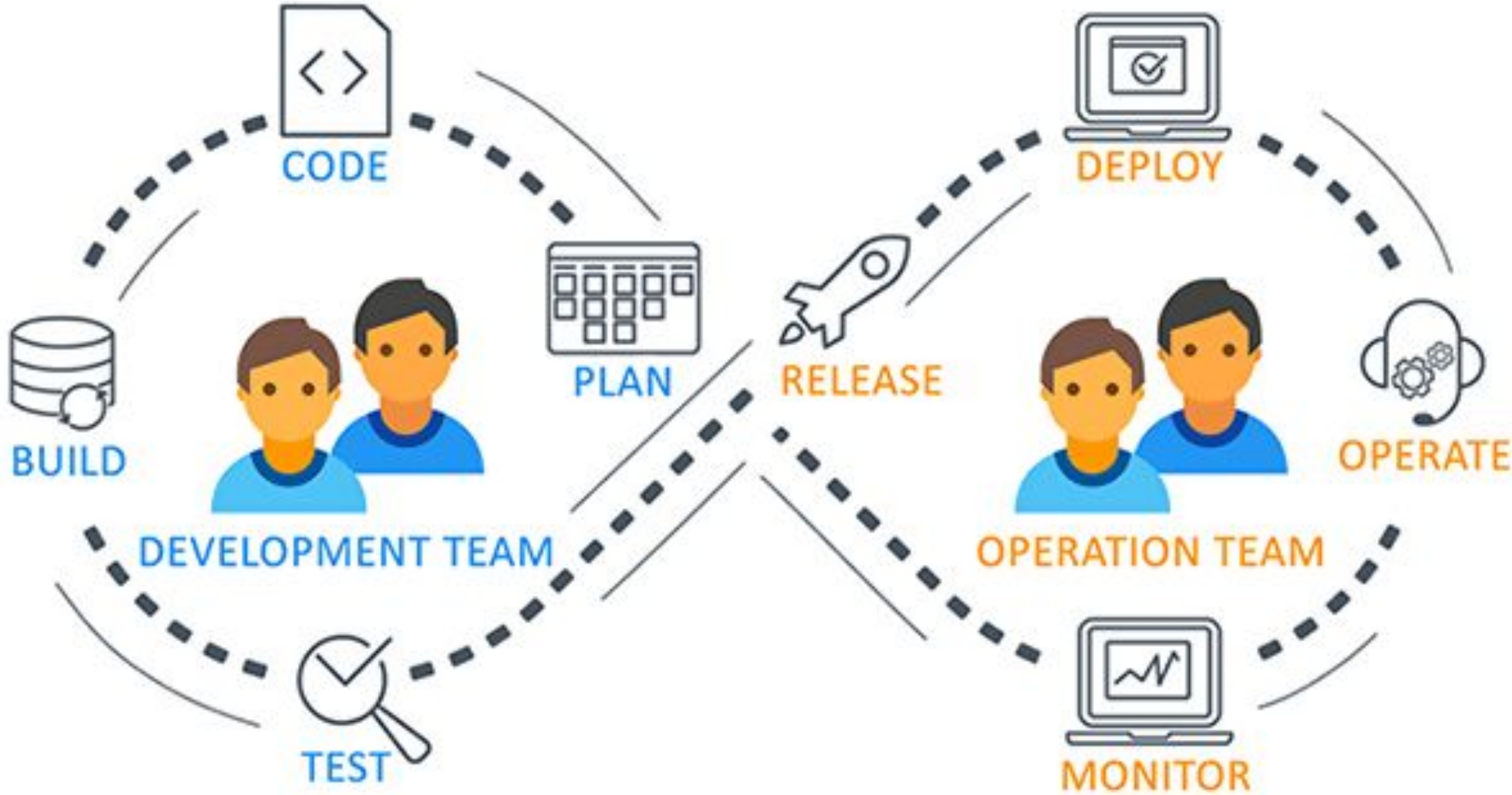
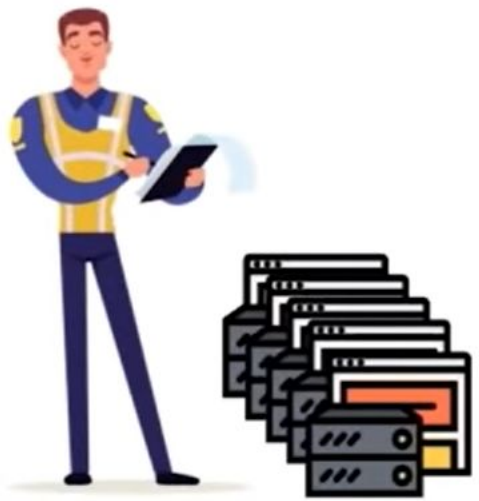
Introduction to DevOps on Cloud


