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Protect Data on Amazon S3 Against Accidental Deletion or Application Bugs Using S3 Versioning, S3 Object Lock, and S3 Replication

TUTORIAL



Overview

[Amazon S3](#) is an object storage service with industry-leading scalability, data availability, security, performance, and 99.999999999% (11 9s) of data durability. However, even the most durable storage cannot protect against human error or software bugs that could cause your applications to become corrupted or to accidentally delete data. With ransomware events on the rise, customers of all sizes are evaluating additional protection options against malicious tampering with their critical data in Amazon S3.

As with any data, it is best practice to have a backup and to put safeguards in place against malicious or accidental deletion. This Amazon S3 getting started guide shows you how to follow best practices with [Amazon S3 Versioning](#), which allows you to preserve, retrieve, and restore every version of every object stored in an Amazon S3 bucket. [Amazon S3 Object Lock](#) can then be added on top of S3 Versioning to prevent data from being deleted or overwritten for a fixed amount of time, or indefinitely. For creating additional copies of your data in another AWS Region for multi-Region protection, [Amazon S3 Replication](#) works with both S3

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What you will accomplish

- Create an Amazon S3 bucket
- Enable S3 Versioning to prevent objects from being overwritten
- Configure S3 Object Lock to prevent accidental deletion of objects
- Review data protection status of S3 buckets using S3 Storage Lens

Prerequisites

To complete this tutorial, you need an AWS account. [Access this support page for more information on how to create and activate a new AWS account.](#)

Note: Since we are demonstrating S3 Object Lock, the data in this lab cannot be deleted until 1 day after it is created.

✓ **AWS experience**

Beginner



⌚ **Time to complete**

30 minutes

฿ **Cost to complete (with free metrics)**

Less than \$1 ([Amazon S3 pricing page](#))

📌 **Requires**

AWS account

📌 **Services used**

[Amazon S3](#)

✍ **Last updated**

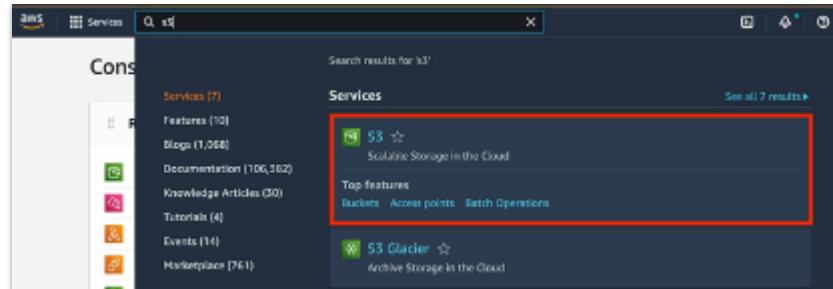
October 3, 2022

Implementation

Step 1: Create an Amazon S3 bucket


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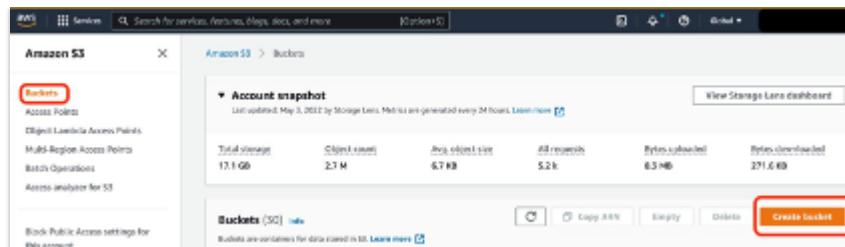
- Log in to the [AWS Management Console](#) using your account information.
- From the AWS console services search bar, enter *S3*. Under the services search results section, select **S3**.



Click the screenshots throughout this tutorial to enlarge the image.

1.2 – Create an S3 bucket

- In the navigation pane on the left, choose **Buckets**, and then choose **Create bucket** in the **Buckets** section.



1.3

- Enter a descriptive name for your bucket. Bucket names are globally unique across all AWS accounts. If you encounter an error with the name you selected, try another combination. Then, select which **AWS Region** you would like your bucket created in.



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AWS Region
US East (N. Virginia) us-east-1

Copy settings from existing bucket - optional
Only the bucket settings in the following configuration are copied.
[Choose bucket](#)

1.4

- Next, in the **Object Ownership** section, leave the default setting with **ACLs disabled**. We recommend that you disable ACLs (access control lists) except in unusual circumstances where you need to control access for each object individually. With Object Ownership, you can disable ACLs and rely on policies for access control. For more information, visit the [Amazon S3 User Guide](#).

Object Ownership [Info](#)
Control ownership of objects written to this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership determines who can specify access to objects.

ACLs disabled (recommended)
All objects in this bucket are owned by this account. Access to this bucket and its objects is specified using only policies.

ACLs enabled
Objects in this bucket can be owned by other AWS accounts. Access to this bucket and its objects can be specified using ACLs.

Object Ownership
Bucket owner enforced



1.5

- In the **Block Public Access** settings for this bucket section, the default block public access setting is appropriate for this workload, so leave the default settings.

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 Block Public Access settings for this account are currently turned on
Block Public Access settings for this account [\[?\]](#) that are enabled apply even if they are disabled for this bucket.

Block off public access
Turning this setting on is the same as turning on all four settings below. Each of the following settings are independent of one another.

