

# CCNP ROUTING AND SWITCHING



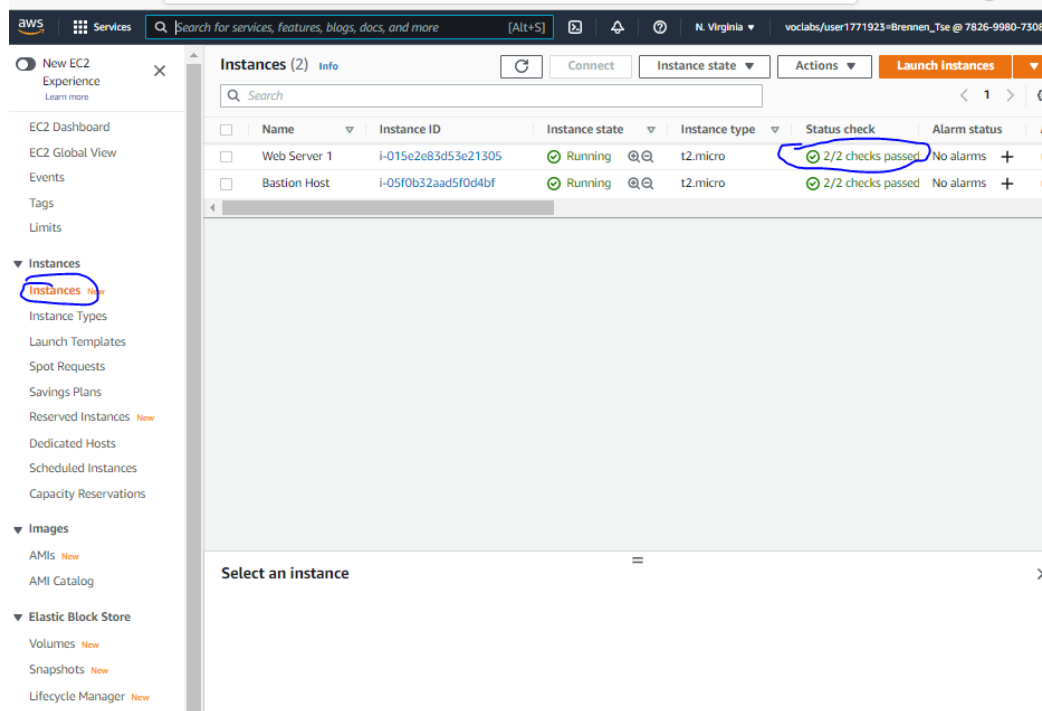
## **AWS Load Balancing**

**Brennen**

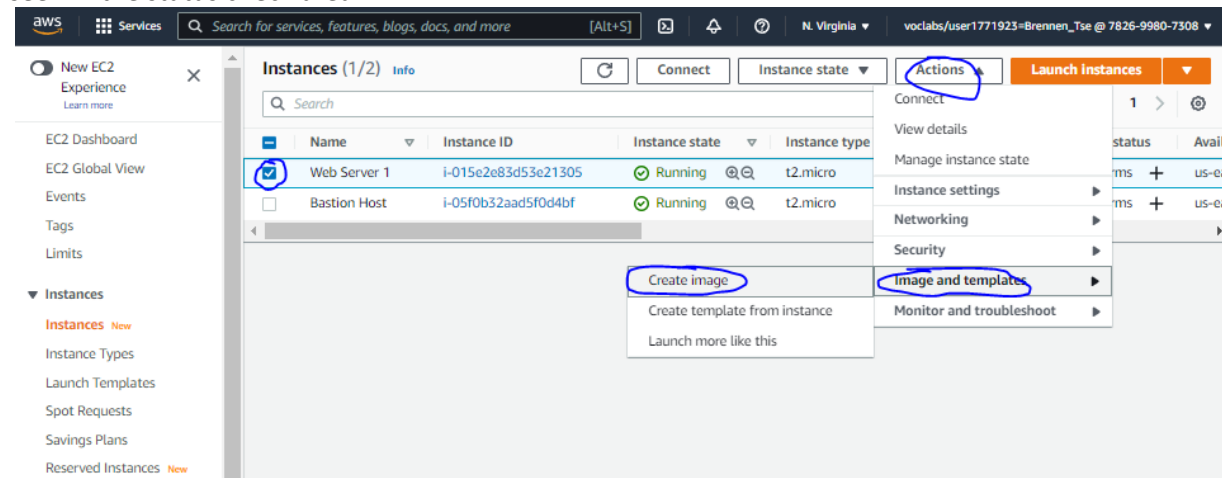
**3/1/2022**

## Creating an AMI for Web Server 1

### Navigate to E2 in the services menu



Confirm instance is running by clicking Instances in the left navigation pane, and checking that the 2/2 checks passed is seen in the status check area.



