RAJKIYA ENGINEERING COLLEGE

BANDA

Internship on Cloud Computing

INFORMATION TECHNOLOGY

2021-2022 (15/09/2021 - 14/10/2021)

Submitted By –

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Submitted To –

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(ASSISTANT PROFESSOR

REC BANDA)

Abstract

Problem

- As we all know that to setup a good hardware is very expensive and also we need a place to setup and good engineers to access the hardware . For a small as well as a big company this is very tremendous task.
- Nowadays, there a lot of user access the websites/apps at same time due to this huge amount users websites/apps get crashed and unable to give the access to all the users.

Solution

- We can use cloud technologies to solve these type of problems.
- Cloud is virtual server which provide a platform to perform our computations according to our need. It is available in very affordable price compare to physical servers.

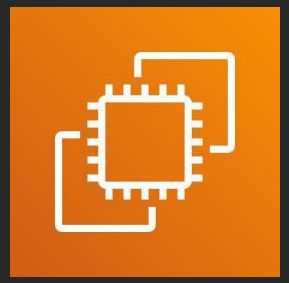
Used tools

- Amazon Web Services
- Windows 10
- Linux
- HTML, CSS, JAVASCRIPT
- MariaDB

TOPIC

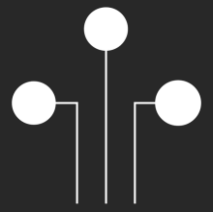
1. VIRTUAL MACHINES VS PHYSICAL SERVERS
2. AMAZON VIRTUAL PRIVATE CLOUD(AMAZON VPC)
3. SHARED RESPONSIBILITY MODEL
4. WHAT IS SERVERLESS COMPUTING
5. SERVERLESS APPLICATION USE CASES
6. AMAZON ELASTIC COMPUTE CLOUD(AMAZON EC2)
7. BENEFITS OF EC2
8. AMAZON EC2 PRICING
9. ELASTIC LOAD BALANCING(ELB)
10. AWS LAMBDA
11. AMAZON S3
12. CHOOSING A REGION
13. AMAZON S3 GLACIER
14. AMAZON ELASTIC BLOCK STORE(AMAZON EBS)
15. AWS IDENTITY AND ACCESS MANAGEMENT(IAM)
16. AMAZON S3 ACCESS CONTROL : GENERAL
17. AWS DATABASE OPTIONS

Virtual machines vs. physical servers



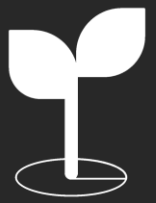
Amazon EC2 can solve some problems that are more difficult with an on-premises server

