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# Amazon AWS- The Big Picture

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# Objective

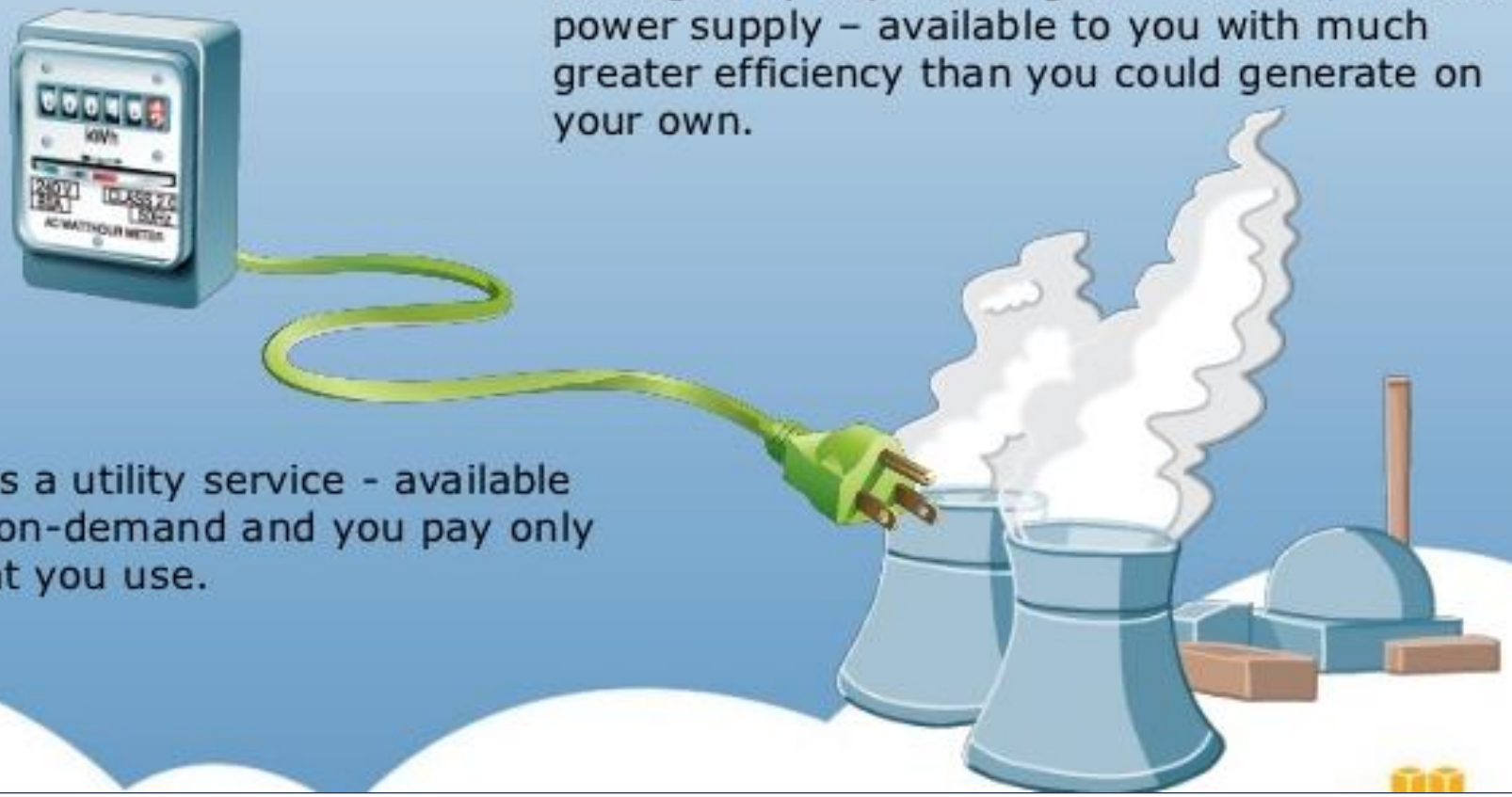
- Cloud Basics
- Introduction to AWS
- AWS Services
- Live Demo

# Cloud Basics

# What is Cloud Computing?

An analogy: think of electricity services…

You simply plug into a vast electrical grid managed by experts to get a low cost, reliable power supply – available to you with much greater efficiency than you could generate on your own.



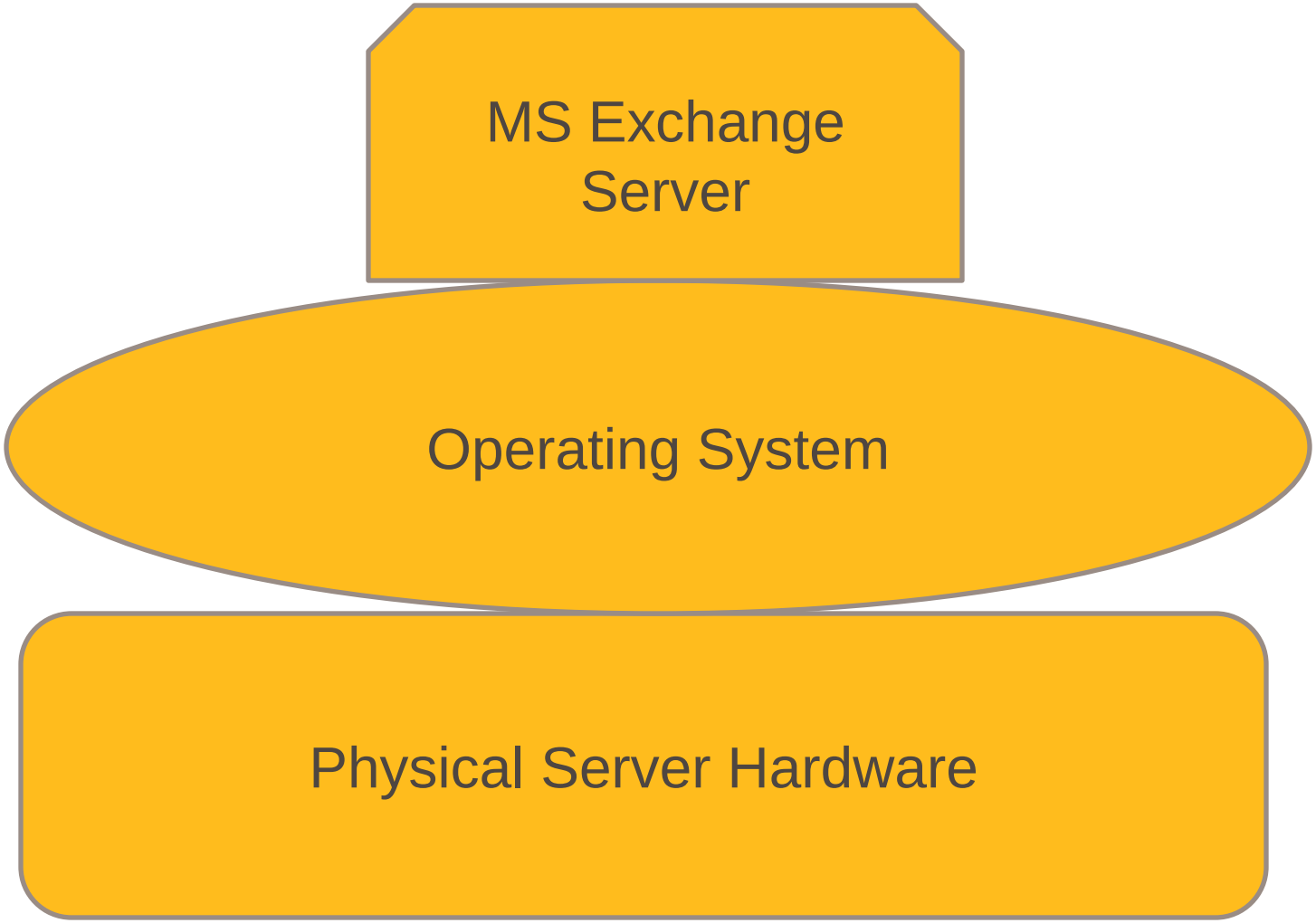
Power is a utility service - available to you on-demand and you pay only for what you use.

