

CLOUD MANAGEMENT AND AUTOMATION

Delivering the Enterprise Cloud Console

Tools for cloud management and automation are poised to become the 'assembly line' for integrated cloud services.

CLOUDSCAPE

KEY FINDINGS

- 'Service integration' is the new game in town. IT services firms refocusing on this space (as opposed to 'systems integration') are turning themselves into software shops, and will require significant cloud management and automation expertise to compete. There will be important partner/M&A exit opportunities for companies that can demonstrate leadership here.
- Successful best-execution-venue (BEV) strategies will mean owning and operating fewer assets, while at the same time integrating additional hosted resources. Cloud management and automation tools will be key to the functioning of these complex, dynamic arrangements.
- 451 Research survey data finds the cloud moving into the delta of assessment and planning, which means the creation of vendor consideration lists will become tactical actions by end users. Cloud management and automation will be critical to the success of cloud deployment infrastructure over its lifecycle.
- Cloud management and automation tools provide the ability to deliver the consumer-technology experience to enterprises: self-service, on-demand, pay-per-use. Consumer technology has set a high bar, and the consumerization of IT is one of the most important developments that organizations can leverage to ensure that IT is successful – i.e., that it is well accepted and used.

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SECTION 1

Executive Overview

1.1 KEY FINDINGS

- ‘Service integration’ is the new game in town. IT services firms refocusing on this space (rather than ‘systems integration’) are turning themselves into software shops, and will require significant cloud management and automation expertise to compete. There will be important partner/M&A exit opportunities for companies that can demonstrate leadership here.
- Successful best-execution-venue (BEV) strategies will mean owning and operating fewer assets, while at the same time integrating additional hosted resources. Cloud management and automation tools will be key to the functioning of these complex, dynamic arrangements.
- 451 Research survey data finds the cloud moving into the delta of assessment and planning, which means the creation of vendor consideration lists will become tactical actions by end users. Cloud management and automation will be critical to the success of cloud deployment infrastructure over its lifecycle.
- Cloud management and automation tools provide the ability to deliver the consumer-technology experience to enterprises: self-service, on-demand, pay-per-use. Consumer technology has set a high bar, and the consumerization of IT is one of the most important developments that organizations can leverage to ensure that IT is successful – i.e., that it is well accepted and used.
- Users are increasingly seeking business outcomes, rather than technology outcomes, from IT deployments. Cloud management and automation tools will be used as a pivot to deliver those business outcomes from the technology underpinnings.
- Delivering an ‘IT vending machine’ experience to end users will require IT departments to become service brokers to their own organizations. This will require the federation of multiple services from multiple providers, the provision and management of these via self-service mechanisms, and policy-based access to applications from a single portal.
- Cloud management and automation functions identified in this report will roll up to a single point of control that operates over the lifecycle of service selection, provisioning, fulfillment and management – aka the ‘enterprise cloud console.’ Service providers, whether internal or external, will require a single pane of glass for operations as they become service brokers to their organizations.
- M&A opportunities will be presented as incumbent framework vendors seek tools to build out their portfolios with cloud management and automation tools.
- Even organizations with sophisticated contract-negotiation resources may not have the expertise to operate bilateral relationships with multiple cloud service providers and, as such, will increasingly seek the use of intermediaries or brokers to support BEV strategies.

1.2 METHODOLOGY

This report on cloud management and automation takes the 451 Research Cloud Computing Study Wave 5 as its starting point. This study takes an in-depth look at key industry trends and tracks the performance of individual vendors. The Wave 5 study used in this report was finalized in July 2013, and is based on 100 interviews.

Our study methodology uses extensive interviews with a proprietary network of IT professionals and key decision-makers at large and midsized enterprises. Each interview explores several fundamental areas, including the implementation and spending plans for technologies, evaluations of vendors observed from business and product perspectives, macro IT influences transforming the sector, and factors affecting decision processes. Results are collated into comprehensive research reports providing business intelligence in the form of technological roadmaps, budget trends, and vendor spending plans and performance ratings.

The report was additionally supported by a series of in-depth interviews with a variety of stakeholders in the industry, including IT managers at end-user organizations across multiple sectors, technology vendors, managed service providers, telcos and VCs. This research was supplemented by additional primary research, including attendance at a number of trade shows and industry events. Reports such as this one represent a holistic perspective on key emerging markets in the enterprise IT space.

Reports such as this one represent a holistic perspective on key emerging markets in the enterprise IT space. These markets evolve quickly, though, so 451 Research offers additional services that provide critical marketplace updates. These updated reports and perspectives are presented on a daily basis via the company's core intelligence service – 451 Market Insight. Forward-looking M&A analysis and perspectives on strategic acquisitions and the liquidity environment for technology companies are also updated regularly via 451 Market Insight, which is backed by the industry-leading 451 M&A KnowledgeBase.

Emerging technologies and markets are also covered in additional 451 practices, including our CloudScape, Datacenter Technologies (DCT), Enterprise Security, Information Management, Infrastructure Computing for the Enterprise (ICE) and 451 Market Monitor services. All of these 451 services, which are accessible via the Web, provide critical and timely analysis specifically focused on the business of enterprise IT innovation.

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SECTION 2

Introduction

As the worlds of outsourcing, hosting, managed services and cloud computing continue to converge, users can choose services that meet a variety of workload, policy and SLA characteristics. ‘Best execution venue’ (BEV) practices will be used to make rational decisions about how and where to best run applications and tasks, and from where to source services. A BEV may be an internal or on-premises cloud; a multi-tenant public cloud; a SaaS offering; some ‘more trusted’ cloud; or a private, hosted, dedicated environment that can fulfill specific economic, operational, latency or data-location requirements.

