

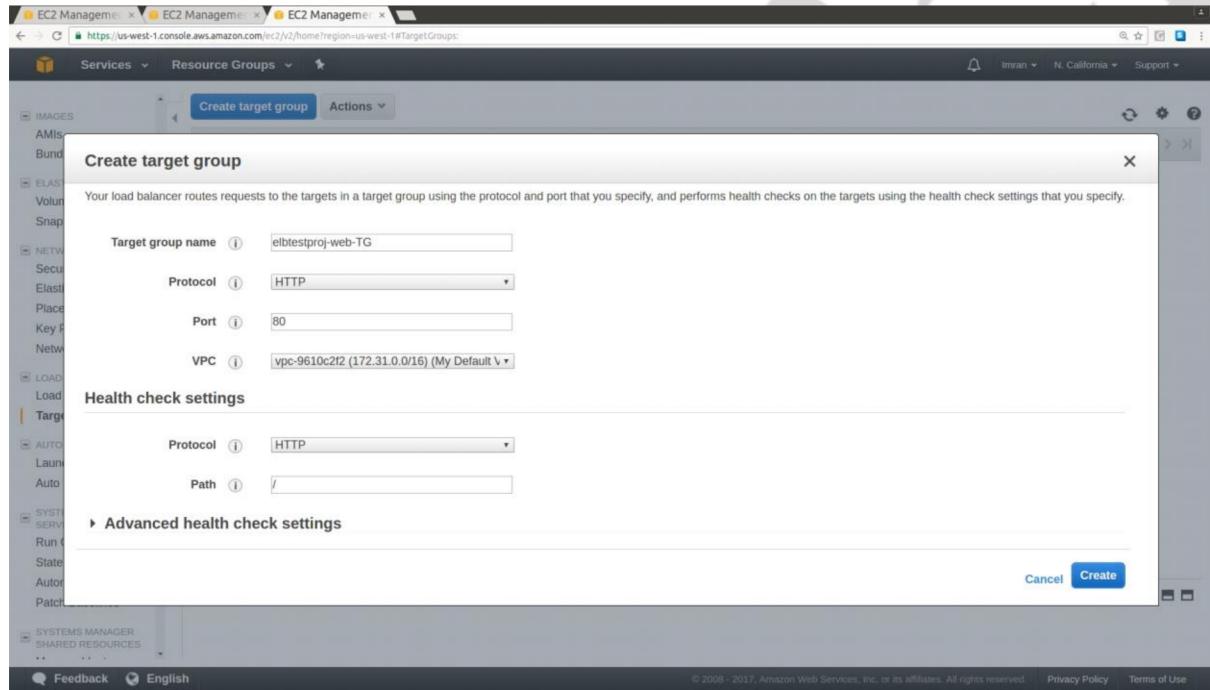
Test the webpage

Enter the ec2 instance public IP in browser.

<http://54.215.191.250/>

Load Balancer setup

- ❖ Click on Target Group on the left side of the navigation pane, click on create target group.
- ❖ Provide name for target group and click on create as shown in below screenshot:



- ❖ Once the Target group is created click on the targets tab, Edit and Select web01 & web02 instances. Add to registered and click on Save.

The screenshot shows the AWS EC2 Target Groups console. On the left sidebar, under the 'LOAD BALANCING' section, 'Target Groups' is selected. In the main content area, a table lists one target group: 'elbtestproj-web-TG' with port 80, protocol HTTP, and VPC ID vpc-9610c2f2. Below the table, tabs for 'Description', 'Targets' (which is selected), 'Health checks', 'Monitoring', and 'Tags' are visible. A note states: 'The load balancer starts routing requests to a newly registered instance as soon as the registration process completes and the instance passes the initial health checks. If demand on your instances increases, you can register additional instances. If demand on your instances decreases, you can deregister instances.' An 'Edit' button is present. The 'Registered instances' section shows a table with columns: Instance ID, Name, Port, Availability Zone, and Status. A note says: 'There are no instances registered to this target group.' The 'Availability Zones' section shows a table with columns: Availability Zone, Instance Count, and Healthy?. A note says: 'There are no instances registered to this target group.'

The screenshot shows the 'Register and deregister instances' dialog box. Under the 'Registered instances' section, it says: 'To deregister instances, select one or more registered instances and then click Remove.' Below is a table with columns: Instance, Name, Port, State, Security groups, and Zone. A note says: 'No instances available.' Under the 'Instances' section, it says: 'To register additional instances, select one or more running instances, specify a port, and then click Add. The default port is the port specified for the target group. If the instance is already registered on the specified port, you must specify a different port.' A search bar 'Search Instances' is present. Below is a table with columns: Instance, Name, State, Security groups, Zone, Subnet ID, and Subnet CIDR. Two instances are listed: 'i-0ad2a814386e38ab3' and 'i-0e240d9ab028759f1', both in the 'running' state, part of 'elbtestproj-SG', in 'us-west-1a', with Subnet IDs 'subnet-6e19a436' and Subnet CIDRs '172.31.0.0/20'. Buttons 'Cancel' and 'Save' are at the bottom right.

Then the instances will be added to the Target Group.

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Register and deregister instances

Registered instances
To deregister instances, select one or more registered instances and then click Remove.

Instance	Name	Port	State	Security groups	Zone
i-0ad2a814386e38ab3	elbtestproj-web2	80	running	elbtestproj-SG	us-west-1a
i-0e240d9ab028759f1	elbtestproj-web1	80	running	elbtestproj-SG	us-west-1a

Instances
To register additional instances, select one or more running instances, specify a port, and then click Add. The default port is the port specified for the target group. If the instance is already registered on the specified port, you must specify a different port.

Add to registered on port 80

Instance	Name	State	Security groups	Zone	Subnet ID	Subnet CIDR
i-0ad2a814386e38ab3	elbtestproj-web2	running	elbtestproj-SG	us-west-1a	subnet-6e19a436	172.31.0.0/20
i-0e240d9ab028759f1	elbtestproj-web1	running	elbtestproj-SG	us-west-1a	subnet-6e19a436	172.31.0.0/20

Cancel Save

Creating Load Balancer:

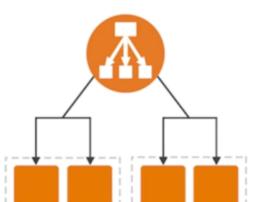
Click on Load Balancers in Left Pane and select Create Load Balancer, you will get two types of load balancers, Application load balancer and Classic load balancer. Select Application Load Balancer and click on Continue.

