

AWS Basic – Project Work

Project Scope : EC2, EBS, DLM ,VPC, AMI, SNS, EIP, ENI, CFN, RDS, S3, IAM, Lambda, Cloud Watch, CLI, VPC PEERING, ELB, ASG,

□ What is Cloud Computing :

A simple definition of cloud computing involves delivering different types of services over the Internet. From software and analytics to secure and safe data storage and networking resources, everything can be delivered via the cloud. For businesses, cloud computing means improved collaboration and productivity, as well as significant cost reductions. It means better data protection, improved availability, and expanded access to cutting-edge technologies.

➤ Five Characteristics of Cloud Computing :

There are five defining characteristics of cloud computing:

1. **On-Demand self-service**: You can use it whenever you need it and pay per use. Think of it like electricity. In essence, the cloud is a form of utility computing. You create an account or pick your provider, and your services will be available to you anytime. You are billed at the end of the month only for what you used. This form of storing and accessing your data gives you full control over your resource usage and spending.
2. **Broad network access**: You must be able to access from across the web using any device with internet connectivity. Wherever you are, your cloud data will be accessible through web browsers, as well as on laptop or mobile devices. The reason for this is the fact its underlying infrastructure includes servers on multiple locations.
3. **Resource pooling**: Multiple tenants can share the same space and resources can be assigned, re-assigned, and distributed as needed. You can be anywhere in the world and still have the equal access as everyone else; provided you have internet access.
4. **Rapid elasticity**: Cloud can grow and shrink as much as possible without affecting any of its users or their information. For example, if your business is experiencing peak traffic, the cloud can expand to accommodate all the new requests.
5. **Measured service**: You can examine how often people are using the cloud. Many cloud service providers utilize a pay-as-you-go model to ensure that their clients are getting what they pay for, no more and no less. Once again, this can be compared to electricity as you get billed for the amount that you use.

➤ Type of cloud computing :

1. **Public Cloud**: Public cloud services are best for development systems and web servers. Your cloud computing provider will give you a slice of their digital space that they must share with other tenants. These types of clouds are cost efficient since a pay-as-you-go model operates most. You pay for the number of hours you need to use the cloud and can exit whenever you complete your work. There are no obligations that require you to pay more than you need.

2. **Private Cloud:** Private clouds offer what their name suggests: privacy. You do not have to share your digital space with anyone else. Private cloud platforms are typically built in-house, and they belong to you and your business. They can also be configured in a third-party data center and still provide the advanced level of privacy. Larger organizations and clients who are concerned about security favor private clouds. The reason for this is primarily the fact that these clouds offer more defense than their public counterparts. Companies who need to protect sensitive information like customer data rely on private clouds. If you are using a private cloud, you know who has access to the data, you know if anyone made changes, and you know what to do in case of an emergency. You have full control over what happens to the cloud and don't have to worry about some third party vendor making changes that would negatively affect you. A firewall protects everything in your cloud from outsiders.
3. **Hybrid Clouds :** Hybrid clouds are the best of both worlds. If you are using a hybrid cloud, you can control an internal database and use the public cloud when needed. There might be times when you will need to move data and applications from the private cloud to the public cloud such as scheduled maintenance, blackouts, and natural disasters. The ability to seamlessly migrate information is perfect for cloud disaster recovery solutions and preventing data loss. The flexibility of hybrid clouds is excellent for scaling as any overflow can regulate in the public cloud. Furthermore, you can keep all non-sensitive tasks in the public cloud while safeguarding the essential data in the private cloud. Regardless of how large your company is or what industry it serves, there will always be a cloud solution that fits your needs the best. Take the time to compare the advantages and disadvantages of each kind before deciding.

Benefits of Cloud Computing:

The examples mentioned above are just the tip of the iceberg. Cloud computing has so many uses that it seems almost impossible to count them all. Every company can find a use for cloud services one way or another.

1. **ALWAYS-ON AVAILABLE STORAGE:** Once again, the cloud provides an easy way to hold all your necessary data. You can rent cloud storage at a low price and scale it according to your demands. You no longer have to use an external hard drive or build an in-house data center.
2. **DISASTER RECOVERY SOLUTIONS:** You need data protection when catastrophe strikes. Preventing as much data loss as possible is critical regarding time, money, and efficiency. Cloud provides a much faster, and cost-effective disaster recovery than traditional solutions could ever offer. Sometimes, the best way to deal with a tragedy is to prepare for it beforehand. You should always consider any worst-case scenarios since most catastrophic events are unplanned. Before cloud computing, you would have to distribute and collect various tapes and drives and then transfer the data to a central location. Now, you can just click a few buttons and have it done for you.

3. COST SAVINGS: You no longer need to buy a ton of external hard drives to keep your critical information. Companies can save up to 43% annually by migrating virtualized operating system instances in the cloud. In addition to that, the cloud gives you access to professional staff, advanced security systems, and cutting-edge hardware and software, which adds up to the projected savings. Cloud service providers that utilize a pay-as-you-go model are especially useful since you will never have to spend money on services that you are not using. Compare this to a monthly subscription service where you must pay to apply for the entire month regardless of how often you use it. If you use a monthly subscription service for only two weeks, you will get half of your money's worth.

4. CONSISTENT UPDATES : The software is continuously being improved to increase security, efficiency, speed, capability, and reliability. On the other hand, updated hardware would require you purchasing a new device to enjoy the recent improvements. Software updates are consistent and usually don't need any extra costs.

5. BUSINESS CONTINUITY: Ensuring business operability in case of a disaster is a significant challenge for most organizations. However, when a single minute of downtime can cost you more than implementing a backup and disaster recovery solution, business continuity management becomes a priority. The cloud offers disaster recovery and business continuity solutions. You can rely on it to keep your data and applications active even if a disaster physically strikes your business. With a solid business continuity plan and right cloud solutions, you can minimize the effects of potential disruptions.

6. IMPROVED COLLABORATION: People can work together more efficiently and efficiently than ever before. Who needs to book a conference room or take an international flight when large groups of people from all over the world can merely meet over a Skype call? Nobody needs to print out copies of the latest report since they can all access it from the cloud. You might work for a large international company with locations across the world. Whether your offices are in India, China, Australia, Ireland, Brazil, or America, every employee has the same access to relevant information via cloud technology. Plus, you can utilize cloud solutions by merely opening your phone. How convenient is that? Cloud collaboration tools offer important advantages to employees. They can make use of file versioning or real-time editing any time. They can access data, applications, and services remotely from any device. All that boosts their productivity and, eventually, company's profits.

7. INCREASED CAPACITY: You no longer need to guess if you will have enough ability to build or destroy an application. Clouds can adjust upwards and downwards depending on what your business needs. The flexibility ensures that you will always be able to utilize cloud services regardless of what your business is doing.

8. PERFORMANCE AND SPEED : The cloud commodities enterprise-grade technology, making it available to smaller companies as well. This form of utility computing makes emerging technologies available to businesses at an affordable price point. You can access high-performance hardware and software to improve your operations.

9. **DATA SECURITY** : Keep your data secure and make sure that it does not fall into the wrong hands. Cloud backups are an ideal solution to ensure business continuity and always-on availability of your files. All clouds offer some degree of encryption, deterrent, and compliance, but private clouds remain the most secure from outsiders. Even so, you must beware of internal attacks.

➤ **Types of Cloud Services :**

Cloud services are as varied as the types of clouds themselves. You can purchase three different kinds of cloud services:

1. **Infrastructure as a service (IaaS)** : Saves you money on buying physical data centers or servers. You pay as you go and only pay for as long as you need or use the service. IaaS allows you to adjust your scale depending on your demand quickly.
2. **Platform as a service (PaaS)** : PAAS has everything you need for your business applications. It comes complete with infrastructures such as networking, online storage, and servers, as well as database management systems, development tools, and more. PaaS is designed to help create, test, develop, and update your application.
3. **Software as a service (SaaS)** : SAAS is what you get whenever you download a new app for your phone. Companies create and develop their software and then lend it out to buyers. Businesses such as Autodesk, Lending Club, Microsoft, and IBM all generate revenue from SaaS. Figure out which service is best for you and your company. Cloud platforms are so diverse that it would be impossible to find a solution that didn't fit your needs.



Amazon Elastic Compute Cloud (Amazon EC2) provides scalable computing capacity in the Amazon Web Services (AWS) cloud. Using Amazon EC2 eliminates your need to invest in hardware up front, so you can develop and deploy applications faster. You can use Amazon EC2 to launch as many or as few virtual servers as you need, configure security and networking, and manage storage. Amazon EC2 enables you to scale up or down to handle changes in requirements or spikes in popularity, reducing your need to forecast traffic. For more information about cloud computing.

Amazon EC2 provides the following purchasing options for instances:

1. **On-Demand Instances** : Pay for the instances that you use by the second, with no long-term commitments or upfront payments.

2. **Savings Plans:** You can reduce your Amazon EC2 costs by making a commitment to a consistent amount of usage, in USD per hour, for a term of 1 or 3 years.
3. **Reserved Instances** You can reduce your Amazon EC2 costs by making a commitment to a specific instance configuration, including instance type and Region, for a term of 1 or 3 years.
4. **Spot Instances:** Request unused EC2 instances, which can reduce your Amazon EC2 costs significantly. For a complete list of charges and prices for Amazon EC2, see Amazon EC2 Pricing. To calculate the cost of a sample provisioned environment.

➤ INSTANCE

An instance is a virtual server in the cloud. Its configuration at launch is a copy of the AMI that you specified when you launched the instance. You can launch different types of instances from a single AMI. An instance type essentially determines the hardware of the host computer used for your instance. Each instance type offers different compute and memory capabilities. Select an instance type based on the amount of memory and computing power that you need for the application or software that you plan to run on the instance. For more information about the hardware specifications for each Amazon EC2 instance type.

• **Project Task:**

1. Go to EC2 Dashboard there is a option for launching instance there is several option for choices like Linux, Ubuntu ,Windows. I selected Linux instance which is free tier eligible

The screenshot shows the 'Choose AMI' step in the Amazon EC2 console. Two AMIs are listed: 'Microsoft Windows Server 2012 R2 Standard edition' and 'Amazon Linux 2 with .NET Core, PowerShell, Mono, and MATE Desktop Environment'. The Linux AMI is selected and highlighted with a blue 'Select' button. Both AMIs are marked as 'Free tier eligible'.

2. There is a option for which kind of Server you want to prefer I prefer T2.micro for free tier.

| | | | | | | | | |
|-------------------------------------|-----------------|--------------------------------|---|---|----------|---|-----------------|-----|
| <input checked="" type="checkbox"/> | General purpose | T2.micro Free tier eligible | 1 | 1 | EBS only | - | Low to Moderate | Yes |
|-------------------------------------|-----------------|--------------------------------|---|---|----------|---|-----------------|-----|

3. After that there is a option for selecting VPC and subnet and there is a option for selecting auto assign public IP and if my VPC and Subnet is supporting IPV6 then there is a option for selecting auto assign IPV6.

