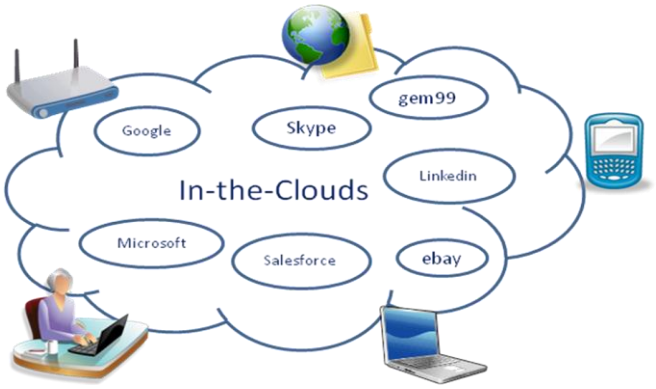
Cloud Computing – What's best for your business?

Overview

Cloud computing is use of web-based computer technology rather than traditional local network or desktop-based storage, software and computing capacity. In concept, it is a major shift in IT whereby users generally no longer need knowledge of, expertise in, or provide administrative support for their technology infrastructure. It typically involves the provision of often 'virtualized' resources as a service over the Internet.



The term 'cloud computing' is used as a metaphor for the Internet - inspired by the cloud symbol often used to represent the Internet in flow charts and diagrams. It is a convenient depiction and abstraction of the underlying infrastructure it conceals. Typical cloud computing providers deliver common business (and other) applications online which are accessed from a web browser, while the software and data are stored on remote servers.

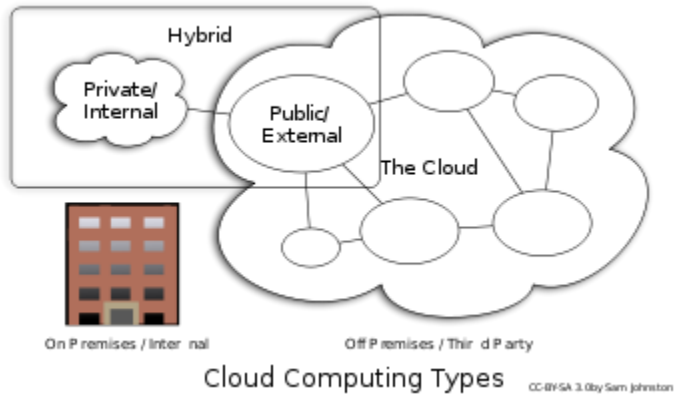
These applications are broadly divided into the following categories: Software as a Service, Utility Computing, Web Services, Platform as a Service, Managed Service Providers, Service Commerce, and Internet Integration.

Characteristics

In its most familiar form, cloud computing users do not own the physical infrastructure or the software / service used which means that, typically, they can have accesses to enormous IT power without the need for capital outlay (known as CapEx – capital expenditure), instead they rent usage from the third-party provider. Users consume resources as a service and pay only for resources that they use. Many cloud-computing offerings employ the utility computing model, which is analogous to how traditional utility services (such as electricity) are consumed, whereas others bill on a subscription basis. Another model, much loved by social networkers, appears to provide free-to-use services but often the provider is earning revenue indirectly – e.g. through presentation of paid-for advertisements, or information gathered about users passed to Third Parties (i.e. for marketing purposes). It is worth noting that many providers using this last model are struggling financially and new ways are being sought to create new revenue streams.

In reality there are a number of 'cloud computing' variations which use the same principles of delivery over the Internet but vary in their configuration:

Types



Public cloud

Public (or 'External') cloud describes cloud computing in the traditional mainstream sense, whereby resources are dynamically provisioned on a self-service basis over the Internet, via web applications/web services, from an off-site third-party provider who shares out resources and bills on a per usage basis. The applications provided may be common 'virtualised' office applications, value-added services or specialised function applications. However, their common element is that they are generic, non-customer specific.

Private cloud

Private (or 'internal') cloud facilities emulate cloud computing on public or private networks. These products are often bespoke, i.e. are built to the specific needs of the business. The convenience and economics of the cloud infrastructure even for specialised facilities is the driving factor – an application can be accessed worldwide through standard or modified web browsers via secure login. The infrastructure may or may not be owned / managed by the business user and so costs may fall under CapEx or OpEx.

