

Integrating Open Source into your business



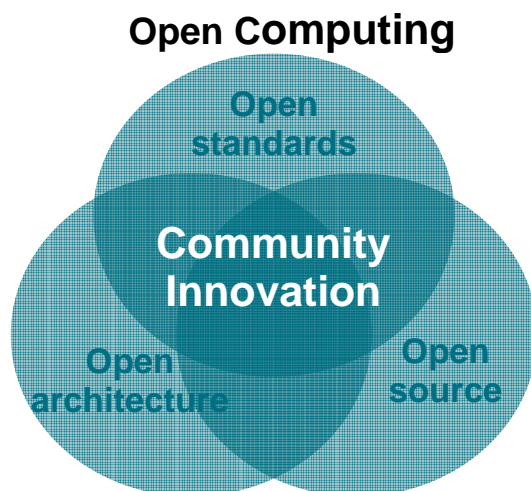
To help businesses deal with the complexity of globalization, unanticipated opportunities, unexpected threats, competitive demands and fiscal constraints, a business' information technology and administrative systems must be highly flexible and resilient so that they can seamlessly communicate with other disparate technologies and systems. It is the enablement of this flexibility and resilience that defines "Openness."

"Open" is simply a better means to an end. It may not be the only means, but it is the simplest and most cost effective approach to building flexible business infrastructures. Closed, or proprietary, systems alone will not spell failure, but will make success more difficult to achieve due to increased integration requirements. These first principles of "open computing" act as filter when determining how to pragmatically implement open technologies in support of business strategy.

- **Choice:** choices made today should not limit choices that can be made in the future, thus ensuring future access to innovation.
- **Flexibility:** internal departments and external partners that make different technology choices can be connected.
- **Speed to market:** new solutions that involve multiple hardware and software platforms can be quickly built and deployed, without vendor lock-in.
- **Agility:** changing business parameters can be accommodated and incorporated into existing systems very rapidly.
- **Skilled resources:** a work force is available that is trained and understands open computing standards and platforms.

What is Open Computing?

Many software companies brand their offerings and architectures as open. We shouldn't be surprised. "Open" is very often an important requirement in most IT acquisitions, so small wonder companies posture their offerings as such. There are as a result, many points of views and many definitions on what is open and what is not.



Open computing is the philosophical principle that describes architecture and technology procurement policies and practices that align IT with the first principles of "openness" by ensuring interoperability with open standards.

Open standards are specifications for API's, protocols, data and file formats that are openly documented and published without restrictions that limit

implementations. Open standards, like HTTP, HTML, TCP/IP, XML and SQL, are evolved collaboratively by software engineers typically from various IT or software companies who collaborate under the auspices of standards organizations such as W3C, OASIS, OMA, ISO and IETF. Open standards are implemented by offerings available in the market.

Open architecture is a flexible architectural approach that allows for the loose binding of application functionality through standardized interfaces. Open architectures provide independence to isolate and distribute work to the most effective teams within and outside the organization. A good example is the Services Oriented Architecture (SOA) which views every application or resource as a reconfigurable service implementing a specific, identifiable set of (business) functions.

Open source is software whose source code is published and made available to the public, enabling anyone to copy, modify and redistribute the source code without paying royalties or fees. Open source software (OSS) usually evolves through community developers composed of individual programmers, as well as very large companies. Some examples of open source initiatives are Linux, Eclipse, Apache, Mozilla, Globus Alliance and various projects hosted on SourceForge.net, a developer portal for the hosting of open source projects.

Community innovation is the common thread that runs across all three of the open computing components. All three require active support and collaboration among individual developers, IT vendors, standards organizations, governments, and universities to accelerate innovation and promote the advancement of critical standards.

Open computing accelerates the process from idea generation to market distribution through a standardized information technology platform. Due to the alignment of technology and business strategies made possible through open computing, businesses have more technology choices and greater flexibility to solve business problems more efficiently.

What is Open Source?

Open source is defined by three key components:

- A **development methodology** which uses a community approach and peer review to develop software. Since the code is openly published, everyone can see whether it is good or bad – and offer feedback on how to improve it. This promotes a meritocracy amongst developers – you basically get to be a key player by writing good code.
- A **licensing approach** that provides free access to source code and conforms to one of about 60 licenses authorised by OSI - the Open Source Initiative. All of these licenses allow users to view and modify the source code but vary greatly in specifying the conditions under which code modifications and extensions must be returned to the community as open source. Visit the OSI web site <http://www.opensource.org/> for details on open source licenses.

