Cutting The Cost Of Virtualization:

Faster, Open and More Affordable

There is little doubt that virtualization can save government agencies money, but it can also require a large upfront investment. According to a survey of over 300 government agency IT decision-makers,[1] respondents expected virtualization-related savings on their IT budget to increase from 19 percent (i.e., $15 billion) in 2011 to 32 percent by 2015 (i.e., $23.6 billion). At the same time, the high cost of virtualization is preventing full deployment across servers and desktops in these organizations. In the same survey, only 39 percent of state and local agencies had funding to reach their virtualization goals.

The high cost and other drawbacks associated with proprietary virtualization solutions reduce the potential benefit to government and leave unrealized value "on the table." However, this is changing with the advent of open source virtualization solutions. As with Web servers, operating systems and other areas of the enterprise that have been enhanced by open source solutions, open source virtualization not only helps organizations cut costs, but also presents new opportunities to accelerate innovation and improve functionality within an organization.

Proprietary Solutions: Straitjacketing Opportunity

Virtualization has rapidly become a mainstay of government data center operations, and was considered the top technology priority for 2012 by chief information officers (CIOs).[2] In addition to helping state and local governments cut costs on energy use, data center real estate and capital investments in hardware, virtualization offers many other benefits. It can extend the life of older applications by providing a more modern, robust platform; increase reliability and availability of mission-critical systems by providing failover capabilities; improve performance by providing hosting and load-balancing functions; and streamline operations by reducing the number of machines that must be managed and maintained.

Despite the allure of virtualization, significant drawbacks have hindered wider adoption, and many organizations are not reaping its full benefits. From the server room to the desktop, virtualization requires a significant investment that many state and local agencies simply cannot afford in a time of budget cutbacks. In addition, the leading virtualization solutions have (until recently) been based on proprietary technology.

Depending on the solution, a proprietary approach can create a number of challenges:

- **Vendor lock-in.** When organizations are locked in to a specific vendor, they become subject to the vendor's production schedules, pricing and service offerings, thereby losing control and flexibility.
- **Cloud shortcomings.** Some vendor solutions are not cloud-ready; taking a proprietary approach with such a vendor can prevent movement to the cloud. This could inhibit future organizational growth and performance.
- **Limited application.** The higher cost of proprietary technology often precludes its application in all but the most important areas of the organization. Use in development or testing environments, for example, may be too costly. This cost is driving public sector organizations like the University of Connecticut to utilize Red Hat Enterprise Virtualization (RHEV). The reduced costs enable them to continue deploying more virtualized applications.

The New Approach

As we have seen with Web servers, operating systems and other areas of the enterprise, open source alternatives can alleviate the costs and complexity associated with proprietary solutions. Open source solutions are based on non-proprietary source code, which is available for free to all users. Users do not have to pay licensing fees for non-commercial versions of open source software, but they may pay commercial vendors for support services and other packages that facilitate integration with their organization.

The same benefits that arise from open source Web servers and operating systems also accrue with open source virtualization solutions. Besides saving money, open source solutions are earning attention for other benefits that give state and local agencies greater freedom and agility in solving IT challenges.

Benefits of Open Source Virtualization

When properly executed, an open source virtualization solution offers the following benefits:

- **Rapid innovation and maturation.** Open source technology draws on a dynamic global community of developers and tech-savvy end users who can contribute resources, help refine code and add new capabilities as needed. Few proprietary vendors can match the collective skill set, knowledge-sharing and support of the open source ecosystem.
- **Flexible adoption model.** Government organizations can deploy and customize raw open source code themselves or purchase a commercial version from a reputable vendor. In addition, because all vendors share the same open source code, organizations can more easily change vendors and migrate systems if needed.
- **Customization and support.** Virtualization solutions must be tailored to an organization's specific requirements. Because open source code is available to anyone, in-house or third-party developers can access and tailor open source code to meet

the organization's specific needs or to resolve issues. In many cases, these developers can work directly with the developer of the open source code to receive support and find solutions. With proprietary solutions, organizations frequently have to settle for a one-size-fits-all solution.

