The background is a light blue gradient with several realistic water droplets of various sizes scattered across the surface. The droplets have highlights and shadows, giving them a three-dimensional appearance.

EC2

(ELASTIC COMPUTE CLOUD)

BY

KESHAV KUMMARI

EC2(ELASTIC COMPUTE CLOUD)

1. EC2 ESSENTIALS
2. EC2 PURCHASING OPTIONS
3. EC2 AMI'S AND VIRTUALISATION
4. EC2 INSTANCE TYPES
5. PUBLIC, PRIVATE & ELASTIC IP ADDRESSES
6. EC2 BOOTSTRAPPING, USER-DATA & META-DATA
7. EC2 STORAGE OPTIONS
8. EC2 SECURITY GROUPS
9. KEY-PAIR AND CONNECTING TO AN EC2 INSTANCE
10. EC2 AND NETWORKING
11. EBS SNAPSHOTS
12. EC2 PLACEMENT GROUPS
13. ELASTIC FILE SYSTEM(EFS)
14. LAB : EC2 BACKUP SOLUTIONS WITH AMI'S AND SNAPSHOTS
15. LAB: ACCESSING INSTANCES USER DATA & META DATA
16. QUIZ

WHAT IS EC2?

- AMAZON **ELASTIC COMPUTE CLOUD** (AMAZON EC2) IS A **WEB SERVICE** THAT PROVIDES **RESIZABLE COMPUTE CAPACITY** IN THE CLOUD.
- AMAZON EC2 REDUCES THE TIME REQUIRED TO OBTAIN AND BOOT NEW SERVER INSTANCES TO MINUTES, ALLOWING YOU TO QUICKLY SCALE CAPACITY, BOTH UP AND DOWN, AS YOUR COMPUTING REQUIREMENTS CHANGE.
- AMAZON EC2 CHANGES THE **ECONOMICS OF COMPUTING** BY ALLOWING YOU TO **PAY ONLY FOR** CAPACITY THAT YOU **ACTUALLY USE**.
- AMAZON EC2 PROVIDES **DEVELOPERS THE TOOLS** TO BUILD FAILURE RESILIENT APPLICATIONS AND ISOLATE THEMSELVES FROM COMMON FAILURE SCENARIOS.

EC2 OPTIONS?

- **ON DEMAND** – ALLOW YOU TO PAY A FIXED RATE BY THE HOUR(OR BY SECOND) WITH NO COMMITMENT.(FOR LINUX BY THE SECOND & FOR WINDOWS BY THE HOUR)
- **RESERVED** – PROVIDE YOU WITH A CAPACITY RESERVATION, AND OFFER A SIGNIFICANT DISCOUNT ON THE HOURLY CHARGE FOR AN INSTANCE. 1 OR 3 YEAR CONTRACT.
- **SPOT** – ENABLE YOU TO **BID** WHATEVER PRICE YOU WANT FOR INSTANCE CAPACITY, PROVIDING FOR EVEN GREATER SAVINGS IF YOUR APPLICATIONS HAVE FLEXIBLE **START** AND **END** TIMES.
- **DEDICATED HOSTS** – PHYSICAL EC2 SERVER DEDICATED FOR YOUR USE. DEDICATED HOSTS CAN HELP YOU REDUCE COSTS BY ALLOWING YOU TO USE YOUR EXISTING SERVER-BOUND SOFTWARE LICENSES.

ON DEMAND

-
- USERS THAT WANT THE LOW COST AND FLEXIBILITY OF AMAZON EC2 WITHOUT ANY UP-FRONT PAYMENT OR LONG-TERM COMMITMENT
- APPLICATIONS WITH SHORT TERM, SPIKY, OR UNPREDICTABLE WORKLOADS THAT CAN NOT BE INTERRUPTED.
- APPLICATIONS BEING DEVELOPED OR TESTED ON AMAZON EC2 FOR THE FIRST TIME.

RESERVED


- APPLICATIONS WITH STEADY STATE OR PREDICTABLE USAGE
- APPLICATIONS THAT REQUIRE RESERVED CAPACITY
- USERS ABLE TO MAKE UPFRONT PAYMENTS TO REDUCE THEIR TOTAL COMPUTING COSTS EVEN FURTHER
 - STANDARD RI'S (UP TO 75% OFF ON DEMAND)
 - CONVERTIBLE RI'S(UP TO 54% OFF ON DEMAND) CAPABILITY TO CHANGE THE ATTRIBUTES OF THE RI AS LONG AS THE EXCHANGE RESULTS IN THE CREATION OF RESERVED INSTANCES OF EQUAL OR GREATER VALUE.
 - SCHEDULED RI'S AVAILABLE TO LAUNCH WITHIN THE TIME WINDOWS YOU RESERVE. THIS OPTION ALLOW YOU TO MATCH YOUR CAPACITY RESERVATION TO A PREDICTABLE RECURRING SCHEDULE THAT ONLY REQUIRES A FRACTION OF A DAY, A WEEK, OR A MONTH



SPOT

- APPLICATIONS THAT HAVE FLEXIBLE START AND END TIMES.
- APPLICATIONS THAT ARE ONLY FEASIBLE AT VERY LOW COMPUTE PRICES.

DEDICATED HOSTS

- USEFUL FOR REGULATORY REQUIREMENTS THAT MAY NOT SUPPORT MULTI-TENANT VIRTUALIZATION.
 - GREAT FOR LICENSING WHICH DOES NOT SUPPORT MULTI-TENANCY OR CLOUD DEPLOYMENTS.
 - CAN BE PURCHASED ON-DEMAND(HOURLY)
 - CAN BE PURCHASED AS A RESERVATION FOR UP TO 70% OFF THE ON-DEMAND PRICE.
- 

SPOT VS ON-DEMAND

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances (i) 1 [Launch into Auto Scaling Group \(i\)](#)

Purchasing option (i) ☒ Request Spot instances

Current price (i) Not available
▲ There is no Spot capacity for instance type t2.micro in availability zone

Maximum price (i) \$ (e.g., 0.045 = 4.5 cents/hour)

Launch group (i) (Optional)

Request valid from (i) Any time [Edit](#)

Request valid to (i) Any time [Edit](#)

Persistent request (i) ☐ Persistent request

Network (i) vpc-a67364cf (default) [Create new VPC](#)

Subnet (i) No preference (default subnet in any Availability Zone) [Create new subnet](#)