The screenshot shows the 'Step 3: Configure Instance Details' page. The 'Number of Instances' is set to 1. The 'Purchasing option' is 'On-Demand'. The 'Network' section shows 'VPC_A' and 'Front_end_subnet_VF' selected. The 'Auto-assign Public IP' and 'Auto-assign IPv6 IP' options are both set to 'Enable'.

- Further, we have a option for selecting Storage or an extra volume which is apart from root storage that's called as EBS(Elastic Block Storage)..we will discuss about it in further.

| Volume Type ⁱ | Device ⁱ | Snapshot ⁱ | Size (GiB) ⁱ | Volume Type ⁱ | IOPS ⁱ | Throughput (MB/s) ⁱ | Delete on Termination ⁱ | Encryption ⁱ |
|--------------------------|---------------------|------------------------|-------------------------|---------------------------|-------------------|--------------------------------|-------------------------------------|-------------------------|
| Root | /dev/xvda | snap-03cccc498b5d7b893 | 8 | General Purpose SSD (gp2) | 100 / 3000 | N/A | <input checked="" type="checkbox"/> | Not Encrypt |
| EBS | /dev/sdb | Search (case-insensit | 5 | General Purpose SSD (gp2) | 100 / 3000 | N/A | <input type="checkbox"/> | Not Encrypt |

Add New Volume

- Next step is adding tag or adding name for the server which I have to create.

| Key ⁱ (128 characters maximum) | Value ⁱ (256 characters maximum) | Instances ⁱ | Volumes ⁱ |
|---|---|-------------------------------------|-------------------------------------|
| Name | Front_end_server | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

Add another tag (Up to 50 tags maximum)

- Next step is very important step it's a security of a server means which port can be accessible its like SSH,HTTP,HTTPS,ICMP,MYSQL and so on. This is define the the security of the server. After that we can launch an instance.

Assign a security group: ☒ Create a new security group
☐ Select an existing security group

Security group name: launch-wizard-2
Description: launch-wizard-2 created 2020-07-08T22:58:28.290+05:30

| Type ⁱ | Protocol ⁱ | Port Range ⁱ | Source ⁱ | Description ⁱ |
|-------------------|-----------------------|-------------------------|-----------------------------------|----------------------------|
| SSH | TCP | 22 | Custom 0.0.0.0/0 | e.g. SSH for Admin Desktop |
| HTTP | TCP | 80 | Custom 0.0.0.0/0, ::/0 | e.g. SSH for Admin Desktop |
| MYSQL/Auror | TCP | 3306 | Custom CIDR, IP or Security Group | e.g. SSH for Admin Desktop |



- Amazon Elastic Block Store (EBS) is an easy to use, high performance block storage service designed for use with Amazon Elastic Compute Cloud (EC2) for both throughput and transaction intensive workloads at any scale. A broad range of workloads, such as relational and non-relational databases, enterprise applications, containerized applications, big data analytics engines, file systems, and media workflows are widely deployed on Amazon EBS. Designed for mission-critical systems, EBS volumes are replicated within an Availability Zone (AZ) and can easily scale to peta bytes of data. Also, you can use EBS Snapshots with automated lifecycle policies to back up your volumes in Amazon S3, while ensuring geographic protection of your data and business continuity.
- Project Task:**
 - First goto EC2 Dashboard there is a option for elastic block storage three options are there volume snapshot and lifecycle manager in this case I created a volume and attached to the instance which I made in the following steps,

2. I selected general purpose SSD(gp2). This storage is depending upon AZ if my instance is in AZ (C) then volume should be in the same AZ. take a 5GB storage and attached it to my instance.

Create Volume

Volume Type General Purpose SSD (gp2) ⓘ

Size (GiB) 5 (Min: 1 GiB, Max: 16384 GiB) ⓘ

IOPS 100 / 3000 (Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS) ⓘ

Availability Zone* us-east-2c ⓘ

- 3 After that my volume is ready and its in available state now I can attach this volume to my instance in the same AZ, by attaching this volume I need to goto attach option and attach it to my concerned EC2.

Volume ⓘ vol-0eefcefe3904c9a69 in us-east-2c

Instance ⓘ i-0ae9e67a43c24726d in us-east-2c

Device ⓘ /dev/sdg

Linux Devices: /dev/sdf through /dev/sdp



- Amazon Data Lifecycle Manager (DLM) for EBS Snapshots provides a simple, automated way to back up data stored on Amazon EBS volumes. You can define backup and retention schedules for EBS snapshots by creating lifecycle policies based on tags. With this feature, you no longer have to rely on custom scripts to create and manage your backups. To get started, tag your EBS volumes and start creating lifecycle policies via Amazon Data Lifecycle Manager. You may call the new APIs using the AWS Command Line Interface (CLI) tool or set policies via the AWS console. Alternatively, download the latest AWS Tools for Windows Power Shell or AWS SDK and call the APIs.
- **Project Task:**
 1. I created a 5GB gp2 storage and I attached it to my frontend EC2 in OHIO region and I want to take a back up in different vpc in US-EAST-1 region at the time of night 12:00 AM IST mean 6:30 UTC. and I select 3 recent backup in place.

Create Snapshot Lifecycle Policy

Data Lifecycle Manager for EBS Snapshots will help you automate the creation and deletion of EBS snapshots based on a schedule. Volumes are targeted by tags.

Description* ⓘ

Select resource type ☒ Volume
☐ Instance

Target with these tags This policy will be applied to EBS volumes with any of the following tags.

* ⓘ

Lifecycle Policy Tags

| Key (128 characters maximum) | Value (256 characters maximum) |
|-----------------------------------|----------------------------------|
| <input type="text" value="name"/> | <input type="text" value="DLM"/> |

49 remaining (Up to 50 tags maximum)

Policy Schedule

Schedule name* ⓘ

Frequency ⓘ

Every Hours

Starting at UTC



- Amazon Virtual Private Cloud (Amazon VPC) lets you provision a logically isolated section of the AWS Cloud where you can launch AWS resources in a virtual network that you define. You have complete control over your virtual networking environment, including selection of your own IP address range, creation of subnets, and configuration of route tables and network gateways. You can use both IPv4 and IPv6 in your VPC for secure and easy access to resources and applications. You can easily customize the network configuration of your Amazon VPC. For example, you can create a public-facing subnet for your web servers that have access to the internet. You can also place your backend systems, such as databases or application servers, in a private-facing subnet with no internet access. You can use multiple layers of security, including security groups and network access control lists, to help control access to Amazon EC2 instances in each subnet.
- A VPC spans all of the Availability Zones in the Region. After creating a VPC, you can add one or more subnets in each Availability Zone. You can optionally add subnets in a Local Zone, which is an AWS infrastructure deployment that places compute, storage, database, and other select services closer to your end users. A Local Zone enables your end users to run applications that require single-digit millisecond latencies. For information about the Regions that support Local Zones, see Available Regions in the Amazon EC2 User Guide for Linux Instances. When you create a subnet, you specify the CIDR block for the subnet, which is a subset of the VPC CIDR block. Each subnet must reside entirely within one Availability Zone and cannot span zones. Availability Zones are distinct locations that are engineered to be isolated from failures in other Availability Zones. By launching instances in separate Availability Zones, you can protect your applications from the failure of a single location. We assign a unique ID to each subnet.

- You can also optionally assign an IPv6 CIDR block to your VPC, and assign IPv6 CIDR blocks to your subnets.
- The following diagram shows a VPC that has been configured with subnets in multiple Availability Zones. 1A, 2A, and 3A are instances in your VPC. An IPv6 CIDR block is associated with the VPC, and an IPv6 CIDR block is associated with subnet 1. An internet gateway enables communication over the internet, and a virtual private network (VPN) connection enables communication with your corporate network.
- Use **route tables** to control where network traffic is directed. The following topics describe routing for specific gateways or connections in your VPC. Options Routing to an internet gateway You can make a subnet a public subnet by adding.
- Enable access to the Internet from your VPC by attaching an **internet gateway**. An internet gateway serves two purposes: to provide a target in your VPC route tables for internet-routable traffic, and to perform network address translation (NAT) for instances that have been assigned public IPv4 addresses.
- **Project Task:**

1. I Created two custom vpc in the same region called VPC_A and VPC_B with the respective CIDR Block 10.0.0.0/16 and 10.1.0.0/16 and give a amazon provided IPV6 block

Create VPC

A VPC is an isolated portion of the AWS cloud populated by AWS objects, such as Amazon EC2 instances. You must specify an IPv4 CIDR block larger than /16. You can optionally associate an IPv6 CIDR block with the VPC.

Name tag: VPC_A

IPv4 CIDR block*: 10.0.0.0/16

IPv6 CIDR block: ☒ No IPv6 CIDR Block ☒ Amazon provided IPv6 CIDR block ☐ IPv6 CIDR owned by me

Tenancy: Default

* Required

Create VPC

A VPC is an isolated portion of the AWS cloud populated by AWS objects, such as Amazon EC2 instances. You must specify an IPv4 CIDR block larger than /16. You can optionally associate an IPv6 CIDR block with the VPC.

Name tag: VPC_B

IPv4 CIDR block*: 10.1.0.0/24

IPv6 CIDR block: ☐ No IPv6 CIDR Block ☒ Amazon provided IPv6 CIDR block ☐ IPv6 CIDR owned by me

Tenancy: Default

* Required

2. In VPC_A I created one subnet named Frontend subnet with the CIDR block of 10.0.0.0/24.(Front_end_subnet_VPC_A) and as the same procedure I created a subnet in VPC_B named Backend subnet (Backend_subnet_VPC_B)

Create subnet

Specify your subnet's IP address block in CIDR format, for example, 10.0.0.0/24. IPv4 block sizes must be between /16 and /30. IPv6 block sizes must be between /64 and /127.

Name tag: Backend_subnet_VPC_B

VPC*: vpc-0a33ade5cc400715

Availability Zone: us-east-2

VPC CIDRs: 10.0.0.0/16, 10.1.0.0/24, 2600:1116:17a:3c00::/56

IPv4 CIDR block*: 10.1.0.0/24

IPv6 CIDR block: Custom IPv6

2600:1116:07a:3c:54::/64

Create subnet

Specify your subnet's IP address block in CIDR format, for example, 10.0.0.0/24. IPv4 block sizes must be between /16 and /30. IPv6 block sizes must be between /64 and /127.