It is also worth noting that ownership or control of a private cloud may provide greater flexibility and make better economic sense in the long run – changes in requirements in particular, as, as a business grows it evolves. Although there may be apparently lower operating costs associated with generic, public cloud applications, the ability to enhance the functional specifications and the costs of doing so may be a major limiting factor and should be borne in mind at the outset.

Additionally, a 'private cloud' application can be created to interface more precisely with other IT essential applications used in a business. A private cloud configuration (on its own or as part of a hybrid configuration) will often provide the benefits of cloud computing whilst addressing a number of the issues (e.g. data security access to audit logs).

Hybrid cloud

A *hybrid cloud* environment consisting of multiple internal and/or external providers will be typical for many enterprises. A hybrid cloud describes a configuration combining a local device, e.g. a private network or even a user's PC, with other cloud services. This 'horses for courses' approach means those businesses 'pick and mix' their IT using components and applications that best suit their

needs. Co-ordination and interfacing between multiple applications is not always straightforward – although there are some notable exceptions – e.g. Skype whose add-ons enable contacts and telephone numbers to be Skype-enabled across applications.

Note: ***Diaxon DevX is a provider of Private Cloud applications and Hybrid Cloud integrations and would be pleased to quote for your a cloud solution.***

Economics

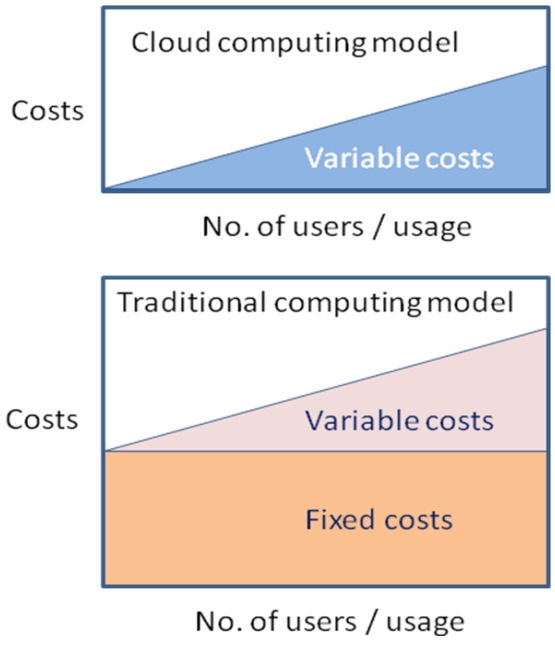


Diagram showing the standard model of economics of cloud computing versus traditional IT, including capital expenditure (CapEx) and operational expenditure (OpEx).

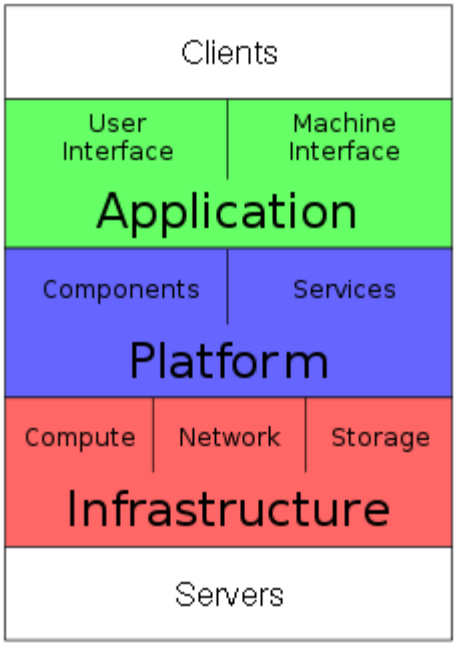
A key advantage of Cloud computing that all Cloud Computing providers cite is that users can avoid capital expenditure and (CapEx) and other fixed cost expenses on hardware, software and services when they pay a provider only for what they use. This is a huge boost particularly to SMEs who now have access to sophisticated and powerful applications for minimal initial outlay.

Consumption is usually billed on a utility (e.g., resources consumed, like electricity) or subscription (e.g., time-based, like a newspaper) basis with little or no upfront cost. Some cloud providers offer the service for a flat monthly fee as opposed to on a utility billing basis. Other benefits of this time sharing-style approach are low barriers to entry, shared infrastructure and costs, low management overhead, and immediate access to a broad range of applications. In general, users can terminate the contract at any time (thereby avoiding return on investment risk and uncertainty), and the services are often covered by service level agreements (SLAs) with financial penalties.

