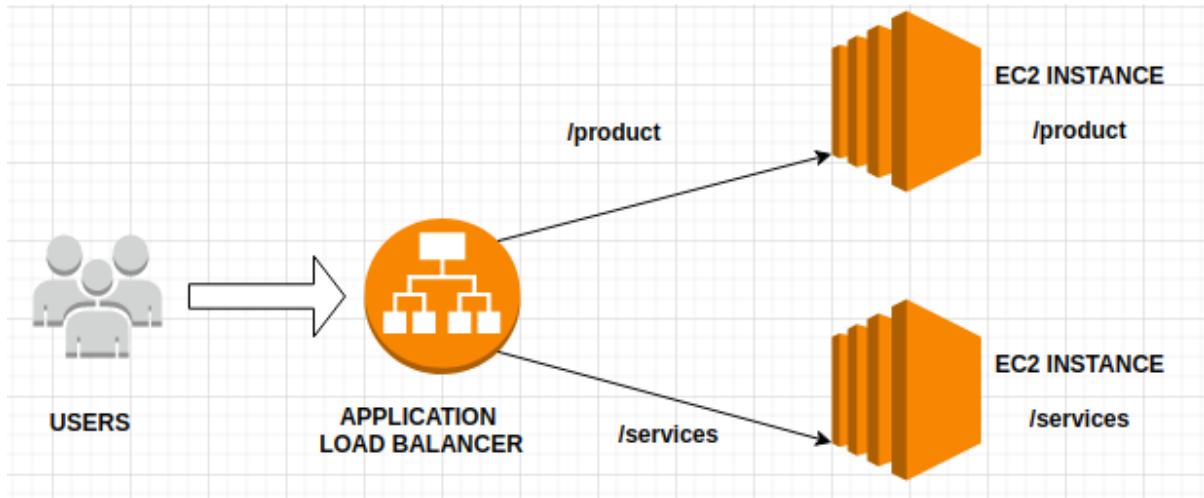




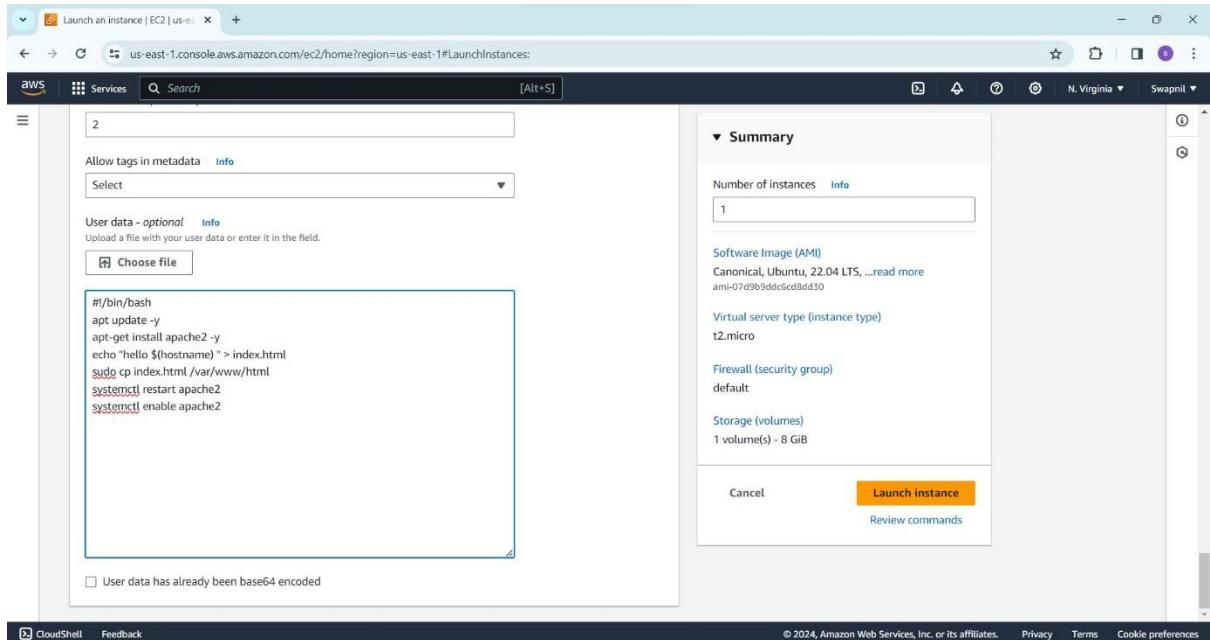
Path Base Routing in Application Load Balancer (ALB)