Welcome to Elastic Load Balancing
Select load balancer type

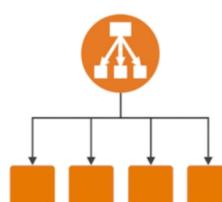
Elastic Load Balancing supports two types of load balancers: Application Load Balancers (new) and Classic Load Balancers. Choose the load balancer type that meets your needs. [Learn more.](#)

Application Load Balancer Classic Load Balancer

Preferred for HTTP/HTTPS



An Application Load Balancer makes routing decisions at the application layer (HTTP/HTTPS), supports path-based routing, and can route requests to one or more ports on each EC2 instance or container instance in your VPC.



A Classic Load Balancer makes routing decisions at either the transport layer (TCP/SSL) or the application layer (HTTP/HTTPS), and supports either EC2-Classic or a VPC.

Cancel Continue

Configure the details of the load balancer. Provide the name for load balancer, the name of your Application Load Balancer must be unique within your set of Application Load Balancers. For one region, it can have a maximum of 32 characters and contain only alphanumeric characters and hyphens, and must not begin or end with a hyphen. Click on next configure security group.

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Step 1: Configure Load Balancer

Basic Configuration

To configure your load balancer, provide a name, select a scheme, specify one or more listeners, and select a network. The default configuration is an Internet-facing load balancer in the selected network with a listener that receives HTTP traffic on port 80.

Name: elbtestproj-web-elb
Scheme: internet-facing
IP address type: ipv4

Listeners

A listener is a process that checks for connection requests, using the protocol and port that you configured.

Load Balancer Protocol	Load Balancer Port
HTTP	80

Add listener

Availability Zones

Specify the Availability Zones to enable for your load balancer. The load balancer routes traffic to the targets in these Availability Zones only. You can specify only one subnet per Availability Zone. You must specify subnets from at least two Availability Zones to increase the availability of your load balancer.

Cancel **Next: Configure Security Settings**

For Availability Zones, select the VPC that you used for your EC2 instances. For each of the two Availability Zones that contain your EC2 instances, select the Availability Zone and then select the public subnet for that Availability Zone.

Add atleast two Availability Zones to increase the availability of the load balancer. Click on next

Step 1: Configure Load Balancer

Listeners

A listener is a process that checks for connection requests, using the protocol and port that you configured.

Load Balancer Protocol	Load Balancer Port
HTTP	80

Add listener

Availability Zones

Specify the Availability Zones to enable for your load balancer. The load balancer routes traffic to the targets in these Availability Zones only. You can specify only one subnet per Availability Zone. You must specify subnets from at least two Availability Zones to increase the availability of your load balancer.

VPC	Availability Zone	Subnet ID	Subnet IPv4 CIDR	Name
vpc-9610c2f2 (172.31.0.0/16) (default)	us-west-1a	subnet-6e19a436	172.31.0.0/20	
	us-west-1b	subnet-8c264ae8	172.31.16.0/20	

At least two subnets must be specified

Cancel **Next: Configure Security Settings**

Configure the details of security group to improve the load balancer's security.

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Step 2: Configure Security Settings

⚠ Improve your load balancer's security. Your load balancer is not using any secure listener.

If your traffic to the load balancer needs to be secure, use the HTTPS protocol for your front-end connection. You can go back to the first step to add/configure secure listeners under [Basic Configuration](#) section. You can also continue with current settings.

Create a new security group for load balancer which accepts HTTP traffic on port 80.

Step 3: Configure Security Groups

A security group is a set of firewall rules that control the traffic to your load balancer. On this page, you can add rules to allow specific traffic to reach your load balancer. First, decide whether to create a new security group or select an existing one.

Assign a security group:

- Create a new security group
- Select an existing security group

Security group name: elbttestproj-elb-SG

Description: elbttestproj-elb-SG

Type	Protocol	Port Range	Source
Custom TCP Rule	TCP	80	Anywhere

Add Rule

Configure the target group. The default rule for your listener routes requests to the registered targets in this target group. The load balancer checks the health of targets in this target group using the health check settings defined for the target group.

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Step 4: Configure Routing
Your load balancer routes requests to the targets in this target group using the protocol and port that you specify, and performs health checks on the targets using these health check settings. Note that each target group can be associated with only one load balancer.

Target group

Target group: Existing target group
Name: elbtestproj-web-TG
Protocol: HTTP
Port: 80

Health checks

Protocol: HTTP
Path: /

» Advanced health check settings

Cancel Previous Next: Register Targets

Register targets with the Target Groups

Step 5: Register Targets
Register targets with your target group. If you register an instance running in an enabled Availability Zone, the load balancer starts routing requests to the instance as soon as the registration process completes and the instance passes the initial health checks.

Registered instances

The following instances are registered with the target group that you selected. You can only modify this list after you create the load balancer.

Instance	Port
i-0ad2a814386e38ab3	80
i-0e240d9ab028759f1	80

Battery Low
10% charge remaining

Cancel Previous Next: Review

Validate the Load Balancer:

Enter Load Balancers DNS name in the browser to test the connection
<http://elbtestproj-web-elb-289295805.us-west-1.elb.amazonaws.com/>

If everything is good you will see webpages from web01 and web02 instances.

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13. AWS Auto Scaling

Auto Scaling is a web service designed to launch or terminate Amazon EC2 instances automatically based on user-defined policies, schedules, and health checks. You can use Auto Scaling to help ensure that you are running your desired number of Amazon EC2 instances. Auto Scaling can also automatically increase the number of Amazon EC2 instances during demand spikes to maintain performance and decrease capacity during lulls to reduce costs. Auto Scaling is well suited both to applications that have stable demand patterns or that experience hourly, daily, or weekly variability in usage.

