

BRIEFING MEMO

CLOUD MARKET

You may perhaps not have realised it, but in the everyday use of your home desktop personal computer, laptop, tablet, & smartphone, you are already operating entirely in a cloud environment. You will know this as being 'on the net' or 'online'. To be able to access the internet is the crux of cloud computing. So, let's take a closer look at what on-line access means.

“We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten. Don’t let yourself be lulled into inaction.” – Bill Gates

Once you have established your physical connection via an Internet Service Provider (ISP), what do we do when using our computing devices to gain access to another computer network? You gained access via a **browser**, a software application for accessing third-party information. The first one created was by the World Wide Web Consortium in 1990. But it was not easy to use and browser software has continually innovated over the last three decades. Today, you will variously be using the trademarked browsers **Edge** (Microsoft), **Chrome** (Google), **Firefox** (Mozilla), **Safari** (Apple), and there are many more.

When using the web, you are networking via **Internet Protocol** (IP). In order to access another computer system, you need to provide a very exact address. This address or **web portal** is a location on a computer network. It is a mechanism for retrieving a resource, a **Uniform Resource Locator** (URL).

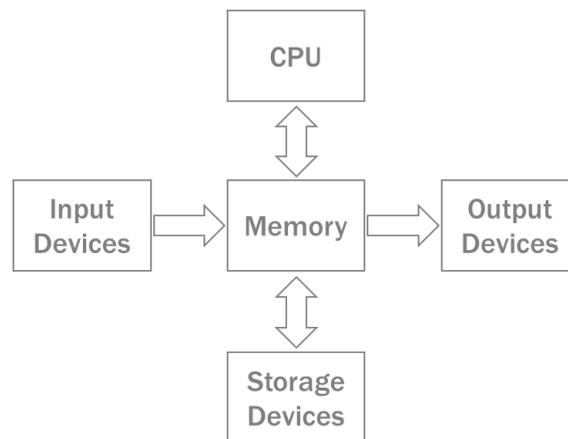


- There are global **protocols** for transmitting data between computers. For the internet exchanges, these are known as **TCP/IP, HTTPS, SMTP, and DNS**. Again, they denote different types of software, but to use one is a must. Your browser will automatically be using one such protocol, so there is no need to type this.
- The next two parts of the address are what we tend to type into our browser. The **subdomain** does nothing other than identify a server dedicated to the web, you will have been in the habit of typing "[www.](#)" because that is what many sites use. A site owner can use any letters, the choice of "[www.](#)" is purely tradition. The **domain name** is what catches the searcher's attention.
- However, IP convention requires you to attach a top-level domain identifier, or an **extension**, which you will know as .com, .net, .org, .eu, etc. From here on out, you are already connected to a website and any click within the site will take you to a file located deeper on their server. With the content on the internet and the numbers of users simply exploding, new sites are moving away from "[www.](#)" or ".com" and replacing them with other subdomains and extensions in order to better distinguish their URL.

As a household subscriber to the internet you are a user of cloud services. You have an ISP, you have created an email address through a provider, and as an email user you can create a system of saving emails in folders. You may also have subscribed to providers of data bases for storage of images, documents, etc. You are probably backing up your computer and mobile phone to these data bases too.

Amazon were the first to identify expanding cloud services on an industrial scale for corporates. **Microsoft, Google, and IBM** are the next largest providers while others are joining the race.

Unlike households, corporations will have built their own park of computer infrastructure. Any isolated home PC and corporate computer system have something in common. They are comprised of input & output devices, processors, memory & storage devices.



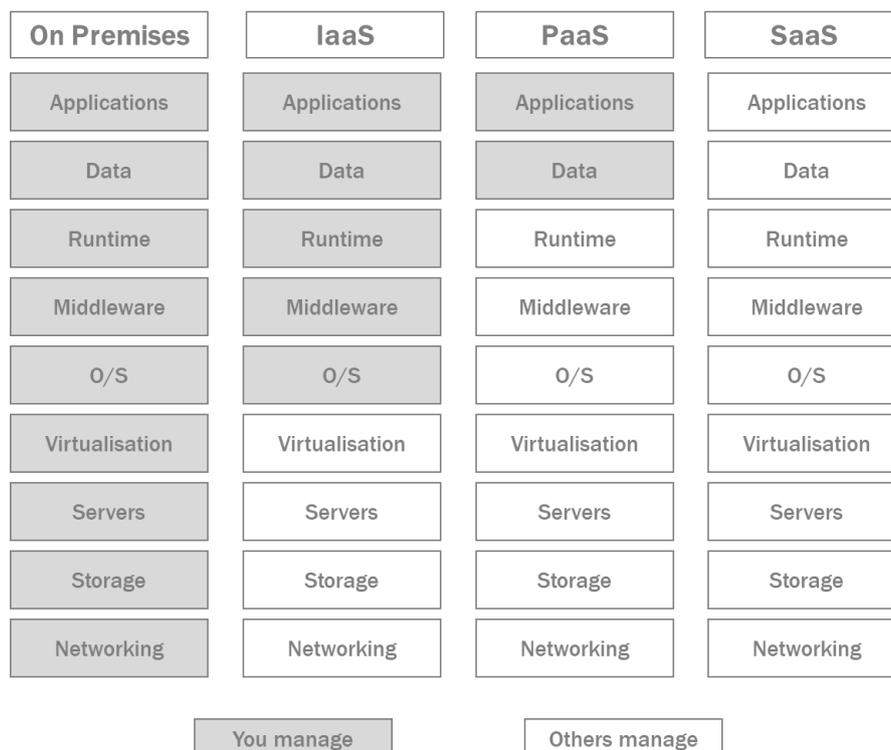
Corporations are using internal mail systems, storing files in electronic format, running financial, accounting, and client relationship management (CRM) software, which is often proprietary but also as part of third-party licensed application packages. It is therefore logical for corporations to have built substantial IT infrastructure. This requires people and space.

