AWS re:Invent

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Best practices for configuring and managing Amazon S3 Replication

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Agenda

S3 Replication overview

S3 Replication Time Control (S3 RTC)

S3 Replication customer use cases

S3 Multi-Region Access Points

Demo: Configuring S3 Replication and Multi-Region Access Points

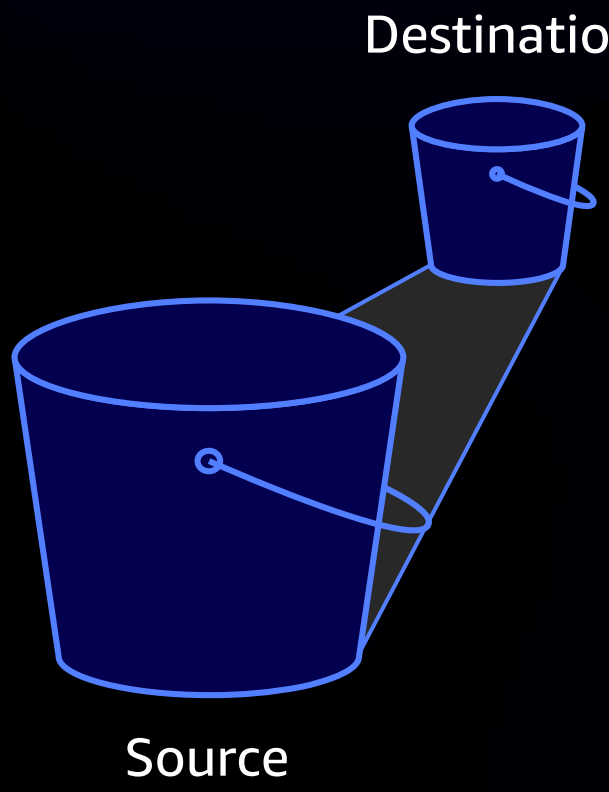
Summary and questions

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Overview of Amazon S3 Replication

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Amazon S3 Replication at a glance

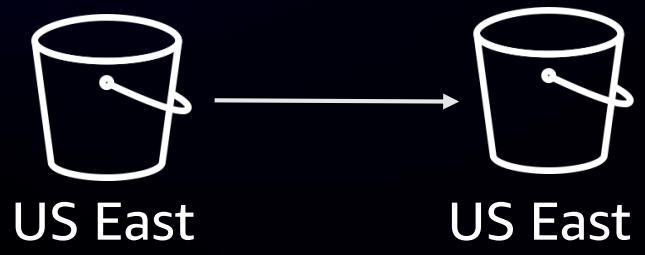


- S3 Replication is an elastic, fully managed, low-cost feature that replicates objects between buckets
- S3 Replication offers flexibility via a rich set of features that allow you to configure where and how you want to replicate
- Once the replication rule is configured, S3 Replication automatically replicates objects and metadata in the source bucket

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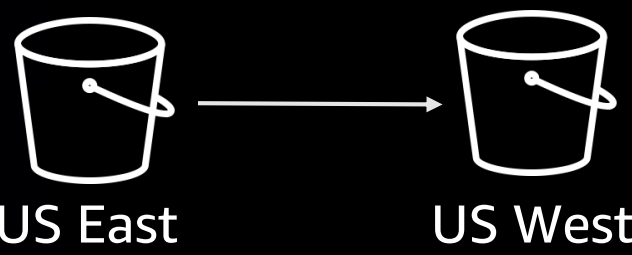
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Flexible replication for different use cases



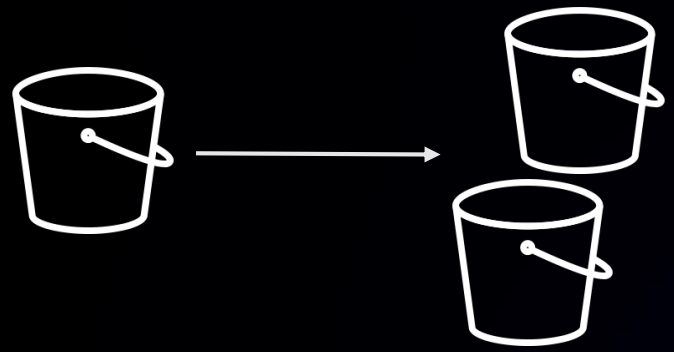
Same Region

Replicate within the same AWS Region



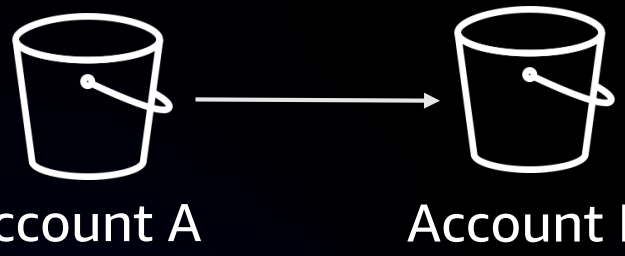
Cross-Region

Replicate to a different AWS Region



Multiple destinations

Replicate to multiple destination buckets



Cross-account

Replicate across different AWS accounts

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Configure to customize

Replicate objects to a different storage class



Use replica sync to enable bidirectional replication



Enable metrics and notifications to monitor progress



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Benefits of Amazon S3 Replication



