EC2 SSH Key Recovery Using Recovery Instance Method

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Abstract

Loss of SSH access to an Amazon EC2 instance is a common operational issue caused by missing private keys, incorrect permissions, or accidental modification of SSH configuration files. This article explains a reliable and industry-accepted recovery technique known as the **Recovery Instance Method**. The method restores SSH access by temporarily attaching the root volume of the affected EC2 instance to a healthy instance, correcting the SSH authorized keys, and reattaching the volume. This document provides a detailed, step-by-step procedure suitable for academic, technical, or internal project submission.

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1. Problem Statement

An EC2 instance (referred to as **OriginalEC2**) becomes inaccessible due to one or more of the following reasons:

- Loss of SSH private key file
- Accidental deletion or corruption of ~/.ssh/authorized_keys
- Incorrect file or directory permissions
- SSH service misconfiguration

The objective is to restore SSH access without terminating the instance or losing data.

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2. Prerequisites

Before starting the recovery process, ensure the following:

- AWS Console access with permissions to manage EC2 and EBS
- One healthy EC2 instance (**RecoveryEC2**) that is accessible via SSH
- Same operating system on both instances
- Both instances are in the same AWS Availability Zone

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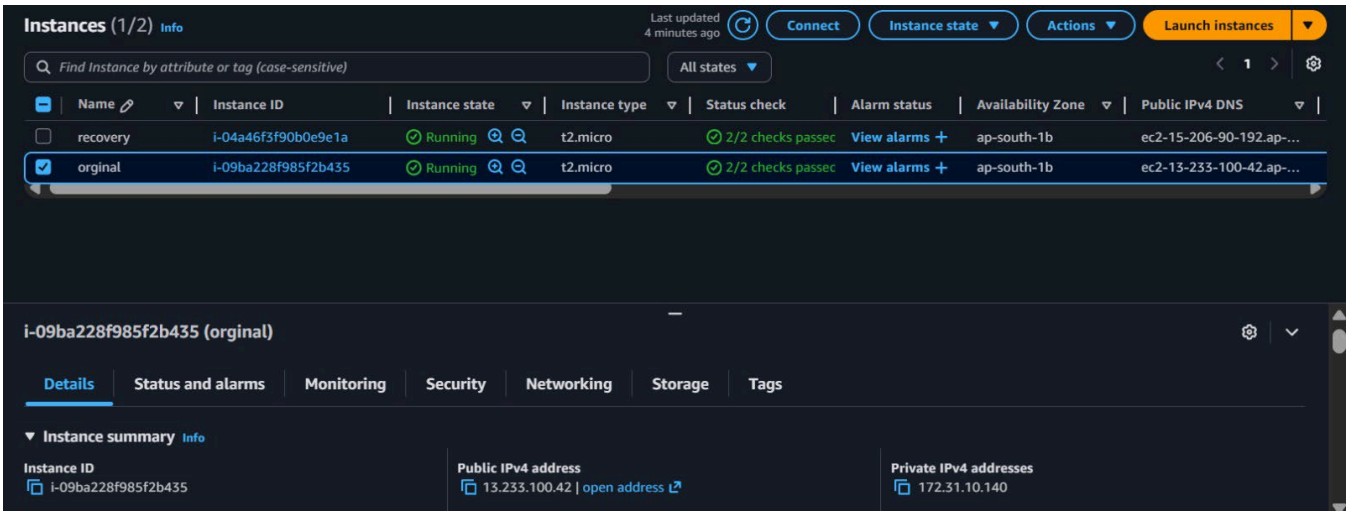
3. Architecture Overview

The recovery process involves the following components:

- **OriginalEC2**: The instance with lost SSH access
- **Root EBS Volume**: The primary storage volume of OriginalEC2
- **RecoveryEC2**: A temporary EC2 instance with working SSH access

The root volume of OriginalEC2 is detached and attached to RecoveryEC2 for repair.



