Perceptions of Cloud Service Providers
Who's Who and Where in the Cloud

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Cloud computing is the 2009 evolution of what used to be called web-based computing and appears to have amassed enough momentum this time around to actually take off. Usually thought of as being based in a public cloud and conducted over the public Internet and usually incorporating virtualization to enhance efficiency, cloud computing now also embraces the private cloud concept in which it all takes place behind the firewall. The benefits of cloud computing (whether public or private) are obvious and compelling – increased virtualized resources when needed, increased accessibility and easier management of software assets, and an "elastic" ability to scale.

With so many benefits, it's not surprising that many of the top vendors in the computing industry are offering cloud services for public or private clouds – or both. And, whenever there's an abundance of new technology offerings, it can become confusing to the corp-

orate CIO, CTO, or the ISV who wants to use the cloud to develop and/or deploy their applications. We asked a global sample of software developers familiar with cloud services offerings to give us their perceptions of the leading vendors. They were asked to evaluate the companies on a series of capabilities related to cloud services offerings, as well as give their impressions of the companies' ability to execute on those offerings and the completeness of them. This report summarizes the developers' opinions along with product managers' insights from the companies within the survey.

Cloud Players Positions

The chart on this page shows major cloud service vendors positioned according to the perceptions of developers in three major dimensions. The horizontal axis represents

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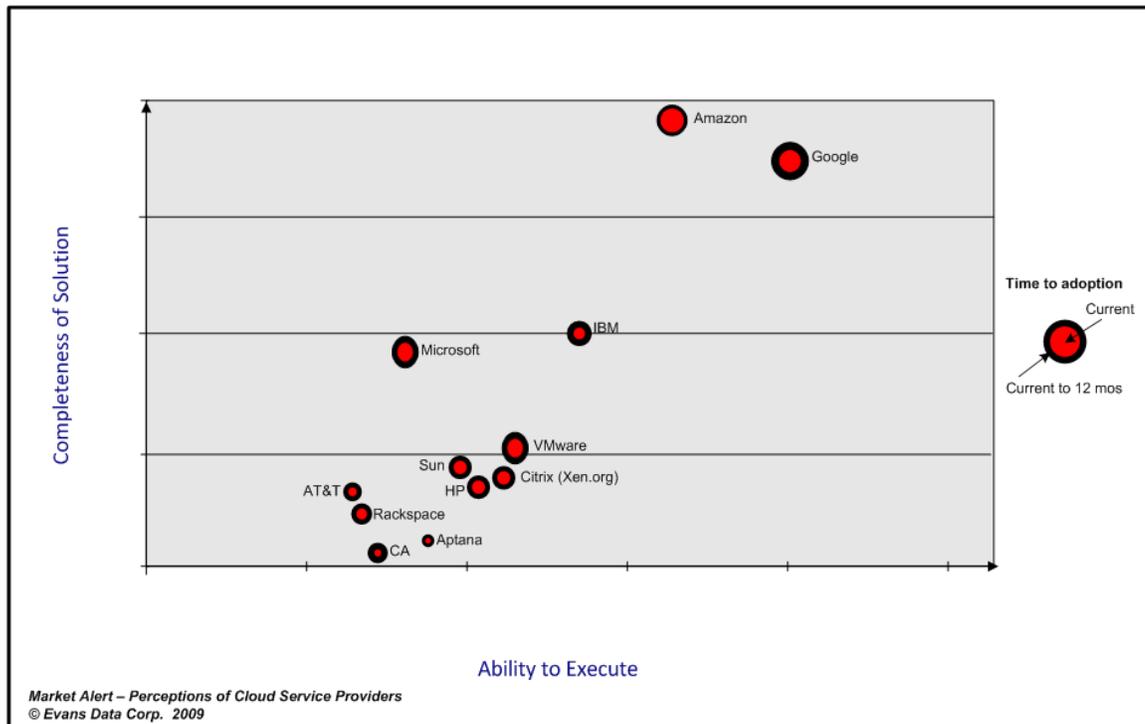
how well developers rated the vendors on the ability to execute a cloud service strategy. The vertical axis shows perceptions around the completeness of the solution, and the size of the round markers depicts adoption.

