

The background features a vibrant blue gradient with subtle, wavy horizontal lines. In the bottom right corner, there is a colorful abstract shape with shades of purple, pink, and orange. The AWS logo is positioned on the left side of the main title.

aws SUMMIT

INDIA | MAY 25, 2023

SDB002

Beyond the 11 9s of durability: Data protection with Amazon S3

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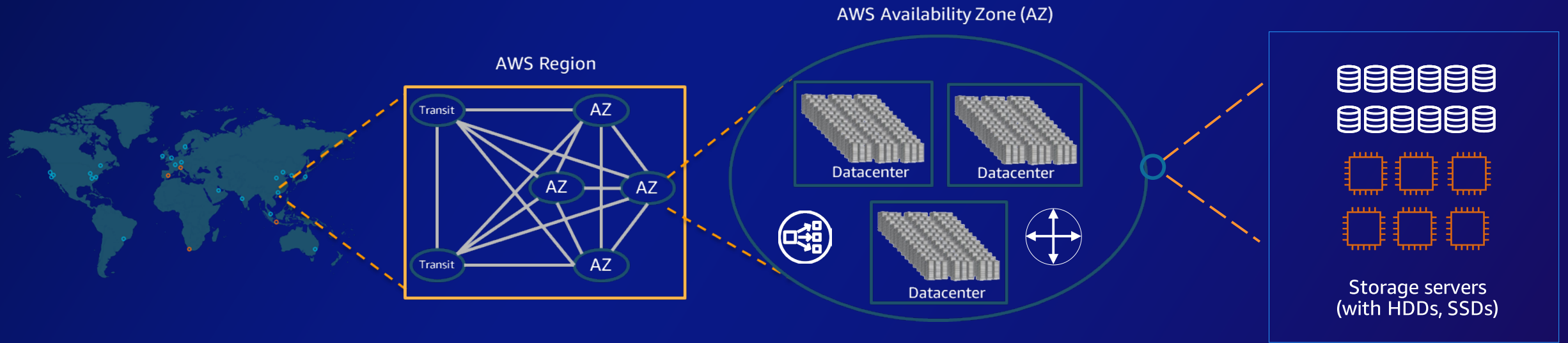
AWS India



Agenda

- Amazon S3: A safe place to store your data
- Why S3 data protection and how to implement it?
- How do you view your protection levels in all of your buckets?
- Demo: S3 data protection using AWS Backup

Amazon S3 architecture: 10,000 foot view



Highly resilient and durable by default

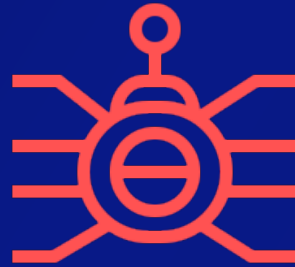


Designed for 99.999999999% of durability

Common causes of data loss or inaccessibility in S3?



Human error - Accidental Object Deletion (API or Lifecycle)