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4. Step-by-Step Recovery Procedure

Step 1: Stop the Broken EC2 Instance

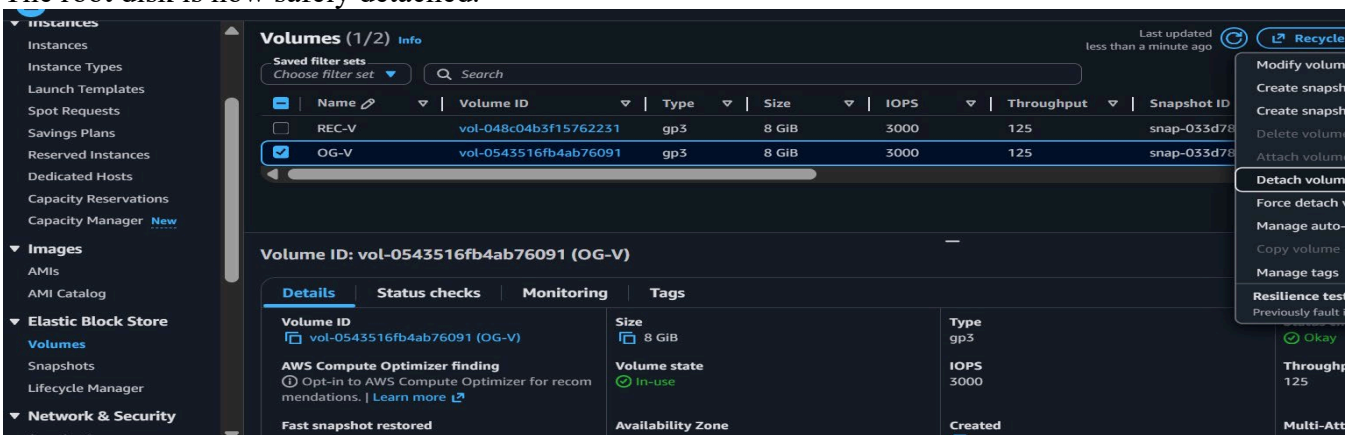
Stopping the instance ensures data integrity before detaching the root volume.

1. Open the AWS EC2 Dashboard
2. Select **OriginalEC2**
3. Choose **Instance state → Stop instance**
4. Wait until the instance state changes to **Stopped**

Step 2: Detach the Root EBS Volume

1. Select the stopped instance
2. Open the **Storage** tab
3. Click the **Volume ID** of the root volume
4. Choose **Actions → Detach volume**

The root disk is now safely detached.



Step 3: Attach the Volume to Recovery Instance

1. Select the detached volume
2. Click **Actions → Attach volume**
3. Choose **RecoveryEC2** as the target instance
4. Specify a device name such as /dev/sdf or /dev/xvdf

Step 4: Mount the Attached Volume

SSH into **RecoveryEC2** and execute the following commands:

```
sudo su
lsblk
```

Identify the newly attached disk (e.g., xvdf, nvme1n1, or nvme1n1p1).

Create a mount directory and mount the volume:

```
mkdir /Original
mount -t xfs -o nouuid /dev/ xvdf /Original
```

Note: Adjust the device name based on the output of lsblk.

Step 5: Restore SSH Authorized Keys (Critical Step)

Copy the working SSH key from the recovery instance to the broken instance's(named original) root volume:

Path of key in recovery EC2 : /**home/ec2-user/.ssh/authorized_keys**

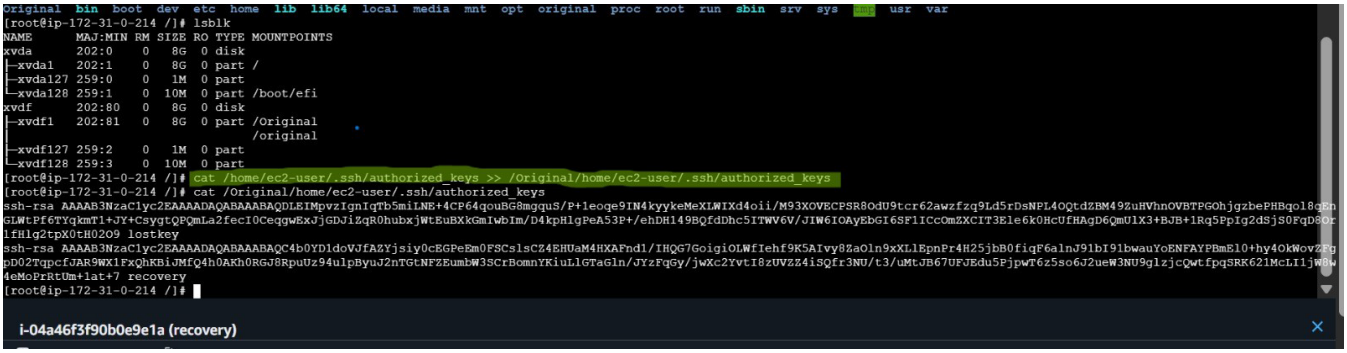
Path of key in original EC2 : **/Original/home/ec2-user/.ssh/authorized_keys**

```
cat /home/ec2-user/.ssh/authorized_keys >> /Original/home/ec2-user/.ssh/authorized_keys
```

