

WHITE PAPER

Novell Holds Down Data Center Costs with PlateSpin Workload Management Solutions

Sponsored by: Novell

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IDC OPINION

Virtual server technology is becoming mainstream in many enterprise data centers. In addition to using the technology to improve server utilization by consolidating workloads, IT leaders are also using virtualization to improve business continuity, enhance peak hour application performance, and dynamically optimize system resources across the data center.

These more dynamic, fast-changing virtual server environments demand workload management tools that can help IT decision makers make better capacity planning decisions and more efficiently migrate workloads as needed across physical and virtual resources in near real time. In particular, IT teams need tools that can:

- Migrate workloads back and forth across diverse physical and virtual platforms using the same interfaces, policies, and performance analytics
- Test newly virtualized workloads to ensure they will run as required and will not impact other workloads that are sharing the same physical server
- Use automation to reduce risk, monitor, and maintain service levels; speed workload migrations; and optimize use of IT staff time and skills

Organizations that attempt to expand use of virtualization without increasing the sophistication of their workload management capabilities may find they are being penny wise but pound foolish. The ability to fully harvest the operational efficiencies and cost savings promised by virtualization depends on IT having sufficient tools available to optimize workload performance and resource allocations.

IN THIS WHITE PAPER

This white paper describes how the use of virtual server technology is evolving in enterprise-class data centers and discusses how these changes impact workload capacity planning and migration requirements. The paper also describes how Novell's PlateSpin Workload Management portfolio is addressing these requirements and considers the challenges and opportunities facing Novell and its customers as virtualized infrastructure strategies mature.

SITUATION OVERVIEW

As the global economic crisis continues to put pressure on IT budgets, server virtualization projects remain high on the list of IT priorities for organizations that want to reduce costs, improve operational efficiency, and promote business agility. For many of these organizations, virtualization is transitioning from small-scale test and development environments to more sophisticated and dynamic production uses. As a result, IDC's research indicates that workload management requirements for virtual server environments are also becoming more demanding.

Virtual Server Environments Becoming More Real Time and Dynamic

For most IT organizations, use of virtual server technology is initially motivated by a desire to squeeze capital costs by consolidating servers and driving up server utilization. Organizations are typically very careful in this initial stage to select applications and workloads that are likely to perform well on virtualized platforms and are not highly critical to day-to-day revenue-generating operations and customer service. Frequently, organizations begin by deploying virtual server technologies in development, test, and non-mission-critical areas. Most of these implementations are relatively small scale, and administrators are able to manage using simple provisioning tools provided by hypervisor vendors.

However, as the scale and the complexity of the environment increase, administrators find that moving workloads from dedicated physical servers to shared, virtualized servers becomes a time-consuming and error-prone activity that can result in unexpected downtime unless specialized virtual system administrators are able to carefully plan and implement required configurations and connections across network, storage, and server infrastructure.

Potential workload conflicts, and resulting performance degradations, could be considered and avoided when the pace of change was relatively slow. Or, migrations could be rolled back if workloads did not perform as expected. However, in larger-scale implementations, it became difficult to keep up with the pace of change.

As a result, early virtualization projects often focused on non-mission-critical workloads that could tolerate some downtime in exchange for reducing IT costs. Systems administrators had to estimate how many resources to assign to each workload and had few tools to assess whether their estimates were optimal. Often, once workloads were successfully migrated to virtual servers, they were more or less left alone as it was too complicated to move them or to assess whether more or fewer resources should be assigned as requirements changed. In many cases, IT lost track of whether the assigned workload was still needed by the business and allowed workloads to consume resources unnecessarily. This combination of virtual server sprawl and overprovisioning often thwarted the organization's goal of driving down costs by increasing physical server utilization.

This situation may have been acceptable when virtual server environments represented only a small portion of the total enterprise IT environment; however, it is unacceptable as virtualization goes mainstream and becomes a core element in many data centers.