Benefits of Auto Scaling:

Adding Auto Scaling to your application architecture is one way to maximize the benefits of the AWS cloud. When you use Auto Scaling, your applications gain the following benefits:

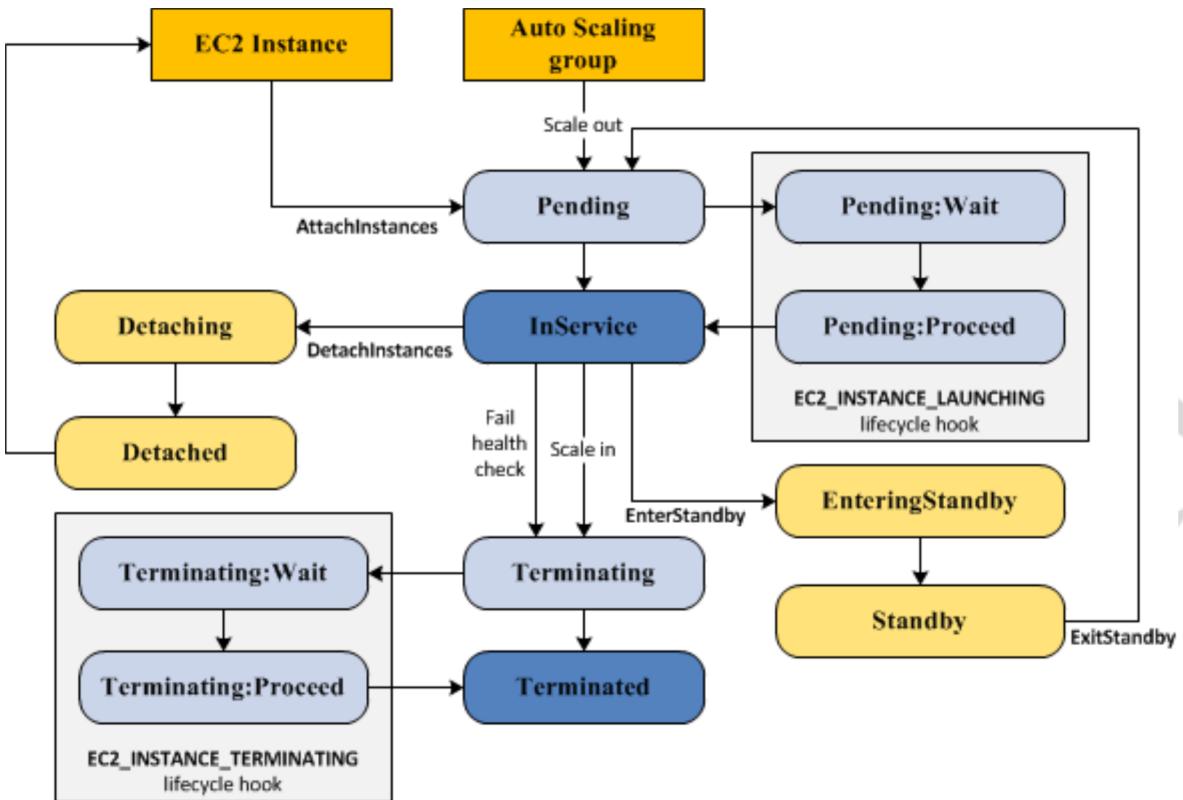
- **Better fault tolerance.** Auto Scaling can detect when an instance is unhealthy, terminate it, and launch an instance to replace it. You can also configure Auto Scaling to use multiple Availability Zones. If one Availability Zone becomes unavailable, Auto Scaling can launch instances in another one to compensate.
- **Better availability.** Auto Scaling can help you ensure that your application always has the right amount of capacity to handle the current traffic demands.
- **Better cost management.** Auto Scaling can dynamically increase and decrease capacity as needed. Because you pay for the EC2 instances you use, you save money by launching instances when they are actually needed and terminating them when they aren't needed.

Auto Scaling Lifecycle:

The EC2 instances in an Auto Scaling group have a path, or lifecycle, that differs from that of other EC2 instances. The lifecycle starts when the Auto Scaling group launches an instance and puts it into service. The lifecycle ends when you terminate the instance, or the Auto Scaling group takes the instance out of service and terminates it.

Note: You are billed for instances as soon as they are launched, including the time that they are not yet in service.

The following illustration shows the transitions between instance states in the Auto Scaling lifecycle.



Scale Out

The following scale out events direct the Auto Scaling group to launch EC2 instances and attach them to the group:

- You manually increase the size of the group.
- You create a scaling policy to automatically increase the size of the group based on a specified increase in demand.
- You set up scaling by schedule to increase the size of the group at a specific time.

When a scale out event occurs, the Auto Scaling group launches the required number of EC2 instances, using its assigned launch configuration. These instances start in the Pending state. If you add a lifecycle hook to your Auto Scaling group, you can perform a custom action here.

When each instance is fully configured and passes the Amazon EC2 health checks, it is attached to the Auto Scaling group and it enters the In-service state. The instance is counted against the desired capacity of the Auto Scaling group.

Instances In Service

Instances remain in the In-service state until one of the following occurs:

- A scale in event occurs, and Auto Scaling chooses to terminate this instance in order to reduce the size of the Auto Scaling group.
- You put the instance into a Standby state.
- You detach the instance from the Auto Scaling group.
- The instance fails a required number of health checks, so it is removed from the Auto Scaling group, terminated, and replaced.

Scale In

It is important that you create a scale in event for each scale out event that you create. This helps ensure that the resources assigned to your application match the demand for those resources as closely as possible.

The following scale in events direct the Auto Scaling group to detach EC2 instances from the group and terminate them:

- ✓ You manually decrease the size of the group.

- ✓ You create a scaling policy to automatically decrease the size of the group based on a specified decrease in demand.
- ✓ You set up scaling by schedule to decrease the size of the group at a specific time.

When a scale in event occurs, the Auto Scaling group detaches one or more instances. The Auto Scaling group uses its termination policy to determine which instances to terminate. Instances that are in the process of detaching from the Auto Scaling group and shutting down enter the Terminating state, and can't be put back into service. If you add a lifecycle hook to your Auto Scaling group, you can perform a custom action here. Finally, the instances are completely terminated and enter the Terminated state.

Attach an Instance

You can attach a running EC2 instance that meets certain criteria to your Auto Scaling group. After the instance is attached, it is managed as part of the Auto Scaling group.

Detach an Instance

You can detach an instance from your Auto Scaling group. After the instance is detached, you can manage it separately from the Auto Scaling group or attach it to a different Auto Scaling group.

Auto Scaling Limits

The following table lists the default limits related to your Auto Scaling resources.

