



CLOUD MANAGEMENT PLATFORMS

A COMPARISON OF PRODUCT CATEGORIES

ABOUT 451 RESEARCH

451 Research is a preeminent information technology research and advisory company. With a core focus on technology innovation and market disruption, we provide essential insight for leaders of the digital economy. More than 100 analysts and consultants deliver that insight via syndicated research, advisory services and live events to over 1,000 client organizations in North America, Europe and around the world. Founded in 2000 and headquartered in New York, 451 Research is a division of The 451 Group.

© 2014 451 Research, LLC and/or its Affiliates. All Rights Reserved. Reproduction and distribution of this publication, in whole or in part, in any form without prior written permission is forbidden. The terms of use regarding distribution, both internally and externally, shall be governed by the terms laid out in your Service Agreement with 451 Research and/or its Affiliates. The information contained herein has been obtained from sources believed to be reliable. 451 Research disclaims all warranties as to the accuracy, completeness or adequacy of such information. Although 451 Research may discuss legal issues related to the information technology business, 451 Research does not provide legal advice or services and their research should not be construed or used as such. 451 Research shall have no liability for errors, omissions or inadequacies in the information contained herein or for interpretations thereof. The reader assumes sole responsibility for the selection of these materials to achieve its intended results. The opinions expressed herein are subject to change without notice.

**New York**

20 West 37th Street, 6th Floor
New York, NY 10018
Phone: 212.505.3030
Fax: 212.505.2630

San Francisco

140 Geary Street, 9th Floor
San Francisco, CA 94108
Phone: 415.989.1555
Fax: 415.989.1558

London

Paxton House (5th floor), 30 Artillery Lane
London, E1 7LS, UK
Phone: +44 (0) 207 426 0219
Fax: +44 (0) 207 426 4698

Boston

125 Broad Street, 4th Floor
Boston, MA 02109
Phone: 617.275.8818
Fax: 617.261.0688

TABLE OF CONTENTS

CLOUD MANAGEMENT PLATFORMS: GOING NATIVE	1
<i>Figure 1: Cloud Adoption Is a Reality – and ‘Hybrid’ Wins</i>	1
<i>Figure 2: Best Execution Venue for Workloads by Cloud Type</i>	2

CLOUD MANAGEMENT PLATFORMS	3
TECHNOLOGY	3
CULTURE	3
<i>Figure 3: Roadblocks to Cloud Evolution.</i>	4

CLOUD MANAGEMENT PLATFORM : SERVICE CATALOG	6
<i>Figure 4: CMP Capabilities.</i>	6