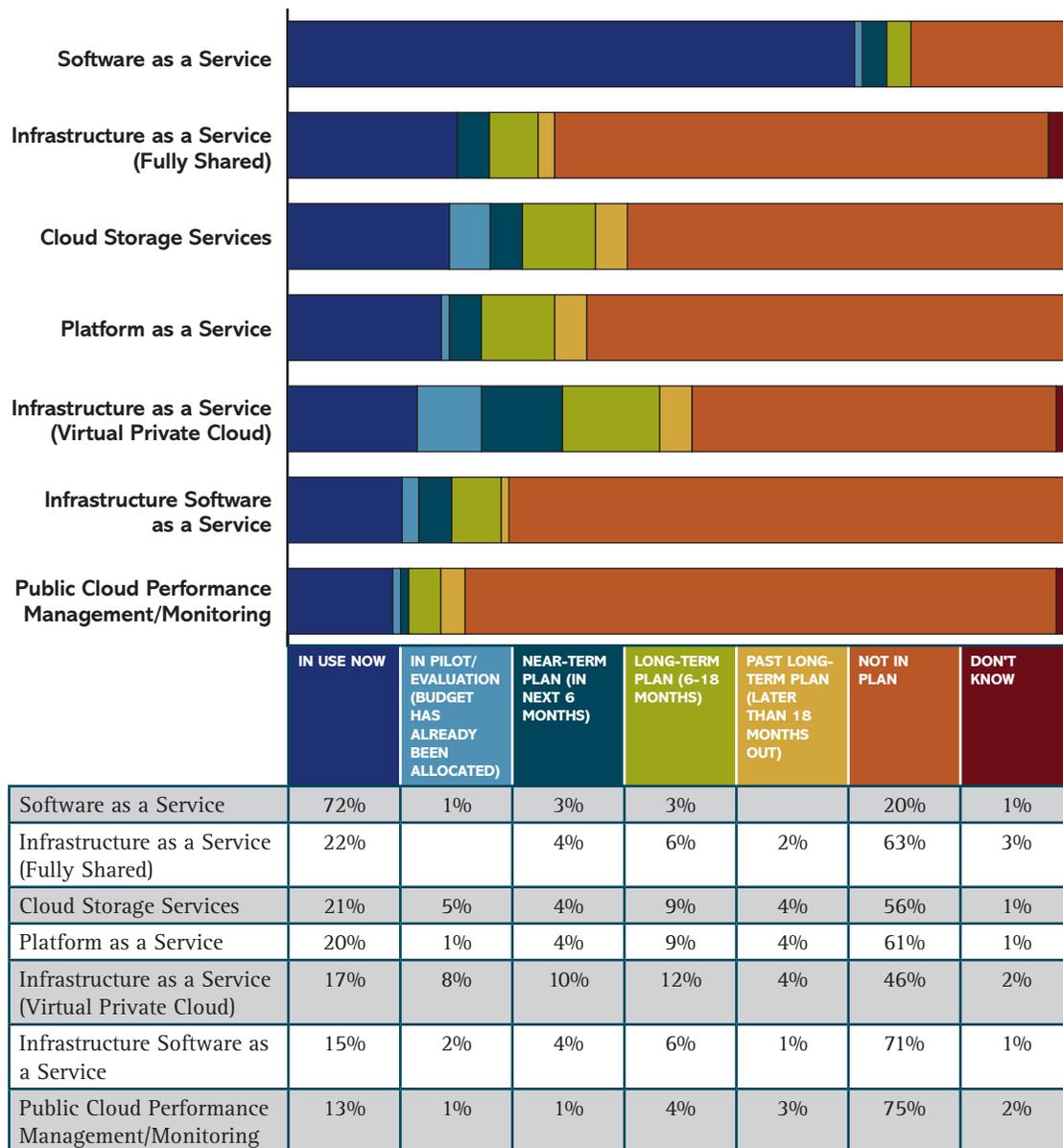
This report examines the adoption of cloud management and automation tools that are emerging to support the selection, provisioning, scheduling and dispatch of work to BEVs and the acquisition of services from them. Of particular interest are tools that can manage this complex and dynamic activity, which are identified within the adoption plans of enterprise end users in our 451 Research Cloud Computing Study.

A cloud platform enables an enterprise or a service provider to offer IaaS (and by extension a PaaS) via an abstraction layer. Cloud automation and management systems care for that infrastructure over its lifecycle.

2.1 SETTING THE SCENE

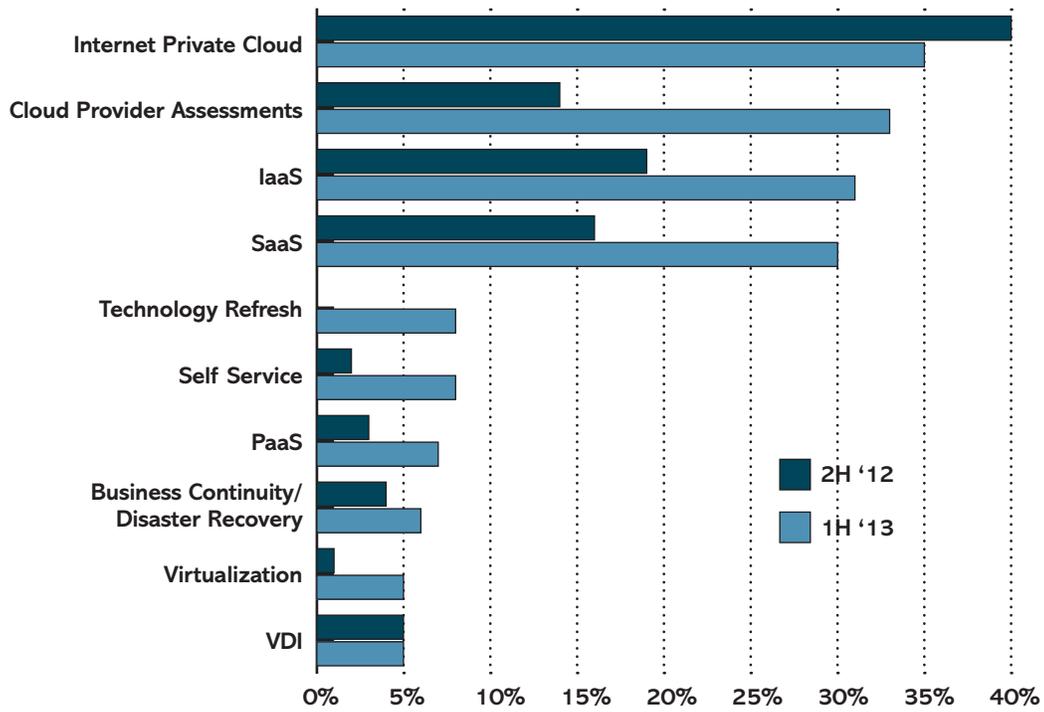
Taken from the Cloud Computing Study Wave 5 survey, Figure 1 shows that SaaS is already well established in the majority of enterprises, with 72% of respondents having some kind of SaaS in use. Shared IaaS is being used by 22% of respondents; cloud storage by 21%; PaaS by 20%; private IaaS by 17%; infrastructure SaaS by 15%; and public cloud performance management/monitoring by 13%.

FIGURE 1: OFF-PREMISES PUBLIC CLOUD SERVICES TECHNOLOGY ROADMAP



Cloud migration is clearly under way, with enterprises evaluating and using infrastructure providers in record numbers. This trend is set to continue – that much is without doubt. While enterprise cloud projects have historically been predominantly focused on internal private cloud buildouts, Figure 2 from the same Cloud Study shows that hosted cloud is now moving into the assessment and adoption plans of enterprises. A key change for 2013 over 2012 is that active projects in cloud-provider assessment, IaaS and SaaS have seen a huge uptick, with provider-assessment activity jumping from 14% to 33% (see Figure 2). This means the creation of vendor consideration lists will be part of the next set of tactical actions by end users.

