



Navigating the Cloud:
Insights and Guidance from Cloud Connect 2011

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The 2011 Cloud Connect conference, held in Silicon Valley, brought together a wide range of cloud experts including providers, developers, vendors, analysts, early adopters, and even current non-users looking for information to bring their organizations into the cloud. The keynote and general session presentations offered insight into cloud computing trends, lively debates, and practical advice for organizations looking to adopt cloud computing. Cloud Connect even organized a product competition, Launch Pad, offering a unique public forum for companies to showcase new platforms and applications to the cloud computing community.

This report synthesizes the content of these sessions to uncover themes and emerging trends and deliver additional insight beyond the points raised in individual presentations. At the highest level, this event showcased the excitement in the cloud community today and provided a unique window into the immediate future of cloud computing.

THE MAP IS NOT THE TERRITORY

“The cloud” is a nebulous term – pun intended – that encompasses a very broad range of services. In order to communicate effectively about the cloud, it helps to use models to organize and frame a discussion. But as scientist and philosopher Alfred Korzybski stated: “the map is not the territory.” This means that an abstraction derived from something is not the thing itself. Many of us are familiar with the various cloud models – in particular the XaaS construct – that vendors and analysts use to discuss and promote cloud computing. Value, however, is ultimately defined by the users and is derived through evolutionary innovations that go beyond the limitations of models. Amazon.com’s Werner Vogels, quoting Korzybski, cautioned that the XaaS models don’t necessarily reflect the real world and can actually restrict the scope of cloud computing and our understanding of the end user. In fact, throughout the conference there was very little discussion of the XaaS models; the focus instead was on how to maximize benefits for the organization as well as the potential technological and social impact of cloud computing.

THE PUBLIC VS. PRIVATE PLUS HYBRID DEBATE

The predominant classification – and debate – has moved from public vs. private vs. hybrid to public vs. private with private and hybrid combined into one solution to accommodate spikes in demand. The relative value and adoption rates of public (commodity) and private/hybrid (enterprise) cloud systems are the subject of heated discussions.

According to Cloudscaling’s Randy Bias, enterprises are embracing the public cloud – not the enterprise cloud – as evidenced by Amazon Web Services’ (AWS) 60,000+ enterprise customers from businesses of varying domains, sizes, and geographies. Microsoft’s Matt Thompson, on the other hand, based on conversations with CIOs around the world, believes that private clouds will see high adoption rates especially in sectors, such as financial services, that might not want to put important assets in an

environment that is not directly managed by them. And VMware's Mathew Lodge predicted that the hybrid cloud will be prevalent because of the volume of corporate data that currently lives on-premises – stating that computing has to come to the data, not the other way around. He sees organizations building new applications where some of the data live in the cloud and the rest will be stored on-premises. In fact, there is likely room for each of these solutions – public, private, and hybrid – to grow and thrive.

Netflix' Kevin McEntee described a virtuous cycle in public clouds – especially AWS – where as large customers adopt them, the cloud provider strives to improve services to meet the large customers' demands, which attracts more large customers, etc. But as Thompson noted, private cloud adoption will be high in organizations with low tolerance for risk and low price sensitivity.

IS THE CLOUD FOR ME?

Markets cannot be created by vendors. Customers create the “pull” and, thereby, create the market. As with any enterprise technology, adoption is driven by economic benefit. In the case of cloud computing, the economic benefit is derived from its elasticity. Even the public vs. private/hybrid debate will be settled on a company-by-company basis as organizations select the approach that cost-effectively meets their individual requirements.

IT'S NOT ABOUT COMPANY SIZE – IT'S ABOUT DATA

For companies wondering if the cloud is right for their organization, size may not be the determining factor. In fact, Amazon.com has found there is a strong relationship between cloud and “big data” rather than company size. According to Vogels, start-ups and young companies growing at a staggering pace tend to have needs that are remarkably similar to those of Fortune 100 companies. At the same time, large enterprises are learning from consumerization of software and becoming as agile as start-ups, moving much faster in their product cycles to respond to increased competition.

IT'S ALSO ABOUT THE APPLICATION

Rackspace's Andy Schroepfer offers the following perspective to further frame the decision-making process: the cloud *is* for every firm, but *not* for every application. So how do you decide which applications may be right to migrate to the cloud? If you anticipate a steady number of concurrent users on an application, then a fixed infrastructure approach might be appropriate. If, however, traffic volumes are dynamic on a daily, weekly, monthly, or even annual basis, that application is a good candidate for the cloud. Schroepfer reminded providers that it's the industry's job to ensure every application can run in the cloud and, until then, customers need to be advised on which applications can be run in the cloud and which cannot.

