NAME	Kavya R
ROLL NO	20BIS020
SUBJECT	ODD 22-23-U18ISE0006-CLOUD ARCHITECTURE AND COMPUTING

LAB -4: Creating a load balancer for managing request from different Ec2 instances

Aim:

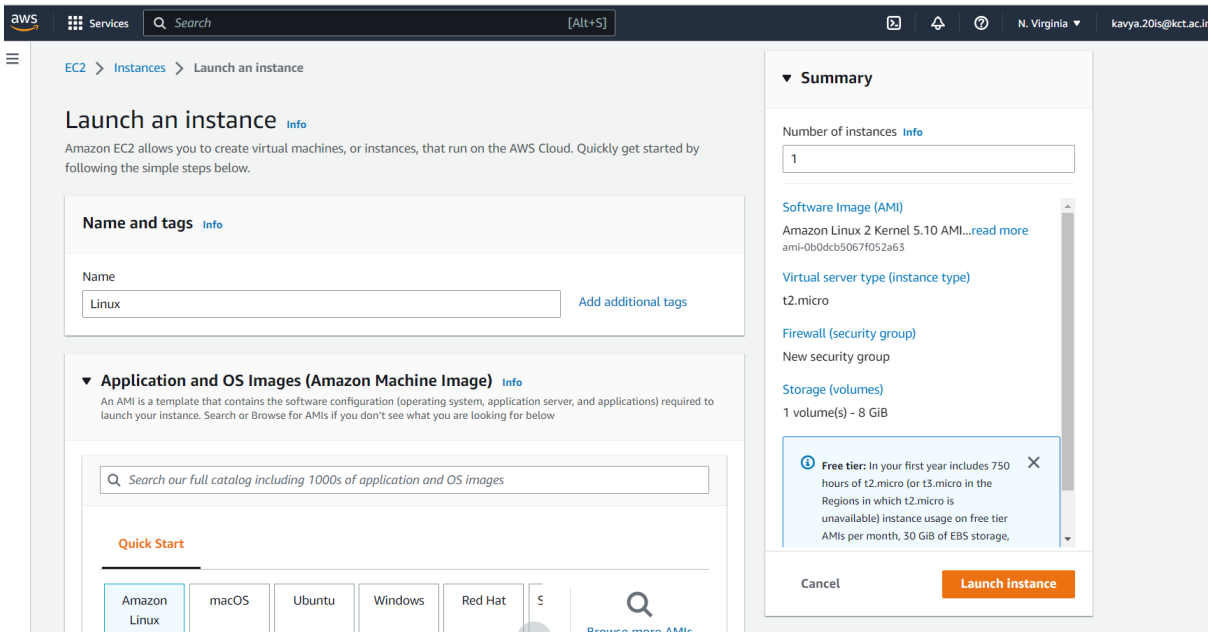
Exploring the use of Load balancer(Ec2) service in amazon.

Required AWS services:

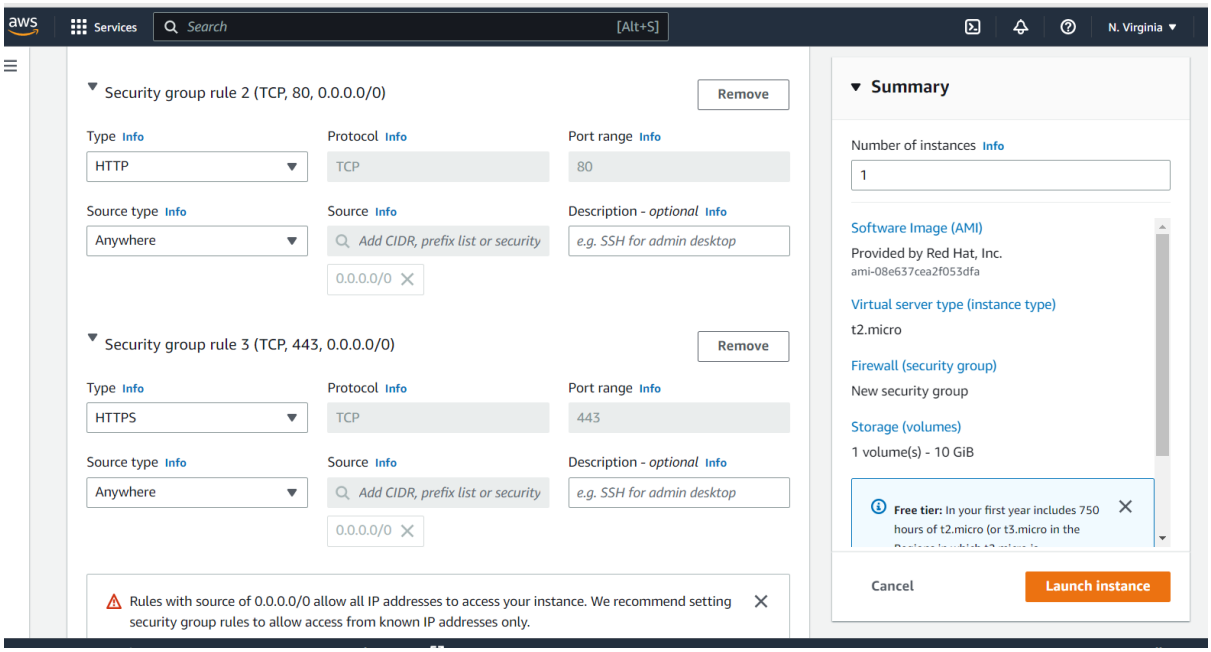
Load Balancer, 3 EC2 instances

Procedure

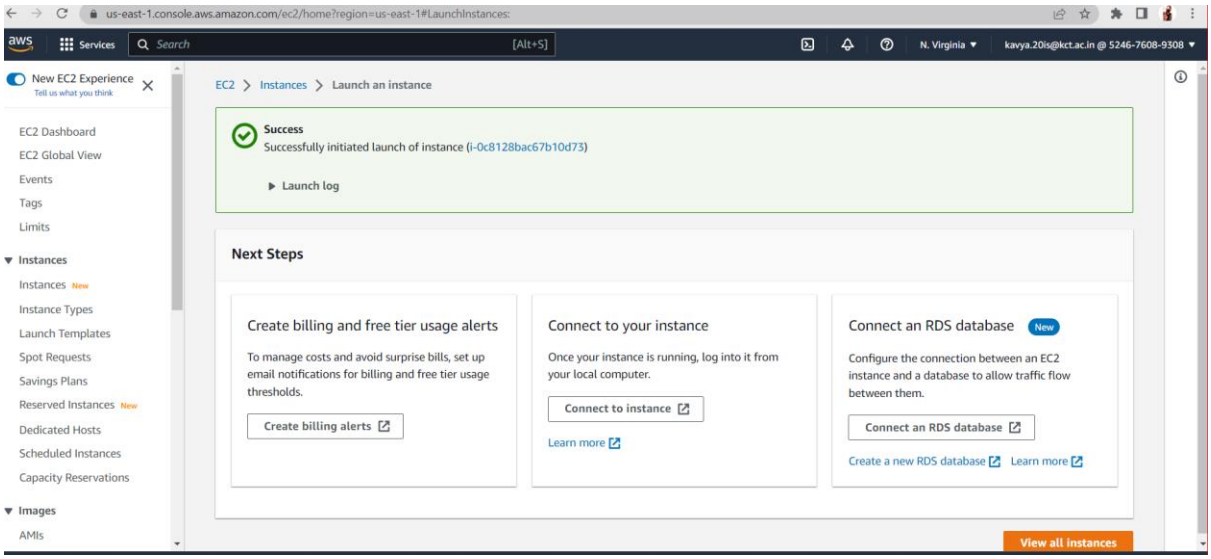
1. Create a linux instance



a. Security group – SSH,HTTP – Anywhere

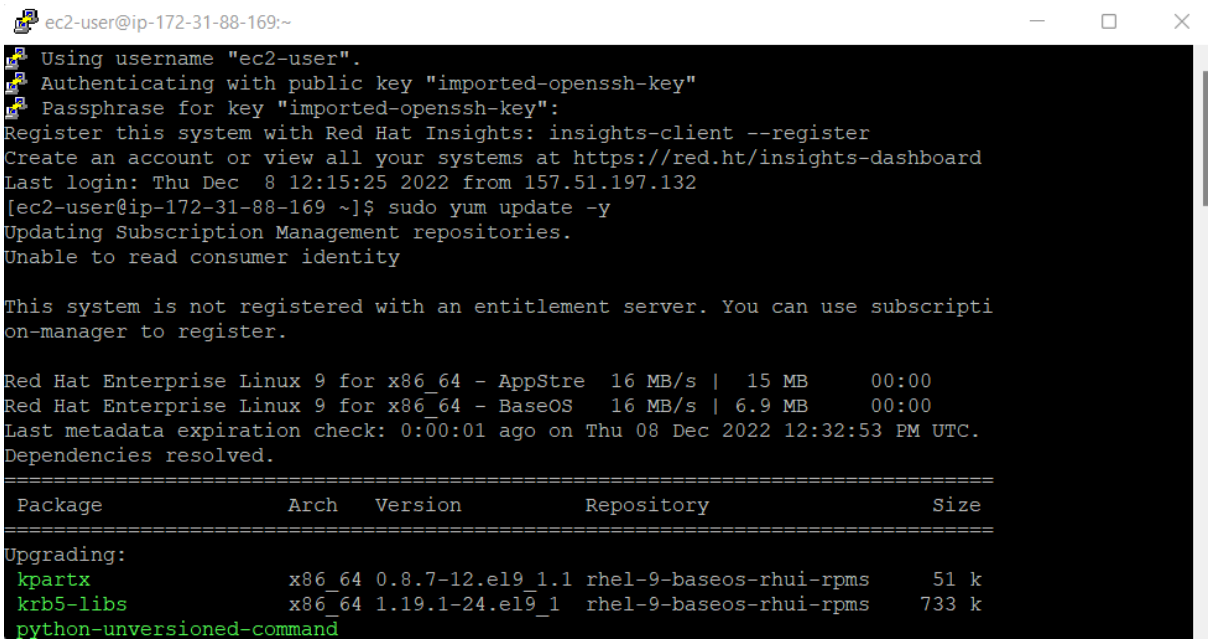


b. Launch the instance



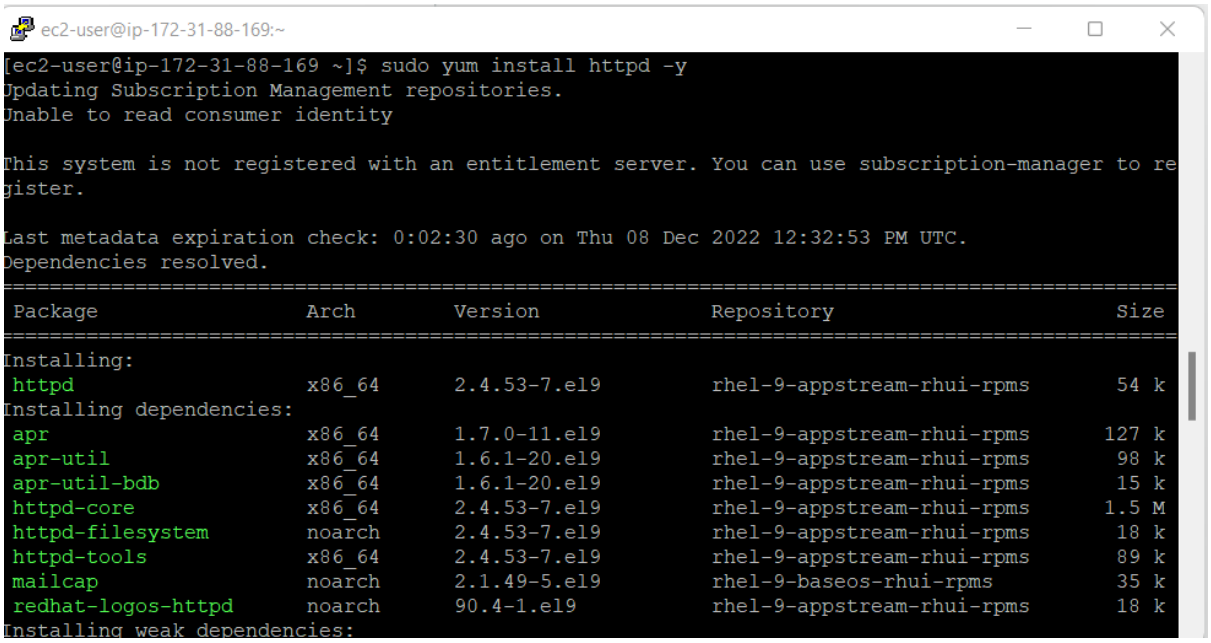
c. Update OS

sudo yum update -y



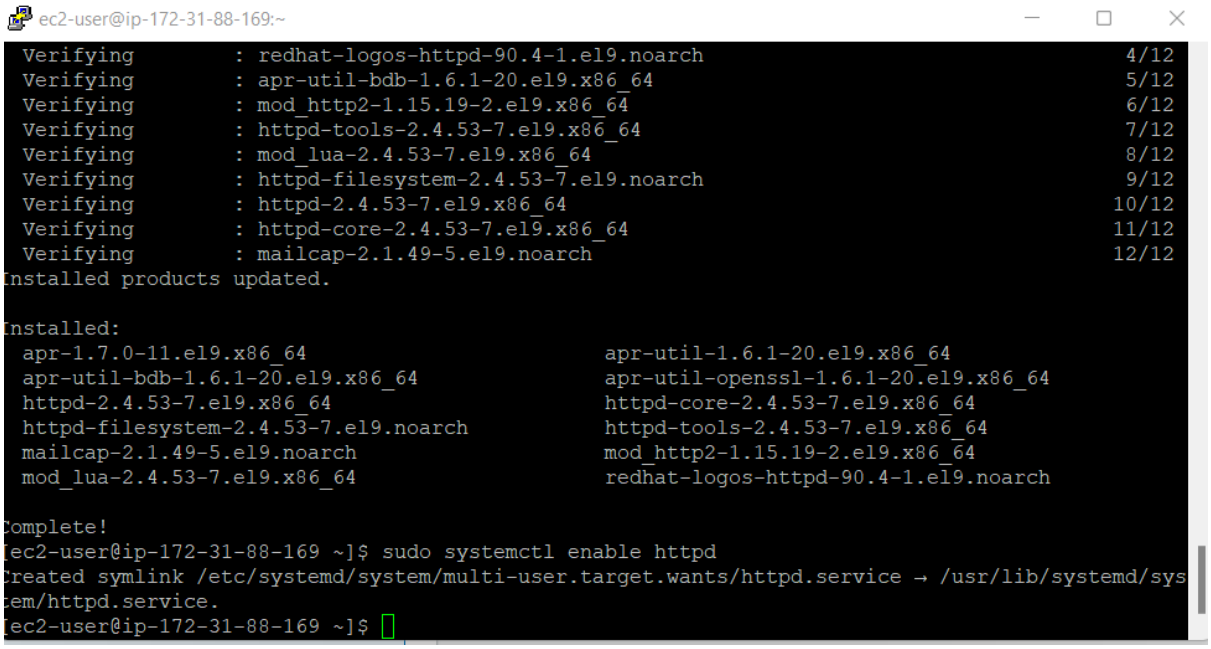
d. Install the apache web server (httpd)

sudo yum install httpd -y

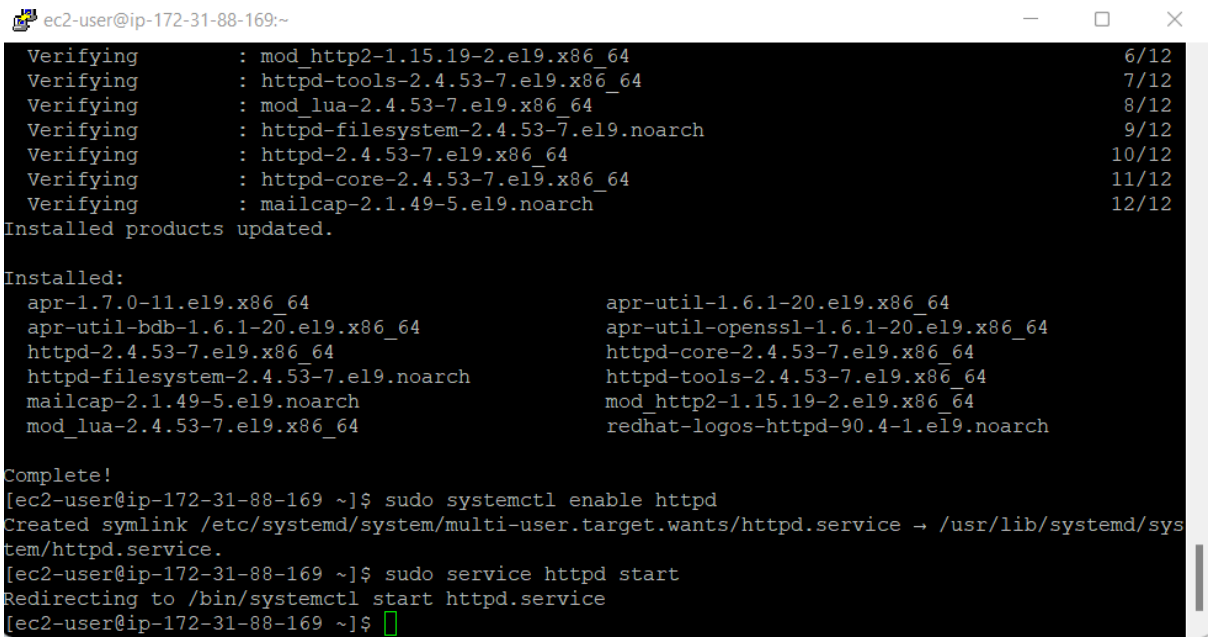


e. Enable at startup, and start service.

sudo systemctl enable httpd



sudo service httpd start



```
[ec2-user@ip-172-31-88-169 ~]$ sudo yum install nano
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use subscription-manager to re
gister.

Last metadata expiration check: 0:01:57 ago on Thu 08 Dec 2022 12:36:47 PM UTC.
Dependencies resolved.
================================================================================
 Package        Architecture     Version               Repository                Size
================================================================================
Installing:
 nano           x86_64           5.6.1-5.el9           rhel-9-baseos-rhui-rpms   714 k

Transaction Summary
================================================================================
Install  1 Package

Total download size: 714 k
Installed size: 2.7 M
Is this ok [y/N]:
```

f. Create a new default page

sudo nano /var/www/html/index.htm

edit it

```
ec2-user@ip-172-31-88-169:~
Using username "ec2-user".
Authenticating with public key "imported-openssh-key"
Passphrase for key "imported-openssh-key":
Wrong passphrase
Passphrase for key "imported-openssh-key":
Register this system with Red Hat Insights: insights-client --register
Create an account or view all your systems at https://red.ht/insights-dashboard
Last login: Thu Dec  8 12:31:55 2022 from 157.51.197.132
[ec2-user@ip-172-31-88-169 ~]$ sudo nano /var/www/html/index.htm
[ec2-user@ip-172-31-88-169 ~]$ sudo nano /var/www/html/index.html
[ec2-user@ip-172-31-88-169 ~]$ sudo nano /var/www/html/login.html
[ec2-user@ip-172-31-88-169 ~]$ sudo nano /var/www/html/login2.html
[ec2-user@ip-172-31-88-169 ~]$
```

