Resolving Disk Full Issue on EC2 by Expanding the Root Volume

Problem Statement:

On an Ubuntu EC2 instance, the root filesystem (/) ran out of disk space. This caused:

- Package installations to fail (E: dpkg was interrupted)
- System updates to break
- Potential service instability

Objective:

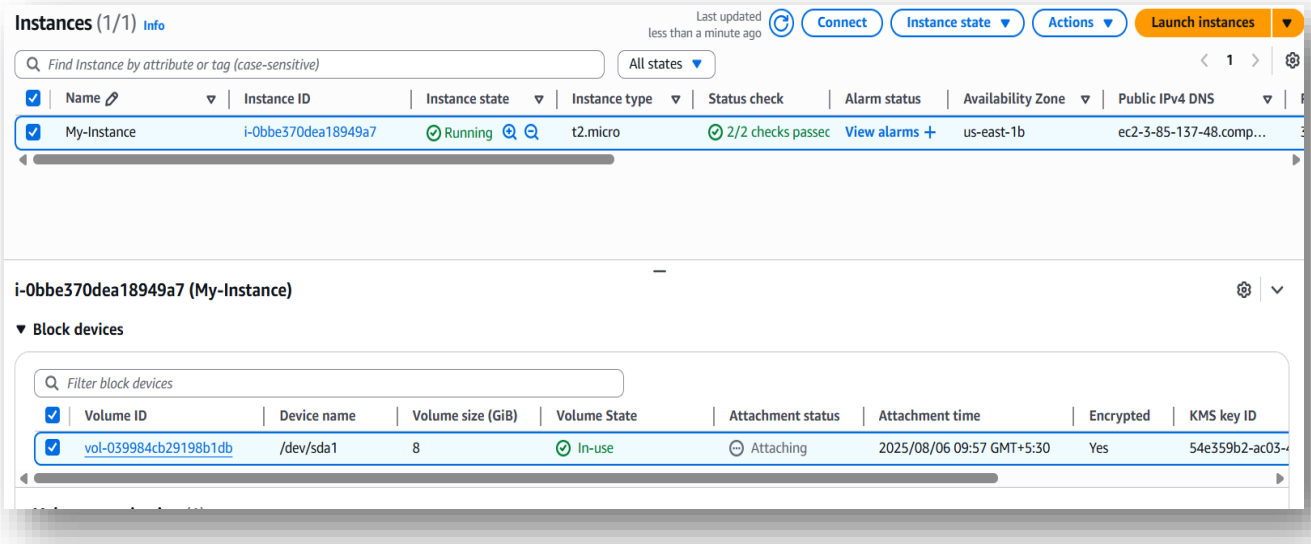
To fix the disk full issue by expanding the root EBS volume from its original size (e.g., 8 GB) to a larger size (e.g., 20 GB) without needing to create a new volume or reboot the instance.

Step-by-Step Guide:

Step1:

- Launch a New Ec2 ubuntu Instance.

Note: By default, most EC2 instances are launched with a root EBS volume of 8 GB.



Step2:

- Connect Instance via SSH and check the default volume and usage.

- Verify Disk space using **df -h** command

```
ubuntu@ip-172-31-27-208:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root       6.8G  1.8G  5.0G  26% /
tmpfs           479M     0  479M   0% /dev/shm
tmpfs           192M  868K  191M   1% /run
tmpfs           5.0M     0  5.0M   0% /run/lock
/dev/xvda16     881M   86M  734M  11% /boot
/dev/xvda15     105M  6.2M   99M   6% /boot/efi
tmpfs            96M   12K   96M   1% /run/user/1000
ubuntu@ip-172-31-27-208:~$
```

Here we can observe that most of the root space is free, with approximately 5 GB available.

