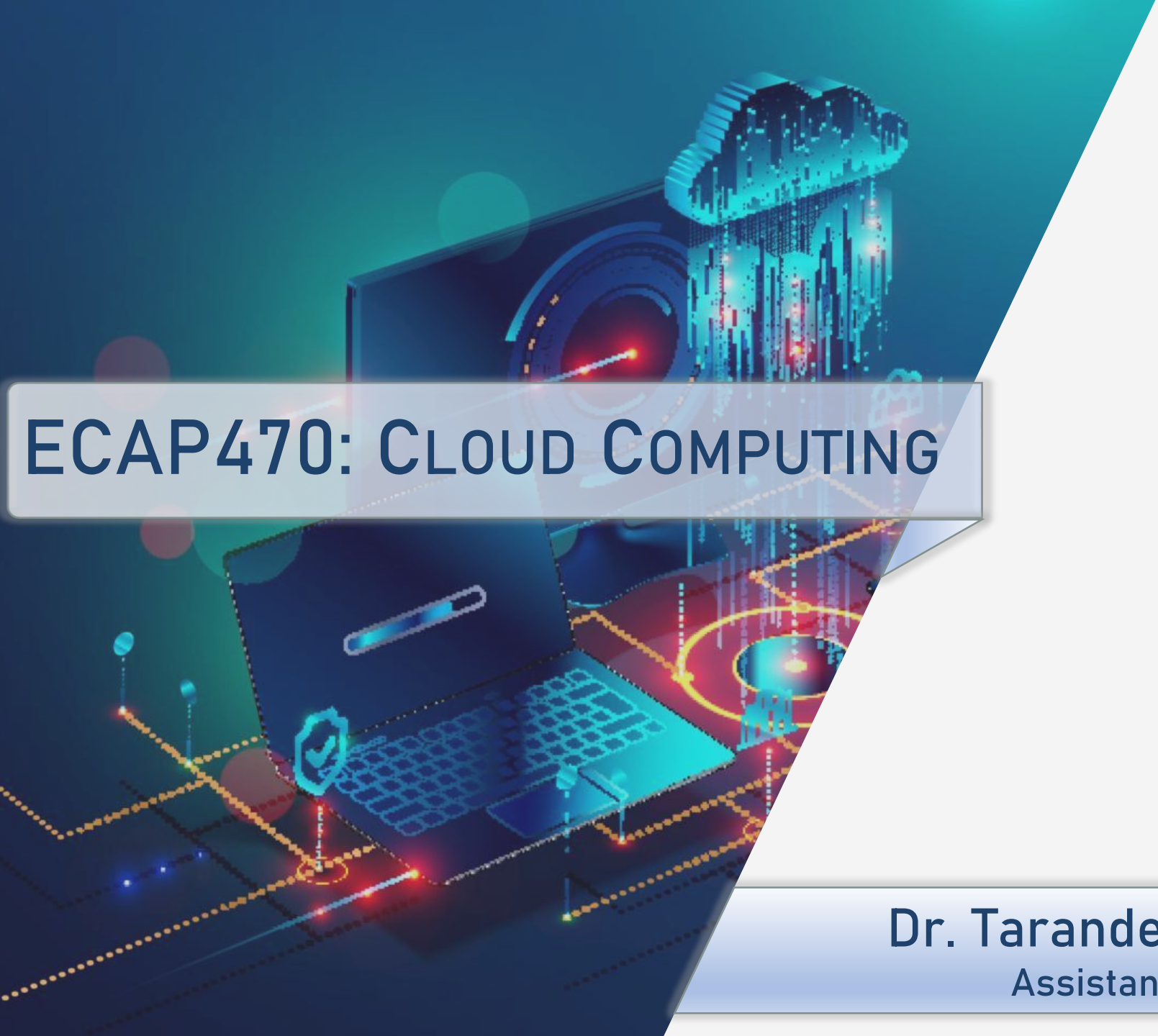

ECAP470: Cloud Computing

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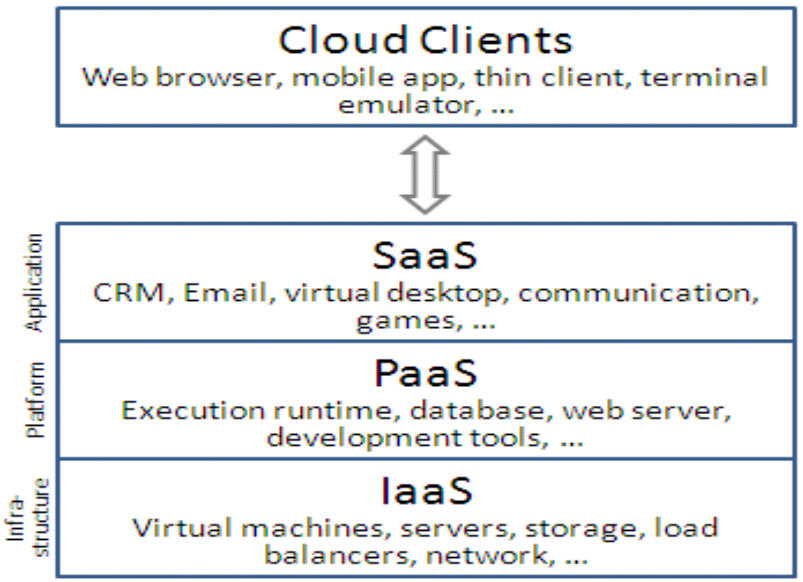
Learning Outcomes

After this lecture, you will be able to,

- ✓ Know about different services offered by Amazon Web Services (AWS).

Infrastructure-as-a-Service (IaaS)

Category of cloud services which provides capability to provision processing, storage, intra-cloud network connectivity services, and other fundamental computing resources of the cloud infrastructure.



Highlights of IaaS

- On demand computing resources
  - Eliminate the need of far ahead planning
- No up-front commitment
  - Start small and grow as required