When using disposable resources



Data-driven decisions

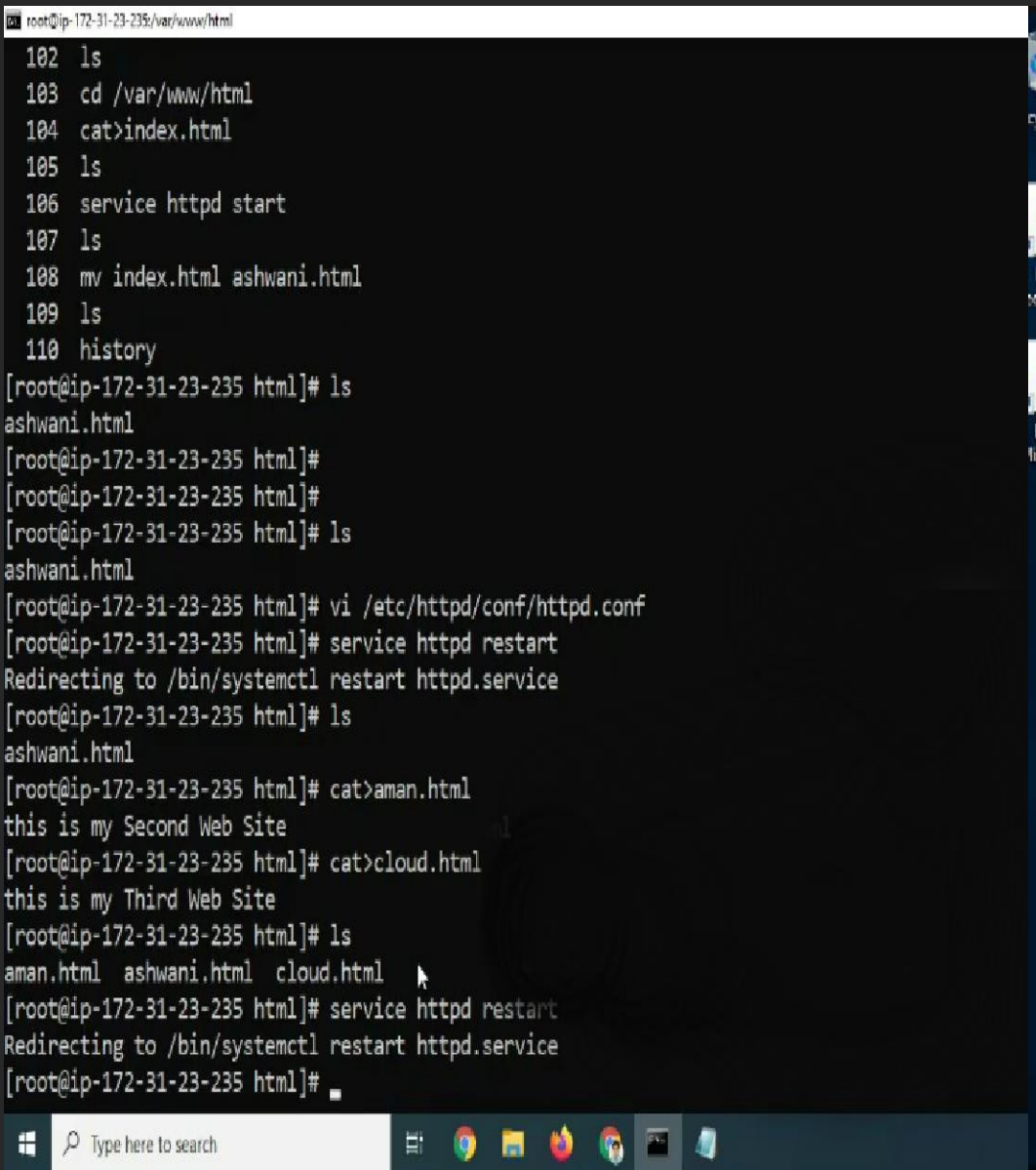
Quick iterations



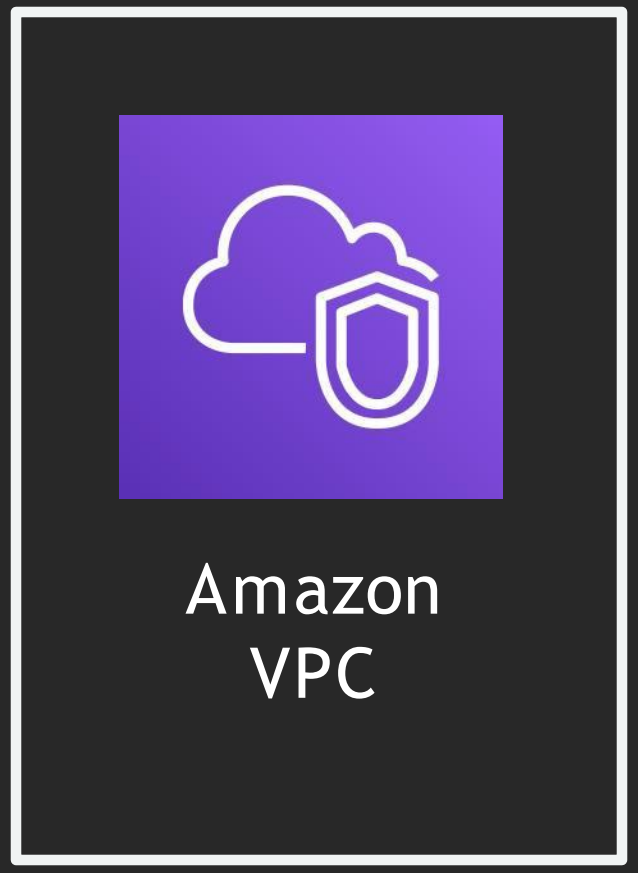
Free to make mistakes

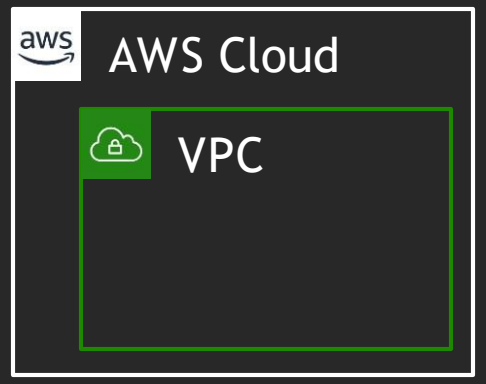
Creating virtual server in Linux

Creating virtual server in Windows



Amazon Virtual Private Cloud (Amazon VPC)



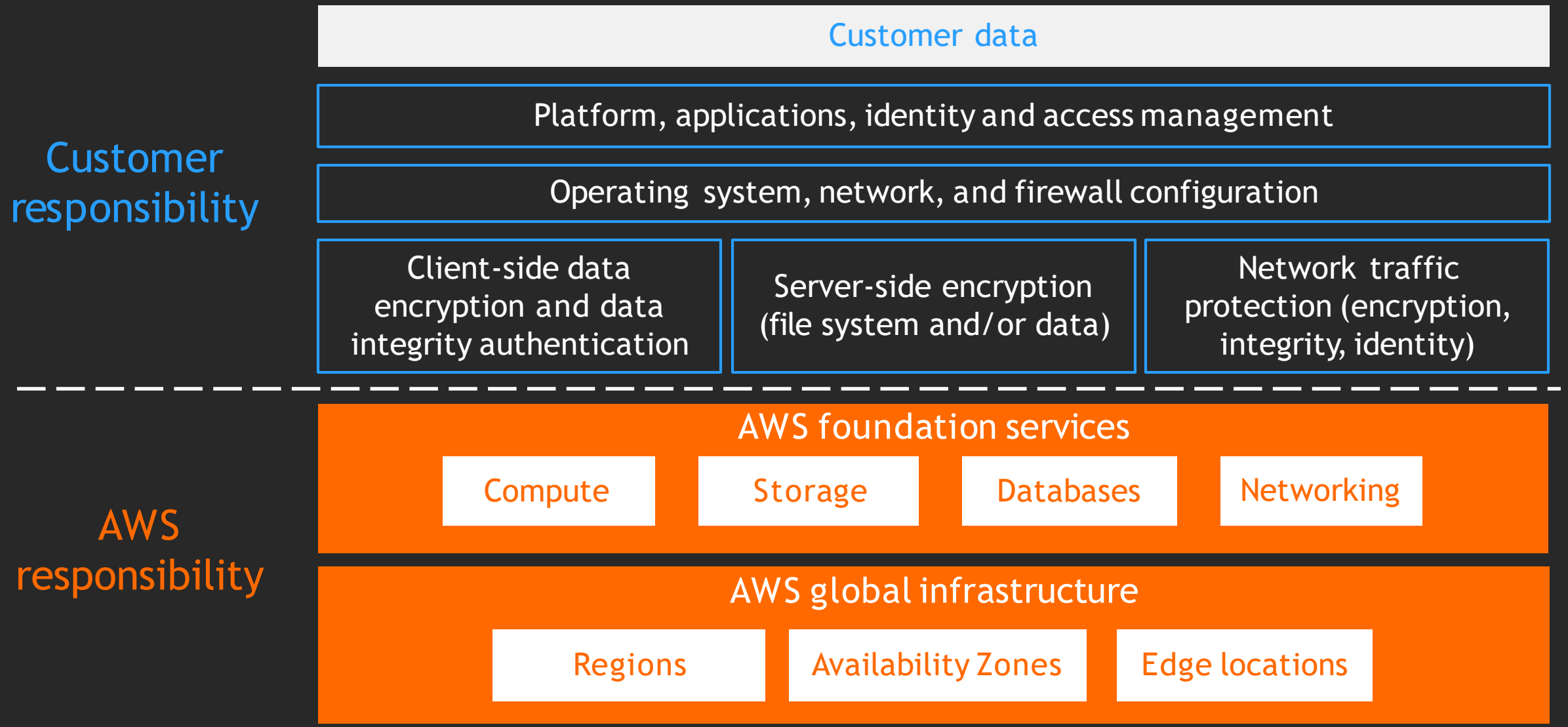


Your private network space in the AWS Cloud

Provides logical isolation for your workloads

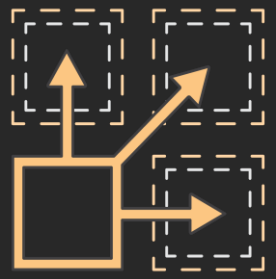
Allows custom access controls and security settings for your resources

Shared responsibility model

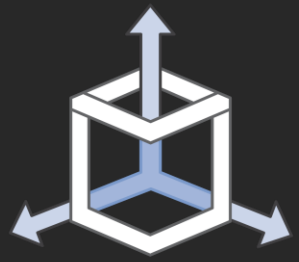


What is serverless computing?