Auto-assign Public IP (i) Use subnet setting (Enable) [Create new subnet](#)

IAM role (i) None [Create new IAM role](#)

Monitoring (i) ☐ Enable CloudWatch detailed monitoring
[Additional charges apply.](#)

▶ Advanced Details

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower price

Number of instances ⓘ 1 [Launch into Auto Scaling Group ⓘ](#)

Purchasing option ⓘ ☐ Request Spot instances

Network ⓘ vpc-e67384cf (default) [Create new VPC](#)

Subnet ⓘ No preference (default subnet in any Availability Zone) [Create new subnet](#)

Auto-assign Public IP ⓘ Use subnet setting (Enable)

IAM role ⓘ None [Create new IAM role](#)

Shutdown behavior ⓘ Stop

Enable termination protection ⓘ ☐ Protect against accidental termination

Monitoring ⓘ ☐ Enable CloudWatch detailed monitoring

[Additional charges apply](#)

Tenancy ⓘ
☒ Shared - Run a shared hardware instance
☐ Dedicated - Run a Dedicated instance
☐ Dedicated host - Launch this instance on a Dedicated host

▶ Advanced Details

NOTES

- ONE SUBNET IS EQUAL TO ONE AVAILABILITY ZONE
- ONE SUBNET CAN NOT SHARED WITH MULTIPLE AVAILABILITY ZONES.

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of

Number of instances ⓘ

1

[Launch into Auto Scaling Group ⓘ](#)

Purchasing option ⓘ

☐ Request Spot instances

Network ⓘ

vpc-a67384cf (default) ⌵



[Create new VPC](#)

Subnet ⓘ

✓ No preference (default subnet in any Availability Zone)

[Create new subnet](#)

subnet-936b57d9 | Default in eu-west-2b

subnet-52ebf32a | Default in eu-west-2a

Auto-assign Public IP ⓘ

IAM role ⓘ

None ⌵



[Create new IAM role](#)

Shutdown behavior ⓘ

Stop ⌵

Enable termination protection ⓘ

☐ Protect against accidental termination

Monitoring ⓘ

☐ Enable CloudWatch detailed monitoring

[Additional charges apply.](#)

Tenancy ⓘ

Shared - Run a shared hardware instance ⌵

[Additional charges will apply for dedicated tenancy.](#)

EC2 - TERMINATION

- Termination Protection is turned off by default, you must turn it on.
- On an EBS-backed instance, the default action is for the root EBS volume to be deleted when the instance is terminated.
- EBS Root Volumes of your DEFAULT AMI's cannot be encrypted. You can also use a third party tool (such as bit locker etc) to encrypt the root volume, or this can be done when creating AMI's (lab to follow) in the AWS console or using the API.
- Additional volumes can be encrypted.

EC2 INSTANCE TYPES

Family	Speciality	Use case
D2	Dense Storage	Fileservers/Data Warehousing/Hadoop
R4	Memory Optimized	Memory Intensive Apps/DBs
M4	General Purpose	Application Servers
C4	Compute Optimized	CPU Intensive Apps/DBs
G2	Graphics Intensive	Video Encoding/ 3D Application Streaming
I2	High Speed Storage	NoSQL DBs, Data Warehousing etc
F1	Field Programmable Gate Array	Hardware acceleration for your code.
T2	Lowest Cost, General Purpose	Web Servers/Small DBs
P2	Graphics/General Purpose GPU	Machine Learning, Bit Coin Mining etc
X1	Memory Optimized	SAP HANA/Apache Spark etc

EC2 INSTANCE TYPES - DIRTMC GFPX

- DR MC GIFT PX

1. **D** FOR DENSITY
2. **R** FOR RAM
3. **M** FOR MAIN CHOICE FOR GENERAL PURPOSE APPS
4. **C** FOR COMPUTE
5. **G** FOR GRAPHICS
6. **I** FOR IOPS
7. **F** FOR FPGA
8. **T** FOR CHEAP GENERAL PURPOSE(T2 MICRO)
9. **P** FOR GRAPHICS
10. **X** FOR EXTREME MEMORY

WHAT IS EBS?

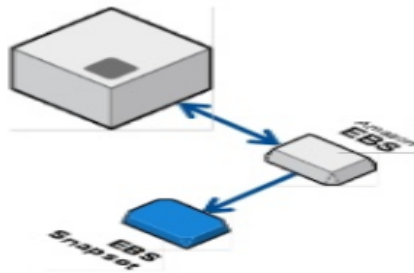
- AMAZON EBS ALLOWS YOU TO **CREATE STORAGE VOLUMES** AND ATTACH THEM TO AMAZON EC2 INSTANCES.
- ONCE ATTACHED, YOU CAN **CREATE A FILE SYSTEM** ON TOP OF THESE VOLUMES, RUN A DATABASE, OR USE THEM IN ANY OTHER WAY YOU WOULD USE A BLOCK DEVICE.
- AMAZON EBS VOLUMES ARE PLACED IN A SPECIFIC **AVAILABILITY ZONE**, WHERE THEY ARE AUTOMATICALLY REPLICATED TO PROTECT YOU FROM THE **FAILURE OF A SINGLE COMPONENT**.

WHAT IS MEANT BY IOPS?

- WHEN EVALUATING A NEW STORAGE SYSTEM, ESPECIALLY AN ALL-FLASH ARRAY, THE NUMBER OF IOPS (**INPUTS/OUTPUTS PER SECOND**) THAT THE STORAGE SYSTEM CAN SUSTAIN IS OFTEN USED TO DIFFERENTIATE ONE STORAGE SYSTEM FROM ANOTHER.

Amazon Elastic Block Store (EBS)

Elastic Block Storage: Persistent Storage for EC2



High performance block storage device
Mount as drives to instances
Persistent and independent of instance lifecycle

Feature	Details
High performance file system	Mount EBS as drives and format as required
Flexible size	Volumes from 1GB to 1TB in size
Secure	Private to your instances
Available	Replicated within an Availability Zone
Backups	Volumes can be snapshotted for point in time restore
Monitoring	Detailed metrics captured via Cloud Watch

1. GENERAL PURPOSE SSD(GP2) : **[BOOT OS FROM THIS STORAGE]**

- GENERAL PURPOSE, BALANCES BOTH PRICE AND PERFORMANCE.
- RATIO OF 3 IOPS PER GB WITH UP TO 10,000 IOPS AND THE ABILITY TO BURST UP TO 3000 IOPS FOR EXTENDED PERIODS OF TIME FOR VOLUMES AT 3334 GIB & ABOVE.