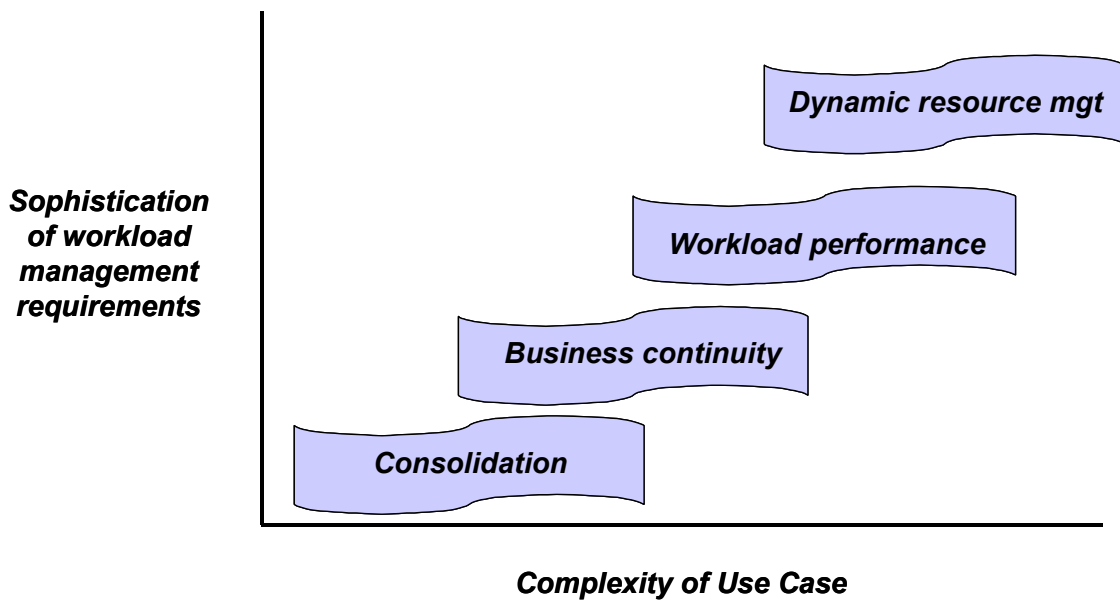
IDC's research shows that more and more organizations are now looking beyond server consolidation to use virtualization to improve business continuity, application performance, and overall IT resource allocation. This second wave of virtual server initiatives is more focused on real-time business priorities, production applications, and finding more ways to squeeze costs out of the IT infrastructure budget. These initiatives are also seeking ways to take advantage of on-demand live workload migration capabilities being made available by many hypervisor vendors.

This second wave of virtual server investment frequently includes the follow types of use cases (see Figure 1):

- ☒ Mission-critical application high-availability and business continuity programs that enable IT to migrate workloads as needed to avoid unplanned and planned downtime impacting workload performance and to restart top priority workloads quickly in the face of outages
- ☒ Workload performance initiatives designed to cost-effectively address peak load requirements by ensuring mission-critical applications can access additional capacity when needed without having to pay for full-time, dedicated servers
- ☒ Dynamic resource pooling and optimization initiatives to avoid server sprawl and ensure that resources are used to the fullest extent possible, even when workloads have different operating system, security, and I/O characteristics

FIGURE 1

Second Wave of Virtualization Requires More Sophisticated Workload Management Capabilities



Source: IDC, 2009

This second wave presents virtual server administrators with significantly more complex operational environments where workload management requirements become more sophisticated and change occurs much more frequently. As organizations move from focusing on workload consolidation to these more dynamic use cases, workload management tools that improve capacity planning and migration will be critical to the success of this second, more complex wave of server virtualization.

Workload Capacity Planning and Migration Tools Become Critical

Effective and accurate workload capacity planning and migration tools are critical to the success of second-generation virtual server programs because workload management decisions need to be made rapidly and workloads need to shift frequently as organizations optimize workloads in real time. IT organizations facing severe budget pressures can no longer afford suboptimal resource allocations and sprawl that result from trial and error resource planning strategies and manual workload management approaches used in smaller, less dynamic first-generation virtual server environments.

In larger-scale environments, IT teams need to anticipate the impact that moving one workload might have on the other workloads sharing the same physical server. They also need to know whether they are assigning the appropriate level of resources to a mission-critical workload in order to ensure adequate performance without overcommitting unneeded resources.

