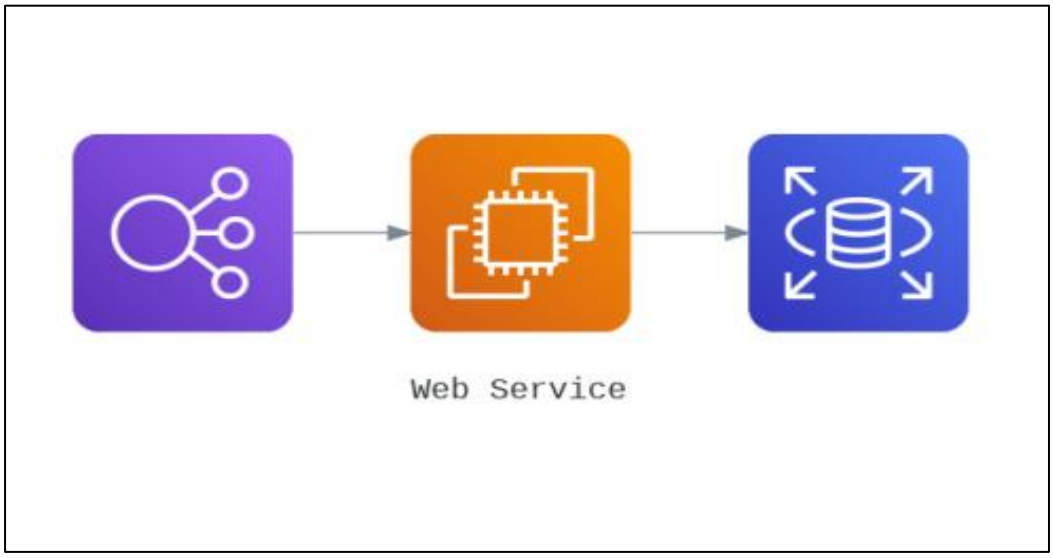
Ques: Complete the below task:

1. Explain the below AWS Architecture

2. Implement the same in the AWS(only do a proper connection between service)

NOTE: Submission can be done by sharing the proper screenshots of implementation and doc for explanation!

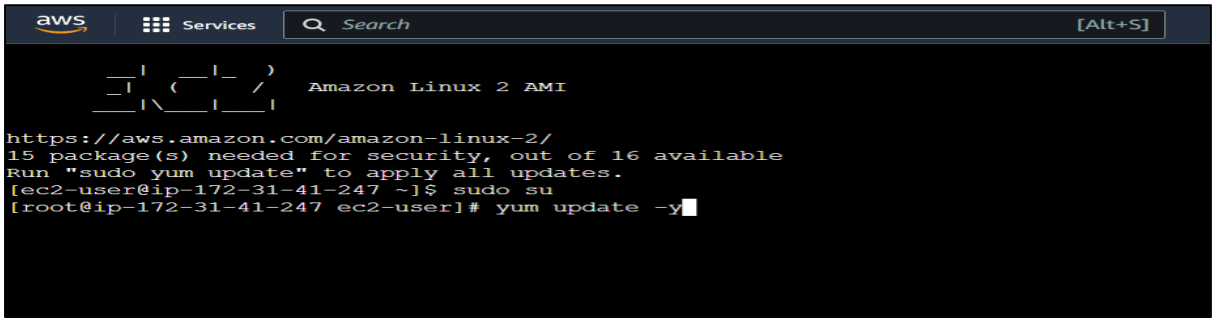



Explanation:

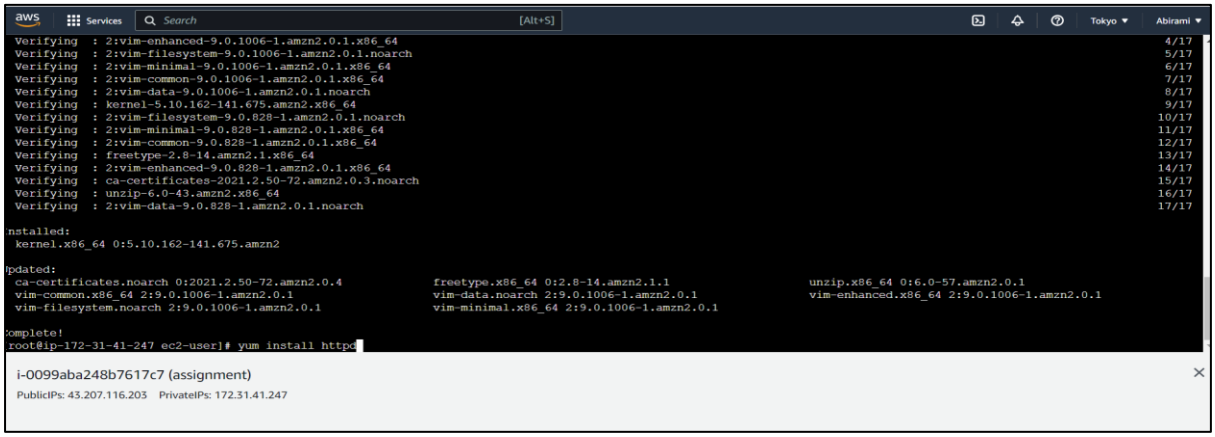
In this assignment we have connected a Load balancer (ELB) with EC2 instance that is further connected to RDS containing MySQL database.

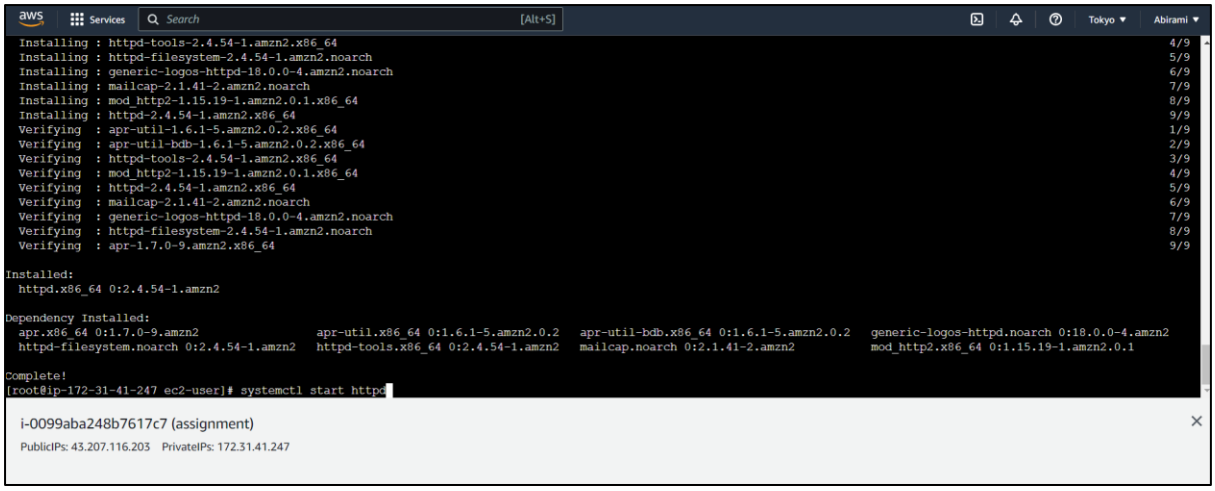
## EC2 Instance:

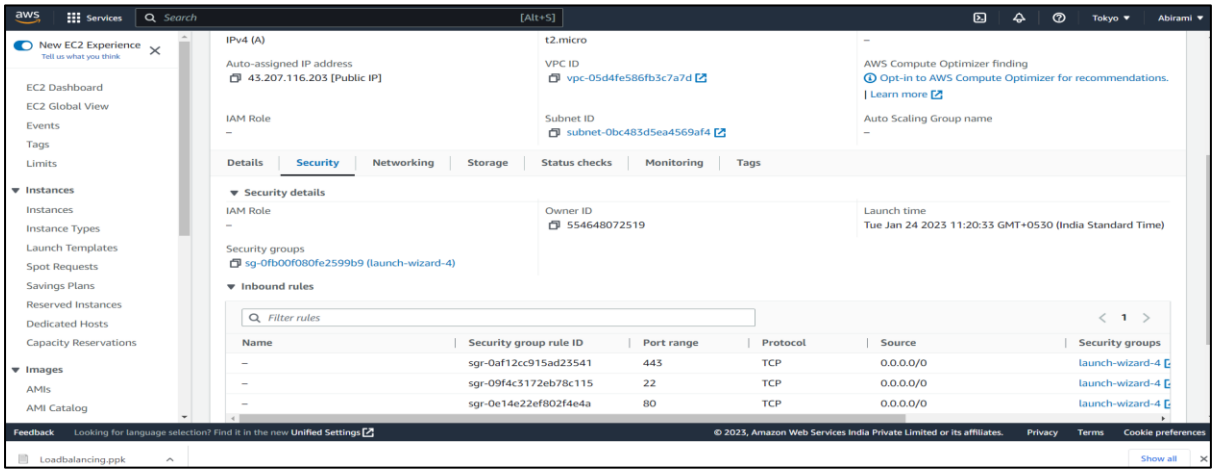
1. Intially I have switched as root user and updated Yum package manager.
2. Using yum install httpd, I have installed Apache web server
3. I have ran the apache web server using systemctl start httpd
4. Additionally I have ran the command systemctl enable httpd to run the apache web server during system startup.
5. Enabled the port 80 in inbound and outbound rules in security group.
6. Created an index.html file inside /var/www/html/.

