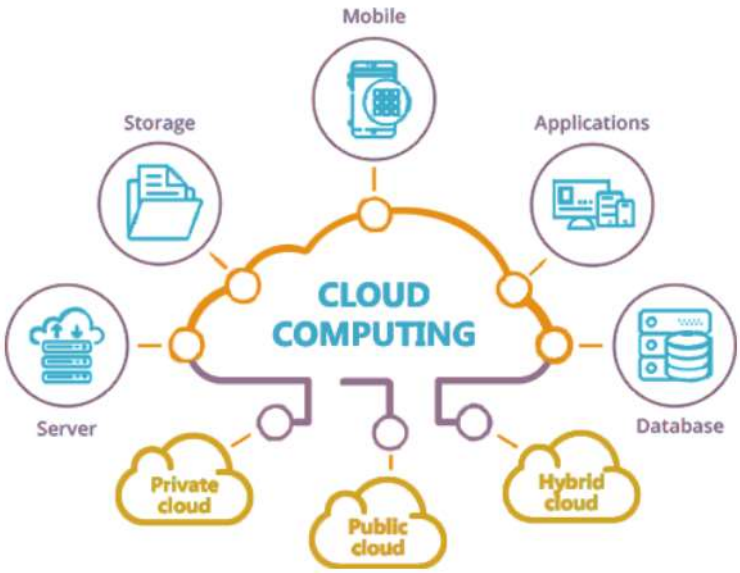
By
Amit Kr

Cloud Computing



Cloud computing refers to the delivery of computing services, including computing power, storage, databases, networking, analytics, software, and intelligence, over the internet to offer faster innovation, flexible resources, and economies of scale. Instead of owning and maintaining physical hardware and infrastructure, users can access and use computing resources as a service from a cloud service provider.

Imagine you have a computer at home, and you use it for various tasks like writing documents, storing pictures, and playing games. Now, think about all the data and programs on your computer as belongings in your house.

Now, let's explore three scenarios:

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Local Storage (No Cloud):

- Without cloud computing, it's like having all your belongings and activities confined to your house. You can access your stuff whenever you're at home, but if you're somewhere else, you can't reach them.

Traditional Web Hosting (Partial Cloud):

- Consider traditional web hosting like storing some of your stuff in a storage unit outside your home. You can access those things when you go to the storage unit, but you're still limited to a specific location.

Cloud Computing:

- Now, imagine a magical backpack (the cloud) that you can take with you everywhere. Instead of keeping all your important things at home or in a storage unit, you put them in this magical backpack. Whenever you need your belongings, you simply open the backpack, no matter where you are. The backpack ensures you can access your stuff from anywhere, as long as you have an internet connection.

In this analogy:

- Your computer at home is like a device you use (like a laptop or smartphone).
- Your belongings represent data, files, and applications.
- The magical backpack is the cloud, which is a remote server or servers on the internet.
- Accessing your belongings from anywhere symbolizes the convenience of cloud computing.

So, in a **nutshell, cloud computing is like having a magical backpack that allows you to access your digital stuff from anywhere, as long as you have an internet connection, without being tied to a specific location or device.**

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Many people use cloud computing in their daily lives, often without realizing it. Here are some common real-life examples:

Email Services:

- Many individuals use cloud-based email services such as Gmail, Outlook, or Yahoo Mail. The emails and attachments are stored in the cloud, allowing users to access them from any device with an internet connection.

File Storage and Sharing:

- Services like Google Drive, Dropbox, and OneDrive are widely used for storing and sharing files. Users can upload documents, photos, and videos to the cloud and access them from different devices.

Social Media:

- Social media platforms like Facebook, Instagram, and Twitter use cloud storage to host user data, photos, and videos. This enables users to access their social media accounts from various devices.

Streaming Services:

- Platforms like Netflix, Spotify, and YouTube use cloud infrastructure to deliver streaming content. Users can watch movies, listen to music, or view videos without downloading large files to their devices.

Online Backup Services:

- Backup services like Backblaze or Carbonite use the cloud to store copies of users' important files. This ensures that even if a local device fails, the data can be retrieved from the cloud backup.

Online Productivity Tools:

- Applications like Google Workspace (formerly G Suite) provide cloud-based productivity tools such as Google Docs, Sheets, and Slides. Users can collaborate on documents in real-time, and the files are stored in the cloud.

Smartphones and Tablets:

- The synchronization of contacts, photos, and app data across multiple devices often relies on cloud services. This ensures that users can seamlessly transition between different devices without losing data.

E-commerce Platforms:

- Online shopping platforms, like Amazon, use cloud computing to handle transactions, store customer data, and manage inventory. This allows for a scalable and reliable infrastructure to support the demands of e-commerce.

Online Banking:

- Many banking services use cloud computing for storage and processing of financial data. Users can access their account information and perform transactions securely through web and mobile applications.

