

ASSIGNMENT-17

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Batch ID-DXC-265-HybridCloud-B15-AWS-6

DOMAIN-Hybrid cloud

QUESTION-1:

1. What is Amazon Dynamo DB and Explain Its Features...?

DynamoDB:

DynamoDB is a fast and flexible NoSQL database service for all the application that require consistent single-digit millisecond latency at any scale.

- DynamoDB is a fully managed database that supports both documents and key value data modules.
- its flexible data model and performance makes it a great fit for mobile, web gaming, IOT and many more application.
- it is stored in SSD storage.
- it's spread across three geographically data centre.

Features:

- Scalable
- Fast, Predictable Performance
- Easy Administration
- Built-in Fault Tolerance

- Flexible
- Strong Consistency, Atomic Counters
- Integrated Monitoring
- Elastic MapReduce Integration
- Secure

QUESTION-2:

Explain Amazon Dynamo DB Concepts.?

- The Amazon DynamoDB data model concepts include tables, items and attributes.
- In Amazon DynamoDB, a database is a collection of tables. A table is a collection of items and each item is a collection of attributes
- DynamoDB allows several "tables", where a record ("Item"), is identified by one or two "Attributes", named:

A "Hash Key, which works as a Primary Key

- Optionally, a "Range Key, which lets you build Composite Keys
- Beside the Key Attributes, everything else is unstructured. For the Keys, there are three data types: String, Binary, Number (anything with up to 38 significant digits and between 10^{-128} and 10^{126})
- You can also have a "Set" datatype (for String, Binary, and Numbers), though they are not indexed

QUESTION-3:

Explain Partitioning and Table Design Consideration in Amazon Dynamo DB.?

Partitioning:

- DynamoDB automatically partitions table based on hash key
- Throughput spread across partitions
- Single partition holds ~ 10GB of data
- Number of partitions is greater of:
 - $(\text{read capacity units}/3000) + (\text{write capacity units} / 1000)$
 - Table size in bytes/ 10 GB
- Unused capacity reserved for bursts

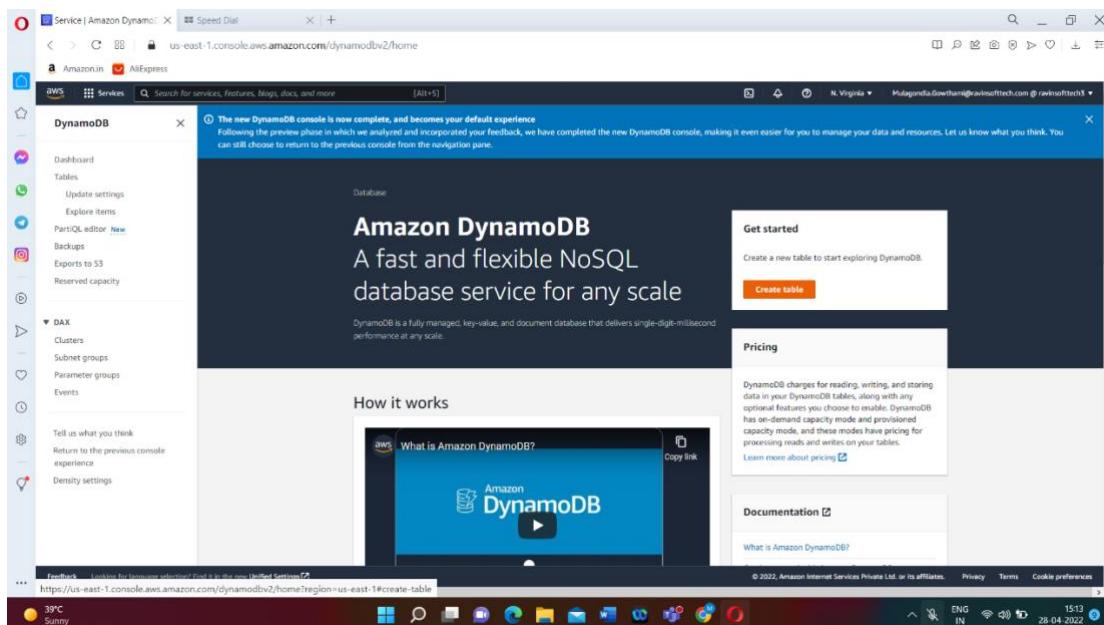
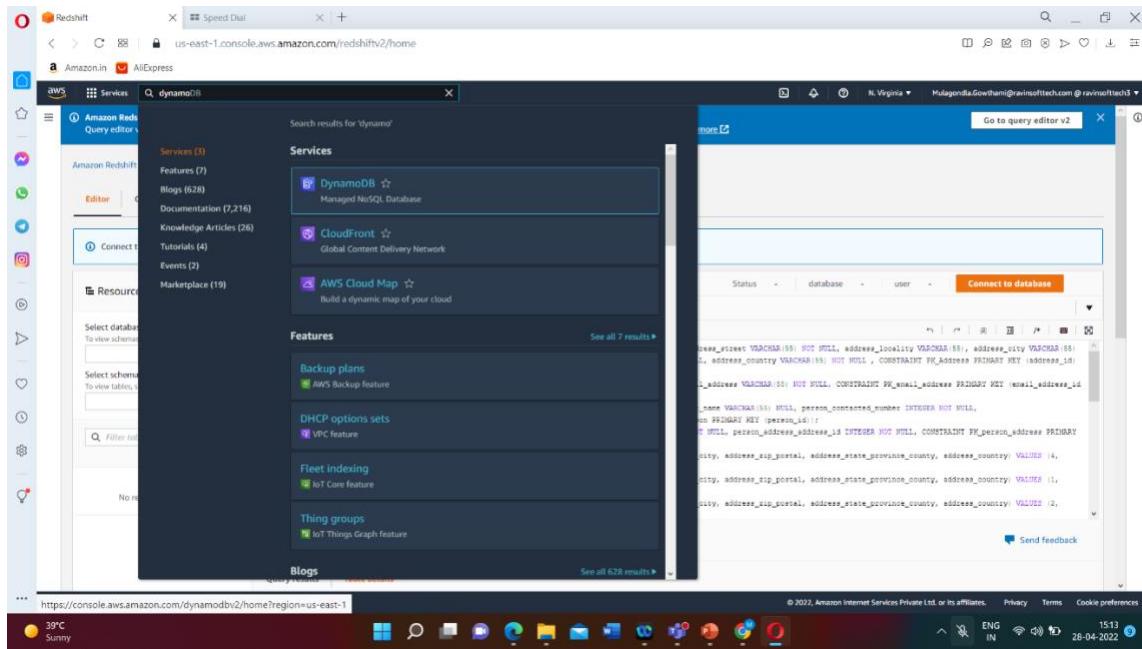
Table Design Considerations:

- Avoid hot keys
 - Random extension to hash key
 - Calculated extension to hash key
- Time series data in multiple tables
- Test applications ahead of time • Storage of large items elsewhere
- Use caching solutions for popular items

QUESTION-4:

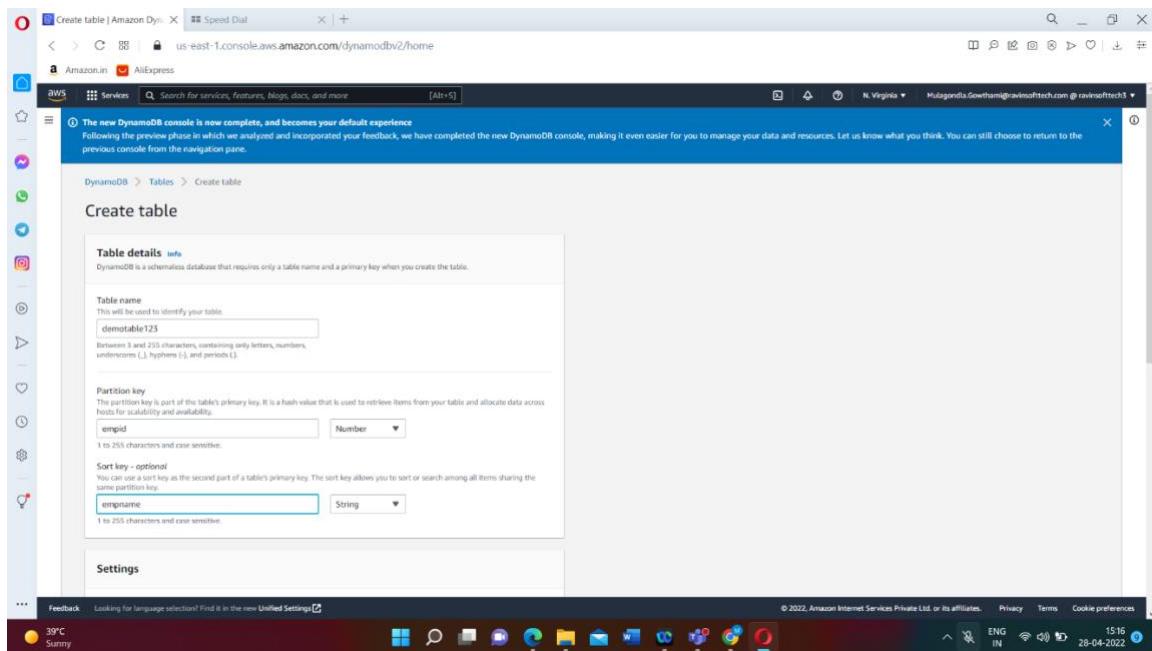
With the help of all the steps and screen shot Explain how to create tables in Amazon Dynamo DB?

Step 1: Open the DynamoDB console at
<https://console.aws.amazon.com/dynamodb/>.



Step2: Suppose that you want to store product information in DynamoDB. Each product has its own distinct attributes, so you need to store different information about each of these products.

You can create a ProductCatalog table, where each item is uniquely identified by a single, numeric attribute: Id.



For the Primary key, in the Partition key box, enter Id. Set the data type to Number.