  - No contract, Only credit card!

Highlights of IaaS

- Pay for what you use
- No maintenance
- Measured service
- Scalability
- Reliability

Infrastructure-as-a-Service (IaaS)- Amazon EC2

AWS EC2

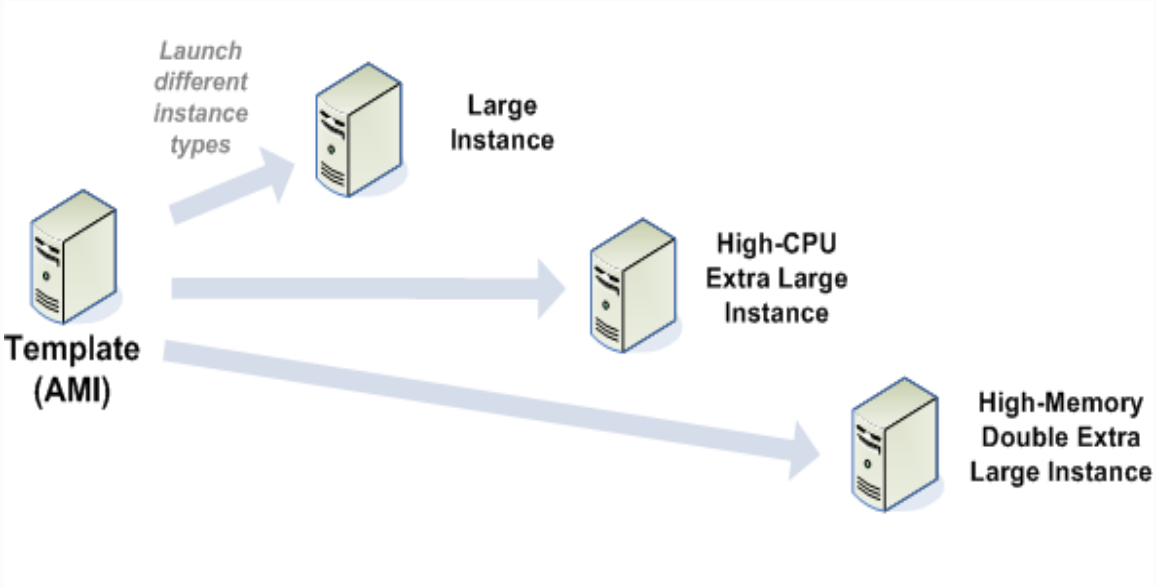
- Amazon Elastic Compute Cloud (EC2) is a web service that provides resizeable computing capacity that one uses to build and host different software systems.
- Designed to make web-scale computing easier for developers.
- A user can create, launch, and terminate server instances as needed, paying by the hour for active servers, hence the term "elastic".
  - Provides scalable, pay as-you-go compute capacity
  - Elastic – scales in both direction

