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General S3 FAQs

Q: What is Amazon S3?

Amazon S3 is object storage built to store and retrieve any amount of data from anywhere on the Internet. It's a simple storage service that offers an extremely durable, highly available, and infinitely scalable data storage infrastructure at very low costs.

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Q: What can I do with Amazon S3?

Amazon S3 provides a simple web service interface that you can use to store and retrieve any amount of data, at any time, from anywhere on the web. Using this web service, you can easily build applications that make use of Internet storage. Since Amazon S3 is highly scalable and you only pay for what you use, you can start small and grow your application as you wish, with no compromise on performance or reliability.

Amazon S3 is also designed to be highly flexible. Store any type and amount of data that you want; read the same piece of data a million times or only for emergency disaster recovery; build a simple FTP application, or a sophisticated web application such as the Amazon.com retail web site. Amazon S3 frees developers to focus on innovation instead of figuring out how to store their data.



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Q: What can developers do with Amazon S3 that they could not do with an on-premises solution?

Amazon S3 enables any developer to leverage Amazon's own benefits of massive scale with no up-front investment or performance compromises. Developers are now free to innovate knowing that no matter how successful their businesses become, it will be inexpensive and simple to ensure their data is quickly accessible, always available, and secure.

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Q: What kind of data can I store in Amazon S3?

You can store virtually any kind of data in any format. Please refer to the [Amazon Web Services Licensing Agreement](#) for details.

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Q: How much data can I store in Amazon S3?

The total volume of data and number of objects you can store are unlimited. Individual Amazon S3 objects can range in size from a minimum of 0 bytes to a maximum of 5 terabytes. The largest object that can be uploaded in a single PUT is 5 gigabytes. For objects larger than 100 megabytes, customers should consider using the [Multipart Upload](#) capability.

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otherwise access your data for any purpose outside of the Amazon S3 offering, except when required to do so by law. Please refer to the [Amazon Web Services Licensing Agreement](#) for details.

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Q: Does Amazon store its own data in Amazon S3?

Yes. Developers within Amazon use Amazon S3 for a wide variety of projects. Many of these projects use Amazon S3 as their authoritative data store and rely on it for business-critical operations.

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Q: How is Amazon S3 data organized?

Amazon S3 is a simple key-based object store. When you store data, you assign a unique object key that can later be used to retrieve the data. Keys can be any string, and they can be constructed to mimic hierarchical attributes. Alternatively, you can use S3 Object Tagging to organize your data across all of your S3 buckets and/or prefixes.

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Q: How do I interface with Amazon S3?

Amazon S3 provides a simple, standards-based REST web services interface that is designed to work with any Internet-development toolkit. The operations are intentionally made simple to make



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Q: How will Amazon S3 perform if traffic from my application suddenly spikes?

Amazon S3 was designed from the ground up to handle traffic for any Internet application. Pay-as-you-go pricing and unlimited capacity ensures that your incremental costs don't change and that your service is not interrupted. Amazon S3's massive scale enables us to spread load evenly, so that no individual application is affected by traffic spikes.

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Q: Does Amazon S3 offer a Service Level Agreement (SLA)?

Yes. The [Amazon S3 SLA](#) provides for a service credit if a customer's monthly uptime percentage is below our service commitment in any billing cycle.

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AWS Regions

Q: Where is my data stored?

You specify an AWS Region when you create your Amazon S3 bucket. For S3 Standard, S3 Standard-IA, and Amazon Glacier storage classes, your objects are automatically stored across



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Q: What is an AWS Availability Zone (AZ)?

An AWS Availability Zone is an isolated location within an AWS Region. Within each AWS Region, S3 operates in a minimum of three AZs, each separated by miles to protect against local events like fires, floods, etc.

Amazon S3 Standard, S3 Standard-Infrequent Access, and Amazon Glacier storage classes replicate data across a minimum of three AZs to protect against the loss of one entire AZ. This remains true in Regions where fewer than three AZs are publicly available. Objects stored in these storage classes are available for access from all of the AZs in an AWS Region.

The Amazon S3 One Zone-IA storage class replicates data within a single AZ. Data stored in this storage class is susceptible to loss in an AZ destruction event.

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Q: How do I decide which AWS Region to store my data in?

There are several factors to consider based on your specific application. You may want to store your data in a Region that...

- ...is near to your customers, your data centers, or your other AWS resources in order to reduce data access latencies.



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Billing

Q: How much does Amazon S3 cost?

With Amazon S3, you pay only for what you use. There is no minimum fee. You can estimate your monthly bill using the [AWS Simple Monthly Calculator](#).

We charge less where our costs are less. Some prices vary across Amazon S3 Regions. Billing prices are based on the location of your bucket. There is no Data Transfer charge for data transferred within an Amazon S3 Region via a COPY request. Data transferred via a COPY request between AWS Regions is charged at rates specified in the pricing section of the Amazon S3 detail page. There is no Data Transfer charge for data transferred between Amazon EC2 and Amazon S3 within the same region or for data transferred between the Amazon EC2 Northern Virginia Region and the Amazon S3 US East (Northern Virginia) Region. Data transferred between Amazon EC2 and Amazon S3 across all other regions (i.e. between the Amazon EC2 Northern California and Amazon S3 US East (Northern Virginia)) is charged at rates specified on the [Amazon S3 pricing page](#).

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Q: How will I be charged and billed for my use of Amazon S3?

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Amazon S3 storage pricing is summarized on the [Amazon S3 Pricing page](#).

The volume of storage billed in a month is based on the average storage used throughout the month. This includes all object data and metadata stored in buckets that you created under your AWS account. We measure your storage usage in "TimedStorage-ByteHrs," which are added up at the end of the month to generate your monthly charges.

Storage Example:

Assume you store 100GB (107,374,182,400 bytes) of data in Amazon S3 Standard in your bucket for 15 days in March, and 100TB (109,951,162,777,600 bytes) of data in Amazon S3 Standard for the final 16 days in March.

