

EBS ATTACHMENT AND DETACHMENT IN AWS

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Abstract: Elastic Block Store (EBS) attachment and detachment are fundamental operations in cloud computing, particularly in Amazon Web Services (AWS). EBS provides block-level storage volumes for EC2 instances, offering persistence and flexibility. Attachment involves associating an EBS volume with an EC2 instance, enabling it to access the data stored on the volume. Detachment, on the other hand, disconnects the volume from the instance, allowing it to be reattached to another instance or remain unattached for storage management purposes. These operations are crucial for dynamic scalability, data management, and ensuring high availability in cloud environments. Elastic Block Store (EBS) attachment and detachment are fundamental operations in cloud computing, particularly in Amazon Web Services (AWS). EBS provides block-level storage volumes for EC2 instances,.

Keywords: AWS,EC2 Instances,Volumes,Snapshots

I. INTRODUCTION

EBS Attachment:

When you attach an EBS volume to an EC2 instance, you're essentially connecting the volume to the instance so that the instance can access the data stored on the volume. You can attach multiple EBS volumes to a single EC2 instance, and each volume retains its own data independently. EBS volumes can be attached to both running and stopped EC2 instances, but they must be in the same Availability Zone. Elastic Block Store (EBS) attachment and detachment are fundamental operations in cloud computing, particularly in Amazon Web Services (AWS). EBS provides block-level storage volumes for EC2 instances, offering persistence and flexibility. Attachment involves associating an EBS volume with an EC2 instance, enabling it to access the data stored on the volume. Detachment, on the other hand, disconnects the volume from the instance, allowing it to be reattached to another instance or remain unattached for storage management purposes. These operations are crucial for dynamic scalability, data management, and ensuring high availability in cloud environment.

EBS Detachment:

Detaching an EBS volume from an EC2 instance disconnects the volume from the instance, effectively stopping the instance's access to the volume's data. Detachment can be temporary or permanent. Temporary detachment allows you to move the volume to another instance within the same Availability Zone, while permanent detachment removes the volume from the instance entirely. Before detaching an EBS volume, it's important to ensure that any data on the volume is properly flushed and any applications using the volume are gracefully stopped to avoid data corruption or loss. Detached volumes remain available in your AWS account and can be reattached to any compatible EC2 instance, or they can be kept unattached for storage management purposes. that allows you to create and manage persistent block storage volumes for use with EC2 instances.

Here's more information on EBS attachment and detachment. EBS volumes have different types and performance characteristics (e.g., General Purpose SSD, Provisioned IOPS SSD, Throughput Optimized HDD, Cold HDD), allowing you to choose the appropriate volume type based on your application requirements. Consider the cost implications of attaching and detaching EBS volumes, as there may be associated charges depending on factors such as volume size, type, and duration of attachment.

II.

II. USE CASES OF VOLUMES

Use Cases:

EBS attachment and detachment are essential for various use cases such as data replication, backup, disaster recovery, and application scaling.

By attaching additional EBS volumes to EC2 instances, you can expand storage capacity or separate data for different applications.