Name tag: Front_end_subnet_VPC_A

VPC*: vpc-08793bd0d625a2de5

Availability Zone: No preference

VPC CIDRs: 10.0.0.0/16, 2600:1116:30c:0a00::/56, 10.1.0.0/24

IPv4 CIDR block*: 10.0.0.0/24

IPv6 CIDR block: Custom IPv6

2600:1116:030c:6a:54::/64

- After completing subnet I create two IGW and associate each to the vpc and then created route table and associate subnet and give a route to IGW.

| | | | | | |
|--------------------------|-----------|-----------------------|----------|-------------------------------|--------------|
| <input type="checkbox"/> | IGW_VPC_B | igw-044bde2a858b25d47 | Attached | vpc-0ae3ade5ecc4007c5 VPC_B | 865498582293 |
| <input type="checkbox"/> | IGW_VPC_A | igw-0874b1bc630cee146 | Attached | vpc-08793bd0d625a2de5 VPC_A | 865498582293 |

- Associate route table to the subnet and IGW.

Edit routes

View: All routes

| Destination | Target |
|-------------------------|-----------------------|
| 10.0.0.0/16 | local |
| 2600:1f16:38c:6a00::/56 | local |
| 0.0.0.0/0 | igw-0874b1bc630cee146 |

Filter by attributes or search by keyword

Subnet ID | IPv4 CIDR | IPv6 CIDR | Current Route Table

| | | | |
|---|-------------|-------------------------|-----------------------|
| subnet-0c0bb655ea39414cd Front_end_subnet_VPC_A | 10.0.0.0/24 | 2600:1f16:38c:6a50::/64 | rtb-035a789385e621f69 |
|---|-------------|-------------------------|-----------------------|

Filter by attributes or search by keyword

Subnet ID | IPv4 CIDR | IPv6 CIDR | Current Route Table

| | | | |
|---|-------------|-------------------------|----------------------|
| subnet-0a07c1e72336de4157 Backend_... | 10.1.0.0/24 | 2600:1f16:77a:3c56::/64 | rtb-095a012dcaaf2791 |
| subnet-04c9c31d03a3b6500 Backend_... | 10.1.1.0/24 | 2600:1f16:77a:3c55::/64 | Main |

| Destination | Target | Status |
|-------------------------|-----------------------|--------|
| 10.1.0.0/16 | local | active |
| 2600:1f16:77a:3c00::/56 | local | active |
| 0.0.0.0/0 | igw-044bde2a858b25d47 | active |

Add route

- As per the same way I created a custom VPC in us-east-1.

Create VPC

VPC is an isolated portion of the AWS cloud populated by AWS objects, such as Amazon EC2 instances. You must specify a VPC ID (CIDR) block, for example, 10.0.0.0/16. You cannot specify an IPv4 CIDR block larger than 10.0.0.0/8.

Name tag: VPC_C

IPv4 CIDR block*: 10.2.0.0/16

IPv6 CIDR block: ☒ Amazon provided IPv6 CIDR block

Tenancy: Default

VPC CIDR

Name tag: VPC_C_Subnet

VPC*: vpc-00b915a7a4d57447f

Availability Zone: No preference

| CIDR | Status |
|--------------------------|------------|
| 10.2.0.0/16 | associated |
| 2600:1f16:23cc:8200::/56 | associated |

IPv4 CIDR block*: 10.2.0.0/24

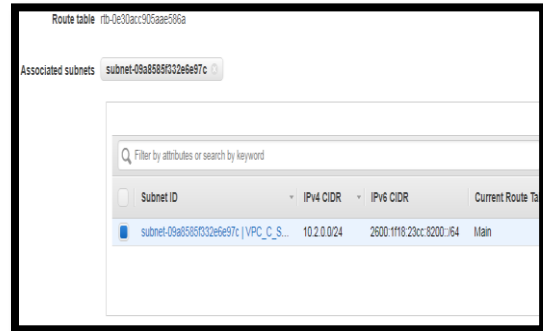
IPv6 CIDR block: Custom IPv6

2600:1f16:23cc:8200::/56

6. Create a IGW and Route table and associate the IGW to the route table for that the vpc will be accessible for publically.

| Destination | Target | Status |
|-------------------------|----------------------------|--------|
| 10.2.0.0/16 | local | active |
| 2600:f1f6:23c::1000::f6 | local | active |
| 0.0.0.0 | igmp::local+IGMPv2::IGMPv2 | active |

Add route



An Amazon Machine Image (AMI) provides the information required to launch an instance. You must specify an AMI when you launch an instance. You can launch multiple instances from a single AMI when you need multiple instances with the same configuration. You can use different AMIs to launch instances when you need instances with different configurations.

An AMI includes the following:

- One or more EBS snapshots, or, for instance-store-backed AMIs, a template for the root volume of the instance (for example, an operating system, an application server, and applications).
- Launch permissions that control which AWS accounts can use the AMI to launch instances.
- A block device mapping that specifies the volumes to attach to the instance when it's launched.

- **Project Task:**

1. I created a AMI as the name of ICSS_Project and make it public this AMI is taken from the front end subnet instance .

Instance ID i-0aebaf7ad3e24f26ed

Region eu-west-1

Image description EC2-AMZ-Projekt

Size selected 0

Instance Volume

| Volume Type | Elastic | Snapshot | Size (GiB) | Volume Type | IOPS (I) | Throughput (MBps) | Delete on Termination | Encrypted |
|-------------|-------------------------------------|--------------------------|------------|-------------------------|--------------|-------------------|-------------------------------------|----------------|
| Standard | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 8 | General Purpose SSD gp2 | 100 I / 3000 | N/A | <input checked="" type="checkbox"/> | Not Encrypted |
| EBDS | <input type="checkbox"/> | <input type="checkbox"/> | 8 | General Purpose SSD gp2 | 100 I / 3000 | N/A | <input type="checkbox"/> | Post Encrypted |

[Add New Volumes](#)

2. When I created a EC2 from cloud formation that instance made in a default VPC for that I used AMI to create a EC2 as the same configuration and put in to my Front_end VPC. Here, server1 is my CFN EC2 and I required same configuration ec2 in my front_end vpc so I used AMI

| Volume Type | Device | Snapshot | Size (GiB) | Volume Type | IOPS | Throughput (MB/s) | Delete on Termination | Encrypted |
|-------------|-----------|------------------------|------------|---------------------------|------------|-------------------|-------------------------------------|--------------------------|
| Root | /dev/xvda | snap-040ce2c3f0d1a8f56 | 8 | General Purpose SSD (gp2) | 100 / 3000 | N/A | <input checked="" type="checkbox"/> | Not Encrypted |
| EBS | /dev/sdb | Search (case-insensit) | 5 | General Purpose SSD (gp2) | 100 / 3000 | N/A | <input type="checkbox"/> | <input type="checkbox"/> |

Add New Volume



- Amazon Simple Notification Service (SNS) is a highly available, durable, secure, fully managed pub/sub messaging service that enables you to decouple microservices, distributed systems, and serverless applications. Amazon SNS provides topics for high-throughput, push-based, many-to-many messaging. Using Amazon SNS topics, your publisher systems can fan out messages to a large number of subscriber endpoints for parallel processing, including [Amazon SQS](#) queues, [AWS Lambda](#) functions, and HTTP/S webhooks. Additionally, SNS can be used to fan out notifications to end users using mobile push, SMS, and email.
 - You can get started with Amazon SNS in minutes by using the AWS Management Console, AWS Command Line Interface (CLI), or AWS Software Development Kit (SDK).
 - **Project Task:**
1. Here, in this project I Created 3 Topics for publish the notification through mail. One is S3trigger, CPU_Frequency and CPU_credit.

| | | |
|-----------------------|---------------|--|
| <input type="radio"/> | cpu_credit | arn:aws:sns:us-east-2:865498582293:cpu_credit |
| <input type="radio"/> | cpu_frequency | arn:aws:sns:us-east-2:865498582293:cpu_frequency |
| <input type="radio"/> | s3trigger | arn:aws:sns:us-east-2:865498582293:s3trigger |

2. After created a topic I generated a subscription option to provide those notification through mail,for that I followed the step below,

Create subscription

Details

Topic ARN

Protocol
 The type of endpoint to subscribe

Endpoint
 An email address that can receive notifications from Amazon SNS.



- An Elastic IP address is a static IPv4 address designed for dynamic cloud computing. An Elastic IP address is associated with your AWS account. With an Elastic IP address, you can mask the failure of an instance or software by rapidly remapping the address to another instance in your account.
- An Elastic IP address is a public IPv4 address, which is reachable from the internet. If your instance does not have a public IPv4 address, you can associate an Elastic IP address with your instance to enable communication with the internet. For example, this allows you to connect to your instance from your local computer. We currently do not support Elastic IP addresses for IPv6.
- **Project Task:**

1. In the EC2 dashboard there is an option into network and security called as Elastic IPs.create a new IP and associated with my running instance.





- You can create and configure network interfaces in your account and attach them to instances in your VPC. Your account might also have requester-managed network interfaces, which are created and managed by AWS services to enable you to use other resources and services. You cannot manage these network interfaces yourself.
- This AWS resource is referred to as a network interface in the AWS Management Console and the Amazon EC2 API. Therefore, we use "network interface" in this documentation instead of "elastic network interface".
- **Project Task:**
- In the EC2 dashboard there is an option into network and security called as Elastic Network Interface I.create a new network interface and associated with my running instance.

The screenshot shows the "Create Elastic Network Interface" page in the AWS Management Console. The "Description" field is set to "AMI_SERVER". The "Subnet" dropdown is set to "subnet-0ccbb55ea39414cd". Under "IPv4 Private IP", the "Auto-assign" option is selected. Under "IPv6 Setting", the "None" option is selected. The "Elastic Fabric Adapter" checkbox is unchecked. The "Security groups" field shows "sg-074715601db312bf6". Below this, a search bar is visible with the text "Filter by attributes or search by keyword". A table lists the available security groups:

| Group ID | Group name | Description |
|-----------------|-----------------|---|
| sg-074715601... | launch-wizard-1 | launch-wizard-1 created 2020-07-06T14:58:12.674+05:30 |
| sg-0b0303aa2... | default | default VPC security group |

- After created network interface I select the subnet I want (Front_end subnet) and then I have one more option to attach which instance I want to attach my ENI.make sure that your instance should be stopped mode.

The screenshot shows the "Attach Network Interface" dialog box. It has a title bar with a close button (X). The "Network Interface" field is set to "eni-0b79620ce79afe841". The "Instance ID" dropdown is set to "i-0ae9e67a43c24726d - AMI SERVER (stopped)". At the bottom right, there are two buttons: "Cancel" and "Attach".



- AWS Cloud Formation provides a common language for you to model and provision AWS and third party application resources in your cloud environment. AWS Cloud Formation allows you to use programming languages or a simple text file to model and provision, in an automated and secure manner, all the resources needed for your applications across all regions and accounts. This gives you a single source of truth for your AWS and third party resources.
- **Project Task:**
 1. From Management & Governance we have a option called cloud formation in that we have to create a new stack and create a EC2 from lamp stack as shown below,

Create stack

Prerequisite - Prepare template

Prepare template
Every stack is based on a template. A template is a JSON or YAML file that contains configuration information about the AWS resources you want to include in the stack.