Compliance

Retain compliance copy in a separate geography from the source



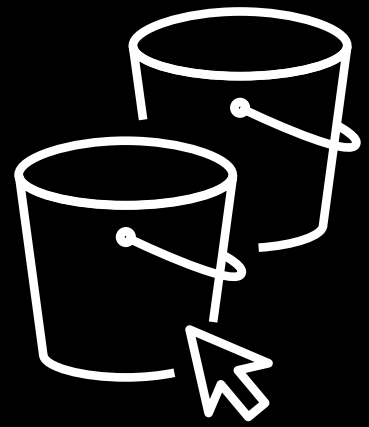
Resiliency

Replicate critical data to a secondary AWS Region



Performance

Have multiple copies across AWS Regions to optimize for latency



Ownership

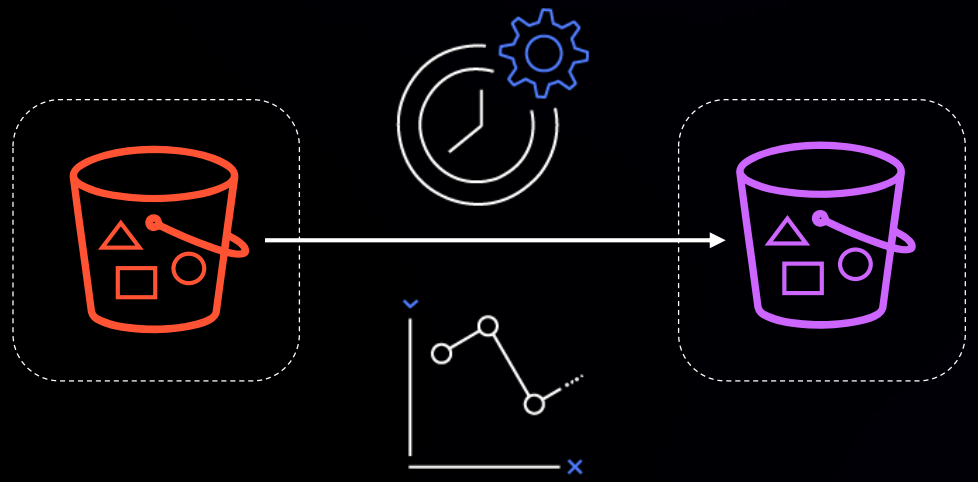
Store additional copies with separate ownership

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S3 Replication Time Control (S3 RTC)

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S3 RTC overview



- Designed to replicate 99.99% of objects under 15 minutes, with most objects replicated within seconds
- Backed by an SLA to replicate 99.9% of objects in under 15 minutes
- Service credit if Amazon S3 does not meet the SLA
- Granular visibility into replication progress

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Benefits of S3 RTC



Compliance

Meet compliance requirements that need predictable, low-latency replication



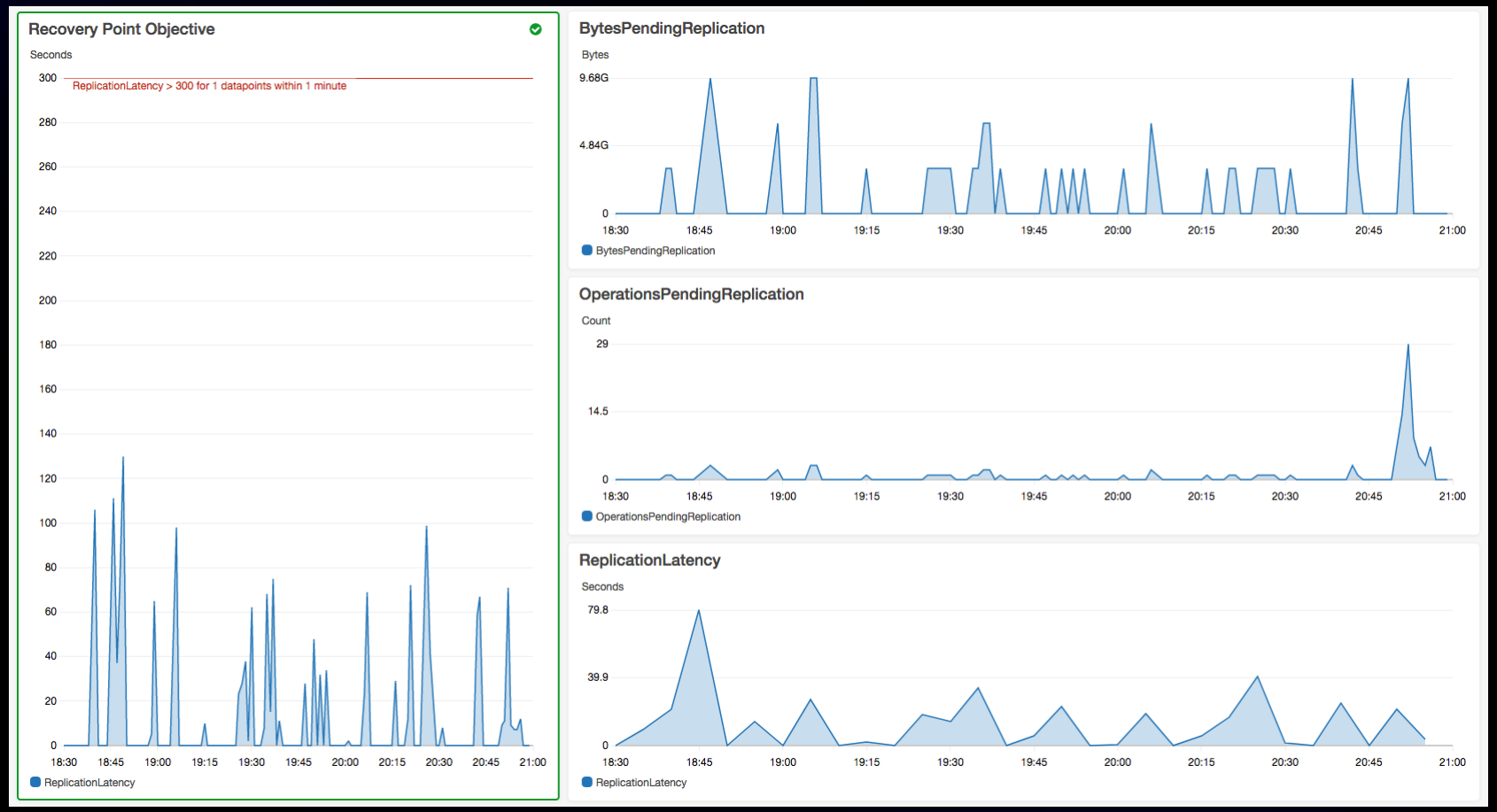
Disaster recovery

Measure and report on Recovery Point Objective (RPO)