MAXIMIZING ECONOMIC BENEFITS

Yahoo's Todd Papiroannou described the concept of elasticity, which is the ability to dynamically provision on-demand computing resources to meet a business need. Solving the real-time elasticity problem is the

Public and Private Cloud Providers

When considering arguments in the public-versus-private cloud debate, it's important to know which vendors provide which services. Following is a list of top cloud providers organized by the type of cloud services they offer.

Public

- Google AppEngine
- Microsoft Azure
- Amazon Web Services (AWS)
- Rackspace CloudServers

Private

- GoGrid
- HP Private Cloud
- IBM
- Intalio
- Microsoft Hyper-V Cloud

key to enabling Yahoo and other cloud providers to serve millions of users in times of peak demand. But Forrester's James Staten reminded us that elasticity isn't just about the ability to provide service during peaks, it's also about maximizing savings during troughs. Economic value is delivered when the application is off and the cost is – at least theoretically – \$0. Businesses were reminded by VMware's Matthew Lodge to continuously analyze their peaks and troughs to evaluate the value of any computing model.

EVALUATING THE OPTIONS

Cloudscaling's Randy Bias offered guidance for performing ROI analysis on public and private cloud options. He suggested that the capital expense required to build an enterprise cloud is six to eight times the amount required to build a commodity cloud. Therefore, to justify the cost, the enterprise cloud should provide at least six to eight times the value gained through increased security, availability, and performance. While the formula was hotly contested in breakout sessions, the point raised is valid: a higher-cost option should deliver commensurate higher value than lower-cost alternatives. Cisco's Lew Tucker offered the following advice to help maximize the efficiencies of a private cloud: you need to extract it as a service out of the data center.

Hybrid solutions can also lower cost and increase flexibility. But Rackspace's Schroepfer cautions that portability can be a challenge today and organizations should not set up hybrid solutions from multiple providers until technology and platforms are truly portable across providers.

PRACTICAL ADVICE FOR COMPANIES CONSIDERING CLOUD DEPLOYMENT

For companies who are ready to adopt cloud computing, the presentations offered plenty of practical advice, from areas to focus on to cost models to practical deployment implications.

HOW TO THINK ABOUT CLOUD COMPUTING

The components of cloud computing – e.g. networking, management, hardware, etc. – are extremely complex. According to Nimbula's Willem van Biljon, companies should focus on the top issues for each component to get closer to the deployment of the "perfect" cloud. Forrester's Staten advises that when companies are evaluating a hybrid cloud and are looking for opportunities to keep costs as low as possible during "down" times, they should consider aggregating solutions which may be combinations of existing offerings.

CLOUDBURSTING

Cloudbursting is an approach which overlays a cloud infrastructure to reduce fixed operating costs and improve utilization of in-house computing resources. eBay's Neal Sample described how eBay uses the cloudbursting approach to compute a capacity curve that closely follows the actual demand curve, enabling them to reduce costs by increasing efficiency. Prior to this model, the cost of owning the infrastructure was flat. Now they use cloudbursting to reduce the fixed cost – by eliminating servers – and transferring a percentage of those fixed costs to variable, usage-based costs in the cloud. They found that even when the cloud costs are four times that of the in-house data center, substantial savings can be still be gained.

LOAD BALANCING

For enterprises planning to deploy applications in multiple availability zones, there could be load balancing challenges. Cedexis' Marty Kagan described two approaches: static geo load balancing and performance-based load balancing. Static geo load balancing provides better performance than single-region methodology but performance can vary dramatically within an individual company and performance within a single network can even vary day to day and region to region depending on peering issues, traffic, etc. Performance-based load balancing provides better coverage than static geo load balancing with 50 percent of users getting into the optimal performance range. Comparing both approaches, Kagan suggested that performance-based load balancing can deliver gains of 20-30 percent over static geo load balancing.

VOICE OF THE CUSTOMER: TRENDS AND CONSIDERATIONS

For cloud application developers and providers, there was no shortage of advice offered by presenters. But this information is also valuable to potential cloud users; understanding early adopters' requests and requirements helps calibrate expectations.