- **Community** of developers, users, and IT vendors that contribute code, test, and provide support for an open source project. A key distinction exists between open communities that encourage broad participation and vendor controlled communities in which a single vendor controls the direction of an open source project. Vendor controlled communities can lead to vendor lock-in and are higher risk given total dependence on a single company.

OSS can be an important source of innovation because it brings together people from different backgrounds and perspectives to work on and solve common business and IT problems. OSS is also an excellent approach for driving emerging standards and, in many cases; an OSS project can become the common implementation of a standard that is used by a large number of IT vendors and customers. The Apache Web Server is a good example of this.

Open Source Benefits and Challenges

The IT industry is seeking a new equilibrium between open source and commercial private source software. In terms of innovation, both private source and open source will continue to be critical in the future. Open source and its collaborative communities will help drive the evolution of emerging standards. And, private source will continue to play a vital role in driving innovation on top of the commoditized layers of open source providing unique value to customers. In the future, we'll increasingly see a combination of open source and private source used to create best of breed solutions. Open source offers a number of potential benefits to customers:

- **Low initial costs:** the cost of acquiring OSS may be low or even zero with optional support offerings priced separately. Free, informal web support is also typically provided for most open source projects.
- **Easy to acquire:** OSS is easy to download from the web or often it's available as part of a Linux distribution. This frictionless access makes it easy for developers to try out the software without needing to go through a formal purchasing process. OSS encourages the rapid prototyping and "do-it-yourself" computing popularized by scripting languages and the LAMP stack.
- **Increased choice and flexibility:** OSS can often be obtained from multiple suppliers and often runs on multiple hardware architectures. Combined with the option of buying support – again often from multiple vendors – this leads to choice and flexibility for customers.
- **High code quality:** the peer review process of open source development has tended to produce high quality code and robust community support helps turn around bug fixes very quickly.
- **Community innovation:** the community approach frees developers to focus on value add components.

However, there are a number of potential challenges that also need to be considered by customers looking at open source software:

- **Support:** Is support available from a trusted vendor at the quality and service levels demanded by mission-critical use?
- **Integration:** Who's responsible for integrating the various OSS components with existing IT infrastructure software? Open source is a collection of communities – some of whom talk with each other and ensure integration, and some of whom don't.
- **Application availability:** Are ISV applications available which build on the open source platform – and are they tested and supported to work on it?
- **Maturity:** How mature is the open source offering? Does it have the functionality and scalability of competitive commercial offerings? Is there broad community and industry support for this offering? And how are the developers of the open source offering going to make money – is there a sustainable business model behind it – and if not, how long is the offering going to last?
- **Complexity:** Rapid prototyping and “do-it-yourself” computing promoted by OSS can be very effective at developing applications fast, but how maintainable are those applications, and how do they relate to the standards and applications mandated by Corporate IT? Uncontrolled open source usage could lead to more complex IT infrastructure environments.

Integrating Open Source into your IT Strategy

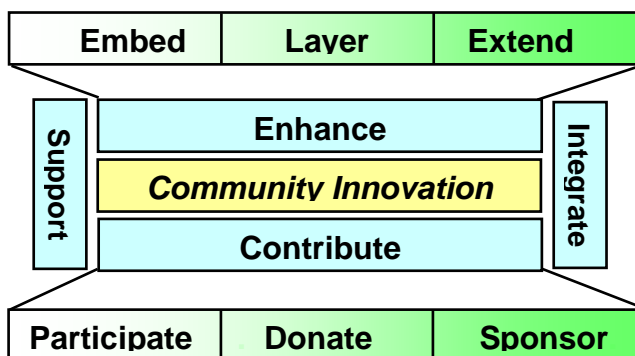
There are lots of open source alternatives available in the market. How do you determine which open source projects to consider? How will you integrate these open source products into your existing IT environment? IBM has helped many customers develop pragmatic open source strategies. Here are some guidelines to determine if a particular open source project meets your business and IT infrastructure needs:

- First and foremost, **insist on open standards**. This applies equally to open source and private source commercial software. Open standards increases choice and flexibility and is absolutely critical to responding quickly to business opportunities and threats, and reducing vendor lock-in.
- **Consider both open source and commercial (private source) software**. Don't build a separate strategy, but integrate open source into your existing strategy. When evaluating open source alternatives consider how these products will integrate with existing technology in your IT environment and determine how you could migrate to more enterprise-strength offerings if/when your performance and scalability needs increase. In addition, take a broad view of total cost of ownership (TCO) when evaluating open source and commercial offerings. In addition to up-front cost, consider support costs, admin and developer costs (including training), migration costs, etc. In general, software acquisition costs account for a small percentage of the overall TCO.