FIGURE 2: TOP CLOUD PROJECTS IN THE NEXT 12 MONTHS



SECTION 3

Management and Automation

Cloud computing is IT as a service. The IT infrastructure is delivered as virtual machines. Automation moves those VMs around and provides the delivery mechanism for the service. Users help themselves to services via an access API and per-use pricing model. It's a flexible service model with retail discipline and a utility-like operating model.

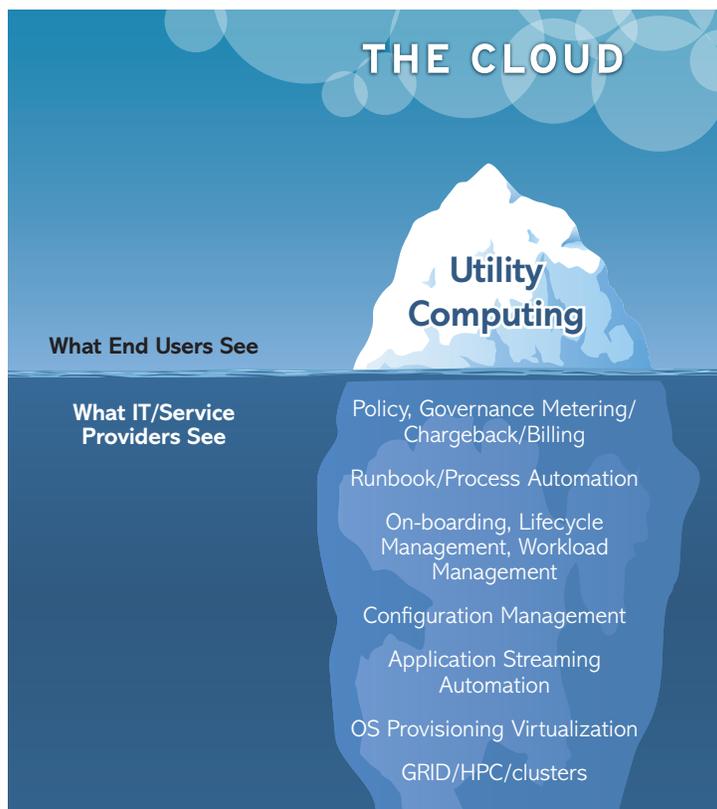
The point is that the user doesn't have to know or necessarily even care where the service is coming from. Moreover, the service provider, whether internal or external, should not matter as long as the experience delivers on expectations in terms of information, functionality and processing quality.

The IT itself is, by design, essentially hidden from the user's view – just as the majority of an iceberg is hidden underwater – while the service is provided via a utility-style (self-service) delivery mechanism (see Figure 3). This is the visible part of the iceberg. The functional aspects and infrastructure of a cloud service – including the virtualization layer; OS, resource and application provisioning; application lifecycle management; and chargeback and billing – are out of view, and have typically been hardwired together to deliver the service.

Some of these functions are now being abstracted to the point where they can be dynamically assembled into service stacks – which we term 'infrastructure SaaS' – and delivered from anywhere in the cloud itself. However, behind the apparent sophistication of self-service portals, many cloud environments are still managed by armies of admins managing an approval process and 'pushing the button until the cloud fills up,' or adding additional capacity as fast as they can.

The upshot of this is that there are a lot of moving (virtual and physical) parts here, and sophisticated management and automation tools are going to be required to ensure that a cloud can deliver on its promise of faster and more flexible services, on more devices and on-demand.

FIGURE 3: CLOUD COMPUTING IS IT AS A SERVICE

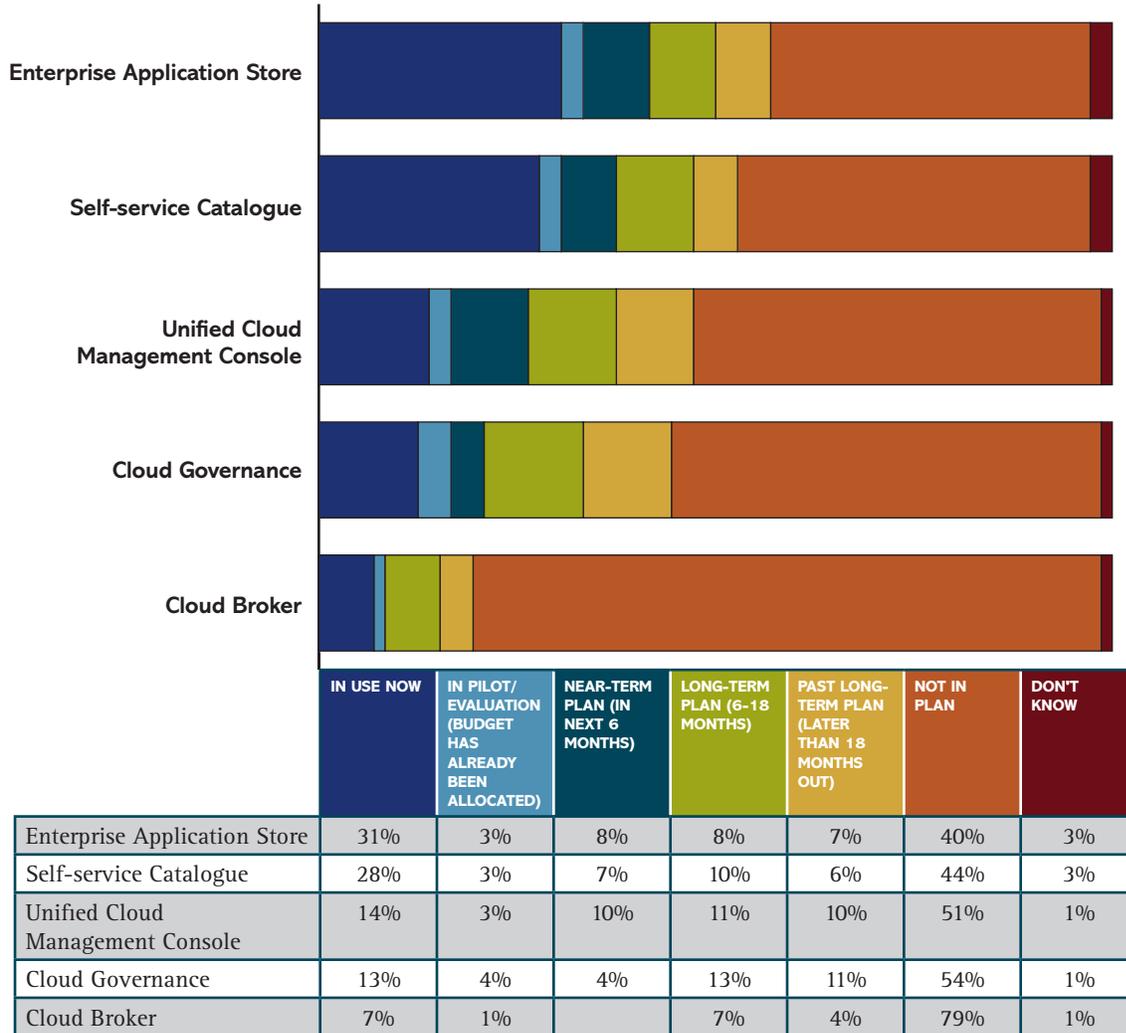


Cloud management and automation tools are coming into the market specifically to address these pain points, and to enable users and administrators to assemble and directly manage cloud service environments. They can act both as the glue that enables components to work together, and as a single point of assembly, delivery and control. As we have already discussed above, the bigger picture here is that these tools assist the development of BEV strategies.