# How Cloud Computing works?

So what do we mean by this?

# Separate applications from the OS and the Hardware that runs everything

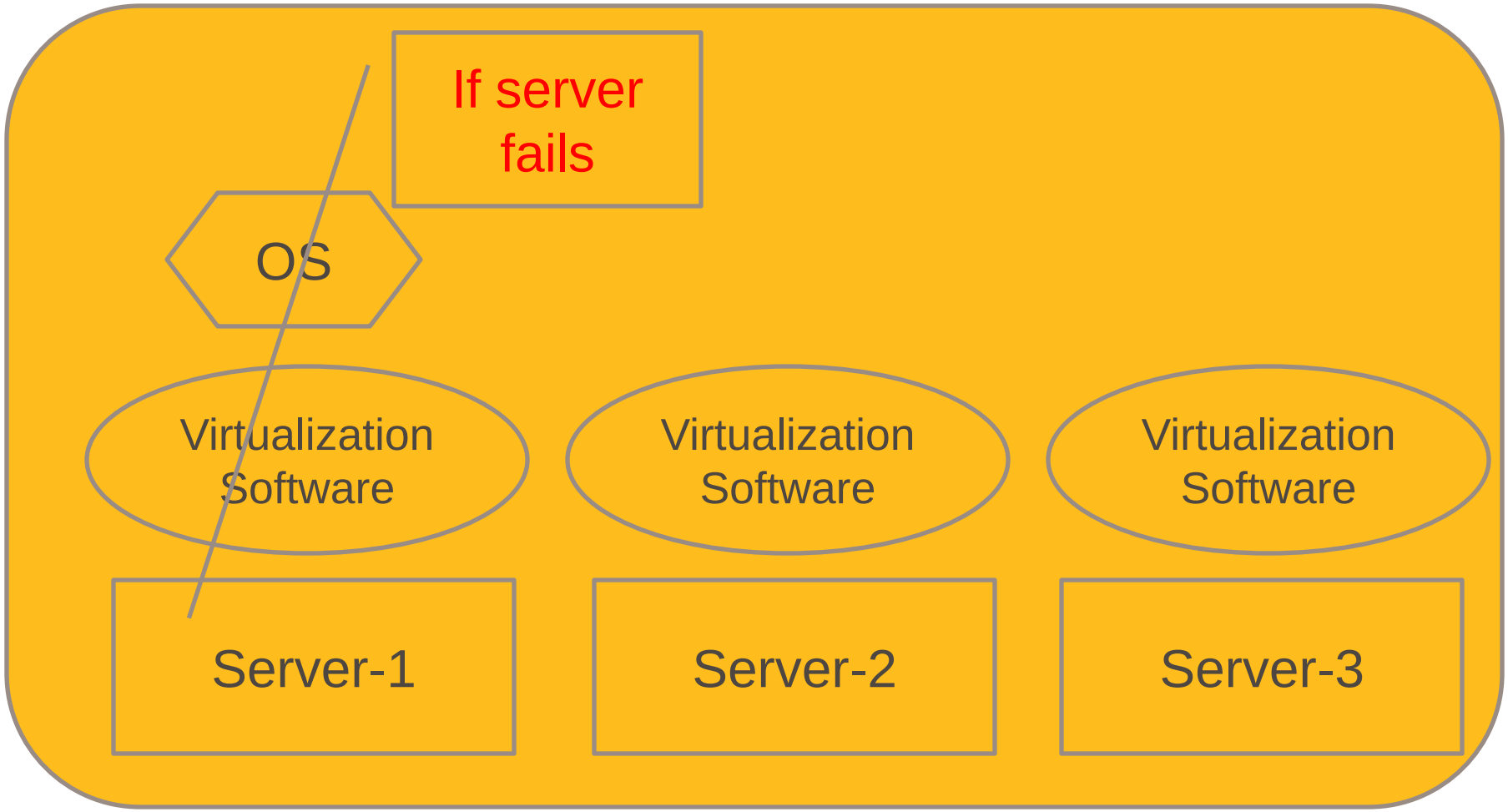
# Few Years Back!!!