☐ Template is ready ☒ Use a sample template ☐ Create template in Designer

Select a sample template [View more sample templates](#)

Sample templates
This collection of sample templates will help you get started with AWS CloudFormation and quickly build your own templates

LAMP Stack

S3 URL: https://s3.us-east-2.amazonaws.com/cloudformation-templates-us-east-2/LAMP_Single_Instance.template [View in Designer](#)

2. After that we have an option for the name of stack and MYSQL username and password.

Stack name
soldDB
Stack name can include letters (A-Z and a-z), numbers (0-9), and dashes (-).

Parameters
Parameters are defined in your template and allow you to input custom values when you create or update a stack.

DBName
MySQL database name
MyDatabase

DBPassword
Password for MySQL database access

DBRootPassword
Root password for MySQL

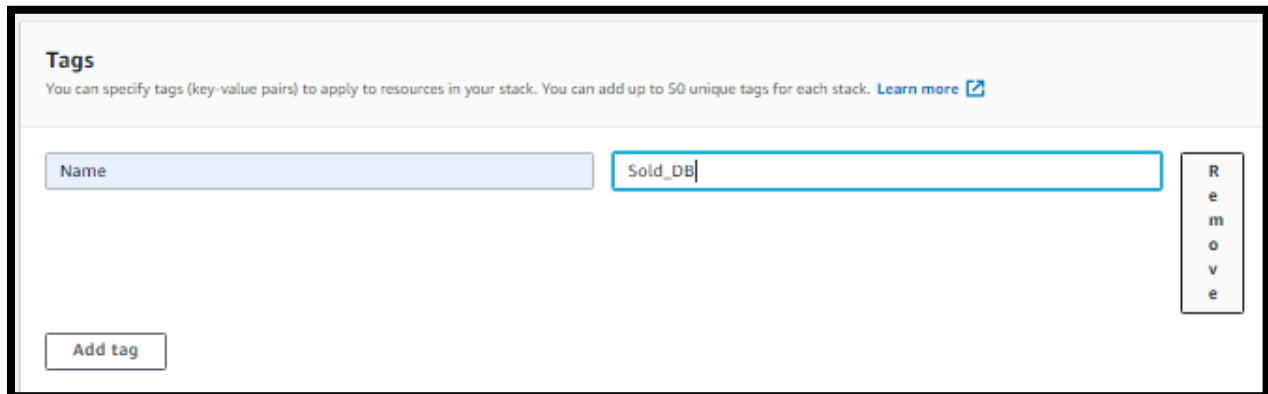
DBUser
Username for MySQL database access

InstanceType
WebServer EC2 instance type
t2.small

KeyName
Name of an existing EC2 KeyPair to enable SSH access to the instance
ggvu

SSHLocation
The IP address range that can be used to SSH to the EC2 instances
0.0.0.0/0

- Now there is option for giving a tag value.

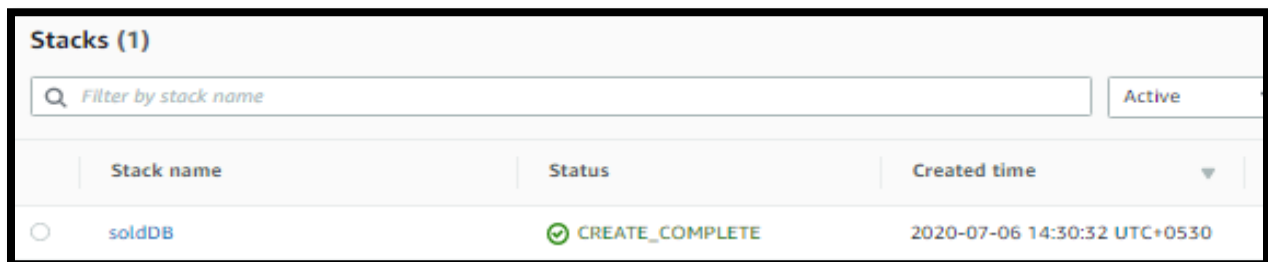


Tags

You can specify tags (key-value pairs) to apply to resources in your stack. You can add up to 50 unique tags for each stack. [Learn more](#)

| Name | Value | Remove |
|------|---------|----------------------------|
| | Sold_DB | R e m o v e |

- After that the Stack will be created and its provided an instance in default vpc we need to take an AMI and Put into required VPC I want discussed in previous.



| Stacks (1) | | |
|------------------------------|---|------------------------------|
| Filter by stack name | | |
| Active | | |
| Stack name | Status | Created time |
| <input type="radio"/> soldDB | <input checked="" type="checkbox"/> CREATE_COMPLETE | 2020-07-06 14:30:32 UTC+0530 |



- Amazon Relational Database Service (Amazon RDS) makes it easy to set up, operate, and scale a relational database in the cloud. It provides cost-efficient and resizable capacity while automating time-consuming administration tasks such as hardware provisioning, database setup, patching and backups. It frees you to focus on your applications so you can give them the fast performance, high availability, security and compatibility they need.
- Amazon RDS is available on several database instance types - optimized for memory, performance or I/O - and provides you with six familiar database engines to choose from, including Amazon,Aurora, PostgreSQL, MySQL,MariaDB, Oracle Database,and SQLServer. You can use the AWS Database Migration Service to easily migrate or replicate your existing databases to Amazon RDS. Amazon RDS supports the most demanding database.

- **Project Task:**

1. In the RDS Dashboard there is an option create database in that I selected standard create and I select for MySQL after that I selected the free tier option for creating databases and the cluster identifier name is database-1 and ,master user name is 'admin'after that I provided a password.

Create database

Choose a database creation method [Info](#)

☒ **Standard Create**
You select all of the configuration options, including ones for availability, security, backups, and maintenance.

☐ **Easy Create**
Use recommended best-practice configurations. Some configuration options can be changed after the database is created.

Engine options

Engine type [Info](#)

☐ Amazon Aurora ☒ **MySQL** ☐ MariaDB

☐ PostgreSQL ☐ Oracle ☐ Microsoft SQL Server

Edition ☒ **MySQL Community**

Version [Info](#)
MySQL 8.0.17

Known issues/limitations
Review the Known issues/limitations to learn about potential compatibility issues with specific database versions.

Templates
Choose a sample template to meet your use case.

☐ Production
Use defaults for high availability and fast, consistent performance.

☐ Dev/Test
This instance is intended for development use outside of a production environment.

☒ **Free tier**
Use RDS Free Tier to develop new applications, test existing applications, or gain hands-on experience with Amazon RDS. [Info](#)

Settings

DB instance identifier [Info](#)
Type a name for your DB instance. The name must be unique across all DB instances owned by your AWS account in the current AWS Region.
database-1

The DB instance identifier is case-insensitive, but is stored as all lowercase (as in `mysql> show databases`). Constraints: 1 to 63 alphanumeric characters or hyphens (1 to 15 for SQL Server). First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

▼ Credentials Settings

Master username [Info](#)
Type a login ID for the master user of your DB instance.
admin

1 to 16 alphanumeric characters. First character must be a letter. Amazon RDS can generate a password for you, or you can specify your own password.

Master username [Info](#)
Type a login ID for the master user of your DB instance.
admin

1 to 16 alphanumeric characters. First character must be a letter. Amazon RDS can generate a password for you, or you can specify your own password.

Master password [Info](#)
Constraints: At least 8 printable ASCII characters. Can't contain any of the following: /, !, @, #, \$, %, ^, &, *, ~, `

Confirm password [Info](#)

DB instance size

DB instance class [Info](#)
Choose a DB instance class that meets your processing power and memory requirements. The DB instance class options below are limited to those supported by the engine you selected above.

☒ **Burstable classes (includes m classes)**

☐ Memory Optimized classes (includes r and x classes)

☐ Include previous generation classes

db.t2.micro
2 vCPUs, 1 GiB RAM
Not EBS Optimized

Storage

Storage type [Info](#)
General Purpose (SSD)

Allocated storage
20 GiB
(Minimum: 20 GiB, Maximum: 16384 GiB) Higher allocated storage may improve IOPS performance.

Storage autoscaling [Info](#)
Provides dynamic scaling support for your database's storage based on your application's needs.

☒ **Enable storage autoscaling**
Enabling this feature will allow the storage to increase once the specified threshold is exceeded.

Maximum storage threshold [Info](#)
Changes will apply when your database autoscales to the specified threshold
100 GiB
(Minimum: 21 GiB, Maximum: 16384 GiB)

Availability & durability

Multi-AZ deployment [Info](#)

☐ Create a standby instance (recommended for production usage)
Create a standby in a different Availability Zone (AZ) to provide data redundancy, eliminate RTO, and minimize latency spikes during system backups.

☒ **Do not create a standby instance**

Connectivity

Virtual private cloud (VPC) [Info](#)
VPC that defines the virtual networking environment for this DB instance.
VPC_B (vpc-0ae3ade5ecc4007c5)

Only VPCs with a corresponding DB subnet group are listed.

☒ After a database is created, you can't change the VPC selection.

2. Then I have an option for selecting which type of instance I required, I select for free tier as T2.micro. make sure that if I am creating a database on my vpc then I need two subnet or AZ in that vpc
3. After that I need to give the permission for publically access to the databases so that I can check from another instance belonging from vpc another VPC.
4. After that I need to give the same Security to the RDS which security is selected to my instance from where I can operate the RDS.
5. After that I can operate from my instance and connect the instance to the RDS through the command (mysql -h (RDS endpoint) -u(user name) -p) then I need to create a Database named BooksDB the need to use that Database for using command (use databases) then create a table on that named BookShop and after that I will be able to put some values in the table. The command is shown in below.

Additional connectivity configuration

Subnet group info
 The subnet group defines which subnets and IP ranges the DB instance can use in the VPC you selected.

Publicly accessible info
☒ Yes
 Amazon EC2 instances and devices outside the VPC can connect to your database. Choose one or more VPC security groups that you want to apply to EC2 instances and devices inside the VPC that can connect to the database.
☐ No
 RDS will not assign a public IP address to the database. Only Amazon EC2 instances and devices inside the VPC can connect to your database.

VPC security group
 Choose one or more RDS security groups to allow access to your database. Ensure that the security group rules allow incoming traffic from EC2 instances and devices outside your VPC. (Security groups are required for publicly accessible databases.)

☒ Choose existing
☐ Create new VPC security group

Existing VPC security groups

Availability Zone info

Database port info
 TCP/IP port that the database will use for application connections.

Database authentication

Database authentication options info
☒ Password authentication
 Authenticates using database passwords.
☐ Password and IAM database authentication
 Authenticates using the database password and user credentials through AWS IAM users and roles.
☐ Password and Kerberos authentication (not available for this engine)
 Choose a directory in which you want to allow authorized users to authenticate with this DB instance using Kerberos authentication.

