What is Cloud Computing

Cloud Computing (n.d.). Retrieved July 19, 2017, from https://pixabay.com/ CC0 Public Domain Free for commercial use No attribution required

Cloud computing is the practice of storing, accessing, and processing data in remote locations through the Internet. Just like the Internet of Things, Cloud Computing is not a single technology. It is a model that consists of many different computing technologies.

Cloud computing is sometimes referred to as *the cloud.* However, the term "the cloud" has a more specific meaning. It refers to the network of servers that contain the computing resources that are made available to the users.

By the end of this module, you should be able to:
03_Obj01: Define important terms such as Cloud, Cloud Computing, Client Server Model, Client, Server, Service, etc
03_Obj02: Identify major technologies and concepts about the evolution of cloud computing
03_Obj03: Identify types of clouds

Client–server model

Cabinet server (n.d.). Retrieved July 19, 2017, from https://pexels.com/ CC0 Public Domain Free for commercial use No attribution required

Before we discuss how the cloud works, first you have to understand the client-server model. The *client server model* is a distributed application structure where roles or functions are separated into service providers and service requesters

Server

A server is a computer that performs a task for other computers in a network. When you go to a website, your computer or device accesses at least one server.

Client

A computer that requests for a task is called a client. Your desktop, laptop, mobile phone and pretty much every device that you use to connect to the Internet are clients.

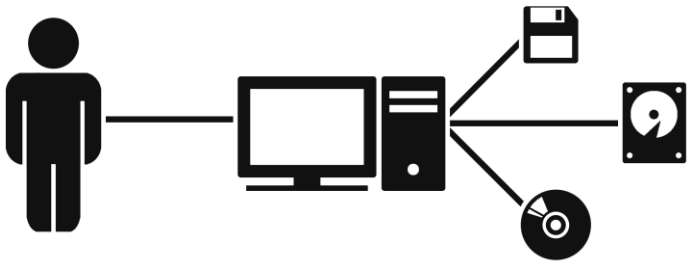
Service

The task that is performed in the client–server model is called a *service*. In the early days of the Internet, services are mainly just file

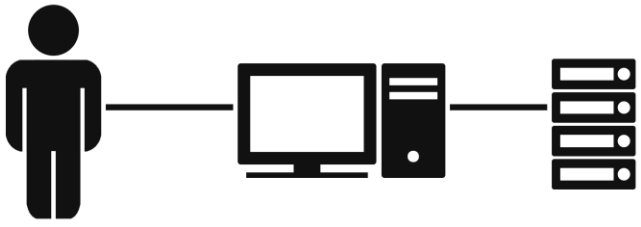
hosting or storage of information. Servers store information, usually texts files in HTML format, and send them to other computers in the network upon request. Today, there are many other types of services, which will be discussed in the next module.

How does cloud computing work?

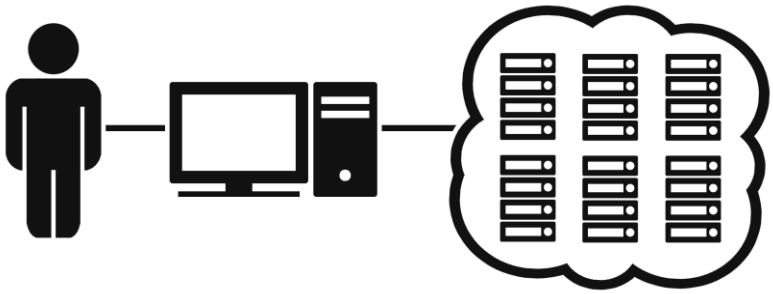
To understand how Cloud Computing works, let's take a closer look at how we use the Internet.



