WHITE PAPER

Oracle Enterprise Manager Ops Center Enables Datacenter Life-Cycle Automation

Sponsored by: Oracle

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IDC OPINION

Datacenter administrators face dramatically increasing rates of change and complexity as they deploy virtualization and refresh existing servers with newer, higher-performance hardware. IDC believes automation and standardization are required to efficiently manage today's dynamic datacenters. Systems administrators should invest in automation tools that:

☑ Reduce the amount of time required to discover, validate, provision, and patch systems and maintain system configurations and changes across the full life cycle from provisioning to decommissioning.

☑ Streamline workflows by providing staff the ability to monitor and administer heterogeneous physical and virtual environments from a common, integrated set of interfaces and workflows.

☑ Improve the quality and timeliness of decision making by providing detailed reporting, analytics, and compliance tracking.

This paper describes the emerging automation and integrated management requirements facing datacenter management teams today and describes how Oracle Enterprise Manager Ops Center is helping customers meet these challenges.

SITUATION OVERVIEW

At a time when IT staff resources are spread thinner than ever, datacenter operations are becoming more complex and time consuming. In a recent IDC survey, 77% of IT systems administrators state they expect the total number of hardware, firmware, software, and related change events they need to deal with to increase by double-digit rates over the coming year, with most saying the increases will range from 10% to as much as 50% (see Figure 1).

Datacenters that make extensive use of virtualization are likely to see the highest rates of change due to the dynamic nature of the technology. However, even without virtualization, the need for complex, high-performance computing (HPC) environments to constantly provision and update firmware, OS, middleware, and applications can consume staff time and make it difficult to address new business priorities. Despite the wide range of monitoring, discovery, and configuration tools already available, many organizations are reaching a breaking point where traditional,

manual, ad hoc strategies for managing and implementing change can no longer effectively scale to support the number of operational actions and analytics required every day.

F I G U R E 1

Estimated Trends in Datacenter Changes for Next Year

Q. Next year, the number of changes in our organization will …
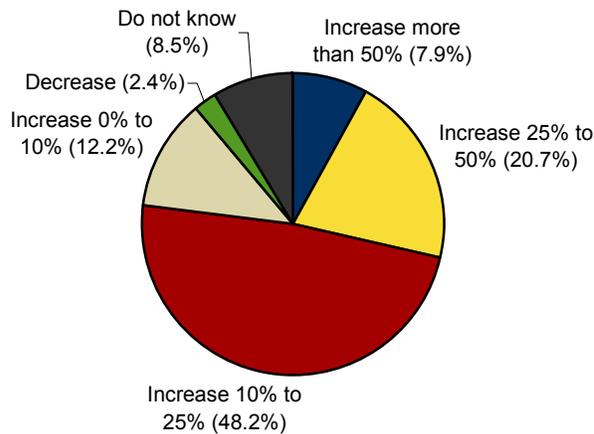
n = 164

Source: IDC, 2010

To operate datacenters efficiently, organizations need to automate and integrate management activity across physical and virtual domains and up and down the applications and infrastructure stack. In many datacenters today, technology-specific domain experts rely on disconnected processes and tools to configure, deploy, and maintain complex multitier environments where cross-departmental communication and coordination are critical to solving problems and serving business needs.

Unfortunately, although IT resources are stretched thin, most budgets are tight and additional staff cannot be hired. Task-specific automation scripts commonly developed by individuals to make their day-to-day jobs easier are not sufficient to keep up with today's dynamic datacenter environments.

Instead, IT teams need end-to-end system management automation coupled with standardized configuration policies and change management processes. Automation plus standardization is the key to reducing time, controlling costs, minimizing errors, and improving resource utilization and availability across the datacenter. By automating monitoring, administrative, and workflow activities on a coordinated, integrated basis, IT teams are finding they can significantly increase productivity and service levels without increasing head count.

## Integrated, Scalable Datacenter Automation Required

Coordination and integration are critical to the successful use of datacenter automation solutions in both physical and virtualized environments. Rather than being asked to manage a single, tightly coupled set of resources, system administrators must now optimize use of resource pools and guarantee the performance of workload requirements that can spike with no notice. Monitoring, analytics, planning, provisioning, and ongoing maintenance activities need to be executed as an integrated end-to-end life cycle. Experts in different technology areas need to share information accurately and quickly.

