Hands On Linux for Windows Users

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Today's Topics

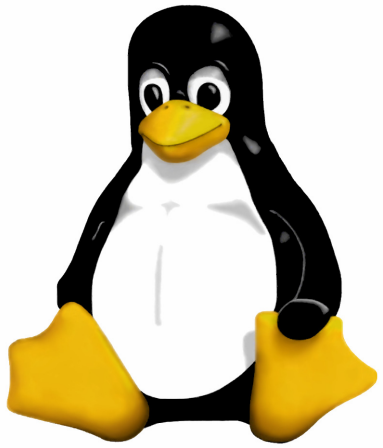
- The Problem
  - Solution Attributes
    - Freedom and Empowerment
- Selected Open Standards
- Free and Open Source Software (FOSS)
  - One Part of the Solution
- Appearance
  - K Desktop Environment
- Open Office and GIMP
- Linux and Linux Distributions
  - Open Source Licenses
- Live Linux CDs
  - Quickest way to FOSS
- FOSS Applications
- A Sample Blogging Assignment
- Conclusions

The Problem

- Because it possess several problematic attributes, proprietary software utilization can constrain educational activities.
- Specific proprietary software problem attributes include :
  - Cost
  - Availability
  - Commitments required
    - Time (budget cycle)
    - Resources (support)
- Also, proprietary file formats and interfaces can create vendor lock in…
- The reality is that each day each of us utilize open computer standards.

Selected Open Standards

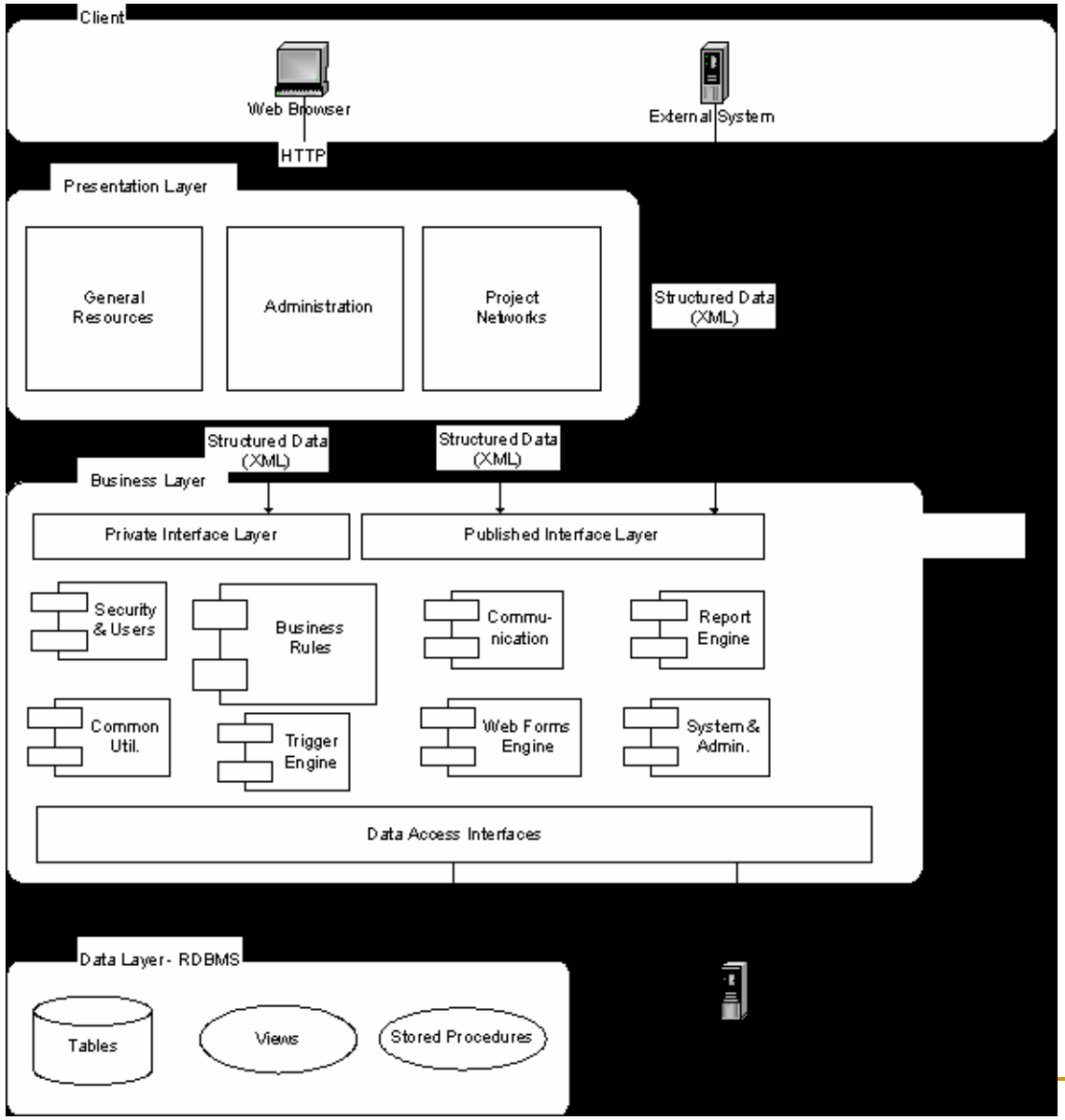
- Networking Hardware
  - Ethernet (Developed ’82, first IEEE standard ’92)
- Networking and O/S Software
  - TCP/IP (IETF RFC 1180, ’91)
  - Apache (Apache License, ‘94)
  - HTML (IETF RFC 1866, ’95)
  - CSS (W3C, ’96)
- GNU (FSF, began ’83)
- SQL (ANSI, began ’86)
- Linux (GNU GPL, ’91)
- XML (W3C, ’98)



