What Is Server Virtualization, and Why Should I Know About It?

Businesses are managing more data than ever before. And, while network data volumes are growing, servers in many organizations operate inefficiently — well below maximum capacity. Small businesses, in particular, need ways to streamline information technology (IT) and scale to meet growing needs, while managing IT costs.

Many organizations are turning to server virtualization to help. At the most basic level, virtualizing a server means running multiple, independent, virtual operating systems on a single server — in effect, creating several “virtual machines” within one physical server. Virtualization enhances hardware efficiency by increasing server capacity utilization. It even increases the business’s agility by enabling the launch of new servers and applications in hours, rather than the days required to buy, configure, test and commission a new physical server.

While medium to large enterprises are virtualizing aggressively, many small businesses are unsure if server virtualization is right for them, and how or when they should implement. Many are uncertain of the benefits they can expect.

The Small Business Virtualization Roadmap

This paper presents the results of CDW’s 2011 survey of nearly 300 small business IT professionals and selected data from 400,000+ members of the Spiceworks social network for IT. The survey captured input from those who have and have not virtualized, looking at their perceptions of and experiences with server virtualization. The results provide a comprehensive snapshot of small businesses’, virtualization steps, challenges and benefits. The results identify best practices and lessons learned from the front lines, including crowdsourced tips from small business IT managers that have implemented virtualization as well as expert advice from CDW virtualization solution architects.

Overall, the results demonstrate a significant opportunity for small businesses, as most that have taken the virtualization plunge report positive results.

79 percent of those that have virtualized say small businesses can see significant benefits from server virtualization and 65 percent say virtualization has significantly improved their organization’s IT Return-on-Investment (ROI). Small businesses that have virtualized are, on average, saving 18 percent of their total IT budget.
Server Virtualization Is Gaining Ground in Small Businesses

Server virtualization is gaining in small business: a full quarter of small businesses surveyed have server virtualization in place today, and, on average, have virtualized one-third (33 percent) of their servers. Of those small businesses that do not have server virtualization in place, nearly three-quarters (73 percent) are investigating or planning to implement virtualization in the future.

Further, the average number of servers that small businesses virtualize is growing. Over the last year, the average number of virtualized servers has increased each quarter:
- Q3 2010: 28 percent
- Q4 2010: 30 percent
- Q1 2011: 31 percent
- Q2 2011: 33 percent

Is Virtualization Right for Your Small Business?

Not surprisingly, as small businesses grow, they are more likely to implement virtualization. The typical small business that has implemented has, on average, 61 employees (two are IT professionals), 18 servers and an IT budget of $108,000. The most common server virtualization solution employed by small businesses is VMware, followed by Microsoft, according to Spiceworks data.

Meanwhile, the typical small business that has not yet implemented virtualization has 41 employees (two are IT professionals), just four servers and an IT budget of $62,000. Of those that have not yet virtualized their servers:
- 40 percent are researching the technology and its benefits
- 27 percent are not considering the technology
- 17 percent have developed a plan and are preparing to implement the technology
- 16 percent are developing a plan to adopt the technology

Virtualization is a means to an end, not an end itself: The decision whether to virtualize comes down to the resources demanded by an application.

— CDW expert

Employee count is just one of many factors to consider when deciding whether virtualization is right for your organization. CDW’s experts suggest these considerations as well:
- Does your business have five-to-seven servers already running?
- Does your business need to replace aging servers?
- Is your server utilization rate low?
- Do your business’s data center management, energy and space costs continue to increase?

There are also business factors to consider when looking at virtualization:
- Is your business growing?
- Does your business need high availability of data and applications?
- Do you need to improve backup and disaster recovery?

Small businesses that have virtualized say their top drivers included:
- Replacing aging hardware: 43 percent
- Consolidating servers: 36 percent
- Improving efficiency of IT infrastructure: 27 percent
- Reducing IT operating costs: 23 percent
- Improve disaster recovery/backup: 35 percent

Virtualization Delivers on Its Promises

CDW compared the IT goals of small business that have not yet virtualized with the benefits that virtualized businesses say they have seen.