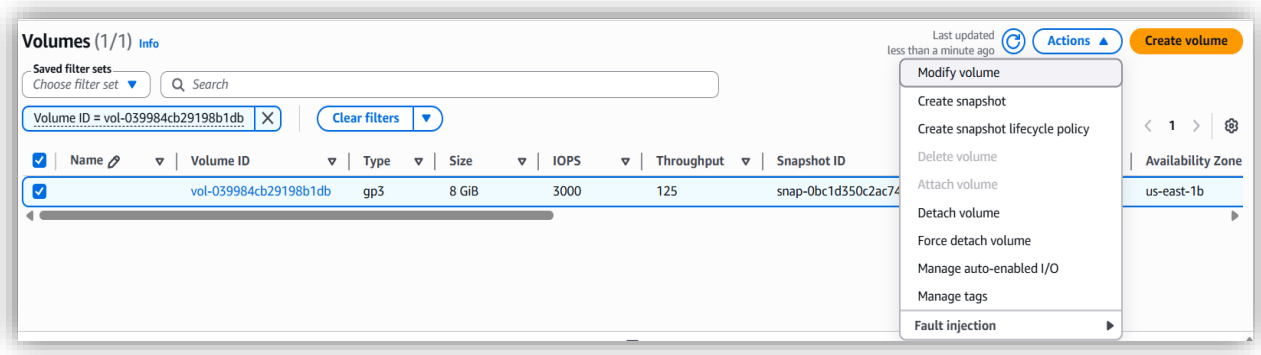
- Here, I am going to install packages such as Jenkins and Docker to monitor disk usage and determine whether additional volume needs to be added.

```
ubuntu@ip-172-31-27-208:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root       6.8G  6.7G   55M 100% /
tmpfs           479M     0  479M   0% /dev/shm
tmpfs           192M  888K  191M   1% /run
tmpfs           5.0M     0  5.0M   0% /run/lock
/dev/xvda16     881M   86M  734M  11% /boot
/dev/xvda15     105M  6.2M   99M   6% /boot/efi
tmpfs            96M   12K   96M   1% /run/user/1000
ubuntu@ip-172-31-27-208:~$
```

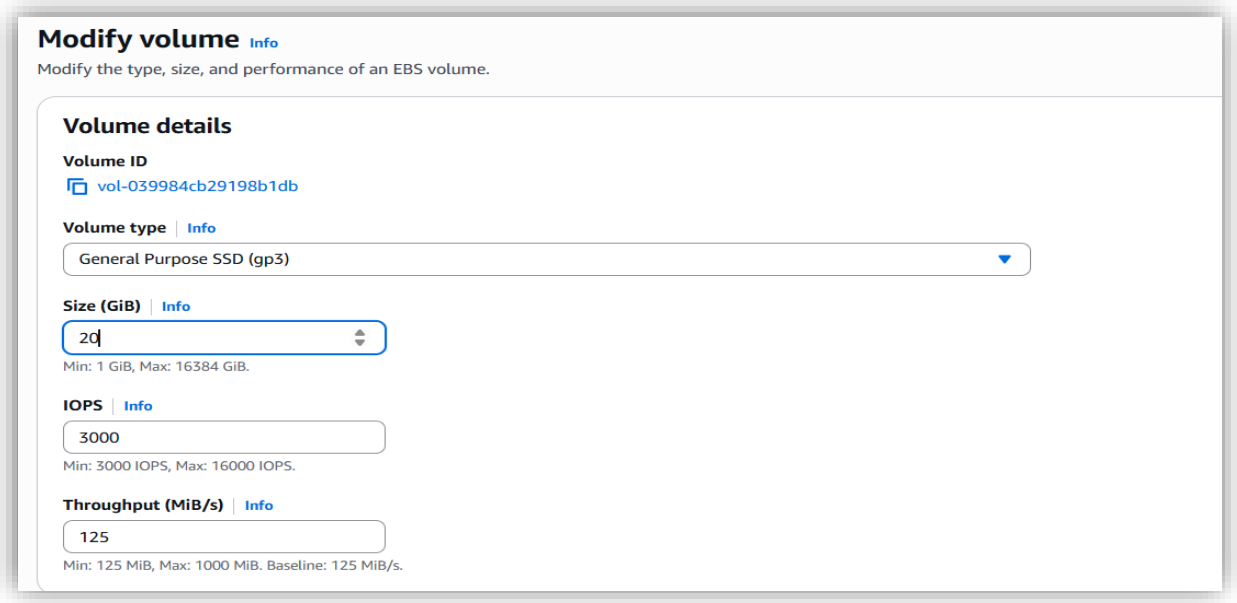
Now we can observe that after installing the packages, only 55 MB of storage is available, which is not sufficient for further operations.