Additional configuration
 Database options, backup enabled, backup retention, Enhanced Monitoring disabled, maintenance, CloudWatch Logs, Delete protection disabled

Estimated monthly costs
 The Amazon RDS Free Tier is available to you for 12 months. Each calendar month, the free tier will allow you to use the Amazon RDS resources listed below for free:
 750 hrs of Amazon RDS in a Single-AZ db.t2.micro instance.
 20 GB of General Purpose Storage (SGS).
 20 GB for automated backup storage and any user-initiated DB Snapshots.
[Learn more about AWS Free Tier.](#)
 When your free usage expires or if your application use exceeds the free usage limit, you simply pay standard, pay-as-you-go service rates as described in the Amazon RDS Pricing page.

☒ You are responsible for ensuring that you have all of the necessary rights for any third-party products or services that you use with AWS services.

```
[ec2-user@ip-10-0-0-46 ~]$ sudo su -
Last login: Wed Jul 8 15:19:01 UTC 2020 on pts/0
[root@ip-10-0-0-46 ~]# yum install mysql
Loaded plugins: priorities, update-notif, upgrade-helper
amazon-
amazon-updates
Package mysql-5.5-1.6.amzn1.noarch already installed and latest version
Nothing to do
[root@ip-10-0-0-46 ~]# mysql -h booksdb.cjbsrond2piv.us-east-2.rds.amazonaws.com -u admin -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 11
Server version: 8.0.17 Source distribution

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+-----+
| Database |
+-----+
| BooksDB  |
| information_schema |
| mysql    |
| performance_schema |
+-----+
4 rows in set (0.01 sec)

mysql> use BooksDB;
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
mysql> show tables;
+-----+
| Tables_in_BooksDB |
+-----+
| BookShop           |
+-----+
1 row in set (0.00 sec)

mysql> describe BookShop;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to
mysql> describe BookShop;
+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+
| BookName | varchar(30) | NO | | NULL | |
| AuthorName | varchar(30) | NO | | NULL | |
| Sold | varchar(10) | NO | | NULL | |
+-----+
3 rows in set (0.00 sec)

mysql> |
```

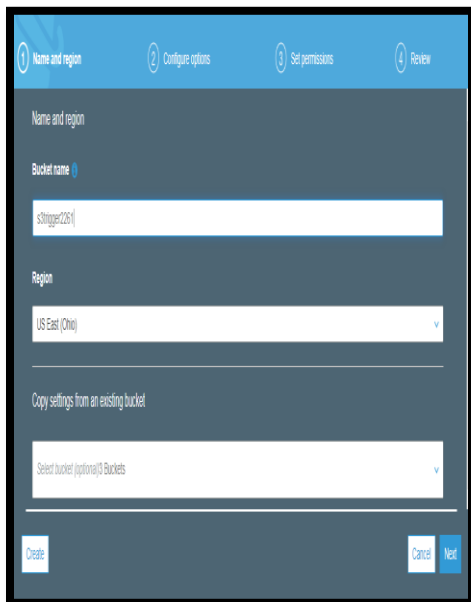


- Amazon Simple Storage Service (Amazon S3) is an object storage service that offers industry-leading scalability, data availability, security, and performance. This means customers of all sizes and industries can use it to store and protect any amount of data for a range of use cases, such as websites, mobile applications, backup and restore, archive, enterprise applications, IoT devices, and big data analytics. Amazon S3 provides easy-to-use management features so you can organize your data and configure finely-tuned access controls to meet your specific business, organizational, and compliance requirements. Amazon S3 is designed for 99.999999999% (11 9's) of durability, and stores data for millions of applications for companies all around the world.
- Save costs without sacrificing performance by storing data across the S3 Storage Classes, which support different data access levels at corresponding rates. You can use S3 Storage Class Analysis to discover data that should move to a lower-cost storage class based on access patterns, and configure an S3 Lifecycle policy to execute the transfer. You can also store data with changing or unknown access patterns in S3 Intelligent-Tiering, which tiers objects based on changing access patterns and automatically delivers cost savings.

- Scale your storage resources up and down to meet fluctuating demands, without upfront investments or resource procurement cycles. Amazon S3 is designed for 99.999999999% (11 9's) of data durability because it automatically creates and stores copies of all S3 objects across multiple systems. This means your data is available when needed and protected against failures, errors, and threats.

- **Project Task:**

1. At first we need to create two bucket in same region named as EC2_private (private bucket) and S3trigger226 (public bucket) and upload a file in both of them and triggered a lambda function to create a SNS topic and send the notification to email. We will discuss it in Lambda briefly.

The image shows the 'Create bucket' wizard in the AWS Management Console, specifically the 'Name and region' step. The wizard has four steps: 1. Name and region, 2. Configure options, 3. Set permissions, and 4. Review. In the 'Name and region' step, the 'Bucket name' field contains 'S3trigger226'. The 'Region' dropdown menu is set to 'US East (Ohio)'. Below that, there is a section 'Copy settings from an existing bucket' with a dropdown menu labeled 'Select bucket (optional)'. At the bottom left, there is a 'Create' button, and at the bottom right, there are 'Cancel' and 'Next' buttons.

2. Now I created a Developer IAM user and give the permission to access S3 bucket and give the user as EC2 access programmable as well as consol because in this project the developer can access CLI and put some object(mp3,text,image).and I attached to the EC2 as the role name S3_trigger.

Set user details

You can add multiple users at once with the same access type and permissions. [Learn more](#)

User name: [Add another user](#)

Select AWS access type

Select how these users will access AWS. Access keys and autogenerated passwords are provided in the last step. [Learn more](#)

Access type: ☒ Programmatic access
Enables an access key ID and secret access key for the AWS API, CLI, SDK, and other development tools.

☒ AWS Management Console access
Enables a password that allows users to sign in to the AWS Management Console.

Console password: ☐ Autogenerated password
☒ Custom password
 [Show password](#)

Require password reset: ☒ User must create a new password at next sign-in
Users automatically get the `AWSCloudChangePassword` policy to allow them to change their own password.

* Required Cancel Next: Permissions

Instance ID: i-0ae9e67a43c24726d (AMI SERVER) ⓘ

IAM role* ⓘ

3. Create a bucket in us-east-1 region name as (hostwebsite82) and give that bucket to the public access for hosting. Make it public and type confirm it will ready.

Name and region

Bucket name:

Region:

Copy settings from an existing bucket

Select bucket (optional)

Create Cancel

Block all public access

Turning this setting on is the same as turning on all four settings below. Each of the following settings are independent of one another.

☒ Block public access to buckets and objects granted through new access control lists (ACLs)

S3 will block public access permissions applied to newly added buckets or objects, and prevent the creation of new public access ACLs for existing buckets and objects. This setting doesn't change any existing permissions that allow public access to S3 resources using ACLs.

Cancel Save

4. Now I am going to host this bucket hostwebsite82 and put two file index.html and 404.html. At first I need to create two index.html and 404.html file in my laptop and upload it in the hostwebsite82 bucket and give the file as accessible publically.

Endpoint: <http://hostwebsite82.s3-website-us-east-1.amazonaws.com>

Use this bucket to host a website. [Learn more](#)

Index document:

Error document:

Redirect rules (optional):

☐ Redirect requests [Learn more](#)

☐ Disable website hosting

Cancel Save

Select files 2 Set permissions 3 Set properties 4 Review

[Add more files](#)

| File | Size | Action |
|------------|------|-------------------------------------|
| 404.html | 0 B | <input checked="" type="checkbox"/> |
| index.html | 0 B | <input checked="" type="checkbox"/> |

5. After that I need to give both of them public access, by clicking on make public.

Open Download Download as Make public Copy path

Owner
soubhikbanerjee925

Last modified
Jul 9, 2020 6:31:15 PM GMT+0530

Etag
55679d4d0e7374e24185af2d1c02ca3b

Storage class
Standard

Server-side encryption
Standard



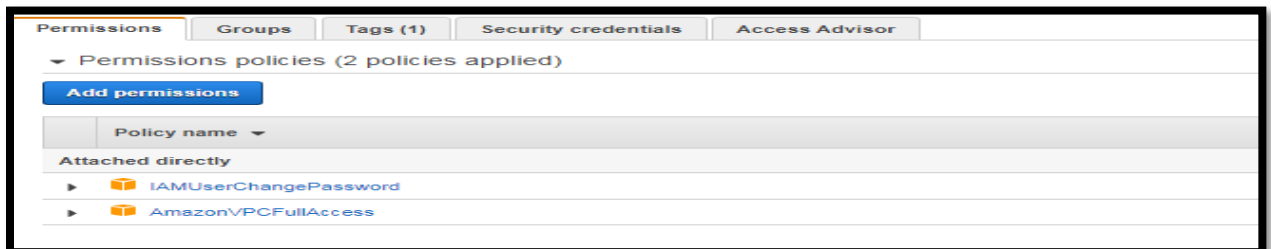
- AWS Identity and Access Management (IAM) enables you to manage access to AWS services and resources securely. Using IAM, you can create and manage AWS users and groups, and use permissions to allow and deny their access to AWS resources.
- IAM is a feature of your AWS account offered at no additional charge. You will be charged only for use of other AWS services by your users.
- To get started using IAM, or if you have already registered with AWS, go to the AWS Management Console and get started with these IAM Best Practices.

• **Project Task:**

1. I Created 5 IAM user – Office Admin, Network Admin, Developer, Database User, Account Manager
2. Office Admin gets full administrative access to all services, except IAM and organizations in the AWS account.



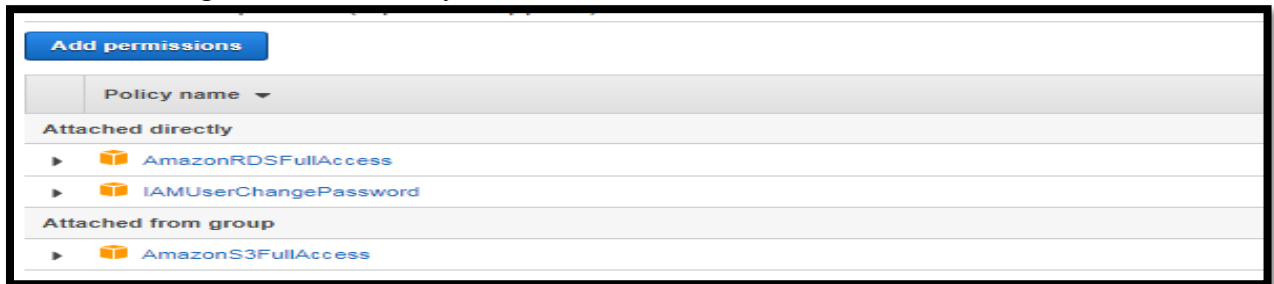
3. Network Admin gets full access to VPC resources.