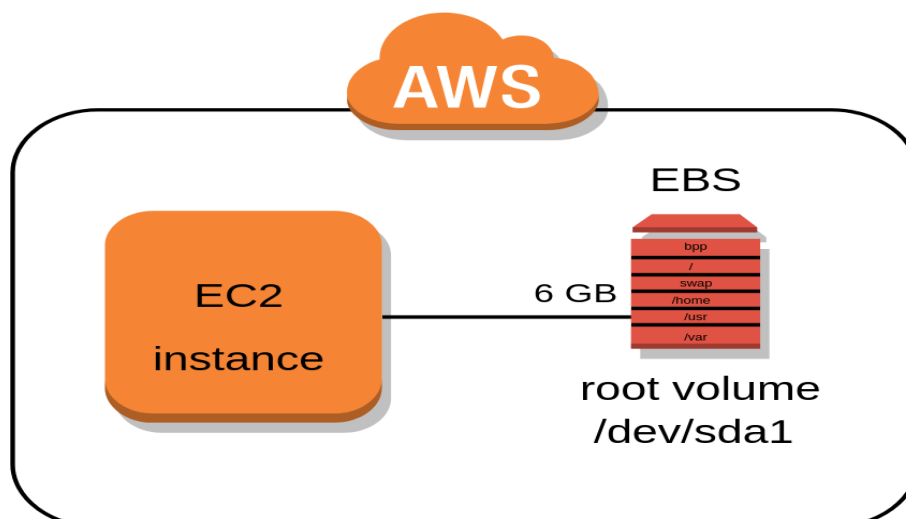
Detachment allows for flexible resource management, enabling you to optimize your infrastructure based on changing workload demands.

Performance and Cost Considerations:

EBS volumes have different types and performance characteristics (e.g., General Purpose SSD, Provisioned IOPS SSD, Throughput Optimized HDD, Cold HDD), allowing you to choose the appropriate volume type based on your application requirements.

Consider the cost implications of attaching and detaching EBS volumes, as there may be associated charges depending on factors such as volume size, type, and duration of attachment.

Overall, EBS attachment and detachment are critical operations for managing storage resources in AWS, offering flexibility, scalability, and reliability for your EC2 instances and applications.



III. VOLUMES AND SNAPSHOTS

COMPONENTS IN ELASTIC BLOCKSTORE:

1. Features and Capabilities:

Snapshots: EBS allows you to create point-in-time snapshots of your volumes, which can be used for backups, data replication, and creating new volumes.

Encryption: EBS volumes can be encrypted using AWS Key Management Service (KMS) keys, providing data security and compliance.

Performance: EBS provides different volume types optimized for various workloads, including General Purpose SSD, Provisioned.

Availability: EBS volumes are replicated within their Availability Zone to ensure high availability and durability.

2. Volume Types:

General Purpose SSD (gp2): Suitable for a wide range of transactional workloads, providing balanced price and performance.

Provisioned IOPS SSD (io1/io2): Designed for I/O-intensive applications that require high performance and consistent I/O latency.

Throughput Optimized HDD (st1): Optimized for frequently accessed, throughput-intensive workloads, such as big data and data warehousing.

Cold HDD (sc1): Ideal for less frequently accessed workloads where low cost is a priority, such as large-scale data lakes and backups.

Magnetic (standard): Legacy volume type with magnetic storage, suitable for workloads with low I/O requirements.

3. Operations:

Create: You can create EBS volumes of various sizes and types through the AWS Management Console, CLI, or API.

Attach/Detach: EBS volumes can be attached to and detached from EC2 instances, allowing you to dynamically manage storage resources.

Snapshot: You can create snapshots of EBS volumes, which are incremental backups stored in Amazon S3, providing data durability and backup functionality.

4. Use Cases:

Database Storage: EBS volumes are commonly used as storage for databases running on EC2 instances, providing durable and scalable storage.

Application Storage: EBS volumes can store application data, logs, and other files required by EC2 instances.

Backup and Restore: Snapshots of EBS volumes serve as backups, allowing you to restore data in

case of data loss or corruption.

Best Practices:

Data Management: Regularly snapshot EBS volumes to create backups and implement a data retention policy.

Performance Optimization: Choose the appropriate volume type and size based on your application's performance requirements.