At the end of March, you would have the following usage in Byte-Hours: Total Byte-Hour usage = [107,374,182,400 bytes x 15 days x (24 hours / day)] + [109,951,162,777,600 bytes x 16 days x (24 hours / day)] = 42,259,901,212,262,400 Byte-Hours.

Let's convert this to GB-Months: 42,259,901,212,262,400 Byte-Hours / 1,073,741,824 bytes per GB / 744 hours per month = 52,900 GB-Months

This usage volume crosses two different volume tiers. The monthly storage price is calculated below assuming the data is stored in the US East (Northern Virginia) Region: 50 TB Tier: 51,200 GB x \$0.023 = \$1,177.60 50 TB to 450 TB Tier: 1,700 GB x \$0.022 = \$37.40

Total Storage Fee = \$1,177.60 + \$37.40 = \$1,215.00



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Amazon S3 in one AWS Region to another AWS Region.

Data Transfer Out Example:

Assume you transfer 1TB of data out of Amazon S3 from the US East (Northern Virginia) Region to the Internet every day for a given 31-day month. Assume you also transfer 1TB of data out of an Amazon EC2 instance from the same region to the Internet over the same 31-day month.

Your aggregate Data Transfer would be 62 TB (31 TB from Amazon S3 and 31 TB from Amazon EC2). This equates to 63,488 GB (62 TB * 1024 GB/TB).

This usage volume crosses three different volume tiers. The monthly Data Transfer Out fee is calculated below assuming the Data Transfer occurs in the US East (Northern Virginia) Region:

10 TB Tier: $10,239 \text{ GB} (10 \times 1024 \text{ GB/TB} - 1 \text{ (free)}) \times \$0.09 = \$921.51$

10 TB to 50 TB Tier: $40,960 \text{ GB} (40 \times 1024) \times \$0.085 = \$3,481.60$

50 TB to 150 TB Tier: $12,288 \text{ GB (remainder)} \times \$0.070 = \$860.16$

Total Data Transfer Out Fee = $\$921.51 + \$3,481.60 + \$860.16 = \$5,263.27$

Data Requests:

Amazon S3 Request pricing is summarized on the [Amazon S3 Pricing Chart](#).

Request Example:

Assume you transfer 10,000 files into Amazon S3 and transfer 20,000 files out of Amazon S3 each day during the month of March. Then, you delete 5,000 files on March 31st.

Total PUT requests = $10,000 \text{ requests} \times 31 \text{ days} = 310,000 \text{ requests}$



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Data Retrieval Example:

Assume in one month you retrieve 300GB of S3 Standard-IA, with 100GB going out to the Internet, 100GB going to EC2 in the same AWS region, and 100GB going to CloudFront in the same AWS Region.

Your data retrieval fees for the month would be calculated as 300GB x \$0.01/GB = \$3.00. Note that you would also pay network data transfer fees for the portion that went out to the Internet.

Please see here for details on [billing of objects archived to Amazon Glacier](#).

* * Your usage for the free tier is calculated each month across all regions except the AWS GovCloud Region and automatically applied to your bill – unused monthly usage will not roll over. Restrictions apply; See [offer terms](#) for more details.

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Q: Why do prices vary depending on which Amazon S3 Region I choose?

We charge less where our costs are less. For example, our costs are lower in the US East (Northern Virginia) Region than in the US West (Northern California) Region.

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Q: How am I charged for using Versioning?



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Total Byte-Hour usage

$[4,294,967,296 \text{ bytes} \times 31 \text{ days} \times (24 \text{ hours} / \text{day})] + [5,368,709,120 \text{ bytes} \times 16 \text{ days} \times (24 \text{ hours} / \text{day})] = 5,257,039,970,304 \text{ Byte-Hours}.$

Conversion to Total GB-Months

$5,257,039,970,304 \text{ Byte-Hours} \times (1 \text{ GB} / 1,073,741,824 \text{ bytes}) \times (1 \text{ month} / 744 \text{ hours}) = 6.581 \text{ GB-Month}$

The fee is calculated based on the current rates for your region on the [Amazon S3 Pricing page](#).

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Q: How am I charged for accessing Amazon S3 through the AWS Management Console?

Normal Amazon S3 pricing applies when accessing the service through the AWS Management Console. To provide an optimized experience, the AWS Management Console may proactively execute requests. Also, some interactive operations result in more than one request to the service.

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Q: How am I charged if my Amazon S3 buckets are accessed from another AWS account?

Normal Amazon S3 pricing applies when your storage is accessed by another AWS Account. Alternatively, you may choose to configure your bucket as a Requester Pays bucket, in which case the requester will pay the cost of requests and downloads of your Amazon S3 data.



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Security

Q: How secure is my data in Amazon S3?

Amazon S3 is secure by default. Upon creation, only the resource owners have access to Amazon S3 resources they create. Amazon S3 supports user authentication to control access to data. You can use access control mechanisms such as bucket policies and Access Control Lists (ACLs) to selectively grant permissions to users and groups of users. The Amazon S3 console highlights your publicly accessible buckets, indicates the source of public accessibility, and also warns you if changes to your bucket policies or bucket ACLs would make your bucket publicly accessible.

You can securely upload/download your data to Amazon S3 via SSL endpoints using the HTTPS protocol. If you need extra security you can use the Server-Side Encryption (SSE) option to encrypt data stored at rest. You can configure your Amazon S3 buckets to automatically encrypt objects before storing them if the incoming storage requests do not have any encryption information. Alternatively, you can use your own encryption libraries to encrypt data before storing it in Amazon S3.

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Q: How can I control access to my data stored on Amazon S3?



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Q: Does Amazon S3 support data access auditing?

Yes, customers can optionally configure an Amazon S3 bucket to create access log records for all requests made against it. Alternatively, customers who need to capture IAM/user identity information in their logs can configure [AWS CloudTrail Data Events](#).