The success of business continuity and high-availability initiatives, as well as dynamic resource pooling use cases, depends on IT managers and virtual server administrators having access to tools that can:

- ☒ Migrate workloads back and forth across diverse physical and virtual platforms using the same interfaces, policies, and analytics (It is inefficient and time consuming to have to shift from one tool to another simply because workloads may require different operating systems or because the organization is running multiple hypervisors.)
- ☒ Test newly virtualized workloads to ensure they will run as required and will not impact other workloads that are sharing the same physical server
- ☒ Maintain a full real-time view of server and workload inventory and utilization levels across all physical and virtual resources
- ☒ Use automation to reduce risk, monitor and maintain service levels, speed implementation, and optimize use of IT staff time and skills
- ☒ Conduct near real-time performance and capacity utilization analytics, trending, and forecasting
- ☒ Provide tools and templates to streamline implementation and use of best practice processes

Organizations that want to get the full value out of their server and virtualization software investments need to be sure they have workload management and analytics tools that will allow them to keep up with the pace of change found in their increasingly dynamic, virtualized data centers.

NOVELL PLATESPIN WORKLOAD MANAGEMENT SOLUTIONS FOR SERVICE-DRIVEN DATA CENTERS

The PlateSpin Workload Management products are part of Novell's broader Service-Driven Data Center solution portfolio. The Novell vision for a Service-Driven Data Center focuses on enabling IT managers to build, manage, and measure virtualized data center environments. With regard to workload capacity planning and migration, the PlateSpin offerings include:

- ☒ **PlateSpin Recon**, which provides consolidation planning and virtual capacity planning and analysis to help IT teams "rightsize" resource allocations and configurations and optimize use of expensive resources

- ☒ **PlateSpin Migrate**, which automates the anywhere-to-anywhere live migration of workloads across diverse virtual and physical environments, validating workload replication and identifying conflicts for more reliable migrations

PlateSpin Recon provides workload analytics to help IT administrators make better decisions about resource allocation and workload migration options. The product is able to profile and track each workload's actual CPU, disk, memory, network utilization, and power and cooling consumption information over time, across physical and virtual hosts. It uses this data to construct consolidation scenarios that match the peaks and valleys of each workload and make recommendations as to which workloads will create the least contention if they reside on the same physical server. This allows IT organizations to maximize physical server utilization while continuing to deliver expected workload service levels. It also helps IT teams identify resources that can be reclaimed and applied to support other workloads.

PlateSpin Migrate is designed to promote extensive workload portability via one consistent interface. The product is able to migrate even highly transactional workloads such as mail servers and database servers without taking the source server offline. The PlateSpin Migrate Live Transfer™ and Server Sync™ technologies allow IT staff to transfer workloads quickly to the new target and test the workload in the new location while continuing to run the source and perform a final synch before cutting over the workload. Postmigration cleanup tasks can be automated using scripts or custom batch files.

Other products in the PlateSpin Workload Management family include PlateSpin Protect and PlateSpin Forge for workload Windows-based replication, recovery, and flexible restore to any hardware type or virtual server and PlateSpin Orchestrate, which uses policies and advanced workflows to automate the life-cycle management of heterogeneous virtual machines while balancing out workloads in the data center and auditing all virtual server life-cycle operations.

All of the PlateSpin products are designed to address the workload management needs of heterogeneous physical and virtual server environments and support Windows and Linux operating systems as well as a wide range of hypervisors, including VMware vSphere, ESX, and ESXi; Microsoft Hyper-V; SUSE Linux Enterprise with Xen; Citrix XenServer; and others. Together, the PlateSpin portfolio aims to help customers cost-effectively optimize data center resources while improving workload performance and reducing business risks associated with workload migration and relocation. The following customer profile illustrates how Novell is helping customers cope with increasingly complex workload management and challenges across physical and virtual systems environments.

GLOBAL MANUFACTURER SAVES TIME AND MONEY WITH PLATESPIN

The experience of one user of PlateSpin Recon and PlateSpin Migrate illustrates these benefits. The customer is a global designer and manufacturer of high-performance microprocessors and has over 5,000 employees in North America, Europe, and Asia. The organization's primary data center houses over 1,500 physical servers plus a growing virtual infrastructure environment that currently resides on approximately 40 high-performance, multicore servers. The combined physical and virtual environment supports more than 1,500 different workloads, of which roughly 650 are virtualized. The organization has relied extensively on PlateSpin Recon to profile hundreds of workloads prior to migrating them from physical to virtual environments in order to make accurate decisions about resource capacity requirements rather than rely on less accurate user or vendor estimates.