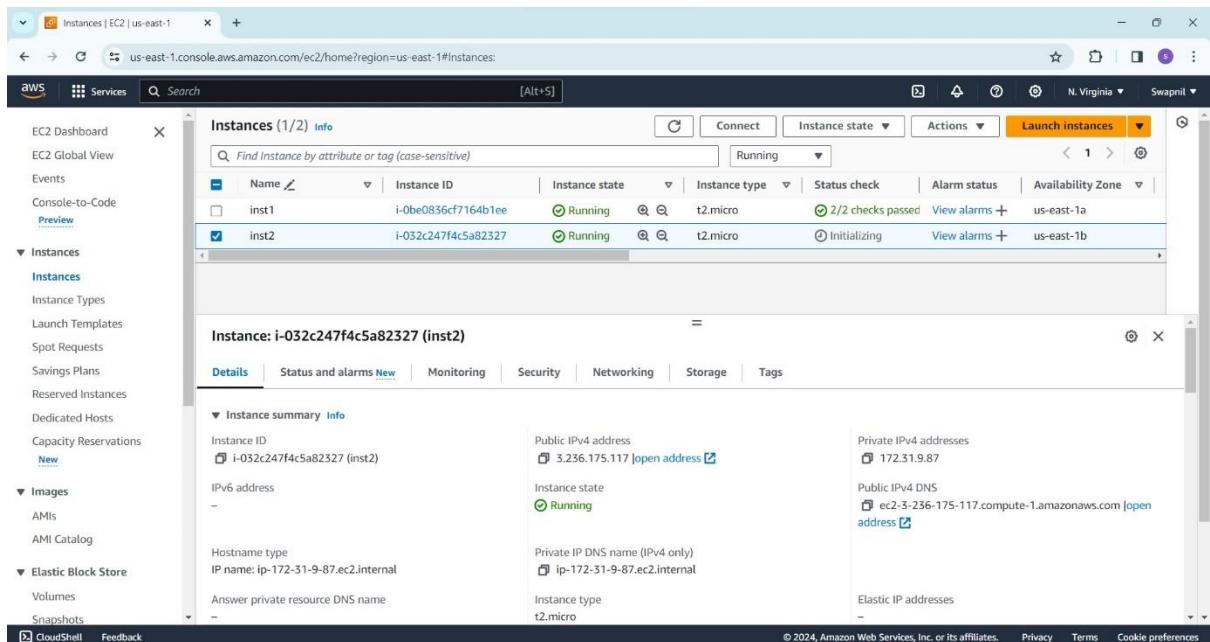
Step 1: Launch an instance.

A screenshot of the AWS EC2 "Launch an instance" wizard. The page shows the configuration for launching a new instance named "inst1". Under "Application and OS Images (Amazon Machine Image)", it specifies the Canonical, Ubuntu, 22.04 LTS AMI (ami-07d9b9ddcccd8dd30) and the t2.micro instance type. It also creates a new security group and attaches one volume (8 GiB). At the bottom right, the "Launch instance" button is highlighted in orange.

➤ Launch an instance with the user-data script.



Step 2: Check launched instances.



Step 3: Target group.

- Select target group from navigation bar of left side.
- Click on create target group.

The screenshot shows the AWS EC2 Target groups page. On the left, there is a navigation sidebar with various services like Images, AMIs, Elastic Block Store, Network & Security, Load Balancing, Auto Scaling, and Target Groups (which is currently selected). The main content area has a title 'Target groups' and a sub-section 'Info'. It features a search bar labeled 'Filter target groups' and a table header with columns: Name, ARN, Port, Protocol, Target type, and Load balancer. Below the table, a message says 'No target groups' and 'You don't have any target groups in us-east-1'. A prominent orange button labeled 'Create target group' is centered at the bottom of the table area. At the very bottom of the page, there are links for CloudShell, Feedback, and a footer with copyright information for 2024, Amazon Web Services, Inc. or its affiliates, along with links for Privacy, Terms, and Cookie preferences.

Step 4: Create target group.

- Do the Basic configuration.
- Select target type.

The screenshot shows the 'Step 1 Create target group' page. On the left, there is a sidebar with 'Step 2 Register targets' and a back arrow. The main content area has a title 'Basic configuration' with a note: 'Settings in this section can't be changed after the target group is created.' Below this, there is a section titled 'Choose a target type' with four options: 'Instances' (selected), 'IP addresses', 'Lambda function', and 'Application Load Balancer'. Each option has a detailed description. For 'Instances', it says: 'Supports load balancing to instances within a specific VPC.' and 'Facilitates the use of [Amazon EC2 Auto Scaling](#) to manage and scale your EC2 capacity.' For 'IP addresses', it says: '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.', and 'Supports IPv6 targets, enabling end-to-end IPv6 communication, and IPv4-to-IPv6 NAT.' For 'Lambda function', it says: 'Facilitates routing to a single Lambda function.' and 'Accessible to Application Load Balancers only.' For 'Application Load Balancer', it says: 'Offers the flexibility for a Network Load Balancer to accept and route TCP requests within a specific VPC.' and 'Facilitates using static IP addresses and PrivateLink with an Application Load Balancer.' At the bottom of the page, there is a 'Target group name' input field and a 'Next Step' button. The footer contains links for CloudShell, Feedback, and a footer with copyright information for 2024, Amazon Web Services, Inc. or its affiliates, along with links for Privacy, Terms, and Cookie preferences.

Step 5: Set target group name.

- Select protocol and port.
- Select IP address type.
- Click next

Target group name
target-1

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

Protocol : Port
Choose a protocol for your target group that corresponds to the Load Balancer type that will route traffic to it. Some protocols now include anomaly detection for the targets and you can set mitigation options once your target group is created. This choice cannot be changed after creation.

HTTP 80 1-65535

IP address type
Only targets with the indicated IP address type can be registered to this target group.

IPv4 Each instance has a default network interface (eth0) that is assigned the primary private IPv4 address. The instance's primary private IPv4 address is the one that will be applied to the target.

IPv6 Each instance you register must have an assigned primary IPv6 address. This is configured on the instance's default network interface (eth0). Learn more [\[?\]](#)

VPC
Select the VPC with the instances that you want to include in the target group. Only VPCs that support the IP address type selected above are available in this list.

vpc-0761d945a7300af6b
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 HTTPS/2.

Step 6: Register targets.

Step 1
Specify group details

Step 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 (2/2)

Instance ID	Name	State	Security groups	Zone
i-032c247f4c5a82327	inst2	Running	default	us-east-1
i-0be0836cf7164b1ee	inst1	Running	default	us-east-1

2 selected

Ports for the selected instances
Ports for routing traffic to the selected instances.
80
1-65535 (separate multiple ports with commas)

Step 7: Include pending instances for review targets.

