

Translating the Vision of Linux and Open Source into Real World Business Solutions.

Linux:

A Leading Example of the Power of Open Platform Technologies

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Agenda

- Open Platform Technologies
- Communities of Interest:
 - Developers
 - Business Partners
 - End Users
- Linux as an Open Platform
- Benefits of Linux and Open Source

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Open Platform Technologies

Defining Openness

- We define an "Open" technology simply as one that allows outsiders (Developers, Business Partners, and/or End-Users) to add value and build functionality into, on top of, or around the core technology.

Effecting Openness

- "Openness" is effected in many ways, from simply publishing API's, all the way up to and including full Open Source licensing of some or all of the core technology.
- For most organizations, determining the proper mixture of open components and proprietary components is a critical determinant of successful value creation.

Why Be Open?

- If a technology is too closed, developers, business partners, and end users are not allowed to add value and do not tend to adopt that technology widely or quickly.
- If, on the other hand, a technology is too open the creator may lose control of key Intellectual Property and thus be unable to capture the value of that which they have created.

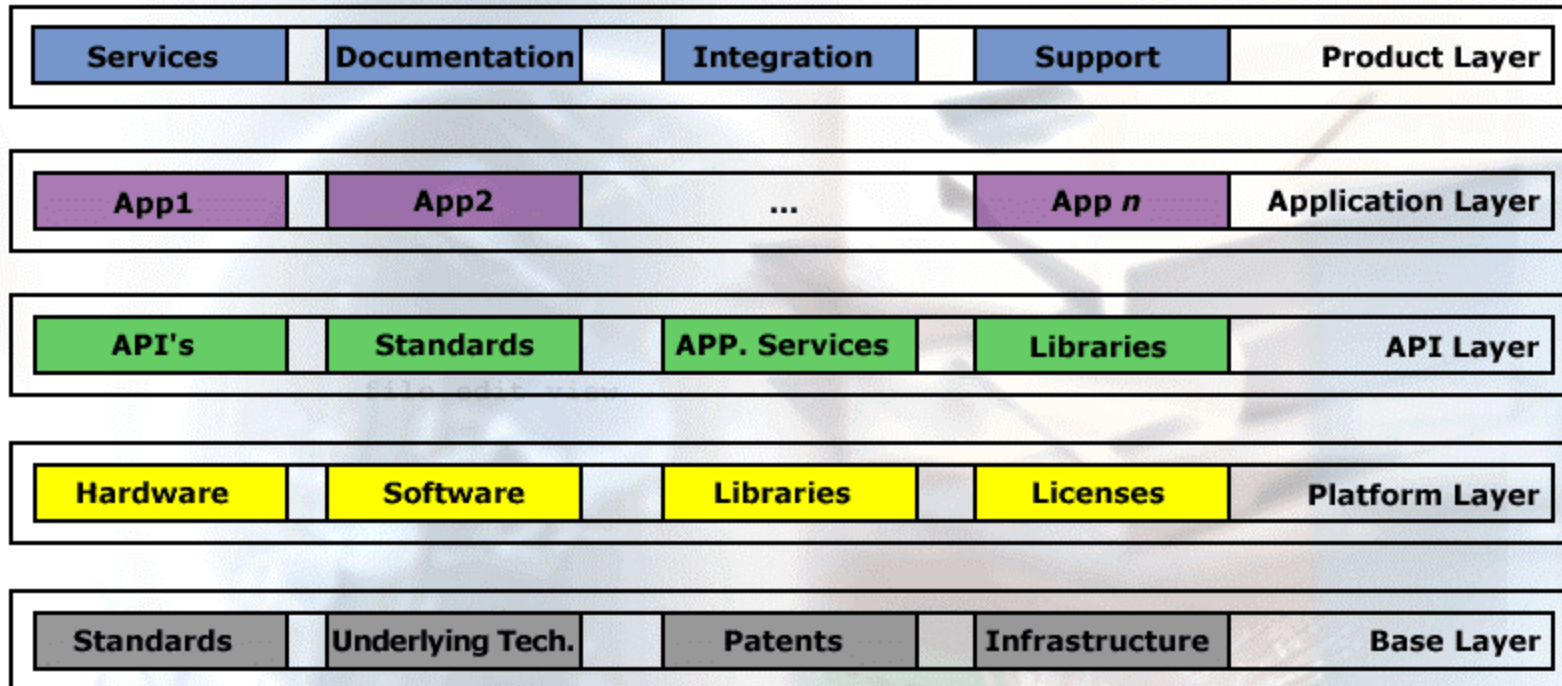
From Closed to Open

- Examples of important technologies that have benefitted (or not benefitted) from a greater or lesser degree of openness can be taken from any technology segment.
- Examples from the Operating Systems market include:
 - **DEC VMS** (totally closed, now dead for all intents and purposes)
 - **Microsoft Windows** (relatively closed but APIs published. Benefited from Wintel duopoly and willingness to work with huge developer community)
 - **UNIX** (source code available for purchase, POSIX standard gives full APIs allowing full replication of functionality (GNU), hardware independence led to wide adoption)
 - **Linux** (Open Source, fastest-growing OS in the world today)

Defining Platforms

- We define a "Platform" as any technology on top of which complex, high-value solutions can be built.
- This is a simple differentiation from what we'll call "End-User Applications", where "what you see is what you get" and no additional functionality or value can be created.

Elements of a Platform



Platform Examples: Software

- Operating Systems are almost always platform technologies (e.g., Microsoft Windows, UNIX, Linux, Palm OS, Macintosh OS, etc.)
