AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

STG343

Introducing Amazon EFS Replication

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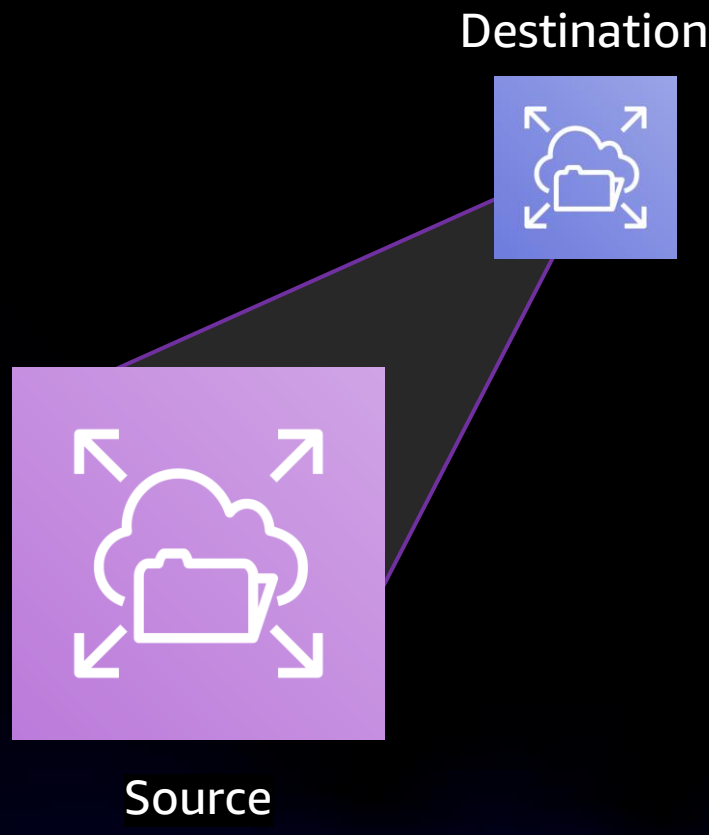
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Introducing Amazon EFS Replication

Coming soon

- Automatically and transparently replicate your data to a second file system. Select a destination Region or Availability Zone of your choice.
- Meet your compliance and business continuity goals. Achieve RTO and RPO of minutes.
- Save up to 85% in disaster recovery storage costs.



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In this session, we will cover

- Amazon EFS – your cloud native elastic file system
- Disaster recovery and compliance
- Amazon EFS Replication
- Customer use cases
- Live demo – Configure replication, monitor status, and failover application
- Amazon EFS Data Protection best practices
- Summary

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Amazon EFS sessions

STG205 AWS storage solutions for containers and serverless applications

STG303 Deep dive on Amazon EFS

STG309 Integrating serverless applications with AWS storage services

STG325 Building serverless modern applications using Amazon S3 or Amazon EFS

STG326 Persistent file storage for containerized CMS platforms on Kubernetes

STG343 Introducing Amazon EFS Replication

STG348 Introducing the latest Amazon EFS performance optimizations

STG401 Get the most out of your Amazon EFS deployments

STG403 Amazon EFS performance best practices

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What is Amazon EFS?

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Amazon Elastic File System (Amazon EFS)

SIMPLE, SERVERLESS, SET-AND-FORGET, CLOUD NATIVE, ELASTIC FILE SYSTEM FOR AWS COMPUTE

CLOUD NATIVE

Built from ground up in the cloud to be simple at cloud-scale and be fully elastic and serverless

Secured and protected using cloud constructs like AWS IAM and AWS Backup

Consumable from any AWS computing model, supports tens of thousands of concurrent connections



Amazon EFS

Highly durable
Highly available

PERFORMANT

Latencies as low as 1 ms

Up to 500 K IOPS

Up to 10+ GB/s of throughput

COST OPTIMIZED

Four storage classes with automatic lifecycle-based cost optimization

Blended storage cost:
$0.043 GB/month

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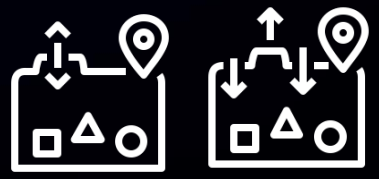
Four storage classes with automatic lifecycle-based cost optimization

Blended storage cost:
$0.043 GB/month

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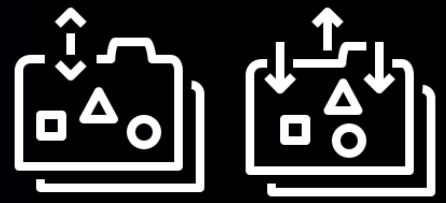
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Amazon EFS storage classes