Building and running applications and services without managing servers



No servers to provision or manage



Scales with usage

Never pay for idle

Availability and fault tolerance built in

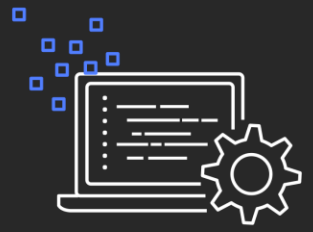
Serverless application use cases

Web applications

Static websites

Complex web applications

Packages for Flask and Express

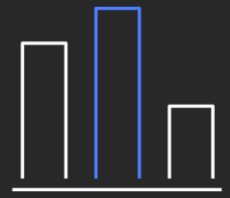


Backends

Applications and services

Mobile

IoT



Data processing

Real time

MapReduce

Batch

Machine learning inference

Chatbots

Powering chatbot logic

Amazon Alexa

Powering voice-enabled applications

Alexa Skills Kit

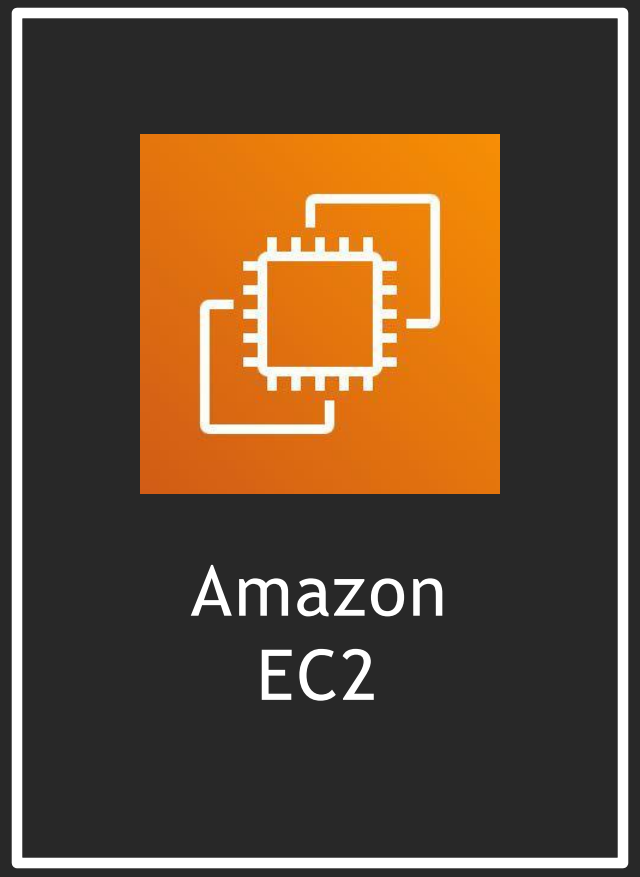
IT automation

Policy engines

Extending AWS services

Infrastructure management

Amazon Elastic Compute Cloud (Amazon EC2)

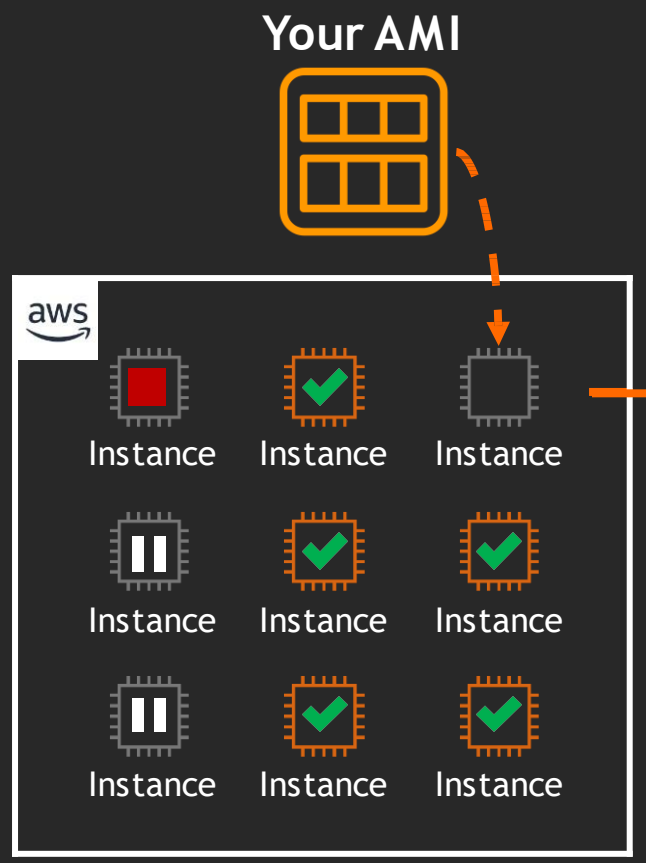


- Resizable compute capacity
- Complete control of your computing resources
- Reduced time required to obtain and boot new server instances

Amazon EC2

Amazon EC2 provides pay-as-you-go pricing and a broad selection of hardware and software

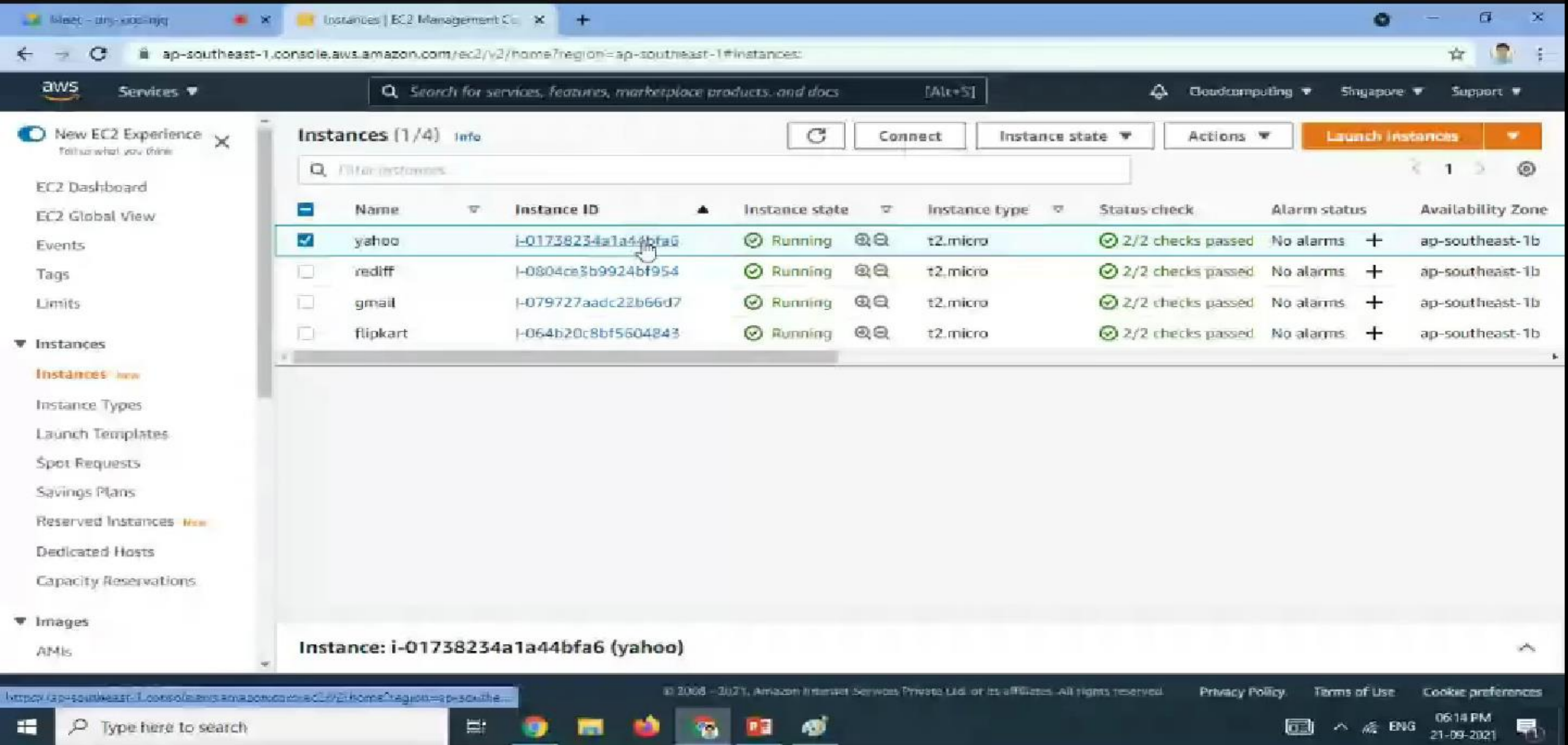
- Use Amazon Machine Images (AMIs)
- Add or terminate instances as needed
- Pause and resume your instances



