

# Cross-region replication in S3

**Cross-Region Replication (CRR):** AWS S3 allows you to replicate objects from one S3 bucket to another in a different AWS region. This feature provides benefits such as reduced latency, compliance, security, disaster recovery, and regional efficiency.

Follow the below steps for set the CRR:

**Step1:** creating 2 buckets in different regions

**Step2:** Enable the versioning

**Step3:** cross region replication

## Step1: Creating s3 buckets

- Open AWS console and N.virginia region
- Go to s3 service
- Click on create bucket
- Give name tag as Prathibha-bucket1
- Click on create bucket
- Follow the steps as shown in the below slides

The screenshot shows the AWS S3 console interface. At the top, there's a navigation bar with the AWS logo, 'Services', a search bar, and the current region 'N. Virginia' and user 'prathibha9297'. The main content area has a dark header with 'Storage' and 'Amazon S3' text, followed by 'Store and retrieve any amount of data from anywhere'. Below this, there's a 'Create a bucket' section with a description and a 'Create bucket' button. The main part of the console shows the 'Create bucket' page with the following configuration:

- General configuration**
- AWS Region:** US East (N. Virginia) us-east-1
- Bucket type:** General purpose (selected), Directory - New (unselected)
- Bucket name:** prathibha-bucket1
- Copy settings from existing bucket - optional:** Choose bucket
- Format:** s3://bucket/prefix

Default encryption

Info

Server-side encryption is automatically applied to new objects stored in this bucket.

Encryption type

Info

☒ Server-side encryption with Amazon S3 managed keys (SSE-S3)

☐ Server-side encryption with AWS Key Management Service keys (SSE-KMS)

☐ Dual-layer server-side encryption with AWS Key Management Service keys (DSSE-KMS)

Secure your objects with two separate layers of encryption. For details on pricing, see [DSSE-KMS pricing](#) on the **Storage** tab of the [Amazon S3 pricing page](#).

Bucket Key

Using an S3 Bucket Key for SSE-KMS reduces encryption costs by lowering calls to AWS KMS. S3 Bucket Keys aren't supported for DSSE-KMS. [Learn more](#)

☐ Disable

☒ Enable

► Advanced settings

After creating the bucket, you can upload files and folders to the bucket, and configure additional bucket settings.

Cancel

Create bucket

- Once created bucket in N.virginia and go to seoul region
- Go to s3 bucket and click on create bucket
- Give name as Prathibha-bucket2
- Remaining field leave it as default and click on create bucket

Search [Alt+S]

Seoul prathibha9297

Amazon S3 > Buckets

Account snapshot - updated every 24 hours All AWS Regions

View Storage Lens dashboard

General purpose buckets

Directory buckets

General purpose buckets (1) Info All AWS Regions

Copy ARN Empty Delete Create bucket

Find buckets by name

< 1 >

Name	AWS Region	IAM Access Analyzer	Creation date
<input type="radio"/> prathibha-bucket1	US East (N. Virginia) us-east-1	<a href="#">View analyzer for us-east-1</a>	August 21, 2024, 18:53:32 (UTC+05:30)

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Amazon S3 > Buckets > Create bucket

Create bucket Info

Buckets are containers for data stored in S3.

General configuration

AWS Region

Asia Pacific (Seoul) ap-northeast-2

Bucket name Info

prathibha-bucket2

Bucket name must be unique within the global namespace and follow the bucket naming rules. [See rules for bucket naming](#)

Copy settings from existing bucket - optional

Only the bucket settings in the following configuration are copied.

Choose bucket

Format: s3://bucket/prefix

Object Ownership Info

Control ownership of objects written to this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership determines who can specify access to objects.

Default encryption

Info

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☐ Disable

☒ Enable

► Advanced settings

ⓘ After creating the bucket, you can upload files and folders to the bucket, and configure additional bucket settings.

Cancel

Create bucket

## Step2: Enable the versioning

prathibha-bucket1

Info

Objects

Properties

Permissions

Metrics

Management

Access Points

Bucket overview

AWS Region

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

Amazon Resource Name (ARN)

arn:aws:s3::prathibha-bucket1

Creation date

August 21, 2024, 18:53:32 (UTC+05:30)

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

Disabled

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](#)

Edit

[Amazon S3](#) > [Buckets](#) > [prathibha-bucket1](#) > [Edit Bucket Versioning](#)

## Edit Bucket Versioning

Info

### Bucket Versioning

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#### Bucket Versioning

☐ Suspend

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

☒ Enable

After enabling Bucket Versioning, you might need to update your lifecycle rules to manage previous versions of objects.

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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

[Amazon S3](#) > [Buckets](#) > [prathibha-bucket2](#) > Edit Bucket Versioning

## Edit Bucket Versioning [Info](#)

### 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](#)

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Disabled

Cancel

Save changes

### Step-3: Cross region replication (CRR):

- Go to the first bucket which is created in N.virginia region
- Open Prathibha-bucket1 and click on management
- Go to cross region replication and click on replication rule
- Give name tag as bucket12-replication
- Click on apply to all objects in the bucket in source bucket field
- Select bucket name in destination field
- Click on replication time control (RTC) in Additional replication options field
- Remaining fields should be default and click on save
- The following will showcase the cross-region replication

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N. Virginia

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Amazon S3 > Buckets > prathibha-bucket1

prathibha-bucket1

Objects | Properties | Permissions | Metrics | **Management** | Access Points

Lifecycle rules

View details Edit Delete Actions Create lifecycle rule

Use lifecycle rules to define actions you want Amazon S3 to take during an object's lifetime such as transitioning objects to another storage class, archiving them, or deleting them after a specified period of time. [Learn more](#)

Lifecycle rule ...	Status	Scope	Current versio...	Noncurrent ve...	Expired object ...	Incomplete m...
--------------------	--------	-------	-------------------	------------------	--------------------	-----------------

No lifecycle rules

There are no lifecycle rules for this bucket.