SECURITY

Security in the cloud has been a hot topic, but concerns seem to be waning as evidenced by the limited keynote and general session discussion focused on this issue. In fact, Microsoft's Thompson has found that the security discussion depends on company size; any security concerns really depend on the specific customers. For start-ups, security seems to be far down on the list of concerns. VMware's Lodge noted that companies should take a risk-based approach to cloud deployment. They should assess what the security controls are, whether they can audit them, and what their confidence level is. He also observed that there isn't anything inherently more secure in an on-premises setup.

As with almost any technology issue, stakeholders can craft a security claim to further almost any argument. In fact, the security/accessibility tradeoff is not unique to cloud computing and is one that businesses make on an ongoing basis. Conference speakers outside of the main sessions debated risk profile in the cloud and, in particular, discussed the following cycle: the cloud offers SMB organizations access to enterprise-level security that they could not otherwise manage or afford; by moving to the cloud and aligning with the likes of Google or Amazon, those organizations raise their risk profile by associating with the targets hackers like to attack.

ARCHITECTURE AND SOFTWARE

DreamWorks' Derek Chan advises providers to support multi-tenancy to keep costs low and to offer a completely flexible model where customers pay for peaks, but not for troughs. This supports Forrester's Staten's advice to minimize baseline application costs in order to minimize the costs to end users when usage drops to low or none.

With commoditized hardware, Nimbula's van Biljon recommends focusing on the software, noting that if the software is done right, then failure resilience, scale, automation, and infrastructure management can reside in the software layer and hardware cost can be reduced.

VMware's Lodge recommended that developers develop a framework – rather than have to build the raft of infrastructure into the application – given his belief that frameworks, not IaaS, are the future for developers. When developers are looking to build new applications on frameworks such as .Net, SpringSource, or Ruby on Rails, then the VM construct is less useful. Where VMs are useful is with more traditional applications as they provide a way to move toward the cloud in an evolutionary manner. Microsoft's Thompson, on the other hand, believes that the VM construct is important from the cloud perspective and will drive the next generation of cloud development.

APPLICATIONS

Cisco's Tucker posits that the real revolution in cloud computing is in how applications are built in a distributed processing environment. Forrester's Staten offered a lot of specific advice to help developers design applications to enable cost-efficient perpetual platforms that minimize the baseline so that the cost for “down” or “off” is as low as possible.

- A very small virtual machine is much more cost-effective than a medium or large VM and far more cost-effective than an extra large VM.
- When designing applications for the cloud, design for specific modules to be activated only when they need to be.
- Applications already built can be re-architected to enable them to go “down” and go “off” as often as possible. When re-architecting, check the discrete functions inside the executables and VMs. Analyze whether discrete functions scale at the same rate and respond in a similar manner to traffic; if not, these discrete functions should be made into separate instances or separate buckets where independent scaling can take place.

COMING SOON: THE VISION FROM VENDORS

The Launch Pad program offers a bellwether for evolving tools and technologies; finalists were successful in identifying needs and developing solutions to help organizations maximize their cloud capabilities and investments. The finalists can be grouped into two high-level categories: performance and evaluation.

MAXIMIZING PERFORMANCE

Launch Pad finalist Aryaka offers a cloud-based WAN optimization solution designed for enterprises having a global presence and a distributed work force. Aryaka offers LAN-like performance over networks between different global offices, delivering a low-cost alternative to costly multiprotocol label switching (MPLS).

Launch Pad finalist Scalebase demonstrated how Database Load Balancer helps enterprises migrate their databases to the cloud to provide them high scalability and availability with 100 percent transparency of data. It has been observed that as the number of simultaneous users of an application increases, the response rate and number of timeout errors also increase. Database Load Balancer helps to correct this without requiring code to be re-written.

CLOUD EVALUATION

Launch Pad finalist Optier showed how CloudFirst enables companies to assess cloud performance and manage the entire cloud lifecycle of planning and migration, operations, and optimization. Companies can

compare the performance of an application before and after moving it to the cloud to help them make informed decisions about whether to migrate that application to the cloud.

Launch Pad winner OpenLogic demonstrated Trial Cloud, which gives enterprises and developers an instant-on cloud sandbox to experiment, evaluate and prototype using open source technologies. The product enables developers to quickly and easily deploy and manage applications in any public or private cloud. Developers can also choose from a catalog of customizable stacks of open-source software as a foundation for their applications. The Trial Cloud includes Web-based tools that automatically track costs, measure SLAs, monitor performance, and ensure license compliance.

CONCLUSION

Cloud computing is maturing and the conversation continues to evolve along with the technology. The question is no longer “what is the cloud?” but “how can I assess cloud opportunities for my business to gain competitive advantage?” Cloud discussions have moved from the theoretical to the applied, focusing on tangible benefits to organizations willing to make the shift.