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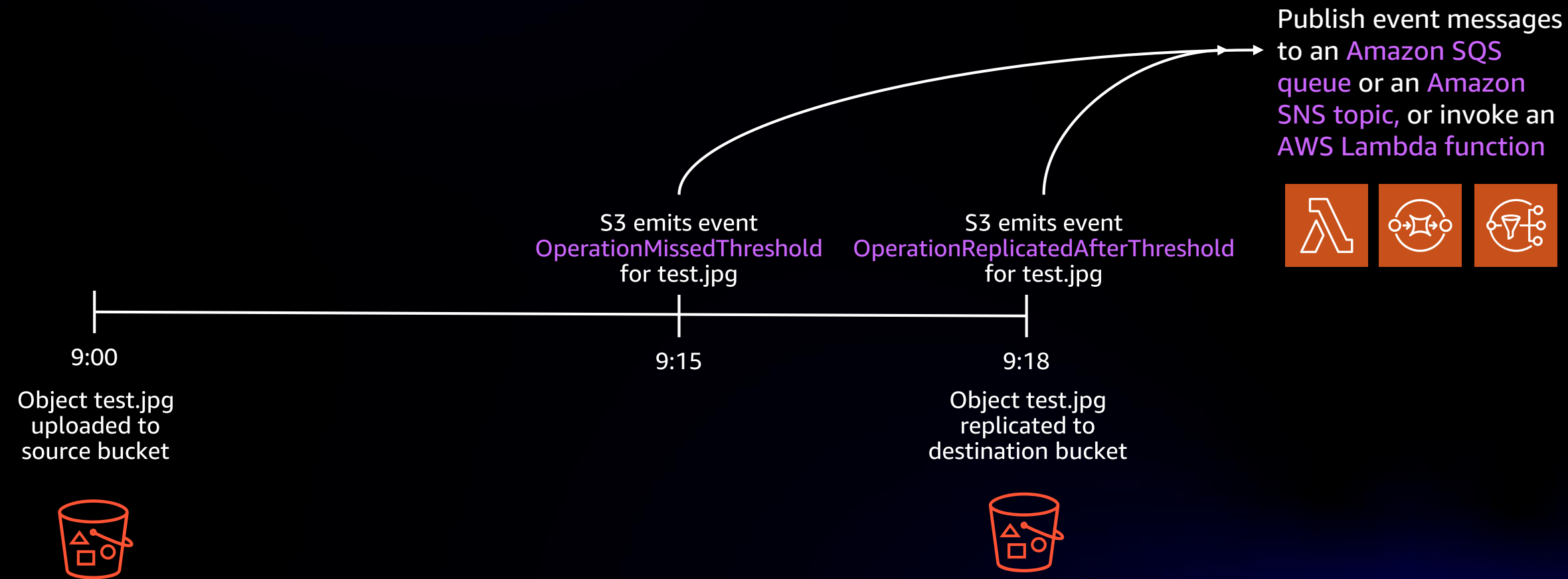
Visibility by default



S3 RTC enables progress monitoring by default

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S3 RTC events to monitor progress and build event-driven logic



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Customer use cases

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Data protection & archival with S3 Replication

- Cross-Region replication to a single destination
- Cross accounts to prevent access in case of unintended access to source account



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Data protection & archival with S3 Replication

- Cross-Region replication to a single destination
- Cross accounts to prevent access in case of unintended access to source account
- Customer wishes to monitor progress through metrics and notifications



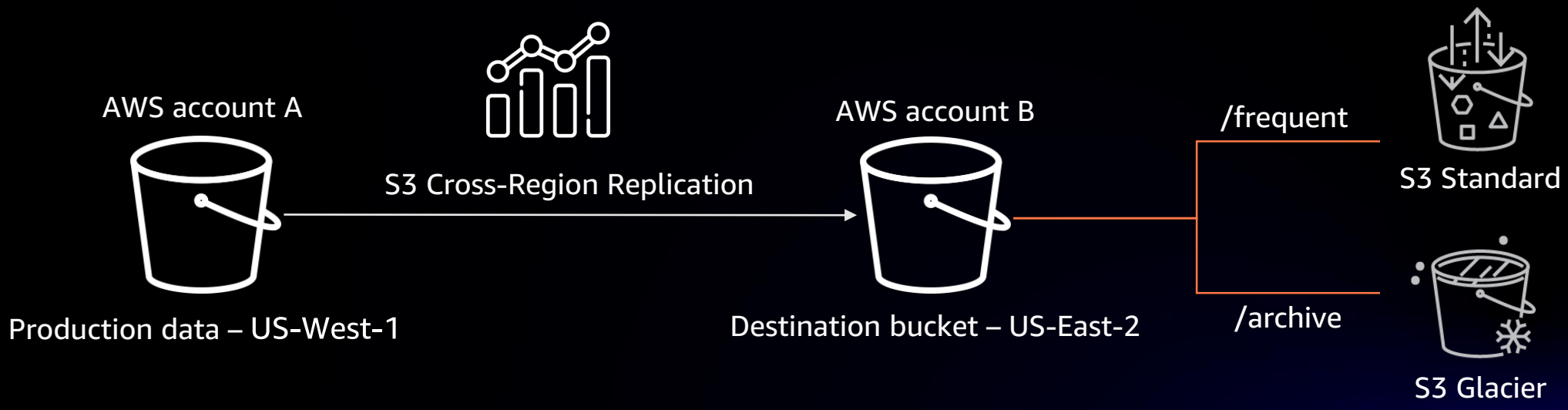
include:

- Bytes pending replication
- Replication latency
- Operations pending replication

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Data protection & archival with S3 Replication

- Cross-Region replication to a single destination
- Cross accounts to prevent access in case of unintended access to source account
- Customer wishes to monitor progress through metrics and notifications
- Customer wishes to optimize for costs using prefix-based rules



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Multi-Region availability with S3 Replication