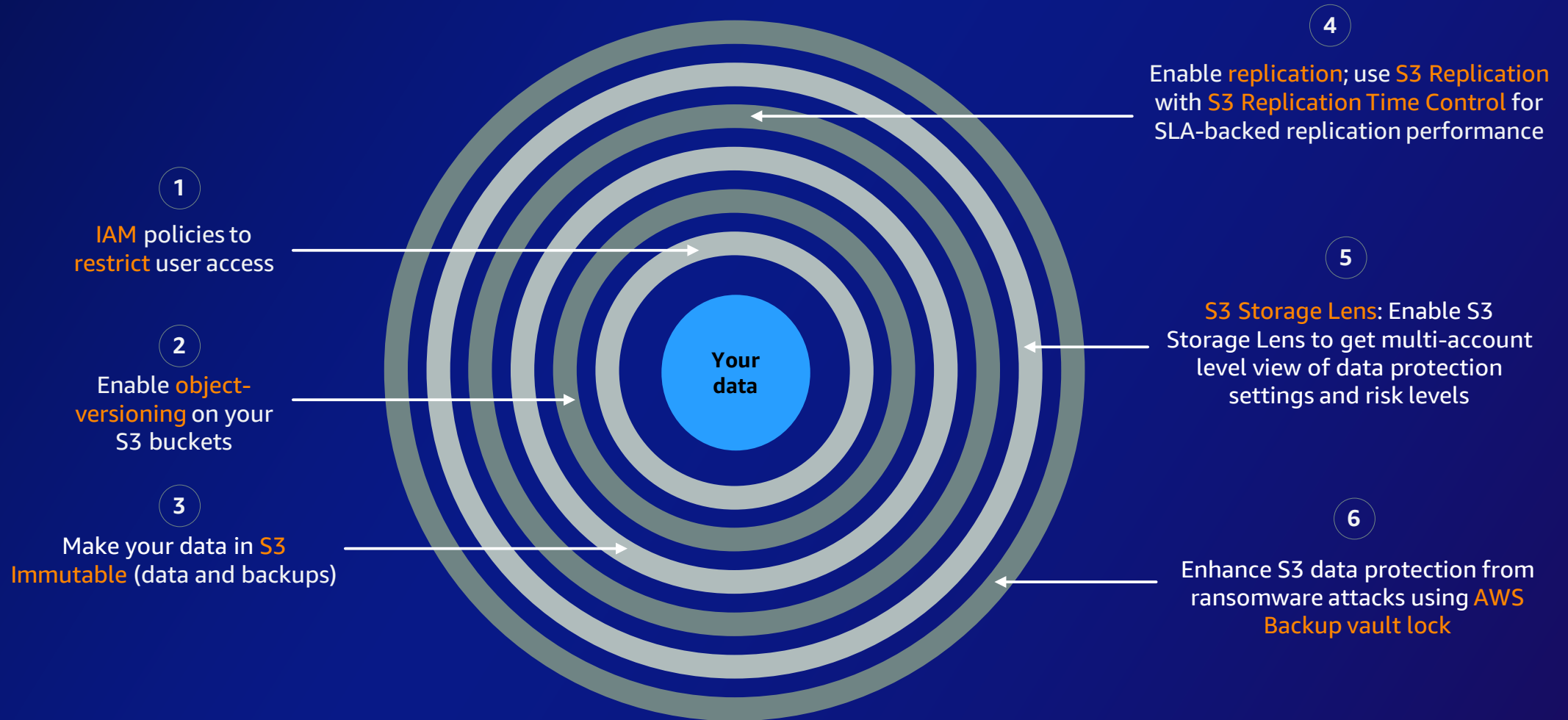


Malicious Actions including Ransomware attacks



Regional disruption

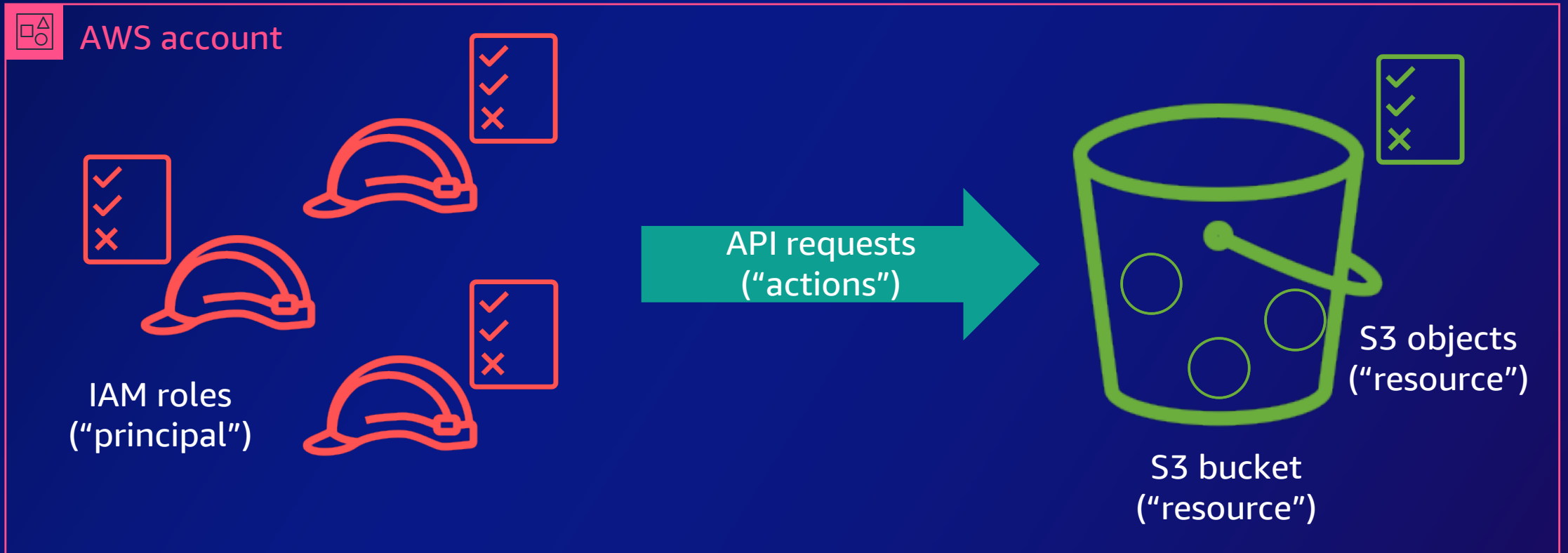
Multi-layer data protection



What if you want to protect your data from human errors?

AWS Identity and Access Management

MODERN PERMISSIONS MANAGEMENT FOR S3 AND ALL OTHER AWS SERVICES



IAM Policies

AWS Identity and Access Management (IAM)

