



Cloud-based Data Management AWS Computing

Objective



Objective

Explain AWS services

Amazon EC2

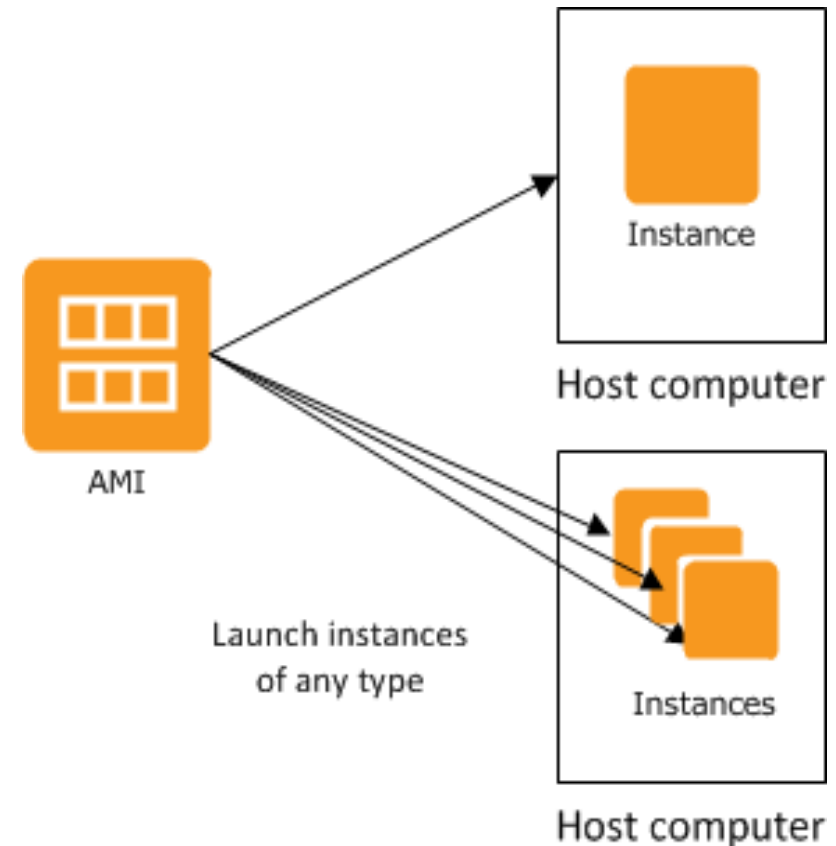


- | Virtual computing environments—instances
- | Preconfigured templates for instances—Amazon Machine Images (AMIs)
- | Different instance types with various configurations of CPU, memory, storage, and network capacity
- | Multiple physical locations for running instances—regions and Availability Zones

Instances and AMIs

Multiple and different types of instances can be created from the same AMI

You can create your own custom AMIs, in addition to choosing from those provided by AWS