CODE
PLAN
BUILD
DEVELOPMENT TEAM
TEST
RELEASE
DEPLOY
OPERATE
OPERATION TEAM
MONITOR

Before Cloud Computing

Suppose you want to host a website, these are the following things that you would need to do:

Buy a stack of servers.



Monitoring and Maintain servers.

High traffic? More servers.

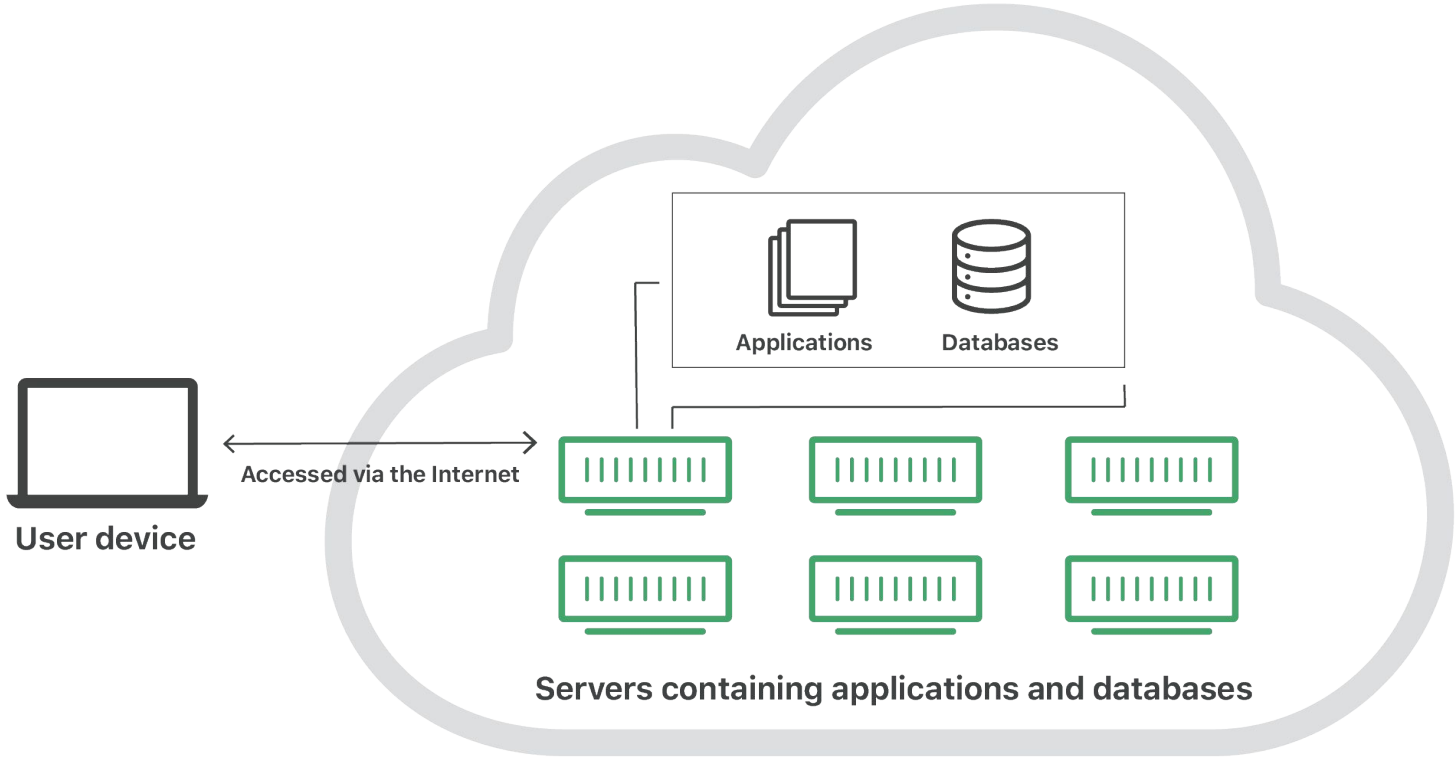
What Is Cloud?