- **Scalability and agility.** Organizations can more easily meet evolving requirements across heterogeneous operating systems and software. In addition, open source models allow for more agility in integrating technology innovations, whereas proprietary models often defer upgrades and innovations until they can be introduced as part of the product lifecycle.
- **Lower total cost of ownership**. Because open source products are developed by a community, no one company has the burden of development costs. In general, there are no licensing fees for commercial open source products, and maintenance and support are included in costs. In addition, open source technology often incorporates key features into the operating system itself, reducing the cost and complexity that comes with purchasing separate proprietary software for these features. The lower cost of open source virtualization solutions allows organizations to deploy virtualization solutions across more environments and for less overall cost than proprietary solutions.

Getting Started

Virtualization is a complex process and requires the expert coordination of many details. The following success factors are vital to organizations as they start the process of adopting an open source virtualization solution:

- **Solicit stakeholder input.** Before creating a vision, goals or project roadmap, work with end users, developers, security teams and all other impacted groups to understand and address their needs.
- **Review policies and procedures.** Update policies and procedures as needed to allow the procurement and sharing of open source solutions across the enterprise and across agencies.
- **Choose a proven vendor.** Team up with a vendor that has a track record of successfully commercializing open source projects. The leading vendors actively develop and regularly update hypervisors and other open source virtualization tools. They work closely with the open source community and participate in industry-wide alliances (e.g., Open Virtualization Alliance) that are working on best practices and common standards for open source virtualization.[3] Your vendor should be able to deploy on-site resources to ensure a smooth transition, as well as have extensive experience performing migrations. Also, look for a vendor with a specialty in virtualization and the management of operating systems.
- **Leverage internal expertise.** Your staff may already have experience in virtualization and in working with specific vendors. Use their expertise and lessons learned as you move forward with open source virtualization.
- **Consider compatibility with other software.** How easily does a proposed solution interoperate with Windows and other proprietary software? Is cross-platform support available? Some vendors have worked closely with Microsoft and other companies to ensure that organizations can combine open source virtualization with proprietary solutions. This collaboration helps ensure that business requirements and user needs are met in multiple environments.
- **Adopt a holistic approach**. A sustainable solution should take into account all aspects of the data center, including data, networking and security.
- **Develop a prototype as quickly as possible.** The sooner you develop a prototype, the sooner you can learn what is and isn't working well. Having something tangible also helps maintain sponsor engagement and project momentum.
- **Use an iterative process.** Each iteration brings the organization incrementally closer to a solution without waiting until full production to discover issues. Smaller steps and more immediate feedback also encourage project teams to innovate and experiment with new ideas because less time and money will have been lost if the idea fails.
- **Maximize value.** Virtualization often provides a more robust, flexible platform than a physical solution. Look for ways to leverage these expanded capabilities to streamline operations or increase revenue (e.g., by sharing services with other agencies).
- **Consider a dual-hypervisor strategy.** Continue using the legacy virtualization vendor to manage existing workloads, while using solutions from the new vendor, such as Red Hat Enterprise Virtualization, to manage all future workloads. Many customers, like the City of Chicago, have taken this approach and are moving their Linux guest workloads over to Red Hat Enterprise Virtualization.
- **Define metrics for success.** To track progress and enable data-driven decision-making, identify metrics for success and establish a baseline against which to measure those metrics.

Conclusion

Open source virtualization is the answer to the high initial cost, complexity and constraints of proprietary virtualization solutions. It yields all the current benefits of virtualization — reduced hardware costs, increased reliability and availability, and improved performance — while also offering a level of flexibility, innovation and quality that closed source solutions cannot match. As organizations turn to commercial vendors to simplify the implementation of open source virtualization solutions, they can follow the success factors outlined here to ensure a strong start.

Endnotes

1. MeriTalk. "Virtualization Vacuum: The 2012 Government Virtualization Study." January 30, 2012
2. NASCIO. "State CIO Priorities for 2012." October 26, 2011 http://www.nascio.org/publications/documents/NASCIO_CIOPriorities2012.pdf
3. Open Virtualization Alliance webpage. http://www.openvirtualizationalliance.org/

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