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# Cloud Management Market Survey and Analysis: A New Business Imperative Emerges

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## Executive Summary & Key Findings

### KEY FINDINGS

This research is the result of an extensive survey of 166 US-based enterprise IT organizations regarding their use of cloud infrastructure and the management and automation of the associated processes and technologies. The survey revealed several key findings:

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**Enterprise IT environments are transforming rapidly.** Over 50% of those surveyed indicated that they are currently using (or planning to use in the next 12 months) container and orchestration technologies. An even greater percentage (63%) have adopted or plan to adopt automation technology. (See Trend 1).

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**Increasingly, IT organizations are tasked with managing multiple cloud environments.** 75% of surveyed organizations say that they are currently using more than one cloud. (See Trend 2).

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**While many companies have some level of cloud management processes in place, business challenges are requiring IT to rethink how they manage through this rapid change.** 52% of enterprises surveyed said they currently have a cloud management platform in place, while 29% have budget allocated and are piloting such technology (see Figure 7). However, survey results show that current cloud management tools fall short in terms of solving some of the key business problems: response time is too slow; creating, managing and tracking digital assets is difficult; VM sprawl is growing; and most tools lack a single interface to view the entire environment.

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**A new business imperative has emerged for companies to examine how they leverage cloud management technologies to automate and orchestrate resources across hybrid cloud environments.** Organizations are successfully using cloud management platforms (CMPs) to support their entire transformation journey, even before a cloud is created internally or a hosted cloud service is selected (see Figure 9). The use of hybrid cloud increases the need for management technologies that can assist at every stage – virtualization, consolidation, automation and orchestration – and deliver a customer experience in which the infrastructure is essentially invisible.

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**For enterprise IT organizations, there is a large opportunity to provide cross-cloud capabilities that address the technology evolution and business demands for increased speed and agility. Cloud management technologies will be central to capitalizing on this opportunity.** To deliver the ‘build faster, run better, lower cost’ benefits to the business, IT teams will require CMPs that can offer multi-cloud service acquisition and control to support the change and complexity associated with IT transformation.

## EXECUTIVE SUMMARY

A cloud management platform provides a set of functions enabling organizations to find, access and manage public, private and hybrid cloud resources. The greater the number of functions available to the user, the better a CMP can help navigate the cloud transformation journey.

With the use of multiple cloud services the de facto reality of IT today, helping enterprises achieve and manage the optimal mix of resources and service types in hybrid IT deployments via a CMP will be a key opportunity for cloud service brokers.

Organizations are increasing their use of third-party clouds – ‘Amazon + 1’ is becoming the CIO’s organizing principle as 75% of companies surveyed say they are now using more than one cloud environment. In order to manage these efficiently, a CMP is becoming a business imperative, not an option.

Most of those surveyed are using multiple tools to manage their cloud assets, which will favor modular, self-service approaches to CMP delivery. This will allow organizations to use best-of-breed approaches and existing tools where appropriate.

CMPs are being successfully used to assist with the journey to virtualization, automation and orchestration, even before a cloud is created or selected. A CMP has a role in helping users manage the process of change and complexity, which leads to the deployment and selection of cloud services.

A CMP can subsequently take care of cloud service aggregation, acquisition and integration. It helps accelerate cloud adoption by shrink-wrapping and de-risking those services, placing the focus on the business outcomes rather than technology outputs.

While CMPs are being used by more than 50% of our survey group, there remain key management deficiencies that need to be addressed. Users require:

- Faster provisioning and response time
- Better cost and utilization reporting
- VM sprawl management
- A single interface to view environments.

These are the specific opportunities that CMP market participants should target going forward.

## BENEFITS OF USING A CMP

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A CMP enables data-driven decision-making.

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Most organizations are still grappling with virtualization and consolidation - a CMP can support an incremental approach to the transformation journey from virtualization to automation and orchestration.

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CMPs support fixed-term and dynamic sourcing, and therefore planned and unplanned options.

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There are fewer headaches in terms of contract complexity and vendor management.

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A CMP provides ease of use and access options.

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CMPs support a mix of old- and new-style IT services.

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Automation improves user satisfaction without raising staffing levels.

## ASSOCIATED CHALLENGES

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A CMP will need to balance the competing needs of different stakeholders - the business, IT and developers.

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Culture vs. strategy - companies must have the organizational maturity required to adopt a CMP and the political will to make the changes needed to drive adoption throughout the organization.

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End-user IT literacy levels within the organization are critical.

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Who owns the paper? Does the user or CMP provider own the relationship with the cloud service providers?

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Where does the buck stop? Who owns the SLA and is responsible for its enforcement?

