

Vendor Landscape: Hybrid Cloud Management Solutions

These Rapidly Maturing Solutions Offer Self-Service And Frictionless Governance Across Clouds

by Dave Bartoletti
October 22, 2015

Why Read This Report

Today's digital businesses rely on a growing portfolio of cloud platforms to create and deliver differentiated customer experiences. Infrastructure and operations (I&O) pros scramble to offer developers and business leaders the optimal mix of private and public clouds, while maintaining security, governance, and operational control. Hybrid cloud management solutions help them manage this tension. In this report, we review the landscape of vendor solutions for hybrid cloud management and offer a high-level overview of the 25 most important solutions available today.

Key Takeaways

Hybrid Cloud Balances Fast Access With Frictionless But Bulletproof Governance

Should you let developers manage their own clouds, or should you centralize control in the I&O team? The best strategy must balance both by offering rapid self-service access with frictionless governance and operational control. Today's hybrid cloud management solutions offer features to help do both at the same time.

Identify Your Hybrid Cloud Challenges And Objectives Before Engaging Vendors

Hybrid cloud creates many challenges, including maintaining consistent configuration and developer experiences, workload migration, cost management, and monitoring. Few vendors serve all purposes. Our review of the most common hybrid cloud management use cases and challenges helps you prioritize tools and features.

The Hybrid Cloud Management Solution Landscape Is Complex And Growing

Established technology vendors, cloud platform providers, and innovative startups clamor for differentiation in this broad category. Slapping a hybrid cloud label on any general-purpose platform is easy, but which one is best for your particular situation? Our review of the 25 leading vendors will help you focus your search and get started faster.

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Notes & Resources

Forrester interviewed 25 vendor and user companies, including BMC Software, Cisco Systems, Citrix, CliQr Technologies, Dell, Embotics, HP, IBM, Jamcracker, Microsoft, Oracle, Red Hat, RightScale, Scalr, and VMware.

Related Research Documents

- [Cloud Management In A Hybrid Cloud World](#)
- [The Forrester Wave™: Enterprise Public Cloud Platforms, Q4 2014](#)
- [Vendor Landscape: Private Cloud Software](#)

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You Face A Tough Struggle With Hybrid Cloud But One You Must Win

I&O pros have never felt as much pressure to help their businesses become customer-obsessed as they do today. Your customers want to find you in the cloud. Your developers and business leaders want to build new software in the cloud to win, serve, and retain those customers. And you need to source and manage all of these clouds and ecosystems without putting your company, your reputation, or your job at risk. To remain competitive, you must be a driving force for your company's business technology (BT) agenda, which means prioritizing operational agility and customer experience (CX) ahead of traditional I&O goals like efficiency and cost savings.

Prioritize Speed And Customer Experience To Drive Hybrid Cloud Success

Cloud infrastructure-as-a-service (IaaS) and platform-as-a-service (PaaS) (i.e., cloud platforms) are critical infrastructure and context technologies that must now be part of your BT customer engagement platform.¹ Cloud platforms are not monoliths, however. The broad range of public, hosted private, and private cloud platforms, plus the explosion in new infrastructure and application services available on those platforms, means that every enterprise cloud portfolio should be a hybrid mix of the best services to meet your company's specific needs. You want the business to turn to you when it needs cloud services, but this can only happen if you recognize that:

- › **Hybrid cloud is already here today, and it's growing.** Hybrid cloud at its very basic definition is cloud plus anything.² If you're using any cloud today, odds are that you're already at hybrid cloud. According to Forrester's Global Business Technographics® Infrastructure Survey, 2015, the enterprises of 29% of infrastructure decision-makers have adopted and manage a public cloud platform, 33% support hosted private cloud, and 43% manage an internal private cloud.³ Our developer survey shows that 34% of enterprise developers have built software for elastic cloud platforms in the past 24 months.⁴ Thus, the number of companies using multiple types of clouds and the number of developers building apps on those clouds are already high and have been steadily growing, with no sign that those trends will reverse. As the head of infrastructure engineering at a major US insurance company said, "We're all hybrid now. Every process we create and every tool we buy must work across five different cloud platforms."
- › **When customer experience and operational control are at odds, CX wins.** Cloud presents a fundamental challenge for I&O pros: Developers want speed (i.e., fast access to the cloud services that they need to build software), but I&O is expected to be responsible for how those services perform and what they cost. In the predigital era, I&O would slow things down with overly bureaucratic and mostly manual processes and wait to offer new technologies only when they were fully tested, hardened, and protected or when I&O felt completely sure of its ability to support them. Today, you can't wait — your developers are already using hybrid cloud to enhance CX. You must master a difficult balancing act: making cloud services available quickly across disparate platforms, while securing, governing, and monitoring them.⁵

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- › **Guardrails encourage adoption, but speed bumps kill adoption.** Speed is nonnegotiable, which means that you must act like the public cloud platform vendors. You can deliver easy self-service access and fast provisioning times, while layering on operational controls quietly — and ideally automatically — behind the scenes. If developers must step through days of approvals to get access to the cloud platforms they need, they will find another way. Developers are excellent proxies for your company’s customers: If customers have to wait too long for your products, they will jump ship to your competitors. It’s especially important to get self-service right if you’re building and managing a private cloud in your hybrid portfolio, because your developers will compare it with public cloud alternatives.⁶

Current Approaches To Hybrid Cloud Management Are Inconsistent And Lack Automation

I&O pros in the age of the customer must spend less time managing data center infrastructure and more time managing a digital ecosystem of cloud services and suppliers.⁷ This digital platform ecosystem depends on a hybrid cloud foundation, and it mirrors the dynamic external ecosystem of suppliers, partners, and customers that the most successful digital businesses are creating today.⁸ One infrastructure engineer at a large US government agency put it simply: “We have developer self-service for our private cloud, and now our developers want to use AWS and Azure. We have to rethink how we built our original portal and make it multicloud.” To date, many hybrid cloud management strategies have limited success, because they are:

- › **Piecemeal collections of tools without clear strategic objectives.** Forrester survey data shows that companies managing multicloud hybrid environments take a wide range of approaches to management. While there is a strong preference for centralized management by I&O, a quarter of decision-makers indicate that their companies let developers manage clouds themselves. Even among those who prefer central control, there is no strong preference for how to implement that control. Twenty-seven percent of enterprise infrastructure pros manage hybrid cloud without additional software, using expertise and tools that they already have. Thirty-one percent rely on third-party on-premises software, and 16% rely on software-as-a-service (SaaS) solutions (see Figure 1).
- › **Too focused on operational efficiency and control.** Many private cloud and hosted private cloud projects have failed because they were too focused on driving up operational efficiency and either ignored self-service customer experience or failed to measure it. Many companies rush into private cloud before they have clearly identified who will use it, what they need, and how they will measure success. The result is an internal cloud platform that pales when developers compare it with public

Don’t try to layer on self-service and hybrid management after the fact; design for excellent CX across your cloud services before you grow your cloud portfolio.

