Cloud Computing

Cloud computing is Internet-based computing, whereby shared servers provide resources, software, and data to computers and other devices on demand, as with the electricity grid. Cloud computing is a natural evolution of the widespread adoption of virtualization, service-oriented architecture and utility computing. Details are abstracted from consumers, who no longer have need for expertise in, or control over, the technology infrastructure "in the cloud" that supports them. Cloud computing describes a new supplement, consumption, and delivery model for IT services based on the Internet, and it typically involves over-the-Internet provision of dynamically scalable and often virtualized resources. It is a byproduct and consequence of the ease-of-access to remote computing sites provided by the Internet. This frequently takes the form of web-based tools or applications that users can access and use through a web browser as if it was a program installed locally on their own computer. The term "cloud" is used as a metaphor for the Internet, based on the cloud drawing used in the past to represent the telephone network, and later to depict the Internet in computer network diagrams as an abstraction of the underlying infrastructure it represents.Typical cloud computing providers deliver common business applications online that are accessed from another Web service or software like a Web browser, while the software and data are stored on servers.

Most cloud computing infrastructures consist of services delivered through common centers and built on servers. Clouds often appear as single points of access for consumers' computing needs. Commercial offerings are generally expected to meet **quality of service** (QoS) requirements of customers, and typically include **service level agreements** (SLAs).

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. SaaS is common for HR apps and has even worked its way up the food chain to ERP.

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. Many companies offer 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 to the full range of APIs offered 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. 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.

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.

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.

7. Internet integration

The integration of cloud-based services is in its early days. 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.