THE PERFECT STORM

EXECUTIVE SUMMARY

These are unprecedented times. The global economy is in free fall, with no geographic region industry unaffected by the scarcity of capital, market volatility, and reduced consumer spending. With stimulus spending and a reduced tax base, the government is not immune. Dismal economic indicators reflect business conditions that haven't been seen for decades. And experts are warning that we haven't yet hit bottom.

At the same time, IT is under more pressure than ever. IT managers are being told to lay off personnel and reduce operating expenses, yet are expected to continue providing the same support to users as when fully staffed. There is less capital to invest in new systems at the very moment when organizations need to leverage technology to innovate.

Open source software steps into the breach. Although open source software has been successful for more than 20 years, some organizations have remained with their proprietary technology alternatives, either due to vendor lock-in or misconceptions about open source. That is rapidly changing. Today, open source is recognized for its ease of use, high performance, and affordability. Many organizations are investigating ways of using the open source development process to improve their internal projects.

Indeed, the high value of open source, coupled with economic and organizational pressure, represents a "perfect storm" for CIOs, giving them the opportunity to deploy high-performing, cost-effective, open source solutions to carve costs out of their IT infrastructures.

CONDITIONS FOR THE PERFECT STORM

Many have heard the phrase "perfect storm" from the best-selling 1997 book by Sebastian Junger. It has since been used to refer to times when a particular combination of events cumulate in an utterly unique situation—one in which the whole is significantly greater than the sum of the parts that created it. The IT world is facing such a situation now.

First, there is the economy. Every day brings further news of massive layoffs, bankruptcies, and reduced consumer confidence. Software and hardware companies are folding and being consolidated, leaving their customers in the lurch. No one is exempt.

Second, there are the demands being placed on IT. Technology is more critical than ever for enabling organizations to function efficiently and innovate. Yet IT budgets are being slashed to the bone. Given that organizations currently spend 80% of their IT budgets just to keep operations going, according to Forrester Research, and that 30% of that budget goes straight into paying the salaries of employees performing routine maintenance, few organizations have the money to invest in new hardware or software.

But the news isn't all bad. The third contributing factor to the current perfect storm actually points the way to a solution: open source. In the past considered immature, today's open source software is reliable, stable, and mature enough to be used to build mission-critical systems in the most conservative environments. According to a survey of IT and business managers performed in 2008 by CIO.com, 53% of organizations are already using open source, and another 10% plan to deploy open source within the next 12 months. Even more significantly, 44% of all respondents said they compare open source applications head-to-head with proprietary solutions during product evaluations.

The emergence of open source has created an unprecedented opportunity. If the IT world were merely suffering conventional economic woes, organizations would be well advised to ensure survival through conventional cost cutting. But open source does much more than just reduce operating expenses and capital expenditures. It gives organizations the chance to seize strategic advantage that will carry them past the current economic conditions and position them for success in the long term.

THE OPEN SOURCE VALUE PROPOSITION

Open source is an innovative, community-enabled model for creating high-quality software based on widely accepted industry standards. Rather than a limited group of for-hire developers tasked to a particular project, open source software is developed by paid developers, hobbyists, and the users of the software themselves. At the heart of these communities is a set of simple rules called the "Four Freedoms":[1]

1. The freedom to run the program, for any purpose.
2. The freedom to study how the program works, and adapt it to your needs. Access to the source code is a precondition for this.
3. The freedom to redistribute copies so you can help your neighbor.
4. The freedom to improve the program, and release your improvements (and modified versions in general) to the public, so that the whole community benefits. Access to the source code is a precondition for this.

Increasingly, commercial vendors have built for-profit businesses around open source products. One common model is to charge for enterprise-class support of the software. This is especially attractive to enterprise users who cannot depend on community forums or bulletin boards for help with mission- critical applications. Some commercial open-source companies offer specialized enterprise versions of their core products, which provide significantly enhanced functionality, proprietary support packages, and management tools in addition to the source code. Another business model involves giving away the software but selling the underlying hardware.

There are four key reasons that open source is increasingly attractive when compared to commercial proprietary software:

1. **Cost.** In virtually all cases, open source products are significantly less expensive than proprietary ones. Because development costs are shared by a wide community of interested parties, they are lower than if a single company were shouldering those costs alone. Even those open source vendors that offer value-added commercial products are reaping the benefits of the core innovations being contributed by others. This allows commercial open source vendors to charge much less than proprietary vendors for similar or even advanced functionality. More than 56% of all enterprise users surveyed in a recent Forrester Report ("Open Source Paves the Way for the Next Generation of Enterprise IT") said cost reduction was their primary motivation for using open source, and 87% of them said their cost-saving expectations had been "met or exceeded."