Software Trends

- Increasing Modularization
  - Client/Server architecture frees the client from hardware and software dependencies
- Increased Independence (layers)
  - Computer System (Hardware)
  - Network
  - Operating System
  - Applications, Web Servers, Data Bases, Etc.
  - Open File Formats
- Internet Centric Application Servers
  - Google's Blogger is independent of:
    - Hardware
    - Operating system
    - Client software

Client/Server Architecture



Note that client is just a "web browser". Could be a computer. Could be a phone. Could be something else.

Complete client side hardware and O/S independence.

Note that server side also exclusively uses open standards to communicate between layers.

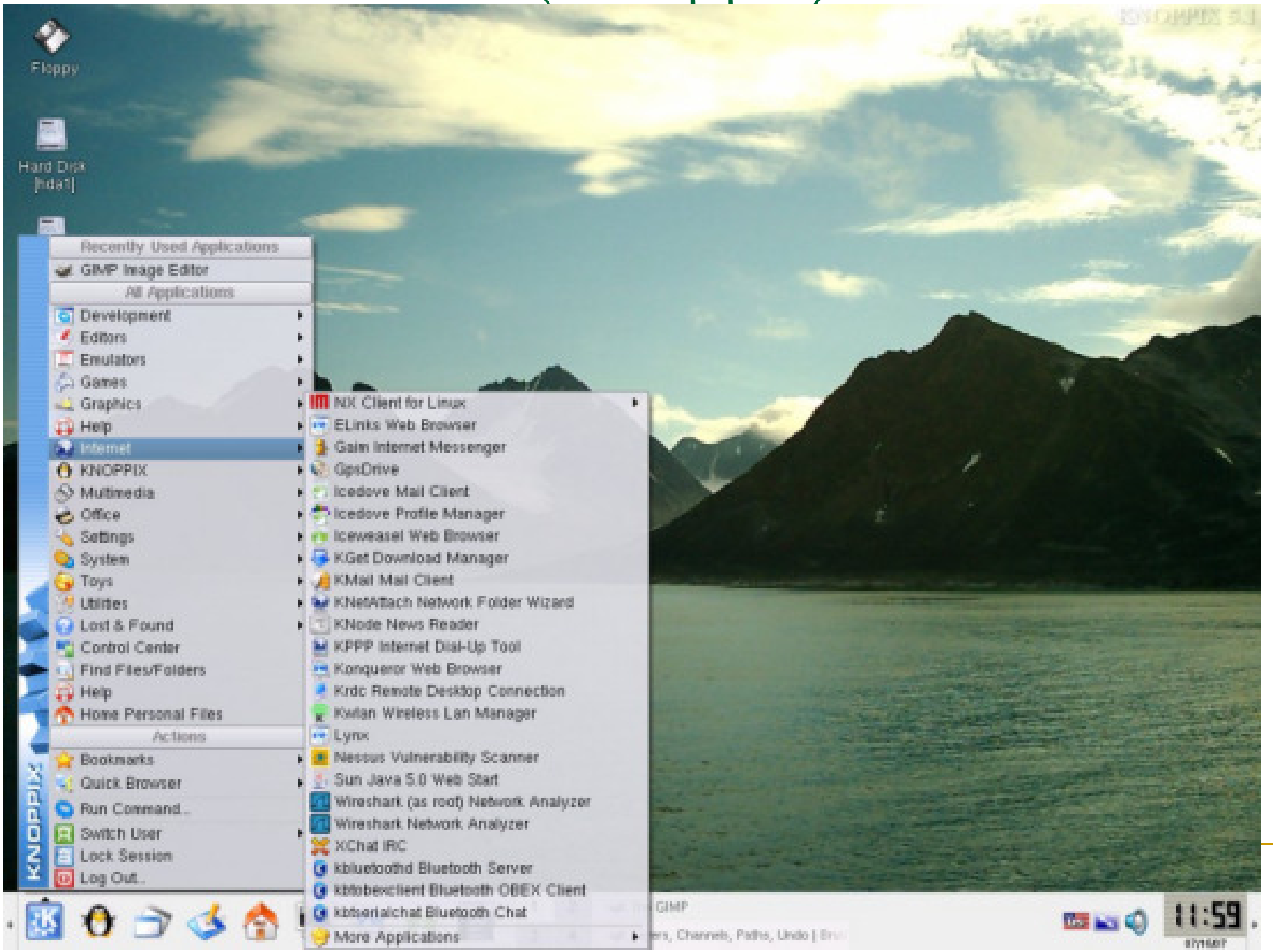
HTTP, XML, SQL

Complete serve side hardware and O/S independence!

One Part of the Solution

- Free and Open Source Software (FOSS) based educational activities
  - Available for Linux and Windows.
- Activities can utilize a variety FOSS desktop, networking, and O/S software tools.
  - For example, Open Office, Ethereal (WireShark), net cat, and Apache.
- Modern Linux uses a graphical interface analogous to that used by Microsoft Windows and Mac OSX.
  - The graphical interface is so similar to what our students are accustomed to that virtually no transition was required.
- What does Linux look like?

What does Linux (Knoppix) Look Like?



