

# Week 2 Lab-Part 2

## Launch EC2 in the N. Virginia region

Step 1: Go to the Launch page in the console after selecting the region to N. Virginia. Select Amazon Linux 2 AMI

Step 2: Use the free tier instance type

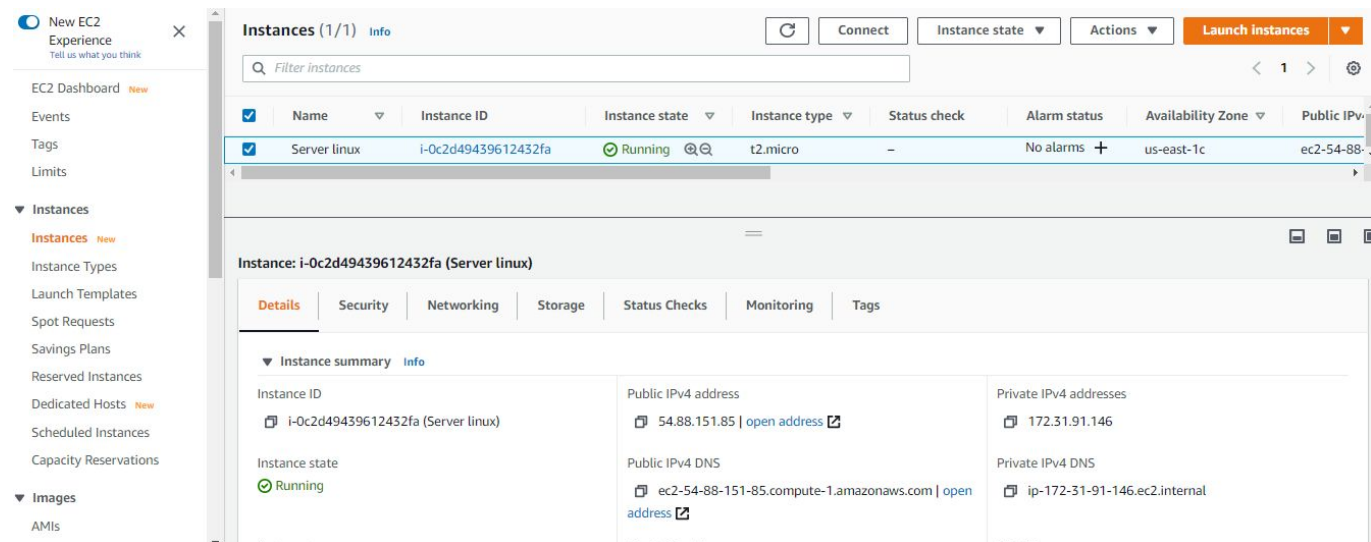
Step 3: Use the default VPC and change the subnet to **1a**. Remaining can be left as default.

Step 4: Default EBS volume of 8GiB is sufficient.

Step 5: Add the name tag for server identification

Step 6: By default a security group is created with port 22 open to the public.

Step 7: Review the configuration - Click Launch->Use the existing key pair if available else create a new one.



The screenshot displays the AWS Management Console interface for EC2 instances. On the left, the navigation pane shows the 'Instances' section selected. The main content area shows a list of instances with one instance, 'Server linux', in a 'Running' state. Below the list, the 'Details' tab for instance 'i-0c2d49439612432fa' is expanded, showing its configuration summary.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4
Server linux	i-0c2d49439612432fa	Running	t2.micro	-	No alarms	us-east-1c	ec2-54-88-