Amazon EFS One Zone

Low cost, low latency, highly durable, and highly available storage classes



Amazon EFS Standard

Regional, highly durable, and highly available storage classes



COST OPTIMIZED

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Amazon EFS storage classes



One Zone

Low cost, low latency, highly durable, and highly available storage classes

Resiliency

Highly durable (11 9s) and available (99.9%)

Highly durable (11 9s) and available (99.99%)

Availability Zones

Data redundantly stored within a single Availability Zone

Data redundantly stored within and across multiple Availability Zones

Pricing

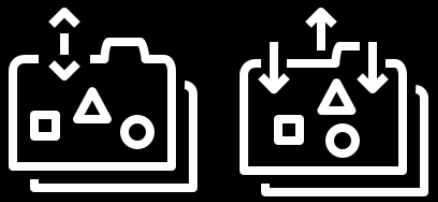
47% lower cost
$0.043/ GB-month[1] blended storage cost

$0.08/ GB-month [1] blended storage cost

Performance

35% lower latencies
Read latencies: As low as 1 ms [2]
Write latencies: As low as 2.4 ms [2]

Read latencies: As low as 1 ms [2,3]
Write latencies: As low as 3.6 ms [2,3]



Standard

Regional, highly durable, and highly available storage classes

[1] Price in US-EAST-1 in December 2021, assuming industry average of 20% Standard storage and 80% Infrequent Access Storage
[2] Average read/write latencies for metadata and 4 KiB data operations in US-EAST-1
[3] General Purpose mode



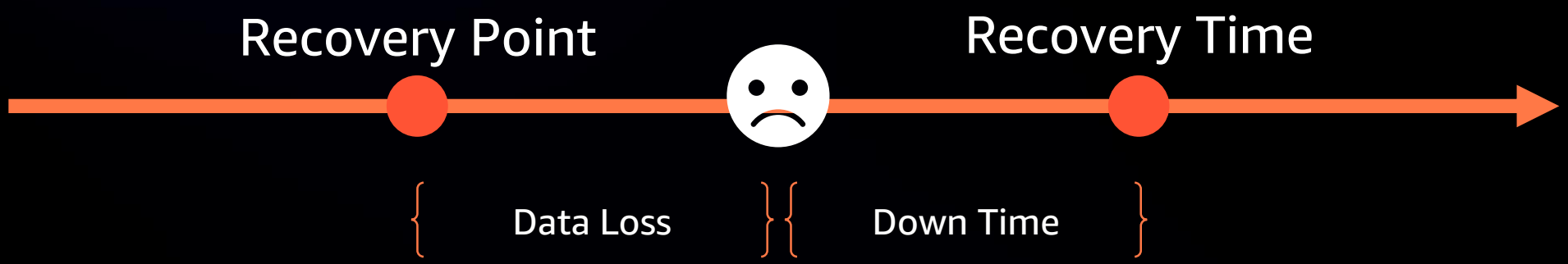
COST OPTIMIZED

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Your compliance and business continuity goals

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Understanding RPO and RTO



Recovery Point Objective (RPO) is the maximum acceptable amount of time since the last data recovery point

Recovery Time Objective (RTO) is is the maximum acceptable delay between an interruption of service and restoration of service

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Compliance and business continuity goals



Compliance requirements

Maintain a copy of a file system in a separate geography from source to meet data protection compliance requirements



Disaster Recovery

Build a Disaster Recovery (DR) strategy with geographic redundancy and achieve Recovery Point Objective (RPO) of minutes



Business continuity

Meet your business continuity goals by achieving Recovery Time Objective (RTO) of minutes

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Challenges to meeting your compliance and business continuity goals



Operational overhead



High total cost of ownership



Difficult to meet RPO and RTO

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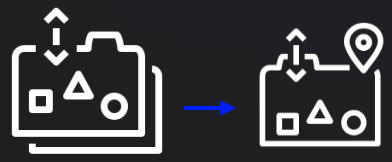
Amazon EFS Replication

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Introducing Amazon EFS Replication

Coming soon

MEET YOUR COMPLIANCE AND BUSINESS CONTINUITY GOALS



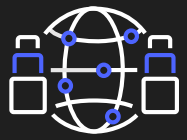
Automatic

Automatically replicate your data to a second file system



Simple

Configure in as little as two clicks; no infrastructure to manage



Flexible

Select a destination Region or Availability Zone of your choice



Compliant

Meet your compliance and business continuity goals with RPO and RTO of minutes



Transparent

Monitor and alarm on replication health status using Amazon CloudWatch



Cost optimized

Save up to 85% in disaster recovery storage costs

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How does Amazon EFS Replication work?



