What's in It for You?

- **Why Cloud Computing?**
- **What Is Cloud Computing?**
- **Benefits of Cloud Computing**
- **Architecture of Cloud Computing**
  - ➤ **Front end**
  - ➤ **Back end**
- **Components of Cloud Computing**

Why Cloud Computing?

Before cloud computing

Challenges

- On-premise is expensive
- Less scalability
- Allot huge space for servers
- Less chance of data recovery
- Long deployment times

Why Cloud Computing?
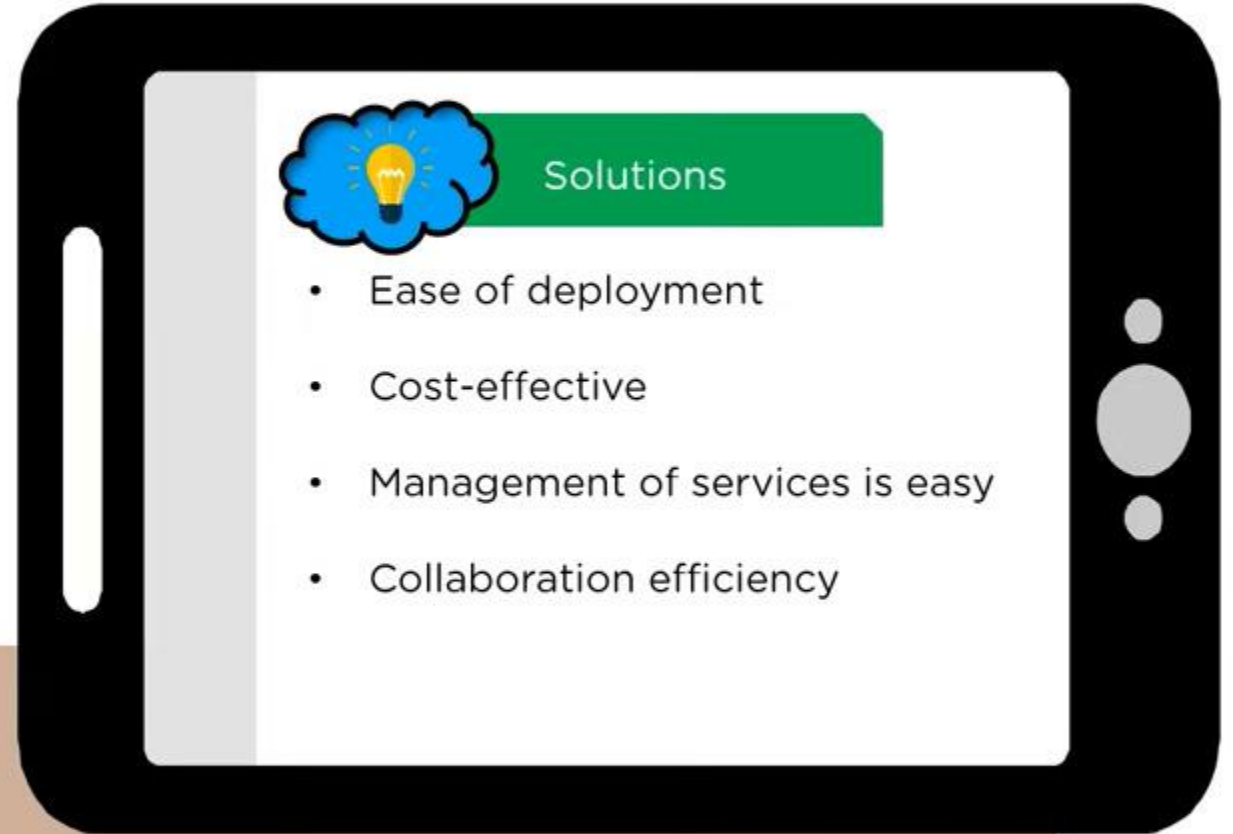
Before cloud computing

Solutions

- No server space required

- No experts required for hardware and software maintenance

- Better data security

- Disaster recovery

Why Cloud Computing?

Before cloud computing

CLOUD COMPUTING IS BETTER THAN ON-PREMISE INFRASTRUCTURE

Solutions

- Ease of deployment
- Cost-effective
- Management of services is easy
- Collaboration efficiency

What Is Cloud Computing?

- Cloud Computing is the delivery of on-demand resources (such as server, database, software, etc.) over the internet

What Is Cloud Computing?

- Cloud Computing is the delivery of on-demand resources (such as server, database, software, etc.) over the internet

- It also gives the ability to build, design and manage applications on the cloud platform

Note: Companies offering these computing services are called cloud providers

What Is Cloud Computing?