- Block public access to buckets and objects granted through new access control lists (ACLs)**
S3 will block public access permissions applied to newly added buckets or objects, and prevent the creation of new public access ACLs for existing buckets and objects. This setting doesn't change any existing permissions that allow public access to S3 resources using ACLs.
- Block public access to buckets and objects granted through any access control lists (ACLs)**
S3 will ignore all ACLs that grant public access to buckets and objects.
- Block public access to buckets and objects granted through new public bucket or access point policies**
S3 will block new bucket and access point policies that grant public access to buckets and objects. This setting doesn't change any existing policies that allow public access to S3 resources.
- Block public and cross-account access to buckets and objects through any public bucket or access point policies**
S3 will ignore public and cross-account access for buckets or access points with policies that grant public access to buckets and objects.

1.6 – Enable versioning

- Next, in the **Bucket Versioning** section, make sure you **Enable Bucket Versioning**. Versioning in Amazon S3 is a means of keeping multiple variants of an object in the same bucket. You can use the S3 Versioning feature to preserve, retrieve, and restore every version of every object stored in your buckets. With S3 Versioning, you can recover more easily from both unintended user actions and application failures. After versioning is enabled for a bucket, if Amazon S3 receives multiple write requests for the same object simultaneously, it stores all of those objects.



Bucket Versioning
Versioning is a means of keeping multiple variants of an object in the same bucket. You can use versioning to preserve, retrieve, and restore every version of every object stored in your Amazon S3 bucket. With versioning, you can easily recover from both unintended user actions and application failures. [Learn more \[?\]](#)

Bucket Versioning

Disable
 Enable

1.7 – Enable default encryption

- Now, in the **Default encryption** section, enable default encryption for the bucket. These settings will apply to any objects uploaded to the bucket where you have not defined at-rest encryption details during the upload process. For this workload, under **Server-side encryption**, select **Enable**. Then, under **Encryption key type**, select **Amazon S3-managed**


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Automatically encrypt new objects stored in this bucket. [Learn more](#)

Server-side encryption

Disable

Enable

Encryption key type

To upload an object with a **customer-provided encryption key (SSE-C)**, use the AWS CLI, AWS SDK, or Amazon S3 REST API.

Amazon S3-managed keys (SSE-S3)

An encryption key that AWS creates, manages, and uses for you. [Learn more](#)

AWS Key Management Service key (SSE-KMS)

An encryption key protected by AWS Key Management Service (AWS KMS). [Learn more](#)

1.8

- Next, in the **Advanced settings** section, under **Object Lock**, select **Enable**.
- You can use [S3 Object Lock](#) to store objects using a write-once-read-many (WORM) model. S3 Object Lock can help prevent objects from being deleted or overwritten for a fixed amount of time, or indefinitely. You can use S3 Object Lock to meet regulatory requirements that require WORM storage, or add an extra layer of protection against object changes and deletion.
- Note that this step simply enabled Object Lock on the bucket. We will set specific settings, such as **Retention Mode** and **Retention Period**, later in the tutorial.
- Create the S3 bucket by choosing **Create bucket**.

Advanced settings

Object Lock

Store objects using a write-once-read-many (WORM) model to help you prevent objects from being deleted or overwritten for a fixed amount of time or indefinitely. [Learn more](#)

Disable

Enable

Permanently allows objects in this bucket to be locked. Additional Object Lock configuration is required in bucket details after bucket creation to protect objects in this bucket from being deleted or overwritten.

Object Lock works only in versioned buckets. Enabling Object Lock automatically enables Bucket Versioning.

⚠️ Enabling Object Lock will permanently allow objects in this bucket to be locked

Enable Object Lock only if you need to prevent objects from being deleted to have data integrity and regulatory compliance. After you enable this feature, anyone with the appropriate permissions can put immutable objects in the bucket. You might be blocked from deleting the objects and the bucket. Additional Object Lock configuration is required in bucket details after bucket creation to protect objects in this bucket from being deleted or overwritten. [Learn more](#)

I acknowledge that enabling Object Lock will permanently allow objects in this bucket to be locked.

After creating the bucket you can upload files and folders to the bucket, and configure additional bucket settings.

[Cancel](#) [Create bucket](#)

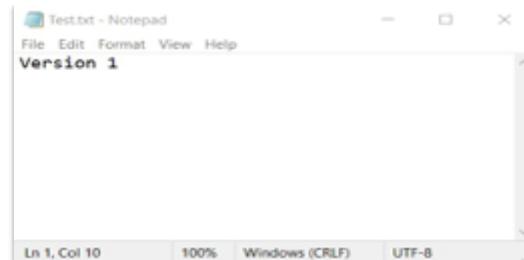


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Step 2. Set up S3 versioning

2.1 – Upload an object

- On your workstation, create a text file that contains the words *Version 1* and save it to your workstation.



2.2

- From the [Amazon S3 console](#), search for the bucket that you created in Step 1, and select the bucket name.

A screenshot of the Amazon S3 console. The left sidebar shows "Buckets" selected. The main area displays an "Account snapshot" with total storage of 186.9 GB, object count of 6.1 M, and avg. object size of 31.2 kB. Below this is a "Buckets (34) list" table. A search bar at the top of the list table has "s3-data" entered. The first result in the table is highlighted with a red box and labeled "s3-data-protection".