These access log records can be used for audit purposes and contain details about the request, such as the request type, the resources specified in the request, and the time and date the request was processed.

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Q: What options do I have for encrypting data stored on Amazon S3?

You can choose to encrypt data using SSE-S3, SSE-C, SSE-KMS, or a client library such as the [Amazon S3 Encryption Client](#). All four enable you to store sensitive data encrypted at rest in Amazon S3.

SSE-S3 provides an integrated solution where Amazon handles key management and key protection using multiple layers of security. You should choose SSE-S3 if you prefer to have Amazon manage your keys.



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AWS KMS provides additional security controls to support customer efforts to comply with PCI-DSS, HIPAA/HITECH, and FedRAMP industry requirements.

Using an encryption client library, such as the [Amazon S3 Encryption Client](#), you retain control of the keys and complete the encryption and decryption of objects client-side using an encryption library of your choice. Some customers prefer full end-to-end control of the encryption and decryption of objects; that way, only encrypted objects are transmitted over the Internet to Amazon S3. Use a client-side library if you want to maintain control of your encryption keys, are able to implement or use a client-side encryption library, and need to have your objects encrypted before they are sent to Amazon S3 for storage.

For more information on using Amazon S3 SSE-S3, SSE-C, or SSE-KMS, please refer to the topic on [Using Encryption](#) in the [Amazon S3 Developer Guide](#).

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Q: Can I comply with EU data privacy regulations using Amazon S3?

Customers can choose to store all data in the EU by using the EU (Frankfurt), EU (Ireland), EU (London), or EU (Paris) region. It is your responsibility to ensure that you comply with EU privacy laws. Please see the [AWS GDPR Center](#) for more information.

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Q: Where can I find more information about security on AWS?



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Q: Can I allow a specific Amazon VPC Endpoint access to my Amazon S3 bucket?

You can limit access to your bucket from a specific Amazon VPC Endpoint or a set of endpoints using Amazon S3 bucket policies. S3 bucket policies now support a condition, `aws:sourceVpce`, that you can use to restrict access. For more details and example policies, read [Using VPC Endpoints](#).

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Q: What is Amazon Macie?

Amazon Macie is an [AI-powered security service](#) that helps you prevent data loss by automatically discovering, classifying, and protecting sensitive data stored in Amazon S3. Amazon Macie uses machine learning to recognize sensitive data such as personally identifiable information (PII) or intellectual property, assigns a business value, and provides visibility into where this data is stored and how it is being used in your organization. Amazon Macie continuously monitors data access activity for anomalies, and delivers alerts when it detects risk of unauthorized access or inadvertent data leaks.

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Q: What can I do with Amazon Macie?

You can use Amazon Macie to protect against security threats by continuously monitoring your data and account credentials. Amazon Macie gives you an automated and low touch way to discover and classify your business data. It provides controls via templated Lambda functions to



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has analyzed the file content for data classification, it deletes the stored content and only retains the metadata required for future analysis. At any time, customers can revoke Amazon Macie access to data in the Amazon S3 bucket. For more information, go to the [Amazon Macie User Guide](#).

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Durability & Data Protection

Q: How durable is Amazon S3?

Amazon S3 Standard, S3 Standard-IA, S3 One Zone-IA, and Amazon Glacier are all designed to provide 99.999999999% durability of objects over a given year. This durability level corresponds to an average annual expected loss of 0.000000001% of objects. For example, if you store 10,000,000 objects with Amazon S3, you can on average expect to incur a loss of a single object once every 10,000 years. In addition, Amazon S3 Standard, S3 Standard-IA, and Amazon Glacier are all designed to sustain data in the event of an entire S3 Availability Zone loss.

As with any environment, the best practice is to have a backup and to put in place safeguards against malicious or accidental deletion. For S3 data, that best practice includes secure access permissions, Cross-Region Replication, versioning, and a functioning, regularly tested backup.

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Amazon S3 uses a combination of Content-MD5 checksums and cyclic redundancy checks (CRCs) to detect data corruption. Amazon S3 performs these checksums on data at rest and repairs any corruption using redundant data. In addition, the service calculates checksums on all network traffic to detect corruption of data packets when storing or retrieving data.

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Q: What is Versioning?

Versioning allows you to preserve, retrieve, and restore every version of every object stored in an Amazon S3 bucket. Once you enable Versioning for a bucket, Amazon S3 preserves existing objects anytime you perform a PUT, POST, COPY, or DELETE operation on them. By default, GET requests will retrieve the most recently written version. Older versions of an overwritten or deleted object can be retrieved by specifying a version in the request.

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Q: Why should I use Versioning?

Amazon S3 provides customers with a highly durable storage infrastructure. Versioning offers an additional level of protection by providing a means of recovery when customers accidentally overwrite or delete objects. This allows you to easily recover from unintended user actions and application failures. You can also use Versioning for data retention and archiving.

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the cost of storing multiple versions of your objects.

[Show less](#)**Q: Can I setup a trash, recycle bin, or rollback window on my Amazon S3 objects to recover from deletes and overwrites?**

You can use [Lifecycle rules](#) along with [Versioning](#) to implement a rollback window for your Amazon S3 objects. For example, with your versioning-enabled bucket, you can set up a rule that archives all of your previous versions to the lower-cost Glacier storage class and deletes them after 100 days, giving you a 100-day window to roll back any changes on your data while lowering your storage costs.

[Show less](#)**Q: How can I ensure maximum protection of my preserved versions?**

Versioning's [Multi-Factor Authentication \(MFA\)](#) Delete capability can be used to provide an additional layer of security. By default, all requests to your Amazon S3 bucket require your AWS account credentials. If you enable Versioning with MFA Delete on your Amazon S3 bucket, two forms of authentication are required to permanently delete a version of an object: your AWS account credentials and a valid six-digit code and serial number from an authentication device in your physical possession. To learn more about enabling Versioning with MFA Delete, including how to purchase and activate an authentication device, please refer to the [Amazon S3 Technical Documentation](#).



