

Cloud computing:

Cloud computing is all the rage. "It's become the phrase du jour," says Gartner senior analyst Ben Pring, echoing many of his peers. The problem is that (as with Web 2.0) everyone seems to have a different definition.

As a metaphor for the Internet, "the cloud" is a familiar cliché, but when combined with "computing," the meaning gets bigger and fuzzier. Some analysts and vendors define cloud computing narrowly as an updated version of utility computing: basically virtual servers available over the Internet. Others go very broad, arguing anything you consume outside the firewall is "in the cloud," including conventional outsourcing.

Cloud computing comes into focus only when you think about what IT always needs: a way to increase capacity or add capabilities on the fly without investing in new infrastructure, training new personnel, or licensing new software. Cloud computing encompasses any subscription-based or pay-per-use service that, in real time over the Internet, extends IT's existing capabilities.

Cloud computing is at an early stage, with a motley crew of providers large and small delivering a slew of cloud-based services, from full-blown applications to storage services to spam filtering. Yes, utility-style infrastructure providers are part of the mix, but so are SaaS (software as a service) providers such as Salesforce.com. Today, for the most part, IT must plug into cloud-based services individually, but cloud computing aggregators and integrators are already emerging.

InfoWorld talked to dozens of vendors, analysts, and IT customers to tease out the various components of cloud computing. Based on those discussions, here's a rough breakdown of what cloud computing is all about:

1. SaaS

This type of cloud computing delivers a single application through the browser to thousands of customers using a multitenant architecture. On the customer side, it means no upfront investment in servers or software licensing; on the provider side, with just one app to maintain, costs are low

compared to conventional hosting. Salesforce.com is by far the best-known example among enterprise applications, but SaaS is also common for HR apps and has even worked its way up the food chain to ERP, with players such as Workday. And who could have predicted the sudden rise of SaaS "desktop" applications, such as Google Apps and Zoho Office?

2. Utility computing

The idea is not new, but this form of cloud computing is getting new life from Amazon.com, Sun, IBM, and others who now offer storage and virtual servers that IT can access on demand. Early enterprise adopters mainly use utility computing for supplemental, non-mission-critical needs, but one day, they may replace parts of the datacenter. Other providers offer solutions that help IT create virtual datacenters from commodity servers, such as 3Tera's AppLogic and Cohesive Flexible Technologies' Elastic Server on Demand. Liquid Computing's LiquidQ offers similar capabilities, enabling IT to stitch together memory, I/O, storage, and computational capacity as a virtualized resource pool available over the network.

3. Web services in the cloud

Closely related to SaaS, Web service providers offer APIs that enable developers to exploit functionality over the Internet, rather than delivering full-blown applications. They range from providers offering discrete business services -- such as Strike Iron and Xignite -- to the full range of APIs offered by Google Maps, ADP payroll processing, the U.S. Postal Service, Bloomberg, and even conventional credit card processing services.

4. Platform as a service

Another SaaS variation, this form of cloud computing delivers development environments as a service. You build your own applications that run on the provider's infrastructure and are delivered to your users via the Internet from the provider's servers. Like Legos, these services are constrained by the vendor's design and capabilities, so you don't get complete freedom, but you do get predictability and pre-integration. Prime examples include Salesforce.com's Force.com, Coghead and the new Google App Engine. For extremely lightweight development, cloud-based mashup platforms abound, such as Yahoo Pipes or Dapper.net.

5. MSP (managed service providers)

One of the oldest forms of cloud computing, a managed service is basically an application exposed to IT rather than to end-users, such as a virus scanning service for e-mail or an application monitoring

service (which Mercury, among others, provides). Managed security services delivered by SecureWorks, IBM, and Verizon fall into this category, as do such cloud-based anti-spam services as Postini, recently acquired by Google. Other offerings include desktop management services, such as those offered by CenterBeam or Everdream.

6. Service commerce platforms

A hybrid of SaaS and MSP, this cloud computing service offers a service hub that users interact with. They're most common in trading environments, such as expense management systems that allow users to order travel or secretarial services from a common platform that then coordinates the service delivery and pricing within the specifications set by the user. Think of it as an automated service bureau. Well-known examples include Rearden Commerce and Ariba.