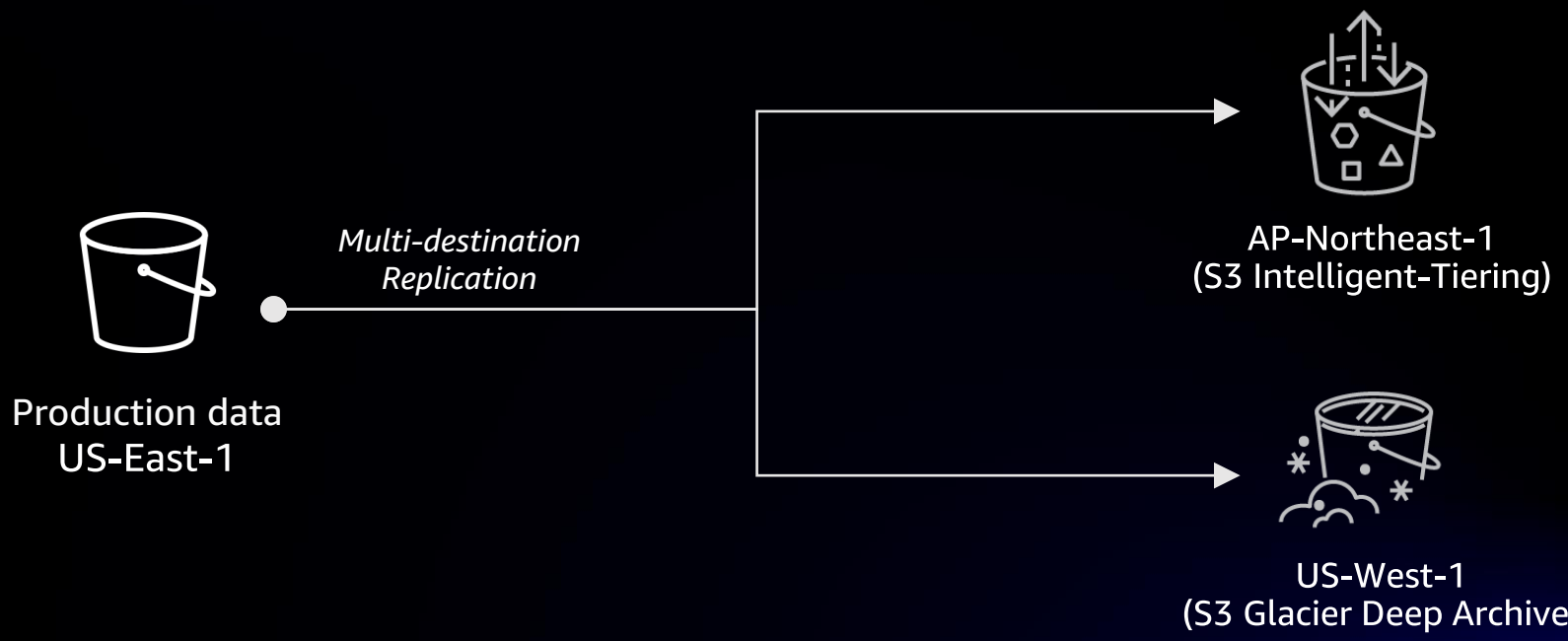
- Cross-Region replication to multiple destinations



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Multi-Region availability with S3 Replication

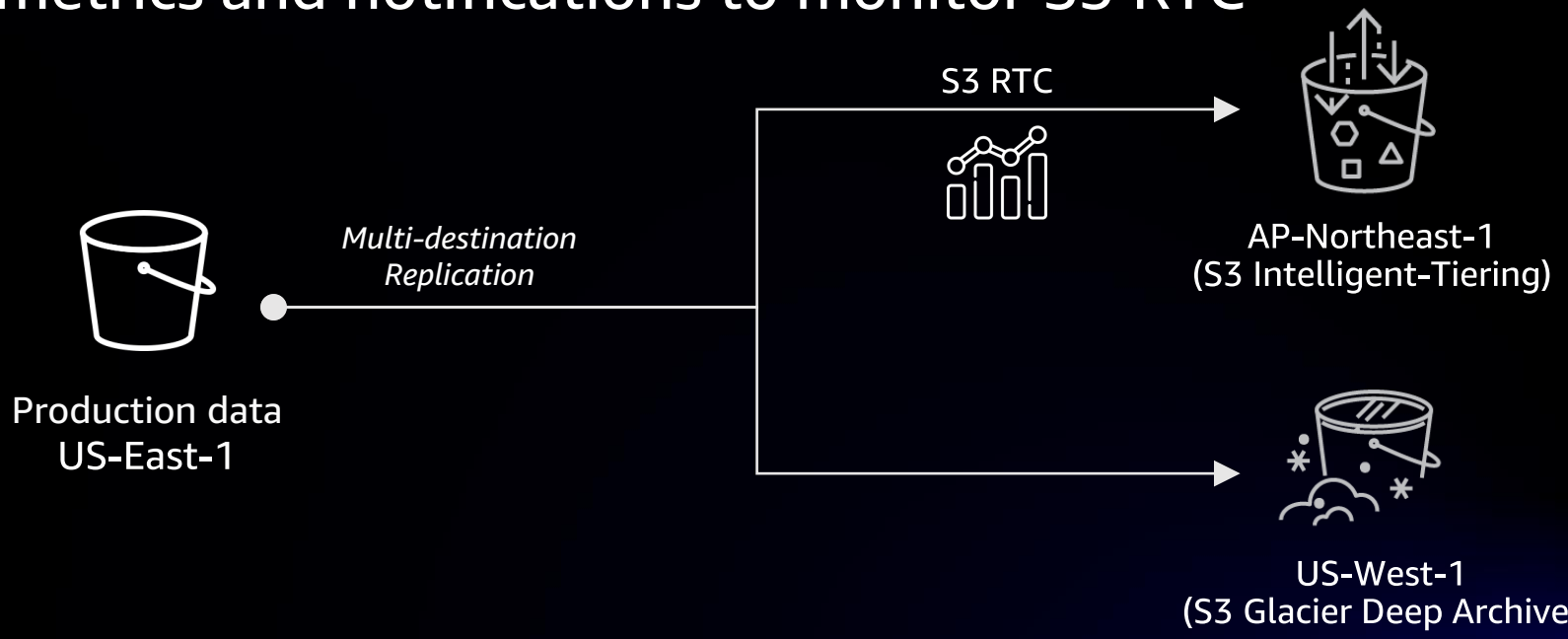
- Cross-Region replication to multiple destinations
- Different storage classes to optimize for costs



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Multi-Region availability with S3 Replication

- Cross-Region replication to multiple destinations
- Different storage classes to optimize for costs
- S3 RTC
- Replication metrics and notifications to monitor S3 RTC



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Knowledge check

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Knowledge check

- Will metadata be replicated?
- Can destination object's storage class differ from the source?
- Can you replicate to more than one destination bucket?
- Can modifications to destination objects sync back to the source objects?
- What events can S3 Replication emit for S3 RTC?

