Predictions 2016: The Cloud Accelerates

Eleven Key Developments For Cloud And What I&O Pros Should Do About Them

by Dave Bartoletti, Lauren E. Nelson, Andras Cser, John R. Rymer, Andre Kindness, and William Martorelli
November 16, 2015

Why Read This Brief

After reaching mainstream acceptance in 2015, cloud will shift into the next gear in 2016. This next stage will focus on expanding cloud use cases and infrastructure and operations (I&O) professionals' attitudes around automation and relinquishing some control. The goal of entire business ecosystems operating in a blend of cloud services is within reach. This brief outlines the 11 key developments coming to the world of cloud in 2016 and provides specific recommendations for I&O leaders.

Key Takeaways

Demand For Hybrid Cloud Management Solutions Will Spike

I&O pros must balance centralized security and management with the speed and UI preferences of modern application developers. The best strategy combines both rapid self-service access backed by frictionless governance and operational oversight.

Automation Will Finally Make A Significant Dent In Cloud Security Fears

Security automation solutions will span both on-premises and cloud-based services, assuaging security fears across the entire hybrid. Since security and risk pros cannot keep coding explicit security policies for emerging and zero-day threats, they'll turn to heuristics-based automation solutions.

Hyperconverged Solutions With Containers Will Become Commonplace

Hyperconverged infrastructure and containers will combine in 2016, yielding the most flexible application packaging yet.

Predictions 2016: The Cloud Accelerates

Eleven Key Developments For Cloud And What I&O Pros Should Do About Them

by Dave Bartoletti, Lauren E. Nelson, Andras Cser, John R. Rymer, Andre Kindness, and William Martorelli
with Glenn O'Donnell, Laura Koetzle, Naveen Chhabra, Liz Herbert, Frank Liu, Paul Miller, Sophia I. Vargas, and Michael Caputo
November 16, 2015

Eleven Factors Will Accelerate Cloud Adoption In 2016

Now that cloud computing is planted firmly in the technology management playbook, I&O pros will speed and spread their adoption of cloud platforms in 2016. Cloud platforms will be the central theme in connected economies that will transform businesses to win, serve, and retain customers.[1] The coming year will be so big for cloud that we added one to our customary 10 cloud predictions. Here's why we turned the dial up to 11:[2]

1. **Size matters: Top vendors gain and others retreat or refocus.** The cloud vendor landscape is too crowded. In 2014 and 2015, ActiveState, Blue Box, Concur, eNovance, Eucalyptus, GoGrid, Metacloud, Piston, ScaleXtreme, ServiceMesh, TOA Technologies, and Virtustream were all acquired.[3] The consolidation and shakeout will accelerate in 2016, which will force many current providers to refocus on a narrower field, retreat from cloud, or exit. The major public cloud providers will gain strength, with Amazon, IBM SoftLayer, and Microsoft capturing a greater share of the business cloud services market. Despite excellent technology and scale, Google will only begin to develop momentum in large-enterprise business in 2016. Even with innovative new players like Aliyun and DigitalOcean emerging, the number of options for general infrastructure-as-a-service (IaaS) cloud services and cloud management software will be much smaller at the end of 2016 than the beginning.[4]

   Action: Standardize on the cloud leaders. You always have some reason to be wary of small players because they carry much more risk. This risk is now gaining steam. Many specialty vendors will be sold or go cold in 2016. Cloud leaders like Amazon and Microsoft are getting stronger because they keep innovating like startups, and they benefit from the massive ecosystems they've attracted with that innovation. Keep pressure on your vendor to innovate — especially incumbents like IBM, Oracle, and VMware. Abandon those that do not, regardless of your existing investment.

2. **Hyperscale clouds report true cloud revenue with impressive profits.** Now that Amazon Web Services (AWS) has reported actual revenue — and a nice profit — Google and Microsoft will definitely follow in 2016.[5] IBM, VMware, and the other public cloud providers had better take notice and start reporting clear, distinct revenue from public cloud platform services. They must stop lumping their public clouds in with consulting, implementation, and on-premises private-cloud-technology sales. The market wants to know if vendors can actually deliver sustainable, profitable, efficient, and transparent public IaaS and platform-as-a-service (PaaS). The actual revenue and margin will become transparent among all cloud providers in 2016 because CIOs and investors will demand visibility and will punish providers that hide behind services revenue and other obfuscations.

