CLOUD COMPUTING BASICS

CLOUD COMPUTING WITH aws

From Zero to One

LEC – 2

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WHAT WE LEARNT IN LEC 1 :

- What is Cloud Computing ?
- Why we go for cloud computing ?
- History and origins of Cloud Computing
- Evolution of Cloud Computing
- Characteristics of cloud computing
- On Demand Self-Service
- Resource Pooling
- Broad Network Access
- Rapid Elasticity
- Measured Service
- Benefits of Cloud Computing
- Types of Cloud Computing responsibilities
- Cloud Deployment Models

WHAT WE WILL LEARN TODAY :

- Total cost of ownership
- CAPEX v/s OPEX
- Cloud architecture terminologies
- High Availability
- Scalability
- Fault Tolerance
- High Durability
- What is Cloud Service Provider (CSP)
- Landscape of CSPs
- Common Cloud Services

TOTAL COST OF OWNERSHIP

CAPEX

On - Premise

Software Licensing Fess

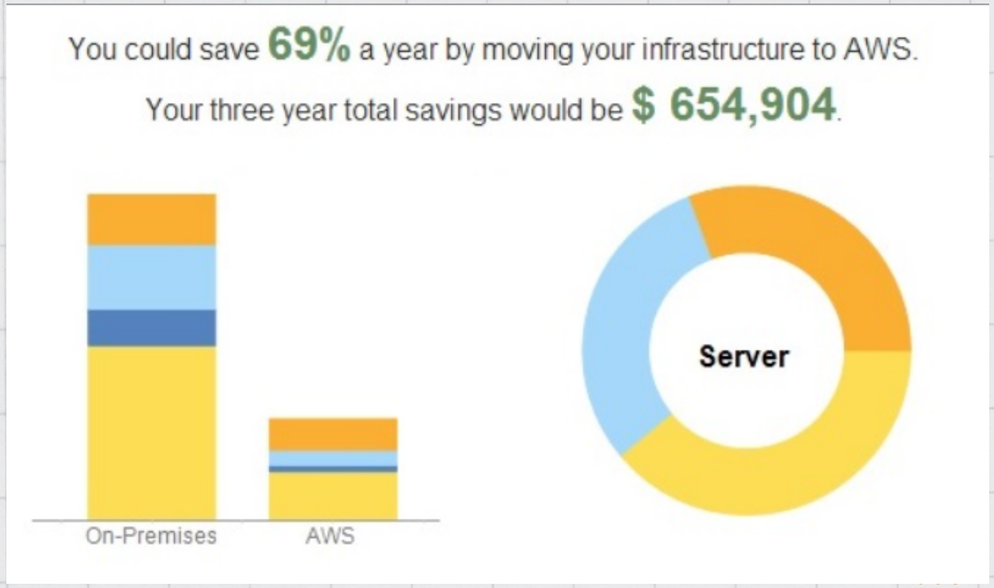
- Implementation
- Configuration
- Training
- Physical Security
- Hardware
- IT Personal
- Maintenance

OPEX

Cloud

Subscription Fees

- Implementation
- Configuration
- Training



CAPEX

Spending money upfront on physical infrastructure
Deducting that expense from your tax bill over time.

- Server Costs (computers)
- Storage Costs (hard drives)
- Network Costs (Routers, Cables, Switches)
- Backup and Archive Costs
- Disaster Recovery Costs
- Datacenter Costs (Rent, Cooling, Physical Security)
- Technical Personal

With Capital Expenses you have to guess upfront what you plan to spend

OPEX

The costs associated with an on-premises datacenter that has shifted the cost to the service provider. The customer only has to be concerned with non-physical costs.