EC2 Concepts

- AMI & Instance
- Region & Zones
- Storage
- Networking and Security
- Monitoring
- Auto Scaling
- Load Balancer

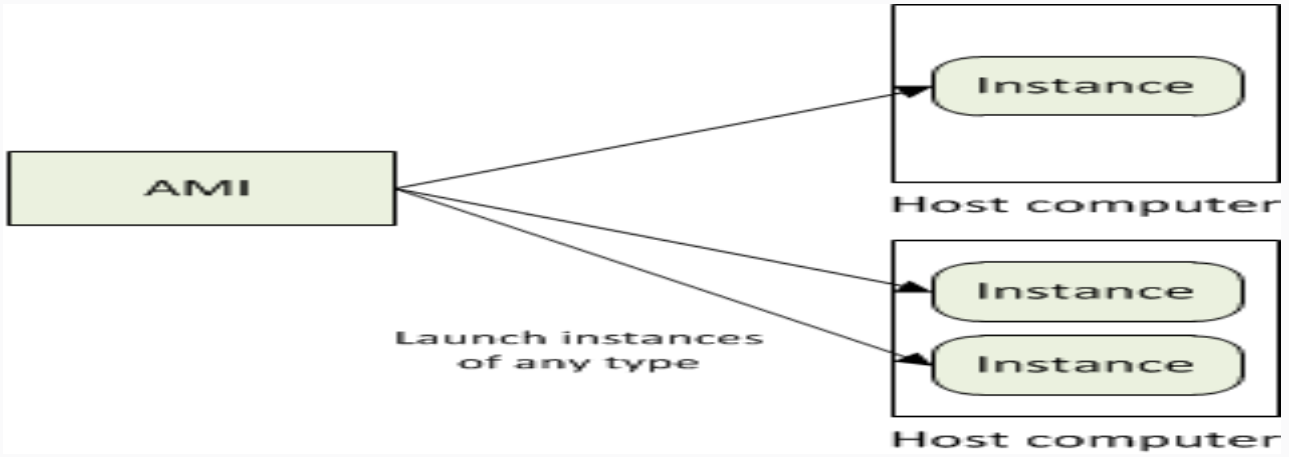
Amazon Machine Images (AMI)

- An immutable representation of a set of disks that contain an operating system, user applications and/or data.
- From an AMI, one can launch multiple instances, which are running copies of the AMI.



AMI and Instance

- Amazon Machine Image (AMI) is a template for software configuration (Operating System, Application Server, and Applications).
- Instance is a AMI running on virtual servers in the cloud.
- Each instance type offers different compute and memory facilities.



Region and Zones

- Amazon have data centers in different region across the globe
- An instance can be launched in different regions depending on the need.
  - Closer to specific customer
  - To meet legal or other requirements