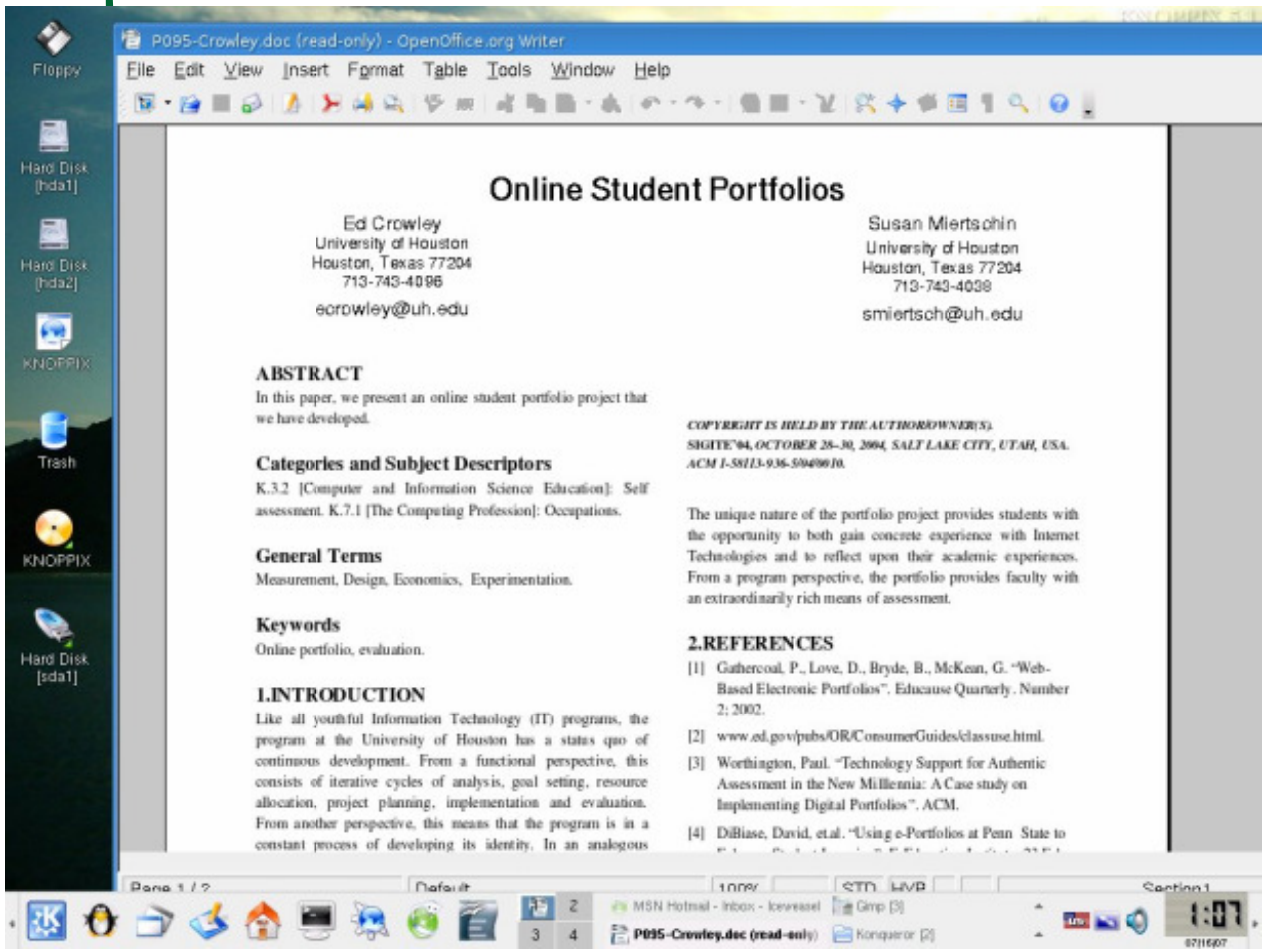
K Desktop Environment

- While you can use a variety of window managers, here we will focus on the K desktop environment (KDE).
- KDE is similar to Macintosh and Microsoft Windows environments. KDE offers:
  - Stability
  - Scalability
  - Openness

KDE Attributes

- Over 800 contributors.
- Widely distributed
  - More than 17 official WWW mirrors (12 countries).
  - More than 106 official FTP mirrors (39 countries).
- KDE source code repository currently holds over 4.0 million lines of code.
  - Linux kernel version 2.5.71 consists of about 3.7 million lines of code.