The external circumference represents adoption currently and within 12 months, while the internal red dot shows only current adoption.

Thus, we can see that developers believe Amazon and Google have the most complete solution, and the best ability to execute, and that currently Amazon and Google have similar adoption rates, though more developers expect to be using Google in the next 12 months than Amazon.

Notice that there is a correlation between adoption and perception both for completeness and ability to execute. Google and Amazon, who both got a quick start in the public cloud arena, are the most familiar for the provision of cloud services and developers know more about their offerings. Couple that with the fact that these two vendors established their cloud offerings early in the game, and the heightened perceptions for these two vendors are quite understandable. The fact that they implemented their offerings some time ago also demonstrates their ability to execute.

The next three in respect to adoption are IBM, Microsoft, and VMware. Both Microsoft and VMware have more current adopters, but IBM is similar when plans for the next 12 months are factored in. IBM has the lead over each company except Amazon and Google when it comes to the perception of ability to execute. Microsoft is viewed as having as complete a set of cloud service offerings in its Azure platform, but is considered less capable of executing cloud services than most of the other companies in the survey. The lack of confidence in Microsoft along these lines may have something to do with the nature of their traditional business model – a model that cloud is at odds with. Although Microsoft has vigorously promoted the Azure platform and has obviously been successful in recruiting developers to the early versions of Azure, they lag behind Sun, HP, and Citrix in eliciting con-

fidence from developers in their offerings. However, Microsoft has the most capable and extensive developer organization in the world, so it would be foolish to discount them.

IBM, on the other hand, has apparently been highly successful in getting their story out to developers and convincing them of their relative strength in providing cloud services. The fact that they are rated so strongly on both completeness of offerings and ability to execute, coupled with the fact that developers are enthusiastic about adoption in the near future present a very positive outlook for IBM in the world of cloud services.

Those at the back of the pack are either very focused on a particular niche, late into the market, or are much better known for other products or services. AT&T in particular, is a company that has not been known for providing software platforms, but has entered the cloud provider arena with a lot of strengths, though only a short time ago. It has been one year since AT&T announced a cloud offering, with its launch of Synaptic Hosting. The service provides pay-as-you-go access to managed hosting, providing computing, storage, security, and networking on an as-needed basis. A few months ago they also announced Storage as a Service using technology from EMC. AT&T's physical infrastructure gives it an advantage in the long run, but is new in the market, and is a new player in the world of software platforms.

CA is very much focused on private enterprise clouds, and the exclusive focus on large enterprises with little outreach to developers obscures the communities' knowledge of their offerings or capabilities. Aptana is an open source company with a cloud service management environment supporting Ruby and PHP. Cloud services were announced earlier this year, but the company is still relatively unknown. Rackspace is well known but for server hosting rather than cloud services, which they now offer. Rackspace seems well positioned to capture a share of the market with its hosting prowess, though apparently they have not yet gotten their message out clearly enough.

HP has an arm's length approach to developers, preferring to work through partners, which may explain its middle of the pack score. Citrix is of course known for its XEN open source virtualization products, but not necessarily for cloud hosting. Although Sun has been well thought of and well positioned in the development community, its sale to Oracle and the inevitable uncertainty in the market, undoubtedly effects the developers' perceptions.

Public or Private?

Although Amazon started it all with a public cloud offering in EC2, the idea of private clouds has taken off in a big way. Private clouds solve some major problems involved with public clouds; e.g., security issues, privacy issues, latency issues and some of the issues involving corporate and government compliance. Although both public clouds and private clouds are basically web-based software implementations with storage and infrastructure that usually involves virtualization at data centers, public clouds provide that storage and infrastructure on a public multi-tenancy basis, whereas private clouds are set up and maintained privately behind the fire wall. Larger enterprises with in-place servers

and established IT departments may find that privacy and control to be more appealing than the easy out-of-the-box access that public clouds provide. Public clouds, on the other hand, provide a quick and affordable way to get a website or business implementation up quickly with a maximum amount of scalability that otherwise wouldn't be affordable.