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What happens with IP created as part of the customization work that will inevitably be required?

## Existing IT Environment: Change and Complexity

Enterprise adoption of cloud is a *fact*. Cloud computing is causing a rethink of how IT is consumed, and a gradual change in actual consumption. There are three key trends to consider here.

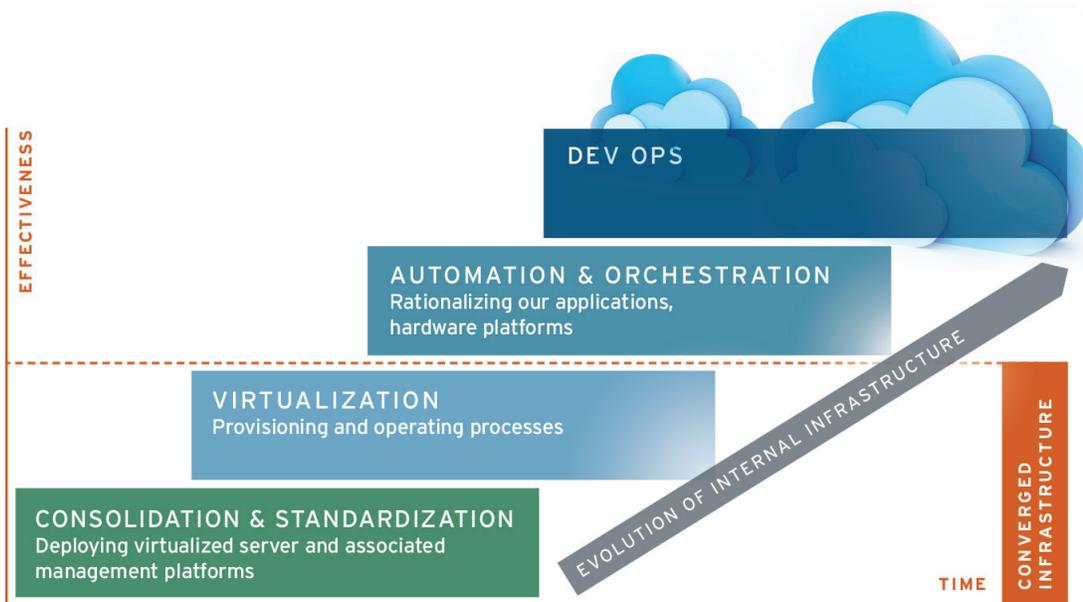
### TREND 1: INTERNAL TRANSFORMATION - PRIVATE CLOUD

First, enterprises are busy transforming their internal IT environments, and where possible are seeking to emulate the success and capture the benefits enjoyed by public cloud providers.

Of those enterprises surveyed, most are maturing in their cloud efforts. Along our 451 Private Cloud Maturity Curve, 35% of organizations have moved beyond virtualization onto automation and orchestration as they transform and seek to increase efficiency, flexibility and agility.

Figure 1: Cloud Maturity Curve

Source: 451 Research



451 Research survey results show that enterprises are increasingly adopting cloud-enabling technologies to support this goal. Over 50% of those surveyed indicated that they are currently using (or planning to use in the next 12 months) container and orchestration technologies. An even greater percentage (63%) have adopted or plan to adopt automation technology. This is no longer just an 'early adopter' market.

Figure 2 shows that 54% of enterprises surveyed have containers in use or plan to have them in use in the next six months. Docker and Rocket are driving adoption, with LXC also in use.

### Figure 2: Enterprise Container Usage

Q: Which of the following best describes your company's use or planned use of containerization systems, such as Docker?

Source: 451 Research

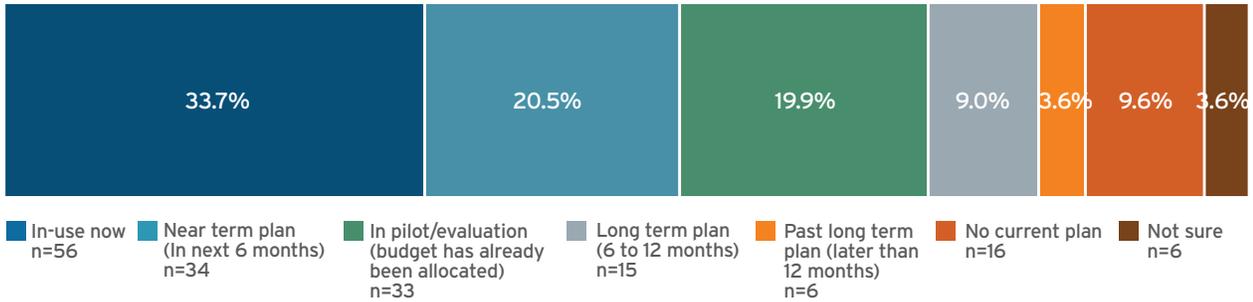


Figure 3 shows that 58% of organizations are using orchestration or plan to do so within the next six months. Swarm, Mesosphere, EC2 Container Service, Kontena and Kubernetes are driving adoption here.

