

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

Automated Provisioning and Orchestration is Critical to Effective Private Cloud Operations

March 2011

Adapted from *Market Analysis Perspective: Worldwide Enterprise System Management Software 2010 — Evolving Strategies for Virtual and Cloud Datacenters*

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Sponsored by Cisco

The increasing use of virtualization and emerging deployments of private cloud computing solutions are 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 resource 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 will also highlight the ways in which Cisco Intelligent Automation for Cloud and for Compute addresses these challenges.

I. Impact of Virtualization and Cloud on Datacenter Provisioning and Operations

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. IDC's research indicates that virtual servers are now the default platform for the majority of new application deployments in enterprise-scale datacenters. IT decision makers are aggressively pursuing virtualization strategies in order to:

- Improve service levels
- Reduce the cost of capital
- Reduce power, cooling, and facilities requirements
- Improve IT operational efficiency
- Improve overall business flexibility and agility

While many organizations have found that virtualization does help to 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 are also 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 actually 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 are more complex across virtualized environments than they are in traditional, static architectures.

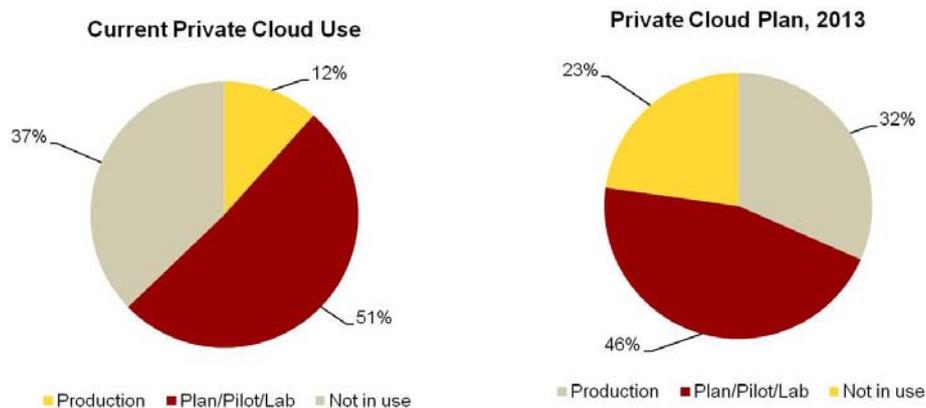
II. Strategies for Improving Operational Productivity in Private Cloud Environments

Just as public cloud services use a shared set of infrastructure resources to support multiple customers and workloads, enterprise IT teams are working to create more dynamic, shared, and standardized internal IT environments, also known as private clouds. The goal of these private cloud initiatives is to improve IT's day-to-day operational effectiveness, reduce costs, and deliver more value to business stakeholders.

The use of private cloud solutions is expected to increase in the coming years. A recent IDC private cloud management survey showed that currently 12% of organizations have any type of production private cloud solution in place. The percentage of organizations running production private clouds by 2013 is expected to nearly triple to 32%. Many of these organizations also expect to make some use of public cloud services which will result in many organizations needing to manage hybrid public/private cloud and legacy environments.

Figure 1

Private Cloud Implementation Plans



n = 250 North American IT decision makers representing organizations with 500 or more employees.

Source: IDC Private Cloud Management Survey, October 2010

Private clouds address many of today's datacenter management challenges and the potential challenges created by hybrid environments in that they shift IT's focus away from managing individual technology silos toward delivering end-to-end business services quickly and cost effectively. Private cloud solutions streamline the operation of virtualized environments by using:

- 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 in order to reduce virtual server sprawl.
- End-to-end performance monitoring and business relevant 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.

III. Benefits of Automated Cloud Provisioning and Orchestration

Based on IDC's research, more and more IT organizations are viewing private cloud solutions as catalysts for making significant changes to internal IT processes and policies in order to reduce costs, streamline operations, and improve service levels. These organizations recognize that a shift 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 implementing significant transformations in 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 consistent definition of 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 it takes to provision — and reclaim — resources.
- Working more closely with business stakeholders to identify priorities, negotiate tradeoffs between standardization and business requirements, and making 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 in order 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 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+, resulting in significant improvements to IT management productivity and cost savings.

- Provision services and resources to the business more quickly; often they are able to reduce the cycle time from service request to service availability from multiple weeks to just a few days or hours in the case of self-service solutions.
- 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 the root cause of problems.
- Reduce business risk, assure 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 successful introduction of self-serve provisioning options. Collaborative business/IT governance and executive leadership are critical success factors.

IV. Attributes of Effective Automated Cloud Provisioning and Orchestration Solutions

Effective automated virtual system and private cloud provisioning and orchestration solutions include a number of critical attributes, such as:

- Support for heterogeneous physical and virtual environments in order 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.
- Spanning infrastructure and applications, including public cloud resources, in order to simplify and standardize workflows and ensure consistent compliance with security policies and approved configuration templates.
- Ability to integrate workflows and approval chains across technology silos in order to improve collaboration and reduce delays that can result from manual or ad hoc approval and hand off procedures.
- Vendor agnostic integration with existing heterogeneous IT management tools including service desk, service catalog, CMDB, performance monitoring, and reporting systems to the extent 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.
- Automated support for day-to-day operational activities, including system and application performance health monitoring, capacity planning, predictive analytics to improve availability and performance production environments, and configuration compliance monitoring.

