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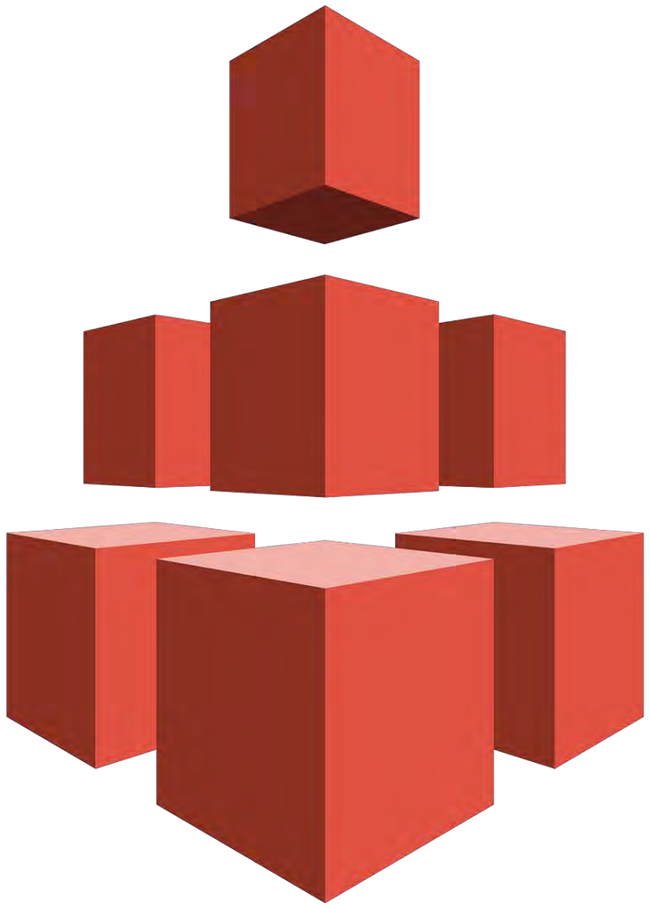
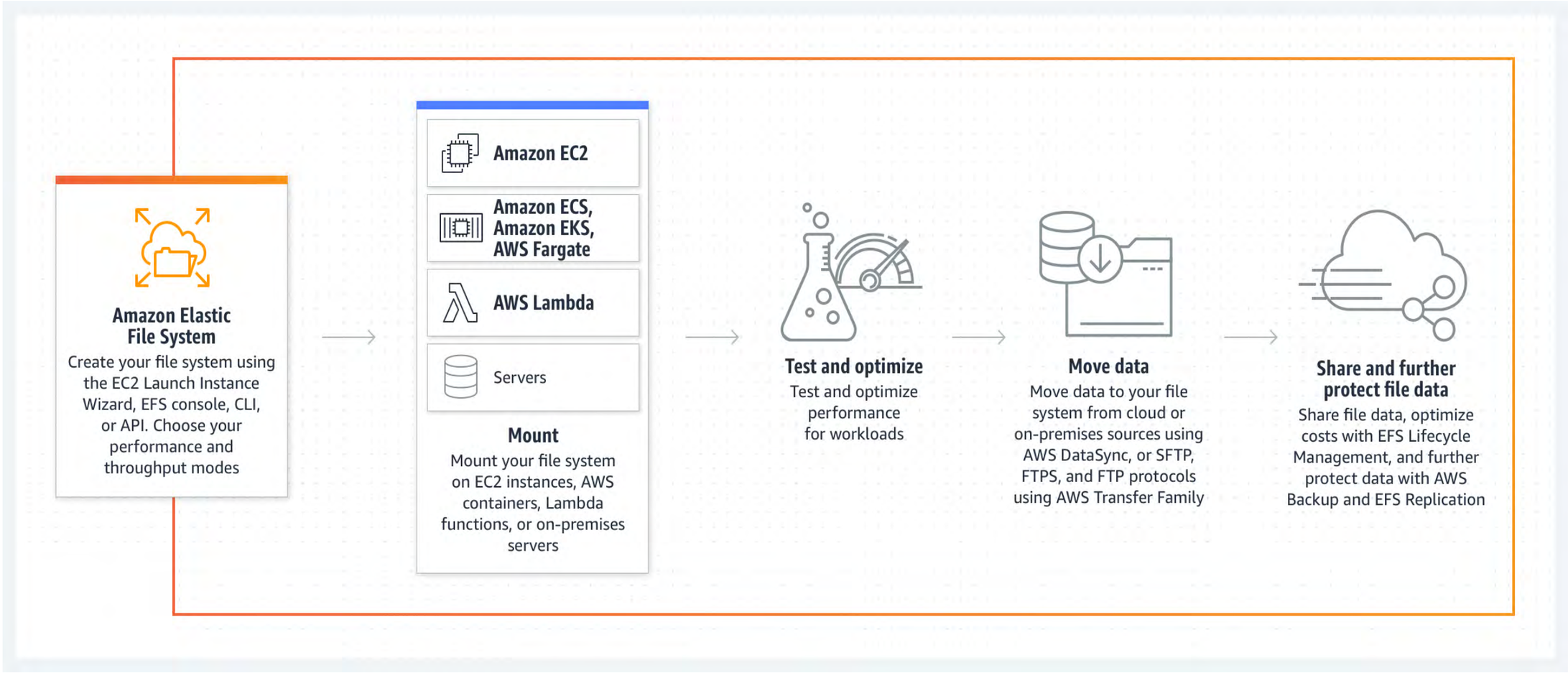
Amazon EFS