### Figure 3: Container Orchestration Usage

Q: Which of the following best describes your company's use or planned use of an orchestration platform for your containers?

Source: 451 Research

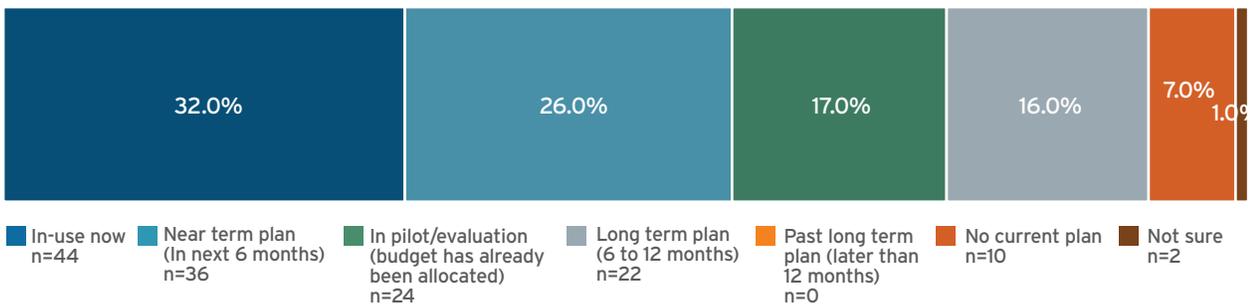
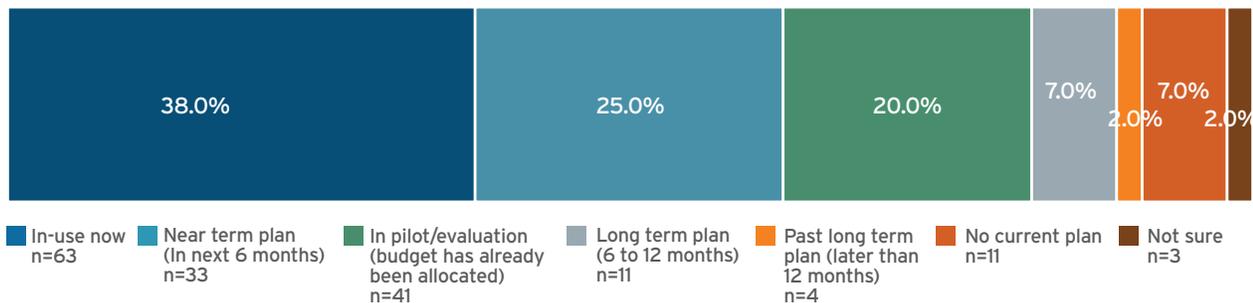


Figure 4 shows that 63% of enterprises are either using application configuration management automation now or have it in their near-term plans.

### Figure 4: Configuration Management Automation Usage

Q: Which of the following best describes your company's use or planned use of Automation systems that automate infrastructure, applications, compliance and the DevOps workflow? (such as Chef, Puppet)