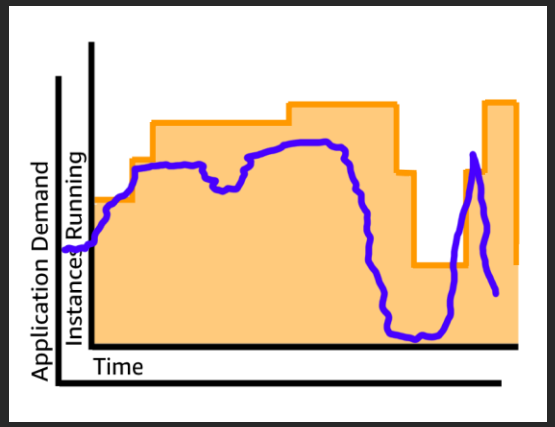
Template for
- Storage volumes
- Launch permissions
- A block device mapping

Examples
- ✓ Application server
- ✓ Web server
- ✓ Database server
- ✓ Game server
- ✓ Mail server
- ✓ Media server
- ✓ Catalog server
- ✓ File server

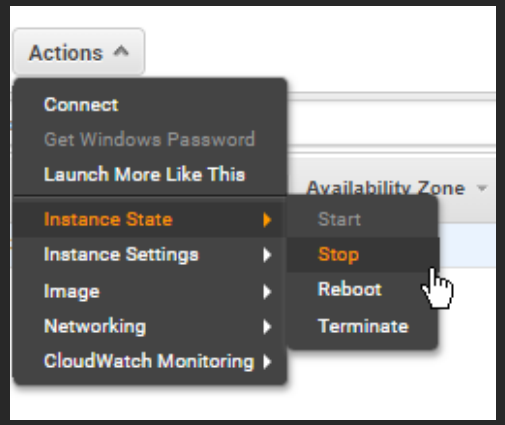
Creating different instances



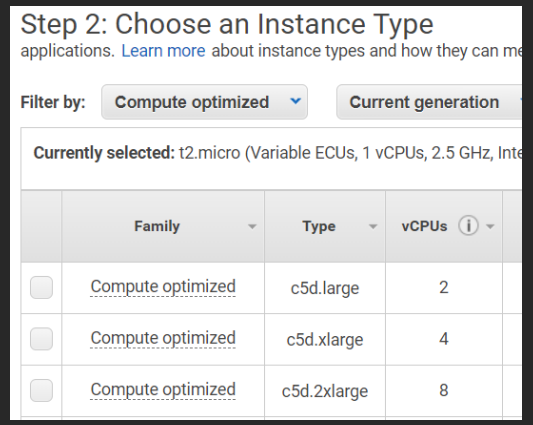
Benefits of Amazon EC2



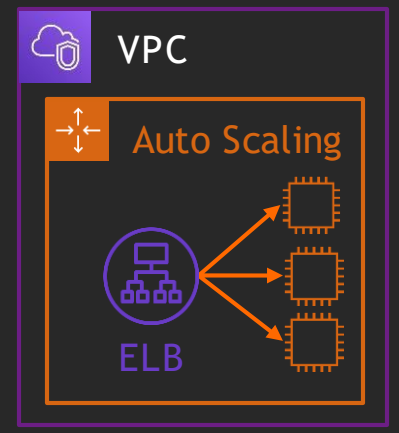
Elasticity



Control

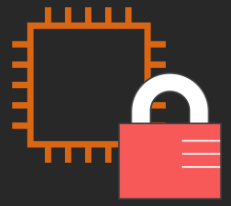


Flexibility



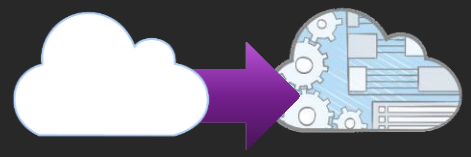
Integrated

Reliable



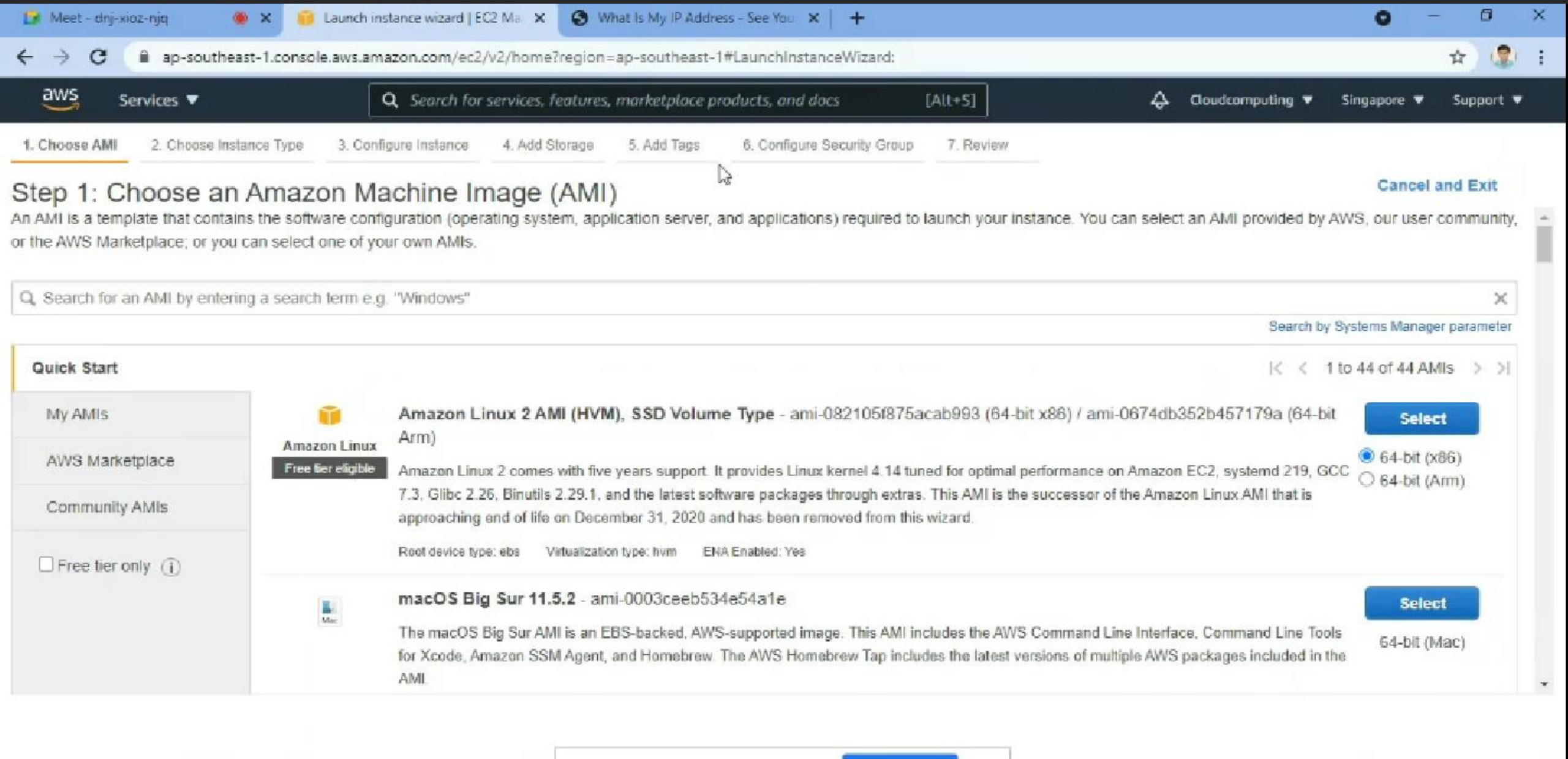
Secure

Inexpensive



Easy

Choosing instances according our need



Amazon EC2 pricing

On-Demand Instances

Reserved Instances

Savings Plans

Spot Instances

- Per-second billing (Amazon Linux and Ubuntu only)
- Per-hour billing (all other OS)

We can buy instance type according to our need

ose AMI | 2. Choose Instance Type | 3. Configure Instance | 4. Add Storage | 5. Add Tags | 6. Configure Security Group | 7. Review

2: Choose an Instance Type

ntly selected: t3.micro (- ECUs, 2 vCPUs, 2.5 GHz, -, 1 GiB memory, EBS only)

Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
t2	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
t2	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
t2	t2.small	1	2	EBS only	-	Low to Moderate	Yes
t2	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
t2	t2.large	2	8	EBS only	-	Low to Moderate	Yes
t2	t2.xlarge	4	16	EBS only	-	Moderate	Yes
t2	t2.2xlarge	8	32	EBS only	-	Moderate	Yes

Cancel | Previous | Review and Launch | Next: Configure Instance Details

Billing And Cost Management Dashboard

EC2 Elastic Beanstalk S3 DynamoDB AWS Auto Scaling Amazon WorkMail Amazon WorkDocs Route 53

Billing & Cost Management Dashboard

Spend Summary

Cost Explorer

Welcome to the AWS Account Billing console. Your last month and month-to-date costs appear below.