Exploring Amazon EFS

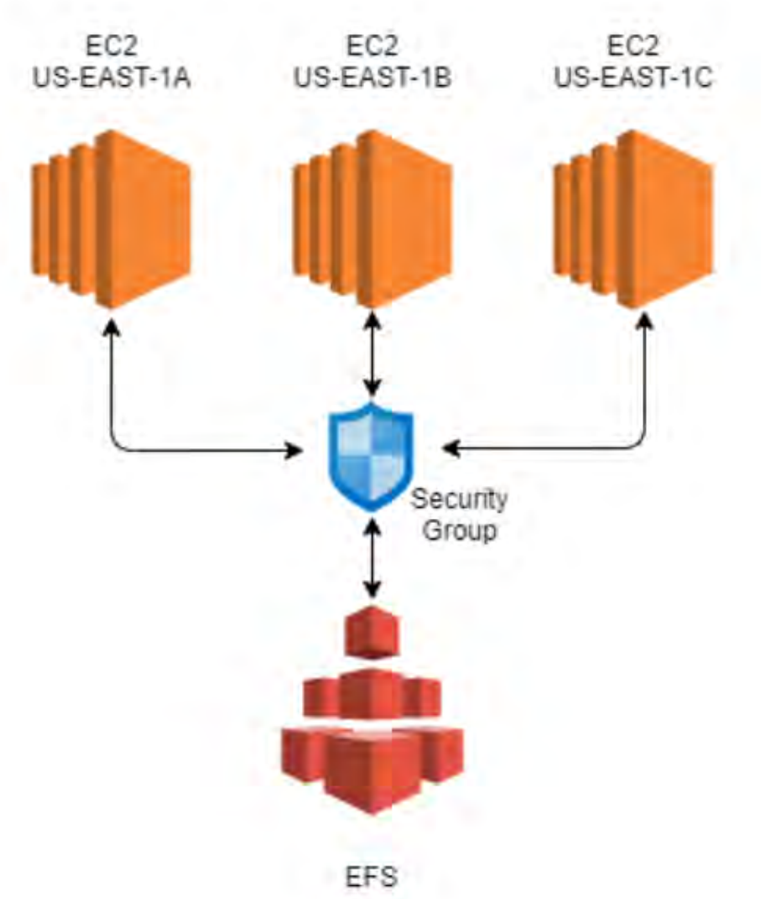
Amazon EFS (Elastic File System) is a scalable, secure, and fully-managed cloud-based file system with high availability and easy access to data from multiple instances. Let's dive deeper into its features, benefits, and potential use cases.