Developers were also asked about their perceptions of the companies as either public or private clouds. Only Amazon and Google are perceived as being primarily dedicated to the public option, although most of the vendors in this survey have professed at least the intention of providing both public cloud and private cloud services. Most of the others are perceived of as being primarily private cloud vendors. The exceptions are AT&T and Microsoft, which fall in the middle and which most developers perceive of as offering "both". It's likely that of all the vendors here, these two will prevail in entering the public cloud space and compete with Google and Amazon. IBM and VMware are the best positioned for private cloud offerings. It is unlikely that either Google or Amazon will be able to shift the strong market perception of themselves far enough to the private area to compete with either IBM or VMware when it come to large enterprise private cloud offerings.

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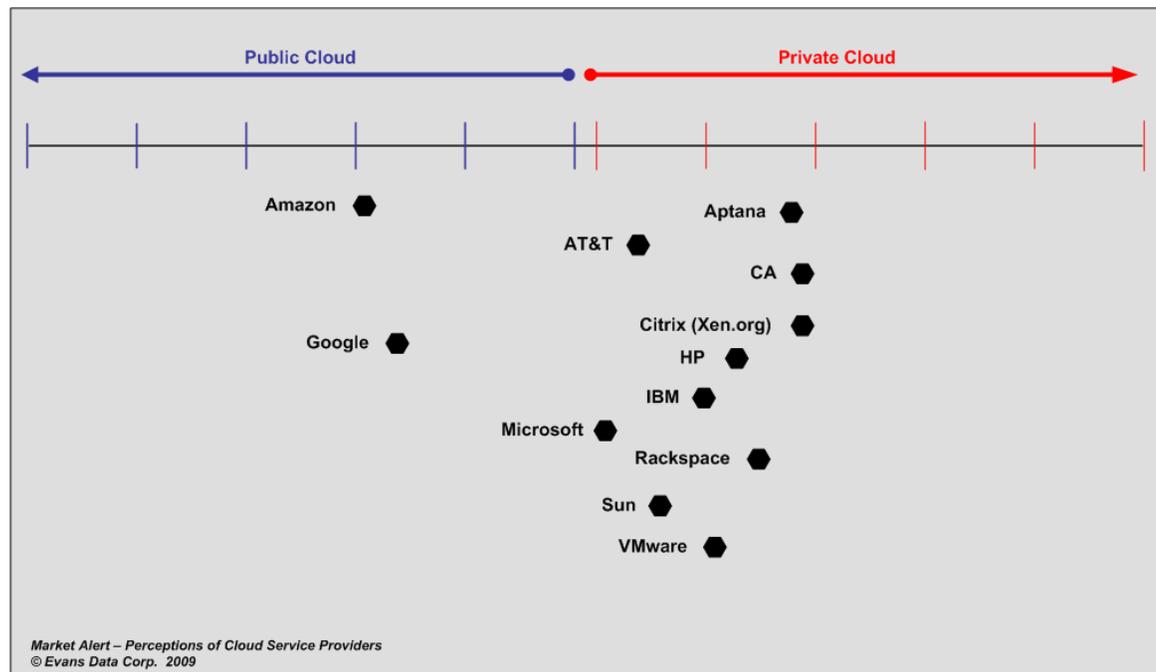
Cloud Player Strengths

SECURITY

The greatest obstacle to deploying applications in the public cloud is without question security. Storing sensitive company or customer data and executing transactions in a multi-tenant virtualized server makes many CIOs queasy. There may not be as much danger of data loss or leaks as some perceive, but the thought of data being out of IT's control is a difficult notion when the process of safeguarding data is essential. Consequently, developers consistently rate security as the biggest obstacle to cloud deployments.

