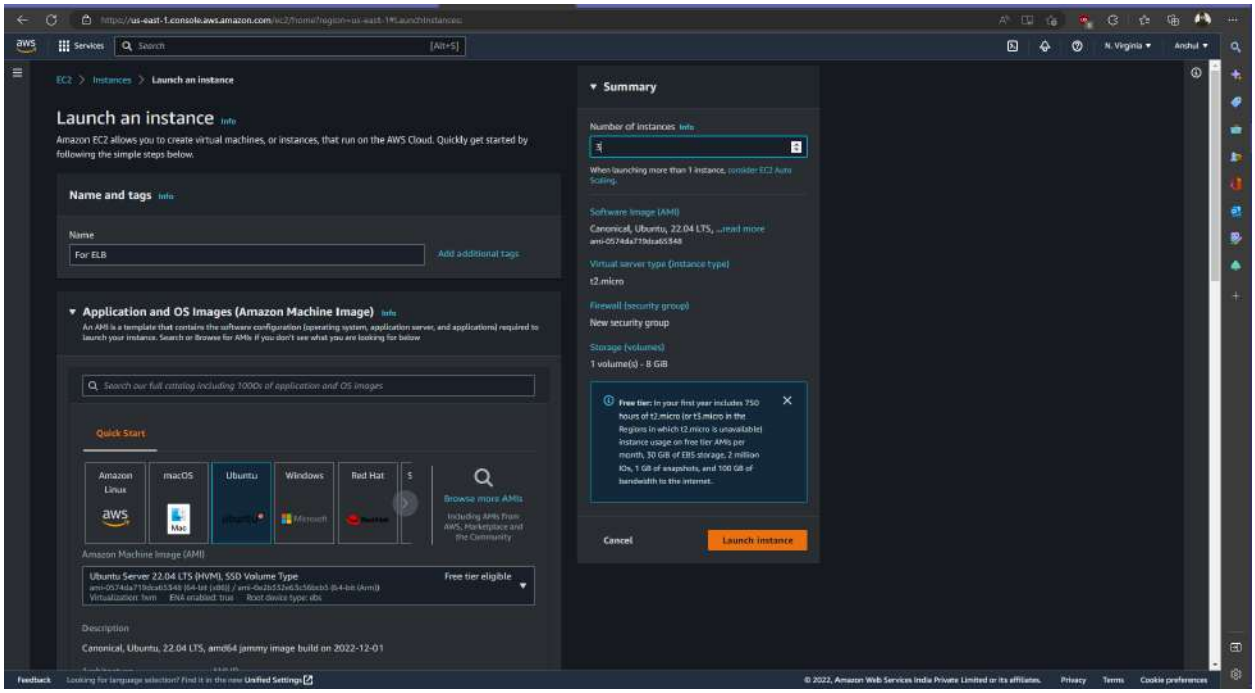
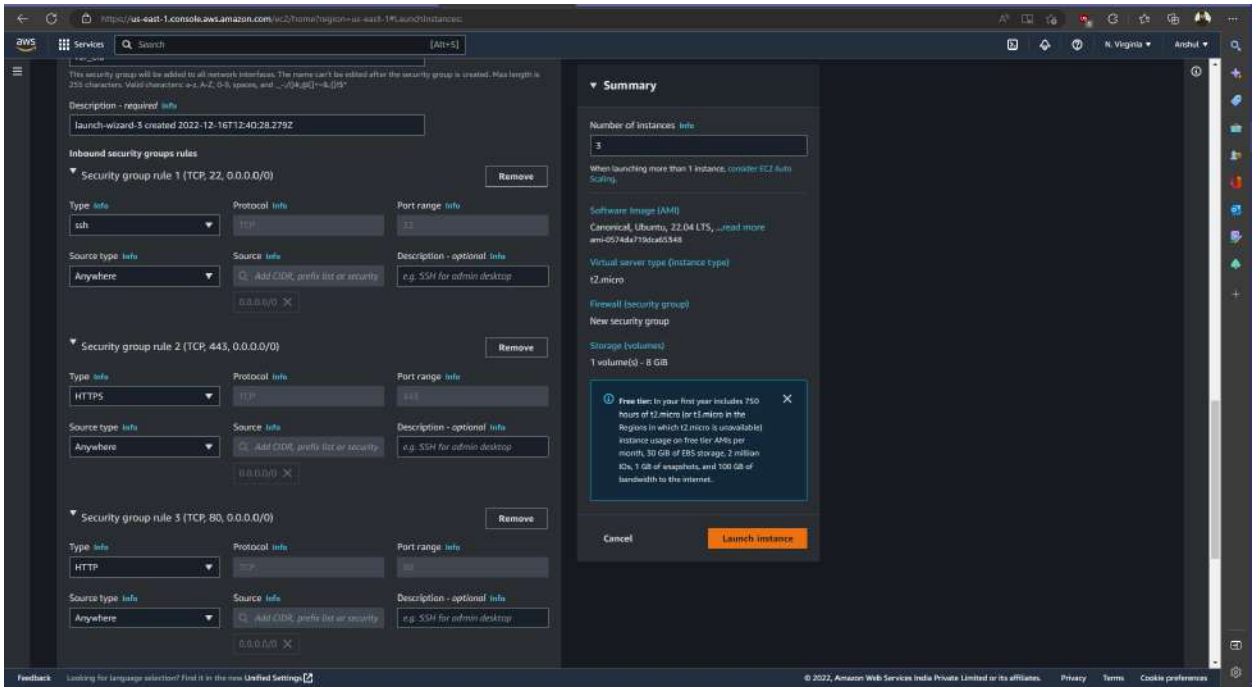
Module-3: ELB Assignment - 1

You have been asked to:
1. Create a Classic Load Balancer and register 3 EC2 instances with different web pages running in them
2. Migrate the Classic Load Balancer into an Application Load Balancer.

Launch 3 instances at the same time with ubuntu as our AMI.

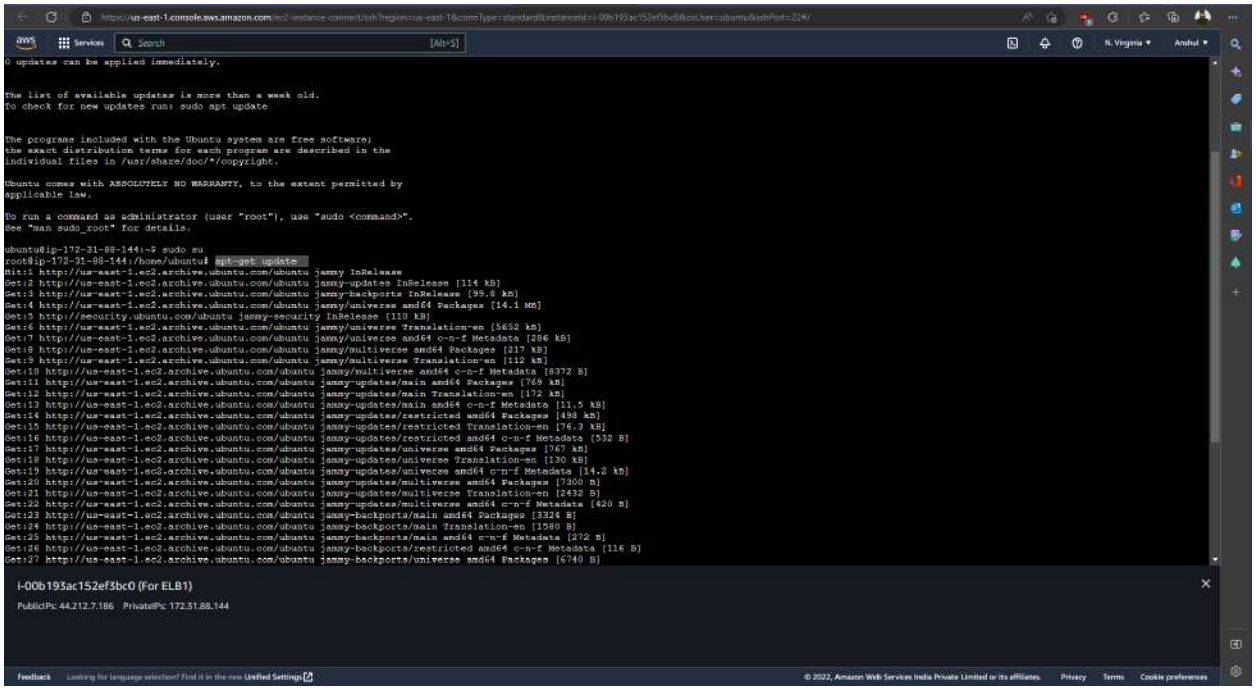


Create security for the instance with allowing traffic for ssh,http,https.



Step3:Follow these steps to all three instances.

First: Update using ‘sudo apt-get update’
Install apache2 for hosting website using ‘apt-get install apache2’
Now change directory to edit html file to be displayed on web server.
cd /var/www/html
rm index.html
nano index.html


0 updates can be applied immediately.
The list of available updates is more than a week old.
To check for new updates run: sudo apt update
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
ubuntu@ip-172-31-88-144:~$ sudo su
root@ip-172-31-88-144:/home/ubuntu# apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [114 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [99.8 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14.1 MB]
Get:5 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe Translation-en [5652 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 c-n-f Metadata [286 kB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [217 kB]
Get:9 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse Translation-en [112 kB]
Get:10 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 c-n-f Metadata [8372 B]
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [769 kB]
Get:12 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [172 kB]
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [11.5 kB]
Get:14 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [498 kB]
Get:15 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [76.3 kB]
Get:16 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 c-n-f Metadata [532 B]
Get:17 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [767 kB]
Get:18 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [130 kB]
Get:19 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 c-n-f Metadata [14.2 kB]
Get:20 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [7300 B]
Get:21 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse Translation-en [2432 B]
Get:22 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 c-n-f Metadata [420 B]
Get:23 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 Packages [3324 B]
Get:24 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main Translation-en [1580 B]
Get:25 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 c-n-f Metadata [272 B]
Get:26 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/restricted amd64 c-n-f Metadata [116 B]
Get:27 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [6740 B]
i-00b193ac152ef3bc0 (For ELB1)
PublicIPs: 44.212.7.186 PrivateIPs: 172.31.88.144
Feedback
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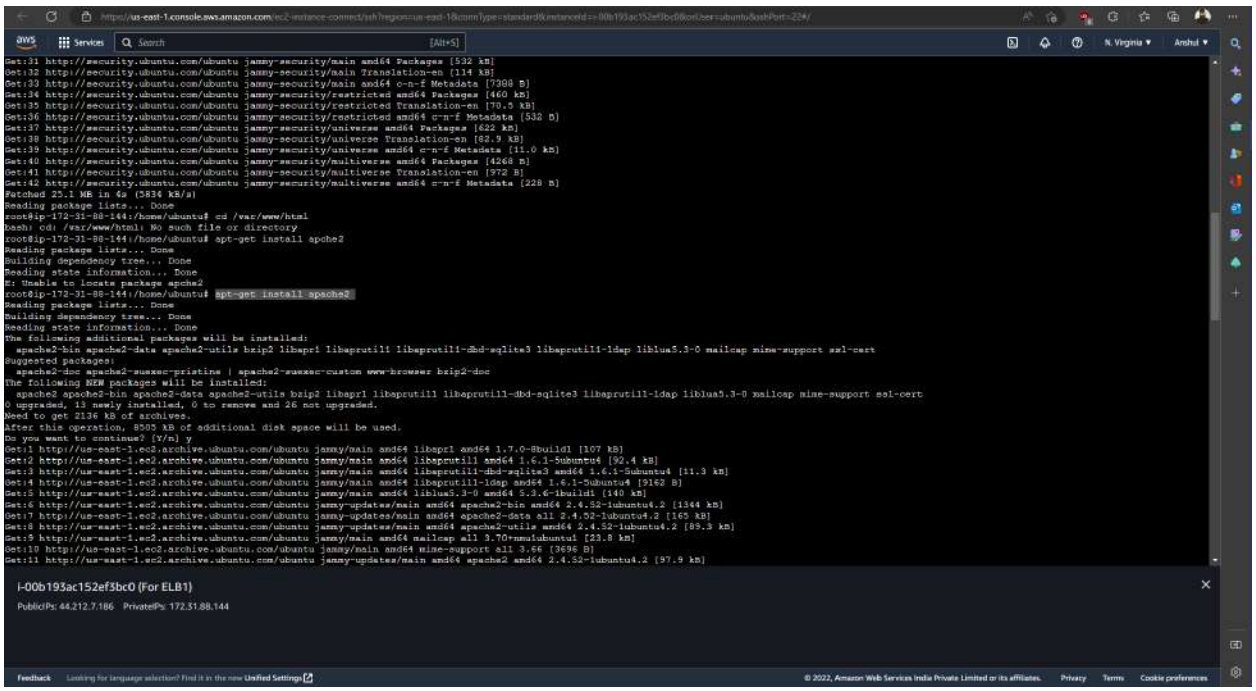
Terms
Cookie preferences