Step3: Modify Volume in AWS Console.

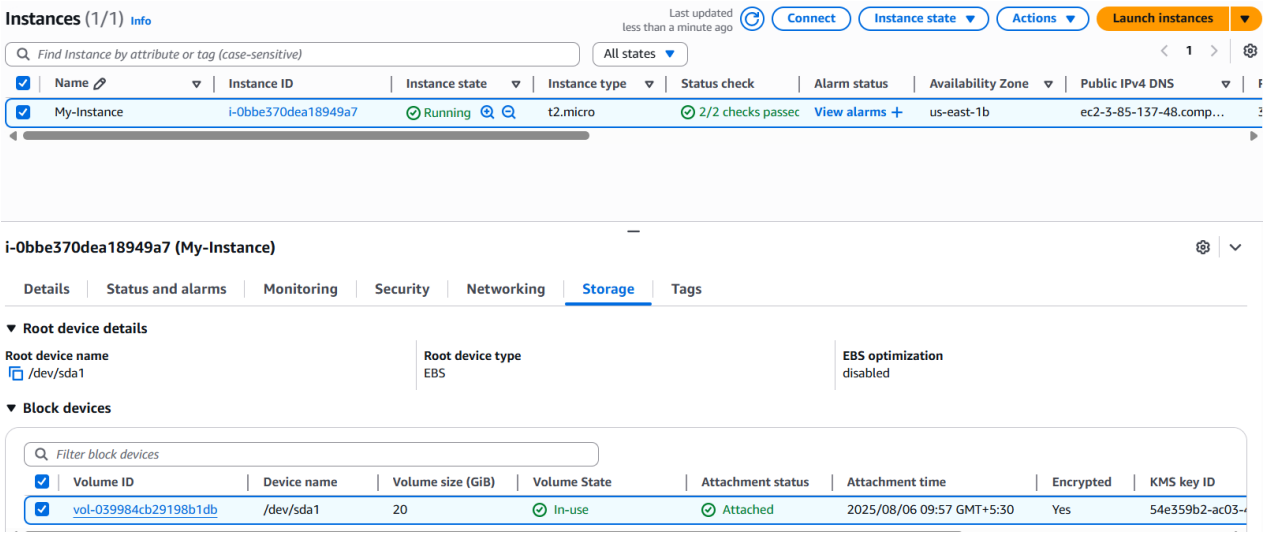
- Go to EC2 → Volumes
- ind your root EBS volume
- Click Actions → Modify Volume



- Change size from 8 GiB to 20 GiB.



After modifying the volume, we can see that the EC2 instance's root volume has increased from 8 GB to 20 GB. Now, we can expand the /root (or /) filesystem to utilize the full 20 GB.



Step4: Install Required packages and Resize the Volume.

```
sudo apt update

sudo apt install cloud-guest-utils
```

```
ubuntu@ip-172-31-27-208:~$
ubuntu@ip-172-31-27-208:~$ sudo apt install cloud-guest-utils
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
cloud-guest-utils is already the newest version (0.33-1).
cloud-guest-utils set to manually installed.
You might want to run 'apt --fix-broken install' to correct these.
The following packages have unmet dependencies:
 python3-pyqt5.qtchart : Depends: python3-pyqt5 (>= 5.15.4) but it is not going to be installed
 python3-pyqt5.qtsvg : Depends: python3-pyqt5 (= 5.15.10+dfsg-1build6) but it is not going to be installed
```

Installs growpart, which is needed to expand the root partition after increasing the EC2 volume size.