Step3: Click the create table.

The screenshot shows the 'Create table' configuration page. In the 'Table details' section, the primary key is set to 'empid' of type 'Number'. The sort key is set to 'empname' of type 'String'. The 'Settings' section is collapsed. At the bottom right, there are 'Cancel' and 'Create table' buttons, with the 'Create table' button highlighted in orange.

Secondary indexes [Info](#)
No secondary indexes have been created. Queries will be run by using the table's partition key and sort key only.

Key management for encryption at rest [Info](#)
Using the AWS owned key. This key is managed by DynamoDB at no extra cost.

Table class
Using DynamoDB Standard table class. The default general-purpose table class. Recommended for the vast majority of tables that store frequently accessed data, with throughput (reads and writes) as the dominant table cost.

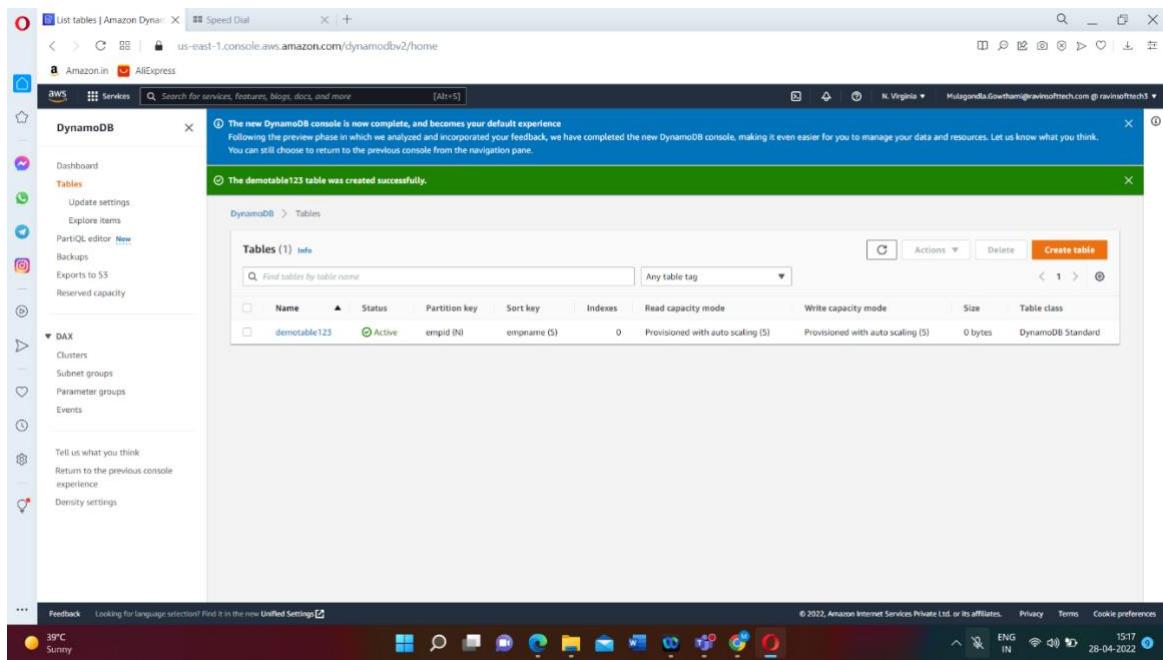
Tags
Tags are pairs of keys and optional values, that you can assign to AWS resources. You can use tags to control access to your resources or track your AWS spending.

No tags are associated with the resource.

Add new tag

You can add 50 more tags.

Cancel **Create table**



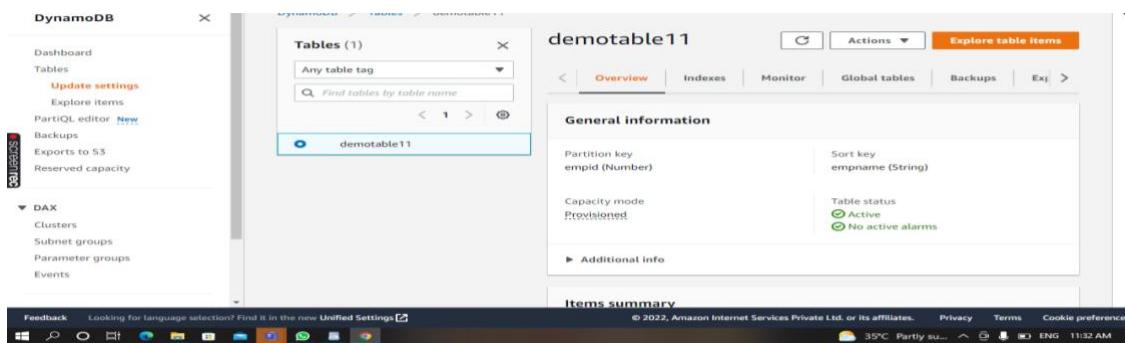
Step4: Choose the Items tab to view the data that you loaded into the table.

To view an item in the table, choose its Id. (If you want, you can also edit the item.)

To return to the list of tables, choose Cancel.

step5: In this step, you will add data to your new DynamoDB table.

a. Select the Items tab. On the Items tab, choose Explore items.



b. In the data entry window, type the following:

For the Artist attribute, type No One You Know.

For the song Title attribute, type Call Me Today.

Choose Create item.

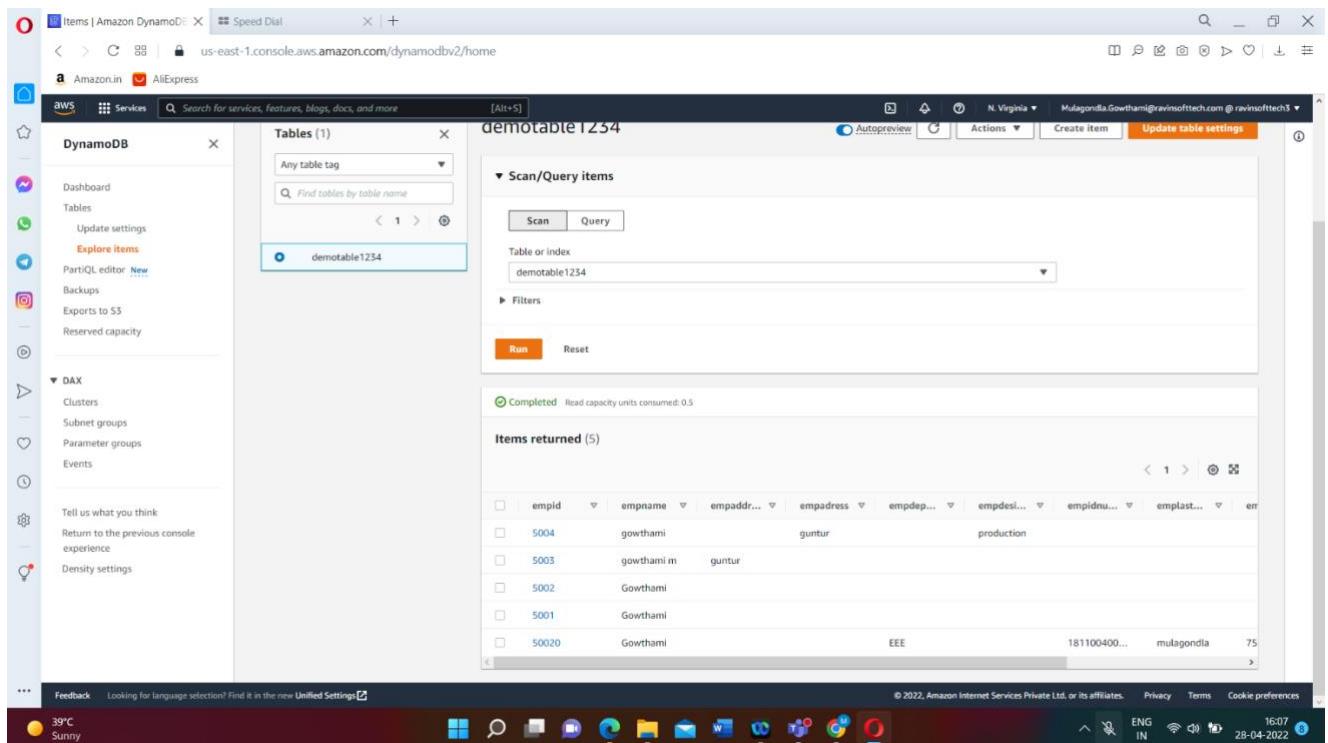
The screenshot shows the AWS DynamoDB console. On the left, there's a navigation sidebar with various options like Dashboard, Tables, Update settings, Explore items, PartiQL editor, Backups, Exports to S3, Reserved capacity, DAX Clusters, Subnet groups, Parameter groups, and Events. The main area shows a table named 'demutable11' with one item listed. Below the table, there's a section for 'Scan/Query items' with tabs for 'Scan' and 'Query', and a dropdown for 'Table or index' set to 'demutable11'. At the bottom, there are 'Run' and 'Reset' buttons.

- c. Repeat the process to add a few more items to your Music table:
- student table: No One You Know; student Name: gowthami
- student table: No One You Know; student lastname: Mulagondla
- student table: The Acme Band; student: EEE
- student table: The Acme Band; student marks: 75

The screenshot shows the AWS DynamoDB Item Editor. It displays a 'Create item' form with the following attribute values:

Attribute name	Value	Type
empid - Partition key	5004	Number
empname - Sort key	gowthami	String
emppress	guntur	String
empsalary	50000	Number
empphonenumber	6281425586	Number
empdesignation	production	String

At the bottom right of the form are 'Cancel' and 'Create item' buttons.



In this step, you will search for data in the table using query operations. In DynamoDB, query operations are efficient and use keys to find data. Scan operations traverse the entire table.

a. Select the arrow next to "Scan/Query items". Then select "Query".