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Day 1 is not deleted from the bucket when the 5 GB object is written on Day 15. Instead, the 4 GB object is preserved as an older version and the 5 GB object becomes the most recently written version of the object within your bucket. At the end of the month:

Total Byte-Hour usage

$[4,294,967,296 \text{ bytes} \times 31 \text{ days} \times (24 \text{ hours} / \text{day})] + [5,368,709,120 \text{ bytes} \times 16 \text{ days} \times (24 \text{ hours} / \text{day})] = 5,257,039,970,304 \text{ Byte-Hours}$.

Conversion to Total GB-Months

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The fee is calculated based on the current rates for your region on the [Amazon S3 Pricing Page](#).

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S3 Standard-Infrequent Access (S3 Standard-IA)

Q: What is S3 Standard-Infrequent Access?

Amazon S3 Standard-Infrequent Access (S3 Standard-IA) is an Amazon S3 storage class for data that is accessed less frequently but requires rapid access when needed. S3 Standard-IA offers the high durability, throughput, and low latency of the Amazon S3 Standard storage class, with a low per-GB storage price and per-GB retrieval fee. This combination of low cost and high performance



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Q: What performance does S3 Standard-IA offer?

S3 Standard-IA provides the same performance as the S3 Standard and S3 One Zone-IA storage classes.

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Q: How durable and available is S3 Standard-IA?

S3 Standard-IA is designed for the same 99.999999999% durability as the S3 Standard and Amazon Glacier storage classes. S3 Standard-IA is designed for 99.9% availability, and carries a [service level agreement](#) providing service credits if availability is less than our service commitment in any billing cycle.

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Q: How do I get my data into S3 Standard-IA?

There are two ways to get data into S3 Standard-IA. You can directly PUT into S3 Standard-IA by specifying STANDARD_IA in the x-amz-storage-class header. You can also set Lifecycle policies to transition objects from the S3 Standard to the S3 Standard-IA storage class.

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You should expect the same latency and throughput performance as the S3 Standard storage class when using S3 Standard-IA.

[Show less](#)**Q: How am I charged for using S3 Standard-IA?**

Please see the [Amazon S3 pricing page](#) for general information about S3 Standard-IA pricing.

[Show less](#)**Q: What charges will I incur if I change the storage class of an object from S3 Standard-IA to S3 Standard with a COPY request?**

You will incur charges for an S3 Standard-IA COPY request and an S3 Standard-IA data retrieval.

[Show less](#)**Q: Is there a minimum storage duration charge for S3 Standard-IA?**

S3 Standard-IA is designed for long-lived but infrequently accessed data that is retained for months or years. Data that is deleted from S3 Standard-IA within 30 days will be charged for a full 30 days. Please see the [Amazon S3 pricing page](#) for information about S3 Standard-IA pricing.

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you can also set up Lifecycle policies to tier objects from S3 Standard-IA to S3 One Zone-IA or Amazon Glacier.

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S3 One Zone-Infrequent Access (S3 One Zone-IA)

Q: What is S3 One Zone-IA storage class?

S3 One Zone-IA storage class is an Amazon S3 storage class that customers can choose to store objects in a single availability zone. S3 One Zone-IA storage redundantly stores data within that single Availability Zone to deliver storage at 20% less cost than geographically redundant S3 Standard-IA storage, which stores data redundantly across multiple geographically separate Availability Zones.

S3 One Zone-IA offers a 99% available SLA and is also designed for eleven 9's of durability within the Availability Zone. But, unlike the S3 Standard and S3 Standard-IA storage classes, data stored in the S3 One Zone-IA storage class will be lost in the event of Availability Zone destruction.

S3 One Zone-IA storage offers the same Amazon S3 features as S3 Standard and S3 Standard-IA and is used through the Amazon S3 API, CLI and console. S3 One Zone-IA storage class is set at the object level and can exist in the same bucket as S3 Standard and S3 Standard-IA storage classes. You can use S3 Lifecycle policies to automatically transition objects between storage classes without any application changes.



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Q: How durable is the S3 One Zone-IA storage class?

S3 One Zone-IA storage class is designed for 99.999999999% of durability within an Availability Zone. However, S3 One Zone-IA storage is not designed to withstand the loss of availability or total destruction of an Availability Zone, in which case data stored in S3 One Zone-IA will be lost. In contrast, S3 Standard, S3 Standard-Infrequent Access, and Amazon Glacier storage are designed to withstand loss of availability or the destruction of an Availability Zone. S3 One Zone-IA can deliver the same or better durability and availability than most modern, physical data centers, while providing the added benefit of elasticity of storage and the Amazon S3 feature set.

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Q: What is the availability SLA for S3 One Zone-IA storage class?

S3 One Zone-IA offers a 99% availability SLA. For comparison, S3 Standard offers a 99.9% availability SLA and S3 Standard-Infrequent Access offers a 99% availability SLA. As with all S3 storage classes, S3 One Zone-IA storage class carries a service level agreement providing service credits if availability is less than our service commitment in any billing cycle. See the [Amazon S3 Service Level Agreement](#).

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As with S3 Standard-Infrequent Access, if you delete a S3 One Zone-IA object within 30 days of creating it, you will incur an early delete charge. For example, if you PUT an object and then delete it 10 days later, you are still charged for 30 days of storage.

Like S3 Standard-IA, S3 One Zone-IA storage class has a minimum object size of 128KB. Objects smaller than 128KB in size will incur storage charges as if the object were 128KB. For example, a 6KB object in a S3 One Zone-IA storage class will incur storage charges for 6KB and an additional minimum object size fee equivalent to 122KB at the S3 One Zone-IA storage price. Please see the pricing page for information about S3 One Zone-IA pricing.