Resource	Default Limit
Launch configurations per region	100
Auto Scaling groups per region	20
Scaling policies per Auto Scaling group	50
Scheduled actions per Auto Scaling group	125
Lifecycle hooks per Auto Scaling group	50
SNS topics per Auto Scaling group	10
Classic Load Balancers per Auto Scaling group	50*
Target groups per Auto Scaling group	50*
Step adjustments per scaling policy	20

* Note that you can attach or detach at most 10 at a time.

Setup for Auto Scaling: Here is process for setting up the basic infrastructure for Auto Scaling.

For practice of auto scaling we need EC2 instances with following details.

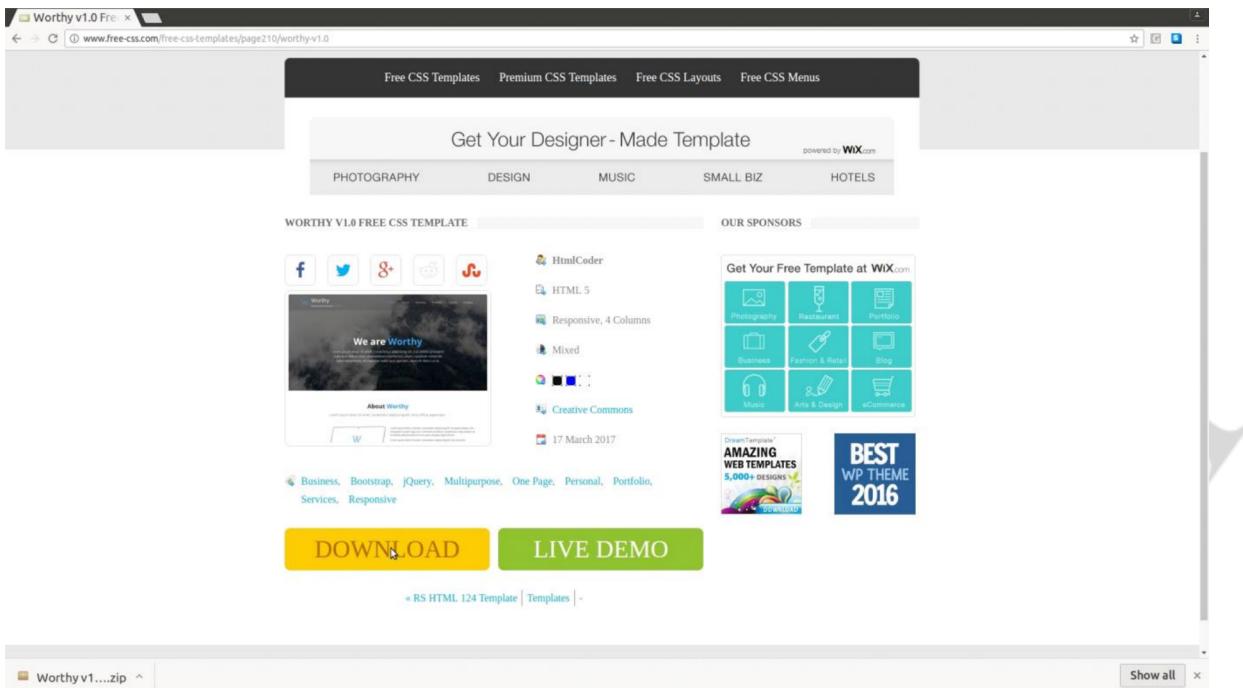
- Create an EC2 instance of CentOS6 with instance type t2.micro, Security Group – SSH => MyIP, HTTP => Anywhere.
- Download the Private Keypair for Access.
- Install HTTPD service and start it. Make sure that it should serve some html website.
- You can get a sample website from below link

<http://www.free-css.com/free-css-templates>

For example let us take sample website template named Worthy. Follow below steps to setup worthy website on our ec2 instance.

1. Setup Website on EC2:

- Download worthy website to your local computer.



- Copy the website file from local computer to the ec2 instance using scp command.

```
imran@DevOps:~/keys$ scp -i worthy-nocalifornia.pem /home/imran/Downloads/Worthy\ v1.0\ Free\ Website\ Template\ -\ Free-CSS.com.zip centos@54.193.0.30:/tmp
Worthy v1.0 Free Website Template - Free-CSS.com.zip
100% 1381KB 276.3KB/s   00:05
imran@DevOps:~/keys$ ssh -i worthy-nocalifornia.pem centos@54.193.0.30
[centos@ip-172-31-6-243 ~]$ sudo -i
```

- Install HTTPD and setup website.



Start httpd service, enable httpd service even after rebooting the system and stop the firewalls.

```
[root@ip-172-31-6-243 ~]# service httpd start
Starting httpd: [ OK ]
[root@ip-172-31-6-243 ~]# service iptables stop
iptables: Setting chains to policy ACCEPT: filter [ OK ]
iptables: Flushing firewall rules: [ OK ]
iptables: Unloading modules: [ OK ]
[root@ip-172-31-6-243 ~]# chkconfig httpd on
[root@ip-172-31-6-243 ~]# chkconfig iptables off
```