**Instance: i-0c2d49439612432fa (Server linux)**

Details	Security	Networking	Storage	Status Checks	Monitoring	Tags						
<p><b>Instance summary</b></p> <table border="1"> <tr> <td> <b>Instance ID</b>  i-0c2d49439612432fa (Server linux) </td> <td> <b>Public IPv4 address</b>  54.88.151.85   <a href="#">open address</a> </td> <td> <b>Private IPv4 addresses</b>  172.31.91.146 </td> </tr> <tr> <td> <b>Instance state</b>  Running </td> <td> <b>Public IPv4 DNS</b>  ec2-54-88-151-85.compute-1.amazonaws.com   <a href="#">open address</a> </td> <td> <b>Private IPv4 DNS</b>  ip-172-31-91-146.ec2.internal </td> </tr> </table>							<b>Instance ID</b> i-0c2d49439612432fa (Server linux)	<b>Public IPv4 address</b> 54.88.151.85   <a href="#">open address</a>	<b>Private IPv4 addresses</b> 172.31.91.146	<b>Instance state</b> Running	<b>Public IPv4 DNS</b> ec2-54-88-151-85.compute-1.amazonaws.com   <a href="#">open address</a>	<b>Private IPv4 DNS</b> ip-172-31-91-146.ec2.internal
<b>Instance ID</b> i-0c2d49439612432fa (Server linux)	<b>Public IPv4 address</b> 54.88.151.85   <a href="#">open address</a>	<b>Private IPv4 addresses</b> 172.31.91.146										
<b>Instance state</b> Running	<b>Public IPv4 DNS</b> ec2-54-88-151-85.compute-1.amazonaws.com   <a href="#">open address</a>	<b>Private IPv4 DNS</b> ip-172-31-91-146.ec2.internal										

## Volume creation

Go to the volume console

**Create Volume** Actions

Filter by tags and attributes or search by keyword

Name	Volume ID	Size	Volume Type	IOPS	Throughput	Snapshot	Created	Availability Zone	State
Server linux	vol-013be6342ebb1c5a9	8 GiB	gp2	100	-	snap-019159f1...	January 23, 2021 at...	us-east-1c	in-use

Volumes: vol-013be6342ebb1c5a9 (Server linux)

Description Status Checks Monitoring Tags

Volume ID: vol-013be6342ebb1c5a9  
Alarm status: None  
Snapshot: snap-019159f1a06f3720  
Outposts ARN: -  
Size: 8 GiB  
Created: January 23, 2021 at 10:55:13 AM UTC+5:30

Note the AZ on which the current volume is present and create another disk on the same AZ.

### Create Volume

Volume Type: Magnetic (standard) ⓘ

Size (GiB): 10 (Min: 1 GiB, Max: 1024 GiB) ⓘ

IOPS: Not applicable ⓘ

Throughput (MB/s): Not applicable ⓘ

Availability Zone\*: us-east-1c ⓘ

Snapshot ID: Select a snapshot ⓘ

Encryption: ☐ Encrypt this volume

---

Key (128 characters maximum) Value (256 characters maximum)

Name Custom magnetic volume ✕

Add Tag 49 remaining (Up to 50 tags maximum)

\* Required

Cancel Create Volume

## Attach the volume to the running instance

The screenshot shows the AWS Management Console interface. On the left, the navigation menu includes sections like 'Instances', 'Images', 'Elastic Block Store', and 'Network & Security'. The 'Elastic Block Store' section is expanded, showing 'Volumes'. The main content area displays a table of volumes. A modal dialog titled 'Attach Volume' is open in the center. The dialog has three fields: 'Volume' (set to 'vol-002546a2606487cad (Custom magnetic volume) in us-east-1c'), 'Instance' (with a search bar containing 'Search instance ID or Name tag' and a dropdown showing 'i-0c2d49439612432fa (Server linux) (running)'), and 'Device' (set to 'i-0c2d49439612432fa (Server linux) (running)'). At the bottom right of the dialog are 'Cancel' and 'Attach' buttons. Below the dialog, a section titled 'Volumes:' lists the selected volume.

Name	Volume ID	Size	Volume Type	IOPS	Throughput	Snapshot	Created	Availability Zone	State	Alarm Status	Attachment
Custom mag...	vol-002546a...	10 GiB	standard	-	-	-	January 23, 2021 at...	us-east-1c	available	None	
Server linux	vol-013be83...	8 GiB	gp2	100	-	snap-019159f1...	January 23, 2021 at...	us-east-1c	in-use	None	i-0c2d49439...