g. stop the instance

2. Create an AMI

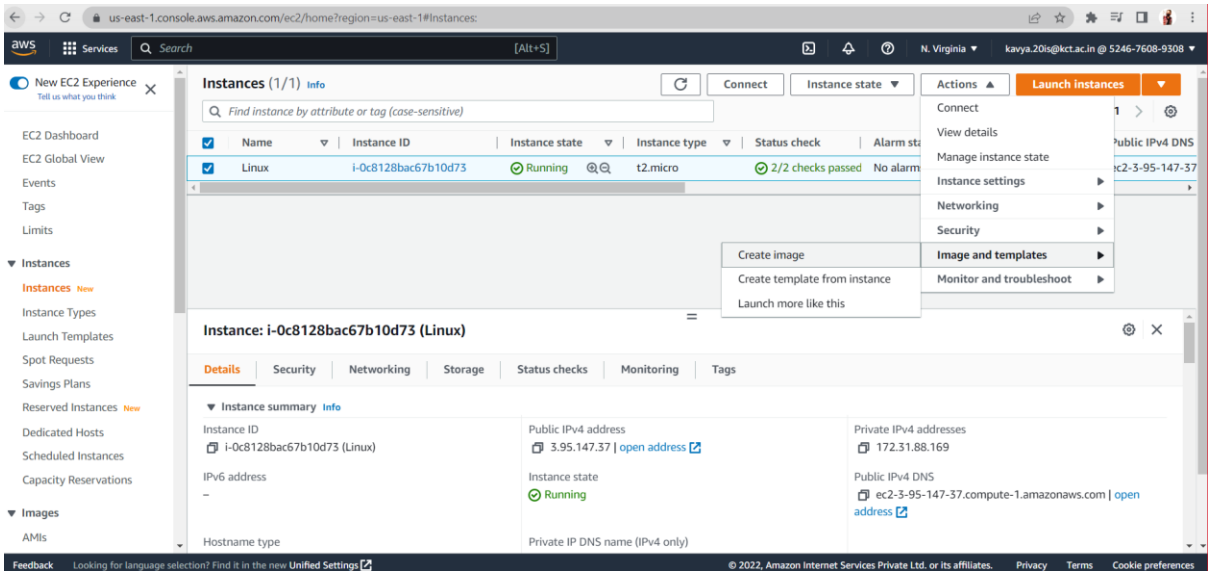
a. Actions -> Image -> Create Imag

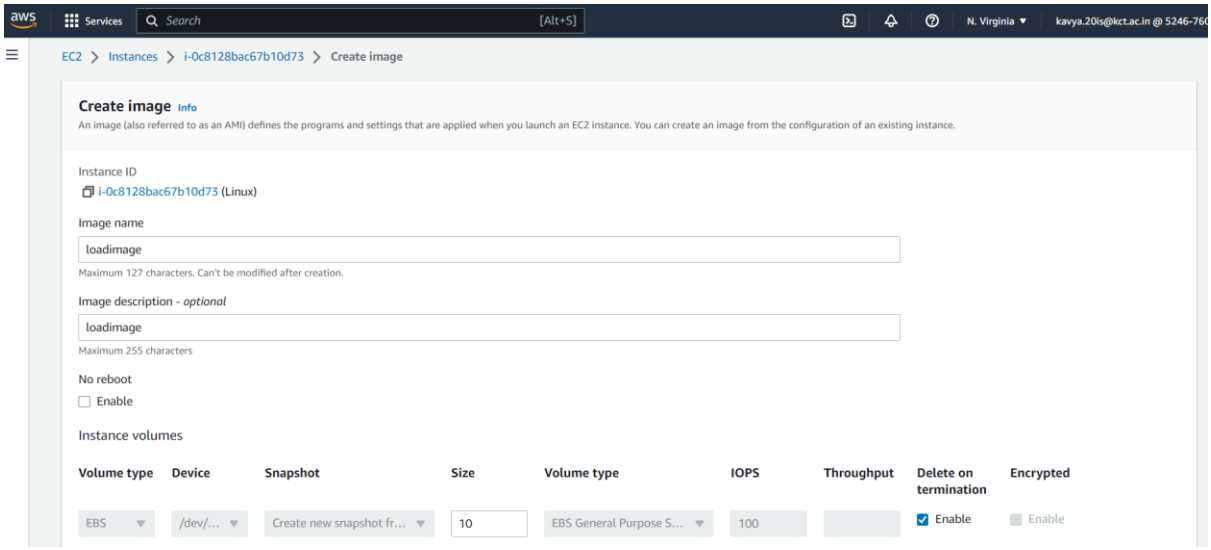
b. Launch 3 instances with the created AMI

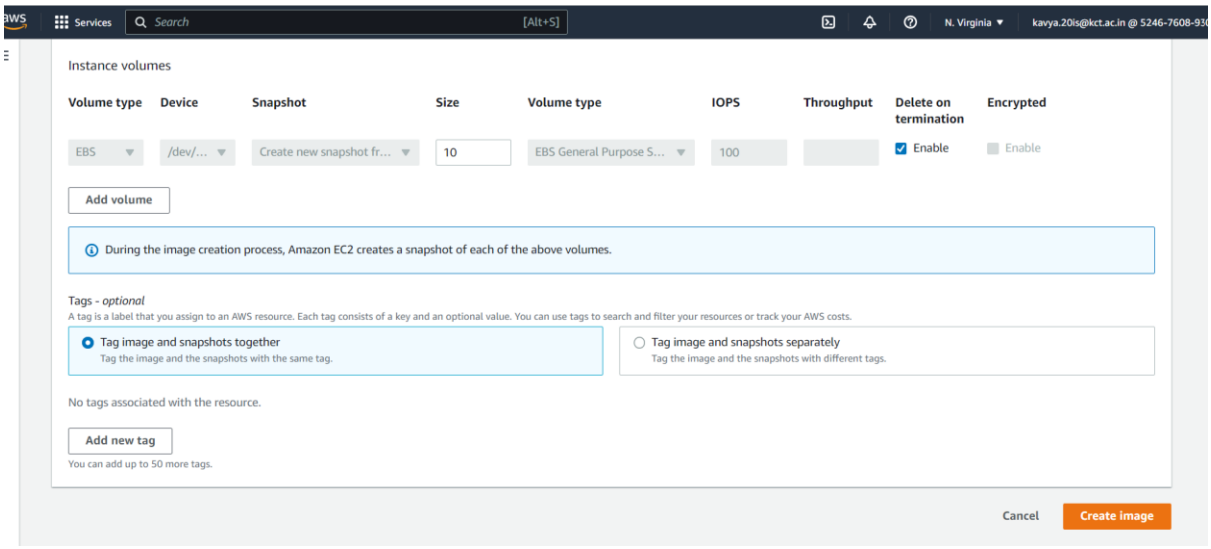
i). Az: us-east-1a , t2.micro , Subnet – eu-west-1a(eu-west-1b, eu-west-1c), default VPC, security group -HTTP, SSH

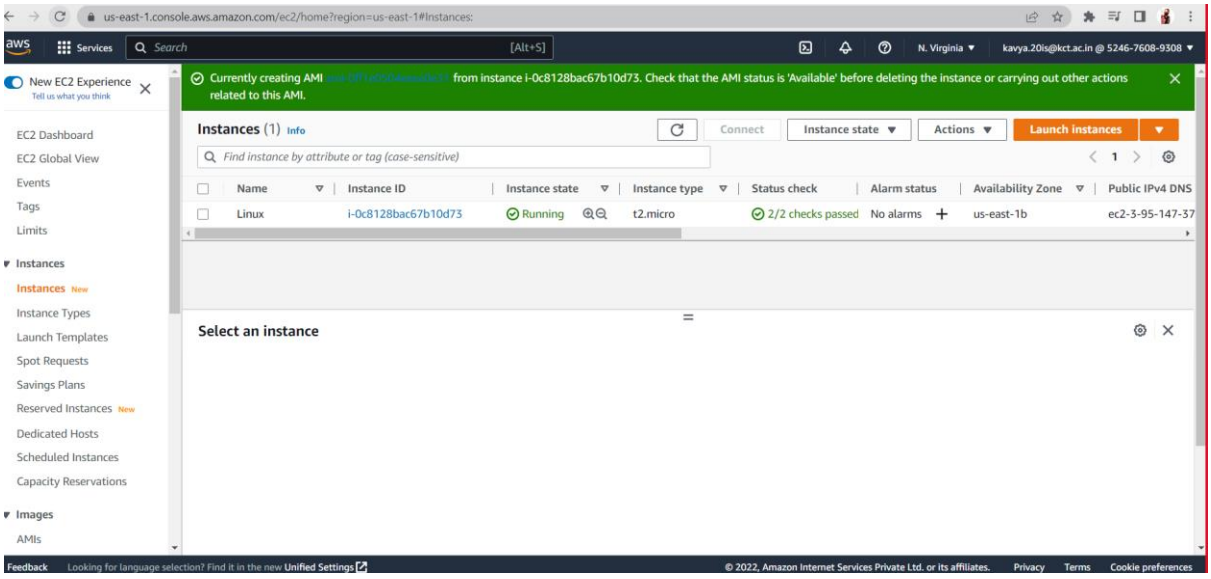
c. To edit the webpage

sudo nano /var/www/html/index.htm






Services
Search
[Alt+S]
N. Virginia
Instance volumes
Volume type
Device
Snapshot
Size
Volume type
IOPS
Throughput
Delete on termination
Encrypted
EBS
/dev/...
Create new snapshot fr...
10
EBS General Purpose S...
100
Enable
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 new tag
You can add up to 50 more tags.
Cancel
Create image


