
Amazon S3 Glacier

Developer Guide

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Amazon S3 Glacier: Developer Guide

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What Is Amazon S3 Glacier?

Amazon S3 Glacier is a secure, durable, and extremely low-cost Amazon S3 storage class for data archiving and long-term backup.

With S3 Glacier, customers can store their data cost effectively for months, years, or even decades. S3 Glacier enables customers to offload the administrative burdens of operating and scaling storage to AWS, so they don't have to worry about capacity planning, hardware provisioning, data replication, hardware failure detection and recovery, or time-consuming hardware migrations. For more service highlights and pricing information, go to the [S3 Glacier detail page](#).

S3 Glacier is one of the many different storage classes for Amazon S3. For a general overview of Amazon S3 core concepts, such as buckets, access points, storage classes and objects, see [What is Amazon S3](#) in the *Amazon Simple Storage Service Developer Guide*.

Topics

- [Are You a First-Time S3 Glacier User? \(p. 1\)](#)
- [Amazon S3 Glacier Data Model \(p. 2\)](#)
- [Supported Operations in S3 Glacier \(p. 4\)](#)
- [Accessing Amazon S3 Glacier \(p. 5\)](#)

Are You a First-Time S3 Glacier User?

If you are a first-time user of S3 Glacier, we recommend that you begin by reading the following sections:

- **What is Amazon S3 Glacier**—The rest of this section describes the underlying data model, the operations it supports, and the AWS SDKs that you can use to interact with the service.
- **Getting Started**—The [Getting Started with Amazon S3 Glacier \(p. 7\)](#) section walks you through the process of creating a vault, uploading archives, creating jobs to download archives, retrieving the job output, and deleting archives.

Important

S3 Glacier provides a console, which you can use to create and delete vaults. However, all other interactions with S3 Glacier require that you use the AWS Command Line Interface (AWS CLI) or write code. For example, to upload data, such as photos, videos, and other documents, you must either use the AWS CLI or write code to make requests, by using either the REST API directly or by using the AWS SDKs. For more information about using S3 Glacier with the AWS CLI, go to [AWS CLI Reference for S3 Glacier](#). To install the AWS CLI, go to [AWS Command Line Interface](#).

Beyond the getting started section, you'll probably want to learn more about S3 Glacier operations. The following sections provide detailed information about working with S3 Glacier using the REST API and the AWS Software Development Kits (SDKs) for Java and Microsoft .NET:

- [Using the AWS SDKs with Amazon S3 Glacier \(p. 116\)](#)

This section provides an overview of the AWS SDKs used in various code examples in this guide. A review of this section will help when reading the following sections. It includes an overview of the high-level and the low-level APIs that these SDKs offer, when to use them, and common steps for running the code examples provided in this guide.

- [Working with Vaults in Amazon S3 Glacier \(p. 24\)](#)

This section provides details of various vault operations such as creating a vault, retrieving vault metadata, using jobs to retrieve vault inventory, and configuring vault notifications. In addition to using the S3 Glacier console, you can use the AWS SDKs for various vault operations. This section describes the API and provides working samples using the AWS SDK for Java and .NET.

- [Working with Archives in Amazon S3 Glacier \(p. 67\)](#)

This section provides details of archive operations such as uploading an archive in a single request or using a multipart upload operation to upload large archives in parts. The section also explains creating jobs to download archives asynchronously. The section provides examples using the AWS SDK for Java and .NET.

- [API Reference for Amazon S3 Glacier \(p. 160\)](#)

S3 Glacier is a RESTful service. This section describes the REST operations, including the syntax, and example requests and responses for all the operations. Note that the AWS SDK libraries wrap this API, simplifying your programming tasks.

Amazon Simple Storage Service (Amazon S3) supports lifecycle configuration on an S3 bucket, which enables you to transition objects to the S3 Glacier storage class for archival. When you transition Amazon S3 objects to the S3 Glacier storage class, Amazon S3 internally uses S3 Glacier for durable storage at lower cost. Although the objects are stored in S3 Glacier, they remain Amazon S3 objects that you manage in Amazon S3, and you cannot access them directly through S3 Glacier.

For more information about Amazon S3 lifecycle configuration and transitioning objects to the S3 Glacier storage class, see [Object Lifecycle Management](#) and [Transitioning Objects](#) in the *Amazon Simple Storage Service Developer Guide*.

Amazon S3 Glacier Data Model

The Amazon S3 Glacier (S3 Glacier) data model core concepts include vaults and archives. S3 Glacier is a REST-based web service. In terms of REST, vaults and archives are the resources. In addition, the S3 Glacier data model includes job and notification-configuration resources. These resources complement the core resources.