Table or index

demutable11

▶ Filters

Run Reset

Completed Read capacity units consumed: 0.5

Items returned (3)

	empid	empname	empaddr...	empdesg...	emppho...	empsalary	NewValue
<input type="checkbox"/>	5004	vishali	delhi	production	9876598763	50000	
<input type="checkbox"/>	5002	jeevi				TN	
<input type="checkbox"/>	5001	nandhu					

b. You can use the console to query the student table in various ways. For your first query, do the following:

In the studentdept, type No One You Know, and choose Run. All studentdetails performed by No One You Know are displayed.

QUESTION-5:

Explain Differences between Amazon Dynamo DB, Amazon RDS and Amazon Redshift...?

Amazon DynamoDB :

1. It was developed by Amazon in 2012. .
2. It is hosted, scalable database service by Amazon with data stored in Amazon cloud.
3. It does not support SQL query language.
4. It does not provide concept of Referential Integrity. Hence, no Foreign Keys.
5. Its Primary database models are Document store and Key-value store.
6. It does not support Server-side scripting.
7. Eventual Consistency and Immediate Consistency are used to ensure consistency in distributed system.
8. It does not offer API for user-defined Map/Reduce methods. But maybe implemented via Amazon Elastic MapReduce.
9. It supports secondary indexes. .

Amazon Redshift:

1. It was developed by Amazon in 2012.
2. It is large scale data warehouse service for use with business intelligence tools.
3. It supports SQL query language. But it does not fully support an SQL-standard.

4. It provides concept of Referential Integrity. Hence, there are Foreign Keys.

5. Its primary database model is Relational DBMS

6. It supports user-defined functions for Server-side scripting in python.

7. Immediate Consistency is used to ensure consistency in distributed system.

8. It does not offer API for user-defined Map/Reduce methods.

9. It supports restricted secondary indexed

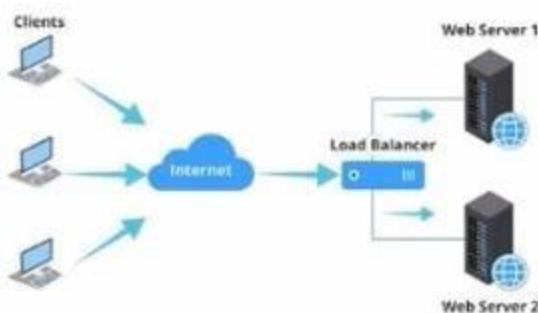
QUESTION-6:

What is Elastic load balancer explain its benefits...?

Elastic Load Balancer is a load balancing service by AWS which distributes and manages the incoming traffic load.

Benefits:

- among several devices to improve the network performance.
- Distributes client traffic across multiple servers.
- Improves the performance of application.
- Sends traffic to server which is healthy and responding.



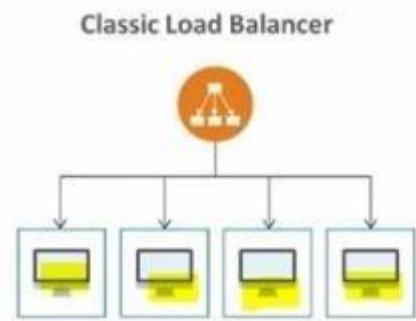
QUESTION-7:

Explain i) Classic or Gateway ii) Application iii) Network Load Balancer...?

i)Classic or Gateway:

The Load Balancer which distributes the incoming traffic across multiple instances availability zones is called as Classic LoadBalancer

- It supports both ECZ-classic and EC2-VPC
- Increases availability of your application by sending traffic to healthy instance
- Supports TCP, HTTP, HTTPS and SSL listeners
- Supports sticky sessions



ii)Application:

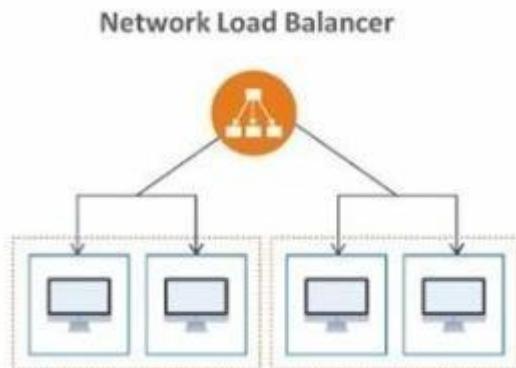
The Load Balancer which distributes the traffic to appropriate target groups on the basis of content is called as Application load Balancer.

- New feature rich, layer 7 load balancing platform
- Reduces hourly cost
- Supports WebSocket's and HTTP and HTTPS
- Supports micro services and container base application, including deep integration with EC2 container service

iii)Network Load Balancer:

Network Load Balancer handles sudden and volatile traffic across the EC2 instances in order to avoid any latency.

- New layer 4 load balancing platform.
- Connection base load balancing
- supports TCP protocol
- Can handle millions of request/seconds



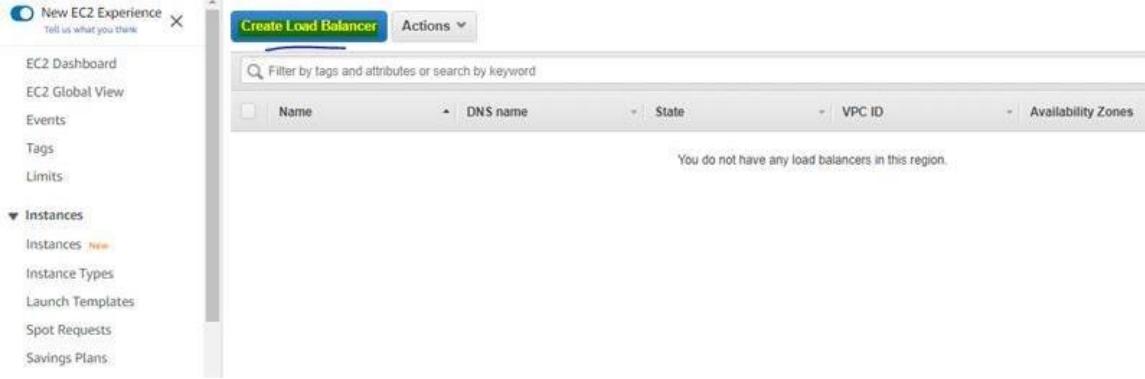
QUESTION-8:

With the help of all the steps and screen shot Explain how to create Application Load Balancer?

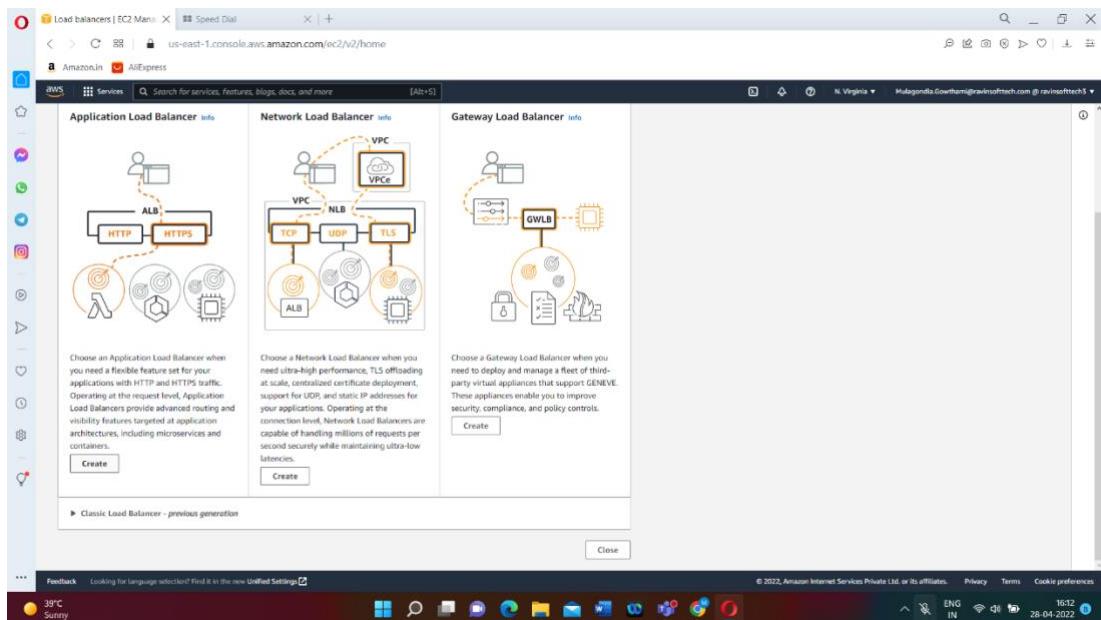
Open the Amazon EC2 console <https://console.aws.amazon.com/ec2/>.

The screenshot shows the AWS CloudFront console with a search bar at the top containing 'load balancers'. Below the search bar, there is a sidebar with links like 'Services (12)', 'Features (22)', 'Blogs (2,305)', etc. The main content area displays search results for 'load balancer', with 'Load balancers' listed under 'Features'. This item is highlighted with a green box. Other items listed include 'Load balancers' (Lightsail feature), 'Target groups', and 'Tags', each with an 'EC2 feature' badge.

Choose Create Load Balancer.