Source: 451 Research

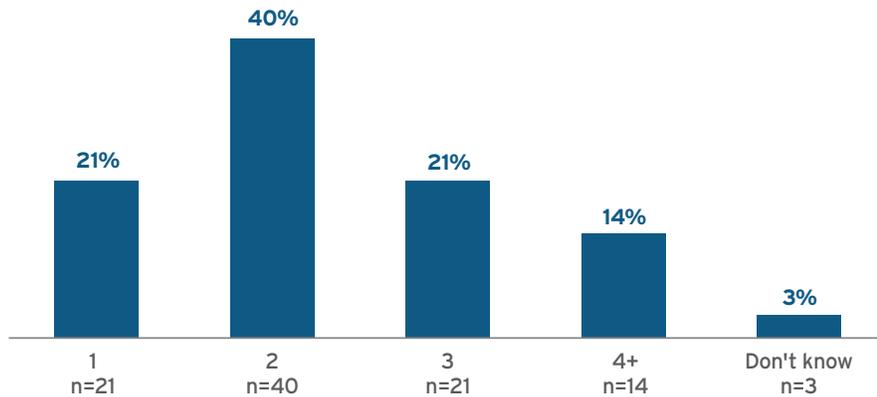


### TREND 2: INCREASED USE OF HOSTED SERVICES

At the same time they are transforming their internal IT environments, enterprises are increasing their use of third-party vendors to host business services. They are using private and public tenant options to complement or replace on-premises systems rather than source hardware and software themselves. As a result, public cloud use is growing strongly, and enterprises are leveraging multiple clouds in order to match applications, workloads and service requests to the right resources. Our survey results show that 60% of organizations are now using public cloud services, and the other 40% have it in planning – soon, the number of enterprises not using any public cloud resources will fall to near zero. More interestingly 75% of surveyed organizations say that they are currently using more than one cloud.

Figure 5: Public Cloud Providers in Use

Q: How many public cloud providers are currently in-use?  
Source: 451 Research



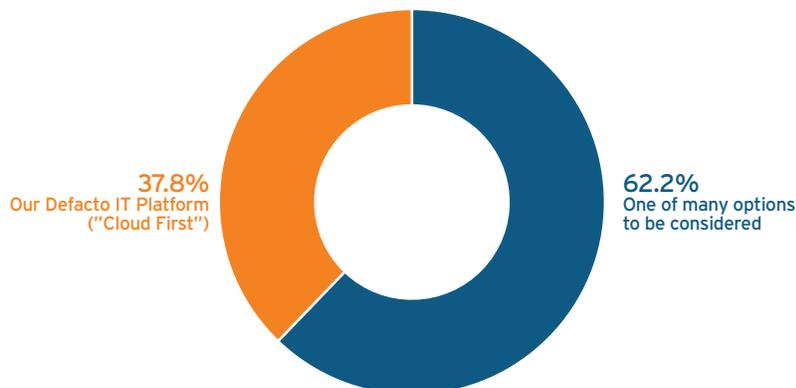
### TREND 3: EMBRACE OF 'CLOUD FIRST' POLICIES

Also accelerating the adoption of cloud computing is the increasing embrace of so-called 'cloud first' policies by organizations of all types. These approaches consider cloud before any other resources as the venue for developing and/or deploying applications and workloads.

When we surveyed 451 Research's global enterprise commentator network about such 'cloud first' policies, 38% said they expect cloud to become their de facto IT platform, as shown in Figure 6. Enterprises are getting started with cloud and various as-a-service (-aaS) deployments wherever possible, instead of starting new datacenter builds or developing infrastructure services that offer no differentiated value than can already be found in public cloud resources.

Figure 6: Cloud-First Adoption

"We expect cloud computing to be:"  
Source: 451 Research, Voice of the Enterprise, Cloud Computing, Workloads and Key Projects 2016



The combined effects of these three current enterprise trends – private cloud buildout, hosted cloud adoption and cloud-first policies – include faster change and increased complexity, which means increased load on IT departments that are already struggling to meet the requirements of the business units they support.

Thus, IT departments are now thinking more like businesses, and are seeking to transform themselves from cost centers into service-delivery organizations, while at the same time benchmarking their costs and effectiveness. The management capabilities needed to operate and control these environments will not be insubstantial.

## Complexity Drives the Need for Cloud Management Technology

The overall cloud and digital transformation journey under way means that organizations of all types must become more agile and more intelligent in their use of services.

The shift to digital processes has been introduced in every market, most often by 'digital native' entrants. However, the vast majority of organizations are not digital-native companies. This means one of the biggest and most persistent challenges facing many companies today is how to respond to a new generation of technology that is essentially aimed at destroying their core profit engines. Such technologies give consumers a better experience at a lower price, and consequently, most organizations need to respond in order to compete more effectively in the digital economy.

Enterprises must therefore undergo digital transformation – this digital transformation will enable even pure product companies to generate revenue from selling ongoing services. From a platform point of view, the task is to connect technology and information assets, customer experience and marketing while harnessing innovation in order to enhance and create new digital processes.

Coordinating these digital processes as repeatable activities results in the creation of a digital platform for applications and services that can be operated internally and will support customers and partners. This requires a different approach than classic infrastructure services because the new opportunity is about developing agile, application-centric transformational services. Moreover, it is an ongoing journey, not a one-time event or destination.

Cloud is proving to be the tool of choice for delivering digital transformation, bringing with it a baked-in process change that addresses an organization's internal operating model in some important ways. It enforces the use of DevOps (digital services require continuous improvement), and by definition it is consumption-based and service-driven, with a retail model discipline.