Topics

- [Vault \(p. 2\)](#)
- [Archive \(p. 3\)](#)
- [Job \(p. 3\)](#)
- [Notification Configuration \(p. 4\)](#)

Vault

In S3 Glacier, a vault is a container for storing archives. When you create a vault, you specify a name and choose an AWS Region where you want to create the vault.

Each vault resource has a unique address. The general form is:

```
https://<region-specific endpoint>/<account-id>/vaults/<vaultname>
```

For example, suppose that you create a vault (`examplevault`) in the US West (Oregon) Region. This vault can then be addressed by the following URI:

```
https://glacier.us-west-2.amazonaws.com/111122223333/vaults/examplevault
```

In the URI,

- `glacier.us-west-2.amazonaws.com` identifies the US West (Oregon) Region.
- `111122223333` is the AWS account ID that owns the vault.
- `vaults` refers to the collection of vaults owned by the AWS account.
- `examplevault` identifies a specific vault in the vaults collection.

An AWS account can create vaults in any supported AWS Region. For list of supported AWS Regions, see [Accessing Amazon S3 Glacier \(p. 5\)](#). Within a Region, an account must use unique vault names. An AWS account can create same-named vaults in different Regions.

You can store an unlimited number of archives in a vault. Depending on your business or application needs, you can store these archives in one vault or multiple vaults.

S3 Glacier supports various vault operations. Note that vault operations are Region specific. For example, when you create a vault, you create it in a specific Region. When you request a vault list, you request it from a specific AWS Region, and the resulting list only includes vaults created in that specific Region.

Archive

An archive can be any data such as a photo, video, or document and is a base unit of storage in S3 Glacier. Each archive has a unique ID and an optional description. Note that you can only specify the optional description during the upload of an archive. S3 Glacier assigns the archive an ID, which is unique in the AWS Region in which it is stored.

Each archive has a unique address. The general form is as follows:

```
https://<region-specific endpoint>/<account-id>/vaults/<vault-name>/archives/<archive-id>
```

The following is an example URI of an archive stored in the `examplevault` vault in the US West (Oregon) Region:

```
https://glacier.us-west-2.amazonaws.com/111122223333/vaults/  
examplevault/archives/NkbByEejwEggmBz2fTHgJrg0XBoDfjP4q6iu87-  
TjhgG6eGoOY9Z8i1_AUyUsuhPAdTqLHy8pTl5nFCFJmDl2yEZONi5L26Omw12vcs01MNGntHEQL8MBfGlqrEXAMPLEArchiveId
```

You can store an unlimited number of archives in a vault.

In addition, the S3 Glacier data model includes job and notification-configuration resources. These resources complement the core vault and archive resources.

Job

S3 Glacier jobs can perform a select query on an archive, retrieve an archive, or get an inventory of a vault. When performing a query on an archive, you initiate a job providing a SQL query and list of S3 Glacier archive objects. S3 Glacier Select runs the query in place and writes the output results to Amazon S3.

Retrieving an archive and vault inventory (list of archives) are asynchronous operations in S3 Glacier in which you first initiate a job, and then download the job output after S3 Glacier completes the job.

Note

S3 Glacier offers a cold storage data archival solution. If your application needs a storage solution that requires real-time data retrieval, you might consider using Amazon S3. For more information, see [Amazon Simple Storage Service \(Amazon S3\)](#).

To initiate a vault inventory job, you provide a vault name. Select and archive retrieval jobs require that both the vault name and the archive ID. You can also provide an optional job description to help identify the jobs.

Select, archive retrieval, and vault inventory jobs are associated with a vault. A vault can have multiple jobs in progress at any point in time. When you send a job request (initiate a job), S3 Glacier returns to you a job ID to track the job. Each job is uniquely identified by a URI of the form:

```
https://<region-specific endpoint>/<account-id>/vaults/<vault-name>/jobs/<job-id>
```

The following is an example of a job associated with an `examplevault` vault.

```
https://glacier.us-west-2.amazonaws.com/111122223333/vaults/examplevault/jobs/  
HkF9p6o7yjhFx-  
K3CGl6fuSm6VzW9T7esGQfco8nUXVYwS0jlb5gq1JZ55yHgt5vP54ZShjoQzQVVh7vEXAMPLEjobID
```

For each job, S3 Glacier maintains information such as job type, description, creation date, completion date, and job status. You can obtain information about a specific job or obtain a list of all your jobs associated with a vault. The list of jobs that S3 Glacier returns includes all the in-progress and recently finished jobs.