- You can enable replication on an existing file system and select the replica settings independent of its source



- A read-only replica is automatically created in the selected Region and changes to your file system are transparently applied to its replica

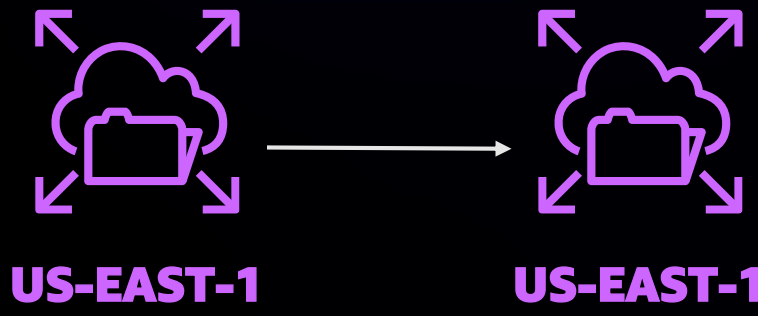


- You can use the AWS Console, API, or CLI to enable replication or initiate failover to the replica

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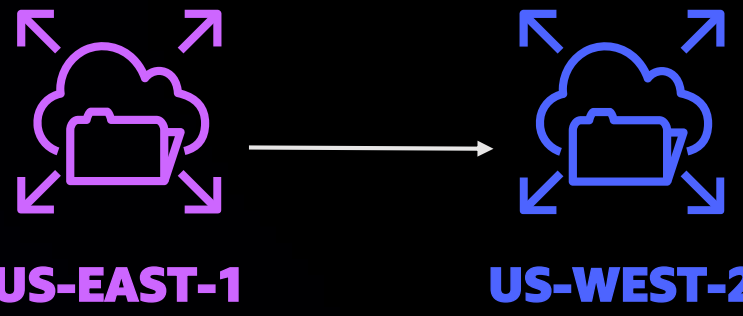
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Replicate your file systems within and across AWS Regions



Same Region

Replicate within the same AWS Region



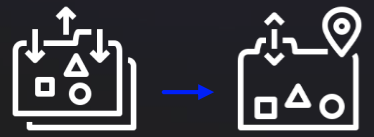
Cross Region

Replicate to a different AWS Region

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Flexible replication options



Replicate from EFS Standard to EFS One Zone storage classes and vice-versa



Set a Lifecycle Management policy for the replica independent of source



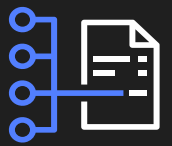
Set backup policy for the replica independent of source