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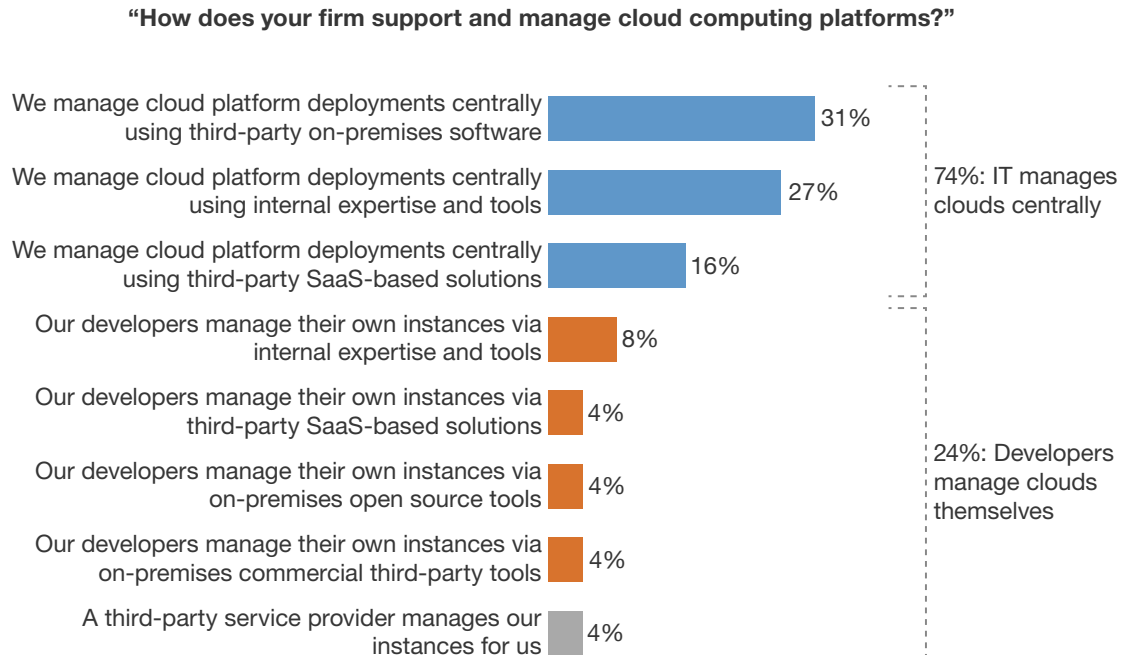
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cloud. The risk is losing your developer audience. Don't try to layer on self-service and hybrid management after the fact; you can design for excellent customer experience across your cloud services before you grow your cloud portfolio.⁹

- › **Not agile enough to match the self-service experience of public clouds.** Modern application delivery is based on Agile development methods, continuous integration and delivery, and development and operations (DevOps) processes. They all remove friction from the app development life cycle and speed app delivery but will fail if they are not paired with equally agile infrastructure delivery. Although five days or 5 hours might be a big improvement, it doesn't compare to the 5 minutes that is available through public cloud providers. I&O pros must drive down provisioning delays to get cloud services into developers' hands quickly and tightly link cloud management processes to application release processes.¹⁰
- › **Partially automated or based on a collection of brittle scripts.** Technology managers have resisted automation for years, but the complexity and rate of change in cloud services mean automation — across your entire multicloud portfolio — which cannot be an afterthought. It is much harder to automate brittle and complex manual and scripted processes once they are in place than to avoid them altogether. And it's much harder to link together and try to orchestrate partial automations built for each new cloud platform that you support. Although I&O pros should leverage infrastructure-as-code tools such as Ansible, Chef, Puppet, and Salt, they must apply them consistently across the entire cloud service life cycle, from request through provisioning, governance, and operations processes.¹¹
- › **Exposing pervasive antiquated technology management thinking.** Nearly everyone claims to be on the cloud bandwagon, but most organizations stubbornly languish in a quagmire of old-school behaviors. They now encounter a phase transition, a crisis requiring a rapid switch from one mode of thinking to another. Even the best tools cannot overcome the behavioral inertia. The often-quoted maxim, "A fool with a tool is still a fool!" applies. Learn from the cloud pioneers. They do things very differently, bearing little resemblance to the IT organization of yore. Staying in your comfort zone will actually prove very uncomfortable in the end.

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FIGURE 1 While Central Cloud Control Is Preferred, Strategies To Implement It Vary Widely

Base: 330 global infrastructure technology decision-makers whose firms (1,000+ employees) have adopted multiple cloud computing platforms

Note: Answers are shown for “primary support” method, and responses of “other” are not shown.
Source: Forrester’s Global Business Technographics® Infrastructure Survey, 2015

Master Hybrid Cloud Management Use Cases And Key Capabilities

Before engaging with vendors, you can arm yourself with a solid understanding of what hybrid cloud management is, what problems you expect it to solve, and the key capabilities you require for your particular mix of cloud services and deployment models. Forrester’s clients often have trouble navigating the wide array of vendor solutions that are labeled “cloud management platforms,” “cloud management,” or, increasingly, “hybrid cloud management.” To avoid confusion, ignore the labels, and instead define your challenges.

Hybrid Cloud Management Solutions Solve Multicloud Challenges

Hybrid cloud is not a type of cloud platform that is distinct from private, hosted private, or public cloud platforms — regardless of vendors’ marketing claims. Hybrid cloud describes the challenges that enterprises face when they use multiple cloud platforms simultaneously. You have a hybrid

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cloud challenge when you move workloads from a private cloud to a public cloud for greater elastic scalability during a sales promotion, for example. You have a hybrid cloud challenge when you develop a web or mobile application in Amazon Web Services (AWS) but run it on a different hosted private cloud. You also have a hybrid cloud challenge when your developers want access to multiple public platforms for different projects.

Forrester defines a hybrid cloud management solution as:

A cloud-agnostic standalone software solution that automates cloud application and infrastructure service delivery, operations, and governance across multiple cloud platforms.

This definition is intentionally broad, since management solutions by nature are platforms and can address a range of use cases and challenges. But the cloud-agnostic and multicloud aspects are critical; hybrid cloud management tools do not help you *build* a specific cloud — they help you build things that *run* on clouds and *manage* the clouds that you use. As such, Forrester considers hybrid cloud management solutions to be distinct from application release automation tools.¹² And while hybrid cloud management is often included in vendors' private cloud suites, its cloud-agnostic nature differentiates its capabilities from the wide range of private cloud software suites on the market.¹³

Hybrid cloud management tools do not help you build a specific cloud — they help you build things that run on clouds and manage the clouds that you use.

