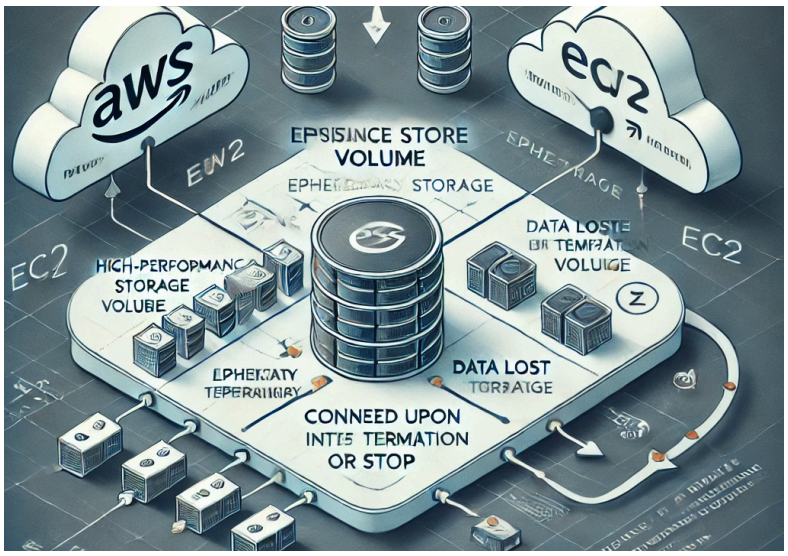
Instance Store Volume in AWS

An **Instance Store Volume** in AWS is a type of ephemeral block storage that is physically attached to the host server that runs your Amazon EC2 instance. Unlike Amazon EBS, instance store volumes are temporary and do not persist beyond the lifecycle of the instance.



Key Features of Instance Store Volumes

1. **Ephemeral Storage**:
   - Data stored on instance store volumes is **temporary**.
   - The data is lost when:
     - The instance is stopped or terminated.
     - The host server experiences hardware failure.
2. **High Performance**:

- Instance store volumes provide **low-latency, high-throughput storage**.
- Ideal for temporary data like caches, buffers, and temporary files.

3. **No Additional Costs**:

- Instance store storage is included in the price of the instance.

4. **Tightly Coupled with the Instance**:

- Instance store volumes are physically attached to the host server.
- They cannot be detached or attached to another instance.

Advantages

1. **Speed**:
   - Very high IOPS and low latency since the storage is directly attached.
2. **Cost-Effective**:
   - No additional charge; the storage is part of the instance's configuration.
3. **Temporary Workloads**:
   - Useful for workloads that can tolerate data loss, such as:

- Temporary scratch space
- Application caches
- Session data

Limitations

1. **Data Loss on Instance Stop**:
   - Instance store volumes do not persist if the instance is stopped or terminated.
2. **Limited Configuration**:
   - Only available for certain instance types.
3. **Non-Persistent**:
   - Not suitable for storing critical or long-term data.

Use Cases

1. **Temporary Data Storage**:
   - Storing intermediary results during batch processing.
2. **High-Performance Caching**:
   - Applications requiring fast, temporary storage for cache data.
3. **Temporary File Systems**:
   - Storing logs, session data, or swap files.

How Instance Store Volumes Work

1. **Automatically Provisioned**:
   - Instance store volumes are automatically included with the instance when launched.
   - The number and size of instance store volumes depend on the instance type.
2. **Formatting**:
   - Instance store volumes need to be formatted and mounted before use.
3. **Temporary Nature**:
   - If the instance is rebooted, the data remains intact.
   - If the instance is stopped or terminated, all data is lost.

Instance Store vs. EBS

Feature	Instance Store	EBS
Persistence	Non-persistent (data lost on stop/terminate)	Persistent
Performance	High throughput, low latency	Configurable (depends on volume type)
Cost	Included in instance cost	Charged based on usage
Attachment	Cannot be detached or reattached	Can be detached/reattached
Use Case	Temporary data, caching	Long-term data storage

Instance Types Supporting Instance Store

Not all instance types in AWS provide instance store volumes. Typically, they are available for specific families, such as:

- **C6gd, M5d, R5d** (with local NVMe SSD storage)
- **i3, i4i** (optimized for high I/O workloads)

Best Practices

1. **Do Not Store Critical Data**:
   - Always store critical data in Amazon EBS or S3.
2. **Use Backups**:
   - Save any necessary data to persistent storage periodically.
3. **Monitor Workloads**:
   - Ensure that the workload can tolerate data loss in case of instance failure.