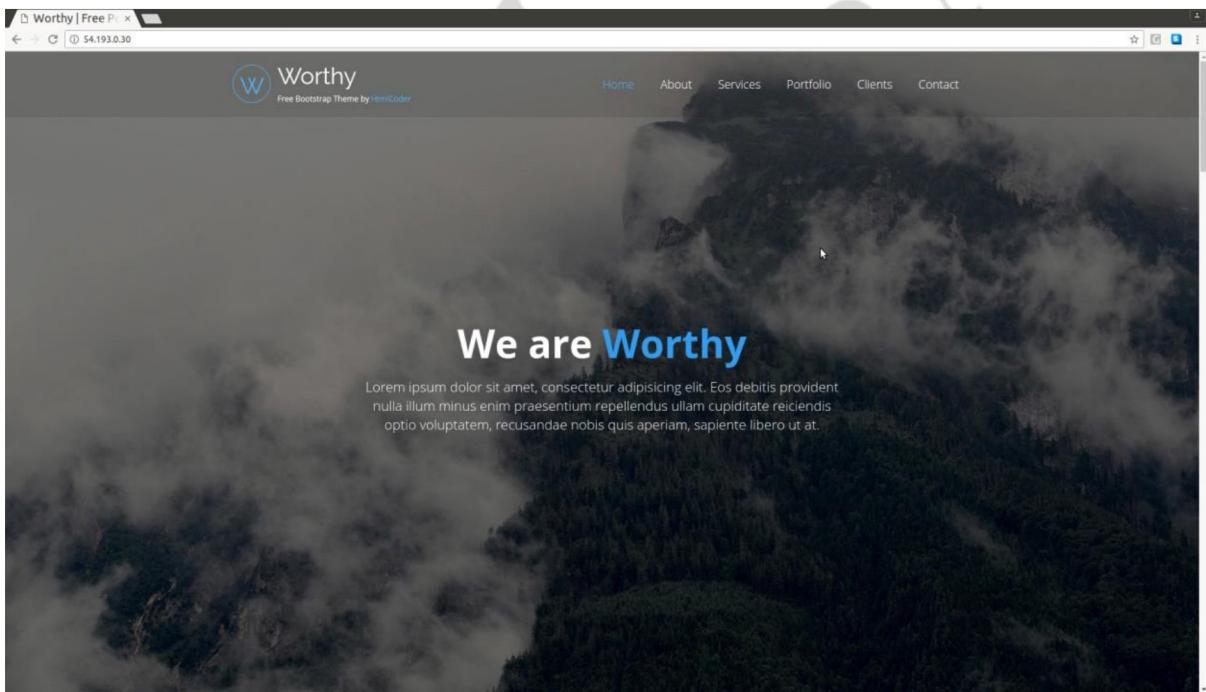
Copy website files to the Document root directory and unzip it in order to access the website.