- Leasing Software and Customizing features
- Training Employees in Cloud Services
- Paying for Cloud Support
- Billing based on cloud metrics eg.
- compute usage
- storage usage

With Operation Expenses you can try a product of service without investing in equipment

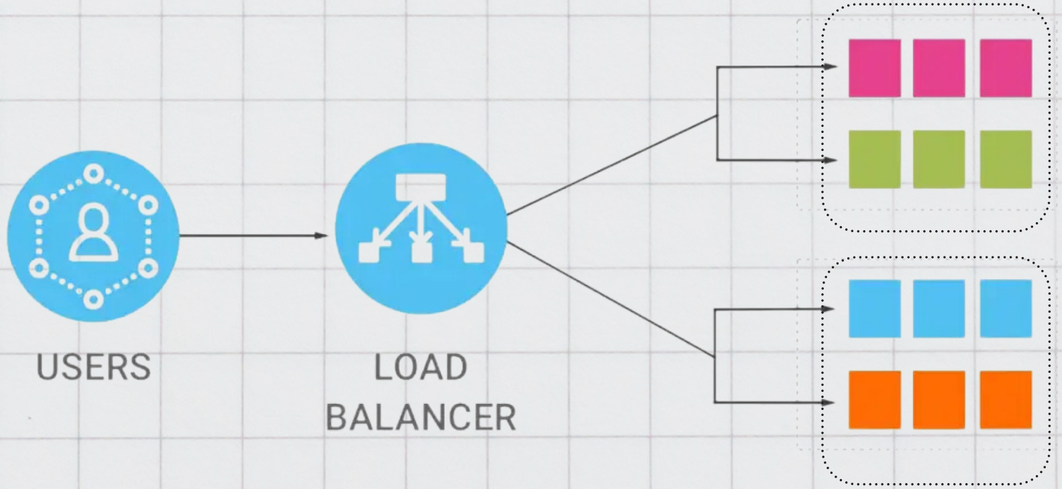
CLOUD ARCHITECTURE TERMINOLOGIES

- Availability - Your ability to ensure a service remains available
  Highly Available (HA)
- Scalability — Your ability to grow rapidly or unimpeded
- Elasticity — Your ability to shrink and grow to meet the demand
- Fault Tolerance — Your ability to prevent a failure
- Disaster Recovery - Your ability to recover from a failure
  Highly Durable (DR)

CLOUD COMPUTING BASICS

HIGH AVAILABILITY

Your ability for your service to remain available by ensuring there is
*no single point of failure and/or ensure a certain level of performance



ELASTIC LOAD BALANCING (ELB)

Elastic Load Balancing (ELB) automatically distributes incoming application traffic across multiple targets and virtual appliances in one or more Availability Zones (AZs).

Running your workload across multiple Availability Zones ensures that if 1 or 2 AZ's become unavailable / application remains available.

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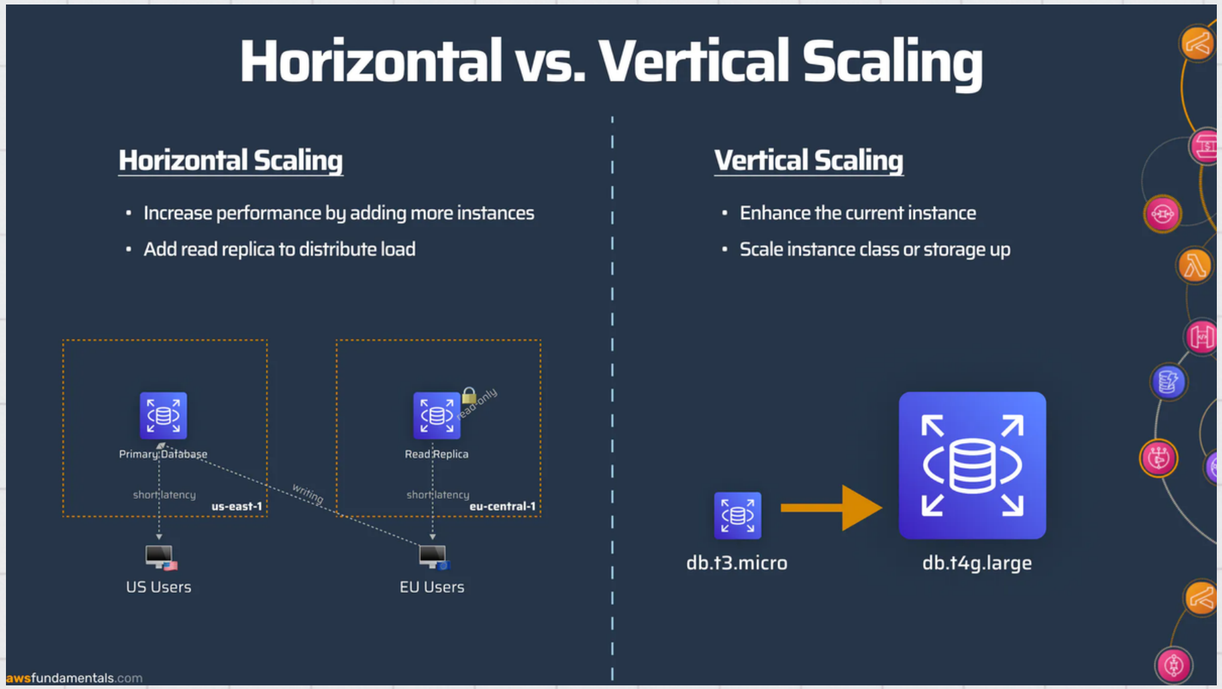
CLOUD COMPUTING BASICS