us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:
Services
Search
[Alt+S]
N. Virginia
New EC2 Experience
Tell us what you think
Currently creating AMI from instance i-0c8128bac67b10d73. Check that the AMI status is 'Available' before deleting the instance or carrying out other actions related to this AMI.
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances New
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances New
Dedicated Hosts
Scheduled Instances
Capacity Reservations
Images
AMIs
Instances (1) Info
Connect
Instance state
Actions
Launch instances
Find instance by attribute or tag (case-sensitive)
Name
Instance ID
Instance state
Instance type
Status check
Alarm status
Availability Zone
Public IPv4 DNS
Linux
i-0c8128bac67b10d73
Running
t2.micro
2/2 checks passed
No alarms
us-east-1b
ec2-3-95-147-37
Select an instance
Feedback
Looking for language selection? Find it in the new Unified Settings
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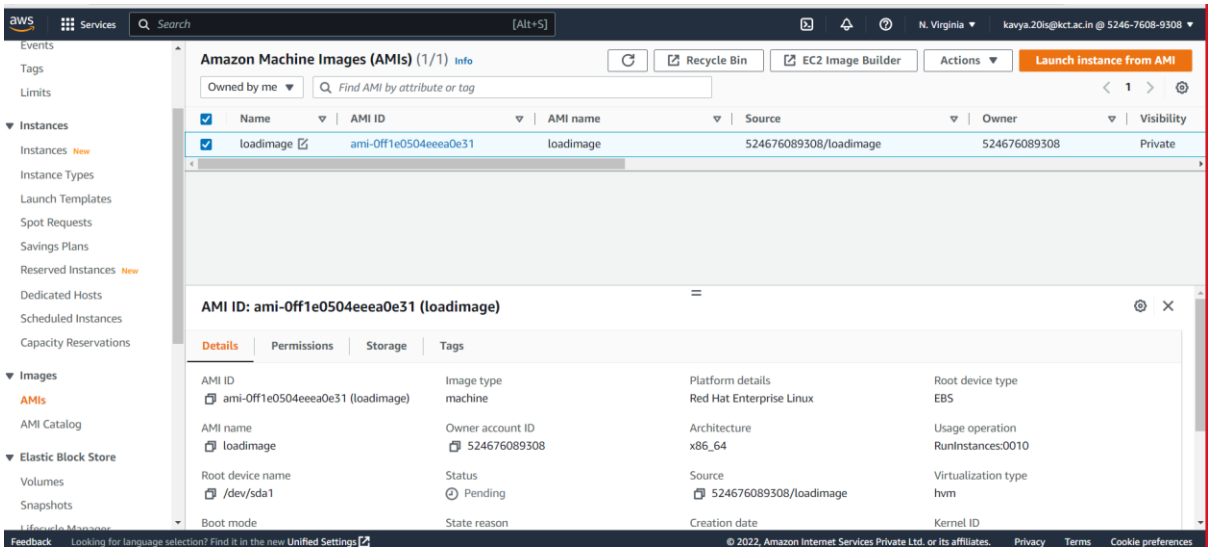
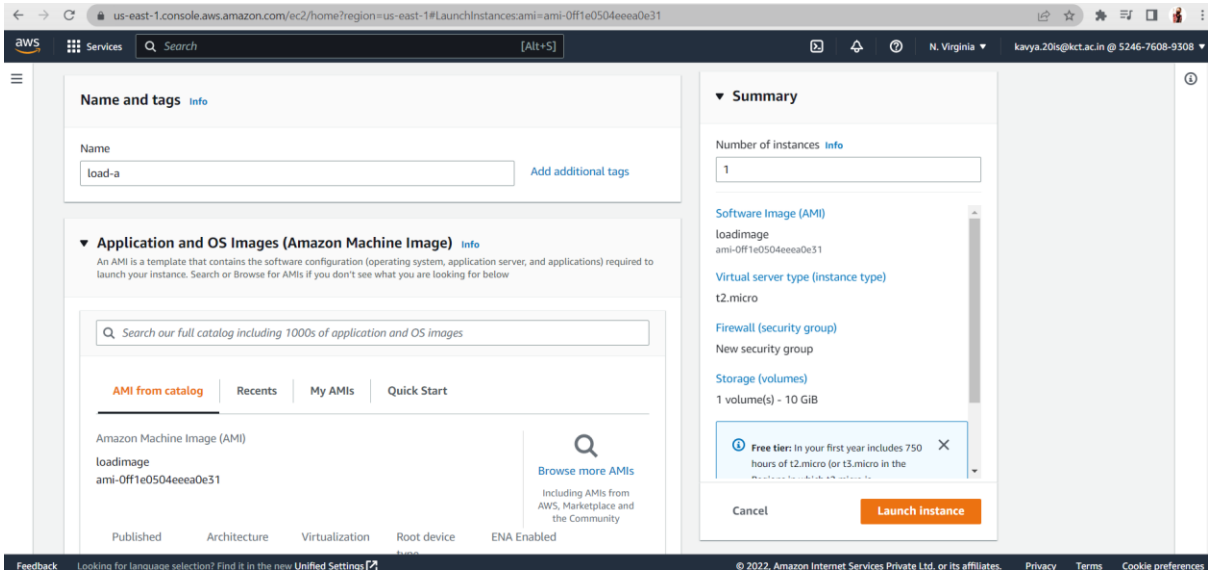
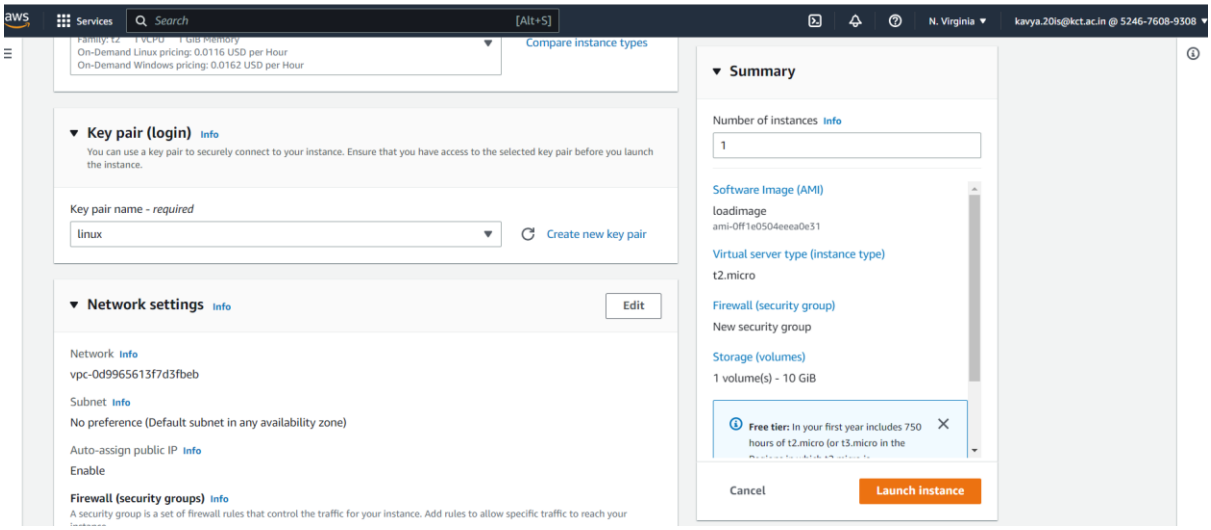
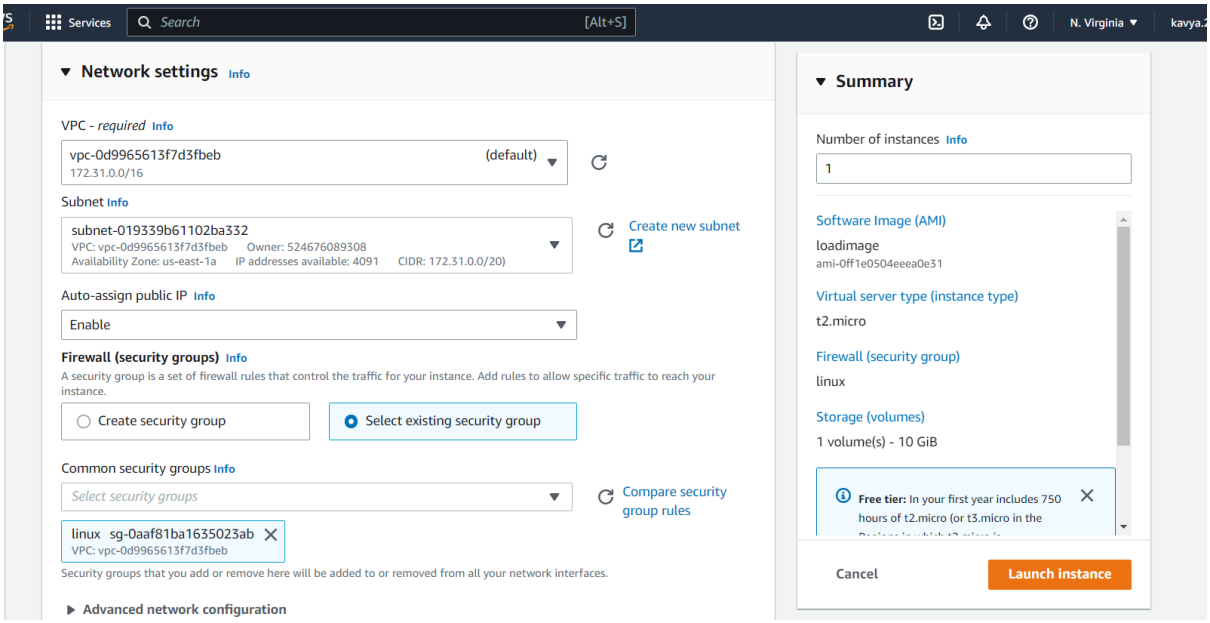
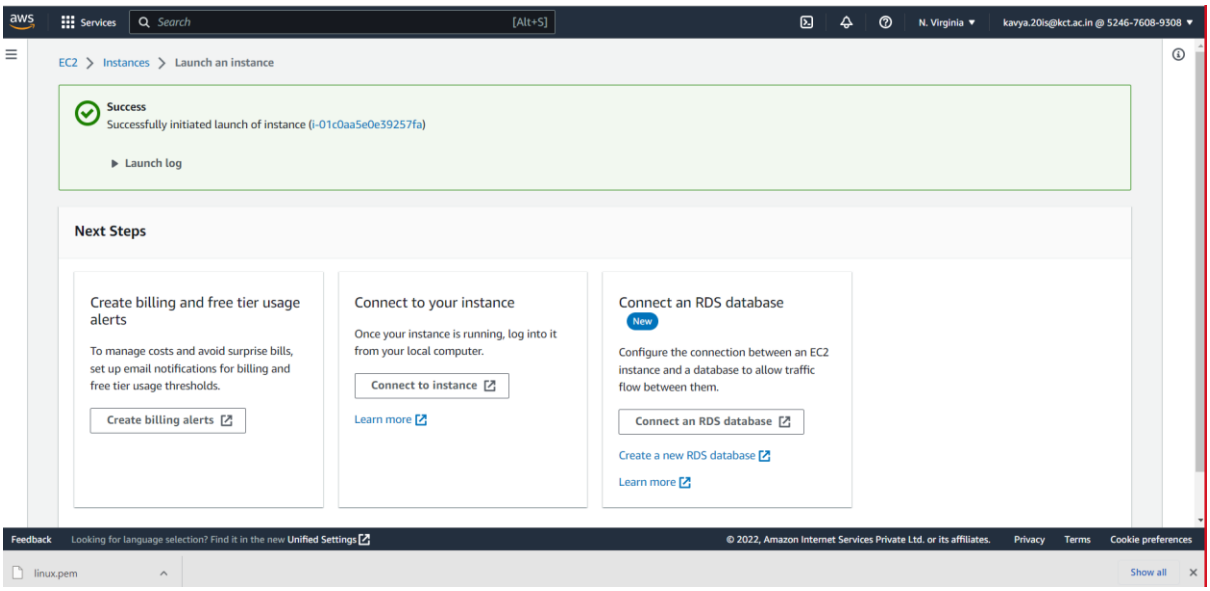
Privacy
Terms
Cookie preferences


Amazon Machine Images (AMIs) (1/1) Info
Recycle Bin
EC2 Image Builder
Actions
Launch instance from AMI
Owned by me
Find AMI by attribute or tag
Name
AMI ID
AMI name
Source
Owner
Visibility
loadimage
ami-0ff1e0504eeea0e31
loadimage
524676089308/loadimage
524676089308
Private
AMI ID: ami-0ff1e0504eeea0e31 (loadimage)
Details
Permissions
Storage
Tags
AMI ID
ami-0ff1e0504eeea0e31 (loadimage)
Image type
machine
Platform details
Red Hat Enterprise Linux
Root device type
EBS
AMI name
loadimage
Owner account ID
524676089308
Architecture
x86_64
Usage operation
RunInstances:0010
Root device name
/dev/sda1
Status
Pending
Source
524676089308/loadimage
Virtualization type
hvm
Boot mode
State reason
Creation date
Kernel ID


us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:ami=ami-0ff1e0504eeea0e31
Name and tags Info
Name
load-a
Add additional tags
Application and OS Images (Amazon Machine Image) Info
An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below
Search our full catalog including 1000s of application and OS images
AMI from catalog
Recents
My AMIs
Quick Start
Amazon Machine Image (AMI)
loadimage
ami-0ff1e0504eeea0e31
Browse more AMIs
Including AMIs from AWS, Marketplace and the Community
Published
Architecture
Virtualization
Root device
ENA Enabled
Summary
Number of instances Info
1
Software Image (AMI)
loadimage
ami-0ff1e0504eeea0e31
Virtual server type (instance type)
t2.micro
Firewall (security group)
New security group
Storage (volumes)
1 volume(s) - 10 GiB
Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the
Cancel
Launch instance