# After Virtualization

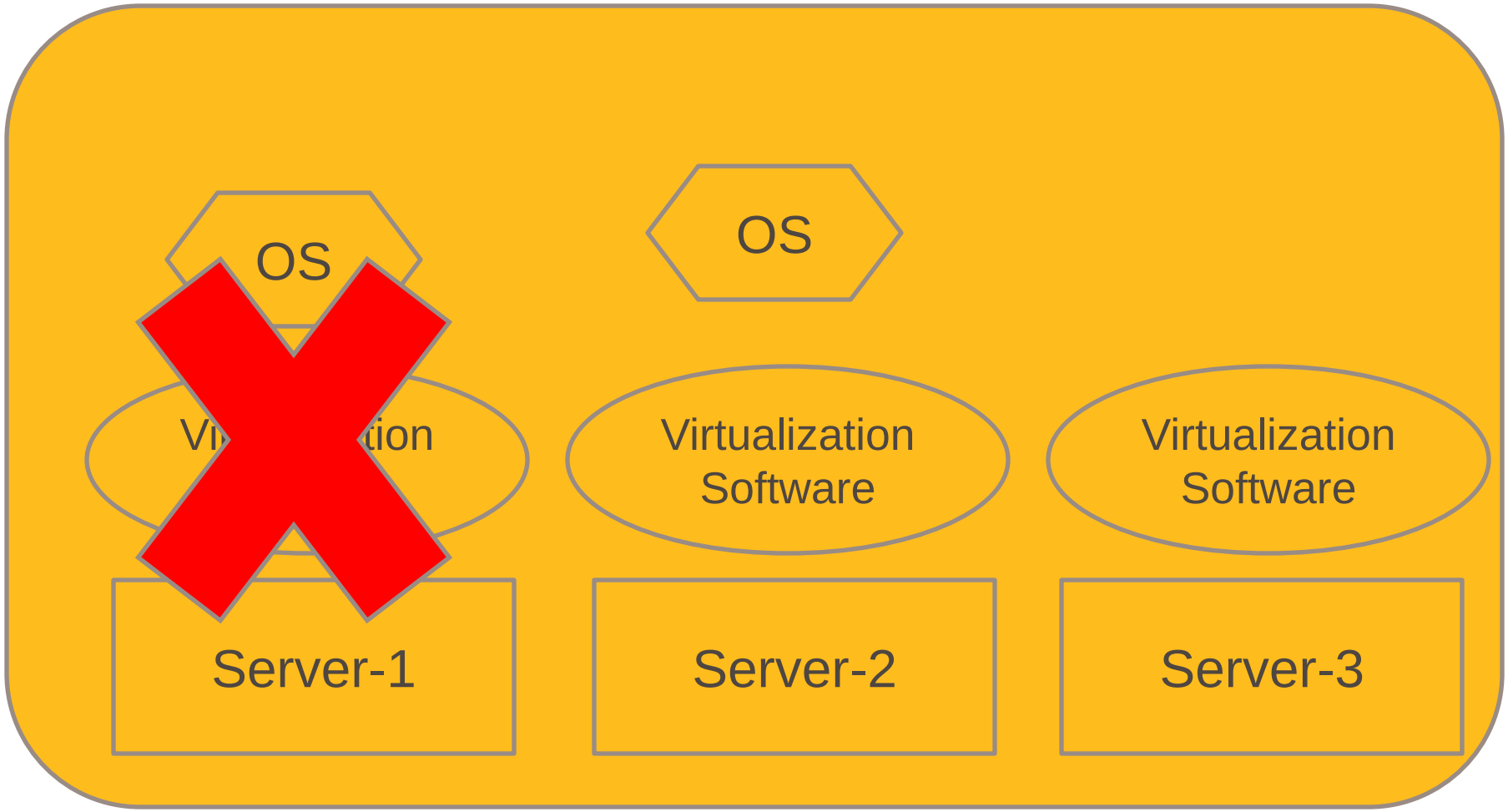
# Virtual Computing

## Cluster of Servers



# Virtual Computing

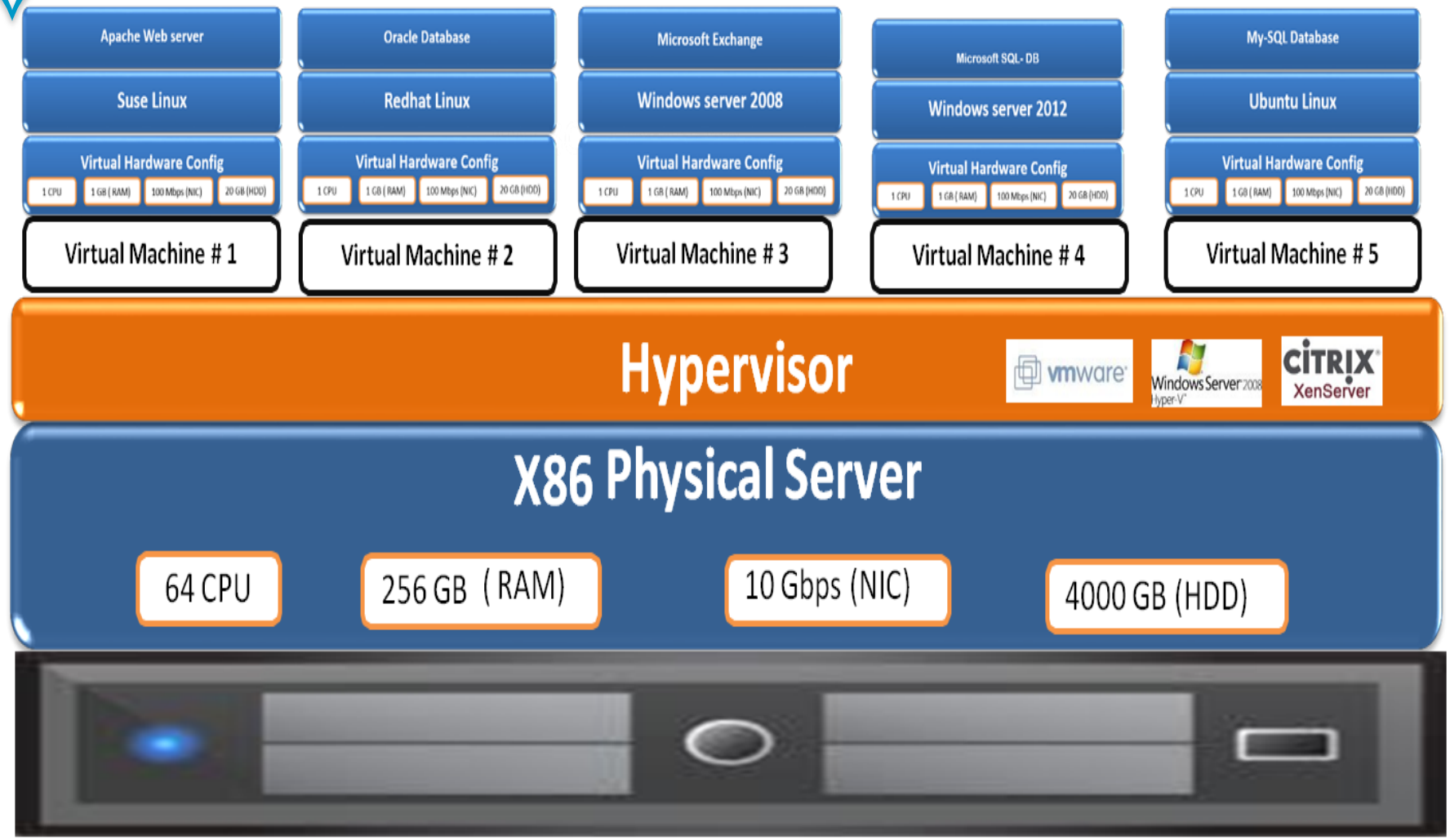
## Cluster of Servers



# Virtualization

- Single physical server can run multiple Virtual servers and each Virtual server can run different operating system and applications
- Each virtual server will have a virtual hardware ( vCPU, vNIC, vRAM, vDisk)