How it Works


Amazon Elastic File System
Create your file system using the EC2 Launch Instance Wizard, EFS console, CLI, or API. Choose your performance and throughput modes
Amazon EC2
Amazon ECS, Amazon EKS, AWS Fargate
AWS Lambda
Servers
Mount
Mount your file system on EC2 instances, AWS containers, Lambda functions, or on-premises servers
Test and optimize
Test and optimize performance for workloads
Move data
Move data to your file system from cloud or on-premises sources using AWS DataSync, or SFTP, FTPS, and FTP protocols using AWS Transfer Family
Share and further protect file data
Share file data, optimize costs with EFS Lifecycle Management, and further protect data with AWS Backup and EFS Replication

Elastic File System (EFS)



- It is a Managed NFS that can be mounted on many EC2 instances within the same region but as many Availability zones you want.
- EFS works with EC2 instances in Multi-AZ.
- Highly available, Scalable, expensive (3 times more then Gp2), but you can pay for what you use.
- Use Cases: Content Management, web serving, Word press and much more.
- Uses NFSv4.1 protocol.

Elastic File System (EFS)

- Uses security group to control access to EFS.
- Compatible with Linux Based AMI (Not Windows).
- Performance:
  - General Purpose (by default)
  - Max I/O – used when thousands of EC2 are using the EFS.
- File Sync to Sync from on-premise File system to EFS.
- Backup EFS-to-EFS (it is incremental, and you can choose frequency)
- Encryption at rest using KMS.

The Many Types of Amazon EFS

Standard

A general-purpose file system for Big Data, content repositories, web server logs, and more.

Infrequent Access

A cost-optimized file system for infrequently accessed data, with lower storage prices. Ideal for backups, logs, and workflows.

One Zone

A fully-managed file system with data stored in a single availability zone, useful for workloads that do not need multi-AZ resiliency.

Lifecycle Management

An automated feature that moves your files between different storage classes based on the frequency of access, reducing costs and optimizing performance.

Features That Make EFS Stand Out

1. Easy to Use
2. High Performance
3. Secure and Compliant
4. Scalable and Flexible

Use Cases for Amazon EFS

Big Data Analytics

EFS can store large volumes of data generated by data processing workflows, Big Data analytics, and machine learning models.

Content Repositories

EFS provides a shared file system for content creation, document management, and collaborative work, accessible by all team members and devices.

Web Applications

EFS can support highly-available and scalable web applications, allowing file sharing across elastic deployments, caching layers, and fault-tolerant architectures.

EFS Performance and Scalability

Throughput Modes

EFS supports two throughput modes which you can switch dynamically: bursting and provisioned. Bursting mode offers up to 10Gbps throughput when a file system is idle, and it applies a bursting credit approach, while provisioned mode offers a predictable throughput level, ranging from 0.001 - 1024 MB/s, based on your setup.

1

I/O Operations

EFS uses an optimized Linux file system driver to minimize write and metadata operations, and support sustained read/write performance at scale.

2

3

Multi-AZ Resiliency

EFS offers data replication across multiple Availability Zones (AZs) within a region, ensuring high durability levels and preventing data loss in case of an outage.

Managing Your Data with Amazon EFS

Backing Up Your Data

- Use Lifecycle Management to move files to S3 buckets on a regular basis for long-term storage.
- Use EFS-to-EFS backup to copy file systems across regions or accounts for higher durability and disaster recovery capabilities.

Securing Your Data

- Encrypt data both in transit and at rest using AWS KMS or your own customer-managed CMK.
- Use IAM access controls to secure your file systems and manage user permissions.