- Internet Infrastructure software can be a platform (e.g., BEA WebLogic, Digital Creation's Zope, Sun's Jini, etc.)
- Databases can be platforms on top of which applications are built (e.g., Oracle, Informix, SAPdb, MS SQL Server, etc.)
- Programming Languages are platforms (C, C++, C#, Java, Perl, Python, etc.)
- Even standards might be considered platforms (though it is actually the implementation of the standard which really comprises the platform, e.g, XML or HTTP)

Platform Examples: Hardware

- Intel's microprocessor family (8088, 8086, 80286, 80386, 80486, and Pentium) is one of the most successful hardware platforms in history.
- Other general-purpose microprocessor families compete to become popular platforms (AMD Athlon, Transmeta Crusoe, etc.)
- Processors such as the PowerPCs from Motorola (8xx and 82xx) and IBM (4xx), and the StrongARM family are popular platforms for embedded systems.
- Even VHS and Betamax are standards-based hardware platforms (note, however, that the open, partner-oriented VHS destroyed the closed, Sony-dominated Betamax format in just a few years).

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Communities of Interest

The Power of Communities

- The adoption of new technology is driven by communities of people with related interests (“weak links” and “near peers”)

“Diffusion investigations show that most individuals do not evaluate an innovation on the basis of scientific studies of its consequences, although such objective evaluations are not entirely irrelevant, especially to the very first individuals who adopt. Instead, most people depend mainly upon a subjective evaluation of an innovation that is conveyed to them from other individuals like themselves who have previously adopted the innovation. This dependence on the experience of near peers suggests that the heart of the diffusion process consists of the modelling and imitation by potential adopters of their network partners who have adopted previously. **So diffusion is a very social process.**”

-- Everett M. Rogers, *Diffusion of Innovations*, 4th Ed., 1995.

(emphasis added)

The Power of Communities

- Therefore, technologies around which communities of interest are built will tend to be more widely adopted, more quickly.
- In the past, these communities have tended to “spring up” of their own accord.
- Today, via the Internet, inventors, corporations, promoters, or even “fans” of a particular technology can intentionally build these communities to help drive the adoption of the technology in which they have an interest.
- The Linux community is Linus Torvalds’ greatest invention.