Get:31 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [532 kB]
Get:32 http://security.ubuntu.com/ubuntu jammy-security/main Translation-en [114 kB]
Get:33 http://security.ubuntu.com/ubuntu jammy-security/main amd64 c-n-f Metadata [7308 B]
Get:34 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [460 kB]
Get:35 http://security.ubuntu.com/ubuntu jammy-security/restricted Translation-en [70.5 kB]
Get:36 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 c-n-f Metadata [532 B]
Get:37 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [622 kB]
Get:38 http://security.ubuntu.com/ubuntu jammy-security/universe Translation-en [82.9 kB]
Get:39 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 c-n-f Metadata [11.0 kB]
Get:40 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 Packages [4268 B]
Get:41 http://security.ubuntu.com/ubuntu jammy-security/multiverse Translation-en [972 B]
Get:42 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 c-n-f Metadata [228 B]
Fetched 25.1 MB in 4s (5836 kB/s)
Reading package lists... Done
root@ip-172-31-88-144:/home/ubuntu# cd /var/www/html
bash: cd: /var/www/html: No such file or directory
root@ip-172-31-88-144:/home/ubuntu# apt-get install apche2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
E: Unable to locate package apche2
root@ip-172-31-88-144:/home/ubuntu# apt-get install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
apache2-bin apache2-data apache2-utils bzip2 libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.3-0 mailcap mime-support ssl-cert
Suggested packages:
apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser bzip2-doc
The following NEW packages will be installed:
apache2 apache2-bin apache2-data apache2-utils bzip2 libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.3-0 mailcap mime-support ssl-cert
0 upgraded, 13 newly installed, 0 to remove and 26 not upgraded.
Need to get 2136 kB of archives.
After this operation, 8505 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libapr1 amd64 1.7.0-8build1 [107 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libaprutil1 amd64 1.6.1-5ubuntu4 [92.4 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libaprutil1-dbd-sqlite3 amd64 1.6.1-5ubuntu4 [11.3 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libaprutil1-ldap amd64 1.6.1-5ubuntu4 [9162 B]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 liblua5.3-0 amd64 5.3.6-1build1 [140 kB]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 apache2-bin amd64 2.4.52-1ubuntu4.2 [1344 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 apache2-data all 2.4.52-1ubuntu4.2 [165 kB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 apache2-utils amd64 2.4.52-1ubuntu4.2 [89.3 kB]
Get:9 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 mailcap all 3.70+nmu1ubuntu1 [23.8 kB]
Get:10 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 mime-support all 3.66 [3696 B]
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 apache2 amd64 2.4.52-1ubuntu4.2 [97.9 kB]
i-00b193ac152ef3bc0 (For ELB1)
PublicIPs: 44.212.7.186 PrivateIPs: 172.31.88.144
Feedback
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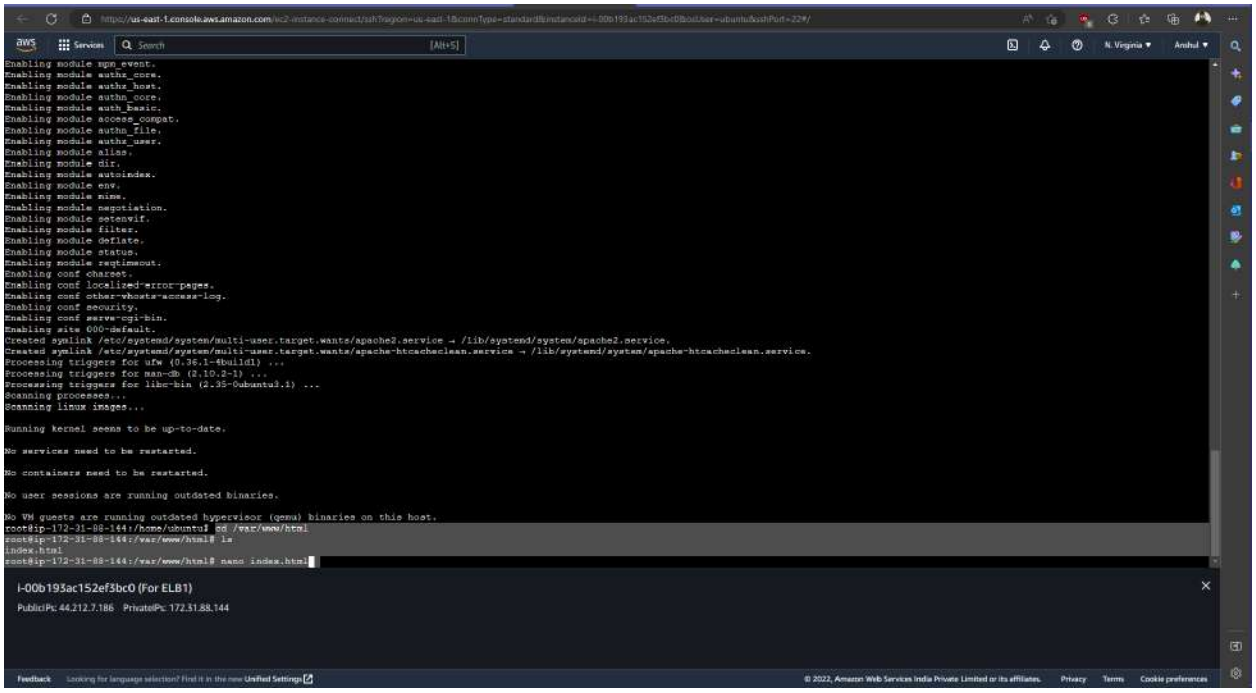
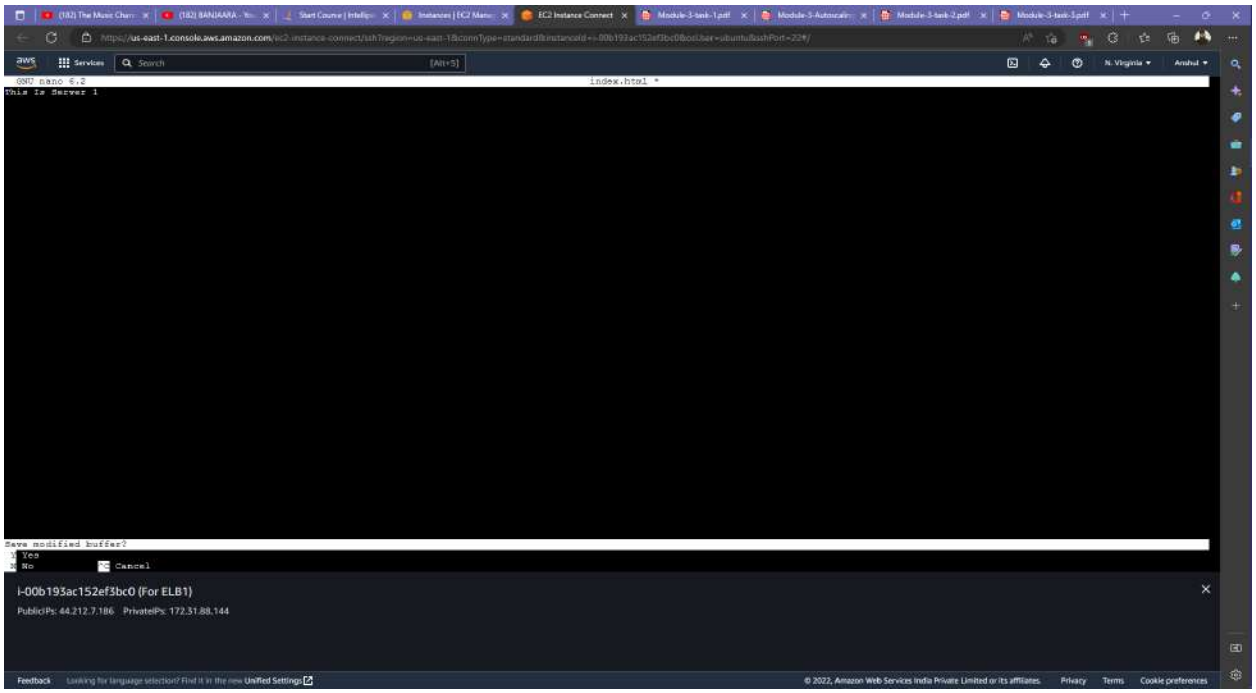
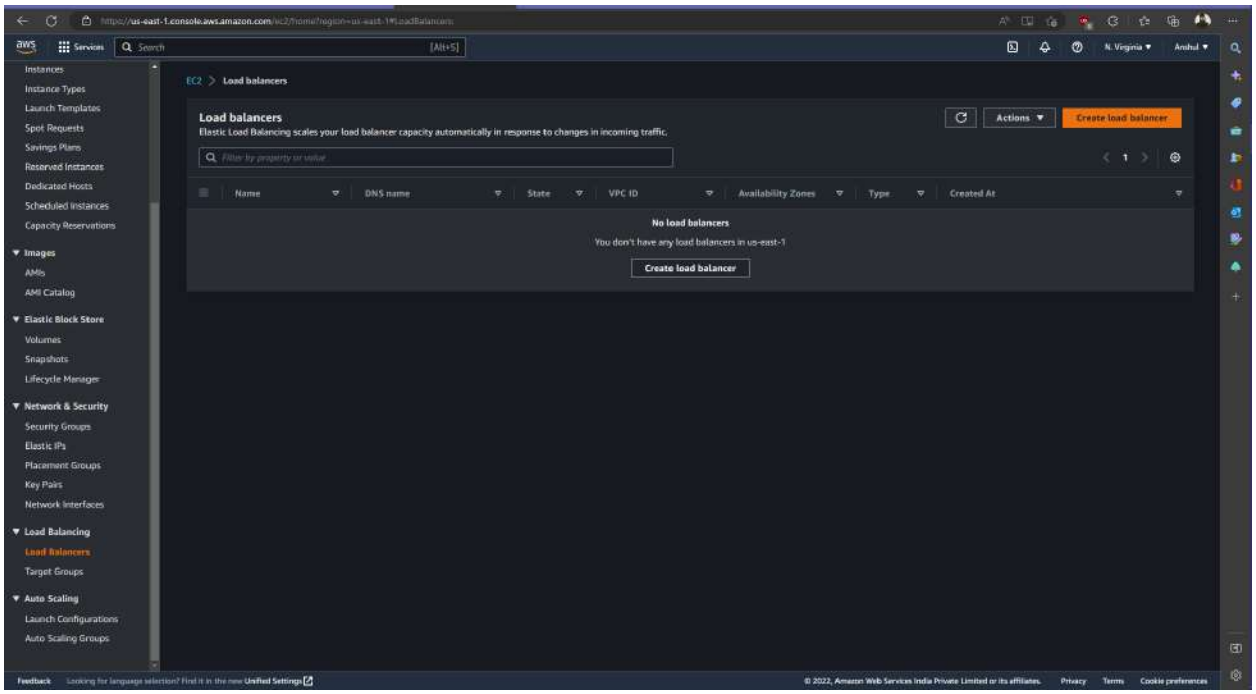


This is the page we see before editing index.html file.

