Virtualization and cloud create increasingly complex datacenter environments where simple tasks, such as configuring and deploying a virtual server, can require a single administrator to work with multiple tools and execute dozens of tasks manually. As the number of production virtual and cloud workloads proliferates, manual workflows are increasingly likely to inject human errors and delays into the operational environment. This paper examines the benefits of system management process and tools integration across physical, virtual, and cloud datacenter operations and discusses how Dell is addressing these requirements.

Virtualization and Cloud Increase Operational Complexity

Corporate IT infrastructure environments are becoming more and more complex as virtualization and cloud become the architectures of choice. IDC estimates that the majority of enterprise workloads will run on virtualized infrastructure by 2012. Simultaneously, most enterprises expect to continue to maintain hybrid environments that mix physical and virtual storage and compute platforms, as well as public cloud services and private cloud architectures that add self-serve provisioning and consumption-based optimization into the mix.

These complex environments create many challenges for IT organizations that are being asked to introduce new systems, migrate existing workloads, scale up the number of virtual servers supported, and better optimize workload performance, resource utilization, and costs. When every new technology and vendor solution comes with its own unique management console and monitoring framework, IT administrators can find themselves bouncing back and forth across multiple, fragmented tools, log-ins, roles, and reports just to complete straightforward tasks such as migrating a virtual workload off a failing server or orchestrating patching and firmware upgrades across physical and virtual environments.

As a result, as shown in Figure 1, it is not surprising that IDC consistently hears from IT leaders that they want to deploy integrated management solutions and suites to help streamline operational processes and reduce the number of system management tools and consoles being used across their physical, virtual, and cloud environments. IT leaders want to improve IT staff productivity and reduce avoidable downtime by making staff more efficient, accurate, and productive. Furthermore, IT leaders want IT staff to be able to work effectively in hybrid cloud and heterogeneous environments and integrate physical and virtual system management processes and approval cycles.
Many IT decision makers see the use of a simpler, more integrated management environment as an important enabler of these goals and expect this type of solution will allow them to better streamline processes, align staff on a common set of metrics and reports, and reduce training and integration time when new capabilities or requirements are introduced. This focus on tools and process integration is becoming increasingly important in organizations that are committing to cloud architectures.

Compared with first-generation virtualization programs that tended to emphasize capital expense savings from hardware consolidation and power and cooling reductions, cloud and self-serve provisioning are shifting the focus to improving business agility, speeding up service deployment, reducing operating expenses, and increasing IT staff productivity. Part of this shift includes strategies to integrate and streamline management across physical and virtual system resources.

**Integrated Physical and Virtual System Management Reduces Operational Complexity and Costs**

Many opportunities exist to integrate physical and virtual systems and storage operations. They range from adoption of a single vendor suite for all management activities to reliance on a primary management console supplemented by plug-ins and management packs to provide control and visibility across a wider range of IT assets and tools.

With virtualization now the default choice for provisioning most new workloads and applications, many IT organizations are focusing on their virtual server management platform as a logical focal point for a broad set of integrated day-to-day physical and virtual system management tasks. These activities can include monitoring virtual workload health and physical server performance, configuring and migrating workloads, updating firmware, notifications and updates to configuration management databases, and root cause and dependency analysis.
To get the full benefit of integrated consoles, IT organizations also need to update administrator roles and responsibilities and ensure that staff members have adequate training so they can effectively use the full range of integrated capabilities provided. Typically, management packs and plug-ins will provide visibility and control for the most common administrative tasks associated with a specific vendor’s product. In the case of physical server monitoring and management, a plug-in for a virtual server console might allow administrators to start, stop, and upgrade the physical server from within the virtual server management console. Administrators might still have to use the vendor-specific monitoring product for deeper troubleshooting and analysis.

Eliminating the need to jump back and forth across multiple management console windows, syntax, workflows, and log-ins enables IT staff to more quickly address business requirements and significantly reduces human error, delays, and costs.

**Dell Management Plug-in for VMware vCenter**

Dell has made a commitment to providing customers with an increasing number of management plug-ins to support integrated management of Dell servers and storage via major virtualization and cloud management platforms, including VMware vCenter. The Dell Management Plug-in for VMware vCenter allows IT administrators to monitor, provision, and manage physical Dell PowerEdge server hardware and firmware from a dedicated Dell tab accessed via the VMware vCenter console using the same role-based access control model as vCenter.

Major Dell plug-in features include:

- The ability to access deep-level details on Dell server inventory and configurations
- Ongoing monitoring and reporting on 55 Dell-specific events/alerts, including power and cooling, memory, fan, device configuration, and temperature
- Immediately initiate vCenter actions based on Dell-defined alarms when workloads need to be moved or modified
- Access to host, cluster, and datacenter views
- The ability to define and automate standard Dell server provisioning templates and execute wizard-based deployments using those templates
- Zero-touch hypervisor deployment to Dell bare metal servers without PXE to improve security
- The ability to automate and stage BIOS and firmware updates from within vCenter
- Online access to warranty information and renewals

The Dell Management Plug-in for VMware vCenter takes advantage of the management capabilities provided by the Integrated Dell Remote Access Controller (iDRAC) and the LifeCycle Controller in Dell 11g PowerEdge servers. Limited support is available for 9g and 10g PowerEdge. The plug-in ships as a virtual appliance that can be quickly activated and integrated with vCenter (see Figure 2).
Customers who want to validate the capabilities of the solution can take advantage of a free download to test on a single host with a single vCenter connection. It is available on the Dell Web site. The plug-in is compatible with ESX4.0 and above as well as with VMware vCenter Foundation, which is shipped with vSphere Essentials.

Customers who have implemented the plug-in report that they can significantly simplify and reduce the number of steps needed to accomplish many repetitive day-to-day tasks. For example, customers are able to reduce the number of steps needed to create and deploy a standard VM template from over 55 to just 9, a reduction of 46 steps.

The Dell Management Plug-in for VMware vCenter is one of a family of plug-ins Dell offers to help customers better integrate physical and virtual system management. Other available plug-ins for vCenter include the Advanced Infrastructure Manager (AIM) plug-in for workload portability and recovery and plug-ins for both EqualLogic and Compellent modules. Dell also supports all of the Microsoft System Center products with plug-ins or third-party system management packs. The company expects to continue to extend the range of plug-in offers and to support additional management consoles such as the BMC Atrium platform.

**Challenges**

Most IT organizations are still in the early stages of integrating physical and virtual system management. In many cases, virtual server administrators operate in relative isolation from physical system managers. To be successful, IT organizations need to merge roles, workflows, and tools. Clear agreement is needed across the physical and virtual system management team with regard to
how these integrated tools will be used and what policies will be used to guide automated responses and configuration activities. Customers need guidance from vendors as to the best practices for implementing integrated approaches. To be successful, Dell and its partners must help customers not only implement the tools but also rethink processes and governance.

Conclusion

The increased use of virtualization and cloud architectures is forcing IT organizations to more tightly integrate and automate virtual and physical system management in order to streamline operations, improve business SLAs, and hold down operational IT costs. To the extent that Dell is able to tightly integrate with important virtualization and cloud management platforms and help customers update operational processes to take advantage of physical and virtual system management integration, it will be able to differentiate its server offerings via the availability of management plug-ins.

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Global Headquarters: 5 Speen Street Framingham, MA 01701 USA P.508.872.8200 F.508.935.4015 www.idc.com