Business Partners

- **Their Goals:** Identify valuable technologies that lead to higher value in products/services offered to customers.
- **Their Needs:** Value Proposition, Applications, Staff Education, Marketing/Sales Tools, Partnership Plan.
- **Their Desires:** Sell more products/services with minimal risk, cost, and effort.
- **Communities They Want:** Well-organized, well-run partnership program rewarding platform expansion and enhancement.

Developers

- **Goals:** Create valuable applications with minimal time, cost, and effort.
- **Needs:** Documentation, Education, Certification, Technology Roadmap, Software Development Toolkits.
- **Desires:** Work on “cool” technology. Be recognized for technical contributions. Meet customers’ goals.
- **Communities They Want:** Technology website-based community. Access to key tools: docs, SDK, education, assistance.

End-Users

- **Goals:** Solve business problems with minimal cost and risk. Avoid “bleeding-edge” solutions.
- **Needs:** High-value applications running on well-designed, well-supported, innovative technology platforms.
- **Desires:** Partner with companies that understand business problems and offer easy-to-implement solutions.
- **Communities They Want:** Support for use of and development of valuable applications on top of Open Platform Technologies they find valuable.

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Linux as an Open Platform

Why Should You Care?

- But does "openness" really matter to you and your business?
 - In the 1980's, there were two major PC architectures to choose from: the Apple Macintosh and the IBM PC.
- Which did your business choose as a standard?
- What were the benefits of one over the other?
 - Harnessing the collective energy of an industry.

Why Should You Care?

- We are at the very beginning of computing history.
- Everything you think you know about computing is subject to change.
- Look at the fundamental changes in the last 50 years:
 - Mainframes...Minis...PCs...Client/Server...Web...ASP...
- HW innovation is moving faster than ever (embedded systems, handhelds, wireless, etc.).
- Demand for complex software is already outstripping supply.
 - How late is Windows 2000?
 - Hint: It used to be called Windows NT 5
 - First beta delivered in September, 1997!

Why Should You Care?

- Proprietary software is doomed. Only an Open Source development method can keep up with the demand for rapid development:
 - Open Source promulgates innovations (once a better way is discovered, it is quickly shared).
 - Proprietary methodologies restrict innovation (once a better way is discovered, it is quickly hidden).
 - Open Source allows new innovations to build on previous accomplishments.

Why Should You Care?

- The move to Linux/Open Source is inevitable.
- In the New Economy, anything which puts more power in the hands of the customer *will* win.
- We are in the first five years of a revolution in the way that business is conducted.
- In five more years, many businesses which haven't adapted will no longer exist.

Why Should You Care?

- Business Models are evolving to focus on new critical success factors:
 - Value
 - Flexibility
 - Speed
- Technology must support these aspects of new Business Models.
- Software is an increasingly important component of every business. Your business must control it's own destiny.

Why Should You Care?

- Linux/Open Source gives you control over a critical aspect of your business: the software that you use.
- Proprietary software, by definition, leaves control in the hands of someone else.
- Open Source puts you in control.

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What is Linux/Open Source?

What is Linux/Open Source?

- Linux, an Operating System, is the most powerful realization of a vision of portable computing that began at Bell Labs in 1969.
 - Ken Thompson: UNIX
 - Portability
 - POSIX and Open Systems
 - Standards
 - Richard Stallman: GNU, the General Public License, and Free Software Foundation
 - Freedom
 - Linus Torvalds: Linux
 - Open Source

What is Linux/Open Source?

- **Drawbacks of earlier iterations:**
 - UNIX -Portable, but not standard. Proprietary licenses, multiple vendors.
 - POSIX -Standard, but not implemented as one source code tree. Multiple vendors trying to embrace & extend.
 - GNU -Free Software allows anyone to control the source. But still not viable for commercial use. No working kernel.
 - Linux -Supported by the community. Had limited commercial support.
- **Linux now supported by commercial companies:**
IBM, HP, Compaq, Dell, Red Hat, Caldera, Corel, TurboLinux, VA Linux, LinuxCare, and many others.