Just move your data to Cloud

Local system with limited space

Cloud with unlimited space

"The cloud" refers to servers that are accessed over the Internet, and the software and databases that run on those servers. Cloud servers are located in data centers all over the world. By using cloud computing, users and companies do not have to manage physical servers themselves or run software applications on their own machines.



The Cloud

Cloud Computing Service Model - IaaS PaaS SaaS Explained | Cloud Computing Tutorial | Simplilearn - YouTube

Types of Cloud Computing Service Models

IaaS

- Definition
- Key Features
- Pros
- Cons

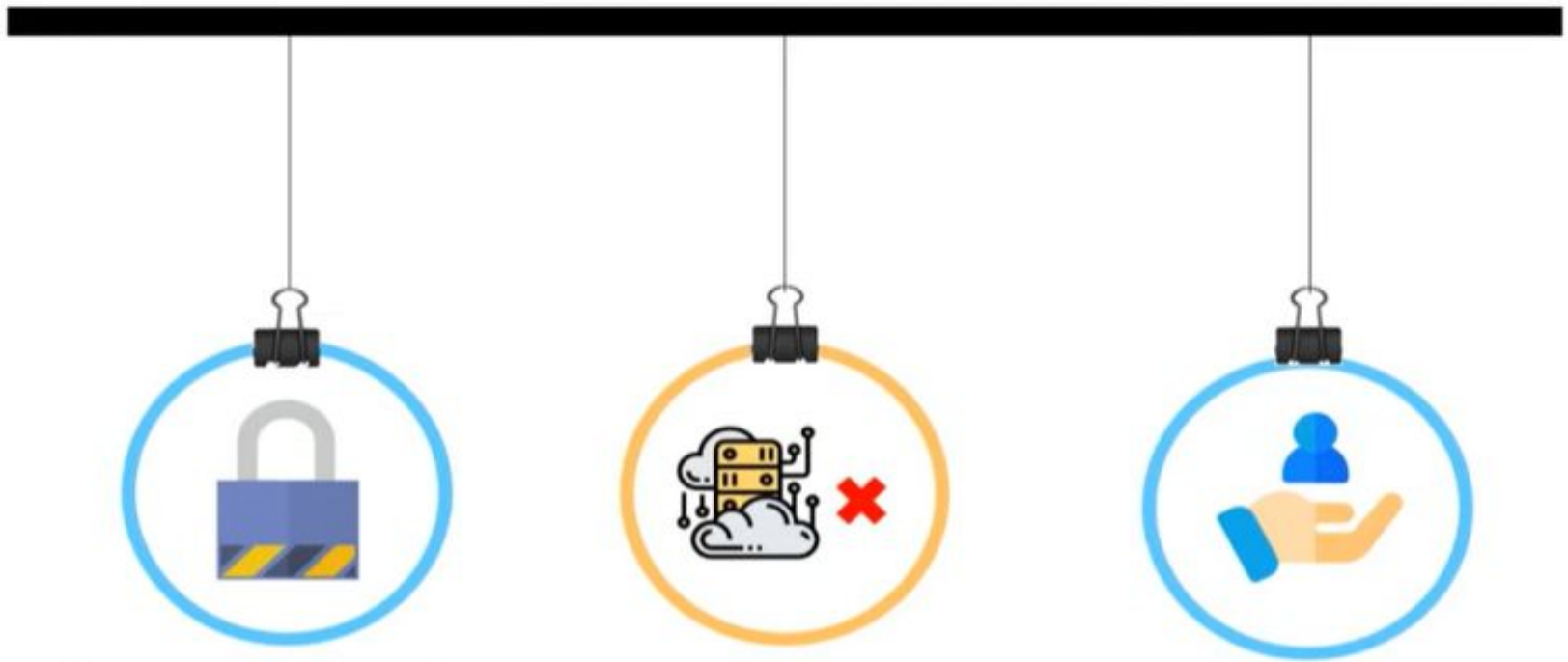
Data security is an issue due to multitenant architecture

