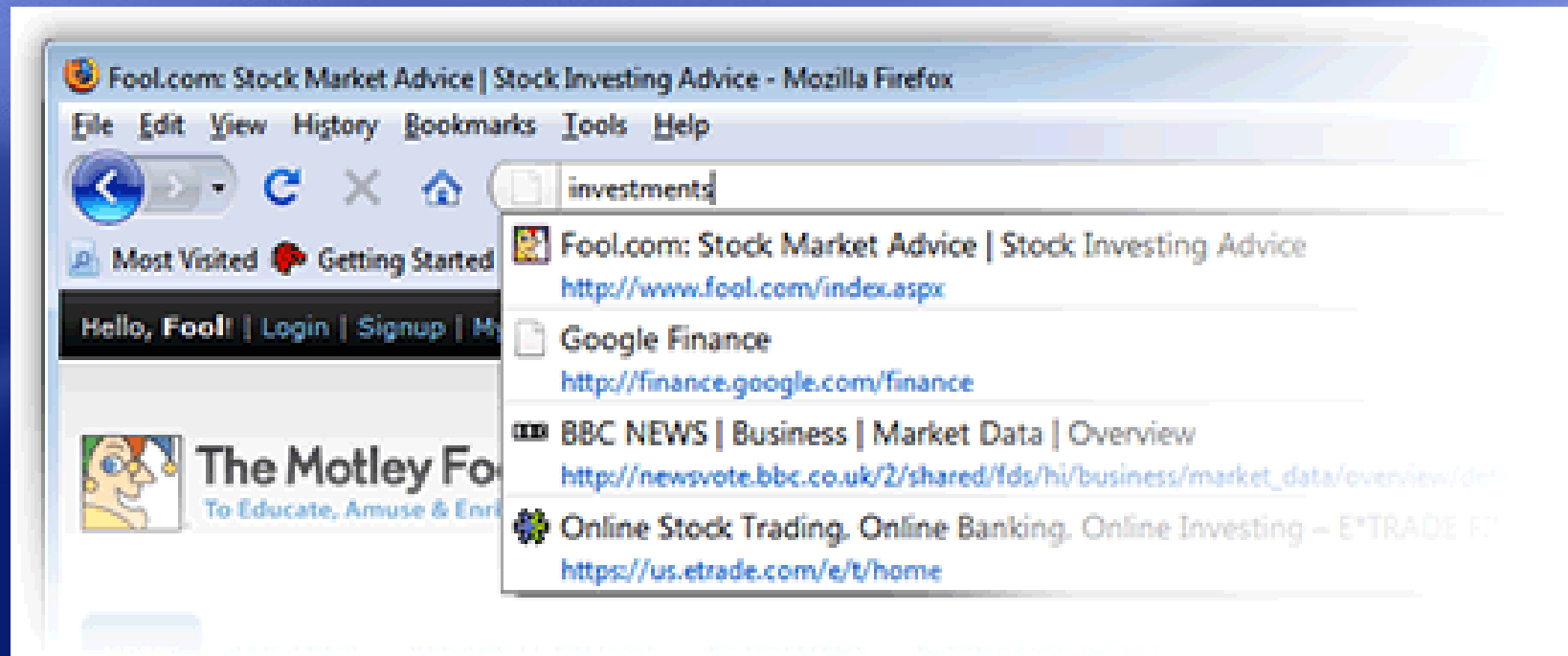


- Many open-source programs create and edit documents which are “cross-compatible” with their MacOS or Windows counterparts.
- Many have “cross-platform” versions.