# Virtualization Infrastructure



# Hypervisor

- It is a software installed on the physical hardware
- It isolates operating system and application from the underlying hardware
- This abstraction allows the underlying host machine hardware to independently operate one or more virtual machines as guests, allowing multiple guest VMs to effectively share the system's physical compute resources, such as processor cycles, memory space, network bandwidth and so on.
- Citrix has XenServer, Oracle has OracleVM, VmWare has ESXI and many more

# What happens when you install Hypervisor

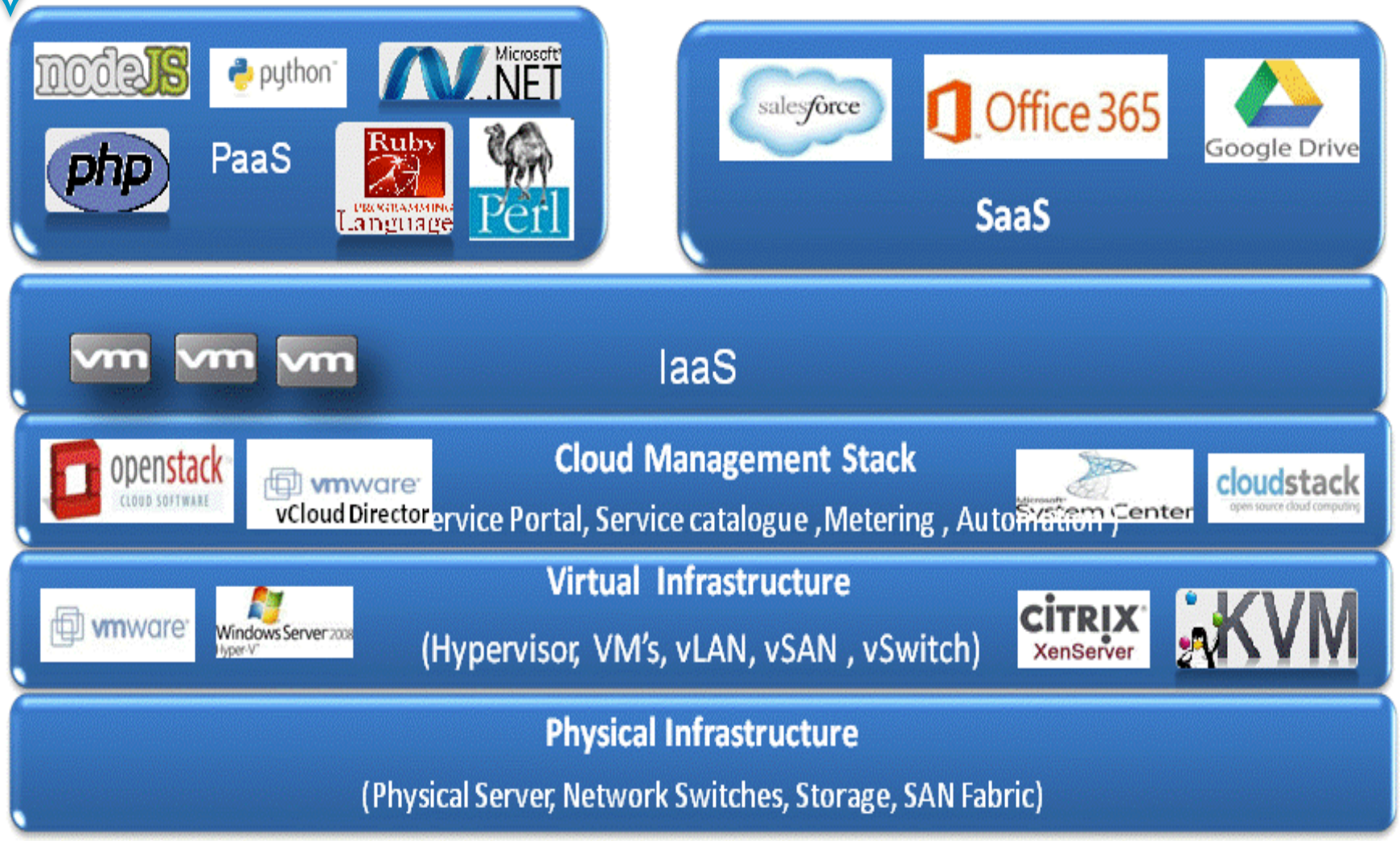
It give you a screen with some IP address, computer name and few bits of information, but otherwise it does’nt allow you to do anything

Install Management Software like vSphere

So How to access Hypervisors

# Public Cloud - Service Provider Example

# Cloud Computing- Infrastructure Framework



# Deployment Models - Summary

## Private Cloud

- Single Tenancy
- CAPEX model
- Owned and managed by customer
- Customer has Complete control over resources
- Cloud infrastructure is hosted on premises or hosted at service provider data centers

## Public Cloud

- Multi-Tenancy
- OPEX Model
- Owned and Managed by Cloud Service Provider(CSP)
- CSP has complete control on resources
- Customer has limited control over his applications based on subscription


## Hybrid Cloud

- Federation of Private and Public Cloud
- Ideal for critical workloads on Private cloud and non critical workloads on Public cloud
- Results in 40 -60 % cost savings compared managing infrastructure in house and Physical data center