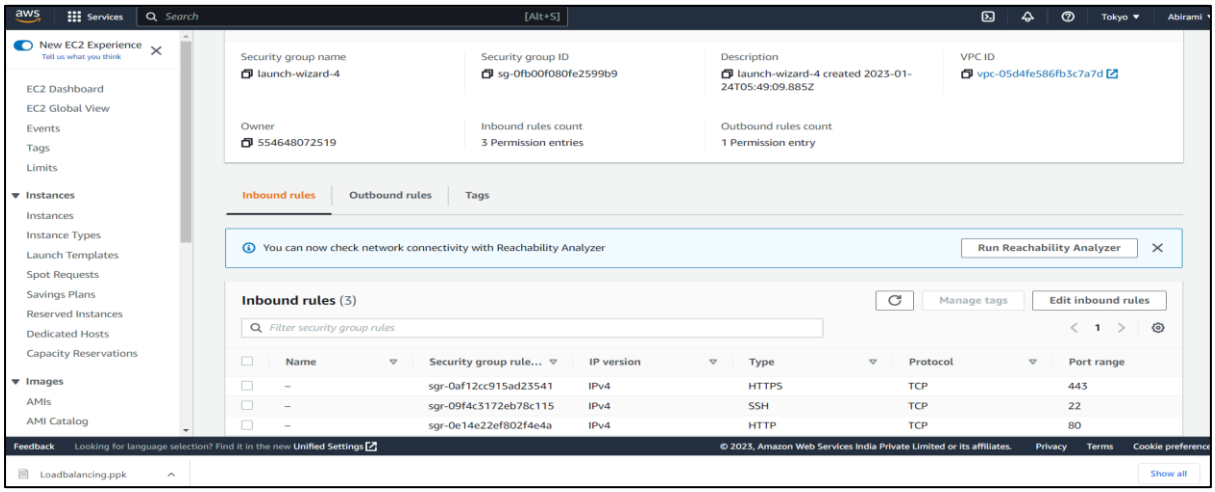


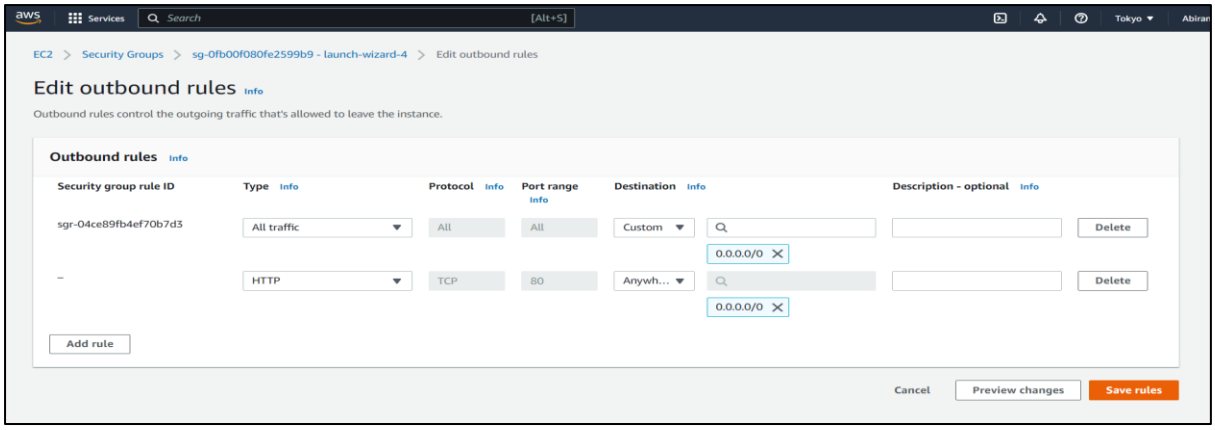


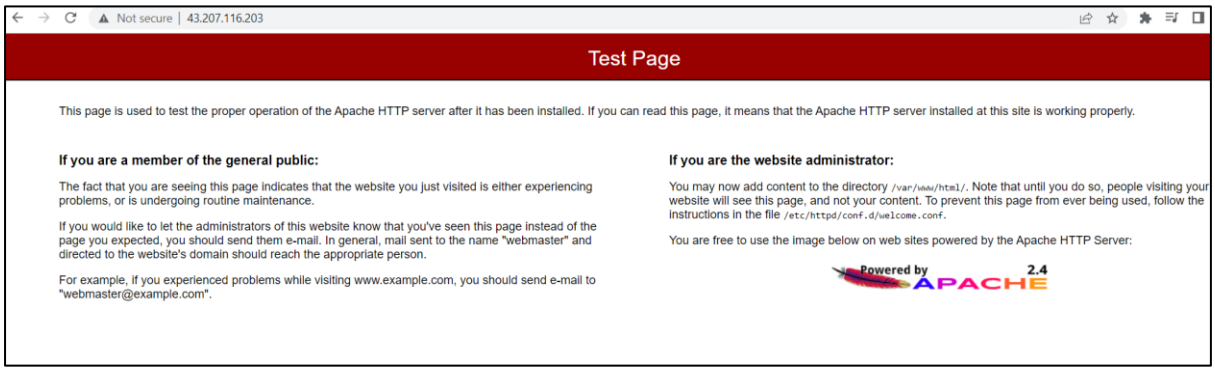


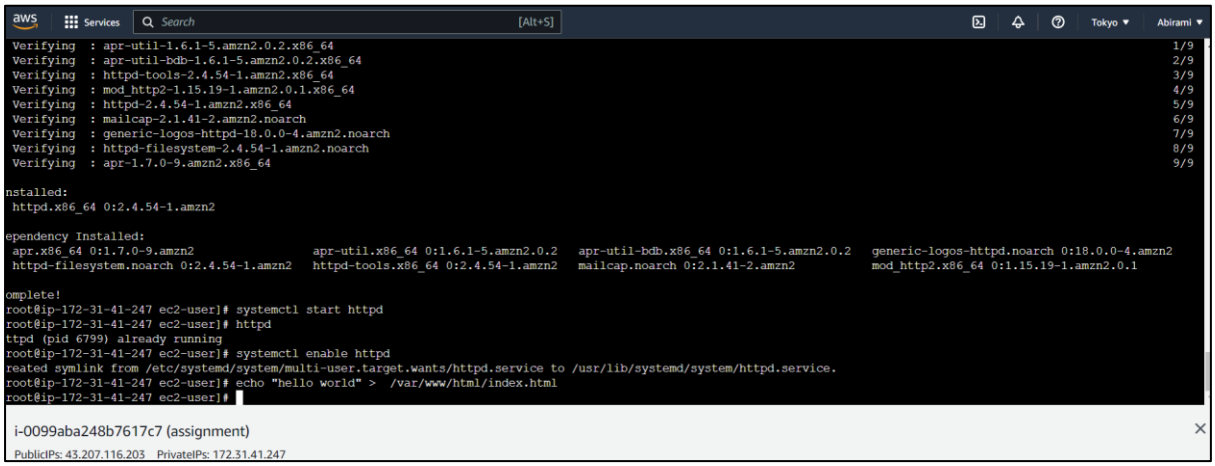

Installing : httpd-tools-2.4.54-1.amzn2.x86_64 4/9
Installing : httpd-filesystem-2.4.54-1.amzn2.noarch 5/9
Installing : generic-logos-httpd-18.0.0-4.amzn2.noarch 6/9
Installing : mailcap-2.1.41-2.amzn2.noarch 7/9
Installing : mod_http2-1.15.19-1.amzn2.0.1.x86_64 8/9
Installing : httpd-2.4.54-1.amzn2.x86_64 9/9
Verifying : apr-util-1.6.1-5.amzn2.0.2.x86_64 1/9
Verifying : apr-util-bdb-1.6.1-5.amzn2.0.2.x86_64 2/9
Verifying : httpd-tools-2.4.54-1.amzn2.x86_64 3/9
Verifying : mod_http2-1.15.19-1.amzn2.0.1.x86_64 4/9
Verifying : httpd-2.4.54-1.amzn2.x86_64 5/9
Verifying : mailcap-2.1.41-2.amzn2.noarch 6/9
Verifying : generic-logos-httpd-18.0.0-4.amzn2.noarch 7/9
Verifying : httpd-filesystem-2.4.54-1.amzn2.noarch 8/9
Verifying : apr-1.7.0-9.amzn2.x86_64 9/9
Installed:
httpd.x86_64 0:2.4.54-1.amzn2
Dependency Installed:
apr.x86_64 0:1.7.0-9.amzn2
apr-util.x86_64 0:1.6.1-5.amzn2.0.2
apr-util-bdb.x86_64 0:1.6.1-5.amzn2.0.2
generic-logos-httpd.noarch 0:18.0.0-4.amzn2
httpd-filesystem.noarch 0:2.4.54-1.amzn2
httpd-tools.x86_64 0:2.4.54-1.amzn2
mailcap.noarch 0:2.1.41-2.amzn2
mod_http2.x86_64 0:1.15.19-1.amzn2.0.1
Complete!
[root@ip-172-31-41-247 ec2-user]# systemctl start httpd
i-0099aba248b7617c7 (assignment)
PublicIPs: 43.207.116.203 PrivateIPs: 172.31.41.247

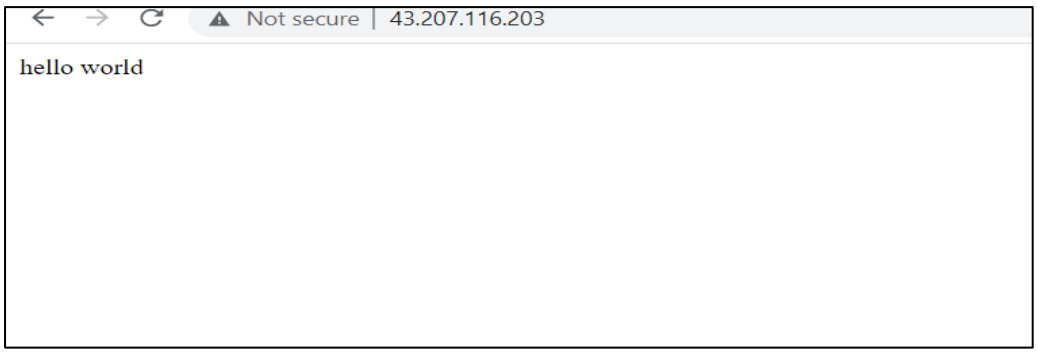

IPv4 (A)
t2.micro
Auto-assigned IP address
43.207.116.203 [Public IP]
VPC ID
vpc-05d4fe586fb3c7a7d
AWS Compute Optimizer finding
Opt-in to AWS Compute Optimizer for recommendations.
Learn more
IAM Role
Subnet ID
subnet-0bc483d5ea4569af4
Auto Scaling Group name
Details
Security
Networking
Storage
Status checks
Monitoring
Tags
Security details
IAM Role
Owner ID
554648072519
Launch time
Tue Jan 24 2023 11:20:33 GMT+0530 (India Standard Time)
Security groups
sg-0fb00f080fe2599b9 (launch-wizard-4)
Inbound rules
Filter rules
Name
Security group rule ID
Port range
Protocol
Source
Security groups
sgr-0af12cc915ad23541
443
TCP
0.0.0.0/0
launch-wizard-4
sgr-09f4c3172eb78c115
22
TCP
0.0.0.0/0
launch-wizard-4
sgr-0e14e22ef802f4e4a
80
TCP
0.0.0.0/0
launch-wizard-4


Security group name
launch-wizard-4
Security group ID
sg-0fb00f080fe2599b9
Description
launch-wizard-4 created 2023-01-24T05:49:09.885Z
VPC ID
vpc-05d4fe586fb3c7a7d
Owner
554648072519
Inbound rules count
3 Permission entries
Outbound rules count
1 Permission entry
Inbound rules
Outbound rules
Tags
You can now check network connectivity with Reachability Analyzer
Run Reachability Analyzer
Inbound rules (3)
Manage tags
Edit inbound rules
Filter security group rules
Name
Security group rule...
IP version
Type
Protocol
Port range
sgr-0af12cc915ad23541
IPv4
HTTPS
TCP
443
sgr-09f4c3172eb78c115
IPv4
SSH
TCP
22
sgr-0e14e22ef802f4e4a
IPv4
HTTP
TCP
80


Services
Search
[Alt+S]
Tokyo
EC2 > Security Groups > sg-0fb00f080fe2599b9 - launch-wizard-4 > Edit outbound rules
Edit outbound rules Info
Outbound rules control the outgoing traffic that's allowed to leave the instance.
Outbound rules Info
Security group rule ID
Type Info
Protocol Info
Port range Info
Destination Info
Description - optional Info
sgr-04ce89fb4ef70b7d3
All traffic
All
All
Custom
0.0.0.0/0
Delete
HTTP
TCP
80
Anywh...
0.0.0.0/0
Delete
Add rule
Cancel
Preview changes
Save rules