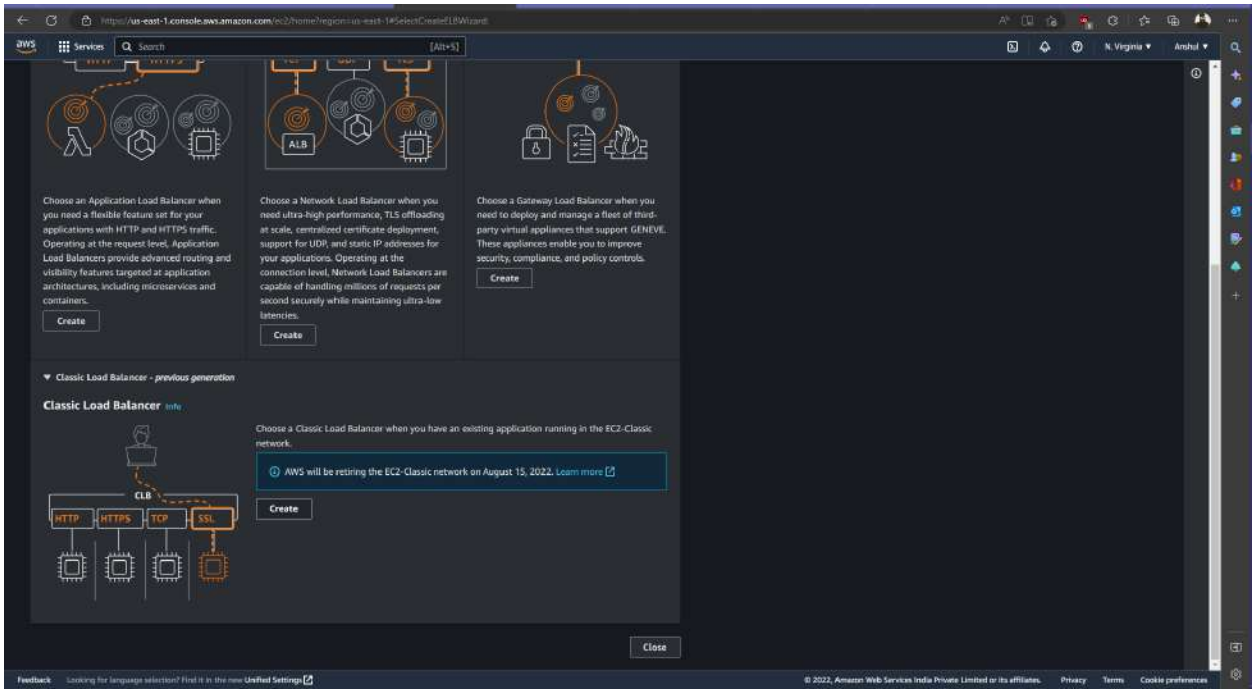
Here edit as “This Is Server <respective server number>”. This is index.html file being edited.



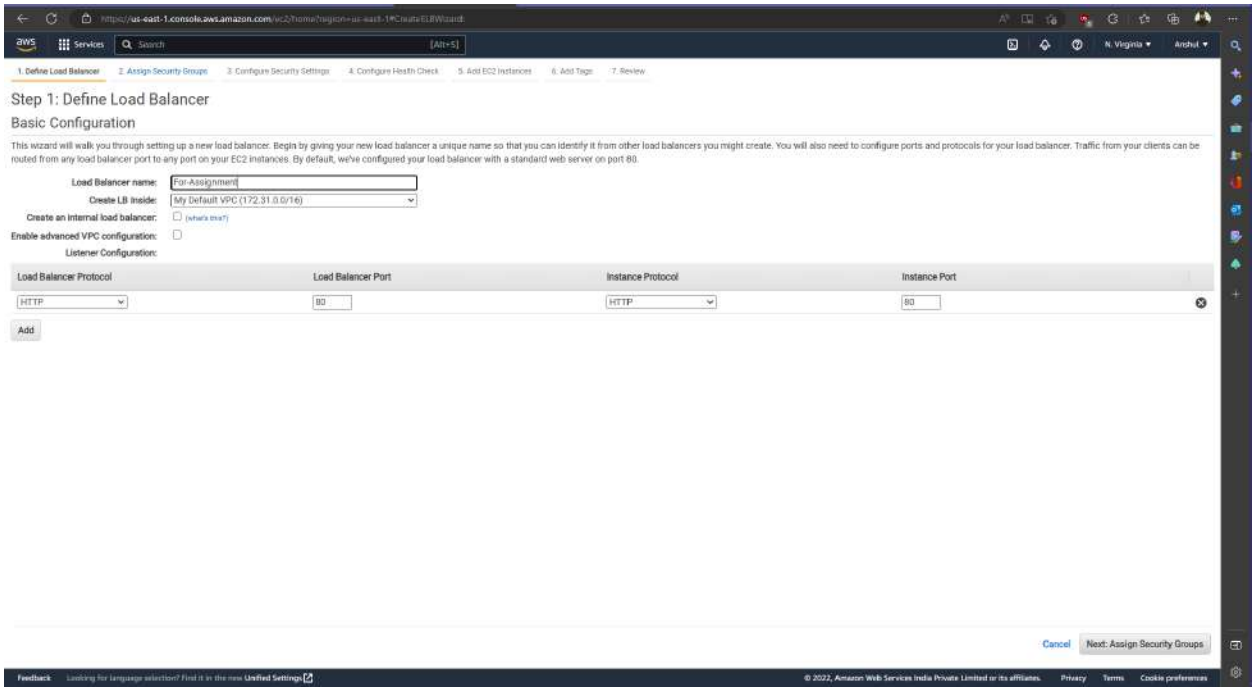
Now lets create a load balancer



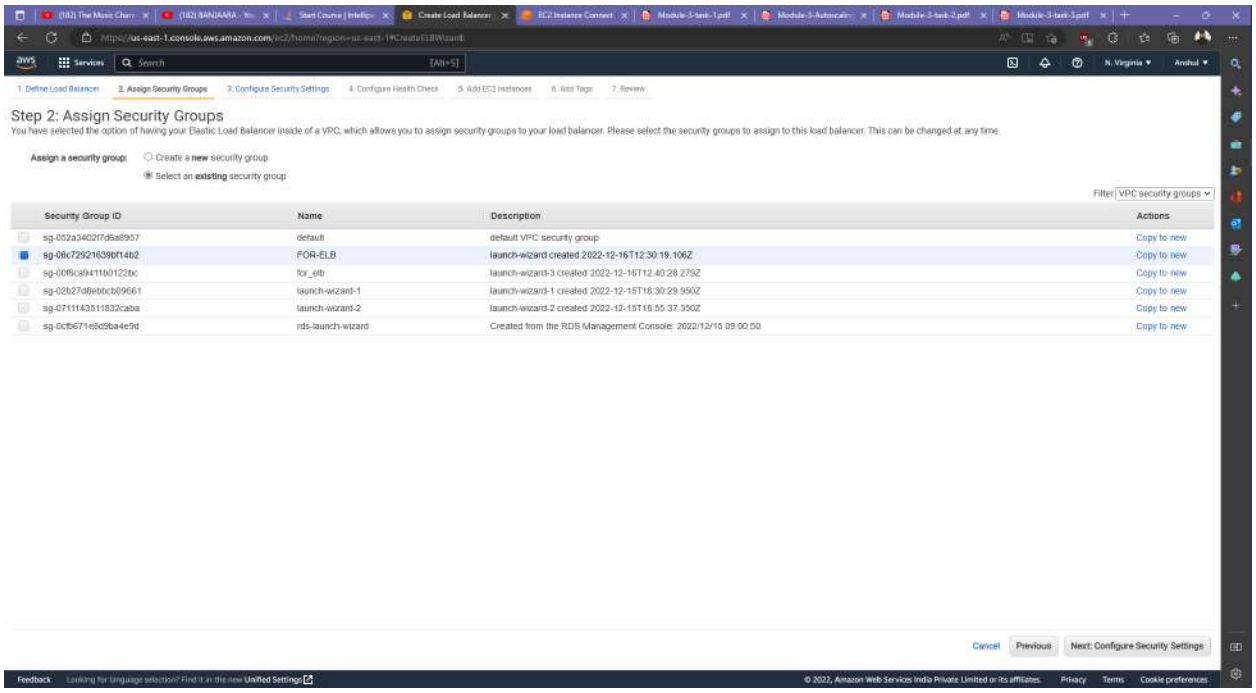
Select classic load balancer for this assignment.

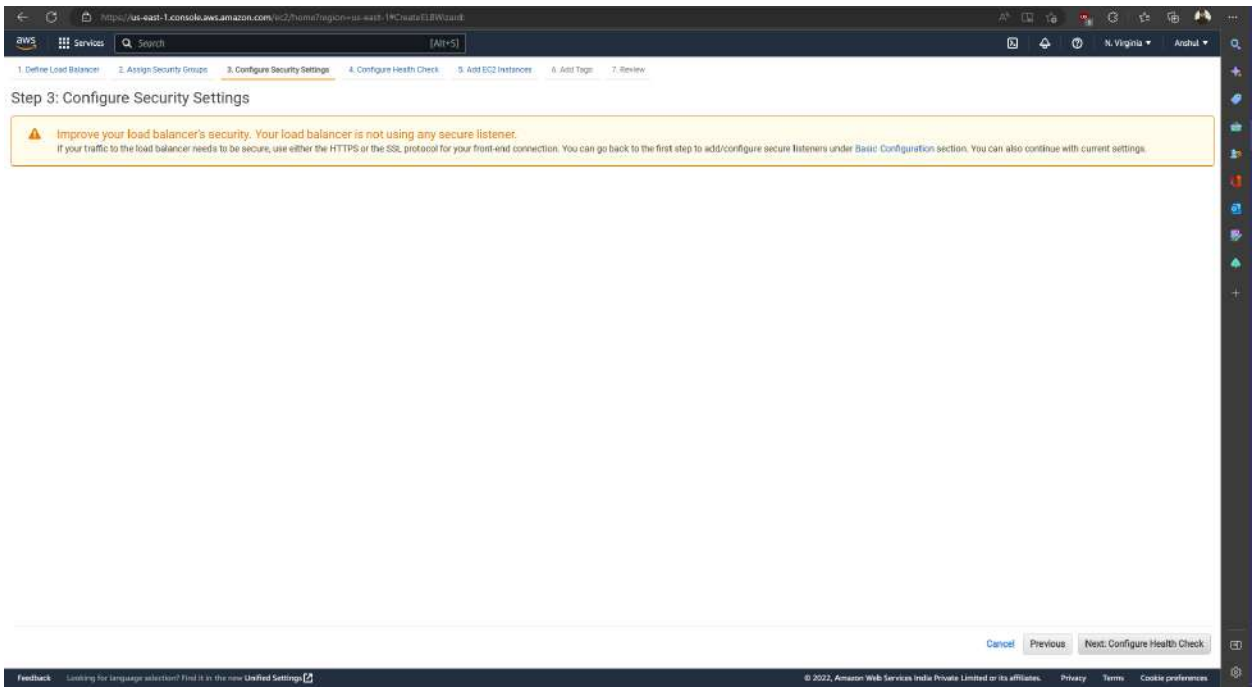


Assign name to your load balancer

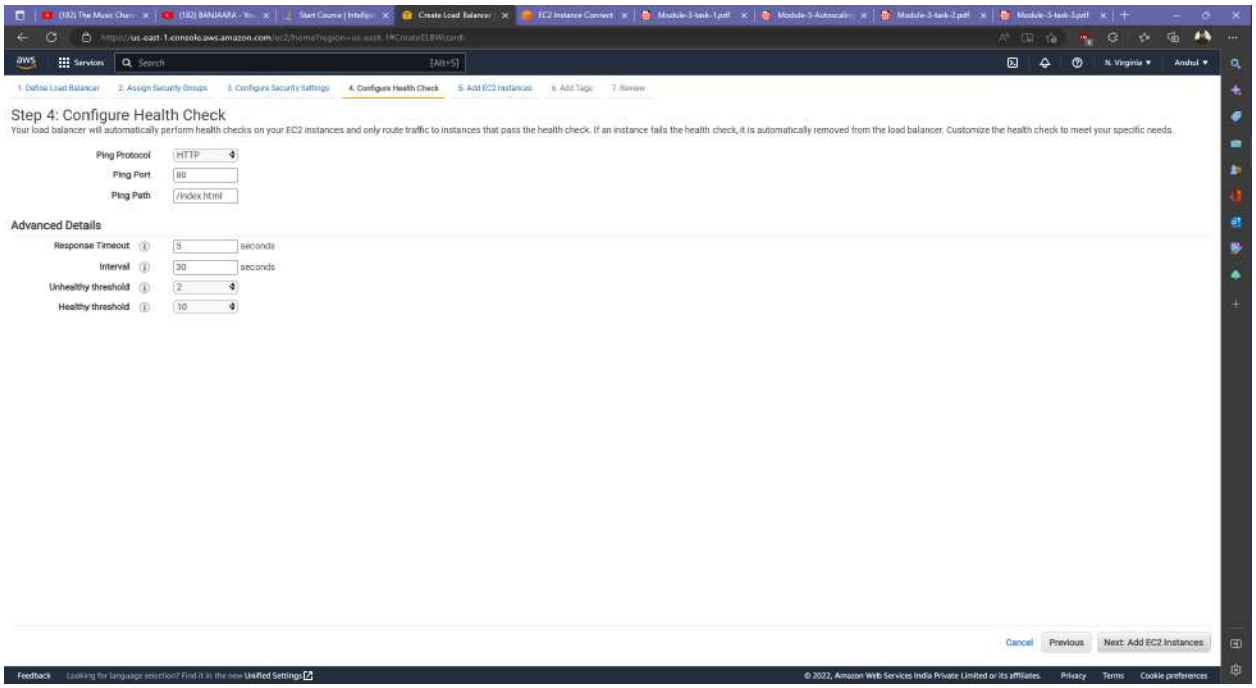


Assign security group. Make sure to allow all HTTP traffic in selected security group.