   Action: Press your cloud providers for more transparency. Vendors will respond to your demands. For example, Oracle recently reported strong cloud platform results and happily broke out SaaS, IaaS, and PaaS revenues.[6] These numbers matter, especially in a dynamic market filled with vendors eager to claim cloud dominance. Platform-level detail is important, because without it you cannot either make valid comparisons across provider services or understand whose public cloud services are growth engines and whose public cloud services are loss leaders.

3. **Many providers adapt to offer managed services for the megaclouds.** Vendors like HP, Rackspace, and Verizon focus their marketing on creating an "enterprise-class cloud" and don't plan to compete head-to-head with hyperscale public clouds like AWS, Azure, and Google.[7] As firms continue to adopt hyperscale public clouds, the onus is on those other providers to carve out niches for themselves as overlays, or value adds to the hyperscale public clouds. For example, Datapipe was the first to create a managed AWS offering that gave its customers a consistent experience between Datapipe cloud services and AWS, including the same support and management up to the OS layer. Connectria, Logicworks, and Rackspace were intrigued by the model and quickly followed suit to capture more hybrid cloud opportunity. This market for managed cloud services will explode with new entrants in 2016.

   Action: Ramp up for cloud with managed services partners — and learn from them. Evaluate how these managed services partners can help you with the cloud challenge. Because the best people to build the "path to cloud" probably don't work for you.

4. **Demand for hybrid cloud management solutions spikes.** Your digital business needs multiple environment types to host different application types. This means that I&O teams face a unique set of challenges in connecting their hybrid assortment of cloud and non-cloud options. Hybrid cloud describes this new reality. As I&O pros problem-solve for hybrid cloud, they will have to balance centralized security and management with the speed and UI preferences of modern application developers. The best strategy combines both: rapid self-service access backed by frictionless governance and operational oversight. I&O pros will prioritize tackling these hybridization challenges in 2016, which means that hybrid cloud management and corresponding network solutions will take off.[8] Thus, platform providers in both the private and public cloud space, plus vendors of standalone management solutions, will continue to pile into this market hoping to be your "single point" of governance.

Action: Stop thinking about cloud management and get moving with real deployment.
Assemble a small team of software experts to develop a strategy and stick to it until you get actionable feedback from your cloud consumers. Current cloud management approaches are piecemeal: 27% of I&O professionals manage hybrid cloud without any new tools (using what they already have); 31% rely on new on-premises software; and 16% use SaaS solutions.[9] If you're in one of these boats, start with tools like the elementary versions of Chef and Puppet to perform basic automation functions for a specific use case. Then build capabilities for self-service and higher-level orchestration atop this core. Aim to provide your developers with some level of self-service by mid-year. You need to wrap governance around your clouds, but don't try to exert tight control or developers will revolt and circumvent your hard work.

5. **Automation finally chips away at cloud security fears.** Security remains the top cloud concern — by a wide margin.[10] Cloud players like AWS, IBM SoftLayer, Microsoft Azure, Rackspace, and Verizon will provide security solutions for data protection, encryption, data governance, access control, network security (intrusion prevention), user directory integration, and configuration management. However, some security and risk (S&R) pros prefer to use third-party security solutions to separate duties so that "someone watches the guards." Security automation solutions will span both on-premises and cloud-based services, assuaging security fears across the entire hybrid. Since S&R pros cannot keep coding explicit security policies for emerging and zero-day threats, they'll turn to heuristics-based automation solutions from vendors like Elastica and Netskope, and cloud security gateways like CipherCloud and Blue Coat's recently acquired Perspecsys.[11] They apply to access control and activity monitoring for IaaS platforms and also in privileged identity management on IaaS platforms and SaaS user applications.

Action: Stop using security as an anti-cloud excuse and tap automated governance. I&O pros must set expectations with their CIOs and CISOs that you cannot secure cloud workloads by retrofitting on-premises security products and solutions (that's just the security version of "cloudwashing"). Mapping out, comparing, reconciling, and uniformly addressing user access scenarios and workload set-up and configuration scenarios for on-premises and cloud-based workloads will greatly simplify and strengthen cloud workload security. Configuration and process consistency is paramount, and a more industrial model of development and operations lets software perform the hard, repetitive work. Let the software also continually analyze the entire landscape more thoroughly — because humans cannot.

6. **Hyperconverged solutions with containers become commonplace.** Use of containers grew meteorically in 2015.[12] Hyperconverged infrastructure is not far behind.[13] These two developments will combine in 2016, yielding the most flexible application packaging yet. AWS, CoreOS, Docker, Google, Mesosphere, Red Hat, VMware, and the various OpenStack players will lead the way. Hyperconverged infrastructure will be the foundation because it provides great flexibility with underlying resources in the pool for cloud services.