Name	AWS Region	Access	Creation Date
s3-data-protection	US East (N. Virginia) us-east-1	Buckets and objects not public	August 2, 2022 10:57:39 UTC/04:00

- Next, select the **Objects** tab. Then, from within the **Objects** section, choose **Upload**.



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2.3

- Then, in the **Upload** section, choose **Add files**. Navigate to your local file system to locate the test file that you created above. Select the appropriate file, and then choose **Open**. Your file will be listed in the **Files and folders** section. Leave the rest of the options on the default settings, and choose the **Upload** button.

Upload Info

Add the files and folders you want to upload to S3. To upload a file larger than 160GB, use the AWS CLI, AWS SDK or Amazon S3 REST API. [Learn more](#)

Drag and drop files and folders you want to upload here, or choose **Add files**, or **Add folders**.

<input type="checkbox"/>	Name	Folder	Type	Size
<input type="checkbox"/>	Test.txt	-	text/plain	9.0 B

Files and folders (1 Total, 9.0 B)

All files and folders in this table will be uploaded.

< 1 >

Destination

Destination
<s3://s3-data-protection>

▶ **Destination details**
Bucket settings that impact new objects stored in the specified destination.

▶ **Permissions**
Grant public access and access to other AWS accounts.

▶ **Properties**
Specify storage class, encryption settings, tags, and more.



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- After the file upload operations have completed, you will be presented with a status message indicating if the upload was successful or not. In this case, the file has uploaded successfully. Then, choose **Close**.

The screenshot shows the 'Upload: status' page after a file has been uploaded successfully. At the top, a green bar indicates 'Upload succeeded' with a link to 'View details below'. Below this, a message states 'The information below will no longer be available after you navigate away from this page.' A summary table shows the destination 's3://s3-data-protection' with one succeeded file (1 file, 16.0 B (100.0%)) and zero failed files (0 files, 0 B (0%)). The 'Files and folders' tab is selected, showing a table with one item: 'Object-Lock-test.txt' (text/plain, 16.0 B, Status: Succeeded). A red box highlights the 'Close' button in the top right corner.

- You can now see the object in the S3 console.

The screenshot shows the 'Objects' page for the 's3-data-protection' bucket. It displays a single object named 'Object-Lock-test.txt' with a size of 9.0 B and a storage class of Standard. The object was last modified on August 5, 2022, at 21:08:38 UTC (04:00). The page includes standard S3 actions like Copy, Delete, and Upload.

2.5

- On your workstation, edit the file that you created. Change the text to *Version 2*, then save it with the same file name. Upload the updated file to Amazon S3 by repeating Steps 2.2 through 2.4.

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2.6

- To see a list of the versions of the objects in the bucket, choose the **Show versions** selection. For each object version, the console shows a unique version ID, the date and time the object version was created, and other properties.

Name	Type	Version ID	Last modified	Size	Storage class
Test.txt	txt	R_XLVDp6Gaj8yaP3dPhxViOei2_No26	August 3, 2022, 21:35:24 (UTC-04:00)	9.0 B	Standard
Test.txt	txt	B0eBNK2v22YTl154WhwSLkdadEidrf	August 3, 2022, 21:20:38 (UTC-04:00)	9.0 B	Standard



Now that you have enabled S3 Object Versioning, all versions of that object will continue to be preserved in your Amazon S3 bucket and can be retrieved or restored. With S3 Versioning enabled, only the owner of an Amazon S3 bucket can permanently delete a version. When a DELETE operation is performed on an object, subsequent simple (unversioned) requests will no longer retrieve the object, but it still remains in S3 as a previous version.

When versioning is enabled, a simple DELETE cannot permanently delete an object. Instead, Amazon S3 inserts a delete marker in the bucket, and that marker becomes the current version of the object with a new ID.

Keeping noncurrent versions of objects can increase your storage costs. You can use [lifecycle rules](#) to manage the lifetime and the cost of storing multiple versions of your objects. You can have lifecycle rules configured to permanently remove these older versions or for additional windows of protection at a lower storage cost. You can also set up a lifecycle rule that archives all of your


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the most recent version of the file, and should say *Version 2*. Repeat the process on the older version of the object and confirm that it says *Version 1*.

Name	Type	Version ID	Last modified	Size	Storage class
Test.txt	txt	0_Xt_Vbq4Cqjyf5dPHWV0e2_Rev26	August 3, 2022, 21:35:24 (UTC-04:00)	9.0 B	Standard
Test.txt	txt	0d9ba2c23f1134d0m5cik6enEaf	August 3, 2022, 21:38:58 (UTC-04:00)	9.0 B	Standard

2.7 – Demonstrate deleting objects

- Turn off **Show versions** to collapse the list of versions.

Name	Type	Last modified	Size	Storage class
Test.txt	txt	August 5, 2022, 21:35:24 (UTC-04:00)	9.0 B	Standard

Enter **delete** in the text input field and choose the **Delete objects** button.


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Specified objects

Name	Type	Last modified	Size
Test.txt	txt	August 3, 2022, 21:55:24 (UTC-04:00)	9.0 B

Delete objects?

To confirm deletion, type delete in the text input field.

Cancel **Delete objects**

- Choose **Close**.