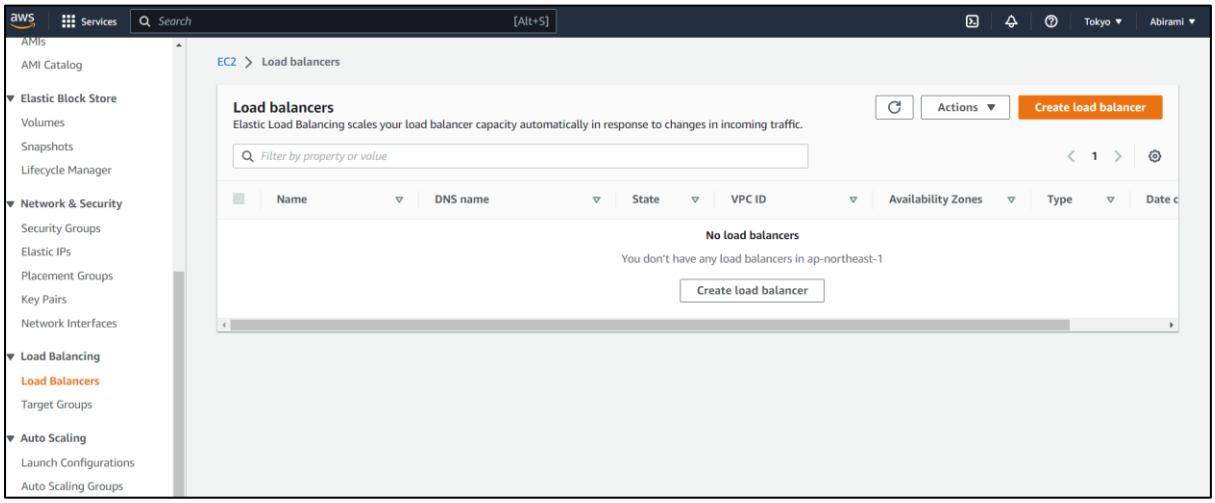

Not secure | 43.207.116.203
Test Page
This page is used to test the proper operation of the Apache HTTP server after it has been installed. If you can read this page, it means that the Apache HTTP server installed at this site is working properly.
If you are a member of the general public:
The fact that you are seeing this page indicates that the website you just visited is either experiencing problems, or is undergoing routine maintenance.
If you would like to let the administrators of this website know that you've seen this page instead of the page you expected, you should send them e-mail. In general, mail sent to the name "webmaster" and directed to the website's domain should reach the appropriate person.
For example, if you experienced problems while visiting www.example.com, you should send e-mail to "webmaster@example.com".
If you are the website administrator:
You may now add content to the directory /var/www/html/. Note that until you do so, people visiting your website will see this page, and not your content. To prevent this page from ever being used, follow the instructions in the file /etc/httpd/conf.d/welcome.conf.
You are free to use the image below on web sites powered by the Apache HTTP Server:
Powered by APACHE 2.4

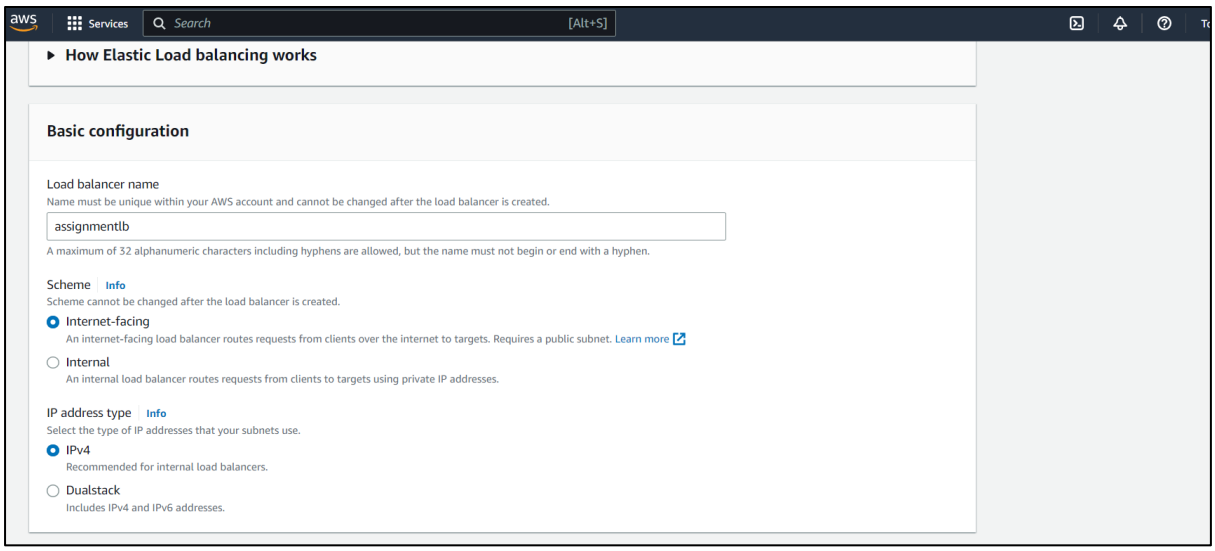

Services
Search
[Alt+S]
Tokyo
Abirami
Verifying : apr-util-1.6.1-5.amzn2.0.2.x86_64 1/9
Verifying : apr-util-bdb-1.6.1-5.amzn2.0.2.x86_64 2/9
Verifying : httpd-tools-2.4.54-1.amzn2.x86_64 3/9
Verifying : mod_http2-1.15.19-1.amzn2.0.1.x86_64 4/9
Verifying : httpd-2.4.54-1.amzn2.x86_64 5/9
Verifying : mailcap-2.1.41-2.amzn2.noarch 6/9
Verifying : generic-logos-httpd-18.0.0-4.amzn2.noarch 7/9
Verifying : httpd-filesystem-2.4.54-1.amzn2.noarch 8/9
Verifying : apr-1.7.0-9.amzn2.x86_64 9/9
nstalled:
httpd.x86_64 0:2.4.54-1.amzn2
ependency Installed:
apr.x86_64 0:1.7.0-9.amzn2
apr-util.x86_64 0:1.6.1-5.amzn2.0.2
apr-util-bdb.x86_64 0:1.6.1-5.amzn2.0.2
generic-logos-httpd.noarch 0:18.0.0-4.amzn2
httpd-filesystem.noarch 0:2.4.54-1.amzn2
httpd-tools.x86_64 0:2.4.54-1.amzn2
mailcap.noarch 0:2.1.41-2.amzn2
mod_http2.x86_64 0:1.15.19-1.amzn2.0.1
omplete!
root@ip-172-31-41-247 ec2-user]# systemctl start httpd
root@ip-172-31-41-247 ec2-user]# httpd
ttpd (pid 6799) already running
root@ip-172-31-41-247 ec2-user]# systemctl enable httpd
reated symlink from /etc/systemd/system/multi-user.target.wants/httpd.service to /usr/lib/systemd/system/httpd.service.
root@ip-172-31-41-247 ec2-user]# echo "hello world" > /var/www/html/index.html
root@ip-172-31-41-247 ec2-user]#
i-0099aba248b7617c7 (assignment)
PublicIPs: 43.207.116.203 PrivateIPs: 172.31.41.247