Notification Configuration

Because jobs take time to complete, S3 Glacier supports a notification mechanism to notify you when a job is complete. You can configure a vault to send notification to an Amazon Simple Notification Service (Amazon SNS) topic when jobs complete. You can specify one SNS topic per vault in the notification configuration.

S3 Glacier stores the notification configuration as a JSON document. The following is an example vault notification configuration:

```
{  
  "Topic": "arn:aws:sns:us-west-2:111122223333:mytopic",  
  "Events": ["ArchiveRetrievalCompleted", "InventoryRetrievalCompleted"]  
}
```

Note that notification configurations are associated with vaults; you can have one for each vault. Each notification configuration resource is uniquely identified by a URI of the form:

```
https://<region-specific endpoint>/<account-id>/vaults/<vault-name>/notification-  
configuration
```

S3 Glacier supports operations to set, get, and delete a notification configuration. When you delete a notification configuration, no notifications are sent when any data retrieval operation on the vault is complete.

Supported Operations in S3 Glacier

To work with vaults and archives (see [Amazon S3 Glacier Data Model \(p. 2\)](#)), Amazon S3 Glacier (S3 Glacier) supports a set of operations. Among all the supported operations, only the following operations are asynchronous:

- Retrieving an archive
- Retrieving a vault inventory (list of archives)

These operations require you to first initiate a job and then download the job output. The following sections summarize the S3 Glacier operations:

Vault Operations

S3 Glacier provides operations to create and delete vaults. You can obtain a vault description for a specific vault or for all vaults in an AWS Region. The vault description provides information such as creation date, number of archives in the vault, total size in bytes used by all the archives in the vault, and the date S3 Glacier generated the vault inventory. S3 Glacier also provides operations to set, retrieve, and delete a notification configuration on the vault. For more information, see [Working with Vaults in Amazon S3 Glacier](#) (p. 24).

Archive Operations

S3 Glacier provides operations for you to upload and delete archives. You cannot update an existing archive; you must delete the existing archive and upload a new archive. Note that each time you upload an archive, S3 Glacier generates a new archive ID. For more information, see [Working with Archives in Amazon S3 Glacier](#) (p. 67).

Jobs

You can initiate a S3 Glacier job to perform a select query on an archive, retrieve an archive, or get an inventory of a vault.

The following are the types of S3 Glacier jobs:

- `select`— Perform a select query on an archive.

For more information, see [Querying Archives with S3 Glacier Select](#) (p. 148).

- `archive-retrieval`— Retrieve an archive.

For more information, see [Downloading an Archive in Amazon S3 Glacier](#) (p. 83).

- `inventory-retrieval`— Inventory a vault.

For more information, see [Downloading a Vault Inventory in Amazon S3 Glacier](#) (p. 37).

Accessing Amazon S3 Glacier

Amazon S3 Glacier (S3 Glacier) is a RESTful web service that uses HTTP and HTTPS as a transport and JavaScript Object Notation (JSON) as a message serialization format. Your application code can make requests directly to the S3 Glacier web service API. When using the REST API directly, you must write the necessary code to sign and authenticate your requests. For more information about the API, see [API Reference for Amazon S3 Glacier](#) (p. 160).

Alternatively, you can simplify application development by using the AWS SDKs that wrap the S3 Glacier REST API calls. You provide your credentials, and these libraries take care of authentication and request signing. For more information about using the AWS SDKs, see [Using the AWS SDKs with Amazon S3 Glacier](#) (p. 116).

S3 Glacier also provides a console. You can use the console to create and delete vaults. However, all the archive and job operations require you to write code and make requests using either the REST API directly or the AWS SDK wrapper libraries. To access the S3 Glacier console, go to [S3 Glacier Console](#).

Regions and Endpoints

You create a vault in a specific AWS Region. You always send your S3 Glacier requests to an endpoint specific to an AWS Region. For a list of the AWS Regions supported by S3 Glacier, go to [Regions and Endpoints](#) in the *AWS General Reference*.

Getting Started with Amazon S3 Glacier

In Amazon S3 Glacier (S3 Glacier), a vault is a container for storing archives, and an archive is any object, such as a photo, video, or document that you store in a vault. An archive is the base unit of storage in S3 Glacier. This getting started exercise provides instructions for you to explore basic S3 Glacier operations on the vaults and archives resources described in the [Amazon S3 Glacier Data Model \(p. 2\)](#) section.

In the getting started exercise, you will create a vault, upload and download an archive, and finally delete the archive and the vault. You can do all these operations programmatically. However, the getting started exercise uses the S3 Glacier management console to create and delete a vault. For uploading and downloading an archive, this getting started section uses the AWS Software Development Kits (SDKs) for Java and .NET high-level API. The high-level API provides a simplified programming experience when working with S3 Glacier. For more information about these APIs, see [Using the AWS SDKs with Amazon S3 Glacier \(p. 116\)](#).