Successfully deleted objects

Delete objects: status

The information below will no longer be available after you navigate away from this page.

Summary	
Successfully deleted 1 object, 1 file 1 object, 1 file	Failed to delete 0 objects

Close



- Then, on the **Objects** tab, you will see the object appears to have been deleted.

Objects (0)

Objects are the fundamental entities in Amazon S3. You can use Amazon S3 Inventory to get a list of all objects in your bucket. For information on your objects, you can use Amazon S3 Metrics. Learn more

Actions Copy S3 URL Copy URL Download Open Delete Archive Create Prefix **Upload**

Name	Type	Last modified	User	Storage class
No objects				

You don't have any objects in this bucket.

Upload

- Turn on **Show versions**. Notice that the top-level object is now listed as a **Delete marker** under the **Type** column, but both versions of the object are still available.


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Name	Type	Version ID	Last modified	Size	Storage class
Test.txt	Delete marker	ne7xv3Mpg6X2mZdTck_eaal.Es5YyYtd	August 3, 2022, 21:49:16 (UTC-04:00)	0 B	-
Test.txt	txt	R_ALWzDq6GqbyP3dHfM0e2_Nz0t	August 3, 2022, 21:15:24 (UTC-04:00)	9.0 B	Standard
Test.txt	txt	BBJ3MK2vCJ73_TSMMRnQAlu00kf	August 3, 2022, 21:28:38 (UTC-04:00)	9.0 B	Standard

2.8 – Demonstrate restoring an object

- To restore the object, delete the **Delete marker** by selecting the check box of the top-level object. Then, choose **Delete**.

The screenshot shows the Amazon S3 console with the path 'Amazon S3 > Buckets > s3-data-protection'. The 'Objects' tab is selected. A table lists three objects:

Name	Type	Version ID	Last modified	Size	Storage class
Test.txt	Delete marker	ne7xv3Mpg6X2mZdTck_eaal.Es5YyYtd	August 3, 2022, 21:49:16 (UTC-04:00)	0 B	-
Test.txt	txt	R_ALWzDq6GqbyP3dHfM0e2_Nz0t	August 3, 2022, 21:15:24 (UTC-04:00)	9.0 B	Standard
Test.txt	txt	BBJ3MK2vCJ73_TSMMRnQAlu00kf	August 3, 2022, 21:28:38 (UTC-04:00)	9.0 B	Standard

- Enter *permanently delete* in the **text input field** and choose **Delete objects**.

The screenshot shows the 'Delete objects' dialog with the path 'Amazon S3 > Buckets > s3-data-protection > Delete objects'. The dialog title is 'Delete objects'.

Specified objects

Name	Version ID	Type	Last modified	Size
Test.txt	ne7xv3Mpg6X2mZdTck_eaal.Es5YyYtd	Delete marker	August 3, 2022, 21:49:16 (UTC-04:00)	0 B

Permanently delete objects?

To confirm deletion, type *permanently delete* in the text input field.

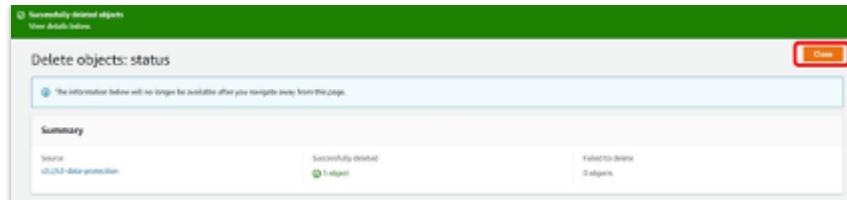
permanently delete

Delete objects



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- Deleting the Delete marker has restored the object.
- Select the check box to the left of the top-level object, and choose **Open**. This object should open as *Version 2*.

Amazon S3 > Buckets > s3-data-protection

s3-data-protection [Info](#)

[Objects](#) [Properties](#) [Permissions](#) [Metrics](#) [Management](#) [Access Points](#)

Objects (2)

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 Inventory [to get a list of all objects in your bucket](#). For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

<input type="checkbox"/>	Name	Type	Version ID	Last modified	Size	Storage class
<input checked="" type="checkbox"/>	Test.txt	txt	UtQeeLezLuliQt5DcTUCfsuZMFPn2Nnq	August 29, 2022, 17:58:05 (UTC-04:00)	9.0 B	Standard
<input type="checkbox"/>	Test.txt	txt	fWr2Msc6COpFk3m4O07WYAbMeAdOmvba	August 29, 2022, 17:57:38 (UTC-04:00)	9.0 B	Standard

[Copy S3 URI](#) [Copy URL](#) [Download](#) [Open](#) [Delete](#) [Actions](#) [Create folder](#) [Upload](#)

[Show versions](#)

[Find objects by prefix](#)



- Select the check box to the left of the older version of the object, and choose **Open**. This object should open as *Version 1*.