- **Evaluate the maturity of open source projects** before committing to them – especially in the areas of community, sustainable business models, and ecosystems. Open source projects that are backed by a strong “open” community present greater value and lower risk than vendor controlled communities. Open communities protect against vendor lock-in and shield customers from the risk that a company goes out of business or gets acquired. Make sure the community is vibrant and active and that the supporting ecosystem of ISVs and corporate backers is strong. Also ensure that the company from which you’re acquiring the open source product/support is financially viable in the future. You want to make sure your open source vendor is around to service your needs for many years in the future.
- **Establish company-wide policies** for working with open source software right from the start. Implement a management system to review and track all use of OSS, and use due diligence to review the licensing for every OSS package used. Open source has a way of finding its way into an enterprise coming in under the radar of the corporate IT organization. For example, many departmental developers use open source to rapidly prototype without going through procurement. It’s important for enterprises to understand where and how open source is being used and to understand how it relates to and impacts the corporate software standards that have been mandated. This knowledge will help your enterprise better leverage open source and prevent the potential disruption undetected usage might cause.
- And lastly – **be pragmatic**. Run a pilot or proof of concept at an early stage and make decisions based on business factors and technical considerations – just as you would for commercial software. Start small by picking one area where you think open source might be beneficial. Consider the costs aspects along with integration, interoperability and migration scenarios up front and then run a pilot to establish benchmarks for cost savings and other business related benefits. Once satisfied with the results of the pilot, plan on a staged implementation to reduce disruption to operations.

IBM and Open Source

IBM’s approach to open source helps enhance the benefits and mitigate the challenges of open source for our customers and business partners. Open source is nothing new to IBM. We’ve been involved in open source for over 7 years and we’re currently engaged in over 150 open source projects. IBM has been a leading contributor to Apache, Mozilla, Eclipse, and Linux for many years starting back in 1999. So we have a lot of experience.



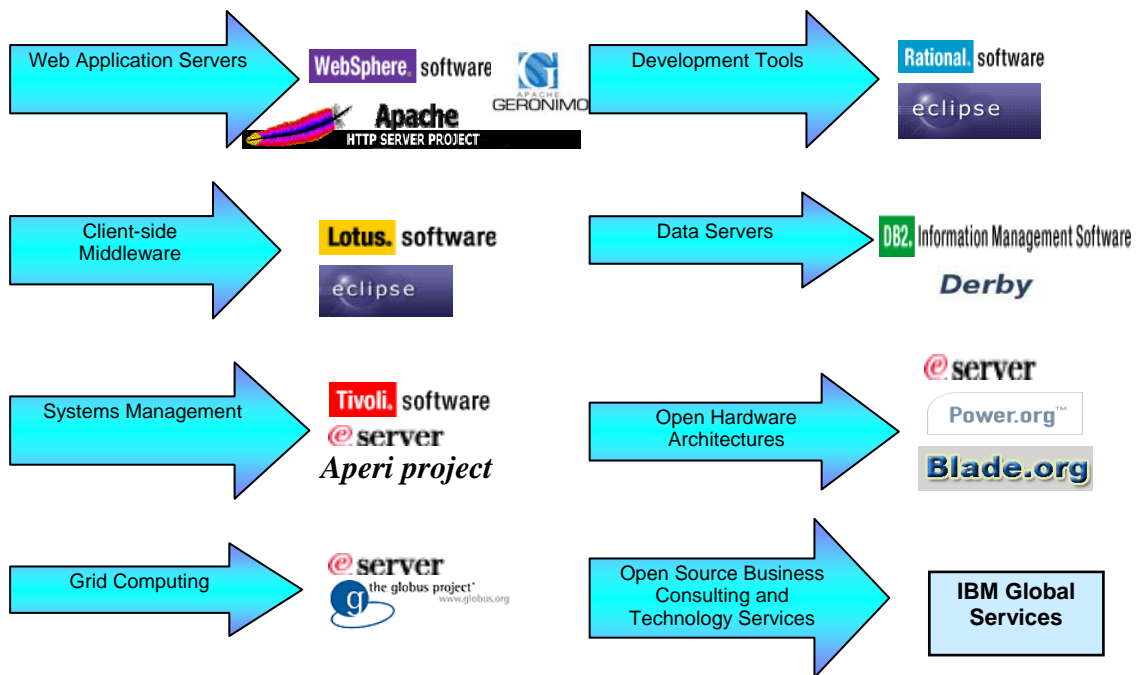
As depicted in the figure, promoting and harnessing community innovation is at the core of IBM’s open source approach both in terms of accelerating the evolution of emerging standards and freeing up resources to focus on higher value services.