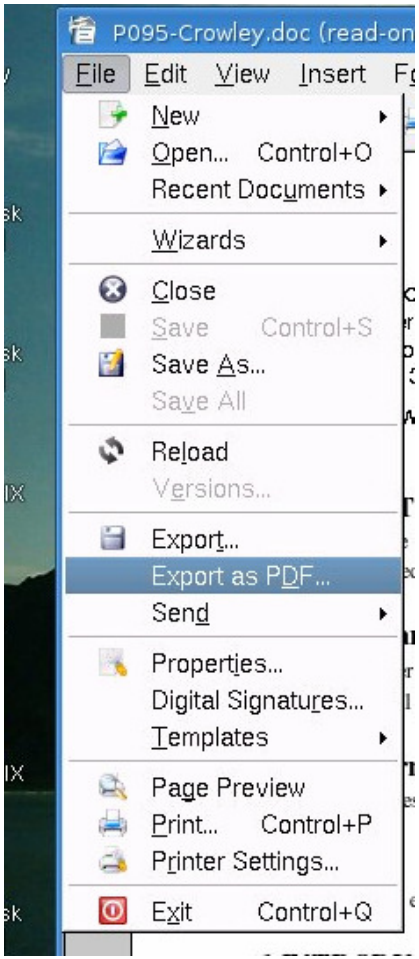
Open Office

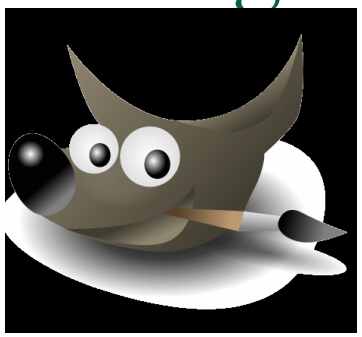


- Opens, reads, and writes Microsoft Word, Powerpoint, and related Office Files
- Transparent to user. Just select and click.
- Open Office can also save in PDF format.

Note, PDF is an example of a free, but not open source tool.

Open Office and the GNU Image Manipulation Program (GIMP)





GIMP: the GNU Image Manipulation Program. Features include:

- Photo retouching
- Screen captures (like you see here.)
- Image Creation

- Often used as a free replacement for Adobe Photoshop
- Available on many different operating systems
- Using the Portable version, the GIMP can be carried on a thumb drive and used on any computer.

What is Linux?

- Linux is the kernel of a Unix-like operating system
  - Originally created by Linus Torvalds et al (1991).
- Each Linux distribution packages related utilities and applications along with the kernel.
  - Many utilities and applications were developed under the GNU program and general public license (GPL).
  - Most Linux software is compatible across all major distributions.

What is a Linux Distribution?

- Typical Linux distributions include:
  - Linux kernel
  - GNU tools and libraries
  - Additional software
    - Windows manager and desktop environment
    - Applications and utilities
  - Documentation
- Diverse Linux distributions target different user groups.
  - Some distros may fully-featured desktops whereas some may be server focused
- The same, but different...
  - All distributions share a common kernel
  - Different distributions combine different tools, windows managers, and software.

Linux distributions may be:

- Released under a variety of Open Source Licenses.
- Open Source
  - Free as in speech, not necessarily free as in beer.
- GNU's, GPL is one popular license
- Some distributions may contain free, but not open source, software as well.
  - Philosophical differences can impact specific distributions.

LiveCDs: Easiest Path to Linux

- Live Linux CD are a specific group of distributions that distinguish themselves by being complete and able to run from a CD or similar media.
  - CD
  - USB
  - DVD
  - Typically, can also be installed on a HD
  - Or can be run under a virtual machine on Windows

LiveCd Advantages

- Lab set up is passing out the Live CDs.
  - Our first effort, it took seven minutes from CD distribution to having everyone booted up…
- CDs contain many applications.
  - Open Office
  - Graphics including screen capture
  - Many, many, networking and system tools.
- No license tracking.
  - Students can reproduce and distribute the O/S.
- Trouble shooting is “turn the computer off, turn the computer on”.
- Immune from virus, worm, and spyware infection.

LiveCD Distributions

ubuntu

There are a variety of Live CD distributions.