Amazon S3 > Buckets > s3-data-protection

s3-data-protection [Info](#)

[Objects](#) [Properties](#) [Permissions](#) [Metrics](#) [Management](#) [Access Points](#)

Objects (2)

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 Inventory [to get a list of all objects in your bucket](#). For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

<input type="checkbox"/>	Name	Type	Version ID	Last modified	Size	Storage class
<input type="checkbox"/>	Test.txt	txt	UtQeeLezLuliQt5DcTUCfsuZMFPn2Nnq	August 29, 2022, 17:58:05 (UTC-04:00)	9.0 B	Standard
<input checked="" type="checkbox"/>	Test.txt	txt	fWr2Msc6COpFk3m4O07WYAbMeAdOmvba	August 29, 2022, 17:57:38 (UTC-04:00)	9.0 B	Standard

[Copy S3 URI](#) [Copy URL](#) [Download](#) [Open](#) [Delete](#) [Actions](#) [Create folder](#) [Upload](#)

[Show versions](#)

[Find objects by prefix](#)

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We can also delete a specific version of an object without creating a Delete marker. In the next step, we will delete the most recent version of the object.

- With the **Show versions** toggle turned on, select the check box to the left of the top-level object, and choose **Delete**.

Name	Type	Version ID	Last modified	Size	Storage class
<input checked="" type="checkbox"/> Test.txt	txt	UtQeeLezLuliQt5DcTUCfzuZMFPn2Nnq	August 29, 2022, 17:58:05 (UTC-04:00)	9.0 B	Standard
<input type="checkbox"/> Test.txt	txt	fWr2Msc6CoFk3m4OO7WVAbMeAd0mwba	August 29, 2022, 17:57:38 (UTC-04:00)	9.0 B	Standard

- Enter *permanently delete* in the **text input field** and choose **Delete objects**.



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To use the console to delete objects from a bucket with Object Lock enabled, you must have s3:BypassGovernanceRetention permission. With this permission, specified objects with Object Lock governance mode applied will be deleted. [Learn more](#)



- If a folder is selected for deletion, all objects in the folder will be deleted, and any new objects added while the delete action is in progress might also be deleted. If an object is selected for deletion, any new objects with the same name that are uploaded before the delete action is completed will also be deleted.
- Deleting the specified objects can't be undone.

[Learn more](#)

Specified objects

 Find objects by name

< 1 >

Name	Version ID	Type	Last modified	Size
Test.txt	fWr2Msc6COpk3m4OO7WYAbMeAdOmvba	txt	August 29, 2022, 17:57:38 (UTC-04:00)	9.0 B

Permanently delete objects?

To confirm deletion, type *permanently delete* in the text input field.

 permanently delete[Cancel](#)[Delete objects](#)

- We have now deleted the most recent version of the object.
- To confirm this, select the check box to the left of the remaining object, and choose **Open**.
- Making the above selection will then open a new tab in your browser, with the text *Version 1*.

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Objects (1)

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory [to get a list of all objects in your bucket](#). For others to access your objects, you'll need to explicitly grant them permissions. Learn more [\[?\]](#)

Name	Type	Version ID	Last modified	Size	Storage class
<input checked="" type="checkbox"/> Test.txt	txt	cXyZJyHNsmUM4DN0mzFu4ChkdSkA5OAZ	August 29, 2022, 18:19:24 (UTC-04:00)	9.0 B	Standard

Step 3: Set up S3 Object Lock

3.1

- Show the detailed features at the bucket level. From your bucket, choose **Properties**.

Amazon S3 > Buckets > s3-data-protection

Properties [Permissions](#) [Metrics](#) [Management](#) [Actions/Policy](#)

Objects (1)

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory [to get a list of all objects in your bucket](#). For others to access your objects, you'll need to explicitly grant them permissions. Learn more [\[?\]](#)

Name	Type	Last modified	Size	Storage class
<input checked="" type="checkbox"/> Test.txt	txt	August 29, 2022, 18:19:24 (UTC-04:00)	9.0 B	Standard



3.2

- Navigate down to the **Object Lock** section. Then, choose **Edit**.

Object Lock

Store objects using a write-once-read-many (WORM) model to help you prevent objects from being deleted or overwritten for a fixed amount of time or indefinitely. [Learn more \[?\]](#)

Object Lock
Enabled

Default retention
Automatically protect new objects put into this bucket from being deleted or overwritten.

Disabled

Edit

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- In the Default retention section, choose Enable.

- Set the Default retention mode to Compliance.
- For the Default retention period, enter 1 in the text input field and leave the dropdown box as Days. Then, choose Save changes.

Object Lock

Store objects using a write-once-read-many (WORM) model to help you prevent objects from being deleted or overwritten for a fixed amount of time or indefinitely. [Learn more](#)

Once Amazon S3 Object Lock is enabled, you can't disable Object Lock or suspend Bucket Versioning for the bucket.

Object Lock

Enabled

Default retention

Automatically protect new objects put into this bucket from being deleted or overwritten.

Disable

Enable

Default retention mode

Governance

Users with specific IAM permissions can overwrite or delete protected object versions during the retention period.

Compliance

No users can overwrite or delete protected object versions during the retention period.



In compliance mode, an object is immutable until its retention date has passed

To delete objects that have this configuration, you must close the AWS account that they are associated with. [Learn more](#)

Default retention period

1

Days

Must be a positive whole number.

Cancel

Save changes



We have now set the default Object Lock settings for any new objects that are uploaded to the bucket. Existing objects in the bucket are not impacted by these settings. To lock existing objects, you can use [S3 Batch Operations](#).

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Operation will succeed. For this reason, we are using compliance mode in this tutorial.