SCALABILITY

Your ability to **increase your capacity** based on the increasing demand of traffic, memory and computing power

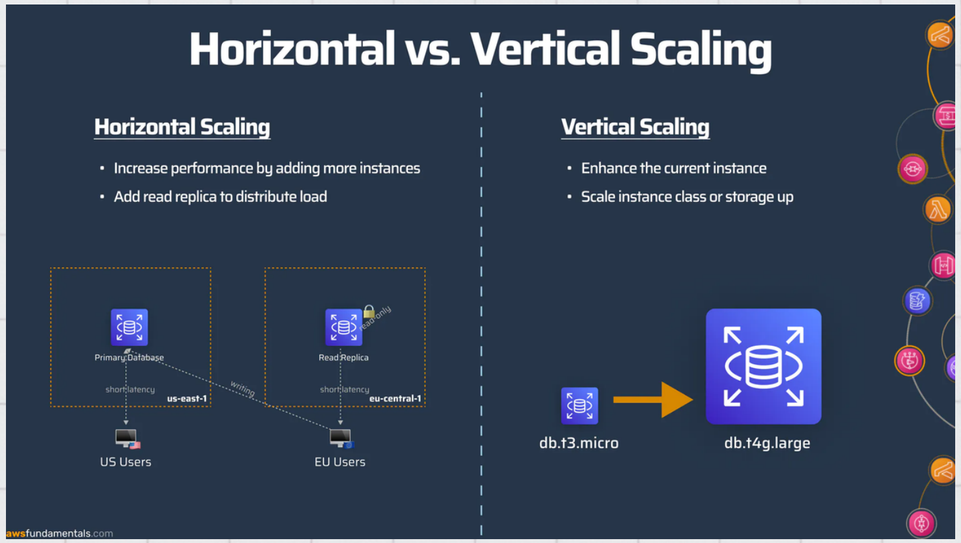


AMAZON AUTO SCALING

AWS Auto Scaling is a service that assists organizations in supervising AWS-based software and infrastructure. The service automatically adjusts capacity to maintain steady, predictable performance at the lowest possible cost.

ELASTICITY

Your ability to automatically increase or decrease your capacity based on the current demand of traffic, memory and computing power