Identity

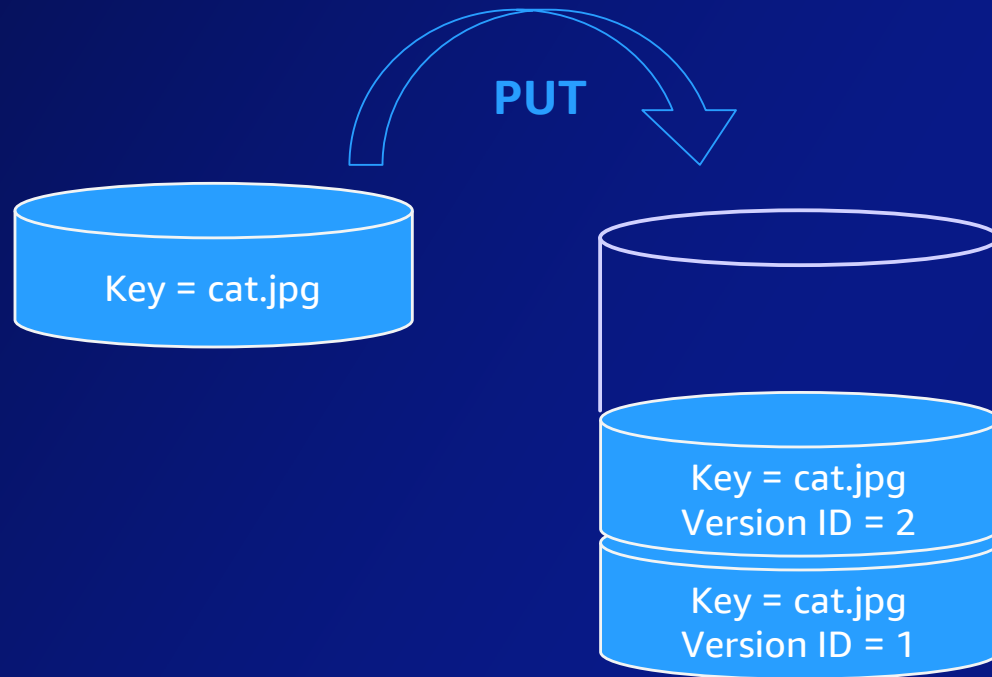


IAM
policy

- Can be applied at **AWS Organization** level using SCP or IAM Principal or Resource level to **deny deletion action**
- The “**s3:put-bucket-lifecycle-configuration**” can be denied to prevent accidental lifecycle expiration
- Flexible and granular, can be applied at **OU, Principal or Resource level**