Small businesses surveyed that have not virtualized say their top IT goals within their companies include:
- Replace aging hardware: 49 percent
- Improve disaster recovery/backup capabilities: 33 percent
- Improve the efficiency of their IT infrastructure: 29 percent
Small businesses that have virtualized confirm that virtualization can deliver on these goals — the majority say they have achieved each of the three top goals with their virtualization implementation:

- Replace aging hardware: 73 percent
- Improve disaster recovery/backup capabilities: 62 percent
- Improve the efficiency of their IT infrastructure: 60 percent

**The Virtualization Roadmap**

**Step One: System Assessment**

Organizations should execute a comprehensive system assessment before starting a virtualization project. Key considerations to understand include: total users today, anticipated total users in the next five years, total memory, storage and network specifications and business considerations such as availability and liability.

In addition, small businesses should address the following questions prior to implementation:

- Which servers are compatible with a virtualization operating system?
- What applications does your business want to reside on a virtual server?
- Will your software vendors provide support in a virtual environment?
- Are there certain departments or applications for which your business would rule out virtualization?
- How much will the transition to virtualization cost?
- Does your business have the budget for virtualization?
- How will your business measure virtualization success?

The CDW survey found that small businesses that virtualized took the following system assessment steps:

- Identified candidates for virtualization: 74 percent
- Created a virtualization plan: 61 percent
- Identified specific goals: 59 percent
- Identified associated costs/created a budget: 56 percent
- Obtained senior management approval on plans and budget: 55 percent

This said, many small businesses are not doing all they can to ensure a successful implementation. Just 39 percent of those that have virtualized executed a data centre audit, while even fewer (23 percent) that plan to virtualize have executed a data centre audit.

Small businesses should know what they have on their systems before they virtualize, a key step that often gets overlooked when considering server virtualization.

— CDW expert

**Step Two: Staff and Management Assessment**

Small businesses need some virtualization expertise prior to starting an implementation project. Of small businesses surveyed that have implemented virtualization, 86 percent report they have the staff knowledge to implement. Small businesses that are planning to implement virtualization have a significant knowledge gap — just one-fifth (20 percent) believe they have adequate staff knowledge.

In addition to having the internal technical knowledge or an external partner with expertise, management support is also critical. The management team should understand anticipated goals and benefits. Small businesses that have implemented virtualization report that nearly all (96 percent) of management who understand server virtualization benefits support its adoption.

Small business IT managers can often find free or affordable training available through virtualization software vendors, such as free webinars or videos on vendor sites, or on YouTube, or simply from working side by side with a skilled technology partner during assessment and deployment. The software vendors also offer data centre management tools that simplify management of the physical and virtual environments together.

Of those that have virtualized, 71 percent report their management fully understands the benefits of server virtualization and 84 percent report that their management fully supports the adoption of server virtualization. In contrast, of those that have not virtualized, 43 percent report their organization fully understands the benefits of server virtualization, and 45 percent fully supports the adoption of server virtualization.

It pretty much sold itself, the things you can do to minimize downtime, the cost savings, the manageability, the disaster recovery options, the maturity of the product — you get the idea. Using the VMware editions comparison chart and a handy IT budget, we worked out the best bang-for-buck solution.

— Spiceworks community member
**Step Three: Execution**

With staff knowledge in place and management approval in hand, small businesses can start the virtualization process. Consider taking the following steps:

- Finalize candidates for virtualization
- Determine the virtualization platform
- Determine the server hardware platform
- Determine the storage hardware platform
- Revisit backup/restore architecture
- Plan the project
- Educate and implement
- Leverage physical-to-virtual (P2V) conversion to the greatest degree possible

Small businesses report their most significant challenges are compatibility issues, timelines and funding. Small businesses that have not yet virtualized also express concerns about funding and timelines. They also list training as a top challenge; those that have implemented are more concerned with compatibility issues.