Team training is required to learn about the new infrastructure

When server crashers at the vendor side, customers cannot access their data for a while

PaaS

- Definition
- Key Features
- Pros
- Cons



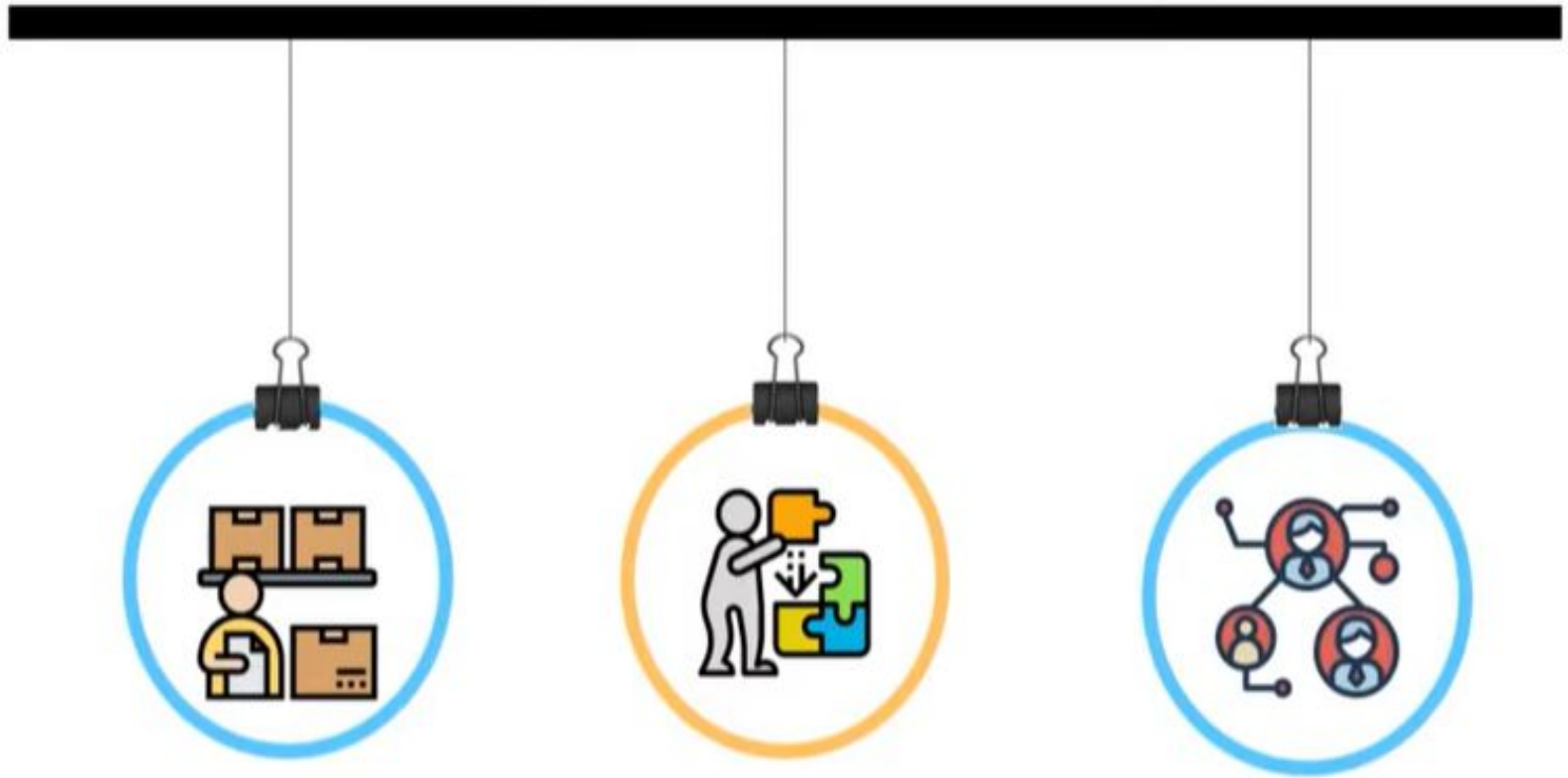
Data security is an issue due to multitenant architecture