Monitoring Your Data

- Use Amazon CloudWatch metrics to monitor file system performance, I/O activities, and throughput utilization.
- Use Amazon CloudTrail logs to track file system events and changes for auditing and compliance purposes.

Pricing and Billing for Amazon EFS

1

Pay-per-Use Model

EFS charges a simple monthly fee based on usage of storage and data transfer, without any upfront fees or minimum commitments.

2

Price per GB

Prices start at $0.30 per GB and decrease based on usage tier and volume; data transfer prices start at $0.01 per GB for transfers that exceed 5% of the total GB-months of storage used per month.

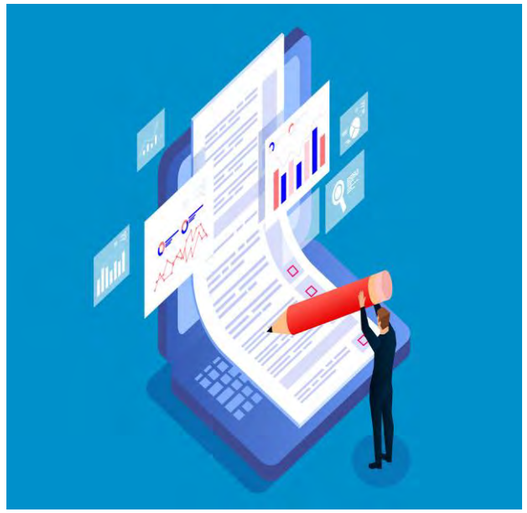
3

Additional Features

EFS offers additional features like Lifecycle Management, Backup, and Multi-AZ support at no extra cost.

Best Practices for Using Amazon EFS

Data Management



Documentation and Expertise

Security and Compliance

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S3 Glacier

Overview of S3 Glacier

Amazon S3 Glacier is a secure, durable, and cost-effective cloud storage service for data archiving and long-term backup. It is designed to deliver 99.999999999% durability and provide comprehensive data management.

Storage Classes and Pricing

S3 Glacier

- S3 Glacier is a low-cost storage service designed for data archiving. It's ideal for data that is seldom accessed but needs to be retained for a long period of time.
- However, retrieval times can range from minutes to hours, so it may not be the best choice for data that needs to be accessed frequently or quickly.
- One key feature of S3 Glacier is the ability to set up lifecycle policies, which automatically transition objects to Glacier from other S3 storage classes based on the age of the object.
- This can help reduce costs by moving less frequently accessed data to a lower-cost storage class, and by removing data that is no longer needed.

Storage Classes and Pricing

S3 Glacier Deep Archive

- S3 Glacier Deep Archive is the lowest-cost storage service available for long-term retention. It's designed for data that is rarely accessed and needs to be retained for up to several decades.
- The price per GB starts from $0.00099/month, making it one of the most affordable storage options in the market

- One important thing to note is that S3 Glacier Deep Archive has a minimum storage duration of 180 days.
- This means that if you delete an object or remove it from the service before the 180 days are up, you will still be charged for the full 180-day duration.

Retrieval Options and Costs

1

Expedited

Retrieval time of 1-5 minutes. Price starts from $0.03 per GB retrieved.

2

Standard

Retrieval time of 3-5 hours. Price starts from $0.01 per GB retrieved.

3

Bulk

Retrieval time of 5-12 hours. Price starts from $0.0025 per GB retrieved.

Configuring S3 Glacier Vaults and Lifecycle Policies

1 Creating a Glacier Vault

Use S3 console, command line tools, or AWS SDKs to create a Glacier vault.

2 Lifecycle Policies

Automate the migration of objects between Amazon S3 and S3 Glacier, and between S3 Glacier and S3 Glacier Deep Archive using lifecycle policies.

3 Notifications

Set up SNS notifications to get notified on vault and inventory events.

Overview of S3 Glacier Deep Archive

Cost-effective Archive Storage

S3 Glacier Deep Archive is the most cost-effective storage option for long-term data retention, backup, and archival.