Verify the file content:

```
cat /Original/home/ec2-user/.ssh/authorized_keys
```

This step ensures that the RecoveryEC2 SSH key is now authorized for OriginalEC2.



Step 6: Unmount and Reattach the Volume

1. Unmount the volume:

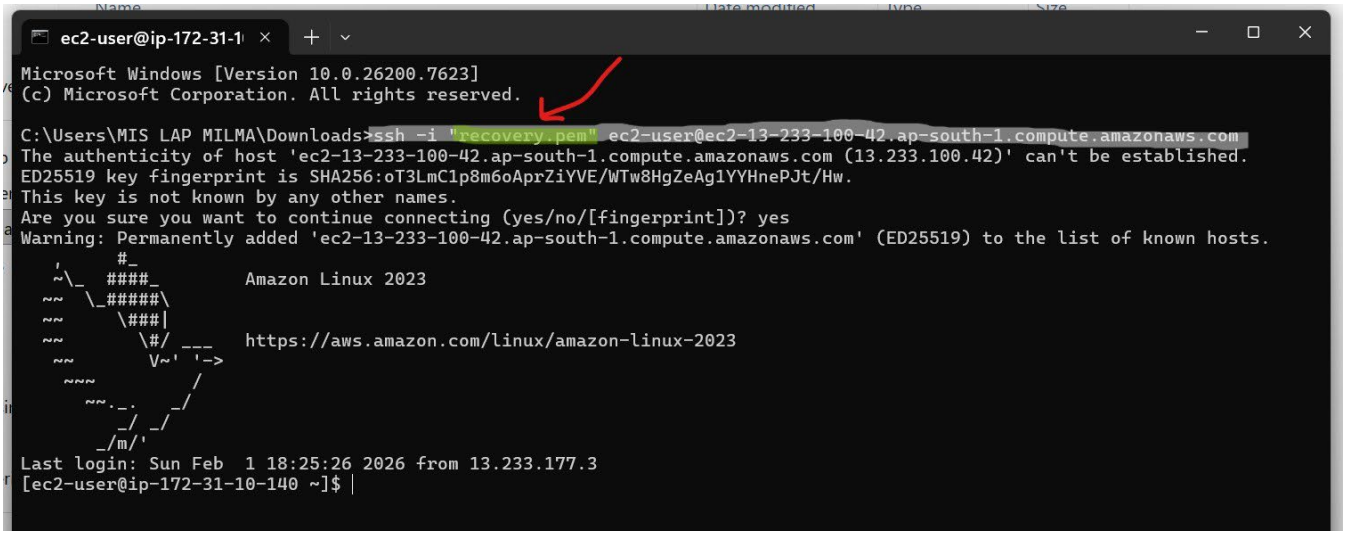
umount /Original

2. Detach the volume from RecoveryEC2 using the AWS Console
3. Reattach it to OriginalEC2
4. Use the original root device name (e.g., /dev/xvda or /dev/sda1)

Step 7: Start and Access the Recovered Instance

1. Start **OriginalEC2**
2. SSH using the RecoveryEC2 key:

ssh -i recovery-key.pem ec2-user@<OriginalEC2-Public-IP>



Successful login confirms recovery.

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6. Result and Validation

SSH access to the original EC2 instance is successfully restored without data loss. The instance functions normally with its original configuration intact.

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8. Conclusion

The Recovery Instance Method is a safe, effective, and AWS-recommended approach for restoring SSH access to EC2 instances. This technique avoids rebuilding infrastructure and ensures business continuity. Understanding this procedure is essential for cloud administrators and DevOps engineers managing production environments.