Organizations that are 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.

V. Considering Cisco's Intelligent Automation for Cloud Solution

The Cisco Intelligent Automation for Cloud 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:

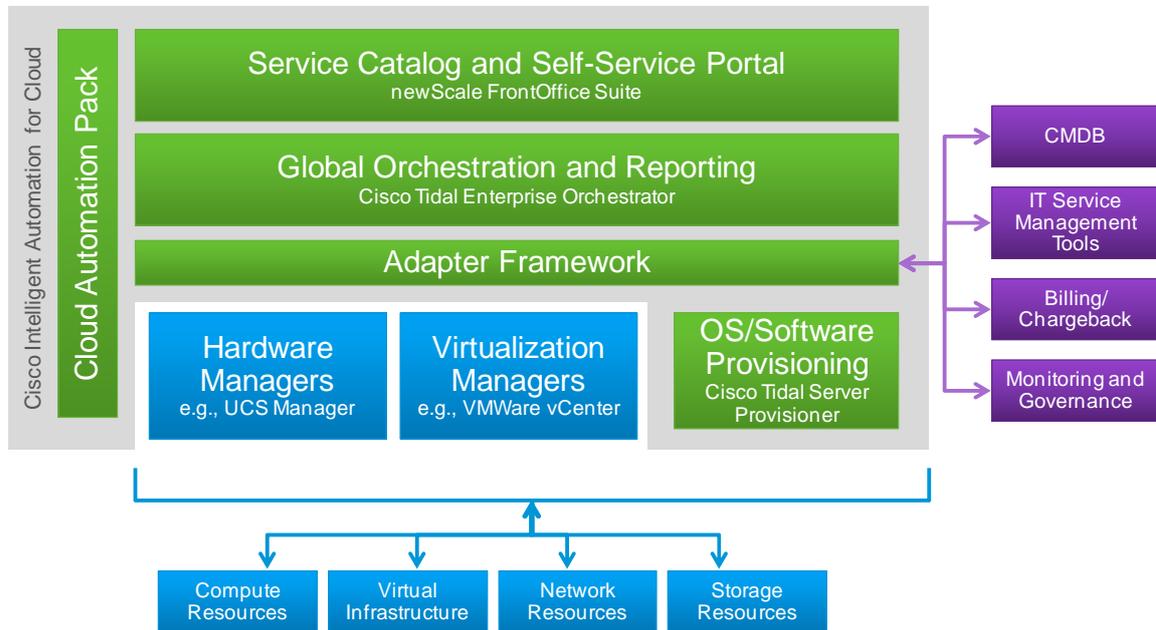
- An adapter framework capable of integrating with a heterogeneous range of physical and virtual systems element management APIs as well as linking to service desk, CMDB, billing, chargeback, and monitoring tools.
- The ability to integrate infrastructure, operating system, and application software provisioning automation using the Cisco Tidal 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.
- Self-serve provisioning interface and service catalog powered by the newScale Front Office Suite. 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 UCS Manager task automation, Cisco Tidal 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.

As shown in Figure 2, Cisco Intelligent Automation for Cloud is designed to enable non-technical users to use a self-service interface and service catalog order and provision predefined solutions such as SQL servers and development software images, without needing to contact the IT organization directly. Underlying orchestration and reporting technology and adaptors integrate workflows across a range of heterogeneous infrastructure resources and third-party management tools. The product is accompanied by an Advanced Services engagement (or, in future, a services engagement with a Cisco certified partner) that is targeted at (i) integrating the solution with hardware managers and service management tools existing in the customer's environment and (ii) building out an initial set of workflows for service delivery and operational management.

A companion product, Cisco Intelligent Automation for Compute, packages together a subset of the Cisco Intelligent Automation for Cloud capabilities to provide technical staff with the core tools needed to automate and orchestrate physical and virtual server provisioning activities.

Figure 2

Cisco Intelligent Automation for Cloud



Source: Cisco

Recognizing that many customers are still in the early stages of their cloud journey, Cisco is providing a range of startup and ongoing support services to make sure customers get the greatest value possible from their investment in Intelligent Automation for Cloud. Services available include:

- Cloud assessment services
- 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

Customers are just beginning to formulate private cloud automation and orchestration strategies and many are struggling to discover best practices for defining standard services, automating provisioning, and gaining business buy-in for self-service initiatives. Other organizations are debating whether to focus cloud efforts on public services rather than private cloud solutions. All customers are looking to avoid creating yet another cloud silo and want to understand how to best integrate cloud management and automation into existing system and application management environments and workflows.

As a relatively new entrant into the market for cloud automation and orchestration, Cisco needs to demonstrate its ability to integrate with existing, heterogeneous environments and show customers how using its solution will simplify and streamline operations and rapidly deliver ROI.

VI. Conclusion

IDC believes the combined market for public and private cloud systems management software will reach \$2.5 billion by 2015. Enterprise customers are actively evaluating and piloting private cloud automation and orchestration solutions today and can be expected to transition from pilots and production solutions this year and moving forward. If Cisco can address customer concerns related to technology, process, and datacenter integration best practices, and provide solid proof points that Cisco Intelligent Automation for Cloud delivers on its promises, it will likely make many customers' shortlist for products to evaluate in this rapidly evolving market space.

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