What is Linux/Open Source?

Benefits of UNIX Heritage

- Linux is based on over 30 years of evolution in the UNIX operating system.
- Linux is a powerful, new implementation of a proven architecture.
- Benefits of UNIX, such as portability, scalability, and interoperability are realized in Linux.

What is Linux/Open Source?

- What is the difference between Linux and Open Source?
 - If Linux were a BMW, Open Source would be the production line at the Bavarian Motor Works.
 - In other words, Open Source is a software development *process* and Linux is a product of that process.

What is Linux/Open Source?

- Open Source is a (r)evolutionary approach to developing software:
 - Maximizes innovation and the sharing of ideas
 - Minimizes wasted effort spent "reinventing the wheel". Ensures higher quality software through peer review
- Unlike proprietary solutions, Open Source software benefits from the network effect:
 - The Open Source movement is fueled by a global community of developers, facilitated by the Internet.

What is Linux/Open Source?

- Open Source results in better software, faster.
→ "With enough eyes, all bugs are shallow.", ESR
- The strange thing about Open Source isn't that it's catching on so fast. It's that it took so long.
- Other branches of science have used an Open Source methodology for hundreds of years.
→ *e.g.*, Civil Engineering
- In fact, Peer Review is the critical element in the Scientific Method.

Open Source → Open Platform

- **“Open Source” Model Radically Accelerates the Adoption of New Technologies**
 - Adoption Against Entrenched Competitors (“**Bottom-up**” (developers) vs. “**Top-down**” (CIOs) adoption).
 - Technologies that are open and extensible by their user/developer communities allow greater value creation.
- **Success of the Open Source Model**
 - Adopted by IBM, HP, Sun Microsystems, Dell, Compaq, SAP, Borland, and hundreds of others.
 - Allows marginal technologies to become key mainstream platforms through accelerated evolution, low-cost support, faster distribution, and no barriers to evaluation and use.
 - Focuses on building “communities of interests” to support, enhance, and advance technology.

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Benefits of Linux/Open Source

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- What are the benefits of an open, non-proprietary operating environment and the open source methodology used to create it?
 - **Speed** (e.g., Develop faster--The world now works on Internet time. Do you?)
 - **Quality and Reliability** (e.g., Develop better--How much does it cost every minute your website is down?)
 - **Control** (e.g., The ability to change the code to meet your needs --Who cares what your software vendor wants? What do you and your shareholders want?)

Benefits of Linux/Open Source

- What are the benefits of an open, non-proprietary operating system and the open source methodology used to create it?
 - **Vendor Independence**
 - Feudal system vs. freedom
 - What are the downsides of independence?
 - You have to be self-reliant. Or do you?
 - The Internet-based Community

Benefits of Linux/Open Source

→ **Availability & Survivability**

- Owned by no one and everyone at the same time. Everyone has the same rights to it. It is available at no charge, from multiple vendors.
- "Put it in a public place and build a religion around it."

→ **Reliability**

- Extensive peer review.
- Bugs Fixed within hours.

Benefits of Linux/Open Source

→ **Customizability**

- Users are free to change Linux to meet their needs.

→ **Adaptability**

- Quickly and easily takes advantage of the latest innovations in hardware & software technology.
- *e.g.*, Itanium & superclustering.

Benefits of Linux/Open Source

→ **Security**

- No secrets. Back-doors cannot be inserted into the code without everyone seeing them.

→ **Scalability**

- Linux allows a single set of application code to run from embedded systems (cell phones, set-top boxes, PDAs) to supercomputers and superclusters.

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Summary

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- **New technologies are brought to market every day.**
 - Those that are **widely adopted** will have the **greatest value**.
 - **Speed, functionality, and price are irrelevant** if others do not invest their time, attention, and money.
 - **Open Platform Technologies** have the greatest chance for wide adoption.
 - Technologies that are **not widely adopted** are **likely to disappear** over time, resulting in increased costs for those who invested in these dead-ends.