Choose the one that offers the optimum potential for your situation.

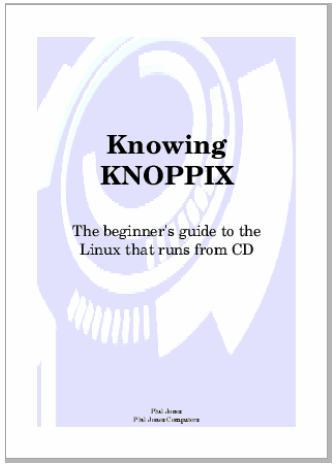
For us that distribution was Knoppix.

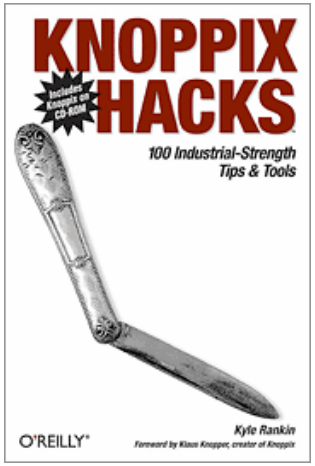
Three Knoppix Design Goals

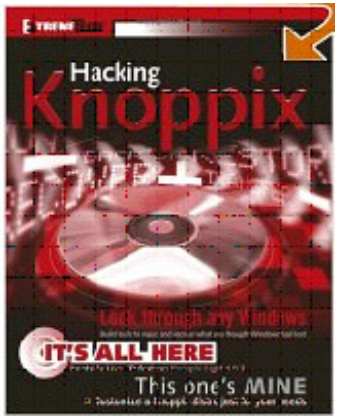
1. Desktop replacement
2. Rescue disk
3. Linux demonstration disk

- Knoppix the first widely distributed Live Linux CD.
- Knoppix documentation is widely available.
- In addition to downloading and burning Knoppix, it comes with several trade books.