On-Demand Linux pricing: 0.0116 USD per Hour
On-Demand Windows pricing: 0.0162 USD per Hour
Compare instance types
Key pair (login) Info
You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.
Key pair name - required
linux
Create new key pair
Network settings Info
Edit
Network Info
vpc-0d9965613f7d3fbeb
Subnet Info
No preference (Default subnet in any availability zone)
Auto-assign public IP Info
Enable
Firewall (security groups) Info
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your
Summary
Number of instances Info
1
Software Image (AMI)
loadimage
ami-0ff1e0504eeea0e31
Virtual server type (instance type)
t2.micro
Firewall (security group)
New security group
Storage (volumes)
1 volume(s) - 10 GiB
Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the
Cancel
Launch instance


Services
Search
[Alt+S]
N. Virginia
Network settings Info
VPC - required Info
vpc-0d9965613f7d3fbeb (default)
172.31.0.0/16
Subnet Info
subnet-019339b61102ba332
VPC: vpc-0d9965613f7d3fbeb Owner: 524676089308
Availability Zone: us-east-1a IP addresses available: 4091 CIDR: 172.31.0.0/20)
Create new subnet
Auto-assign public IP Info
Enable
Firewall (security groups) Info
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.
Create security group
Select existing security group
Common security groups Info
Select security groups
Compare security group rules
linux sg-0aaf81ba1635023ab
VPC: vpc-0d9965613f7d3fbeb
Security groups that you add or remove here will be added to or removed from all your network interfaces.
Advanced network configuration
Summary
Number of instances Info
1
Software Image (AMI)
loadimage
ami-0ff1e0504eeea0e31
Virtual server type (instance type)
t2.micro
Firewall (security group)
linux
Storage (volumes)
1 volume(s) - 10 GiB
Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the
Cancel
Launch instance


aws
Services
Search
[Alt+S]
N. Virginia
kavya.20is@kct.ac.in @ 5246-7608-9308
EC2 > Instances > Launch an instance
Success
Successfully initiated launch of instance (i-01c0aa5e0e39257fa)
Launch log
Next Steps
Create billing and free tier usage alerts
To manage costs and avoid surprise bills, set up email notifications for billing and free tier usage thresholds.
Create billing alerts
Connect to your instance
Once your instance is running, log into it from your local computer.
Connect to instance
Learn more
Connect an RDS database
New
Configure the connection between an EC2 instance and a database to allow traffic flow between them.
Connect an RDS database
Create a new RDS database
Learn more
Feedback
Looking for language selection? Find it in the new Unified Settings
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Terms
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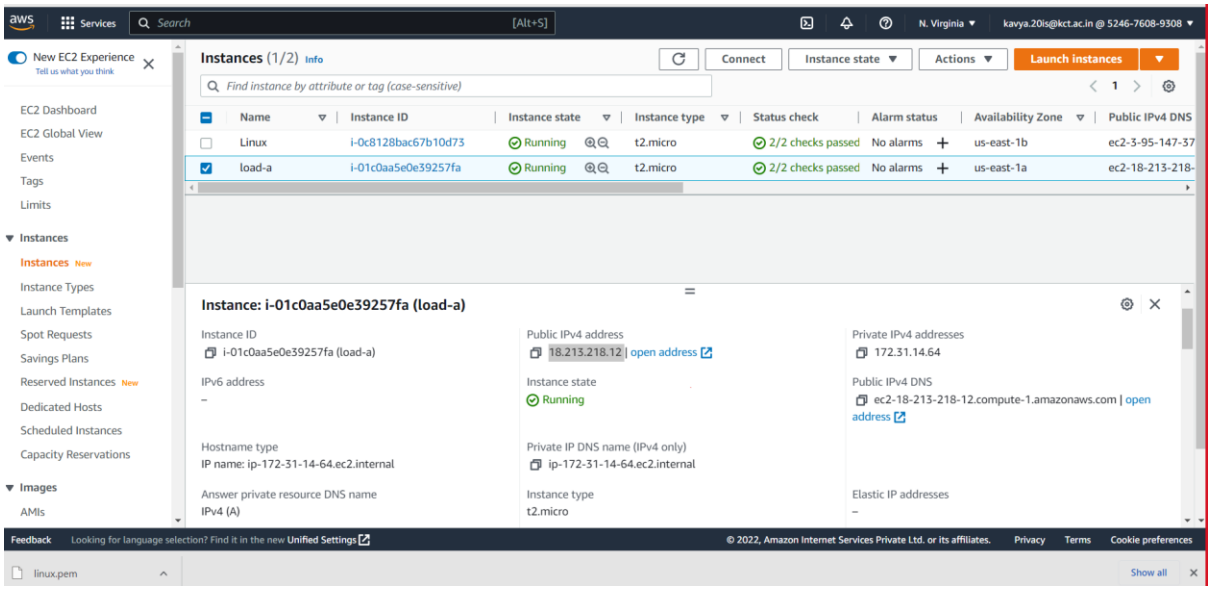
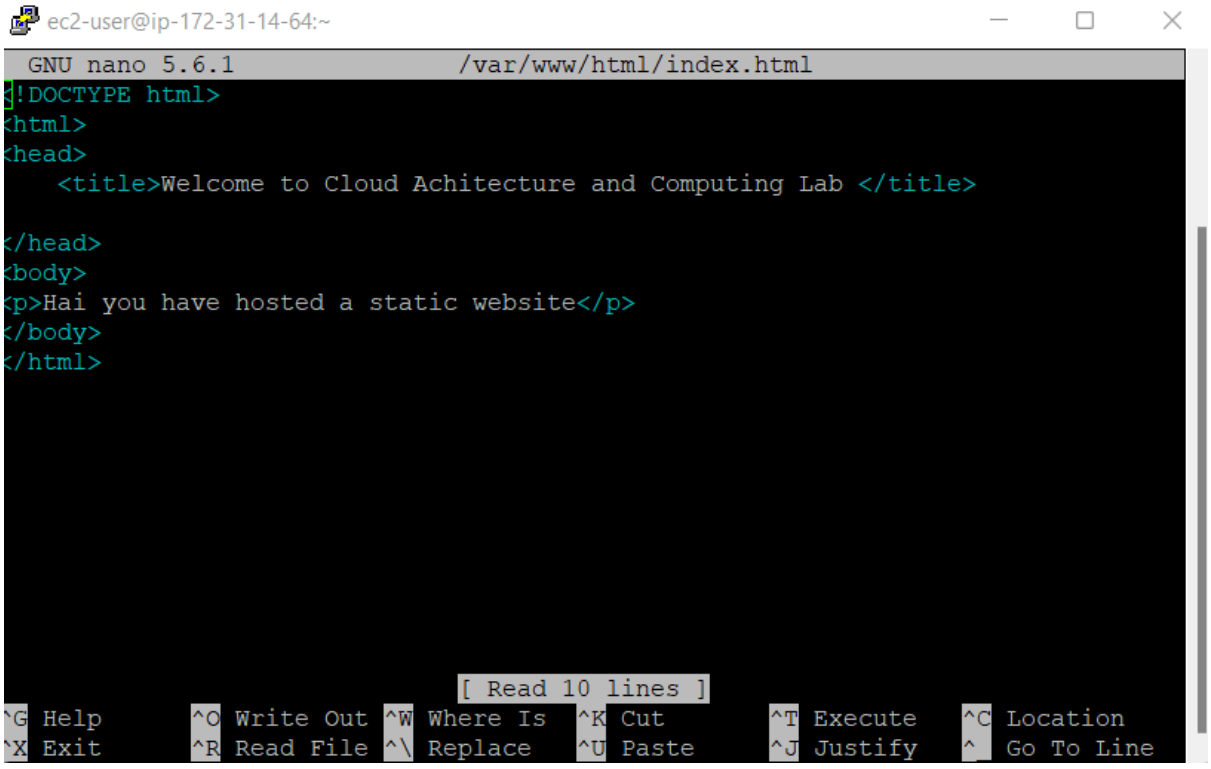
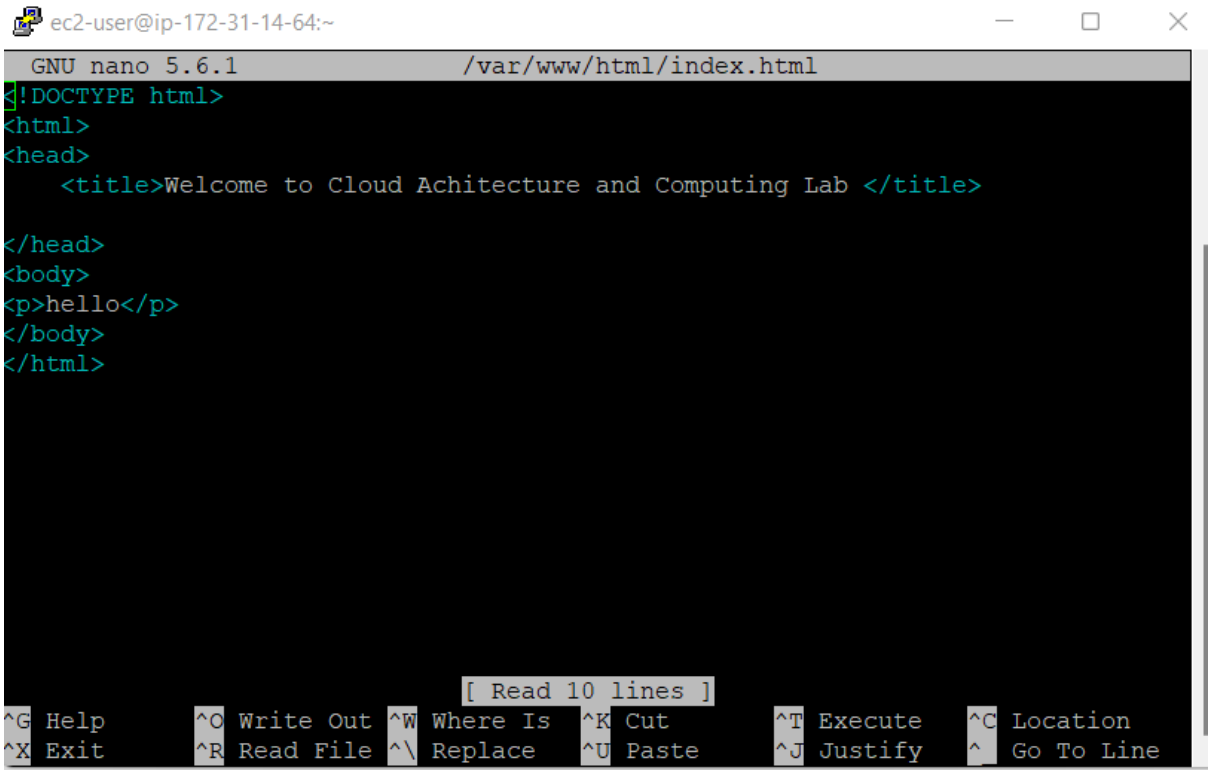