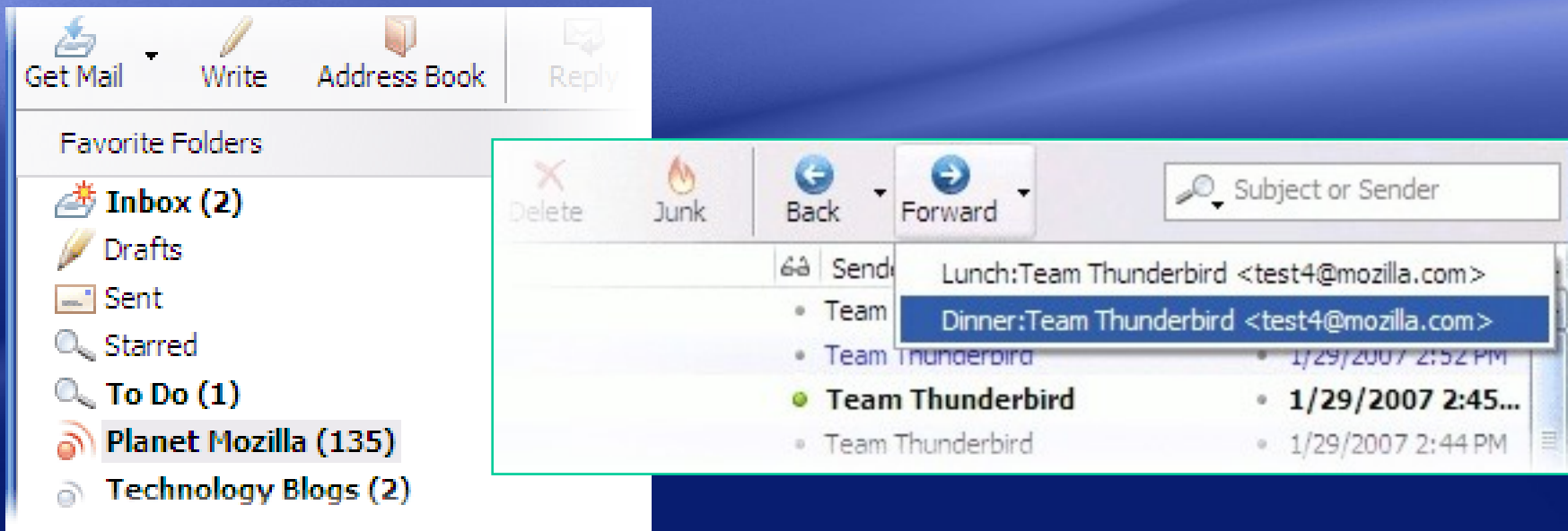
# Communications

- Web Browser - Firefox
  - Features an adaptable address & search bar, making it easier to find information on the Internet.