Knoppix Documentation







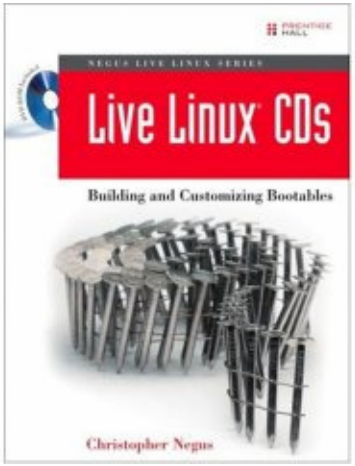
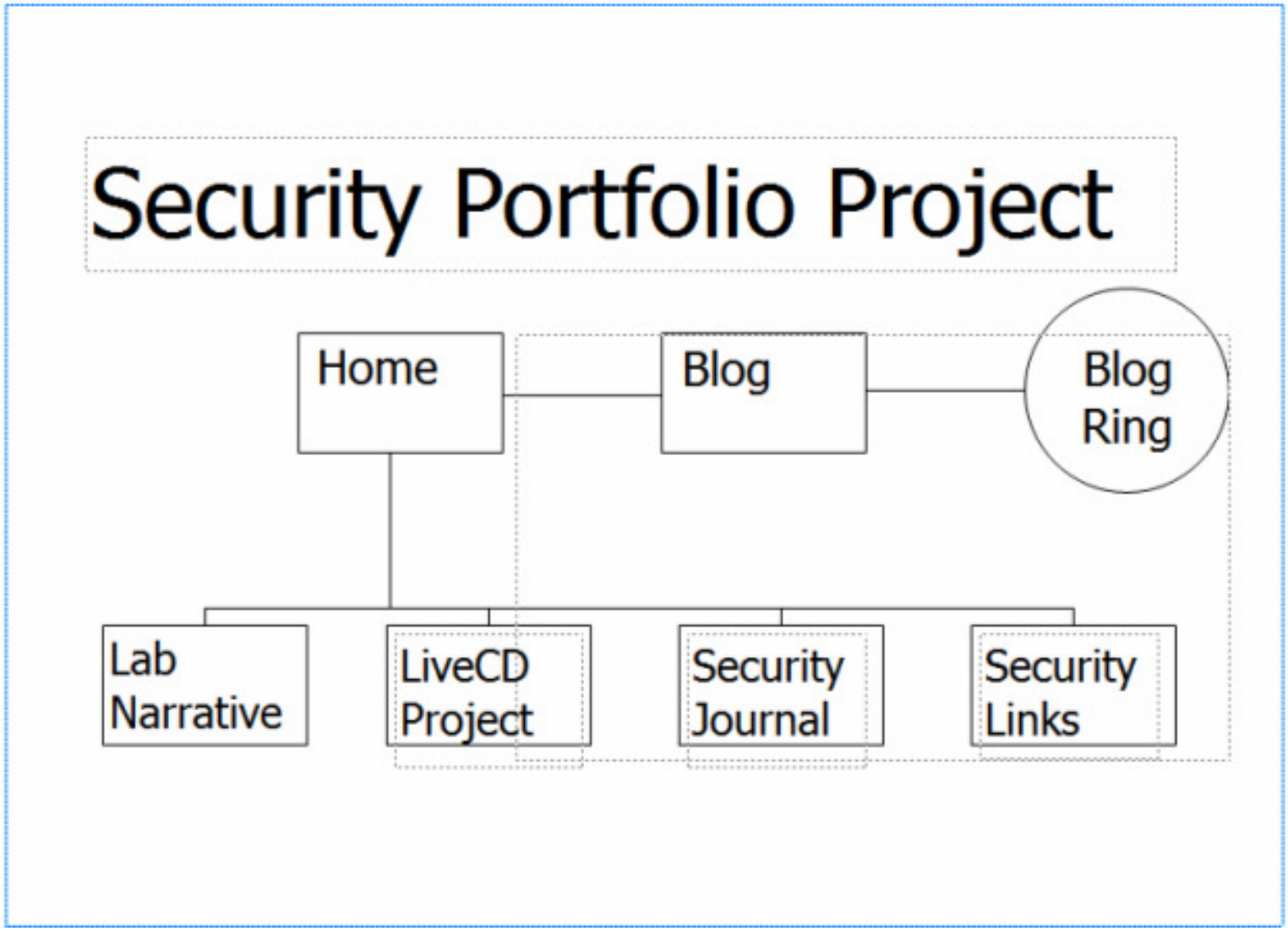


Figure 1-1 Portfolio Project



Blog

Each student will create an online blog. It is strongly recommend that you use Google's Blooger. This blog will hold your journal articles. These articles will be driven by in class assignments. This blog/journal will allow you to connect conceptual class activities with current news events.

While you don't necessarily have to use your name to identify the blog, you must let me know how to identify your blog. For example, rather than your name you may, by prearrangement, list a hash of your name.

Historically, the class has used blogs from Xanga.com. This enables all student blogs to be linked into a class blog ring. You may join the blog ring at:
http://www.xanga.com/home.aspx?user=croweye

Each student is also required to have an online web site. For a free web site, most students choose Geocities.com. Here, each student posts online copies of their work. Each site's home page will link to both the student's online blog and the class blog ring. Likewise, the blog should link to the online portfolio.

Online Journal

When assigned, you will find, and link to, a relevant security article concerning a specific topic. Your article must relate to the assigned security topic

Once you have selected an appropriate article, you should write a brief expository essay pertaining to the article. Brief here means from one to five paragraphs. The essay should

Conclusions

- Antidotal student response has been enthusiastic.
- Because the labs are open source and LiveCD based, students can repeat and/or verify their labs at home or at work.
- Students can freely distribute lab software.
- Software is free consequently budget discussions are irrelevant.
- I can burn the software myself – not subject to purchasing inertia.

Questions?

- Thanks for attending!

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