CLOUD COMPUTING AND DEVOPS

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Assignment 3:

Title:

Deploy Web application on AWS Cloud (or any cloud) (PHP/Python/Node js any application)

Theory:

1) Cloud Computing Definition

2) Cloud Service models and Deployment models

3) Step-by-step screenshot to upload web application on the cloud

Theory:

1. Cloud computing definition:

   Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models.

2. Cloud service and deployment models

   A. Software as a Service (SaaS).

   The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure2 . The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited userspecific application configuration settings.

   B. Platform as a Service (PaaS).

   The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider.3 The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment.

   C. Infrastructure as a Service (IaaS).

   The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications; and possibly limited control of select networking components (e.g., host firewalls).

Deployment Models:

Private cloud.

The cloud infrastructure is provisioned for exclusive use by a single organization comprising multiple consumers (e.g., business units). It may be owned, managed, and operated by the organization, a third party, or some combination of them, and it may exist on or off premises. Community cloud. The cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be owned, managed, and operated by one or more of the organizations in the community, a third party, or some combination of them, and it may exist on or off premises.

Public cloud.

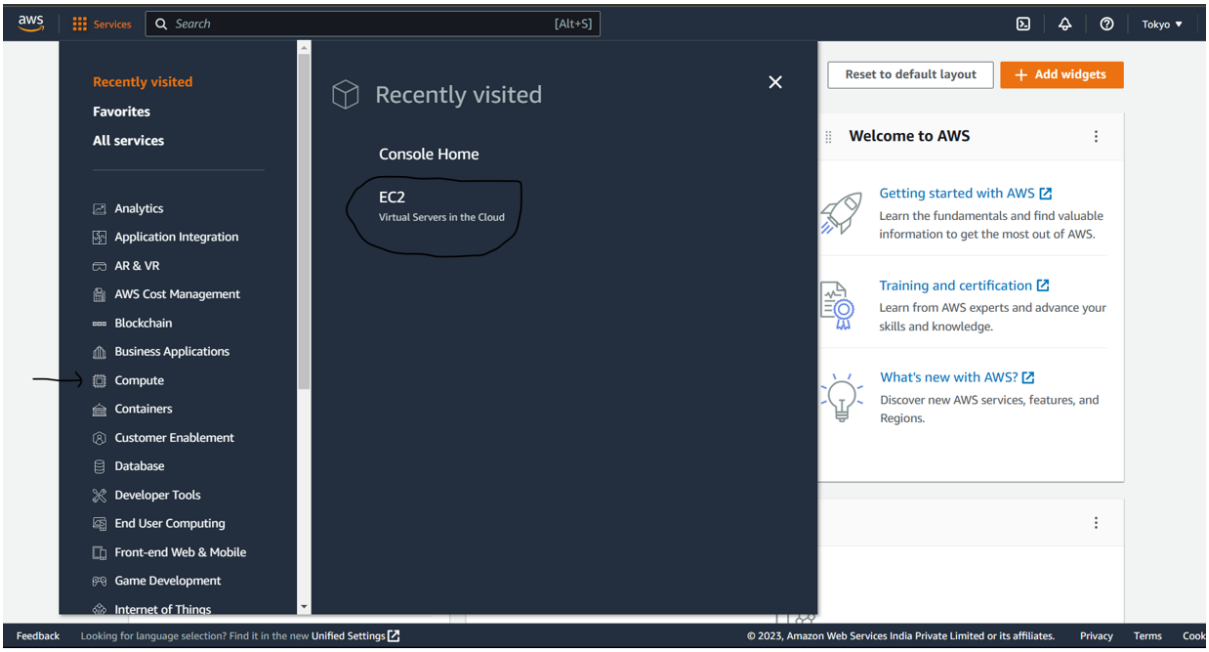
The cloud infrastructure is provisioned for open use by the general public. It may be owned, managed, and operated by a business, academic, or government organization, or some combination of them. It exists on the premises of the cloud provider.