Identify Solution Value By Understanding Your Hybrid Cloud Use Cases

At their core, hybrid cloud management solutions are automation and orchestration platforms. They automate manual or scripted tasks, and they orchestrate tasks and processes that execute across a range of platforms, often leveraging other automation tools. Because any automation platform is only useful if it solves specific challenges, you should identify your primary use case and the benefits that you expect to achieve before evaluating vendor solutions. Building on insights from client inquiries, vendor discussions, and our related cloud platforms research, Forrester has identified the four most common hybrid cloud management use cases today (see Figure 2):

- › Accelerating hybrid cloud application development and delivery.
- › Managing and governing the hybrid cloud infrastructure life cycle.
- › Migrating cloud apps and infrastructure among cloud platforms.
- › Creating an enterprise cloud brokering function.

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FIGURE 2 Common Hybrid Cloud Management Use Cases And Enterprise Benefits

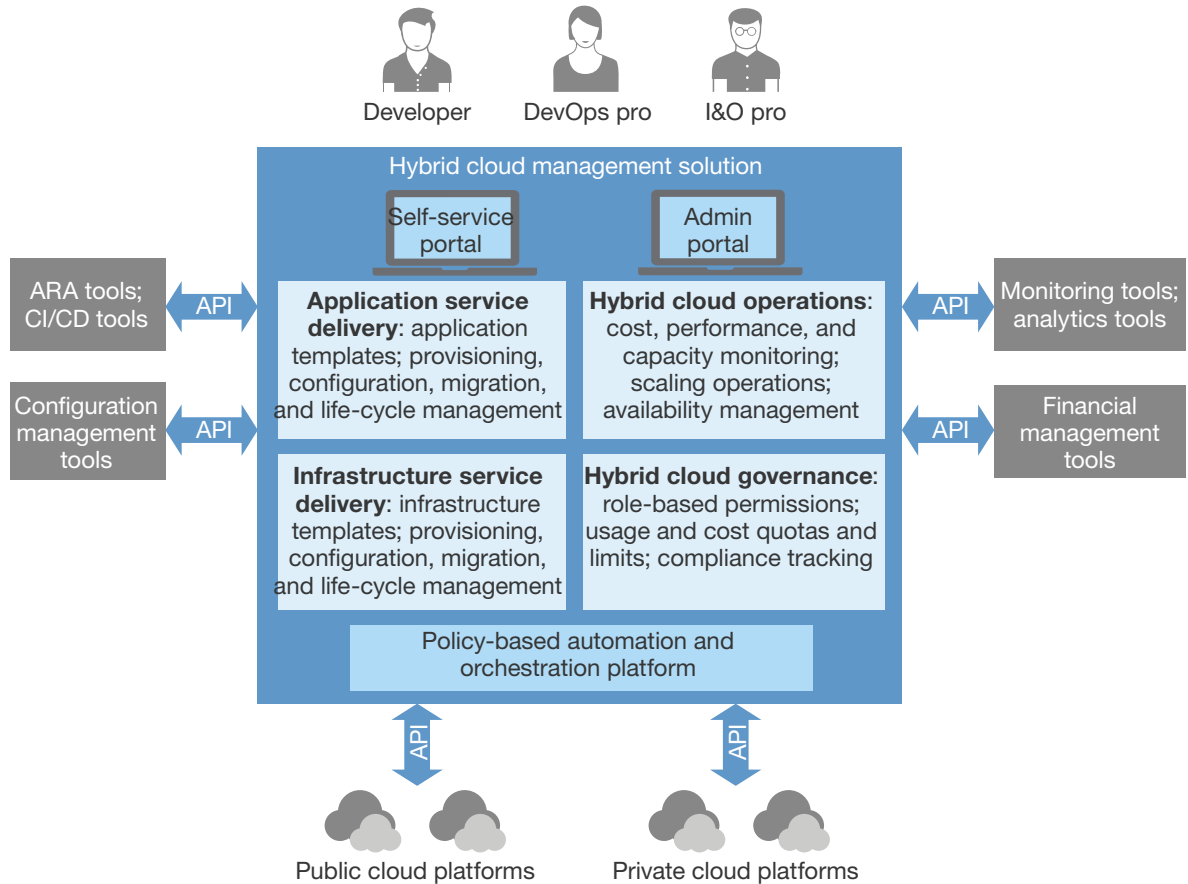
Hybrid cloud use case	Description and objectives	Enterprise benefits
Accelerating hybrid cloud application development and delivery	Accelerate and simplify developer access to and productivity across multiple cloud platforms by offering self-service access and APIs for cloud app and infrastructure services.	<ul style="list-style-type: none"> • Higher developer productivity • Faster release cycles • More frequent releases • Consistent app deployments • Access to advanced cloud services
Managing and governing the hybrid cloud infrastructure life cycle	Deliver, govern, and optimize enterprise use of cloud infrastructure services across multiple cloud platforms, focused on virtual resource provisioning, life cycle, and operations.	<ul style="list-style-type: none"> • Higher operations productivity • Expanded cloud deployment options • Faster infrastructure provisioning • Easier multicloud governance • Consistent usage policy enforcement
Migrating cloud apps and infrastructure among cloud platforms	Migrate existing virtual resources or applications among multiple cloud platforms, either as a one-time onboarding exercise or as an ongoing function.	<ul style="list-style-type: none"> • Faster onboarding to public clouds • Lower migration costs • Greater cloud platform independence • Less time spent on manual migrations
Creating an enterprise cloud brokering function	Source, recommend, and optimize the use of multiple cloud platforms based on price benchmarking, best-fit analysis, cost forecasting, and other cost analytics.	<ul style="list-style-type: none"> • Lower cloud usage costs • Greater developer choice • Simplified consumption model • Consistent usage policy enforcement

Focus On The Right Hybrid Use Case To Achieve Hybrid Cloud Mastery

Once you've identified the use case(s) that's most important to you, you can build out your required solution capabilities and align them to your expected benefits. For example, if your hybrid cloud challenges are primarily around the cloud infrastructure life cycle, focus on features that help package up infrastructure components, present them to your cloud consumers, automate deployment and migration, and monitor consumption and performance. If you are more concerned with accelerating cloud development, look for prepackaged app templates, cloud-agnostic and developer-friendly APIs, integrations with application release automation (ARA) tools, and policy-based automation of app life-cycle events like autoscaling. If cost management is a top concern, prioritize price benchmarking and cost analytics features. The key capabilities are summarized in the reference architecture model that follows (see Figure 3).¹⁴

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FIGURE 3 Reference Model For Hybrid Cloud Management Solution Capabilities

The Hybrid Cloud Management Landscape Is Complex And Expanding

For many incumbent enterprise systems and technology vendors, hybrid cloud management is an evolution of existing IT service management (ITSM) suites. They are extended to manage cloud infrastructure endpoints using the same automation tools that the vendor sells to manage physical and virtualized infrastructure in the data center. Similarly, enterprise technology vendors that have built private cloud solutions often consider hybrid cloud management to be an extension of private cloud and a way to add a bit of public cloud for data center augmentation. Challenging these established vendors is a field of smaller software companies that created solutions to manage multiple public cloud platforms first and are now reaching into the data center to manage private clouds. Still others built solutions for migration or brokerage and are now extending to add more life-cycle and governance features.