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Q: Is an S3 One Zone-IA “Zone” the same thing as an AWS Availability Zone?

Yes. Each AWS Region is a separate geographic area. Each region has multiple, isolated locations known as Availability Zones. The Amazon S3 One Zone-IA storage class uses an individual AWS Availability Zone within the region.

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Q: Are there differences between how Amazon EC2 and Amazon S3 work with Availability Zone-specific resources?



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Q: Is S3 One Zone-IA available in all AWS Regions in which S3 operates?

Yes.

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Q: How much disaster recovery protection do I forgo by using S3 One Zone-IA?

Each Availability Zone uses redundant power and networking. Within an AWS Region, Availability Zones are on different flood plains, earthquake fault zones, and geographically separated for fire protection. S3 Standard and S3 Standard-IA storage classes offer protection against these sorts of disasters by storing your data redundantly in multiple Availability Zones. S3 One Zone-IA offers protection against equipment failure within an Availability Zone, but it does not protect against the loss of the Availability Zone, in which case, data stored in S3 One Zone-IA would be lost. Using S3 One Zone-IA, S3 Standard, and S3 Standard-IA options, you can choose the storage class that best fits the durability and availability needs of your storage.

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Amazon Glacier



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You can use [Lifecycle rules](#) to automatically archive sets of Amazon S3 objects to Amazon Glacier based on object age. Use the Amazon S3 Management Console, the AWS SDKs, or the Amazon S3 APIs to define rules for archival. Rules specify a prefix and time period. The prefix (e.g. "logs/") identifies the object(s) subject to the rule. The time period specifies either the number of days from object creation date (e.g. 180 days) or the specified date after which the object(s) should be archived. Any S3 Standard, S3 Standard-IA, or S3 One Zone-IA objects which have names beginning with the specified prefix and which have aged past the specified time period are archived to Amazon Glacier. To retrieve Amazon S3 data stored in Amazon Glacier, initiate a retrieval job via the Amazon S3 APIs or Management Console. Once the retrieval job is complete, you can access your data through an Amazon S3 GET object request.

For more information on using Lifecycle rules for archival to Amazon Glacier, please refer to the [Object Archival](#) topic in the Amazon S3 Developer Guide.

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Q: Can I use the Amazon S3 APIs or Management Console to list objects that I've archived to Amazon Glacier?

Yes, like Amazon S3's other storage classes (S3 Standard, S3 Standard-IA, and S3 One Zone-IA), Amazon Glacier objects stored using Amazon S3's APIs or Management Console have an associated user-defined name. You can get a real-time list of all of your Amazon S3 object names, including those stored using the Amazon Glacier storage class, using the S3 LIST API or the [S3 Inventory report](#).



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To retrieve Amazon S3 data stored in Amazon Glacier, initiate a retrieval request using the Amazon S3 APIs or the Amazon S3 Management Console. The retrieval request creates a temporary copy of your data in the S3 RRS or S3 Standard-IA storage class while leaving the archived data intact in Amazon Glacier. You can specify the amount of time in days for which the temporary copy is stored in S3. You can then access your temporary copy from S3 through an Amazon S3 GET request on the archived object.

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Q: How long will it take to restore my objects archived in Amazon Glacier?

When processing a retrieval job, Amazon S3 first retrieves the requested data from Amazon Glacier, and then creates a temporary copy of the requested data in S3 (which typically takes a few minutes). The access time of your request depends on the retrieval option you choose: Expedited, Standard, or Bulk retrievals. For all but the largest objects (250MB+), data accessed using Expedited retrievals are typically made available within 1-5 minutes. Objects retrieved using Standard retrievals typically complete between 3-5 hours. Bulk retrievals typically complete within 5-12 hours. For more information about Glacier retrieval options, please refer to the [Glacier FAQ](#).

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Q: What am I charged for archiving objects in Amazon Glacier?

Amazon Glacier storage is priced based on monthly storage capacity and the number of Lifecycle transition requests into Amazon Glacier. Objects that are archived to Amazon Glacier have a



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This enables you to get a real-time list of all of your Amazon S3 objects, including those stored using the Amazon Glacier storage class, using the Amazon S3 LIST API or the S3 Inventory report. For example, if you have archived 100,000 objects that are 1GB each, your billable storage would be:

1.000032 gigabytes for each object x 100,000 objects = 100,003.2 gigabytes of Amazon Glacier storage.

0.000008 gigabytes for each object x 100,000 objects = 0.8 gigabytes of Amazon S3 Standard storage.

The fee is calculated based on the current rates for your AWS Region on the [Amazon S3 Pricing Page](#).

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Q: How much data can I retrieve from Amazon Glacier for free?

You can retrieve 10GB of your Amazon Glacier data per month for free with the [AWS free tier](#). The free tier allowance can be used at any time during the month and applies to Amazon Glacier Standard retrievals.

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Q: How am I charged for deleting objects from Amazon Glacier that are less than 90 days old?



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Retrievals - and each has a different per-GB retrieval fee and per-archive request fee (i.e. requesting one archive counts as one request). For detailed Glacier pricing by AWS Region, please visit the [Amazon Glacier pricing page](#).

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Query in Place

Q: What is "Query in Place" functionality?

Amazon S3 allows customers to run sophisticated queries against data stored without the need to move data into a separate analytics platform. The ability to query this data in place on Amazon S3 can significantly increase performance and reduce cost for analytics solutions leveraging S3 as a data lake. S3 offers multiple query in place options, including S3 Select, Amazon Athena, and Amazon Redshift Spectrum, allowing you to choose one that best fits your use case. You can even use Amazon S3 Select with AWS Lambda to build serverless apps that can take advantage of the in-place processing capabilities provided by S3 Select.

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Q: What is S3 Select?