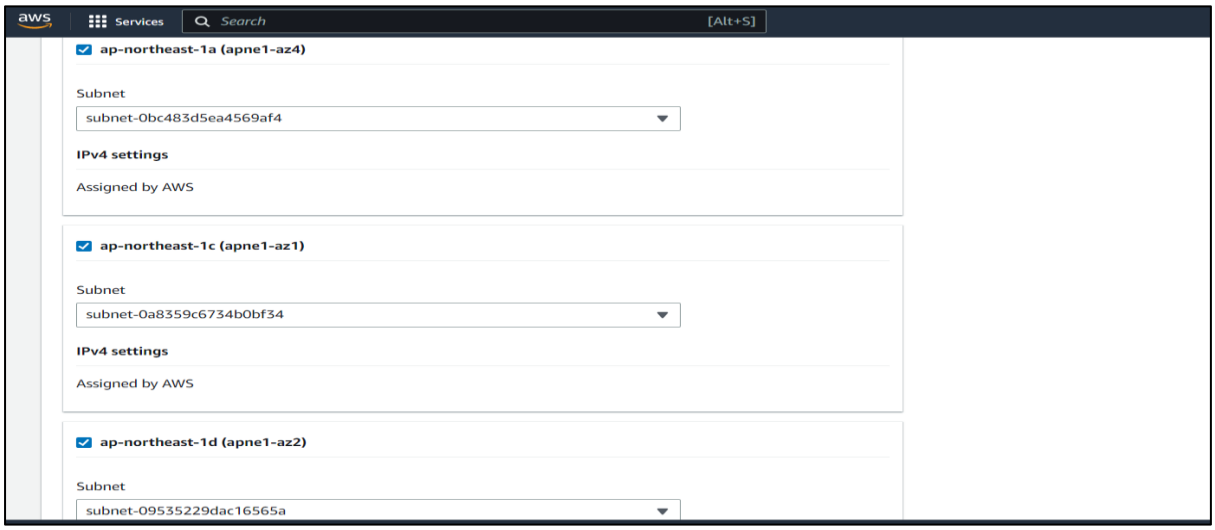

Not secure | 43.207.116.203
hello world

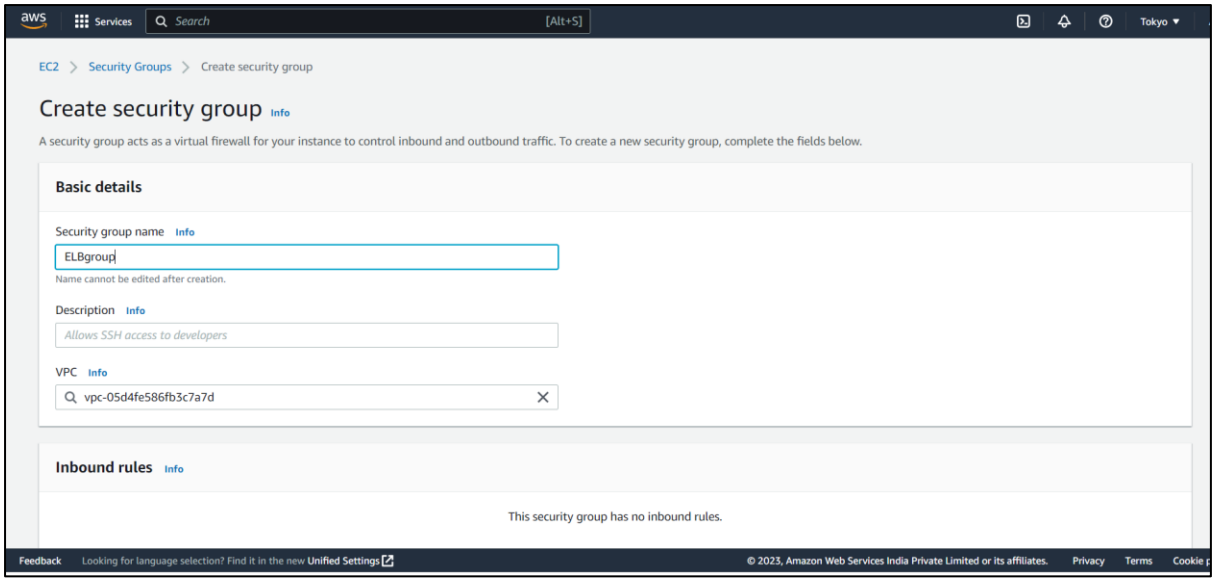
# Load Balancer:

I have created a load balancer using the security group option and I have set the inbound and outbound rules to permit http. Also I have registered the target EC2 instance which I have created earlier.




