

I D C V E N D O R S P O T L I G H T

Automated Provisioning and Orchestration Are Critical to Effective Private Cloud Operations

June 2012

Adapted from *U.S. 2011 Private Cloud Management Survey: The Journey Continues* by Mary Johnston Turner, IDC #230188

Sponsored by Cisco

The increasing use of virtualization and private cloud computing solutions is creating highly complex datacenter environments. This complexity results in significant IT operational challenges in the areas of provisioning, change and configuration management, root cause analysis, and performance management because traditional processes and tools are unable to scale and adapt to the rapid rate and pace of change experienced in these highly dynamic settings. Integrated, automated application and infrastructure provisioning, workflow orchestration, and self-service management tools are needed to streamline deployments, better optimize use of resources, and speed up delivery of critical business services to end users. This paper discusses why automated provisioning, orchestration, and self-service are so critical to the effective operation of virtualized, private cloud datacenters and identifies the most important attributes customers should consider when evaluating solutions. The paper also highlights the ways in which Cisco Intelligent Automation for Cloud addresses these challenges.

Impact of Virtualization and Cloud on Datacenter Provisioning and Operations

IDC's research indicates that virtual servers are now the default platform for the majority of new application deployments in enterprise-scale datacenters. In many cases, these virtualization technologies are also being deployed as platforms for current or future private cloud environments.

Virtualized, cloud datacenters enable IT organizations to share compute resources across multiple applications and user groups in a much more dynamic way than is possible in traditional environments where applications, middleware, and infrastructure are tightly coupled and resource allocations are highly static. IT decision makers are aggressively pursuing private cloud and virtualization to:

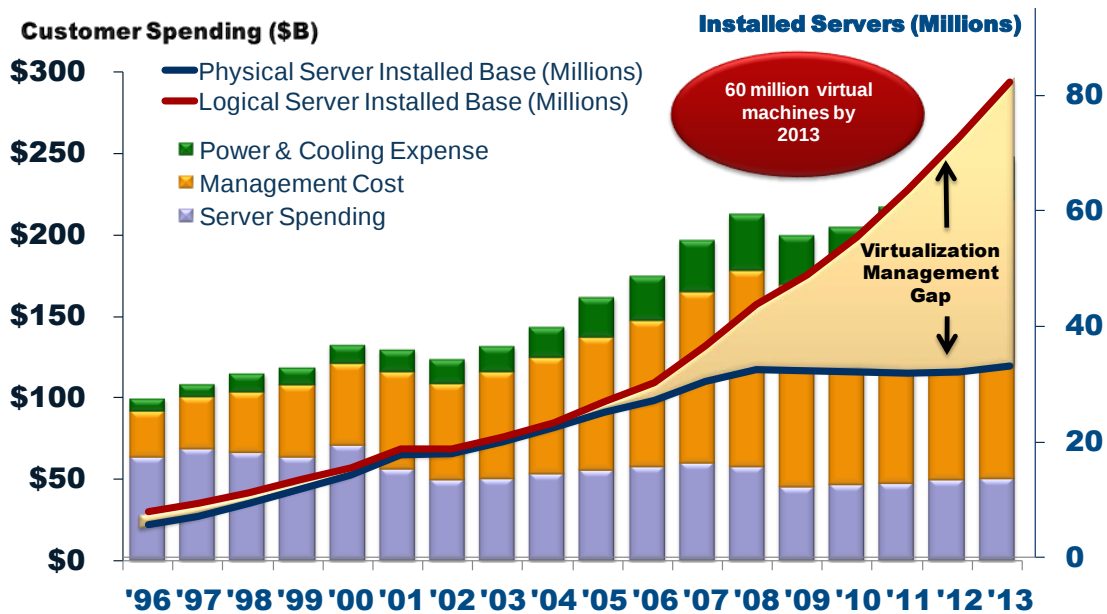
- Improve end-to-end service levels
- Reduce the cost of capital
- Reduce power, cooling, and facilities requirements
- Improve IT operational efficiency
- Improve overall business flexibility and agility
- Better match IT spending and resource utilization to business priorities

While many organizations have found that virtualization initially helps increase utilization of servers, reduce datacenter footprints, and minimize power requirements, most IT teams have seen only minimal productivity improvements in the day-to-day operation of virtual servers as measured in terms of improving the ratio of IT staff to servers. IT teams have also been challenged to maintain optimal use of resources as many organizations find it difficult to rein in server sprawl.