When a lock is placed on an object using *Compliance* mode, the object version cannot be deleted by any user, including the root user, until the retention period expires. In addition, its retention mode can't be changed, and its retention period can't be shortened.

This tutorial will demonstrate how even a user with administrative rights is unable to delete objects protected with compliance mode. Note that objects that are locked and cannot be deleted will continue to be billed. To minimize costs for this tutorial, ensure you have set the default retention to only 1 day, and only upload small files.

3.4 – Upload a new object

- From within the **Objects** tab, choose **Upload**.

The screenshot shows the Amazon S3 console interface. The top navigation bar includes 'Amazon S3' and 'Buckets' with 's3-data-protection' selected. Below the navigation is a toolbar with tabs: 'Objects' (highlighted in orange), 'Properties', 'Permissions', 'Metrics', 'Management', and 'Access Points'. On the left, there's a sidebar with social sharing icons: a thumbs up, a thumbs down, and a speech bubble. The main content area is titled 'Objects (1)'. It displays a table with one row for 'Test.txt'. The table columns are: Name, Type, Last modified, Size, and Storage class. The 'Name' column shows 'Test.txt', 'Type' shows 'txt', 'Last modified' shows 'August 29, 2022, 17:58:05 (UTC-04:00)', 'Size' shows '9.0 B', and 'Storage class' shows 'Standard'. Above the table is a toolbar with actions: 'Copy S3 URI', 'Copy URL', 'Download', 'Open', 'Delete', 'Actions', 'Create folder', and 'Upload' (which is highlighted with a red box). A search bar labeled 'Find objects by prefix' is also present.

Name	Type	Last modified	Size	Storage class
Test.txt	txt	August 29, 2022, 17:58:05 (UTC-04:00)	9.0 B	Standard

3.5

- Then, in the **Upload** section, under **Files and folders**, choose **Add files**. Navigate to your local file system and select any small file to be used for testing, and then choose **Open**. Your file

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Add the files and folders you want to upload to S3. To upload a file larger than 160GB, use the AWS CLI, AWS SDK or Amazon S3 REST API. [Learn more](#)

Drag and drop files and folders you want to upload here, or choose **Add files**, or **Add folders**.

Files and folders (1 Total, 16.0 B)

All files and folders in this table will be uploaded.

Remove**Add files****Add folder** Find by name**< 1 >****Name****Folder****Type****Size**

Object-Lock-test.txt



text/plain

16.0 B

Destination**Destination**[s3://s3-data-protection](#)**▶ Destination details**

Bucket settings that impact new objects stored in the specified destination.

▶ Permissions

Grant public access and access to other AWS accounts.

▶ Properties

Specify storage class, encryption settings, tags, and more.

Cancel**Upload**

3.6

- After the file upload operations have completed, you will be presented with a status message indicating if the upload was successful or not. In this case, the file has uploaded successfully. Then, choose **Close**.

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The screenshot shows the AWS S3 console with a summary of the upload process. It indicates 1 file succeeded (16.0 B) and 0 files failed (0 B). The 'Files and folders' tab is selected, showing a single object named 'Object-Lock-test.txt' with a size of 16.0 B, type 'text/plain', and status 'Succeeded'.

3.7

- From the **Objects** tab, choose the new test object that you uploaded.

The screenshot shows the 'Objects' tab for the 's3-data-protection' bucket. It displays two objects: 'Object-Lock-test.txt' and 'Test.txt'. The 'Object-Lock-test.txt' object is highlighted with a red box. The table columns include Name, Type, Last modified, Size, and Storage class.

Name	Type	Last modified	Size	Storage class
Object-Lock-test.txt	txt	August 29, 2022, 19:43:00 (UTC-04:00)	16.0 B	Standard
Test.txt	txt	August 29, 2022, 17:58:05 (UTC-04:00)	9.0 B	Standard

On the object **Properties** tab, review the **Object management overview** section. Note that the Object Lock defaults that we set have been applied to the object. You can also override these defaults when uploading a new object, and extend (but not reduce) the retention date applied to a locked object.



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Owner
davdeluc

AWS Region
US East (N. Virginia) us-east-1

Last modified
August 29, 2022, 19:43:00 (UTC-04:00)

Size
16.0 B

Type
txt

Key
 Object-Lock-test.txt

Object management overview

The following bucket properties and object management configurations impact the behavior of this object.

Bucket properties

Bucket Versioning

When enabled, multiple variants of an object can be stored in the bucket to easily recover from unintended user actions and application failures.

Enabled

Object Lock

When enabled, this object will be prevented from being deleted or overwritten until the hold is explicitly removed.

Enabled

Object Lock retention mode

In governance mode, users can't overwrite or delete this object or alter its lock settings unless they have special permissions. In compliance mode the object can't be overwritten or deleted by any user, including the root user in your AWS account.

Compliance mode

Default retention period

Objects will be prevented from being overwritten or deleted for the duration of the retention period.

1 day



3.8 – Attempt to delete the object

In this section, we will explore another method of permanently deleting a specific version of an object, without creating a Delete marker.

- Choose the **Versions** tab.
- Select the check box to the left of the object, then choose **Delete**.

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Enter *permanently delete* in the **text input field** and choose **Delete objects**.