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```
File Edit View Search Terminal Tabs Help
imran@DevOps:~/Downloads                                     root@ip-172-31-6-243:/var/www/html
[root@ip-172-31-6-243 ~]# cp /tmp/Worthy\ v1.0\ Free\ Website\ Template\ -\ Free-CSS.com.zip /var/www/html/
[root@ip-172-31-6-243 ~]# cd /var/www/html/
[root@ip-172-31-6-243 html]# ls
Worthy v1.0 Free Website Template - Free-CSS.com.zip
[root@ip-172-31-6-243 html]# unzip Worthy\ v1.0\ Free\ Website\ Template\ -\ Free-CSS.com.zip > /dev/null
[root@ip-172-31-6-243 html]# ls
worthy v1.0 Worthy v1.0 Free Website Template - Free-CSS.com.zip
[root@ip-172-31-6-243 html]# mv worthy_v.1.0/* .
[root@ip-172-31-6-243 html]# ls
bootstrap css fonts images index.html js plugins README.md ReadMe.txt
[root@ip-172-31-6-243 html]# rm -rf worthy_v.1.0/ Worthy\ v1.0\ Free\ Website\ Template\ -\ Free-CSS.com.zip
[root@ip-172-31-6-243 html]# ls
bootstrap css fonts images index.html js plugins README.md ReadMe.txt
[root@ip-172-31-6-243 html]#
```

Test the website by accessing ec2 instance public IP from browser.



Setting up AMI: For more details about AMI refer ELB-exercise.

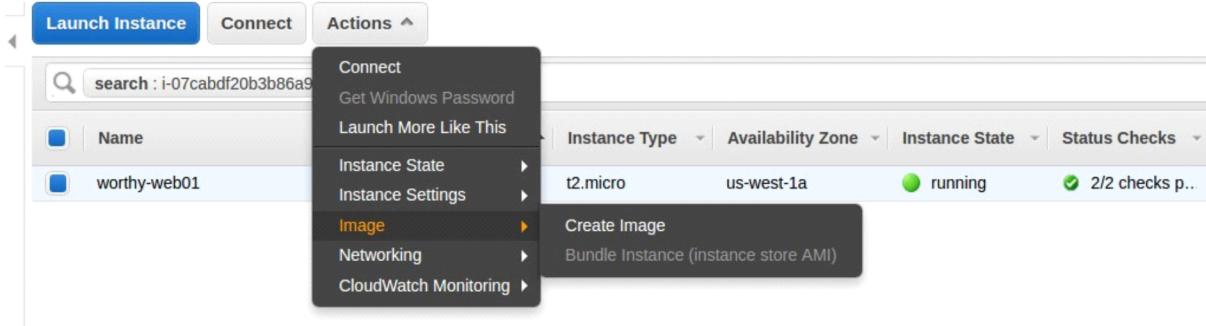
Now once we have our instance ready we will create an AMI for the purpose of autoscaling.

Creating AMI:

Select an instance, click on Actions and select Image Create Image

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You will see create image dialog box as shown below:

Create Image

Instance ID	i-07cabdf20b3b86a9a							
Image name	worthy-web-AMI							
Image description								
No reboot	<input type="checkbox"/>							
Instance Volumes								
Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/sda1	snap-f711c830	8	General Purpose SSD (GP2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	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

Creating AWS ELB:

Once we have our AMI ready we can start creating ELB, please refer to below screenshots.

Select Load Balancer on the left pane of the EC2 Dashboard. To create Load Balancer, follow the steps mentioned in the ELB-Exercise.

EC2 Management Home > Load Balancers > Create Load Balancer

Create Load Balancer

None found

Filter: Search

Select a load balancer

Bundle Tasks

- ELASTIC BLOCK STORE
- Volumes
- Snapshots
- NETWORK & SECURITY
- Security Groups
- Elastic IPs
- Placement Groups
- Key Pairs
- Network Interfaces
- LOAD BALANCING
- Load Balancers**
- Target Groups
- AUTO SCALING
- Launch Configurations
- Auto Scaling Groups
- SYSTEMS MANAGER SERVICES
- Run Command
- Stat Manager
- Automations
- Patch Baselines
- SYSTEMS MANAGER SHARED RESOURCES

Feedback English Show all

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Welcome to Elastic Load Balancing

Select load balancer type

Elastic Load Balancing supports two types of load balancers: Application Load Balancers (new) and Classic Load Balancers. Choose the load balancer type that meets your needs. [Learn more.](#)

Application Load Balancer

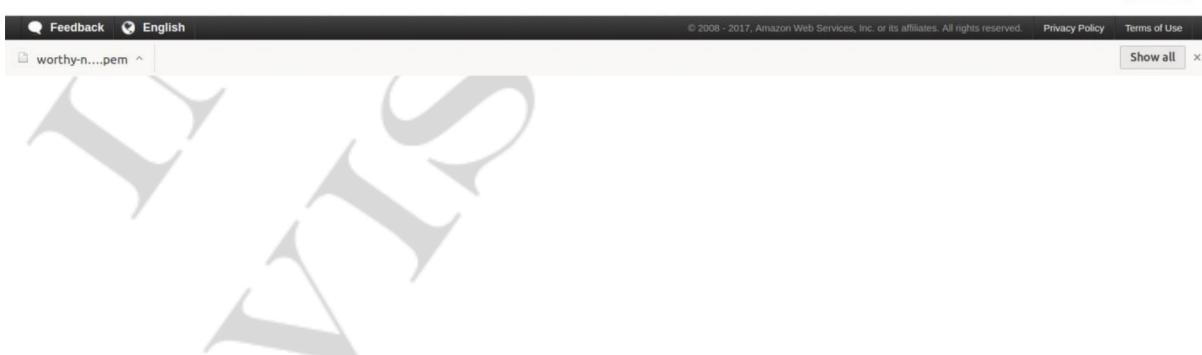
Preferred for HTTP/HTTPS

An Application Load Balancer makes routing decisions at the application layer (HTTP/HTTPS), supports path-based routing, and can route requests to one or more ports on each EC2 instance or container instance in your VPC.

Classic Load Balancer

A Classic Load Balancer makes routing decisions at either the transport layer (TCP/SSL) or the application layer (HTTP/HTTPS), and supports either EC2-Classic or a VPC.

Cancel Continue



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Step 2: Assign Security Groups

You have selected the option of having your Elastic Load Balancer inside of a VPC, which allows you to assign security groups to your load balancer. Please select the security groups to assign to this load balancer. This can be changed at any time.

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

Security group name: worthy-elb-sg

Description: worthy-elb-sg

Type	Protocol	Port Range	Source
Custom TCP Rule	TCP	80	Anywhere 0.0.0.0/0

Add Rule

Cancel Previous Next: Configure Security Settings

Step 5: Add EC2 Instances

The table below lists all your running EC2 Instances. Check the boxes in the Select column to add those instances to this load balancer.

VPC vpc-9610c2f2 (172.31.0.0/16)

Instance	Name	State	Security groups	Zone	Subnet ID	Subnet CIDR
<input type="checkbox"/>	i-0558aae47.. Jenkins	stopped	Jenkins-SG	us-west-1a	subnet-6e19a436	172.31.0.0/20
<input checked="" type="checkbox"/>	i-07bb42f08.. worthy-web01	running	elitestproj-web-SG	us-west-1a	subnet-6e19a436	172.31.0.0/20
<input type="checkbox"/>	i-03a21f531.. Nexus	stopped	nexus&tom-SG	us-west-1a	subnet-6e19a436	172.31.0.0/20

Availability Zone Distribution
1 instance in us-west-1a