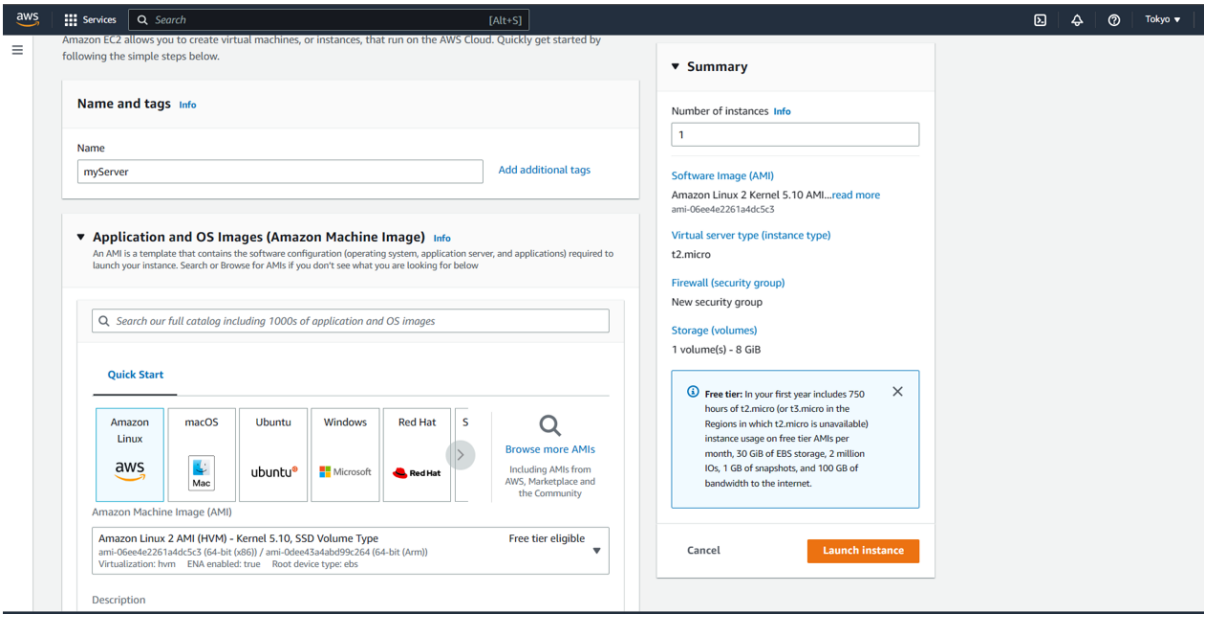
Hybrid cloud.

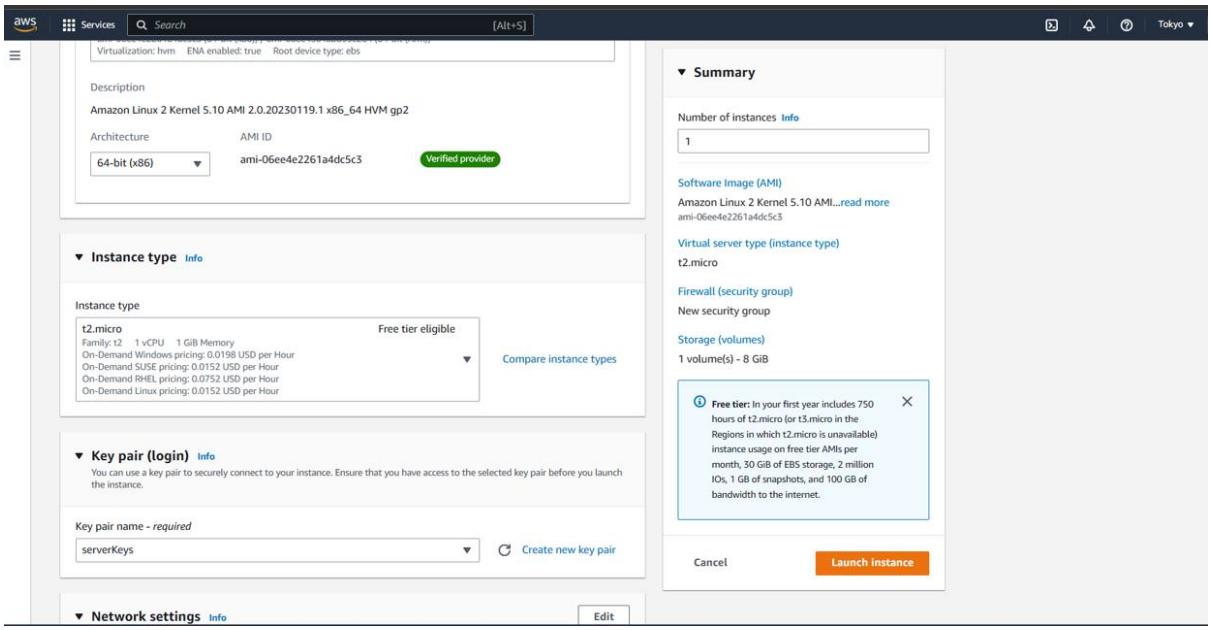
The cloud infrastructure is a composition of two or more distinct cloud infrastructures (private, community, or public) that remain unique entities, but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing between clouds).

