Cloud Computing V2

Cloud computing overview

What is cloud computing and how can it benefit businesses regardless of the industry they occupy?

To get started on the future of cloud, watch the following video:

What is cloud computing?

The term *cloud* is used as a metaphor for the internet and a virtualized set of hardware resources. The cloud is an abstraction for the complex infrastructure it conceals. The generally accepted definition of cloud computing comes from the National Institute of Standards and Technology (NIST). The NIST definition runs to several hundred words but essentially says that:

“Cloud Computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction.”

Cloud computing is a disruptive change in the IT industry that represents a new model for the IT infrastructure that is

different from traditional IT computing models. Cloud computing enables ubiquitous computing, where computing is

This new model demands a dynamic and responsive IT infrastructure due to short application lifecycles. To support this model, new development processes, application design, and development tools are required.

Elastic resources: Scale up or down quickly and easily to meet changing demand.

Metered services: Pay only for what you use.

Self-service: Find all the IT resources that you need by using self-service access.

The following examples of computing resources are typically found in cloud computing (as shown in *the figure below*):

- Servers
- Storage
- Networks
- Security
- Applications
- Platforms
- Runtimes
- Databases
- Managed services

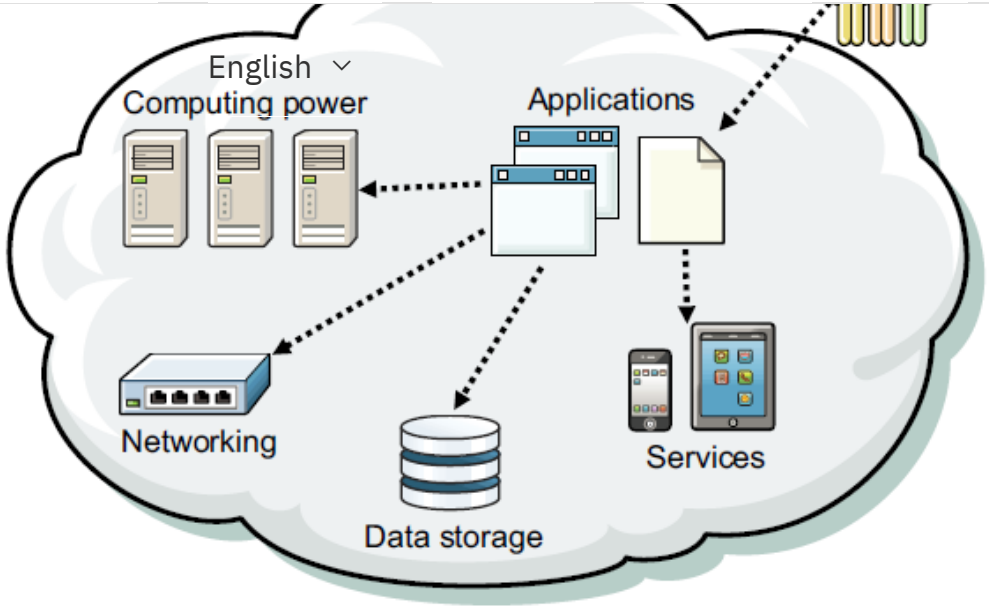

Figure 1: What is cloud computing?

As opposed to...

Traditional computing model

Cloud computing as a deployment model is replacing a more traditional approach where each application that a user interacts with has its own custom-built services, networking, data storage, and computing power.

The ability to reuse and repurpose hardware rapidly, and to host multiple applications and systems within a single set of hardware in an isolated fashion, are some of the main characteristics driving the adoption of cloud computing.

Within the traditional approach (as shown in the figure below), the IT staff needs to manage the entire stack, from

hardware all the way to the latest software updates. Therefore, you can't use this model to manage the requirements of