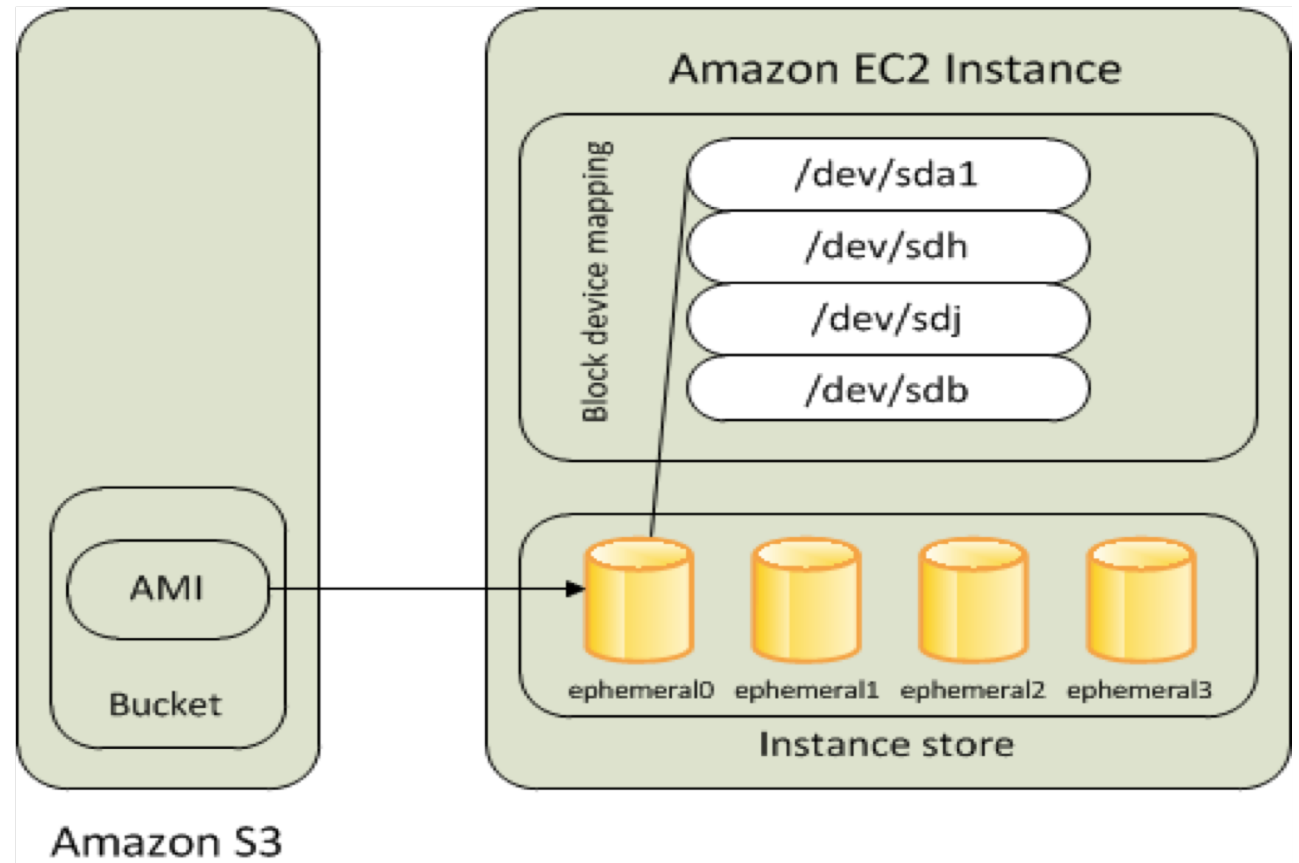


Root Device Volume

The root device of an instance can be backed by the instance store or EBS

Instance store-backed root device **does not persist**

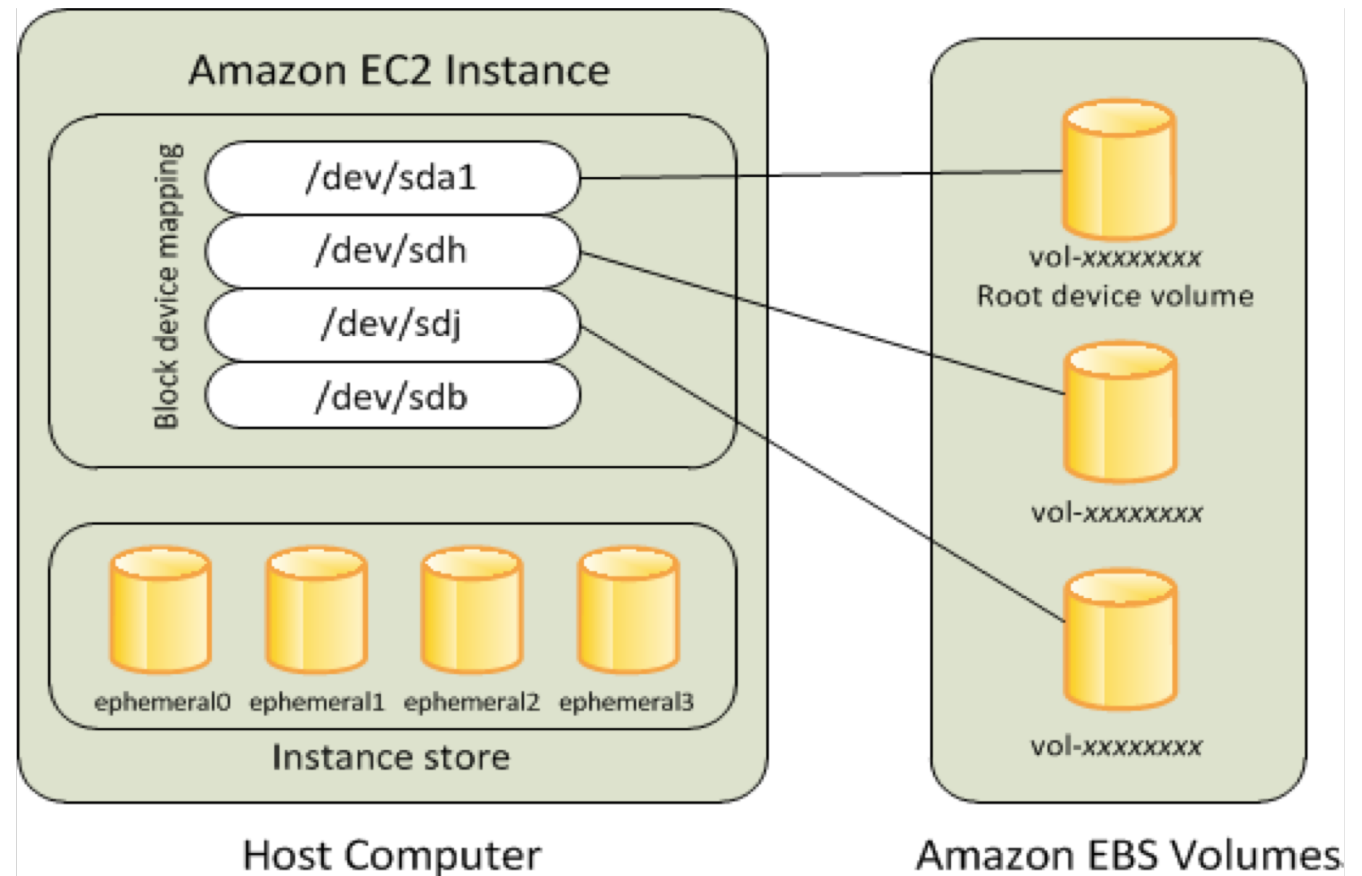
- Data stored on the root volume is deleted after the instance is terminated