1, check the box for webserver, then in the actions dropdown menu, select image and templates and create an image.

**Create image** Info  
 An image (also referred to as an AMI) defines the programs and settings that are applied when you launch an EC2 instance. You can create an image from the configuration of an existing instance.

Instance ID  
 I-015e2e83d53e21305 (Web Server 1)

Image name

Maximum 127 characters. Can't be modified after creation.

Image description - optional

Maximum 255 characters

No reboot  
☐ Enable

Instance volumes

Volume type	Device	Snapshot	Size	Volume type	IOPS	Throughput	Delete on termination	Encrypted
EBS	/dev/x...	Create new snapshot fr...	8	EBS General Purpose S...	100		<input checked="" type="checkbox"/> Enable	<input type="checkbox"/> Enable

[Add volume](#)

During the image creation process, Amazon EC2 creates a snapshot of each of the above volumes.

Tags - optional  
 A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

☒ Tag image and snapshots together  
 Tag the image and the snapshots with the same tag.

☐ Tag image and snapshots separately  
 Tag the image and the snapshots with different tags.

No tags associated with the resource.

[Add tag](#)

You can add 50 more tags.

[Cancel](#) [Create image](#)

Name the image WebServerAMI, describe it as LAB AMI for webserver and create image.

EC2 > Target groups

**Target groups** Info [Actions](#) [Create target group](#)

Name	ARN	Port	Protocol	Target type	Load balance
No target groups to display.					

[New EC2 Experience](#) [Learn more](#)

EC2 Dashboard  
 EC2 Global View  
 Events  
 Tags  
 Limits

▼ Instances  
 Instances Now  
 Instance Types  
 Launch Templates  
 Spot Requests  
 Savings Plans  
 Reserved Instances Now  
 Dedicated Hosts  
 Scheduled Instances  
 Capacity Reservations

▼ Images  
 AMIs Now  
 AMI Catalog

▼ Elastic Block Store  
 Volumes Now  
 Snapshots Now  
 Lifecycle Manager Now

▼ Network & Security  
 Security Groups  
 Elastic IPs  
 Placement Groups  
 Key Pairs  
 Network Interfaces

▼ Load Balancing  
 Load Balancers  
 Target Groups Now

Select Target Groups and Create a target group

EC2 > Target groups > Create target group

Step 1  
Specify group details

Step 2  
Register targets

## Specify group details

Your load balancer routes requests to the targets in a target group and performs health checks on the targets.

### Basic configuration

Settings in this section cannot be changed after the target group is created.

Choose a target type

☒ Instances

• Supports load balancing to instances within a specific VPC.

☐ IP addresses

- Supports load balancing to VPC and on-premises resources.
- Facilitates routing to multiple IP addresses and network interfaces on the same instance.
- Offers flexibility with microservice based architectures, simplifying inter-application communication.

☐ Lambda function

- Facilitates routing to a single Lambda function.
- Accessible to Application Load Balancers only.

☐ Application Load Balancer

- Offers the flexibility for a Network Load Balancer to accept and route TCP requests within a specific VPC.
- Facilitates using static IP addresses and PrivateLink with an Application Load Balancer.

Target group name

LabGroup

A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

Protocol

HTTP

Port

80

VPC

Select the VPC with the instances that you want to include in the target group.

Lab VPC

ip-0e70706cc5af7a89b  
IPv4: 10.0.0.0/16

Protocol version

☒ HTTP1

Send requests to targets using HTTP/1.1. Supported when the request protocol is HTTP/1.1 or HTTP/2.

☐ HTTP2

Send requests to targets using HTTP/2. Supported when the request protocol is HTTP/2 or gRPC, but gRPC-specific features are not available.