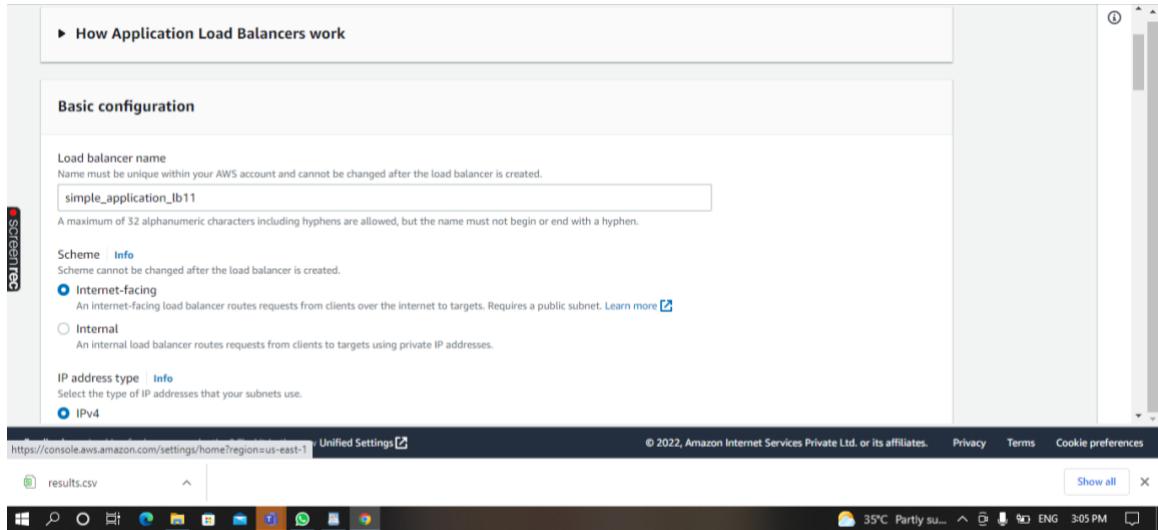
Under Application Load Balancer, choose Create.



Basic configuration

- For Load balancer name, enter a name for your load balancer. For example, my-alb. The name of your Application Load Balancer must be unique within your set of Application Load Balancers and Network Load Balancers for the Region. Names can have a maximum of 32 characters, and can contain only alphanumeric characters and hyphens. They cannot begin or end with a hyphen, or with internal-.
- For Scheme, choose Internet-facing or Internal. An internet-facing load balancer routes requests from clients to targets over the internet. An internal load balancer routes requests to targets using private IP addresses.

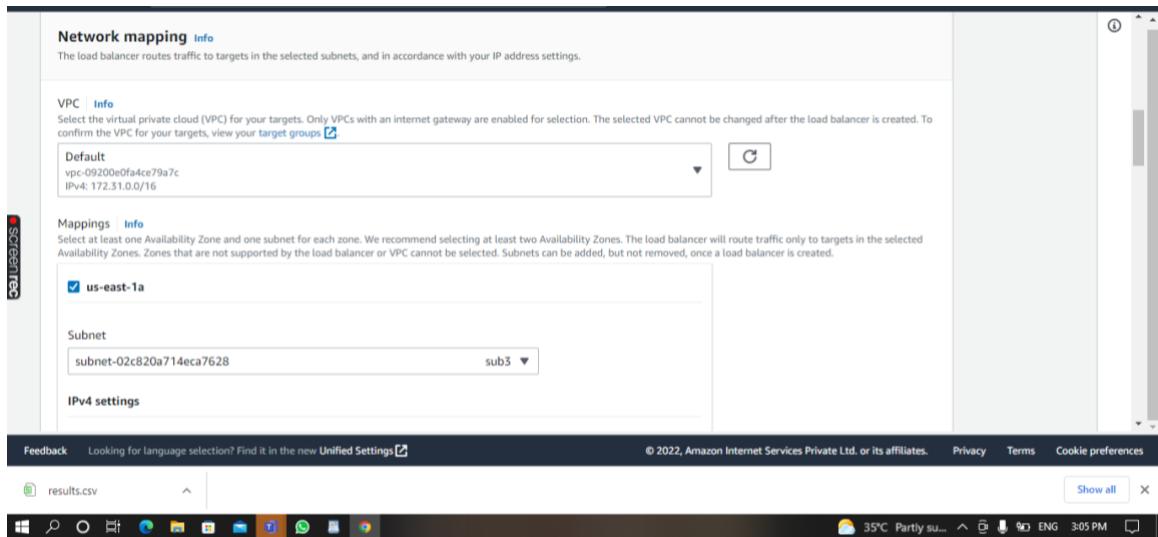
c) For IP address type, choose IPv4 or Dual stack. Use IPv4 if your clients use IPv4 addresses to communicate with the load balancer. Choose Dual stack if your clients use both IPv4 and IPv6 addresses to communicate with the load balancer.



Network mapping

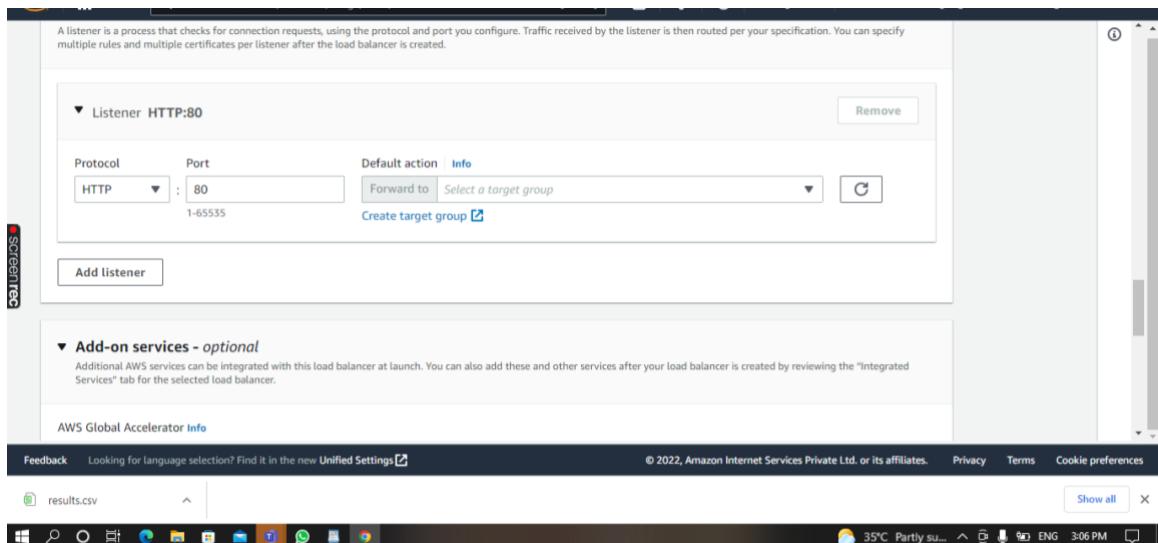
- a) For VPC, select the VPC that you used for your EC2 instances. If you selected Internet-facing for Scheme, only VPCs with an internet gateway are available for selection.
- b) For Mappings, select two or more Availability Zones and corresponding subnets. Enabling multiple Availability Zones increases the fault tolerance of your applications.

For an internal load balancer, you can assign a private IP address from the IPv4 or IPv6 range of each subnet instead of letting AWS assign one for you.



Tag and create

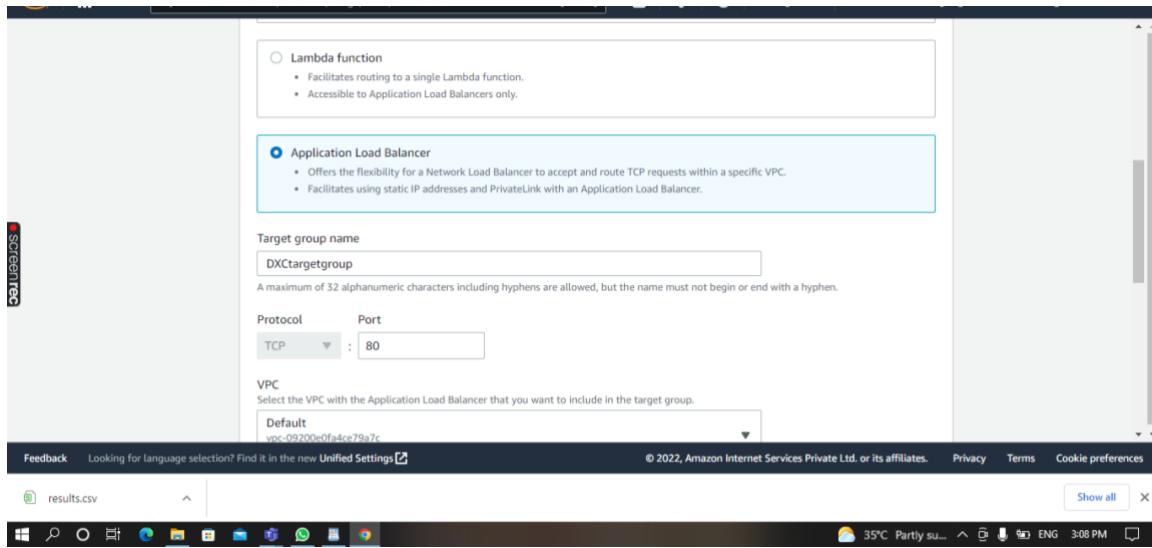
- (Optional) Add a tag to categorize your load balancer. Tag keys must be unique for each load balancer. Allowed characters are letters, spaces, numbers (in UTF-8), and the following special characters: + - =. _ : / @. Do not use leading or trailing spaces. Tag values are case-sensitive.
- Review your configuration, and choose Create load balancer. A few default attributes are applied to your load balancer during creation. You can view and edit them after creating the load balancer. For more information, see Load balancer attribute



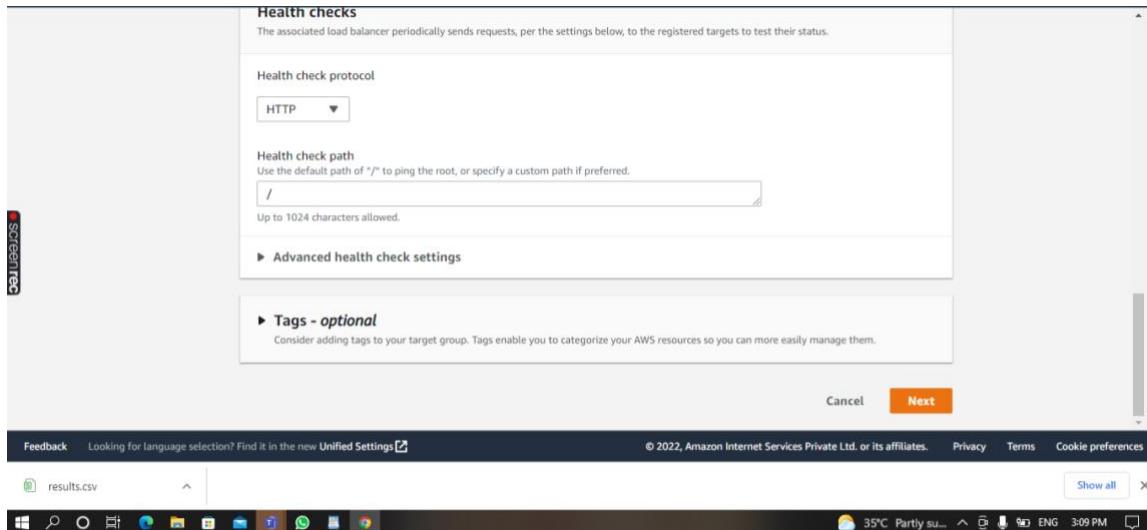
After the load balancer is created, choose Close.