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entire object. You can also use S3 Select with Big Data frameworks, such as Presto, Apache Hive, and Apache Spark to scan and filter the data in Amazon S3.

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Q: Why should I use S3 Select?

S3 Select provides a new way to retrieve specific data using SQL statements from the contents of an object stored in Amazon S3 without having to retrieve the entire object. S3 Select simplifies and improves the performance of scanning and filtering the contents of objects into a smaller, targeted dataset by up to 400%. With S3 Select, you can also perform operational investigations on log files in Amazon S3 without the need to operate or manage a compute cluster.

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Q: What is Amazon Athena?

Amazon Athena is an interactive query service that makes it easy to [analyze data in Amazon S3 using standard SQL queries](#). Athena is serverless, so there is no infrastructure to setup or manage, and you can start analyzing data immediately. You don't even need to load your data into Athena, it works directly with data stored in any S3 storage class. To get started, just log into the Athena Management Console, define your schema, and start querying. Amazon Athena uses Presto with full standard SQL support and works with a variety of standard data formats, including CSV, JSON, ORC, Apache Parquet and Avro. While Athena is ideal for quick, ad-hoc querying and integrates



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Redshift Spectrum scales out to thousands of instances if needed, so queries run quickly regardless of data size. And, you can use the exact same SQL for Amazon S3 data as you do for your Amazon Redshift queries today and connect to the same Amazon Redshift endpoint using the same BI tools. Redshift Spectrum lets you separate storage and compute, allowing you to scale each independently. You can setup as many Amazon Redshift clusters as you need to query your Amazon S3 data lake, providing high availability and limitless concurrency. Redshift Spectrum gives you the freedom to store your data where you want, in the format you want, and have it available for processing when you need it.

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Event Notification

Q: What are Amazon S3 Event Notifications?

Amazon S3 event notifications can be sent in response to actions in Amazon S3 like PUTs, POSTs, COPYs, or DELETEs. Notification messages can be sent through either [Amazon SNS](#), [Amazon SQS](#), or directly to [AWS Lambda](#).

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Q: What can I do with Amazon S3 event notifications?



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Q: How do I set up Amazon S3 event notifications?

For a detailed description of how to configure event notifications, please refer to the [Configuring Amazon S3 event notifications](#) topic in the [Amazon S3 Developer Guide](#). You can learn more about AWS messaging services in the [Amazon SNS Documentation](#) and the [Amazon SQS Documentation](#).

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Q: What does it cost to use Amazon S3 event notifications?

There are no additional charges for using Amazon S3 for event notifications. You pay only for use of Amazon SNS or Amazon SQS to deliver event notifications, or for the cost of running an AWS Lambda function. Visit the [Amazon SNS](#), [Amazon SQS](#), or [AWS Lambda](#) pricing pages to view the pricing details for these services.

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Amazon S3 Transfer Acceleration



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enabled, you can point your Amazon S3 PUT and GET requests to the s3-accelerate endpoint domain name. Your data transfer application must use one of the following two types of endpoints to access the bucket for faster data transfer: `s3-accelerate.amazonaws.com` or `s3-accelerate.dualstack.amazonaws.com` for the “dual-stack” endpoint. If you want to use standard data transfer, you can continue to use the regular endpoints.

There are certain restrictions on which buckets will support S3 Transfer Acceleration. For details, please refer the [Amazon S3 developer guide](#).

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Q: How fast is S3 Transfer Acceleration?

S3 Transfer Acceleration helps you fully utilize your bandwidth, minimize the effect of distance on throughput, and is designed to ensure consistently fast data transfer to Amazon S3 regardless of your client's location. The amount of acceleration primarily depends on your available bandwidth, the distance between the source and destination, and packet loss rates on the network path. Generally, you will see more acceleration when the source is farther from the destination, when there is more available bandwidth, and/or when the object size is bigger.

One customer measured a 50% reduction in their average time to ingest 300 MB files from a global user base spread across the US, Europe, and parts of Asia to a bucket in the Asia Pacific (Sydney) region. Another customer observed cases where performance improved in excess of 500% for users in South East Asia and Australia uploading 250 MB files (in parts of 50MB) to an S3 bucket in the US East (N. Virginia) region.

**Amazon S3** ▾[Overview](#)[Features](#)[Storage Classes](#)[Pricing](#)[Resources](#) ▾[FAQs](#)**Q: How secure is S3 Transfer Acceleration?**

S3 Transfer Acceleration provides the same security as regular transfers to Amazon S3. All Amazon S3 security features, such as access restriction based on a client's IP address, are supported as well. S3 Transfer Acceleration communicates with clients over standard TCP and does not require firewall changes. No data is ever saved at AWS Edge Locations.

[Show less](#)**Q: What if S3 Transfer Acceleration is not faster than a regular Amazon S3 transfer?**

Each time you use S3 Transfer Acceleration to upload an object, we will check whether S3 Transfer Acceleration is likely to be faster than a regular Amazon S3 transfer. If we determine that S3 Transfer Acceleration is not likely to be faster than a regular Amazon S3 transfer of the same object to the same destination AWS Region, we will not charge for the use of S3 Transfer Acceleration for that transfer, and we may bypass the S3 Transfer Acceleration system for that upload.

[Show less](#)**Q: Can I use S3 Transfer Acceleration with multipart uploads?**

Yes, S3 Transfer Acceleration supports all bucket level features including multipart uploads.

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The AWS Snow Family is ideal for customers moving large batches of data at once. The AWS Snowball has a typical 5-7 days turnaround time. As a rule of thumb, S3 Transfer Acceleration over a fully-utilized 1 Gbps line can transfer up to 75 TBs in the same time period. In general, if it will take more than a week to transfer over the Internet, or there are recurring transfer jobs and there is more than 25Mbps of available bandwidth, S3 Transfer Acceleration is a good option. Another option is to use both: perform initial heavy lift moves with an AWS Snowball (or series of AWS Snowballs) and then transfer incremental ongoing changes with S3 Transfer Acceleration.