Horizonal Scaling

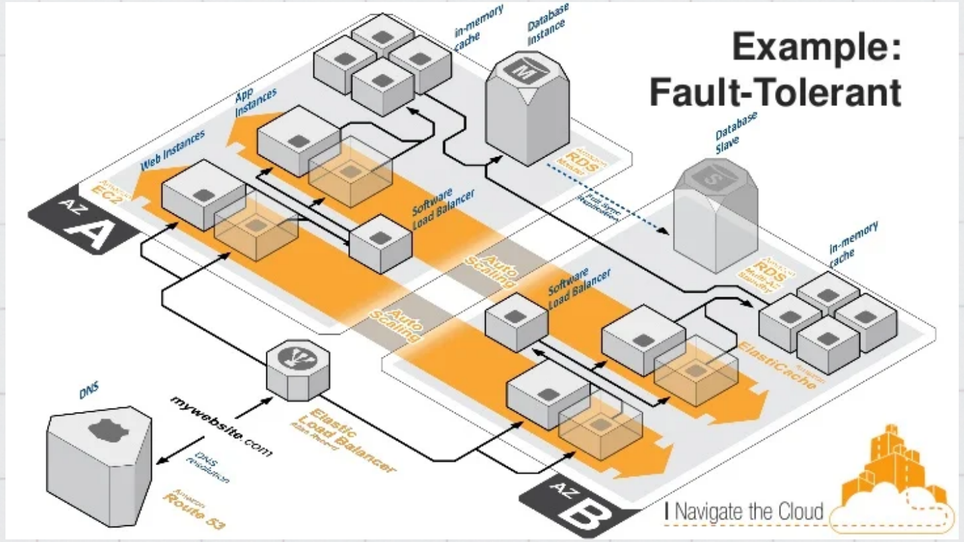
Scaling Out — Add more servers of the same size
Scaling In — Removing more servers of the same size

Vertical Scaling is generally hard for traditional architecture so you'll usually only see horizontal scaling described with Elasticity.

CLOUD COMPUTING BASICS

FAULT TOLERANCE

the ability of a system to continue operating even when one or more components fail. In a fault-tolerant system, if one component fails, another component takes over its function without any disruption in service.



AWS fault tolerance components that you can use:

- Auto Scaling
- Elastic Load Balancing
- Elastic IPs
- Reserved Instances
- Elastic Block Store
- Relational Database Service

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HIGH DURABILITY

Your ability to recover from a disaster and to prevent the loss of data

Solutions that recover from a disaster is known as Disaster Recovery (DR)

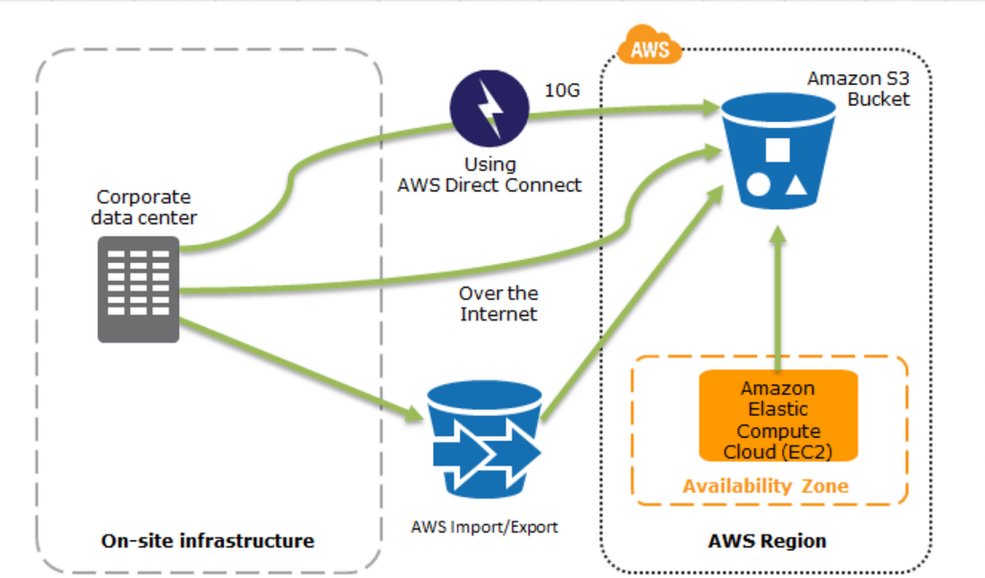


Figure 2: Data Backup Options to Amazon S3 from On-Site Infrastructure or from AWS.