LEGACY CMP VENDORS	7
BMC	7
RED HAT	7
VMWARE	8

CLOUD-NATIVE CMP VENDORS	10
RIGHTSCALE	10
SCALR	10
OTHERS	11

THE 451 TAKE: ‘MY CLOUD, MY WAY’	12
---	-----------

CLOUD MANAGEMENT PLATFORMS

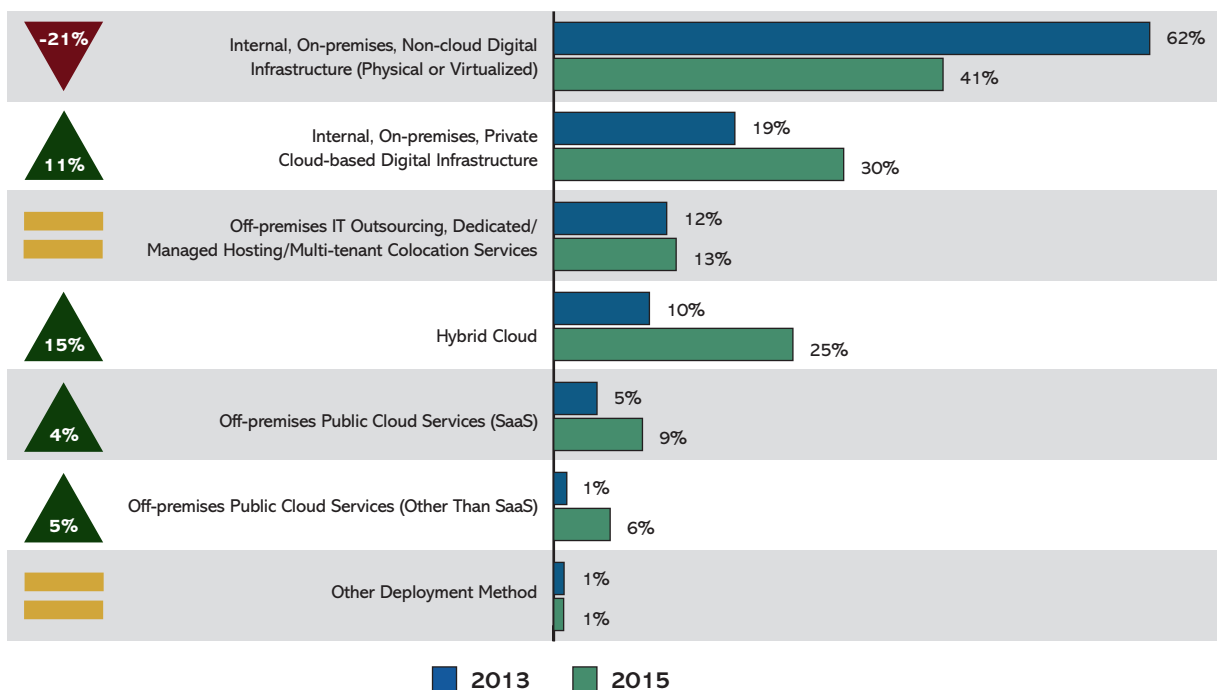
Going Native

Cloud adoption is a reality. Demand for delivering IT at lower cost is growing and irreversible. The increased experience of using 'new style' IT services – principally cloud and new-generation applications – underpins this shift. These economic pressures and the rise of the cloud have IT departments thinking more like businesses, striving to transform themselves from cost centers into ITaaS-delivery organizations. The most recent Corporate Cloud Computing Trends survey analysis from ChangeWave Research, a service of 451 Research, indicates steady and strong demand for public cloud services, with 41% of those surveyed currently using public clouds. Planned use is also indicative of growth, as 35% of current cloud users plan to increase their cloud spending over the next six months.

For many enterprises, it is cost and the economic model that drive an initial business case for cloud adoption, usually on the back of a particular project or application. Almost without exception, however, 451 Research finds that the main driver of ongoing and accelerated adoption among cloud users is not cost, but rather the greater agility and flexibility that the cloud model brings, especially in terms of time-to-provision, time-to-market and, therefore, time-to-value. This is delivered via the cloud's self-service, consumption-based model, and it applies whether we are talking about public, private or hybrid clouds. In fact, 451 Research's Wave 6 Cloud Study finds that by 2015, 25% of enterprises will be deploying workloads and applications into some type of hybrid cloud environment (see Figure 1).