1 http://www.gnu.org/philosophy/free-sw.html

2. **Innovation.** Open source stays on the leading edge of technology thanks to many people developing functionality simultaneously. Open source products are frequently the first to market with innovative new features and capabilities. Internet email was developed and standardized by open source software—the SMTP protocol, which carries email across the Internet, was created and nurtured through open source software projects. The first instant messaging applications were created using the open source process. Phil Zimmerman's Pretty Good Privacy (PGP) famously brought military-grade encryption to the average user, a tremendous boon to human rights activists and ultimately laying the groundwork for the commercial use of encryption on the Internet, creating the entire e-commerce industry.

3. **Quality.** Because the large open source community works together to develop, test, and debug projects, the quality tends to be higher than proprietary products. Upgrades, patches, and bug fixes are also released faster. More than 92% of respondents to the Forrester survey said their quality expectations have been "met or exceeded." A 2008 study by the Department of Homeland Security established that open source software has not only a remarkably low number of bugs, but that number has also dropped in the last two years:[2]

   The analysis's results seem to demonstrate that regular static analysis resulted in a lower defect density rate for the majority of the programs that were scanned. In 2006, Coverity's scan detected an average of 0.30 defects per 1,000 lines of code, or, put differently, one code defects per every 3,333 lines. The lower boundary, in this case, was 0.02 (one defect per 50,000 lines) and the upper boundary was 1.22 defects per thousand lines of code.

   Two years later, the average defect density has fallen to 0.25, or one error per 4,000 lines of code. The upper boundary remains unchanged at 1.22, but the lower boundary has shrunk to 0, implying that repeated scanning has eliminated the errors from at least one program—at least all the errors that Coverity's 2006 static analysis program was able to detect.

4. **Choice.** One of the key tenets of open source software is that it is built using standard technologies, and different implementations of an open source product can easily be swapped with one another. This creates a market for the support of that product, and prevents customers from being committed to a single software vendor. Given the rapid consolidation of the software industry, this is a major selling point for many organizations; according to Forrester, this vendor independence is "very important" for 43% of all enterprise open source users.

2 http://arstechnica.com/security/news/2008/05/dhs-sponsored-audit-number-of-oss-code-defects-dropping.ars

CARVING OUT COSTS: HOW OPEN SOURCE SAVES ORGANIZATIONS MONEY

Most organizations approach open source software as a means to save money, according to Forrester. Although organizations save considerably on the licensing fees, that is not the only or even the main driver of cost reduction. Open source software also enables organizations to dramatically reduce expenditures in many ways. Instead of using the software provided by the hardware company, open source operating systems use commodity hardware, such as Intel x86 systems. It is less expensive and the customer has a negotiating position when the contract is renewed because there are many vendors for the same hardware. This is only possible because open source operating systems are hardware-agnostic, as they may be easily ported from one platform to another.

The annual maintenance fees on proprietary software drive up the total cost of ownership (TCO) of such systems dramatically. The customer must pay for licensing, maintenance, and support for a single piece of software. Enterprise versions of open source products have no license fee and generally include updates and maintenance as part of the core pricing model.

Proprietary software has a very limited audience, as only paying customers may use it. This means that the software is given less exposure to a smaller and less diverse audience. This lack of diversity and breadth in the software's user community makes it less likely that the software has been used in a given environment. Open source software, on the other hand, benefits from hobbyists, enterprise customers, and academics in a wide variety of computing environments. The same software, then, is optimized for handheld devices, high-performance computing clusters, and the traditional server market. This flexibility means that open source operating systems tend to be more reliable and higher performing than their proprietary counterparts. This ultimately reduces TCO and allows users to do more with a given piece of hardware.

With the widespread consolidation taking place in the software industry, organizations find themselves held captive by license and maintenance contract price hikes from proprietary software vendors. Because of the interoperability of open source products, organizations have flexibility in moving to a different open source product.

Because open source systems—specifically, the Common Criteria-certified Linux distributions—are more secure than proprietary ones, fewer remedial activities and resources are needed to keep systems and data safe.

WHAT OPEN SOURCE SOLUTIONS ARE AVAILABLE TO HELP CUT COSTS?

Once an organization has made the decision to move to open source, there are a number of different components that can be combined to form an open source IT stack.