Current month-to-date balance for December 2021, the exchange rate for the Payment Currency is estimated.

0.00 USD which converts to

0.00 INR

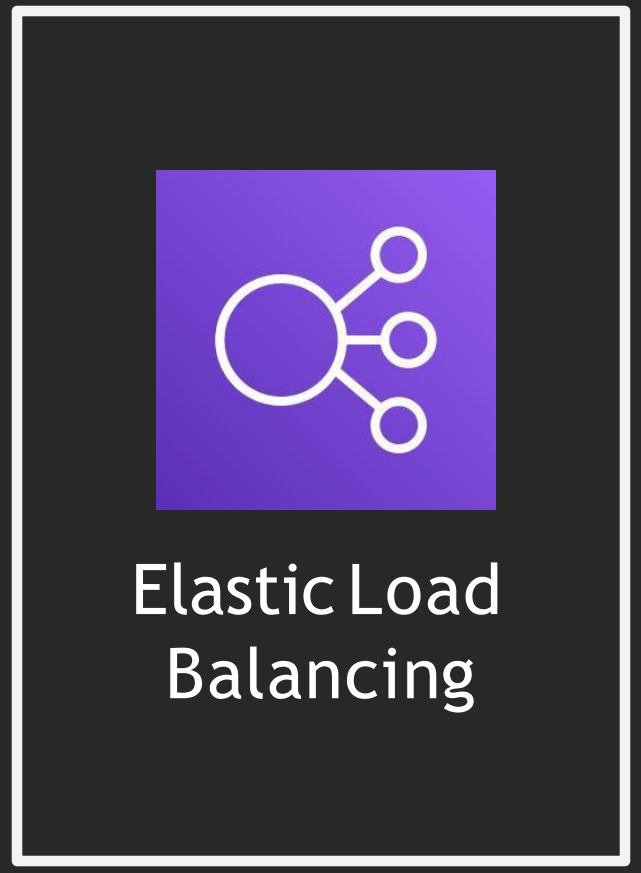
at today's exchange rate of 76.19

Month-to-Date Spend by Service

Bill Details

The chart below shows the proportion of costs spent for each service you use.

Elastic Load Balancing (ELB)

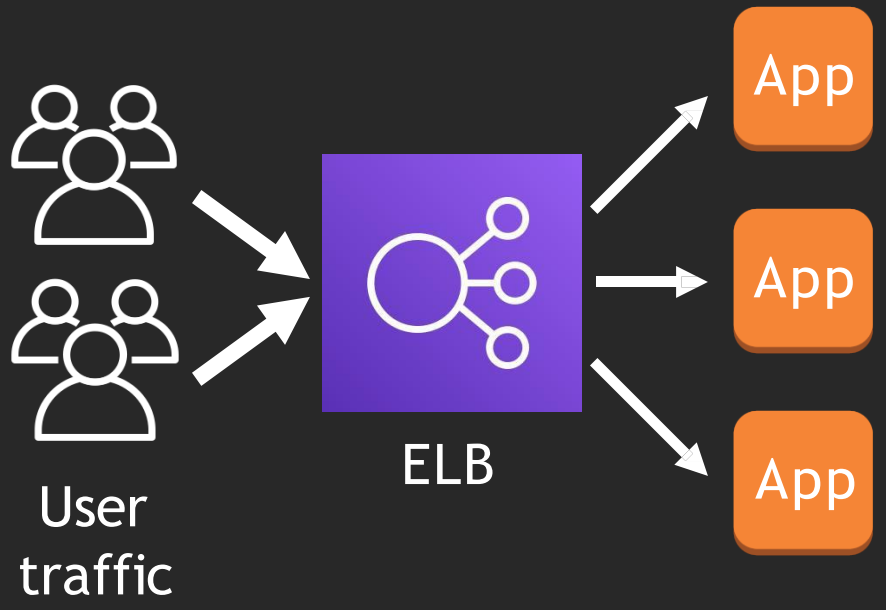


A managed load balancing service that distributes incoming application traffic across multiple Amazon EC2 instances, containers, and IP addresses.

