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Subject: CC

Practical No. : 2

Practical Name: Lab 3: Introduction to Amazon EC2

Amazon Elastic Compute Cloud (Amazon EC2)

Definition :

Amazon Web Services provides scalable virtual server for hosting applications this virtual server are called **INSTANCES**.

EC2 instance is a virtual machine running on AWS.

Why EC2 ?

- 1). **Scalability** – Scale Resource
- 2). **Flexibility** - Choose instance type, operating system, and software.
- 3). **Cost Effective** – Pay for your use.
- 4). **Global Reach** - Deploy applications in multiple geographic regions for low latency.
- 5). **Storage** - Use Elastic Block Storage (EBS) for persistent data storage.
- 6). **Networking** - Attach your instance to a Virtual Private Cloud (VPC) for secure communication.

Example Use Case :

There are four steps

- 1). Launch an EC2 Instance
- 2). Install web server
- 3). Configure security groups
- 4). Monitor and Scale

1). Launch an EC2 Instance

Instance Types:

- **General Purpose:** For web servers and development environments (e.g., t2, t3).
- **Compute Optimized:** For compute-intensive tasks (e.g., c5, c6g).
- **Memory Optimized:** For large in-memory databases (e.g., r5, x2idn).
- **Storage Optimized:** For high read/write access to data (e.g., i3, d2).

Steps to launch EC2 :

1). EC2 > Instances > Launch an instance.

Give instance name “Web Server”

The screenshot shows the AWS Management Console interface for launching an EC2 instance. The breadcrumb navigation at the top reads 'EC2 > Instances > Launch an instance'. The main heading is 'Launch an instance' with an 'Info' link. Below this, a sub-header 'Name and tags' has a text input field containing 'Web Server' and an 'Add additional tags' link. The next section is 'Application and OS Images (Amazon Machine Image)' with a search bar and a 'Quick Start' tab. Under 'Quick Start', there are several AMI tiles for Amazon Linux, macOS, Ubuntu, Windows, Red Hat, SUSE Linux, and Debian. To the right, a 'Summary' panel displays configuration details: 'Number of instances' is 1, 'Software Image (AMI)' is 'Amazon Linux 2023 AMI 2023.6.2', 'Virtual server type (Instance type)' is 't2.micro', 'Firewall (security group)' is 'New security group', and 'Storage (volumes)' is '1 volume(s) - 8 GiB'. A 'Free tier' notification is visible in the summary panel. At the bottom right of the summary panel are 'Cancel', 'Launch instance', and 'Preview code' buttons.

2). Select Instance type :

Here we have to host a website for that select t2

What is t2.micro ?

T is...

T (Burstable Performance): Economical, designed for workloads with occasional peaks in usage.

M (General Purpose): Balanced CPU and memory for general use cases.

C (Compute Optimized): High CPU for compute-intensive tasks.

R (Memory Optimized): High memory for memory-intensive applications.

I (Storage Optimized): High disk throughput for data-intensive tasks.

2 is the generation of instance family.

Micro is size. (ex. Xlarge, small, medium, large etc..)

The screenshot shows the 'Launch an instance' page in the AWS Management Console. The 'Instance type' section is expanded, showing 't2.micro' as the selected instance type. It lists pricing for various operating systems: On-Demand Windows (0.0162 USD per Hour), On-Demand Ubuntu Pro (0.0134 USD per Hour), On-Demand SUSE (0.0116 USD per Hour), and On-Demand RHEL (0.026 USD per Hour). A 'Free tier eligible' badge is present. The 'Key pair (login)' section is also expanded, showing a key pair named 'vockey' and a 'Create new key pair' button. The 'Summary' section on the right shows 'Number of instances' as 1, 'Software Image (AMI)' as 'Amazon Linux 2023 AMI 2023.6.2...', 'Virtual server type (instance type)' as 't2.micro', 'Firewall (security group)' as 'New security group', and 'Storage (volumes)' as '1 volume(s) - 8 GiB'. A 'Free tier' notice is also visible.

3).Select VPC and Security Group :

The screenshot shows the 'Launch an instance' page in the AWS Management Console, with the 'Network settings' section expanded. The 'VPC - required' dropdown is set to 'vpc-0759853f6495dc9d7 (Lab VPC)'. The 'Subnet' dropdown is set to 'subnet-0bfa1e97c0542d9c5 (PublicSubnet1)'. The 'Auto-assign public IP' is set to 'Enable'. The 'Firewall (security groups)' section shows 'Create security group' selected. The 'Security group name - required' field is set to 'launch-wizard-1'. The 'Summary' section on the right is the same as in the previous screenshot. At the bottom, there are 'Cancel', 'Launch instance', and 'Preview code' buttons.

4).Pass User data :

- Install an Apache web server (httpd)
- Configure the web server to start on boot automatically
- Run the Web server once it has finished installing
- Create a simple web page

Allow tags in metadata [Info](#)

Select

User data - optional [Info](#)

Upload a file with your user data or enter it in the field.

[Choose file](#)

```
#!/bin/bash
dnf install -y httpd
systemctl enable httpd
systemctl start httpd
echo '<html><h1>Hello From Your Web Server</h1></html>' > /var/www/html/index.html
```

☐ User data has already been base64 encoded

Summary

Number of instances [Info](#)

1

Software Image (AMI)

Amazon Linux 2023 AMI 2023.6.2...[read more](#)

ami-09115b7bf8be3c5e4

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, 750 hours of public IPv4 address usage per month, 30

[Cancel](#) [Launch instance](#) [Preview code](#)

Successfully created instance...

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public
<input type="checkbox"/>	Bastion Host	i-035b99e4807ed556a	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	ec2-44-211-93-205.co...	44.211
<input type="checkbox"/>	Web Server	i-056d8ddad25a709c5	Running	t2.micro	Initializing	View alarms +	us-east-1a	ec2-44-200-59-232.co...	44.200

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public
<input type="checkbox"/>	Bastion Host	i-035b99e4807ed556a	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	ec2-44-211-93-205.co...	44.211
<input type="checkbox"/>	Web Server	i-056d8ddad25a709c5	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	ec2-44-200-59-232.co...	44.200

Instances (1/2) Info

Find Instance by attribute or tag (case-sensitive)

All states

Last updated 1 minute ago

Connect

Instance state

Actions

Launch instances

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
<input type="checkbox"/>	Bastion Host	i-035b99e4807ed556a	Running	t2.micro	2/2 checks passed	View alarms	us-east-1a
<input checked="" type="checkbox"/>	Web Server	i-056d8ddad25a709c5	Running	t2.micro	2/2 checks passed	View alarms	us-east-1a

i-056d8ddad25a709c5 (Web Server)

Details

Status and alarms

Monitoring

Security

Networking

Storage

Tags

▼ Instance summary Info

Instance ID

i-056d8ddad25a709c5

IPv6 address

-

Hostname type

IP name: ip-10-0-1-8.ec2.internal

Public IPv4 address

44.200.59.232 [open address](#)

Instance state

Running

Private IP DNS name (IPv4 only)

ip-10-0-1-8.ec2.internal

Get system log

Get instance screenshot

Manage detailed monitoring

Manage CloudWatch alarms

Configure CloudWatch agent

EC2 serial console

Replace root volume

Fleet Manager

Instance audit

Monitor and troubleshoot

EC2-44-200-59-232.compute-1.amazonaws.com

[open address](#)

aws

EC2

Instances

l-056b8ddad25a709c5

Get system log

Search

Alt+S

United States (N. Virginia)

vocabu:svr572427228C197@nirmamun.in on 1372-2047-3149

Dashboard

EC2 Global View

Events

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Capacity Reservations

Images

AMIs

AMI Catalog

Elastic Block Store

Volumes

Snapshots

Lifecycle Manager

Network & Security

Security Groups

Elastic IPs

Placement Groups

Get system log

When you experience issues with your EC2 instance, reviewing system logs can help you pinpoint the cause.

System log

Review system log for instance i-056b8ddad25a709c5 as of Wed Jan 15 2025 09:23:06 GMT+0530 (India Standard Time)

29.91820

cloud-init[2182]:

Verifying

:

mod_httpd-2.0.27-1.amzn2023.0.3.x86_64

11/12

30.257923

cloud-init[2182]:

Verifying

:

mod_lua-2.4.62-1.amzn2023.x86_64

12/12

30.258093

cloud-init[2182]:

Installed:

30.258942

cloud-init[2182]:

apr-1.7.2-1.amzn2023.0.2.x86_64

30.258965

cloud-init[2182]:

apr-util-1.6.3-1.amzn2023.0.1.x86_64

30.258987

cloud-init[2182]:

apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64

30.259009

cloud-init[2182]:

generic-logos-httpd-18.0.0-12.amzn2023.0.3.noarch

30.259040

cloud-init[2182]:

httpd-2.4.62-1.amzn2023.x86_64

30.259062

cloud-init[2182]:

httpd-core-2.4.62-1.amzn2023.x86_64

30.259071

cloud-init[2182]:

httpdfilesystem-2.4.62-1.amzn2023.noarch

30.269958

cloud-init[2182]:

httpd-tools-2.4.62-1.amzn2023.x86_64

30.272437

cloud-init[2182]:

libbrotli-1.0.9-4.amzn2023.0.2.x86_64

30.274681

cloud-init[2182]:

mailcap-2.1.40-3.amzn2023.0.2.noarch

30.274917

cloud-init[2182]:

mod_httpd-2.0.27-1.amzn2023.0.3.x86_64

30.278231

cloud-init[2182]:

mod_lua-2.4.62-1.amzn2023.x86_64

30.289535

cloud-init[2182]:

complete!

30.290479

cloud-init[2182]:

Created symlink /etc/systemd/system/multi-user.target.wants/http.service > /usr/lib/systemd/system/http.service.

30.072665

rpm generator[config[425]]:

rpm: system has too much memory (04990), limit is 100m, ignoring

i-info:

Authorized keys from /home/ec2-user/.ssh/authorized_keys for user ec2-user

ci-info:

ci-info:

KeyType | Fingerprint (sha256) | Options | Comment

For boot or networking issues, use the EC2 serial console for troubleshooting. Choose the **Connect** button to start a session.

Connect

Amazon CloudShell

EC2 > Instances > i-056d8ddad25a709c5 > Get instance screenshot

Get instance screenshot [Info](#)

Instance screenshot

i-056d8ddad25a709c5 (Web Server) on 2025-01-15 at T09:16:43.142 +05:30

[Refresh](#) [Download](#)

```
Amazon Linux 2023.6.20250114
Kernel 6.1.119-129.201.amzn2023.x86_64 on an x86_64 (-)

ip-10-0-1-8 login: [ 29.028534] zram_generator::config[22701]: zram0: system has too much memory (949MB), limit is 800MB, ignoring.
[ 30.072066] zram_generator::config[34251]: zram0: system has too much memory (949MB), limit is 800MB, ignoring.
```

CloudShell Feedback

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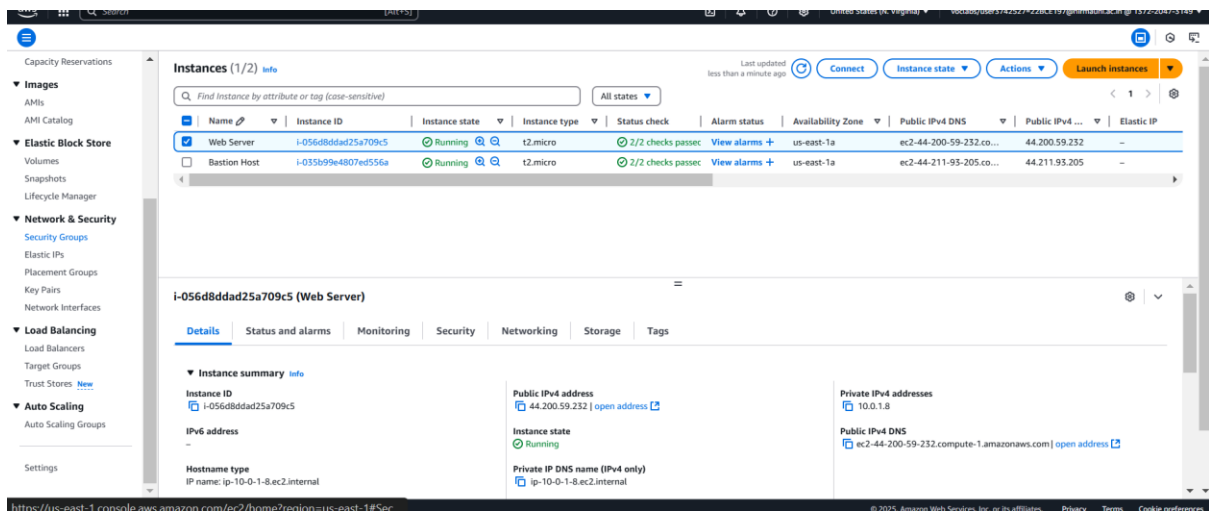
Upcoming

Search

ENG

09:16

Create Security Groups :



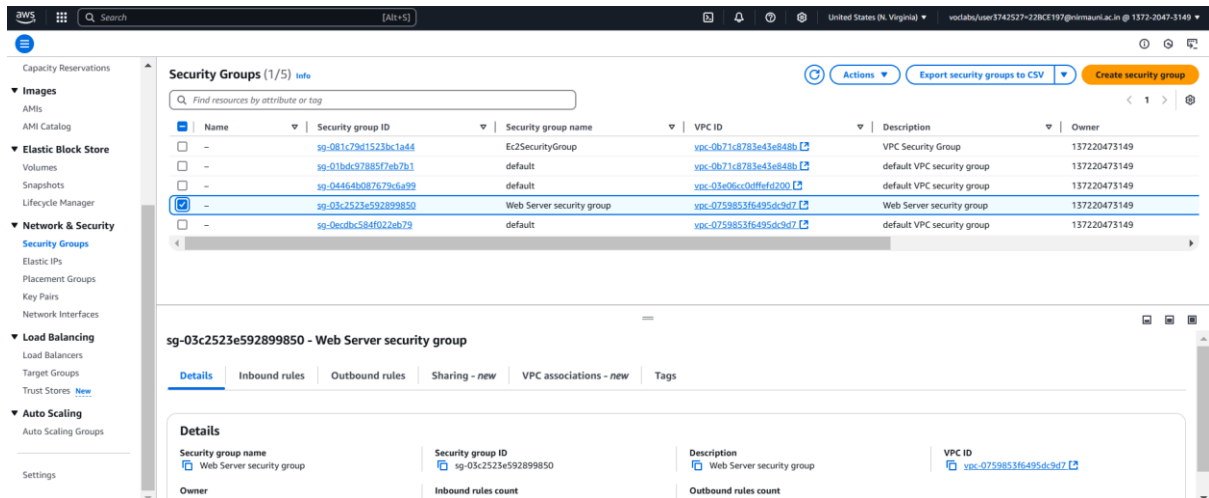
Instances (1/2)

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
Web Server	i-056d8ddad25a709c5	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	ec2-44-200-59-232.co...	44.200.59.232	-
Bastion Host	i-035b99e4807ed556a	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	ec2-44-211-93-205.co...	44.211.93.205	-

i-056d8ddad25a709c5 (Web Server)

Instance summary

Instance ID i-056d8ddad25a709c5	Public IPv4 address 44.200.59.232 open address	Private IPv4 addresses 10.0.1.8
IPv6 address -	Instance state Running	Public IPv4 DNS ec2-44-200-59-232.compute-1.amazonaws.com open address
Hostname type IP name: ip-10-0-1-8.ec2.internal	Private IP DNS name (IPv4 only) ip-10-0-1-8.ec2.internal	



Security Groups (1/5)

Name	Security group ID	Security group name	VPC ID	Description	Owner
-	sg-081c79d1523bc1a44	Ec2SecurityGroup	vpc-0b71c8783e43e848b	VPC Security Group	137220473149
-	sg-01bd97885f7eb7b1	default	vpc-0b71c8783e43e848b	default VPC security group	137220473149
-	sg-04464b087679c6a99	default	vpc-03e0ccc0ffefcd200	default VPC security group	137220473149
-	sg-03c2523e592899850	Web Server security group	vpc-0759853f6495dc9d7	Web Server security group	137220473149
-	sg-0ecdc8c584f022eb79	default	vpc-0759853f6495dc9d7	default VPC security group	137220473149

sg-03c2523e592899850 - Web Server security group

Details

Security group name Web Server security group	Security group ID sg-03c2523e592899850	Description Web Server security group	VPC ID vpc-0759853f6495dc9d7
Owner -	Inbound rules count -	Outbound rules count -	



All Bookmarks

Hello From Your Web Server!

Stop instance

Stopping your instance allows you to reduce costs, modify settings, and troubleshoot problems.

Instance ID: [i-056d8ddad25a709c5 \(Web Server\)](#) | Stop protection: [Off \(Can stop instance\)](#)

You will be billed for associated resources
After you stop the instance, you are no longer charged usage or data transfer fees for it. However, you will still be billed for associated Elastic IP addresses and EBS volumes.

Associated resources
You will continue to incur charges for these resources while the instance is stopped.

[Cancel](#) [Stop](#)

Instances (2) [Info](#)

Find Instance by attribute or tag (case-sensitive) [All states](#)

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
<input type="checkbox"/>	Bastion Host	i-035b99e4807ed556a	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	ec2-44-211-93-205.co...	44.211.93.205	-
<input type="checkbox"/>	Web Server	i-056d8ddad25a709c5	Stopped	t2.micro	-	View alarms +	us-east-1a	-	-	-

Now lets change instance type for better performance , storage etc...

Change instance type [Info](#) [Get advice](#)

You can change the instance type only if the current instance type and the instance type that you want are compatible.

Instance ID
[i-056d8ddad25a709c5 \(Web Server\)](#)

Current instance type
t2.micro

New instance type

☐ EBS-optimized
EBS-optimized is not supported for this instance type

▼ Instance type comparison

How to avoid instances accidentally stopped :

Change Stop Protection

The screenshot shows the AWS Management Console interface. On the left, the navigation menu includes 'Instances', 'Images', 'Elastic Block Store', and 'Network & Security'. The main content area displays a table of instances. The 'Web Server' instance (ID: i-056d8ddad25a709c5) is selected, and its details are shown below the table. The 'Actions' menu is open, and 'Change stop protection' is highlighted. The instance details show it is in a 'Stopped' state.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP v4 DNS
Web Server	i-056d8ddad25a709c5	Stopped	t2.small	-	View alarms +	-	-
Bastion Host	i-035b99e4807ed556a	Running	t2.micro	2/2 checks passed	View alarms +	-	-

i-056d8ddad25a709c5 (Web Server)

Instance summary

Instance ID: i-056d8ddad25a709c5

IP v6 address: -

Hostname type: IP name: ip-10-0-1-8.ec2.internal

Answer private resource DNS name: -

Public IP v4 address: -

Instance state: Stopped

Private IP DNS name (IPv4 only): ip-10-0-1-8.ec2.internal

Instance type: t2.small

Elastic IP addresses: -

The screenshot shows the 'Change stop protection' page in the AWS Management Console. The page title is 'Change stop protection'. Below the title, it says 'Enable stop protection to prevent your instance from being accidentally stopped.' The instance ID is 'i-056d8ddad25a709c5 (Web Server)'. The 'Stop protection' checkbox is checked, and the label 'Enable' is next to it. There are 'Cancel' and 'Save' buttons at the bottom right.

Change stop protection

Enable stop protection to prevent your instance from being accidentally stopped.

Instance ID: i-056d8ddad25a709c5 (Web Server)

Stop protection: ☒ Enable

Cancel Save

Search[Alt+S]

United States (N. Virginia)vol-labs/user3742527-228CE197@inmamauri.ac.in @ 1372-2047-3149

EC2

Volumes

vol-08058b0a8c354cf5a

Modify volume

Modify volume

Info

Modify the type, size, and performance of an EBS volume.

Volume details

Volume ID

vol-08058b0a8c354cf5a

Volume type

Info

General Purpose SSD (gp3)

Size (GiB)

Info

10

Min: 1 GiB, Max: 16384 GiB.

IOPS

Info

3000

Min: 3000 IOPS, Max: 16000 IOPS.

Throughput (MiB/s)

Info

125

Min: 125 MiB, Max: 1000 MiB. Baseline: 125 MiB/s.

Cancel

Modify

Instances (2)

Info

Last updated less than a minute ago

Connect

Instance state

Actions

Launch instances

Find Instance by attribute or tag (case-sensitive)

All states

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
<input type="checkbox"/>	Bastion Host	i-035b99e4807ed556a	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	ec2-44-211-93-205.co...	44.211.93.205	-
<input type="checkbox"/>	Web Server	i-056d8ddad25a709c5	Running	t2.small	2/2 checks passed	View alarms +	us-east-1a	ec2-3-80-12-30.comput...	3.80.12.30	-

Failed to stop the instance i-056d8ddad25a709c5

The instance i-056d8ddad25a709c5 may not be stopped. Modify its 'disableApiStop' instance attribute and try again.

Diagnose with Amazon Q

Instances (1/2)

Info

Last updated 1 minute ago

Connect

Instance state

Actions

Launch instances

Find Instance by attribute or tag (case-sensitive)

All states

<input checked="" type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
<input type="checkbox"/>	Bastion Host	i-035b99e4807ed556a	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	ec2-44-211-93-205.co...	44.211.93.205	-
<input checked="" type="checkbox"/>	Web Server	i-056d8ddad25a709c5	Running	t2.small	2/2 checks passed	View alarms +	us-east-1a	ec2-3-80-12-30.comput...	3.80.12.30	-

i-056d8ddad25a709c5 (Web Server)

Details

Status and alarms

Monitoring

Security

Networking

Storage

Tags

Instances (2)

Info

Last updated less than a minute ago

Connect

Instance state

Actions

Launch instances

Find Instance by attribute or tag (case-sensitive)

All states

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
<input type="checkbox"/>	Bastion Host	i-035b99e4807ed556a	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	ec2-44-211-93-205.co...	44.211.93.205	-
<input type="checkbox"/>	Web Server	i-056d8ddad25a709c5	Stopped	t2.small	-	View alarms +	us-east-1a	-	-	-

Marks :

01:06

▶ Start Lab

■ End Lab

ⓘ AWS Details

ⓘ Details

✕

SubmitSubmission ReportGrades

Amazon EC2 provides different resources that you can use. These resources include images, instances, volumes, and snapshots. When you create an AWS account, there are default limits on these resources on a per-region basis.

51. In the AWS Management Console, in the search box next to **Services**, search for and choose Service Quotas.

52. Choose **AWS services** from the navigation menu and then in the AWS services *Find services* search bar, search for `ec2` and choose **Amazon Elastic Compute Cloud (Amazon EC2)**.

53. In the *Find quotas* search bar, search for `running on-demand`, but do not make a selection. Instead, observe the filtered list of service quotas that match the criteria.

Notice that there are limits on the number and types of instances that can run in a region. For example, there is a limit on the number of *Running On-Demand Standard...* instances that you can launch in this region. When launching instances, the request must not cause your usage to exceed the instance limits currently defined in that region.

If you are the AWS account owner, you can request an increase for many of these limits.

Task 6: Test Stop Protection

Total score25/25

Task 1 - EC2 instance created correctly5/5

Task 2 - get system log requested5/5

Task 3 - security group updated5/5

Task 4 - EC2 instance updated5/5

Task 6 - Instance stopped on second try5/5

Nifty bank
+0.78%

Search

ENG
IN

09:36
15-01-2025