- **Expand the Partition**

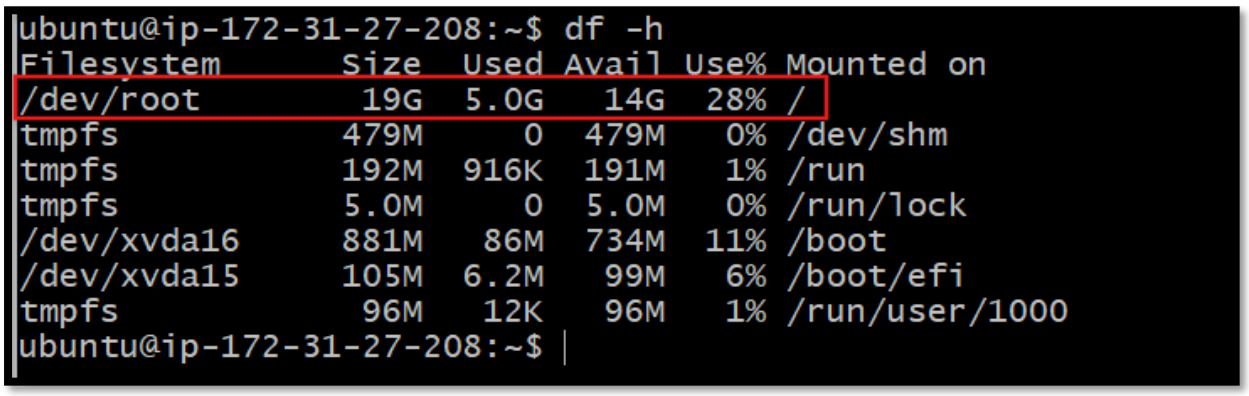
```
ubuntu@ip-172-31-27-208:~$
ubuntu@ip-172-31-27-208:~$ lsblk
NAME     MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
loop0      7:0    0  27.2M  1 loop /snap/amazon-ssm-agent/11320
loop1      7:1    0  73.9M  1 loop /snap/core22/1981
loop2      7:2    0  50.9M  1 loop /snap/snapd/24505
loop3      7:3    0  63.8M  1 loop /snap/core20/2599
loop4      7:4    0 401.5M  1 loop /snap/blender/6438
xvda     202:0    0    20G  0 disk
├─xvda1  202:1    0     7G  0 part /
├─xvda14 202:14   0     4M  0 part
├─xvda15 202:15   0   106M  0 part /boot/efi
└─xvda16 259:0    0   913M  0 part /boot
ubuntu@ip-172-31-27-208:~$ sudo growpart /dev/xvda 1
CHANGED: partition=1 start=2099200 old: size=14677983 end=16777182 new: size=39843807 end=41943006
ubuntu@ip-172-31-27-208:~$
ubuntu@ip-172-31-27-208:~$ sudo resize2fs /dev/xvda1
resize2fs 1.47.0 (5-Feb-2023)
Filesystem at /dev/xvda1 is mounted on /; on-line resizing required
old_desc_blocks = 1, new_desc_blocks = 3
The filesystem on /dev/xvda1 is now 4980475 (4k) blocks long.
```

`sudo growpart /dev/xvda 1` (This expands partition 1 (xvda1) to use the full disk space (20 GB).)

`sudo resize2fs /dev/xvda1` (This resizes the ext4 filesystem to match the new partition size.)

After completing the following steps, the expanded volume will be attached and available under the root (/) filesystem.

- Verify Final output using **df -h**



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