

Quick Guide to Data Centre Terminology

CDN (content delivery network)

A large distributed network of servers deployed in multiple data centres across the internet. The goal of a CDN is to serve content as near to the user as possible, ensuring fast and reliable downloads. A CDN operator gets paid by the likes of media and ecommerce companies for delivering their content to their audience.

Chillers

These are industrial-scale refrigeration systems similar to (but many times the size of) those seen on company roofs to power the air conditioning. Often these units are capable of providing half a megawatt of cooling. They chill water which is transported via lagged pipework to Crac units inside the data centre.

Cloud (private and public)

The Cloud has become a colloquial expression used to describe a variety of concepts that involve computing which, as far as most users are concerned, is simply "somewhere out there". There are now a wide and growing range of cloud services all provided by server equipment running in various data centres around the globe. Among the best known are iTunes and Microsoft's i360 cloud version of Microsoft Office. A private cloud is one operated and ring-fenced for the benefit of one company or organisation. This is usually on dedicated hardware so that it is easily secured. In a public cloud all users share the same hardware and also the same software in the case of SaaS.

Colocation

A colocation data centre (also spelled colocation, collocation, or colo) is a type of data centre where racks are available for rental to retail customers. Colos provide space, power, cooling, and physical security for the racks, servers, storage area networks, and networking equipment of many firms. Significant benefits of scale (large power and mechanical systems, the operational systems and staff) result in some very large colocation facilities with much lower PUEs than average.

Crac units

Computer room air conditioning units are very large fan-based units within the data centre's operational area or data hall. They force hot air through a heat exchanger fed with very cold water from the external chillers, removing the excess heat and providing cold air back into the data hall. Air is circulated through the servers to cool down internal electronics.

Data centre

A data centre, computer centre or server farm is a facility used to house computer systems and associated components, such as telecommunications and storage systems plus cooling systems which extract heat produced by the electronic equipment. Large data centres are industrial scale operations using as much electricity as a town or small city.

Free cooling

In many data centres there is a move away from relying on energy hungry chillers and Crac units. Servers can now operate at higher temperatures than before and in some countries, the UK included, the outside temperature is low enough most days of the year to provide adequate cooling without the need to run chillers. In some systems the external air and the data hall air are kept separate by heatexchangers and others add a process of sprayed water to cool air even more. This is far more efficient than using refrigeration units. Days where refrigeration units don't have to be run are called "free cooling days".

IaaS (Infrastructure as a service)

IaaS is the most basic cloud service model. Providers of IaaS own and deploy physical computers in data centres and then make available virtual computers, commonly called virtual machines. These virtual machines include processors, disk-space and RAM plus access to internet bandwidth and are frequently offered on a subscription or pay-per-use model. The IaaS customer is responsible for loading and maintaining the operating system and application programs (and licences) on their virtual machine(s).

Managed hosting (dedicated hosting)

This is where the service provider takes over most of the management, including security, memory, storage and IT support. Usually, the hosting service provider owns and manages the machine, leasing full control to the client.



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Network operations centre

This is usually a centralised office with multiple massive display screens and specialised control software monitoring the condition of a data centre, set of data centres or wide-area networks. It is staffed 24 hours a day, 365 days a year.

Outsourcing

IT outsourcing occurs when a contracts an outside vendor to provide IT services that the customer would otherwise deliver in-house. Services include disaster recovery, data storage or other IT functions through web-hosting, server-hosting in colocation facilities to the provision, operation and maintenance of an entire data centre.

PaaS (Platform as a service)

In the PaaS model, the cloud operators provide a complete computing platform, typically including the operating system, the programming language execution environment, database and web server in addition to the virtual machines and physical hardware. Customers can develop and run software solutions on a PaaS cloud platform without the cost and complexity of buying and managing the underlying hardware and software layers.

PUE

Power usage effectiveness (PUE) is a measure of how efficiently a data centre uses its power. It compares the power used by the computing and related electronics with that needed for cooling, lighting and other ancillary systems. PUE is calculated as the total power used by the data centre divided by the power used by the IT servers and networking electronics. The ideal (but unachievable) PUE would 1.0 where the IT equipment uses 100 per cent of the energy and other services use zero. Older server rooms and data centres have PUEs of 2.0, 2.7 or even more. Modern, large-scale data centres have PUEs of 1.3 or less.

Remote hands

When a company has its IT servers and hardware remotely located in a colocation data centre, there are times when a physical re-start, a change of connections or the insertion of a program DVD is needed. Colocation centres have technical staff who can carry out these tasks on behalf of the firm's IT department. The IT person guides or instructs the colocation technician to do exactly what he/she needs – hence the term remote hands.

Rack

The 19-inch rack is an internationally standard frame or cabinet for mounting multiple equipment modules. Each module has a front panel that is 19 inches (482.6mm) wide. The height of the electronic modules is 1.75 inches (44.45 mm), also known as one rack unit or '1U'. The most common rack or cabinet is 42U tall. 19-inch racks hold most equipment in modern data centres, ISP facilities and server rooms. They allow for dense hardware configurations without occupying excessive floor space.

Tier

Data centre availability is related to the provision of redundancy within its systems. Tier 1 is basic with no redundant components and statistically has an availability of 99.671 per cent (an annual downtime of 28.8 hours). The majority of data centres are being built now at Tier 3 with 99.982 per cent availability or 1.6 hours annual downtime. Tier 4 requires every system component to be fully duplicated plus a spare and so is very expensive but achieves 99.995 per cent availability or just 24 minutes of downtime per year.

SaaS (Software as a service)

With SaaS (formerly known as hosted applications) users are provided access to application software and databases without having to give any consideration to the installation and maintenance of the software, operating systems, servers, networking, or any of the physical and security aspects of the data centres in which the physical equipment is housed. SaaS is sometimes referred to as "ondemand software" and is usually priced on a pay-per-use basis. SaaS providers generally price applications using a subscription fee. Examples of SaaS include Google Apps, Microsoft's Office 365, and Salesforce.com.



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Server virtualisation

Studies in the IT industry a few years ago found that many of the servers in companies' server rooms and data centres were operating on average at 5 to 15 per cent of their processing capabilities making them both expensive and inefficient. A new type of software called the Hypervisor enables one physical server to run maybe a dozen or more virtual machines where each has its own operating system and a guaranteed share of the physical RAM, hard disk storage and processor. Often, as well as the guaranteed share of these common resources, a particular virtual machine can use a bit more when the other virtual machines are not busy making the whole even more efficient and effective. Despite the fact that virtual machines share a common hardware host they are completely isolated from each other and can only share information via a network as discrete servers would.

UPS (uninterruptible power supplies)

Should the mains power ever fail, most data centres have massive diesel generators standing by to take over. However, because these can take a few minutes to get started and settle down, a battery-based system is also provided that will keep all the servers, systems and cooling running at full power for around ten minutes until the generators are ready to take over. These systems also step in to smooth out the power supply when, for example, a heavy load on the national grid causes a power dip or "brown-out".

Web hosting

An internet hosting service (a pre-cloud term) that runs internet servers, allowing organisations and individuals to serve web content to the Internet. There are various levels of service and various kinds of services offered. Most hosting providers offer a combination of services e-mail hosting, for example. DNS (domain name system) hosting are usually bundled with domain name registration.

White space

A term used to describe the area within a data centre available for the siting of racks to contain the server and networking equipment. It is typically, though not always, an area of raised computer-room flooring covered in white floor tiles (hence the name) and is usually expressed in square metres or square feet. Non-white space in the data centre houses heavy plant like cooling units, uninterruptible power supplies, electricity transformers and sub-stations, generators and diesel storage tanks.