(Reference: NIST website)

3. Screenshot to deploy a web application on AWS cloud






aws
Services
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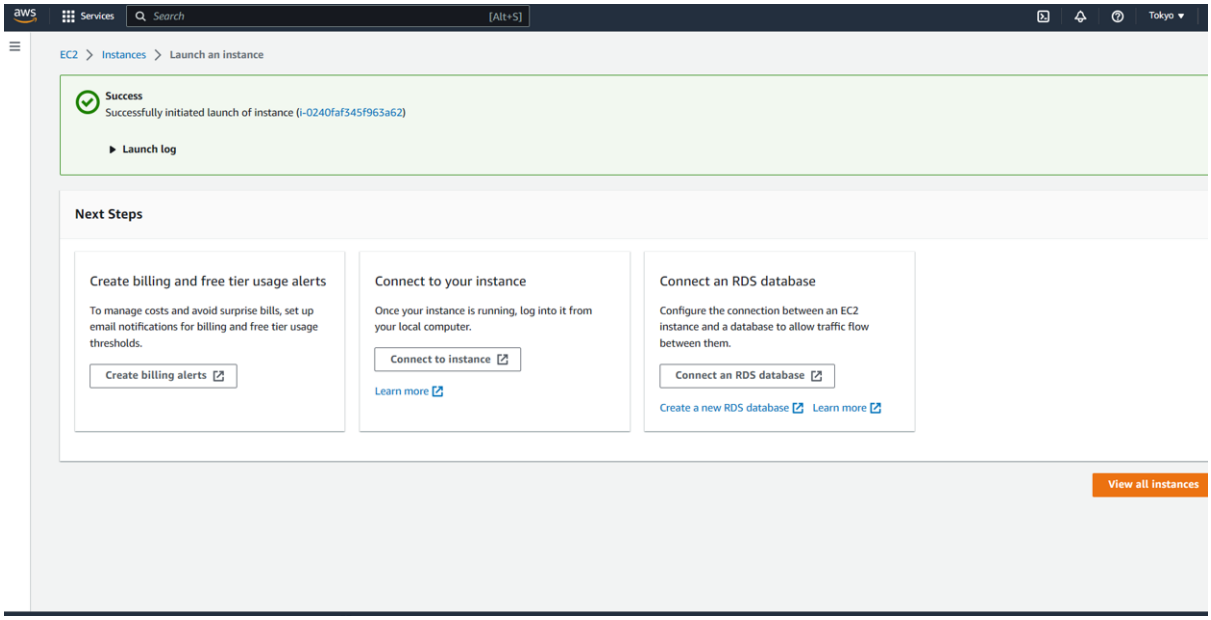
Virtualization: hvm ENA enabled: true Root device type: ebs
Description
Amazon Linux 2 Kernel 5.10 AMI 2.0.20230119.1 x86_64 HVM gp2
Architecture
AMI ID
64-bit (x86)
ami-06ee4e2261a4dc5c3
Verified provider
Instance type Info
Instance type
t2.micro
Free tier eligible
Family: t2 1 vCPU 1 GiB Memory
On-Demand Windows pricing: 0.0198 USD per Hour
On-Demand SUSE pricing: 0.0152 USD per Hour
On-Demand RHEL pricing: 0.0752 USD per Hour
On-Demand Linux pricing: 0.0152 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
serverKeys
Create new key pair
Network settings Info
Edit
Summary
Number of instances Info
1
Software Image (AMI)
Amazon Linux 2 Kernel 5.10 AMI...read more
ami-06ee4e2261a4dc5c3
Virtual server type (instance type)
t2.micro
Firewall (security group)
New security group
Storage (volumes)
1 volume(s) - 8 GiB
Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.
Cancel
Launch instance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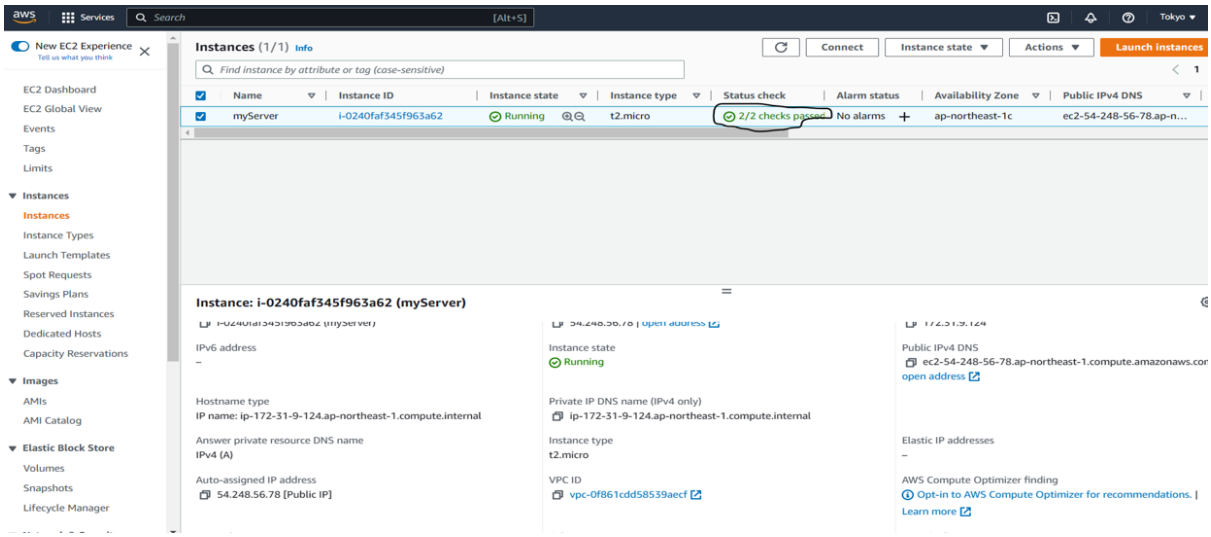
EC2 > Instances > Launch an instance
Success