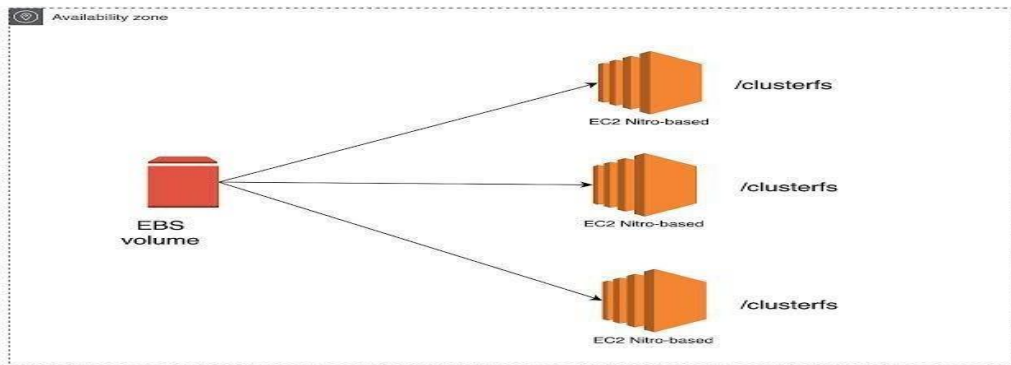
5. **Cost Management:** Monitor and optimize EBS usage to control costs, considering factors such as volume types, sizes, and usage patterns.

Overall, Amazon EBS provides scalable and reliable block storage for EC2 instances, offering a range of features and capabilities to meet diverse storage needs in the AWS cloud.

Creating an EBS Volume:

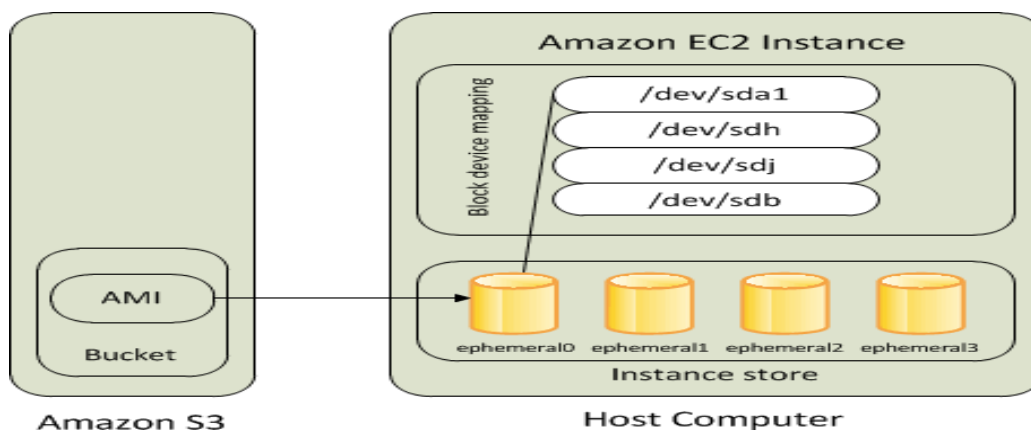
1. Log in to your AWS account via console (<https://aws.amazon.com/console/>)
2. Once you have logged in, search for EC2 in the Search bar
3. Once the EC2 console opens select Volumes on the left side navigation pane under the Elastic Block Store section.
4. Click on Create Volume option
5. In the Volume Settings, provide the **Volume Type**. For more details about volume AWS (<https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ebs-volume-types.html>)
6. Select the size of the volume as per the requirement. There are certain constraints on sizing of EBS volumes. For details refer the following documentation (https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/volume_constraints.html)
7. Select the IOPS for your EBS volume. IOPS is the number of I/O operations per second that the volume can support EBS volume IOPS. Throughput is the amount of data transferred from or to a volume. For EBS it is measured in MiB/s.
8. EBS volume Throughput A volume can be attached to an EC2 Instance which is in the same AZ (Availability zone). So select the AZ in which your EC2 Instance is present and to which you want to attach the volume

Select Availability zone. In Snapshot ID select the option Don't create volume from a snapshot since in this walkthrough we want to create a fresh volume. You can select the snapshot ID in case you want to create the volume from an existing snapshot.
9. Encryption helps secure your data on EBS volumes. It uses the AWS KMS key to encrypt the data. Encryption EBS volume.
10. Create tags which will help to categorise your volumes, the team, or user it belongs etc. EBS volume Tags .Select Create volume and your volume will be successfully created.



