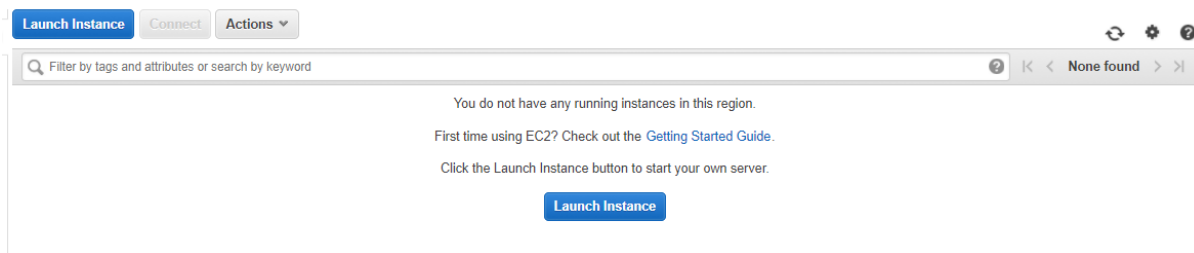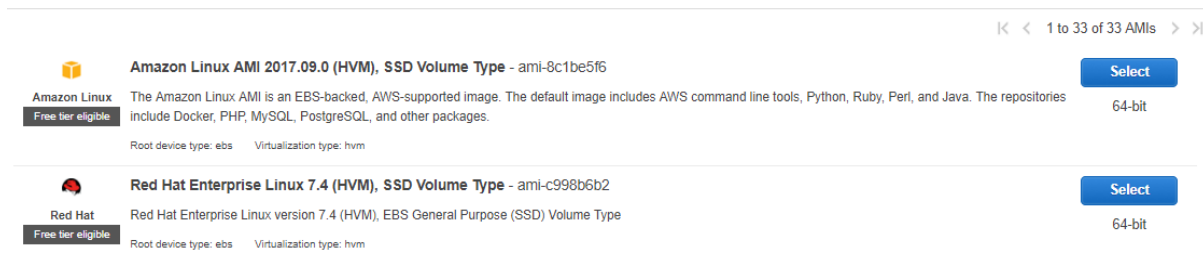# ACADGILD-PROJECT

Project: **This project aims at creating a highly available, fault tolerant application environment with specific points.**

Using AWS Resources: EC2 Instances, Auto-scaling, Load-balancer, Snapshots, Cloud watch.

- Fresh ec2 dashboard look like as shown in the above screenshot.
- Click on launch instance button to create any instance.

- To complete this project, Amazon Linux Ami was selected.
- We can select that by clicking on select button.

	Family	Type	vCPUs ⓘ	Memory (GiB)	Instance Storage (GB) ⓘ	EBS-Optimized Available ⓘ	Network Performance ⓘ	IPv6 Support ⓘ
☐	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
☑	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes

- Instance type selected as t2.micro

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advant

Number of instances ⓘ	1	Launch into Auto Scaling Group ⓘ
Purchasing option ⓘ	☐ Request Spot instances	
Network ⓘ	vpc-ebac9d92 (default) ▾	↻ Create new VPC
Subnet ⓘ	No preference (default subnet in any Availability Zon ▾	Create new subnet
Auto-assign Public IP ⓘ	Use subnet setting (Enable) ▾	
IAM role ⓘ	None ▾	↻ Create new IAM role
Shutdown behavior ⓘ	Stop ▾	
Enable termination protection ⓘ	☐ Protect against accidental termination	
Monitoring ⓘ	☐ Enable CloudWatch detailed monitoring Additional charges apply.	
Tenancy ⓘ	Shared - Run a shared hardware instance ▾ Additional charges will apply for dedicated tenancy.	

- Above screen shot describes the details of the instance.

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. Learn more about storage options in Amazon EC2.

Volume Type ⓘ	Device ⓘ	Snapshot ⓘ	Size (GiB) ⓘ	Volume Type ⓘ	IOPS ⓘ	Throughput (MB/s) ⓘ	Delete on Termination ⓘ	Encrypted ⓘ
Root	/dev/xvda	snap-080eb3cb2eda29974	8	General Purpose SSD (GP2) ▾	100 / 3000	N/A	☑	Not Encrypted

Add New Volume

- In add storage, volume type is General Purpose SSD(GP2).

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.
A copy of a tag can be applied to volumes, instances or both.
Tags will be applied to all instances and volumes. Learn more about tagging your Amazon EC2 resources.

Key (127 characters maximum)	**Value** (255 characters maximum)	**Instances** ⓘ	**Volumes** ⓘ	
Name	Primary	☑	☑	✕

Add another tag (Up to 50 tags maximum)

- For the first instance, name given as primary.

