BATCH : BATCH 85

LESSON : **AWS DAY 8**

DATE : 12.08.2022

SUBJECT : **EBS VOLUMES**

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AWS EBS (Elastic Block Store)

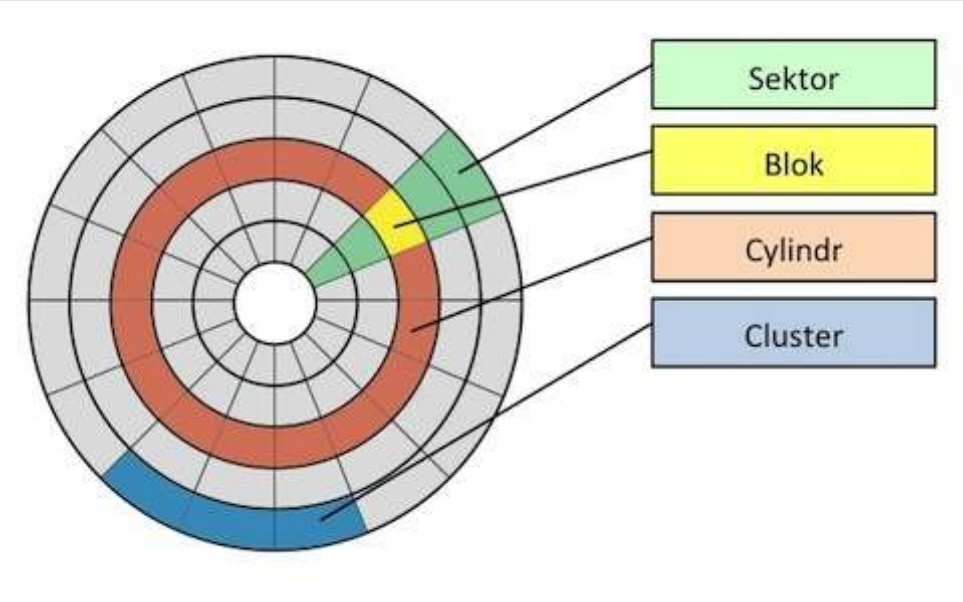
AWS Storage

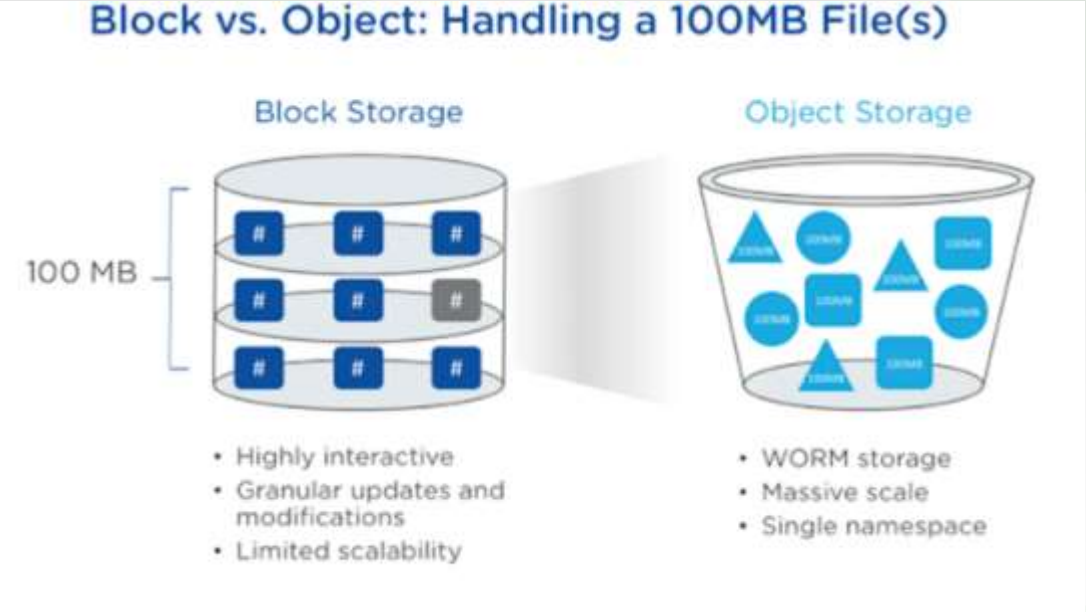
CLOUDIAN

STORAGE TYPES

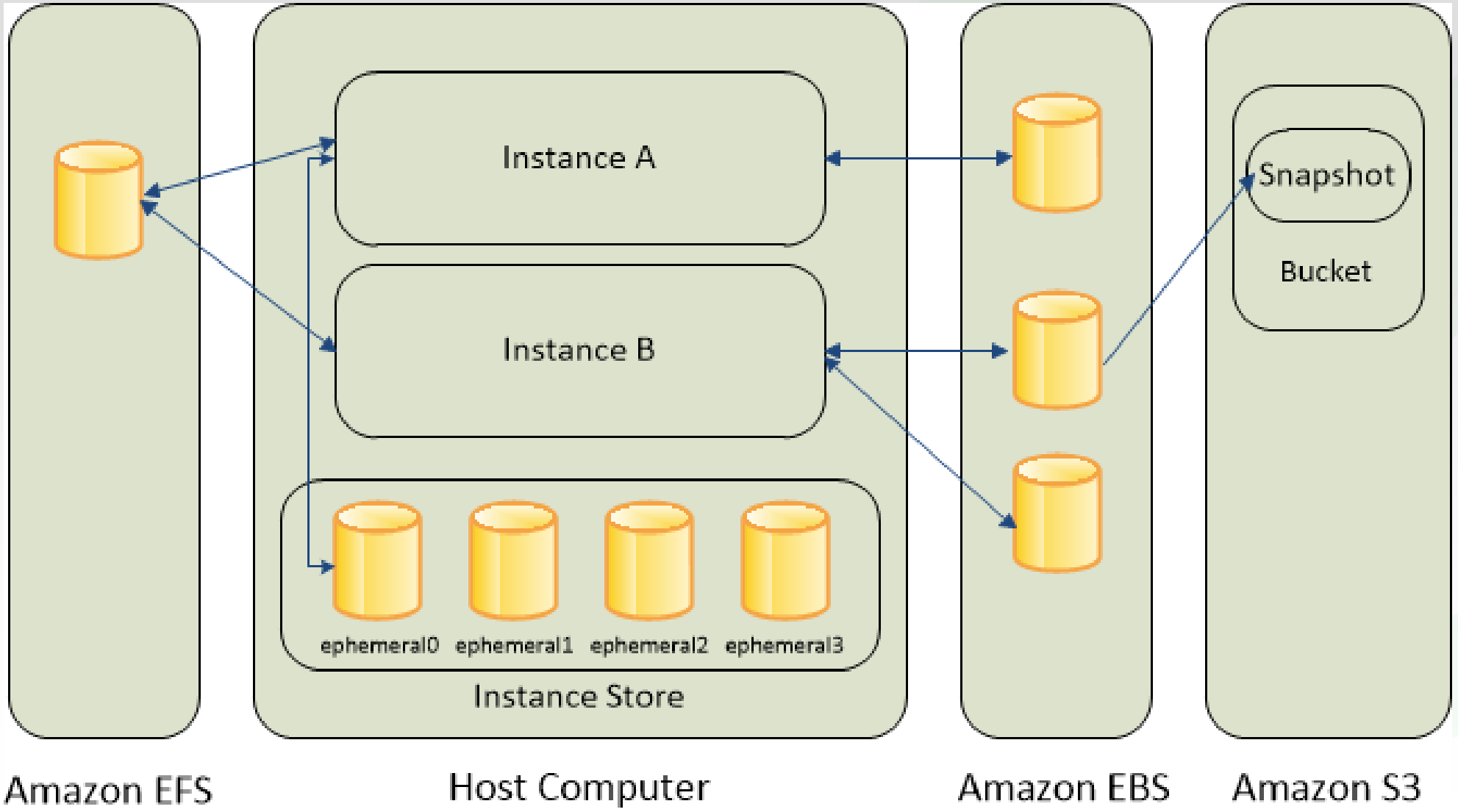
	BLOCK STORAGE	FILE STORAGE	OBJECT STORAGE
			
TRANSPORT:	FC or iSCSI	TCP/IP	TCP/IP
INTERFACE:	Direct Attached or SAN	NFS, SMB	HTTP, REST
USE CASE:	Low Latency Best for Structured Data	Good Performance File Sharing, Global File Locking	Easy Scaling with No Limits Accessible across LAN & WAN

Block Storage





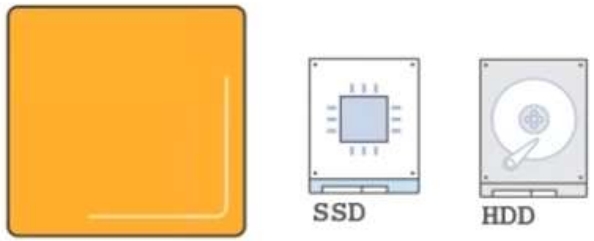
AWS Storage


Instance A
Instance B
ephemeral0
ephemeral1
ephemeral2
ephemeral3
Instance Store
Snapshot
Bucket
Amazon EFS
Host Computer
Amazon EBS
Amazon S3

EBS Instance Store vs EBS

EC2 Instance Store

- Local to instance