Please pick the company that YOU THINK BEST fits the value - Security

	Valid Percent
IBM	21.7
Amazon	20.2
VMWare	9.9
Microsoft	9.1
Google	8.7
Sun	7.5
Citrix (Xen)	6.7
HP	5.5
Computer Associates	4.0
AT&T	3.2
Rackspace	2.8
Aptana	.8
Total	100.0

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IBM is considered to be the company capable of providing the best security. IBM has a complete and working cloud service offering that is currently being used by developers for both development and deployment of applications. IBM sells cloud services on the IBM cloud to external businesses in a public cloud format, but are mostly perceived of as a private cloud vendor. In each case the solid reputation that IBM has built over many years in all types of computing no doubt contributes to the strong sense of security that the IBM solution provides.

SCALABILITY

If security is the main obstacle to cloud computing, then scalability is the main driver. To be able to scale immediately from a handful of users to a multitude and then back again would typically require a host of servers that ordinarily would be idle. That's not just inefficient, it's downright wasteful. Even with virtualization, additional physical resources are needed to accommodate a highly dynamic application.

Please pick the company that YOU THINK BEST fits the value - Scalability

	Valid Percent
Google	31.0
Amazon	17.8
Microsoft	10.9
IBM	8.9
VMWare	7.0
Sun	5.4
HP	5.0
Aptana	4.3
AT&T	3.1
Rackspace	3.1
Citrix (Xen)	1.9
Computer Associates	1.6
Total	100.0

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Google has been perfecting scalability across multiple datacenters and has demonstrated deep proficiency in this respect. Google App Engine uses master/slave replication between datacenters. They chose this approach in order to provide low latency writes, strong consistency guarantees and enhanced reliability or uptime and datacenter failure survival. Note how many developers perceive of Google as providing the best scalability over Amazon. This and the projected adoption trends could be a problem for Amazon as they compete with Google in the public cloud space.

RELIABILITY / UPTIME

Another great obstacle to cloud services adoption is the possibility that the service provider's servers will fail or the communications equipment will be disrupted, or for some other reason the cloud service provider will at some point be unable to service the cloud, meaning that some or none of their customers will be able to do anything.

Consequently, it's very easy to understand why reliability would be such a compelling obstacle. As with security, it is probably no more likely, and maybe even less likely, that the cloud provider would catastrophically fail than that an in-house enterprise datacenter would. However, there is once again the issue of control. In-house systems can be constantly monitored and constantly backed up with failover equipment. When using a cloud vendor, reliability must be a matter of trust.

Please pick the company that YOU THINK BEST fits the value - Reliability / uptime

	Valid Percent
Google	29.0
IBM	17.3
Amazon	16.9
VMWare	8.1
Microsoft	7.3
HP	4.8
Sun	4.4
Rackspace	3.2
AT&T	2.8
Citrix (Xen)	2.8
Aptana	1.6
Computer Associates	1.6
Total	100.0

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Google's efficient use of multiple datacenters provides developers with that trust, as does its embrace of the development community. Notice that IBM inspires reliability next, and on par with Amazon. AT&T, which has introduced guaranteed service level agreements guaranteeing 99.9% availability, inspires much less confidence, probably because its presence in the market is relatively new.

LOW LATENCY

Cloud infrastructure services provide rapidly scalable architectures that can offer support to internal applications, without taxing or waiting for internal enterprise resources. But the promise of significant productivity gain is weakened when it becomes a labor-intensive and time-consuming task to move massive amounts of data into the cloud. Latency threatens to impact the improved efficiency offered by cloud services, and if taken far enough could be so off putting that the cloud service would become unacceptable.

Please pick the company that YOU THINK BEST fits the value - Low latency

	Valid Percent
Google	28.2
Amazon	13.2
VMWare	12.8
Sun	8.8
Microsoft	8.4
AT&T	6.2
IBM	4.8
Rackspace	4.4
HP	4.0
Computer Associates	3.5
Aptana	3.1
Citrix (Xen)	2.6
Total	100.0

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Here we see that the two established giants of the public cloud world are perceived of as having the lowest latency. Both Amazon and Google are Internet companies that have proven themselves in an environment where low latency is key, and so have come to be seen in developers' minds as having the best guarantee of low latency.