☐ gRPC

Send requests to targets using gRPC. Supported when the request protocol is gRPC.

Step 1  
Specify group detailsStep 2  
**Register targets**

## Register targets

This is an optional step to create a target group. However, to ensure that your load balancer routes traffic to this target group you must register your targets.

### Available instances (2)

&lt; 1 &gt; ⓘ

<input type="checkbox"/>	Instance ID	Name	State	Security groups	Zone	Subnet ID
<input type="checkbox"/>	i-015e2e83d55e21305	Web Server 1	running	Web Security Group	us-east-1a	subnet-014965e1bcd390a17
<input type="checkbox"/>	i-05f0b32aad5f0d4bf	Bastion Host	running	c45804a626226l1619193t1w7826 99807308-BastionSecurityGroup- 1GIBONOFYBRGY	us-east-1a	subnet-014965e1bcd390a17

**0 selected**

Ports for the selected instances  
Ports for routing traffic to the selected instances.

1-65535 (separate multiple ports with commas)

### Review targets

**Targets (0)**

All ▼

&lt; 1 &gt; ⓘ

Remove	Health status	Instance ID	Name	Port	State	Security groups	Zone	Subnet ID
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**No instances added yet**

Specify instances above, or leave the group empty if you prefer to add targets later.

0 pending

Cancel

**aws** **Services**

☐ New EC2 Experience [Learn more](#) ×

**Create Load Balancer** **Actions** ▾

☐ **Name** ▴ **DNS**

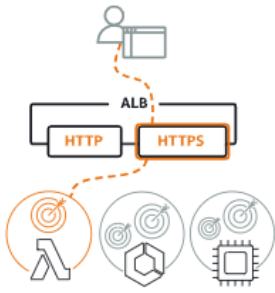
- EC2 Dashboard
- EC2 Global View
- Events
- Tags
- Limits
- ▼ **Instances**
  - Instances *Now*
  - Instance Types
  - Launch Templates
  - Spot Requests
  - Savings Plans
  - Reserved Instances *Now*
  - Dedicated Hosts
  - Scheduled Instances
  - Capacity Reservations
- ▼ **Images**
  - AMIs *Now*
  - AMI Catalog
- ▼ **Elastic Block Store**
  - Volumes *Now*
  - Snapshots *Now*
  - Lifecycle Manager *Now*
- ▼ **Network & Security**
  - Security Groups
  - Elastic IPs
  - Placement Groups
  - Key Pairs
  - Network Interfaces
- ▼ **Load Balancing**
  - Load Balancers**
  - Target Groups *Now*

Select a load balancer

Select Load Balancer and Create Load Balancer

## Load balancer types

### Application Load Balancer [Info](#)



Choose an Application Load Balancer when you need a flexible feature set for your applications with HTTP and HTTPS traffic. Operating at the request level, Application Load Balancers provide advanced routing and visibility features targeted at application architectures, including microservices and containers.

Create

▶ Classic Load Balancer - *previous generation*

Choose Create under Application Load Balancer  
For the name of the Load Balancer, use LabELB  
Scroll down to the Network mapping section then

### Network mapping [Info](#)

The load balancer routes traffic to targets in the selected subnets, and in accordance with your IP address settings.

#### VPC [Info](#)

Select the virtual private cloud (VPC) for your targets. Only VPCs with an internet gateway are enabled for selection. The selected VPC cannot be changed after the load balancer is created. To confirm the VPC for your targets, view your [target groups](#).

Lab VPC  
vpc-09b95a4af873425b  
IPv4: 10.0.0.0/16

#### Mappings [Info](#)

Select at least one Availability Zone and one subnet for each zone. We recommend selecting at least two Availability Zones. The load balancer will route traffic only to targets in the selected Availability Zones. Zones that are not supported by the load balancer or VPC cannot be selected. Subnets can be added, but not removed, once a load balancer is created.

☒ us-east-1a

Subnet

subnet-0243701330779788e

Public Subnet 1

IPv4 settings

Assigned by AWS

☒ us-east-1b

Subnet

subnet-059281d5e8f681de2

Public Subnet 2

IPv4 settings

Assigned by AWS

In the group of Security Groups,  
Select Web Security Group, remove the default security group, leaving only Web Security Group.  
Set default action of HTTP:80 row to forward to Lab Group  
Create load balancer and view it.

