

E-Guide

Expert Best Practices

Using Linux for Data Center Consolidation

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Why is Linux the answer for data center

consolidation? For one, Linux can resolve the TCO and ROI demands of a data center consolidation project. In this e-guide, from SearchEnterpriseLinux.com, discover the top advantages of using Linux in a data center consolidation project. Also learn which Linux server consolidation tools—such as PlateSpin and VMware Capacity Planner—are best for your data center.

Using Linux in a Data Center Consolidation Management Strategy

By: Ken Milberg

Why is Linux the answer for data center consolidation? To start, for a large IT infrastructure project to be approved in today's climate, it must make real business sense. The project must have a significant return on investment (ROI), which will lower total cost of ownership (TCO). Linux operating systems work well with these demands, as will be explained in this tip.

The primary goal of any data center consolidation project is to lower power and cooling costs, reduce real estate footprint and improve overall server workload utilization. Because data center consolidation usually involves server consolidation, this type of project should also substantially reduce the cost of service contracts and software licensing, while substantially increasing overall server workload utilization. I've led projects in which the largest single cost reduction was on the software licensing side. (Those of you that have worked with Oracle licensing on your server farms know what I'm talking about.)

Data center consolidation strategies

There are essentially two ways to consolidate data centers. One is a like-for-like forklift move. For example, a customer looking to consolidate four data centers into two. This scenario simply involves moving all of the equipment from the four sites into two data centers. There may be some virtualization

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and server consolidation involved, but no real effort to redesign or reengineer infrastructure. The other scenario would be to increase efficiencies and processes along with the consolidation of data centers. This involves strategic planning regarding the overall direction of infrastructure. While more complex and difficult, the latter move is the one that will provide the greatest ROI and TCO.

So why should Linux be part of a data center consolidation plan? To start, it's important to note that Linux runs on more types of hardware platforms than any other operating system. This include everything from x86 commodity hardware, to Unix RISC based systems from HP, Sun and IBM to the IBM System z (mainframes). In a typical enterprise environment, there may be up to half-a-dozen operating systems to support. This might include Windows, Linux, several flavors of Unix and zOS (on the mainframe). As you know every OS requires staff to support that system: operators, administrators, engineers, capacity planners and architects. A typical enterprise organization may have at least a dozen folks supporting each OS. If you're supporting six operating systems, that's a staff of 72 people.

Operating system consolidation

If your data center consolidation management strategy is built around Linux, you can keep your mainframe but run Linux. Same thing with your IBM p595 Power servers (formally running Unix) and your commodity x86 blades. At the same time you may also consider migrating off of Solaris to Linux. These moves can streamline your infrastructure. While you will not likely be able to trim staff down to just six people, but you might be able to get by with half of the staff previously needed. This is just one small example of how you can increase efficiencies by doing an operating system consolidation project in conjunction with a data center migration. As you know, Linux is no longer something just resigned to the back-end of data centers running Web or DNS servers. In fact, many companies already run all their information systems on this platform (e.g., Oracle).

In regard to the mainframe, running Linux on the mainframe has become increasingly popular in recent years. This is because in many ways it gives customers the best of all worlds: the dependability of 40 + years of hardware

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maturity and resiliency, along with a flexible resilient open source operating system. Many customers actually use Linux on the Mainframe as the basis for their entire data center consolidation strategy. We've come full circle from the days of decentralization with a server under users desks, all the way back to the data center.

For customers that don't have Mainframe expertise, you can do a similar effort using High end RISC servers that formally ran only Unix. IBM's POWER servers are one example, and you can run either IBM's Unix, AIX, or Linux (SUSE or Red Hat) on their System p platform. Both operating systems support IBM's PowerVM, which provides many elements that lend themselves to consolidation of systems. This includes the ability to use Virtual I/O servers, shared processors and take advantage of recent innovations such as Live Partition Mobility, a technology that allows movement of a running partition from one server to another.

These elements help contribute to a reduction in footprint and reduced power and cooling cost. IBM's top-of-the-line server – the p595 is actually built on a Mainframe chassis – and provides many of the same reliability, availability and serviceability (RAS) benefits of the IBM mainframe. Using Linux in a data center migration strategy provides another important advantage: market product sustainability. Linux is the only OS that is actually growing market share, which will help companies protect the investment which they would be making. Further, most of today's innovation is occurring with open source systems like Linux.

In my opinion, one of the best data center consolidation strategies you can use is building around Linux. Data center consolidation projects allow business to cut costs, increase efficiencies and improve upon the ability of IT to support the business. Consolidating operating systems as part of a greater IT strategic plan will help you make optimum use of your data centers and the personal supporting your infrastructure.

Weighing Linux Server Consolidation Tools

By: Paul Ferril

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Over the past decade, reducing energy usage in the data center has been all about server consolidation. But deciding which servers to consolidate and which server consolidation software to use is another story altogether.

While there are some generic rules of thumb in identifying which consolidation candidates -- considering the role of each server as well as memory, CPU and I/O -- you need to truly understand your data center resources to make informed decisions about which tools to use.