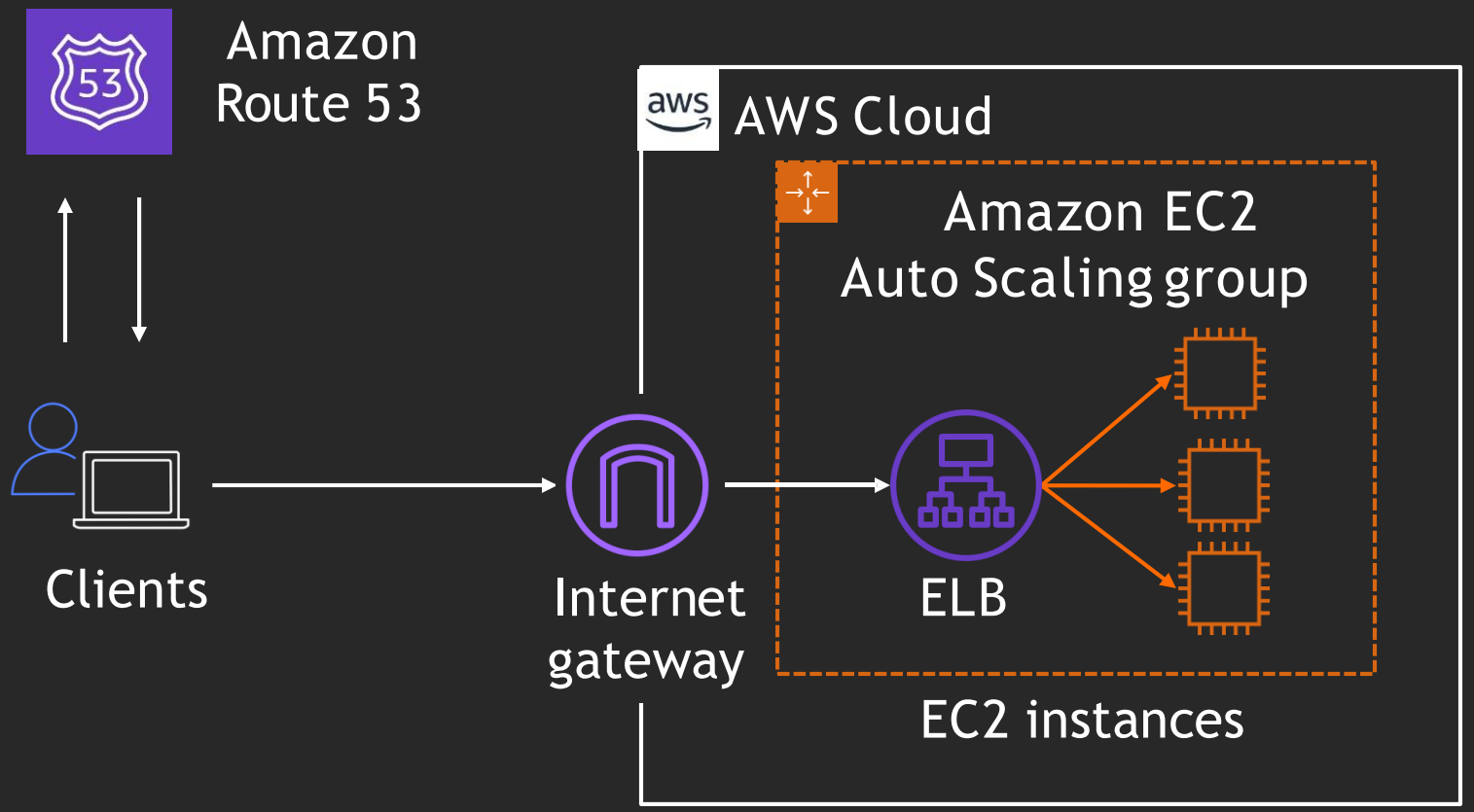
High availability

Health checks

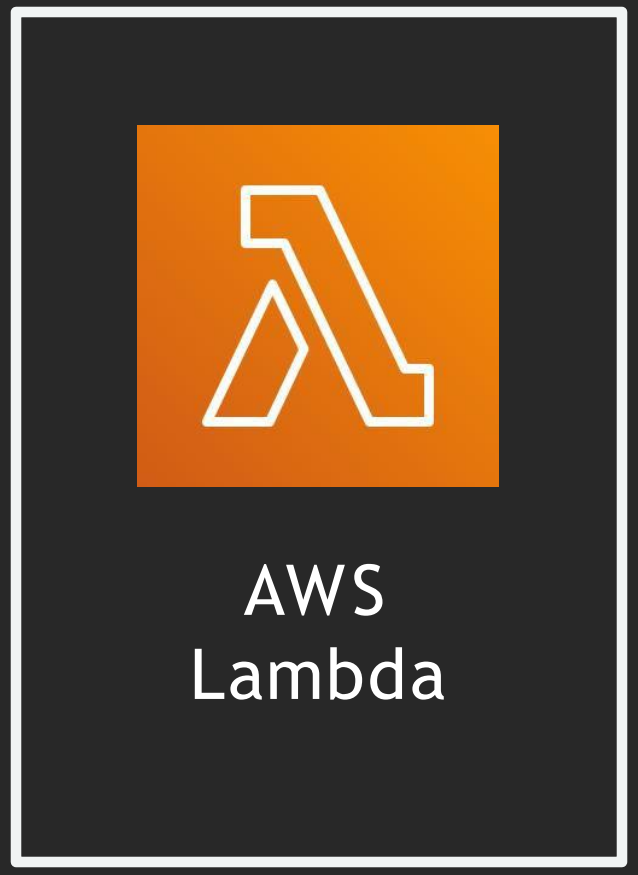
Security features



Putting it all together



AWS Lambda



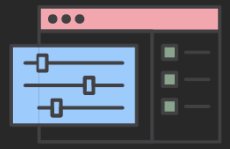
- Fully managed compute service
- Runs stateless code
- Supports multiple languages
- Runs your code on a schedule or in response to events (e.g., changes to data in an Amazon S3 bucket or Amazon DynamoDB table)