On the end-user side, these tools include (but are not limited to) enterprise application stores and self-service catalogs through which services can be selected. For administrators, unified management consoles, cloud-governance tools and cloud brokers offer automated and federated ways to compose and curate environments for end users. Together with cloud-cost optimization and hybrid cloud management tools, plus consolidated cloud-control dashboards, these can individually (and in some cases, collectively) provide the control points for delivering BEV strategies. But let's not get ahead of ourselves, or the reality of today's market.

Cloud management technologies in the form of unified cloud management consoles and cloud-governance tools have not yet gained 15% user adoption (see Figure 4). The next few years, however, will see a significant change in these areas, with close to one-third of respondents planning to implement these technologies in their cloud environments. Spending plans are beginning to gain momentum, with 16% and 10% of respondents citing increased spending on cloud management consoles and governance technologies, respectively, in 2013.

FIGURE 4: CLOUD MANAGEMENT AND AUTOMATION TECHNOLOGY ROADMAP



SECTION 4

Cloud Management Tools

4.1 ENTERPRISE APPLICATION STORE

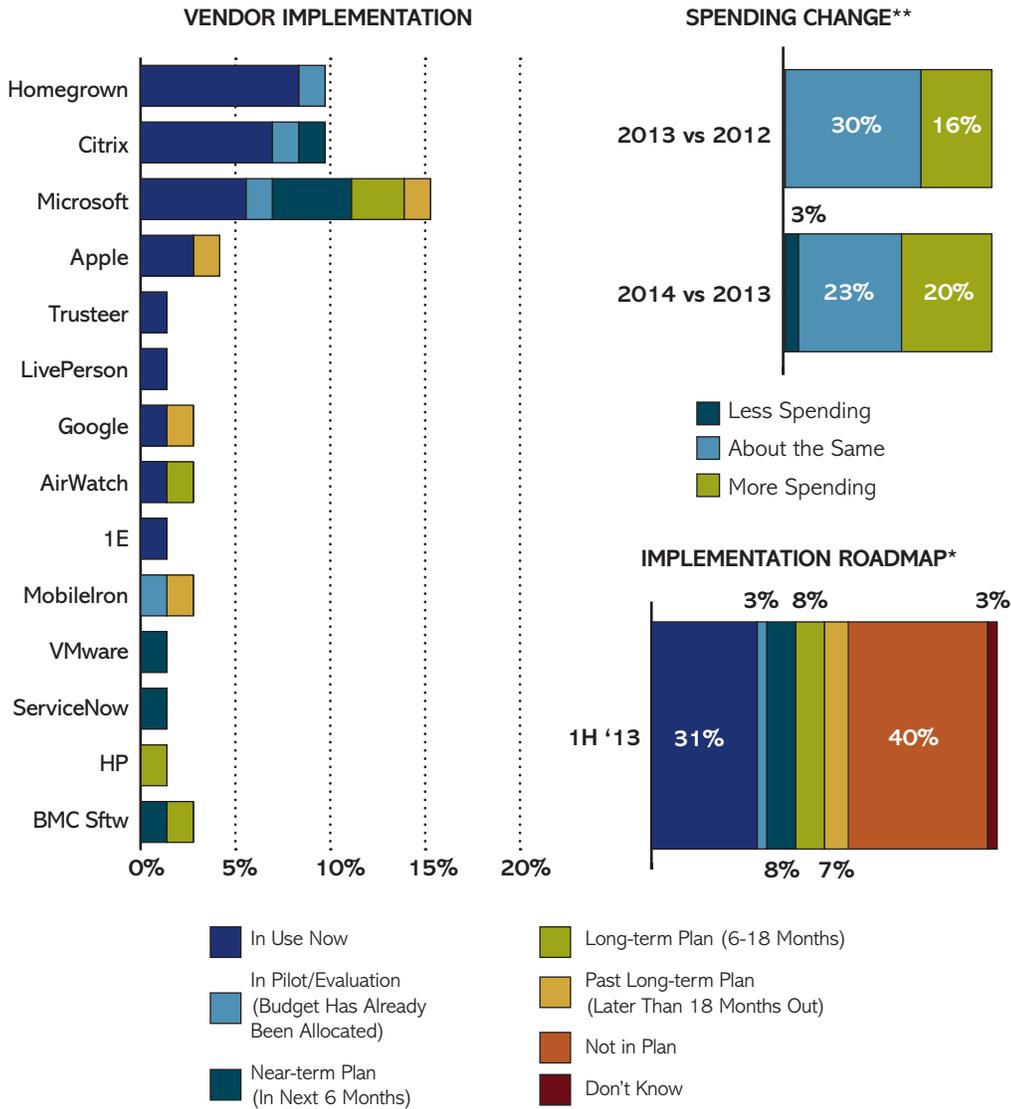
Consumer technology has set a high bar, and the consumerization of IT is one of the most important developments that organizations can leverage to ensure that IT is successful – i.e., that it is well accepted and used. Offering the consumer app-store experience as a way to access business applications – whether it’s provided as an internal service or a hosted offering – can deliver this success to enterprise employees, partners and customers.

An enterprise-application store is a Web portal through which end users can access, download and install software applications. In a corporate situation, access may be gated by role or segmented by service function. It’s effectively taking the consumer-application marketplace model and putting it into an enterprise-IT context. For our survey respondents, this clearly has a number of manifestations; this is a market still being defined.

First, it can mean selecting a hosted business-application store from a service provider, such as Microsoft, Google, Apple, ServiceNow and others. Second, it can mean creating an internal enterprise-application store from infrastructure components. This may be home-grown, or an offering from Citrix, BMC or other vendors. Alternatively, it can also mean selecting a ‘white label’ application store that is created, maintained and managed by a third party, but hosted internally with a user’s own brand.

For service providers, there is another set of firms pitching their ability to create enterprise-app stores that can be delivered as part of an overall service offering. Figure 5 indicates that one-third of enterprises in our Cloud Computing Study are currently deploying an enterprise-application store, with a further 20% in planning.