Furthermore, virtualization has not always improved IT's ability to react rapidly to changing business needs. Despite the fact that IT organizations can provision virtual machines very quickly, many organizations find that it often still takes weeks to complete all the related storage, network, security, application, and middleware provisioning activities and work request approvals that are required to deliver a working service to business users. Once the resources are activated, the ongoing management of software patches, security policy updates, root cause analysis, end-to-end performance optimization, and capacity planning is more complex across virtualized environments than in traditional, static architectures. As a result, the costs of IT staff are escalating much faster than spending on physical virtual servers (see Figure 1). Without making major changes to the way they manage these environments, IT organizations will find it impossible to keep up with the rate and pace of change enabled by virtualization and cloud.

Figure 1

Worldwide Spending on Servers, Power and Cooling, and Management/Administration



Source: IDC

Strategies for Improving Operational Productivity Using Private Cloud

To address priorities around business agility, resource optimization, and ongoing improvement of IT operational efficiency and service levels, many organizations are investing in private cloud programs that promote end-user self-service and automated end-to-end system, network, and workload provisioning. These programs incorporate a number of important management resources and tools, including:

- Standardized service menus and provisioning templates to enable wide-scale automation that can speed up resource and application provisioning while reducing human error and enforcing corporate standards and compliance
- Self-serve provisioning solutions to empower selected user groups and IT staff to more quickly specify and deploy required resources (Self-service technologies allow IT teams to automate policies related to the assignment and reclamation of resources to reduce virtual server sprawl.)
- End-to-end performance monitoring and business-relevant service-level agreements (SLAs) to drive policy-based provisioning and self-service activities
- Consumption-based metering and capacity planning to help align IT spending with business needs and ensure optimal use of available system, application, and staff resources

Effective use of these powerful capabilities frequently requires business and IT decision makers to adopt new governance processes. At a minimum, to get the full value out of these sophisticated management tools, both business and IT stakeholders need to agree on streamlined approval workflows, standardized end-user configuration options and system images, and a commitment to encouraging end users to adopt new processes and self-service tools where appropriate. The shift to shared infrastructure and automated operations can often create a significant amount of anxiety among business stakeholders who fear their priorities may lose out. Yet, continued reliance on processes and policies designed for traditional static environments can make it almost impossible for organizations to efficiently use virtualization, cloud, and automation.

Benefits of Automated Cloud Provisioning and Orchestration

The most effective private cloud and virtualization automation programs address governance issues from day one and evolve policies and governance in lockstep with changes to the management tools and infrastructure architectures. Organizations that have implemented such programs recognize that shifting to a standardized service-centric delivery model, paired with extensive use of automation and orchestration technologies, can significantly improve IT operational productivity and end-to-end service levels.

These IT organizations are going beyond the automated scripts and physical server provisioning tools that have been available for some time and are using private cloud as the platform to drive a significant expansion of automation and orchestration strategies across the internal datacenter environment. The most effective organizations are significantly transforming the way they define, operate, and govern their environments as well as preparing for widespread use of automation, orchestration, and self-service provisioning tools. Specifically, they are:

- Focusing on developing consistent standard service definitions, SLAs, and templates to allow for large-scale automated provisioning activities
- More tightly integrating and orchestrating cross-domain workflows and approval cycles to dramatically reduce the time needed to provision and reclaim resources