Root Device Volume

EBS-backed root device persist

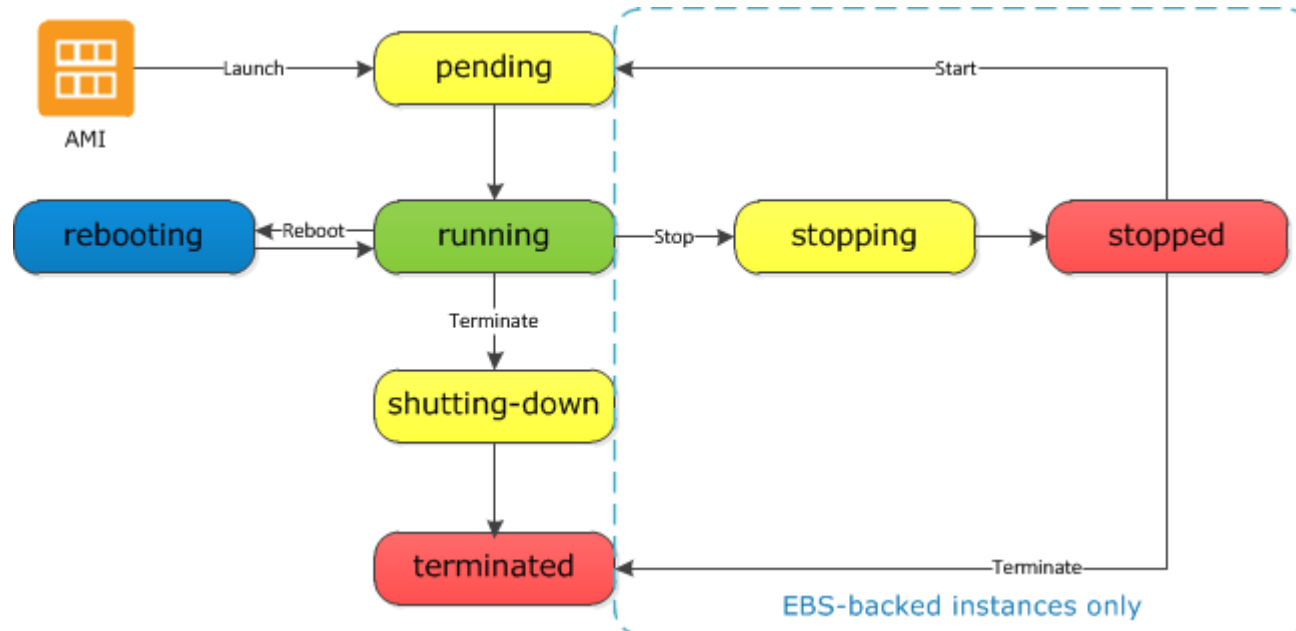
- But by default the root volume and other EBS volumes attached to an instance are **automatically deleted** when the instance terminates
- You have to manually change this behavior if you want the root volume to persist—but **watch your EBS usage**



