

Service Name

AWS Storage Gateway

Service Overview

AWS Storage Gateway is a hybrid cloud storage service that connects on-premises software appliances with cloud-based storage to provide seamless integration between on-premises IT environments and AWS storage infrastructure. The service enables organizations to store data in the AWS Cloud for scalable and cost-effective storage while maintaining data security features. Storage Gateway can be deployed as a VM appliance on VMware ESXi, KVM, or Microsoft Hyper-V hypervisors, as a hardware appliance on-premises, or as an Amazon EC2 instance in AWS. It provides file-based, volume-based, and tape-based storage solutions using standard storage protocols such as iSCSI, SMB, and NFS, allowing organizations to use AWS storage without rewriting existing applications.

Key Use Cases

- Backup and disaster recovery: Move backups and archives to the cloud while maintaining on-premises access for quick recovery
- Hybrid cloud file shares: Reduce on-premises storage footprint with cloud-backed file shares using SMB and NFS protocols
- Data lake ingestion: Store file data as objects in Amazon S3 for data lakes, analytics, and machine learning workflows
- Application data migration: Migrate application data to AWS while providing low-latency access to frequently used data
- Virtual tape library replacement: Replace physical tape infrastructure with virtual tapes stored in Amazon S3 and Glacier storage classes

Features

- **Amazon S3 File Gateway:** Enables file storage as objects in Amazon S3 accessible via NFS and SMB protocols with local caching
- **Amazon FSx File Gateway:** Provides low-latency access to Amazon FSx for Windows File Server file shares on-premises
- **Volume Gateway (Cached Volumes):** Stores data in Amazon S3 with frequently accessed data cached locally for low-latency access
- **Volume Gateway (Stored Volumes):** Stores primary data locally with asynchronous backup to Amazon S3 as EBS snapshots
- **Tape Gateway:** Virtual tape library (VTL) interface for backup applications with cloud-based virtual tape storage
- **Local Caching:** Intelligent caching of frequently accessed data on-premises for low-latency performance

- **Data Optimization:** Compresses data and transfers only changed data to optimize bandwidth usage
- **Multiple Deployment Options:** Deploy as VM, hardware appliance, or EC2 instance with support for multiple hypervisors

Value Proposition

AWS Storage Gateway provides unique value by enabling seamless hybrid cloud storage without requiring application rewrites or changes to existing workflows. It reduces on-premises storage costs and complexity while maintaining low-latency access to frequently used data through intelligent local caching:

- The service offers flexible deployment options across VM, hardware appliance, and cloud-based instances, making it adaptable to various infrastructure requirements
- Storage Gateway integrates natively with AWS services like S3, CloudWatch, IAM, and KMS, providing enterprise-grade security, monitoring, and management capabilities
- Unlike pure cloud storage solutions, it bridges on-premises and cloud environments with standard protocols (iSCSI, SMB, NFS) that existing applications already understand

Service Integration

AWS Storage Gateway integrates deeply with multiple core AWS services to provide comprehensive hybrid storage capabilities. It stores data in Amazon S3 for file gateways and uses S3 storage classes including Glacier and Deep Archive for cost optimization:

- Volume Gateway creates EBS snapshots stored in S3 for backup and recovery
- The service leverages AWS IAM for access management and security, AWS KMS for encryption at rest, and integrates with AWS Backup for centralized backup management across AWS resources
- CloudWatch provides monitoring and metrics, while CloudTrail logs all API activities
- Storage Gateway also works with AWS Direct Connect for dedicated network connectivity and supports VPC endpoints for private connectivity to AWS services

Onboarding and Offboarding

Customers begin by signing up for an AWS account and creating an IAM user with administrative permissions to access Storage Gateway through the console or programmatically via AWS SDKs. The setup process involves choosing the gateway type (File, Volume, or Tape), selecting the host platform (VM, hardware appliance, or EC2), and downloading/deploying the gateway software:

- After deployment, customers activate the gateway by specifying service endpoints and IP addresses, then allocate local storage for caching and configure cloud storage resources like volumes, file shares, or virtual tapes
- The service provides setup wizards and documentation to guide users through requirements, network configuration, and initial resource creation to begin transferring data between on-premises and AWS storage

Getting Started Guide:

<https://docs.aws.amazon.com/storagegateway/latest/vgw/GettingStarted.html>

Data Removal

To offboard from AWS Storage Gateway, customers must first ensure no applications are writing to gateway resources to prevent data loss. The process involves deleting gateway-specific resources (volumes, file shares, or virtual tapes), followed by deleting the gateway itself through the Storage Gateway console. For on-premises deployments, customers must also remove the gateway VM from their virtualization environment. Associated AWS resources like EBS snapshots, S3 objects, and EC2 instances persist after gateway deletion and must be manually removed to avoid ongoing charges. Customers should backup critical data before deletion as gateway resources cannot be recovered once deleted.