# Cloud Computing - Summary

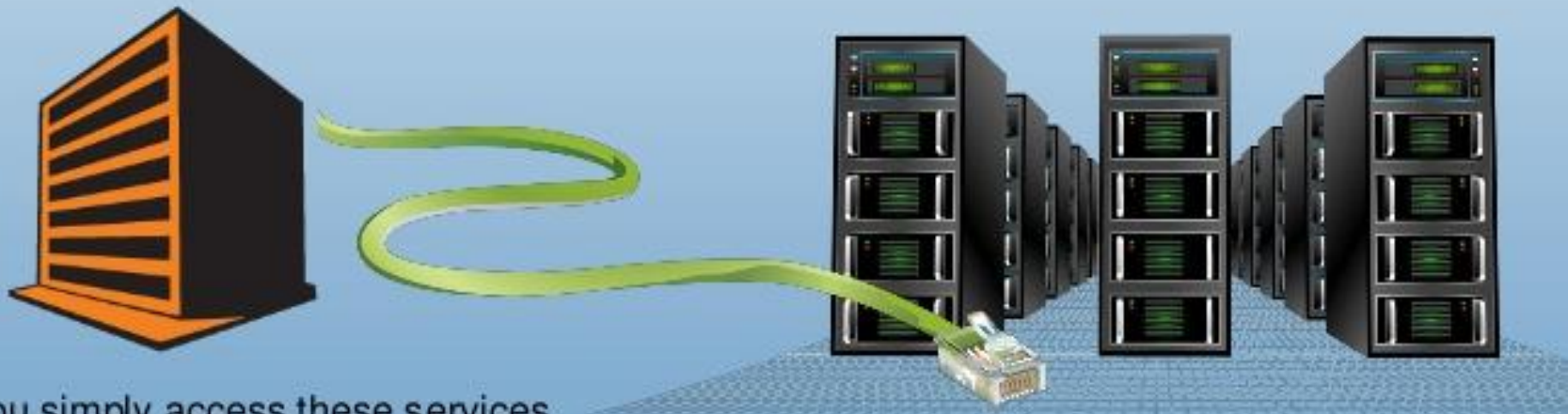

- On Demand Self Service
- Broad Network Access
- Resource Pooling
- Rapid Elasticity
- Measured Service


- Infrastructure-As-A-Service ( IaaS)
- Platform-As-A-Service ( PaaS)
- Software-As-A-Service ( SaaS)


- Private Cloud
- Public Cloud
- Hybrid Cloud

# What is Cloud Computing?

Cloud Computing is also a utility service - giving you access to technology resources managed by experts and available on-demand.



You simply access these services over the internet, with no up-front costs and you pay only for the resources you use.

# AWS Global Presence

# AWS Global Presence 16 Regions | 42 AZ

1. **What is a Region ?**

   - A region is geographical location of the AWS data centre

2. **What is a Availability Zone (AZ) ?**

   - Each availability zone is isolated location within the same region

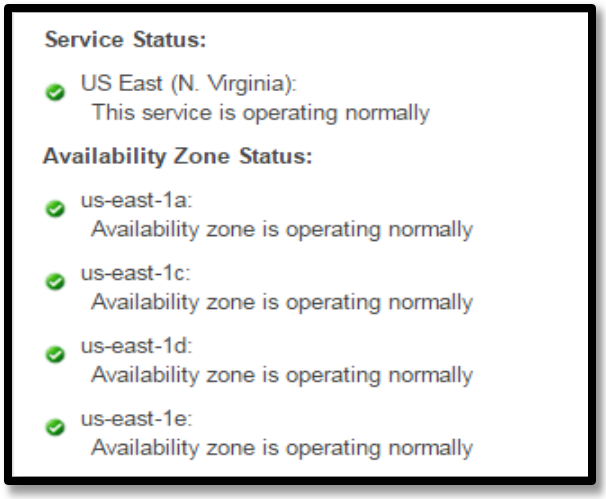
• All communications between regions is across the public Internet. Data transfer between regions is charged at the Internet data transfer rate for both the sending and the receiving instance.

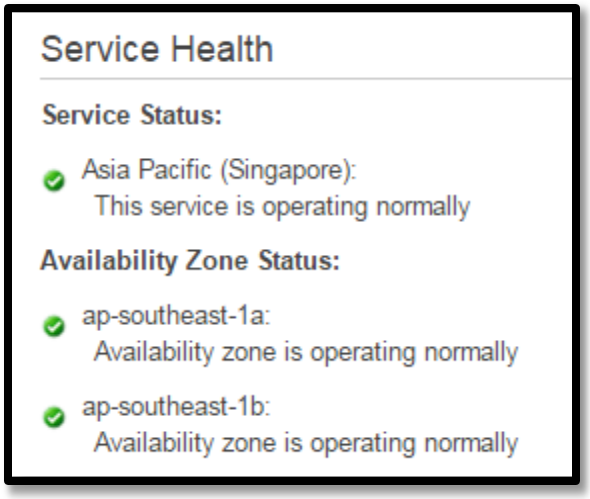
# AWS Global Presence 16 Regions | 42 AZ

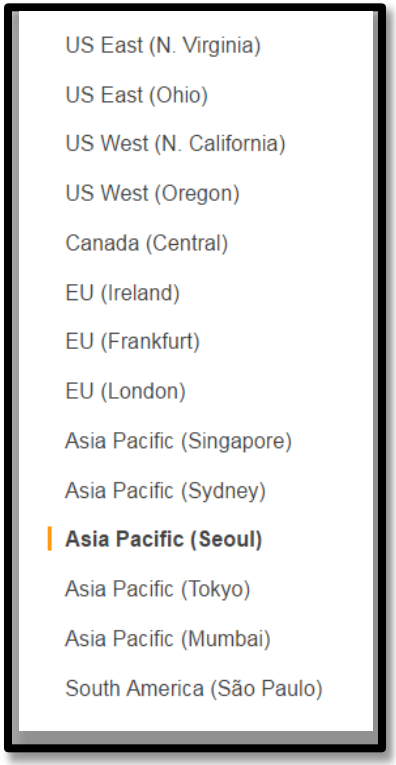
There are below two regions not available to everyone

I. AWS Gov cloud (US) : Accessible only to US government agencies

II. China ( Beijing) region : It is a limited preview available to select group of china based and multi national customers in china