- Cloud Computing service providers are the vendors who provide services to manage applications through a global network

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- Example: Amazon Web Service, Microsoft Azure, GCP etc.
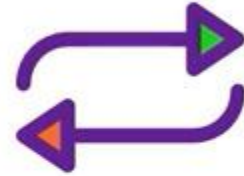
Benefits of Cloud Computing

Easily upgraded

Cost-efficient

Scalability

Automated

Highly available

Flexibility
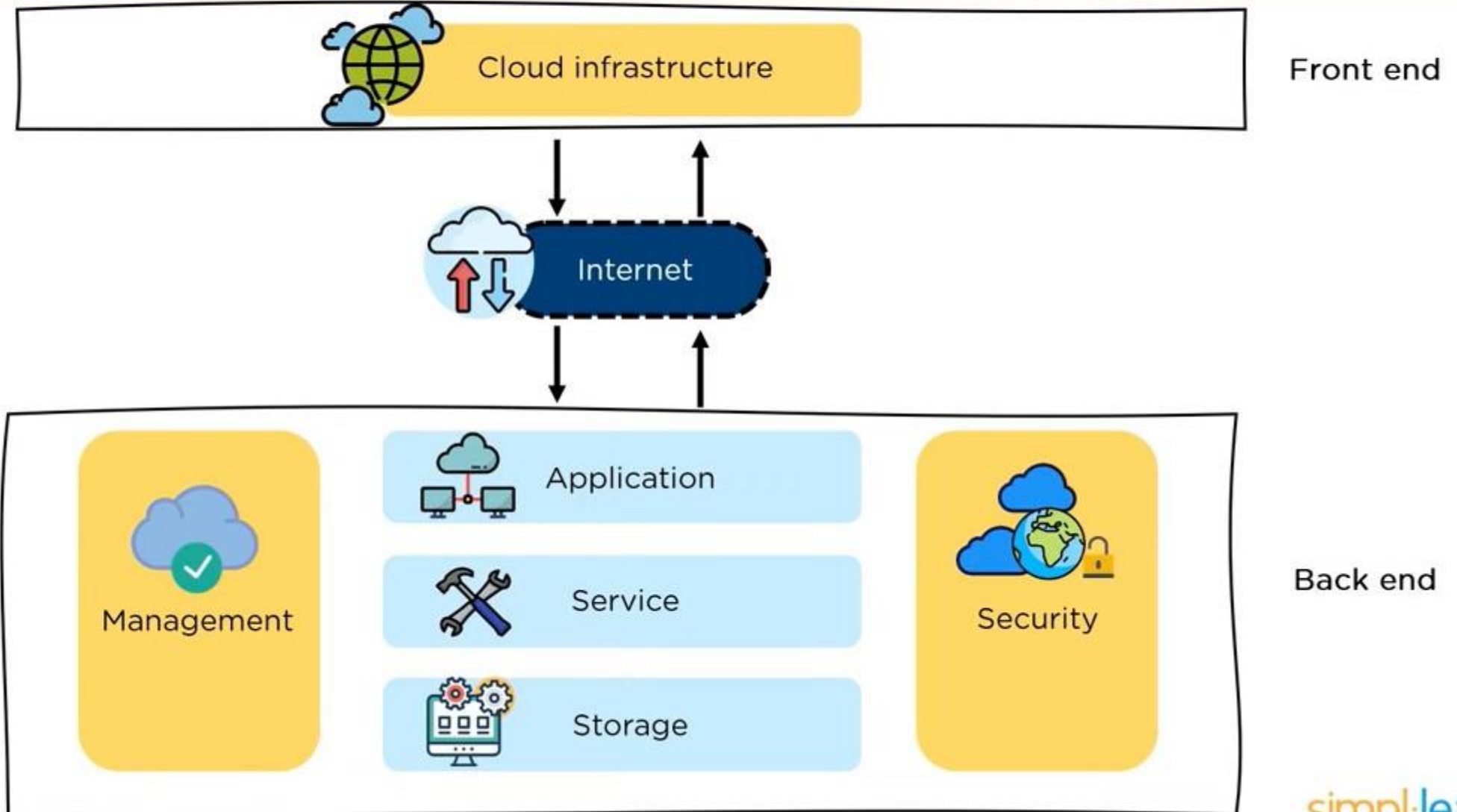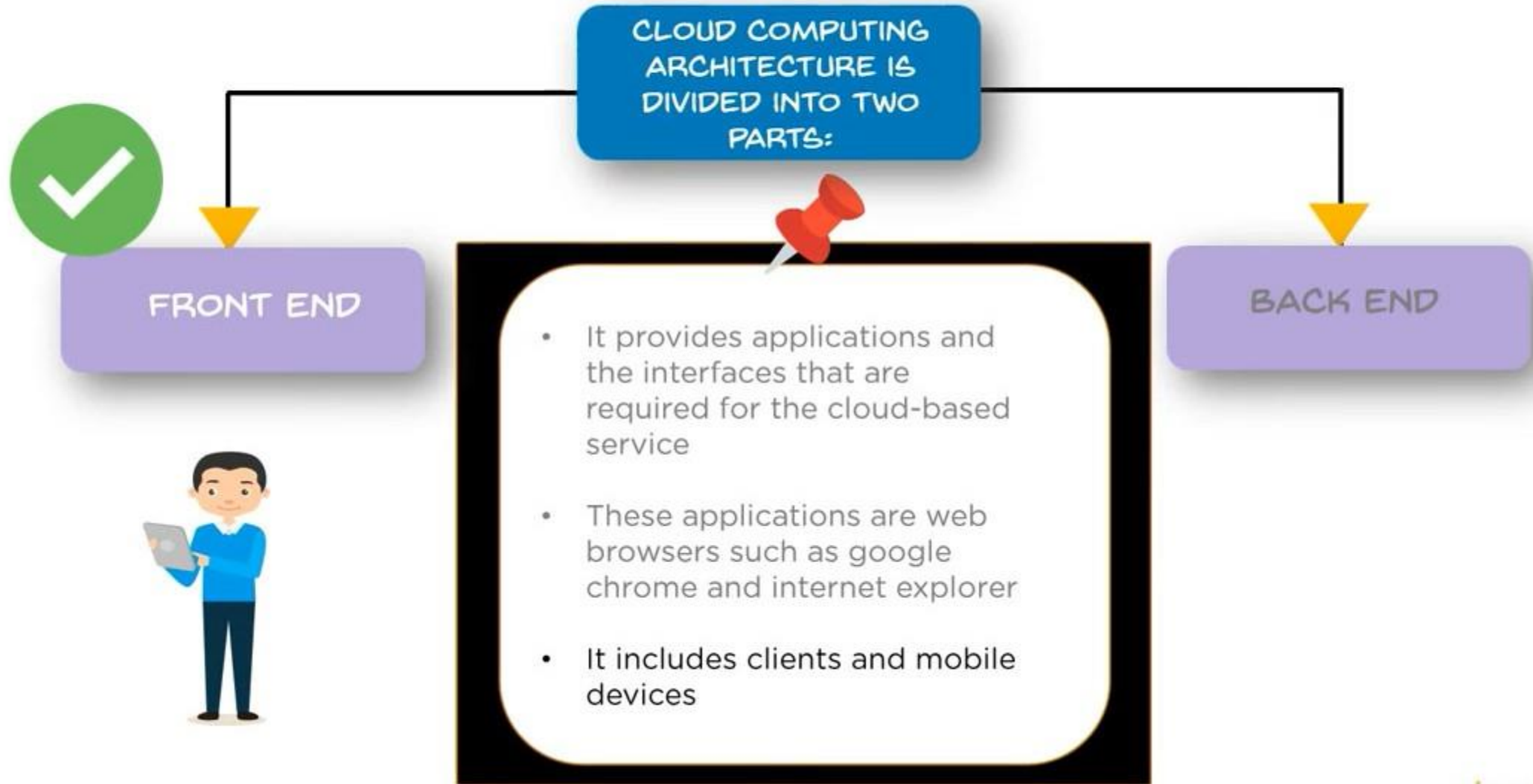
Better security