- Non-persistent data store
- Data not replicated (by default)
- No snapshot support
- SSD or HDD



Elastic Block Store

- Persistent block storage volumes
- 99.999% availability
- Automatically replicated within its Availability Zone (AZ)
- Point-in-time snapshot support
- Modify volume type as needs change
- SSD or HDD
- Auto recovery

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/InstanceStorage.html#instance-store-volumes

What is Elastic Block Storage(EBS)?

EBS = **E**lastic **B**lock **S**tore

Amazon Elastic Block Store (Amazon EBS) provides block level storage volumes for use with EC2 instances.

✓ EBS volumes provide benefits that are not provided by instance store volumes.

Data availability

Data persistence

Data encryption

Data security

Snapshots

Flexibility

EBS Volume Types - Solid state drives (SSD)

	General Purpose SSD		Provisioned IOPS SSD		
Volume type	gp3	gp2	io2 Block Express ‡	io2	io1
Durability	99.8% - 99.9% durability (0.1% - 0.2% annual failure rate)	99.8% - 99.9% durability (0.1% - 0.2% annual failure rate)	99.999% durability (0.001% annual failure rate)	99.999% durability (0.001% annual failure rate)	99.8% - 99.9% durability (0.1% - 0.2% annual failure rate)
Use cases	• Low-latency interactive apps • Development and test environments		Workloads that require: • Sub-millisecond latency • Sustained IOPS performance • More than 64,000 IOPS or 1,000 MiB/s of throughput	• Workloads that require sustained IOPS performance or more than 16,000 IOPS • I/O-intensive database workloads	
Volume size	1 GiB - 16 TiB		4 GiB - 64 TiB	4 GiB - 16 TiB	
Max IOPS per volume (16 KiB I/O)	16,000		256,000	64,000 †	
Max throughput per volume	1,000 MiB/s	250 MiB/s *	4,000 MiB/s	1,000 MiB/s †	
Amazon EBS Multi-attach	Not supported		Supported		
Boot volume	Supported				

EBS Volume Types - Hard disk drives (HDD)