Not every element is compatible with the existing infrastructure

It is dependent on vendor's speed, reliability and support

SaaS

- Definition
- Key Features
- Pros
- Cons



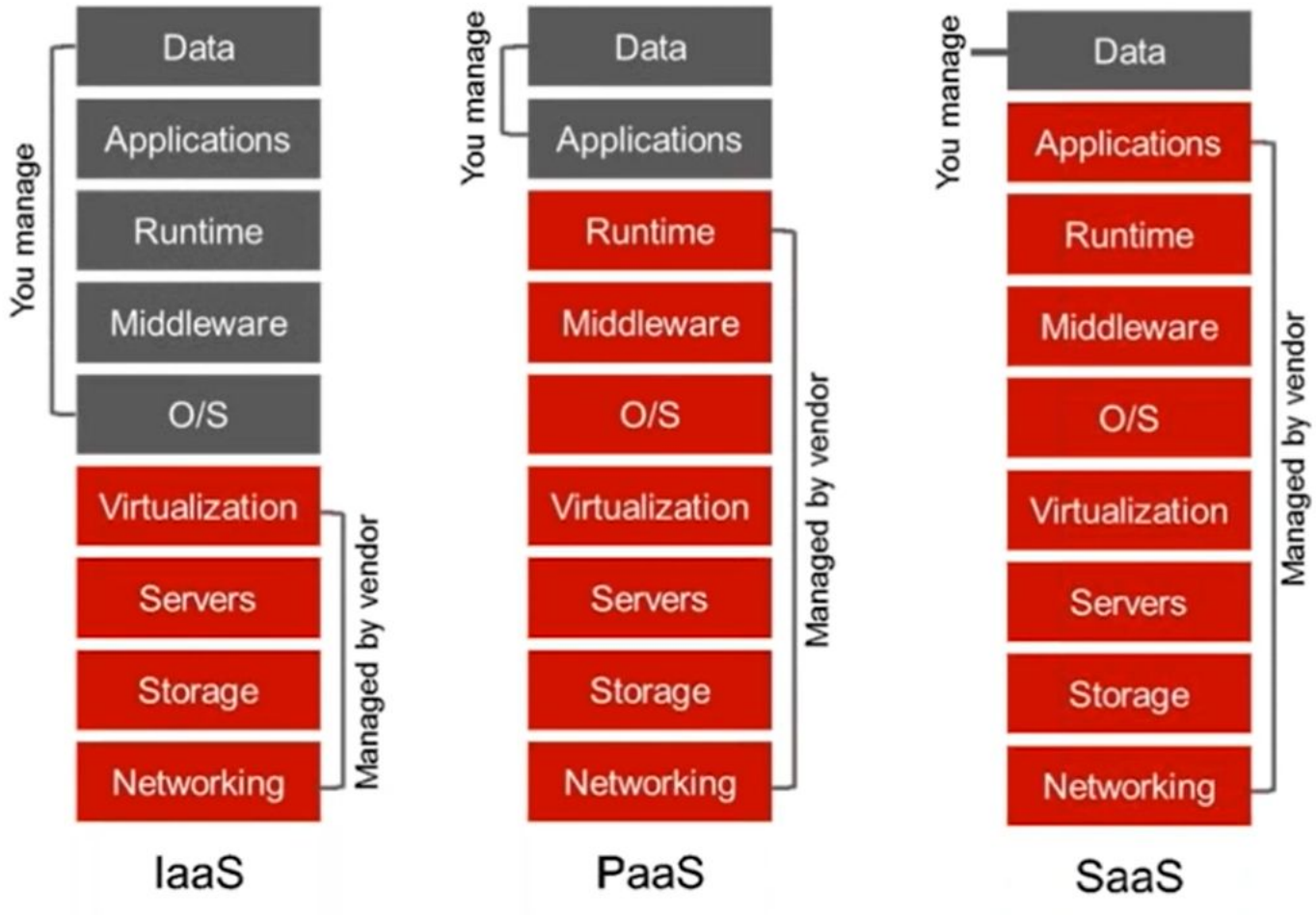
The provider has the entire control

Limited range of solutions for crashes

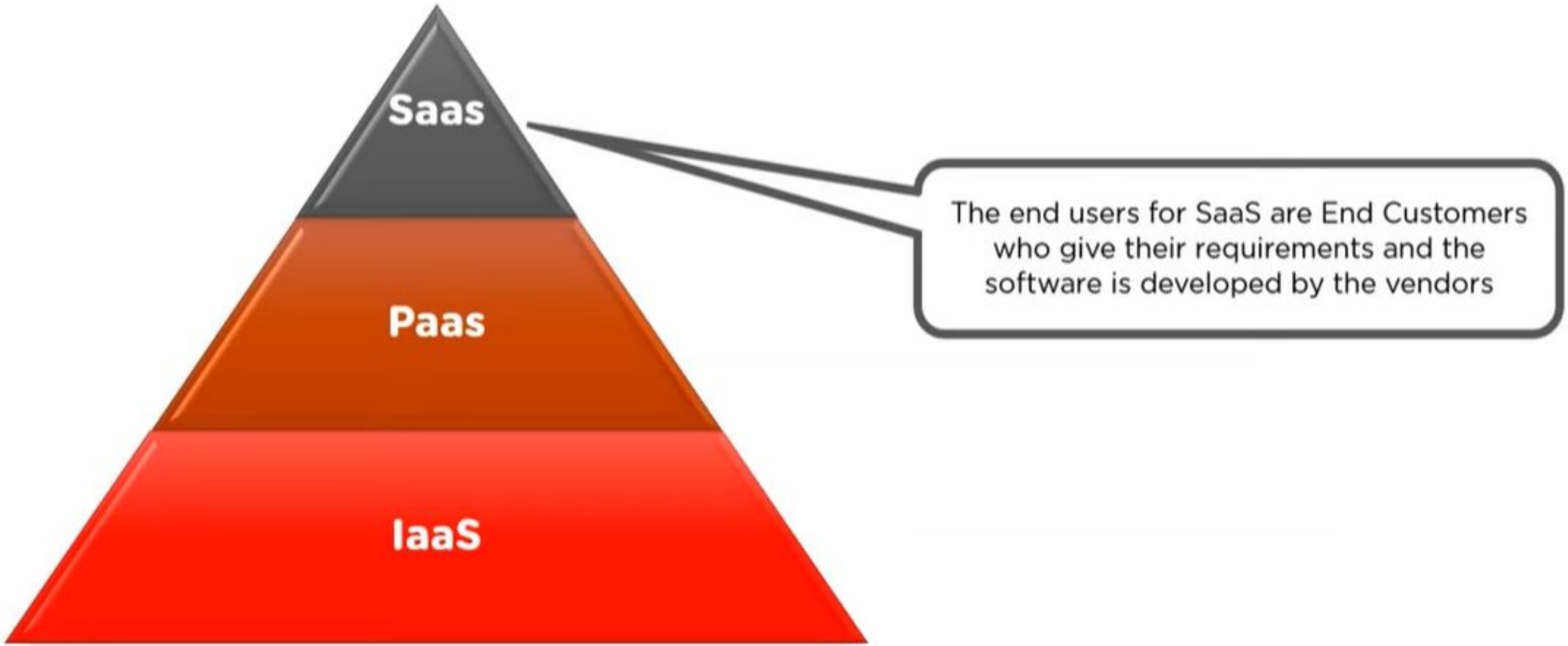
The devices should be connected for efficient working

Famous SaaS Providers

Service Models



End Users of Service Models



Deployment Models

Hybrid Cloud

- A cloud computing environment which uses a mix of on-premises, private cloud and third-party, public cloud services
- It helps you leverage the best of both worlds

Cloud Providers

Cloud Computing is considered the latest technology breed with the immense flexibility of budget, speed, and infrastructure. It provides self-service capabilities to users with scalable features to upgrade usage based on the requirement. Cloud computing technology offers particular types of services that users can access the cloud platform.