In the navigation pane, under Load Balancing, choose Target Groups.

Select the newly created target group



Choose Targets and verify that your instances are ready. If the status of an instance is initial, it's typically because the instance is still in the process of being registered. This status can also indicate that the instance has not passed the minimum number of health checks to be considered healthy. After the status of at least one instance is healthy, you can test your load balancer. For more information, see Target health status.



In the navigation pane, under Load Balancing, choose Load Balancers.

This screenshot shows the 'Register targets' step of the 'Create target group' wizard. The left sidebar has 'Step 1 Specify group details' and 'Step 2 Register targets'. The main area is titled 'Application Load Balancer' with the sub-instruction: 'You can specify a single Application Load Balancer as the target. The Application Load Balancer you specify must have a listener on the same port as the target group you're creating.' Below this are two radio button options: 'Choose an Application Load Balancer from the list or create Application Load Balancer' (unchecked) and 'Add an Application Load Balancer later' (checked). At the bottom are 'Cancel', 'Previous', and 'Create target group' buttons.

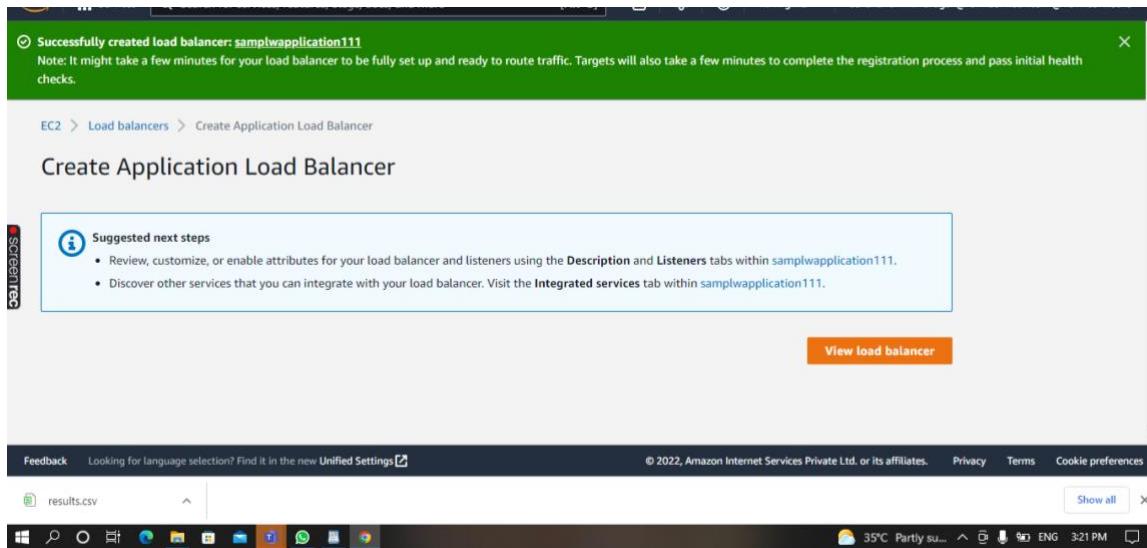
Select the newly created load balance

This screenshot shows the configuration page for the load balancer 'simple_application_lb11'. The tabs at the top are 'Basic Configuration', 'Security groups', 'Network mapping', 'Listeners and routing', 'Add-on services', and 'Tags'. Under 'Basic Configuration', it lists 'Internet-facing' and 'IPv4'. Under 'Network mapping', it shows 'VPC vpc-09200e0fa4ce79a7c' with 'Default' and 'us-east-1a' subnets. Under 'Listeners and routing', it shows 'HTTP-80' with 'Target group not defined'. Under 'Attributes', there's a note: 'Certain default attributes will be applied to your load balancer. You can view and edit them after creating the load balancer.' At the bottom are 'Cancel' and 'Create load balancer' buttons.

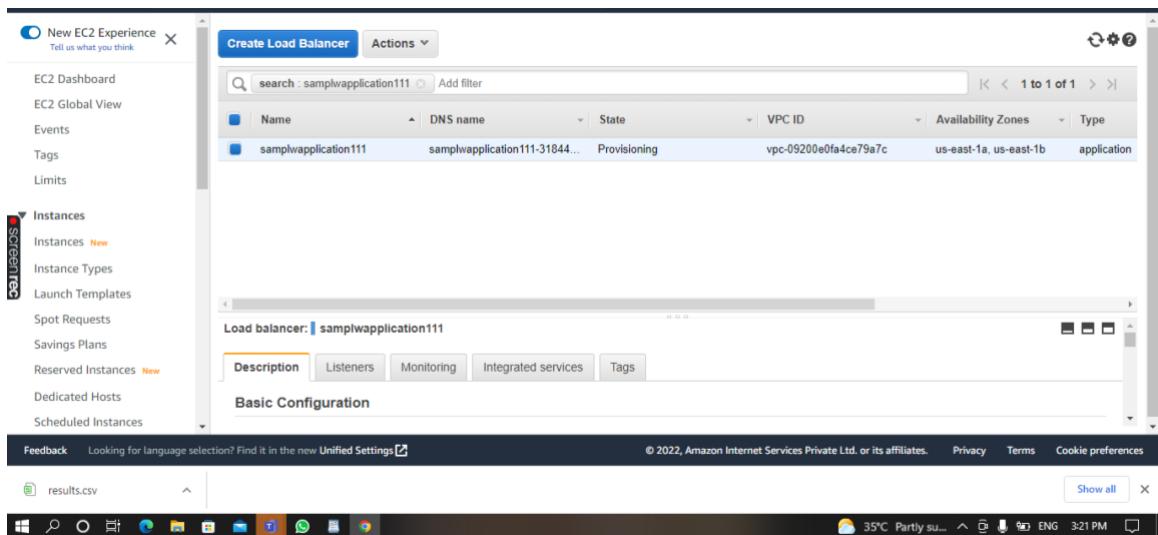
This screenshot shows the 'Target groups' page with a success message: 'Successfully created target group: DXCTargetgroup'. It provides instructions to use static IP addresses, AWS PrivateLink, and Network Load Balancer. Below this is a table of target groups:

Name	ARN	Port	Protocol	Target type
DXCTargetgroup	arn:aws:elasticloadbalancing...	80	TCP	Application Load Balancer

The table includes columns for Name, ARN, Port, Protocol, and Target type. The 'DXCTargetgroup' row is selected. At the bottom are 'Actions' and 'Create target group' buttons.



Choose Description and copy the DNS name of the load balancer (for example, my-load-balancer-1234567890abcdef.elb.us-east-2.amazonaws.com). Paste the DNS name into the address field of an internet-connected web browser. If everything is working, the browser displays the default page of your server.



The screenshot shows the AWS EC2 Load Balancer console. In the top navigation bar, there is a link to 'Create Load Balancer' and an 'Actions' dropdown. Below the navigation, a search bar is followed by a table listing a single load balancer named 'samplapplication111'. The table includes columns for Name, DNS name, State, VPC ID, Availability Zones, and Type. The 'DNS name' column shows 'samplapplication111-31844...'. The 'State' column shows 'Active'. The 'VPC ID' column shows 'vpc-09200e0fa4ce79a7c'. The 'Availability Zones' column shows 'us-east-1a, us-east-1b'. The 'Type' column shows 'application'. Below the table, a modal window titled 'Load balancer: samplapplication111' displays tabs for 'Description', 'Listeners', 'Monitoring', 'Integrated services', and 'Tags'. The 'Basic Configuration' tab is selected. At the bottom of the page, there is a feedback link and a copyright notice for 2022.

QUESTION-9:

- . With the help of all the steps and screen shot Explain how to create Network Load Balancer in AWS...?**

open the Amazon EC2 console at
<https://console.aws.amazon.com/ec2/>.

In the navigation pane, under Load Balancing, choose Load Balancers.

The screenshot shows the AWS Lightsail console search results for 'load'. The search bar at the top contains the query 'load'. Below the search bar, there are two main sections: 'Features' and 'Blogs'. The 'Features' section lists 'Load balancers' (marked as a 'Lightsail feature'), 'Load balancers' (marked as an 'EC2 feature'), 'Target groups' (marked as an 'EC2 feature'), and 'Workloads' (marked as an 'AWS Well-Architected Tool feature'). The 'Blogs' section lists 'See all 2,250 results ▾'. On the right side of the screen, there is a sidebar titled 'Console Home' with instructions on how to customize the home page. At the bottom of the page, there is a feedback link and a copyright notice for 2022.

Choose Create Load Balancer.