FIGURE 1: CLOUD ADOPTION IS A REALITY – AND 'HYBRID' WINS

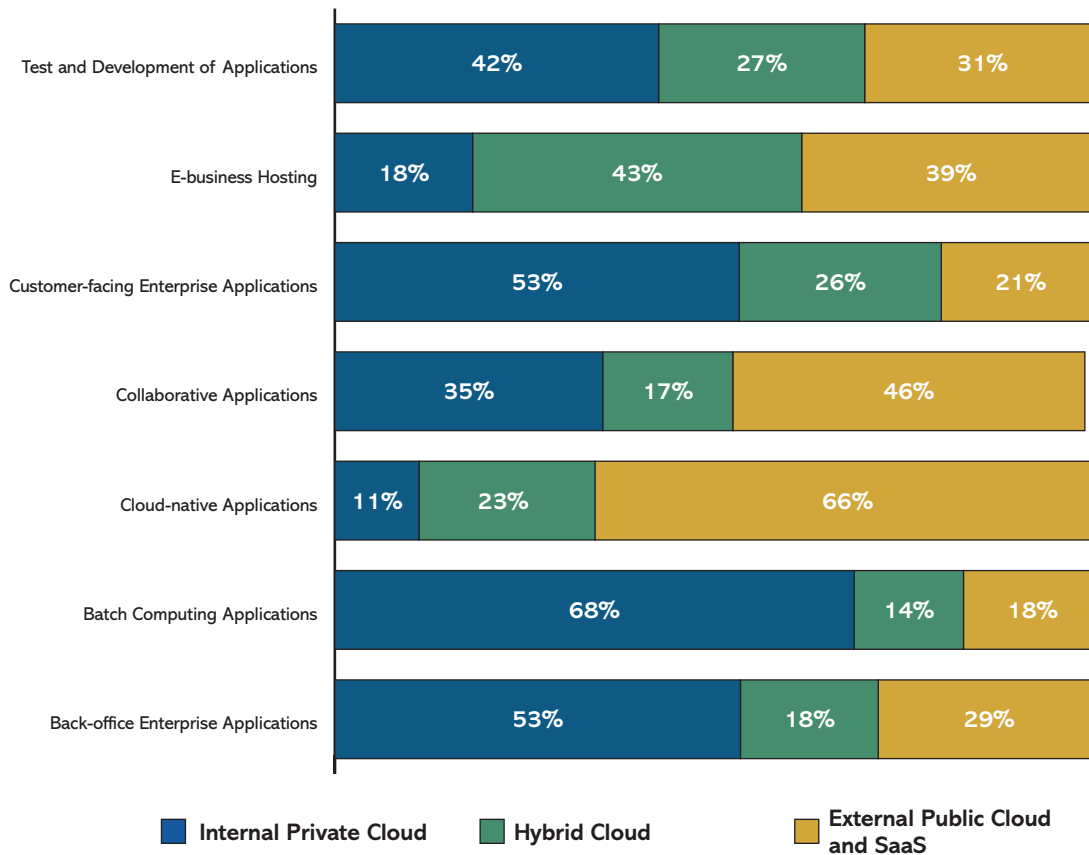
For each of the major Digital Infrastructure deployment methods, how are your IT services (% of applications/workloads delivered) distributed?



451 Research's Wave 6 Cloud Study data also illustrates how different execution venues will be required for different workload and application types. Private cloud is the preferred option for the majority of enterprise workload types, followed closely by hybrid cloud deployments. What this indicates is that there will be a very real need for management tools that can operate across the spectrum of cloud delivery models to support this enterprise demand (see Figure 2).

FIGURE 2: BEST EXECUTION VENUE FOR WORKLOADS BY CLOUD TYPE

For each of the following categories of workload/business functions, what is your primary deployment method likely to be in the next two years (internal private cloud, external public cloud, hybrid cloud or SaaS)?



CLOUD MANAGEMENT PLATFORMS

To meet these enterprise needs, a seemingly endless stream of cloud management platforms (CMPs) are emerging. Every management platform, it seems, is now a CMP. However, it's important to recognize that they are not all created equally. They come from various starting and design points, which will have a direct bearing on their suitability for specific purposes.

While it may be a no-brainer for organizations that are 'straight to cloud' or have a 'cloud first' policy, for other organizations, the use of a cloud-native CMP – one that encourages work-flows and practices that are native to the cloud – may not be straightforward. Some may want to adopt cloud, but not a cloud-native CMP.