FIGURE 5: ENTERPRISE APPLICATION STORE



The enterprise-application store or marketplace evolved as a group of cloud vendors that provided platform services to support existing customers began to extend their offerings to deliver a comprehensive storefront/IT supermarket experience on a hosted (and/or on-premises) basis to enterprise IT departments. These include salesforce.com's AppExchange, Amazon Web Services Marketplace, Heroku and Liferay Marketplace.

Other service providers not represented here have typically built their own app stores, or have used one of the growing number of third-party app-enabling tools to develop their own business application marketplaces. Figure 5 shows that while a number of third-party suppliers are in use, the biggest footprint is that of homegrown marketplaces.

Business-application stores are seen universally as an important way for cloud and other service providers to increase the value of customer engagements over and above the sale of basic infrastructure services. Application services can be charged at a higher rate than renting VMs.

There are differences between marketplaces – some act as very capable storefronts to large product portfolios, such as CA CloudCommons (CA is not a cloud service provider, of course), while others such as Google Apps Marketplace or T-Systems Business Marketplace aggregate third-party commercial applications. There will typically be a range of downloadable perpetual-license and ‘aaS’ offerings.

In our view, application stores will bring significant new opportunities to service providers that can effectively operate as ISVs, especially those with the domain expertise from application management to sell and support enterprise software applications to organizations on an ‘aaS’ basis.

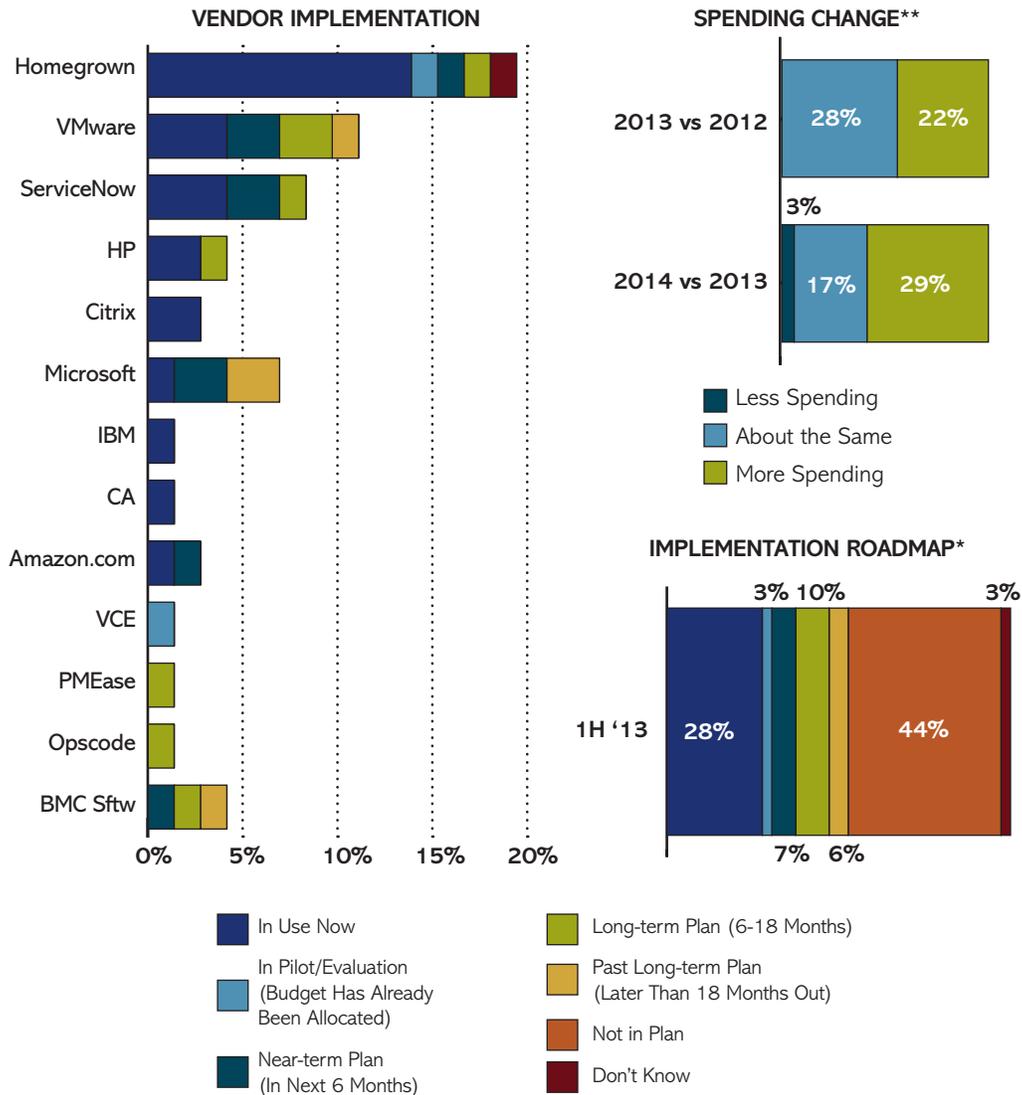
Application store owners are numerous – examples include Bell Canada, Colt, Deutsche Telekom, SingTel, Amazon, SingleHop, Interoute, GetApp and Fujitsu. Some target enterprises directly, and have a channel offering to reach SMBs.

In addition to those vendors identified by end users in Figure 5, firms targeting the enablement of application stores using their tools include Nokia Siemens and Amdocs, which have a specific service-provider focus. Other vendors targeting both service providers and enterprises include AppDirect, Ensim, Interworks Cloud Services, Parallels, Jamcracker, NEC, CA Technologies, Dell, BMC Partnerpedia, Orange Business Services, Verio, Oracle Portal, Standing Cloud and Zimory.

4.2 SELF-SERVICE CATALOG

The self-service catalog provides IT resource provisioning across internal and external infrastructure. Figure 6 shows that 28% of enterprises in the Cloud Computing Study are currently deploying a self-service catalog for accessing cloud services, with a further 20% in planning.

FIGURE 6: SELF-SERVICE CATALOG



More than the business-application store, it is the self-service-catalog function for selecting and automatically provisioning infrastructure resources that is dominated by the use of home-grown tools. Why is this? Enterprises deploy products from multiple suppliers, which are less capable by design and by their nature of supporting heterogeneous environments – so the users end up having to glue them together themselves.