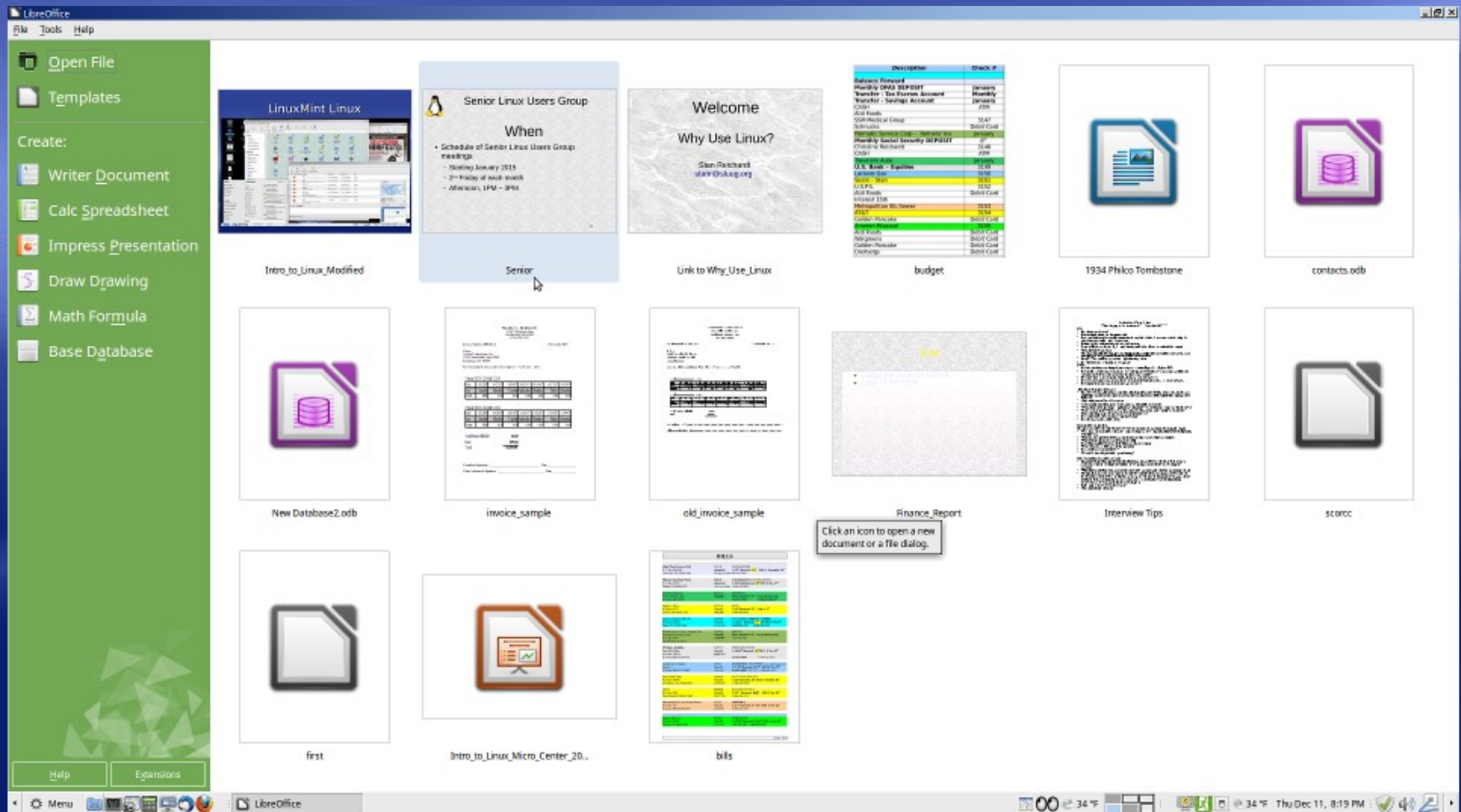
# Communications

- E-mail Client - Thunderbird
  - Includes advanced searching features within the e-mail program itself.



# Productivity

- The LibreOffice Suite



# Productivity

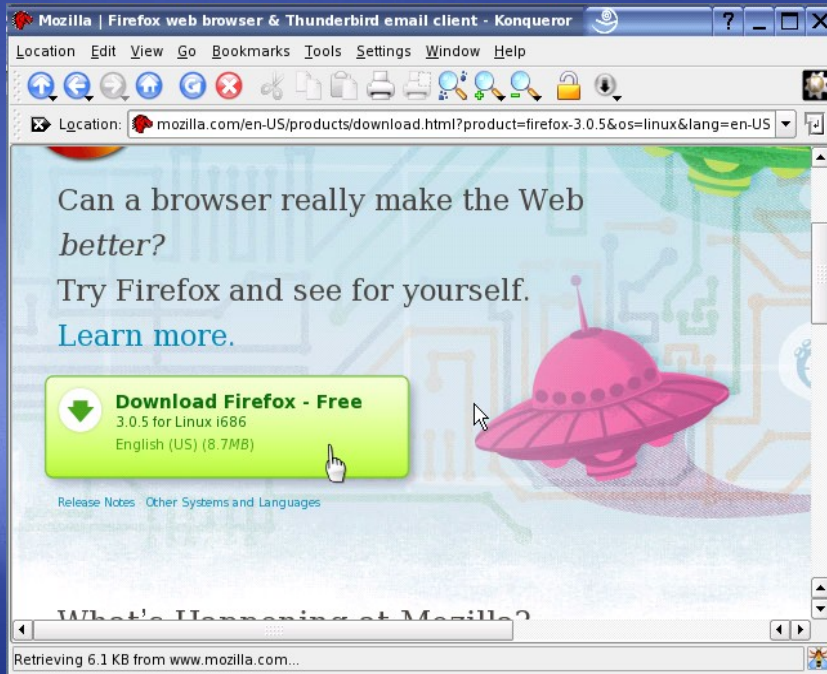
The **LibreOffice** Suite came from the OpenOffice Suite.

- Developer community took the OpenOffice open source software code and greatly improved it.
- It started as an exact duplicate, added many fixes and continues to improve at a faster rate.