- Working more closely with business stakeholders to identify priorities, negotiate tradeoffs between standardization and business requirements, and make commitments to new levels of service and cost control (These collaborations include programs to clearly define security and data protection policies for ensuring regulatory compliance and reducing business risk across public, private, and hybrid cloud environments.)
- Considering opportunities to source IT infrastructure and applications from public cloud as well as in-house resources and developing service definitions, SLAs, and monitoring strategies that allow IT teams to optimize resource utilization across these hybrid environments
- Identifying opportunities to enable end-user self-service and new service request management technologies to reduce the time and cost required to deliver business services and keep internal IT resources competitive with public cloud alternatives

Due to the complexity and scope of operational changes needed to fully implement private cloud provisioning and self-service solutions, most organizations are taking a step-by-step approach to rolling out these types of tools and processes and to integrating cross-silo workflows.

IDC's research shows that early private cloud adopters are reporting that they have been able to:

- Improve the ratio of administrators to physical and virtual servers from 1:30 to 1:100 or even 1:300 or more, resulting in significant improvement to IT management productivity and cost savings (IDC's research among organizations that have already implemented private clouds shows that 76.5% expect to at least double IT staff productivity.)
- Provision services and resources to the business more quickly (Often, organizations that have aggressively deployed self-service provisioning solutions for highly standardized virtual machines and selected workloads are able to reduce the cycle time from service request to service availability from multiple weeks to as little as 10–15 minutes.)
- Better optimize end-to-end application performance and availability by reducing downtime, maintaining more consistent patching and security processes, and improving the ability to diagnose and reduce root cause of problems
- Reduce business risk, ensure more consistent compliance with standards and policies, and conduct better configuration and change management tracking

Standardized service descriptions, SLAs, security policies, configurations, and provisioning templates are required to fully exploit automation and create environments where workloads and computing resources can be rapidly provisioned, migrated, and deprovisioned as needed. Well-defined service menus are also critical for the successful introduction of self-serve provisioning options. Collaborative business/IT governance and executive leadership are critical success factors.

Attributes of Effective Automated Cloud Provisioning and Orchestration Solutions

For complex enterprise-class datacenters, effective automated virtual system and private cloud provisioning and orchestration solutions involve a number of critical attributes, including:

- Support for heterogeneous physical and virtual environments to allow IT organizations to rely on a single set of interfaces and tools to scale up automation across datacenter resources and diverse workloads as required

- The ability to span infrastructure and applications, including public cloud resources, to simplify and standardize workflows and ensure consistent compliance with security policies and approved configuration templates
- The ability to integrate workflows and approval chains across technology silos to improve collaboration and reduce delays that can result from manual or ad hoc approval and handoff procedures
- Vendor-agnostic integration with existing heterogeneous IT management tools, including service desk, service catalog, CMDB, performance monitoring, and reporting systems, to the extent that these types of tools are already deployed
- Self-service portal for service ordering and provisioning to allow selected user groups to use browser-based interfaces to rapidly provision standard services from a predefined menu of offerings (Policy-based self-service tools can automate virtual machine sprawl management by reclaiming resources on a scheduled basis and tracking resource assignment requests and fulfillment on a consistent basis across the organization.)
- Out-of-the-box templates, adapters, and workflow best practices to accelerate time to value and ensure that the customer organization is implementing best practice workflow and configuration management programs (Rather than waste time and resources creating policies, workflows, and configuration templates from scratch, many organizations can benefit significantly from using out-of-the-box resources as a starting point for standard activities and workflows.)

Organizations evaluating these types of solutions should consider how well the solution will integrate with existing systems and applications and consider how extensively they plan to scale the solution over time. In some cases, simplified entry-level products may allow organizations to get started and demonstrate value quickly; however, these entry products must be able to scale over time so that organizations don't lose their investment in tools and integrations.