aws
Services
Search
[Alt+S]
Tokyo
EC2 > Security Groups > Create security group
Create security group Info
A security group acts as a virtual firewall for your instance to control inbound and outbound traffic. To create a new security group, complete the fields below.
Basic details
Security group name Info
ELBgroup
Name cannot be edited after creation.
Description Info
Allows SSH access to developers
VPC Info
vpc-05d4fe586fb3c7a7d
Inbound rules Info
This security group has no inbound rules.
Feedback
Looking for language selection? Find it in the new Unified Settings
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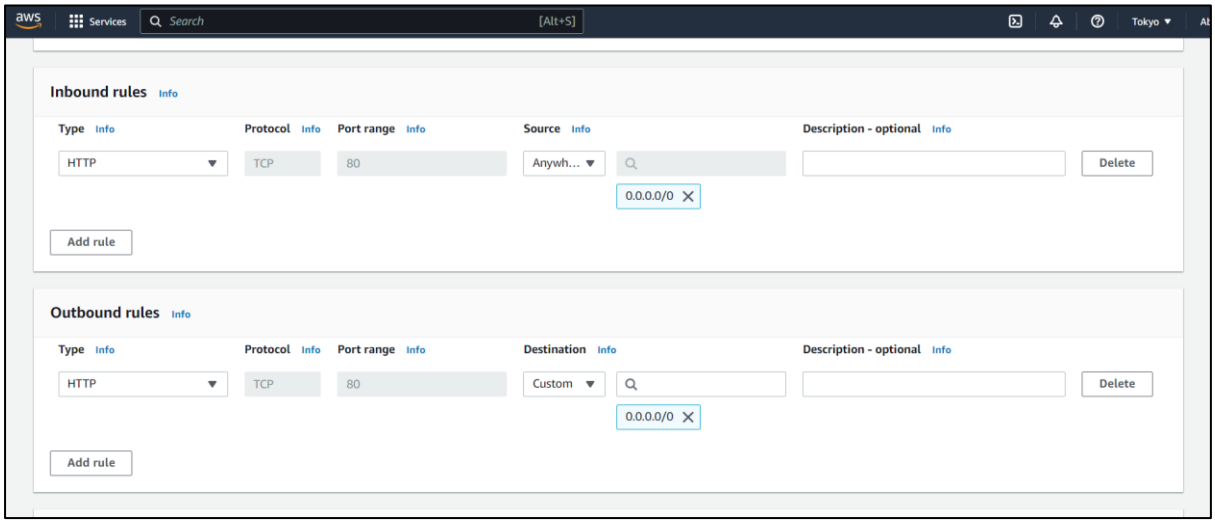
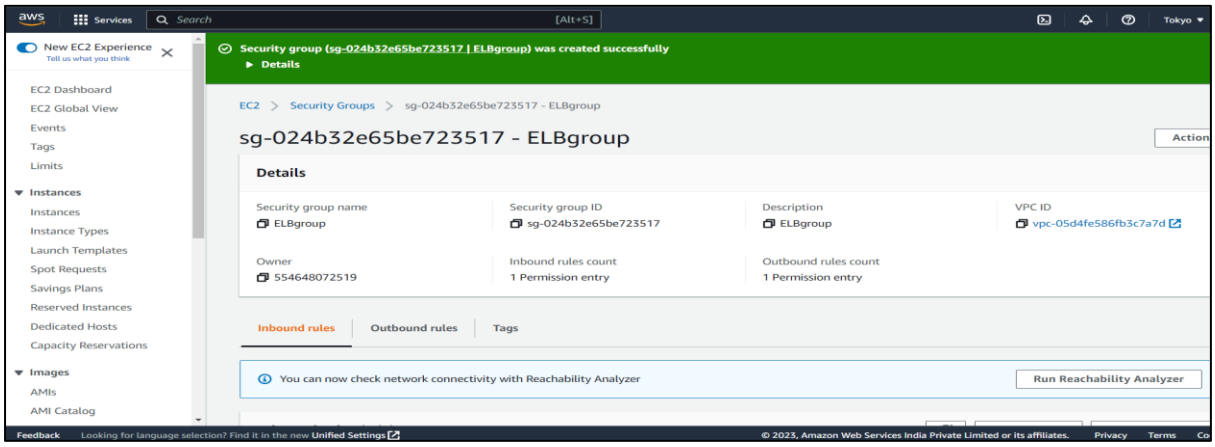
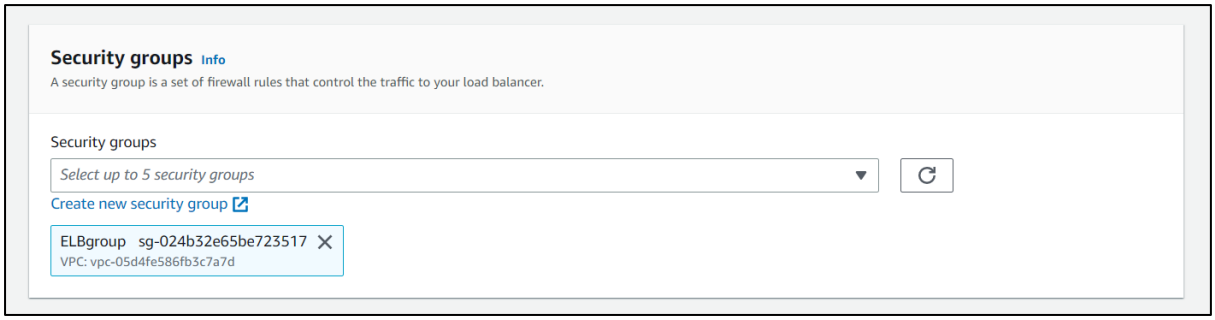
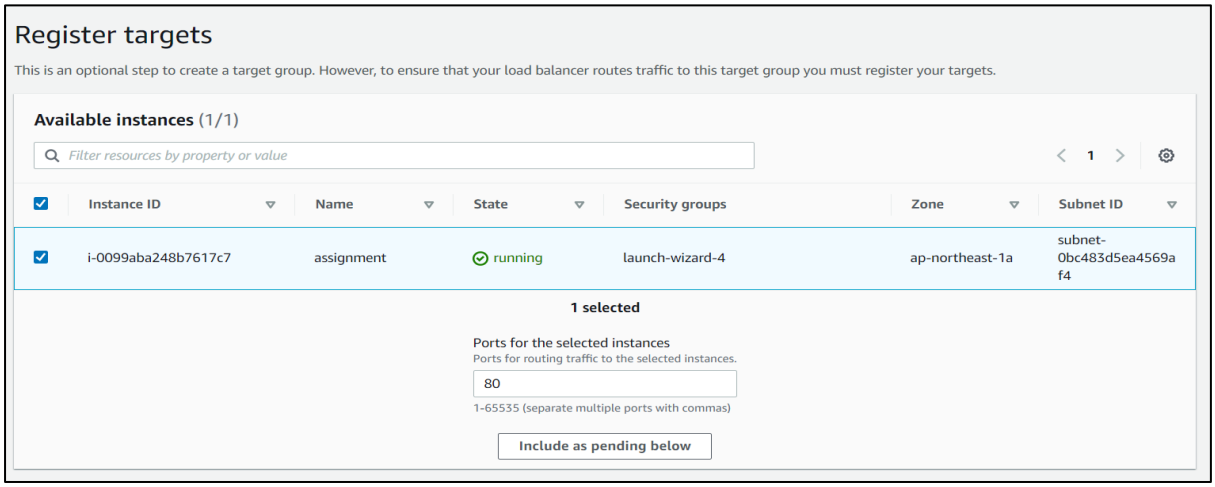
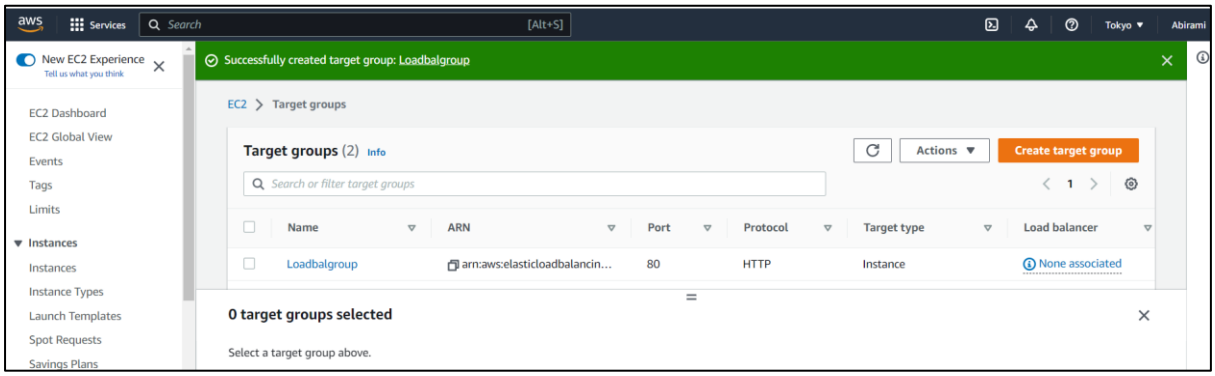
Privacy
Terms

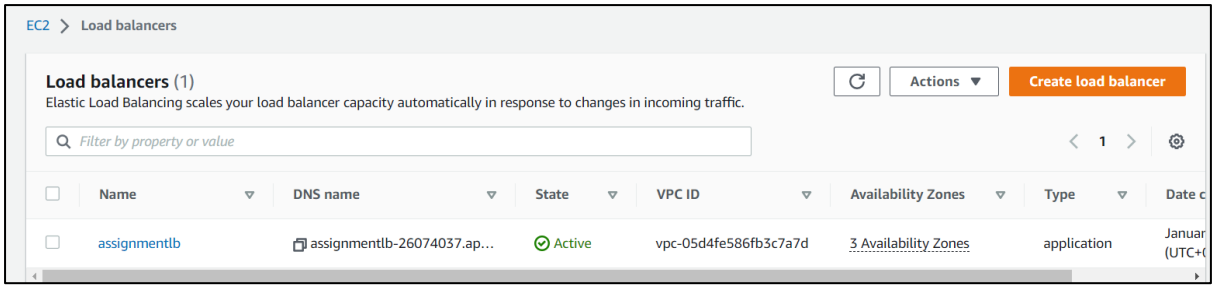

aws
Services
Search
[Alt+S]
Tokyo
Inbound rules Info
Type Info
Protocol Info
Port range Info
Source Info
Description - optional Info
HTTP
TCP
80
Anywh...
0.0.0.0/0
Delete
Add rule
Outbound rules Info
Type Info
Protocol Info
Port range Info
Destination Info
Description - optional Info
HTTP
TCP
80
Custom
0.0.0.0/0
Delete
Add rule