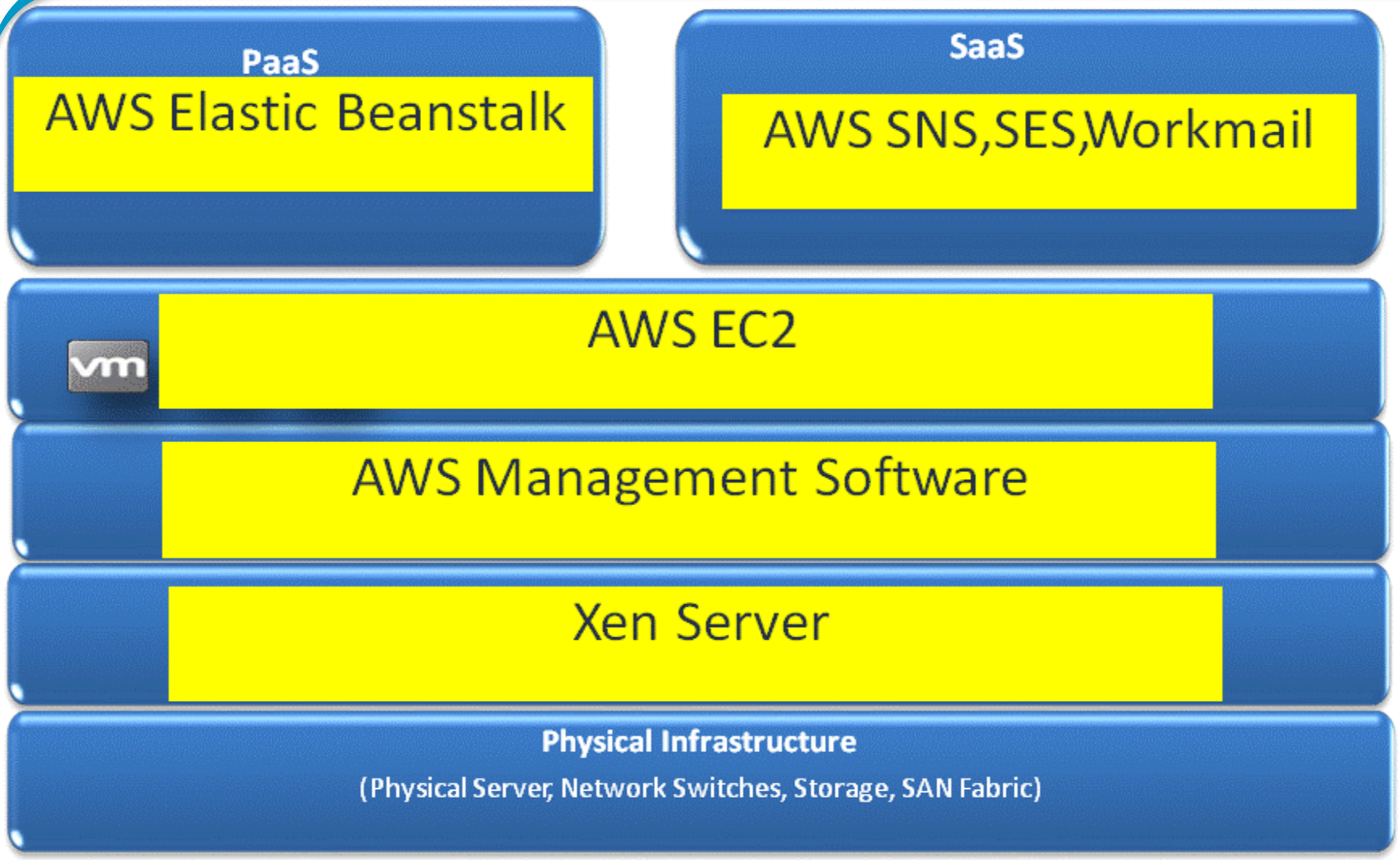


# Amazon web Services overview

# AWS Cloud Infrastructure - Brief



# Amazon Elastic compute cloud

# Amazon Elastic Compute Cloud (EC2)

- Amazon EC2 is compute server from AWS


- You have choice to run Windows and Linux virtual machines

- You can use various instance types based on your application requirement

| Type | vCPUs | Memory (GiB) |
|---|---|---|
| t2.nano | 1 | 0.5 |
| t2.micro Free tier eligible | 1 | 1 |
| t2.small | 1 | 2 |
| t2.medium | 2 | 4 |
| t2.large | 2 | 8 |
| m4.large | 2 | 8 |
| m4.xlarge | 4 | 16 |

# Amazon EC2 Instance configuration

- T2 instance are use in dev environment where there is less usage of CPU
- M3 Instance used for data processing tasks that require additional memory, for running backend servers on SAP
- C3/C4 Instance type used for high performance front-end ,web servers
- G2 Instance type used for Game streaming, Video streaming, 3d application streaming
- HS1 Instance type used for parallel systems

# Amazon Elastic Block Store

# Amazon Elastic Block Store (EBS)

- Amazon Elastic Block Store (Amazon EBS) provides persistent block level storage volumes .
- Amazon EBS allows you to create storage volumes and attach them to Amazon EC2 instances.
- Once attached, you can create a file system on top of these volumes ( NTFS for windows and ext3/ext4 for linux )
- In easy words , think of EBS volumes like a D drive of your VM
- **Why do you need to use EBS ?**
  - You have launched to EC2 windows instance which has C drive of 100 GB , you would want additional 500 GB for your data .
  - Cloud Enabled recommends you to store your critical data on D drive (ebs volume) instead C drive. In case of accidental deletion of a VM you can always launch new VM and attach to the new VM

# Amazon Elastic Block Store (EBS)

- EBS General Purpose (SSD)
  - for small to med size data
  - charges $0.10/GB/month
- EBS Provisioned IOPS (SSD)
  - for large relational data
  - charges $0.125/GB/month

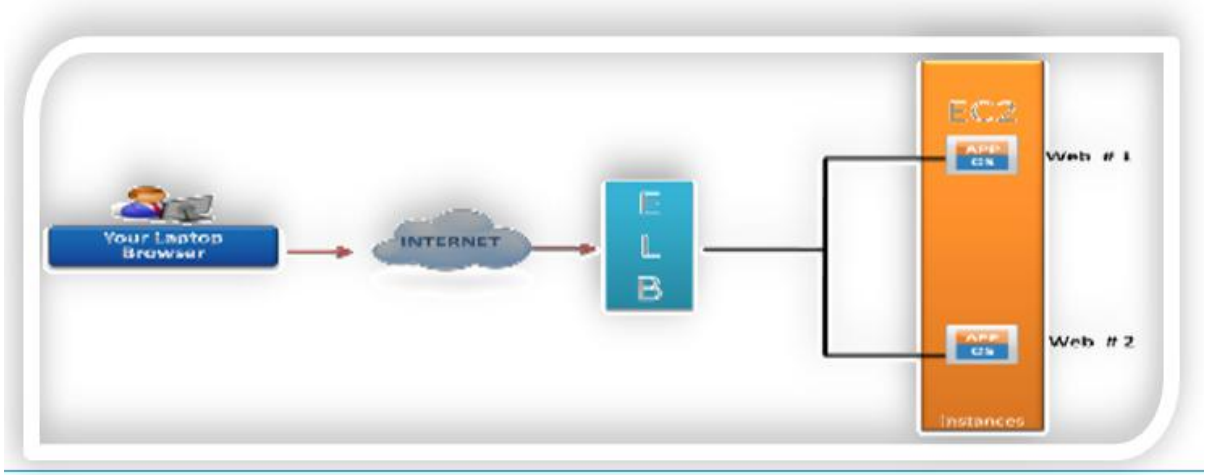
# Amazon Elastic Load Balancer

# Amazon Elastic Load Balancer ( ELB)

- Elastic Load Balancing automatically distributes incoming application traffic across multiple Amazon EC2 instances in the cloud