2. PROVISIONED IOPS SSD(IO1): **[BOOT OS FROM THIS STORAGE]**

- DESIGNED FOR I/O INTENSIVE APPLICATIONS SUCH AS LARGE RELATIONAL OR NOSQL DATABASES.
- USE IF YOU NEED MORE THAN 10,000 IOPS
- CAN PROVISION UP TO 20,000 IOPS PER VOLUME.

3. THROUGHPUT OPTIMIZED HDD(ST1):

- BIG DATA
- DATA WAREHOUSES
- LOG PROCESSING
- ***CAN NOT BE A BOOT VOLUME***

4. COLD HDD(SC1):

- LOWEST COST STORAGE FOR INFREQUENTLY ACCESSED WORKLOADS
- FILE SERVER
- ***CAN NOT BE A BOOT VOLUME***

5. MAGNETIC(STANDARD): [BOOT OS FROM THIS STORAGE]

- LOWEST COST PER GIGABYTE OF ALL EBS VOLUME TYPES THAT IS BOOTABLE.
- MAGNETIC VOLUMES ARE IDEAL FOR WORKLOADS WHERE DATA IS ACCESSED INFREQUENTLY, AND APPLICATIONS WHERE THE LOWEST STORAGE COST IS IMPORTANT.

EBS - ELASTIC BLOCK STORE

	Solid-State Drives (SSD)		Hard disk Drives (HDD)	
Volume Type	General Purpose SSD (gp2)*	Provisioned IOPS SSD (io1)	Throughput Optimized HDD (st1)	Cold HDD (sc1)
Description	General purpose SSD volume that balances price and performance for a wide variety of workloads	Highest-performance SSD volume for mission-critical low-latency or high-throughput workloads	Low cost HDD volume designed for frequently accessed, throughput-intensive workloads	Lowest cost HDD volume designed for less frequently accessed workloads
Use Cases	<ul style="list-style-type: none"> Recommended for most workloads System boot volumes Virtual desktops Low-latency interactive apps Development and test environments 	<ul style="list-style-type: none"> Critical business applications that require sustained IOPS performance, or more than 10,000 IOPS or 160 MiB/s of throughput per volume Large database workloads, such as: <ul style="list-style-type: none"> MongoDB Cassandra Microsoft SQL Server MySQL PostgreSQL Oracle 	<ul style="list-style-type: none"> Streaming workloads requiring consistent, fast throughput at a low price Big data Data warehouses Log processing Cannot be a boot volume 	<ul style="list-style-type: none"> Throughput-oriented storage for large volumes of data that is infrequently accessed Scenarios where the lowest storage cost is important Cannot be a boot volume
API Name	gp2	io1	st1	sc1
Volume Size	1 GiB - 16 TiB	4 GiB - 16 TiB	500 GiB - 16 TiB	500 GiB - 16 TiB
Max. IOPS**/Volume	10,000	32,000	500	250
Max. Throughput/Volume	160 MiB/s	500 MiB/s***	500 MiB/s	250 MiB/s
Max. IOPS/Instance	80,000	80,000	80,000	80,000
Max. Throughput/Instance†	1,750 MiB/s	1,750 MiB/s	1,750 MiB/s	1,750 MiB/s
Dominant Performance Attribute	IOPS	IOPS	MiB/s	MiB/s

SUMMARY

- **KNOW THE DIFFERENCES BETWEEN:**

1. ON DEMAND 2. SPOT 3. RESERVED & 4. DEDICATED HOSTS

- **REMEMBER WITH SPOT INSTANCES:**

- IF YOU TERMINATE THE INSTANCE, YOU PAY FOR THE HOUR.
- IF AWS TERMINATES THE SPOT INSTANCE, YOU GET THE HOUR IT WAS TERMINATED IN FOR FREE.

- **EBS CONSISTS OF:**

1. SSD, GENERAL PURPOSE – GP2 (UP TO 10,000 IOPS)
2. SSD, PROVISIONED IOPS – IO1 (MORE THAN 10,000 IOPS)
3. HDD, THROUGHPUT OPTIMIZED – ST1 (FREQUENTLY ACCESSED WORKLOADS)
[NOT BOOTABLE]
4. HDD, COLD – SC1 (LESS FREQUENTLY ACCESSED DATA) [NOT BOOTABLE]
5. HDD, MAGNETIC – STANDARD (CHEAP, INFREQUENTLY ACCESSED STORAGE)

- *NOTE: YOU CAN NOT MOUNT 1 EBS VOLUME TO MULTIPLE EC2 INSTANCES, INSTEAD USE EFS:*

EBS SNAPSHOTS

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more about storage options in Amazon EC2.](#)

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MiB/s)	Delete on Termination	Encrypted
Root	/dev/xvda	snap-0fba5380e5a7ea56	8	General Purpose SSD (GP2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted
EBS	/dev/xvdb	Search (case-insensitive)	0	Magnetic	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>
EBS	/dev/xvdc	Search (case-insensitive)	500	Throughput Optimized HDD (ST1)	N/A	20 / 125	<input type="checkbox"/>	<input type="checkbox"/>
EBS	/dev/xvdd	Search (case-insensitive)	500	Cold HDD (SC1)	N/A	6 / 40	<input type="checkbox"/>	<input type="checkbox"/>

Add New Volume

EBS - PARTITIONS(VOLUMES)

EC2 Dashboard

Events

Tags

Reports

Limits

INSTANCES

Instances

Spot Requests

Reserved Instances

Dedicated Hosts

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

Create Volume Actions

Filter by tags and attributes or search by keyword

Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone	State
MyLittleWeb...	vol-0718028...	500 GiB	sc1	-		November 8, 2017 ...	eu-west-2a	in-use
MyLittleWeb...	vol-0a96e98...	8 GiB	standard	-		November 8, 2017 ...	eu-west-2a	in-use
MyLittleWeb...	vol-0bc33d5f...	500 GiB	st1	-		November 8, 2017 ...	eu-west-2a	in-use
MyLittleWeb...	vol-011ce0a...	8 GiB	gp2	100 / 3000	snap-0414716...	November 8, 2017 ...	eu-west-2a	in-use
	vol-0a42930...	8 GiB	gp2	100 / 3000	snap-0ba2627...	November 7, 2017 ...	eu-west-2a	available
MyLittleWeb...	vol-006a40a5...	8 GiB	standard	-	snap-0414716...	November 7, 2017 ...	eu-west-2a	available

EBS – MODIFY THE VOLUME SNAPSHOT

The screenshot displays the AWS Management Console interface for EBS volumes. On the left, the navigation pane shows the 'Volumes' section under 'ELASTIC BLOCK STORE'. The main content area shows a list of volumes. One volume, 'MyLittleWeb...', is selected and highlighted. A 'Modify Volume' dialog box is open in the foreground, allowing for modifications to the selected volume.

Modify Volume

Volume ID: vol-011ce0abbe4a2aa13

Volume Type: General Purpose SSD (GP2) ⓘ

Size: 8 (Min: 1 GiB, Max: 16384 GiB) ⓘ

IOPS: 100 / 3000 (Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS) ⓘ

Buttons: Cancel, Modify

Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created
MyLittleWeb...	vol-07f18526...	500 GiB	sc1	-		November 8, 2017 ...
MyLittleWeb...	vol-0a86e9f8...	8 GiB	standard	-		November 8, 2017 ...
MyLittleWeb...	vol-0bc33d5f...	500 GiB	st1	-		November 8, 2017 ...
MyLittleWeb...	vol-011ce0ab...	8 GiB	gp2	100 / 3000	snap-04147f166cc0f7214	November 8, 2017 ...
MyLittleWeb...	vol-0e42930...	8 GiB	gp2	100 / 3000	snap-0ba0527c76b47d39e	November 7, 2017 ...
MyLittleWeb...	vol-096a40d5...	8 GiB	standard	-	snap-04147f166cc0f7214	November 7, 2017 ...

EBS – CREATING SNAPSHOTS

The screenshot shows the AWS Management Console interface. On the left is a navigation menu with categories like EC2 Dashboard, INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The 'Volumes' link under 'ELASTIC BLOCK STORE' is highlighted. The main area displays a table of EBS volumes. One volume, 'MyLittleWebServer', is selected and highlighted in yellow. Overlaid on this is a 'Create Snapshot' dialog box. The dialog box contains the following fields:

- Volume:** vol-011ce0bbe4a2ae13 (MyLittleWebServer)
- Name:** MyLittleWebServerSnap
- Description:** MyLittleWebServerSnap
- Encrypted:** No

At the bottom right of the dialog box are 'Cancel' and 'Create' buttons. The 'Create' button is highlighted in yellow.

Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone
MyLittleWeb...	vol-07116926...	500 GiB	sc1	-		November 8, 2017 ...	eu-west-2a
MyLittleWeb...	vol-0a96e96...	8 GiB	standard	-		November 8, 2017 ...	eu-west-2a
MyLittleWeb...	vol-0bc33d5f...	500 GiB	st1	-		November 8, 2017 ...	eu-west-2a
MyLittleWeb...	vol-011ce0a...	8 GiB	gp2	100 / 3000	snap-04147166cc0f7214	November 8, 2017 ...	eu-west-2a
	vol-0e42930...	8 GiB	ssd	100 / 3000	snap-0ba0507c78b47c39a	November 7, 2017 ...	eu-west-2a
MyLittleWeb...	vol-09fa40e5...					November 7, 2017 ...	eu-west-2a

EBS – CREATING VOLUMES

The screenshot shows the AWS Management Console interface. On the left is a navigation sidebar with the following items: EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES (with sub-items: Instances, Spot Requests, Reserved Instances, Dedicated Hosts), IMAGES (with sub-items: AMIs, Bundle Tasks), ELASTIC BLOCK STORE (with sub-items: Volumes, and **Snapshots** which is highlighted in yellow), and a search bar.

The main content area displays the 'Snapshots' page. At the top, there is a 'Create Snapshot' button and an 'Actions' dropdown menu. The 'Owned By Me' filter is selected. Below the filter is a table with columns: Name, Size, Description, and Status. A single snapshot is listed:

Name	Size	Description	Status
MyLittleWeb...	8 GiB	MyLittleWebServerSnap	completed

The 'Actions' dropdown menu is open, showing the following options: Delete, **Create Volume** (highlighted in yellow), Create Image, Copy, Modify Permissions, and Add/Edit Tags. A mouse cursor is pointing at the 'Create Volume' option.

EBS – CREATE VOLUMES

Snapshots > Create Volume

Create Volume

Are you sure you want to perform this action?

Snapshot ID snap-0c435a6703be5dcf7 (MyLittleWebServerSnap)

Volume Type General Purpose SSD (GP2) ⓘ

Size (GiB)

Filter by attributes

General Purpose SSD (GP2)

Provisioned IOPS SSD (IO1)

Cold HDD (SC1)

Throughput Optimized HDD (ST1)

Magnetic

B, Max: 16384 GiB) ⓘ

IOPS

of 3 IOPS per GiB with a

of 100 IOPS, burstable to

5) ⓘ

Availability Zone*

eu-west-2a ⓘ

Throughput (MB/s)

Not applicable ⓘ

Encryption

Not Encrypted

Tags

☐ Add tags to your volume

* Required

Cancel

Create Volume

EBS – COPYING SNAPSHOTS

The screenshot displays the AWS Management Console interface for EBS snapshots. On the left, a navigation sidebar includes links to EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The 'Snapshots' link under 'ELASTIC BLOCK STORE' is highlighted. The main panel shows a table of snapshots owned by the user. One snapshot, 'MyLittleWeb...', is selected. An 'Actions' dropdown menu is open, showing 'Copy Snapshot' as the selected option. A modal dialog titled 'Copy Snapshot' is displayed, showing the source snapshot details and a list of available destination regions. The 'Destination Region' is set to 'Asia Pacific (Tokyo)'. The modal also includes fields for 'Description' and 'Encryption', and 'Cancel' and 'Copy' buttons at the bottom.

EC2 Dashboard
Events
Tags
Reports
Limits
INSTANCES
Instances
Spot Requests
Reserved Instances
Dedicated Hosts
IMAGES
AMIs
Bundle Tasks
ELASTIC BLOCK STORE
Volumes
Snapshots
NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups

Create Snapshot Actions

Owned By Me Filter by tags and attributes or search by keyword

Name	Snapshot ID	Size	Description	Status	Started
MyLittleWeb...	snap-0e435a6703b...	8 GiB	MyLittleWebServerSnap	completed	Novemb

Copy Snapshot

This snapshot, snap-0e435a6703b..., snapshot settings below:

Destination Region

Description

Encryption

Asia Pacific (Tokyo)
Asia Pacific (Tokyo)
Asia Pacific (Mumbai)
Asia Pacific (Singapore)
Asia Pacific (Sydney)
Canada (Central)
EU (Frankfurt)
EU (Ireland)
✓ EU (London)
South America (Sao Paulo)
US East (N. Virginia)
US East (Ohio)
US West (N. California)
US West (Oregon)

Cancel Copy

EBS – CREAING IMAGE FROM EBS SNAPSHOT

EC2 Dashboard

Create Snapshot Actions

Owned By Me Filter by tags and attributes or search by keyword

Name	Snapshot ID	Size	Description	Status	Started	Progress
MyLittleWebServer	snap-0c435af703be5d4f7	8 GiB	MyLittleWebServerSnap	completed	November 8, 2013 at 8:41:55	available (100%)

Create Image from EBS Snapshot

Name: MyLittleWebServer Description: MyLittleWebServer

Architecture: x86_64 Virtualization type: Paravirtual

Root device name: /dev/sda1 Kernel ID: Use default

EBS disk ID: Use default

Block Device Mappings

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/sda1	snap-0c435af703be5d4f7	0	General Purpose SSD (GP2)	100 / 3000	N/A	<input type="checkbox"/>	Not Encrypted

Add New Volume

Cancel Create

AMI'S – CREATING A IMAGE

The screenshot displays the AWS Management Console interface. On the left, the navigation menu includes 'EC2 Dashboard', 'Events', 'Tags', 'Reports', 'Limits', 'INSTANCES', 'IMAGES', and 'ELASTIC BLOCKSTORE'. The 'IMAGES' section is expanded, and 'AMIs' is highlighted. The main content area shows a table of AMIs. The table has columns: Name, AMI Name, AMI ID, Source, Owner, Visibility, Status, Creation Date, and Platform. One AMI is listed: 'MyLittleWebS...' with AMI ID 'ami-84fe3e0', Source '308877447137/...', Owner '308877447137', Visibility 'Private', Status 'available', Creation Date 'November 8, 2017 at 10:24...', and Platform 'OtherLinux'.

Below the AMI list, the 'Launch' wizard is shown. The steps are: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Add Tags, 6. Configure Security Group, and 7. Review. Step 2, 'Choose an Instance Type', is currently active.

Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of Instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: All instance types (dropdown), Current generation (dropdown), [Show/Hide Columns](#)

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)
No valid instance types found.				

WHILE CREATING A SNAPSHOT, WE GOT THE ERROR AND THAT IS BECAUSE OF ONLY ONE PRIMARY PARTITION WAS TAKEN AS SNAPSHOT.

EC2 Dashboard

Events

Tags

Reports

Limits

INSTANCES

Instances

Spot Requests

Reserved Instances

Dedicated Hosts

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Create Volume Actions

Filter by tags and attributes or search by keyword

<input type="checkbox"/>	Name	Volume ID	Size	Volume Type	IOPS	Snapshot
<input type="checkbox"/>	MyLittleWeb...	vol-07f16926...	500 GiB	sc1	-	
<input type="checkbox"/>	MyLittleWeb...	vol-0a95e98...	8 GiB	standard	-	
<input type="checkbox"/>	MyLittleWeb...	vol-0bc33d5f...	500 GiB	st1	-	
<input type="checkbox"/>	MyLittleWeb...	vol-0110e0a...	8 GiB	gp2	100 / 3000	snap-04147f166cc0ff7214

GO TO INSTANCES & TAKE THE SNAPSHOT OF EC2 INSTANCE & REMOVE VOLUMES IF ANY

EC2 Dashboard

Events

Tags

Reports

Limits

INSTANCES

Instances

Spot Requests

Reserved Instances

Dedicated Hosts

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Placement Groups

Key Pairs

Network Interfaces

LOAD BALANCING

Load Balancers

Target Groups

Launch Instance

Connect

Actions

Filter by tags and attributes or search by keyword

Create Image

Instance ID: i-0e1904584b4832038

Image name: MyLittleWebServer2

Image description: MyLittleWebServer2

No reboot: ☐

Instance Volumes

Volume Type	Device	Snapshot	Size (GB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/xvda	Snapshot: 04147f166cc0f7214	8	General Purpose SSD (GP2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	No: Encrypted
EBS	/dev/sdb	Search (case-insensit)	8	Magnetic	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>
EBS	/dev/sdd	Search (case-insensit)	500	Cold HDD (SC1)	N/A	6 / 40	<input type="checkbox"/>	<input type="checkbox"/>
EBS	/dev/sdc	Search (case-insensit)	500	Throughput Optimized HDD (ST1)	N/A	20 / 125	<input type="checkbox"/>	<input type="checkbox"/>

Add New Volume

Total size of EBS Volumes: 1016 GiB

When you create an EBS image, an EBS snapshot will also be created for each of the above volumes.

Cancel Create Image

IMAGE HAS BEEN CREATED

The screenshot displays the AWS Management Console interface. On the left, the navigation menu includes 'EC2 Dashboard', 'Events', 'Tags', 'Reports', 'Limits', 'INSTANCES', 'Images', 'ELASTIC BLOCK STORE', and 'NETWORK & SECURITY'. The 'INSTANCES' section is expanded, showing 'Instances', 'Spot Requests', 'Reserved Instances', and 'Dedicated Hosts'. The 'Images' section is also visible, showing 'AMIs', 'Bundle Tasks', and 'Snapshots'. The main content area shows the 'Launch Instance' button, a search bar, and a table of instances. A modal window titled 'Create Image' is open, displaying a green checkmark and the message 'Create image request received. View pending image ami-4cfd6129'. Below this, it states 'Any snapshots backing your new EBS image can be managed on the snapshots screen after successful image creation.' A 'Close' button is located at the bottom right of the modal.

EC2 Dashboard

Events

Tags

Reports

Limits

INSTANCES

Instances

Spot Requests

Reserved Instances

Dedicated Hosts

IMAGES

AMIs

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ELASTIC BLOCK STORE

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NETWORK & SECURITY

Security Groups

Elastic IPs

Launch Instance

Connect

Actions

Filter by tags and attributes or search by keyword

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)
MyLittleWeb...	i-0e1904584b46320...	t2.micro	eu-west-2a	running	1/2 checks ...	None	ec2-35-177-80-114.eu...

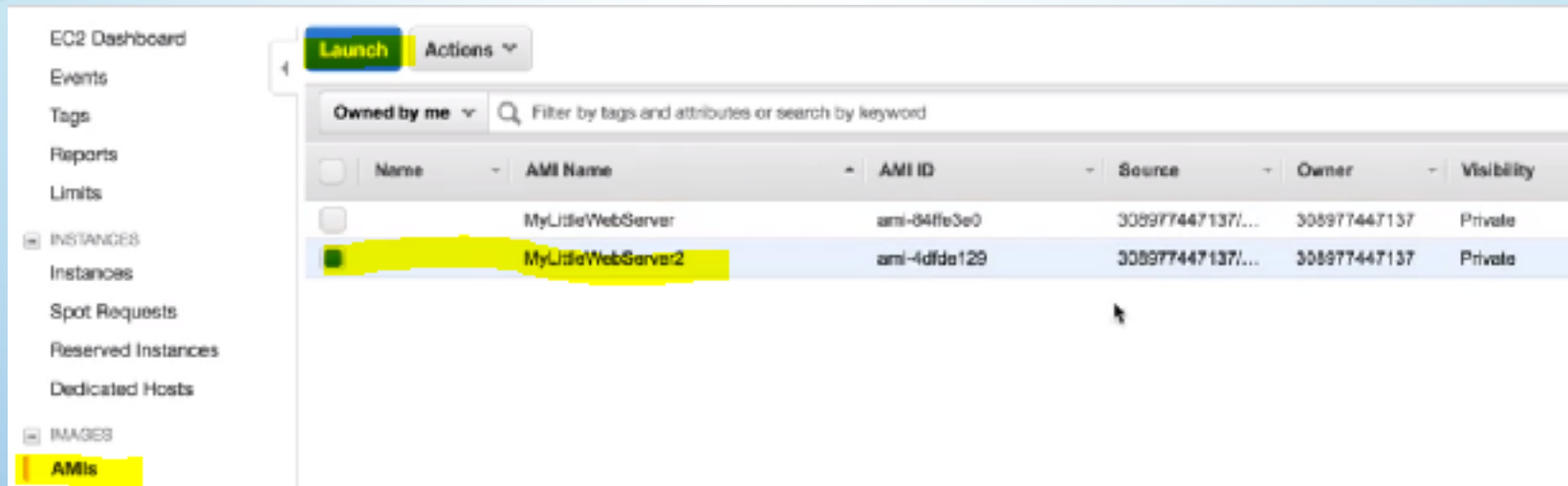
Create Image

✓ Create image request received.
View pending image ami-4cfd6129

Any snapshots backing your new EBS image can be managed on the [snapshots screen](#) after successful image creation.

Close

CLICK ON LAUNCH TO CREATE A EC2 INSTANCE



EC2 Dashboard

Events

Tags

Reports

Limits

INSTANCES

Instances

Spot Requests

Reserved Instances

Dedicated Hosts

IMAGES

AMIs

Launch Actions

Owned by me Filter by tags and attributes or search by keyword

Name	AMI Name	AMI ID	Source	Owner	Visibility
	MyLittleWebServer	ami-84ffe3e0	308977447137/...	308977447137	Private
	MyLittleWebServer:2	ami-4dfda129	308977447137/...	308977447137	Private

CREATING EC2 INSTANCE FROM IMAGES

1. Choose AMI

2. Choose Instance Type

3. Configure Instance

4. Add Storage

5. Add Tags

6. Configure Security Group

7. Review

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage

Number of instances ⓘ

1

Launch into Auto Scaling Group ⓘ

Purchasing option ⓘ

☐ Request Spot instances

Network ⓘ

vpc-1f357f76 (default) ⌵

Create new VPC

Subnet ⓘ

No preference (default subnet in any Availability Zone) ⌵

Create new subnet

Auto-assign Public IP ⓘ

Use subnet setting (Enable) ⌵

IAM role ⓘ

None ⌵

Create new IAM role

Shutdown behavior ⓘ

Stop ⌵

Enable termination protection ⓘ

☐ Protect against accidental termination

Monitoring ⓘ

☐ Enable CloudWatch detailed monitoring

Additional charges apply.

Tenancy ⓘ

Shared - Run a shared hardware instance ⌵

Additional charges will apply for dedicated tenancy.

▶ Advanced Details

COPY AMI

EC2 Dashboard

Events

Tags

Reports

Limits

INSTANCES

Instances

Spot Requests

Reserved Instances

Dedicated Hosts

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Placement Groups

Key Pairs

Network Interfaces

Launch Actions

Owned by me

Filter by tags and attributes or search by keyword

Name	AMI Name	AMI ID	Source	Owner	Visibility
	MyLittleWebServer	ami-84fe3e0	308977447137/...	308977447137	Private
	MyLittleWebServer2	ami-4d1de129	308977447137/...	308977447137	Private

Image: ami-4d1de129

Copy AMI

AMI ami-4d1de129 will be copied to a new AMI. Set the new AMI settings below.

Destination region*

Name

Description

Encryption ☐ Encrypt target EBS snapshots ⓘ

Cancel Copy AMI

VOLUMES & SNAPSHOTS

- VOLUMES EXISTS ON EBS: VIRTUAL HARD DISK
- SNAPSHOTS EXISTS ON S3
- SNAPSHOTS ARE POINT IN TIME COPIES OF VOLUMES
- SNAPSHOTS ARE INCREMENTAL - THIS MEANS THAT ONLY THE BLOCKS THAT HAVE CHANGED SINCE YOUR LAST SINCE YOUR LAST SNAPSHOT ARE MOVED TO S3.
- IF THIS IS YOUR FIRST SNAPSHOT, IT MAY TAKE SOME TIME TO CREATE.

SNAPSHOTS OF ROOT DEVICE VOLUMES

- TO CREATE A SNAPSHOT FOR AMAZON EBS VOLUMES THAT SERVE AS ROOT DEVICES, YOU SHOULD STOP THE INSTANCE BEFORE TAKING THE SNAPSHOT.
- HOWEVER YOU CAN TAKE A SNAP WHILE THE INSTANCE IS RUNNING
- YOU CAN CREATE AMI'S FROM BOTH VOLUMES AND SNAPSHOTS
- YOU CAN CHANGE EBS VOLUME SIZES ON THE FLY INCLUDING CHANGING THE SIZE AND STORAGE TYPE.
- VOLUMES WILL ALWAYS BE IN THE SAME AVAILABILITY ZONE AS THE EC2 INSTANCE
- TO MOVE AN EC2 VOLUME FROM ONE AZ/REGION TO ANOTHER, TAKE A SNAP OR AN IMAGE OF IT, THEN COPY IT TO THE NEW AZ/REGION.

VOLUMES VS SNAPSHOTS - SECURITY

- SNAPSHOTS OF ENCRYPTED VOLUMES ARE ENCRYPTED AUTOMATICALLY.
- VOLUMES RESTORED FROM ENCRYPTED SNAPSHOTS ARE ENCRYPTED AUTOMATICALLY.
- YOU CAN SHARE SHANPSHOTS, BUT ONLY IF THEY ARE UNENCRYPTED.
- THESE SNAPSHOTS CAN BE SHARED WITH OTHER AWS ACCOUNTS OR MADE PUBLIC.

SECURITY GROUPS BASICS

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and all instances, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☐ Create a new security group

☒ Select an existing security group

Security Group ID	Name	Description
<input type="checkbox"/> sg-69b8180c	default	default VPC security group
<input checked="" type="checkbox"/> sg-f58c749c	MyWebDMZ	MyWebDMZ

Inbound rules for sg-f58c749c (Selected security groups: sg-f58c749c)

Type ⁽ⁱ⁾	Protocol ⁽ⁱ⁾	Port Range ⁽ⁱ⁾	Source ⁽ⁱ⁾
HTTP	TCP	80	0.0.0.0/0
SSH	TCP	22	0.0.0.0/0
HTTPS	TCP	443	0.0.0.0/0

LAUNCH A WEBSITE AND TEST SECURITY GROUP

- DOWNLOAD APACHE WEBSERVER AND LAUNCH A WEBSITE AND CROSS CHECK ON THE BROWSER
- REMOVE THE SECURITY GROUP AND CROSS CHECK AGAIN.

Edit inbound rules

Type	Protocol	Port Range	Source
HTTP	TCP	80	Custom 0.0.0.0/0
SSH	TCP	22	Custom 0.0.0.0/0
HTTPS	TCP	443	Custom 0.0.0.0/0

Add Rule Cancel Save

Description Inbound Outbound Tags

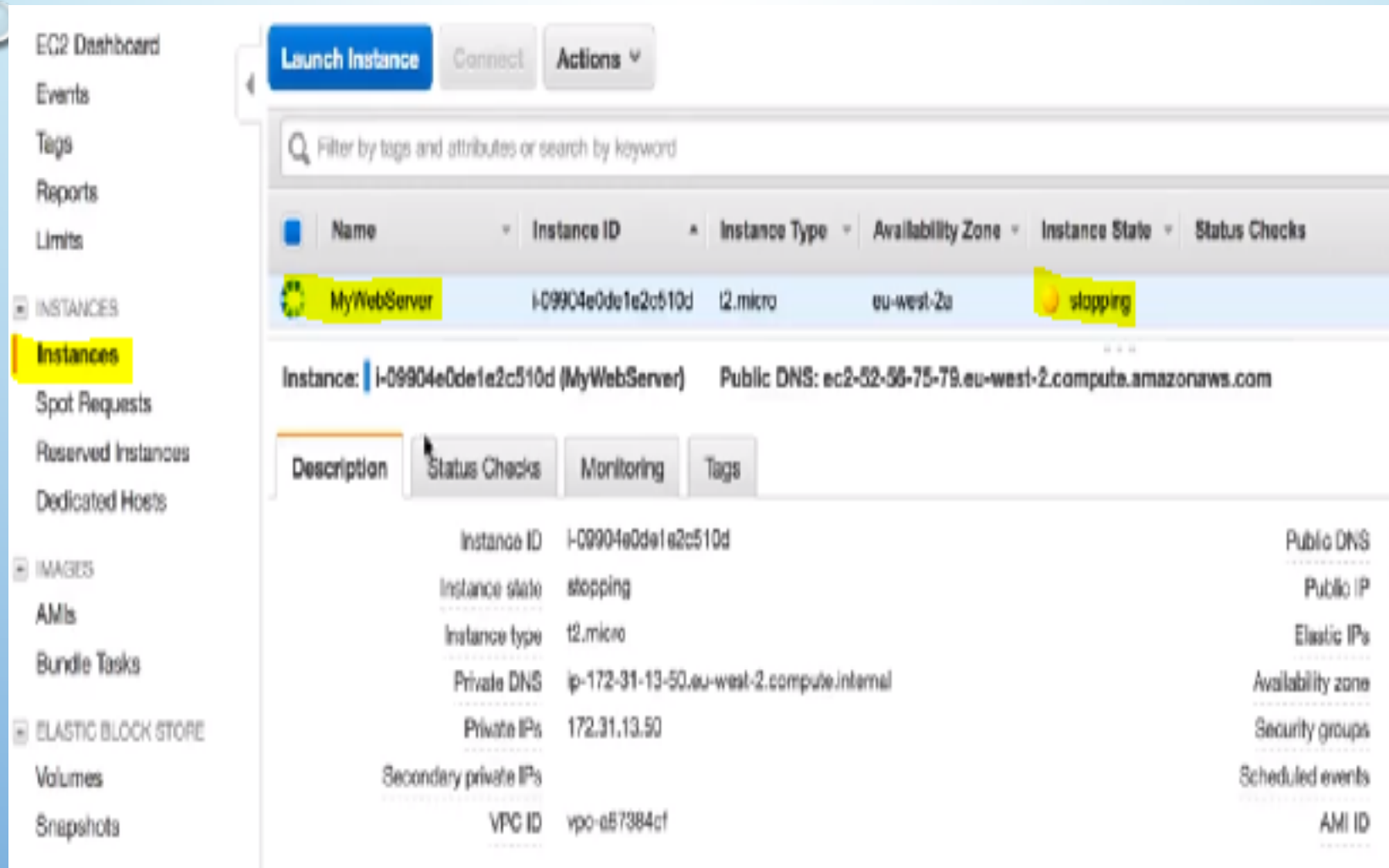
Edit

Type	Protocol	Port Range	Source
HTTP	TCP	80	0.0.0.0/0
SSH	TCP	22	0.0.0.0/0
HTTPS	TCP	443	0.0.0.0/0

SECURITY GROUP SUMMARY

- All Inbound Traffic is Blocked By Default
- All Outbound Traffic is Allowed
- Changes to Security Groups take effect immediately
- You can have any number of EC2 instances within a security group.
- You can have multiple security groups attached to EC2 Instances
- Security Groups are **STATEFUL**.
 - If you create an inbound rule allowing traffic in, that traffic is automatically allowed back out again.
- You cannot block specific IP addresses using Security Groups, instead use Network Access Control Lists.
- You can specify allow rules, but not deny rules.

ENCRYPT ROOT DEVICE VOLUME & CREATE AN AMI



The screenshot displays the AWS Management Console interface for EC2 instances. On the left sidebar, the 'INSTANCES' section is expanded, and 'Instances' is selected. The main content area shows a table of instances with the following details:

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks
MyWebServer	i-09904e0de1e2c510d	t2.micro	eu-west-2a	stopping	

Below the table, the instance details for 'i-09904e0de1e2c510d (MyWebServer)' are shown. The 'Status Checks' tab is selected, displaying the following information:

Property	Value	Property	Value
Instance ID	i-09904e0de1e2c510d	Public DNS	ec2-52-58-75-79.eu-west-2.compute.amazonaws.com
Instance state	stopping	Public IP	
Instance type	t2.micro	Elastic IPs	
Private DNS	ip-172-31-13-50.eu-west-2.compute.internal	Availability zone	
Private IPs	172.31.13.50	Security groups	
Secondary private IPs		Scheduled events	
VPC ID	vpc-a87384cf	AMI ID	

VOLUME – CREATING A SNAPSHOT

The screenshot displays the AWS Management Console interface. On the left, the navigation menu includes 'EC2 Dashboard', 'Events', 'Tags', 'Reports', 'Limits', 'INSTANCES', 'IMAGES', 'ELASTIC BLOCK STORE', and 'NETWORK & SECURITY'. The 'VOLUMES' link under 'ELASTIC BLOCK STORE' is highlighted. The main content area shows a table of volumes with the following data:

Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created
	vol-0065bc19d512daf62	8 GB	gp2	100 / 3000	snap-091e5596...	January 10, 2017

A 'Create Snapshot' dialog box is open in the foreground. It contains the following fields:

- Volume:** vol-0065bc19d512daf62
- Name:** MyRootDeviceVolume
- Description:** MyRootDeviceVolume
- Encrypted:** No

At the bottom right of the dialog, there are 'Cancel' and 'Create' buttons.

COPYING A SNAPSHOT & CHANGING THE REGION

The screenshot displays the AWS Management Console interface for the 'Snapshots' section. On the left, a navigation menu includes 'EC2 Dashboard', 'Events', 'Tags', 'Reports', 'Limits', 'INSTANCES', 'IMAGES', 'ELASTIC BLOCK STORE', and 'NETWORK & SECURITY'. The 'Snapshots' link under 'ELASTIC BLOCK STORE' is highlighted. The main content area shows a 'Create Snapshot' button and an 'Actions' dropdown. Below this is a table of snapshots owned by the user. A 'Copy Snapshot' dialog box is open, showing the details of the selected snapshot 'snap-085cf270563...'. The dialog box has a 'Destination Region' dropdown menu open, listing various AWS regions. The 'EU (London)' region is selected. The dialog box also shows fields for 'Description' and 'Encryption'. The background table lists the snapshot 'MyRootDeviceVolume' with a size of 8 GiB.

Name	Snapshot ID	Size	Description
MyRootDeviceVolume	snap-085cf270563...	8 GiB	MyRootDeviceVolume

Copy Snapshot

This snapshot, **snap-085cf270563...**
snapshot settings below:

Destination Region
Description
Encryption

Available Regions:

- Asia Pacific (Tokyo)
- Asia Pacific (Seoul)
- Asia Pacific (Mumbai)
- Asia Pacific (Singapore)
- Asia Pacific (Sydney)
- Canada (Central)
- EU (Frankfurt)
- EU (Ireland)
- EU (London)**
- South America (Sao Paulo)
- US East (N. Virginia)
- US East (Ohio)
- US West (N. California)**
- US West (Oregon)

Cancel Copy

CREATING AN UNENCRYPTED AMI

The screenshot shows the AWS Management Console interface. On the left is a navigation menu with options like EC2 Dashboard, INSTANCES, IMAGES, and NETWORK. The main area displays a table of snapshots, with one snapshot selected. A modal window titled 'Create Image from EBS Snapshot' is open, showing the configuration for a new AMI.

Create Image from EBS Snapshot

Name: MyEncryptedAMI
Description: MyEncryptedAMI

Architecture: x86_64
Virtualization type: Paravirtual
Root device name: /dev/sda1
Kernel ID: Use default
RAM disk ID: Use default

Block Device Mappings

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/sda1	snap-0b26c579b63e508da	8	General Purpose SSD (GP2)	100 / 3000	N/A	<input type="checkbox"/>	Encrypted

Add New Volume

Cancel **Create**

SELECT AN AMI

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 1: Choose an Amazon Machine Image (AMI)

[Cancel and Exit](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace, or you can select one of your own AMIs.

Quick Start

My AMIs

AWS Marketplace

Community AMIs

Ownership

SEARCH MY AMIs

MyEncryptedAMI • ami-1543u80f

MyEncryptedAMI

Root device type: ebs Virtualization type: paravirtual Created: 18-06-2022

Select

64-bit

CREATE A EC2 INSTANCE USING ENCRYPTED SNAPSHOT

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type ⓘ	Device ⓘ	Snapshot ⓘ	Size (GiB) ⓘ	Volume Type ⓘ	IOPS ⓘ	Throughput (MiB/s) ⓘ	Delete on Termination ⓘ	Encrypted ⓘ
Root	/dev/sda1	map-0b26b575b63e608da	8	General Purpose SSD (GP2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Encrypted

Add New Volume

Free tier eligible customers can get up to 30 GiB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

SUMMARY

- Snapshots of encrypted volumes are encrypted automatically.
- Volumes restored from encrypted snapshots are encrypted automatically.
- You can share snapshots, but only if they are unencrypted.
 - These snapshots can be shared with other AWS accounts or made public