IT departments with specialists for hardware maintenance & software development have grown and contribute substantially to the fixed costs of corporations. Huge investment budgets are allocated to the purchase of licensed software and hardware, requiring specialised technical real estate. The offices we usually see have **endpoints** i.e. screens, keyboards and a few printers. Behind all of this, apart from the jungles of hidden cables in floors or ceilings, is a vast park of **servers** which provide functionality to the endpoints where our screen terminals are attached.

There are dedicated servers for a multitude of purposes, including databases, file storage, email, printing, web management, and software applications. They require routers and switches to communicate, and, crucially, energy to power the servers as well as the cooling units. Servers usually sit in secure rooms, floors, buildings, often occupying entire branch offices. It is no surprise therefore, that very quickly business models began to evolve. It started making sense to look at IT infrastructure as non-core and outsourced.

A whole industry of **cloud services** has rapidly grown, with four constituent parts:

1. The traditional **telecom companies** for the cables and wireless access points.
2. The **data centre providers** manage vast computer parks in remote locations.
3. **Content delivery networks** (CDNs) specialise in providing geographically distributed proxy servers in smaller but still substantial data centres. They ensure high availability of services and performance closer to the end-users. Together, these three levels are providing the networking hardware, or nodes.
4. The owners of the technology are themselves tenants of data centre providers. Given they are the ones providing services to corporate clients, they are the **hosts** of computers and apps, they are the **cloud providers**. Competition in this fast-evolving market is fierce, the two main battlegrounds being IT infrastructure for computing, networking, and storage on the one hand, with value-add services such as database security, disaster recovery, and business applications on the other.



- There are three service levels, starting with the virtualisation of machines & networks. **Infrastructure as a Service**, abbreviated as IaaS, means clients no longer need enterprise owned appliances locally or in branch offices.

- The **Platform as a Service level**, or PaaS, adds the choice of operating system and foundational software, leaving the user free to build, test, deploy their own apps.
- The third level known as **Software as a Service**, or SaaS, adds software for customer use. Code is created and controlled by the vendor but configured for customer use. One version of the software is used for all customers, so it must be compelling.

The cloud industry is still being organised, but the pace of its growth is undoubted. In a sense, any large corporate is already managing its own **private cloud**. It progressively moves the real estate management of its own parks to third parties, winds down hardware by moving to cloud providers in a **hybrid model**, and in extreme adopts a **public cloud** service altogether to focus on its core business.

Cloud computing is a paid for, on-demand self-service, providing elasticity in provision. There are of course deemed advantages and disadvantages in a cloud migration. Cost-effectiveness, economies of scale, flexibility, and operational efficiencies are a plus. While security used to be the primary reason for hesitating to adopt the cloud model, cloud hosts are proving to be more resilient to electronic crime given size and resources. Location & concentration risk can be addressed by using multiple cloud providers.

In Europe, just over 25% of companies used cloud computing for emails & storage. Half of these firms used advanced services, the strongest growth being by large firms. At national levels, guidelines are produced to help clients embrace this technology. Governments believe wider adoption will make national economies more competitive, and there is an on-going push to foster supervisory convergence between nations.

IT infrastructure is universally needed in order to operate as a business. It is therefore no longer core to any user, but rather becoming **more utility-like**. Cloud computing ties together data and spoken word transition via Internet Protocol (IP). This concludes a telecommunication revolution that began in the last Century (see our Insight – *Origins of Cloud Computing*). Cloud Computing is the logical path for all businesses to mature technologically and its adoption is inevitable.

For further insights on this topic, please contact us via our homepage (www.kloudwerk.com)