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Startups Seek Disruption, While Established Players Expand And Extend

This complex market has no clear subcategories, but many vendor solutions have similar provenances. Across the range of vendors in the hybrid cloud management market, identifying vendors with a similar approach to cloud computing or a similar mix of products can help tame the complexity when doing an initial review. We interviewed the 25 vendors most mentioned by clients exploring the hybrid cloud management landscape, and they can be roughly clustered into several categories (see Figure 4):

- › **Established management solution providers extend existing management suites.** Three of the traditional big-four enterprise management vendors (BMC Software, HP, and IBM) offer standalone hybrid cloud management solutions, often integrating with and leveraging other tools from the vendor's existing catalog. Microsoft and Oracle have added hybrid cloud management features to System Center and Enterprise Manager, respectively.
- › **Enterprise systems vendors add hybrid management to private cloud platforms.** Cisco Systems, Citrix, Computer Sciences Corp (CSC), Dell, HP, IBM, Microsoft, Oracle, and VMware all offer private cloud suites that may also include hybrid cloud management capabilities. If private cloud is critical to your hybrid cloud strategy, consider whether such an extension of private cloud meets your needs.
- › **Hypervisor and OS vendors target technology managers who own infrastructure.** Citrix, Microsoft, Red Hat, and VMware offer virtualization platforms and virtual machine (VM)-focused management tools and focus hybrid cloud management solutions on the cloud infrastructure life-cycle use case. CloudBolt and Embotics also feature VM-focused management capabilities.
- › **Independent software vendors target cloud-focused developers and DevOps.** CliQr, CSC, Dell, DivvyCloud, GigaSpaces, RightScale, and Scalr market their solutions primarily at cloud developers and the DevOps pros who support them.¹⁵ Their solutions are well suited for the cloud application life-cycle use case.
- › **Public cloud platform vendors focus on their own clouds in hybrid scenarios.** Cisco, IBM, Microsoft, Oracle, Red Hat, and VMware offer public cloud platforms in addition to hybrid cloud management software. Naturally, these vendors encourage use of their own platforms for hybrid deployments. Pay attention to how strongly the vendor's own platform is favored when evaluating its hybrid cloud management capabilities.
- › **Cloud migration vendors add more life-cycle management features.** HotLink and RackWare are cloud migration tools with added VM-management features that extend to public cloud platforms. They stress the onboarding and disaster recovery use cases for cloud migration. RISC Networks is a cloud migration analysis tool. In addition to these vendors, many other hybrid cloud management vendors in this landscape have migration capabilities.¹⁶
- › **Cloud brokers and brokerage enablers extend beyond cost analytics.** AppDirect, Gravitant, Jamcracker, and Ostrato primarily focus on the enterprise cloud brokerage use case. Each of these vendors, however, offers additional capabilities beyond cost brokering and analytics that we felt warranted inclusion in this vendor landscape.¹⁷

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FIGURE 4 Vendor Landscape Of Hybrid Cloud Management Solutions

Vendor	Product(s) and version	Current version and licensing options				Cloud platforms managed						
		Current version date*	SaaS/off-premises license	Open source license	Open source version	AWS	Azure	Google	OpenStack-based	VMware-based	Other public	Other private
AppDirect	Private App Management	Jun-15	✓	✓		✓	✓		✓	✓	✓	✓
BMC Software	Cloud Lifecycle Management 4.5	Mar-15	✓	✓		✓	✓		✓	✓	✓	✓
Cisco Systems	ONE Enterprise Cloud Suite v2	Apr-15	✓			✓	✓		✓	✓		
Citrix	Lifecycle Management	May-15		✓		✓	✓		✓			✓
CliQr Technologies	CloudCenter 4	Jun-15	✓	✓		✓	✓	✓	✓	✓	✓	✓
CloudBolt Software	CloudBolt 5.01	Jun-15	✓			✓	✓	✓	✓	✓		✓
CSC	Agility Platform 9.2	Nov-14	✓	✓		✓	✓		✓	✓	✓	✓
Dell	Dell Cloud Manager 11	Jun-15	✓	✓		✓	✓	✓	✓	✓	✓	✓
DivvyCloud	DivvyCloud 15.1	Jun-15	✓	✓		✓	✓	✓	✓	✓	✓	✓
Embotics	Embotics vCommander 5.2	Oct-14	✓			✓	✓		✓		✓	
GigaSpaces Technologies	Cloudify 3.2	Jun-15			✓	✓		✓	✓	✓	✓	✓
Gravitant	cloudMatrix 7.2	Jan-15		✓		✓	✓	✓	✓	✓	✓	✓
HotLink	HotLink Hybrid Express 4.1	Dec-14	✓			✓			✓			✓
HP	HP Cloud Service Automation 4.5 and HP Operations Orchestration 10.2	Jun-15	✓			✓	✓		✓	✓	✓	✓

*For unversioned SaaS offerings, release date is June 2015 when vendors were interviewed.

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FIGURE 4 Vendor Landscape Of Hybrid Cloud Management Solutions (Cont.)

Hybrid cloud management use-case focus

Vendor	Manage infrastructure life cycle	Manage app development and delivery	Enable cloud brokerage and apps	Manage infrastructure and apps
AppDirect		●		●
BMC Software	●		●	
Cisco Systems	●		●	
Citrix	●	●		
CliQr Technologies	●	●	●	●
CloudBolt Software	●	●		
CSC	●	●		
Dell	●	●		●
DivvyCloud	●	●		
Embotics	●	●		●
GigaSpaces Technologies	●	●	●	
Gravitant	●			●
HotLink	●		●	
HP	●	●	●	●

Note: A dark circle represents a primary use case; a light circle represents a secondary use case.
 *For unversioned SaaS offerings, release date is June 2015 when vendors were interviewed.