Nowhere is the benefit of integrated, automated datacenter life-cycle management demonstrated more obviously than in the way it can improve basic processes such as problem/incident management and root cause analysis. IDC's research shows that, on average, more than half of the time involved with resolving a problem is related to isolating the source of the problem (see Figure 2). Much of this time can be attributed to time-consuming tasks such as verifying configurations, tracking change authorization, and assessing dependencies across multitier environments.

FIGURE 2

Incident and/or Problem Resolution Isolation Time

Q. What percentage of time in the incident and/or problem resolution process is dedicated to isolating the incident or problem?
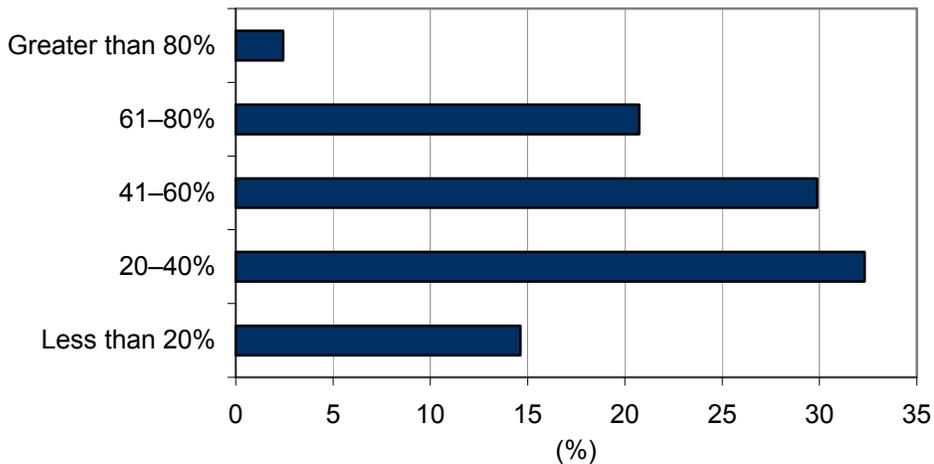
n = 164

Source: IDC, 2010

In today's complex datacenter environments, automated management tools are critical to reducing the time it takes to solve problems. Automation of many interrelated tasks such as firmware, OS, and software upgrades and patching

combined with compliance programs, to maintain standard images and builds, will save time and money while improving service levels and reducing the business risks associated with downtime.

Most Important Capabilities to Consider

Some of the most important attributes IT decision makers should look for in selecting tools to streamline and automate system operations activities are:

- ☑ Highly scalable systems that can discover and maintain environments that are subject to rapid increases in scale and complexity

- ☑ Automated workflow supported by regularly updated knowledge bases and patching programs

- ☑ Detailed reporting and analytics to accelerate decision making and enforce compliance using policy-based automation and workflows

- ☑ Ability to monitor and administer heterogeneous physical and virtual environments from a common, integrated set of interfaces and workflows

- ☑ Ability to monitor and administer resources and operational workflows across their entire life cycle, from provisioning to decommissioning

- ☑ Ability to integrate workflows, troubleshooting, and operations across physical and virtual environments and between infrastructure and applications environments

Systems management tools that are able to automate time-consuming, error-prone processes such as patching, provisioning, and decommissioning across complex environments can save IT teams thousands of dollars and hundreds of man-hours by streamlining, simplifying, and standardizing routine operational activities. IDC's research shows that 79% of datacenter managers strongly or firmly agree with the statement that "automation is very important in deploying, provisioning, and managing virtualized environments." (See Figure 3.)

As datacenters become more densely virtualized, the challenges of maintaining configurations, managing sprawl, and maintaining SLAs will need to be addressed proactively in a consistent, organized manner. Rather than reply on multiple, divergent point solution tools and work processes, systems administrators will find that operations can be much more efficient and less error prone if all staff relies on a common set of configuration, status, and performance data and coordinates workflows using integrated, policy-driven automation tools.