Backup/Restore and Disaster Recovery

AWS Storage Gateway provides comprehensive backup and disaster recovery capabilities through integration with AWS Backup and native snapshot functionality. Volume Gateway creates point-in-time EBS snapshots stored in Amazon S3 for data protection and recovery. Tape Gateway offers virtual tape archives in S3 Glacier and Deep Archive for long-term backup retention. The service enables cross-region replication for disaster recovery scenarios and supports recovery to both on-premises environments and Amazon EC2 instances. All backup data benefits from S3's 99.999999999% durability and can be managed through centralized policies using AWS Backup.

Backup Capabilities

Storage Gateway provides native backup capabilities through automated EBS snapshots for Volume Gateway and integrates with AWS Backup for centralized backup management across all gateway types. The service supports both scheduled and on-demand snapshots, with incremental backups to reduce storage costs and transfer time:

- Backup data is stored in Amazon S3 with high durability and supports cross-region backup for disaster recovery
- Customers can restore volumes from snapshots to any compatible gateway or directly to EBS volumes in EC2 for cloud-based recovery scenarios

Disaster Recovery

Storage Gateway supports comprehensive disaster recovery through multiple mechanisms including cross-region snapshot replication, cloud-based recovery to EC2 instances, and integration with AWS Elastic Disaster Recovery. The service enables rapid recovery from backup snapshots stored in S3, supports failover to alternate gateway instances, and provides high availability configurations on VMware environments. Volume Gateway cached volumes can be quickly provisioned from snapshots for disaster recovery scenarios, while stored volumes provide local data protection with cloud-based backup for comprehensive DR coverage.

Recovery Objectives

AWS Storage Gateway helps customers meet RPO objectives through frequent incremental snapshots (as often as every hour) and continuous data replication to AWS storage services. RTO objectives are supported through local caching for immediate access to frequently used data, rapid snapshot restoration capabilities, and the ability to recover volumes directly to EC2 instances in the cloud. Cached volumes provide near-instantaneous access to cached data while stored volumes offer immediate access to all local data with cloud-based recovery options for comprehensive RPO/RTO coverage.

Service Constraints

Service Quotas: <https://docs.aws.amazon.com/general/latest/gr/sg.html>

FAQ: <https://aws.amazon.com/storagegateway/faqs/>

Technical Requirements

Service Documentation: <https://docs.aws.amazon.com/storagegateway/>

User Guide:

<https://docs.aws.amazon.com/storagegateway/latest/vgw/WhatIsStorageGateway.html>

API Reference:

<https://docs.aws.amazon.com/storagegateway/latest/APIReference/Welcome.html>

Pricing Overview

Please see the AWS UK G Cloud 15 Pricing Document accompanying this service in the Digital Marketplace.

Public Pricing: <https://aws.amazon.com/storagegateway/pricing/>

Cost Optimization

AWS Storage Gateway offers several unique cost optimization features including intelligent data tiering that automatically moves infrequently accessed data to lower-cost S3 storage

classes like Glacier and Deep Archive. The service reduces data transfer costs through local caching, compression, and incremental data synchronization that only transfers changed data:

- Amazon S3 File Gateway provides up to 98% cost savings compared to traditional on-premises storage by leveraging S3's various storage classes
- FSx File Gateway can save approximately \$180 per month for multi-region workloads through intelligent caching and reduced data transfer charges
- The service eliminates the need for expensive on-premises storage infrastructure while providing pay-as-you-use pricing for actual data stored and transferred

Savings Considerations

Primary cost savings come from eliminating expensive on-premises storage hardware, maintenance contracts, and infrastructure scaling costs. Storage Gateway reduces operational expenses through automated data management, eliminating the need for manual tape handling and offsite storage logistics:

- The service provides significant savings through S3's tiered storage pricing, with automatic lifecycle transitions to cheaper storage classes for infrequently accessed data
- Data compression and deduplication reduce both storage costs and bandwidth charges
- Organizations can optimize costs by right-sizing local cache storage based on access patterns and leveraging AWS Free Tier benefits
- The hybrid model allows customers to maintain local performance while benefiting from cloud economics and virtually unlimited scale without upfront capital investments