Cloud computing providers also have the advantage of scale; with large numbers of users / subscribers they have very advantageous buying / negotiating power with suppliers and the cost reductions from economies of scale can be passed on to their customers.

However, although most companies may well be able to save significantly on upfront capital expenditures, they might not always save much and might actually end up paying more for operating expenses. In situations where the capital expense would be relatively small, or where the organization has more flexibility in their capital budget than their operating budget, the cloud model might not make great financial sense. Other factors impacting the scale of any potential cost savings include the efficiency and flexibility of a company's IT department as compared to the cloud vendor's, the company's existing operating costs, the level of adoption of cloud computing, and the type of functionality being hosted in the cloud.

Architecture: The Layers



Cloud Computing Stack

Clients

A *cloud client* consists of computer hardware and/or computer software that relies on cloud computing for application delivery, or that is specifically designed for delivery of cloud services E.g. A web-browser or specific desktop / mobile 'applet'.

Application

A *cloud application* leverages cloud computing in software architecture, often eliminating the need to install and run the application on the customer's own computer, thus removing the need for costly software maintenance, ongoing operation, and support. Examples include:

Skype, Linkedin, Google Apps, Salesforce, social networking sites and MS Online Services. N.B. Diaxon gem99.com a web-based contact management service.

Platform

A *cloud platform* delivers a computing platform, generally consuming *cloud infrastructure* and supporting *cloud applications*. It facilitates deployment of applications without any cost and complexity of buying and managing the underlying hardware and software layers. For example, many providers (including Diaxon, use Microsoft's .Net and SQLServer (database) technology).

Infrastructure

Cloud infrastructure is the delivery of computer infrastructure – the physical and software networking facilities that provide connectivity on the web.

Servers

The *servers* layer consists of computer hardware and/or computer software products that are specifically designed for the delivery of cloud services – the machines that host your application and data stores.

Summary of cloud computing characteristics

- **Agility** improves with users able to rapidly and inexpensively re-provision technological infrastructure resources
- **Cost** can be greatly reduced and capital expenditure is converted to operational expenditure. This lowers barriers to entry, as infrastructure is typically provided by a third-party and does not need to be purchased for one-time or infrequent intensive computing tasks. Pricing on a utility computing basis with usage-based options and fewer IT skills are required for implementation (in-house).
- **Device and location independence** enable users to access systems using a web browser regardless of their location or what device they are using (e.g., PC, mobile). As infrastructure is off-site (typically provided by a third-party) and accessed via the Internet, users can connect from anywhere.
- **Multi-tenancy** enables sharing of resources and costs across a large pool of users thus allowing for:
    - **Centralisation** of infrastructure in locations with lower costs (such as real estate, electricity, etc.)
    - **Peak-load capacity** increases (users need not engineer for highest possible load-levels)
- **Utilisation and efficiency** improvements for systems that are often only 10–20% utilized.
- **Reliability** improves through the use of multiple redundant sites, which makes cloud computing suitable for business continuity and disaster recovery. Nonetheless, many major cloud computing services have suffered outages, and IT and business managers can at times do little when they are affected.
- **Scalability** via dynamic ("on-demand") provisioning of resources on a, self-service basis near real-time, without users having to engineer for peak loads. Performance is monitored and consistent and loosely-coupled architectures are constructed using web services as the system interface.
- **Security** typically improves due to centralization of data, increased security-focused resources, etc., but concerns can persist about loss of control over certain sensitive data, and the lack of security for key data stored remotely. Security is often as good as or better than under traditional systems, in part because providers are able to devote resources to solving security issues that many customers cannot afford. Providers typically log accesses, but accessing audit logs themselves can be difficult or impossible. Furthermore, the complexity of security is greatly increased when data is distributed over a wider area and / or number of devices.
- **Sustainability** comes about through improved resource utilization, more efficient systems, and carbon neutrality. Nonetheless, computers and associated infrastructure are major consumers of energy.

Diaxon's Business Application Factory can create architectures and configurations that best suit your business. For further details refer to our website www.diaxon.com

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