Importance of Automation

Q. *Automation is very important in deploying, provisioning, and managing virtualized environments.*
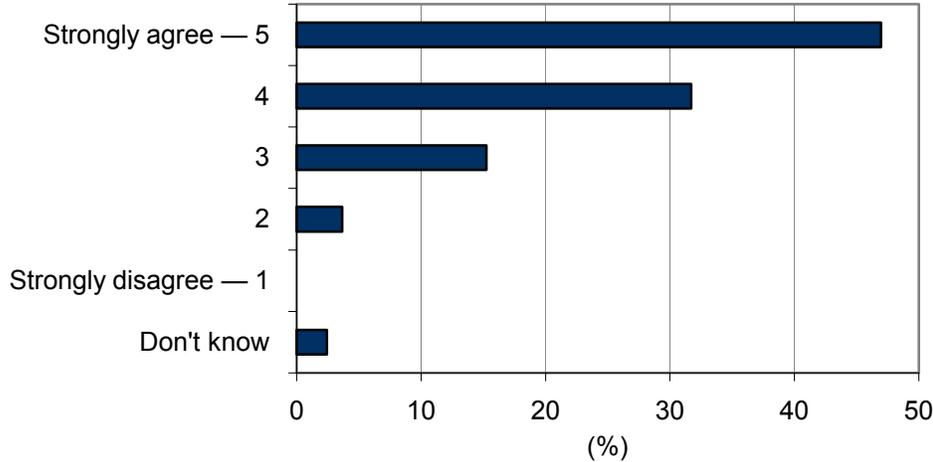
n = 164

Source: IDC, 2010

Oracle Enterprise Manager Ops Center Automation Simplifies Operational Complexity

Oracle Enterprise Manager Ops Center has been designed to help customers simplify and streamline end-to-end physical and virtual server operations, from initial provisioning through the life cycle to decommissioning. With release 2.5, Ops Center has been significantly enhanced to enable customers to automate and optimize server management across physical and virtual environments. Specifically, Ops Center enables IT system administrators to automate many routine provisioning, patching, and compliance management processes so they can efficiently address the proliferation of virtualized systems, better integrate physical and virtual systems management, and improve the performance of mission-critical application workloads.

Ops Center addresses a number of the important requirements noted above as follows:

☑ **Scalability:** The product relies on a scalable three-tier architecture that uses a centralized controller along with distributed proxies. Proxies enable rapid, secure scaling of operations as most information can be collected and stored locally and securely. Information needed for central analytics and control is passed to the central controller as needed.

☑ **Automation:** In addition to linking to the proxy controllers, the central controller is responsible for accessing a wide range of third-party OS patch management systems and system upgrade tracking tools. It maintains the database of record regarding patch and upgrade policies for all managed machines. Built-in analytics and reports simplify the administrator's job by automatically identifying machines that need updates and by directing operators to only those patches and updates that are appropriate for the machine being evaluated. Snapshot and simulation capabilities allow operators to model the impact of changes and to quickly execute rollback when needed. Similarly, standard profiles can be automatically provisioned based on predefined policies and profiles.

☑ **Reporting and compliance:** Compliance and change tracking reports enable staff to quickly compare actual configurations to targets and can be used to drive automated patching and workflow activities. The central controller provides operators with a graphical Web browser interface that includes real-time status as well as contextual information about resource pools, dynamic topology, and actions available based on the context.

☑ **Heterogeneous coverage:** Ops Center can support heterogeneous physical server environments running Solaris, Linux, and Microsoft Windows operating systems on bare metal hardware or virtualized Oracle VM Server for SPARC (formerly Sun Logical Domains) and Solaris Containers.

☑ **Integrated workflows:** Ops Center offers users of x86 and SPARC-based systems an integrated platform to automate discovery, provisioning, configuring, patching, monitoring, and compliance activities across hardware, firmware, and virtual infrastructure layers. Integration across physical and virtual domains in particular enables more effective troubleshooting and more efficient resource management across the infrastructure stack.

Using a common GUI for discovery, inventory, reporting, analytics, and automation, Ops Center enables Oracle customers to become more productive and efficient by integrating and automating many formerly ad hoc, fragmented processes and policies. Customers report using Ops Center to:

☑ Reduce the amount of time required to discover, validate, provision, and patch systems.

☑ Improve asset management and compliance with automated patching and reporting.

☑ Improve system stability, security, and availability by maintaining consistent use of standard images and patches.

☑ Improve end-user satisfaction by delivering instances faster and maintain service-level commitments.

☑ Increase system utilization and reduce capital spending requirements by automatically pooling and dynamically allocating resources to workloads as needed.

The goal of Ops Center is to provide busy administrators with a holistic, end-to-end understanding of the status of physical and virtual server resources across the life cycle of the physical server and the virtual server and the workloads they support. Many of the design choices made in the development of Ops Center are anchored in Oracle-Sun's extensive experience with high-performance computing markets. These experiences helped developers learn how to address the needs of large-scale, dynamic, heterogeneous environments. Ops Center applies these lessons in the context of today's increasingly dynamic and distributed enterprise datacenters.