Attaching an EBS Volume to an EC2 instance:

1. Once the EBS volume is created select the EBS volume you want to attach to the EC2 Instance. The EBS volume should be in Available state.
2. Click on the dropdown of Actions and select the option Attach Volume.
3. Once the Attach Volume window opens select the EC2 instance you want to attach the volume.
4. Select the Device Name which is the same device name used by the EC2 Instance selected in step 3 above.
5. Select the Attach Volume option and the volume will be successfully attached. Once the volume is attached to an EC2 instance, the Volume Instance will be In-use



Detach an EBS Volume:

1. In the Amazon EC2 console, choose Volumes in the navigation pane on the right side.
2. Once the Volumes page opens, select the volume you want to detach. An attached volume shows in-use state.
3. Click on the Actions drop-down and select the Detach volume option.
4. pop-up will appear for confirmation, select the Detach button to detach the volume from the EC2 instance.
5. Once you have successfully detached the volume you can again see that the volume is in Available state



IV. UBUNTU AND PUTTY TOOL

Attach/Detach: EBS volumes can be attached to and detached from EC2 instances, allowing you to dynamically manage storage resources.

Snapshot: You can create snapshots of EBS volumes, which are incremental backups stored in Amazon S3, providing data durability and backup

Database Storage: EBS volumes are commonly used as storage for databases running on EC2 instances, providing durable and scalable storage.

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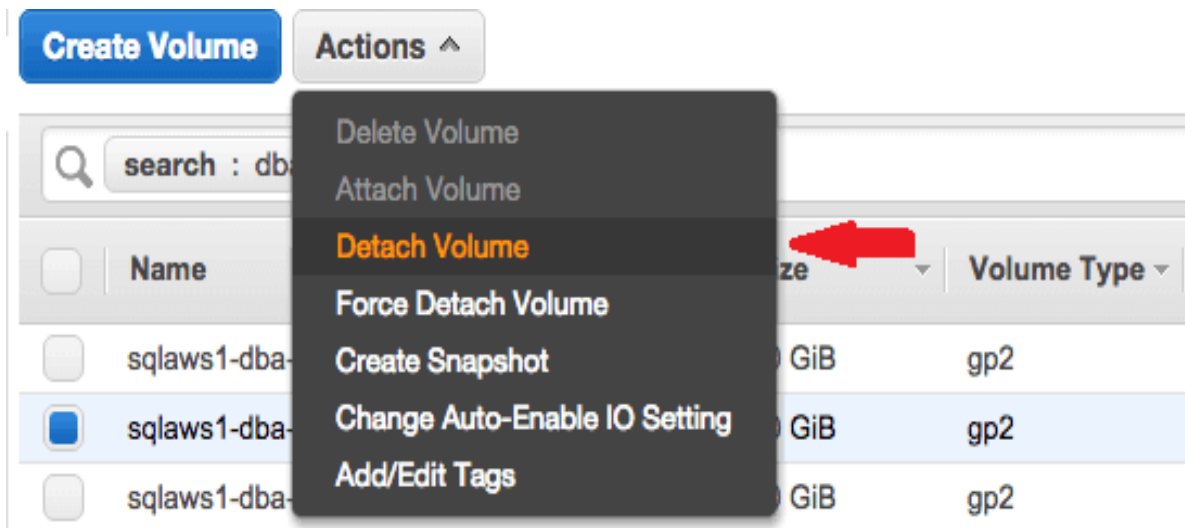
Backup and Restore: Snapshots of EBS volumes serve as backups, allowing you to restore data in case of data loss or

Data Management: Regularly snapshot EBS volumes to create backups and implement a data retention policy.