TECHNOLOGY

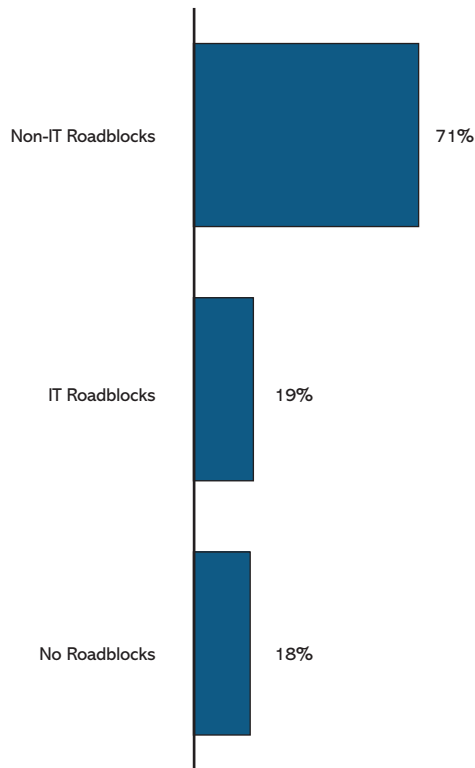
Support for a cloud-native approach is important when considering a CMP for cloud infrastructure design and application management because cloud-native architectures are different from traditional IT infrastructure. First and foremost, they are fully automated. Every resource is considered disposable because it is so easily replaceable. Moreover, using automation, cloud-native applications are able to autonomously handle scaling needs, and can withstand failures with the addition of hosts and the provision of replacement nodes. When applications can autonomously commission and decommission resources using the cloud platform's APIs, it is easier to design for failure and distribute workloads across instances. In a sense, cloud-native applications provide for their own lifecycle management, and do not rely on the underlying infrastructure to provide it.

CULTURE

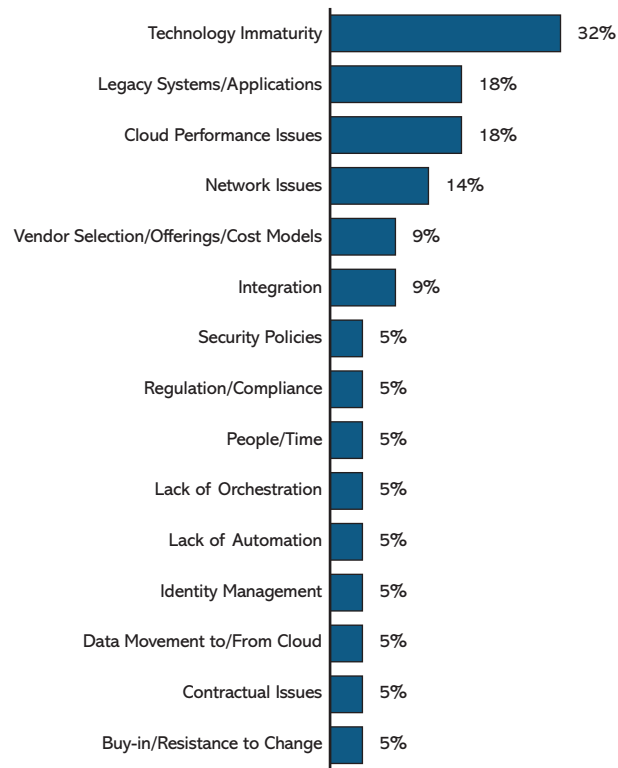
In many ways, technology is less important in the decision to adopt cloud and CMPs than the cultural and organizational maturity of processes and change management required by organizations in order to make use of and benefit from cloud services. 451 Research believes cloud adoption takes place over a number of phases – standardization, consolidation, virtualization, automation, orchestration, etc. – and we found that over two-thirds (71%) of organizations surveyed in our Wave 6 Cloud Study are being held back from reaching the next phase by non-IT roadblocks, which is more than three times the percentage facing IT-related roadblocks (see Figure 3). The percentage of respondents citing buy-in and resistance to change as a roadblock increased to 26% from 11% in the previous survey.

FIGURE 3: ROADBLOCKS TO CLOUD EVOLUTION

ROADBLOCKS TO REACHING NEXT PHASE



IT ROADBLOCKS



Traditionally, developers file a ticket with the IT department when they need access to infrastructure resources. IT processes the ticket and provides the developer with the access needed. Developers have very limited control over the infrastructure they use, and it may take a long time to get it with all the manual steps required, reducing overall time to market. However, IT is able to do its job and keep operational, financial and legal risk in good shape by checking all infrastructure requests for compliance with internal policies, particularly in terms of cost-control, security and any legal regulations.