Note that AT&T does significantly better in this respect than in some others, undoubtedly due to their strong network capabilities.

NO VENDOR LOCK-IN

Though not as compelling of an obstacle as security or reliability, the cloud does bring the potential problem of vendor lock-in. Lock-in can occur when a platform as a service vendor provides an environment for applications to be developed that will only run in that environment, which is the case with Salesforce. Or, a lock-in can happen if a vendor provides tools that create apps that only work with one hypervisor, or when a provided database has a proprietary structure that doesn't allow data to be gracefully exported. The fear of vendor lock-in is a real one as it could seriously limit a customer's options down the road. Interoperability insures against vendor lock-in and should provide the ability to move apps in and back out of the cloud as well as providing the ability to move between clouds.

Please pick the company that YOU THINK BEST fits the value - No vendor lock-in

	Valid Percent
Google	26.1
Amazon	15.4
Sun	9.5
VMWare	8.3
Rackspace	7.9
Citrix (Xen)	6.2
Microsoft	5.8
HP	5.4
Computer Associates	4.6
Aptana	4.1
AT&T	4.1
IBM	2.5
Total	100.0

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Although there should be some concern about the proprietary nature of Google's Big Table database, developers were nonetheless most assured that Google would avoid locking them into their technology. The odd thing here is that AT&T and IBM scored so poorly. Both are building their cloud structures on open technologies, which should result in little to no vendor lock-in.

COST TO VALUE RATIO

Considering that the market for cloud services is new and extremely competitive, and that most public cloud services are priced within a few cents of each other for access and storage, it's hard to identify a single vendor that possesses the best objective cost to value ratio. Costs across public cloud providers are almost identical and vary according to every case for private cloud implementations. So the subjective factor must be value in this equation.

Please pick the company that YOU THINK BEST fits the value - Cost value ratio

	Valid Percent
Google	32.5
Amazon	20.0
Microsoft	8.2
HP	6.3
Citrix (Xen)	5.9
IBM	5.1
Sun	5.1
VMWare	4.7
Aptana	4.3
Rackspace	3.1
AT&T	2.4
Computer Associates	2.4
Total	100.0

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Google shines above all the others in developers' perception of the value it provides. This may be due to the free open source tools it has provided for several years, and the fact that a business model which relies on search advertising instead of product sales has allowed them to provide, without charge, considerable engineering resources for developers on their platforms and with their tools. That is certainly a great model to generate a good cost to value ratio.

Cloud Picks

Though most of these cloud service vendors have announced intentions to provide both public cloud and private cloud infrastructures, these are two very different markets, and there are distinctly different market leaders. Amazon, who was first to market in the public cloud space, now shares the leadership position for publicly accessible clouds with Google.   However, Google shows more strength in both perceived capabilities and perceived ability to execute, and the adoption patterns for Google are stronger going into the future. Google is likely to be the top performer in the public cloud space.

For private clouds, IBM has already taken the lead perceptually, and is in an excellent position to dominate the market going into the future. This is especially true amongst the largest corporations who are most likely already IBM customers, as well as those who want the security and reliability of a vendor with an established reputation for excellence in the large enterprise space. IBM offers private cloud services built behind the customer's firewall and will even run those services for customers, providing the same kind of management that public clouds provide but without the security risk. They also provide pre-integrated cloud appliances that make private cloud setup easy.

The two companies that truly straddle the cloud worlds, AT&T and Microsoft, both have excellent potential: through existing physical infrastructure in the case of AT&T or as in the case of Microsoft, by virtue of a prodigious developer network and well known software capabilities. But, both are late to the party. And, in a market that's evolving as quickly as this one, that's a significant handicap.

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Janel Garvin *is the founder of Evans Data Corp and covers cloud computing, parallel programming and software development tools.*

Market Alert is an ongoing series of regularly published research studies on adoption trends, product innovations and developments affecting the software development landscape.

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Evans Data Corporation provides regularly updated IT industry market intelligence based on in-depth surveys of the global developer population. Evans' syndicated research includes surveys focused on developers in a wide variety of subjects.

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