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FIGURE 4 Vendor Landscape Of Hybrid Cloud Management Solutions (Cont.)

Vendor	Product(s) and version	Current version and licensing options				Cloud platforms managed						
		Current version date*	SaaS/off-premises license	Open source license	Open source version	AWS	Azure	Google	OpenStack-based	VMware-based	Other public	Other private
IBM	IBM UrbanCode Deploy with Patterns 6.1.1.4 and IBM Cloud Orchestrator 2.4	May-15/ Oct-14	✓	✓		✓			✓	✓	✓	✓
Jamcracker	Jamcracker Platform v7.8	May-15	✓	✓		✓	✓		✓	✓	✓	✓
Microsoft	System Center 2012 v2 with Azure Pack and Operations Management Suite	Jun-15	✓	✓		✓	✓		✓		✓	✓
Oracle	Enterprise Manager 12c Release 5	Jun-15	✓	✓							✓	✓
Ostrato	cloudSM v24	Jun-15	✓			✓	✓		✓	✓	✓	
RackWare	Management Module 4.1	May-15	✓			✓	✓		✓	✓	✓	✓
Red Hat	CloudForms 3.2	Jun-15	✓		✓	✓			✓	✓		✓
RightScale	Cloud Portfolio Management	Jun-15		✓		✓	✓	✓	✓	✓	✓	✓
RISC Networks	CloudScape 1.2	Apr-15		✓		✓	✓	✓	✓	✓	✓	
Scalr	Scalr 5.2	Jun-15	✓		✓	✓	✓	✓	✓	✓	✓	✓
VMware	vRealize Suite 6.0	Dec-14	✓			✓	✓		✓	✓	✓	✓

*For unversioned SaaS offerings, release date is June 2015 when vendors were interviewed.

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FIGURE 4 Vendor Landscape Of Hybrid Cloud Management Solutions (Cont.)

Hybrid cloud management use-case focus

Vendor	Manage infrastructure life cycle	Manage app development and delivery	Migrate infrastructure and apps	Enable cloud brokerage
IBM	●	●	○	
Jamcracker	○			●
Microsoft	●	●	○	
Oracle	●	●	●	
Ostrato	●			●
RackWare	○		●	
Red Hat	●	○	○	
RightScale	●	●	○	●
RISC Networks			○	●
Scalr	●	●	○	○
VMware	●	●	○	

Note: A dark circle represents a primary use case; a light circle represents a secondary use case.
 *For unversioned SaaS offerings, release date is June 2015 when vendors were interviewed.

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Explore The Vendor Landscape To Find The Best Matches For Your Needs

The competitive and active hybrid cloud management solutions market includes a range of startups, developer-focused tools, broad infrastructure management suites, migration tools, and brokerage enabling tools. Forrester tracks hybrid cloud management solutions from the following vendors:

- › **AppDirect.** The AppDirect Private App Management (PAM) service enables service providers and enterprises to build self-service cloud application portals and marketplaces. It is available both as SaaS and on-premises and packages cloud apps for scripted deployments to a broad range of cloud platforms. PAM does not offer cloud operations or governance for the cloud infrastructure technology manager; it is most commonly used to enable app stores and cloud service catalogs. AppDirect sells to cloud service providers primarily, with a growing emphasis on enterprises managing growing multicloud application environments.
- › **BMC Software.** BMC's Cloud Lifecycle Management (CLM) is a cloud-agnostic solution that automates provisioning of cloud infrastructure services and includes a self-service portal, automated provisioning workflows, compliance tracking, and health monitoring. CLM integrates with and leverages BMC TrueSight Capacity Optimization for enhanced capacity planning and optimizations across cloud platforms. CLM is primarily sold to enterprise technology managers to direct both cloud and on-premises VM life cycles and for migrations from on-premises to public cloud environments.
- › **Cisco Systems.** Early in 2015, Cisco consolidated and integrated several existing cloud management and platform technologies into the ONE Enterprise Cloud Suite. The suite includes the Prime Service Catalog (self-service portal), an application stack modeling utility (infrastructure templates), UCS Director (infrastructure provisioning), virtual network services, and InterCloud Fabric (hybrid cloud connectivity). Cisco's hybrid cloud management strategy focuses on simplifying cloud infrastructure life-cycle activities across Cisco-based private cloud, InterCloud partners (via a marketplace), and other public clouds. Cisco ONE is targeted primarily at enterprise technology managers extending Cisco-based private cloud environments.
- › **Citrix.** Citrix Lifecycle Management is based on the ScaleXtreme technology, which Citrix acquired in 2014. The solution is SaaS-based and enables design, deployment, and management of apps across multiple clouds. It also includes application blueprints, deployment workflows, monitoring, alerting, disaster recovery, and autoscaling to help technology managers accelerate the delivery of mainly Citrix applications. These include XenDesktop, XenMobile, and Workspace Suite. Citrix's hybrid cloud strategy strongly focuses on managing Citrix applications. Customers can manage Citrix's own CloudPlatform (commercial distribution of Apache CloudStack), plus other virtualization and cloud platforms. Lifecycle Management targets enterprise application managers looking to simplify operations for Citrix workloads and other enterprise applications.
- › **CliQr Technologies.** CliQr CloudCenter is a cloud-agnostic standalone hybrid cloud management solution. CliQr does not sell private or public cloud platforms, and CloudCenter is designed to provide a unified interface for developers and technology managers to manage both cloud

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application and infrastructure life cycles. CloudCenter includes a self-service portal, modeling (app and infrastructure templates), price and performance benchmarks, automated deployment workflows, policy-based scaling and other operations, governance, security, and financial control features. CliQr targets enterprises (both technology managers and DevOps pros) and service providers and addresses the app and infrastructure life-cycle management, migration, and brokerage-enablement hybrid cloud use cases.