In this tip, we describe options for Linux server consolidation that can analyze a data center environment, consolidate the right servers and manage these servers going forward.

Using PlateSpin for server consolidation

Novell Inc.'s PlateSpin suite offers an option to achieve these consolidation goals. The PlateSpin product portfolio includes tools to facilitate the planning and analysis of a data center consolidation (PlateSpin Recon), to physically accomplish the migration (PlateSpin Migrate) and to manage day-to-day operations (PlateSpin Orchestrate).

PlateSpin gathers performance information to develop a profile of the workloads on each server. It can also look at energy usage and cooling requirements in either a manual mode or by gathering available data. Collecting this raw data over a period of time helps ensure that you get an accurate picture of a data center's real-world requirements.

Once analysis is complete, the tool builds a set of consolidation scenarios to match the requirements from the data. It uses real data to map servers onto a physical machine to optimize the available resources and reduce excess capacity. The server consolidation software also supports what-if modeling to account for future requirements and appropriate levels of reserve capacity to accommodate potential demand surges.

PlateSpin Migrate provides the tools to perform physical-to-virtual, virtual-to-virtual, virtual-to-physical and image-to-virtual migrations. Live file- and block-based transfers enable moving mission-critical systems without taking data

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offline. The tool also supports virtual-to-physical and physical-to-physical server sync for running systems. When used in conjunction with PlateSpin Recon, the entire migration process can be automated.

PlateSpin Orchestrate is the final piece of the puzzle. In most cases, a data center consolidation project may have been completed and the system placed into production, but it's still important to keep everything running smoothly. The only way to keep a server consolidation project from falling short is to monitor performance and take action to prevent service disruption.

PlateSpin Orchestrate can fully automate large virtual server farms with a combination of policy-based management rules job-and-resource management tools. The technology enables rapid server repurposing through workload migration and the provisioning of new virtual machine instances.

PlateSpin's suite makes sense for data centers with many servers that require constant monitoring and management. While you may pay more for this suite of products, the combination of Recon, Migrate and Orchestrate helps a data center manage servers during their entire lifecycle. PlateSpin's suite also makes sense for organizations that have large server consolidation projects on the roster and want a single-source technology that addresses the full project cycle, from planning to conversion to maintenance.

HP's server consolidation software with virtualization

While Hewlett-Packard Co. is known for its hardware, it also offers a range of virtualization tools that complement its server hardware products, including management and monitoring tools. In addition to these product offerings, the company offers HP Virtualization Assessment Services which involve on-site support and data-gathering capabilities with VMware Capacity Planner.

HP's server automation software consists primarily of applications acquired through the Opware acquisition. These offerings provide a full range of server lifecycle management tools that include baselining, provisioning and patching for physical and virtual servers. These automation tools work in conjunction with other products, such as HP's Storage Essentials to provide a consolidated management framework for all data center assets.

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Many large IT organizations have standardized on HP hardware and management tools such as HP Openview. For these shops, including the Opsware toolset is a logical choice and can even save money over the long term as compared with single-point solutions or integrating another vendor's products into the mix.

Managing server consolidation with VMware's Capacity Planner

VMware Inc. also offers a range of tools that complement its server and workstation virtualization products. As mentioned previously, VMware Capacity Planner competes directly with the PlateSpin Recon product. It performs data gathering, although the capacity assessment function targets consultants and professional services providers.

CapacityIQ uses both data gathering and capacity modeling to identify high-demand applications. A dashboard with analysis charges and graphs presents the captured information visually. For quick identification of key performance indicators, this information can be viewed in real time and from a historical perspective. A report provides recommendations for configurations to support existing workloads and those anticipated through the modeling function.

VMware is an industry leader in server virtualization software and is the product of choice for IT shops large and small. So for shops with VMware already installed, VMware's server consolidation software makes sense. Shops with VMware already installed can benefit from the tight integration between VMware Capacity Planner and their existing production environment.

Point Solutions

VKernel offers several tools that provide functionality similar to that of PlateSpin Recon and VMware CapacityIQ. Capacity Optimization works with existing virtual machines to identify underutilized server resources. Performance Optimization attempts to identify capacity bottlenecks to help reallocate resources for better performance. It also includes a capacity analyzer function to help with virtual machine deployments.

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VKernel's greatest advantage is cost. Small- and medium-sized enterprises can use VKernel's tools to get a sense of their current server utilization and to make strategic decisions without breaking their budget. The results can indicate adequate capacity and therefore also indicate that an expensive consolidation project can be postponed.

Which tools to choose

IT purchasing decisions are influenced by many factors. The technologies already deployed in an environment, vendor affinity, past experience, risk avoidance and inertia frequently outweigh cost. Choosing a vendor whose technology is already installed for other tasks is a safe decision -- even if it means going to management for budget approval. On the other hand, for organizations new to new server consolidation, cost becomes more important. But for all data centers, making the right choice on server consolidation tools requires weighing all the available options.



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