7. Internet integration

The integration of cloud-based services is in its early days. OpSource, which mainly concerns itself with serving SaaS providers, recently introduced the OpSource Services Bus, which employs in-the-cloud integration technology from a little startup called Boomi. SaaS provider Workday recently acquired another player in this space, CapeClear, an ESB (enterprise service bus) provider that was edging toward b-to-b integration. Way ahead of its time, Grand Central -- which wanted to be a universal "bus in the cloud" to connect SaaS providers and provide integrated solutions to customers -- flamed out in 2005.

Today, with such cloud-based interconnection seldom in evidence, cloud computing might be more accurately described as "sky computing," with many isolated clouds of services which IT customers must plug into individually. On the other hand, as virtualization and SOA permeate the enterprise, the idea of loosely coupled services running on an agile, scalable infrastructure should eventually make every enterprise a node in the cloud. It's a long-running trend with a far-out horizon. But among big metatrends, cloud computing is the hardest one to argue with in the long term.

Applications:

So far the applications segment of cloud computing is the only segment that has proven useful as a 'business model. By running business applications over the internet from centralized servers rather than from on-site servers, companies can cut some serious costs. Furthermore, while avoiding maintenance costs, licensing costs and the costs of the hardware required to run servers on-site, companies are able to run applications much more efficiently from a computing standpoint.

On Demand software services come in a few different varieties which vary in their pricing scheme and how the software is delivered to the end users. In the past, the end-user would generally purchase a servers and is accessed by the end user over the internet. While this is the most common platform for On Demand software services, thereewr are also some slightly different offerings which can be described as a hybrid of these two platforms. For instance, a program through which the end user pays a license fee, but then accesses the software over the internet from centralized servers is considered a hybrid service. zszz

Who is Offering On Demand Software? - The companies below are already established in the On-Demand software or SaaS business. These companies charge their customers a subscription fee and in return host software on central servers that are accessed by the end user via the internet.

- International Business Machines (IBM)
- Salesforce.com (CRM)
- Google (GOOG)
- NetSuite (N)
- Cordys
- Taleo (TLEO)
- Concur Technologies (CNQR)

Who is Offering Traditional Software? - The following companies have established themselves as traditional software providers. These companies sell licenses to their users who then run the software from on premise servers.

- SAP AG (SAP)
- Oracle (ORCL)

- Blackbaud (BLKB)
- Lawson Software (LWSN)
- Blackboard (BBBB)

Platforms:

Many of the companies that started out providing On Demand application services have developed platform services as well. The platform segment of cloud computing refers to products that are used to deploy internet. NetSuite, Amazon, Google, and Microsoft have also developed platforms that allow users to access applications from centralized servers.

In July 2008, HP, Yahoo! (YaHOO), and Intel (INTC) announced a joint cloud computing research project called the Cloud Computing Test Bed. The companies are jointly designing and producing the internet based testing utilizing HP hardware and Intel processors.

Active platforms - The following companies are some that have developed platforms that allow end users to access applications from centralized servers using the internet. Next to each company is the name of their platform.

- International Business Machines (IBM) - IBM Cloud - Lotus Live
- Google (GOOG) - Apps Engine
- Amazon.com (AMZN) - EC2
- Microsoft (MSFT) - Windows Azure
- SAVVIS (SVVS) - Symphony VPDC
- Terremark Worldwide (TMRK) - The Enterprise Cloud
- Salesforce.com (CRM) - Force.com
- NetSuite (N) - Suiteflex
- Rackspace Cloud - cloudservers, cloudsites, cloudfiles

Infrastructure:

The final segment in cloud computing, known as the infrastructure, is very much the backbone of the entire concept. Infrastructure vendors environments (such as Google gears) that allow users to build applications. Cloud storage, such as Amazon's S3, is also considered to be part of the infrastructure segment.

Major Infrastructure Vendors - Below are companies that provide infrastructure services:

- Google (GOOG) - Managed hosting, development environment
- International Business Machines (IBM) - Managed hosting
- SAVVIS (SVVS) - Managed hosting & cloud computing
- Terremark Worldwide (TMRK) - Managed hosting
- Amazon.com (AMZN) - Cloud storage
- Rackspace Hosting (RAX) - Managed hosting & cloud computing

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