Customization

Cloud Computing Architecture

Cloud infrastructure

Front end

Internet

Management

Application

Service

Storage

Security

Back end

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Cloud Computing Architecture

CLOUD COMPUTING ARCHITECTURE IS DIVIDED INTO TWO PARTS:

FRONT END

BACK END

- It provides applications and the interfaces that are required for the cloud-based service

- These applications are web browsers such as google chrome and internet explorer

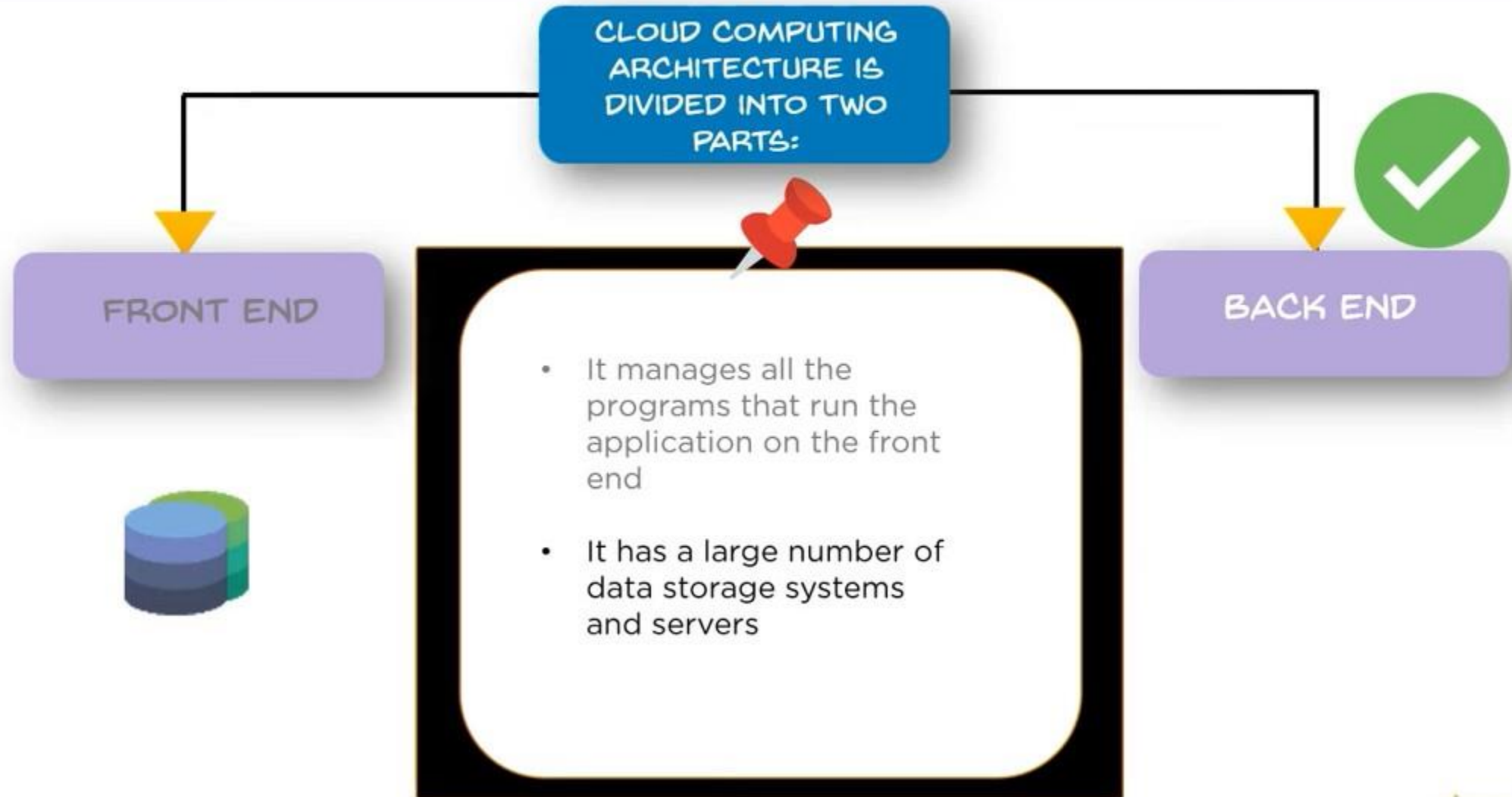- It includes clients and mobile devices

Front End - Cloud Infrastructure

- Cloud infrastructure consists of hardware and software components such as data storage, server, virtualization software etc.

- It also provides Graphical User Interface to end users in order to perform respective tasks

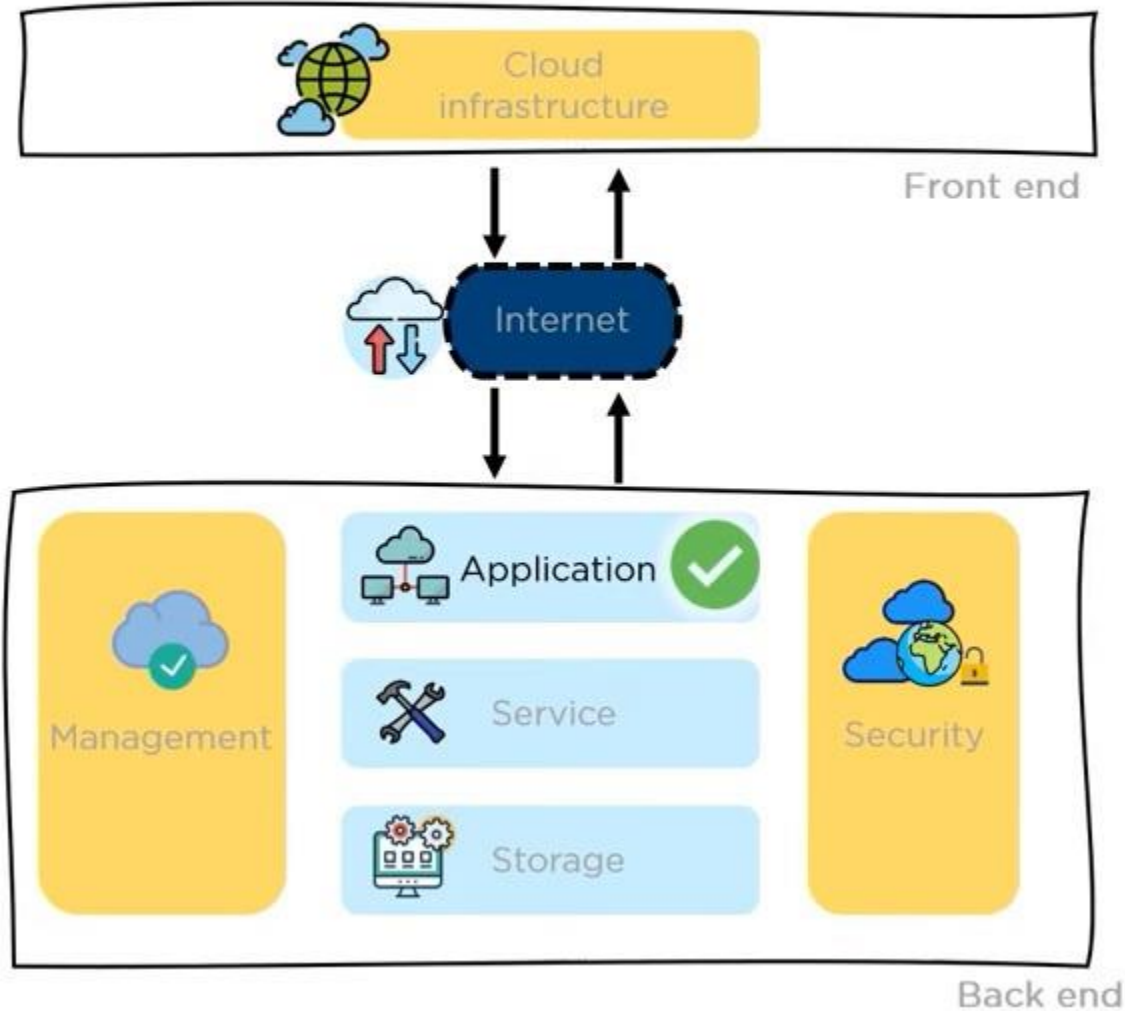# Back End - Cloud Computing Architecture