Set throughput mode for the replica independent of source



Set resource policies for the replica independent of source



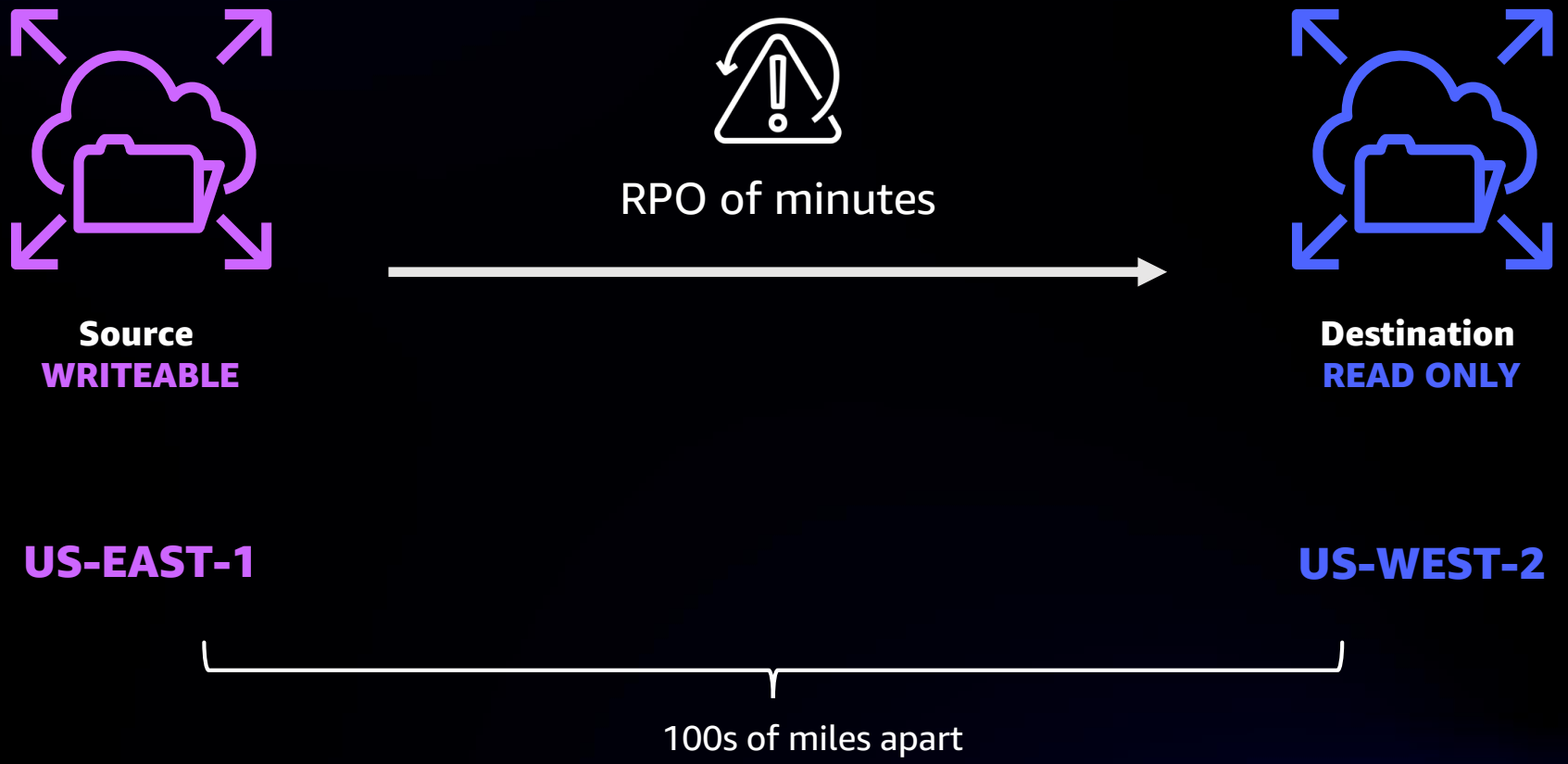
Set access points for replica independent of source

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Meet your disaster recovery requirements