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Q: Can S3 Transfer Acceleration complement AWS Direct Connect?

AWS Direct Connect is a good choice for customers who have a private networking requirement or who have access to AWS Direct Connect exchanges. S3 Transfer Acceleration is best for submitting data from distributed client locations over the public Internet, or where variable network conditions make throughput poor. Some AWS Direct Connect customers use S3 Transfer Acceleration to help with remote office transfers, where they may suffer from poor Internet performance.

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Q: Can S3 Transfer Acceleration complement the AWS Storage Gateway or a 3rd party gateway?

If you can configure the bucket destination in your 3rd party gateway to use an S3 Transfer Acceleration endpoint domain name you will see the benefit.



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Q: Is S3 Transfer Acceleration HIPAA eligible?

Yes, AWS has expanded its HIPAA compliance program to include Amazon S3 Transfer Acceleration as a HIPAA eligible service. If you have an executed Business Associate Agreement (BAA) with AWS, you can use Amazon S3 Transfer Acceleration to enable fast, easy, and secure transfers of files including protected health information (PHI) over long distances between your client and your Amazon S3 bucket.

[Learn more about HIPAA Compliance »](#)

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Storage Management

S3 Object Tagging

Q: What are S3 object tags?

S3 object tags are key-value pairs applied to S3 objects which can be created, updated or deleted at any time during the lifetime of the object. With these, you'll have the ability to create Identity and Access Management (IAM) policies, setup S3 Lifecycle policies, and customize storage metrics. These object-level tags can then manage transitions between storage classes and expire objects in the background.



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ability to create, update, and delete tags at any time during the lifetime of your object, your storage can adapt to the needs of your business. These tags allow you to control access to objects tagged with specific key-value pairs, allowing you to further secure confidential data for only a select group or user. Object tags can also be used to label objects that belong to a specific project or business unit, which could be used in conjunction with S3 Lifecycle policies to manage transitions to other storage classes (S3 Standard-IA, S3 One Zone-IA, and Amazon Glacier) or with S3 Cross-Region Replication to selectively replicate data between AWS Regions.

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Q: How can I update the object tags on my objects?

Object tags can be changed at any time during the lifetime of your S3 object, you can use either the AWS Management Console, the REST API, the AWS CLI, or the AWS SDKs to change your object tags. Note that all changes to tags outside of the AWS Management Console are made to the full tag set. If you have five tags attached to a particular object and want to add a sixth, you need to include the original five tags in that request.

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Q: Will my object tags be replicated if I use Cross-Region Replication?

Object tags can be replicated across AWS Regions using Cross-Region Replication. For customers with Cross-Region Replication already enabled, new permissions are required in order for tags to

**Amazon S3** ▾**Overview****Features****Storage Classes****Pricing****Resources** ▾**FAQs****Storage Class Analysis****Q: What is Storage Class Analysis?**

With Storage Class Analysis, you can analyze storage access patterns and transition the right data to the right storage class. This new S3 feature automatically identifies infrequent access patterns to help you transition storage to S3 Standard-IA. You can configure a Storage Class Analysis policy to monitor an entire bucket, prefix, or object tag. Once an infrequent access pattern is observed, you can easily create a new S3 Lifecycle age policy based on the results. Storage Class Analysis also provides daily visualizations of your storage usage on the AWS Management Console that you can export to an S3 bucket to analyze using business intelligence tools of your choice such as Amazon QuickSight.

[Show less](#)**Q: How do I get started with Storage Class Analysis?**

You can use the AWS Management Console or the S3 PUT Bucket Analytics API to configure a Storage Class Analysis policy to identify infrequently accessed storage that can be transitioned to the S3 Standard-IA or S3 One Zone-IA storage class or archived to the Amazon Glacier storage class. You can navigate to the “Management” tab in the S3 Console to manage Storage Class Analysis, S3 Inventory, and S3 CloudWatch metrics.

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S3 Inventory

Q: What is S3 Inventory?

The S3 Inventory report provides a scheduled alternative to Amazon S3's synchronous List API. You can configure S3 Inventory to provide a CSV or ORC file output of your objects and their corresponding metadata on a daily or weekly basis for an S3 bucket or prefix. You can simplify and speed up business workflows and big data jobs with S3 Inventory. You can also use S3 inventory to verify encryption and replication status of your objects to meet business, compliance, and regulatory needs.

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Q: How do I get started with S3 Inventory?

You can use the AWS Management Console or the PUT Bucket Inventory API to configure a daily or weekly inventory report for all the objects within your S3 bucket or a subset of the objects under a shared prefix. As part of the configuration, you can specify a destination S3 bucket for your S3 Inventory report, the output file format (CSV or ORC), and specific object metadata necessary for your business application, such as object name, size, last modified date, storage class, version ID, delete marker, noncurrent version flag, multipart upload flag, replication status, or encryption status.

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[Learn more about querying S3 inventory with Athena »](#)

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Q: How am I charged for using S3 Inventory?

Please see the [Amazon S3 pricing page](#) for S3 Inventory pricing. Once you configure encryption using SSE-KMS, you will incur KMS charges for encryption, refer to the [KMS pricing page](#) for detail.

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S3 CloudWatch Metrics

Q: How do I get started with S3 CloudWatch Metrics?

You can use the AWS Management Console to enable the generation of 1-minute CloudWatch request metrics for your S3 bucket or configure filters for the metrics using a prefix or object tag. Alternatively, you can call the S3 PUT Bucket Metrics API to enable and configure publication of S3 storage metrics. CloudWatch Request Metrics will be available in CloudWatch within 15 minutes after they are enabled. CloudWatch Storage Metrics are enabled by default for all buckets, and reported once per day.

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Q: Can I align S3 CloudWatch request metrics to my applications or business organizations?



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Q: How am I charged for using S3 CloudWatch Metrics?