Action: Collaborate on an integrated approach to code, containers, and infrastructure. The promise of containers is faster app delivery cycles, better runtime execution, and lower production infrastructure costs. The first two depend on working with your app developers to leverage microservices in your app designs. The last depends on having a highly efficient shared platform on which to deploy containerized apps. Hyperconverged infrastructure should be your foundation, so make sure to link your app and infrastructure strategies tightly in 2016.

7. **Networking becomes the linchpin of hybrid cloud.** At its 2015 VMworld conference, VMware repeatedly highlighted the importance of networking in creating hybrid clouds — and for good reason.[14] Forrester has recognized networks as a critical element and hurdle for I&O teams in creating hybrid cloud services.[15] Software-defined networking (SDN) overlay solutions have therefore appeared on the market to tackle those challenges. I&O professionals will leverage SDN overlays as a short-term solution. In the long run, SDN will be a key embedded element in hybrid cloud services, with little need for an adjunct overlay. I&O teams will use multiple vendors, connectivity, and transport options — such as colocation facilities, SDN overlays, direct connect options, and MPLS — to fill out an enterprise hybrid cloud portfolio.

   Action: Follow Forrester's VNI architecture to accelerate hybrid cloud. Forrester's virtual network infrastructure (VNI) research covers how the five-part architecture binds the various hybrid parts into a shared, standardized, simple, and secure service.[16] Tackling every network element is too much for most I&O groups, so use SDN overlays to get started and then bridge to your hybrid cloud resources.[17] Next, consider a colocation vendor like Equinix or Interoute that can offer connectivity to other platforms — software, monitoring, or communication platforms to name a few. Finally, build a comprehensive business process network platform that encompasses all five tenets of VNI.[18]

8. **Systems of record drive new growth.** Web and mobile applications and businesses (systems of engagement) drove the growth of public cloud platforms. A new breed of analytics applications (systems of insight) and core business applications (systems of record) will fuel the next phase of cloud adoption.[19] Both are interesting, but systems of record will be the big push in 2016. Your firm needs the flexibility of cloud for some core business applications. An increasing number believe public clouds are their best option for data security as well. These enterprises are the vanguard of a trend to take core systems of record applications to public cloud platforms.

   Action: Avoid "lifting and shifting" systems of record into the cloud. Beware the term lift and shift, a fancy way of saying rehosting. Rehosting existing apps on elastic clouds displaces operations costs but won't add enough flexibility to be an attractive long-term option. The greater software flexibility that business leaders want is only available by extending, modifying, or replacing older applications with new code that actually takes advantage of cloud platforms.

9. **Geopolitical dynamics create opportunities for local competition.** Although the major public cloud hubs have largely stabilized in the United States, the international dust hasn't settled. The US Patriot Act has left the Canadian and European markets looking for cloud providers headquartered

outside the US for their cloud usage. This presents a real opportunity for non-US pure-plays and telcos.[20] Telstra will gain significant share in Asia Pacific, while other telcos will suffer. Alibaba and Huawei will see significant traction in China, while Fujitsu and NTT Communications will see continued success in Japan. In 2016, Forrester anticipates that Alibaba will encroach into the top tier of public cloud services globally but Huawei will not. Both will struggle to expand in the US outside their niche of serving the US portions of Chinese firms.

Action: Fortify your geopolitical hybrid with global management and local providers. If you have a global presence, you have an even stronger need for a hybrid approach to cloud. You face transnational issues in addition to the challenges of integrating on-prem and off-prem services. Insulate yourself with a consistent global strategy of hybrid cloud management supported by tactically local providers. The current data sovereignty laws and regulations indicate you will eventually need to keep all customer data in-country. Use colocation and other services to maintain close contact with cloud partners.[21] Global providers like Equinix are attractive, but consider local partners for specific markets — especially China.[22] Work with your S&R colleagues to implement Forrester's Zero Trust or a similar model to protect your data and remain vigilant.[23]

10. **Cloud brokering recedes as a distinct category in favor of broader cloud governance.** In 2016, we will finally stop talking about cloud brokering as a distinct subject, or separate set of products. Most now recognize cloud brokering as a set of functions that assists and enables enterprise consumption of the cloud, and thus should form part of broader hybrid cloud management solutions. For example, erstwhile cloud brokers like Gravitant (recently acquired by IBM) include cloud provisioning features, and cloud management platforms like RightScale have brokering features. Moreover, a market for automated, policy-based cloud sourcing engines (i.e., brokering) has yet to emerge. Activities from major suppliers will help to clarify and debunk the cloud brokering mystique.