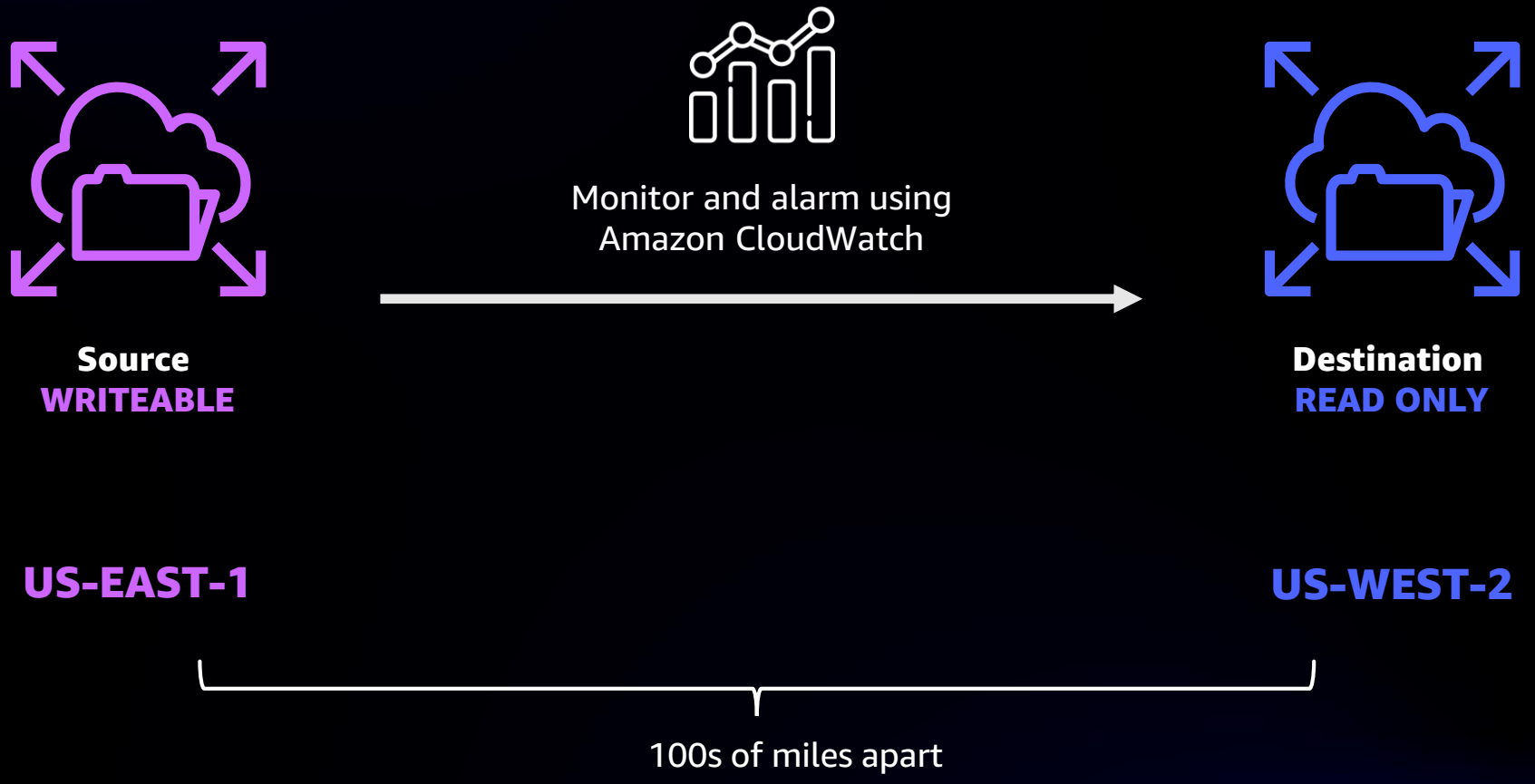
ACHIEVE RPO OF MINUTES



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Meet your compliance requirements

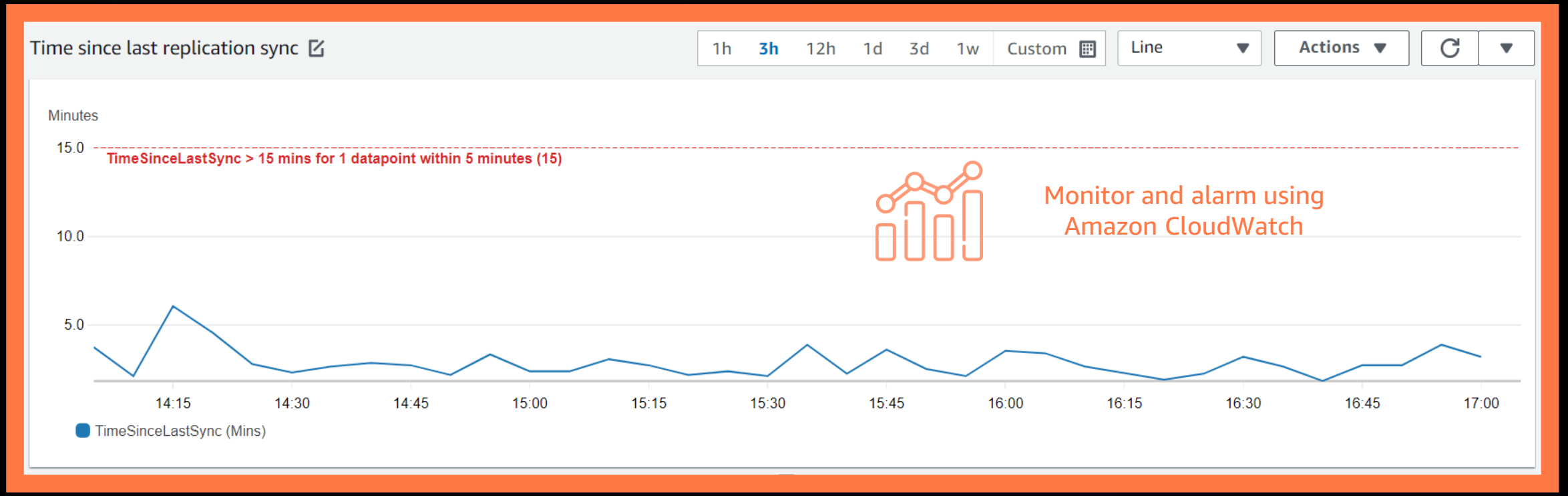
REPLICATE YOUR FILE SYSTEM WITHIN AND ACROSS REGIONS, MONITOR AND ALARM ON STATUS



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Meet your compliance requirements

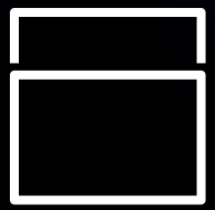
REPLICATE YOUR FILE SYSTEM WITHIN AND ACROSS REGIONS, MONITOR AND ALARM ON STATUS