TASK 3: Create a Launch Configuration and an Auto Scaling Group

1. Click Launch Configurations from the left navigation pane
2. Then create that Launch configuration
3. Configure:

### Create launch configuration [Info](#)

**Launch configuration name**

Name

LabConfig

**Amazon machine image (AMI) [Info](#)**

AMI

WebServerAMI

**Instance type [Info](#)**

Instance type

t3.micro (2 vCPUs, 1 GiB, EBS Only) [Choose instance type](#)

**Additional configuration - optional**

**Purchasing option [Info](#)**

☐ Request Spot Instances

**IAM instance profile [Info](#)**

Select IAM role

**Monitoring [Info](#)**

☒ Enable EC2 instance detailed monitoring within CloudWatch

4. In the security groups, select the web security group from the existing groups.
5. Under Key Pair:

### Key pair (login) [Info](#)

**Key pair options**

Choose an existing key pair

**Existing key pair**

vockey

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

[Cancel](#) [Create launch configuration](#)

6. Select the LabConfig Launch Config checkbox
7. Create auto Scaling group from the actions menu
8. Name this group Lab Auto Scaling Group



## 9. Choose Next and configure on the network page

EC2 > Auto Scaling groups > Create Auto Scaling group

### Choose instance launch options [Info](#)

Choose the VPC network environment that your instances are launched into, and customize the instance types and purchase options.

#### Network [Info](#)

For most applications, you can use multiple Availability Zones and let EC2 Auto Scaling balance your instances across the zones. The default VPC and default subnets are suitable for getting started quickly.

**VPC**  
Choose the VPC that defines the virtual network for your Auto Scaling group.

vpc-09b95a4a8fa73425b (Lab VPC)  
10.0.0.0/16

↻

[Create a VPC](#)

**Availability Zones and subnets**  
Define which Availability Zones and subnets your Auto Scaling group can use in the chosen VPC.

Select Availability Zones and subnets

↻

us-east-1a | subnet-08bf6b9e02afdc65e  
(Private Subnet 1)  
10.0.1.0/24

×

us-east-1b | subnet-0464fd5930d9c2c57  
(Private Subnet 2)  
10.0.3.0/24

×

[Create a subnet](#)

Cancel

Previous

Skip to review

Next

## 10. Choose next

11. Attach to an existing load balancer from the load balancing optional pane and select lab group after attaching.

12. In additional settings optional pane, check the enable group metrics collection...

13. Choose next, then under group size configure:

## Group size - *optional* [Info](#)

Specify the size of the Auto Scaling group by changing the desired capacity. You can also specify minimum and maximum capacity limits. Your desired capacity must be within the limit range.

Desired capacity

Minimum capacity

Maximum capacity

14. Under **Scaling policies**, choose *Target tracking scaling policy* and configure:

### Scaling policies - *optional*

Choose whether to use a scaling policy to dynamically resize your Auto Scaling group to meet changes in demand. [Info](#)



**Target tracking scaling policy**

Choose a desired outcome and leave it to the scaling policy to add and remove capacity as needed to achieve that outcome.



None

Scaling policy name

Metric type

Target value

Instances need

seconds warm up before including in metric



Disable scale in to create only a scale-out policy

Choose next, then next, then add tag, configure

## Tags (1)

Key

Name

Value - optional

Lab Instance

Tag new instances



Remove

Add tag

49 remaining

### TASK 4: Verify that Load Balancing is Working

1. Click Instances and confirm that Lab Instance have passed the health check.
2. Select Target Groups from the Load Balancing Section, and Choose LabGroup. See if these instances are healthy and refresh to update.
3. Select Load Balancers, copy the DNS name and paste the name into a web browser.

### TASK 5: Test Auto Scaling

1. From the Services menu, select CloudWatch
2. Select all alarms
3. Choose the OK alarm which is the AlarmHigh. Return to the browser, click load test, and refresh. When the usage crosses 60%, the scaling should kick in.

### TASK 6: Terminate Web Server 1

1. Select the web server, choose instance state and terminate it.