Action: Think about cloud brokering as part of hybrid cloud management. Your cloud future is now and brokering capabilities are here now, so get to work on building your cloud governance structure. Pursue hybrid cloud management software, with brokering as just another function in these automation suites. Shun anything and anyone with a myopic focus on brokering.

11. **OpenStack leaders attempt an OpenStack public cloud system.** OpenStack is now established as a private cloud platform standard, where every private cloud suite and management solution must support OpenStack APIs to some extent.[24] But in the public cloud market, it is far from a standard. Although OpenStack boasts 20 OpenStack-based public clouds, only four of these are from two major vendors — HP and Rackspace. With HP leaving the public cloud market in 2016, it seems unlikely that OpenStack still has the potential to become a major platform camp in the public cloud space.[25] In 2015, Red Hat jumped into this market. Forrester predicts that in 2016, there will be other major OpenStack players entering the public cloud market, and some existing public clouds will re-platform their solutions on OpenStack.

Action: Get involved in the OpenStack community — with some healthy skepticism. At this point, it is too early to predict the outcome of public OpenStack cloud services, but what is the alternative for non-dominant public cloud players? Camps are forming around the major providers, and smaller vendors must establish an ecosystem or quickly get left behind. An OpenStack-based provider can enjoy some advantages: 1) It can credibly simplify the public-plus-private hybrid cloud; 2) the service will be relatively easy and cost-effective to develop, since much of the platform development is already done; and 3) the OpenStack community has earned some respect after great doubt. So don't discount anything coming out of this movement. Start your OpenStack journey with private cloud players, where the standard has been established, and press the emerging providers to forge ahead. Demand transparency so you know if they have long-term viability and know that if public OpenStack doesn't take flight, many OpenStack users will successfully connect to non-OpenStack-based public clouds.

Engage With An Analyst

Gain greater confidence in your decisions by working with Forrester thought leaders to apply our research to your specific business and technology initiatives.

Analyst Inquiry

Ask a question related to our research; a Forrester analyst will help you put it into practice and take the next step. Schedule a 30-minute phone session with the analyst or opt for a response via email.

Learn more about inquiry, including tips for getting the most out of your discussion.

Analyst Advisory

Put research into practice with in-depth analysis of your specific business and technology challenges. Engagements include custom advisory calls, strategy days, workshops, speeches, and webinars.

Learn about interactive advisory sessions and how we can support your initiatives.

Endnotes

[1] This trend grew through 2014 and 2015 and will see an inflection in 2016. Please see the "Cloud Evolves From Point Solution To Strategic Enabler Of The New Connected Economy" Forrester report.

[2] Source: "*This is Spinal Tap,*" IMDb, March 2, 1984 (http://www.imdb.com/title/tt0088258/).

[3] For more information on these acquisitions, please see the "Quick Take: HP Acquires Eucalyptus Systems" Forrester report.

[4] DigitalOcean is a cloud infrastructure provider based in New York and focused on simplifying web infrastructure for software developers. Aliyun is a multifaceted Chinese cloud infrastructure and platform provider.

[5] Source: "Amazon.com Announces First Quarter Sales up 15% to $22.72 Billion," Amazon press release, April 23, 2015 (http://phx.corporate-ir.net/phoenix.zhtml?c=97664&p=irol-newsArticle&ID=2039598).

[6] Source: "Cloud SaaS and PaaS Revenues up 34% in U.S. Dollars and up 38% in Constant Currency," Oracle, September 16, 2015 (http://investor.oracle.com/financial-news/financial-news-details/2015/Cloud-SaaS-and-PaaS-Revenues-up-34-in-US-Dollars-and-up-38-in-Constant-Currency/default.aspx).

[7] For more information on the facts about so-called enterprise class cloud services, see the upcoming Forrester report on the truth behind enterprise-class cloud.

[8] For an overview of hybrid cloud management solution providers in the market today, please see the "Vendor Landscape: Hybrid Cloud Management Solutions" Forrester report.

[9] 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 the following 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. See the "Vendor Landscape: Hybrid Cloud Management Solutions" Forrester report.

[10] Security topped the list of public cloud concerns: 31% of global infrastructure decision-makers said it's a concern, followed closely by privacy at 27%, and software licensing issues was a distant third at 19%. Source: Forrester's Global Business Technographics® Infrastructure Survey, 2015.

[11] For more information on cloud security gateways, please see the "Brief: The Emergence Of The Cloud Security Gateway" Forrester report.