Select an existing key pair or create a new key pair ✕

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about removing existing key pairs from a public AMI.

Choose an existing key pair ▾

Select a key pair

srinu ▾

☑ I acknowledge that I have access to the selected private key file (srinu.pem), and that without this file, I won't be able to log into my instance.

Cancel   **Launch Instances**

- We have to provide the key pair to create a new instance.
- If any key pair is not available, then we can simply download the .pem file.

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.
A copy of a tag can be applied to volumes, instances or both.
Tags will be applied to all instances and volumes. Learn more about tagging your Amazon EC2 resources.

Key (127 characters maximum)	Value (255 characters maximum)	Instances ⓘ	Volumes ⓘ	
Name	Secondary	☑	☑	✖

Add another tag (Up to 50 tags maximum)

Allocate new address   Actions ▾   ↻ ✦ ❓

	Elastic IP	▲ Allocation ID	▼ Instance	▼ Private IP address	▼ Scope	▼ Association ID	▼ Network Interface ID	▼ Netw
■	34.236.67.9	eipalloc-56459063	i-03c67312c506b3b...	172.31.84.14	vpc	eipassoc-5c5f8f6b	eni-fb955d71	51460
	52.4.174.175	eipalloc-43449176	i-03c7f02f2b19cb359	172.31.28.250	vpc	eipassoc-a05d8d97	eni-adc9c513	51460

Q Filter by attributes or search by keyword |< < 1 to 2 of 2 > >|

- By complete the same steps, also created second instance named as secondary.
- Those two instances were allocated to two different elastic ip address.
- We can clearly see that elastic ip address in above screen shot.
- So, we were completed the instances creation process.
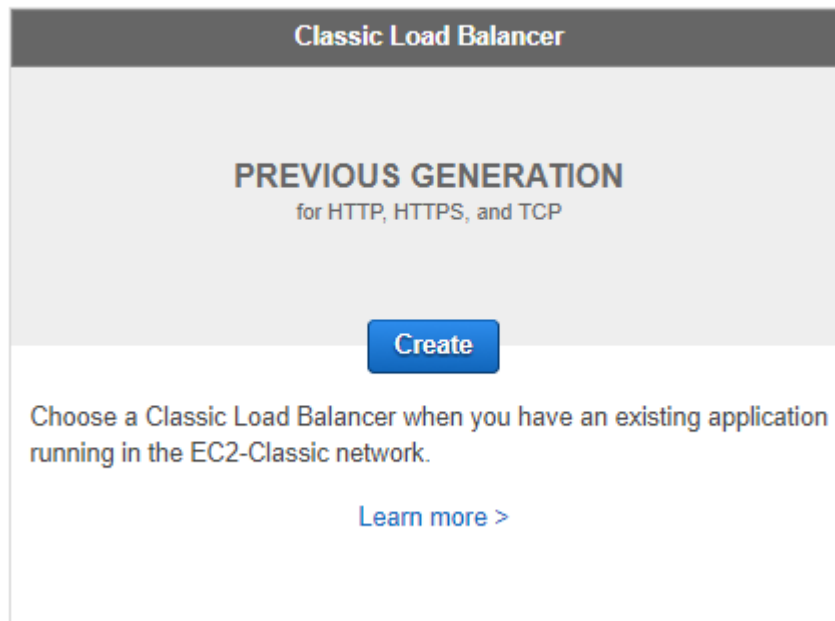
- Fresh load balancer dashboard look like above screen shot.
- To create a load balancer, click on create button.

1. Define Load Balancer **2. Assign Security Groups** **3. Configure Security Settings** **4. Configure Health Check** **5. Add EC2 Instances** **6. Add Tags** **7. Review**

Step 1: Define Load Balancer

Basic Configuration

This wizard will walk you through setting up a new load balancer. Begin by giving your new load balancer a unique name so that you can identify it from other load balancers you might create. You
protocols for your load balancer. Traffic from your clients can be routed from any load balancer port to any port on your EC2 instances. By default, we've configured your load balancer with a stand

Load Balancer name:	LB-server
Create LB Inside:	My Default VPC (172.31.0.0/16) ▼
Create an internal load balancer:	☐ (what's this?)
Enable advanced VPC configuration:	☐
Listener Configuration:	

Load Balancer Protocol	Load Balancer Port	Instance Protocol	Instance Port
HTTP ▼	80	HTTP ▼	80

Add

Key	Value
Name	Server-Loadbal

Create Tag

Instance ID	Name	Availability Zone	Status	Actions
i-03c67312c506b3b42	Secondary	us-east-1a	InService ⓘ	Remove from Load Balancer
i-03c7f02f2b19cb359	Primary	us-east-1b	InService ⓘ	Remove from Load Balancer

- Load balancer name provided as lb-server.
- At the time of load balancer creation, those two instances were added to load balancer.