- Click on create target group.

The screenshot shows the 'Step 2 Create target group' page in the AWS EC2 console. At the top, there's a header bar with the URL 'us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateTargetGroup'. Below it is the AWS navigation bar with 'aws', 'Services', 'Search', and 'N. Virginia'. The main content area has a title 'Available Instances (2)'. A table lists two instances: 'inst2' and 'inst1', both running in the 'default' security group, located in 'us-east-1b' and 'us-east-1a' respectively, with private IP addresses 172.31.9.87 and 172.31.56.88. Below the table, a section titled 'Review targets' shows a table for 'Targets (2)'. It lists the same two instances ('inst2' and 'inst1') with port 80, state 'Running', and security group 'default'. A button 'Create target group' is visible at the bottom right of the 'Review targets' section.

Step 8: Check the created target group.

The screenshot shows the 'Target groups' page in the AWS EC2 console. The left sidebar includes categories like 'Instance Types', 'Launch Templates', 'Spot Requests', 'Savings Plans', 'Reserved Instances', 'Dedicated Hosts', 'Capacity Reservations', 'Images', 'AMIs', 'AMI Catalog', 'Elastic Block Store', 'Network & Security', and 'Placement Groups'. The main content area shows a table for 'Target groups (1/1) info'. It lists one target group named 'target-1' with ARN 'arn:aws:elasticloadbalancing:us-east-1:1891377111868:targetgroup/target-1/5071684a9e919704'. Below this, a detailed view for 'Target group: target-1' shows the following metrics: Total targets (2), Healthy (0), Unhealthy (0), Unused (2), Initial (0), and Draining (0). The VPC associated with the target group is 'vpc-0761d945a7300af6b'. The bottom of the page includes the standard AWS footer with links to 'CloudShell', 'Feedback', and copyright information.

Step 9: Create a load balancer.

➤ Click on create load balancer.

The screenshot shows the AWS EC2 Load Balancers console. On the left, there's a navigation sidebar with various services like Dedicated Hosts, Capacity Reservations, Images, AMIs, AMI Catalog, Elastic Block Store, Network & Security, Load Balancing, and Load Balancers. The main area is titled 'Load balancers' and contains a message about the resource map. Below that, there's a table header for 'Name', 'DNS name', 'State', 'VPC ID', 'Availability Zones', 'Type', and 'Data'. A message says 'No load balancers' and 'You don't have any load balancers in us-east-1'. At the bottom right of the table area is a large orange 'Create load balancer' button. The status bar at the bottom right includes links for CloudShell, Feedback, Privacy, Terms, and Cookie preferences.

Step 10: Select load balancer type.

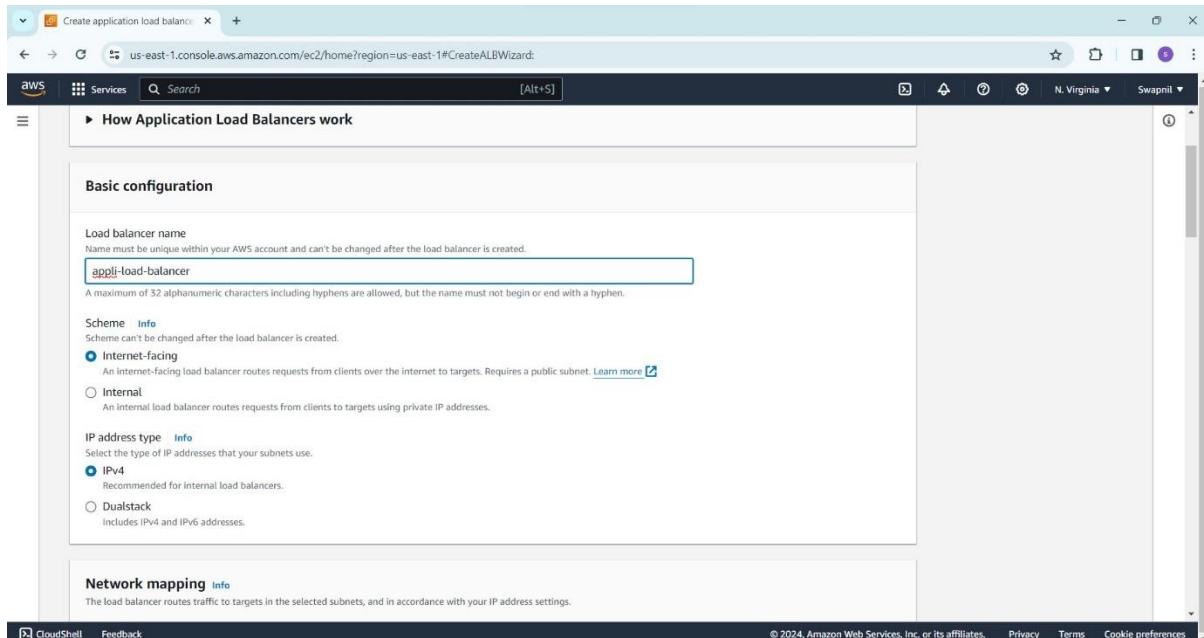
➤ Click on create.

The screenshot shows the 'Compare and select load balancer' wizard. It features three cards: 'Application Load Balancer Info', 'Network Load Balancer Info', and 'Gateway Load Balancer Info'. Each card has a diagram and a brief description. The 'Create' button is located at the bottom of each card. The status bar at the bottom right includes links for CloudShell, Feedback, Privacy, Terms, and Cookie preferences.