Amazon S3

Amazon
S3

Object-level storage

Designed for 99.999999999% durability



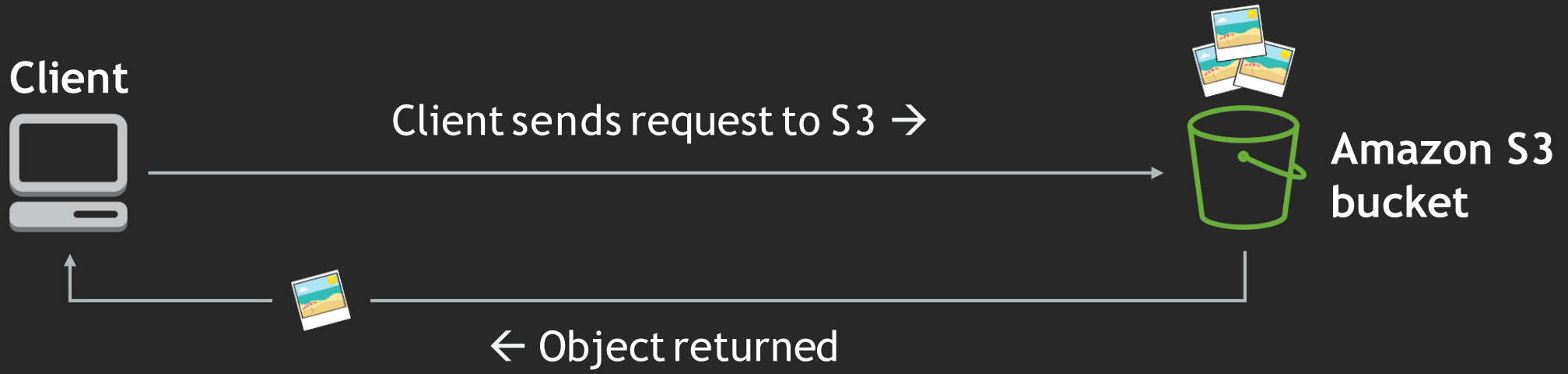
Event triggers

Use cases

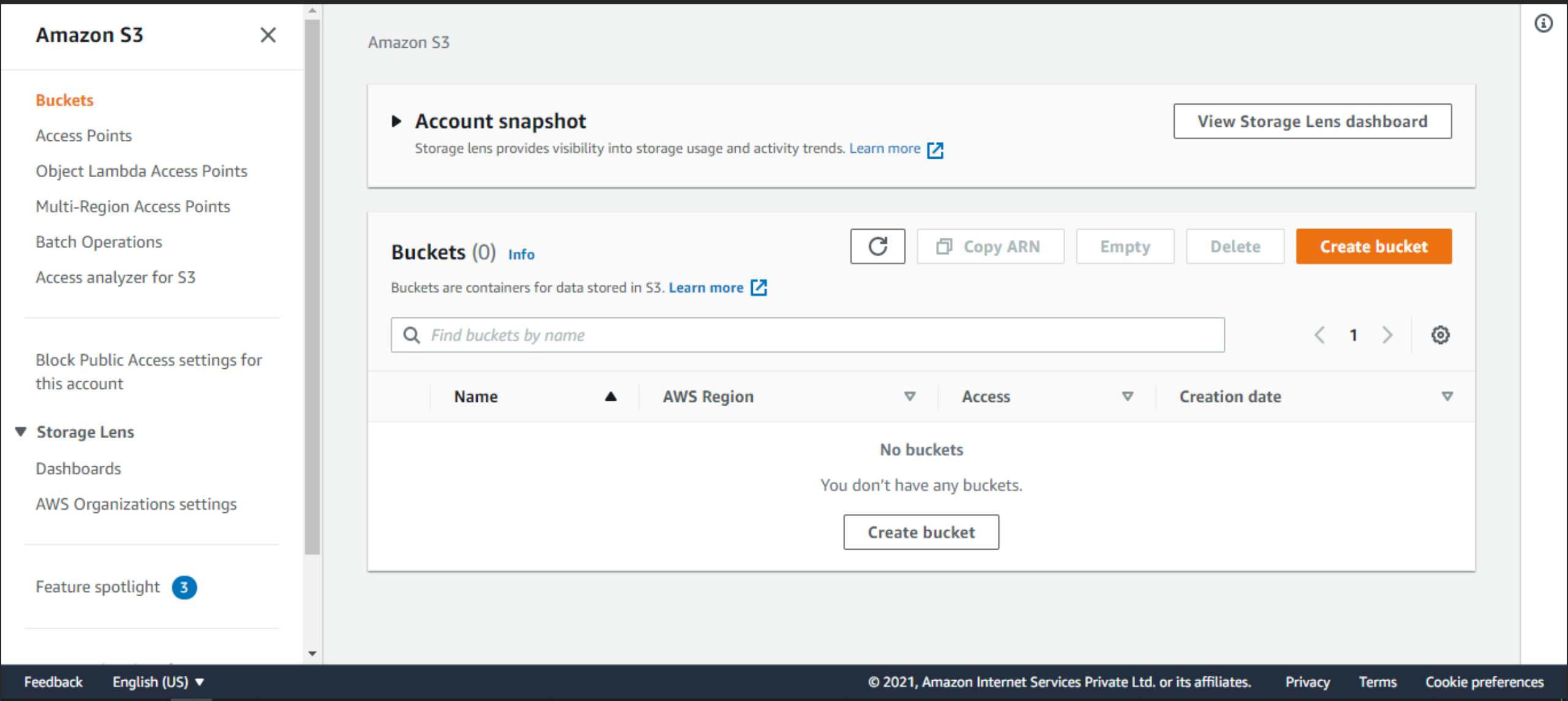
- Content storage and distribution
- Backup and archiving
- Big data analytics
- Disaster recovery
- Static website hosting

Amazon S3

- Built to **store and retrieve** data
- Fast, durable, **highly available access** to objects
- Can store an **unlimited number of objects** in a bucket
- Store and retrieve data at any time, from **anywhere on the web**



Creating S3 storage



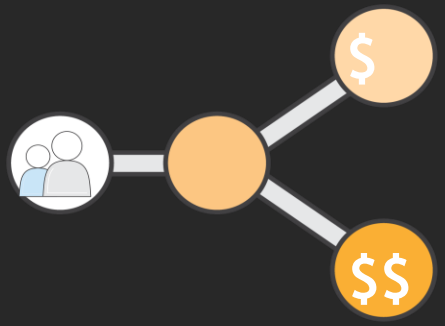
Choosing a Region

Data residency regulatory compliance

Are there relevant Region data privacy laws?

Can customer data be stored outside the country?

Proximity of users to data



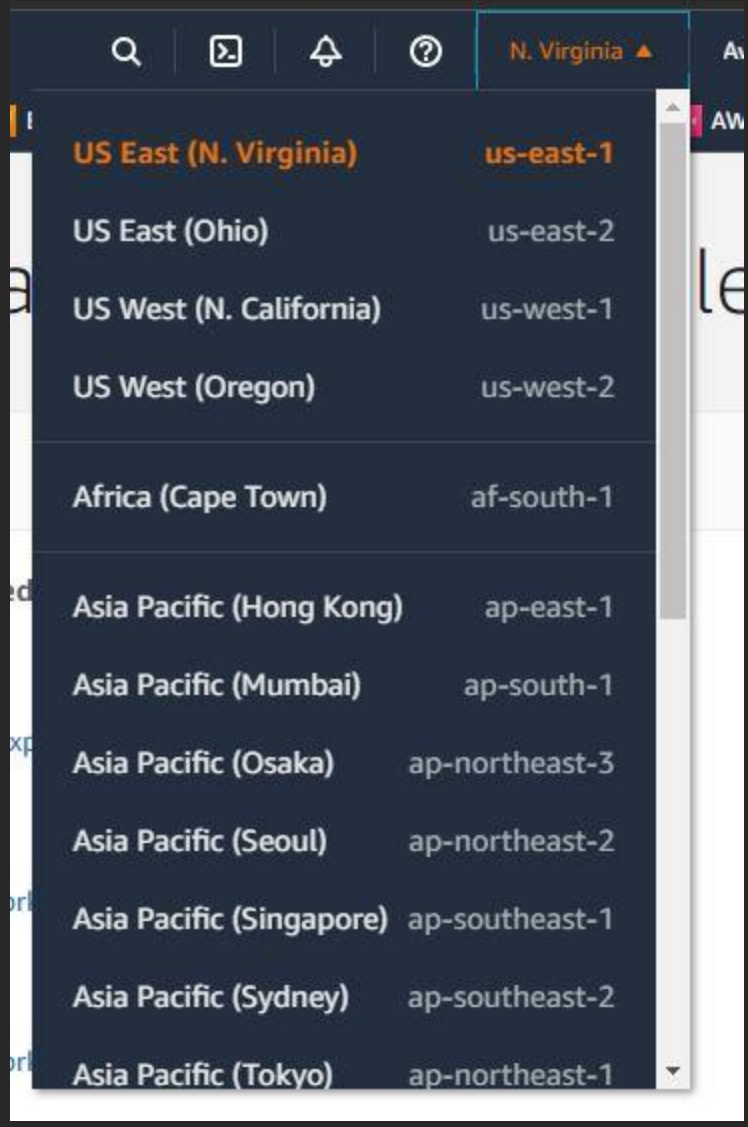
Small differences in latency can impact customer experience

Choose the Region closest to your users

Cost-effectiveness

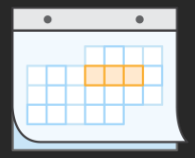
Costs vary by Region

Evaluate cost-effectiveness of replicating data to another Region



Amazon S3 Glacier

Amazon
S3 Glacier



Long-term
data storage

Archival &
backup

Very low-cost
storage

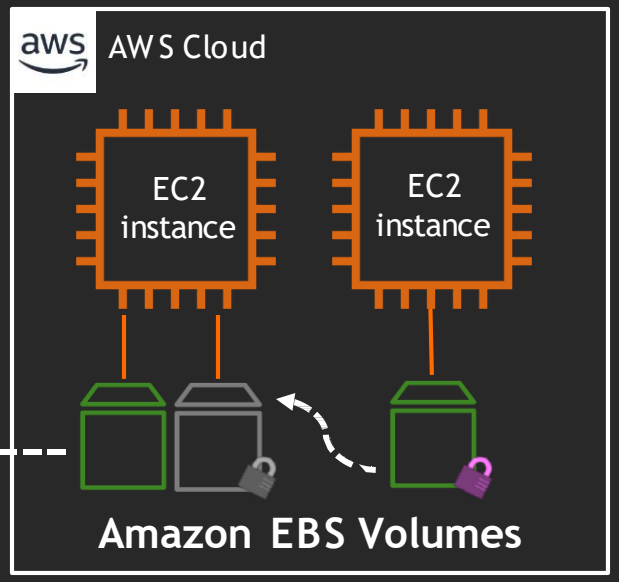
Use cases

- Media asset workflows
- Healthcare information archiving
- Regulatory and compliance archiving
- Scientific data storage
- Digital preservation
- Magnetic tape replacement

Amazon Elastic Block Store (Amazon EBS)