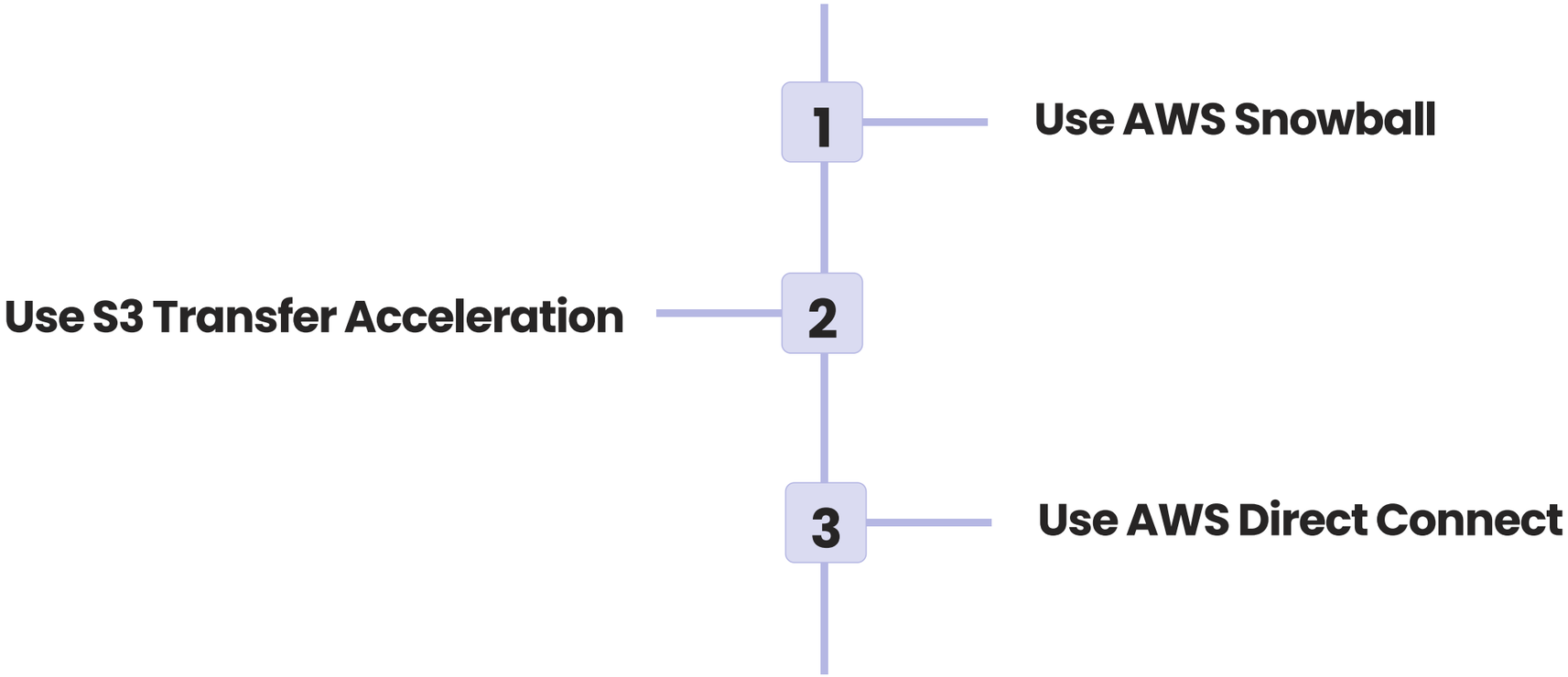
Retention Periods

S3 Glacier Deep Archive provides retention periods ranging from seven years to 30 years.

Secure Storage

S3 Glacier Deep Archive provides industry-standard AES-256 encryption for data at rest and in transit.

Data Transfer



Use Cases

1 Data Archiving

Archive and manage data that may be rarely accessed, but still needs to be available for compliance.