Enable Cross-Zone Load Balancing
 Enable Connection Draining (300 seconds)

Cancel Previous Next: Add Tags

Once we have our ELB ready, wait for the instance in ELB to become healthy and use ELB DNS name to verify if the Worthy website is accessible.

❖ Create Launch Configuration:

First we need to create and configure a Launch Configuration. From the EC2 Management Dashboard, select the AutoScaling Groups option from the navigation pane as shown in the following screenshot. This will bring up the Auto Scaling Groups dashboard. Next, select the Create Auto Scaling group to bring up the Auto Scaling setup wizard.

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Spot Requests
Reserved Instances
Dedicated Hosts

AMIs
Bundle Tasks

ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Key Pairs
Network Interfaces

LOAD BALANCING
Load Balancers
Target Groups

AUTO SCALING
Launch Configurations
Auto Scaling Groups

SYSTEMS MANAGER SERVICES
Run Command

Feedback **English**

Welcome to Auto Scaling
You can use Auto Scaling to manage Amazon EC2 capacity automatically, maintain the right number of instances for your application, operate a healthy group of instances, and scale it according to your needs.
[Learn more](#)

Create Auto Scaling group

Note: To create your Auto Scaling groups in a different region, select your region from the navigation bar.

Benefits of Auto Scaling

Reusable Instance Templates

Provision instances based on a reusable template you define, called a launch configuration.
[Learn more](#)

Automated Provisioning

Keep your Auto Scaling group healthy and balanced, whether you need one instance or 1,000.
[Learn more](#)

Adjustable Capacity

Maintain a fixed group size or adjust dynamically based on Amazon CloudWatch metrics.
[Learn more](#)

Additional Information
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[Documentation](#)
[All EC2 Resources](#)
[Forums](#)
[Pricing](#)
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Click on Create Auto Scaling group.

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. You can optionally configure your group to adjust in capacity according to demand, in response to Amazon CloudWatch metrics.

Create launch configuration

Feedback **English**

❖ Choose the AMI that we created previously.

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❖ **Choose an instance type:** Select t2.micro for free tier.

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate
<input checked="" type="checkbox"/>	General purpose	t2.micro	1	1	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.xlarge	4	16	EBS only	-	Moderate
<input type="checkbox"/>	General purpose	t2.2xlarge	8	32	EBS only	-	Moderate
<input type="checkbox"/>	General purpose	m4.large	2	8	EBS only	Yes	Moderate
<input type="checkbox"/>	General purpose	m4.xlarge	4	16	EBS only	Yes	High
<input type="checkbox"/>	General purpose	m4.2xlarge	8	32	EBS only	Yes	High
<input type="checkbox"/>	General purpose	m4.4xlarge	16	64	EBS only	Yes	High

❖ **Configure details:** Provide a Name for the Launch Configuration. Select the Enable CloudWatch detailed monitoring checkbox if you wish to have your instances monitored for a duration of 60 seconds. By default your instances will be monitored by CloudWatch for a minimum period of 300 seconds (five minutes) for no charge at all. Selecting detailed monitoring will incur additional charges, so use it with caution.

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Create Launch Configuration

Name: worthy-servers-config

Purchasing option: Request Spot Instances

IAM role: None

Monitoring: Enable CloudWatch detailed monitoring

Advanced Details

Kernel ID: Use default

RAM Disk ID: Use default

User data: As text (Optional)

IP Address Type: Assign a public IP address to every instance.

Note: Later, if you want to use a different launch configuration, you can create a new one and apply it to any Auto Scaling group. Existing launch configurations cannot be edited.

Cancel Previous Skip to review Next: Add Storage

Note: Enabling the CloudWatch detailed monitoring option is highly recommended in case the instances belong to a production environment.

Once the configure details are filled out, you can even set the instance's IP addressing scheme by selecting the Assign a public IP address to every instance option from the Advanced Details section.

- ❖ **Add storage:** You can add an optional Volume to your instances by selecting the Add New Volume button on the Add Storage page. Here I have not provided any additional volumes to my instances. Click on Next: Configure Security Group to either create or select an existing security group for your auto scaled instances.

Create Launch Configuration