Load balancer: LB-server

Description | Instances | Health Check | Listeners | Monitoring | Tags

Basic Configuration

Name: LB-server
*DNS name: LB-server-342990844.us-east-1.elb.amazonaws.com (A Record)

Scheme: internet-facing

Availability Zones:
subnet-0888c304 - us-east-1f,
subnet-3aecb016 - us-east-1a,
subnet-3db3a175 - us-east-1b,
subnet-68ef380c - us-east-1d,
subnet-94b3e2ce - us-east-1c,
subnet-fd8d79c2 - us-east-1e

Creation time: October 7, 2017 at 11:34:17 AM UTC+5:30
Hosted zone: Z35SXDOTRQ7X7K
Status: 2 of 2 instances in service
VPC: vpc-ebac9d92

- After creation of load balancer, under description we can get the DNS name of load balancer.
- Load balancer not having the ip-address.
- Individual DNS links will automatically generated after completion of load balancer.
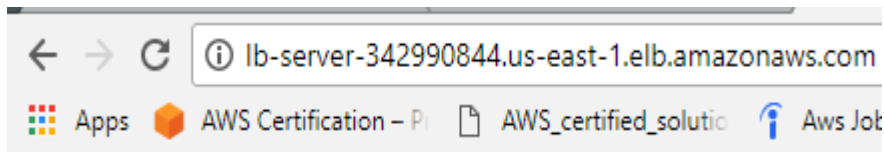
first one

Team Performance Survey

First name   Last name

Evaluate your team

Please rate the following statements on a scale from 1(worst) to 5(best)

How well do members of your team share responsibility for tasks?
[▼]

How honest with each other are the members of your team?
[▼]

How much attention is given to the most difficult issues during team meetings?
[▼]

How well do the members of your team communicate with each other?
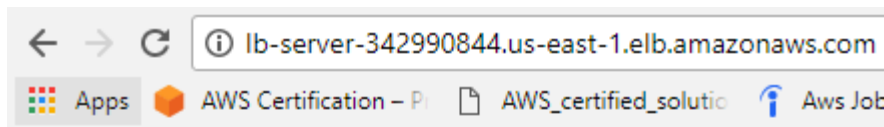[▼]

How do members of your team deal with each other's mistakes?
[▼]

How quickly does your team act on their decisions?
[▼]

Additional comments

[   ]

[Submit]

- When we browse that load balancer link, we will obtain the web page provided to the instances.
- This is simple team performance survey.

second one

Team Performance Survey

First name   Last name

Evaluate your team

Please rate the following statements on a scale from 1(worst) to 5(best)

How well do members of your team share responsibility for tasks?

How honest with each other are the members of your team?

How much attention is given to the most difficult issues during team meetings?

How well do the members of your team communicate with each other?

How do members of your team deal with each other's mistakes?

How quickly does your team act on their decisions?

Additional comments

Submit

- When refresh the same load-balancer DNS link, we will get the second virtual machine output as shown in screen shot.
- Because load-balancer balance the load between virtual machines or web servers..

Create Image

	Instance ID (i)	i-03c7f02f2b19cb359
	Image name (i)	Instance-image
	Image description (i)	Instance-image
	No reboot (i)	☐

Instance Volumes

Volume Type (i)	Device (i)	Snapshot (i)	Size (GiB) (i)	Volume Type (i)	IOPS (i)	Throughput (MB/s) (i)	Delete on Termination (i)	Encrypted (i)
Root	/dev/xvda	snap-080eb3cb2eda29974	8	General Purpose SSD (GP2) ▼	100 / 3000	N/A	☑	Not Encrypted

Add New Volume

Total size of EBS Volumes: 8 GiB
When you create an EBS image, an EBS snapshot will also be created for each of the above volumes.

Cancel   **Create Image**

- Here we are creating image of virtual machine which we can use for the generation of auto scaling policy

Create Auto Scaling Group

To create an Auto Scaling group, you will first need to choose a template that your Auto Scaling group will use when it launches instances for you, called a launch configuration. Choose a launch configuration or create a new one, and then apply it to your group.

Later, if you want to use a different template, you can create another launch configuration and apply it to this group, even if you already have instances running in it. Using this method, you can update the software that your group uses when it launches new instances.

Step 1: Create launch configuration

First, define a template that your Auto Scaling group will use to launch instances. You can change your group's launch configuration at any time.

Step 2: Create Auto Scaling group

Next, give your group a name and specify how many instances you want to run in it.

Your group will maintain this number of instances, and replace any that become unhealthy or impaired.

🔍 Search my AMIs   ✕

△ **Instance-image** - ami-83ec2cf9
    Instance-image
    Root device type: ebs   Virtualization type: hvm   Owner: 514602770466

- We will select created image from AMI's dashboard to create a new launch configuration and to create auto scaling group.