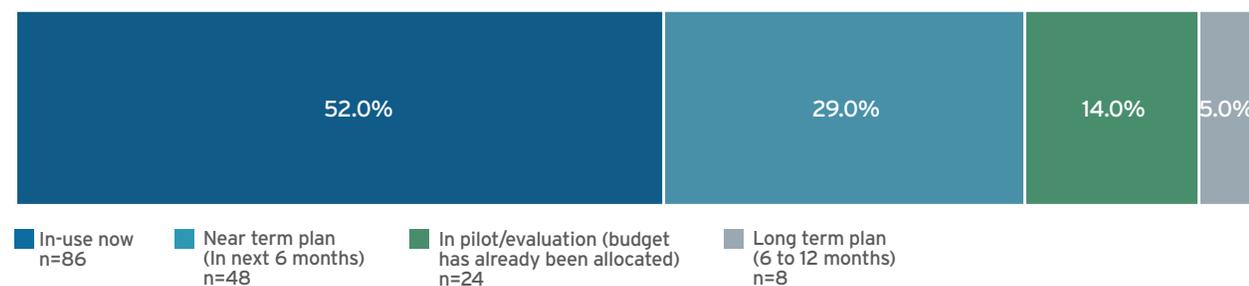
However, as increasing number of buyers are beginning to realize, a tool is only as useful as the manner in which it's used. As more and more services are used, the greater the need for tools that can harness these services to deliver meaningful business benefit. Cloud management platform technologies can assist users in navigating this transformation journey.

Figure 7 shows that 52% of enterprises surveyed said they currently have a cloud management platform in place, while 29% have budget allocated and are piloting such technology.

### Figure 7: Usage of Cloud Management Platforms

Q: Which of the following best describes your company's use or planned use of Cloud Management Platforms?

Source: 451 Research

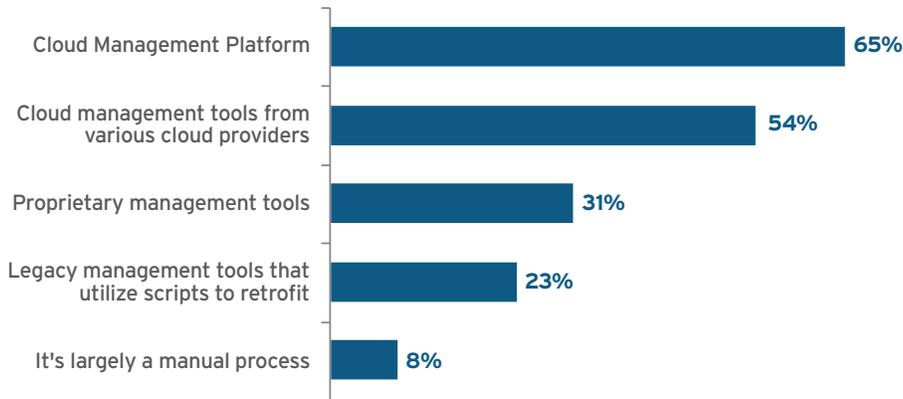


Our survey results in Figure 8 illustrate the fact that organizations are generally using multiple tools to manage their cloud environments. Of those organizations that use multiple clouds, 65% use a CMP, and 54% use tools from multiple providers. Users also employ homegrown proprietary tools, legacy tools that are retrofitted and manual processes to manage their multiple cloud environments. There is no single or standard approach.

**Figure 8: Managing Multiple Clouds**

Q: How are you currently managing your multiple cloud venues?

Source: 451 Research



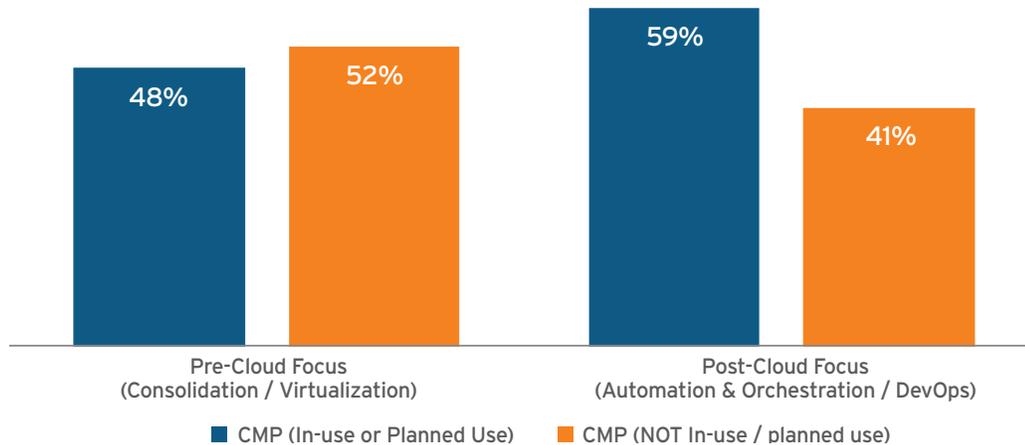
Organizations are using CMPs to support their transformation journey, even before a cloud is created internally or a hosted cloud service is selected. Figure 9 shows that CMPs have additional value in helping organizations mature their virtualization, consolidation, automation and orchestration efforts. Among organizations with a pre-cloud focus on virtualization and consolidation, 48% are using or plan to use a CMP. Even greater adoption occurs post-virtualization – 59% of organizations with a focus on automation, orchestration and DevOps are using or plan to use a CMP.