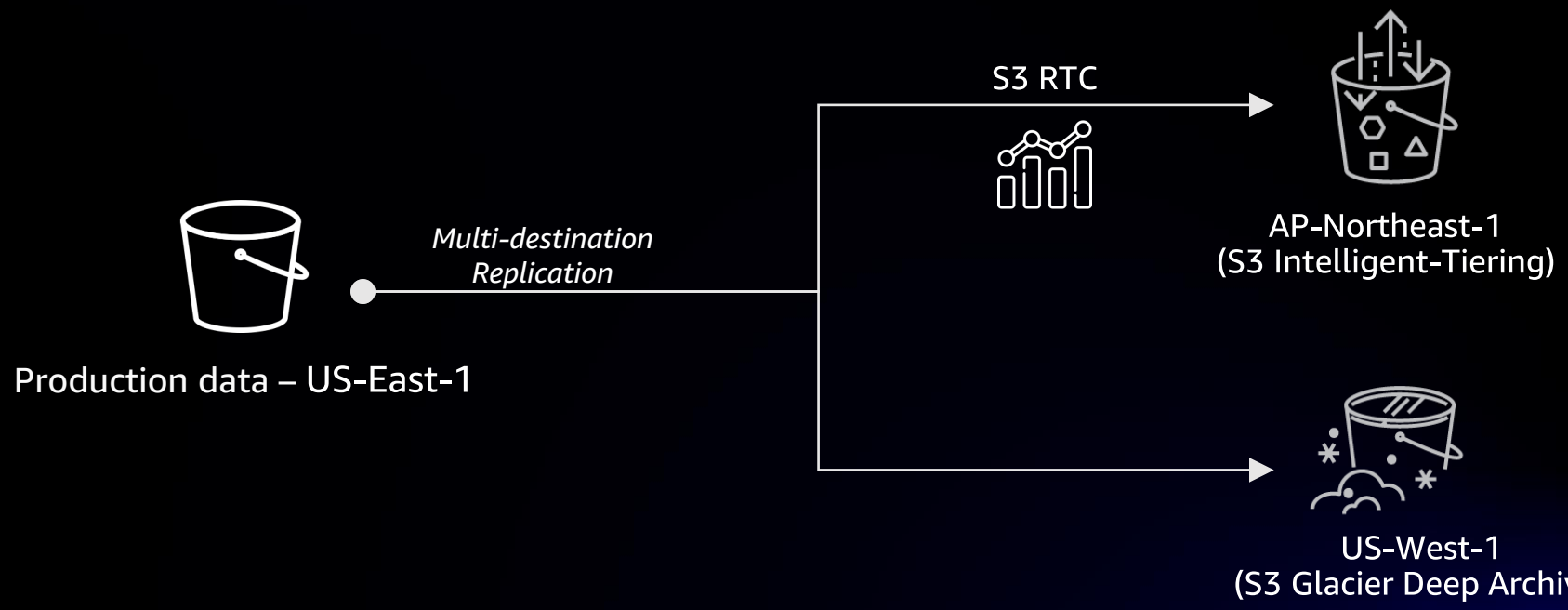
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Amazon S3 Multi-Region Access Points

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Multi-Region availability with S3 Replication

- In the last example, we discussed using S3 Replication to build a multi-Region storage solution



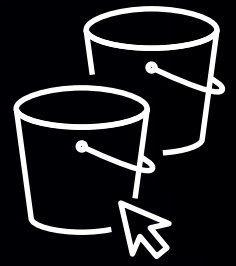
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Benefits of multi-Region storage



Performance

Maintain different copies of data in different AWS Regions to optimize for latency and performance



Resiliency

Maintain secondary copies of data in different AWS Regions for operational resiliency