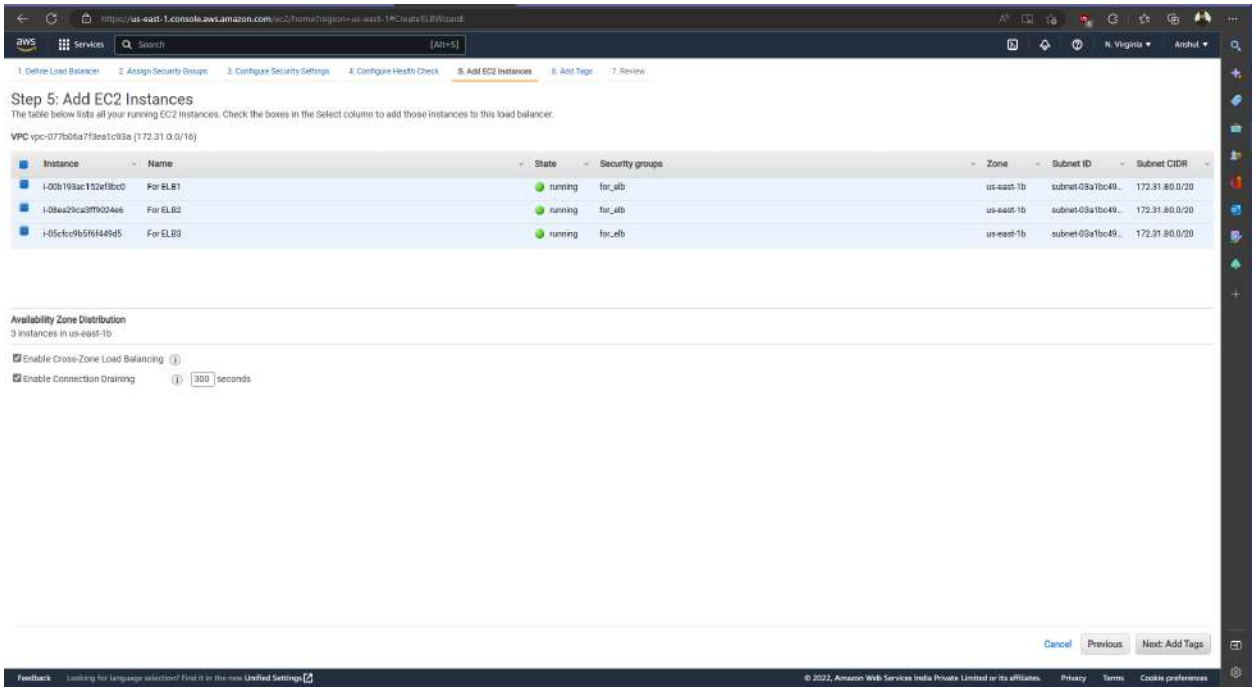


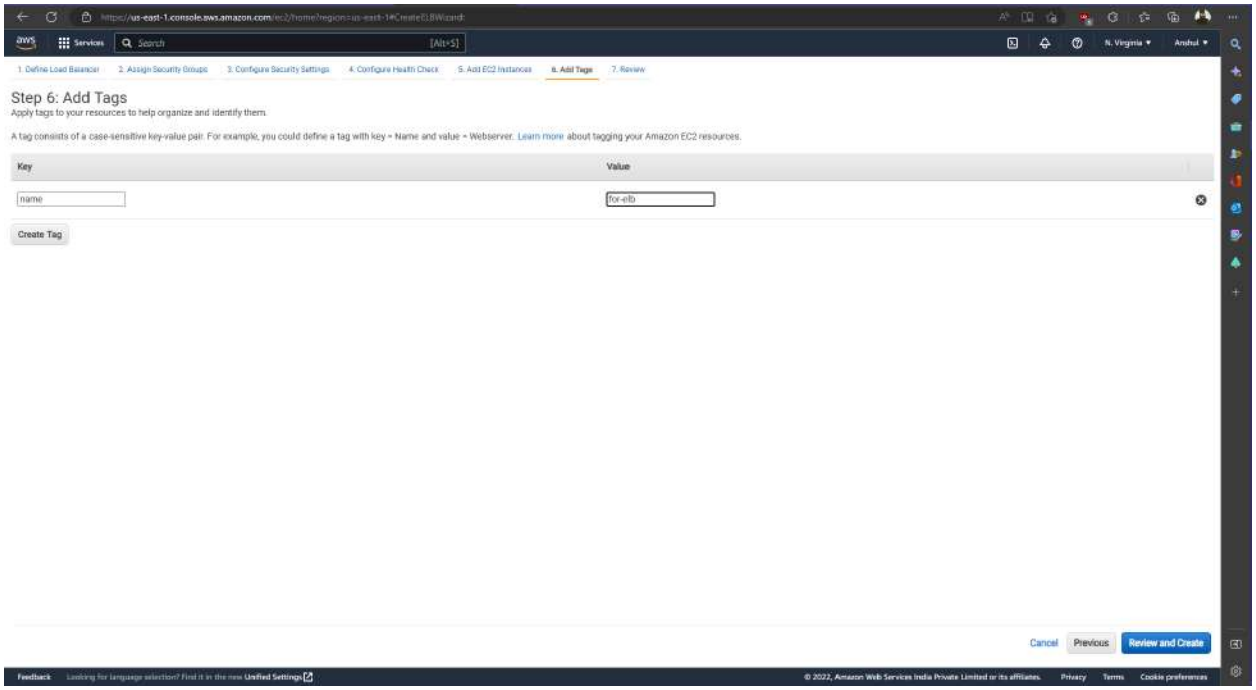


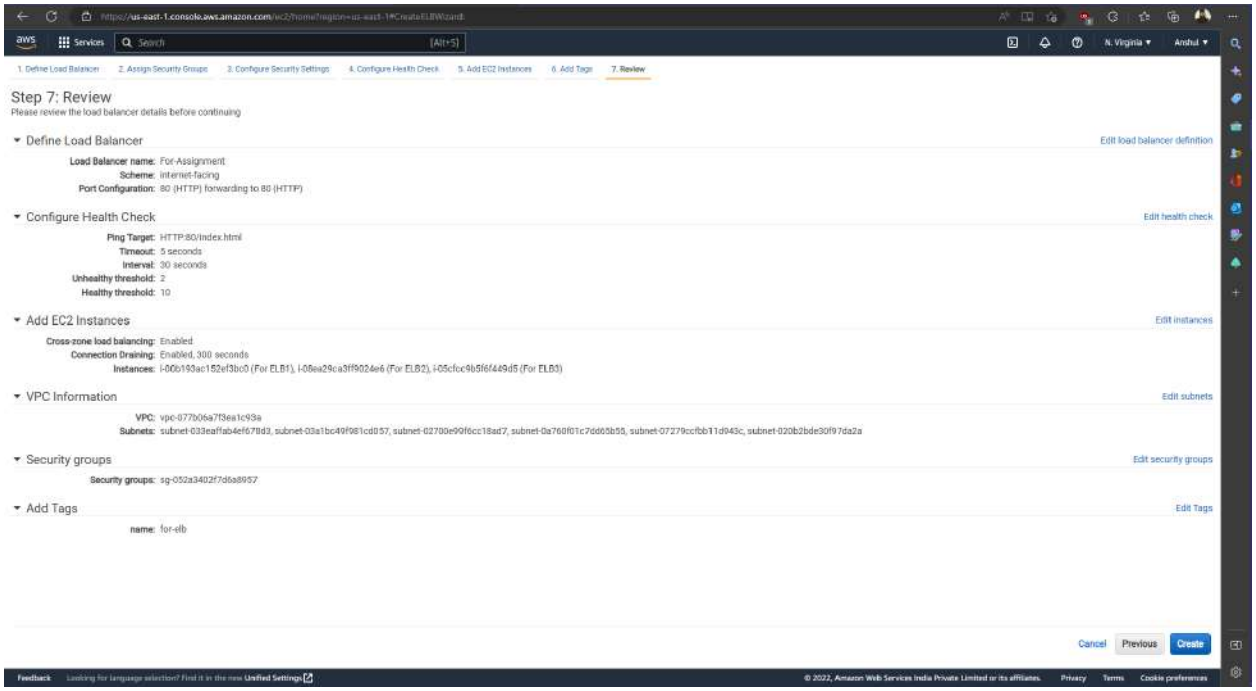
For health check it will ping index.html file.

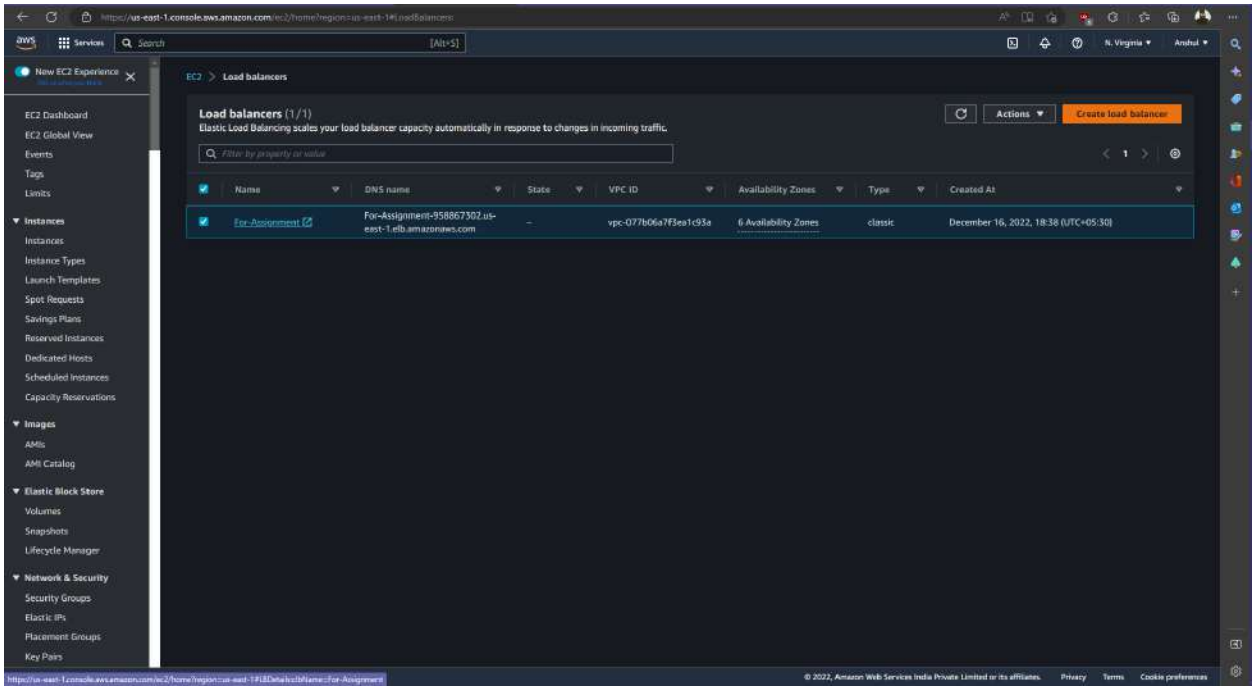


Add all 3 instances

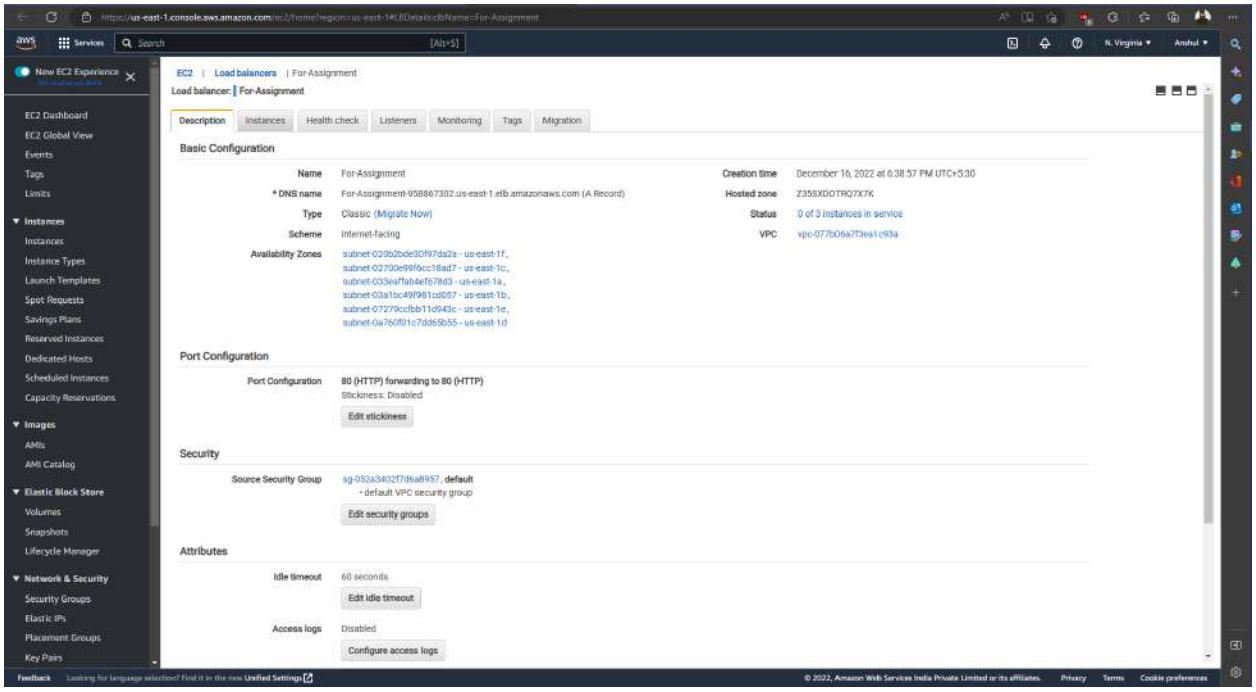



Step 6: Add Tags
Apply tags to your resources to help organize and identify them.
A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. Learn more about tagging your Amazon EC2 resources.
Key
Value
name
for-elb
Create Tag
Cancel
Previous
Review and Create