Under Network Load Balancer, choose Create

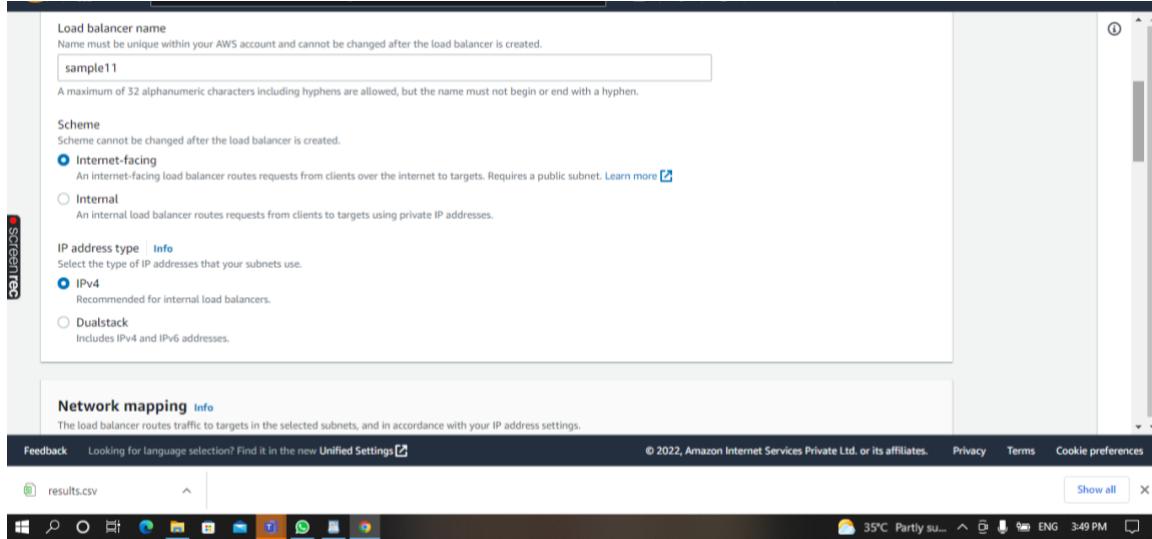
Load Balancer Type	Description	Action
Application Load Balancer (ALB)	Choose an Application Load Balancer when you need a flexible feature set for your applications with HTTP and HTTPS traffic. Operating at the request level, Application Load Balancers provide advanced routing and visibility features targeted at application architectures, including microservices and containers.	Create
Network Load Balancer (NLB)	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. Operating at the connection level, Network Load Balancers are capable of handling millions of requests per second securely while maintaining ultra-low latencies.	Create
Gateway Load Balancer (GLB)	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

Basic configuration

a)For Load balancer name, enter a name for your load balancer. For example, my-nlb. The name of your Network Load Balancer must be unique within your set of Application Load Balancers and Network Load Balancers for the Region. It can have a maximum of 32 characters, and contain only alphanumeric characters and hyphens. It must not begin or end with a hyphen, or with internal-.

b)For Scheme, choose Internet-facing or Internal. An internet-facing load balancer routes requests from clients to targets over the internet. An internal load balancer routes to targets using private IP addresses.

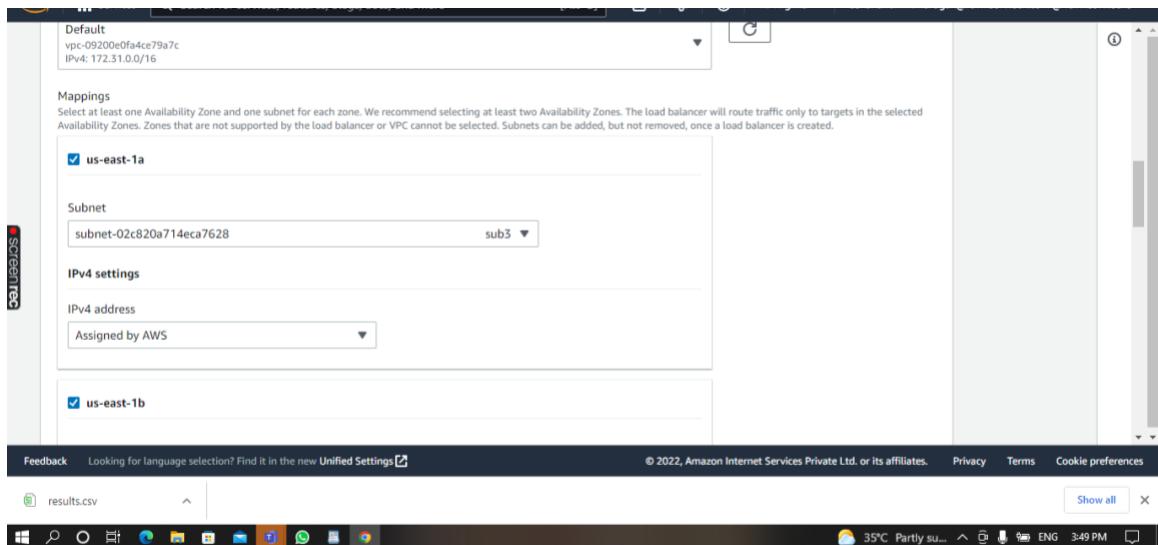
c)For IP address type, choose IPv4 or Dualstack. Use IPv4 if your clients use IPv4 addresses to communicate with the load balancer. Use Dualstack if your clients use both IPv4 and IPv6 addresses to communicate with the load balancer.



Network and security

For VPC, select the VPC that you used for your EC2 instances. If you selected Internet-facing for Scheme, only VPCs with an internet gateway are available for selection.

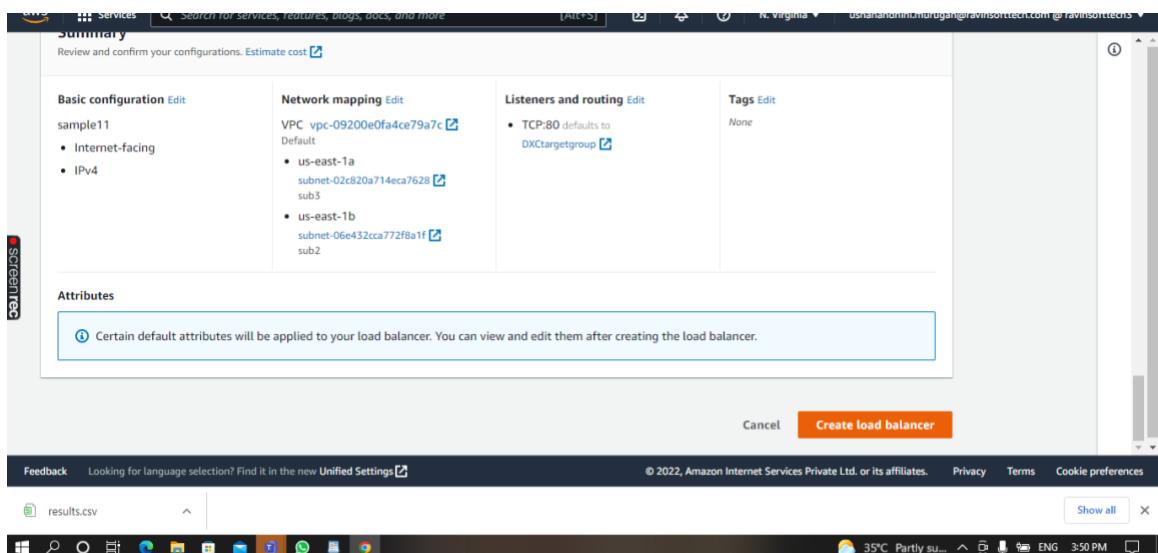
For Mappings, select one or more Availability Zones and corresponding subnets. Enabling multiple Availability Zones increases the fault tolerance of your applications. For internet-facing load balancers, you can select an Elastic IP address for each Availability Zone. This provides your load balancer with static IP addresses. Alternatively, for an internal load balancer, you can assign a private IP address from the IPv4 range of each subnet instead of letting AWS assign one for you.



Tag and create

(Optional) Add a tag to categorize your load balancer. Tag keys must be unique for each load balancer. Allowed characters are letters, spaces, numbers (in UTF-8), and the following special characters: + - = . _ : / @. Do not use leading or trailing spaces. Tag values are case-sensitive.

Review your configuration, and choose Create load balancer. A few default attributes are applied to your load balancer during creation. You can view and edit them after creating the load balancer. For more information, see Load balancer attributes.



In the navigation pane, under Load Balancing, choose Load Balancers.

Select the newly created load balancer

Choose Description and copy the DNS name of the load balancer (for example, my-load-balancer-1234567890abcdef.elb.us-east-2.amazonaws.com). Paste the DNS name into the address field of an internet-connected web browser. If everything is working, the browser displays the default page of your server.

The screenshot shows the AWS EC2 Load Balancers console. On the left, there's a navigation pane with options like EC2 Dashboard, EC2 Global View, Events, Tags, Limits, Instances, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, and Scheduled Instances. The main area has a title 'Create Load Balancer' and a search bar. Below it is a table with columns: Name, DNS name, State, VPC ID, Availability Zones, and Type. One row is selected, showing 'sample11' with its DNS name, state 'Provisioning', VPC ID 'vpc-09200e0fa4ce79a7c', Availability Zones 'us-east-1a, us-east-1b', and Type 'network'. At the bottom, there are tabs for Description, Listeners, Monitoring, Integrated services, and Tags, with 'Description' being the active tab. A status bar at the bottom right shows '35°C Partly su...' and the time '3:46 PM'.