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.

<https://docs.aws.amazon.com/console/ec2/launchinstance/storage/about-storage-options-in-amazon-ec2>

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput	Delete on Termination	Encrypted
Root	/dev/sda1	snap-f83ca4dd	8	General Purpose (SSD)	100 / 3000	N/A	<input checked="" type="checkbox"/>	No

Add New Volume

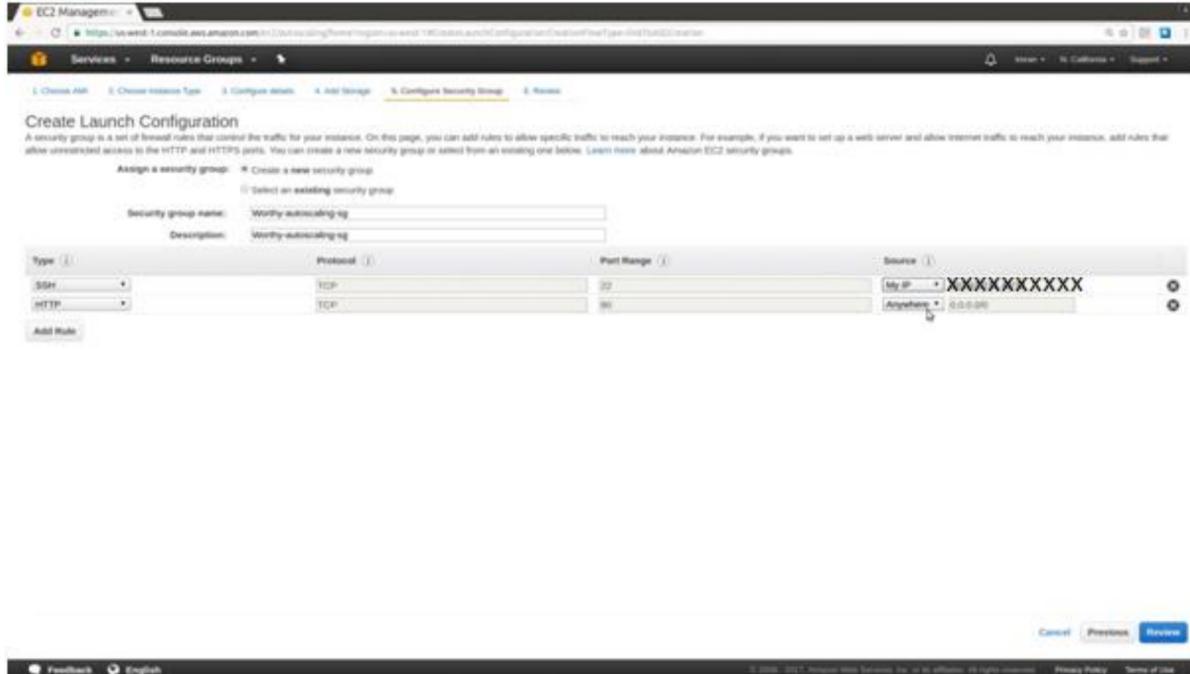
Free tier eligible customers can get up to 30 GB of EBS storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

Cancel Previous Skip to review Next: Configure Security Group

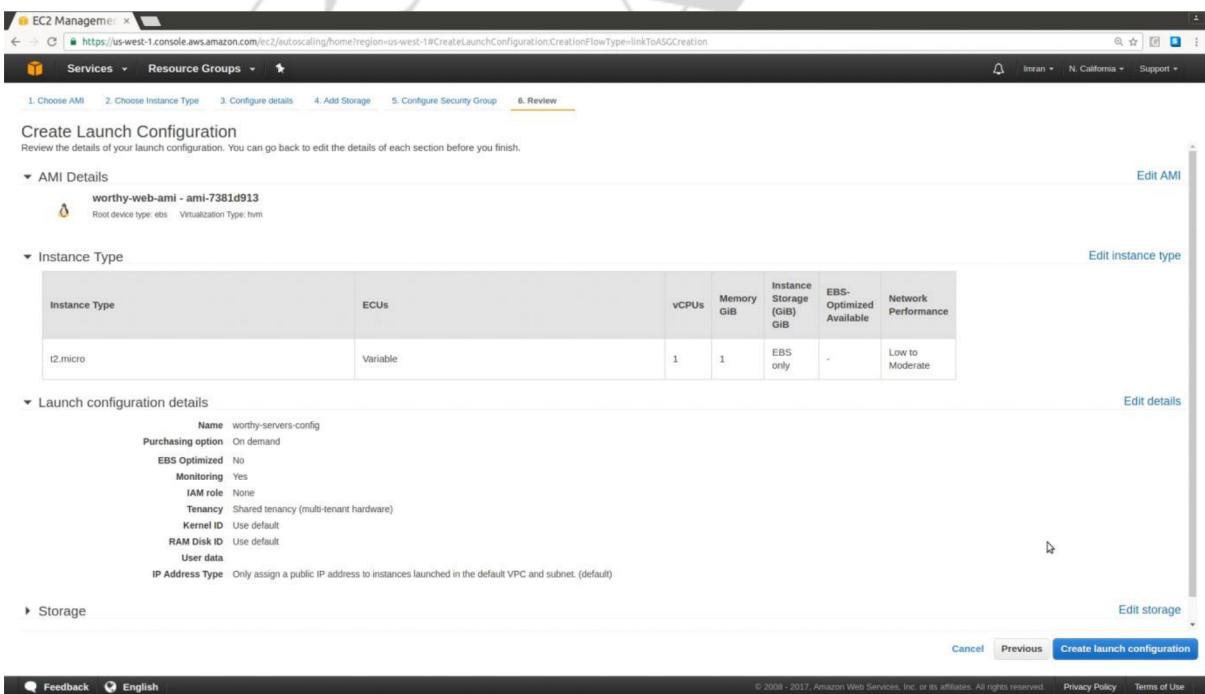
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- ❖ **Configure Security Group:** From the **Configure Security Group** page, select an appropriate **Security Group** for your Auto Scaled instances. Since we are working with web server instances we use the following inbound rules:
SSH MyIP and HTTP Anywhere

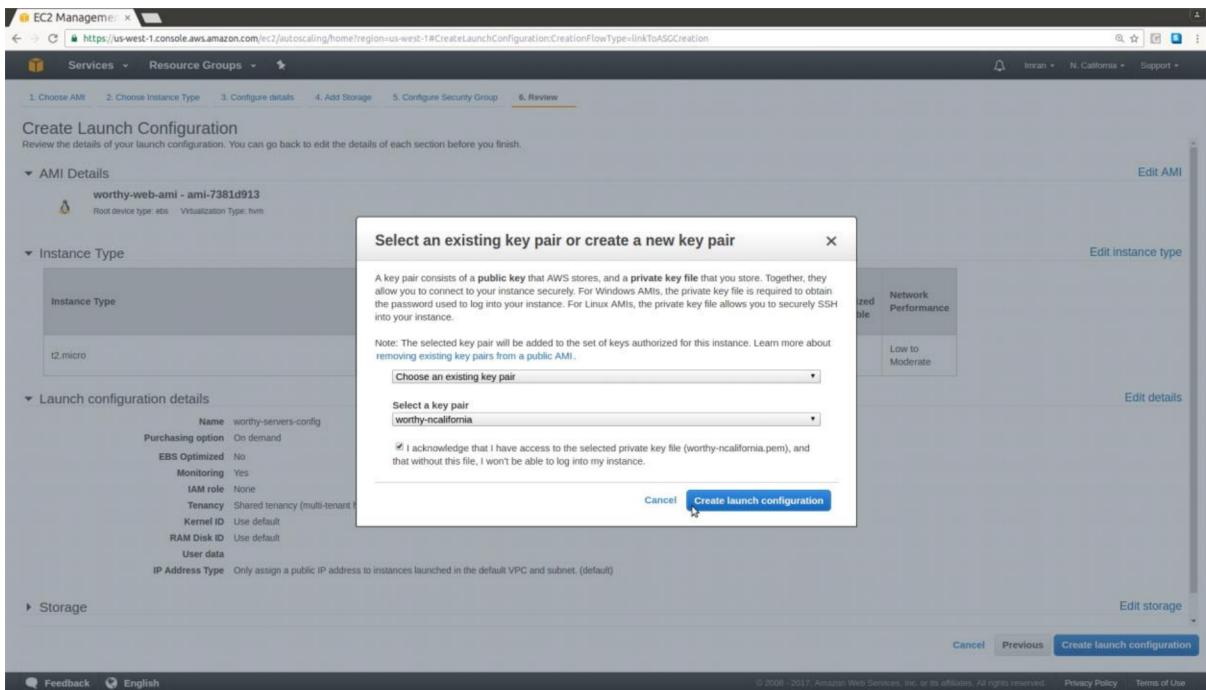


- ❖ **Review:** Make sure that all the details are configured correctly. Once verified, click on Create Launch Configuration to complete the process.



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Creating the Auto Scaling Group: An Auto Scaling group is a collection of EC2 instances, and the core of the Auto Scaling service. You create an Auto Scaling group by specifying the launch configuration you want to use for launching the instances and the number of instances your group must maintain at all times. You also specify the Availability Zone in which you want the instances to be launched.

Configure Auto Scaling group details:

The first step in creating Auto Scaling Group requires providing a suitable name for Auto Scaling Group as well as its Network and Load Balancing details.

Fill in the required fields as per your requirements:

- **Group name:** Provide a suitable name for your Auto Scaling Group.
- **Group size:** Here, enter the desired capacity for your Auto Scaling Group. The value entered here represents the number of instances. Here I have chosen 2 instances just for practice.
- **Network:** If you are launching a t2.micro instance, you must select a VPC in Network. Otherwise, if your account supports EC2-Classic and you are launching a type of instance that doesn't require a VPC, you can select either Launch into EC2-Classic or a VPC.
- **Subnet:** If you select a VPC in the previous step, select one or more subnets from Subnet. If you select EC2-Classic in the previous step, select one or more Availability Zones from Availability Zones. In my case, I have selected two subnets, each created in a different AZ.

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EC2 Management Console > Services > Resource Groups > Create Auto Scaling Group

Create Auto Scaling Group

Launch Configuration: worthy-servers-config

Group name: worthy-auto-scale-group

Group size: Start with 2 instances

Network: vpc-9610c2f2 (172.31.0.0/16) (default)

Subnet: subnet-6e19a436 (172.31.0.0/20) | Default in us-west-1a
subnet-8c264aae (172.31.16.0/20) | Default in us-west-1b

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

Advanced Details

Load Balancing: worthy-web-elb

Target Groups: empty

Health Check Type: ELB

Health Check Grace Period: 300 seconds

Monitoring: checked

Instance Protection: empty

Next: Configure scaling policies

Note: Each instance in this Auto Scaling Group will be provided with a public IP address.

After filling the basic details we will configure the Advanced Details section of our Auto Scaling Group:

Load Balancing: Since we have already created and configured our ELB, we will be using that to balance out incoming traffic for our instances.

Health Check Type: We can use either our EC2 instances or ELB as a health check mechanism to make sure that your instances are in a healthy state. By default, Auto Scaling will check your EC2 instances periodically for their health status. If an unhealthy instance is found, Auto Scaling will immediately replace that with a healthy one. Here, I have selected ELB as my health check type, so all the instances health checks are now performed by the ELB itself.

Health Check Grace Period: By default, this value is set to 300 seconds.

Configure Scaling policies:

You can create a scaling policy that uses CloudWatch alarms to determine when your Auto Scaling group should scale out or scale in. Each CloudWatch alarm watches a single metric and sends messages to Auto Scaling when the metric breaches a threshold that you specify in your policy. You can use alarms to monitor any of the metrics that the services in AWS that you're using send to CloudWatch, or you can create and monitor your own custom metrics.

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