Successfully initiated launch of instance (i-0240faf345f963a62)
Launch log
Next Steps
Create billing and free tier usage alerts
To manage costs and avoid surprise bills, set up email notifications for billing and free tier usage thresholds.
Create billing 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
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
View all instances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Elastic Block Store
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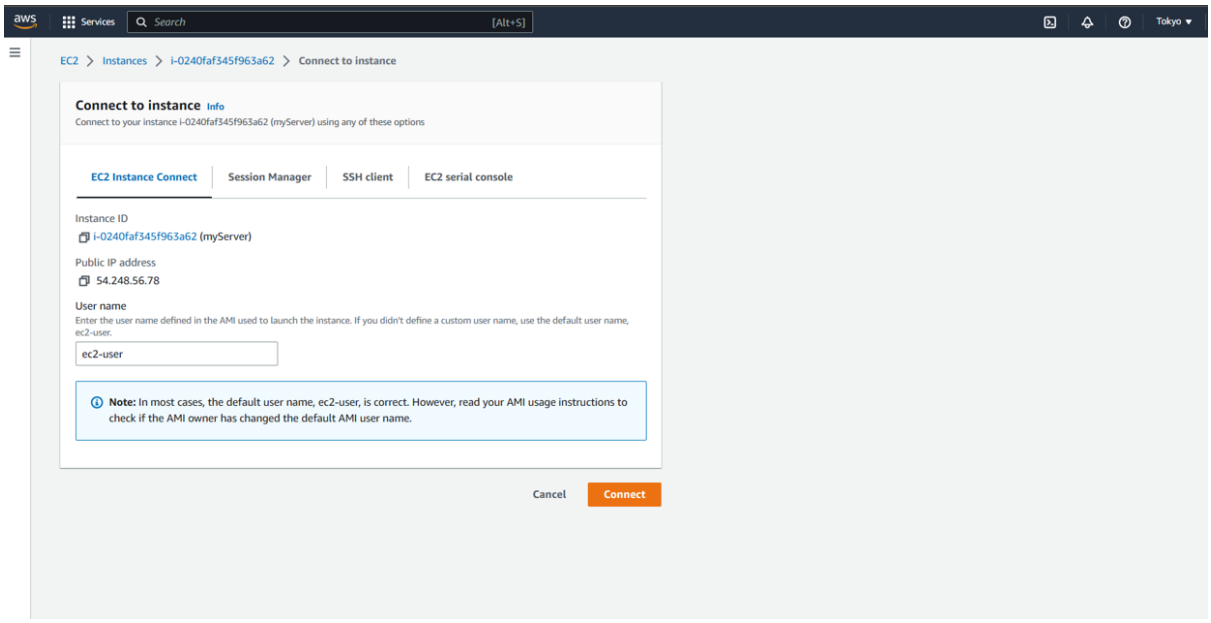
Lifecycle Manager
Instances (1/1) Info
Find instance by attribute or tag (case-sensitive)
Connect
Instance state
Actions
Launch instances
Name
Instance ID
Instance state
Instance type
Status check
Alarm status
Availability Zone
Public IPv4 DNS
myServer
i-0240faf345f963a62
Running
t2.micro
2/2 checks passed
No alarms
ap-northeast-1c
ec2-54-248-56-78.ap-n...
Instance: i-0240faf345f963a62 (myServer)
IPv6 address
–
Instance state
Running
Public IPv4 DNS
ec2-54-248-56-78.ap-northeast-1.compute.amazonaws.com
open address
Hostname type
IP name: ip-172-31-9-124.ap-northeast-1.compute.internal
Private IP DNS name (IPv4 only)
ip-172-31-9-124.ap-northeast-1.compute.internal
Answer private resource DNS name
IPv4 (A)
Instance type
t2.micro
Elastic IP addresses
–
Auto-assigned IP address
54.248.56.78 [Public IP]
VPC ID
vpc-0f861cdd58539aecf
AWS Compute Optimizer finding
Opt-in to AWS Compute Optimizer for recommendations.
Learn more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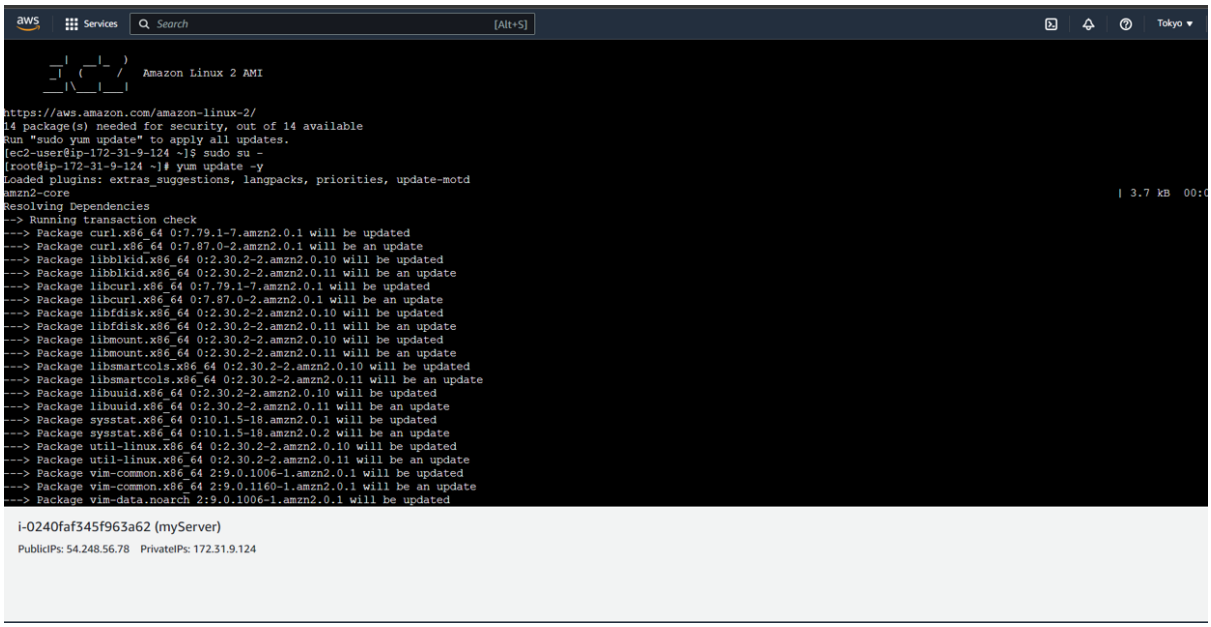
EC2 > Instances > i-0240faf345f963a62 > Connect to instance
Connect to instance Info
Connect to your instance i-0240faf345f963a62 (myServer) using any of these options
EC2 Instance Connect
Session Manager
SSH client
EC2 serial console
Instance ID
i-0240faf345f963a62 (myServer)
Public IP address
54.248.56.78
User name
Enter the user name defined in the AMI used to launch the instance. If you didn't define a custom user name, use the default user name, ec2-user.
ec2-user
Note: In most cases, the default user name, ec2-user, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI user name.
Cancel
Connect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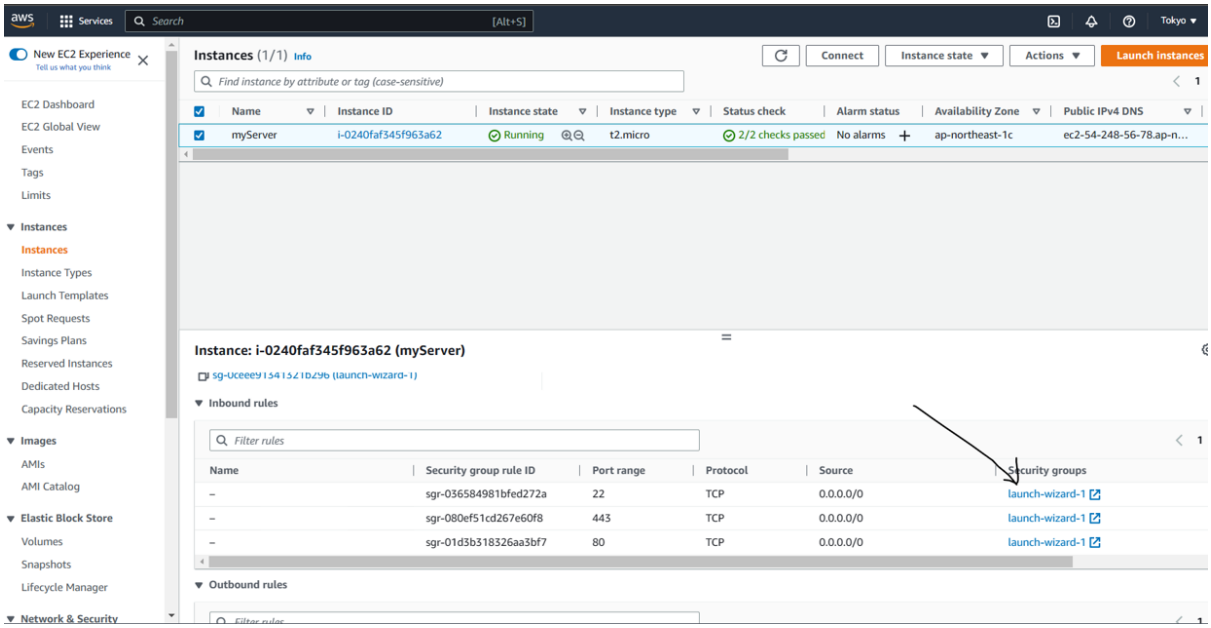
Amazon Linux 2 AMI
https://aws.amazon.com/amazon-linux-2/
14 package(s) needed for security, out of 14 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-9-124 ~]$ sudo su -
[root@ip-172-31-9-124 ~]# yum update -y
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core
| 3.7 kB 00:0
Resolving Dependencies
--> Running transaction check
---> Package curl.x86_64 0:7.79.1-7.amzn2.0.1 will be updated
---> Package curl.x86_64 0:7.87.0-2.amzn2.0.1 will be an update
---> Package libblkid.x86_64 0:2.30.2-2.amzn2.0.10 will be updated
---> Package libblkid.x86_64 0:2.30.2-2.amzn2.0.11 will be an update
---> Package libcurl.x86_64 0:7.79.1-7.amzn2.0.1 will be updated
---> Package libcurl.x86_64 0:7.87.0-2.amzn2.0.1 will be an update
---> Package libfdisk.x86_64 0:2.30.2-2.amzn2.0.10 will be updated
---> Package libfdisk.x86_64 0:2.30.2-2.amzn2.0.11 will be an update
---> Package libmount.x86_64 0:2.30.2-2.amzn2.0.10 will be updated
---> Package libmount.x86_64 0:2.30.2-2.amzn2.0.11 will be an update
---> Package libsmartcols.x86_64 0:2.30.2-2.amzn2.0.10 will be updated
---> Package libsmartcols.x86_64 0:2.30.2-2.amzn2.0.11 will be an update
---> Package libuuid.x86_64 0:2.30.2-2.amzn2.0.10 will be updated
---> Package libuuid.x86_64 0:2.30.2-2.amzn2.0.11 will be an update
---> Package sysstat.x86_64 0:10.1.5-18.amzn2.0.1 will be updated
---> Package sysstat.x86_64 0:10.1.5-18.amzn2.0.2 will be an update
---> Package util-linux.x86_64 0:2.30.2-2.amzn2.0.10 will be updated
---> Package util-linux.x86_64 0:2.30.2-2.amzn2.0.11 will be an update
---> Package vim-common.x86_64 2:9.0.1006-1.amzn2.0.1 will be updated
---> Package vim-common.x86_64 2:9.0.1160-1.amzn2.0.1 will be an update
---> Package vim-data.noarch 2:9.0.1006-1.amzn2.0.1 will be updated
i-0240faf345f963a62 (myServer)
PublicIPs: 54.248.56.78 PrivateIPs: 172.31.9.124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Alarm status
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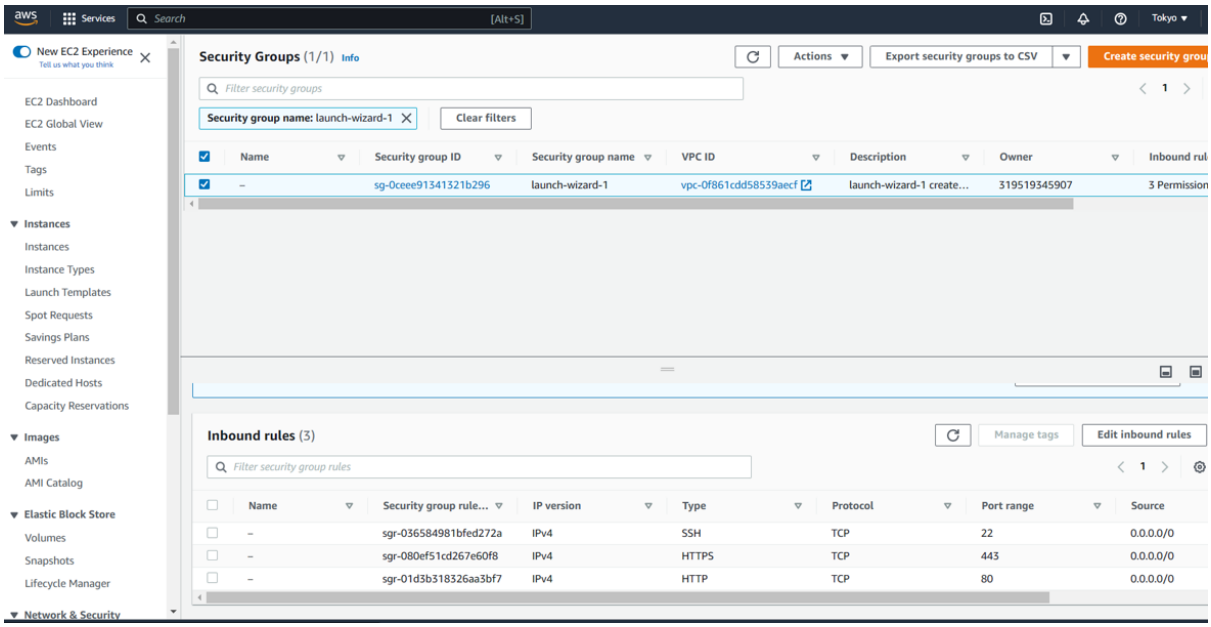
myServer
i-0240faf345f963a62
Running
t2.micro
2/2 checks passed
No alarms
ap-northeast-1c
ec2-54-248-56-78.ap-n...
Instance: i-0240faf345f963a62 (myServer)
Inbound rules
Filter rules
Name
Security group rule ID
Port range
Protocol
Source
Security groups
sgr-036584981bfed272a
22
TCP
0.0.0.0/0
launch-wizard-1
sgr-080ef51cd267e60f8
443
TCP
0.0.0.0/0
launch-wizard-1
sgr-01d3b318326aa3bf7
80
TCP
0.0.0.0/0
launch-wizard-1
Outbound rules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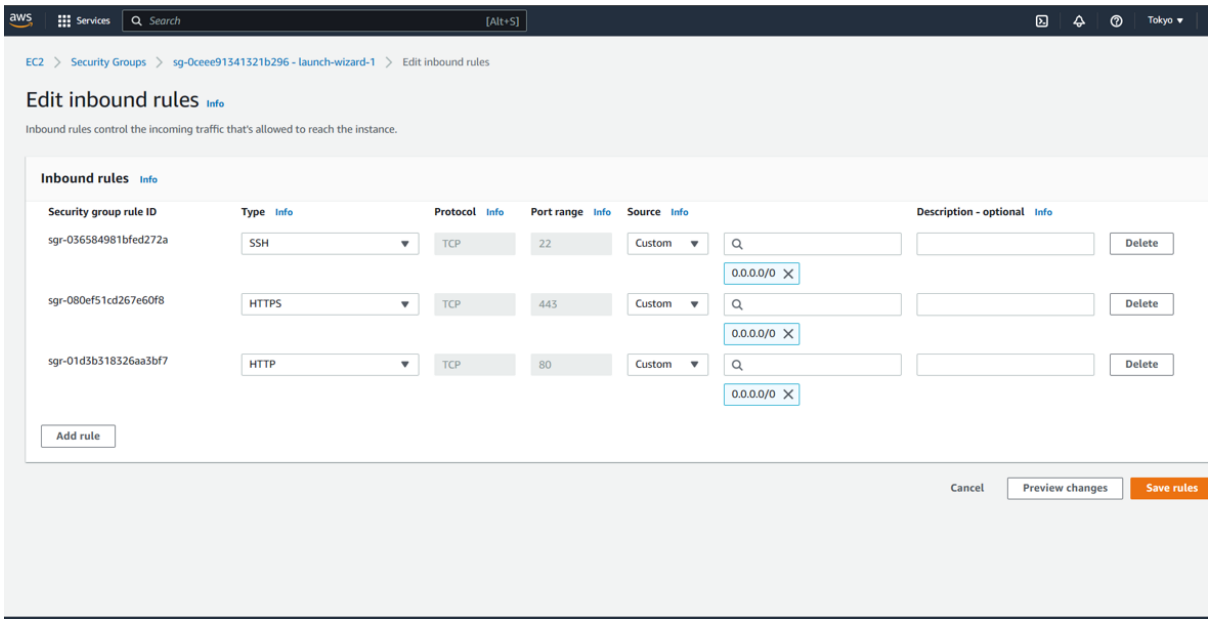
Security Groups (1/1) Info
Actions
Export security groups to CSV
Create security grou
Filter security groups
Security group name: launch-wizard-1
Clear filters
Name
Security group ID
Security group name
VPC ID
Description
Owner
Inbound rul
sg-0ceee91341321b296
launch-wizard-1
vpc-0f861cdd58539aecf
launch-wizard-1 create...
319519345907
3 Permission
Inbound rules (3)
Manage tags
Edit inbound rules
Filter security group rules
Security group rule...
IP version
Type
Protocol
Port range
Source
sgr-036584981bfed272a
IPv4
SSH
TCP
22
0.0.0.0/0
sgr-080ef51cd267e60f8
HTTPS
443
sgr-01d3b318326aa3bf7
HTTP
80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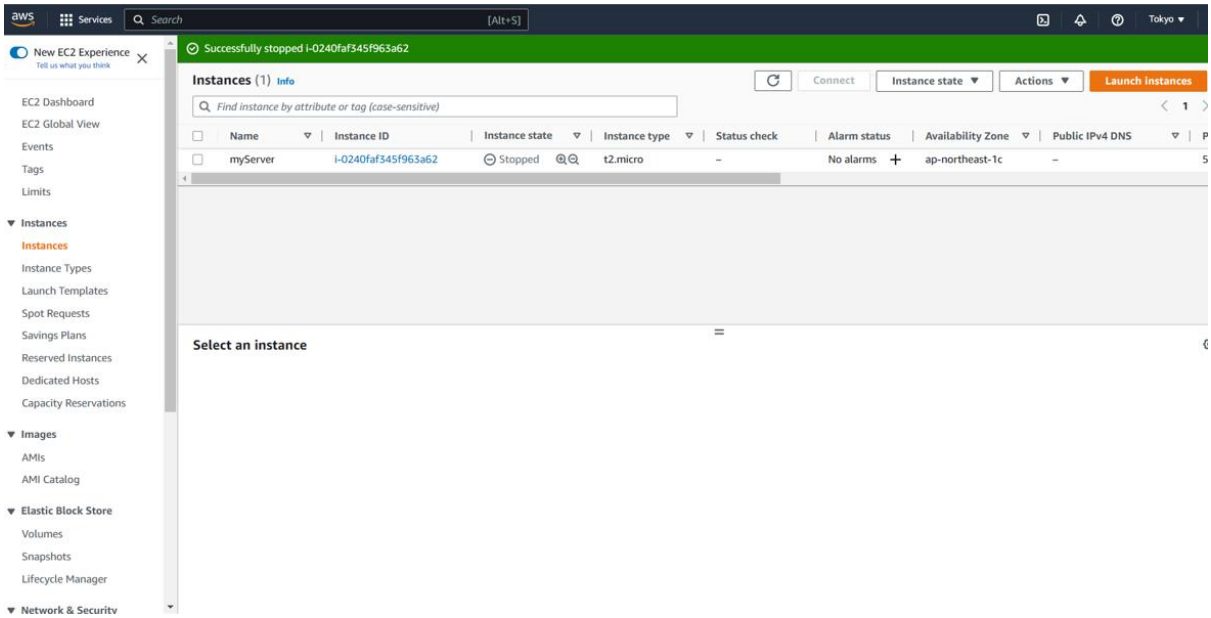
EC2 > Security Groups > sg-0ceee91341321b296 - launch-wizard-1 > Edit inbound rules
Edit inbound rules Info
Inbound rules control the incoming traffic that's allowed to reach the instance.
Inbound rules Info
Security group rule ID
Type Info
Protocol Info
Port range Info
Source Info
Description - optional Info
sgr-036584981bfed272a
SSH
TCP
22
Custom
0.0.0.0/0
Delete
sgr-080ef51cd267e60f8
HTTPS
443
sgr-01d3b318326aa3bf7
HTTP
80
Add rule
Cancel
Preview changes
Save rules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Instance state
Instance type
Status check
Alarm status
Availability Zone
Public IPv4 DNS
myServer
i-0240faf345f963a62
Stopped
t2.micro
No alarms
ap-northeast-1c
Select an instance