QUESTION-10:

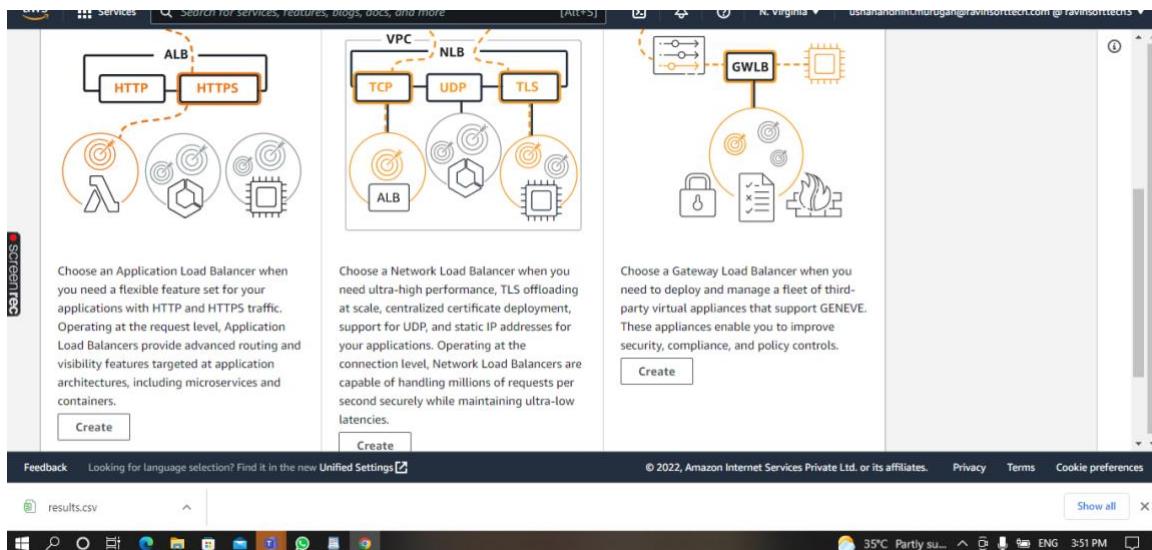
With the help of all the steps and screen shot Explain how to create Gateway Load Balancer in AWS..?

open the Amazon EC2 console at
<https://console.aws.amazon.com/ec2/>.

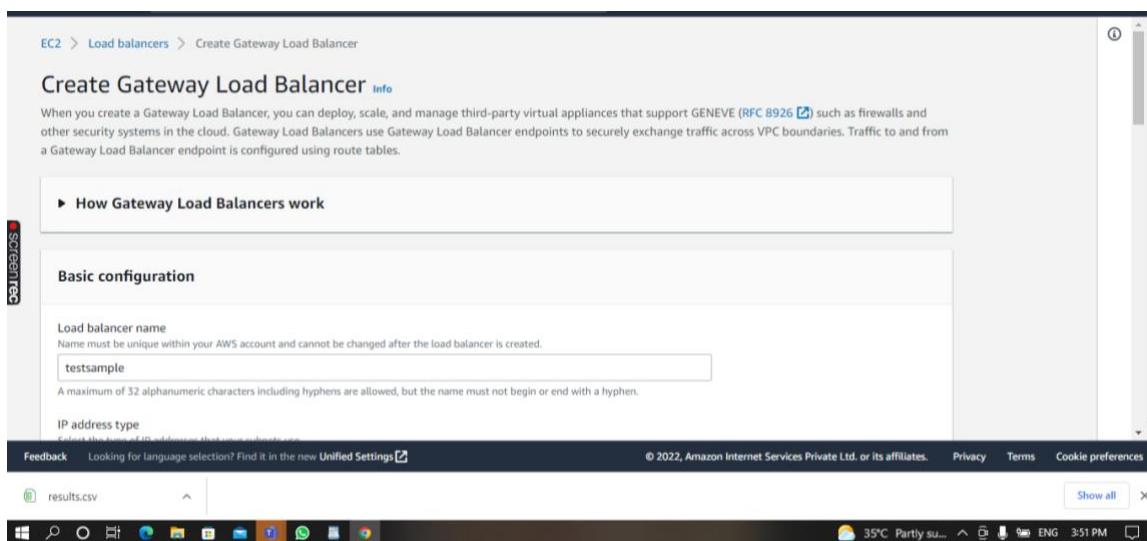
In the navigation pane, under Load Balancing, choose Load Balancers

The screenshot shows the AWS Lightsail console search results for 'load'. The search bar at the top says 'Search results for "load"'. The results are categorized into 'Features' and 'Blogs'. Under 'Features', there are sections for 'Load balancers' (with 'Lightsail feature' and 'EC2 feature' options), 'Target groups' (with 'EC2 feature' option), and 'Workloads' (with 'AWS Well-Architected Tool feature' option). Under 'Blogs', there is a section for 'Blogs' with a link to 'See all 2,250 results'. A sidebar on the right provides information about the 'Console Home' and how to customize it. The status bar at the bottom right shows '35°C Partly su...' and the time '3:46 PM'.

Choose Create Load Balancer



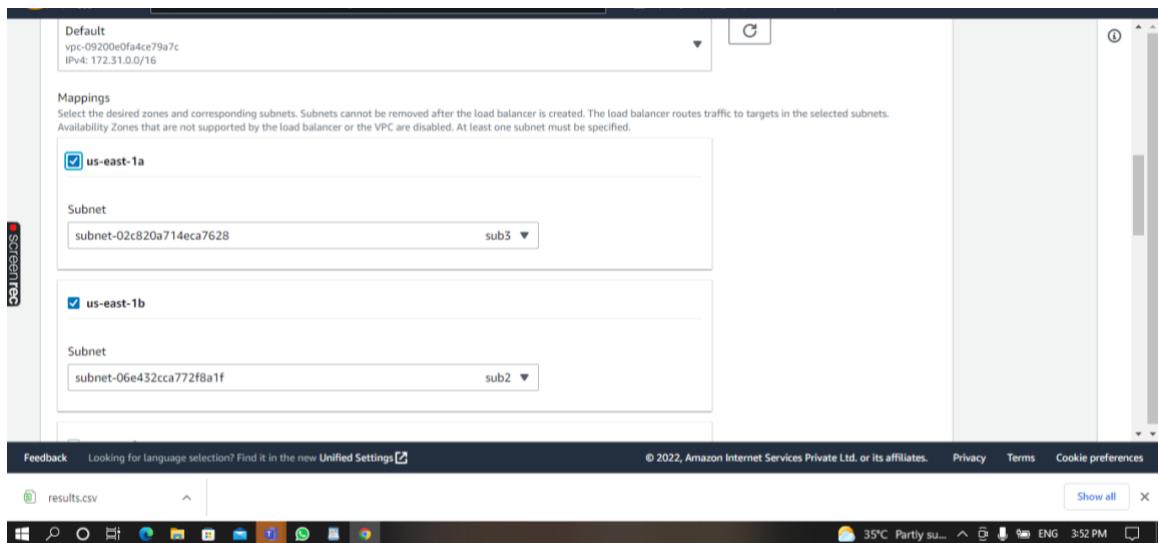
Under Gateway Load Balancer, choose Create



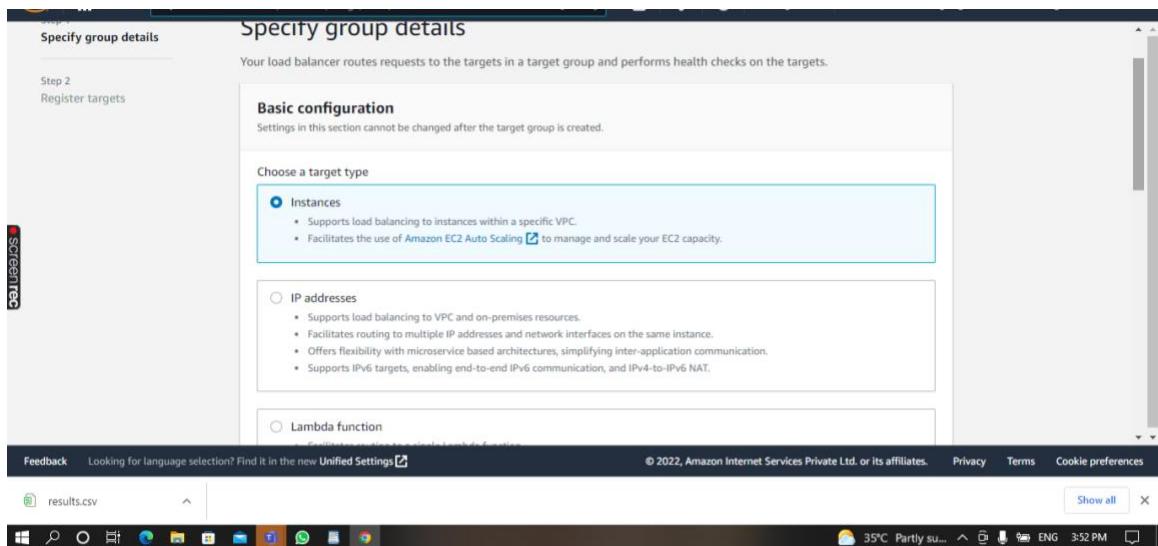
Basic configuration

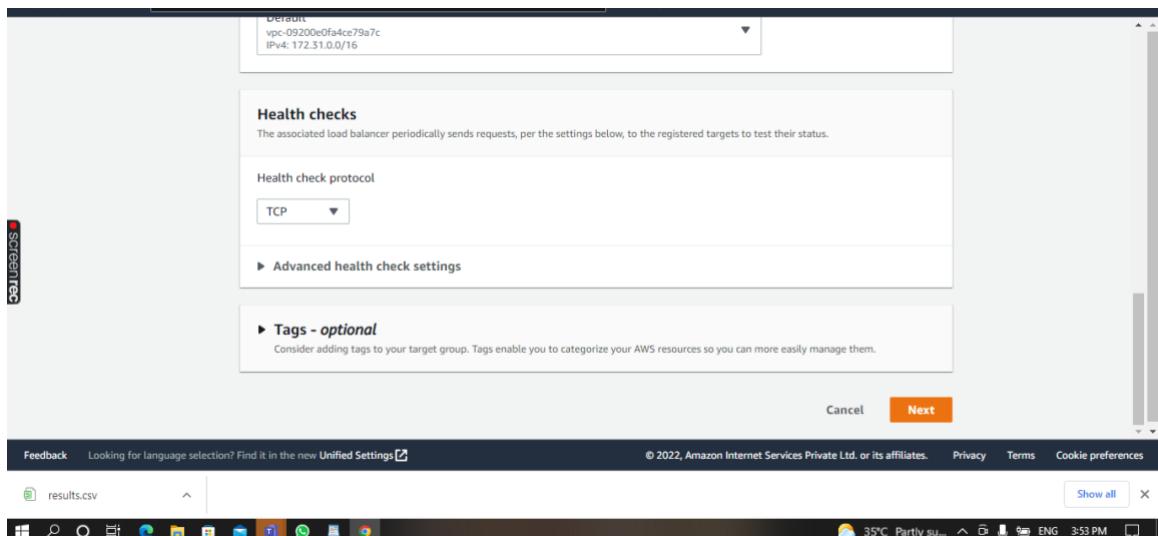
For Load balancer name, enter a name for your load balancer. For example, my-glb. The name of your Gateway Load Balancer must be unique within your set of load balancers for the Region. It can have a maximum of 32 characters, can contain only alphanumeric characters and hyphens, and must not begin or end with a hyphen.