4. Developer gets full access to EC2 and S3 resources.



5. Database User gets full access only to the RDS instance in the 'BackEnd' subnet.



6. Account Manager gets full access to the billing console and IAM console.



7. I created a group S3 full access and put both the Developer and Database User in that.

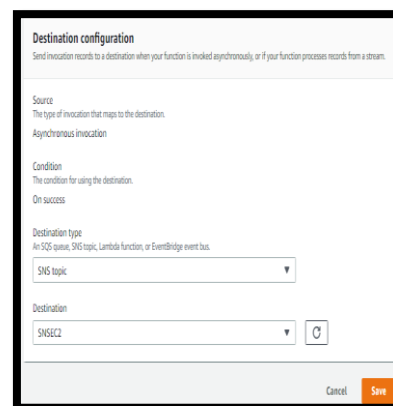
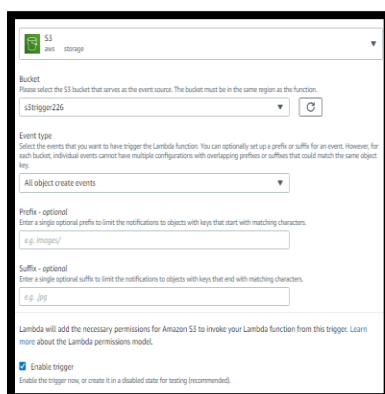


- I created one more user for Aritra sir for administrator role and the user name is [ICSS Aritra Sir](#) give a programmable access as well as consol access.



- AWS Lambda lets you run code without provisioning or managing servers. You pay only for the compute time you consume. With Lambda, you can run code for virtually any type of application or backend service - all with zero administration. Just upload your code and Lambda takes care of everything required to run and scale your code with high availability. You can set up your code to automatically trigger from other AWS services or call it directly from any web or mobile app.
- Project Task:**

- Created two lambda function one is in region ohio in VPC A and one is in region N.varginia VPC C. There is two option one is trigger and another one is destination for that purpose we need to select in trigger as S3 and the destination is SNS in that we have to give the permission to the SNS to produce a notification to a given mail.



- After selected the S3 need to select destination as SNS topic. After that we need to select the topic and the publish way we need in this project we need to get the notification through mail



- Amazon CloudWatch is a monitoring and management service that provides data and actionable insights for AWS, hybrid, and on-premises applications and infrastructure resources. With CloudWatch, you can collect and access all your performance and operational data in form of logs and metrics from a single platform. This allows you to overcome the challenge of monitoring individual systems and applications in silos (server, network, database, etc.). CloudWatch enables you to monitor your complete stack (applications, infrastructure, and services) and leverage alarms, logs, and events data to take automated actions and reduce Mean Time to Resolution (MTTR). This frees up important resources and allows you to focus on building applications and business value.
- CloudWatch gives you actionable insights that help you optimize application performance, manage resource utilization, and understand system-wide operational health. CloudWatch provides up to 1-second visibility of metrics and logs data, 15 months of data retention (metrics), and the ability to perform calculations on metrics. This allows you to perform historical analysis for cost optimization and derive real-time insights into optimizing applications and infrastructure resources. You can use CloudWatch Container Insights to monitor, troubleshoot, and alarm on your containerized applications and microservices.

• **Project Task:**

1. I set a cloud watch monitoring to the instance there is two type of cloud watch I created one is CPU_Frequency and another one is CPU_credit and connect it to the SNS topic to generate email if the mentioned threshold crossed.

Send a notification to: [create topic](#)

Take the action: ☐ Recover this instance ☐ Stop this instance ☐ Terminate this instance ☐ Reboot this instance

Whenever: of

Is:
 ⚠ Threshold required
 Bytes

For at least: consecutive period(s) of

Name of alarm:

Disk Reads Bytes
 1,000
 i-0ae9e67a43c24726d

Send a notification to: [create topic](#)

Take the action: ☐ Recover this instance ☐ Stop this instance ☐ Terminate this instance ☐ Reboot this instance

Whenever: of

Is:
 Percent

For at least: consecutive period(s) of

Name of alarm:

CPU Utilization Percent

2. For cpu_frequency for 80% nor more than 80% its generate a SNS topic and send it to my email same as for the CPU_CREDIT Disk read/write usage alarm for a consecutive period of 5 minutes if crossed it will send an email.



- The AWS Command Line Interface (CLI) is a unified tool to manage your AWS services. With just one tool to download and configure, you can control multiple AWS services from the command line and automate them through scripts.
- The AWS CLI introduces a new set of simple file commands for efficient file transfers to and from Amazon S3.

- **Project Task:**

1. At first I connect the instance through CLI and then I put some object(mp3,photo,text or html)to my S3bucket and operate through command.

```
abc@abc-PC MINGW64 ~/Downloads
$ ssh -i "ggyu.pem" ec2-user@ec2-3-128-165-252.us-east-2.compute.amazonaws.com
Last login: Fri Jul 10 11:32:15 2020 from 157.40.2.252

 _ _ _ _ _
| | | | |
|_|_|_|_|_| Amazon Linux AMI

https://aws.amazon.com/amazon-linux-ami/2018.03-release-notes/
28 package(s) needed for security, out of 53 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-10-0-0-46 ~]$ aws s3 ls
2020-07-06 08:05:11 cf-templates-1wb4tpkskdn8-us-east-2
2020-07-07 19:32:51 ec2private
2020-07-09 16:13:20 hostwebsite82
2020-07-06 11:07:56 s3trigger226
[ec2-user@ip-10-0-0-46 ~]$ cat > soubhik.txt
hello friends its my text file and i wanna upload it to my s3 bucket
in privet as well as public
^C
```

2. As per the project I create one text file in my AMI_SERVER and copy that file to S3 bucket.but make sure that the instance have the role to access s3 bucket.

```
[ec2-user@ip-10-0-0-46 ~]$ aws s3 cp soubhik.txt s3://s3trigger226/soubhik2.txt/
upload: ./soubhik.txt to s3://s3trigger226/soubhik2.txt/soubhik.txt
[ec2-user@ip-10-0-0-46 ~]$ aws s3 cp soubhik.txt s3://ec2private/soubhik2.txt/
upload: ./soubhik.txt to s3://ec2private/soubhik2.txt/soubhik.txt
[ec2-user@ip-10-0-0-46 ~]$ aws s3 cp soubhik.txt s3://hostwebsite82/soubhik2.txt/
upload: ./soubhik.txt to s3://hostwebsite82/soubhik2.txt/soubhik.txt
[ec2-user@ip-10-0-0-46 ~]$ |
```

3. So I need to create a role and attached it to the EC2 and the I continue upload or download to the bucket or from the bucket.(as discussed in S3).

- Through CLI I can operate the RDS instance made the table and put values over there shown in below,

```
[ec2-user@ip-10-0-0-46 ~]$ mysql -h booksdb.cjbsroml2piv.us-east-2.rds.amazonaws.com -u admin -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 17
Server version: 8.0.17 Source distribution

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+-----+
| Database |
+-----+
| BooksDB  |
| information_schema |
| mysql    |
| performance_schema |
+-----+
4 rows in set (0.00 sec)

mysql> use BooksDB;
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
mysql> show tables;
+-----+
| Tables_in_BooksDB |
+-----+
| BookShop           |
+-----+
1 row in set (0.00 sec)

mysql> describe BookShop;
+-----+
| Field      | Type          | Null | Key | Default | Extra |
+-----+
| BookName   | varchar(30)   | NO   |     | NULL    |       |
| AuthorName | varchar(30)   | NO   |     | NULL    |       |
| Sold       | varchar(10)   | NO   |     | NULL    |       |
+-----+
3 rows in set (0.00 sec)
```

```
mysql> show databases;
+-----+
| Database |
+-----+
| BooksDB  |
| information_schema |
| mysql    |
| performance_schema |
+-----+
4 rows in set (0.00 sec)

mysql> use BooksDB;
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
mysql> show tables;
+-----+
| Tables_in_BooksDB |
+-----+
| BookShop           |
+-----+
1 row in set (0.00 sec)

mysql> describe BookShop;
+-----+
| Field      | Type          | Null | Key | Default | Extra |
+-----+
| BookName   | varchar(30)   | NO   |     | NULL    |       |
| AuthorName | varchar(30)   | NO   |     | NULL    |       |
| Sold       | varchar(10)   | NO   |     | NULL    |       |
+-----+
3 rows in set (0.00 sec)
```

- I created one user called Developer and give them programmable access and put a file from my system to the S3 bucket through CLI command. After that I create one .bak file in my system and want to transfer it to the S3 bucket.

```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows\system32>aws configure
AWS Access Key ID [*****]: AN164T064JUT7JUL7E7F
AWS Secret Access Key [*****]: c0qoWUThctzWADZANIc0802370pjmWN
Default region name [us-east-2]: us-east-2
Default output format [json]: json

C:\Windows\system32>aws s3 mb s3://newbucketl133
make_bucket failed: s3://newbucketl133 An error occurred (AccessDenied) when c
alling the CreateBucket operation: Access Denied

C:\Windows\system32>sudo aws s3 mb s3://newbucketl133
'sudo' is not recognized as an internal or external command,
operable program or batch file.

C:\Windows\system32>cd ..

C:\Windows>cd ..

C:\Windows>aws s3 mb s3://newbucketl133
'sudo' is not recognized as an internal or external command,
operable program or batch file.

C:\Windows>aws s3 mb s3://newbucketl133
make_bucket failed: s3://newbucketl133 An error occurred (AccessDenied) when c
alling the CreateBucket operation: Access Denied

C:\Windows>cd /ahc
The system cannot find the path specified.

C:\Windows>cd /ahc
The system cannot find the path specified.

C:\Windows>cd user
The system cannot find the path specified.

C:\Windows>cd users
The system cannot find the path specified.

C:\Users>cd ahc

C:\Users>
```

```
C:\Windows\system32>cd ..

C:\Windows>cd ..

C:\Windows>aws s3 mb s3://newbucketl133
'sudo' is not recognized as an internal or external command,
operable program or batch file.

C:\Windows>aws s3 mb s3://newbucketl133
make_bucket failed: s3://newbucketl133 An error occurred (AccessDenied) when c
alling the CreateBucket operation: Access Denied

C:\Windows>cd /ahc
The system cannot find the path specified.

C:\Windows>cd /ahc
The system cannot find the path specified.

C:\Windows>cd user
The system cannot find the path specified.

C:\Windows>cd users
The system cannot find the path specified.

C:\Users>cd ahc

C:\Users>aws s3 cp "C:\Users\ahc\CLI.bak.txt" s3://ec2private
upload: .\CLI.bak.txt to s3://ec2private/CLI.bak.txt

C:\Users>aws s3 mb s3://newl133
make_bucket: newl133

C:\Users>aws s3 cp "C:\Users\ahc\CLI.bak.txt" s3://newl133
upload: .\CLI.bak.txt to s3://newl133/CLI.bak.txt

C:\Users>
```