CLOUD COMPUTING ARCHITECTURE IS DIVIDED INTO TWO PARTS:

FRONT END

BACK END

- It manages all the programs that run the application on the front end

- It has a large number of data storage systems and servers

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# Back End - Cloud Computing Architecture

- It can also be a software or a platform

- Based on the requirement, the application provides output to the end-user (with resources) in the back end

Back End - Cloud Computing Architecture

Cloud infrastructure

Front end

Internet

Application

Management

Service

Security
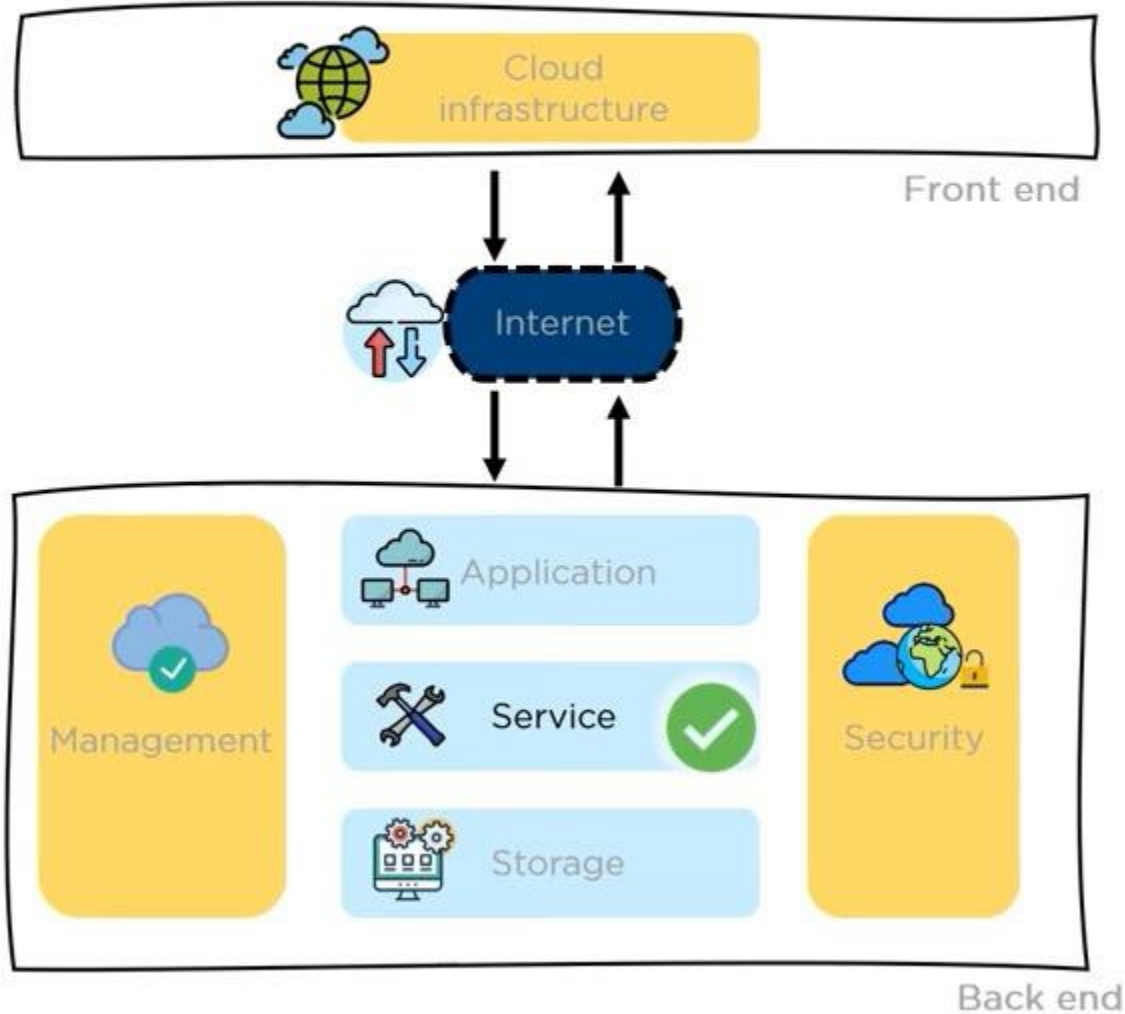
Storage

Back end

- It is one of the most important components in the cloud

- Its task is to provide utility in the architecture

- Few services that are widely used among the end users are storage, application development environments, and web services
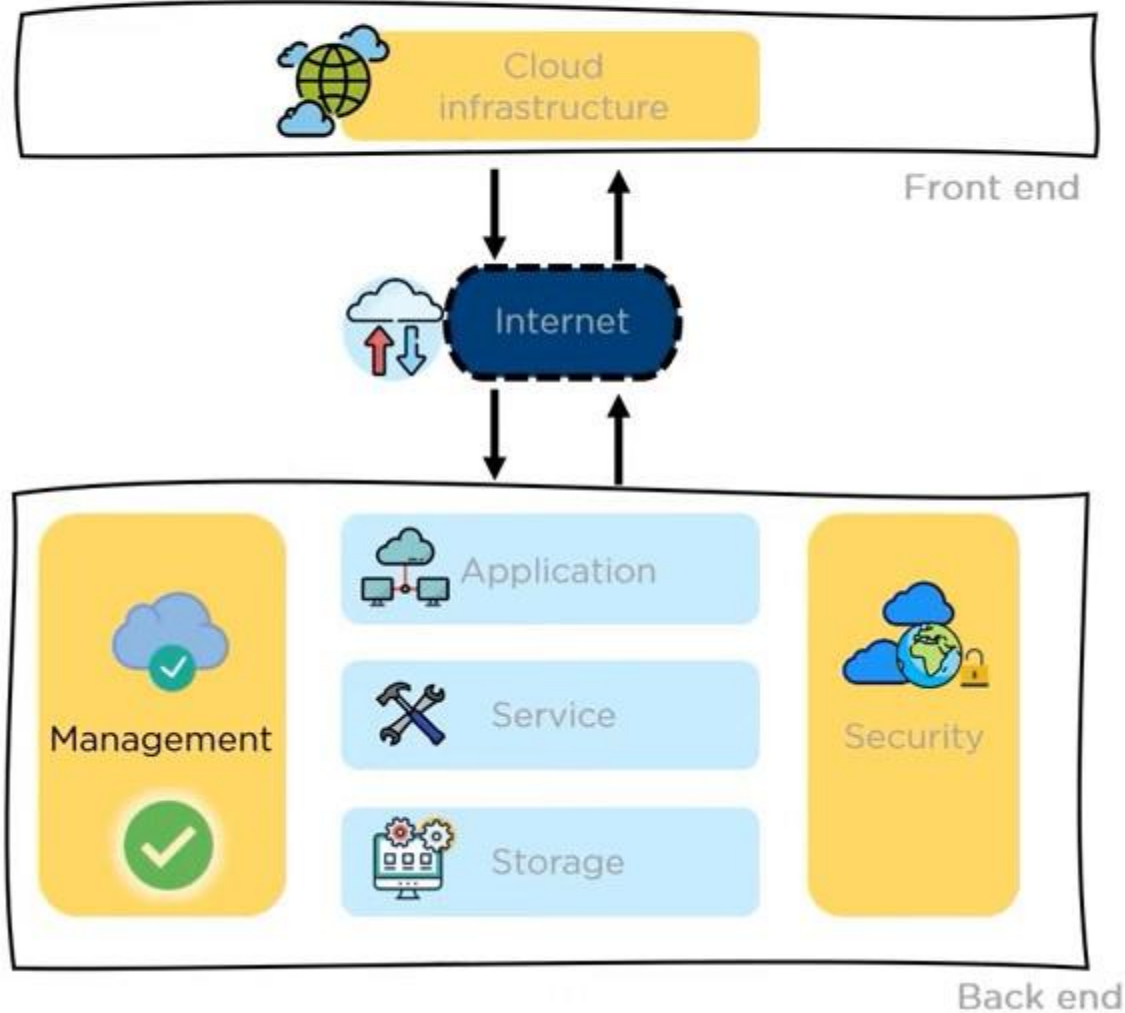
Back End - Cloud Computing Architecture
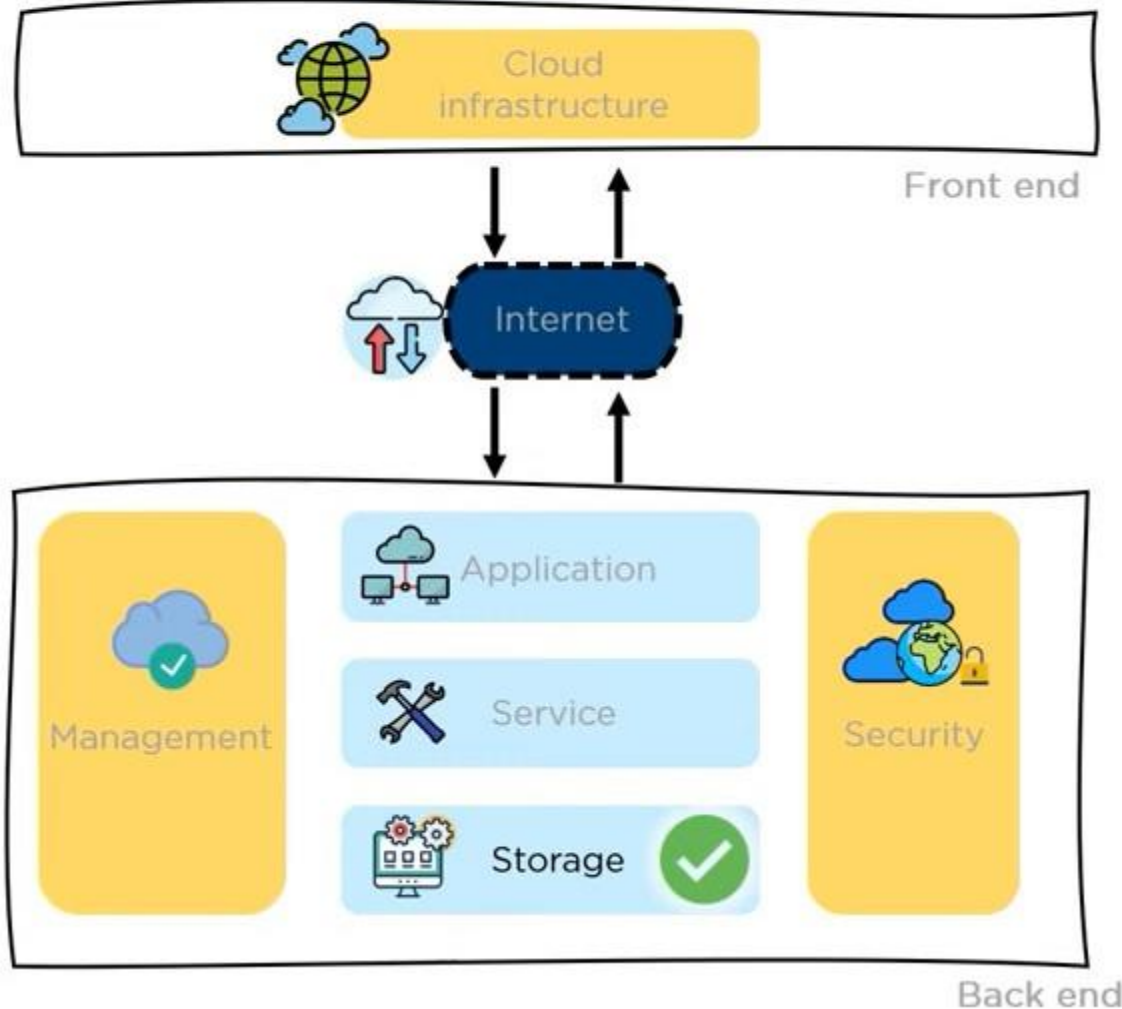
- It maintains and manages any amount of data over the internet