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To avoid compatibility issues, the most significant challenge small businesses face, execute a system assessment before beginning virtualization.

— **CDW expert**

Those that have virtualized list their biggest challenges with implementation:

- Compatibility issues: 41 percent
- Time required to implement: 37 percent
- Funding: 34 percent
- Technical support requirements: 31 percent
- Training requirements: 30 percent
- Uncertainty of ROI: 14 percent
- Security concerns: 13 percent
- Perception that virtualization is not beneficial to small businesses: 9 percent

Small businesses that have implemented virtualization report they relied heavily on peer support to overcome the challenges. Nearly half (45 percent) report that peer advice, gathered online, helped them the most to overcome challenges they faced. Small businesses also found interacting with peers they know (37 percent) and an assessment of their potential for server virtualization (19 percent) helpful.

Those that have not yet virtualized ask leaders in the field to help them out. They are most interested in case studies of other small businesses that have virtualized, so they may reference them to overcome any potential challenges they might face with their implementation.

**CDW recommendations:**

- **Build in limits for virtual machine (VM) sprawl:** Too many VMs can hinder efficiency just as much as too many servers can
- **Be consistent in technology purchases:** While the server virtualization hypervisor and related products are not brand specific, it is a good idea to be consistent in hardware brands and components
- **Allocate VMs running a variety of applications to a given host:** This will amplify the network and application optimization measures in place
- **Avoid single points of failure:** SANs should be linked to back one another up: Redundant network interface cards (NICs) will keep a host connected should one fail
- **Keep up with security developments for the virtualized world:** Research is focusing on the security at the hypervisor level of virtualization and the improved protection of virtual machines

**Step Four: Measuring Success**

Small businesses that have implemented server virtualization have no trouble seeing the benefits. The majority, 79 percent, believe small businesses can realize significant benefits from virtualization.

In addition to seeing increased efficiency, 65 percent say virtualization has significantly improved their IT department ROI. Small businesses that have implemented virtualization report saving 18 percent of their IT budget on average, or approximately $19,400 a year.

Those that have virtualized report they are measuring the following hard ROI metrics:

- **Reduction of server count:** 65 percent
- **Server/storage management and support costs:** 34 percent
- **IT energy consumption and costs:** 32 percent
- **Software licensing costs:** 17 percent
In addition, those that have virtualized report they are measuring the following soft ROI metrics:

- Improved IT productivity (easier management): 52 percent
- Increased uptime: 51 percent
- Increased business agility, adaptability or flexibility: 43 percent
- Data centre footprint: 25 percent

**CDW experts share expected benefits:**

- Smaller physical footprint for servers: Consuming less space can reduce a company’s real estate costs or free up that space to be used for other purposes
- Reduced hardware costs: Virtualization improves machine utilization rates, meaning IT shops need fewer servers
- More efficient IT administration: Once the virtualization environment is set up, administrators can quickly create and provision virtual machines through a web browser from almost anywhere on the network, which speeds up application deployment
- Reduced software licensing costs: Fewer licenses might be in actual use in a virtual setup, compared with what might have had been required in an application-per-server physical environment
- Improved power and cooling efficiency: By reconfiguring cooling and concentrating it where it’s most needed, the system uses less total energy to remove hot air

**Looking Ahead:**

**Data Centre Vision**

Small businesses plan continued investment in server virtualization. Those that have virtualized plan to invest an average of 23 percent of their IT budget in server virtualization in the next two years. Even those small businesses that have not yet implemented say they will invest an average of 17 percent of their IT budget in virtualization in the next two years.

**For More Information:**

Visit the CDW Canada Server Virtualization Solution Centre page, CDW.ca/virtualization to learn more about CDW’s server virtualization products and services.