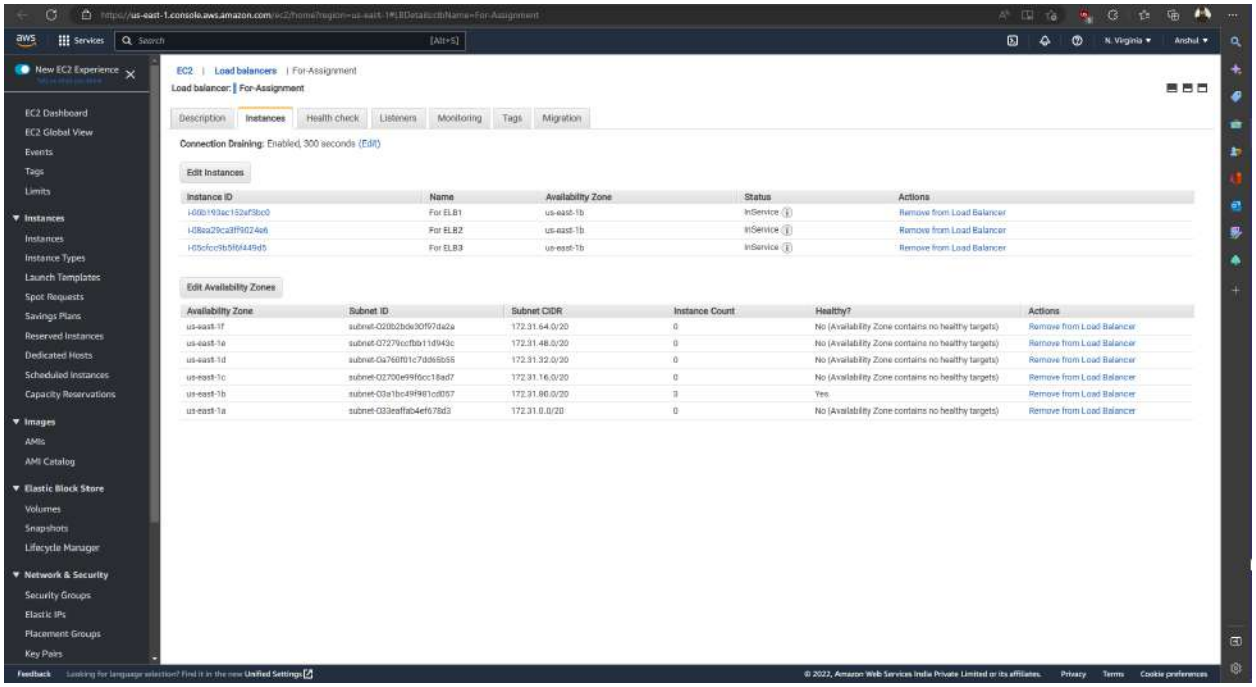

Step 7: Review
Please review the load balancer details before continuing
Define Load Balancer
Edit load balancer definition
Load Balancer name: For-Assignment
Scheme: internet-facing
Port Configuration: 80 (HTTP) forwarding to 80 (HTTP)
Configure Health Check
Edit health check
Ping Target: HTTP:80/index.html
Timeout: 5 seconds
Interval: 30 seconds
Unhealthy threshold: 2
Healthy threshold: 10
Add EC2 Instances
Edit instances
Cross-zone load balancing: Enabled
Connection Draining: Enabled, 300 seconds
Instances: i-00b193ac152ef3bc0 (For ELB1), i-08ea29ca3ff9024e6 (For ELB2), i-05cfcc9b5f6f449d5 (For ELB3)
VPC Information
Edit subnets
VPC: vpc-077b06a7f3ea1c93a
Subnets: subnet-033eaffab4ef678d3, subnet-03a1bc49f981cd057, subnet-02700e99f6cc18ad7, subnet-0a760f01c7dd65b55, subnet-07279ccfbb11d943c, subnet-020b2bde30f97da2a
Security groups
Edit security groups
Security groups: sg-052a3402f7d6a8957
Add Tags
Edit Tags
name: for-elb
Cancel
Previous
Create



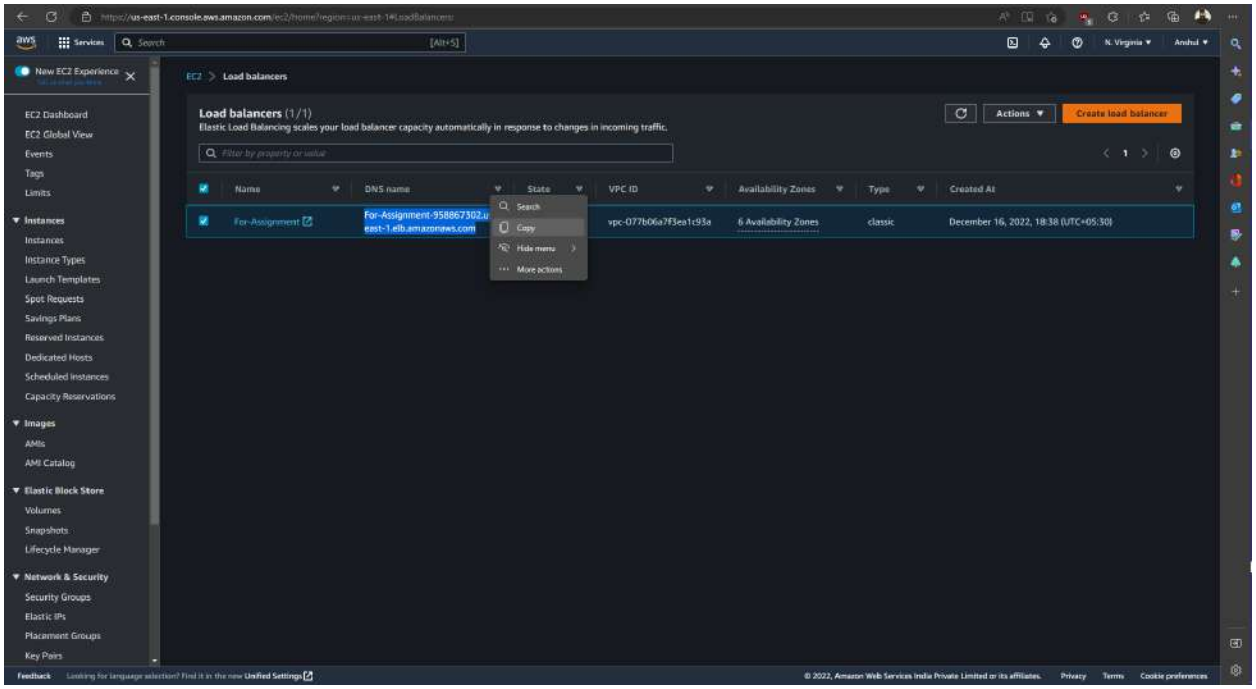
Click on created load balancer check if instances are ready.