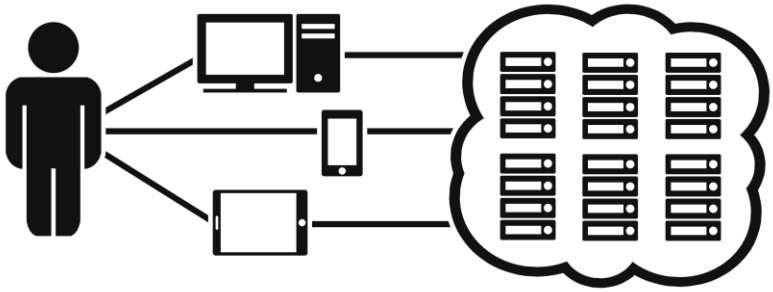
This is computing without the Internet or any other network connection. You have a computer that you use to process information. All the information are stored internally in hard drives or externally in diskettes, CD's, or flash drives.



With Internet connection, your computer can access a server. The server can provide you with the information and services that you need. You no longer have to store everything locally.



You can even access multiple servers. In fact, more complex services such as social media require multiple servers to work. That's what the Cloud is. The Cloud is the collective term for the servers that work together to provide services to clients.

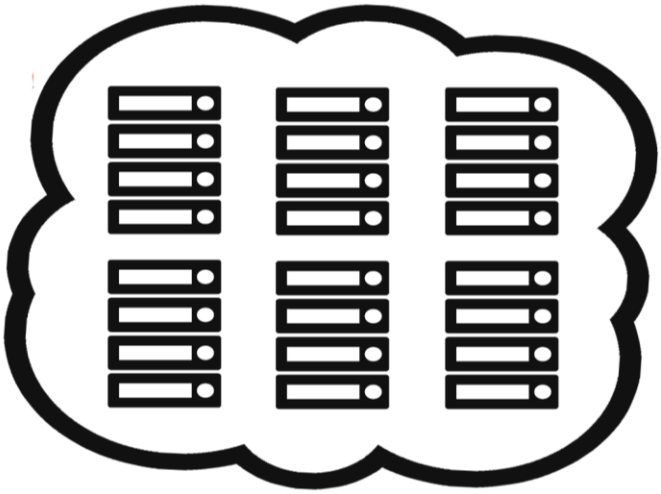


Cloud computing makes these services available to you anytime, anywhere, as long as you have Internet connection. You even can use different devices. For example, if you do your homework in your desktop at home, you can just upload it in the cloud and download it in a computer in your school.

Evolution of Cloud Computing

While the term Cloud Computing became widely used in the 21st century, the evolution of Cloud Computing is as old as digital computing itself. The following are some of the major technologies and concepts that influenced the evolution of cloud computing.

Origins



The exact origin of the term Cloud Computing is unknown. Several persons and organizations claim to have coined the term. The accepted generally accepted origin story has to do with network diagrams where groups of servers and other remote assets are usually represented by a drawing of a cloud. The idea is that multiple components in different locations can work together to provide a service.

Virtualization

Virtual is used to describe something that does not physically exist. In computing, virtual means something that exists only in software form, without actual hardware components. Virtualization is the practice of creating a virtual or software version of a device and resource.

A *virtual machine* is an emulation of a computer system. A virtual machine is usually contained in or *hosted* by a real-world computer; a computer within a computer. However, it is also possible to create a virtual machine inside another virtual machine; a computer within a computer within a computer ad infinitum.

Just like a computer, it has its own Operating System or OS (e.g. Windows 10) and can run programs (e.g. Microsoft Word) but unlike a real computer, it does not have actual hardware components such as hard drives and processors. Instead, it borrows these hardware functions from its host.

Virtualization is a integral element of Cloud Computing. The cloud hosts multiple virtual systems that are used by different clients.

Utility Computing

The traditional approach to computing, especially in a business setting is like this: you buy the hardware, you develop the software, and you hire people to manage them. If you need to upgrade your system, you buy more servers, you develop better software, and you hire more people. If you need to downgrade your system, You may have to fire some of your employees and you're most likely stuck with a surplus of hardware and needlessly complicated software.