Amazon S3 Bucket Versioning

PROTECT YOUR DATA FROM ACCIDENTAL DELETION



Create a new version with every upload
Previous versions are retained, not overwritten

Protect from unintended user delete
Delete requests without version ID removes access to object but keeps the data

Manage previous versions with lifecycle
Transition or expire objects a specified number of days after they are no longer the current version

Amazon S3 Bucket Versioning

Objects (3)

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](#)

Copy S3 URI

Copy URL

Download

Open

Delete

Actions

Create folder

Upload

Find objects by prefix

☒ Show versions

<input type="checkbox"/>	Name	Type	Version ID	Last modified	Size	Storage class
<input type="checkbox"/>	cat.jpg	Delete marker	igqvzCZlweXQBEo._nmHhOBnYCuwc8oj	November 30, 2022, 10:17:42 (UTC-08:00)	0 B	-
<input type="checkbox"/>	cat.jpg	jpg	bCTCvteVA31vCYdgi5N3EAgOymzkgpUei	November 30, 2022, 10:17:33 (UTC-08:00)	120.3 KB	Standard
<input type="checkbox"/>	cat.jpg	jpg	D50UyzD9M_B7XliirLzkP73m4FuFTtFK	November 30, 2022, 10:17:24 (UTC-08:00)	120.3 KB	Standard

Amazon S3 Bucket Versioning

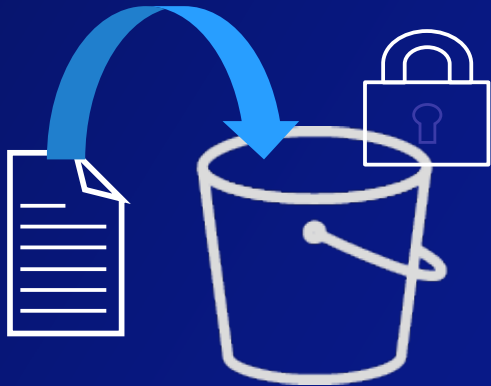
Two ways to permanently delete versioned data:

1. Issuing a delete request against a specific version
2. Using a non-current S3 Lifecycle expiration policy **[recommended]**

What if you want to protect your data against malicious activity?

Amazon S3 Object Lock – Immutable storage

Per object version lock on upload to S3



Bucket default object lock on all new objects

De facto standard

- Enforce write-once-read-many (WORM) policies
- Prevents permanently deleted or overwritten data
- Meet regulatory requirements (SEC 17a-4, CFTC and FINRA)