Delete objects Info



Deleting objects from a bucket with Object Lock enabled

To use the console to delete objects from a bucket with Object Lock enabled, you must have `s3:BypassGovernanceRetention` permission. With this permission, specified objects with Object Lock governance mode applied will be deleted. [Learn more](#)



- If a folder is selected for deletion, all objects in the folder will be deleted, and any new objects added while the delete action is in progress might also be deleted. If an object is selected for deletion, any new objects with the same name that are uploaded before the delete action is completed will also be deleted.
- Deleting the specified objects can't be undone.

[Learn more](#)

Specified objects

 Find objects by name

1



Name	Version ID	Type	Last modified	Size
Object-Lock-test.txt	VqCefcjc2ZSIlwzwFbL.81pWYdKi0mSi	txt	August 29, 2022, 19:43:00 (UTC-04:00)	16.0 B

Permanently delete objects?

To confirm deletion, type *permanently delete* in the text input field.

 permanently delete[Cancel](#)[Delete objects](#)

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- Then, choose **Close** to exit this window.

Source	Successfully deleted	Failed to delete
s3://s3-data-protection/Object-Lock-test.txt	0 objects	1 object, 16.0 B

Failed to delete (1 object, 16.0 B)								
<input type="text"/> Find objects by name								
Name	Folder	Version ID	Type	Last modified	Size	Error		
Object-Lock-test.txt	-	VqCefcjq225flwwfbl.81pWYdK0mSi	txt	August 29, 2022, 19:43:00 (UTC-04:00)	16.0 B	Access denied		



Step 4: Explore additional S3 data protection features

Although out of scope for this tutorial, there are two other S3 data protection topics that you should be aware of:

- [Amazon S3 Replication](#)

S3 Replication enables automatic, asynchronous copying of objects across Amazon S3 buckets. Buckets that are configured for object replication can be owned by the same AWS account or by different accounts. You can replicate objects to a single destination bucket or to multiple destination buckets. The destination buckets can be in different AWS Regions or within the same Region as the source bucket.

S3 Replication requires S3 Versioning to be enabled on both the source and destination buckets.

If the source bucket has S3 Object Lock enabled, the destination bucket(s) must also have S3 Object Lock enabled. To enable replication on a bucket that has Object Lock enabled,

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default retention period is applied to your object replicas.

Logging options

- [AWS CloudTrail](#)

Amazon S3 is integrated with AWS CloudTrail, a service that provides a record of actions taken by a user, role, or an AWS service in Amazon S3. CloudTrail captures a subset of API calls for Amazon S3 as events, including calls from the Amazon S3 console and code calls to the Amazon S3 APIs.

- [Amazon S3 server access logging](#)

Server access logging provides detailed records for the requests that are made to a bucket. Server access logs are useful for many applications. For example, access log information can be useful in security and access audits. It can also help you learn about your customer base and understand your Amazon S3 bill.

- [AWS Backup](#)

Use AWS Backup to centralize and automate data protection across AWS services and hybrid workloads. AWS Backup offers a cost-effective, fully managed, policy-based service that further simplifies data protection at scale. AWS Backup also helps you support your regulatory compliance or business policies for data protection.

Amazon S3 is one of the many supported AWS Backup resources. AWS Backup also leverages S3 Versioning.



Step 5: View S3 data protection metrics with Amazon S3 Storage Lens

[Amazon S3 Storage Lens](#) delivers organization-wide visibility into the data protection status of your data stored in Amazon S3. S3 Storage Lens can easily show you the percentages of your data that are

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the total amount of data. These include: current version bytes, noncurrent version bytes, encrypted bytes, replicated bytes, and object lock bytes.

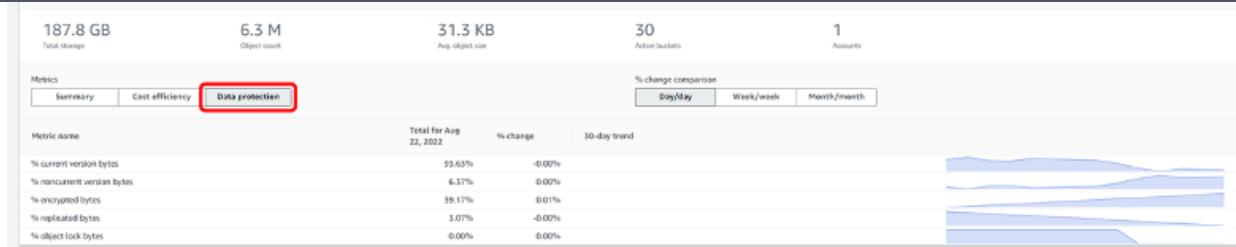
5.1

- From the [S3 console](#), find **Storage Lens** in the navigation pane.
- Choose **Dashboards**, then **default-account-dashboard**.

The screenshot shows the AWS Storage Lens interface. The left sidebar has a 'Storage Lens' section with 'Dashboards' highlighted. The main content area has a 'Getting started with Storage Lens' section with three cards: 'Create dashboard', 'Daily aggregation', and 'Analyze your storage'. Below this is a table titled 'Dashboards (1)' with one row for 'default-account-dashboard'. The 'Dashboard name' column shows 'default-account-dashboard' with a red box around it. The 'Home Region' column shows 'US East (N. Virginia) us-east-1'. The 'Status' column shows 'Enabled'. On the right side, there is a vertical sidebar with social media-style icons: a thumbs up, a thumbs down, and a speech bubble.