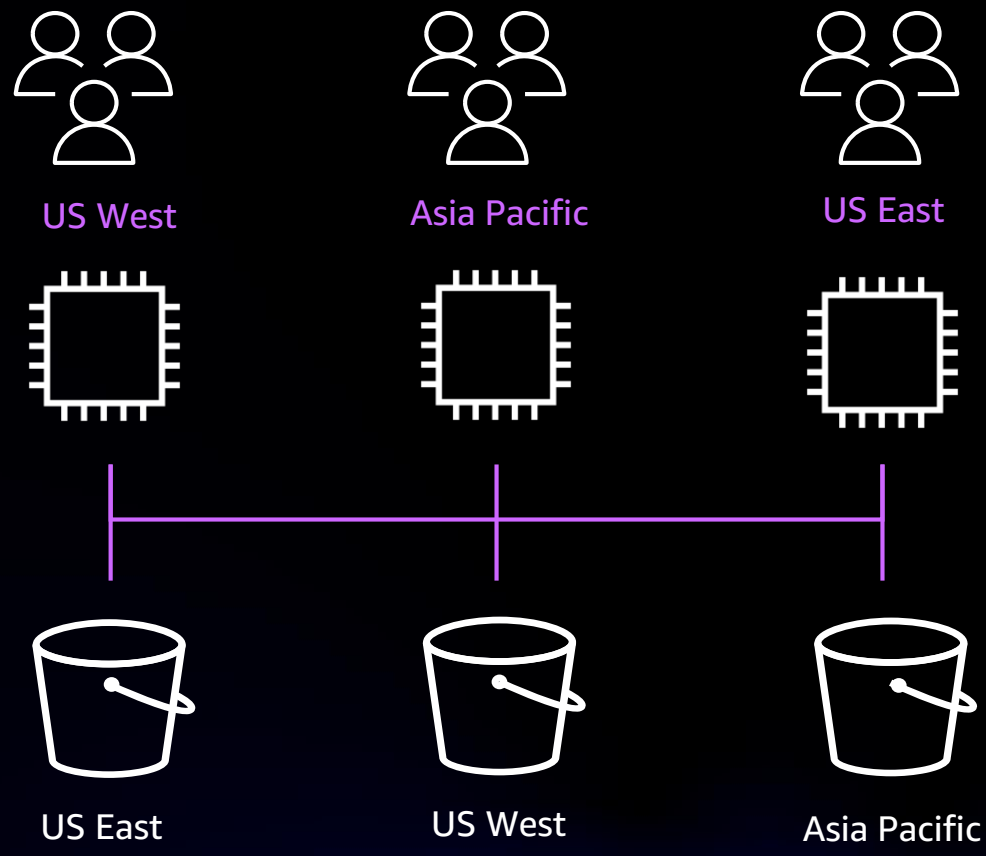
Compliance

Adhere to business requirements related to data residency

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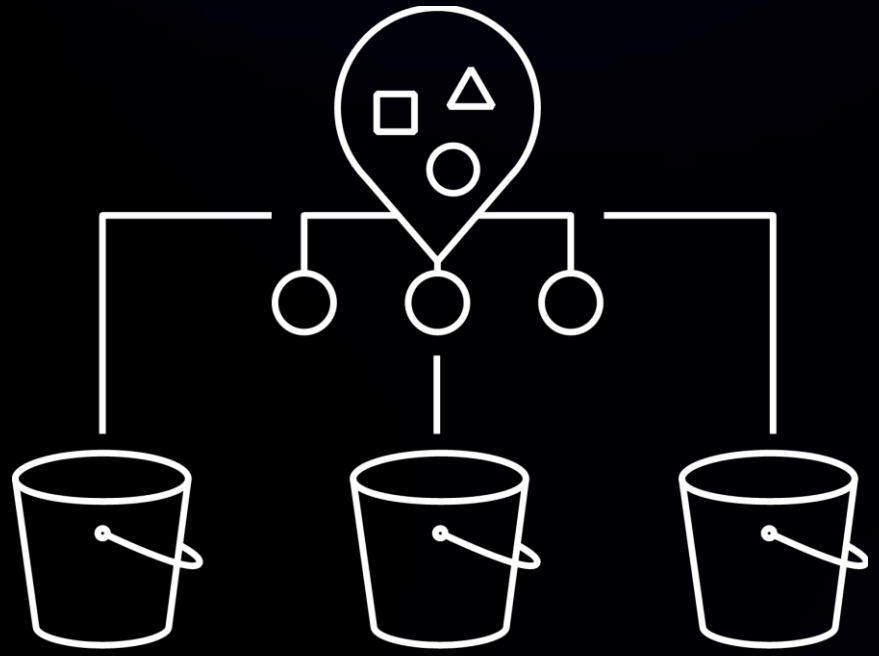
Building multi-Region storage

- Traditionally, accessing multi-Region storage required custom regional logic that routes requests to the closest bucket
- The logic became more complex when you added advanced traffic management such as failover and latency-based routing



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Introducing S3 Multi-Region Access Points

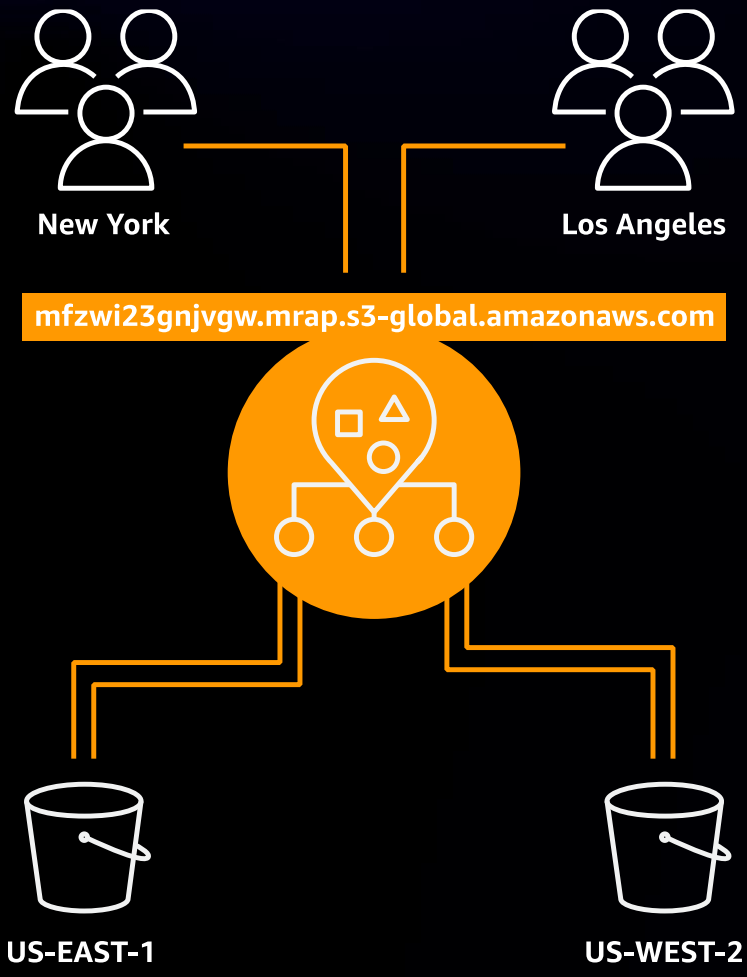


- Add multiple S3 buckets to a new global Multi-Region Access Point
- Create a new unique global hostname to access data in buckets in multiple AWS Regions
- Allows applications to operate across multiple AWS Regions without code changes
- Requests made to a MRAP global hostname are routed and accelerated across AWS Global Accelerator network

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Configuring S3 Multi-Region Access Points

BACKED BY AWS GLOBAL ACCELERATOR



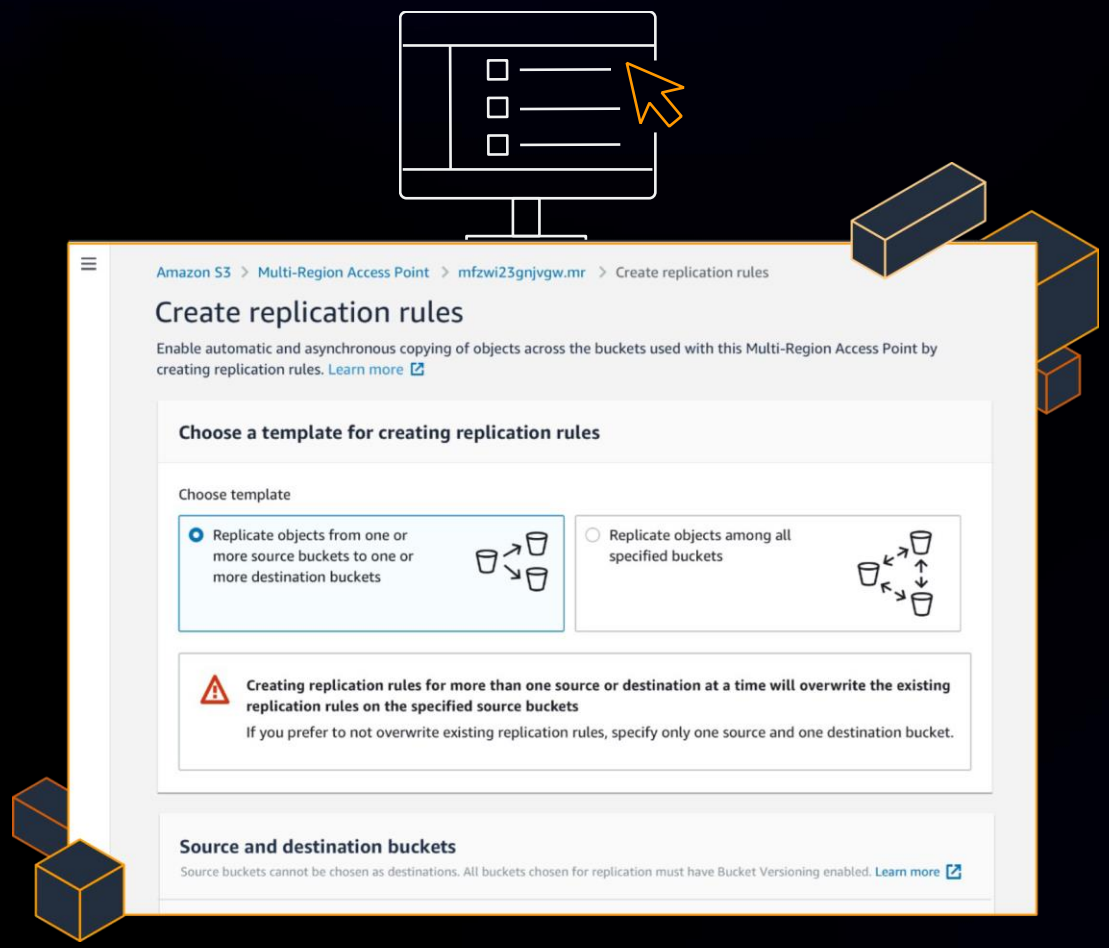
1. Create a Multi-Region Access Point (MRAP) in front of one or more S3 buckets with a few clicks in the S3 Management Console or a single CLI command
2. Once the Multi-Region Access Point has been created, you can configure permission, public access, and replication if you desire