For IP address type, you must choose IPv4, because your clients can only use IPv4 addresses to communicate with the load balancer.



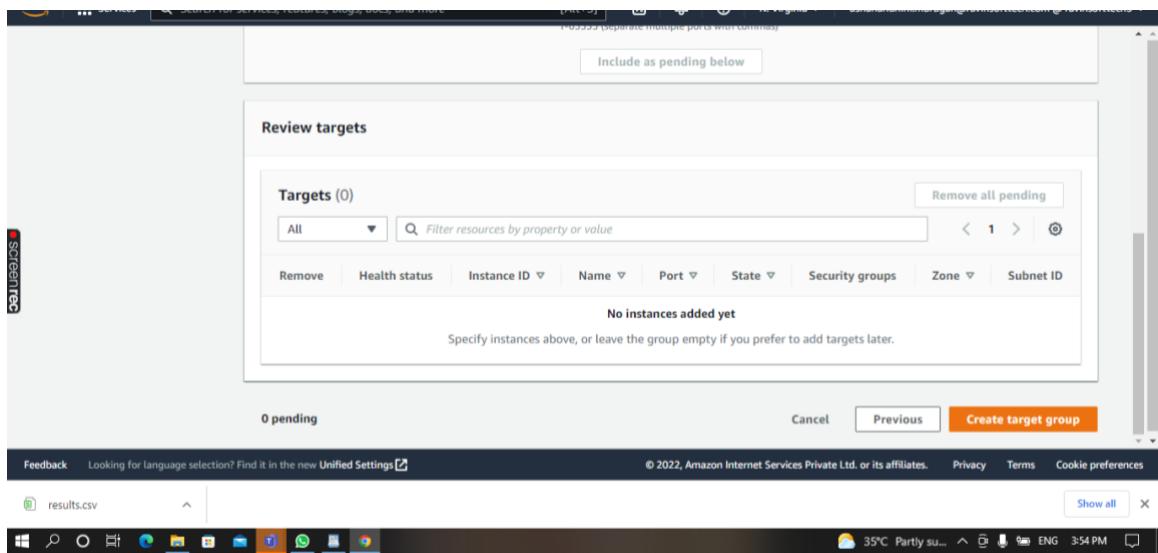
For Default action, select a target group to forward traffic to. If you don't have a default target group, create a target group first. Only target groups with GENEVE protocol are available for use with the Gateway Load Balancer.





Tag and create

Add an optional tag to categorize your load balancer. Tag keys must be unique for each load balancer. Allowed characters are letters, spaces, numbers (in UTF-8), and the following special characters: + - = . _ : / @. Do not use leading or trailing spaces. Tag values are case-sensitive. For more information, see [Update tags](#).



Review your configuration, and choose Create load balancer. A few default attributes are applied to your load balancer during creation. You can view and edit them after creating the load balancer

Successfully created target group: DXctest

EC2 > Target groups

Target groups (16) info

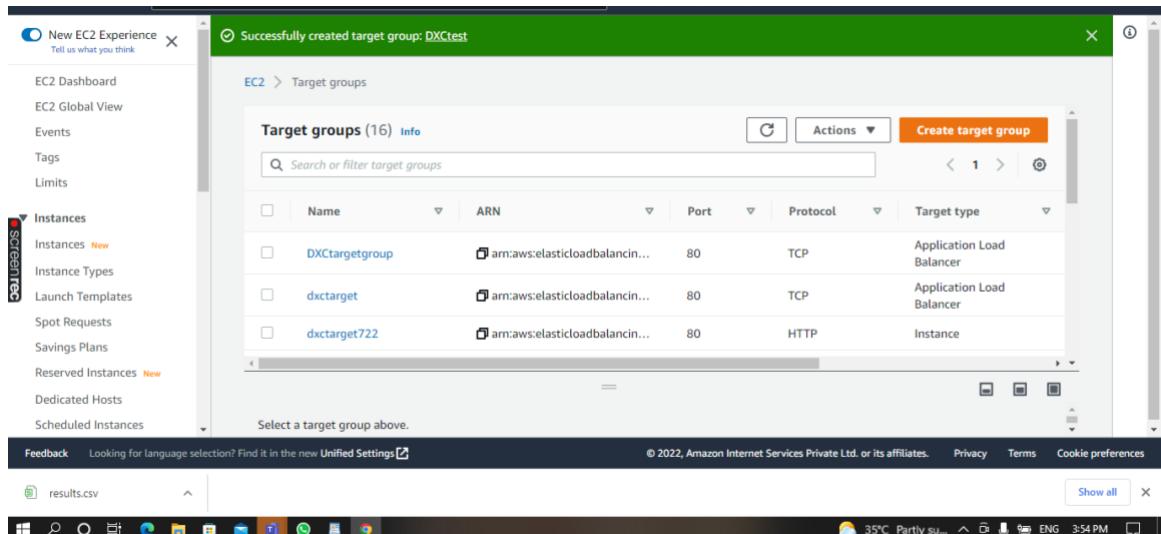
Name	ARN	Port	Protocol	Target type
DXtargetgroup	arn:aws:elasticloadbalancing:us-east-1:123456789012:targetgroup/DXctest/5555555555555555	80	TCP	Application Load Balancer
dxtarget	arn:aws:elasticloadbalancing:us-east-1:123456789012:targetgroup/dxtarget/5555555555555555	80	TCP	Application Load Balancer
dxtarget722	arn:aws:elasticloadbalancing:us-east-1:123456789012:targetgroup/dxtarget722/5555555555555555	80	HTTP	Instance

Select a target group above.

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Successfully created load balancer: sampletest

Note: It might take a few minutes for your load balancer to be fully set up and ready to route traffic. Targets will also take a few minutes to complete the registration process and pass initial health checks.

EC2 > Load balancers > Create Gateway Load Balancer

Create Gateway Load Balancer

Important next steps

1. Create a Gateway Load Balancer endpoint in the Amazon VPC console [?](#). Gateway Load Balancer endpoints are zonal. We recommend that you create one Gateway Load Balancer endpoint per zone.
2. Update your route table to make the Gateway Load Balancer endpoint the next hop. Route table configurations are set within the VPC console [?](#). For more information, see [Routing](#) and [Step 3: Configure routing](#) [?](#) in the Gateway Load Balancer documentation.

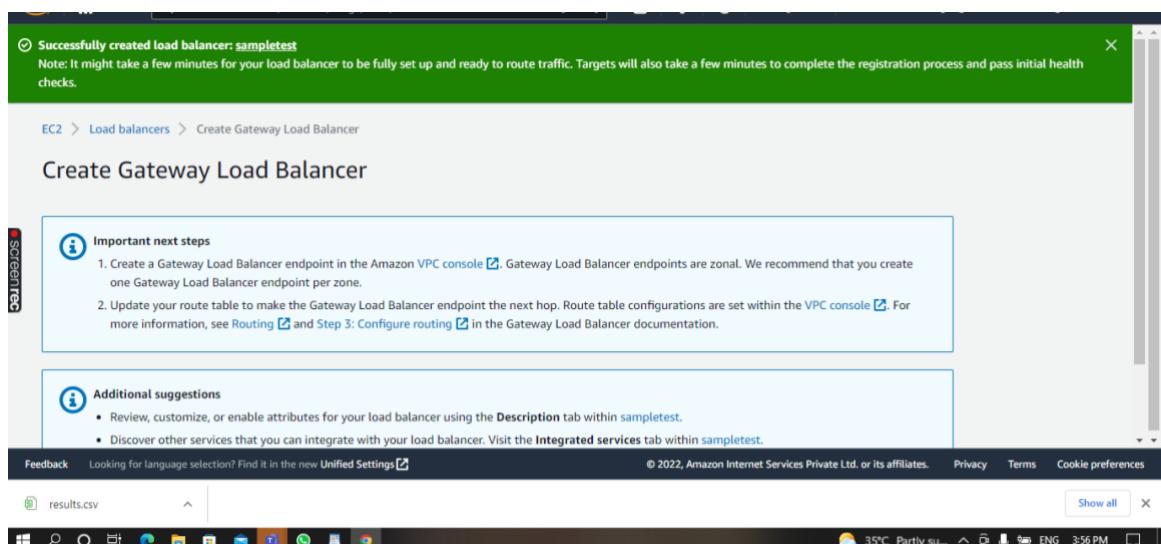
Additional suggestions

- Review, customize, or enable attributes for your load balancer using the **Description** tab within [sampletest](#).
- Discover other services that you can integrate with your load balancer. Visit the **Integrated services** tab within [sampletest](#).

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Create Load Balancer

Actions

Load balancer: sampletest

Description **Listeners** **Monitoring** **Integrated services** **Tags**

Basic Configuration

Name	DNS name	State	VPC ID	Availability Zones	Type
sampletest		Active	vpc-09200e0fa4ce79a7c	us-east-1b, us-east-1a	gateway