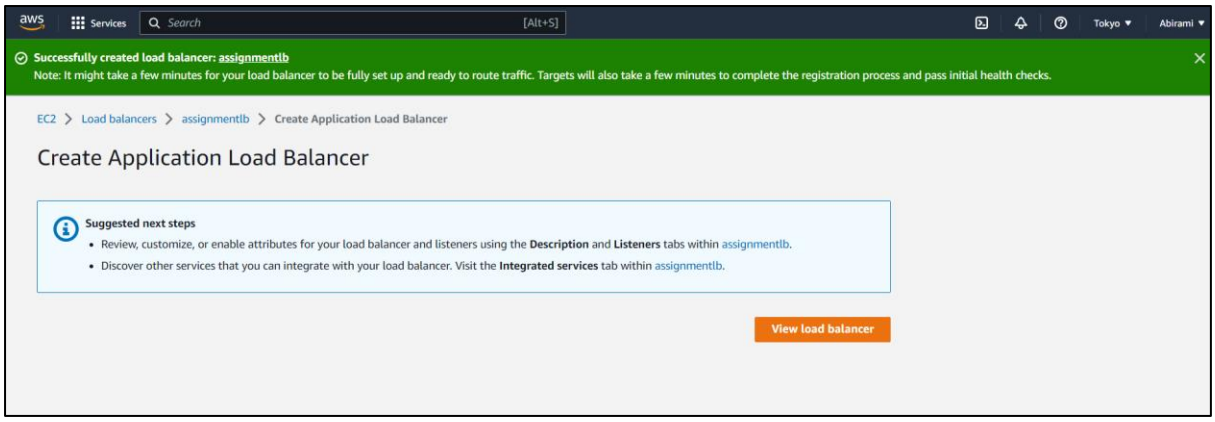

aws
Services
Search
[Alt+S]
Tokyo
New EC2 Experience
Tell us what you think
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
Images
AMIs
AMI Catalog
Security group (sg-024b32e65be723517 | ELBgroup) was created successfully
Details
EC2 > Security Groups > sg-024b32e65be723517 - ELBgroup
sg-024b32e65be723517 - ELBgroup
Action
Details
Security group name
ELBgroup
Security group ID
sg-024b32e65be723517
Description
ELBgroup
VPC ID
vpc-05d4fe586fb3c7a7d
Owner
554648072519
Inbound rules count
1 Permission entry
Outbound rules count
1 Permission entry
Inbound rules
Outbound rules
Tags
You can now check network connectivity with Reachability Analyzer
Run Reachability Analyzer
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2023, Amazon Web Services India Private Limited or its affiliates.
Privacy
Terms


Security groups Info
A security group is a set of firewall rules that control the traffic to your load balancer.
Security groups
Select up to 5 security groups
Create new security group
ELBgroup sg-024b32e65be723517
VPC: vpc-05d4fe586fb3c7a7d


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 (1/1)
Filter resources by property or value
Instance ID
Name
State
Security groups
Zone
Subnet ID
i-0099aba248b7617c7
assignment
running
launch-wizard-4
ap-northeast-1a
subnet-0bc483d5ea4569af4
1 selected
Ports for the selected instances
Ports for routing traffic to the selected instances.
80
1-65535 (separate multiple ports with commas)
Include as pending below

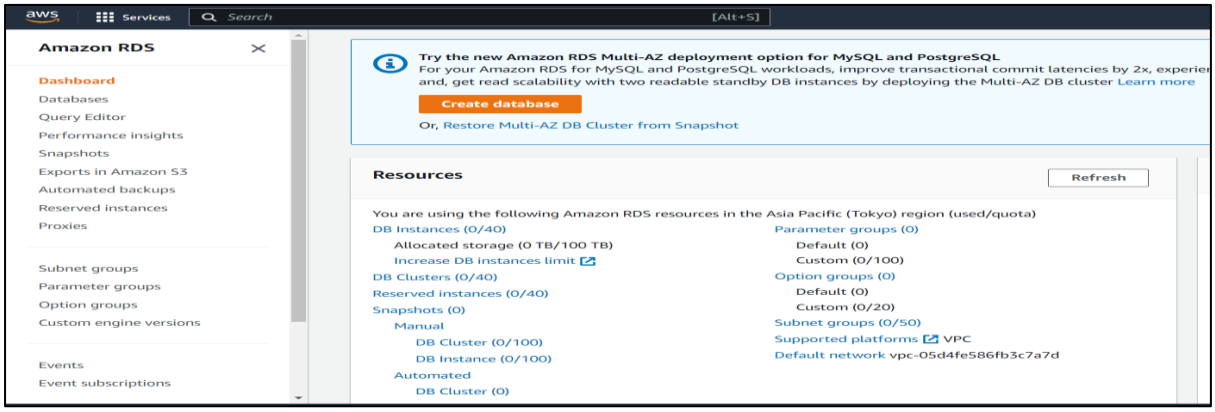

Services
Search
[Alt+S]
Tokyo
Abirami
New EC2 Experience
Tell us what you think
Successfully created target group: Loadbalgroup
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
EC2 > Target groups
Target groups (2) Info
Actions
Create target group
Search or filter target groups
Name
ARN
Port
Protocol
Target type
Load balancer
Loadbalgroup
arn:aws:elasticloadbalancin...
80
HTTP
Instance
None associated
0 target groups selected
Select a target group above.