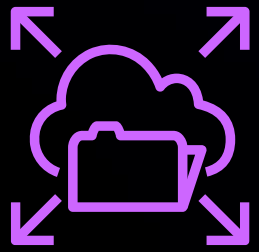
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Meet your business continuity goals

FAILOVER YOUR APPLICATION IN THE EVENT OF A DISASTER, ACHIEVE RTO OF MINUTES



Business Critical Application



Source
WRITETABLE

US-EAST-1





Destination
~~READ ONLY~~
WRITEABLE

US-WEST-2



RTO of minutes

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Customer use cases

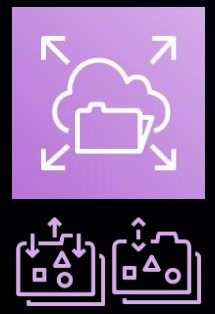
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Optimize DR storage costs with a 7-day policy for replica

Source EFS file system

US-EAST-1

Standard storage classes



Up to **72%** savings in storage costs



Destination EFS file system

US-WEST-2

Standard storage classes

Estimated monthly storage cost for source file system:

- Storage: 100 TB
- Storage in Infrequent Access: 80 TB
- Blended storage price: $0.08/GB-month*
- Lifecyle Management policy: 30 days
- Estimated monthly storage cost: $8,192

*Pricing in the US East (N. Virginia) Region. Assumes 80% of the files are infrequently accessed

Estimated monthly storage cost for source file system:

- Storage: 100 TB
- Storage in Infrequent Access: 95 TB
- Blended storage price: $0.022/GB-month**
- Lifecyle Management policy: 7 days
- Estimated monthly storage cost: $2,223

**Pricing in the US West (Oregon) Region. Assumes 95% of the files are infrequently accessed

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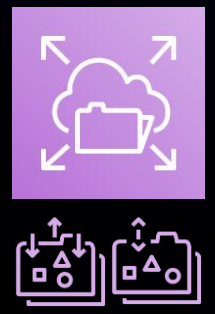
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Optimize DR storage costs with One Zone storage classes for replica

Source EFS file system

US-EAST-1

Standard storage classes





Up to **85%** savings in storage costs



Destination EFS file system

US-WEST-2

One Zone storage classes

Estimated monthly storage cost for source file system:

- Storage: 100 TB
- Storage in Infrequent Access: 80 TB
- Blended storage price: $0.08/GB-month*
- Lifecyle Management policy: 30 days
- Estimated monthly storage cost: $8,192

*Pricing in the US East (N. Virginia) Region. Assumes 80% of the files are infrequently accessed

Estimated monthly storage cost for source file system:

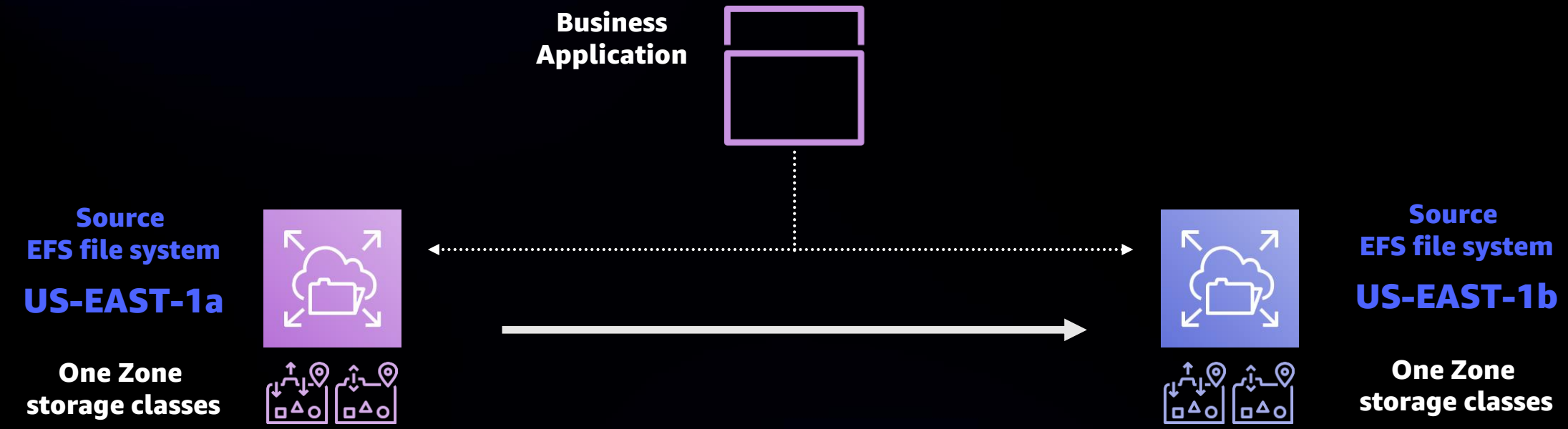
- Storage: 100 TB
- Storage in Infrequent Access: 95 TB
- Blended storage price: $0.012/GB-month**
- Lifecyle Management policy: 7 days
- Estimated monthly storage cost: $1,183