Region and Zones

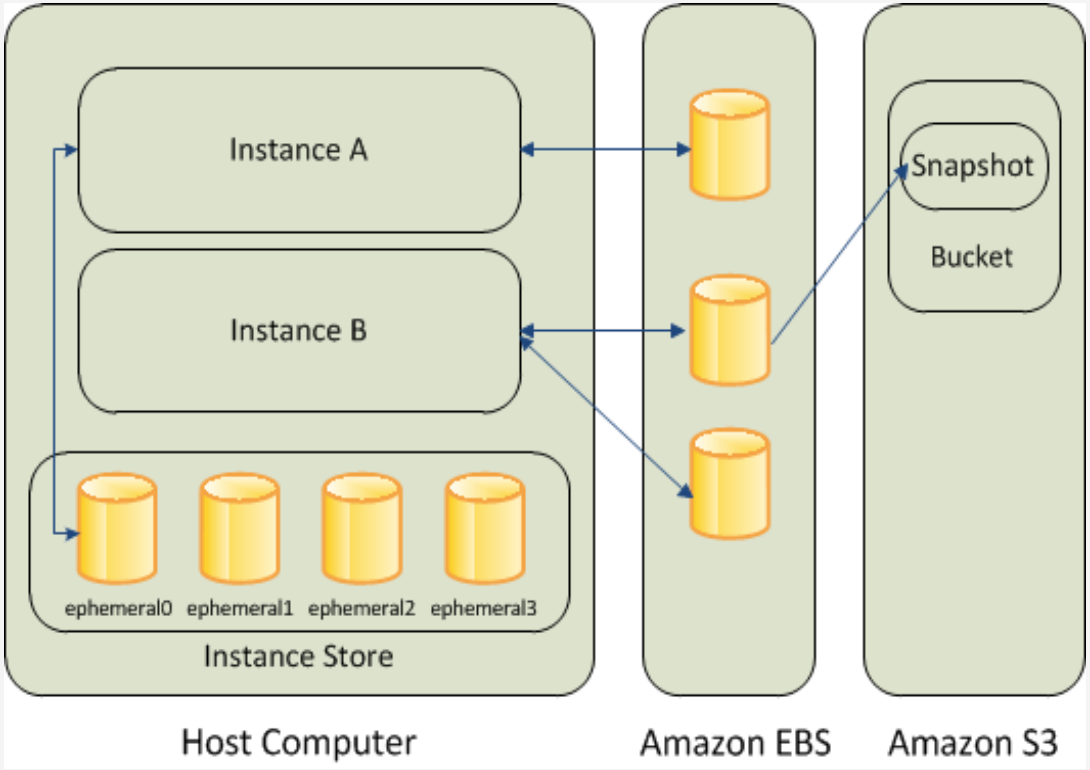
Each region has set of zones

- Zones are isolated from failure in other zones
- Inexpensive, low latency connectivity between zones in same region

Storage

Amazon EC provides three type of storage option:

- Amazon EBS
- Amazon S3
- Instance Storage



Networking and Security

- Instances can be launched on one of the two platforms
  - EC2-Classic
  - EC2-VPC
- Each instance launched is assigned two addresses a private address and a public IP address.
  - A replacement instance has a different public IP address

Networking and Security

- Instance IP address is dynamic:
  - new IP address is assigned every time instance is launched
- Amazon EC2 offers Elastic IP addresses (static IP addresses) for dynamic cloud computing
  - Remap the Elastic IP to new instance to mask failure
  - Separate pool for EC2-Classic and VPC
- Security Groups to access control to instance

Monitoring, Auto Scaling and Load Balancing

Monitor statistics of instances and EBS

- CloudWatch (monitor, manage and publish various metrics; configure alarms based on metrics)

Monitoring, Auto Scaling and Load Balancing

Automatically scales amazon EC2 capacity up and down based on rules

- Add and remove compute resource based on demand
- Suitable for businesses experiencing variability in usage

Monitoring, Auto Scaling and Load Balancing

Distribute incoming traffic across multiple instances

- Elastic Load Balancing

Amazon S3

- S3 stands for = Simple Storage Service
- SOA– Service Oriented Architecture which provides online storage using web services.
- Allows read, write and delete permissions on objects.
- Uses REST and SOAP protocols for messaging.

Amazon SimpleDB

- Amazon SimpleDB is a highly available, flexible, and scalable non-relational data store that offloads the work of database administration.
- Creates and manages multiple geographically distributed replicas of your data automatically to enable high availability and data durability.
- The service charges you only for the resources actually consumed in storing your data and serving your requests.

AWS Lambda

- Truly Serverless.
- You know longer have the overhead of administration.
- No need to manage any servers.
- Focus is entirely on your business logic.

AWS DynamoDB

- Database that delivers single-digit millisecond performance at any scale.
- Fully managed, cost effective, durable, multi-region NoSQL database.