- › **CloudBolt Software.** CloudBolt is a cloud-agnostic standalone hybrid cloud management solution. It automates delivery of cloud infrastructure services and includes a self-service portal, automated provisioning workflows, VM life cycle and configuration management, usage quotas, costing, and charge-back reporting. It is designed to provide a unified interface for a range of virtualization and cloud platforms. CloudBolt is primarily an orchestration platform, with integrations to leverage existing configuration management, provisioning, networking, and container technologies as well as other orchestration platforms. Used with existing virtualization platforms, it can also help build a private cloud. CloudBolt addresses the infrastructure and app life-cycle management hybrid cloud use cases.
- › **CSC.** The CSC Agility Platform is built on the product that ServiceMesh developed, which CSC acquired in 2013. Agility Platform is a cloud-agnostic standalone hybrid cloud management solution that includes integrated modules for unified multicloud governance, security, orchestration, and automation. It features API integrations to CSC's own BizCloud private cloud solutions as well as a range of other private and public platforms. Agility targets both the app and the infrastructure life-cycle hybrid cloud management use cases, and CSC targets enterprise technology managers who are expanding their hybrid cloud portfolios.
- › **Dell.** Dell Cloud Manager is a cloud-agnostic standalone hybrid cloud management solution built on the product that Enstratus developed, which Dell acquired in 2013. Cloud Manager includes automated provisioning, a self-service portal, application and infrastructure templates, single sign-on, scaling, governance, security, monitoring, and integrations with a broad range of private and public cloud platforms. It is available as a SaaS subscription or for on-premises deployment. Dell also sells converged private cloud platforms separately. Cloud Manager targets the app and infrastructure life-cycle hybrid cloud use cases, focusing on accelerating the cloud app delivery life cycle for DevOps pros.
- › **DivvyCloud.** DivvyCloud is a cloud-agnostic standalone hybrid cloud management solution targeting DevOps pros and technology managers. Founded in 2013, DivvyCloud includes autodiscovery and ongoing monitoring of multicloud resources, a policy-based governance engine, event-driven automation workflows, and scaling operations. It is targeted at DevOps pros and technology managers seeking to accelerate cloud-based software delivery. DivvyCloud claims to enhance or augment other hybrid cloud management vendor solutions, via autonomic monitoring of multiple cloud platforms. It does this to identify policy violations and configuration errors.

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- › **Embotics.** Embotics' vCommander is a cloud-agnostic standalone hybrid cloud management solution that automates delivery of cloud infrastructure services and includes a self-service portal, automated provisioning of workflows, cost reporting and comparison, policy-based life-cycle actions, capacity optimization, and rightsizing recommendations. It is designed to provide a unified interface for technology managers for a range of virtualization and cloud platforms. vCommander includes a policy-based orchestration platform and targets enterprise technology managers (including those who manage development labs) and managed service providers who offer multitenant cloud services. Embotics addresses the app and infrastructure life-cycle management hybrid cloud use cases.
- › **GigaSpaces.** GigaSpaces' Cloudify is an open source standards-based orchestration platform for automating delivery and scaling of multitier, microservices, big data, and network function virtualization apps on multiple cloud platforms. It includes a policy-based orchestration engine to trigger workflows based on monitored events, infrastructure and app templates, and integrations with app release automation and configuration management tools. It also has alerting and dashboards and automated scaling and support for multiple private and public cloud platforms. Cloudify focuses on accelerating the app and infrastructure life-cycle hybrid cloud management use cases. GigaSpaces targets cloud-first development teams and enterprise technology managers.
- › **Gravitant.** Gravitant cloudMatrix is a cloud-agnostic cloud brokering software suite that aims to accelerate and optimize the entire technology delivery value chain, from assessment through comparison, design, procurement, and operations. It includes centralized pricing comparisons and billing management, an application designer, approvals and provisioning workflows, resource discovery and monitoring, and a self-service catalog. CloudMatrix focuses on helping enterprises create an internal cloud brokerage function, with added features for cloud infrastructure life-cycle management.
- › **HotLink.** The HotLink Hybrid Management Suite is a cloud and virtual infrastructure migration and management tool that is deployed as a plug-in to VMware's vCenter Server management product. The HotLink platform is not an overlay hybrid cloud management tool itself but enables technology managers to bidirectionally migrate, protect, and manage hybrid cloud resources via vCenter and compatible tools. HotLink includes features to discover infrastructure assets, transform and convert VMs across multiple hypervisor and cloud platforms, manage hybrid cloud networking and storage attributes, and coordinate cross-cloud disaster recovery. HotLink targets the hybrid cloud infrastructure life-cycle management use case primarily.
- › **HP.** HP Cloud Service Automation (CSA) is an open, heterogeneous cloud infrastructure and app automation solution supporting a range of HP private cloud and non-HP public cloud platforms. It includes a self-service portal, cost comparison reports to enable cloud brokerage, an infrastructure and app template designer, and automated provisioning, scaling, and monitoring workflows. CSA integrates with and leverages HP's Operations Orchestration solution to automate provisioning

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across multiple cloud platforms. CSA is also sold as part of the HP Helion CloudSystem Enterprise edition, which includes cloud infrastructure and developer platforms based on OpenStack. CSA automates both infrastructure and app life-cycle activities, with a focus on infrastructure and VM management. HP targets CSA at enterprise cloud technology managers and service providers with multihypervisor and multicloud portfolios.

- › **IBM.** IBM Cloud Orchestrator (ICO) is a hybrid cloud infrastructure and application automation solution supporting a range of IBM and non-IBM cloud platforms. It includes a self-service portal, infrastructure and app patterns, automated provisioning and scaling workflows, metering, accounting, and monitoring. ICO integrates with and leverages IBM's UrbanCode Deploy with Patterns and PureApp solutions to support continuous app delivery and create reusable application patterns (templates) for multicloud deployments. IBM also offers its own public and private cloud platforms (including SoftLayer, IBM Cloud Manager with OpenStack, and Bluemix). IBM targets ICO at enterprise cloud technology managers and service providers with complex middleware and application topologies spanning multiple clouds.
- › **Jamcracker.** The Jamcracker Platform is a cloud-agnostic cloud brokering software suite that aims to extend cloud brokerage functions to include cloud infrastructure and app governance, spend/budget management, and operations management. The platform includes a self-service catalog, identity and access management, automated provision workflows, policy-based governance, monitoring, and usage-based accounting features. Jamcracker is extending its expertise in SaaS application brokerage enablement to a broader range of cloud infrastructure platforms. The vendor primarily targets cloud service providers and brokers but is currently adding capabilities for enterprise technology managers as well.
- › **Microsoft.** Microsoft's Windows Azure Pack installs and runs on top of System Center and integrates with Windows Server and SQL Server to create a private cloud that is consistent with Azure. As such, it is not a hybrid cloud management solution as described in this report but enables multicloud capabilities that are consistent across Microsoft-based private and public (Azure) platforms. The Microsoft Operations Management Suite (OMS) extends System Center for hybrid cloud management. OMS is cloud-based and includes log analytics, automation, backup and disaster recovery, and security and compliance capabilities across Microsoft and other public/private cloud platforms. It can be purchased as an add-on to System Center or as standalone services.
- › **Oracle.** Oracle Enterprise Manager is a unified management console for handling the life cycle of Oracle applications and infrastructure deployed on-premises as well as off-premises, including the vendor's data-as-a-service, SaaS, PaaS, and IaaS offerings. Enterprise Manager is sold to Oracle's customers to manage hybrid portfolios of Oracle applications and infrastructure services and includes automated deployment workflows, governance and compliance controls, a self-service catalog, and secure connectivity to the Oracle Cloud Platform from an enterprise data center.

