**Clouds**

Cloud and Cloud Computing

**The cloud** refers to [servers](https://lms.clarusway.com/mod/lesson/view.php?id=1015" \o "Servers) that are accessed over the Internet and the software and [databases](https://lms.clarusway.com/mod/lesson/view.php?id=995" \o "Databases) that run on those [servers](https://lms.clarusway.com/mod/lesson/view.php?id=1015" \o "Servers). Cloud [servers](https://lms.clarusway.com/mod/lesson/view.php?id=1015" \o "Servers) are located in data centers all over the world. By using cloud computing, users and companies don't have to manage physical [servers](https://lms.clarusway.com/mod/lesson/view.php?id=1015" \o "Servers) themselves or run software applications on their own machines.

Cloud computing is possible because of a technology called virtualization. Virtualization allows for the creation of a simulated, digital-only **virtual computer/machine** that behaves as if it were a physical computer with its own hardware.

| **https://docs.google.com/uc?id=1cJZlYgaBBb2Cnjdd38_UCJY3tfGv5FIF** |
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| *The Cloud and user device* |

**Service models of cloud computing**

The main service models of cloud computing are:

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| *Service models* |

* **Software-as-a-Service (SaaS)**: Instead of users installing an application on their device, SaaS applications are hosted on cloud [servers](https://lms.clarusway.com/mod/lesson/view.php?id=1015" \o "Servers), and users access them over the Internet. SaaS is like renting a house: the landlord maintains the house, but the tenant mostly gets to use it as if they owned it. Examples of SaaS applications include Salesforce, MailChimp, and Slack.
* **Platform-as-a-Service (PaaS)**: In this model, companies don't pay for hosted applications; instead they pay for the things they need to build their own applications. PaaS vendors offer everything necessary for building an application, including development tools, infrastructure, and [operating systems](https://lms.clarusway.com/mod/lesson/view.php?id=56" \o "Operating Systems), over the Internet. PaaS can be compared to renting all the tools and equipment necessary for building a house, instead of renting the house itself. PaaS examples include Heroku and Microsoft Azure.
* **Infrastructure-as-a-Service (IaaS)**: In this model, a company rents the [servers](https://lms.clarusway.com/mod/lesson/view.php?id=1015" \o "Servers) and storage they need from a cloud provider. They then use that cloud infrastructure to build their applications. IaaS is like a company leasing a plot of land on which they can build whatever they want – but they need to provide their own building equipment and materials. IaaS providers include DigitalOcean, Google Compute Engine, and OpenStack.

Formerly, SaaS, PaaS, and IaaS were the three main models of cloud computing, and essentially all cloud services fit into one of these categories. However, in recent years a fourth model has emerged:

* **Function-as-a-Service (FaaS)**: FaaS, also known as serverless computing, breaks cloud applications down into even smaller components that only run when they're needed. Imagine if it was possible to rent a house one little bit at a time: for instance, the tenant only pays for the dining room at dinner time, the bedroom while they're sleeping, the living room while they're watching TV, and when they aren't using those rooms, they don't have to pay rent on them.

FaaS or serverless applications still run on [servers](https://lms.clarusway.com/mod/lesson/view.php?id=1015" \o "Servers), as do all these models of cloud computing. But they're called "serverless" because they don't run on dedicated machines and because the companies building the applications don't have to manage any [servers](https://lms.clarusway.com/mod/lesson/view.php?id=1015" \o "Servers).

**Types of Cloud Deployments**

The most common cloud deployments are:

* **Private cloud**: A private cloud is a server, data center, or distributed network wholly dedicated to one organization.
* **Public cloud**: A public cloud is a service run by an external vendor that may include [servers](https://lms.clarusway.com/mod/lesson/view.php?id=1015" \o "Servers) in one or multiple data centers. Unlike a private cloud, public clouds are shared by multiple organizations.
* **Hybrid cloud**: Hybrid cloud deployments combine public and private clouds, and may even include on-premises legacy [servers](https://lms.clarusway.com/mod/lesson/view.php?id=1015" \o "Servers).
* **Multicloud**: Multicloud is a type of cloud deployment that involves using multiple public clouds.