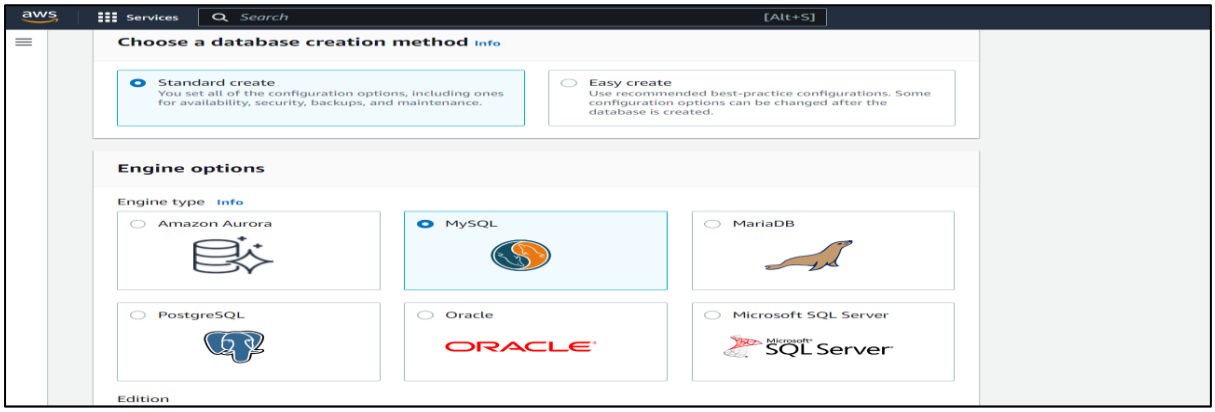


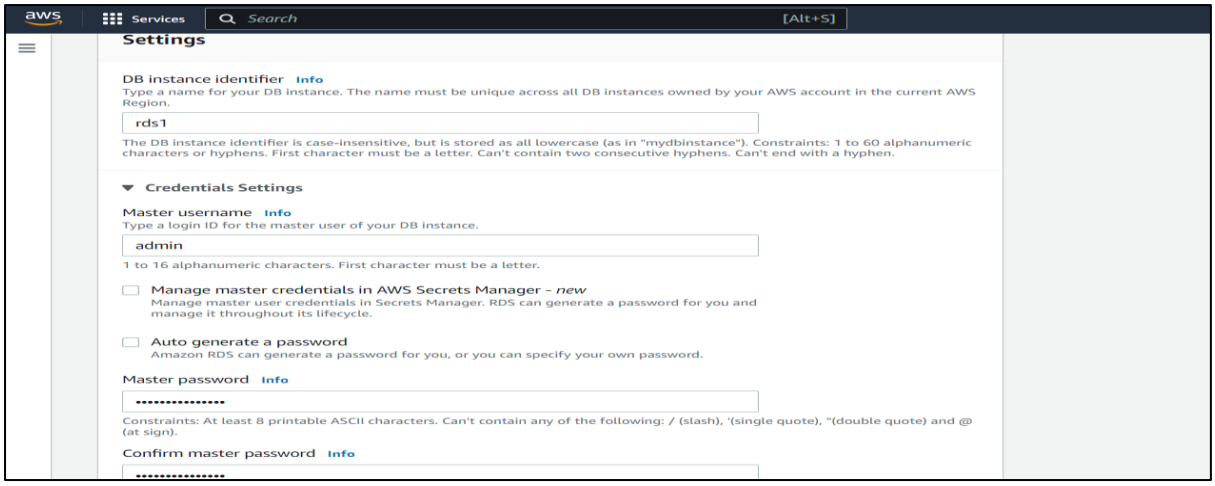



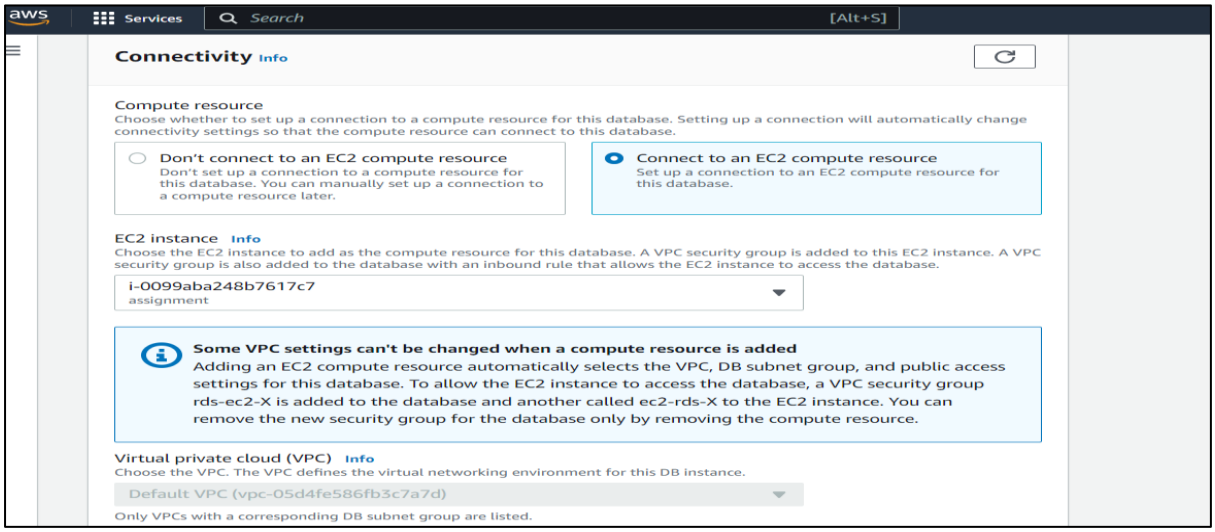

## RDS:

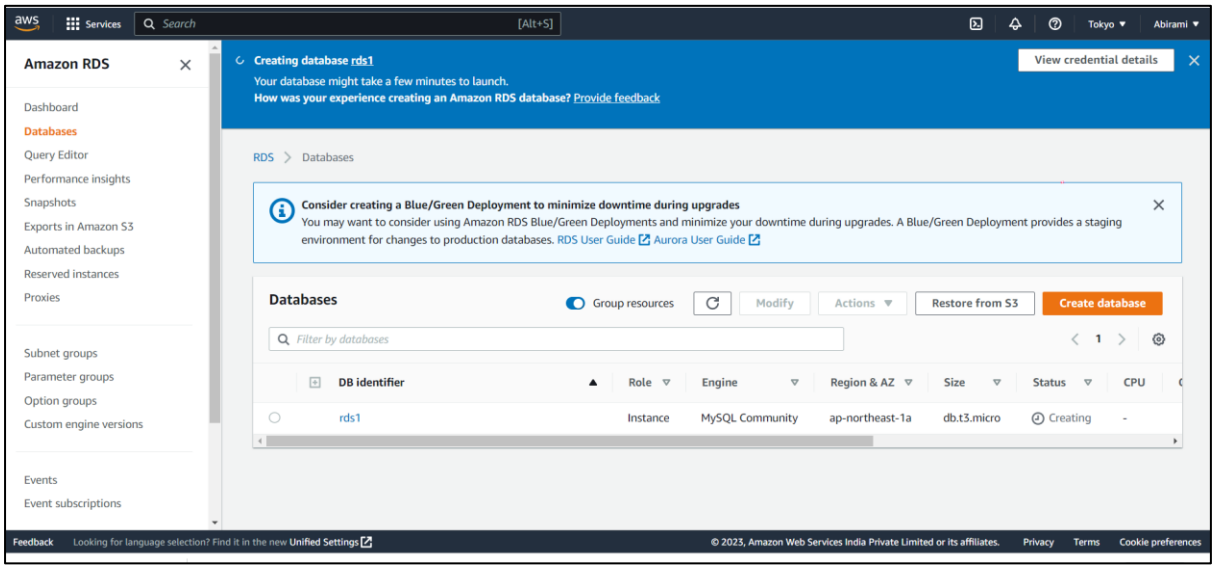
Finally I have created RDS instance with MySQL as the database. In the connectivity section I have added the previously created EC2 instance.




Services
Search
[Alt+S]
Settings
DB instance identifier Info
Type a name for your DB instance. The name must be unique across all DB instances owned by your AWS account in the current AWS Region.
rds1
The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 60 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.
Credentials Settings
Master username Info
Type a login ID for the master user of your DB instance.
admin
1 to 16 alphanumeric characters. First character must be a letter.
Manage master credentials in AWS Secrets Manager - new
Manage master user credentials in Secrets Manager. RDS can generate a password for you and manage it throughout its lifecycle.
Auto generate a password
Amazon RDS can generate a password for you, or you can specify your own password.
Master password Info
Constraints: At least 8 printable ASCII characters. Can't contain any of the following: / (slash), '(single quote), "(double quote) and @ (at sign).
Confirm master password Info


Services
Search
[Alt+S]
Connectivity Info
Compute resource
Choose whether to set up a connection to a compute resource for this database. Setting up a connection will automatically change connectivity settings so that the compute resource can connect to this database.
Don't connect to an EC2 compute resource
Don't set up a connection to a compute resource for this database. You can manually set up a connection to a compute resource later.
Connect to an EC2 compute resource
Set up a connection to an EC2 compute resource for this database.
EC2 instance Info
Choose the EC2 instance to add as the compute resource for this database. A VPC security group is added to this EC2 instance. A VPC security group is also added to the database with an inbound rule that allows the EC2 instance to access the database.
i-0099aba248b7617c7
assignment
Some VPC settings can't be changed when a compute resource is added
Adding an EC2 compute resource automatically selects the VPC, DB subnet group, and public access settings for this database. To allow the EC2 instance to access the database, a VPC security group rds-ec2-X is added to the database and another called ec2-rds-X to the EC2 instance. You can remove the new security group for the database only by removing the compute resource.
Virtual private cloud (VPC) Info
Choose the VPC. The VPC defines the virtual networking environment for this DB instance.
Default VPC (vpc-05d4fe586fb3c7a7d)
Only VPCs with a corresponding DB subnet group are listed.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You may want to consider using Amazon RDS Blue/Green Deployments and minimize your downtime during upgrades. A Blue/Green Deployment provides a staging environment for changes to production databases. RDS User Guide Aurora User Guide
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