**Attach Volume**

Volume ⓘ vol-002546a2606487cad (Custom magnetic volume) in us-east-1c

Instance ⓘ  in us-east-1c

Device ⓘ i-0c2d49439612432fa (Server linux) (running)

[Cancel](#) [Attach](#)

Volumes: vol-002546a2606487cad (Custom magnetic volume)

## PG Program in Cloud Computing

After SSHing into the server, Format and mount the custom volume with the provided commands

```
root@ip-172-31-91-146:~/home/ X + v
[ec2-user@ip-172-31-91-146 ~]$ lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
xvda        202:0    0   8G  0 disk
└─xvda1     202:1    0   8G  0 part /
xvdf        202:80    0  10G  0 disk
[ec2-user@ip-172-31-91-146 ~]$ file -s /dev/xvdf
/dev/xvdf: no read permission
[ec2-user@ip-172-31-91-146 ~]$ mkfs -t ext4 /dev/xvdf
mke2fs 1.42.9 (28-Dec-2013)
mkfs.ext4: Permission denied while trying to determine filesystem size
[ec2-user@ip-172-31-91-146 ~]$ sudo su
[root@ip-172-31-91-146 ec2-user]# file -s /dev/xvdf
/dev/xvdf: data
[root@ip-172-31-91-146 ec2-user]# mkfs -t ext4 /dev/xvdf
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
655360 inodes, 2621440 blocks
131072 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=2151677952
80 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632
```

## PG Program in Cloud Computing

```

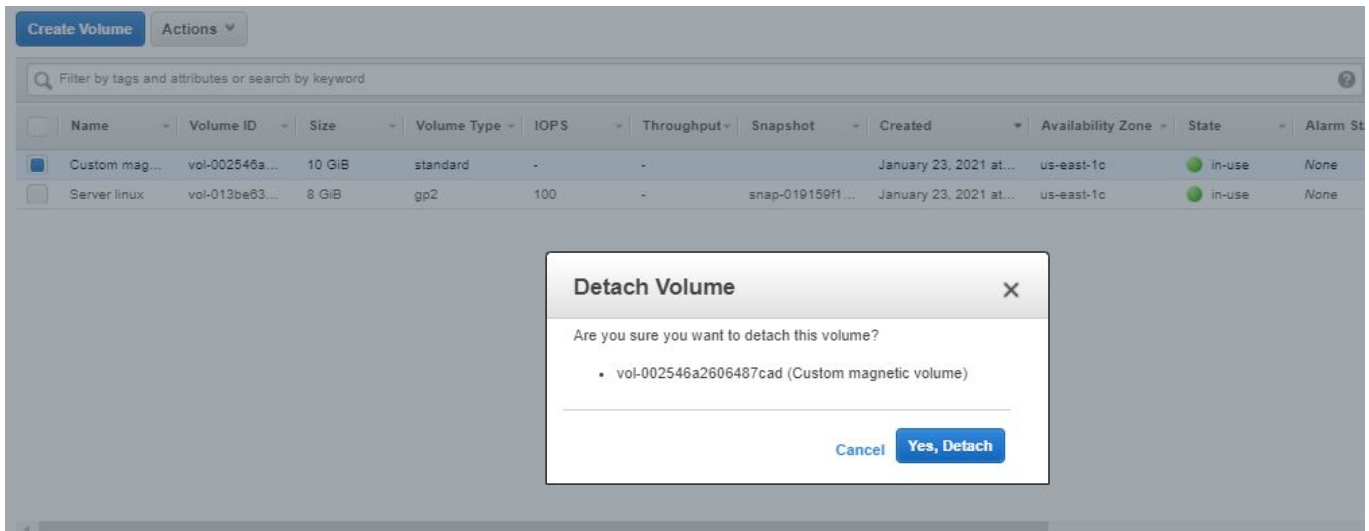
root@ip-172-31-91-146/home/ X + v
[root@ip-172-31-91-146 ec2-user]# file -s /dev/xvdf
/dev/xvdf: data
[root@ip-172-31-91-146 ec2-user]# mkfs -t ext4 /dev/xvdf
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
655360 inodes, 2621440 blocks
131072 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=2151677952
80 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

[root@ip-172-31-91-146 ec2-user]# mkdir /appdata
[root@ip-172-31-91-146 ec2-user]# mount /dev/xvdf /appdata
[root@ip-172-31-91-146 ec2-user]# echo "This is a sample file" > /appdata/sample.txt
[root@ip-172-31-91-146 ec2-user]# echo "This is a custom file added to the custom volume" > /appdata/custom.txt
[root@ip-172-31-91-146 ec2-user]# umount /dev/xvdf
[root@ip-172-31-91-146 ec2-user]#

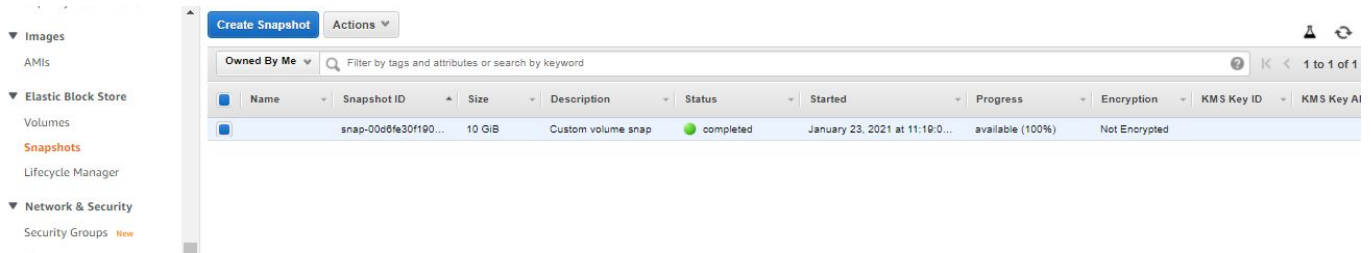
```