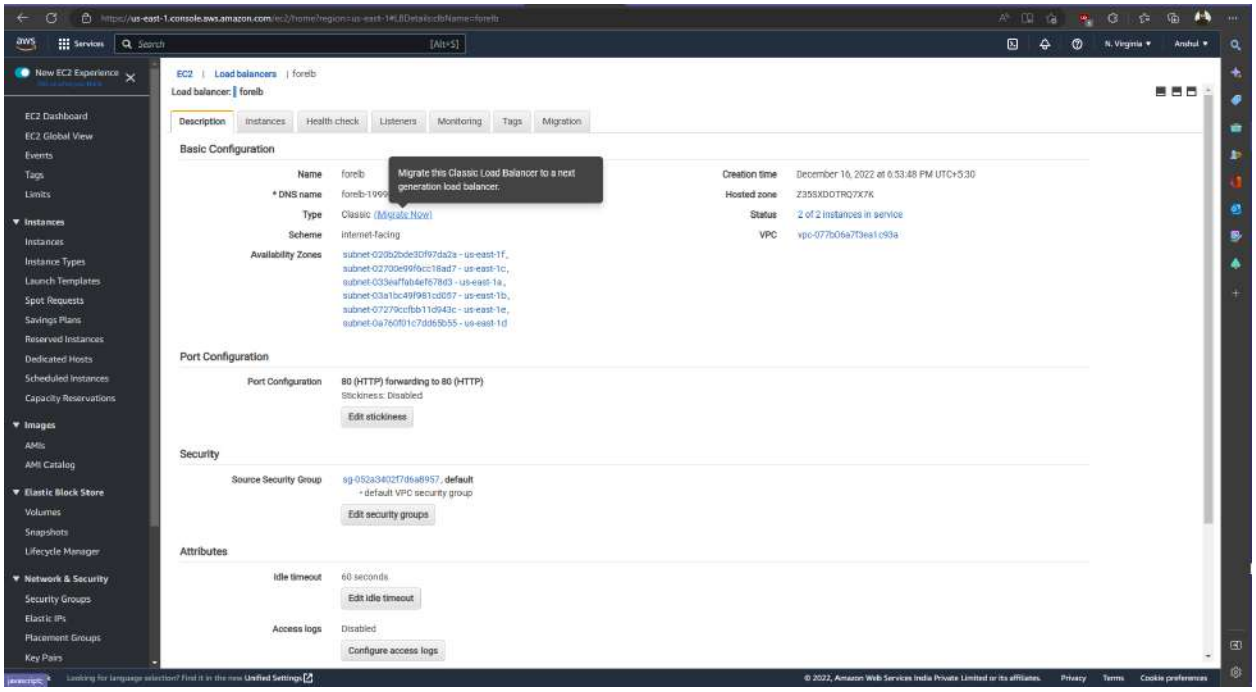
They are in service

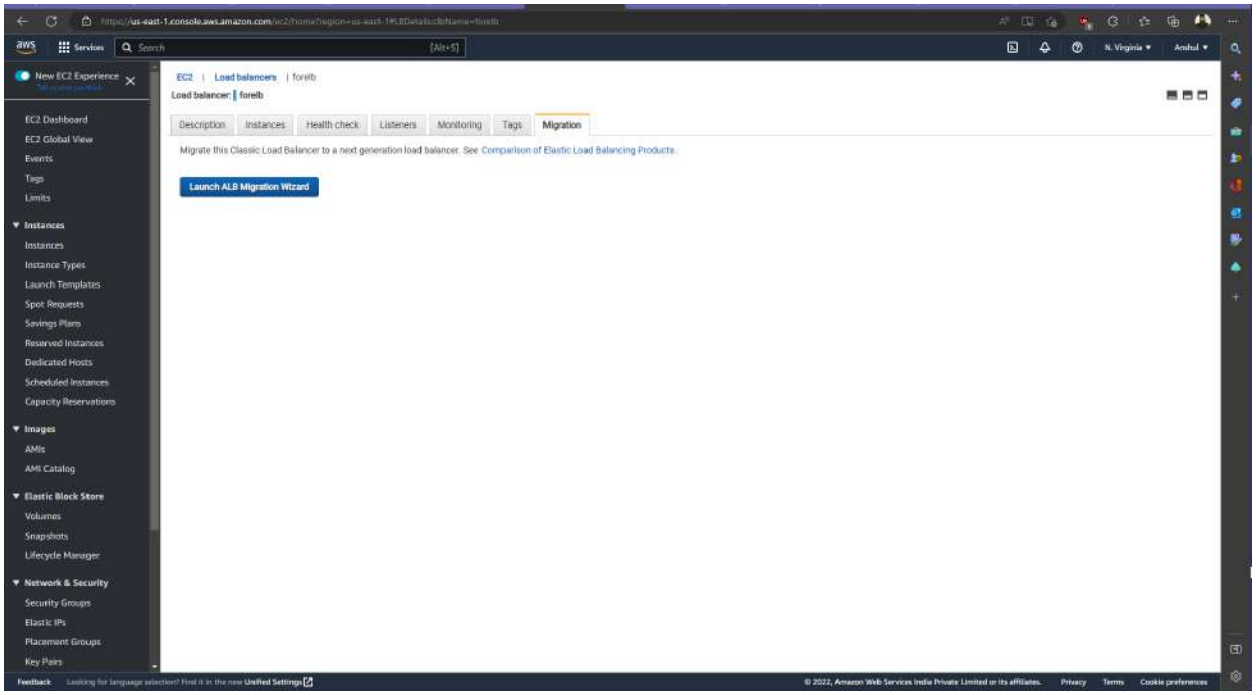


Copy the dns of load balancer and check after pasting it as url in browser

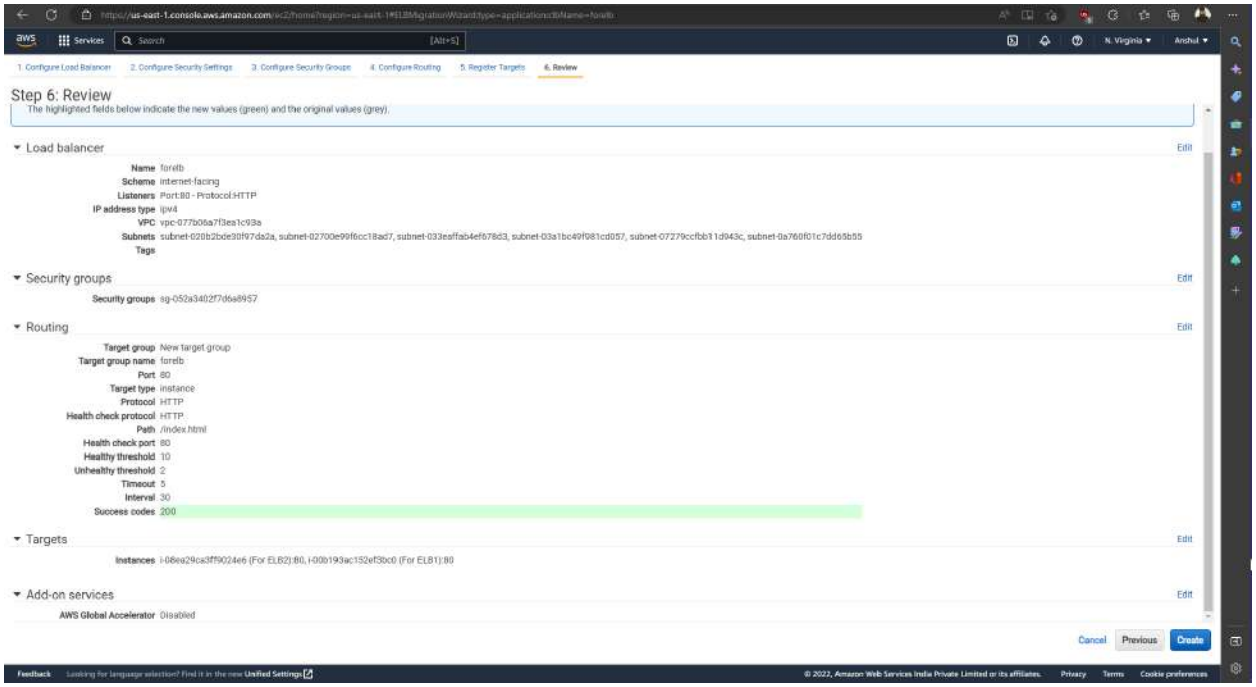


To change classic load balancer to application load balancer click on load balancer and then choose migrate now.

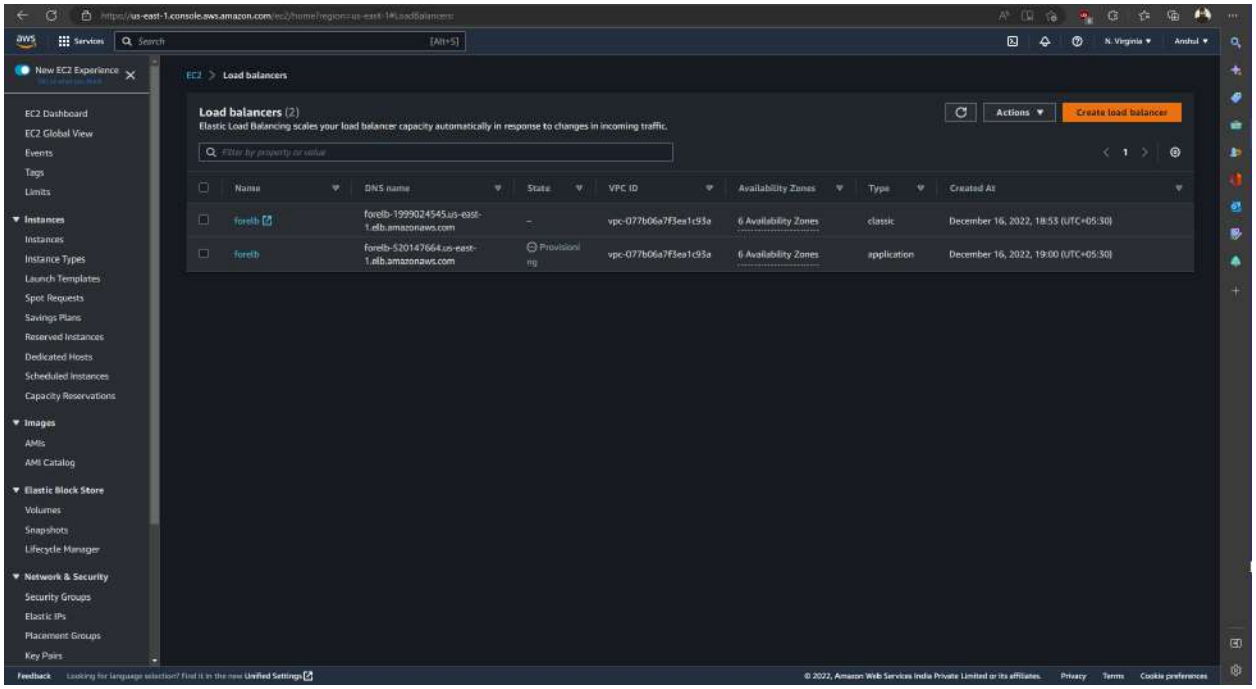




Click on create to migrate finally.



Your load balancer has been migrated from classic load balancer to application load balancer.



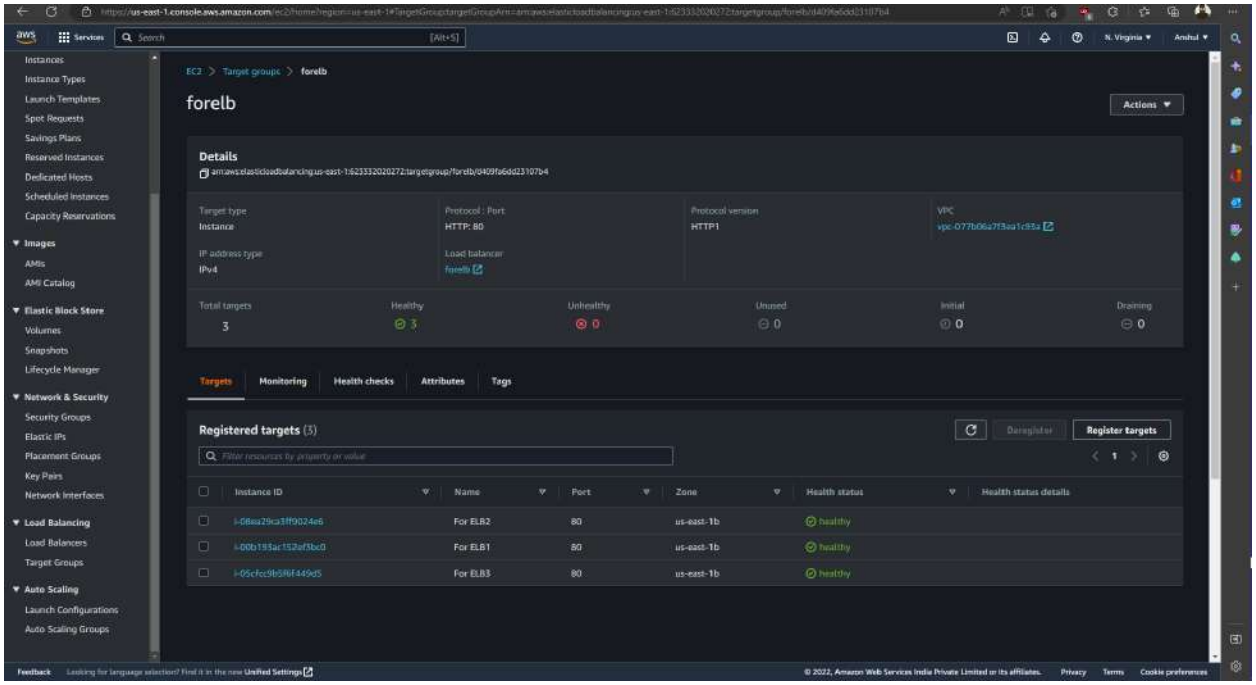
Optional:Since we created an Application load balancer let's apply load accordingly.

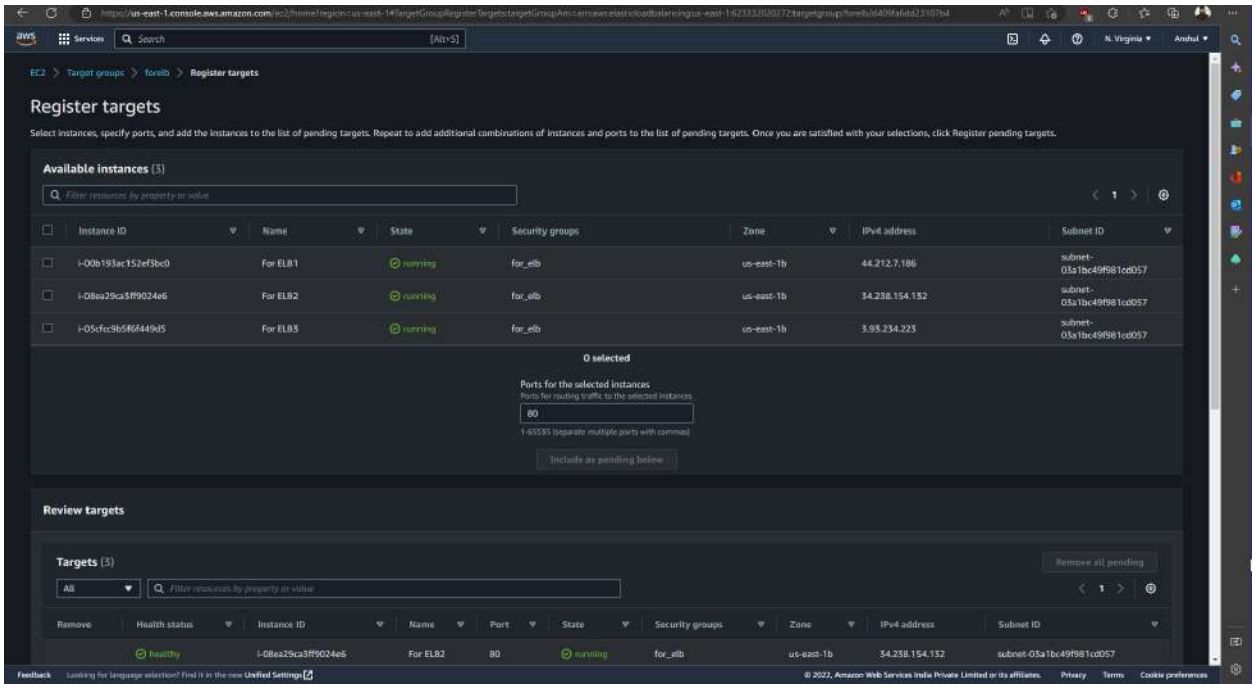
First create 3 target groups for 34 instances separately.