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- › **Ostrato.** The Ostrato cloudSM management platform is a cloud-agnostic standalone hybrid cloud management solution that includes role-based access controls, multicloud provisioning automation, governance controls, integration APIs, a self-service portal with templates, and usage reporting. Ostrato primarily targets the hybrid cloud infrastructure life-cycle use case but has recently shifted focus to cloud cost management and analytics. The vendor sells to managed service providers and enterprise cloud technology managers.
- › **RackWare.** The RackWare Management Module (RMM) is a cloud and virtual infrastructure migration and management tool. RMM includes wizard-driven automations for migrating workloads across a broad range of private and public cloud platforms for various targeted use cases, including disaster recovery, autoscaling, onboarding, and scheduled parking of resources (i.e., turning cloud instances on or off at specific times). RackWare primarily targets the hybrid cloud migration use case.
- › **Red Hat.** Red Hat CloudForms is a cloud-agnostic standalone virtualization and hybrid cloud management solution built on the proprietary product that ManagelQ developed, which Red Hat acquired in 2012. CloudForms includes a self-service portal, automated provisioning, quotas and charge-back/show-back, policy-based control, orchestration, governance, and capacity management. CloudForms is now based on the open source ManagelQ project, which was formed when Red Hat released the code as open source. Red Hat targets technology managers seeking to improve infrastructure efficiency and increase app delivery speeds. CloudForms primarily targets the hybrid cloud infrastructure life-cycle use case.
- › **RightScale.** The RightScale Cloud Portfolio Management suite is a cloud-agnostic standalone hybrid cloud management solution that includes a self-service portal, a cloud management module, and a cloud analytics module. RightScale delivered one of the first independent cloud management solutions and targets both application and infrastructure cloud life-cycle management. The suite includes a self-service portal with cost visibility and controls, automated provisioning, app and infrastructure templates, policy-based governance and workload life-cycle operations, change control auditing, and monitoring across a range of private and public cloud platforms. RightScale is available as a SaaS subscription, and the company targets cloud developers, DevOps pros, and technology managers with growing hybrid cloud portfolios.
- › **Scalr.** The Scalr Cloud Management Platform (version 5.2) is an open source cloud-agnostic standalone hybrid cloud management solution offered in three editions. These include an open source edition called Open Source Scalr, the Scalr Hosted Edition, and an on-premises Scalr Enterprise Edition. Scalr includes a self-service portal, Lightweight Directory Access Protocol role-based access control, integrations with configuration management and ITSM systems, cost analytics and budget management, policy-based governance controls, and a cloud-independent abstraction API that targets developers. Scalr aims to accelerate and simplify the process of building cloud-native applications across multiple cloud platforms and targets both the app and the infrastructure life-cycle management use cases. The vendor primarily sells to cloud developers, DevOps pros, and technology managers seeking to design and enforce cloud best practices.

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- › **RISC Networks.** RISC Networks offers two products, IT HealthCheck and CloudScape, to assist systems integrators and solution providers with infrastructure health assessments and cloud migration projects. The tools include resource discovery, inventory management, dependency mapping, workload analysis, and competitive cloud price comparisons. They are not typically sold directly to enterprise customers, nor are they hybrid cloud application or infrastructure life-cycle management tools. RISC Networks targets the cloud migration and brokerage use cases by enabling cloud service providers to optimize the performance of their own cloud services and to help enterprises plan cloud migration costs.
- › **VMware.** The vRealize Suite packages several hybrid cloud management products, including vRealize Automation, vRealize Operations (with vRealize Log Insight), and vRealize Business. vRealize Suite includes a self-service portal, app and infrastructure templates, policy-based governance controls, performance and capacity monitoring and management, log management, usage metering and cloud cost benchmarking, and integrations with configuration management tools. VMware offers private cloud platforms based on vSphere or VMware Integrated OpenStack. The Advanced and Enterprise editions of vRealize Suite include support for AWS and Azure public clouds in addition to vCloud Air and vCloud Provider public clouds. vRealize Suite primarily targets virtualization and private cloud technology managers extending their cloud infrastructure portfolios to include multiple public clouds, but newer app life-cycle management features are aimed at DevOps pros building multicloud applications.

Recommendations

Start Small, And Focus On Your Top Hybrid Cloud Challenges First

I&O pros should plan for a hybrid cloud future starting today. Don't let hybrid cloud happen to you — plan for it. If you're only using one private or public cloud platform today, you should still explore the hybrid solution landscape, because these tools can offer deeper and broader automation than you might have implemented so far — and they can help you provide self-service that will delight your business customers. Unless your development teams already agree that your entire enterprise cloud portfolio is as easy to use as public cloud, you have some work to do. Before you select a vendor or start evaluating features, answer these questions:

- › **How are we falling short on a hybrid cloud customer experience?** Find out how long developers wait for infrastructure and what's keeping them from coding. Target those sources of friction with true self-service. Make sure that you offer a consistent experience across private and public if you have both or plan to soon. Also, don't forget monitoring and reporting. The more utilization and performance data transparency you expose to your cloud consumers, the more they will trust the platforms that you deliver.

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- › **Where are my technology managers wasting the most time?** Find out how much time is spent duplicating VMs, creating cloud instances, or moving VMs among clouds or availability zones, and work to automate those processes first. Review your end-to-end cloud delivery workflows: How are templates created, consumed, modified, and updated? How much scripting do you rely on, and where are the bottlenecks? Knowing what you need to automate will shorten the time-to-value for any hybrid cloud management solution.
- › **Which hybrid cloud benefit will create customer value fastest?** If you just need to get existing workloads to the cloud reliably, focus on migration features. If you need to rein in cloud spending and make sure that developers use the most cost-effective cloud platforms, focus on cost analytics and brokerage features. If your developers are clamoring to leverage more cloud platforms than you offer today, focus on enabling a cloud-agnostic API layer to multiple clouds. Start small, and identify success metrics for each hybrid process you automate.

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Supplemental Material

Survey Methodology

Forrester's Global Business Technographics Infrastructure Survey, 2015, was fielded to 3,592 business and technology decision-makers located in Australia, Brazil, Canada, China, France, Germany, India, New Zealand, the UK, and the US from companies with two or more employees. This survey is part of Forrester's Business Technographics and was fielded from May 2015 to June 2015. ResearchNow fielded this survey on behalf of Forrester. Survey respondent incentives include points redeemable for gift certificates. We have provided exact sample sizes in this report on a question-by-question basis.