In a cloud model, though, developers make infrastructure requests directly to the cloud platform, so manual steps are eliminated, and the process is executed much faster. In effect, ownership of the provisioning process is transferred from IT to the developers. This leads to agility, faster time-to-market and a better competitive position in the marketplace for the company. However, developers gaining control of this process – and IT losing control of it – can also be seen as engendering increased risk when it comes to cost-control, security and legal compliance. This makes CIOs cautious.

Approaches that seek to impose legacy processes onto a cloud model may be equally risky, and could end up being more costly and less safe in the end. For example, if all of the red tape associated with approval is simply moved to the cloud without changing the underlying process or culture, all that's really happening is that the hardware underneath is changing.

CMP suppliers are in a tricky position, then. They must preserve the agility and self-service model that led the business to adopt cloud in the first place, while at the same time allowing IT to retain control. Failing to do so will result in pushback from developers, and a return to 'shadow IT,' where developers get their infrastructure directly from public cloud providers and bypass IT altogether.

Adopting a DevOps culture is one approach here – it increases communication and cooperation between developers and IT operations. But cultural changes at a large enterprise can take a long time. The optimal solution is to have a self-service provisioning platform that enables IT control, without creating overhead for developers. This would result in CMPs with automated IT controls built into the provisioning process itself, which are transparent to developers. This approach enables the shared ownership of infrastructure resources between developers and IT. Additionally, successful CMP vendors will help users implement the cultural shift required, in a way that doesn't slow down developers.

CLOUD MANAGEMENT PLATFORM

Service Catalog

A CMP can provide a range of capabilities to support the needs of organizations using hybrid clouds and multiple suppliers. Figure 4 summarizes many of these. The more features that are made available in a product, the greater the overall CMP capability. The CMP is not necessarily a supplier or developer of these features, but must integrate or interoperate with them.

FIGURE 4: CMP CAPABILITIES

FEATURE	AUDIENCE
Supports hybrid cloud networking (multi-vendor, public, hosted)	DevOps and enterprise business users
Supports private cloud offerings	Both
Supports vendor and user service blueprints	Enterprise business
Supports VM provisioning, HA, scaling, recovery	DevOps
Integrates with developer tools (such as Chef or New Relic)	DevOps
Offers a self-service portal, service catalog	DevOps
Integration/migration (transformation engine)	DevOps
Provides workload placement recommendations	Enterprise business
Offers consumption management/optimization recommendations	Enterprise business
Supports role-based access control/security	Both
SaaS and on-premises license models	Enterprise business
Offers app monitoring and system tool extensions (patching, backup, OS monitoring, etc.)	Both

LEGACY CMP VENDORS

BMC

BMC Software has worked hard to transcend its humble mainframe origins, chiefly with an IT service management (ITSM) business, of which Remedy is the crown jewel, and by extending its BladeLogic and ProactiveNet acquisitions to the fast-growing cloud-enablement market in the shape of Cloud Lifecycle Management (CLM) and Cloud Operations Management (COM). These live in the Data Center Automation and Cloud Management product line, a \$200m business with more than 800 employees run by Chris Keene.

When BMC launched CLM in 2010, the product was the logical application of BladeLogic's provisioning automation techniques to the enterprise cloud environments that BMC hoped would be its future. CLM dynamically provisions a services stack – server, network and storage allotments, plus applications – across more or less any hardware and virtualization platform you'd expect to find in a modern enterprise datacenter. A catalog provides role-based access to services, SaaS requests and provisioning, and a portal allows users to request resources and workflows, enforce compliance policies, and spin up monitoring tools across the whole architecture.

CLM features a self-service portal, policy engine, chargeback, metering and blueprints, plus a Service Governor. In addition to supporting on-premises private clouds utilizing Citrix XenServer, VMware vSphere, VMware vCloud Director, OpenStack, IBM pSeries and Microsoft Hyper-V, it also supports Amazon Web Services, Microsoft Azure, CenturyLink and Verizon Terremark hosted clouds.

If CLM is BladeLogic adapted for the cloud, then Cloud Operations Management is the cloud phase of ProactiveNet and Neptuny. Like CLM, COM uses automated workflows – in its case, to monitor cloud services as soon as they are deployed and to automate chargeback reports, triage and repair.