Service Models of Cloud

- The cloud computing service models are categorized into three different types:

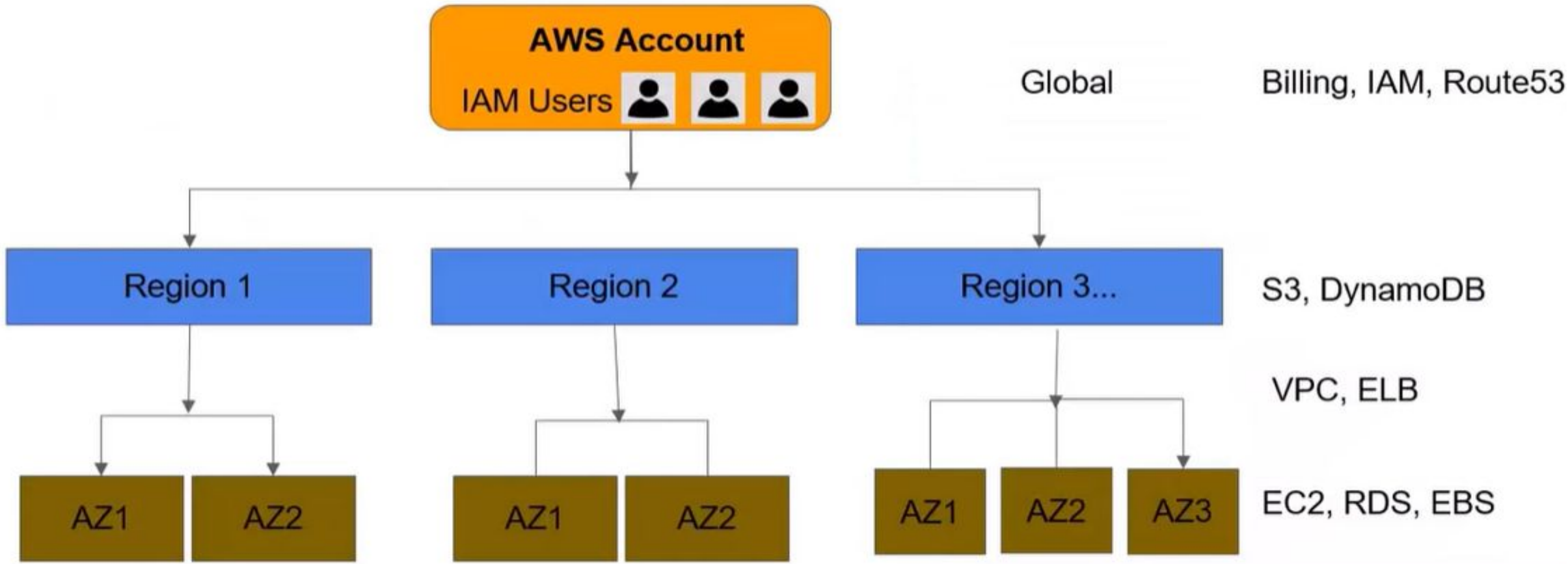
1. Software as a Service (SaaS)
2. Platform as a Service (PaaS)
3. Infrastructure as a Service (IaaS)

- **Two other services don't fall under the major categories of the service model.**
- These are:
- Identity as a Service (IDaaS)
- Network as a Service (NaaS)

- **Cloud Service Providers**
  - Amazon Cloud
  - Google Cloud
  - IBM
  - Salesforce Cloud
  - Microsoft Cloud
  - Rackspace
  - VMware
  - AT&T
  - HP
  - Internap
  - Bluelock
  - Softlayer
  - NetSuite

AWS(Amazon Web Services)

AWS Account, Users and Services scope



AWS Application and Development Services

API Gateway

Managed REST and Websocket APIs

SQS

Simple Queue Service

SNS

Simple Notification Service

SES

Simple Email Service

Cognito

User Management for Web & Mobile Apps

CodeCommit

Hosted GIT Repository by AWS

CodeBuild

Continuous Integration Service

CodeDeploy

Automated Deployments

Code Pipeline

Continuous Delivery Service

Code Star

Develop, Build, Deploy, Manage and Track

Some of the other advantages of AWS are:

Security

Experience

Flexible

Easy to use

Scalable

Let’s try to build an Social Media application
(with AWS services)

What is AWS?

- The full form of AWS is Amazon Web Services. It is a platform that offers flexible, reliable, scalable, easy-to-use and, cost-effective cloud computing solutions.
- AWS is a comprehensive, easy to use computing platform offered Amazon. The platform is developed with a combination of infrastructure as a service (IaaS), platform as a service (PaaS) and packaged software as a service (SaaS) offerings.