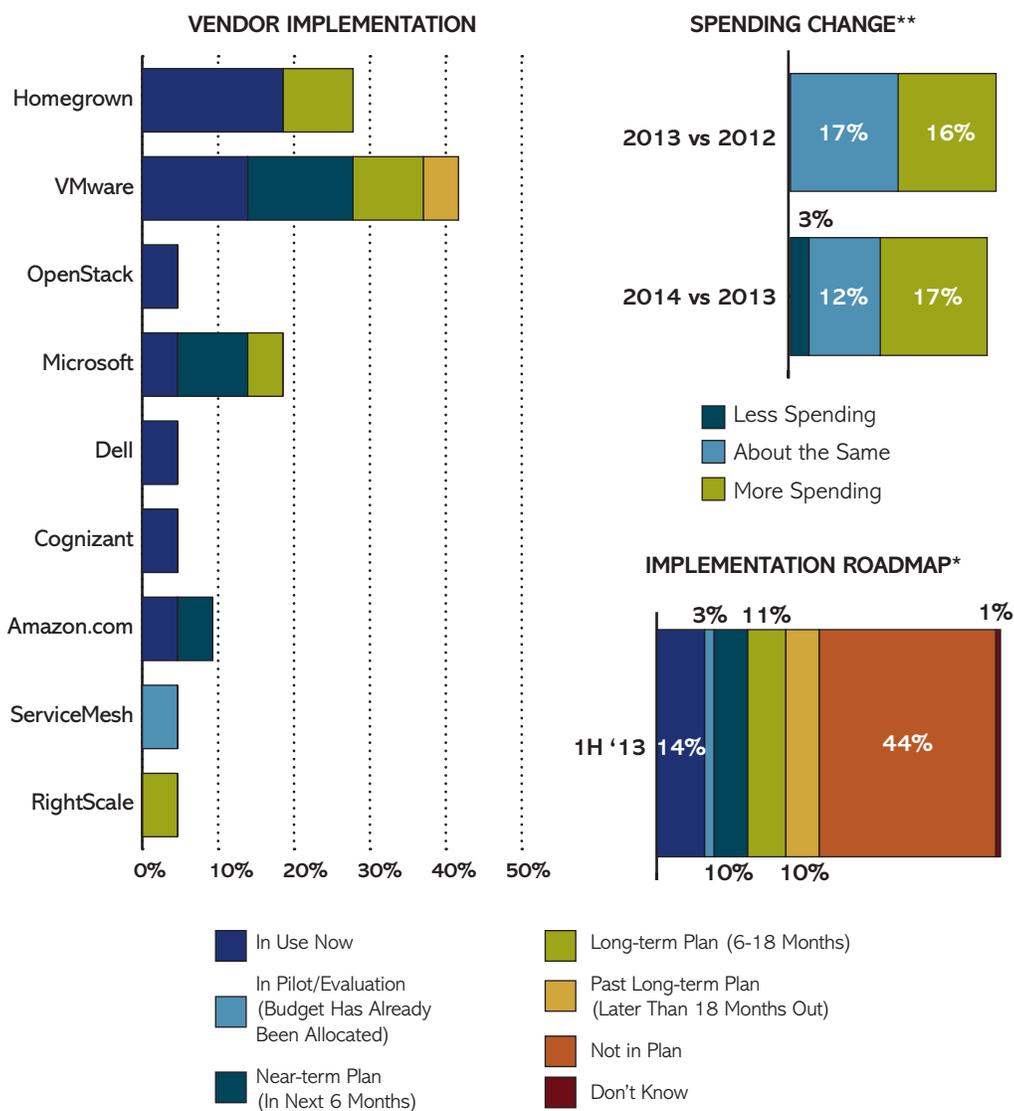
A self-service catalog may also support workflow management for the creation, automation, monitoring and deployment of resources and services. The catalog will be accessed via a portal,

which may also be directly linked to capacity planning, workload blueprint design and workload automation. Most of the major incumbent IT vendors have built or acquired self-service catalog properties to build out their capabilities in this area.

4.3 UNIFIED CLOUD MANAGEMENT CONSOLE

A unified cloud management console provides a single window from which to access and manage a hybrid cloud ecosystem. It must provide a holistic view of cloud-resource usage across providers, and must optimize this usage.

FIGURE 7: UNIFIED CLOUD MANAGEMENT CONSOLE



Unified cloud management consoles (see Figure 7) are less widely implemented than application marketplaces or catalogs, with 14% of users deployed, but a further 25% of users in planning – representing a significant opportunity for suppliers.

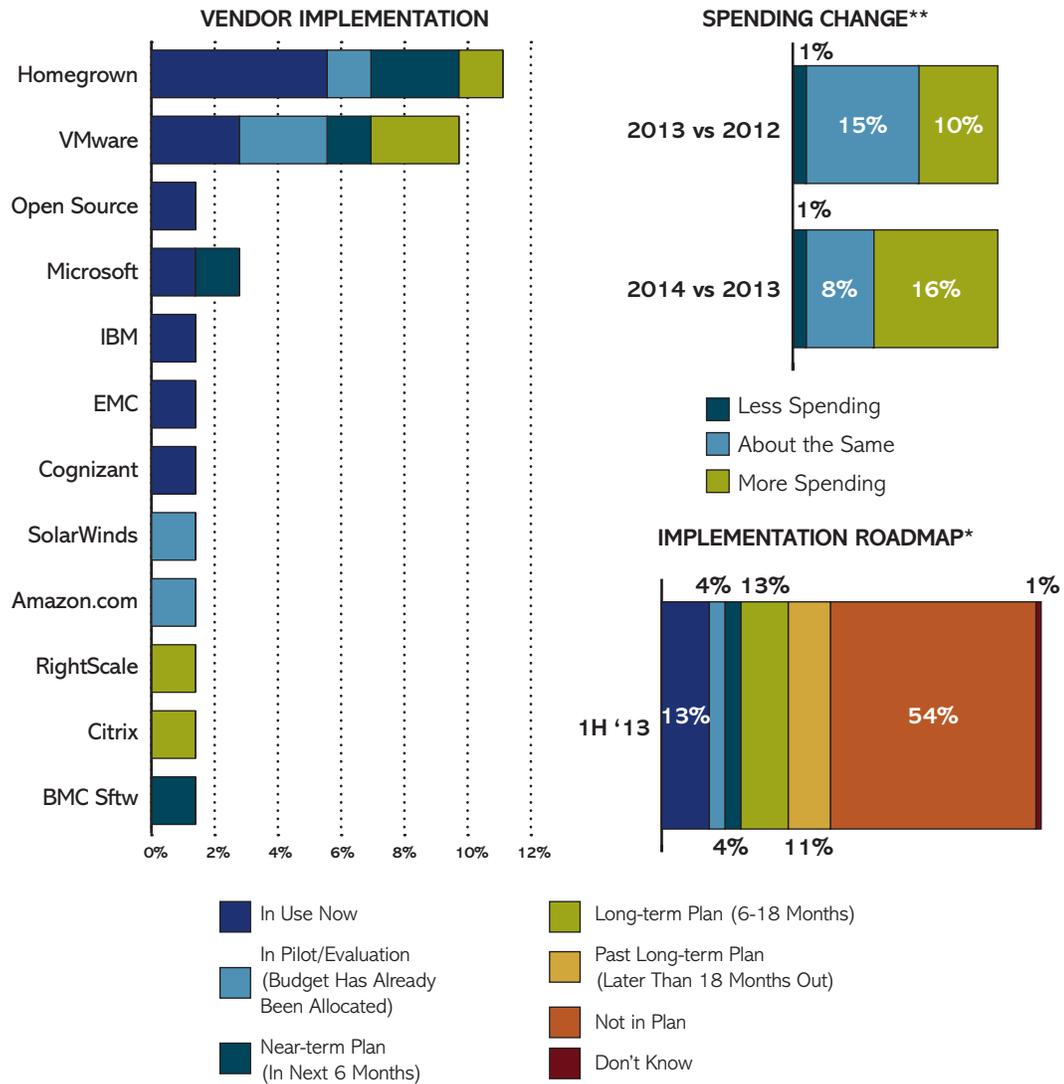
We see the unified cloud management console closely aligned with self-service catalogs, and as another key enabler of the IT vending machine. Most of the vendors already discussed provide a unified management console that incorporates – or provides access to – the other functions discussed.