**Pricing in the US West (Oregon) Region. Assumes 95% of the files are infrequently accessed

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Increase availability of applications using EFS One Zone storage classes



- EFS One Zone classes are highly durable (designed for 11 9s durability) and available (99.9% availability SLA)
- Because data is stored in a single AZ, the file system may not be available in the event of a disaster that affects all copies of data within the AZ
- You can increase the availability of applications using cross-AZ Replication within or across Regions
- You can failover your business application to use the Replica One Zone file system

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Optimize network latency for file system cross-Region access



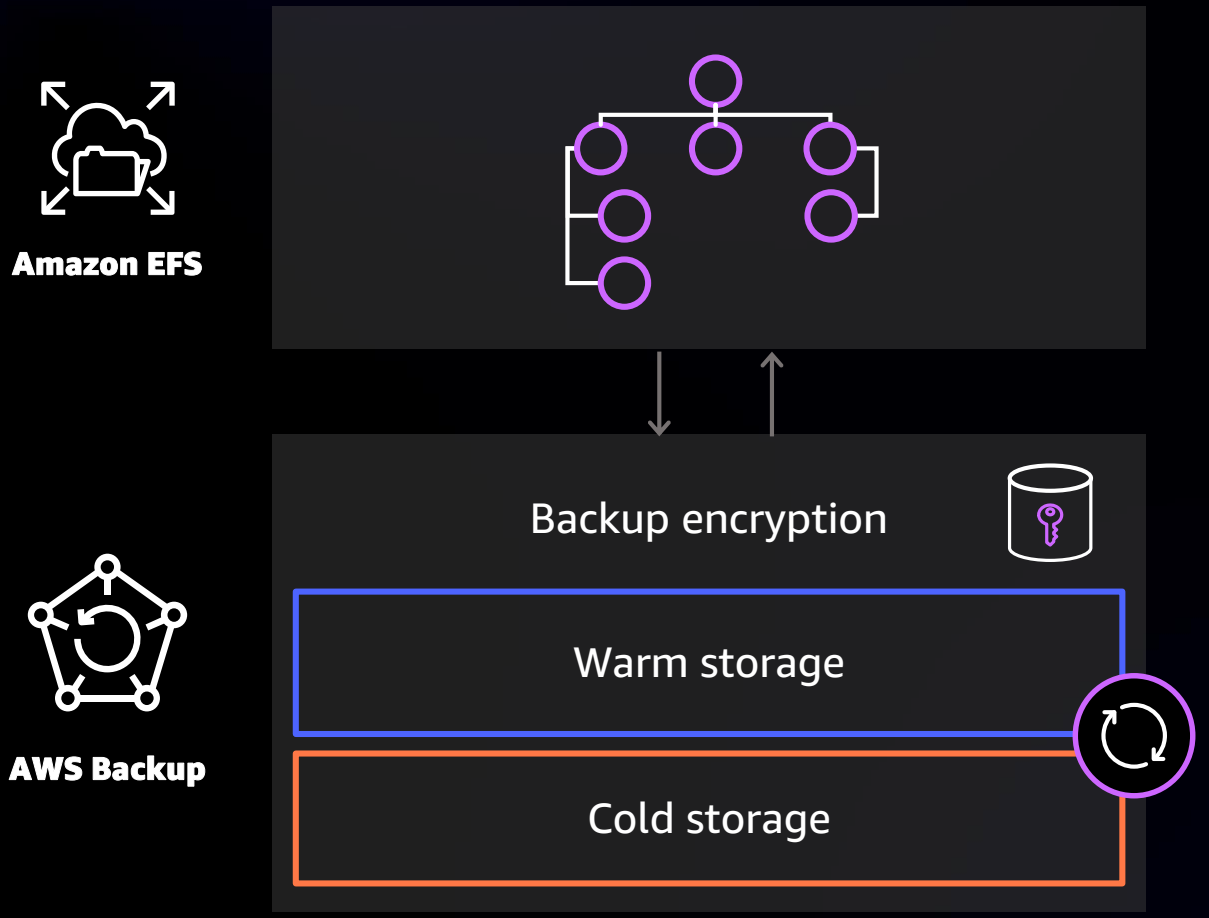
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Comprehensive data protection for Amazon EFS