BMC's CLM is targeted at enterprise clouds, but is not cloud-native – extensions to support Amazon and Microsoft public clouds came later on in its evolution, and the company is still working to check all of the CMP boxes.

RED HAT

Red Hat created a dedicated Cloud Management business unit in January 2014, rolling up its CloudForms cloud management platform and tools (based largely on its 2012 acquisition of ManageIQ). ManageIQ launched in 2007 as a VM management tool. Its management team hailed from change and configuration management company Novadigm (acquired by HP), and the Cloud Management group at Red Hat is now run by ManageIQ cofounder Joe Fitzgerald.

The CloudForms code base is now mostly inherited from ManageIQ's Enterprise Virtualization Management Suite, which is written in Ruby on Rails. Indeed, the current 3.1 release of CloudForms is based on the now-open-sourced ManageIQ code. It can provision servers and storage, and provides chargeback billing for capacity, plus VM lifecycle management, and it has an analytics engine. It was designed as a platform and has a service catalog and portal. CloudForms supports Red Hat (KVM), VMware vSphere and Microsoft System Center Virtual Machine Manager, as well as the OpenStack cloud platform, and Amazon, Google and other public clouds. It is integrated with ServiceNow, as well as the systems management tools from BMC Software, HP, IBM, Microsoft and others.

ManageIQ's core expertise was in helping customers adopt and manage VMware virtualization, and this remains the case. The major use case for CloudForms is among 100% VMware ESXi shops that are building private clouds, and especially running Windows workloads within those environments. Other use cases are now coming onto the radar – including Azure and OpenStack – albeit slowly. Red Hat sees VMware users now also wanting to manage OpenStack, especially where new workloads have been created specifically for use on OpenStack.

Red Hat is pushing CloudForms into use as a set of open-source tools for managing multi-vendor clouds in public, private and hybrid deployment models. However, its bread-and-butter business is in supporting VMware private cloud management, with other use cases being supported gradually.

VMWARE

VMware has recently re-branded its CMPs to enhance its position as a supplier of tools not only for VMware, but also heterogeneous environments and hybrid cloud.

The company has created a portfolio called the vRealize suite, the key component of which is vCloud Automation Center 6.1 (in both Advanced and Enterprise Editions). It also includes other existing VMware products: vCenter Operations Management Suite 6.0 (advanced and Enterprise); vCenter Log Insight 2.5; and IT Business Management Suite Standard Edition 1.1/8.1. Now known as vRealize Operations, Automation and Business, these are on-premises services. They can also for the first time be consumed via a SaaS model: vRealize Air Automation is in beta and is delivered from vCloud Air. The components are called vRealize Air Operations, Automation and Business. This will make vRealize look more like other cloud management consoles.

The vRealize offering is positioned as extending vCloud Suite to manage OpenStack, AWS, Hyper-V, KVM, bare-metal and vCloud Air. Indeed, until recently features of VMware's hosted cloud service vCloud Air (nee vCHS) could only be accessed by customers running the on-premises version of vCloud Automation Center (vCAC) and vCenter Operations Manager. Until now, VMware's hosted cloud service customers couldn't take full advantage of the automation, management and monitoring functions these provide unless they bought an on-premises license to vCAC. This was a large enterprise-only undertaking. But now vCloud Air users don't need to run vCAC or other components internally.

The vCloud Suite, now at v5.8, is positioned as a set of tools for managing on-premises vSphere-based private clouds. It includes vSphere, vCenter Site Recovery Manager, vCenter Operations Management suite and vCAC.

VRealize Automation (formerly vCAC) is based on the DynamicOps Virtual Resource Manager technology, which had been in development as a research project at Credit-Suisse in 2006, and was eventually spun out as a separate company in 2008. VMware acquired DynamicOps in 2012. The software has a strong command-and-control design philosophy, having been built by banking IT engineers for use by banks, on the Windows Workflow Foundation. It doesn't have a 'native cloud' starting point, and it's regarded as useful for supporting groups that want to retain control of IT, while it's less useful for servicing DevOps with workflows. VRealize Automation has also inherited a range of management features from vCloud Director, including the portal, lifecycle management and multi-tenancy, according to VMware, as well as application management in the form of vFabric App Director, which is bundled in. VMware's prior tool for hybrid cloud management, vCloud Director, has been pulled back into the main development trunk, and is now being positioned as the tool for service providers.