Performance Optimization: Choose the appropriate volume type and size based on your application's performance . Monitor and optimize EBS usage to control costs, considering factors such as volume types, sizes, and usage patterns.

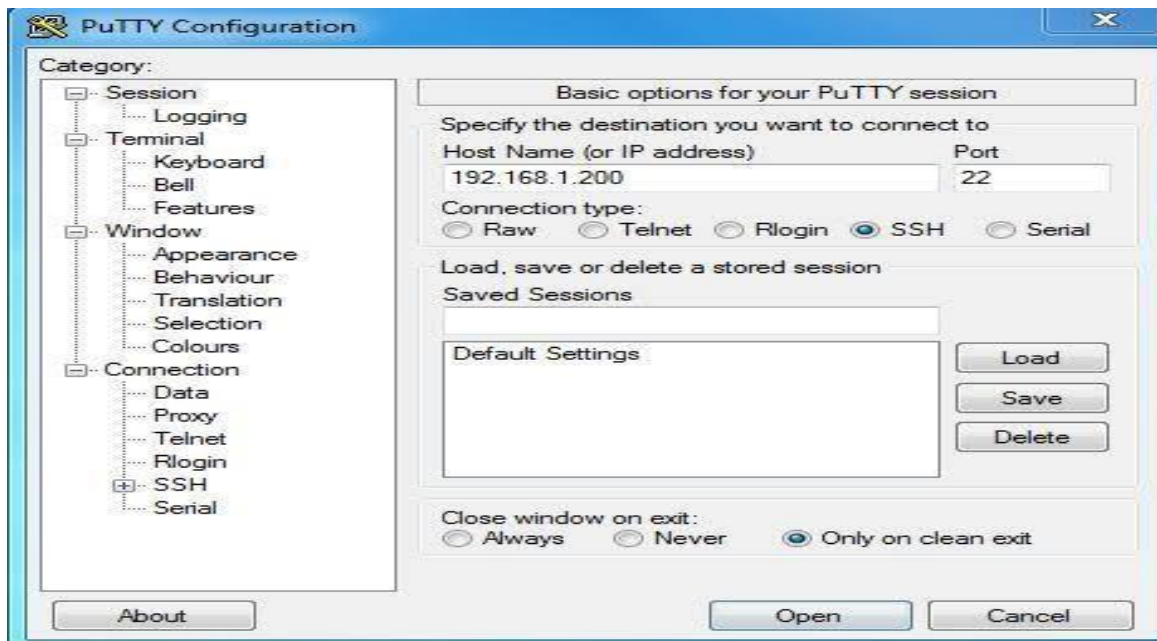
Overall, Amazon EBS provides scalable and reliable block storage for EC2 instances, offering a range of features and capabilities to meet diverse storage needs in the AWS cloud.

user can watch himself/herself in the mirror at the same time the allows the light from monitor to pass through it and make available the UI.



Using Putty with EBS volumes:

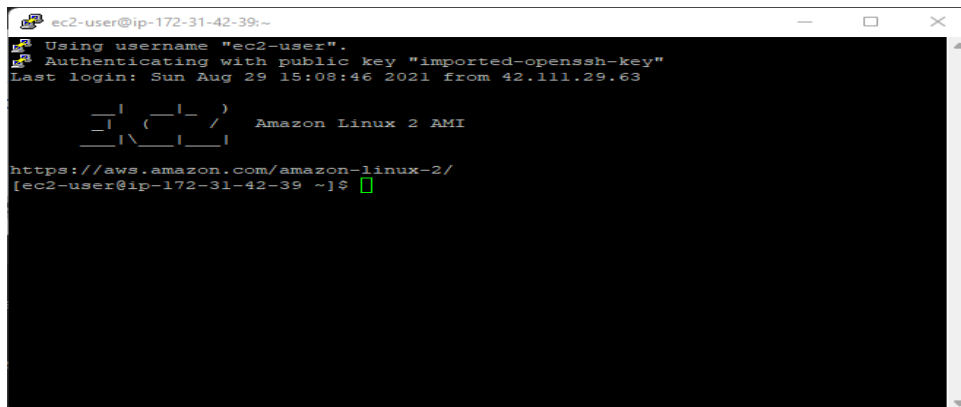
Putty is primarily used to establish SSH connections to EC2 instances. Once connected, you can access the command line interface of the instance to manage files, run scripts, configure software, and perform other administrative. Putty includes tools like `pscp` and `psftp` for secure file transfer between your local machine and the EC2 instance. This allows you to transfer files to and from EBS volumes attached to the instance. When connecting to an EC2 instance using Putty, you typically authenticate using a key pair. This key pair is used to encrypt the connection, providing a secure means of accessing the instance. While most EBS volume management tasks are performed through the AWS Management Console or CLI, you can also manage volumes directly from the EC2 instance using Putty. This includes tasks such as formatting volumes, creating file systems, mounting and unmounting volumes, and checking disk health. Putty can be used to monitor system logs, check disk health, and troubleshoot issues related to EBS volumes indirectly by examining system logs or running diagnostic commands on the instance. When using Putty to access EC2 instances, it's important to follow best practices for security, such as securing your private key, restricting access to authorized users, and regularly updating your software to patch security vulnerabilities. Overall, Putty serves as a versatile tool for managing EC2 instances, including those with EBS volumes attached, by providing secure SSH access and facilitating file transfer and management tasks.



Usage of Putty tool in EBS:

Putty is commonly used as an SSH client to connect to instances running on Amazon EC2, which may or may not use EBS volumes. However, Putty itself doesn't interact directly with EBS volumes; it's simply a tool for establishing secure shell connections to servers. When using Putty to connect to an EC2 instance that utilizes EBS volumes, you can perform various tasks such as:

1. **Managing Files:** You can use command-line tools like `scp` or `rsync` over SSH to transfer files between your local machine and the EC2 instance. These files can reside on EBS volumes attached to the instance.
2. **Executing Commands:** Once connected, you can execute commands on the EC2 instance's terminal. These commands can involve interacting with files or directories stored on EBS volumes.
3. **Monitoring:** You can use Putty to monitor system logs, check disk usage, or troubleshoot any issues related to EBS volumes indirectly by examining system logs or running diagnostic commands.
4. **Mounting and Managing Volumes:** Although you typically manage EBS volumes through the AWS Management Console or CLI, you can also perform some management tasks directly on the instance using Putty. This includes mounting/unmounting volumes, checking disk health, or formatting volume



```
ec2-user@ip-172-31-42-39:~$ ssh -i /path/to/key.pem ec2-user@ip-172-31-42-39
Using username "ec2-user".
Authenticating with public key "imported-openssh-key"
Last login: Sun Aug 29 15:08:46 2021 from 42.111.29.63

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Amazon Linux 2 AMI

https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-172-31-42-39 ~]$
```

V. CONCLUSION

EBS (Elastic Block Store) attachment and detachment is ensuring data integrity and proper resource management. When attaching an EBS volume to an EC2 instance, ensure the volume is properly mounted and accessible. During detachment, make sure any data is safely flushed and unmounted before detaching to avoid data loss or corruption. Properly managing EBS volumes helps maintain a reliable and efficient AWS infrastructure. EBS volumes provide persistent storage and can be used just like physical hard drives for storing data. This article provides a step-by-step walkthrough of how you can create EBS volumes. It also covers how you can attach and detach volumes to your EC2 instances. EBS volumes have different types and performance characteristics (e.g., General Purpose SSD, Provisioned IOPS SSD, Throughput Optimized HDD, Cold HDD), allowing you to choose the appropriate volume type based on your application requirements.

Consider the cost implications of attaching and detaching EBS volumes, as there may be associated charges depending on factors such as volume size, type, and duration of attachment.

VI. REFERENCES

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