4.4 OTHER TOOLS

Going forward, tools for cloud governance (such as policy implementation and resource tracking), as well as cloud cost and performance management/optimization, will become features of cloud management and automation suites, rather than point-product functions.

4.4.1 CLOUD GOVERNANCE

FIGURE 8: CLOUD GOVERNANCE



For the purposes of the Wave 5 Cloud Computing Study, 'governance' refers to the use of an orchestration platform that enables dynamic placement of workloads based on policy. Orchestration brings together automated self-service resource provisioning, on-boarding and management with process, policy, governance and security. It is effectively the control point for delivering BEV strategies. Governance control points are deployed by 13% of our survey respondents (see Figure 8), with more than 20% in planning for use.

4.4.2 MULTI-CLOUD MANAGEMENT

Vendors that offer multi-cloud management should also be considered when examining cloud-automation providers because these firms tend to offer lifecycle management of workloads across multiple clouds, policy creation and implementation, federation of different cloud technologies, aggregation of cloud access, and tools for monitoring, alerting and auto-scaling.

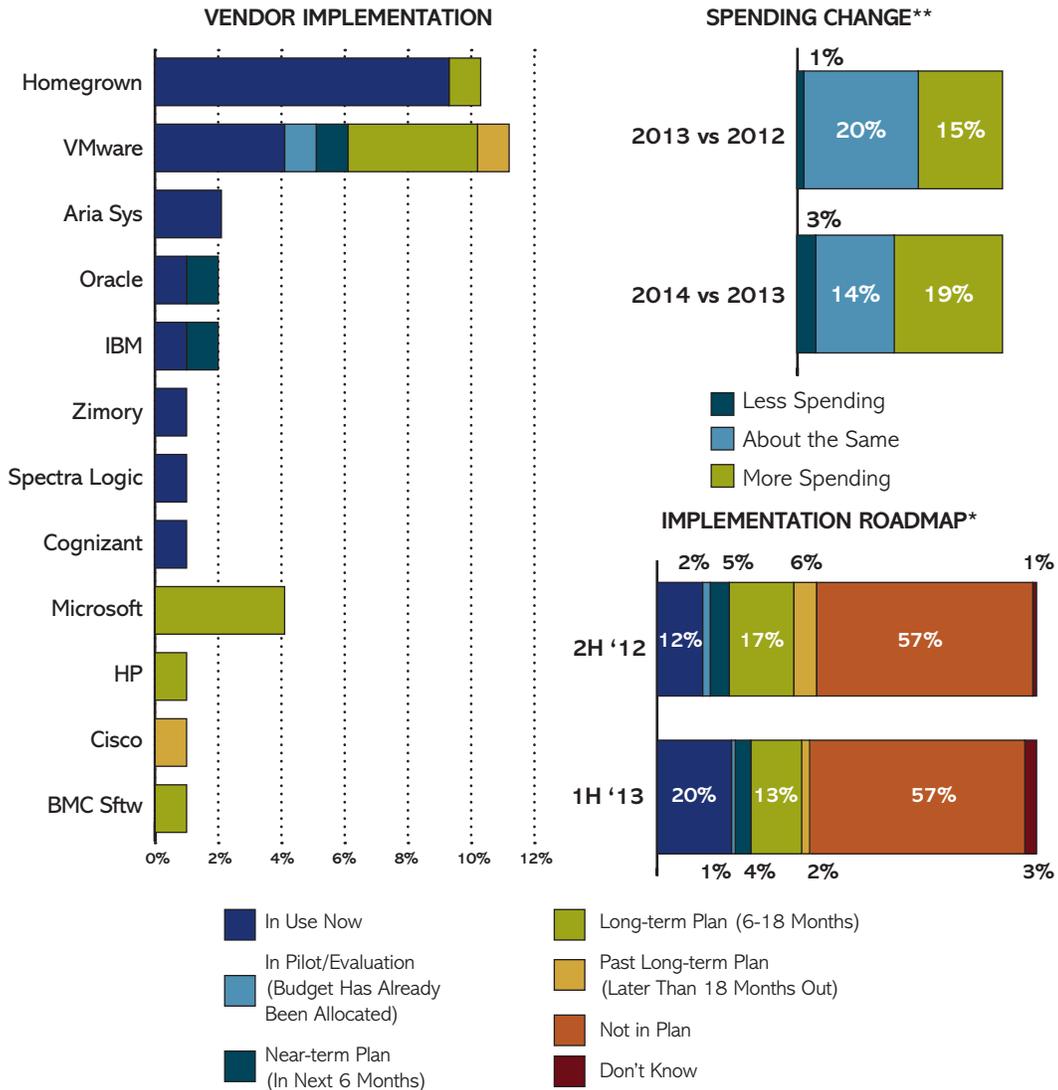
These vendors include:

Accenture	Copper.io	OnApp CDN	Racemi
Besol	ECmanaged	Kaavo	Scalr
Capgemini	eNovance	ServiceMesh	ScaleXtreme
CSC	Hedera	Dell Enstratus/Gale	VMUnify
Cognizant	Infosys	RiverMeadow	Zimory
CliQr	TappIn	VMware	

4.4.3 METERING/BILLING

Cloud cost/spend management and optimization firms offer detailed reporting of cloud usage with metadata tagging, often across multiple clouds. They can provide forecasting of expenditure based on historical performance and can recommend changes to deployments. They should be considered an important feature of cloud management and automation strategies.

FIGURE 9: METERING/BILLING ACROSS INTERNAL, EXTERNAL & HYBRID CLOUDS



A channel check with suppliers and recent conversations with end users suggest they are starting to get serious about measuring IT consumption, especially with regard to cloud use. ‘Obsessing about chargeback’ was how one ISV characterized it. Indeed, it seems that some kind of consumption measurement and chargeback (née ‘showback,’ or ‘shadow billing’) is increasingly a precondition for launching a cloud initiative.