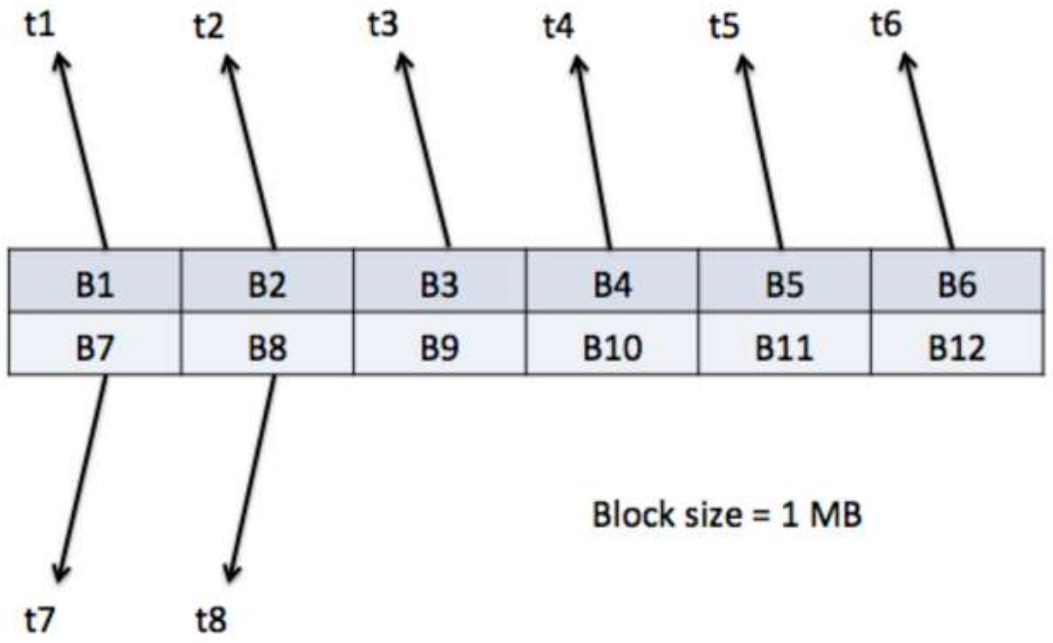
	Throughput Optimized HDD	Cold HDD
Volume type	`st1`	`sc1`
Durability	99.8% - 99.9% durability (0.1% - 0.2% annual failure rate)	99.8% - 99.9% durability (0.1% - 0.2% annual failure rate)
Use cases	• Big data • Data warehouses • Log processing	• Throughput-oriented storage for data that is infrequently accessed • Scenarios where the lowest storage cost is important
Volume size	125 GiB - 16 TiB	125 GiB - 16 TiB
Max IOPS per volume (1 MiB I/O)	500	250
Max throughput per volume	500 MiB/s	250 MiB/s
Amazon EBS Multi-attach	Not supported	Not supported
Boot volume	Not supported	Not supported