As it seeks to extend its business from a technology provider to a service provider, VMware is beginning to take steps to enfranchise the use of hosted and third-party clouds. However, its starting position is managing VMware virtualized environments and, until recently, managing only on-premises environments. So at the same time, the company has to ensure that the transition from 'traditional' virtualization to cloud-based IT doesn't affect its bottom line. With 500,000 customers and 40 million servers virtualized, VMware has a large base of customers to retain and convert to cloud use.

VMware sees its role as helping IT shops transition into acting as service brokers for their companies, managing clouds on both sides of the firewall. However, VMware's approach is squarely focused on helping IT administrators. This contrasts with many other cloud platform strategies that approach the cloud through developers first, bringing in IT admins afterward.

CLOUD-NATIVE CMP VENDORS

RIGHTSCALE

Since it launched in 2007, RightScale has been (and continues to be) the benchmark for born-in-the-cloud management. It recognized from the very outset that the cloud was not for the technology faint-hearted, and it offered users a template-based SaaS experience for creating a new application that could be deployed to and managed on AWS, and then other clouds. Over time RightScale has added hybrid and multi-cloud management capabilities, and it is now focused on becoming a full-fledged enterprise management provider, adding features such as cloud analytics and a vSphere appliance that connects to VMware environments and presents them as clouds to users. Here, it appears to be taking advantage of the perceived weakness in VMware's own offerings by bolstering support for self-service access to vSphere environments so that application developers, DevOps teams and others beyond systems administrators (where VMware is focused) can more easily leverage VMware environments.

RightScale Cloud Portfolio Management is an integrated software suite that includes self-service, cloud management and cloud analytics. It supports IaaS resource pools across public clouds, private clouds and virtualization. RightScale's most common customer profiles are multi-cloud and hybrid users, as well as those requiring management of cloud infrastructure alongside hosted and traditional datacenters. This multi-cloud and hybrid cloud use is being driven by enterprise organizations that are leveraging clouds beyond AWS – typically Azure, Google Compute Engine, Rackspace or VMware. As these organizations expand to other clouds, they don't want to start from scratch; they would prefer to apply their experience and expertise with cloud thus far to expedite the efficient use of multiple clouds. Moreover, they demand SaaS-like services rather than heavyweight datacenter installs.

RightScale is at an inflection point, with global offices, well over 200 employees and strong revenue built on AWS and Rackspace Cloud users. It is starting to make a serious foray into the enterprise, but as cloud use normalizes, the large vendors will turn to meet the demand, and RightScale has to move swiftly before they do. It has begun adding support for hybrid environments, and its enterprise business is growing, but its core business and domain expertise is in new application deployment and management on AWS.

SCALR

Scalr's open-source Cloud Management Platform has been designed from the ground up to manage multi-cloud infrastructure – public, private and hybrid. It's been in the wild since 2008, and the company now has over 700 customers, including Samsung Electronics, NASA, Oracle and Expedia, demonstrating a broad cross-sector and multi-function capability. These are mostly enterprise end users, but Scalr also has some service-provider customers.

As a counterpoint to the focus of traditional management frameworks, which is typically for use by the IT administrator, Scalr offers more of a DevOps approach to cloud management, enfranchising the developer. It's aimed at handing control back to the user (whether it's an enterprise or service provider), enabling them to deliver cloud services via a self-service portal, and to monitor cost and chargeback for use. To that end, Scalr has cost analytics tools built into its CMP, and by merging cloud management with cost control, Scalr believes its software can help enterprises better associate cloud costs with IT delivery. The result is more accurately allocated costs and quicker resolution of financial issues.

