Week 7 Day 3

AWS Services

REVATURE

Public data storage | Private data storage | Dynamic web hosting | Web Apps hosting | Web Apps hosting | VPN gateway | Multimedia streaming | Load balancing | Auto scaling

... and much, much more!

Amazon Web Services (AWS)

- Cloud computing services provided by Amazon
- Simple ways to access servers, storage, and more

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Source: https://www.amoebanetworks.com/media/Amazon-Web-Services/original/aws.png
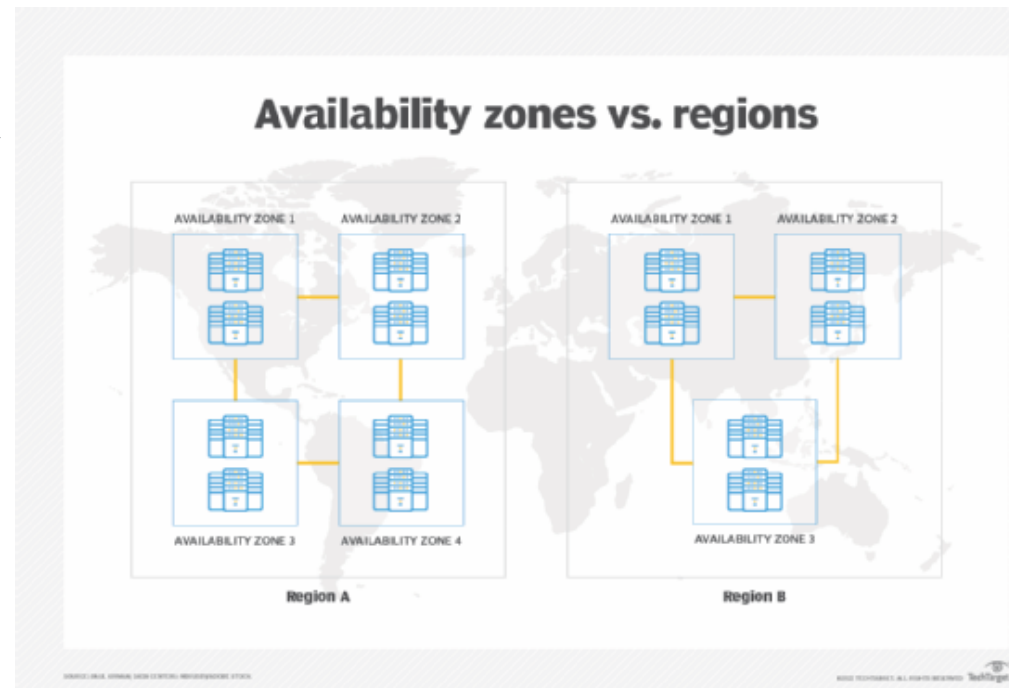
Advantages of Cloud Computing

- Pay as you go
- Automatic app scaling
- Reallocate resources quickly
- Lower startup cost
- Global deployment instantly

Cloud Computing Models

- SaaS
  - Software as a service
  - Google Docs, Zoom
- PaaS
  - Platform as a service
  - AWS RDS, GCP Cloud SQL
- IaaS
  - Infrastructure as a service
  - AWS EC2, GCP Compute Engine

AWS Regions and Availability Zones

- Available in 24 regions, with 77 availability zones
- Regions:
  - Location with a cluster of availability zones
- Availability Zone:
  - Physical data center

Availability zones vs. regions

AVAILABILITY ZONE 1   AVAILABILITY ZONE 2   AVAILABILITY ZONE 1   AVAILABILITY ZONE 2

AVAILABILITY ZONE 3   AVAILABILITY ZONE 4   AVAILABILITY ZONE 3

Region A   Region B

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Source: https://cdn.ttgtmedia.com/rms/onlineimages/aws_availability_zones_vs_regions-f_mobile.png

RDS:

- Service which makes it easier to
  - Setup
  - Operate
  - Scale
- Industry standard relational databases
- Management of admin tasks

Setup an RDS Instance Demo

AWS Elastic Compute Cloud

EC2:

- Secure resizable virtual machine

- Use it to host applications globally

- Setup quickly with preconfigured AMI's
  - Amazon Machine Images

- Configure everything from CPU, to MEMORY

- Secure login with SSH keys and firewalls
  - Security Groups prevent access by default

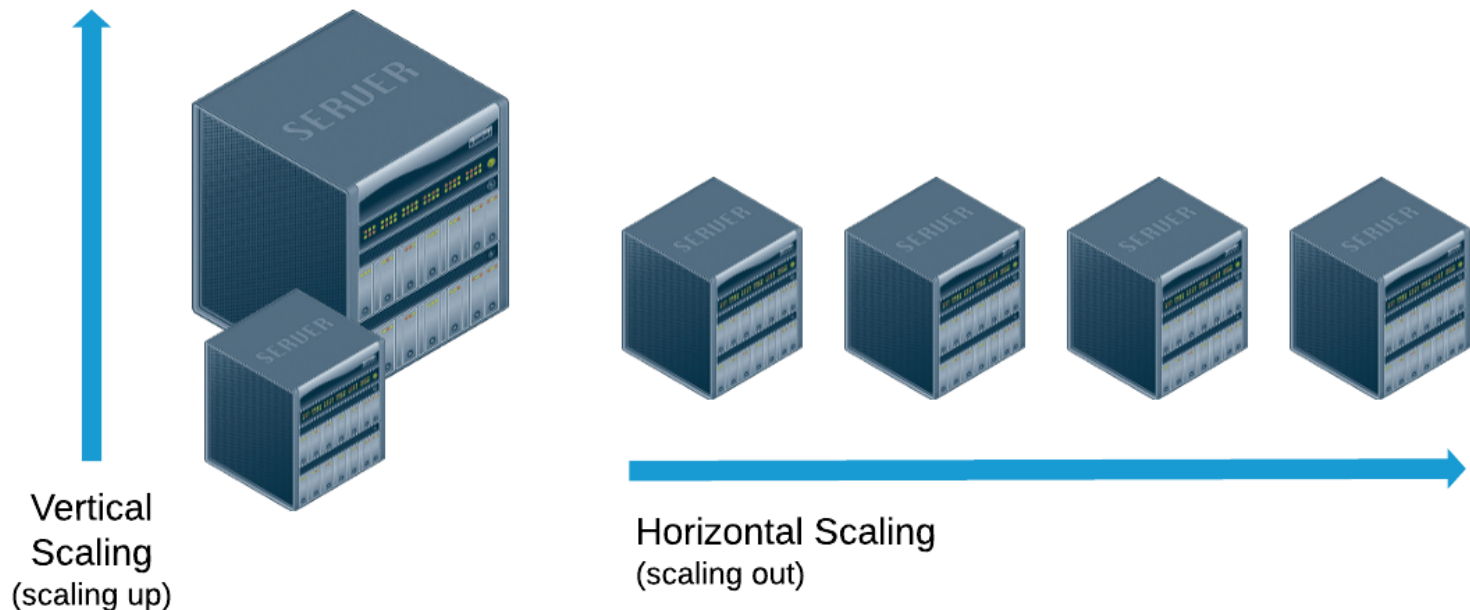- Extra storage can be added with Elastic Block Storage
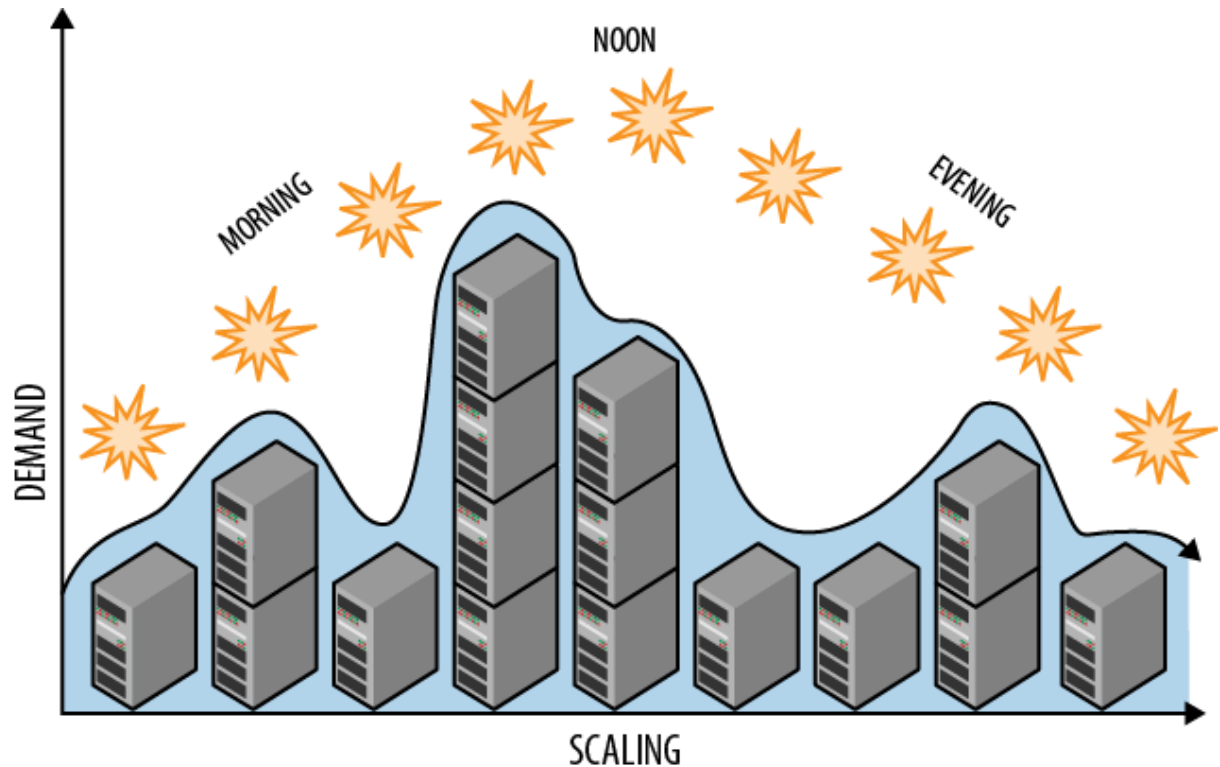
Setup EC2 and Security Groups

Application Scaling

- Scale an application in two ways
  - Vertical vs Horizontal

Vertical Scaling (scaling up)

Horizontal Scaling (scaling out)

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Source: https://www.section.io/assets/images/blog/featured-images/horizontal-vs-vertical-scaling-diagram.png

Autoscaling Benefits

- Improved fault tolerance
- Increased availability
- Lower costs

Source: https://www.oreilly.com/api/v2/epubs/9781449357979/files/httpatomoreillycomsourceoreillyimages1352543.png

Autoscaling EC2s

EC2s use automatic horizontal scaling with Autoscaling Groups

- Increase instances
- Decrease instances
- Fixed about
- Use scaling plans to tell the EC2s when and how to scale
  - Scheduled
  - Dynamic
  - Predictive

AWS Simple Storage Service

S3:

- Object storage service that offers
  - Industry leading scalability
  - Data availability
  - Security and Performance
- Store and retrieve any data from a bucket
- Each bucket has a unique URL to access objects
- Use them to store images, videos, or even host static websites
- Amazon provides access to an API to access buckets programmatically

REVATURE

Setup and host a site on S3 Demo