**Figure 9: CMP Adoption by Organizational Focus**

Q: When thinking about your internal environment where is your organization today, based on primary work effort and spending, along the following dimensions? n=166

Q: Which of the following best describes your company's use or planned use of Cloud Management Platforms? n=166

Source: 451 Research



## Cloud Management

Our survey results show that current cloud management tools fall short in terms of solving some of the key management problems. Although survey results show that many users have adopted CMPs, some of their most relevant issues have yet to be resolved.

Users complain that response time is too slow; IT admins are challenged with the creation, management and tracking of digital assets; IT teams often have no idea why virtual machines exist in their environments; and more than half of all stakeholders lack a single interface to view their entire environment.

### MOST PRESSING MANAGEMENT ISSUES

These management issues have real business impact. In Figure 10, respondents used a scale of 1 to 5 to rate the impact of specific issues, with 5 indicating a significant upstream business impact (cost, time to market) and/or downstream technical operations impact. What's clear from these survey results is that there are pressing issues that need to be resolved – and therefore significant opportunity for suppliers.

1. **'My users expect faster provisioning times and complain that response and turnaround time is too slow.'** – 74% say this is relevant to their organization (see Figure 10), and on a scale of 1 to 5, users gave it a 3.8 for business impact (Figure 11), while 23% said it poses significant upstream business and/or downstream technical operations impact (Figure 12).
2. **'We are constantly challenged with the management and tracking of our digital and virtual assets.'** – 64% said this was relevant to their organization; on a scale of 1 to 5, users gave it a 3.8 for business impact, while 14% said it poses significant upstream business and/or downstream technical operations impact.
3. **'Our IT teams often have no idea why a virtual machine exists in our environment.'** – 64% said that this was relevant to their organization; on a scale of 1 to 5, users gave it a 3.6 for business impact. Only 5% said it poses significant upstream business and/or downstream technical operations impact.

**Figure 10: Relevance of CMP Issues to Surveyed Organizations**

Q: Please indicate if the following CMP related issues are relevant to your organization.

Source: 451 Research



Figure 11: Impact of CMP Issues on Surveyed Organizations

Q: On a scale of 1 to 5 What is the extent of the impact that each of the following pose? Rating 5: Poses significant upstream business (cost impact, time to market) and/or downstream technical operations impact (5)

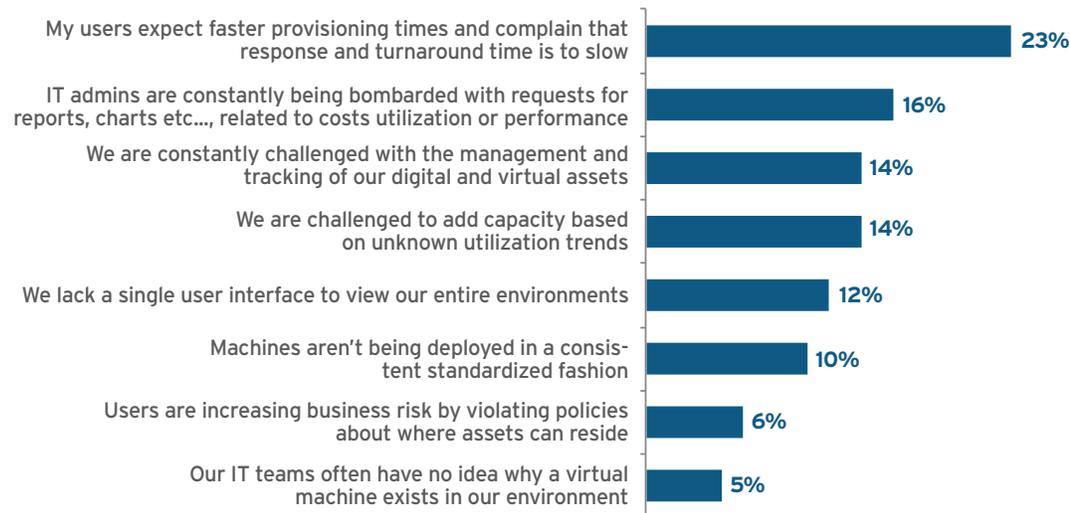
Source: 451 Research



Figure 12: Significant Business Impact of CMP Issues

Q: Which of the following best describes your company's use or planned use of containerization systems, such as Docker?