Considering Cisco's Intelligent Automation for Cloud Solution

The Cisco Intelligent Automation for Cloud solution offers IT teams a fully integrated stack of management software for automated private cloud application and infrastructure provisioning, workflow orchestration, self-service, and service catalogs. As shown in Figure 2, Cisco Intelligent Automation for Cloud components include:

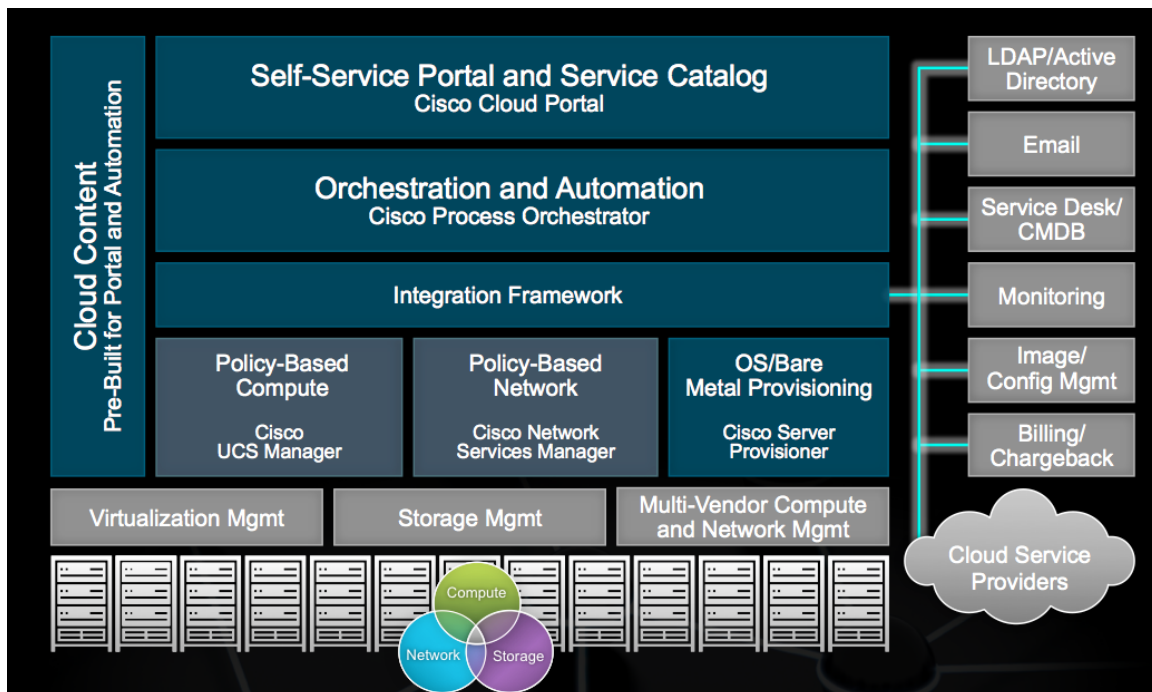
- An adapter framework capable of integrating with a heterogeneous range of physical and virtual system element management APIs and linking to service desk, CMDB, billing, chargeback, and monitoring tools
- The ability to integrate infrastructure, operating system, and application software provisioning automation using the Cisco Server Provisioner
- A global orchestration and reporting engine that manages service models and orchestrates the automation of the various provisioning activities needed to deliver services to end users (This module also includes a reporting and analytics capability using the Cisco Process Orchestrator.)
- Self-serve provisioning interface and service catalog powered by the Cisco Cloud Portal (This Web-based self-service portal allows users to order and manage services and provides built-in policy enforcement and tracking.)

- Out-of-the-box templates and best practices provided by Cloud Automation Packs, which contain a set of preconfigured workflows for common private cloud computing tasks, including VMware task automation, Cisco Unified Computing System (UCS) Manager task automation, Cisco Server Provisioner task automation, and automation of core and common activities that span multiple domains
- Application-specific Automation Packs that provide standard best practice workflows and automated service provisioning templates, as well as ongoing operations monitoring and reporting, out of the box for critical application environments such as SAP (Tools are also provided to enable customers to write their own automation scripts.)