Storage Types

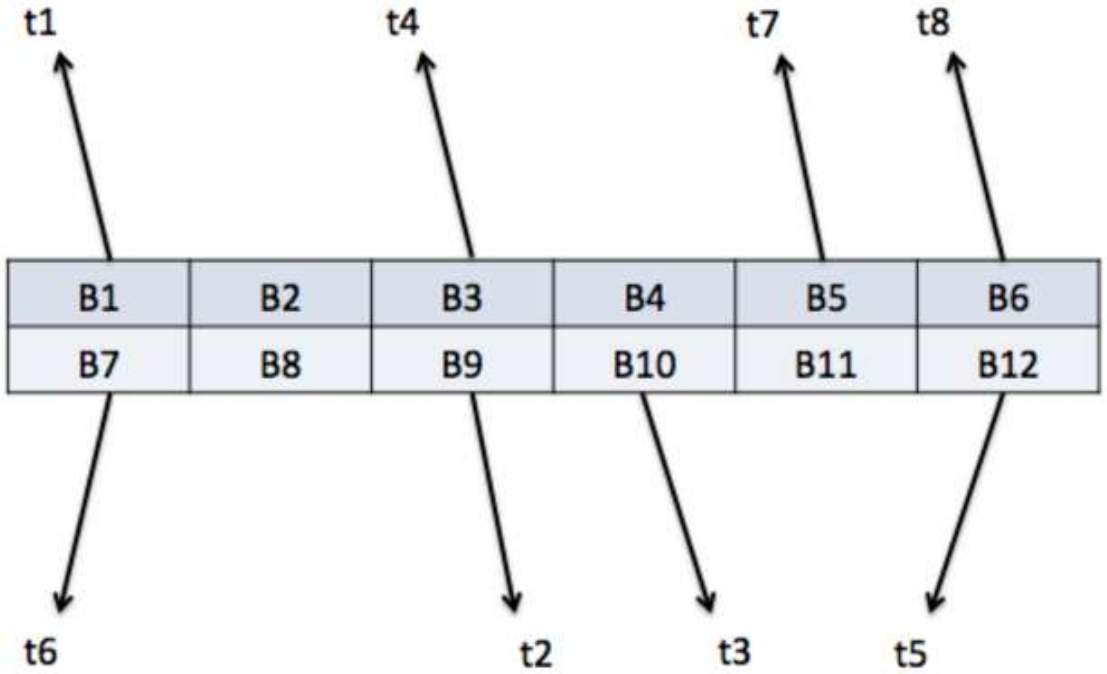
	Performance	Availability and Accessibility	Access Control	Storage and File Size Limits	Cost
Amazon S3	- Supports 3500 PUT / LIST / DELETE requests per second - Scalable to 5500 GET requests per second	- Usually 99.9% available - If lower, returns 10-100% of cost as service credits - Accessible via Internet using APIs	- Access is based on IAM - Uses bucket policies and user policies - Public access via Block Public Access	- No limit on quantity of objects - Individual objects up to 5TB	- **Free tier:** 5GB - **First 50 TB/month:** $0.023 per GB - **Next 450 TB/month:** $0.022 per GB - **Over 500 TB/month:** $0.021 per GB
AWS EBS	- HDD volumes: 250-500 IOPS/volume depending on volume type - SSD volumes: 16-64K IOPS/volume	- 99.99% available - Accessible via single EC2 instance	- Security groups - User-based authentication (IAM)	- Max storage size of 16TB - No file size limit on disk	- **Free tier:** 30GB - **General Purpose:** $0.045 per GB/month - **Provisioned SSD:** $0.125 per GB/month, $0.065 per IOPS/month
AWS EFS	- 3GB/s baseline performance - Up to 10GB/s - Up to 7K IOPS	- No publicly available SLA - Up to 1,000 concurrent EC2 instances - Accessible from any AZ or region	- IAM user-based authentication - Security groups	- 16TB per volume - 52TB maximum for individual files	- **Standard storage:** $0.30-$0.39 per GB-month depending on region - **Infrequent storage:** $0.025-$0.03 per GB-month - **Provisioned throughput:** $6 per MB/s-month

Throughput (HDD) vs IOPS (SSD)

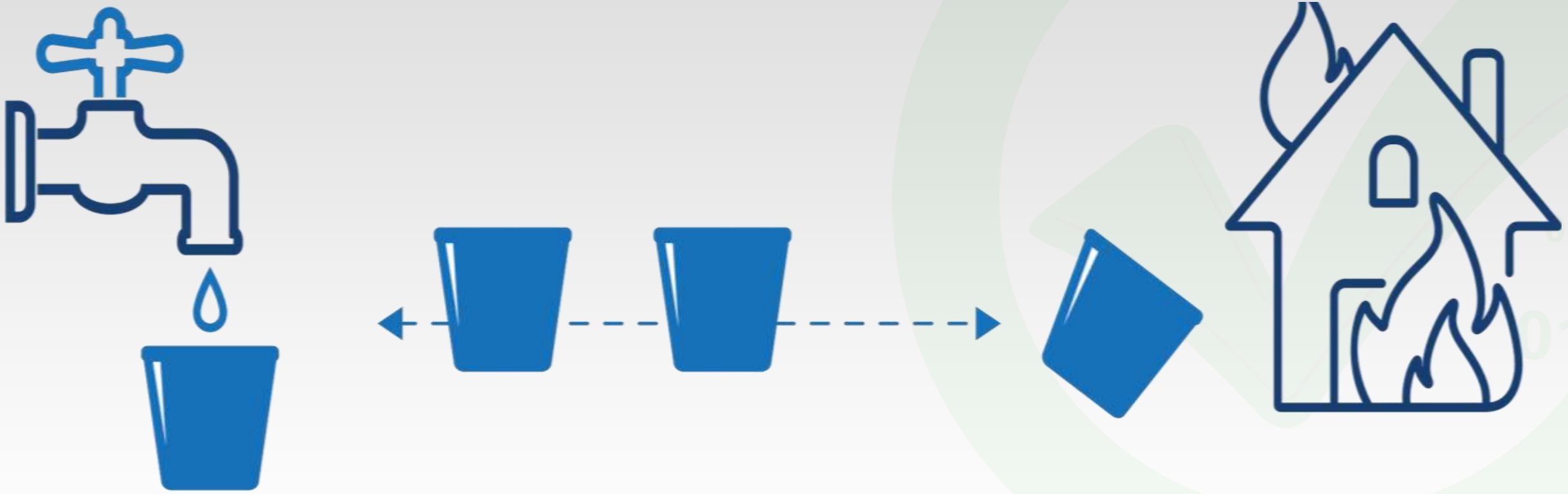
Throughput (HDD)