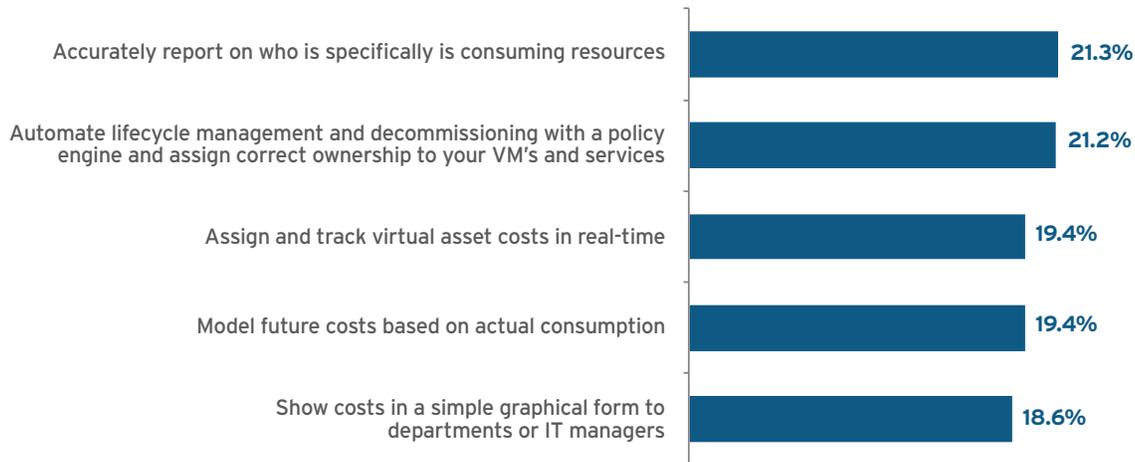
Source: 451 Research



Our research also found that existing management tools have fairly limited capabilities. Of those surveyed, 80% said their CMP tools lack essential capabilities, including cost modeling, lifecycle and policy management, real-time asset management, and resource consumption tracking. Even those respondents whose tools have these capabilities say they are limited.

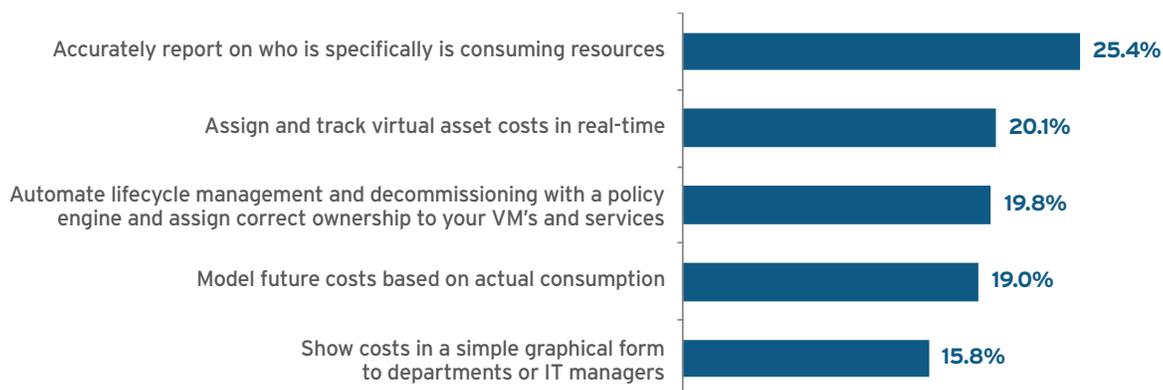
**Figure 13: Cloud Management Capabilities**

*Q: Please indicate if your existing cloud management solution enables the following capabilities. (Reflects those respondents who selected YES)*  
Source: 451 Research