- Application Load Balancer Info:** Diagram shows traffic from a client through an ALB to Lambda and API Gateway. Description: 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**
- Network Load Balancer Info:** Diagram shows traffic from a client through an NLB to an ALB and VPCe. Description: Choose a Network Load Balancer when you need ultra-high performance, TLS offloading at scale, centralized certificate deployment, support for UDP, and static IP addresses for your applications. Network Load Balancers are capable of handling millions of requests per second securely while maintaining ultra-low latency. **Create**
- Gateway Load Balancer Info:** Diagram shows traffic from a client through a GWLB to a virtual appliance. Description: Choose a Gateway Load Balancer when you need to deploy and manage a fleet of third-party virtual appliances that support GENEVE. These appliances enable you to improve security, compliance, and policy controls. **Create**

Step 11: Basic configuration.

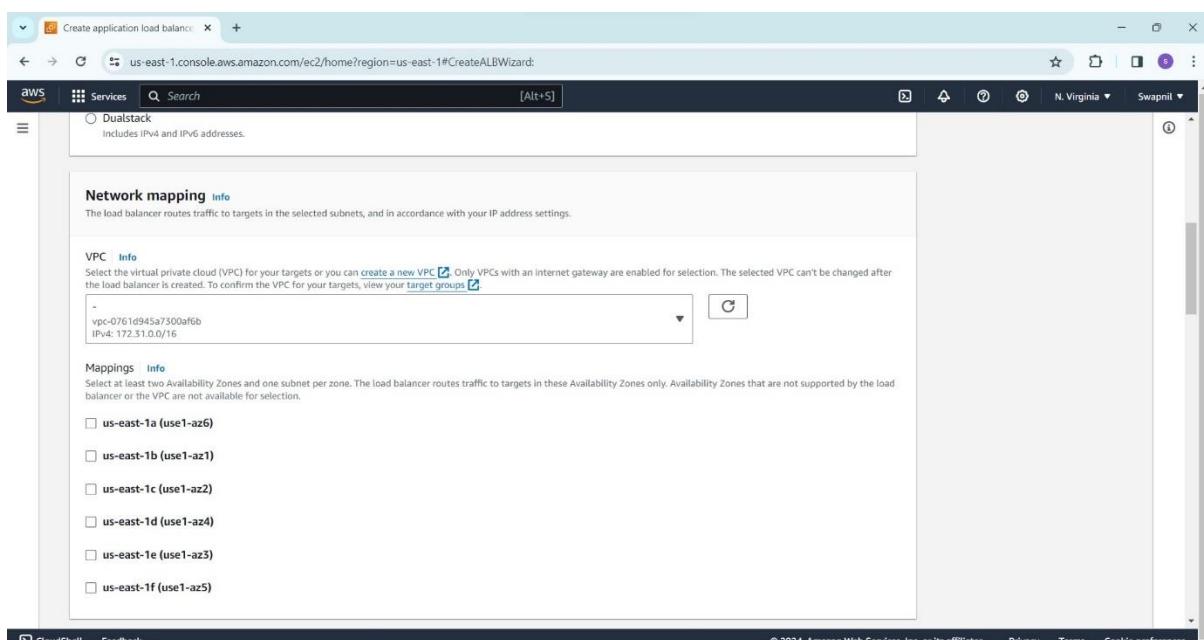
- Enter load balancer IP name.
- Select scheme and address type.



The screenshot shows the 'Create application load balancer' wizard in the AWS CloudFormation console. The current step is 'Basic configuration'. The 'Load balancer name' field is set to 'appli-load-balancer'. Under 'Scheme', 'Internet-facing' is selected. Under 'IP address type', 'IPv4' is selected. The 'Network mapping' section is collapsed.

Step 12: Network mapping.

- Select at least two availability zone and one subnet per zone.



The screenshot shows the 'Create application load balancer' wizard in the AWS CloudFormation console. The current step is 'Network mapping'. The 'VPC' section shows 'Dualstack' selected. The 'Mappings' section lists availability zones: us-east-1a, us-east-1b, us-east-1c, us-east-1d, us-east-1e, and us-east-1f. Subnet 'vpc-07610945a7300af6b' is selected.

Step 13: Security group.

- Select security group at least one.
- Select protocol and for with the target group.

The screenshot shows the 'Listeners and routing' configuration step of the 'Create application load balancer' wizard. It displays a table for defining listeners:

Protocol	Port	Default action	Info
HTTP	: 80 1-65535	Forward to target-1 Target type: Instance, IPv4	HTTP

Below the table, there is a section for 'Listener tags - optional' with a note: 'Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.'

Step 14: Load balancer is created.

The screenshot shows the 'Load balancers' page in the EC2 service. A table lists the load balancer 'appli-load-balancer' with the following details:

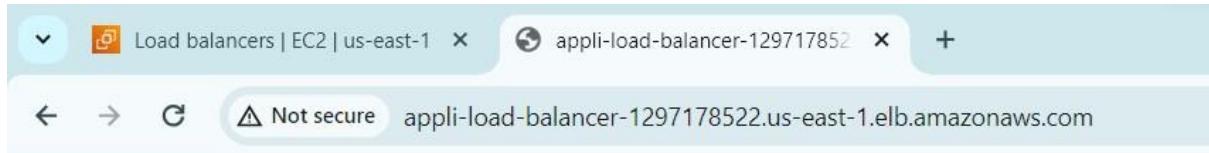
Name	DNS name	State	VPC ID	Availability Zones	Type
appli-load-balancer	appli-load-balancer-12971...	Provisioning	vpc-0761d945a7300af6b	2 Availability Zones	application

The 'Load balancer: appli-load-balancer' modal window is open, showing the configuration details:

- Load balancer type: Application
- Status: Provisioning
- Scheme: Internet-facing
- Hosted zone: Z355XD0TRQ7X7K
- IP address type: IPv4
- Availability Zones:
 - subnet-03ed8fb3df7a60ab (us-east-1a (use1-aZ6))
 - subnet-09b6f38576ba9d184 (us-east-1c (use1-cZ1))
- Date created: March 5, 2024, 23:44 (UTC+05:30)
- Load balancer ARN: arn:aws:elasticloadbalancing:us-east-1:891377111868:loadbalancer/app/appli-load-balancer/61efa04afba58f60
- DNS name copied: appli-load-balancer-1297178522.us-east-1.elb.amazonaws.com (A Record)

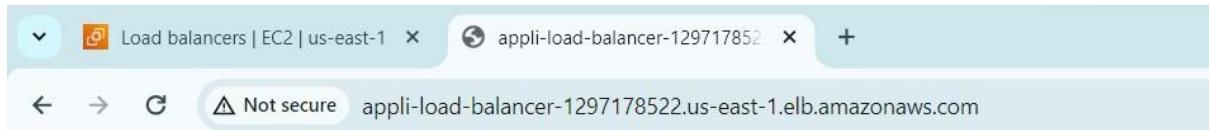
Step 15: Check the load balancer.

- Copy the DNS address.



hello ip-172-31-9-87

- After refresh the web page it reflected message of instance2.

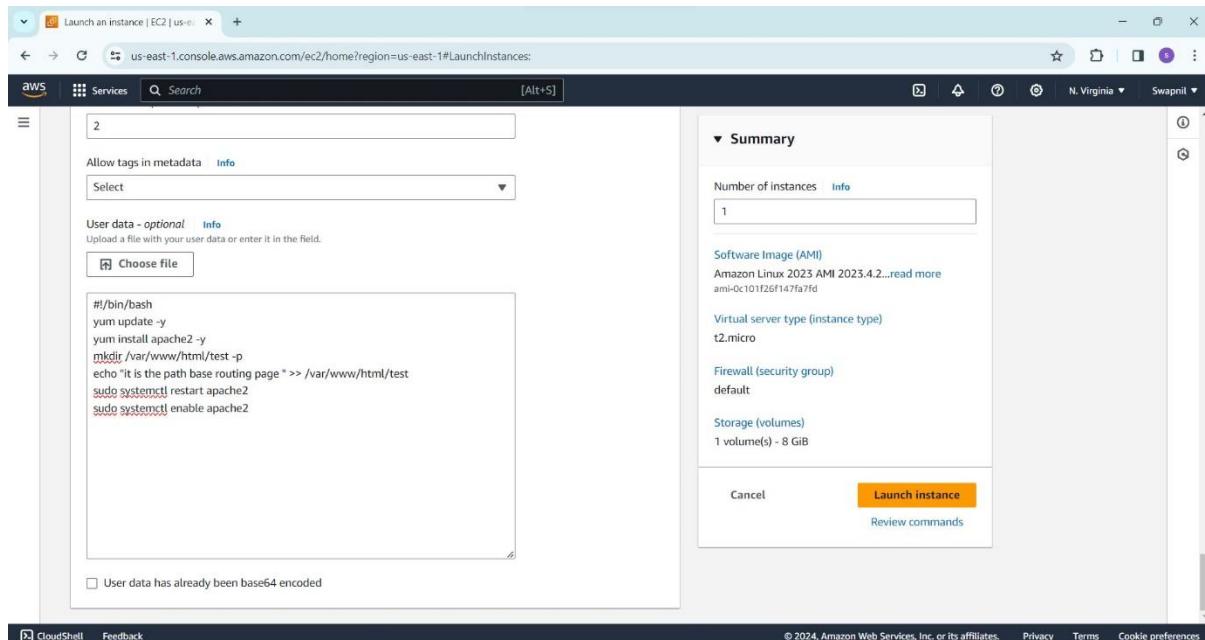


hello ip-172-31-36-88

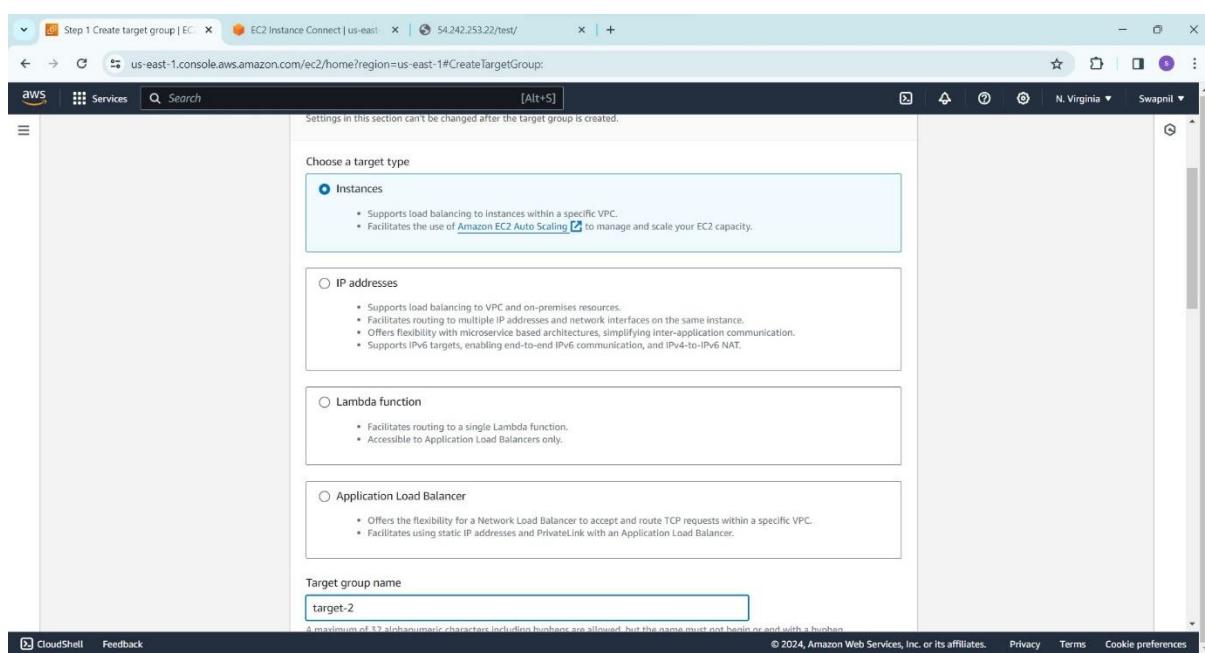
Add Path Rule In Application Load Balancer