Scalr provides control over resources, while at the same time empowering developers with services that can be provisioned more quickly than via traditional internal IT, thereby reducing the recourse to 'shadow IT' and improving productivity. With this clear line of sight – serving developers as well as IT with management capabilities – Scalr has been ahead of the curve when it comes to DevOps. As enterprises and service providers adopt more agile DevOps methodologies and seek to contain shadow IT, Scalr's appeal and opportunity will broaden.

Scalr, which is open-source under the Apache 2.0 license, is offered as an on-premises license (the one used by most enterprise customers) and as a hosted SaaS offering. Most enterprises opt for the on-premises option, given security policies, operational risk, compliance, and regulatory and other concerns. Scalr's customers point to its support for end-to-end automation of IT requests and fulfillment across private and public clouds, which enables them to optimize workload placement across cloud environments in terms of regulatory compliance, performance and cost management. Scalr supports backup, disaster recovery, application deployment, auto-scaling and provisioning to meet these needs. Importantly, it also provides flexibility, enabling customers to both add and eliminate vendors, as well as integrating with a customer's existing practices and tooling for application delivery and ITSM.

OTHERS

There are numerous cloud-native CMP vendors in the market, and many of them are recent startups. However, most important among those not profiled in detail here are incumbent vendors that have been quick to recognize the need for a cloud-native CMP and have bought their way into the space rather than developing their own tools.

In acquiring Enstratus and ServiceMesh, respectively, Dell and CSC have arguably taken out two of the leading independent cloud-native CMPs that had been competing with RightScale, Scalr and others. Both Dell and CSC have recently delivered updates to these CMPs following the acquisitions (Dell Cloud Manager and CSC ServiceMesh), and we expect them to become more competitive going forward.

THE 451 TAKE

'My Cloud, My Way'

Legacy CMPs by their nature tend to have strong integration with traditional enterprise tooling, such as ITSM and deep domain expertise around specific technology, like on-premises VMware. The downside is that support for public and private clouds is an add-on in most cases – it's not in the DNA of the CMP – and is usually immature as well. CMPs spawned from a traditional systems management heritage will have a focus on giving control to IT administrators rather than enfranchising developers, and have typically been slower to recognize the importance of DevOps. Lack of platform APIs leave them vulnerable to being swapped out for more flexible approaches.

Cloud-native CMPs are in many cases regarded as relative newcomers to the market, which will lead to justifiable questions about business viability. Organizations that are risk-averse will seek customer references and evidence of long-term sustainability before entrusting management tasks to third parties. However, the benefits of using a cloud-native CMP are that it supports cloud's design points: automation, scalability and failover. Being 'born in the cloud,' these CMPs are typically API-rich. Integrations are easier, and they can quickly be extended to support new services. They are architected in such a way as to provide control for IT and quicker time to provisioning for developers. They offer organizations a starting point from which to deliver ITaaS.

This is a long-term game. An IBM or HP can afford to not do anything here for many years and still come out on top by acquiring market leaders. We wouldn't bet against the CMP opportunity ultimately rolling up to the incumbent management framework vendors, which have proved very resilient over the years.

Successful CMPs will enable customers to consume cloud the way they want to, rather than enforcing a prescriptive approach. The more of the features outlined in Figure 4 that are available in a product, the greater the CMP's capability, whether legacy or native.

Cloud service provider evaluation by enterprise end users at 451 Research's Cloud Computing Executive Summits generated a set of best-practices recommendations, which will be useful in assessing the suitability of CMPs:

- Avoid vendor lock-in.
- Ensure that you are in the driver's seat when it comes to data locality, security and recovery.
- Seek enterprise-grade offerings – multiyear, up-front payment terms, indemnification.
- Regain control over shadow IT.
- Runaway costs are a real fear. Predictable pricing models are required (cost/spend management/optimization tools).

- The ability to manage flexibility – to turn services on and off – is critical.
- Secure, HA services at low cost are key – inner workings of service delivery are *FAR* less important.
- The engagement model should start with this question: What do you want to achieve, and how do you want to achieve it?
- Can it deliver 'My cloud, my way?'

William Fellows, Vice President, Research

William.fellows@451research.com