Create lifecycle rule

Replication rules (0)

View details Edit rule Delete Actions Create replication rule

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](#)

Replication rule name	Status	Destination bucket	Destination Region	Priority	Scope	Storage class	Replica owner	Replie
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No replication rules

You don't have any rules in the replication configuration.

Create replication rule

Amazon S3 > Buckets > prathibha-bucket1 > Replication rules > Create replication rule

Create replication rule [Info](#)

Replication rule configuration

Replication rule name

bucket12-replication

Up to 255 characters. In order to be able to use CloudWatch metrics to monitor the progress of your replication rule, the replication rule name must only contain English 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

Source bucket name

prathibha-bucket1

Source Region



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

Choose a rule scope

- ☐ Limit the scope of this rule using one or more filters
- ☒ Apply 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.

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.

prathibha-bucket2

Browse S3

Destination Region

Asia Pacific (Seoul) ap-northeast-2

## IAM role

- ☒ Create new role
- ☐ Choose from existing IAM roles
- ☐ Enter IAM role ARN

## Encryption

Server-side encryption protects data at rest.



### Additional replication options

☒ Replication Time Control (RTC)  
Replication Time Control replicates 99.99% of new objects within 15 minutes and includes replication metrics. Additional fees will apply. [Learn more](#)

☒ Replication metrics  
With replication metrics, you can monitor the total number and size of objects that are pending replication, and the maximum replication time to the destination Region. You can also view and diagnose replication failures. CloudWatch metrics fees apply. [Learn more](#) or see [Amazon CloudWatch pricing](#)

To publish event notifications to a destination whenever replication events occur, set S3 event notifications or CloudWatch alarms before replication begins. [Learn more](#)

☐ Delete marker replication  
Delete markers created by S3 delete operations will be replicated. Delete markers created by lifecycle rules are not replicated. [Learn more](#)

☐ Replica modification sync  
Replicate metadata changes made to replicas from the destination bucket to the source bucket. [Learn more](#)

Cancel

Save

- Once created the cross-region replication upload a file or folder in bucket one which is created in N.virginia as shown in below slides.

Amazon S3 > Buckets > prathibha-bucket1 > Upload

## Upload Info

Add the files and folders you want to upload to S3. To upload a file larger than 160GB, use the AWS CLI, AWS SDK or Amazon S3 REST API. [Learn more](#)

Drag and drop files and folders you want to upload here, or choose **Add files** or **Add folder**.

Files and folders (0)

Remove

Add files

Add folder

All files and folders in this table will be uploaded.

Find by name

< 1 >

	Name	Folder	Type
No files or folders			
You have not chosen any files or folders to upload.			

Upload: status

The information below will no longer be available after you navigate away from this page.

Summary

Destination

s3://prathibha-bucket1

Succeeded

1 file, 1.8 MB (100.00%)

Failed

0 files, 0 B (0%)

Files and folders

Configuration

Files and folders (1 Total, 1.8 MB)

Find by name

Name	Folder	Type	Size	Status	Error
TRANSIT_GA...	-	application/v...	1.8 MB	Succeeded	-

Upload

Info

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Drag and drop files and folders you want to upload here, or choose **Add files** or **Add folder**.

Files and folders (1 Total, 1.8 MB)

Remove

Add files

Add folder

All files and folders in this table will be uploaded.

Find by name

< 1 >

<input type="checkbox"/>	Name	Folder	Type
<input type="checkbox"/>	TRANSIT_GATEWAY-updated.docx	-	application/vnd...

Destination

Info

Destination

s3://prathibha-bucket1

Destination details

Bucket settings that impact new objects stored in the specified destination.

Permissions

Grant public access and access to other AWS accounts.

Properties

Specify storage class, encryption settings, tags, and more.

Cancel

Upload

Amazon S3

>

Buckets

>

prathibha-bucket1

prathibha-bucket1

Info

Objects

Properties

Permissions

Metrics

Management

Access Points

Objects (1)

Info

Copy S3 URI

Copy URL

Download

Open

Delete

Actions

Create folder

Upload

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

Find objects by prefix

Show versions

< 1 >

<input type="checkbox"/>	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	TRANSIT_GATEWAY-updated.docx	docx	August 21, 2024, 19:10:28 (UTC+05:30)	1.8 MB	Standard

- We uploaded file in bucket1 and it was replicated in bucket2 because of we enable the cross-region replication
- It was shown in below slide

Amazon S3 > Buckets > prathibha-bucket2

## prathibha-bucket2 [Info](#)

[Objects](#) | [Properties](#) | [Permissions](#) | [Metrics](#) | [Management](#) | [Access Points](#)

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**Objects (1) [Info](#)**

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

☐ Show versions

<input type="checkbox"/>	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	<a href="#">TRANSIT_GATEWAY-updated.docx</a>	docx	August 21, 2024, 19:10:28 (UTC+05:30)	1.8 MB	Standard

## Conclusion:

cross-region replication in AWS is a powerful strategy for enhancing the availability, durability, and resilience of critical data across geographically dispersed locations. By replicating data to multiple AWS regions, organizations can ensure high levels of redundancy and disaster recovery capabilities, effectively mitigating the risk of data loss due to regional failures or outages