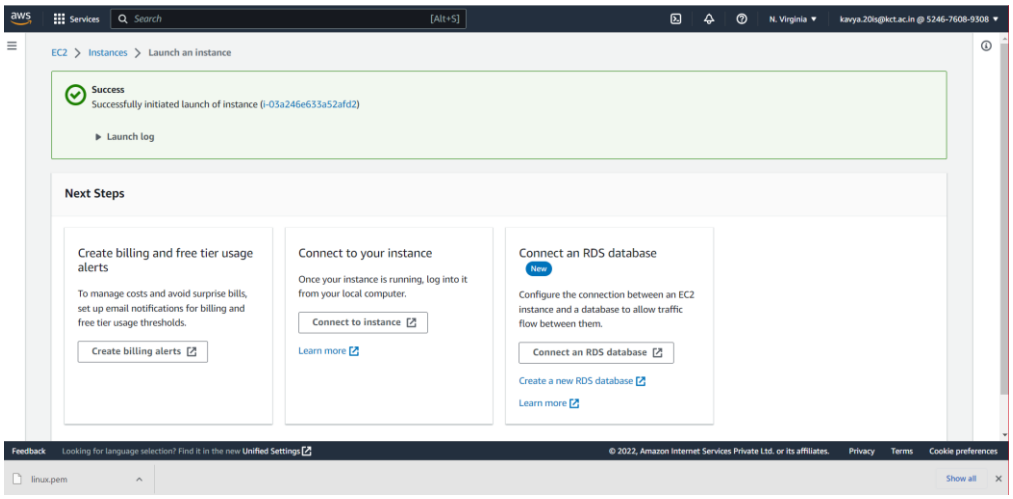


Changing the comments:


ec2-user@ip-172-31-14-64:~
GNU nano 5.6.1 /var/www/html/index.html
<!DOCTYPE html>
<html>
<head>
<title>Welcome to Cloud Achitecture and Computing Lab </title>
</head>
<body>
hello
</body>
</html>
[Read 10 lines]
^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^_ Go To Line


Not secure | 18.213.218.12

hello


Services
Search
[Alt+S]
N. Virginia
EC2 > Instances > Launch an instance
Success
Successfully initiated launch of instance (i-03a246e633a52afd2)
Launch log
Next Steps
Create billing and free tier usage alerts
To manage costs and avoid surprise bills, set up email notifications for billing and free tier usage thresholds.
Create billing alerts
Connect to your instance
Once your instance is running, log into it from your local computer.
Connect to instance
Learn more
Connect an RDS database
New
Configure the connection between an EC2 instance and a database to allow traffic flow between them.
Connect an RDS database
Create a new RDS database
Learn more
Feedback
Looking for language selection? Find it in the new Unified Settings
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3. Create Load Balancers

a. Application Load Balancer, Availability Zones – default

b. select all three subnets of EC2 instances

c. security group SSH,HTTP

d. Give your target group a name and leave the default settings

e. Register 3 instances with the load balancer

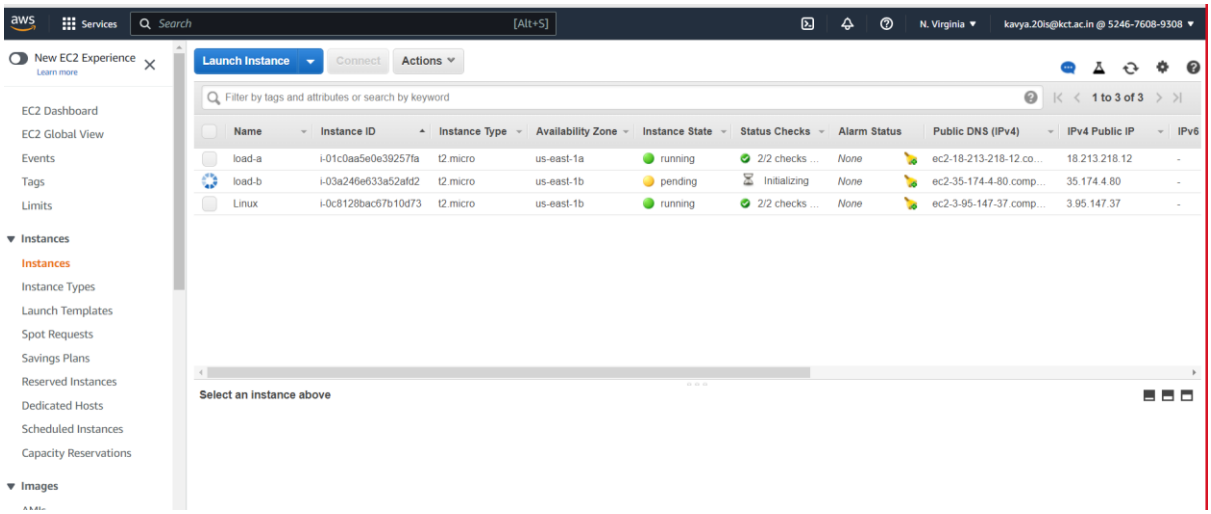
f. Select the instances and “Add to registered”

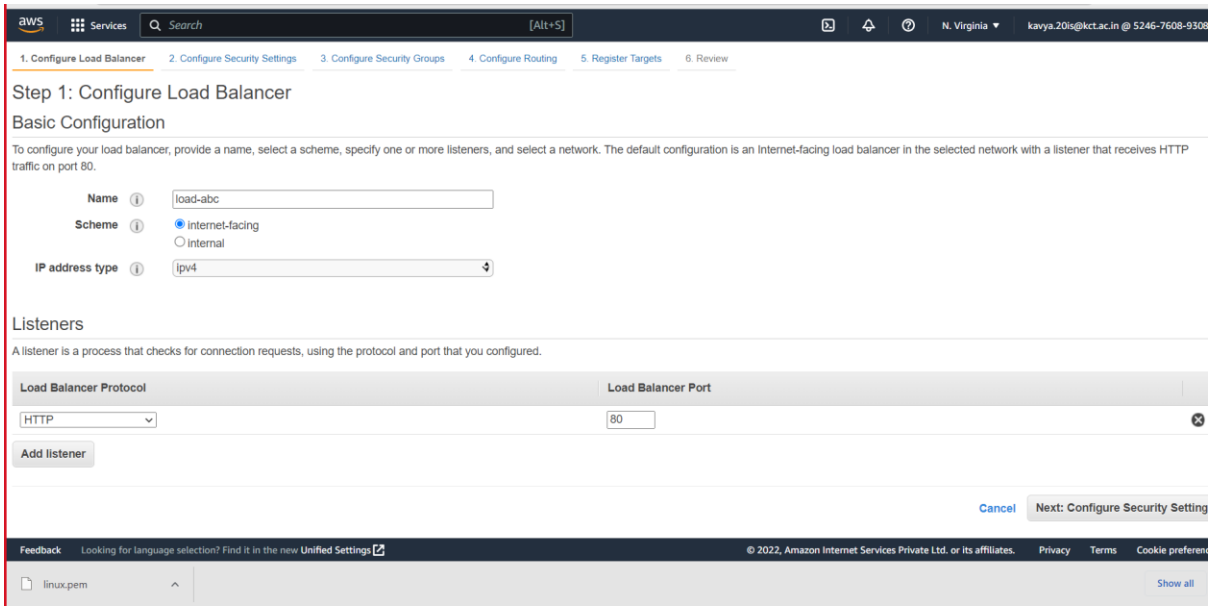
g. Copy the DNS from load balancer

h. In browser

http://load-balancer-dns-name.

i. Refresh to find out which instance handled that particular request.




aws
Services
Search
[Alt+S]
N. Virginia
kavya.20is@kct.ac.in @ 5246-7608-9308
1. Configure Load Balancer
2. Configure Security Settings
3. Configure Security Groups
4. Configure Routing
5. Register Targets
6. Review
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
load-abc
Scheme
internet-facing
internal
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
Cancel
Next: Configure Security Setting
Feedback
Looking for language selection? Find it in the new Unified Settings
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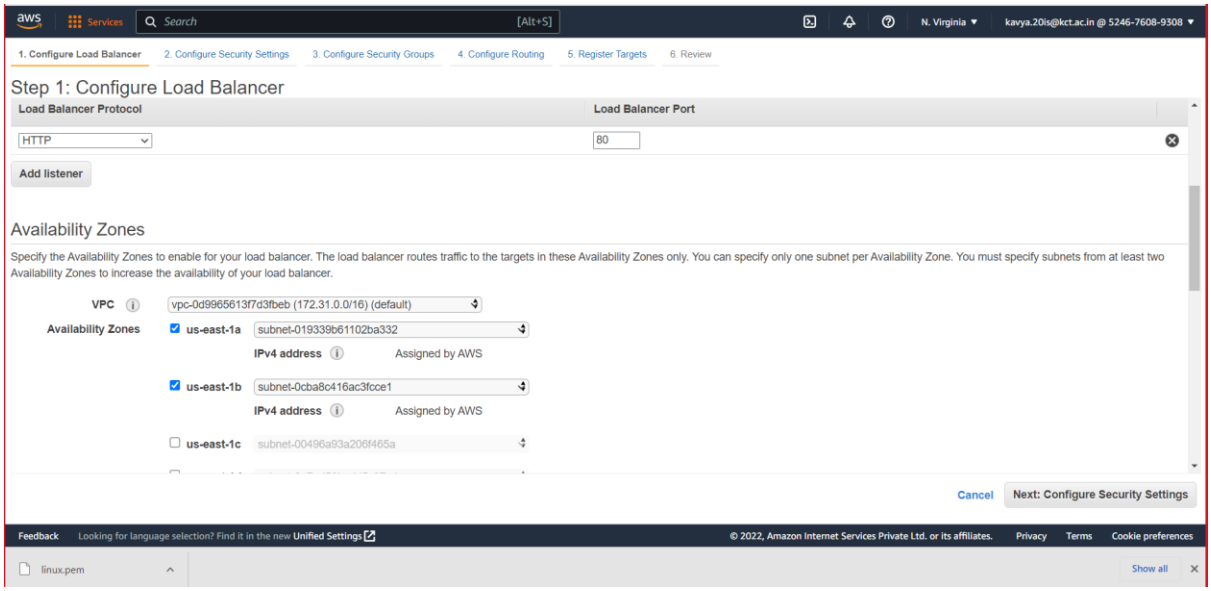
Cookie preferenc
linux.pem
Show all