After this setup, requests made to an MRAP global hostname are routed and served by the bucket with the lowest latency

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Combine Multi-Region Access Points with S3 Replication

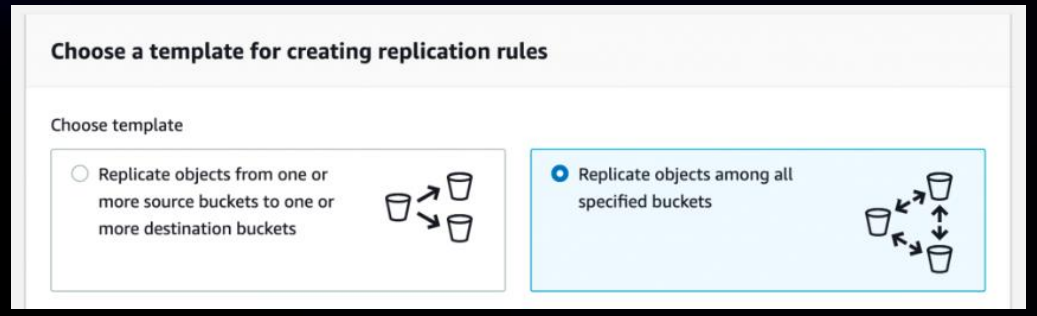


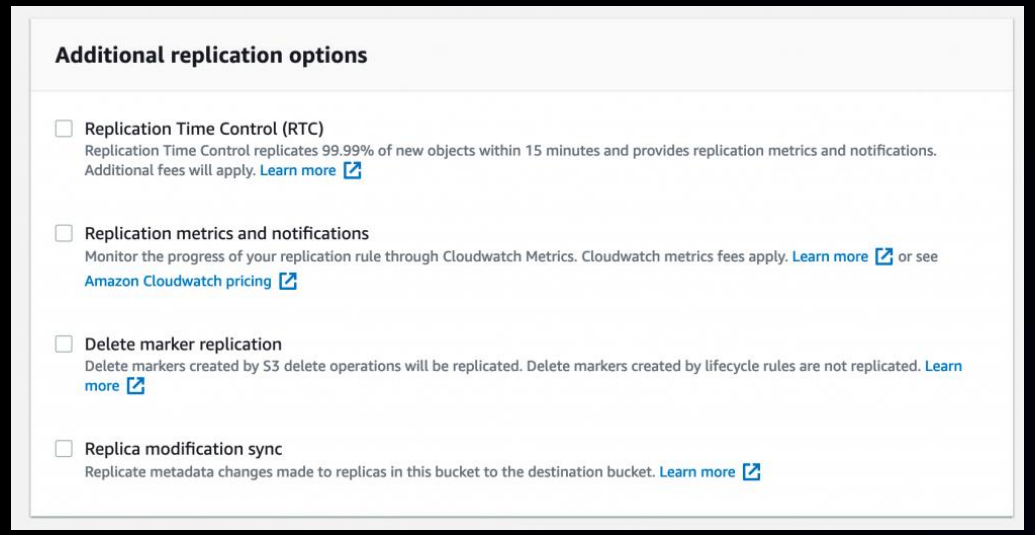
- Combine Multi-Region Access Point with S3 Replication for an AWS managed multi-Region storage solution
- Simplified experience to easily configure S3 Replication within Multi-Region Access Points console
- Centrally configure Amazon S3 cross-Region replication rules for all source and destination buckets
- Configure S3 Replication Time Control (S3 RTC) for SLA-backed replication