- Some of the examples of storage services are Amazon S3, Oracle Cloud-Storage, and Microsoft Azure Storage

- However, the storage capacity varies depending upon the service providers available in the market

Back End - Cloud Computing Architecture

Cloud infrastructure

Front end

Internet

Application

Management

Service

Security

Storage

Back end

- It allocates specific resources to a specific task. Also, it handles functions of cloud environment

- It helps in the management of components like application, task, service, security, data storage, and cloud infrastructure

- In simple terms, it establishes coordination among the resources

Back End - Cloud Computing Architecture

Front end

Cloud infrastructure

Internet

Back end

Management

Application

Service

Storage
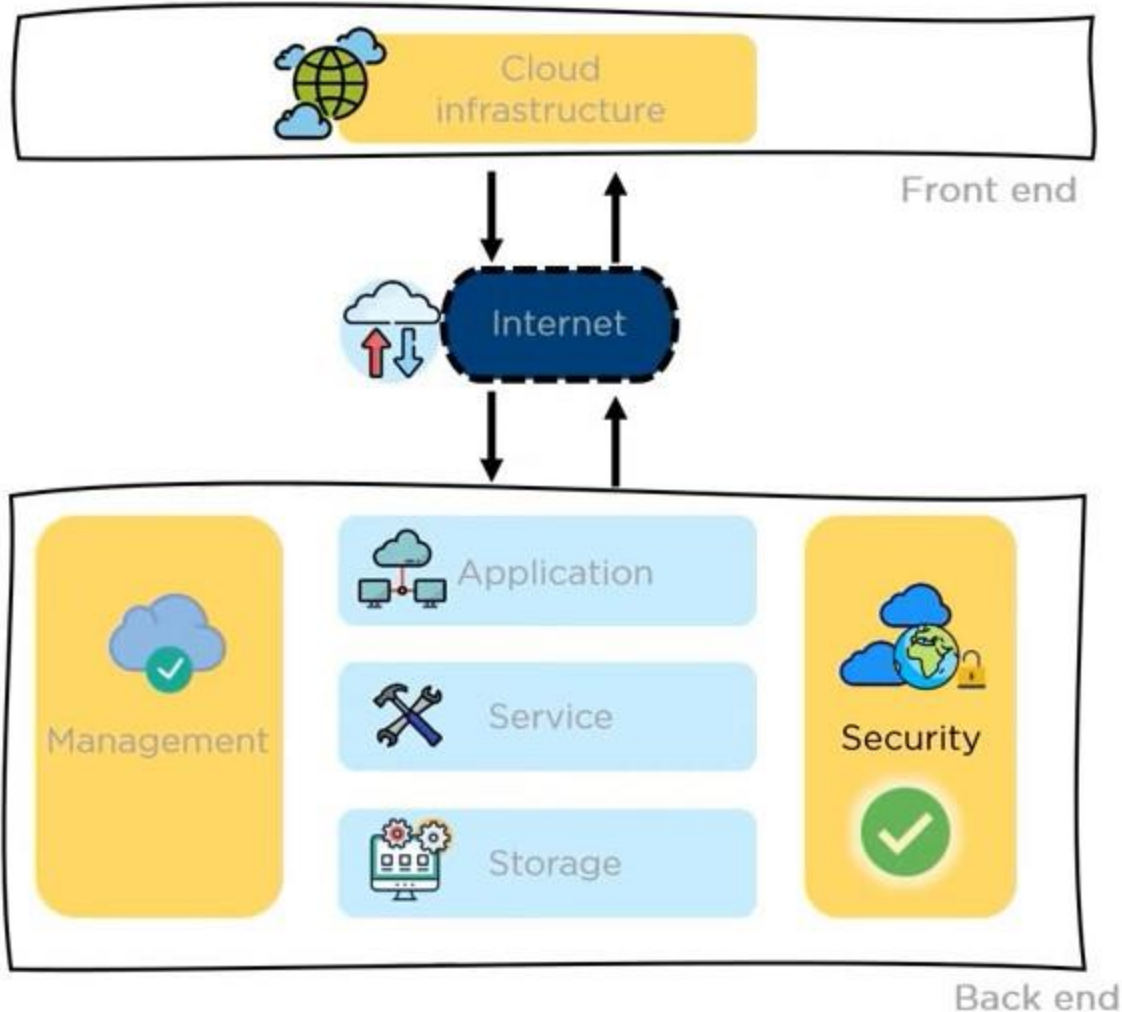
Security

- Security is an integral part of cloud infrastructure

- It helps in protecting cloud resources, systems, files, and infrastructure

- Also, it provides security to the cloud server with virtual firewalls which results in preventing data loss

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Components of Cloud Computing Architecture

Hypervisor

Management software

Deployment software

Network

Cloud server

Cloud storage

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Components of Cloud Computing Architecture

Hypervisor

- It is a *Virtual Operating Platform* for every user

- It runs a separate virtual machine on the back-end which consists of software and hardware

- Its main objective is to divide and allocate resources

Components of Cloud Computing Architecture

Management Software

- Its responsibility is to manage and monitor cloud operations

- It helps in improving the performance of the cloud

- For example high security, flexibility, full-time access, etc.

Components of Cloud Computing Architecture

Deployment Software

- It consists of all the mandatory installations and configurations required to run a cloud service

- Every deployment of cloud services is performed using a deployment software

Components of Cloud Computing Architecture

Deployment Software

The three different models which can be deployed are:

- **SaaS** - Software as a service hosts and manages applications of the end-user
  Example: Gmail

- **PaaS** - Platform as a Service. It helps developers to build, create, and manage applications
  Example: Microsoft Azure

- **IaaS** - Infrastructure as a Service provides services on a pay-as-you-go pricing model

Components of Cloud Computing Architecture

Network

- It connects the front end and back end. Also, allows every user to access cloud resources

- It helps users to connect and customize the route and protocol

Components of Cloud Computing Architecture

Network

- It is a virtual server which is hosted on the cloud computing platform

- It is highly flexible, secure and cost-effective

Components of Cloud Computing Architecture

Cloud storage

- Here, every data is stored and accessed by a user from anywhere over the internet

- It is scalable at run-time and is automatically accessed

- Data can be modified and retrieved from cloud storage over the web