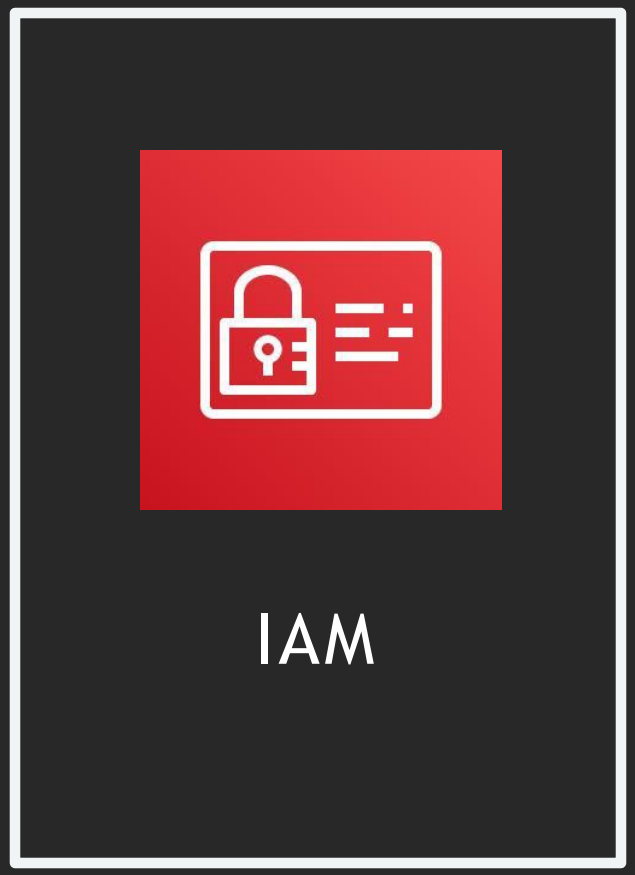
- Persistent block storage for instances
- Protected through replication
- Different drive types
- Scale up or down in minutes
- Pay for only what you provision
- Snapshot functionality
- Encryption available

Create volume snapshots for backup and recovery



Detach and reattach volumes to other EC2 instances

AWS Identity and Access Management (IAM)



- Securely control access to your AWS resources
- Assign granular permissions to users, groups, or roles
- Share temporary access to your AWS account
- Federate users in your corporate network or with an internet identity provider

IAM components

Create

Users
A person or application that interacts with AWS

Groups
Collection of users with identical permissions

Roles
Temporary privileges that an entity can assume

Permissions Policies

IAM

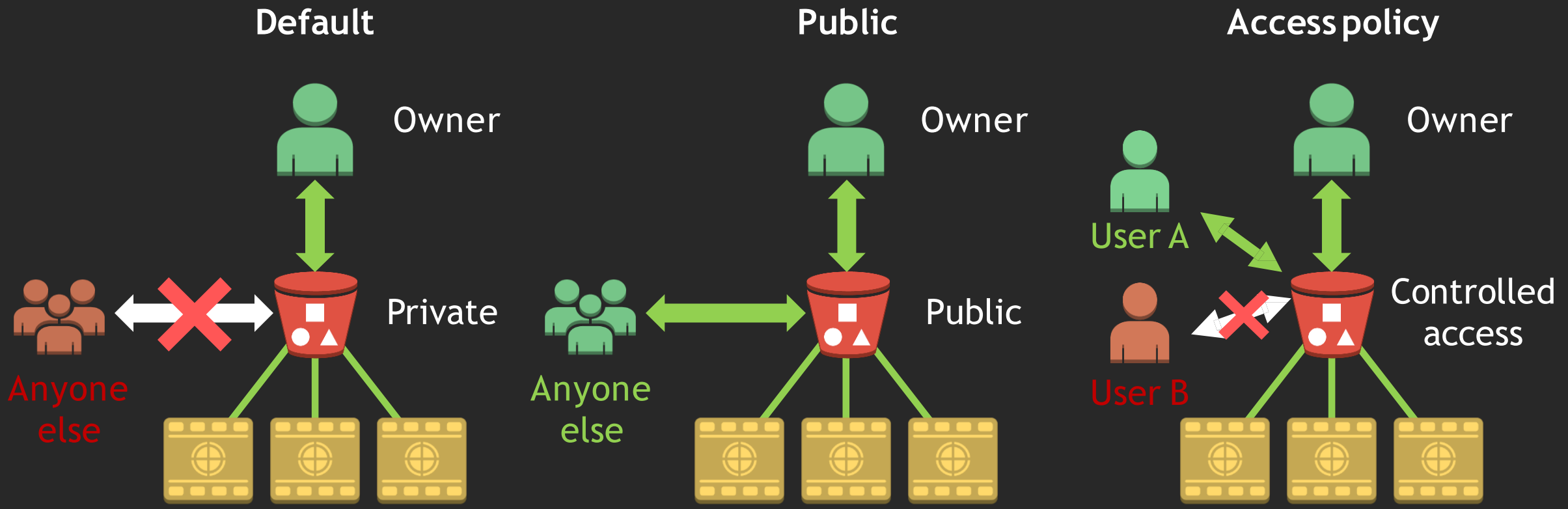
Defines permissions to control which AWS resources users can access

Helps you to meet identity and access control standards

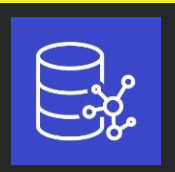
- Authentication
- Authorization

Amazon S3 access control: General

Some services support resource-based policies, such as S3 bucket policies



AWS database options

	SQL	NoSQL
Transactional databases	 Amazon RDS	 Amazon DynamoDB
Data analytics or relationships	 Amazon Redshift	 Amazon Neptune
In-memory data store and cache		 Amazon ElastiCache

Creating Database using MariaDB

root@ip-172-31-21-179:/var/www/html

```
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [employee]> select * from emp_info;
+--------+---------------+--------------+--------------+-----------------------------------+------------+
| emp_id | emp_name      | emp_username | emp_password | emp_email                         | emp_phone  |
+--------+---------------+--------------+--------------+-----------------------------------+------------+
|   1212 | advait prakash | advait       | qwerty       | advait@gmail.com                  | 9999999999 |
|      0 | Aman Verma    | Aman         | 1234         | amanverma3519@gmail.com           | 6393227209 |
|   2323 | Munendra Kumar | munendra     | Richa@1234   | munedrakumar202134@gmail.com      | 9528245097 |
|  64938 | Arvind kumar  | Verma        | 2227         | arvindkumarverma2289@gmail.com    | 8795470006 |
|      2 | Ashwani       | Ashwani      | 123          | ash1imaurya@gmail.com             | 9119943010 |
+--------+---------------+--------------+--------------+-----------------------------------+------------+
5 rows in set (0.000 sec)

MariaDB [employee]> select * from emp_info;
+--------+---------------+--------------+--------------+-----------------------------------+------------+
| emp_id | emp_name      | emp_username | emp_password | emp_email                         | emp_phone  |
+--------+---------------+--------------+--------------+-----------------------------------+------------+
|   1212 | advait prakash | advait       | qwerty       | advait@gmail.com                  | 9999999999 |
|      0 | Aman Verma    | Aman         | 1234         | amanverma3519@gmail.com           | 6393227209 |
|   2323 | Munendra Kumar | munendra     | Richa@1234   | munedrakumar202134@gmail.com      | 9528245097 |
|  64938 | Arvind kumar  | Verma        | 2227         | arvindkumarverma2289@gmail.com    | 8795470006 |
|      2 | Ashwani       | Ashwani      | 123          | ash1imaurya@gmail.com             | 9119943010 |
+--------+---------------+--------------+--------------+-----------------------------------+------------+
5 rows in set (0.000 sec)

MariaDB [employee]>
```

Thank you!