GPS and Navigation Services:

- Navigation apps like Google Maps or Waze use cloud-based maps and data to provide real-time traffic information and route recommendations.

These examples illustrate how cloud computing has become an integral part of various aspects of our daily lives, offering convenience, accessibility, and scalability for a wide range of services and applications.

Cloud computing is categorized into different types based on the service models and deployment models. Here are the main types of cloud computing, along with examples:

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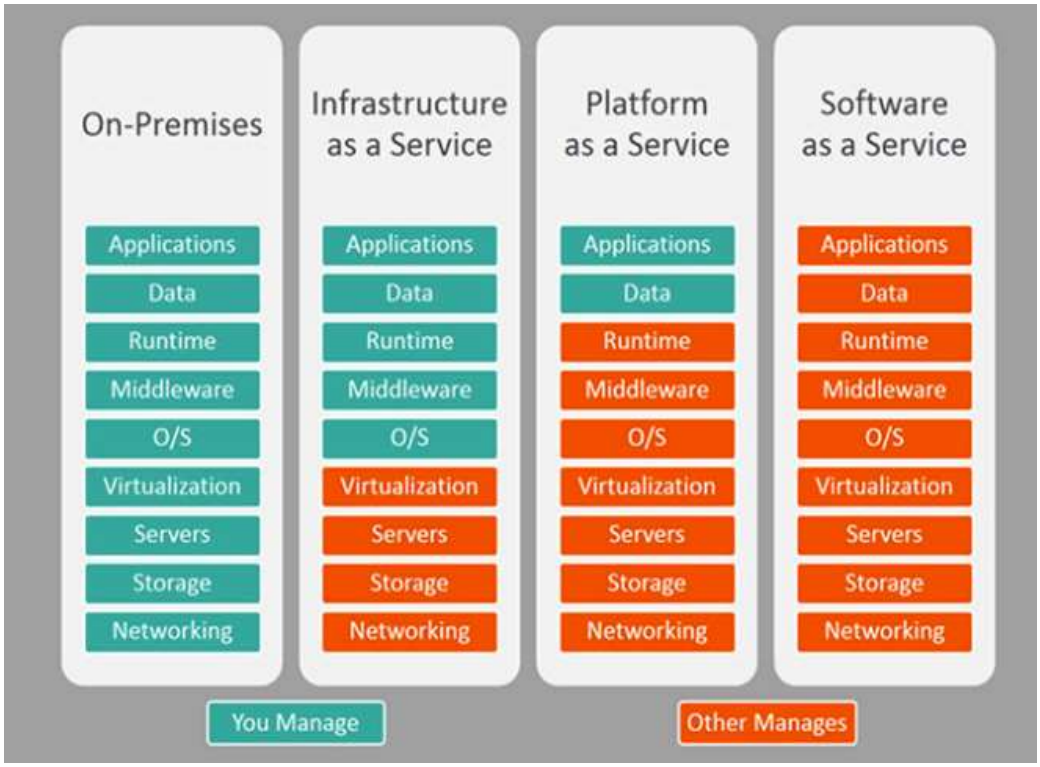
Service Models:



Infrastructure as a Service (IaaS):

- In IaaS, users rent virtualized computing resources over the internet. This includes virtual machines, storage, and networking.
- Example: Amazon Web Services (AWS) Elastic Compute Cloud (EC2), Microsoft Azure Virtual Machines.

Platform as a Service (PaaS):

- PaaS provides a platform that allows users to develop, run, and manage applications without dealing with the complexity of infrastructure management. It includes tools for building, testing, and deploying applications.
- Example: Google App Engine, Heroku, Microsoft Azure App Service.

Software as a Service (SaaS):

- SaaS delivers software applications over the internet on a subscription basis. Users can access the software through a web browser without needing to install or maintain it locally.
- Example: Salesforce, Google Workspace, Microsoft 365.

Deployment Models:

Public Cloud:

- Public cloud services are provided by third-party providers and are made available to the general public. Resources are shared among multiple users.
- Example: AWS, Microsoft Azure, Google Cloud Platform.

Private Cloud:

- Private clouds are used exclusively by a single organization. The infrastructure can be managed by the organization itself or by a third-party provider.
- Example: VMware Cloud Foundation, OpenStack.

Hybrid Cloud:

- Hybrid clouds combine both public and private cloud models. This allows data and applications to be shared between them.
- Example: A company might use a private cloud for sensitive workloads and a public cloud for scalable tasks or backup.

Community Cloud:

- Community clouds are shared by several organizations with common concerns, such as compliance and regulatory requirements.

- Example: Cloud services tailored for specific industries like healthcare or finance.

Additional Model:

Function as a Service (FaaS) / Serverless Computing:

- In FaaS, the cloud provider manages the infrastructure, and users only pay for the actual compute time consumed by their functions.
- Example: AWS Lambda, Azure Functions, Google Cloud Functions.

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