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Backup and restore using AWS Backup

POLICY-BASED CENTRALIZED DATA PROTECTION FOR AMAZON EFS



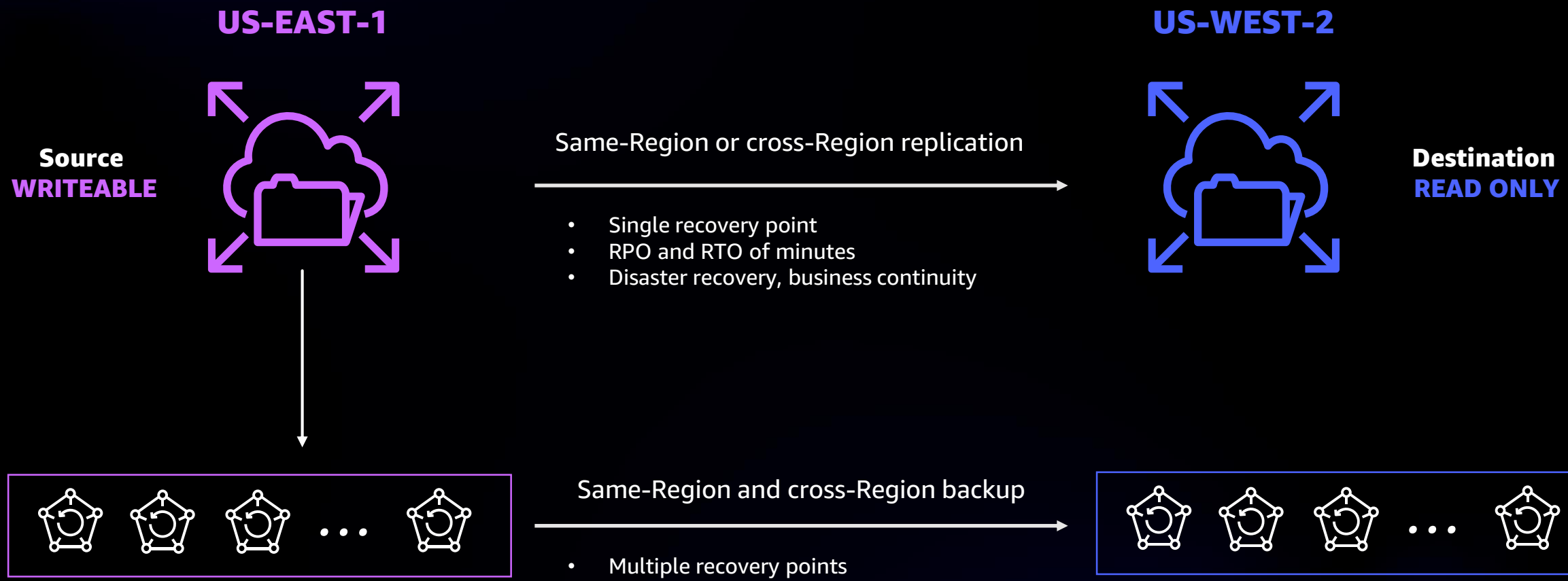
- AWS Backup provides policy-based data protection and management to meet your compliance needs
- Automatic tag-based backup scheduling and retention per user defined policy
- Lifecyle backups from warm storage tier to cold storage tier for cost optimization
- Setup cross-Region and cross-account backups
- Protect your Amazon EFS file systems from accidental deletion by a user or an unintended overwrite by an application
- Recover an entire file system or individual files and directories

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Amazon EFS Replication and AWS Backup

COMPREHENSIVE DATA PROTECTION FOR AMAZON EFS



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Summary

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Top 5 takeaways from the session

1. Amazon EFS Replication is coming soon to your favorite AWS Region
2. Select a destination Region or Availability Zone of your choice
3. Meet your compliance, disaster recovery, and business continuity goals and achieve RPO and RTO of minutes
4. Optimize your disaster recovery storage costs and save up to 85% by using EFS One Zone storage classes and 7-day lifecycle management policy for your Replica file system
5. You can use Amazon EFS Replication alongside with AWS Backup for comprehensive data protection for Amazon EFS

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Getting started with Amazon EFS

1

Sign up for an AWS account

Instantly get access to the AWS Free Tier

2

10-minute tutorial

Learn how to use Amazon EFS

3

Start building your cloud-native file system

Step-by-step walkthroughs

Get started: aws.amazon.com/efs/getting-started

Tutorials: github.com/aws-samples/amazon-efs-tutorial

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STG401 Get the most out of your Amazon EFS deployments

STG403 Amazon EFS performance best practices

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