### Detaching the volume



## Snapshot

Creating a snapshot of the custom volume. Could be accessed thru the Snapshots console



The screenshot shows the AWS Snapshots console. On the left, there is a navigation menu with options: Images, AMIs, Elastic Block Store (with sub-items Volumes and Snapshots), Lifecycle Manager, Network & Security, and Security Groups. The main area has a 'Create Snapshot' button and an 'Actions' dropdown. Below this is a search bar 'Owned By Me' and a table of snapshots. The table has columns: Name, Snapshot ID, Size, Description, Status, Started, Progress, Encryption, KMS Key ID, and KMS Key ARN. One snapshot is listed with ID 'snap-00d6fe30f19035a07', size '10 GiB', description 'Custom volume snap', status 'completed', and started on 'January 23, 2021 at 11:19:0...'. The progress is 'available (100%)' and it is 'Not Encrypted'.

Select the snapshot and create a volume from there. Make sure the AZ is the same as where your EC2 is present and on which you are planning to mount.

[Snapshots](#) > [Create Volume](#)

### Create Volume

Snapshot ID

Volume Type

Size (GiB)  (Min: 1 GiB, Max: 16384 GiB)

IOPS  (Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS)

Throughput (MB/s)

Availability Zone\*

Fast Snapshot Restore

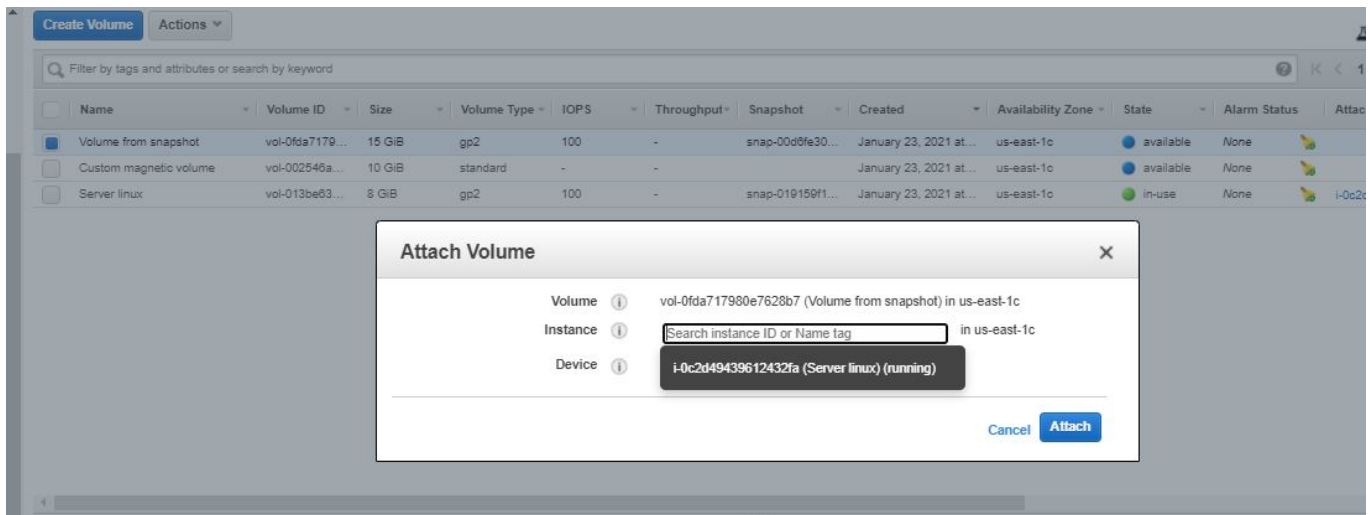
Encryption ☐ Encrypt this volume

Key (128 characters maximum)