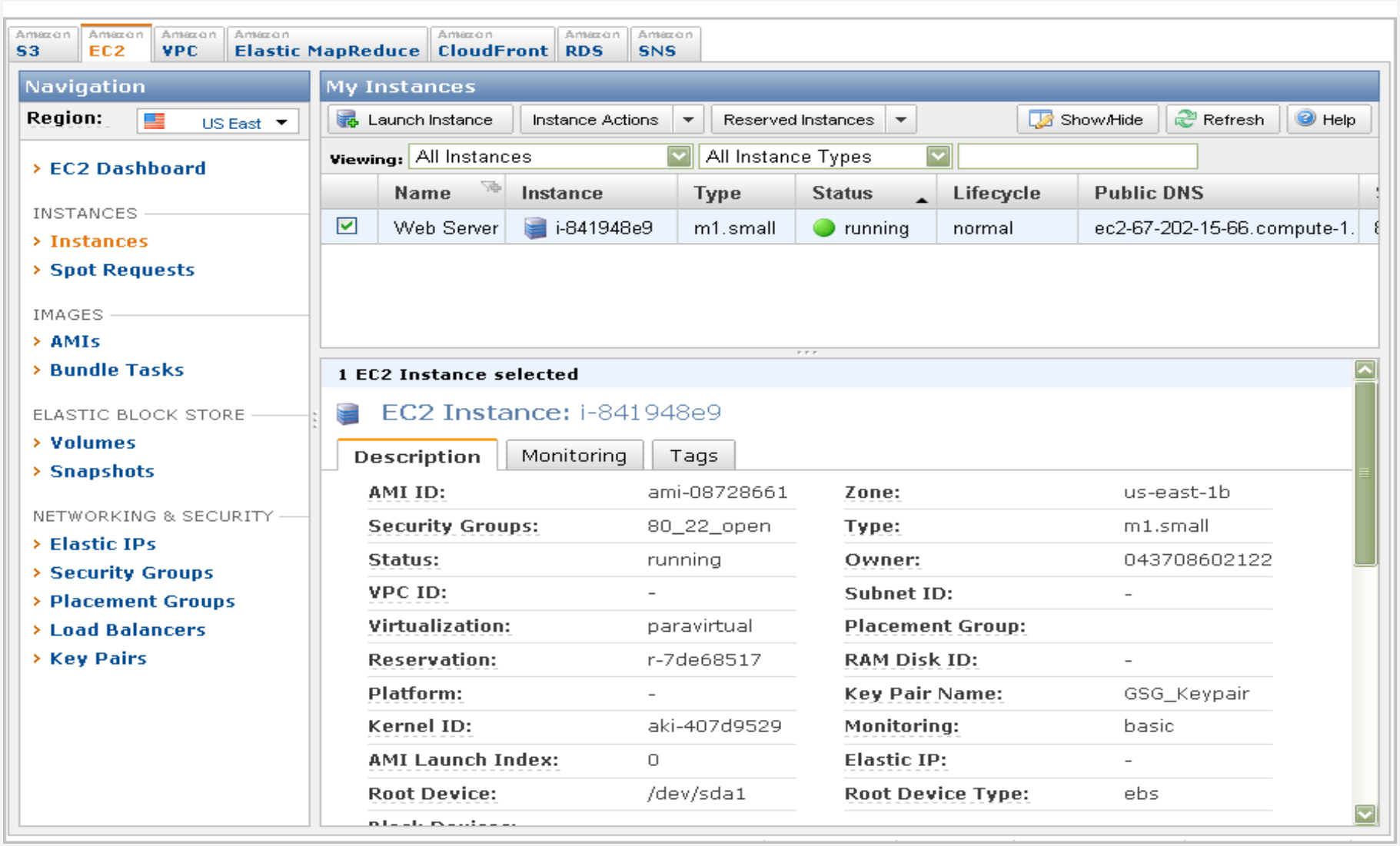
AWS Amazon API Gateway

- Fully managed service.
- Simple way to create, publish, maintain, monitor, and secure APIs at any scale. RESTful APIs and WebSocket APIs are types of APIs you can create using API Gateway.