**Figure 14: Extent of Management Capabilities**

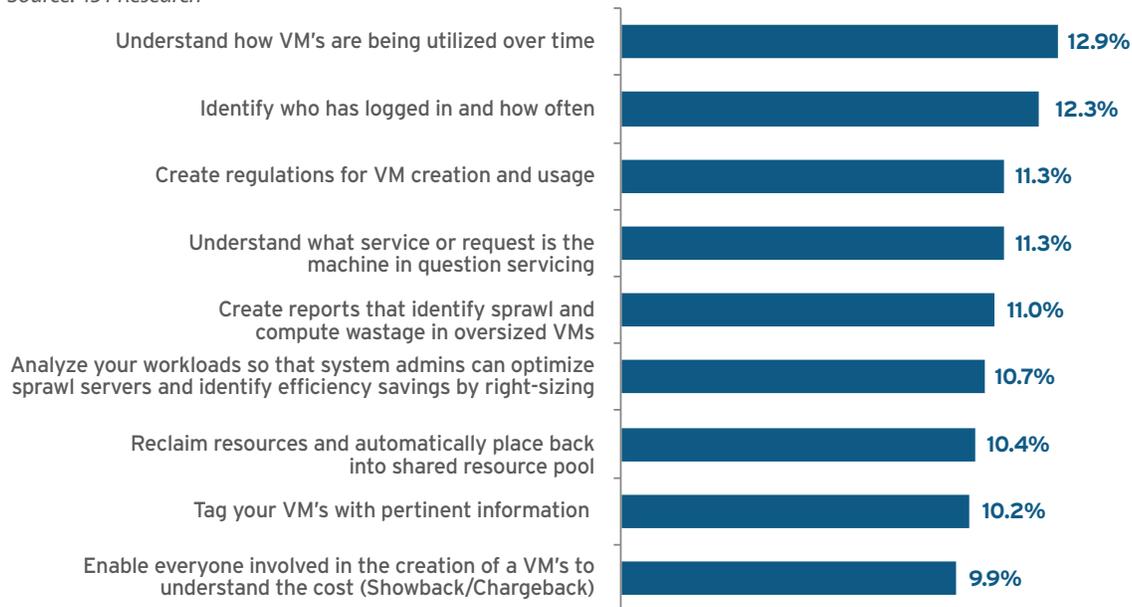
*Q: Please indicate whether the capability provided is limited or comprehensive?*  
Source: 451 Research



Meanwhile, VM sprawl continues to be a problem for many organizations, and today's tools do not have the necessary capabilities to effectively manage it. Figure 15 shows that VM sprawl is a significant problem and that users are not able to manage it – 87% of survey respondents say their existing management tools lack the ability to show how VMs are being utilized over time, while 88% say they lack the ability to identify who has logged in and how often, and 89% say they are unable to understand what service or request a VM is addressing.

Figure 15: Management Capabilities Checklist

Q: With your existing management tools do you have the ability to do the following? (Y/N) (Reflects those respondents who selected YES)  
Source: 451 Research



## Conclusions

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The change and complexity associated with IT transformation, multi-cloud service acquisition and control requirements will continue to drive the need for cloud management platforms.

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The transformation of internal IT is being driven by cloud-enabling technology. Most of the activity here is in virtualization and consolidation, although the overall direction of travel is toward automation and orchestration, supported by CMPs.

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CMPs are currently acting as valuable tools for assisting with this IT transformation journey, even before a cloud is created or a hosted cloud service is selected.

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Users are seeking ways to manage VM sprawl as the legacy problems of VM management move to the public cloud - this is a key opportunity for CMPs.

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Collectively, CMP services enable users to apply cloud decision criteria to find, access and use cloud applications and services. These criteria include (but are not limited to) cost, compliance, utility, governance and auditability. The point is that rules are applied to every application.

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At a high level, the role of policy-based CMP practices will mean that users can devote less time to compliance issues in the selection of multiple individual services, and instead focus on more strategic risk assessment in choosing federated services.

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As cloud adoption accelerates, demand for services that can help navigate the journey to cloud transformation – and broader digital agendas – is growing rapidly. This is where CMPs can help, providing a basis for accessing and using cloud services securely, optimizing for price and performance, and supporting the needs of different groups of users.

The components should address technology, economics and organizational dimensions, and help answer questions such as: How can I best take advantage of cloud services to meet particular application and workload needs? How can I make internal services as flexible as an AWS or Azure? How do I make our business look at us like a service? Am I paying too much? Cloud has become an agent for digital transformation, with 'cloud first' strategies (where a cloud solution is considered or prioritized for all workload deployments) becoming the new norm. The adoption of cloud is accelerating as enterprises find they can 'build faster and run better at lower cost.'

Enterprises are getting started with cloud and 'as-a-service' deployments wherever possible, instead of starting new data-center builds or developing infrastructure services that offer no differentiated value beyond what can already be found in the cloud. A CMP will be necessary to automate and orchestrate this process and ensure that business goals are met.