Value (256 characters maximum)

*This resource currently has no tags*  
*Choose the Add tag button or click to add a Name tag*

Attach the new volume to the EC2 and check the files



Mount and check for the file system you created is present or not.

```
ec2-user@ip-172-31-91-146:/m x + v
[ec2-user@ip-172-31-91-146 mnt]$ lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
xvda         202:0    0   8G  0 disk
└─xvda1      202:1    0   8G  0 part /
xvdf         202:80    0  15G  0 disk
[ec2-user@ip-172-31-91-146 mnt]$ mount /dev/xvdf /mnt
mount: only root can do that
[ec2-user@ip-172-31-91-146 mnt]$ sudo mount /dev/xvdf /mnt
[ec2-user@ip-172-31-91-146 mnt]$ ls
custom.txt  sample.txt
[ec2-user@ip-172-31-91-146 mnt]$ |
```



## S3 Operations

Creating a bucket in a region of your choice.

Amazon S3

Manage tens to billions of objects in a few clicks with S3 Batch Operations. [Learn more](#)

**Buckets (1)** [Refresh](#) [Copy ARN](#) [Empty](#) [Delete](#) [Create bucket](#)

Buckets are containers for data stored in S3. [Learn more](#)

Find buckets by name

Name	Region	Access	Creation date
sivew16112020	US East (N. Virginia) us-east-1	Only authorized users of this account	November 16, 2020, 22:24:39 (UTC+05:30)

Copy local file to bucket

```
PS C:\Users\swaminathan> aws s3 cp Dummy_text_file.txt s3://sivew16112020/CustomFolder/  
upload: .\Dummy_text_file.txt to s3://sivew16112020/CustomFolder/Dummy_text_file.txt  
PS C:\Users\swaminathan> |
```

Amazon S3

Amazon S3 > sivew16112020 > CustomFolder/ > Dummy\_text\_file.txt

**Dummy\_text\_file.txt** [Copy S3 URI](#) [Object actions](#)

**Properties** | Permissions | Versions

**Object overview**

Owner	[REDACTED]
AWS Region	US East (N. Virginia) us-east-1
Last modified	January 23, 2021, 13:14:47 (UTC+05:30)
Size	
S3 URI	s3://sivew16112020/CustomFolder/Dummy_text_file.txt
Amazon resource name (ARN)	arn:aws:s3:::sivew16112020/CustomFolder/Dummy_text_file.txt
Entity tag (Etag)	d41d8cd98f00b204e9800998ecf8427e