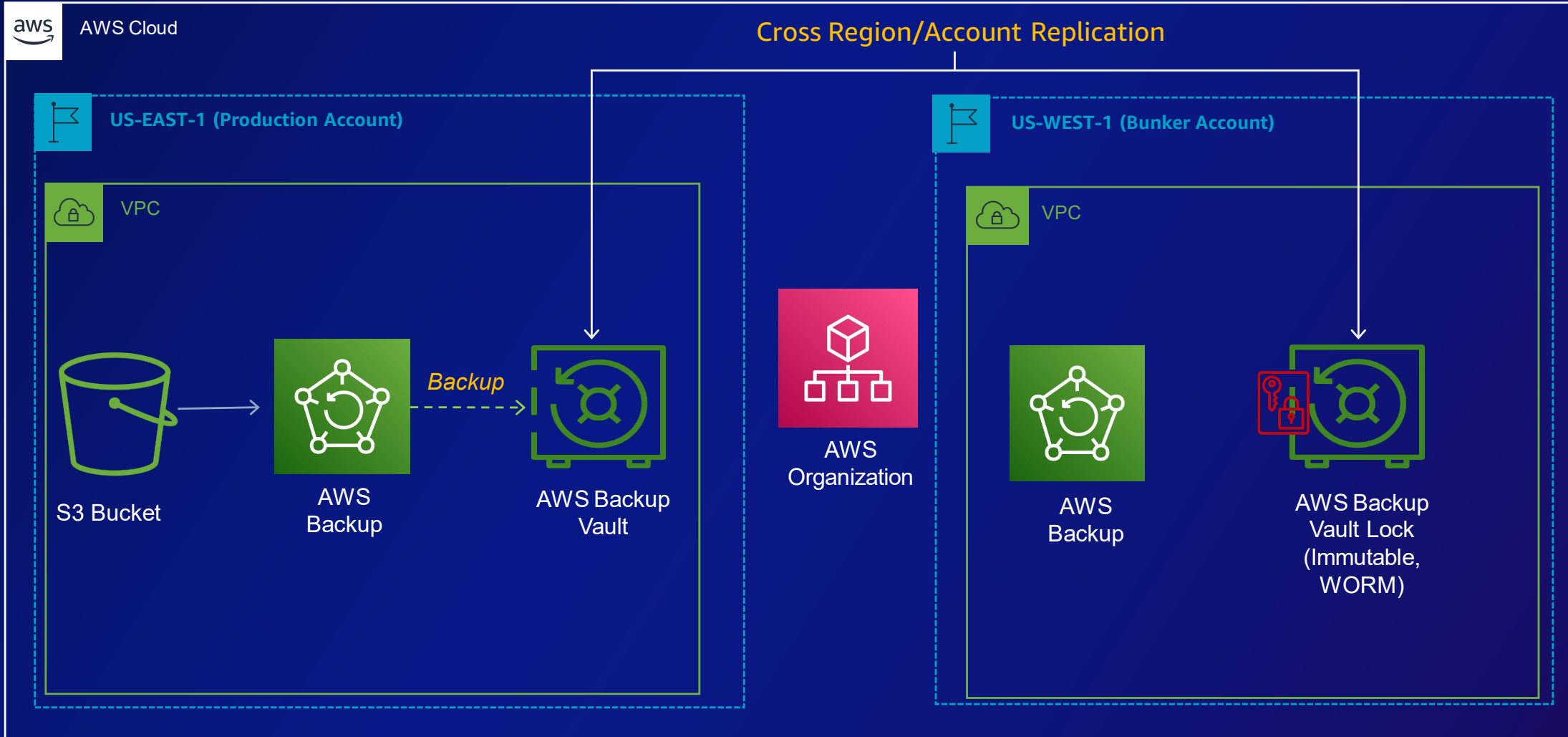
Multiple Object Lock types

- Governance Mode
- Compliance Mode
- Legal Hold

Managing Object Lock at scale

- Batch Operations

AWS Backup Vault lock – Immutable backups



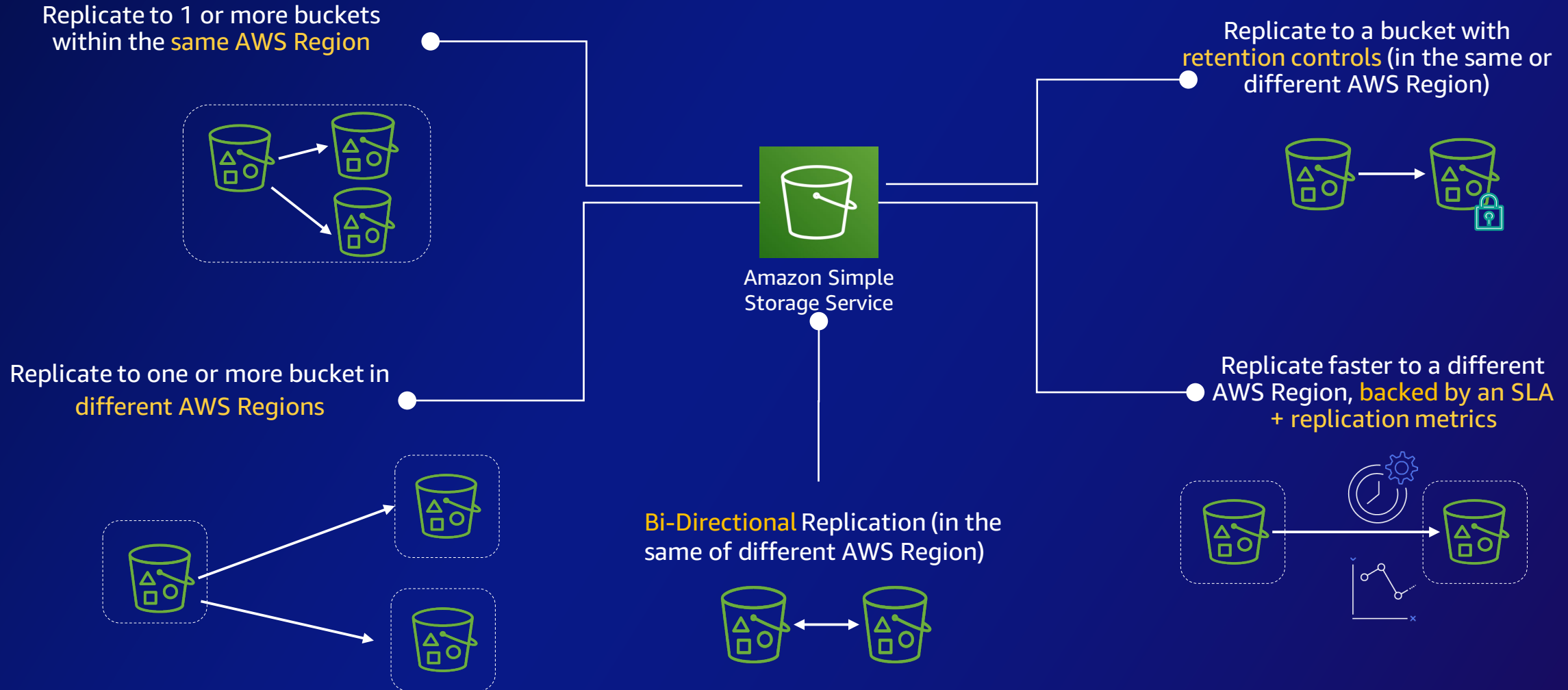
What if you want to protect your data from regional disruptions?