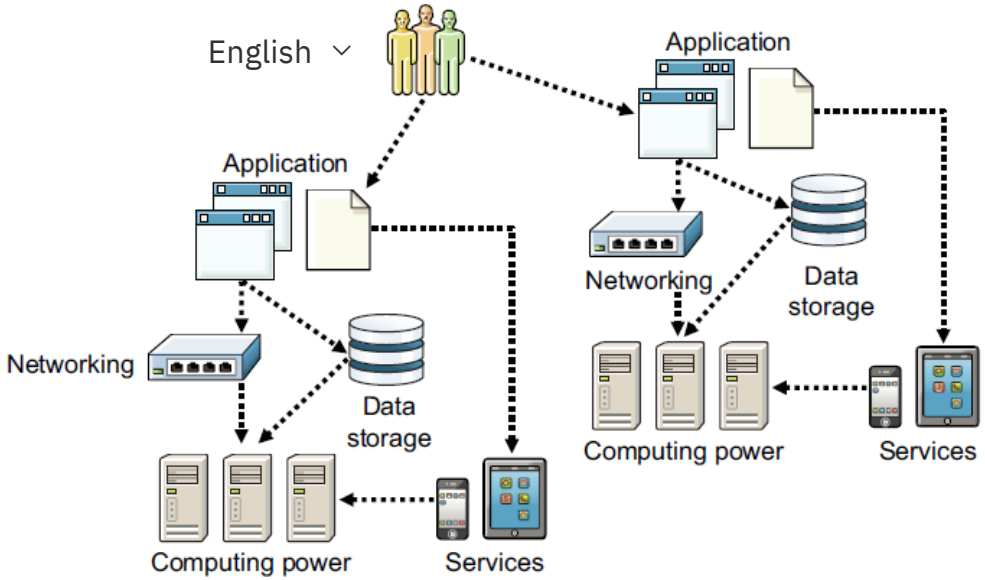

Figure 2: Traditional computing

Characteristics of the cloud

Modern applications must be delivered quickly. Developers are pressured to get their product to market as soon as possible. They want to get feedback quickly, and then iterate on the idea to make the product better and faster.

The cloud makes hardware resources readily available and quick to configure, which shortens the time that is required for developers to show a working version of their products. Also, cloud allows the reuse of the same resources for multiple successive projects, which is more cost-efficient.

Characteristics of the cloud:

- On-demand resources: Have it when you need it with no need for tiresome preparation, downloads, and installations

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- Ubiquitous access: Access the cloud from anywhere just by using an internet connection and a cloud account (user name and password).
- Resource pooling: Pooling hardware resources and abstracting them so that when resources are not being used by one customer, instead of sitting idle, those resources can be used by another customer.
- Rapid elasticity: Scaling up or down resource consumption is available on demand with any quantity and at any time.
- Measured service: Pay only for what you use, which helps you monitor any wastage of resources.

Benefits of the cloud

Enterprises eager to undergo digital transformations and modernize their applications are quick to see the value of adopting a cloud-computing platform. They are increasingly finding business agility or cost savings by renting software and infrastructure. Each cloud-computing service and deployment model type provides you with different levels of control, flexibility, and management.

- Achieves economies of scale (do more with less).

Economies of scale decrease costs because of increased production. These economies became achievable in software because of the flexibility of the cloud.

- Reduces capital expenditure (CAPEX) by moving to the operational expenditure (OPEX) model (use only when needed).

CAPEX is the money that is used to acquire or update the assets of a firm. OPEX is the money that is used on running operations. So, in the software industry the “pay as you go” model helps you go from CAPEX to OPEX.

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- Facilitates agile methodology (faster time to market).

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English

- Ensures Global Availability (focus on developing applications, and the rest automatically follows).

It helps to improve reliability and provide a good disaster recovery plan with high availability.

- Built-in security

Cloud providers typically have standards to build their environments and standardized practices to run operations that meet the security needs of enterprise clients. As a user of cloud, your application could benefit from higher orders of security by virtue of it being built into the cloud offering for all.

- Provides advanced capabilities (advanced technology that is readily available and you can experiment with).

Many advanced technologies, such as big data and AI services that need high-computing-power capabilities would not be available without cloud computing.

The following factors have contributed to the growth of cloud computing:

- **Applications with a short lead time to delivery:** Today's applications require a short time to delivery. Developers are pressured to get their product to market as soon as possible. They want to get feedback quickly and then iterate on the idea to make the product better and faster. The cloud makes hardware resources readily available and quick to configure, which shortens the time that is required for developers to show a working version of their products. Also, the cloud allows for the reuse of the same resources for multiple, successive projects, which is more cost-efficient.
- **Developers expect to have programming language options and to interact with predefined services:** Cloud computing provides prepackaged language support, which enables the support of many more languages than the traditional do-it-yourself environment. Cloud computing can also make available shared services that provide an externally-managed way of delivering frequently-used functions.

of an application, which is known as scaling out (horizontal scaling) to handle increased customer load. Cloud platforms provide standardized methods to scale applications.

- **Developers expect the pay-as-you-go (PAYG) utility computing billing method:** This method means they pay only for their cloud usage.