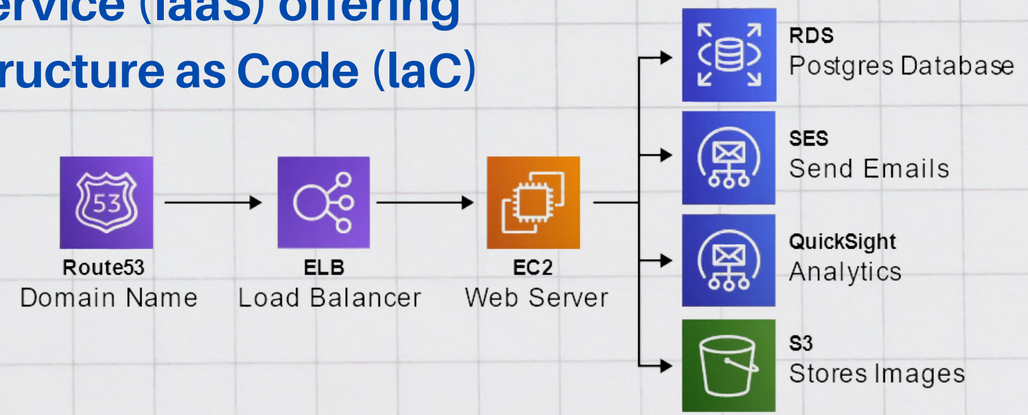
- Do you have a backup?
- How fast can you restore that backup?
- Does your backup still work?
- How do you ensure current live data is not corrupt?

CLOUD COMPUTING BASICS

WHAT IS CLOUD SERVICE PROVIDER (CSP)

- A Cloud Service Provider (CSP) is a company which

- provides multiple Cloud Services e.g. tens to hundreds of services
- those Cloud Services can be chained together to create cloud architectures
- those Cloud Services are accessible via Single Unified API eg. AWS API
- those Cloud Services utilized metered billing based on usage e.g. per second, per hour
- those Cloud Services have rich monitoring built in eg. AWS CloudTrail
- those Cloud Services have an Infrastructure as a Service (IaaS) offering
- Those Cloud Services offers automation via Infrastructure as Code (IaC)



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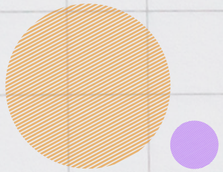
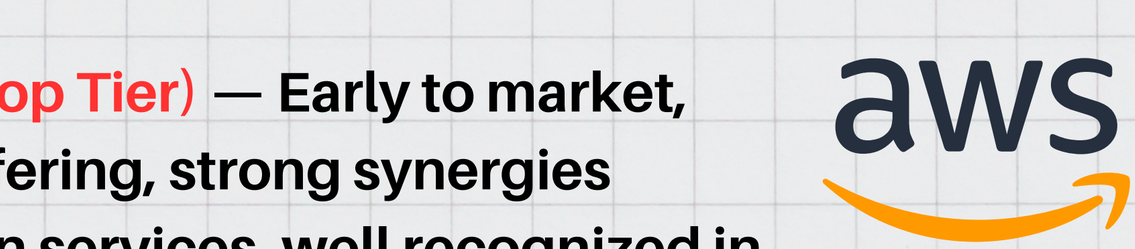
LANDSCAPE OF CSP'S

Tier-I (Top Tier) — Early to market, wide offering, strong synergies between services, well recognized in the industry

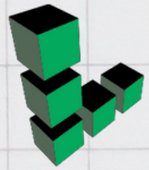
Tier-2 (Mid Tier) — Backed by well-known tech companies, slow to innovate and turned to specialization.

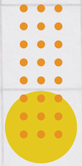
Tier-3 (Light Tier) — Virtual Private Servers (VPS) turned to offer core IaaS offering. Simple, cost-effective





IBM **Cloud**





COMMON CLOUD SERVICES

A cloud service provider can have hundreds of cloud services that are grouped into various types of services. The four most common types of cloud services (the 4 core) for Infrastructure as a Service (IaaS) would be:

Compute

I magine having a virtual computer that can run application, programs and code.

Databases

Imagine a virtual database for storing reporting data or a database for genera purpose web-application

Networking

Imagine having virtual network defining internet connections or network isolations between services or outbound to the internet

Storage

Imagine having a virtual hard-drive that can store files

hashnode

https://abhiivops.hashnode.dev/

THANKS FOR WATCHING

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LINK IN THE DESCRIPTION FOR NOTES