## PG Program in Cloud Computing

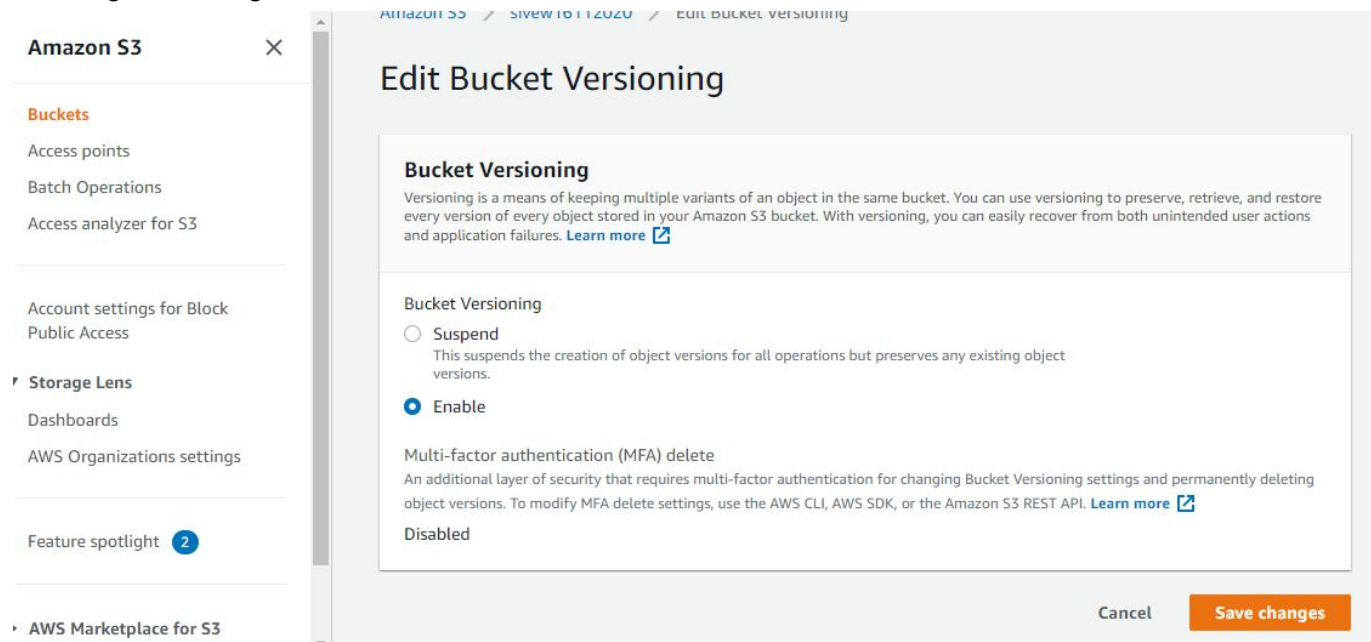
List of bucket

```
upload: .\Dummy_text_file.txt to s3://sivew16112020/CustomFolder/Dummy_text_file.txt
PS C:\Users\swaminathan> aws s3api list-buckets
{
  "Buckets": [
    {
      "Name": "sivew16112020",
      "CreationDate": "2020-11-16T16:54:39.000Z"
    }
  ],
  "Owner": {
    "DisplayName": "swaminathan",
    "ID": "4172d8ff9dd5e20e9f249b694d63e749590179797e8eb3414eb8181291ef230c"
  }
}
PS C:\Users\swaminathan> |
```

List of file in the bucket

```
PS C:\Users\swaminathan> aws s3 ls sivew16112020
PRE CustomFolder/
PRE css/
PRE css_404/
PRE fonts/
PRE images/
PRE js/
PRE scss/
PRE trail_ezhil/
2020-12-02 23:13:51      8196 .DS_Store
2020-12-07 12:29:00       942 currentpage.html
2020-12-04 00:30:22      1302 error_page.html
2020-12-02 23:13:51     32823 index.html
2020-12-02 23:13:51     12010 prepros-6.config
2020-12-02 23:13:51     19265 single.html
PS C:\Users\swaminathan> |
```

## Enabling versioning in bucket



**Amazon S3** ×

**Buckets**

- Access points
- Batch Operations
- Access analyzer for S3

Account settings for Block Public Access

**Storage Lens**

- Dashboards
- AWS Organizations settings

Feature spotlight 2

AWS Marketplace for S3

## Edit Bucket Versioning

### Bucket Versioning

Versioning is a means of keeping multiple variants of an object in the same bucket. You can use versioning to preserve, retrieve, and restore every version of every object stored in your Amazon S3 bucket. With versioning, you can easily recover from both unintended user actions and application failures. [Learn more](#)

**Bucket Versioning**

☐ Suspend  
This suspends the creation of object versions for all operations but preserves any existing object versions.