Create Launch Configuration

Name ⓘ	Auto-Instances	
Purchasing option ⓘ	☐ Request Spot Instances	
IAM role ⓘ	None ▼	
Monitoring ⓘ	☐ Enable CloudWatch detailed monitoring Learn more	

- This step is for creating a launch configuration. Here we have to specify instance type and all what we were already done at before step.
- For launch configuration, we were provided name as Auto-instances.
- Right now no IAM role is available.

Launch Configuration ⓘ	Auto-Instances
Group name ⓘ	Auto-instances
Group size ⓘ	Start with 3 instances
Network ⓘ	vpc-ebac9d92 (172.31.0.0/16) (default) ▼ C Create new VPC
Subnet ⓘ	subnet-0888c304(172.31.64.0/20) | Default in us-east-1f ✕ subnet-3aecb016(172.31.80.0/20) | Default in us-east-1a ✕ subnet-3db3a175(172.31.16.0/20) | Default in us-east-1b ✕ subnet-68ef380c(172.31.0.0/20) | Default in us-east-1d ✕ subnet-fd8d79c2(172.31.48.0/20) | Default in us-east-1e ✕ subnet-94b3e2ce(172.31.32.0/20) | Default in us-east-1c ✕ | Create new subnet

Each instance in this Auto Scaling group will be assigned a public IP address. ⓘ

- For high availability of application, here we were selected all the subnets present in the VPC network.

- Group size will be started from 3. We can set the auto scaling policy for increasing and decreasing the number of instances.

Advanced Details

Load Balancing ⓘ	☑ Receive traffic from one or more load balancers	Learn about Elastic Load Balancing
Classic Load Balancers ⓘ	LB-server ✕	
Target Groups ⓘ		

Health Check Type ⓘ	◉ ELB ○ EC2
Health Check Grace Period ⓘ	297 seconds
Monitoring ⓘ	Amazon EC2 Detailed Monitoring metrics, which are provided at 1 minute frequency, are not enabled for the launch configuration Auto-Instances. Instances launched from it will use Basic Monitoring metrics, provided at 5 minute frequency. Learn more

- In advance settings, we can select the load balancer to balance the load between number of servers and it also check the health conditions of instances with in the load balancer.
- So, to get that facility we have to change health check type from EC2 to ELB.

Key	Value	Tag New Instances ⓘ	
Name	Auto-Instances	☑	✕

Add tag   49 remaining

Filter: Q Filter Auto Scaling groups...   ✕   I< <   1 to 1 of 1 Auto Scaling Groups   > >I

	Name ▲	Launch Configuration ▾	Instances ▾	Desired ▾	Min ▾	Max ▾	Availability Zones ▾	Default Cooldown ▾	Health Check Grac ▾
	Auto-instances	Auto-Instances	3	3	3	3	us-east-1a, us-east-1b, us-e...	300	297

- We set a tag to Auto scaling group as a Auto-instances.

- So finally, auto scaling group has created successfully with max and min number of 3 instances.

Instance ID	Name	Availability Zone	Status	Actions
i-0f0575b6acffa7987	Auto-Instances	us-east-1f	OutOfService ⓘ	Remove from Load Balancer
i-03c67312c506b3b42	Secondary	us-east-1a	InService ⓘ	Remove from Load Balancer
i-03c7f02f2b19cb359	Primary	us-east-1b	OutOfService ⓘ	Remove from Load Balancer
i-0321d4a171223034f	Auto-Instances	us-east-1a	OutOfService ⓘ	Remove from Load Balancer

- Here we can see all the servers are not available, but still we can reach the website from the secondary server which is working under the load balancer.
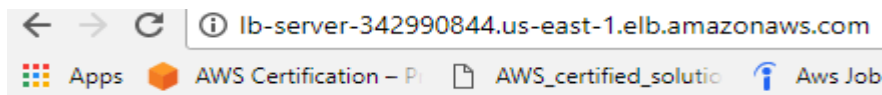
← → C ⓘ lb-server-342990844.us-east-1.elb.amazonaws.com

▦ Apps 🔶 AWS Certification – P ▭ AWS_certified_solutic 🎯 Aws Job

second one

Team Performance Survey

First name

Last name

Evaluate your team

Please rate the following statements on a scale from 1(worst) to 5(best)

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How do members of your team deal with each other's mistakes?

How quickly does your team act on their decisions?

Additional comments

Submit

- So, by using auto scaling we can increase the number of instances and by load balancer we can find out health of instances, if those are not fine, then send the all responses to the working server.
- **To creating a highly available, fault tolerant application environment with specific points We can simply use these two amazon resources.**