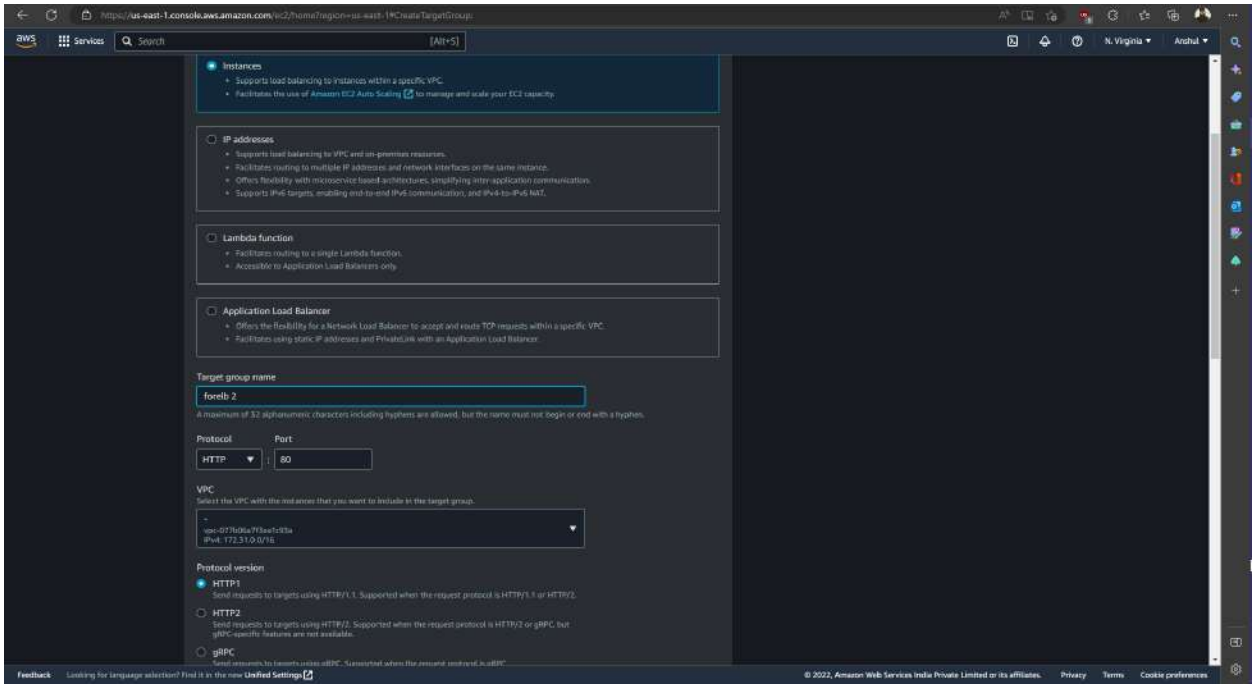
Then go to load balancer,select the listener,go to the actions drop down menu and select edit listeners.

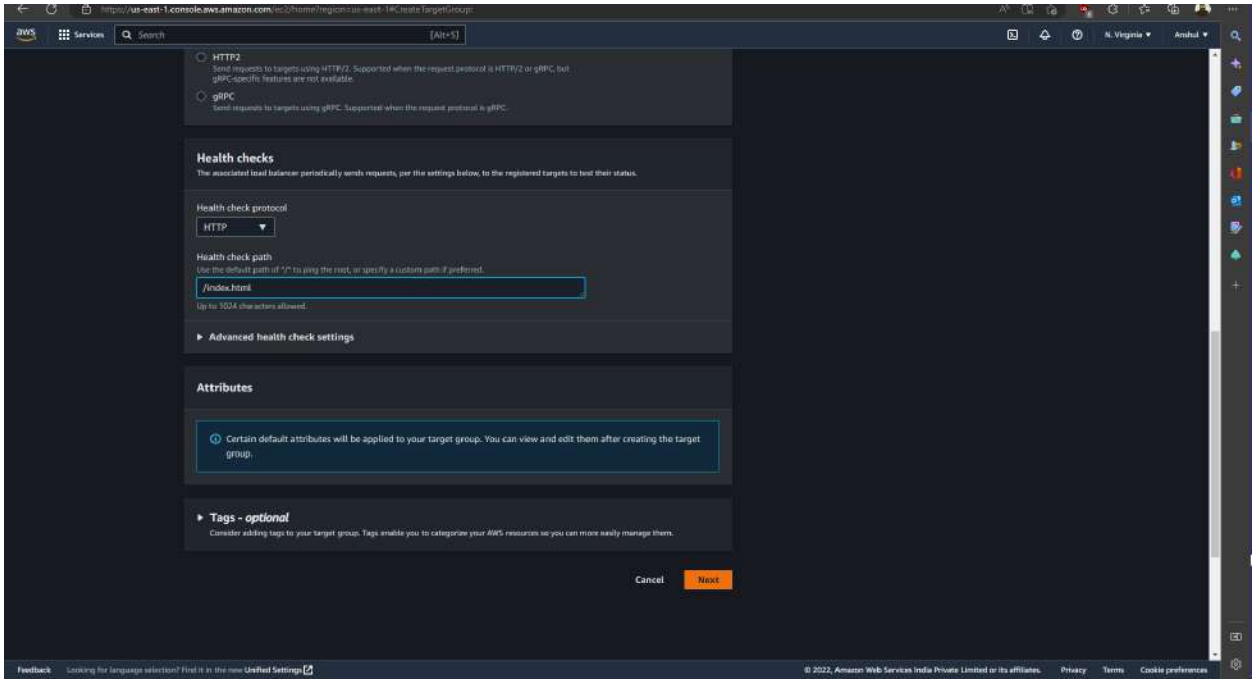
Add 3 target groups with load assigned according to you.

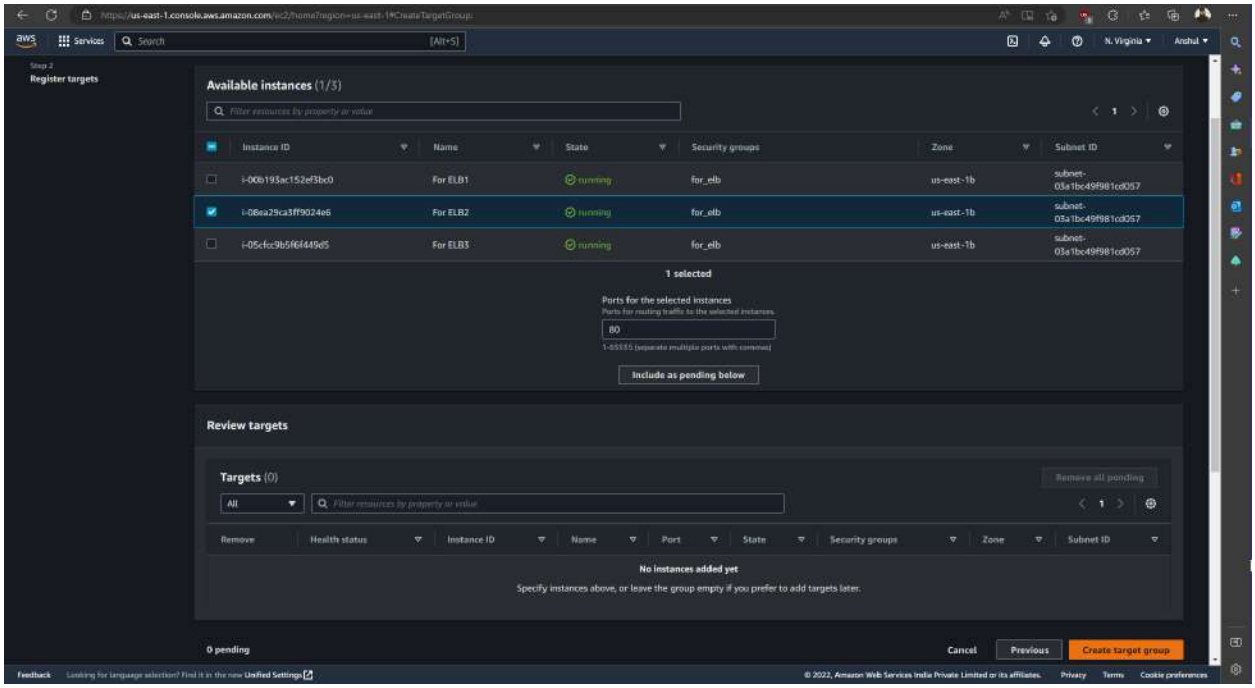
Here I applied equal load i.e 1 1 1 i.e 33.33 percent.