2 Backup and Disaster Recovery

Ensure reliable backup and recovery of critical business data in the cloud.

3 Media Archives

Preserve and manage media assets, such as movies, audio files, and original recordings, for long-term storage.

Benefits and Drawbacks

Benefits

- Cost-effective
- Secure
- Reliable
- Scalable for all business sizes.
- Provides low-cost storage for rarely accessed but important data.

Drawbacks

- Retrieving data can take a while depending on the retrieval option selected.
- Large object transfers can be challenging and can take time.

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S3 Snowball

Overview of AWS Snowball

Hardware Device

- AWS Snowball is a physical device that organizations can use to migrate large amounts of their data to AWS.
- The device comes with a built-in E Ink shipping label, making it easy to track and manage the device during shipping.

Data Migration

- Snowball enables organizations to migrate huge volumes of data to AWS with ease and confidence.
- It also provides tools to help you automate the data transfer process, saving you time and reducing the risk of error.

Accelerated Transfer

- Snowball uses multiple network connections, helping to accelerate the data transfer process.
- This means you can transfer large amounts of data to AWS in less time than other data transfer methods.

Overview of AWS Snowball

Easier Integration

- Snowball integrates seamlessly with Amazon S3 and other AWS storage services to boost data transfer ease and consistency.
- This means you can easily integrate Snowball into your existing workflows and data management systems.

Increased Security

- Snowball provides built-in security features to keep your data safe during the transfer process.
- The device is tamper-resistant and uses 256-bit encryption to secure your data.
- You also have the option to use your own encryption keys for added security.

Benefits of using AWS Snowball

1. **Fast and Reliable Data Transfer**
2. **Cost-Effective Solution**
3. **Highly Secure**

Use cases for AWS Snowball

1

Content Distribution

Snowball allows content providers to distribute video content and large files to end-users quickly and seamlessly.

2

Backup and Disaster Recovery

Snowball enables companies to back up huge amounts of data to the cloud, ensuring safety from the risk of data loss and ensuring continuity of operations in the event of a disaster.

3

Big Data Applications

Snowball provides the perfect infrastructure for big data applications by enabling organizations to quickly move large amounts of data from their data center to their AWS environment.

How to request and set up an AWS Snowball

Open AWS Management Console

Log into the AWS Management Console and choose Amazon Snowball to create a new job.

Specify Job Details

Enter details about the job and the data transfer, including pick-up and drop-off addresses, destination S3 bucket, and other details.

Connect and Use the Snowball

Snowball gets shipped to the client, and then the data gets loaded onto the Snowball with the help of a user-friendly interface designed for novice users.

How to transfer data with AWS Snowball

1

Step 1. Create an Export Job

The first step is to use the AWS Management Console to create a new export job. This job contains information about the data you want to transfer.

2

Step 2. Load Data on the Device

Once you have created your export job, it's time to load your data onto the Snowball device. This is done using a user-friendly interface that is designed for novice users.

3

Step 3. Connect the Device and Create a Job

After your data is loaded onto the Snowball, it's time to connect the device to your AWS account and create an import job. Then, plug the Snowball into a power source and wait for the data to transfer.

AWS Snowball pricing and limitations

Data Transfer Cost: $0.03/GB	**Snowball Size Limit:** 80TB starting at $300 + shipping costs
Data Export: Nothing	**Imported Data:** $15 per Snowball transfer job
Data Eras: Nothing	**Snowball Capacity:** 80-100TB depending on the device version

Conclusion and next steps

1 Cost-Effective Data Migration

With AWS Snowball, organizations can transfer significant amounts of data to AWS in a simple yet cost-effective way.

2 Flexible and Highly Secure

Snowball provides the perfect solution for transferring data, back up, and disaster recovery, as well as handling big data applications.

3 Start Your Data Transfer Strategy Now

Sign up for AWS Snowball and make your data transfer easier and faster.