Furthermore, enterprises with a fully developed IT chargeback process already have a forensic understanding of what the cost of deploying services are, and benchmark themselves against the cost of service acquisition from a third-party provider – namely, Amazon. Whatever the case, the need for these tools appears to have moved well beyond the education phase, with implementation at 20%, and a further 20% in planning.

Runaway costs are a real fear for many organizations, and end users appear to be demanding more predictable pricing models. These tools can potentially aid IT teams as they seek to move from system management functions to account manager roles in order to service users' needs. This underpins the emergence of IT business management (ITBM) tools to help contain costs, ascertain value and determine the best place to run workloads. Other drivers here include the use of multiple clouds, hybrid cloud strategies (hence the need for tools that work across internal and hosted services), and the arrival of other mega-clouds into the market – Microsoft, Google, etc.

To this end, a small army of vendors has emerged offering tools that allow end users to better monitor and manage their cloud spending, as well as plan, model and optimize the current and future use of the cloud across and between different providers.

These vendors include:

Basic6	Cloudyn	Apptio	Xervmon
Cedexis	Copper.io	RightScale	Talligent
Cloudability	6fusion	Newvem	MetraTech
CloudCruiser	Sensible Cloud	Rackspace	VMware
CloudRows			

What's apparent is that the convergence of IT cost management, ITBM and cloud cost/spend management, and utility-metering approaches is coming into view (again) as part of this trend. Internal cost management and resource-utilization-monitoring tools are being extended to encompass data on cloud use, while other tools have been developed to work specifically with the cloud.

ITBM suppliers and established cloud vendors have responded by tweaking existing cloud management tools and, in some cases, acquiring cost management tools. Aside from the Big Four – IBM, HP, CA Technologies and BMC – ITBM firms include Apptio, Costnomics, ComSci, VMware (Digital Fuel), iQuate and VAlign.

4.4.4 CLOUD BROKERS

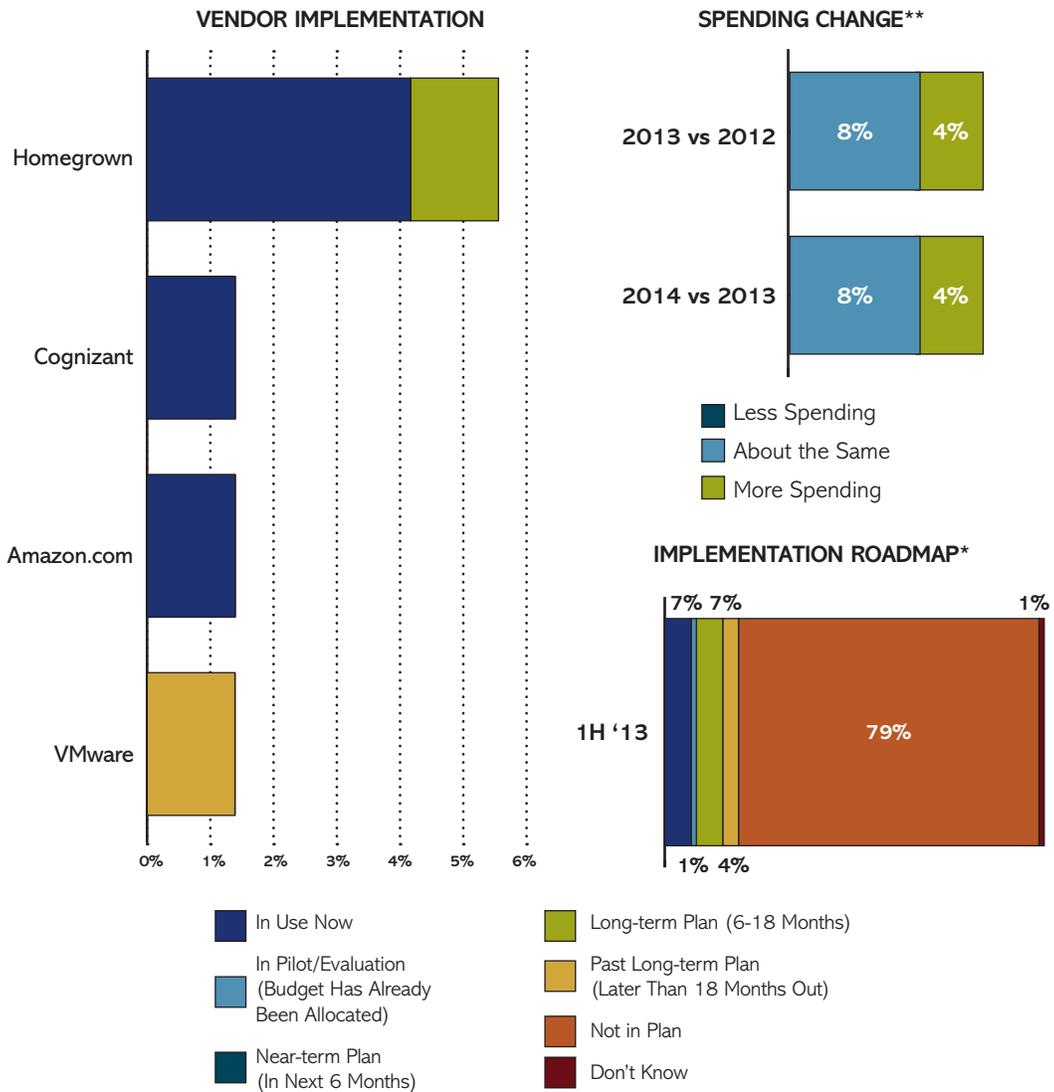
A cloud broker offers a decision-support framework to determine the appropriate cloud service (i.e., BEV) for workloads. It should enable effective data-driven decision-making by offering transparent choice in cloud services, while removing the pain in terms of governance, procurement, utilization and settlement. A broker can procure and manage a wide range of cloud services for customers in a many-to-many model.

A broker may or may not offer service recommendations. We see brokers as a kind of over-the-counter marketplace that offers a non-mediated introduction service to a limited set of suppliers using custom contracts. Brokers have a direct relationship with suppliers – they broker connections. Even organizations with sophisticated contract-negotiation resources may not have the expertise to operate bilateral relationships with multiple cloud service providers, and as such, will increasingly seek the use of intermediaries or brokers to support BEV strategies.

In addition to vendors deployed by end users in Figure 10, we see an increasing opportunity for vendors that make it easier for a user to purchase cloud services from a range of providers. ComputeNext, Fedr8, Gravitant and RightScale provide this kind of broker-type service. Systems integration, outsourcing and consulting firms such as Capgemini, Cognizant, Infosys, CSC and Accenture also have cloud brokering in their service portfolios.

Indeed, IT services shops are turning themselves into software shops to meet the demand of cloud and BEV strategies. As a consequence, these firms will be operating a more 'asset light' model than they have been historically, emphasizing 'service integration' rather than 'systems integration.' Cloud management and automation is the enabler of these models.

FIGURE 10: CLOUD BROKERS



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