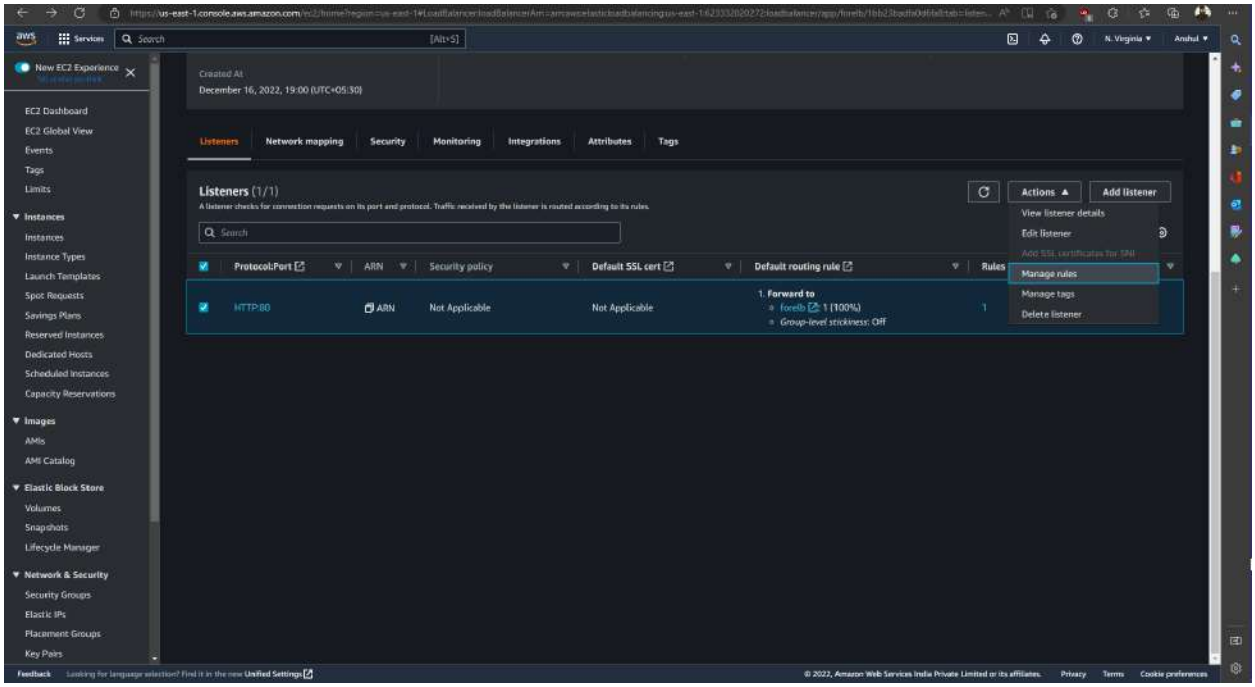


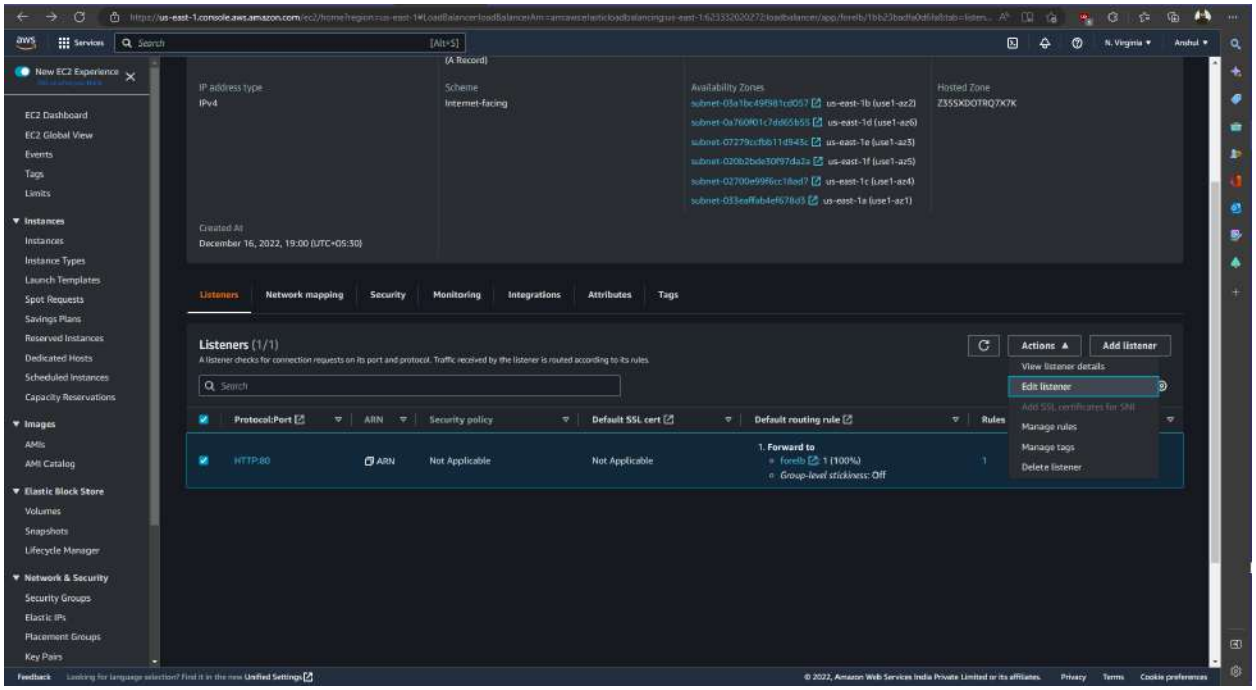



Instances
Supports load balancing to instances within a specific VPC.
Facilitates the use of Amazon EC2 Auto Scaling to manage and scale your EC2 capacity.
IP addresses
Supports load balancing to VPC and on-premises resources.
Facilitates routing to multiple IP addresses and network interfaces on the same instance.
Offers flexibility with microservice based architectures, simplifying inter-application communication.
Supports IPv6 targets, enabling end-to-end IPv6 communication, and IPv4-to-IPv6 NAT.
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
forelb 2
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.
IPv4: 172.31.0.0/16
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
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services India Private Limited or its affiliates.
Privacy
Terms
Cookie preferences


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.
Health checks
The associated load balancer periodically sends requests, per the settings below, to the registered targets to test their status.
Health check protocol
HTTP
Health check path
Use the default path of "/" to ping the root, or specify a custom path if preferred.
/index.html
Up to 1024 characters allowed.
Advanced health check settings
Attributes
Certain default attributes will be applied to your target group. You can view and edit them after creating the target group.
Tags - optional
Consider adding tags to your target group. Tags enable you to categorize your AWS resources so you can more easily manage them.
Cancel
Next
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services India Private Limited or its affiliates.
Privacy
Terms
Cookie preferences


Register targets
Available instances (1/3)
Instance ID
Name
State
Security groups
Zone
Subnet ID
i-00b193ac152ef3bc0
For ELB1
running
for_elb
us-east-1b
i-08ea29ca3ff9024e6
For ELB2
running
for_elb
us-east-1b
i-05cfcc9b5f6f449d5
For ELB3
running
for_elb
us-east-1b
1 selected
Ports for the selected instances
80
Include as pending below
Review targets
Targets (0)
Remove all pending
Remove
Health status
Instance ID
Name
Port
State
Security groups
Zone
Subnet ID
No instances added yet
Specify instances above, or leave the group empty if you prefer to add targets later.
0 pending
Cancel
Previous
Create target group


Created At
December 16, 2022, 19:00 (UTC+05:30)
Listeners
Network mapping
Security
Monitoring
Integrations
Attributes
Tags
Listeners (1/1)
A listener checks for connection requests on its port and protocol. Traffic received by the listener is routed according to its rules.
Actions
Add listener
View listener details
Edit listener
Manage rules
Manage tags
Delete listener
Protocol:Port
ARN
Security policy
Default SSL cert
Default routing rule
Rules
HTTP:80
ARN
Not Applicable
Not Applicable
1. Forward to
Group-level stickiness: Off


Services
Search
[Alt+S]
N. Virginia
Anshul
New EC2 Experience
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Scheduled Instances
Capacity Reservations
Images
AMIs
AMI Catalog
Elastic Block Store
Volumes
Snapshots
Lifecycle Manager
Network & Security
Security Groups
Elastic IPs
Placement Groups
Key Pairs
(A Record)
IP address type
IPv4
Scheme
Internet-facing
Availability Zones
subnet-05a1bc49f981cd057 us-east-1b (use1-az2)
subnet-0a760f01c7dd65b55 us-east-1d (use1-az6)
subnet-07279ccfbb11d943c us-east-1e (use1-az3)
subnet-020b2bde30f97da2a us-east-1f (use1-az5)
subnet-02700e99f6cc18ad7 us-east-1c (use1-az4)
subnet-033eaffab4ef678d3 us-east-1a (use1-az1)
Hosted Zone
Z35SXDOTRQ7X7K
Created At
December 16, 2022, 19:00 (UTC+05:30)
Listeners
Network mapping
Security
Monitoring
Integrations
Attributes
Tags
Listeners (1/1)
A listener checks for connection requests on its port and protocol. Traffic received by the listener is routed according to its rules.
Search
Actions
Add listener
View listener details
Edit listener
Add SSL certificates for SNI
Manage rules
Manage tags
Delete listener
Protocol:Port
ARN
Security policy
Default SSL cert
Default routing rule
Rules
HTTP:80
ARN
Not Applicable
Not Applicable
1. Forward to
forelb 1 (100%)
Group-level stickiness: Off
1
Feedback
Looking for language selection? Find it in the new Unified Settings
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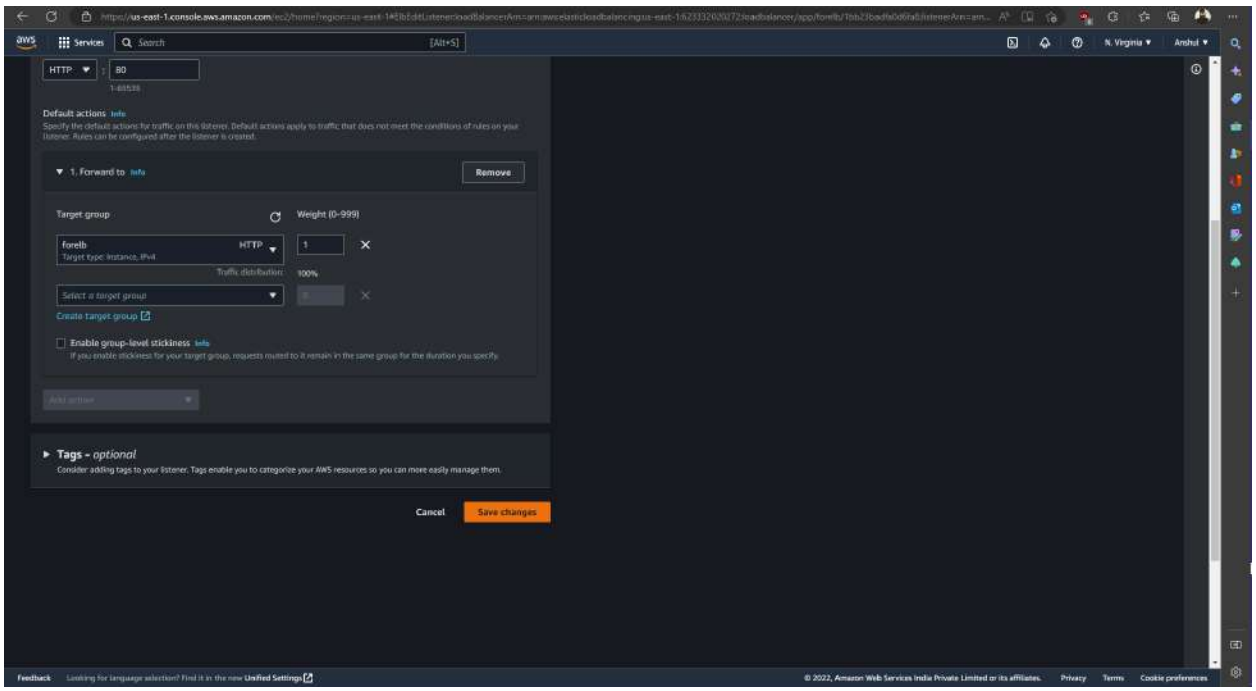
Services
Search
[Alt+S]
N. Virginia
Anshul
HTTP
80
Default actions
Specify the default actions for traffic on this listener. Default actions apply to traffic that does not meet the conditions of rules on your listener. Rules can be configured after the listener is created.
1. Forward to
Remove
Target group
Weight (0-999)
forelb
Target type: Instance, IPv4
HTTP
1
Traffic distribution
100%
Select a target group
Create target group
Enable group-level stickiness
If you enable stickiness for your target group, requests routed to it remain in the same group for the duration you specify.
Add action
Tags - optional
Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.
Cancel
Save changes
Feedback
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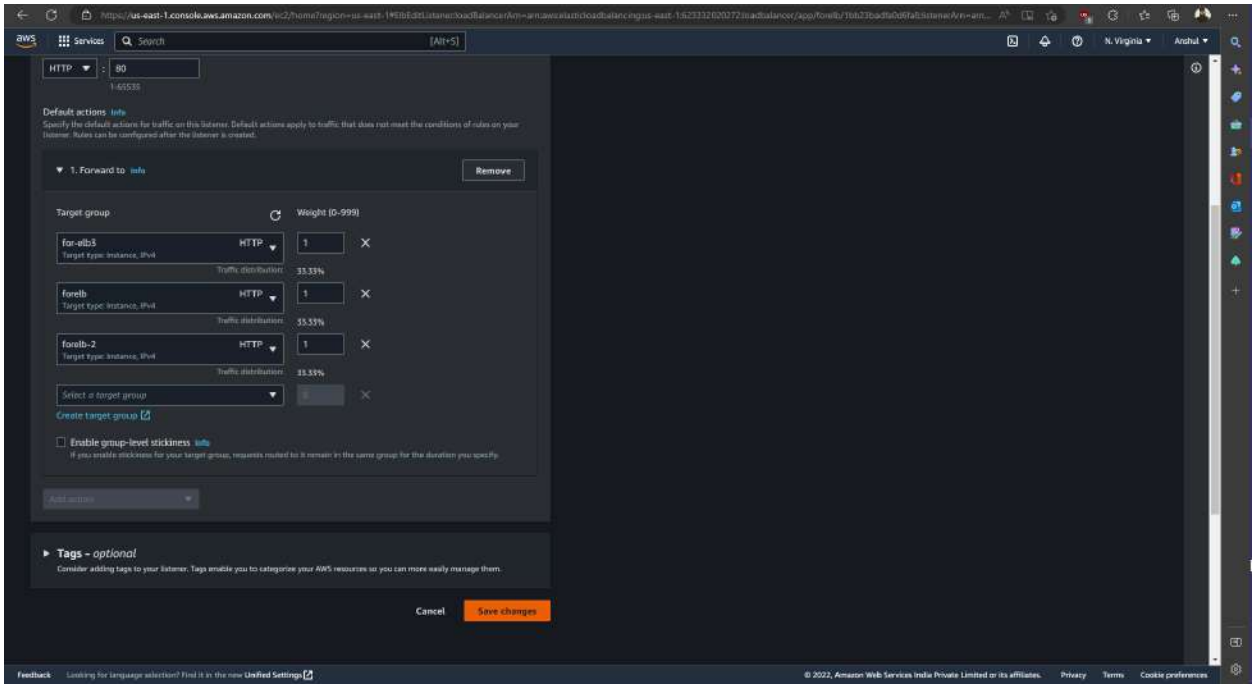
Services
Search
[Alt+S]
N. Virginia
Anshul
HTTP
80
Default actions
1. Forward to
Remove
Target group
Weight (0-999)
for-alb3
HTTP
Target type: Instance, IPv4
Traffic distribution
33.33%
forelb
HTTP
Target type: Instance, IPv4
Traffic distribution
33.33%
forelb-2
HTTP
Target type: Instance, IPv4
Traffic distribution
33.33%
Select a target group
Create target group
Enable group-level stickiness
Tags - optional
Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.
Cancel
Save changes
Feedback
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Not secure
forassignment-597951386.us-east-1.elb.amazonaws.com
This Is Server 1


Not secure
forassignment-597951386.us-east-1.elb.amazonaws.com
This Is Server 2


This Is Server 2

Final Result:

Use: “for i in {1..10}; do curl your-alb-dnsname.us-east-1.elb.amazonaws.com; done” to test the traffic distribution.

Result in our case is as follows.