Forrester's Business Technographics provides demand-side insight into the priorities, investments, and customer journeys of business and technology decision-makers and the workforce across the globe. Forrester collects data insights from qualified respondents in 10 countries spanning the Americas, Europe, and Asia. Business Technographics uses only superior data sources and advanced data-cleaning techniques to ensure the highest data quality.

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Forrester's Global Business Technographics Infrastructure Survey, 2015, of Australia, Brazil, Canada, China, France, Germany, India, New Zealand, the UK, and the US includes many additional questions and parameters by which you can analyze the data contained in this report.

We can provide additional insights about the consumers highlighted in this report:

- › Who they are (e.g., demographics, lifestyle, interests).
- › What they do (e.g., digital, mobile, social behaviors).
- › Affiliations they have (e.g., brands used, products owned).
- › How they feel (e.g., attitudes, interests).

If you wish to subscribe to Forrester's Technographics services, please contact your account manager or data@forrester.com. If you are an existing Technographics client, please contact your data advisor at data@forrester.com.

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Companies Interviewed For This Report

AppDirect	HP
BMC Software	IBM
Cisco Systems	Jamcracker
Citrix	Microsoft
CliQr Technologies	Oracle
CloudBolt	Ostrato
Computer Sciences Corp (CSC)	RackWare
Dell	Red Hat
DivvyCloud	RightScale
Embotics	RISC Networks
GigaSpaces	Scalr
Gravitant	VMware
HotLink	

Endnotes

¹ For more information on the top BT agenda technologies for the I&O professional, please see the [“Top Technologies For The Infrastructure & Operations BT Agenda”](#) Forrester report.

² For more information, see the [“Which Cloud Computing Platform Is Right For You?”](#) Forrester report.

³ Source: Forrester’s Global Business Technographics Infrastructure Survey, 2015.

Are you ahead of your competitors or falling behind on cloud adoption? To understand the current state of cloud adoption and the impact on enterprise technology infrastructures, see the [“Benchmark Your Enterprise Cloud Adoption”](#) Forrester report.

⁴ Source: Forrester’s Business Technographics Global Software Survey, 2014, and Forrester’s Business Technographics Global Developer Survey, 2015.

⁵ Cloud is a great opportunity for I&O pros. Your business users want to build and deploy applications faster, and they need an IT foundation that can keep up with them. They don’t want to operate the supporting IT environments (i.e., secure them, back them up, maintain them, or fix performance problems). This is where you come in. To master the key skills that you need to balance speed with control, see the [“Cloud Management In A Hybrid Cloud World”](#) Forrester report.

⁶ Developers can’t wait hours or days for the cloud services they need to build your company’s customer-facing applications. If they can’t get what they need from you, they will go around you. This is especially important when building and operating a private cloud. Forrester analyst Lauren Nelson discusses this challenge in detail and charts the technologies you can use to optimize your private cloud strategy in the following report. See the [“TechRadar™: Private Cloud, Q3 2015”](#) Forrester report.

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⁷ Your technology ecosystem is rich and deep. To deliver good services, master this ecosystem. More help can be found in the following reports. See the [“Embrace The Hybrid Technology Ecosystem For Service Design”](#) Forrester report, see the [“Service Design Is Your New Approach To Infrastructure”](#) Forrester report, and see the [“The All-Digital Era Requires An Application Ecosystem”](#) Forrester report.

Specifically with cloud, the following report is a must-read. See the [“Cloud Evolves From Point Solution To Strategic Enabler Of The New Connected Economy”](#) Forrester report.

⁸ Forrester believes that to become a successful digital business, you must learn to think as your customers do. Right now, your customers are assembling the solutions to their problems with a collection of instantly available digital products and services from your suppliers, partners, digital disruptors, other customers, and competitors. I&O leaders must create hybrid cloud ecosystems to support and accelerate the creation of these dynamic ecosystems. For more on how every company is becoming a cloud company, see the [“Recast Your Digital Ecosystem With Cloud”](#) Forrester report.

⁹ Developer empowerment is a core tenet of cloud computing, and self-service is readily available within all private cloud product suites. Yet only 28% of North American and European enterprise private cloud environments offer self-service access for developers. For more information about adding self-service to your cloud strategy, see the [“How Will Your Private Cloud Pass The Developer Self-Service Litmus Test?”](#) Forrester report.

¹⁰ The traditional service delivery life cycle involved a formal handoff to operations, at which point I&O professionals were only responsible for improving the delivery of the run phase. With little to no feedback into the rest of the life cycle, expertise on how to better enable services was left out completely from the other phases of the life cycle. In the new modern service delivery life cycle, operations professionals can contribute in the design of a stable and reliable service and create and automate Lean processes. See the [“What Makes Modern Service Delivery Modern?”](#) Forrester report.

¹¹ Today’s automation solutions answer the fundamental issues of scale, speed, costs, and repeatable accuracy that I&O organizations must resolve to stay competitive. This report is the first in a series on automation to inform I&O pros of the current market and how they can automate specific domains of technology management production to help win, serve, and retain customers. See the [“Automate I&O To Answer Digital Disruption”](#) Forrester report.

¹² Forrester evaluates the seven application release automation vendors that matter most in the following report. See the [“The Forrester Wave™: Application Release Automation, Q2 2015”](#) Forrester report.

¹³ Hybrid cloud management solutions are “standalone cloud management” solutions, as defined by Lauren Nelson in Forrester’s in-depth coverage of the private cloud software vendor landscape and TechRadar™ report. Because many hybrid cloud management solutions are also sold as part of private cloud software suites and can be used to manage environments with private cloud platforms only, many of the vendors discussed in this report are also covered in the following report. See the [“Vendor Landscape: Private Cloud Software”](#) Forrester report and see the [“TechRadar™: Private Cloud, Q3 2015”](#) Forrester report.

¹⁴ For detailed descriptions of each of the essential hybrid cloud management capabilities, see the [“Cloud Management In A Hybrid Cloud World”](#) Forrester report.

¹⁵ DevOps pros are developers and technology managers who create and manage DevOps processes. DevOps processes are inspired by Agile software development and help both development and operations teams achieve continuous improvement by automating infrastructure delivery tasks to match the rapid pace of modern software delivery. Are you a DevOps shop? See the [“The Seven Habits Of Highly Effective DevOps”](#) Forrester report.

¹⁶ Additional vendors of cloud migration solutions include AppZero, CloudVelox, Racemi, and Rivermeadow. These vendors focus more narrowly on the migration use case alone, and we determined that they were outside of the scope of this vendor landscape.

¹⁷ Additional vendors of cloud brokerage and brokerage-enabling solutions include Ensim and Parallels. Both declined to participate in this vendor landscape research.