☒ **Enable**

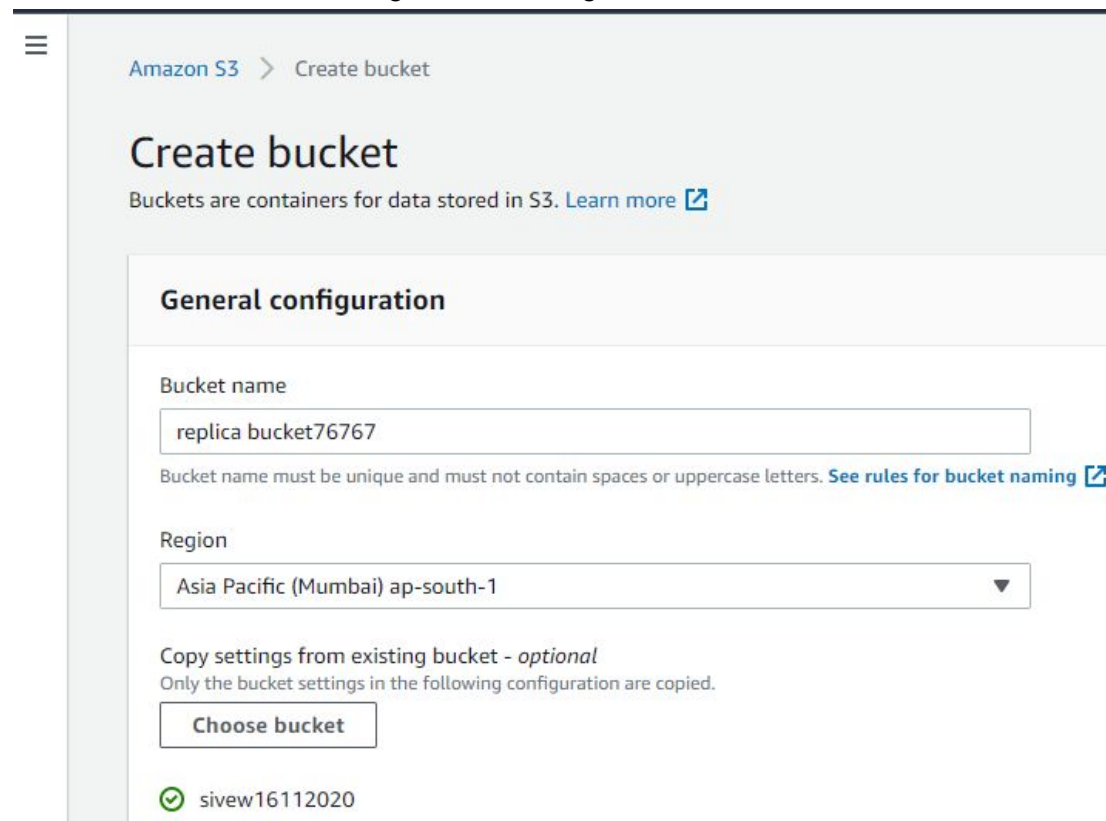
**Multi-factor authentication (MFA) delete**  
An additional layer of security that requires multi-factor authentication for changing Bucket Versioning settings and permanently deleting object versions. To modify MFA delete settings, use the AWS CLI, AWS SDK, or the Amazon S3 REST API. [Learn more](#)

Disabled

Cancel **Save changes**

## Enabling Cross regions replication

Create a bucket in another region with settings similar to the current bucket.



Amazon S3 > Create bucket

## Create bucket

Buckets are containers for data stored in S3. [Learn more](#)

### General configuration

**Bucket name**

replica bucket76767

Bucket name must be unique and must not contain spaces or uppercase letters. [See rules for bucket naming](#)

**Region**

Asia Pacific (Mumbai) ap-south-1 ▼

**Copy settings from existing bucket - optional**  
Only the bucket settings in the following configuration are copied.

**Choose bucket**

✓ sivew16112020

✔ Successfully created bucket "replicabucket76767"  
To upload files and folders, or to configure additional bucket settings choose **View details**.

[View details](#)

Amazon S3

**Buckets (2)**Buckets are containers for data stored in S3. [Learn more](#)

&lt; 1 &gt;



	Name ▲	Region ▼	Access ▼	Creation date ▼
<input type="radio"/>	replicabucket76767	Asia Pacific (Mumbai) ap-south-1	Bucket and objects not public	January 23, 2021, 17:26:10 (UTC+05:30)
<input type="radio"/>	sivew16112020	US East (N. Virginia) us-east-1	Only authorized users of this account	November 16, 2020, 22:24:39 (UTC+05:30)

Amazon S3 &gt; replicabucket76767

# replicabucket76767

**Objects**

Properties

Permissions

Metrics

Management

Access points

**Objects (0)**Objects are the fundamental entities stored in Amazon S3. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)☒ List versions

Delete

Actions ▼

Create folder

Upload

&lt; 1 &gt;



	Name ▲	Type ▼	Last modified ▼	Size ▼	Storage class ▼
--	--------	--------	-----------------	--------	-----------------

**No objects**

You don't have any objects in this bucket.