Instance Lifecycle

You stop incurring charges for an instance as soon as its state changes to stopping

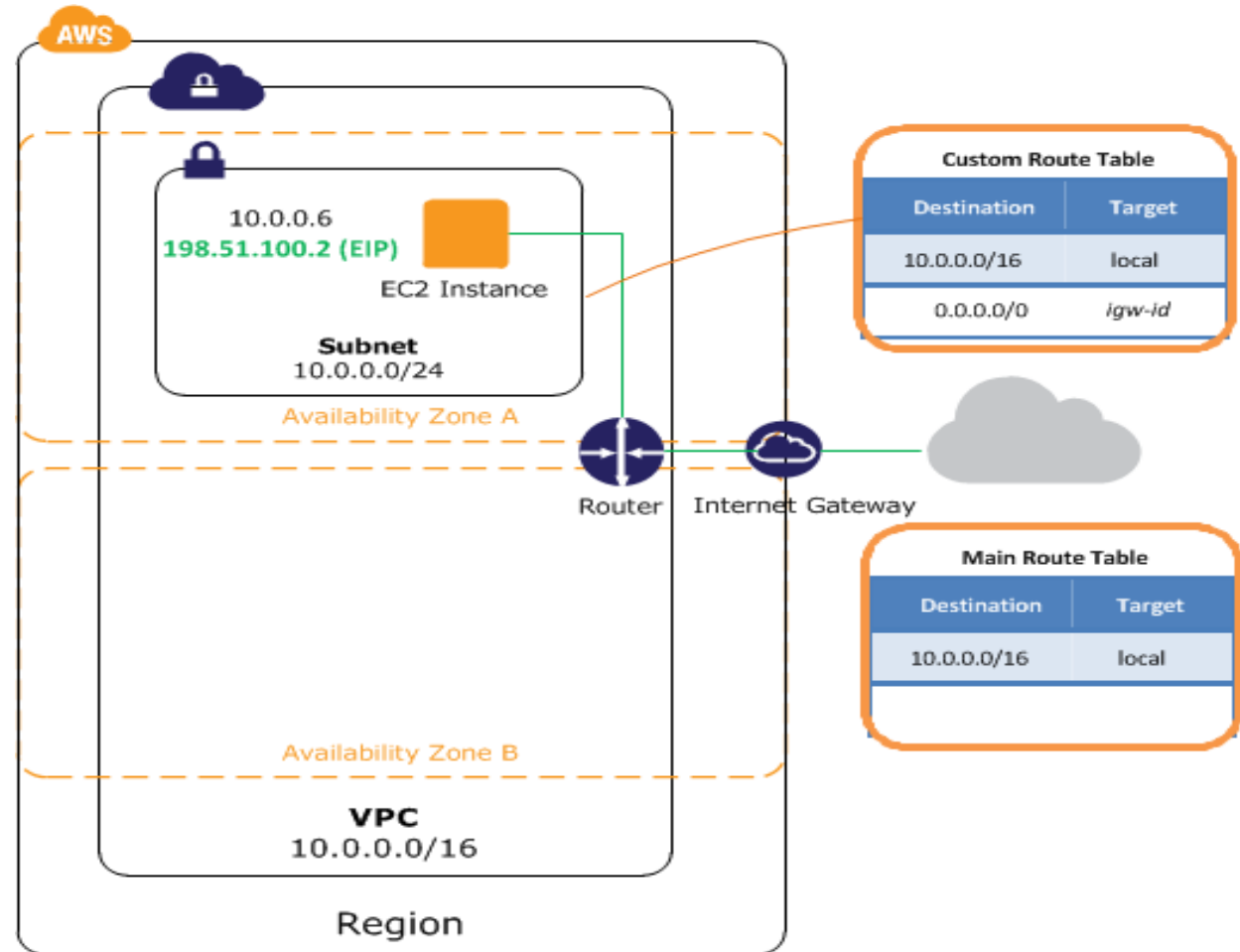
Each time an instance transitions from stopped to pending, we start a new instance billing hour



Networking

Amazon Virtual Private Cloud (Amazon VPC)

- User-defined virtual network in a logically isolated area within the AWS cloud



IP Addressing



| An instance gets an private IP address and an internal DNS hostname

- Useful for communications within the cloud network

| An instance also gets a public IP and an external DNS hostname

- NAT—automatically mapped to the private IP address through network address translation
- Non-persistent—Automatically released when the instance is stopped or terminated