IBM actively **contributes** to a

number of open source communities in various ways. We *participate* in work groups to help develop new technology – for example, our involvement in Linux. We *donate* code, patents and other resources to the open source community, both as part of existing communities and to start new projects – for example, our donation of accessibility code to the Firefox web browser. We *sponsor* foundations and cross-vendor organizations to accelerate open source adoption and usage – for example, our formation of the Eclipse foundation.

We then **enhance** open source with our own skills, technologies and people to benefit our customers and partners. IBM provides *support* for both open source offerings and for associated IBM commercial software offerings. We *integrate* open source components with commercial software to provide customers with integrated software stacks. We *embed* open source components in our commercial software offerings. We *layer* our commercial software on top of an open source platforms – for example, IBM middleware on Linux. We *extend* open source products by ensuring affinity and easy migration to our commercial software which offers greater scalability and higher functionality.

The figure below illustrates IBM’s broad support for open source across software, hardware and services. This is in addition to the comprehensive support for Linux that IBM provides across its entire portfolio.



- *Web Application Servers* – IBM contributes to the Apache Geronimo project and then uses Geronimo as the base for WebSphere Application Server Community Edition (WAS CE).
- *Client-side Middleware* – IBM contributes to the Eclipse Rich Client Platform (RCP) project and then uses Eclipse RCP as the platform for building IBM Workplace Client

Technology and delivering cross-client GUI applications such as Lotus Notes. IBM also contributes to Mozilla and to OpenAjax.

- *Systems Management* – IBM is working with other IT vendors on a range of open source systems management projects. These include the Aperi project to provide a common open source storage management platform on which future generations of products, such as Tivoli Storage Manager, can be built, and “Project Higgins” which is developing software for "user-centric" identity management, an emerging trend in security software.
- *Grid Computing* – IBM is working with the Globus Alliance to develop the Globus Grid toolkit.
- *Development Tools* – IBM contributes to the Eclipse Integrated Development Environment (IDE) project and then uses Eclipse as the foundation for the Rational Software Development Platform.
- *Data Servers* – IBM donated the Cloudscape database to open source as the Apache Derby project. Derby is used as the basis for future generations of the IBM Cloudscape embedded relational database which is included in a number of IBM products.
- *Open Hardware Architectures* – IBM established the Power.org and Blade.org organizations to accelerate the ecosystem around POWER processors and Blade systems through an open hardware approach.
- *Open Source Business Consulting and Technology Services* – IBM is actively identifying and leveraging new services opportunities around open source software.

Conclusion

Businesses and governments alike recognize value in “openness” and are striving to attain the flexibility and agility required of the on demand world. Open computing platforms -- both hardware and software -- are essential underpinnings for the journey towards on demand computing. The role that open computing and open standards have played in the evolution of e-business and the Internet have been well established. The role that open computing and open standards *will* play, together with the open commercial and open source projects that embrace those specifications and standards, is central to the further evolution towards more responsive, focused and resilient on demand capabilities.

Businesses and governments are embracing open computing, open standards, and some open source projects because they provide higher value than the alternatives. Procurement policies should reflect this pragmatism, choosing openness wherever possible, but never losing focus on business need or government objectives.

IBM has made a strategic commitment to these concepts and has aligned its hardware, software, services and consulting businesses to support the building of open infrastructures enabling our customers to make the journey toward “on demand.”

Resources

- Linux and Open Source zones on the IBM developerWorks website
 - ibm.com/developerworks/opensource
- IBM's Open Computing Development Environment
 - Includes WAS CE, DB2 Express-C, and Eclipse
 - ibm.com/developerworks/kickstart
- IBM Systems Journal
 - "Open Source" edition - Vol 44, No 2, 2005
 - www.research.ibm.com/journal/sj44-2.html
- IBM Press Books
 - eg. Apache Derby – Off to the Races
 - ibm.com/ibmpress