[Upload](#)

Configure the replica rule now



Amazon S3 > sivew16112020 > Replication rules > Create replication rule

## Create replication rule

### Replication rule configuration

Replication rule name

Up to 255 characters.

Status

Choose whether the rule will be enabled or disabled when created.

☒ Enabled

☐ Disabled

Priority

The priority value resolves conflicts that occur when an object is eligible for replication under multiple rules to the same destination. The rule is added to the configuration at the highest priority and the priority can be changed on the replication rules table.

0

### Source bucket

Source bucket name

sivew16112020

Source Region

US East (N. Virginia) us-east-1

Choose a rule scope

☐ Limit the scope of this rule using one or more filters

☒ This rule applies to *all* objects in the bucket

## Destination

### Destination

You can replicate objects across buckets in different AWS Regions (Cross-Region Replication) or you can replicate objects across buckets in the same AWS Region (Same-Region Replication). You can also specify a different bucket for each rule in the configuration. [Learn more](#) or see [Amazon S3 pricing](#)

- ☒ Choose a bucket in this account
- ☐ Specify a bucket in another account

### Bucket name

Choose the bucket that will receive replicated objects.

[Browse S3](#)

### Destination Region

Asia Pacific (Mumbai) ap-south-1

## IAM role

### IAM role

[View](#)

✓ Replication configuration successfully updated  
Press the refresh button if changes to the configuration are not displayed.

Amazon S3 > sivev16112020 > Replication rules

## Replication rules

Replication enables automatic and asynchronous copying of objects across buckets in the same or different AWS Regions. A replication configuration is a set of rules that define what options should be applied to a group of objects during replication.

### Replication configuration settings

Configuration settings affect all replication rules in the bucket.

[Edit](#)

Source bucket  
sivev16112020

Source Region  
US East (N. Virginia) us-east-1

IAM role  
[s3crr\\_role\\_for\\_sivev16112020](#)

### Replication rules (1)

Use replication rules to define options you want Amazon S3 to apply during replication such as server-side encryption, replica ownership, transitioning replicas to another storage class, and more. [Learn more](#)

[View details](#)[Edit rule](#)[Delete](#)[Actions](#)[Create replication rule](#)

Adding new object to the first bucket after creating the replication rule

```
2020-12-02 23:13:51 19265 single.html
PS C:\Users\swaminathan> aws s3 cp athena-margins.csv s3://sivew16112020/CustomFolder/
upload: .\athena-margins.csv to s3://sivew16112020/CustomFolder/athena-margins.csv
PS C:\Users\swaminathan> aws s3 cp CIDR_table.png s3://sivew16112020/CustomFolder/
upload: .\CIDR_table.png to s3://sivew16112020/CustomFolder/CIDR_table.png
PS C:\Users\swaminathan> |
```

On the original bucket

Amazon S3 > sivew16112020 > CustomFolder/

## CustomFolder/

**Objects** | Folder properties

**Objects (3)**  
Objects are the fundamental entities stored in Amazon S3. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

☒ List versions

<input type="checkbox"/>	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	athena-margins.csv	csv	January 23, 2021, 17:39:52 (UTC+05:30)	61.0 B	Standard
<input type="checkbox"/>	CIDR_table.png	png	January 23, 2021, 17:40:51 (UTC+05:30)	855.9 KB	Standard
<input type="checkbox"/>	Dummy_text_file.txt	txt	January 23, 2021, 13:14:47 (UTC+05:30)	0 B	Standard

On the replication bucket added automatically

Amazon S3 > replicabucket76767 > CustomFolder/

## CustomFolder/

**Objects** | Folder properties

**Objects (2)**  
Objects are the fundamental entities stored in Amazon S3. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

☒ List versions

< 1 >

<input type="checkbox"/>	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	athena-margins.csv	csv	January 23, 2021, 17:39:52 (UTC+05:30)	61.0 B	Standard
<input type="checkbox"/>	CIDR_table.png	png	January 23, 2021, 17:40:51 (UTC+05:30)	855.9 KB	Standard