IP Addressing



| Elastic IP address (EIP) is a public IP that you can allocate to your account

- You can associate it to an instance and it persists
- But you will be charged if your EIP is associated with a running instance
- The first EIP associated with a running instance is free—additional ones will be charged

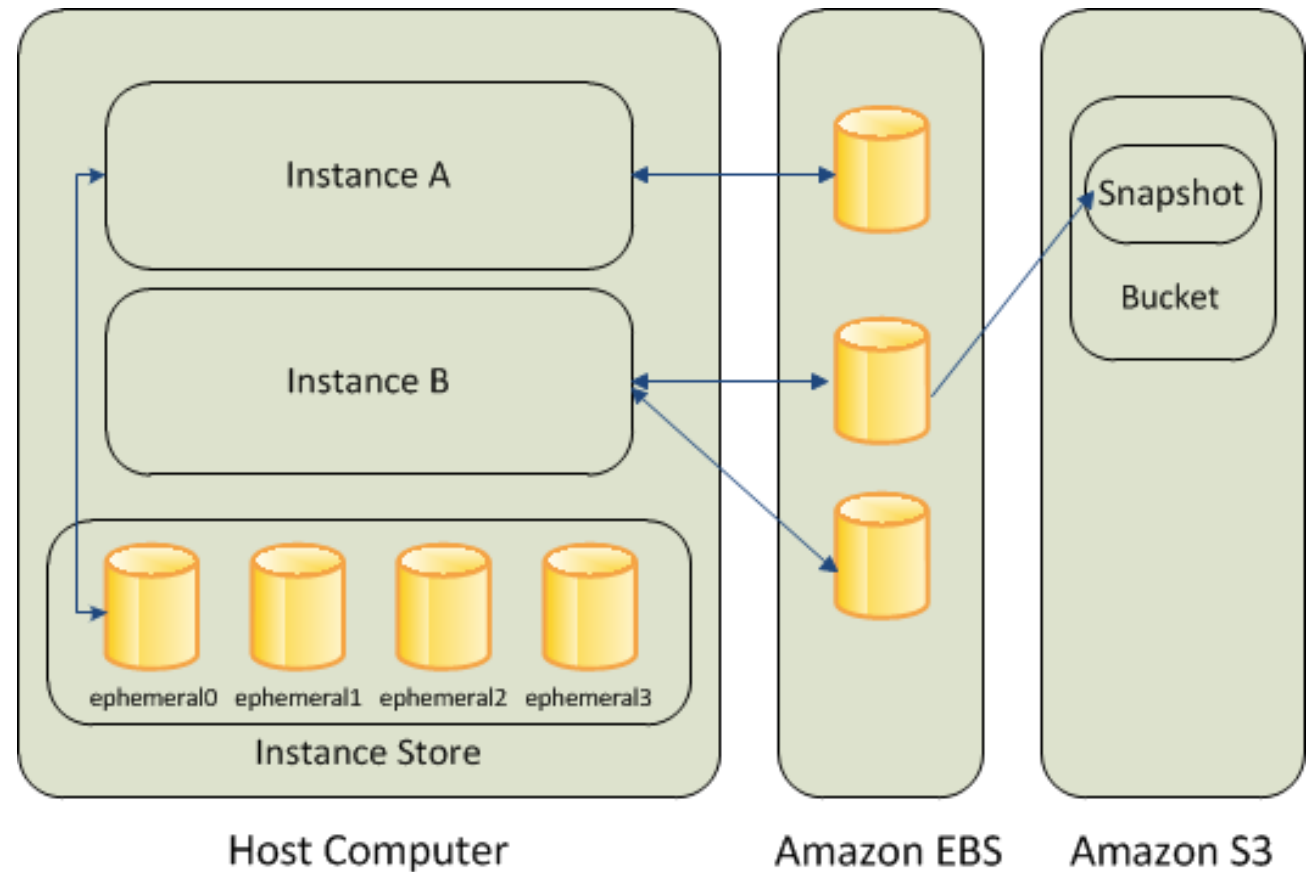
Root Device Volume

Instance storage

- Temporary block-level storage, persist only during the life of the associated instance