Step 16: Launch another new instance.

➤ User data add /test/ path



Step 17: Create another target group.



Step 18: Register targets.

The screenshot shows the 'Register targets' step of a Lambda Step Function. The 'Available instances (1/3)' table lists three instances:

Instance ID	Name	State	Security groups
i-090b61b375b9092f7	inst3	Running	default
i-0bd24fa3cd42d023e	inst1	Running	default
i-0b9cfe9f358c53765	inst2	Running	default

One instance, 'inst3', is selected. The 'Ports for the selected instances' section shows port 80. A button 'Include as pending below' is visible.

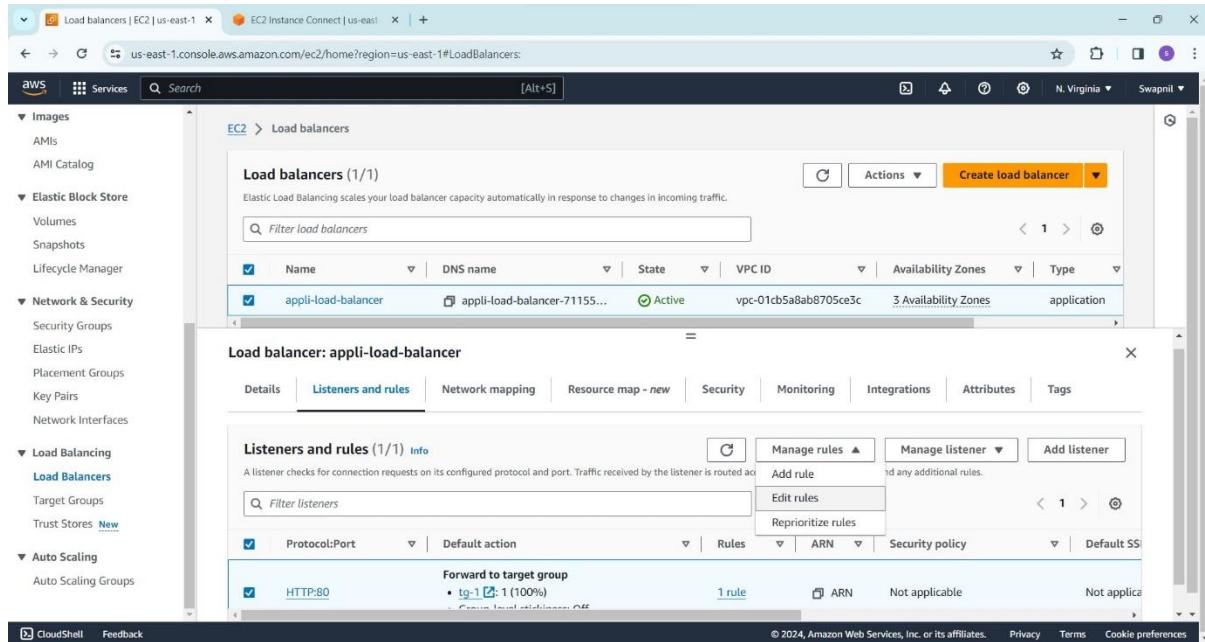
Step 19: Target group is created.

The screenshot shows the 'Review targets' step of a Lambda Step Function. A success message at the top states: "Successfully created the target group: target-2. Anomaly detection is automatically applied to all registered targets. Results can be viewed in the Targets tab." The 'target-2' page is displayed, showing the following details:

Target type	Protocol : Port	Protocol version	VPC
Instance	HTTP: 80	HTTP1	vpc-01cb5a8ab8705ce3c
IP address type	Load balancer		
IPv4	(None associated)		