There is little doubt that cloud computing is here to stay. Initial apprehensions about security, vendor lock-in, and data privacy are subsiding and new debates, such as public versus private/hybrid deployment, are taking center stage. The Cloud Connect event provided further proof that cloud computing is changing not just the nature of information technologies, but how companies are doing business.

For more information on this report, contact Jocelyn DeGance Graham at jdgraham@grailresearch.com.

Follow Jocelyn on Twitter: [JocelynDG](https://twitter.com/JocelynDG).

The cloud conversation continues at Interop

May 8-12, 2011 at Mandalay Bay in Las Vegas – www.interop.com/lasvegas

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Join cloud thought leaders – including Vinton Cerf, VP and chief Internet evangelist at Google; Dave Donatelli, EVP and GM of enterprise servers, storage and networking at HP; and Mark Templeton, president and CEO, Citrix Systems, Inc. – for a pragmatic look at clouds today, and how on-demand computing will change not only enterprise IT, but also technology and society:

- What is the Impact of Cloud Computing on the Network?
- Which Cloud Provider is Right for You?
- A Roadmap for Transitioning to Cloud Computing
- Handling Big Data on Public Clouds
- On-Demand SLAs: Cloud Terms of Service
- Cloud Integration

LIST OF PRESENTATIONS

KEYNOTES

- Werner Vogels, VP and CTO of Amazon.com
- Marty Kagan, president and co-founder of Cedexis
- Lew Tucker, CTO of cloud computing at Cisco
- Derek Chan, head of digital operations at DreamWorks Animation
- Neal Sample, VP of architecture at eBay
- Scott Baker, director of systems engineering and operations at Eventbrite
- Kevin McEntee, VP of systems engineering at Netflix
- Andy Schroepfer, VP of enterprise strategy at Rackspace

PANEL DISCUSSION

- **No Private Cloud Should be an Island**

Moderator: Alistair Croll, partner at Bitcurrent

Panelists: Mathew Lodge, senior director of cloud services at VMware; Matt Thompson, general manager, developer, and platform evangelism at Microsoft

SESSION PRESENTATIONS

- **Accelerating Business Transformation through Smarter Computing**
Willy Chiu, VP of IBM Cloud Labs
- **Are You Activating Cloud Economics?**
Presented by James Staten, VP and senior analyst at Forrester Research
- **Building the Overmind: AI and Automatic Clouds**
Oriol Vinyals, PhD student at UC Berkeley and Microsoft Research Fellow
- **Elasticity: the What and the Why**
Dr. Todd Papiroannou, VP of cloud architecture at Yahoo! Inc.
- **Enterprise Cloud Myth(s)**
Randy L. Bias, CEO, founder and cloud strategist at Cloudscaling
- **The Cloud Ecosystem**
Willem van Biljon, co-founder and VP of products at Nimbula

LAUNCH PAD FINALISTS

- Aryaka
- OpenLogic's Trail Cloud
- Optier's CloudFirst
- Scalebase's Database Load Balancer

For more information on Cloud Connect, visit www.cloudconnectevent.com.

ABOUT THE AUTHOR

Named by United Business Media's CRN as one of the 100 most influential women in IT, Jocelyn DeGance Jocelyn has deep expertise in the areas of marketing, communications and research and has spent the majority of her career advising Fortune 100 companies including Hewlett-Packard, Intuit, and Arthur Andersen on strategic emerging technology decisions. Prior to joining Grail Research, Jocelyn directed the marketing program for an award-winning cloud start-up which was recognized by Gartner as one of the "Coolest Emerging Technologies" of 2010. She holds a Master's degree in Industrial/Organizational Psychology and a Bachelor's degree from University of California, Santa Barbara.

ABOUT GRAIL RESEARCH

Grail Research is a global research and decision support firm that provides organizations with accurate, succinct answers to their most important business questions. In today's rapidly changing environment, global corporations rely on Grail Research to deliver the critical market intelligence required to make fact-based strategic decisions that support business growth. These include topics such as entering new markets, launching and enhancing products, making acquisitions or strategic investments, unseating competitors, and more. Based in Cambridge, Mass., Grail Research is a division of Integreon, the largest and highest-impact provider of integrated research, legal and business solutions to corporations and law firms. For more information, visit www.grailresearch.com. For more about cloud computing from Grail Research, see:

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- [Cloud – from Buzz to Business Critical](#)
- [Cloud Computing: At the Horizon's Watch](#)