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Configure S3 Replication

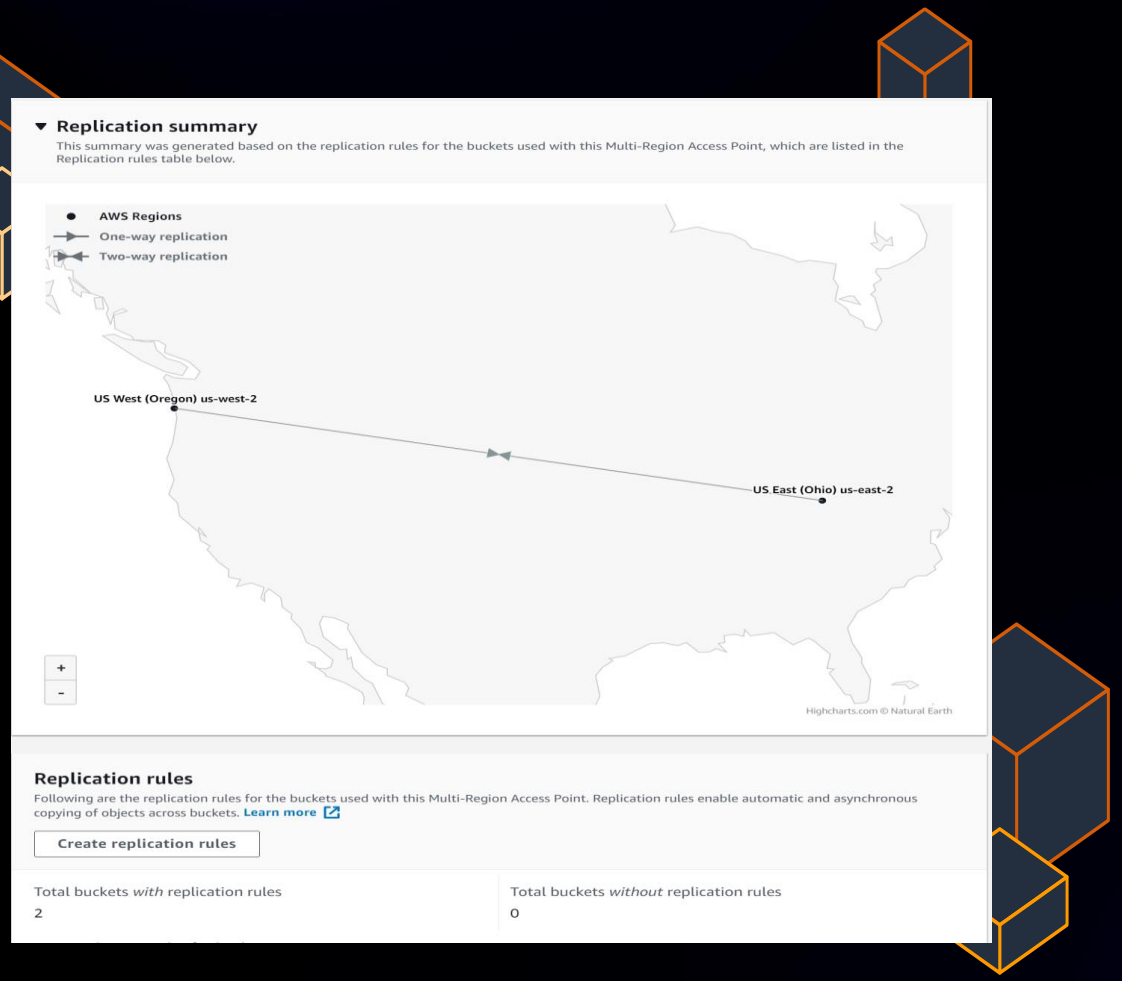


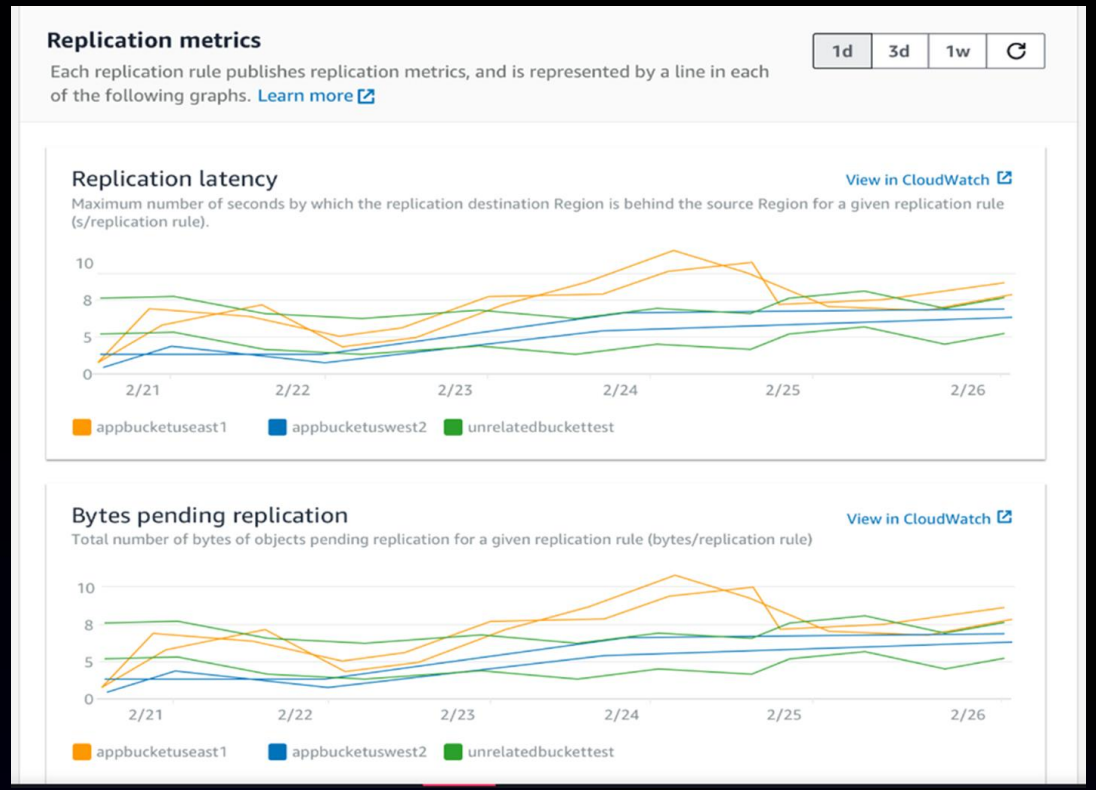


- Using the MRAP console, you can configure from two templates: replicate from one source bucket to destination bucket(s), or let buckets mirror each other
- The console will then create and configure for you the replication rules and IAM roles
- Configure additional replication options such as S3 RTC, replication metrics and notifications, and bidirectional sync

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S3 Multi-Region Access Point replication metrics and summary map





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Multiple ways to connect to S3 Multi-Region Access Points

Cross-Region VPC with no VPC peering via AWS PrivateLink



On premises to S3 via AWS PrivateLink



Internet-based



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Benefits of Amazon S3 Multi-Region Access Points



- Improve **performance** with dynamic request routing over the AWS backbone
- **Simplify** development of multi-Region apps with a Region-agnostic storage architecture
- Combine with **S3 Replication** for a managed multi-Region storage solution

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Demo: Configuring S3 Replication and Multi-Region Access Points

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Summary

- Use Amazon S3 Replication to satisfy compliance, improve resiliency, optimize performance, and maintain data under different ownerships
- Use S3 Replication Time Control (S3 RTC) for SLA-backed predictable replication
- Combine S3 Replication with Amazon S3 Multi-Region Access Points to simplify building multi-Region application
- Demo: Configuring S3 Replication and Multi-Region Access Points

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Thank you!

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