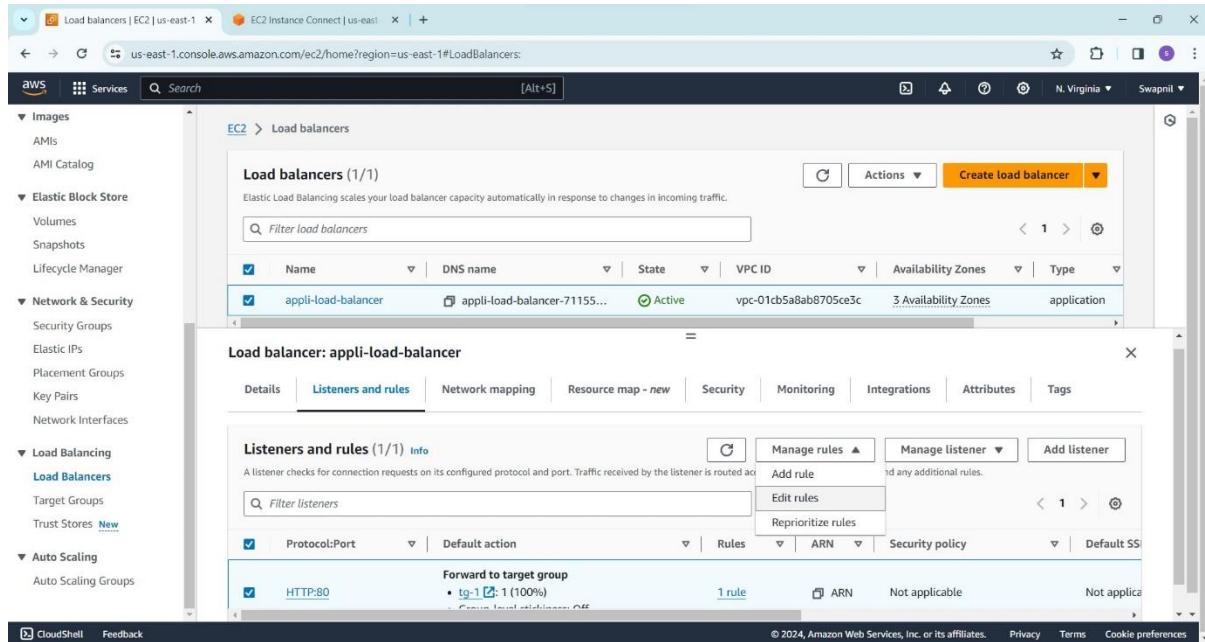
The 'Targets' tab is selected. At the bottom, it says 'Anomaly mitigation: Not applicable'.

Step 20: Edit the listeners and rule in application load balancer.



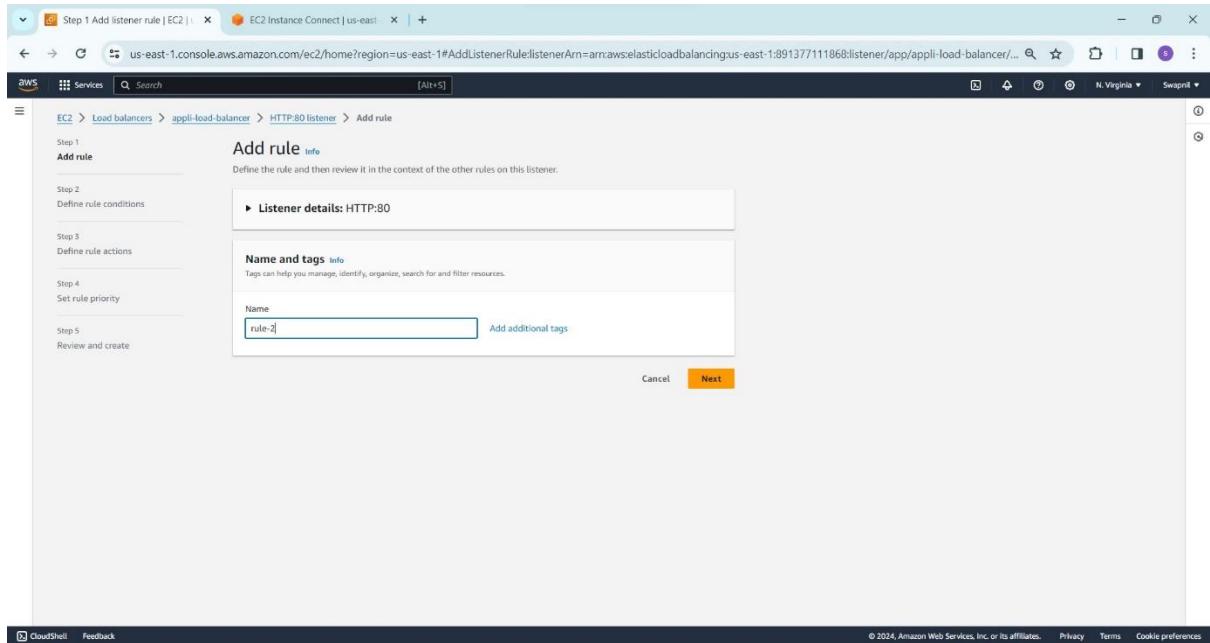
The screenshot shows the AWS Cloud Console interface for managing load balancers. The left sidebar navigation includes 'Images', 'AMIs', 'AMI Catalog', 'Elastic Block Store', 'Volumes', 'Snapshots', 'Lifecycle Manager', 'Network & Security', 'Security Groups', 'Elastic IPs', 'Placement Groups', 'Key Pairs', 'Network Interfaces', 'Load Balancing', 'Load Balancers' (selected), 'Target Groups', and 'Trust Stores'. The main content area displays 'Load balancers (1/1)'. A table lists one load balancer: 'appli-load-balancer' (Active, vpc-01cb5a8ab8705ce3c, 3 Availability Zones, application type). Below this, the 'Load balancer: appli-load-balancer' details page is shown, with the 'Listeners and rules' tab selected. It shows a single listener for 'HTTP:80' with a 'Forward to target group' rule pointing to 'tg-1' (100%).

Step 21: Add the rule.