- Achieve higher levels of fault tolerance for your applications by using Elastic Load Balancing to automatically route traffic across multiple instances and multiple Availability Zones.

- Additionally, Elastic Load Balancing offers integration with Auto Scaling to ensure that you have back-end capacity to meet varying levels of traffic without requiring minimal intervention



# Amazon Route-53

# Amazon Route53

1) Amazon Route 53 is a highly available and scalable cloud Domain Name System (DNS) web service.

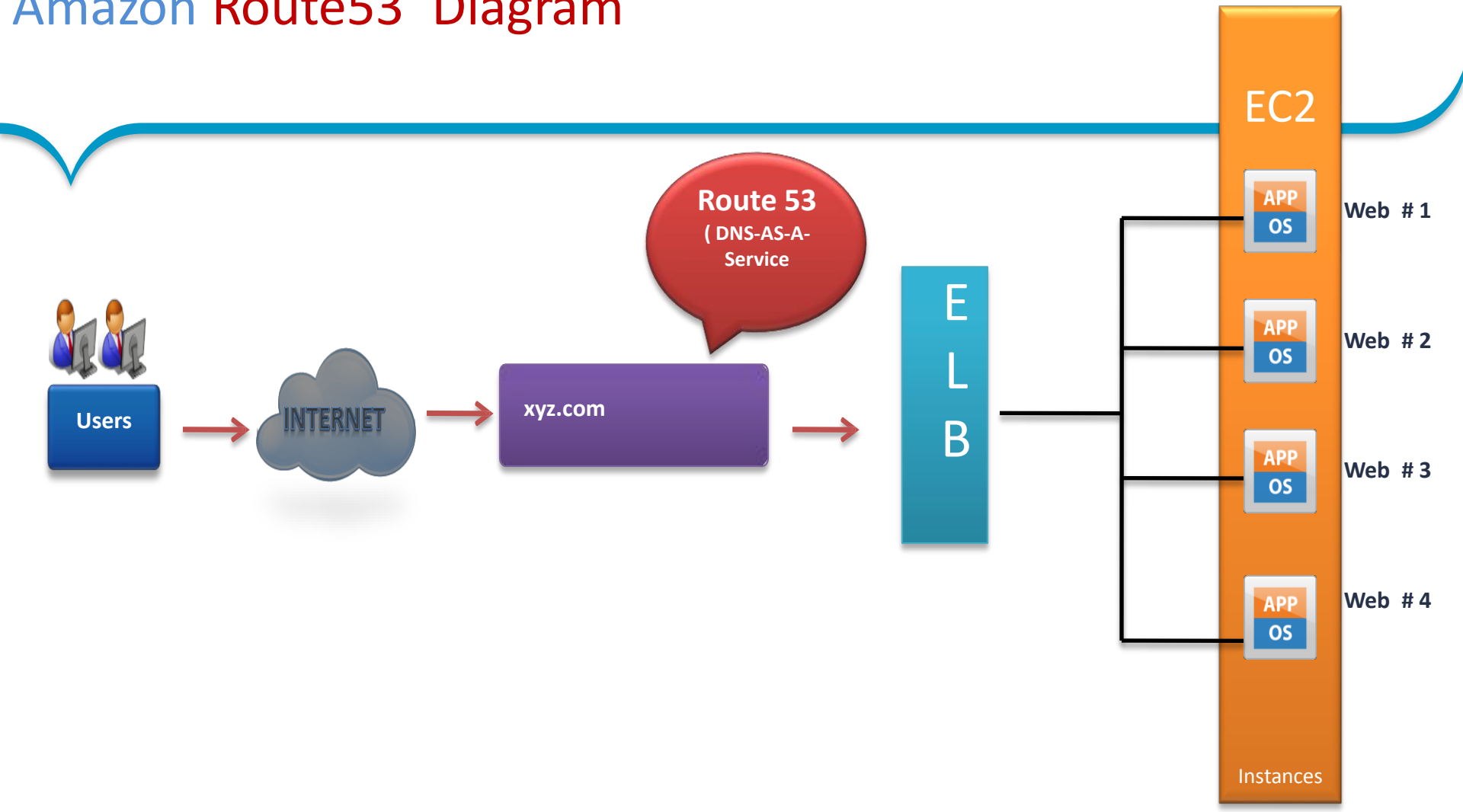
2) It is designed to route end users to Internet applications by translating names like www.example.com

   Into numeric IP addresses like 192.0.2.1 that computers use to connect to each other.

   Amazon Route 53 effectively connects user requests to infrastructure running in AWS – such as Amazon EC2 instances, ELB, etc

3) The DNS port number is 53 and that is how the name Route53 was coined by AWS for the global DNS service