The customer's virtualization team has consistently found that both users and vendors tend to specify significantly more resource requirements than the workload actually requires. Often, user requests can be for more than double the capacity that is recommended by the PlateSpin Recon tool. The tool also helps the team identify the least utilized machines, which are often good candidates to take additional workloads.

When it comes time to migrate workloads from physical to virtual servers, or to move a virtualized workload to a different virtual server, the customer relies on PlateSpin Migrate. The customer reports that PlateSpin Migrate's ability to shift workloads out of band, without disrupting end users, is a significant benefit as are the product's ability to automate many routine conversion and postconversion tasks. The customer reports that workload migrations driven by PlateSpin Migrate have few errors requiring remediation and are overall very reliable. With regard to physical-to-virtual conversion, the client estimates that PlateSpin Migrate reduces the time required by 30–40% compared with manual conversion processes, particularly when older operating systems are involved.

Together, PlateSpin Recon and PlateSpin Migrate have become vital products for the organization's virtualization management team. The team estimates that without these tools, both capacity planning and workload migration activities would take longer and be much more error prone than they are today.

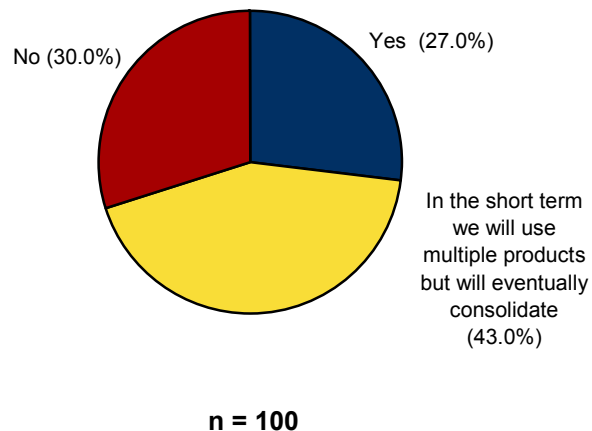
FUTURE OUTLOOK POINTS TO INTEGRATED PHYSICAL AND VIRTUAL INFRASTRUCTURE MANAGEMENT

IDC's research indicates that IT decision makers expect to increasingly integrate physical and virtual infrastructure management in the coming years (see Figure 2).

FIGURE 2

Plans to Integrate Physical and Virtual Infrastructure Management

Q. *Do you plan to use one tool or product to manage both your physical and virtual environments?*



Source: IDC's Virtualization Infrastructure Management Study, 2009

The goals of this integration are efficiency and improved service. IT managers are recognizing that treating virtual infrastructure management as an operational silo slows down many IT management activities, including workload optimization, root cause analysis, and system provisioning. IDC expects the introduction of more sophisticated virtualization use cases will speed up demand for workload management and automation solutions that can work seamlessly across physical and virtual environments, as well as across heterogeneous operating system and hypervisor solutions.

NOVELL CHALLENGES/OPPORTUNITIES

Novell's PlateSpin Workload Management solutions target important challenges being faced by many IT organizations as they expand the use of virtual server technology across their organizations. Novell boasts numerous customers that are successfully using the products today to save time and improve workload performance. The portfolio's ability to work across multiple operating system, physical server, and

hypervisor environments will be important to many potential customers as virtualized data centers become more heterogeneous over time.

Novell's ability to capitalize on its market opportunity depends on the extent to which the firm can educate potential customers about the value of these types of workload management products. In the current bleak economic environment, many IT organizations are deferring management software purchases or making these investments only after they begin to experience operational problems. Many customers limit initial virtual server management tool purchases to products provided by hypervisor vendors and may be hesitant to consider third-party tools.

As a result, Novell's major near-term challenge focuses on educating customers and channel partners about the capabilities of the PlateSpin portfolio and the value that comes from implementing these products proactively as part of a sophisticated virtualization solution rollout.

CONCLUSION

Expanded Virtualization Use Cases Demand Enhanced Workload Management Solutions

As data center environments make greater use of virtualization technology, and IT teams look to virtualization for more than just hardware consolidation savings, appropriate workload management tools must be in place. IT decision makers should build funding for virtualization workload management tools and automation into their virtualization plans from the beginning.

Lack of automation and best practices will ultimately cost the IT organization more in terms of IT staff time and suboptimal physical and virtual capacity utilization. Organizations that want to operate flexible, dynamic infrastructure environments need automated, integrated workload management tools to get the job done.

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