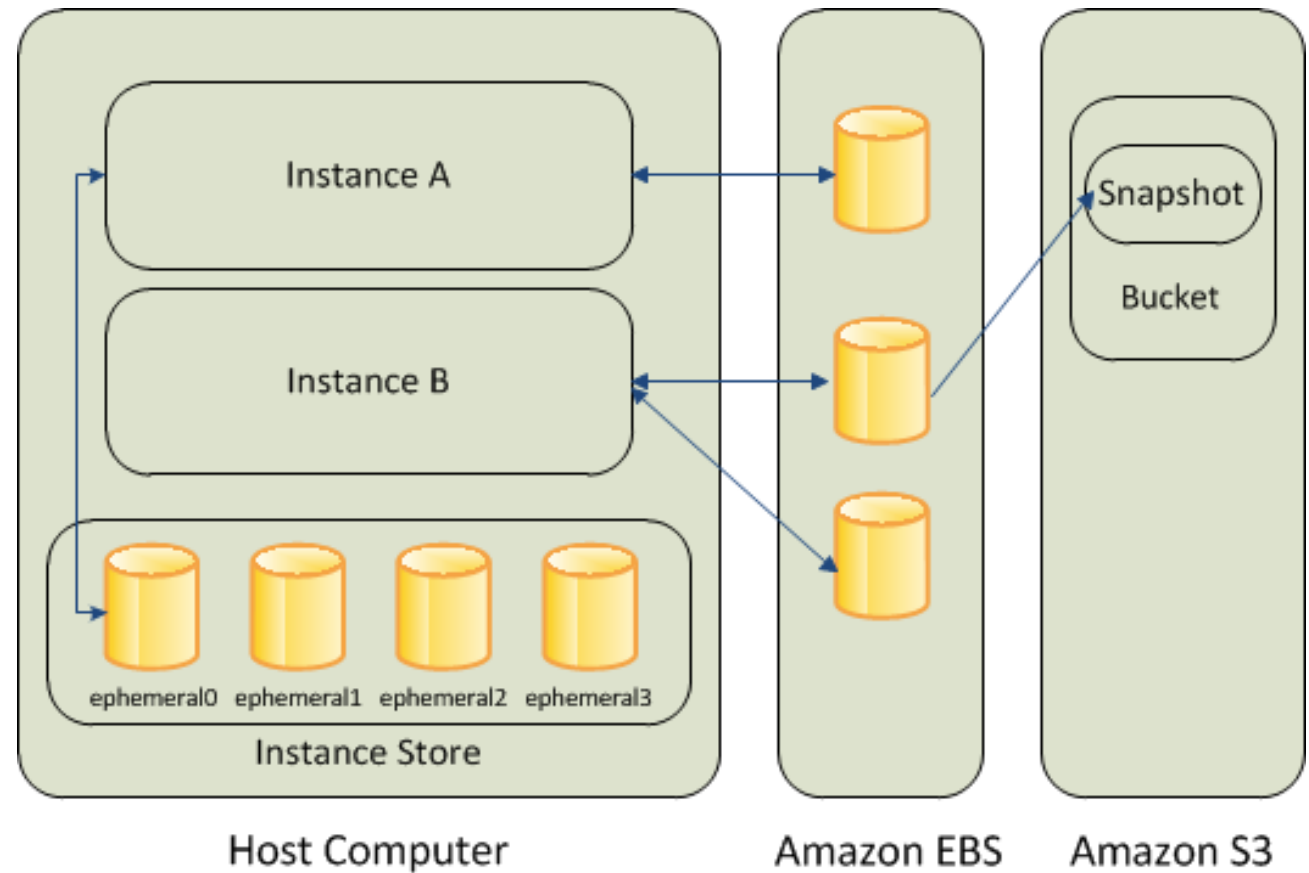
–EBS

- Reliable block-level storage, automatically replicated within its Availability Zone
- Can persist independently from instances
- Can be attached/detached to/from any instance
- Multiple volumes can be attached to a single instance



Root Device Volume

- You can back up an EBS volume by taking snapshots
- Snapshots are stored in S3 with high reliability
- A snapshot stores only the changes to the volume since the previous snapshot
- You can create new EBS volumes from a snapshot



IP Addressing

| A reliable, inexpensive object store

- Durability of 99.999999999%: data is redundantly stored across multiple facilities and multiple devices in each facility
- Stores AMIs, EBS volume snapshots, ... and any data

| Data are stored as objects within buckets

- Access control can be assigned to each bucket
- Each objects has a unique key and accessed using HTTP URLs
 - E.g.,
`http://myawsbucket.s3.amazonaws.com/photos/mygarden.jpg`