aws
Services
Search
[Alt+S]
N. Virginia
kavya.20is@kct.ac.in @ 5246-7608-9308
1. Configure Load Balancer
2. Configure Security Settings
3. Configure Security Groups
4. Configure Routing
5. Register Targets
6. Review
Step 1: Configure Load Balancer
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
vpc-0d9965613f7d3fbeb (172.31.0.0/16) (default)
Availability Zones
us-east-1a
subnet-019339b61102ba332
IPv4 address
Assigned by AWS
us-east-1b
subnet-0cba8c416ac3fcce1
IPv4 address
Assigned by AWS
us-east-1c
subnet-00496a93a206f465a
Cancel
Next: Configure Security Settings
Feedback
Looking for language selection? Find it in the new Unified Settings
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Terms
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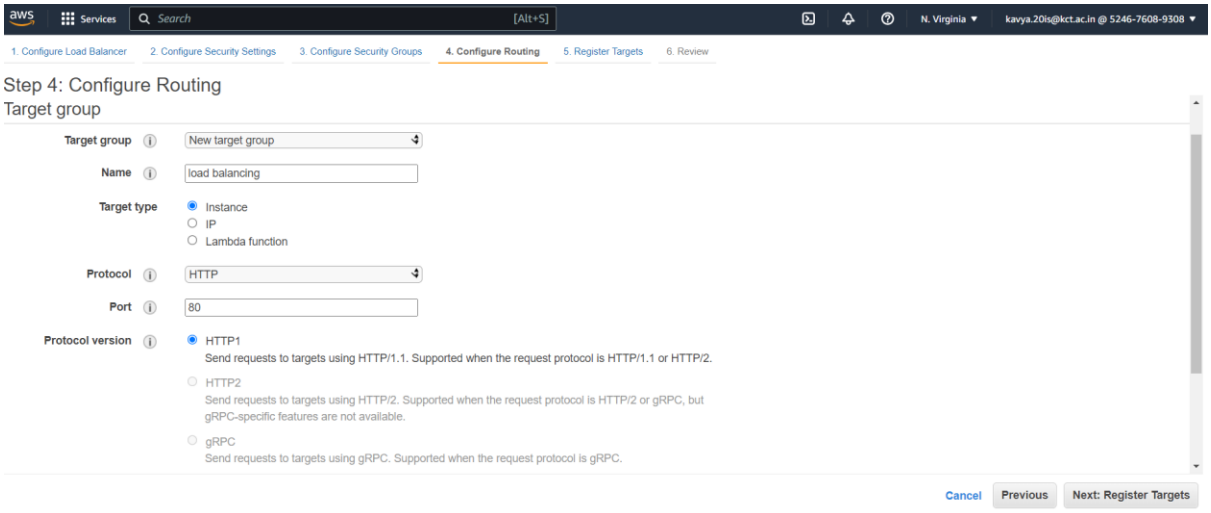
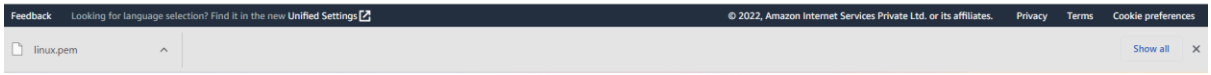
Show all


aws
Services
Search
[Alt+S]
N. Virginia
kavya.20is@kct.ac.in @ 5246-7608-9308
1. Configure Load Balancer
2. Configure Security Settings
3. Configure Security Groups
4. Configure Routing
5. Register Targets
6. Review
Step 4: Configure Routing
Target group
Target group
New target group
Name
load balancing
Target type
Instance
IP
Lambda function
Protocol
HTTP
Port
80
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.
Cancel
Previous
Next: Register Targets


Feedback
Looking for language selection? Find it in the new Unified Settings
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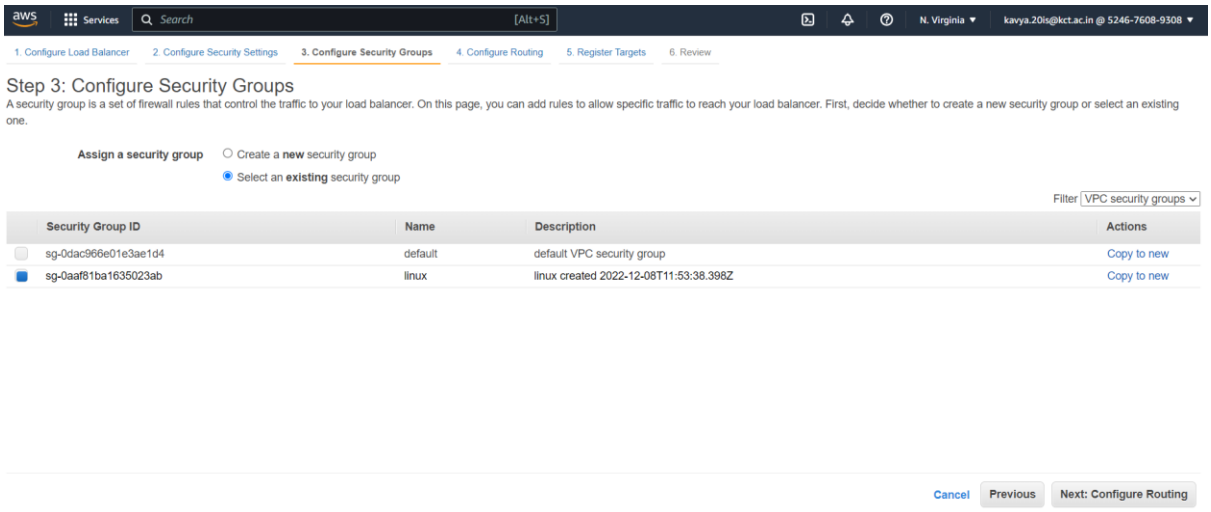
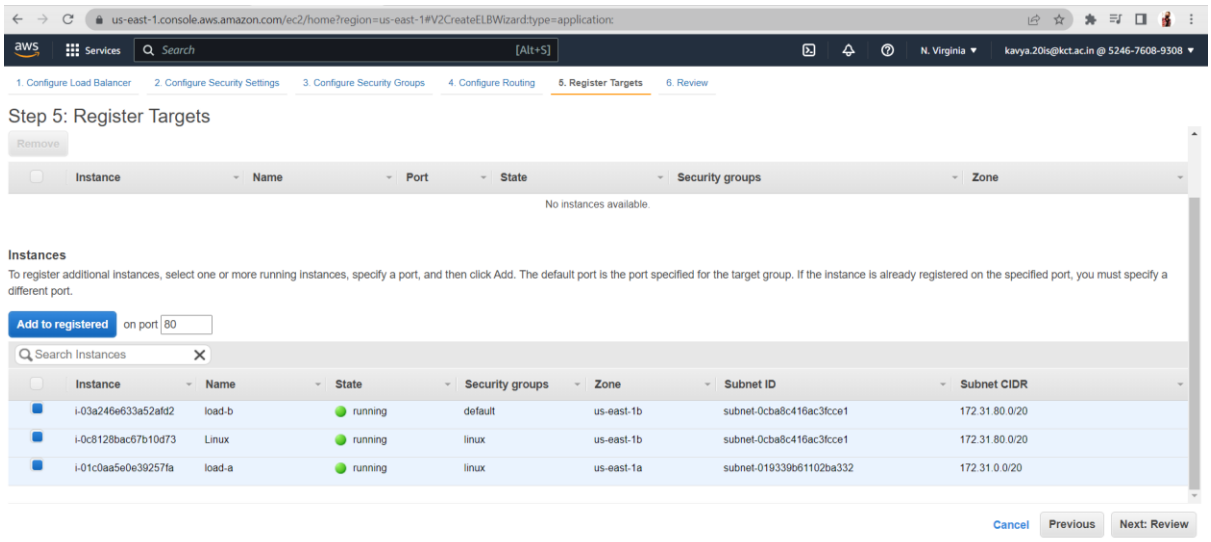
Show all


aws
Services
Search
[Alt+S]
N. Virginia
kavya.20is@kct.ac.in @ 5246-7608-9308
1. Configure Load Balancer
2. Configure Security Settings
3. Configure Security Groups
4. Configure Routing
5. Register Targets
6. Review
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
Filter
VPC security groups
Security Group ID
Name
Description
Actions
sg-0dac966e01e3ae1d4
default
default VPC security group
Copy to new
sg-0aaf81ba1635023ab
linux
linux created 2022-12-08T11:53:38.398Z
Copy to new
Cancel
Previous
Next: Configure Routing