CloudWatch storage metrics are provided free. Cloudwatch request metrics are priced as custom metrics for Amazon CloudWatch. Please see the [Amazon CloudWatch pricing page](#) for general information about S3 CloudWatch metrics pricing.

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S3 Lifecycle Management

Q: What is S3 Lifecycle management?

S3 Lifecycle management provides the ability to define the lifecycle of your object with a predefined policy and reduce your cost of storage. You can set a lifecycle transition policy to automatically migrate objects stored in the S3 Standard storage class to the S3 Standard-IA, S3 One Zone-IA, and/or Amazon Glacier storage classes based on the age of the data. You can also set lifecycle expiration policies to automatically remove objects based on the age of the object. You can set a policy for multipart upload expiration, which expires incomplete multipart uploads based on the age of the upload.

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Q: How do I set up an S3 Lifecycle management policy?



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Q: What can I do with Lifecycle management policies?

As data matures, it can become less critical, less valuable, and/or subject to compliance requirements. Amazon S3 includes an extensive library of policies that help you automate data migration processes between storage classes. For example, you can set infrequently accessed objects to move into lower cost storage classes (like S3 Standard-IA or S3 One Zone-IA) after a period of time. After another period, those objects can be moved into Amazon Glacier for archive and compliance. If policy allows, you can also specify a lifecycle policy for object deletion. These rules can invisibly lower storage costs and simplify management efforts. These policies also include good stewardship practices to remove objects and attributes that are no longer needed to manage cost and optimize performance.

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Q: How can I use Amazon S3 Lifecycle management to help lower my Amazon S3 storage costs?

With Amazon S3 Lifecycle policies, you can configure your objects to be migrated to from the S3 Standard storage class to S3 Standard-IA or S3 One Zone-IA and/or archived to Amazon Glacier. You can also specify an S3 Lifecycle policy to delete objects after a specific period of time. You can use this policy-driven automation to quickly and easily reduce storage costs as well as save time. In each rule you can specify a prefix, a time period, a transition to S3 Standard-IA, S3 One Zone-IA, or Amazon Glacier, and/or an expiration. For example, you could create a rule that archives into Amazon Glacier all objects with the common prefix "logs/" 30 days from creation and expires these objects after 365 days from creation. You can also create a separate rule that only expires all



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You can set an S3 Lifecycle expiration policy to remove objects from your buckets after a specified number of days. You can define the expiration rules for a set of objects in your bucket through the Lifecycle configuration policy that you apply to the bucket.

[Learn more about S3 Lifecycle expiration policies »](#)

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Q: Why would I use an S3 Lifecycle policy to expire incomplete multipart uploads?

The S3 Lifecycle policy that expires incomplete multipart uploads allows you to save on costs by limiting the time non-completed multipart uploads are stored. For example, if your application uploads several multipart object parts, but never commits them, you will still be charged for that storage. This policy can lower your S3 storage bill by automatically removing incomplete multipart uploads and the associated storage after a predefined number of days.

[Learn more about using S3 Lifecycle to expire incomplete multipart uploads »](#)

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Cross-Region Replication

Q: What is Amazon S3 Cross-Region Replication (CRR)?



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[How to Set Up Cross-Region Replication in the Amazon S3 Developer Guide.](#)

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Q: Can I use CRR with S3 Lifecycle rules?

Yes, you can configure separate S3 Lifecycle rules on the source and destination buckets. For example, you can configure a lifecycle rule to migrate data from the S3 Standard storage class to the S3 Standard-IA or S3 One Zone-IA storage class or archive data to Amazon Glacier on the destination bucket.

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Q: Can I use CRR with objects encrypted by AWS Key Management Service (KMS)?

Yes, you can replicate KMS-encrypted objects by providing a destination KMS key in your replication configuration.

[Learn more about replicating KMS-encrypted objects »](#)

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Q: Are objects securely transferred and encrypted throughout replication process?



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Q: What is the pricing for S3 Cross-Region Replication?

You pay the Amazon S3 charges for storage (in the S3 storage class you select), COPY requests, and inter-Region data transfer for the replicated copy of data. COPY requests and inter-Region data transfer are charged based on the source Region. Storage for replicated data is charged based on the target Region. For more information, please visit the [S3 pricing page](#).

If the source object is uploaded using the multipart upload feature, then it is replicated using the same number of parts and part size. For example, a 100 GB object uploaded using the multipart upload feature (800 parts of 128 MB each) will incur request cost associated with 802 requests (800 Upload Part requests + 1 Initiate Multipart Upload request + 1 Complete Multipart Upload request) when replicated. You will incur a request charge of \$0.00401 (802 requests x \$0.005 per 1,000 requests) and a charge of \$2.00 (\$0.020 per GB transferred x 100 GB) for inter-region data transfer. After replication, the 100 GB will incur storage charges based on the destination region.

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Amazon S3 and IPv6

Q: What is IPv6?



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expensive networking equipment to handle the address translation. You can also now utilize the existing source address filtering features in IAM policies and bucket policies with IPv6 addresses, expanding your options to secure applications interacting with Amazon S3.

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Q: How do I get started with IPv6 on Amazon S3?

You can get started by pointing your application to Amazon S3's new "dual-stack" [endpoint](#), which supports access over both IPv4 and IPv6. In most cases, no further configuration is required for access over IPv6, because most network clients prefer IPv6 addresses by default.

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Q: Should I expect a change in Amazon S3 performance when using IPv6?

No, you will see the same performance when using either IPv4 or IPv6 with Amazon S3.

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Q: What can I do if my clients are impacted by policy, network, or other restrictions in using IPv6 for Amazon S3?



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You can use IPv6 with Amazon S3 in all commercial AWS Regions except China (Beijing) and China (Ningxia). You can also use IPv6 in the AWS GovCloud (US) Region.

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Learn more about Amazon S3 pricing

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