



NBA 600
Open Source
Class 12, Mon 11/26

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Short Papers

- Considerable consensus on continued mix of amateur and professional content
- But somewhat different views on
 - Revenue models for amateur content
 - Separate versus combined sites
 - Future strength of current networks

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Wednesday – Final Class

- Attendance required
 - Hand in comments on student presentations
- Presentations by 4 student teams
 - Approx 15 mins (bring copy for me to class)
 - Okonmah, Farhangi, Figlioni
 - Golden, Slowik, Wilks
 - Lim, Moth, Johnson
 - Fritz, Adelco, Chang
- Course evaluations

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What is Open Source (OSS)?

- Open source software is distributed in human readable form without charge
 - Subject to a license that encourages or requires similar terms for derivative works
 - Machine executable form readily created from this source form by knowledgeable people
- Phrase “open source” widely used
 - Early project was Stallman’s GNU project, termed “Free Software”
 - Free Software Foundation (FSF), philosophical objections to term open source

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Open Source Licensing

- Protect rights to do following with software
 - Free distribution and redistribution of source and executable
 - Use the software
 - Study and learn from the code
 - Creation of derivative works
 - Improve the software
 - Extend the software
 - Integrity of reputation
 - Protect the good name of the software
- Several standard licenses: GPL, Apache, ...

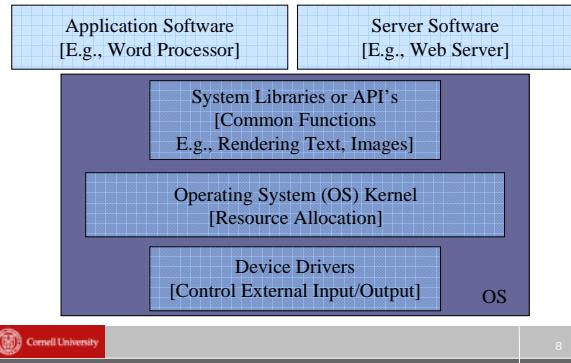
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Where OSS Has Succeeded

- There are many open source projects
 - SourceForge.net, a leading site for open source development, lists over 100,000 projects
 - A small number of open source projects are highly successful
 - Provide widely used alternative to traditional commercial or “closed source” software
 - Many more projects are used by small communities of experts
- The most successful projects tend to be systems software, not applications

Systems Software Components



Goldman Report: Rise of Linux

- Linux on Intel likely to emerge as dominant platform in corporate data centers
 - Replacing proprietary Unix systems
 - Sun Solaris, HP UX, IBM AIX
 - Limiting growth of Windows server systems
- Linux has evolved into “enterprise class” operating system
 - Not just for low-end “edge” servers such as file, print, Web, email
- Significant consequences for both IT vendors and IT departments

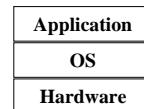
Linux Value Proposition

- Enables use of lower-cost Intel based (IA) server hardware with Unix-like OS
 - Previous choice of Windows on IA hardware vs. vendor-specific Unix and hardware bundle
- Enables use of many hardware vendors
 - Linux runs on IA servers from Dell, IBM, HP, etc. as well as variety of non-IA servers
 - Previous choice of vendor-specific solution resulted in “lock in”
 - Switching cost to change applications to new OS
- Relatively easy to port to Linux from Unix

Change in Industry Structure

- Competitive structure of IT industry long based on proprietary lock-in
 - Hardware-software-services bundle from one vendor works together but not with components from other vendors
- IBM, Sun, Apple historically large forces in this approach
- Linux interoperates with hardware from all vendors, and with broad range of applications software
 - Breaking the lock-in

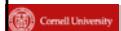
Linux Provides Common Platform



- Sun Solaris on Sparc
 - IBM AIX on AS-400
 - ...
 - MS Windows on IA
 - Linux on ...
 - MS Windows on IA
- Applications need only support Linux API's and not different vendor-specific Unix API's

Linux Vendors

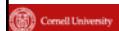
- No proprietary software advantage
 - Open source, widely available
- Main value is in certification and support
 - Certifying that certain versions of Linux perform up to particular standards
 - With various commonly used application and infrastructure software
 - Cataloging and providing easy patches/updates
- Possibility of proprietary extensions
 - But generally counter to open source community



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Server Vendor Strategies

- Complete solution vendors (IBM, HP) embracing Linux
 - HW, OS, infrastructure SW, consulting, support
 - Somewhat cannibalizing own proprietary Unix
 - IBM most aggressive
 - Linux competency center, 250 engineers
- Box vendors (Dell) embracing Linux
 - Largely as alternative to Windows
 - Mainly lower end servers
- Proprietary Unix vendors (Sun) – success?



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OS Vendor Market

- HP and IBM exploiting Linux to
 - Cut own costs
 - Provide better cross-platform support to customers
 - Providing appropriate solutions components from hardware, software, consulting
- Apple and Sun continuing their model of bundled proprietary system
 - Sun much less successful because of head-on Linux competition in core market
- Microsoft having mixed server success



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Broader Open Source Context

- Open source is changing IT industry competitive structure
 - Making certain lines of business less attractive and others more attractive
 - Too big to ignore, demands a response from many industry players
- Open content potential new model for digital goods more broadly – “guilds”
 - Much of the reward comes from recognition rather than financial remuneration
 - But where do companies and people get paid?



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Other Open Source Projects

- Technology-focused systems software
 - Broad base of technical users with skills and desire to contribute
 - Operating systems (Linux and GNU)
 - Web and application servers (Apache/Tomcat)
 - Databases (MySQL, Postgres, Cloudscape/Derby)
 - Security
 - Storage
- Less domain-specific application software
 - Business process critical
 - Users don't have technical skills or motivation



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Systems Software Market

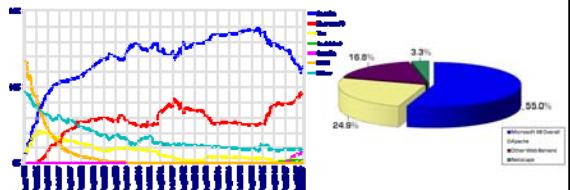
- Linux has had substantial effect on OS market
 - Support from large firms like IBM important for mainstream adoption
- Open source email and Web servers predate many commercial solutions
- What other infrastructure software likely to move to open source
 - E.g., Databases with MySQL
 - What important from business perspective



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Apache a Major Web Server

- Surveys of Web server software
 - Netcraft polls nearly 150M host names
 - Port80 polls hosts at Fortune 1000 companies



Open Source Project Structure

- Apache Software Foundation (ASF) has relatively formal organizational structure
- Foundation sponsors multiple OSS projects
- Structure of ASF
 - Rings of “merit”
 - Commiters can modify code of particular project
 - Members of ASF generally chosen from meritorious committers



ASF Collection of Projects

- The ASF is an umbrella organization whose policies and operations are decided by the members
 - Board acting on behalf of membership
- Day to day work done by individual projects
 - Each governed by project management team with a lead who is “corporate officer”
- Promotion to being a committer from a contributor is a big deal
 - About 1000

- Thanks for a good half semester
- Next class four student team presentations plus course evaluations