Oracle Enterprise Manager Integration Road Map

Ops Center currently addresses many operational challenges faced by server administrators in large datacenters. It is also being positioned by Oracle as a critical part of the firm's integrated, full-stack application and infrastructure management strategy. With hardware, database, middleware, and applications, as well as systems management, now all under one roof, Oracle's goal is to drive tight integration across the entire stack to provide customers with better performance, reliability, scalability, security, and operational efficiency than more loosely coupled solutions or point products. Oracle has already begun delivering on this integration strategy with solutions such as the Oracle Exadata database appliance, and it has rightly identified integrated management as a critical enabler of this strategy and is promising to deliver it by driving deep integration across the current Oracle Enterprise Manager (OEM) and Ops Center products.

There is little to no overlap in the capabilities of OEM and Ops Center. In the near term, Oracle has committed to supporting both standalone products; however, the goal is to drive integration between the tools relatively quickly over two or three release cycles. Oracle has already delivered initial integration between OEM and Ops Center by providing a connector between the two to allow the exchange of events and alerts. The connector provides application administrators visibility into underlying infrastructure issues that may be impacting application performance and helps them more quickly resolve issues and more effectively interact with systems administrators. Step 2 will be to allow each console to launch the other's events in context with the ultimate goal being full integration of all discovery, reporting, automation, and analytics. IDC expects that although not specifically called out, integration of Oracle's existing virtualization management capabilities with Ops Center will also be a priority.

As the tools become more streamlined and integrated, Oracle also aims to move them into the My Oracle Support platform to leverage proactive and personalized support capabilities to enable more automated remote discovery, monitoring, diagnostics, and management of the full application-to-disk stack — just as My Oracle Support integrates with OEM today to aid customers in the time-consuming task of patch management by providing proactive patch recommendations and patch automation.

Oracle paints a long-term picture of a world where applications are developed from the ground up in ways that maximize and streamline runtime manageability of infrastructure resources. Oracle's goal is to shift the industry to a highly integrated life-cycle view of systems management that provides integrated visibility and insight across the stack using the integrated OEM/Ops Center platform as the central console and integration point.

CUSTOMER EXPERIENCE

Ops Center Increases Multichannel Retailer's IT Staff Productivity

A major multichannel retailer deployed Ops Center as part of an effort to consolidate distribution center, store, and logistics SAP systems on servers using Solaris Containers. The primary datacenter contains approximately 175 Unix servers supporting over 400 logical Unix instances. In 2010, the retailer will also complete the buildout of a remote disaster recovery center.

Prior to implementation of Ops Center, the retailer's Unix system engineering staff relied on a mix of ad hoc tools and manual processes to manage OS, firmware and hardware inventory, and provisioning updates. The processes related to finding, verifying, and provisioning firmware updates were particularly time consuming. With just two full-time employees assigned to Unix system engineering tasks, the retailer recognized the need for automation to help manage the fivefold increase in total Unix physical and virtual instances that is expected as part of this project.

The initial Ops Center deployment focused on automating firmware, hardware, and OS provisioning. The impact was felt quickly as the time needed to deliver a provisioned instance, ready for an application, dropped by more than 50%. This was critical as the scope of the physical Unix environment more than tripled while Unix engineering head count stayed steady during this initial phase of the workload migration and Solaris Containers deployments.

As the retailer's use of Ops Center has increased over time, the Unix system engineering team has extended Ops Center to manage and deploy custom system configurations automatically and to generate compliance reports. Future plans include upgrading to Ops Center 2.5 to enable automated initial provisioning of global and nonglobal zones and to automatically standardize new system builds on a single Solaris image.

By using Ops Center to standardize system configurations; automatically find, verify, and apply updates; and track system utilization and compliance over the life cycle of the system, the retailer's Unix system engineering team expects to continue to improve operational efficiency, increase overall system utilization, speed deployment times, and improve end-user service levels.

The retailer expects its Unix systems environment will continue to expand in terms of both physical and virtual instances, even as the datacenter migrates to higher-performance machines during an upcoming planned hardware refresh cycle. The Unix system engineering team believes Ops Center will be critical to enabling the staff to manage this significant increase in workload and configuration management requirements.