Utility computing, on the other hand, treats computing as a utility like water and electricity. Instead of building your own system, you just pay to use someone else's. You don't have to buy your own server. You can just rent a server space somewhere.

Just like water and electricity, you only pay for what you consume. Utility computing is one of the defining characteristics of Cloud Computing. This will be discussed further in the next module

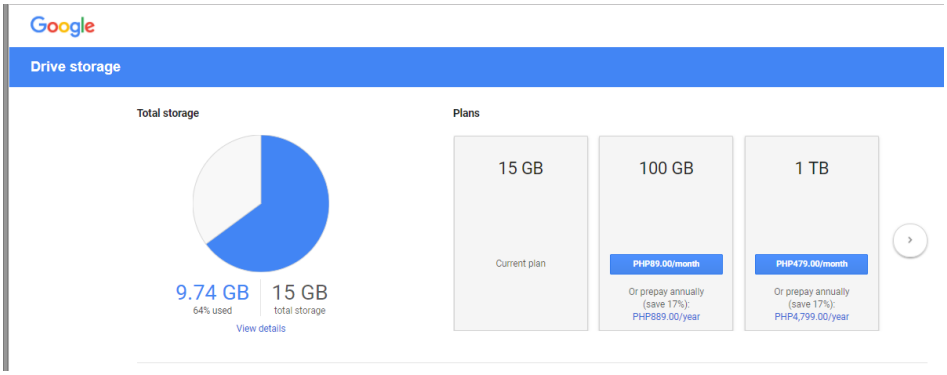
Types of clouds

Most of the time, "the Cloud" is used to refer to the entirety of Cloud Computing but as you recently learned, cloud actually refers to a group of servers. Obviously, there are many groups of servers out there. Therefore, we can say that there is more than one cloud. Clouds are generally classified into three:

Public Cloud

A public cloud is a type of cloud that is available to many users. Public clouds can be free to use by the general public. Social media sites are popular examples. Public clouds can also be offered as paid services. Businesses normally pay for the cloud services that they use. Many cloud services have both free and paid features. For example, Google Drive, Google's cloud-based file storage and sharing service allots

every user 15 gigabytes of storage space for free but also offers 100 gigabytes or 1 terabyte of paid storage.



Source: https://www.google.com/settings/u/0/storage?hl=en date retrieved: July 29, 2017

Private Cloud

Private cloud is a type of cloud used solely by a single organization. A private cloud can be owned and operated by the same organization that uses it. Big organizations can build their own clouds by purchasing their own hardware and developing their own software. A private cloud can also be owned by a third-party provider and be leased to a single organization for exclusive use. The bottom line is it doesn't matter who the owner is. A cloud is private as long as it only has one user.

Hybrid Cloud

Hybrid cloud uses both private and public cloud services from different providers. Some users have diverse needs that cannot be filled by just one provider and cloud type. That is why many organizations subscribe to several cloud services from different providers. For example, a business owns a private cloud that securely stores and manages their sensitive information; at the same time they also pay for third party cloud services such as emailing and teleconferencing.

Glossary of Terms

CLOUD COMPUTING – is sometimes referred to as *the cloud*. It is the practice of storing, accessing, and processing data in remote locations through the Internet

CLOUD – refers to the network of servers that contain the computing resources that are made available to the users.

CLIENT SERVER MODEL – is a distributed application structure where roles or functions are separated into service providers and service requesters

SERVER – is a computer that performs a task for other computers in a network.

CLIENT – a computer that requests for a task

SERVICE – the task that is performed in the client–server model

VIRTUAL – is used to describe something that does not physically exist.

VIRTUAL MACHINE – is an emulation of a computer system

PUBLIC CLOUD – is a type of cloud that is available to many users

HYBRID CLOUD – uses both private and public cloud services from different providers

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Links to Videos and Readings

Video: Changes to computer thinking - Stephen Fry explains cloud computing

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