Cisco Intelligent Automation for Cloud is designed to enable nontechnical users to use a self-service interface and service catalog to order and provision predefined solutions such as SQL servers and development software images, without needing to contact the IT organization directly. Underlying orchestration technology and adapters integrate workflows across a range of heterogeneous infrastructure resources and third-party management tools. The product is accompanied by an Advanced Services engagement with Cisco or a Cisco-certified partner. This engagement is targeted at integrating the solution with hardware managers and service management tools existing in the customer's environment and building out an initial set of workflows for service delivery and operational management.

Figure 2

Cisco Intelligent Automation for Cloud



Source: Cisco

A companion product, Cisco Intelligent Automation for Cloud Starter Edition, packages together a subset of the Cisco Intelligent Automation for Cloud capabilities to provide UCS customers with the core tools needed to automate and orchestrate physical and virtual server provisioning activities in that environment. Customers can upgrade this edition to the full Cisco Intelligent Automation for Cloud when desired without losing the value of their initial investment.

Recognizing that many customers are still in the early stages of their cloud journey, Cisco provides a range of start-up and ongoing support services to make sure that customers get the value possible from their investment in Intelligent Automation for Cloud. Available services include:

- Cloud assessment
- Service profile design and deployment
- Change management and workflow automation design
- Testing and verification
- Virtual and physical infrastructure installation and deprovisioning
- Capacity optimization
- Routine maintenance and ongoing operational support

Cisco's goal is to enable customers to reduce the cost and complexity of application provisioning and operations in virtualized datacenters and cloud environments.

Challenges

Many IT organizations that are in the early stages of developing production-scale private cloud automation and orchestration strategies may struggle to effectively collaborate with business stakeholders in defining standard services, fully automating end-to-end workflows and approvals, and gaining business buy-in for self-service initiatives. IT decision makers want to avoid creating yet another IT silo and want to understand how to best integrate cloud management and automation into existing system and application management environments and workflows. They also need to understand how to best align the management and control of private cloud resources with public cloud services to provide end users with a seamless day-to-day experience.

As a relatively new entrant in the market for cloud automation and orchestration, Cisco needs to help customers with governance as well as technology challenges and demonstrate its ability to integrate with existing heterogeneous environments. It also needs to clearly show customers how using its solution will simplify and streamline operations and rapidly deliver ROI.

Conclusion

IDC believes the combined market for public and private cloud systems management software will reach \$3.1 billion by 2016. Enterprise IT customers are actively evaluating and piloting private cloud automation and orchestration solutions today and can be expected to transition from pilots to production solutions at an increasing rate over the next several years. If Cisco can address customer concerns related to technology, process, and datacenter integration while providing solid proof points that Cisco Intelligent Automation for Cloud delivers on its promises, it will likely make many customers' short lists for products to evaluate in this rapidly evolving market space.

ABOUT THIS PUBLICATION

This publication was produced by IDC Go-to-Market Services. The opinion, analysis, and research results presented herein are drawn from more detailed research and analysis independently conducted and published by IDC, unless specific vendor sponsorship is noted. IDC Go-to-Market Services makes IDC content available in a wide range of formats for distribution by various companies. A license to distribute IDC content does not imply endorsement of or opinion about the licensee.

COPYRIGHT AND RESTRICTIONS

Any IDC information or reference to IDC that is to be used in advertising, press releases, or promotional materials requires prior written approval from IDC. For permission requests, contact the GMS information line at 508-988-7610 or gms@idc.com. Translation and/or localization of this document requires an additional license from IDC.

For more information on IDC, visit www.idc.com. For more information on IDC GMS, visit www.idc.com/gms.

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