# Amazon Route53 Diagram



# Amazon Simple Storage Service (S3)

# Amazon S3- Overview

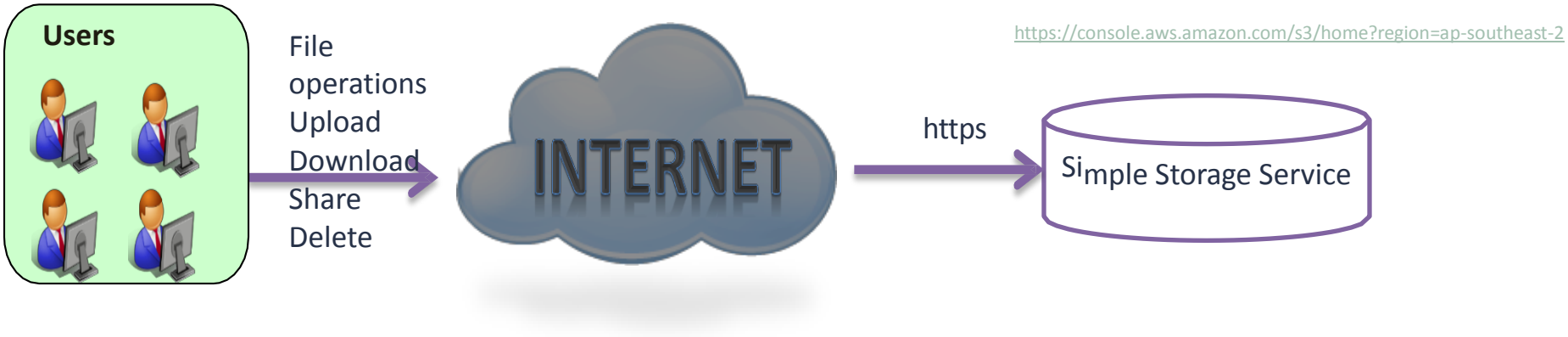
- Amazon S3 is easy to use object storage, with a simple web service interface to store and retrieve any amount of data from anywhere on the web. You can store static files docs, ppt ,xls , pdf ,audio and video files any other files

- Amazon S3 provides cost-effective object storage for a wide variety of use cases including
  - backup and recovery,
  - nearline archive,
  - big data analytics,
  - content distribution,

**Customer case study (Netflix)**

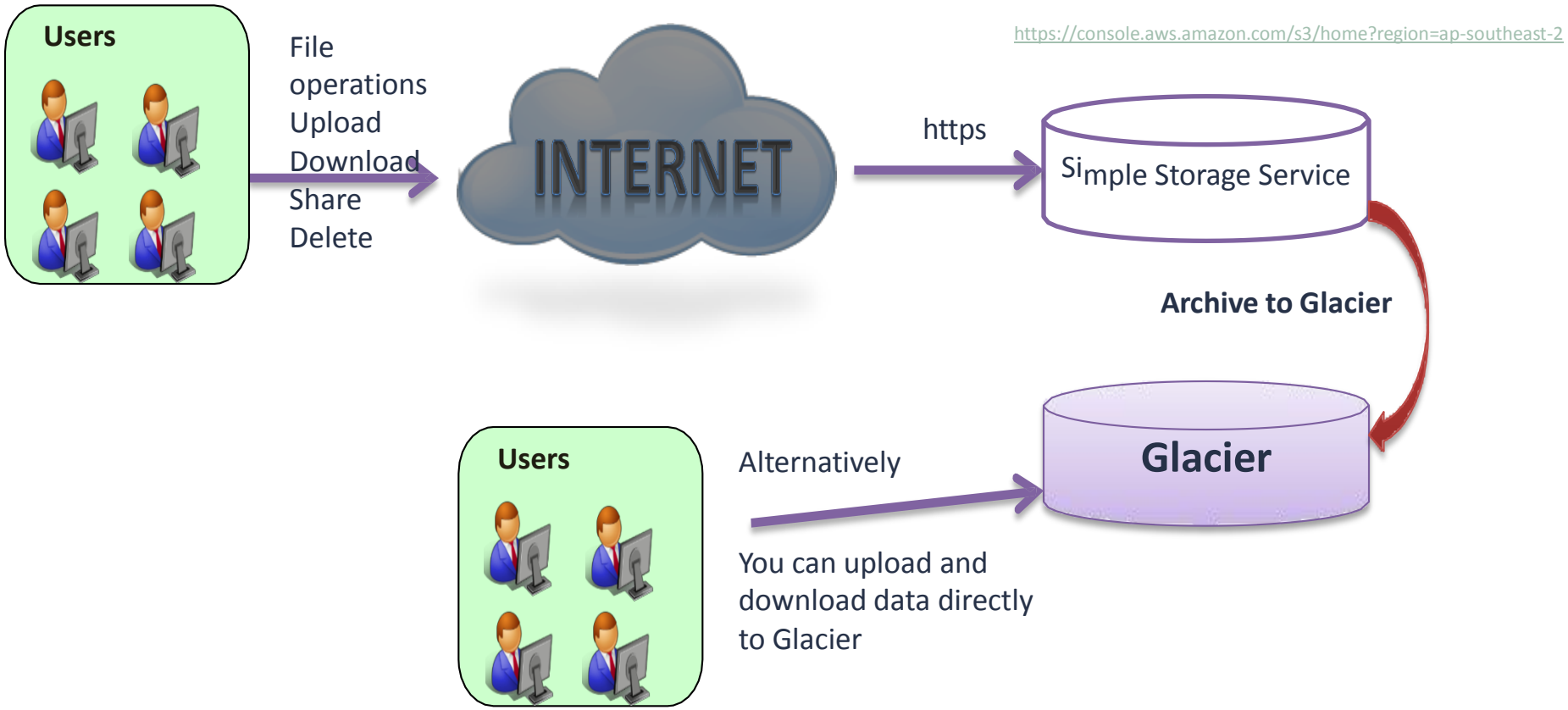
AWS enables Netflix to quickly deploy thousands of servers and terabytes of storage within minutes. Users can stream Netflix shows and movies from anywhere in the world, including on the web, on tablets, or on mobile devices such as iPhones

# Amazon Use case of S3



# Amazon Glacier

# Amazon Use case of Glacier



# Amazon Relational DataBase Service (RDS)

# Amazon RDS-overview

1) Amazon Relational Database Service (Amazon RDS) makes it easy to set up, operate, and scale a relational database in the cloud.

2) It provides cost-efficient and resizable capacity while managing time-consuming database administration tasks, freeing you up to focus on your applications and business.

3) Amazon RDS provides you six familiar database engines to choose from, including any one of the below

# Amazon RDS- Benefits

- No need launch a EC2 instance
- No Need Install and manage database servers
- No need to setup replication ( primary database on instance A and secondary database on instance B)
- Even minor upgrade of your database version are taken care by AWS
- When you provision a Multi-AZ DB Instance, Amazon RDS synchronously replicates the data to a standby instance in a different Availability Zone (AZ).

# Amazon : Direct connect

# AWS Certification

Solutions Architect

Developer

SysOps Administrator

| | | |
|---|---|---|
| AWS Certified Solutions Architect - Associate | AWS Certified Developer - Associate | AWS Certified SysOps Administrator - Associate |
| AWS Certified Solutions Architect - Professional | AWS Certified DevOps Engineer - Professional | |

# Thank You