- **Operating system.** Today's open source Linux operating systems feature technology advancements developed by the fast-innovating global open source community. Rapidly overtaking proprietary solutions in the market in terms of performance, scalability, and security, Linux operating systems are also extremely cost-effective, especially when offered via innovative business models such as subscriptions.
- **Middleware.** Stable and cost-effective open source middleware is compliant with open standards, making them well-suited for reference architectures. Open source application servers are more likely to be platform-independent and standards-compliant—it is not possible to develop open source software that implements a closed or proprietary standard. This is ideal for constructing a reference architecture, as the final implementation can be deployed on the user's choice of platforms.
- **Virtualization technologies.** Many datacenters have very low hardware utilization rates that can be dramatically improved through virtualization technology and the raw performance advantages that open source software delivers. With open source virtualization systems, it is possible to improve operational efficiency without having to modify the application environment. For example, a server can be virtualized with one solution, and then run existing operating systems and applications as virtual "guests," without making any changes to those operating systems or applications. This is a low-cost, low-risk way of significantly enhancing hardware utilization.
- **Systems management.** To easily manage and monitor your open source solutions, many open source vendors provide alternatives for proprietary systems management solutions. Linux management tools are better suited to managing multiple systems efficiently, allowing internal IT staff resources to redirect resources elsewhere for enhanced organizational productivity.

QUALITIES TO LOOK FOR IN AN OPEN SOURCE VENDOR

Once an organization has decided to go the open source route, its next step is to choose the specific open source product(s) to implement. But even when cost is a concern—and even when it's the primary reason for choosing open source to begin with—that doesn't mean it should be the only concern when it comes down to selecting a vendor. There are other critical factors that will determine if a particular open source software deployment is successful or not.

- **Industry leadership.** Organizations are often as concerned about the financial stability of potential software vendors as the features of the products themselves. Open source is no different. Organizations should choose a leading company in its market space—one that has a proven track record for delivering value to customers, a large installed base of users, and the broadest possible stable of independent software vendors (ISV), hardware partners, and trained workers in the marketplace.
- **High-quality products**. In addition to the sort of quality assurance, testing, and debugging that goes on in the open source community, leading open source vendors will perform exhaustive internal testing and quality assurance. They also participate in certification programs that ensure compatibility with other hardware and software products. For many customers, the availability of audited performance results is an important consideration during the product evaluation and purchase cycle. Security is also an issue: certain vendors have over time proven their ability to deliver code that is of higher quality, with fewer bugs and security flaws, than other open source distributions.
- **Industry-leading support.** One of the key things that distinguishes the free versions of open source software from the commercial versions is the quality of support. Choose a vendor that has a reputation for providing top-notch support as part of its enterprise solution. Leading open source companies will offer various tiers of support—including 24-hour coverage—and should include the caliber of help desk and escalation options suitable for keeping mission-critical applications up and running.
- **Extensive ecosystem.** The value of any computer system ultimately rests with the applications that run on it. One of the key differentiators of leading open source vendors is the number of certifications they have achieved in the technology world. Choose a technology vendor with the broadest array of hardware and software partners whose products have been certified to work with its products.
- **Availability of skilled professionals.** A critical concern of many IT managers is whether they will be able to find experienced staff members to support open source. This is a valid consideration. Choose a vendor that possesses the largest population of potential administrators, contractors, and consultants with the necessary skill sets.
- **Version and architecture independence.** Rather than settling for the rigid licensing structures imposed by most proprietary software vendors, look for an open source vendor with a flexible pricing scheme that allows customers to run any version of the software and transfer it across physical systems and architectures.
- **Legal protection.** Periodically, controversy erupts in the industry about the legal status of a particular piece of open source software due to potential copyright and trademark infringement violations. Seek a vendor that indemnifies customers against any potential legal problems that might arise.

CONCLUSION: HARNESSING THE PERFECT STORM

It's critical to understand that although cost-cutting measures might be driving the move to open source, there's also the issue of risk. In the past, IT managers might have felt safer sticking with proprietary systems, but today the situation has been reversed. "Playing it safe" with traditional technologies is actually the riskier course of action to take. Many enterprises that had considered and dismissed open source have now completely changed their assumptions about how best to safeguard their futures.

This is a critical time that will impact IT for years to come. Organizations face an important choice. They can use conventional means of cutting costs by laying off workers, holding off on capital expenditures, and delaying deployment of new technologies. Or they could seize the opportunity to take their organizations in a completely new direction. By harnessing the perfect storm rather than letting the storm set priorities and dictate tasks, IT managers have the chance to truly transform their organizations through the use of open source.

ABOUT RED HAT

Red Hat, the world's leading open source solutions provider, is headquartered in Raleigh, NC with over 65 offices spanning the globe. CIOs ranked Red Hat as one of the top vendors delivering value in enterprise software for five consecutive years in the CIO Insight Vendor Value survey. Red Hat provides high-quality, affordable technology with its operating system platform, Red Hat Enterprise Linux, together with applications, management and service oriented architecture (SOA) solutions, including JBoss Enterprise Middleware. Red Hat also offers support, training, and consulting services to its customers worldwide.

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