# Program Downloads

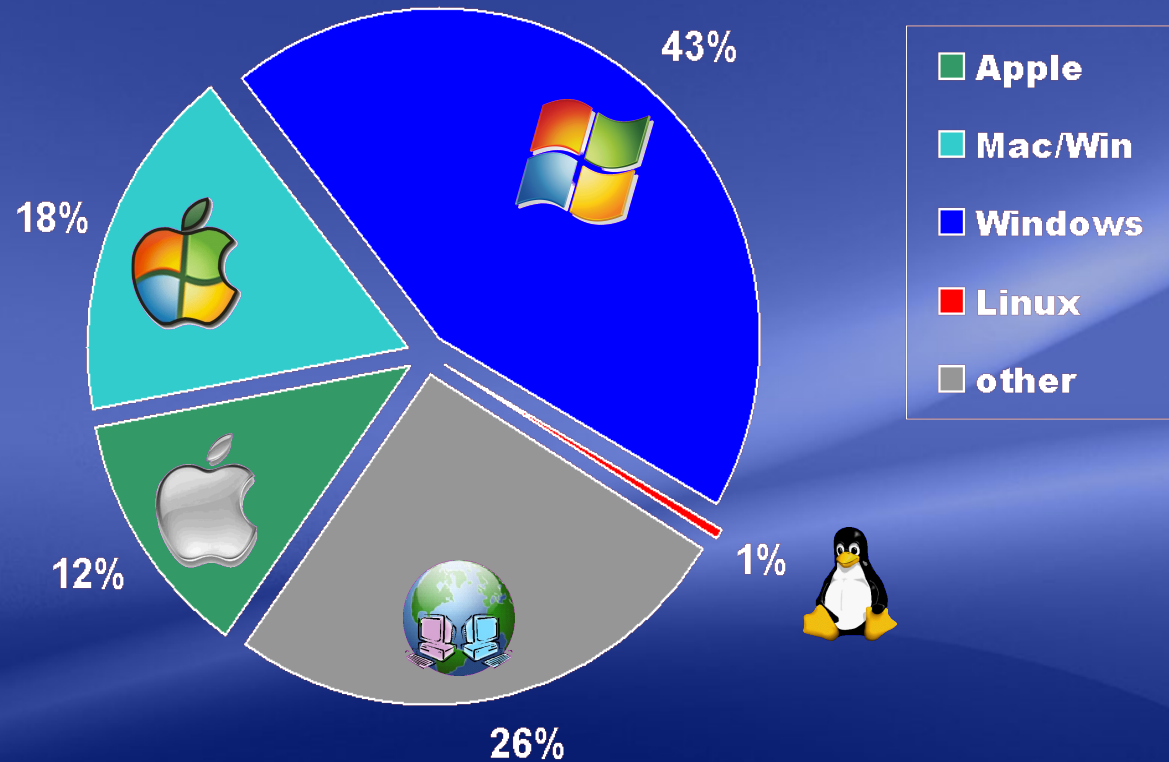


- One of the “trade-offs” of using Linux is the relative lack of over-the-counter application software.

- However, Linux users can download and install nearly any kind of application software imaginable from the Internet.

# Security

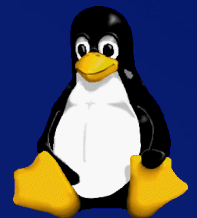
Total US CERT  
Threat Bulletins  
issued between  
2004-2009



- "Malware" threats still exist under Linux.
- Open source anti-virus and security programs are available.

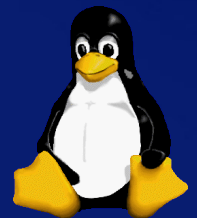
# Resources

- **Original presentation from MicroCenter**
- <http://en.wikipedia.org/wiki/Linux>
- <http://www.opensource.org/>
- <http://www.distrowatch.com/>
- <http://www.linuxscreenshots.org/>
- <http://images.google.com/>
- <http://www.osdisc.com/>
- <http://www.linuxmint.com/>
- <http://www.dedoimedo.com/computers/ubuntu-utopic-mate.html>
- <http://hzwlug.sluug.org/>



# Summary

- **Advantages of Linux:**
  - Inexpensive to buy, free to download.
  - Multiple versions, different features.
  - Safe “**Run Live**” trial before installation.
  - Works on many PC and Mac systems.
  - Can co-exist with original vendor OS.
- **Trade-offs of Linux:**
  - Less “over-the-counter” software.
  - Sometimes can require more complex installation and set up of peripherals.







# Intro to Linux

## Questions

What are your questions?

stan reichardt

[stanr@sluug.org](mailto:stanr@sluug.org)