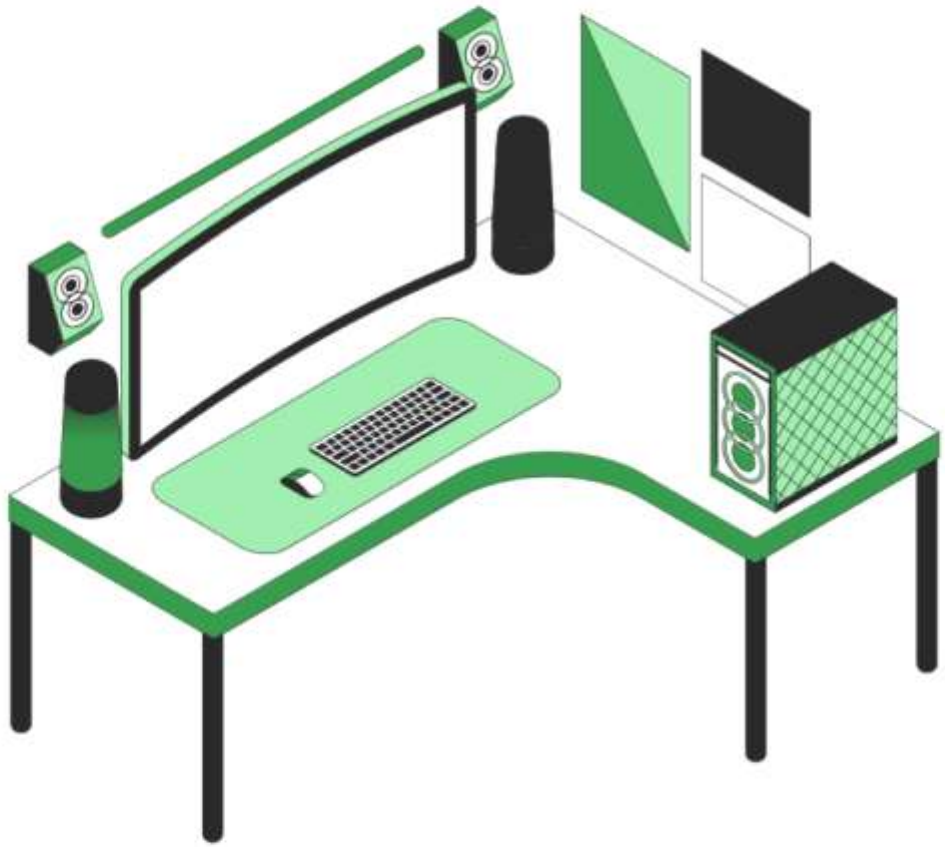
IOPS (SDD)



Throughput (HDD) vs IOPS (SSD)



HDD - SSD



Do you have any questions?

Send it to us! We hope you learned something new.