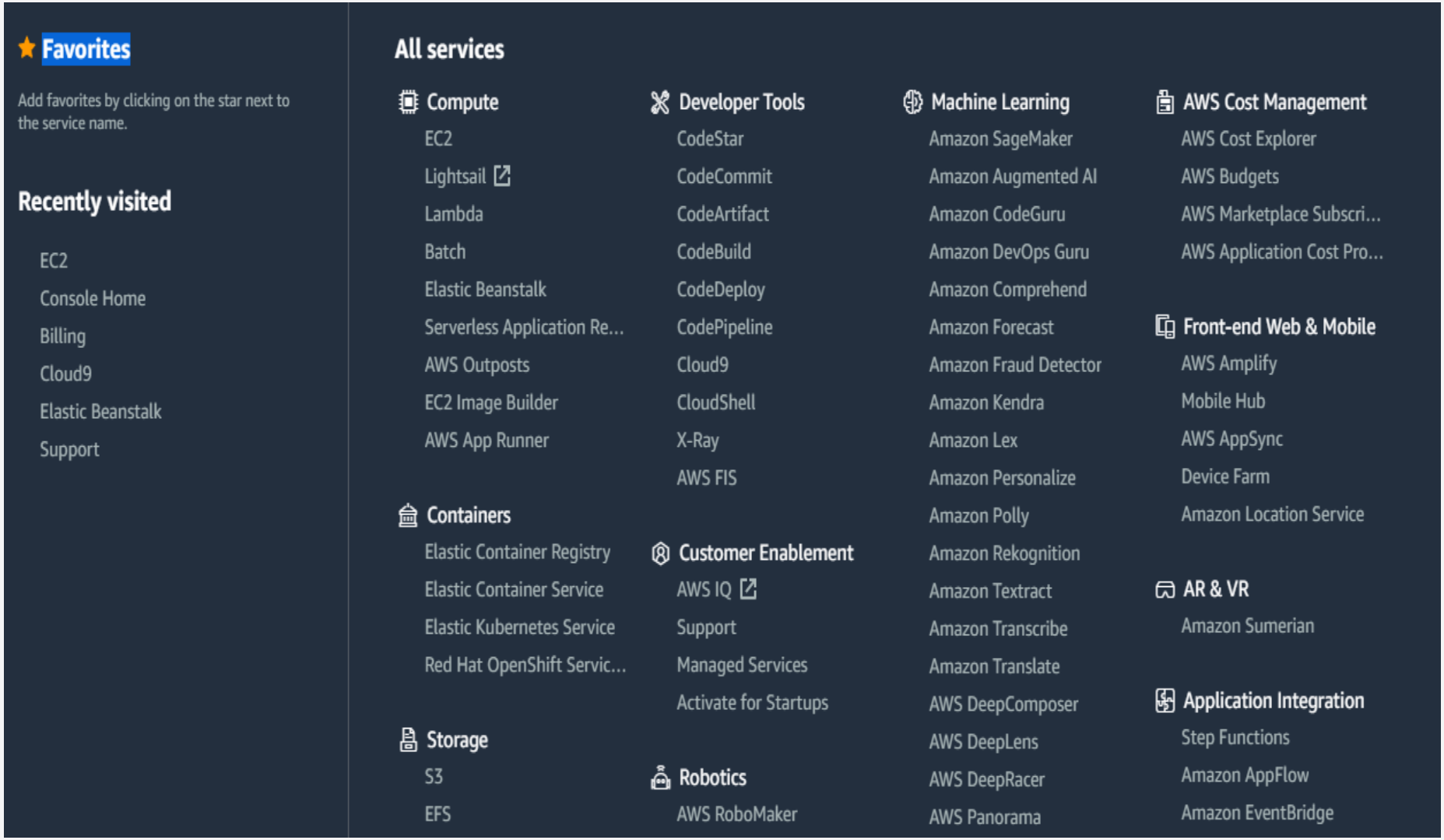
AWS EC2 Practical

- Launching an Instance
- Connecting
- Terminating
- Stop
- Budget & Preferences setting

AWS Management Console



AWS Management Console- All Services



That's all for now...