- **History of AWS**
- 2002- AWS services launched
- 2006- Launched its cloud products
- 2012- Holds first customer event
- 2015- Reveals revenues achieved of $4.6 billion
- 2016- Surpassed $10 billon revenue target
- 2016- Release snowball and snowmobile
- 2019- Offers nearly 100 cloud services
- 2021- AWS comprises over 200 products and services

- **Important AWS Services**
- Amazon Web Services offers a wide range of different business purpose global cloud-based products. The products include storage, databases, analytics, networking, mobile, development tools, enterprise applications, with a pay-as-you-go pricing model.

AWS Compute Services

Here, are Cloud Compute Services offered by Amazon:

1. **EC2(Elastic Compute Cloud)-** EC2 is a virtual machine in the cloud on which you have OS level control. You can run this cloud server whenever you want.
2. **LightSail-** This cloud computing tool automatically deploys and manages the computer, storage, and networking capabilities required to run your applications.
3. **Elastic Beanstalk-** The tool offers automated deployment and provisioning of resources like a highly scalable production website.
4. **EKS (Elastic Container Service for Kubernetes)-** The tool allows you to Kubernetes on Amazon cloud environment without installation.
5. **AWS Lambda-** This AWS service allows you to run functions in the cloud. The tool is a big cost saver for you as you to pay only when your functions execute.

Migration

Migration services used to transfer data physically between your datacenter and AWS.

1. **DMS (Database Migration Service)**– DMS service can be used to migrate on-site databases to AWS. It helps you to migrate from one type of database to another — for example, Oracle to MySQL.
2. **SMS (Server Migration Service)**– SMS migration services allows you to migrate on-site servers to AWS easily and quickly.
3. **Snowball**— Snowball is a small application which allows you to transfer terabytes of data inside and outside of AWS environment.

Storage

1. **Amazon Glacier-** It is an extremely low-cost storage service. It offers secure and fast storage for data archiving and backup.
2. **Amazon Elastic Block Store (EBS)-** It provides block-level storage to use with Amazon EC2 instances. Amazon Elastic Block Store volumes are network-attached and remain independent from the life of an instance.
3. **AWS Storage Gateway-** This AWS service is connecting on-premises software applications with cloud-based storage. It offers secure integration between the company's on-premises and AWS's storage infrastructure.

Security Services

1. **IAM (Identity and Access Management)**— IAM is a secure cloud security service which helps you to manage users, assign policies, form groups to manage multiple users.
2. **Inspector**— It is an agent that you can install on your virtual machines, which reports any security vulnerabilities.
3. **Certificate Manager**— The service offers free SSL certificates for your domains that are managed by Route53.
4. **WAF (Web Application Firewall)**— WAF security service offers application-level protection and allows you to block SQL injection and helps you to block cross-site scripting attacks.
5. **Cloud Directory**— This service allows you to create flexible, cloud-native directories for managing hierarchies of data along multiple dimensions.

Continue..

6. KMS (Key Management Service)— It is a managed service. This security service helps you to create and control the encryption keys which allows you to encrypt your data.

7. Organizations— You can create groups of AWS accounts using this service to manages security and automation settings.

8. Shield— Shield is managed DDoS (Distributed Denial of Service protection service). It offers safeguards against web applications running on AWS.

9. Macie— It offers a data visibility security service which helps classify and protect your sensitive critical content.

10. GuardDuty— It offers threat detection to protect your AWS accounts and workloads.

Database Services

1. **Amazon RDS-** This Database AWS service is easy to set up, operate, and scale a relational database in the cloud.
2. **Amazon DynamoDB-** It is a fast, fully managed NoSQL database service. It is a simple service which allow cost-effective storage and retrieval of data. It also allows you to serve any level of request traffic.
3. **Amazon ElastiCache-** It is a web service which makes it easy to deploy, operate, and scale an in-memory cache in the cloud.
4. **Neptune-** It is a fast, reliable and scalable **graph database** service.
5. **Amazon RedShift-** It is Amazon's data warehousing solution which you can use to perform complex OLAP queries.

- **Applications of AWS services**
- Amazon Web services are widely used for various computing purposes like:
- Web site hosting
- Application hosting/SaaS hosting
- Media Sharing (Image/ Video)
- Mobile and Social Applications
- Content delivery and Media Distribution
- Storage, backup, and disaster recovery
- Development and test environments
- Academic Computing
- Search Engines
- Social Networking