FUTURE OUTLOOK

IDC forecasts that by 2012, virtual servers will outnumber physical servers by at least a 2:1 ratio. VMs per server will increase from today's average of 6.3 to 8 virtual machines per server by 2012. Simultaneously, the major motivation for deploying virtual instances is shifting from simple server consolidation projects to more complex efforts designed to improve business continuity and workload performance and to create environments where server resources can be pooled and shared dynamically as needed by business requirements (see Figure 4).

FIGURE 4

Evolution of Virtualization Priorities

Increasing sophistication of workload management requirements
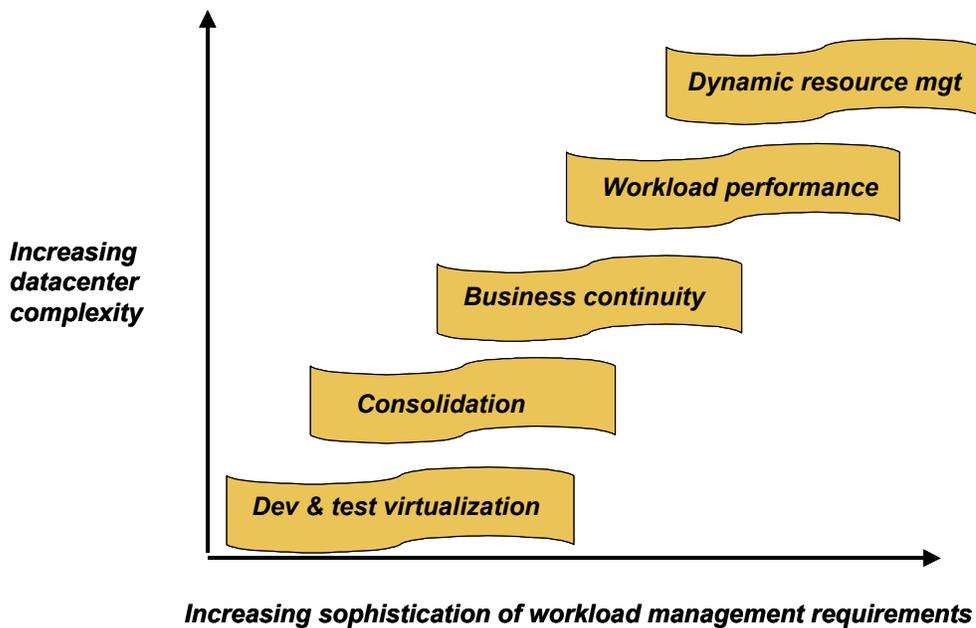
Source: IDC, 2010

This dynamic approach to pooling resources across the datacenter will put extreme pressure on IT administrations to integrate and automate operations across physical and virtual domains and across infrastructure and application environments. Manual approaches to system configuration and life-cycle management will need to be standardized and automated so that workload migration and optimization can occur accurately and efficiently in real time.

As a result, IDC advises IT decision makers to begin investing in configuration and process standardization and integration, supported by automation, as quickly as possible. For many organizations, their level of management automation maturity will directly impact the extent to which the organization can fully realize the ROI expected from virtualization and cloud computing initiatives.

CHALLENGES/OPPORTUNITIES

The increasing availability of sophisticated system management and workflow automation solutions provides IT decision makers with an opportunity to dramatically improve staff productivity, increase resource utilization, and reduce the total cost of operations across both physical and virtual server environments. The challenge, however, is that standardization of configurations, operational policies, and workflows is required to take fullest advantage of the technologies.

IDC works with many organizations that are beginning to recognize the business value of IT operations and configuration standardization. However, many other organizations struggle to fully appreciate the importance of a standardized, automated approach to systems management. IT decision makers, and their system management suppliers such as Oracle, need to develop crisp payback models that can motivate automation initiatives and encourage IT staff to invest the effort required to standardize activities and implement automation solutions. Because automation can often result in changes to the way staff works on a day-to-day basis, and can be disruptive when first deployed, stakeholders need to be specific in terms of expected benefits and plans for phased implementation that increase the sophistication of the automated management environment over time.

CONCLUSION: GET AHEAD ON AUTOMATION

Given that IDC expects use of virtual servers to continue to increase dramatically, and the number of virtual instances per server to increase as well, IT decision makers need to explicitly recognize how their change, configuration, and compliance requirements will evolve in 2010 and beyond. Budgets should build in support for automated, integrated management tools as part of the project budget, and tools should be deployed and actively used.

Customers are advised to begin with a focused automation agenda that will deliver ROI rapidly, then expand the use of the technology as appropriate to the needs of their organization.