Amazon S3 Replication

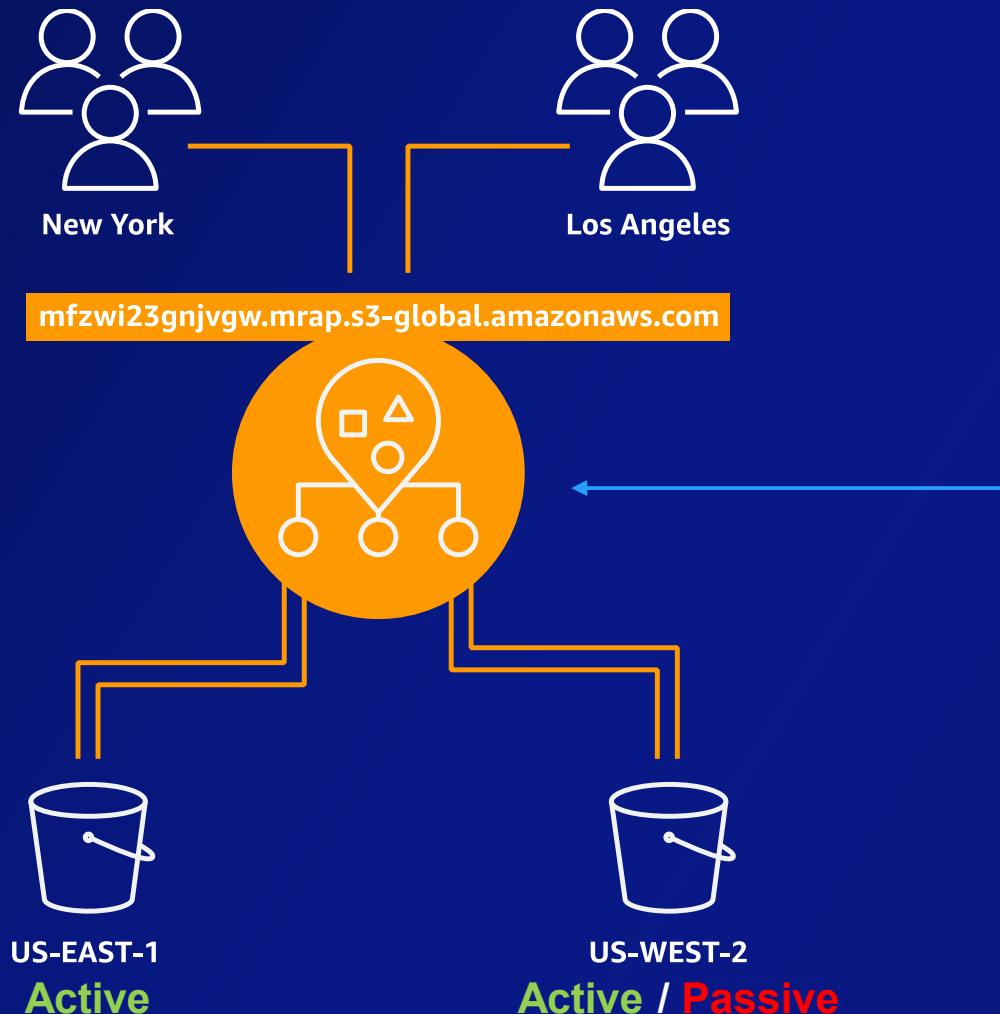
The 3-2-1 rule:

- Three copies of data
- Two backup copies on different storage media
- One backup copy offsite

S3 Replication



S3 Multi-Region Access Points (A/A or A/P)



- Backed by AWS Global Accelerator
- Dynamically routes requests to the lowest latency copy of your data
- Increase upload and download performance by up to 60%
- Achieve higher availability and resiliency in case of unexpected disasters
- Allows applications to operate across multiple AWS Regions without code or configuration changes

How do you view your protection levels in all of your buckets?

Amazon S3 Storage Lens



- Interactive dashboard experience in the S3 console – auto-configured
- Organization-wide visibility
- Drill down by Region, storage class, bucket, and prefix
- Granular usage & activity metrics
- Automated alarms & anomaly detection

Data protection in S3 Storage Lens

Metrics selection
Choose additional metrics and functionality.

Metrics selection

- ☐ Free metrics
Includes usage metrics aggregated at the bucket level. Data is available for queries for 14 days. [Learn more](#)
- ☒ Advanced metrics and recommendations
Includes options for additional metrics and aggregations and other advanced capabilities. Data is available for queries for 15 months. See [Storage Lens metrics pricing](#) on the Management & analytics tab.

Advanced metrics and recommendations features [Info](#)

Advanced metrics ☒

Choose advanced metrics categories to display in the dashboard.

Advanced metrics are not available at the prefix level.

CloudWatch publishing ☒

Access metrics in CloudWatch without incurring separate CloudWatch metrics publishing charges. See [CloudWatch Pricing](#)

Prefix-level metrics are not available in CloudWatch.

Prefix aggregation ☒

Generate insights for usage metrics aggregated by top prefixes.

Advanced metrics categories
Specify which advanced metrics categories to display in the dashboard. [Learn more](#)

- ☒ Activity metrics
Generate metrics that show details about how your storage is requested, such as requests, bytes uploaded/downloaded, and errors aggregated by bucket.
- ☒ Detailed status code metrics - new
Generate detailed metrics for HTTP status codes such as 200 OK, 400 Bad Request, 500 Internal Server Error, and others. Detailed status metrics are displayed with activity metrics in the dashboard.
- ☒ Advanced cost optimization metrics - new
Generate metrics that can help you manage and optimize your storage costs, such as lifecycle rule counts for transitions, expirations, and incomplete multipart uploads.
- ☒ Advanced data protection metrics - new
Generate metrics that can help you protect your data, such as replication rule counts within and across Regions and accounts.

- Every customer gets a default dashboard in S3 Storage Lens
- Automatically includes 14 days of historical data
- Data protection metric include:
 - Versioning
 - Encryption
 - Replication
 - Object Lock

Key takeaways

- S3 is **a safe place to store your data** but do not mistake S3 durability with S3 data protection
- Leverage native S3 data protection features: **Versioning, Object Lock, Replication** and **AWS Backup Vault Lock**
- Control **business continuity** with S3 Multi-Region Access Points
- Use S3 Storage Lens to gain visibility into your **data protection levels**

Demo: S3 data protection using AWS Backup



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Thank you!

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