- Amazon VPC enables you to launch AWS resources into a virtual network that you've defined. A VPC peering connection is a networking connection between two VPCs that enables you to route traffic between them using private IPv4 addresses or IPv6 addresses. Instances in either VPC can communicate with each other as if they are within the same network.
- You can create a VPC peering connection between your own VPCs, or with a VPC in another AWS account. The VPCs can be in different regions (also known as an inter-region VPC peering connection).
- AWS uses the existing infrastructure of a VPC to create a VPC peering connection; it is neither a gateway nor a VPN connection, and does not rely on a separate piece of physical hardware. There is no single point of failure for communication or a bandwidth bottleneck.
- A VPC peering connection helps you to facilitate the transfer of data. For example, if you have more than one AWS account, you can peer the VPCs across those accounts to create a file sharing network. You can also use a VPC peering connection to allow other VPCs to access resources you have in one of your VPCs.
- You can establish peering relationships between VPCs across different AWS Regions (also called Inter-Region VPC Peering). This allows VPC resources including EC2 instances, Amazon RDS databases and Lambda functions that run in different AWS Regions to communicate with each other using private IP addresses, without requiring gateways, VPN connections, or separate network appliances. The traffic remains in the private IP space. All inter-region traffic is encrypted with no single point of failure, or bandwidth bottleneck. Traffic always stays on the global AWS backbone, and never traverses the public internet, which reduces threats, such as common exploits, and DDoS attacks. Inter-Region VPC Peering provides a simple and cost-effective way to share resources between regions or replicate data for geographic redundancy.
- **Project Task:**
 1. At first I need to connect the same region VPC_A and VPC_B through peering connection called VPCATOB and here VPC_A is the requester and VPC_B is the acceptor so I need to go to the peering connection and make a vpc peering connection and associate that the requester and the acceptor one as shown in below.

Create Peering Connection

Peering connection name tag

Select a local VPC to peer with

VPC (Requester)*

| CIDRs | CIDR | Status | Status Reason |
|-------|-------------------------|------------|---------------|
| | 10.0.0.0/16 | associated | |
| | 2600:1f16:38c:6a00::/56 | associated | |

Select another VPC to peer with

Account ☒ My account ☐ Another account

Region ☒ This region (us-east-2) ☐ Another Region

VPC (Acceptor)*

| CIDRs | CIDR | Status | Status Reason |
|-------|-------------------------|------------|---------------|
| | 10.1.0.0/16 | associated | |
| | 2600:1f16:f7a:3c00::/56 | associated | |

- After that connection I need to do one more vpc peering which has to connect VPC_a and VPC_C with the name of VPCATOC and do the same accept the peering connection.
- I create one more peering called VPCCTOB and I accept that request and goto my VPC_A VPC_B and VPC_C route table and add the correspond route as shown in below.

| | | |
|-------|-------------|-------|
| VPC_A | 10.0.0.0/16 | local |
| | 10.1.0.0/16 | VPC_B |
| | 10.2.0.0/16 | VPC_C |
| | | |
| VPC_B | 10.1.0.0/16 | local |
| | 10.0.0.0/16 | VPC_A |
| | 10.2.0.0/16 | VPC_C |
| | | |
| VPC_C | 10.2.0.0/16 | LOCAL |
| | 10.0.0.0/16 | VPC_A |
| | 10.1.0.0/16 | VPC_B |

- As I sown in table I added all the route and peering connection.

| Destination | Target | Status | Propagated |
|-------------------------|-----------------------|--------|------------|
| 10.0.0.0/16 | local | active | No |
| 2600:1f16:38c:6a00::/56 | local | active | No |
| 0.0.0.0/0 | igw-0874b1bc630cee146 | active | No |
| 10.1.0.0/16 | pcx-05f70c526cb34cf82 | active | No |
| 10.2.0.0/16 | pcx-054f368ff4a33ea5d | active | No |

5. Image for VPC_B route table.

| Destination | Target | Status | Propagated |
|-------------------------|-----------------------|--------|------------|
| 10.1.0.0/16 | local | active | No |
| 2600:1f16:17a:3c00::/56 | local | active | No |
| 0.0.0.0/0 | igw-044bde2a858b25d47 | active | No |
| 10.0.0.0/16 | pcx-05f70c526cb34cf82 | active | No |
| 10.2.0.0/16 | pcx-0e45869bbddead948 | active | No |

6. For VPC_C route table image.

| Destination | Target | Status | Propagated |
|--------------------------|-----------------------|--------|------------|
| 10.2.0.0/16 | local | active | No |
| 2600:1f18:23cc:8200::/56 | local | active | No |
| 0.0.0.0/0 | igw-0cd415256ee803125 | active | No |
| 10.0.0.0/16 | pcx-054f368ff4a33ea5d | active | No |
| 10.1.0.0/16 | pcx-0e45869bbddead948 | active | No |

7. I gave all the instances as a rule ALL ICMP-IPV4 and check ping of one by one its responding.

```
$ ssh -i "foruseast.pem" ec2-user@ec2-3-227-249-86.compute-1.amazonaws.com
Last login: Fri Jul 10 08:54:26 2020 from 157.40.2.252

 _| _|_ )
 _| ( /  Amazon Linux AMI
 _|\_|_|_|

https://aws.amazon.com/amazon-linux-ami/2018.03-release-notes/
1 package(s) needed for security, out of 3 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-10-2-0-181 ~]$ ping ssh -i "foruseast.pem" ec2-user@ec2-3-227-249-86.compute-1.amazonaws.com^C
[ec2-user@ip-10-2-0-181 ~]$ ping 10.0.0.46
PING 10.0.0.46 (10.0.0.46) 56(84) bytes of data.
64 bytes from 10.0.0.46: icmp_seq=1 ttl=255 time=12.1 ms
64 bytes from 10.0.0.46: icmp_seq=2 ttl=255 time=12.1 ms
64 bytes from 10.0.0.46: icmp_seq=3 ttl=255 time=12.1 ms
64 bytes from 10.0.0.46: icmp_seq=4 ttl=255 time=12.1 ms
64 bytes from 10.0.0.46: icmp_seq=5 ttl=255 time=12.1 ms
64 bytes from 10.0.0.46: icmp_seq=6 ttl=255 time=12.1 ms
64 bytes from 10.0.0.46: icmp_seq=7 ttl=255 time=12.1 ms
64 bytes from 10.0.0.46: icmp_seq=8 ttl=255 time=12.2 ms
64 bytes from 10.0.0.46: icmp_seq=9 ttl=255 time=12.1 ms
|
```




- Elastic Load Balancing automatically distributes incoming application traffic across multiple targets, such as Amazon EC2 instances, containers, IP addresses, and Lambda functions. It can handle the varying load of your application traffic in a single Availability Zone or across multiple Availability Zones. Elastic Load Balancing offers three types of load balancers that all feature the high availability, automatic scaling, and robust security necessary to make your applications fault tolerant.
- Three type of load balancer are there.

1.APPLICATION LOAD BALANCER(ALB):

Application Load Balancer is best suited for load balancing of HTTP and HTTPS traffic and provides advanced request routing targeted at the delivery of modern application architectures, including microservices and containers. Operating at the individual request level (Layer 7), Application Load Balancer routes traffic to targets within Amazon Virtual Private Cloud (Amazon VPC) based on the content of the request.

2.NETWORK LOAD BALANCER(NLB):

Network Load Balancer is best suited for load balancing of Transmission Control Protocol (TCP), User Datagram Protocol (UDP) and Transport Layer Security (TLS) traffic where extreme performance is required. Operating at the connection level (Layer 4), Network Load Balancer routes traffic to targets within Amazon Virtual Private Cloud (Amazon VPC) and is capable of handling millions of requests per second while maintaining ultra-low latencies. Network Load Balancer is also optimized to handle sudden and volatile traffic patterns.

3. CLASSIC LOAD BALANCER(CLB):

Classic Load Balancer provides basic load balancing across multiple Amazon EC2 instances and operates at both the request level and connection level. Classic Load Balancer is intended for applications that were built within the EC2-Classical network.

- **Project Task:**

1. Before creating a ALB I need to create a target group and take those instance which I need to connect with ALB and make sure that the instances has the HTTP port enable so that the traffic will distribute and get entered in the EC2 as per the load.

Your load balancer routes requests to the targets in a target group using the target group settings that you specify.

Target group name

Target type ☒ Instance ☐ IP ☐ Lambda function

Protocol

Port

VPC

Health check settings

Protocol

Path

▶ **Advanced health check settings**

- I created a target group named VPCALBTG and take all the instances in VPC_A
- Now connect the target group to the ALB.

| Remove | | | | | | |
|-------------------------------------|---------------------|------------|------|---------|-----------------|------------|
| <input type="checkbox"/> | Instance | Name | Port | State | Security groups | Zone |
| <input checked="" type="checkbox"/> | i-078c43f4b03a8d016 | Servernew | 80 | stopped | launch-wizard-1 | us-east-2a |
| <input checked="" type="checkbox"/> | i-01e30b8e7631d1d82 | serverold | 80 | stopped | launch-wizard-1 | us-east-2b |
| <input checked="" type="checkbox"/> | i-0ae9e67a43c24726d | AMI SERVER | 80 | stopped | launch-wizard-1 | us-east-2c |

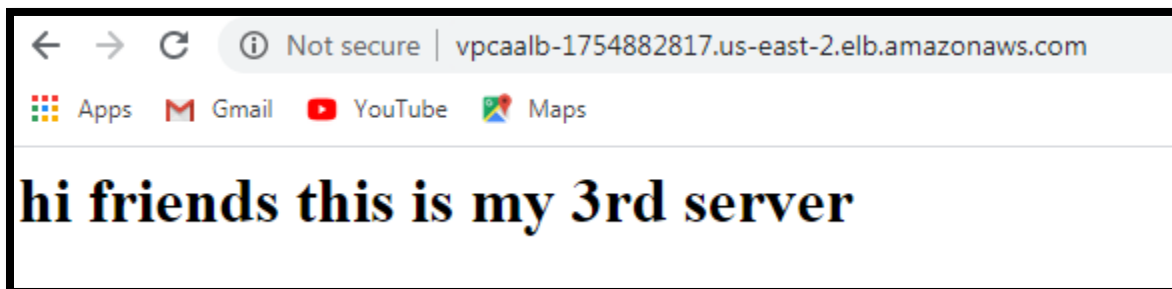
- When I start my EC2 in the target group it will show this server is healthy.

| Edit | | | | | |
|---------------------|------------|------|-------------------|---------|--|
| Registered targets | | | | | |
| Instance ID | Name | Port | Availability Zone | Status | Description |
| i-078c43f4b03a8d016 | Servernew | 80 | us-east-2a | healthy | This target is currently passing target group's health checks. |
| i-01e30b8e7631d1d82 | serverold | 80 | us-east-2b | healthy | This target is currently passing target group's health checks. |
| i-0ae9e67a43c24726d | AMI SERVER | 80 | us-east-2c | healthy | This target is currently passing target group's health checks. |