[12] For more information on containers, please see the "Brief: Why Docker Is All The Rage" Forrester report and see the "From Application Design To Application Composition" Forrester report.

[13] For more information on hyperconverged infrastructures, please see the "Vendor Landscape: Hyperconverged Platforms" Forrester report.

[14] For more detail on announcements made at VMware's flagship event, please see the "Brief: VMworld 2015 Reveals A Disruptor In Transition" Forrester report.

[15] For more information on the challenges of integrating cloud resources, please see the "Beware The Pitfalls Within Networking For Hybrid Cloud" Forrester report.

[16] Four years ago, Forrester laid out a vision for virtual network infrastructure based on software-defined networking concepts. Cloud services are finally catching up to these ideas. See the "Virtual Network Infrastructure" Forrester report.

[17] For extensive information on the SDN overlay options available, please see the "Why Overlays Are Getting The Most Attention In The Software-Defined Network Market" Forrester report.

[18] The business process network supports application-centric capabilities as outlined in the following Forrester report. See the "Create A Customer Engagement Network For Your BT Agenda" Forrester report.

[19] Business intelligence (BI) has been faithfully serving enterprises for more than two decades. The world, however, doesn't stand still. BI must keep evolving, improving, and adapting to key business agility trends in the age of the customer. Its next evolution? Systems of insight. The following Forrester report connects the dots between our research on BI, Agile BI, and big data; proposes best practices for merging previously separate efforts into a more cohesive systems of insight strategy; and offers actionable advice for AD&D pros working on BI and big data initiatives on supercharging BI and upgrading to 21st-century systems of insight. See the "It's Time To Upgrade Business Intelligence To Systems Of Insight" Forrester report.

[20] The following Forrester reports highlight research that indicates that secretive US government surveillance is driving cloud business away from the US firms, but not quite at the level feared by these firms and many activists and elected officials. See the "PRISM's Impact On The US Cloud Industry" Forrester report, see the "Did PRISM Cause An Exodus From US Clouds?" Forrester report, and see the "Government Spying Will Cost US Vendors Fewer Billions Than Initial Estimates" Forrester report.

[21] For more insight into how colocation services can enhance your global services, see the "Brief: Change Buying Habits For New Data Center Solution Packaging" Forrester report and see the "Brief: Service Marketplaces Create A Hub For Your Hybrid Ecosystem" Forrester report.

[22] As diplomatic rhetoric between China and western governments escalates, doing business is getting more difficult across these boundaries.

[23] For a rundown of the Forrester Zero Trust model and information on how to harness it for your own organization, please see the "No More Chewy Centers: The Zero Trust Model Of Information Security" Forrester report.

[24] As Forrester stated in 2011, standards development organizations (SDOs), market leaders, and open source solutions will create de facto standards that together will influence overall cloud standards. For a complete rundown of where cloud standards are now and where they are headed in the cloud market, please see the "The State Of Cloud Platform Standards: Q2 2015" Forrester report.

[25] The OpenStack Foundation hosts a semi-annual release summit to provide a mix of end user stories, release updates, and OpenStack deep-dive sessions. The Tokyo summit held from October 27 to October 30, 2015, drew a crowd of over 5,000 to celebrate the Liberty release. Keynotes featured actual live demos from end users and new-project demonstrations from project technical leads (PTLs). This quick take covers the most important Liberty announcements and what they mean for infrastructure and operations (I&O) professionals driving their business technology agenda. For more information, please see the "Quick Take: OpenStack Summit, Q4 2015" Forrester report.

We work with business and technology leaders to develop customer-obsessed strategies that drive growth.

PRODUCTS AND SERVICES

› Core research and tools
› Data and analytics
› Peer collaboration
› Analyst engagement
› Consulting
› Events

Forrester's research and insights are tailored to your role and critical business initiatives.

ROLES WE SERVE

Marketing & Strategy Professionals	**Technology Management Professionals**	**Technology Industry Professionals**
CMO	CIO	Analyst Relations
B2B Marketing	Application Development & Delivery	
B2C Marketing	Enterprise Architecture	
Customer Experience	› Infrastructure & Operations	
Customer Insights	Security & Risk	
eBusiness & Channel Strategy	Sourcing & Vendor Management	

CLIENT SUPPORT

For information on hard-copy or electronic reprints, please contact Client Support at +1 866-367-7378, +1 617-613-5730, or clientsupport@forrester.com. We offer quantity discounts and special pricing for academic and nonprofit institutions.