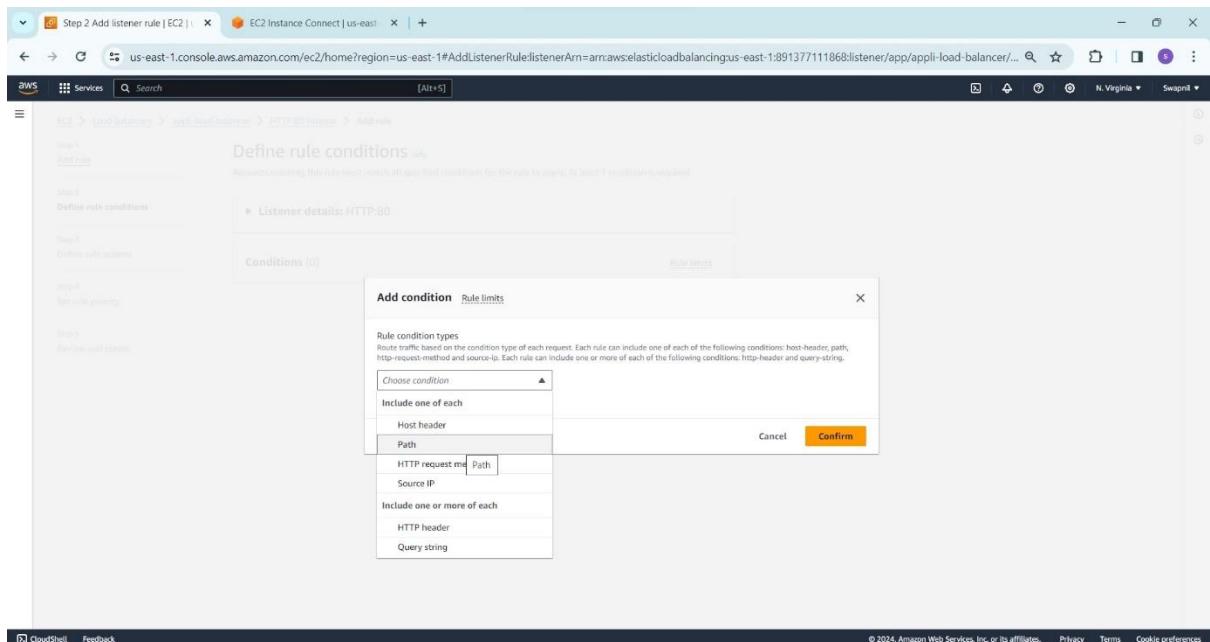
This screenshot is identical to the previous one, showing the 'Listeners and rules' tab for the 'appli-load-balancer'. However, a modal dialog box is open over the table, indicating that a new rule is being added or edited. The dialog contains fields for 'Protocol:Port' (HTTP:80), 'Default action' (Forward to target group), 'Rules' (tg-1), 'ARN' (Not applicable), and 'Security policy' (Not applicable).

Step 22: Define Name and tags.



Step 23: Select the condition.

➤ Select the rule condition type.



Step 24: Add the condition.

The screenshot shows the AWS CloudFormation console with the URL <https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#EditListenerRule?ruleArn=arn:aws:elasticloadbalancing:us-east-1:891377111868:listener/app/appi-load-balancer/240...>. The page title is "Step 1 Edit listener rule | EC2". The left sidebar shows "Step 1 Define rule conditions", "Step 2 Define rule actions", and "Step 3 Review changes". The main content area is titled "Define rule conditions" with the sub-section "Listener details: HTTP:80". Below it is a table titled "Conditions (1/1)" with one row: "Path (1) If Path is appli-load-balancer-711553237.us-east-1.elb.amazonaws.com/test". At the bottom right are "Cancel" and "Next" buttons.

Step 25: Define rule action.

➤ Select the target group.

The screenshot shows the AWS CloudFormation console with the URL <https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#AddListenerRule?listenerArn=arn:aws:elasticloadbalancing:us-east-1:891377111868:listener/app/appi-load-balancer/240...>. The page title is "Step 3 Add listener rule | EC2". The left sidebar shows "Step 1 Add rule", "Step 2 Define rule conditions", "Step 3 Define rule actions", "Step 4 Set rule priority", and "Step 5 Review and create". The main content area is titled "Define rule actions" with the sub-section "Listener details: HTTP:80". It shows an "Actions" section with "Action types" "Forward to target groups" selected. Below it is a "Forward to target group" section with a table:

Target group	Weight	Percent	
target-2	HTTP	1	100%
		0.999	

At the bottom right are "Cancel", "Previous", and "Next" buttons.

Step 26: Set rule priority for the rule.

The screenshot shows the AWS CloudFormation console with the title "Step 4 Add listener rule | EC2 |". The main content area is titled "Set rule priority" with a sub-section "Listener details: HTTP:80". It displays a table of "Listener rules" with two entries:

Name tag	Priority	Conditions (If)	Actions (Then)	ARN
rule-2	Pending	Path Pattern is /test	Forward to target group <ul style="list-style-type: none">target-2 [1] 1 (100%)Group-level stickiness: Off	Pending
Default	Last (default)	If no other rule applies	Forward to target group <ul style="list-style-type: none">tg-1 [1] 1 (100%)Group-level stickiness: Off	ABN

At the bottom, there are "Cancel", "Previous", and "Next" buttons, with "Next" being highlighted in yellow.

Step 27: Review and create.

➤ Click on create.

The screenshot shows the AWS CloudFormation console with the title "Step 5 Add listener rule | EC2 |". The main content area is titled "Review and create" with a sub-section "Listener details: HTTP:80". It displays the same rule configuration as the previous step:

Priority	Conditions (If)	Actions (Then)
2	If request matches all: Path Pattern is /test	Forward to target group <ul style="list-style-type: none">target-2 [1] 1 (100%)Group-level stickiness: Off

Below the table, there is a section for "Rule tags (1)" with a single entry: "Key: rule-2, Value: rule-2". At the bottom, there are "Cancel", "Previous", and "Create" buttons, with "Create" being highlighted in yellow.

Step 28: Check the result.

- Add the /test/ path with application load balance DNS in URL.