- Before attaching to the ALB make sure that in your server index.html file is already created if not then create a index.html file in var/www/html folder and put some values to determine or identify my server and also its help to check my load is distributing or not.

```
Amazon Linux 2 AMI
https://aws.amazon.com/amazon-linux-2/
3 package(s) needed for security, out of 133 available
run "sudo yum update" to apply all updates.
ec2-user@ip-10-0-1-149 ~]$ cd /var/www/html
ec2-user@ip-10-0-1-149 html]$ ls
index1.html  index.html
ec2-user@ip-10-0-1-149 html]$ sudo service httpd start
Redirecting to /bin/systemctl start httpd.service
ec2-user@ip-10-0-1-149 html]$ sudo service httpd status
Redirecting to /bin/systemctl status httpd.service
httpd.service - The Apache HTTP Server
Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor preset: disabled)
Active: active (running) since Sat 2020-07-11 08:47:35 UTC; 8s ago
Docs: man:httd.service(8)
Main PID: 3671 (httpd)
Status: "Processing requests..."
CGroup: /system.slice/httpd.service
├─3671 /usr/sbin/httpd -DFOREGROUND
├─3672 /usr/sbin/httpd -DFOREGROUND
├─3673 /usr/sbin/httpd -DFOREGROUND
├─3674 /usr/sbin/httpd -DFOREGROUND
├─3675 /usr/sbin/httpd -DFOREGROUND
└─3676 /usr/sbin/httpd -DFOREGROUND
Jul 11 08:47:35 ip-10-0-1-149.us-east-2.compute.internal systemd[1]: Starting The Apache HTTP Server...
Jul 11 08:47:35 ip-10-0-1-149.us-east-2.compute.internal systemd[1]: Started The Apache HTTP Server.
ec2-user@ip-10-0-1-149 html]$ ls
index1.html  index.html
ec2-user@ip-10-0-1-149 html]$
```

- After that I need check through my ALB DNS and copy that DNS and paste it to google it will show my html.



➤ AUTO SCALLING

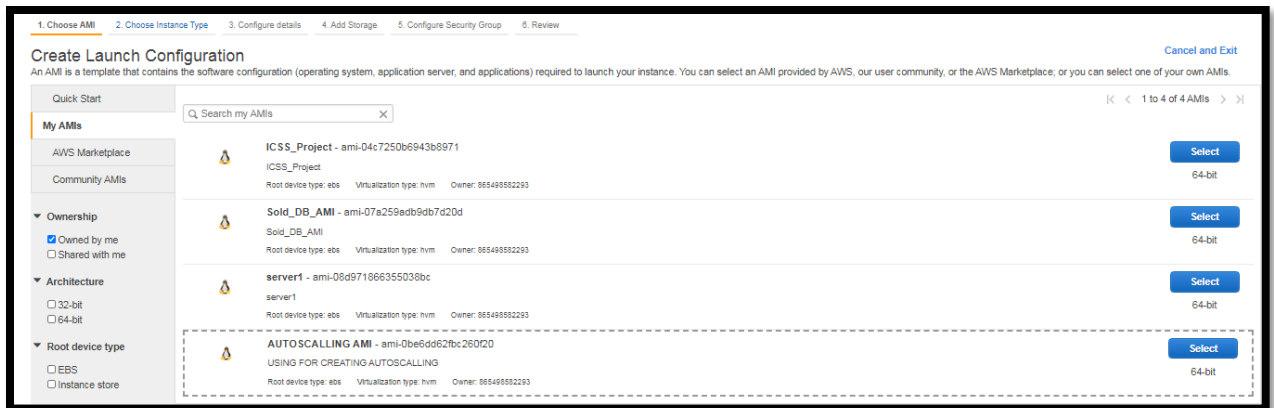
- AWS Auto Scaling monitors your applications and automatically adjusts capacity to maintain steady, predictable performance at the lowest possible cost. Using AWS Auto Scaling, it's easy to setup application scaling for multiple resources across multiple services in minutes. The service provides a simple, powerful user interface that lets you build scaling plans for resources including Amazon EC2 instances and Spot Fleets, Amazon ECS tasks, Amazon DynamoDB tables and indexes, and Amazon Aurora Replicas.
- AWS Auto Scaling makes scaling simple with recommendations that allow you to optimize performance, costs, or balance between them. If you're already using Amazon EC2 Auto Scaling to dynamically scale your Amazon EC2 instances, you can now combine it with

AWS Auto Scaling to scale additional resources for other AWS services. With AWS Auto Scaling, your applications always have the right resources at the right time.

- It's easy to get started with AWS Auto Scaling using the AWS Management Console, Command Line Interface (CLI), or SDK. AWS Auto Scaling is available at no additional charge. You pay only for the AWS resources needed to run your applications and Amazon CloudWatch monitoring fees.
- AWS Auto Scaling lets you set target utilization levels for multiple resources in a single, intuitive interface. You can quickly see the average utilization of all of your scalable resources without having to navigate to other consoles. For example, if your application uses Amazon EC2 and Amazon DynamoDB, you can use AWS Auto Scaling to manage resource provisioning for all of the EC2 Auto Scaling groups and database tables in your application.

- **Project Task:**

1. First I need to create a AMI for the same configuration in my case its servernew and I save it as auto scaling AMI.



2. From this AMI I configure the instance type I required for auto scaling and configure it as shown in below.

1. Configure Auto Scaling group details 2. Configure scaling policies 3. Configure Notifications 4. Configure Tags 5. Review

Create Auto Scaling Group

Group name ⓘ AUTOSCALLING GROUP

Launch Configuration ⓘ autoscaling group

Group size ⓘ Start with instances

Network ⓘ vpc-08793bd0d625a2de5 (10.0.0.0/16) | VPC_A [Create new VPC](#)

Subnet ⓘ

- subnet-03b42589637463ec5 (10.0.1.0/24) | frontend_subnet_2 | us-east-2b [x](#)
- subnet-0ccbbb55ea39414cd (10.0.0.0/24) | Front_end_subnet_VPC_A | us-east-2c [x](#)
- subnet-0060ad3a5ac611707 (10.0.2.0/24) | front_endsubnet | us-east-2a [x](#)

[Create new subnet](#)

3. In this group I need to select which VPC I need to configure and attach the subnet after that I need to attach this auto scaling group to the existing ALB shown in snapshot. I mentioned the health check as 30 sec means it will check after 30sec the status of the instances . If it is in healthy status or not.

▼ Advanced Details

Subnet ⓘ [subnet-03b42589637463ec5 \(10.0.1.0/24\) | frontend_subnet_2 | us-east-2b](#)

Load Balancing ⓘ ☐ Receive traffic from one or more load balancers [Learn about Elastic Load Balancing](#)

Health Check Grace Period ⓘ seconds

Monitoring ⓘ Amazon EC2 Detailed Monitoring metrics, which are provided at 1 minute frequency, are not enabled for the launch configuration autoscaling group. Instances launched from it will use Basic Monitoring metrics, provided at 5 minute frequency. [Learn more](#)

Instance Protection ⓘ

Service-Linked Role ⓘ AWSServiceRoleForAutoScaling [View Role in IAM](#)

4. After that I set the scaling features the minimum instances is 2 and the maximum instance should be 10 as per the mail and the cpu utilization is not more than 60% and I select 120sec for creating another instance if any of instance is in unhealthy condition then autoscaling will make an instance within 120 sec.

[1. Configure Auto Scaling group details](#)[2. Configure scaling policies](#)[3. Configure Notifications](#)[4. Configure Tags](#)[5. Review](#)

Create Auto Scaling Group

You can optionally add scaling policies if you want to adjust the size (number of instances) of your group automatically. A scaling policy is a set of rules that you assign to it. In each policy, you can choose to add or remove a specific number of instances or a percentage of the existing group size, or adjust the size of your group accordingly. [Learn more](#) about scaling policies.

☐ Keep this group at its initial size

☒ Use scaling policies to adjust the capacity of this group

Scale between and instances. These will be the minimum and maximum size of your group.

Scale Group Size

Name:

Metric type:

Target value:

Instances need: seconds to warm up after scaling

Disable scale-in: ☐

[Scale the Auto Scaling group using step or simple scaling policies](#) ⓘ

5. After that we need to get a SNS if CPU_utilization is more than 60% that topic will send a mail.

[1. Configure Auto Scaling group details](#)[2. Configure scaling policies](#)[3. Configure Notifications](#)[4. Configure Tags](#)[5. Review](#)

Create Auto Scaling Group

Configure your Auto Scaling group to send notifications to a specified endpoint, such as an email address, whenever a specified event takes place and failed instance termination.

If you created a new topic, check your email for a confirmation message and click the included link to confirm your subscription. Notifications are sent to the email address you specified when you created the topic.

Send a notification to: [create topic](#)

Whenever instances:

- ☒ launch
- ☒ terminate
- ☒ fail to launch
- ☒ fail to terminate

1. Configure Auto Scaling group details

2. Configure scaling policies

3. Configure Notifications

4. Configure Tags

5. Review

Create Auto Scaling Group

A tag consists of a case sensitive key-value pair that you can use to identify your group. For example, you could define a tag with Key = Environment and Value = Production. You can optionally ch

| Key | Value |
|-----------------------------------|---|
| <input type="text" value="Name"/> | <input type="text" value="AUTOSCALLING_group"/> |

Add tag

49 remaining

- ```
Last login: Sat Jul 11 08:12:45 2020 from 47.15.43.10

 | _|_)
 | (_|_ / Amazon Linux 2 AMI
 ||_|_|_|_|_|

https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-10-0-0-182 ~]$ sudo yum install httpd -y
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core | 3.7 kB 00:00:00
274 packages excluded due to repository priority protections
Package httpd-2.4.43-1.amzn2.x86_64 already installed and latest version
Nothing to do
[ec2-user@ip-10-0-0-182 ~]$ sudo service httpd start
Redirecting to /bin/systemctl start httpd.service
[ec2-user@ip-10-0-0-182 ~]$ █
```

- | Instance ID         | Name               | Port | Availability Zone | Status    | Description                                                    |
|---------------------|--------------------|------|-------------------|-----------|----------------------------------------------------------------|
| i-041b5ef95c48a9fb3 | servernew          | 80   | us-east-2a        | healthy   | This target is currently passing target group's health checks. |
| i-01e30b9e7631d1d82 | serverold          | 80   | us-east-2b        | healthy   | This target is currently passing target group's health checks. |
| i-0c30e6c1f7f01cd3  | Auto_scaling_group | 80   | us-east-2b        | unhealthy | Health checks failed with these codes: [502]                   |
| i-0ae9e67a43c24726d | AMI SERVER         | 80   | us-east-2c        | healthy   | This target is currently passing target group's health checks. |
| i-037f18a6ee7742eec | Auto_scaling_group | 80   | us-east-2c        | healthy   | This target is currently passing target group's health checks. |