us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#V2CreateELBWizard:type=application
aws
Services
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1. Configure Load Balancer
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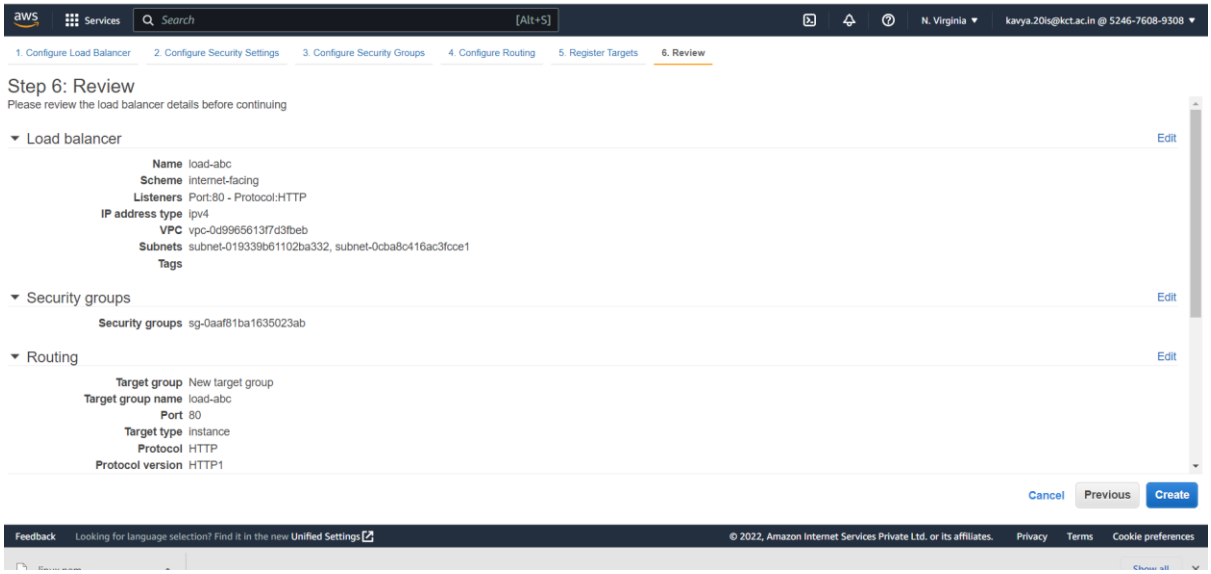
Step 5: Register Targets
Remove
Instance
Name
Port
State
Security groups
Zone
No instances available.
Instances
To register additional instances, select one or more running instances, specify a port, and then click Add. The default port is the port specified for the target group. If the instance is already registered on the specified port, you must specify a different port.
Add to registered
on port
80
Search Instances
Instance
Name
State
Security groups
Zone
Subnet ID
Subnet CIDR
i-03a246e633a52afd2
load-b
running
default
us-east-1b
subnet-0cba8c416ac3fcce1
172.31.80.0/20
i-0c8128bac67b10d73
Linux
running
linux
us-east-1b
subnet-0cba8c416ac3fcce1
172.31.80.0/20
i-01c0aa5e0e39257fa
load-a
running
linux
us-east-1a
subnet-019339b61102ba332
172.31.0.0/20
Cancel
Previous
Next: Review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1. Configure Load Balancer
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Step 6: Review
Please review the load balancer details before continuing
Load balancer
Edit
Name load-abc
Scheme internet-facing
Listeners Port:80 - Protocol:HTTP
IP address type ipv4
VPC vpc-0d9965613f7d3fbeb
Subnets subnet-019339b61102ba332, subnet-0cba8c416ac3fcce1
Tags
Security groups
Edit
Security groups sg-0aaf81ba1635023ab
Routing
Edit
Target group New target group
Target group name load-abc
Port 80
Target type instance
Protocol HTTP
Protocol version HTTP1
Cancel
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Feedback
Looking for language selection? Find it in the new Unified Settings
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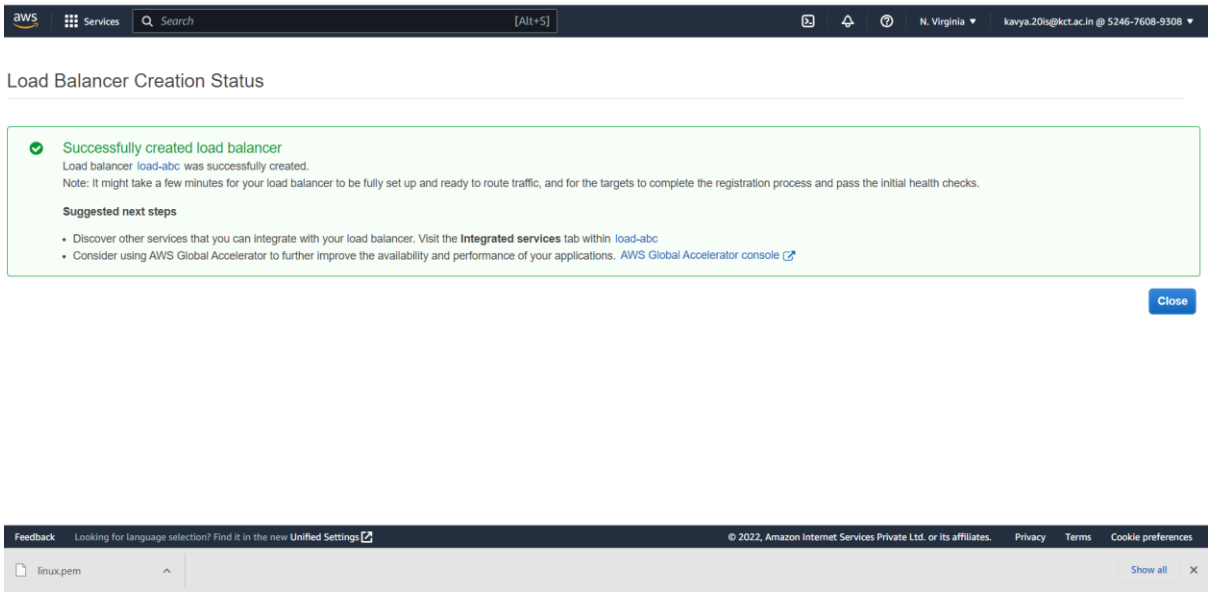
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Load Balancer Creation Status
Successfully created load balancer
Load balancer load-abc was successfully created.
Note: It might take a few minutes for your load balancer to be fully set up and ready to route traffic, and for the targets to complete the registration process and pass the initial health checks.
Suggested next steps
Discover other services that you can integrate with your load balancer. Visit the Integrated services tab within load-abc
Consider using AWS Global Accelerator to further improve the availability and performance of your applications. AWS Global Accelerator console
Close
Feedback
Looking for language selection? Find it in the new Unified Settings
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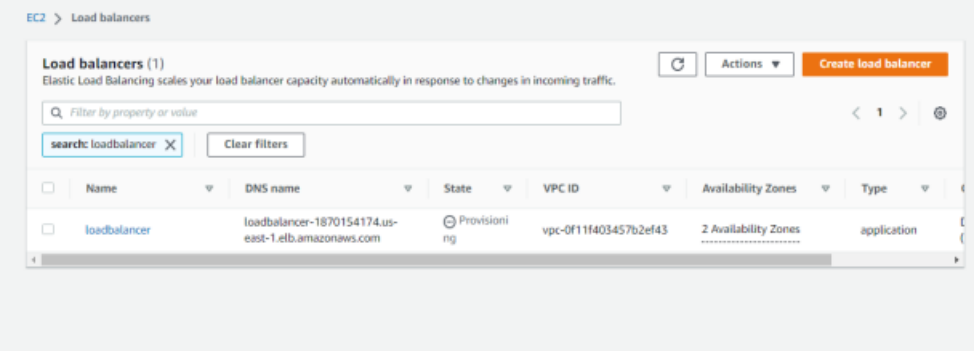
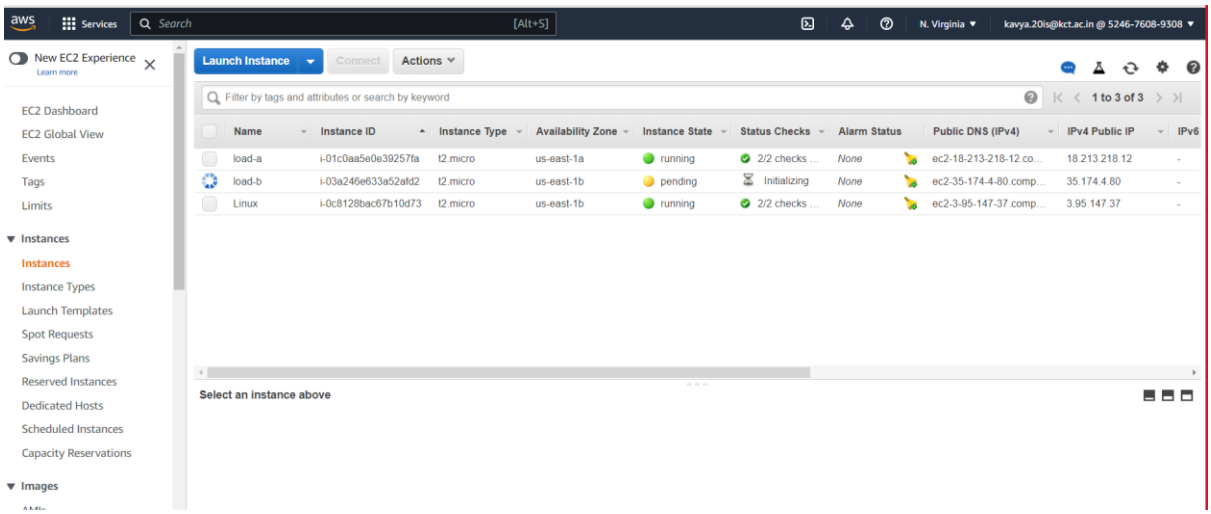
linux.pem
Show all


EC2 > Load balancers
Load balancers (1)
Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.
Actions
Create load balancer
Filter by property or value
search: loadbalancer
Clear filters
Name
DNS name
State
VPC ID
Availability Zones
Type
loadbalancer
loadbalancer-1870154174.us-east-1.elb.amazonaws.com
Provisioning
vpc-0f11f403457b2ef43
2 Availability Zones
application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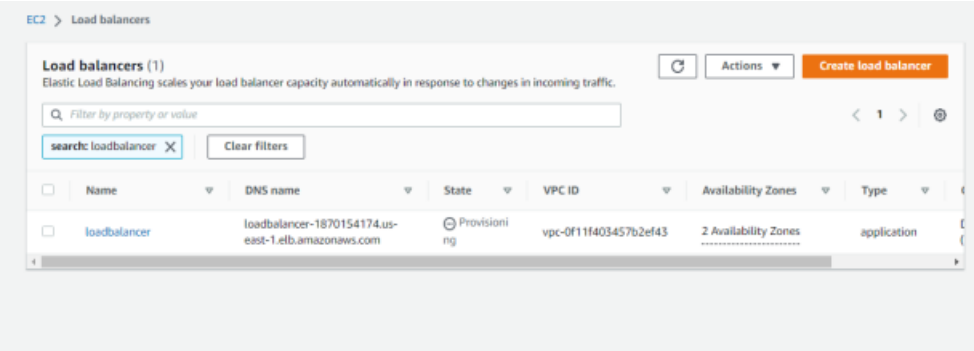
New EC2 Experience
Learn more
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Scheduled Instances
Capacity Reservations
Images
Launch Instance
Connect
Actions
Filter by tags and attributes or search by keyword
1 to 3 of 3
Name
Instance ID
Instance Type
Availability Zone
Instance State
Status Checks
Alarm Status
Public DNS (IPv4)
IPv4 Public IP
IPv6
load-a
i-01c0aa5e0e39257fa
t2.micro
us-east-1a
running
2/2 checks ...
None
ec2-18-213-218-12.co...
18.213.218.12
load-b
i-03a246e633a52afd2
t2.micro
us-east-1b
pending
Initializing
None
ec2-35-174-4-80.comp...
35.174.4.80
Linux
i-0c8128bac67b10d73
t2.micro
us-east-1b
running
2/2 checks ...
None
ec2-3-95-147-37.comp...
3.95.147.37
Select an instance above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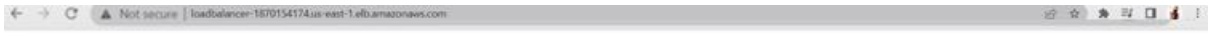
Create load balancer
Filter by property or value
search: loadbalancer
Clear filters
Name
DNS name
State
VPC ID
Availability Zones
Type
loadbalancer
loadbalancer-1870154174.us-east-1.elb.amazonaws.com
Provisioning
vpc-0f11f403457b2ef43
2 Availability Zones
application

In Browser pasting the DNS name of load balancer:

hello
my name is kavya



hello

hello
good evening

TERMINATION: