

AWS Certified Solutions Architect — Associate (SAA-C01)



Module 3

Storage — EBS Volumes

Agenda

- Storage solutions on AWS
- EBS Architecture
- Instance/Ephemeral Stores
- Volume types
- Snapshots
- Labs

AWS Storage portfolio

Block storage



Amazon
EBS

File storage



Amazon
EFS

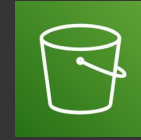


Amazon FSx for
Windows File Server

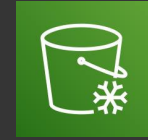


Amazon FSx
for Lustre

Object storage



Amazon S3



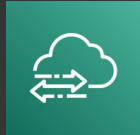
Amazon S3
Glacier

Hybrid

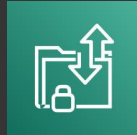


AWS Storage
Gateway family

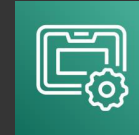
Transport and edge



AWS
DataSync

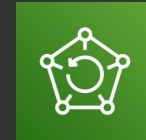


AWS Transfer
for SFTP



AWS Snow*
family

Backup



AWS
Backup

AWS Storage portfolio

Block storage



Amazon
EBS

File storage



Amazon
EFS



Amazon FSx for
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Amazon FSx
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Object storage



Amazon S3



Amazon S3
Glacier

Hybrid



AWS Storage
Gateway family

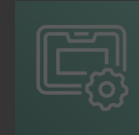
Transport and edge



AWS
DataSync

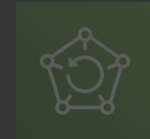


AWS Transfer
for SFTP









AWS Snow*
family

Backup



AWS
Backup

Elastic Block Store (EBS)

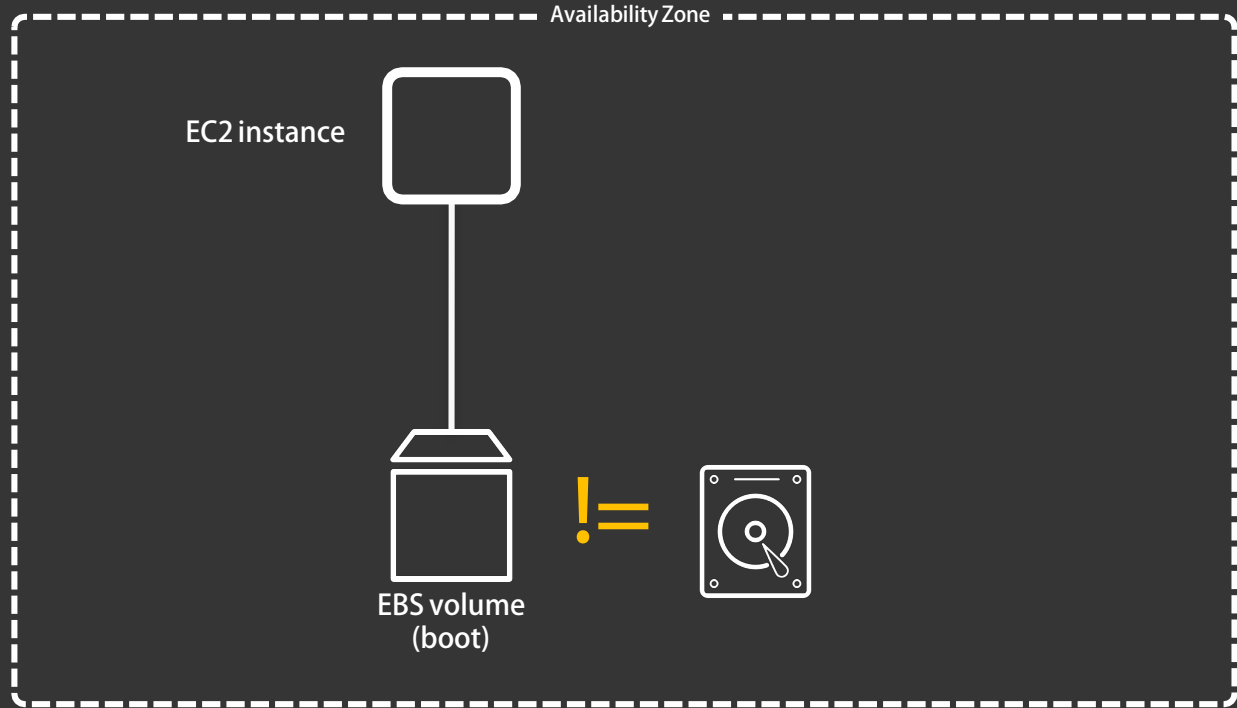
-  Persistent off-instance block storage as a service.
-  Accessed over the network with 99.999% availability.
-  SSD or HDD magnetic disk.
-  Durable point in time snapshots to S3.
-  Encryption support.
-  Provisioned IOPS option.



Amazon EBS

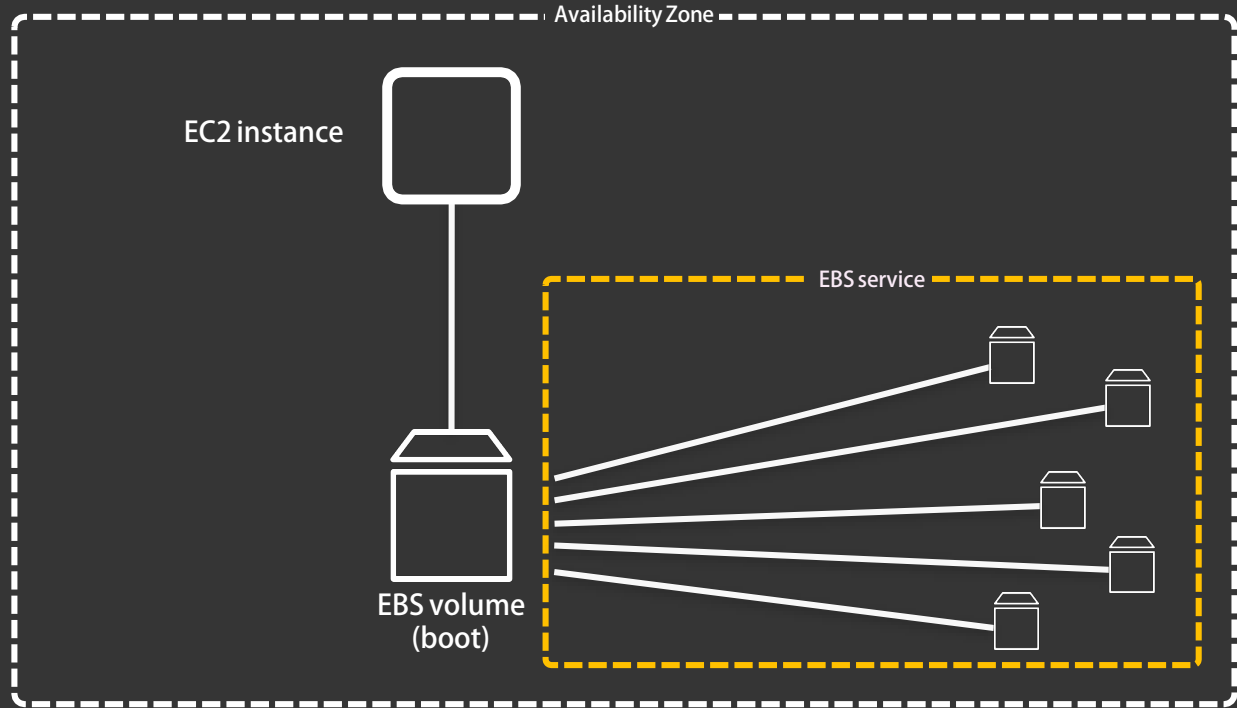


What is Amazon EBS?



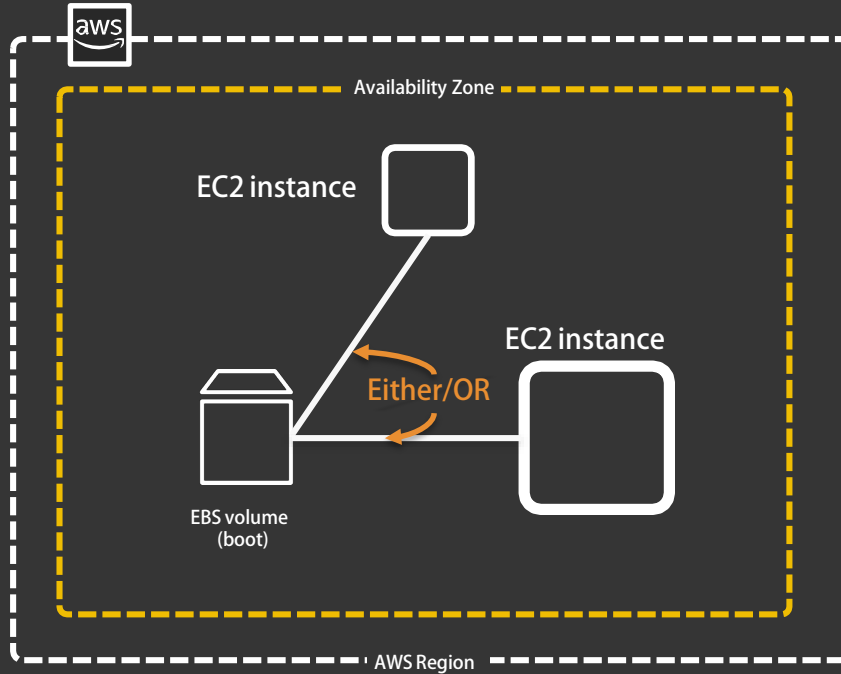


What is Amazon EBS?





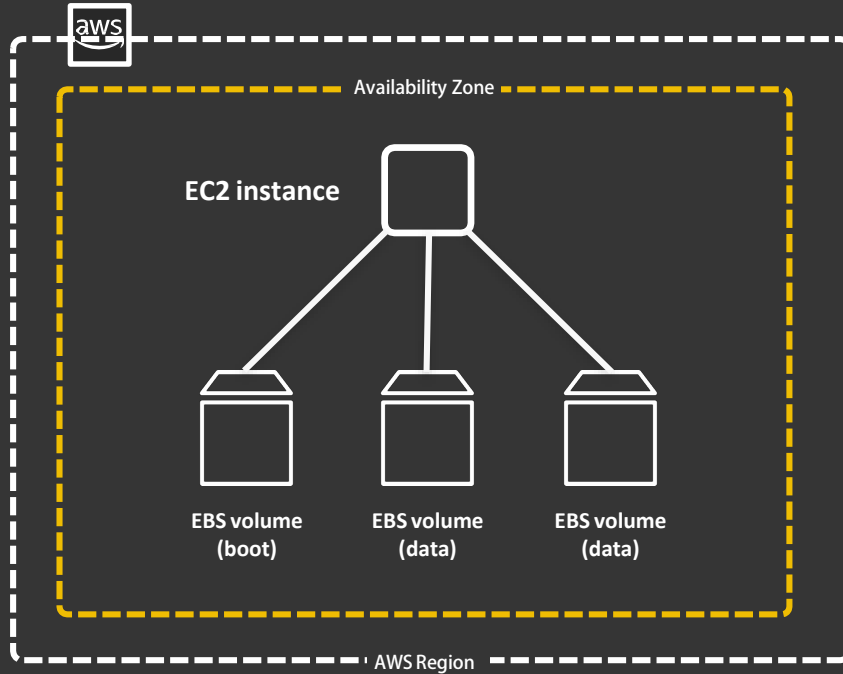
What is Amazon EBS?



- Volumes persist independent of Amazon EC2
- Select storage and compute based on your workload
- Detach and attach between instances within the same Availability Zone



What is Amazon EBS?



One instance can have many volumes attached

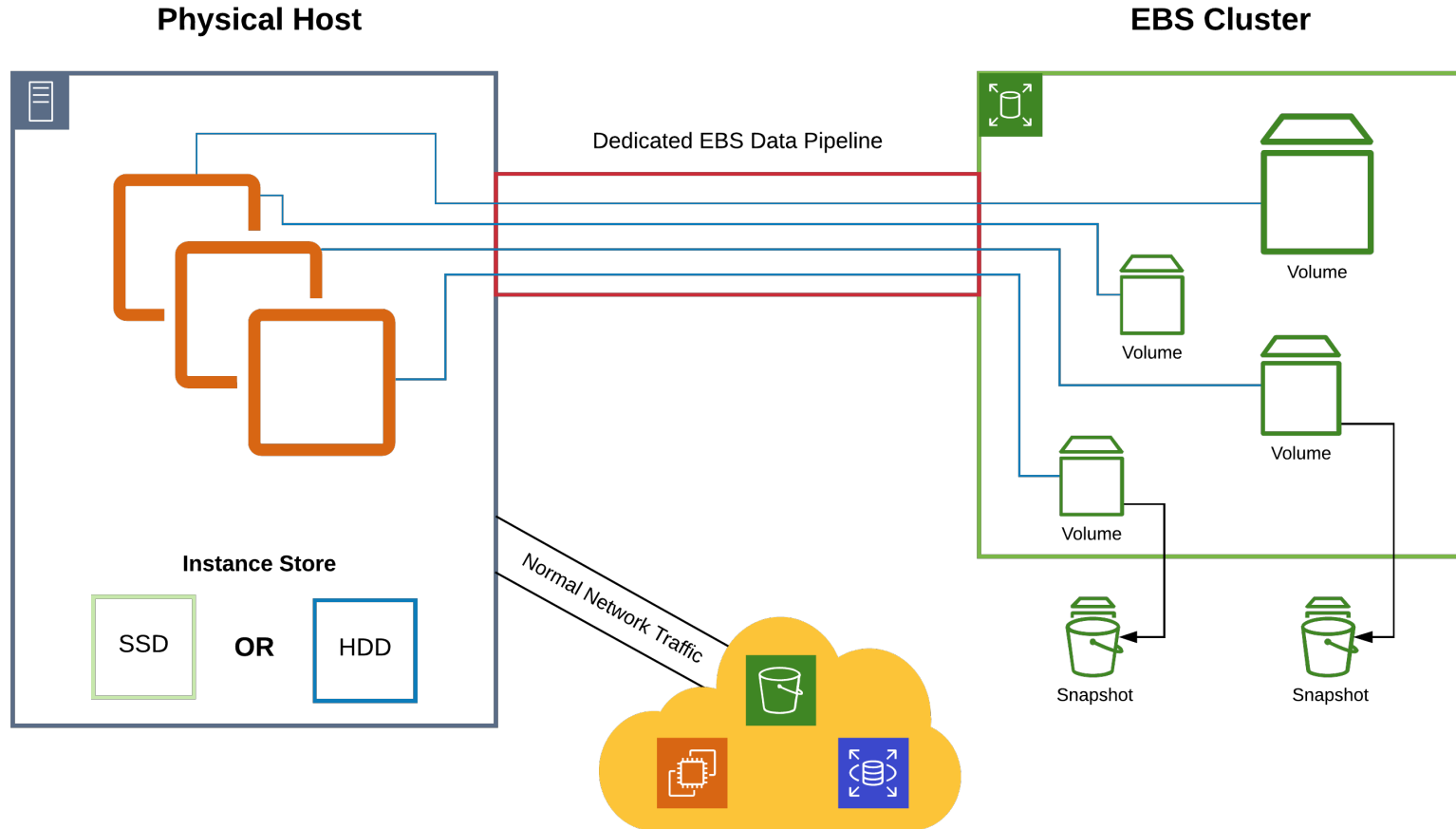


Volumes attach to one instance



Best practice – separate boot and data volumes





EBS Architecture



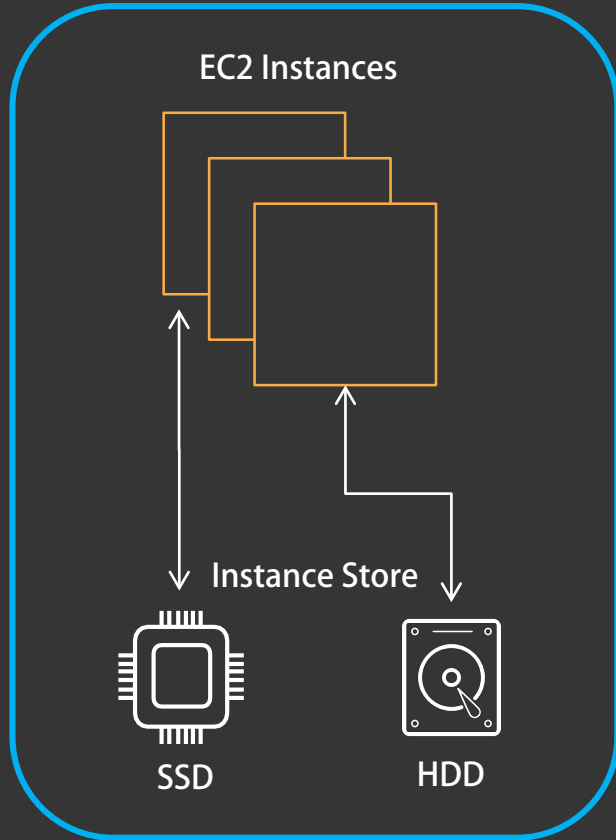


Amazon EBS

Elastic Volumes

-  Increase volume size
-  Modify performance
-  Change volume type
-  Continue using your application without downtime

Instance Store / Ephemeral Disk

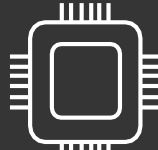


- Local to instance
- Non-persistent data store
(Data is wiped/cleared when instance is stopped)
- Data not replicated (by default)
- No snapshot support
- SSD or HDD



AWS block storage offerings

Amazon EC2
instance store

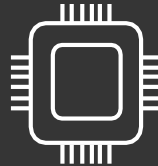


SSD

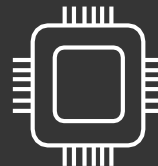


HDD

Amazon EBS SSD-
backed volumes



gp2



io1

Amazon EBS HDD-
backed volumes



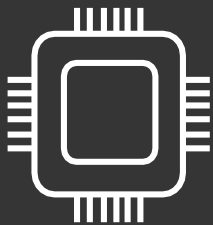
st1



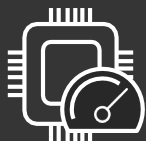
sc1



Volume types and performance



SSD-based

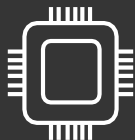


io1

\$0.125/GiB*
\$0.065/IOP*

Highest performance SSD volume designed for critical and I/O intensive workloads requiring 99.9% consistent performance

Up to 64K IOPS and 1,000 MB/sec



gp2

\$0.10/GiB*

General purpose SSD volume that balances price and performance for a wide variety of workloads with predictable baseline and burst

Up to 16K IOPS and 256 MB/sec

*per GB month of provisioned storage (us-east-1)



Volume types and performance



HDD-based



st1

\$0.045/GiB*

Low-cost HDD volume designed for frequently accessed, **throughput intensive sequential workloads**

Up to 500 IOPS and 500 MB/sec



sc1

\$0.025/GiB*

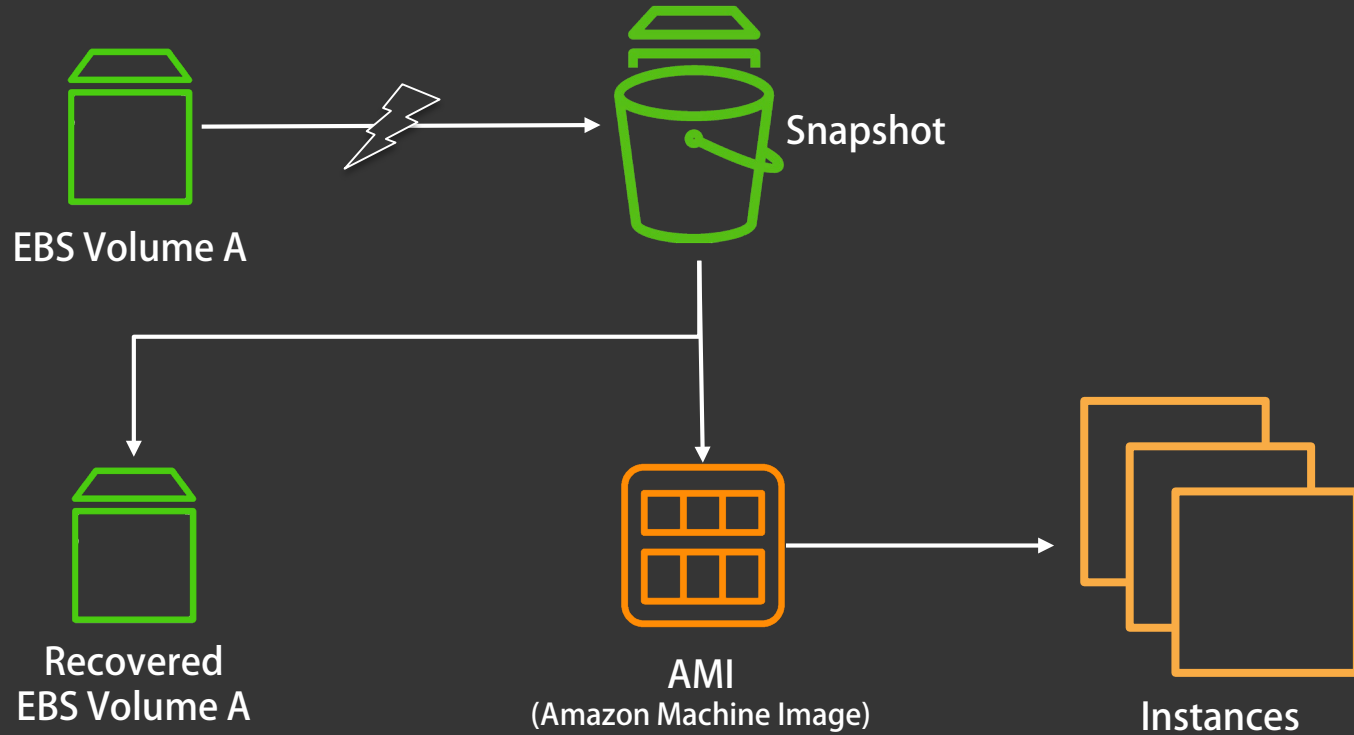
Lowest cost HDD volume designed for **less frequently accessed sequential workloads**

Up to 250 IOPS and 250 MB/sec

*per GB month of provisioned storage (us-east-1)

	Solid State Drives (SSD)		Hard Disk Drives (HDD)	
Volume Type	EBS Provisioned IOPS SS (io1)	EBS General Purpose SSD (gp2)*	Throughput Optimized HDD (st1)	Cold HDD (sc1)
Short Description	Highest performance SSD volume designed for latency-sensitive transactional workloads	General Purpose SSD volume that balances price performance for a wide variety of transactional workloads	Low cost HDD volume designed for frequently accessed, throughput intensive workloads	Lowest cost HDD volume designed for less frequently accessed workloads
Use Cases	I/O-intensive NoSQL and relational databases	Boot volumes, low-latency interactive apps, dev & test	Big data, data warehouses, log processing	Colder data requiring fewer scans per day
API Name	io1	gp2	st1	sc1
Volume Size	4 GB - 16 TB	1 GB - 16 TB	500 GB - 16 TB	500 GB - 16 TB
Max IOPS**/Volume	64,000	16,000	500	250
Max Throughput***/Volume	1,000 MB/s	250 MB/s	500 MB/s	250 MB/s
Max IOPS/Instance	80,000	80,000	80,000	80,000
Max Throughput/Instance	1,750 MB/s	1,750 MB/s	1,750 MB/s	1,750 MB/s
Price	\$0.125/GB-month \$0.065/provisioned IOPS	\$0.10/GB-month	\$0.045/GB-month	\$0.025/GB-month
Dominant Performance Attribute	IOPS	IOPS	MB/s	MB/s

EBS Snapshots



Labs

Thank You!

Q & A