5.2

- Select the **Data protection** tab to see statistics relating to versioning, encryption, replication, and object lock.
- For additional information, view this tutorial on [how to optimize costs and gain visibility into usage with Amazon S3 Storage Lens](#).


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Step 6: Clean up

In the following steps, you clean up the resources you created in this tutorial. It is a best practice to delete resources that you are no longer using so that you do not incur unintended charges.

Note that you will need to wait 1 day for S3 Object Lock to expire before attempting these steps.



6.1 — Delete test objects

- If you have logged out of your AWS Management Console session, log back in. Navigate to the [S3 console](#) and select **Buckets** in the navigation pane. First you will need to delete the test object(s) from your test bucket. Select the radio button to the left of the bucket you created for this tutorial, and then choose **Empty**.

Buckets

- Access Points
- Object Lambda Access Points
- Multi-Region Access Points
- Batch Operations
- Access analyzer for S3
- Block Public Access settings for this account
- Storage Lens
- Dashboards
- AWS Organizations settings

Account snapshot

Last updated: Aug 22, 2022 by Storage Lens. Metrics are generated every 24 hours. Learn more

Total storage: 187.8 GB | Object count: 6.3 M | Avg. object size: 31.3 KB | You can enable advanced metrics in the "default-account-dashboard" configuration.

Buckets (35)

Buckets are containers for data stored in S3. Learn more

Name	AWS Region	Access	Creation date
s3-data-protection	US East (N. Virginia) us-east-1	Bucket and objects not public	August 2, 2022, 10:57:20 (JTC-04:00)

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Empty bucket Info

- ⚠** • Emptying the bucket deletes all objects in the bucket and cannot be undone.
 • Objects added to the bucket while the empty bucket action is in progress might be deleted.
 • To prevent new objects from being added to this bucket while the empty bucket action is in progress, you might need to update your bucket policy to stop objects from being added to the bucket.

[Learn more](#)

- ⓘ** If your bucket contains a large number of objects, creating a lifecycle rule to delete all objects in the bucket might be a more efficient way of emptying your bucket. [Learn more](#)

[Go to lifecycle rule configuration](#)

- ⓘ** To use the console to delete objects from a bucket with Object Lock enabled, you must have `s3:BypassGovernanceRetention` permission. With this permission, specified objects with Object Lock governance mode applied will be deleted. [Learn more](#)

Permanently delete all objects in bucket "s3-data-protection"?

To confirm deletion, type *permanently delete* in the text input field.

[Cancel](#)[Empty](#)

- Next, you will be presented with a banner indicating if the deletion has been successful. Choose **Exit**.

Successfully emptied bucket "s3-data-protection"
View details below. If you want to delete this bucket, use the [delete bucket configuration](#).

Empty bucket: status																
<small>The details below are no longer available after you navigate away from this page.</small>																
Summary																
Source	Successfully deleted 1 object, 16.0 B	Failed to delete 0 objects														
Failed to delete <small>(0)</small>																
<table border="1"> <thead> <tr> <th>Name</th> <th>Prefix</th> <th>Version ID</th> <th>Type</th> <th>Last modified</th> <th>Size</th> <th>Error</th> </tr> </thead> <tbody> <tr> <td colspan="7">No failed object deletions</td> </tr> </tbody> </table>			Name	Prefix	Version ID	Type	Last modified	Size	Error	No failed object deletions						
Name	Prefix	Version ID	Type	Last modified	Size	Error										
No failed object deletions																

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6.2 – Delete test bucket

- Finally, you need to delete the test bucket you have created. Return to the list of buckets in your account. Select the radio button to the left of the bucket you created for this tutorial, and then choose **Delete**.

The screenshot shows the AWS S3 Buckets page. On the left, there's a sidebar with links like 'Buckets', 'Access Points', 'Object Lambda Access Points', 'Multi-Region Access Points', 'Batch Operations', 'Access analyzer for S3', 'Block Public Access settings for this account', 'Storage Lens', 'Dashboards', and 'AWS Organizations settings'. The main area has a header 'Account snapshot' with metrics: Total storage (187.8 GB), Object count (6.3 M), Avg. object size (31.3 KB). Below this is a table titled 'Buckets (35)'. A search bar shows 'Q s3-data'. The table columns are Name, AWS Region, Access, and Creation date. A row for 's3-data-protection' is selected, indicated by a red box around its radio button. To the right of the table are buttons for 'Copy ARN', 'Empty', 'Delete' (which is highlighted with a red box), and 'Create bucket'.

- Review the warning message. If you desire to continue deletion of this bucket, enter the bucket name into the **text input field** confirmation box and choose **Delete bucket**.

The screenshot shows the 'Delete bucket' dialog. At the top, it says 'Delete bucket [Info](#)'. Below that is a warning section with a red triangle icon:

- Deleting a bucket cannot be undone.
- Bucket names are unique. If you delete a bucket, another AWS user can use the name.

[Learn more](#)

Then it asks 'Delete bucket "s3-data-protection"?'. It says 'To confirm deletion, enter the name of the bucket in the text input field.' A text input field contains 's3-data-protection', which is highlighted with a red box. At the bottom are 'Cancel' and 'Delete bucket' buttons, the latter of which is also highlighted with a red box.

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Next steps

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