Important

S3 Glacier provides a management console. You can use the console to create and delete vaults as shown in this getting started exercise. However, all other interactions with S3 Glacier require that you use the AWS Command Line Interface (CLI) or write code. For example, to upload data, such as photos, videos, and other documents, you must either use the AWS CLI or write code to make requests, using either the REST API directly or by using the AWS SDKs. For more information about using S3 Glacier with the AWS CLI, go to [AWS CLI Reference for S3 Glacier](#). To install the AWS CLI, go to [AWS Command Line Interface](#).

This getting started exercise provides code examples in Java and C# for you to upload and download an archive. The last section of the getting started provides steps where you can learn more about the developer experience with S3 Glacier.

Topics

- [Step 1: Before You Begin with Amazon S3 Glacier \(p. 7\)](#)
- [Step 2: Create a Vault in Amazon S3 Glacier \(p. 11\)](#)
- [Step 3: Upload an Archive to a Vault in Amazon S3 Glacier \(p. 12\)](#)
- [Step 4: Download an Archive from a Vault in Amazon S3 Glacier \(p. 15\)](#)
- [Step 5: Delete an Archive from a Vault in Amazon S3 Glacier \(p. 18\)](#)
- [Step 6: Delete a Vault in Amazon S3 Glacier \(p. 22\)](#)
- [Where Do I Go From Here? \(p. 23\)](#)

Step 1: Before You Begin with Amazon S3 Glacier

Before you can start with this exercise, you must sign up for an AWS account (if you don't already have one), and then download one of the AWS Software Development Kits (SDKs). The following sections provide instructions.

Topics

- [Set Up an AWS Account and an Administrator User \(p. 8\)](#)
- [Download the Appropriate AWS SDK \(p. 10\)](#)

Important

Amazon S3 Glacier (S3 Glacier) provides a management console, which you can use to create and delete vaults. However, all other interactions with S3 Glacier require that you use the AWS Command Line Interface (CLI) or write code. For example, to upload data, such as photos, videos, and other documents, you must either use the AWS CLI or write code to make requests, using either the REST API directly or by using the AWS SDKs. For more information about using S3 Glacier with the AWS CLI, go to [AWS CLI Reference for S3 Glacier](#). To install the AWS CLI, go to [AWS Command Line Interface](#).

Set Up an AWS Account and an Administrator User

If you have not already done so, you need to sign up for an AWS account and create an administrator user in the account.

To complete the setup, follow the instructions in the following topics:

Set Up an AWS Account and Create an Administrator User

Sign up for AWS

When you sign up for Amazon Web Services (AWS), your AWS account is automatically signed up for all services in AWS, including S3 Glacier. You are charged only for the services that you use. For more information about S3 Glacier usage rates, see the [Amazon S3 Glacier product page](#).

If you already have an AWS account and you have created an IAM user for the account, skip to the next task. If you don't have an AWS account, use the following procedure to create one.

To create an AWS account

1. Open <https://portal.aws.amazon.com/billing/signup>.
2. Follow the online instructions.

Part of the sign-up procedure involves receiving a phone call and entering a verification code on the phone keypad.

Note your AWS account ID, because you'll need it for the next step.

Create an IAM User

Services in AWS, such as S3 Glacier, require that you provide credentials when you access them, so that the service can determine whether you have permissions to access the resources owned by that service. The console requires your password. You can create access keys for your AWS account to access the AWS CLI or API. However, we don't recommend that you access AWS using the credentials for your AWS account. Instead, we recommend that you use AWS Identity and Access Management (IAM). Create an IAM user, add the user to an IAM group with administrative permissions, and then grant administrative permissions to the IAM user that you created. You can then access AWS using a special URL and that IAM user's credentials.

If you signed up for AWS, but you haven't created an IAM user for yourself, you can create one using the IAM console.

The Getting Started examples in this guide assume you have a user with administrator privileges.

To create an administrator user for yourself and add the user to an administrators group (console)

1. Sign in to the [IAM console](#) as the account owner by choosing **Root user** and entering your AWS account email address. On the next page, enter your password.

Note

We strongly recommend that you adhere to the best practice of using the **Administrator** IAM user below and securely lock away the root user credentials. Sign in as the root user only to perform a few [account and service management tasks](#).

2. In the navigation pane, choose **Users** and then choose **Add user**.
3. For **User name**, enter **Administrator**.
4. Select the check box next to **AWS Management Console access**. Then select **Custom password**, and then enter your new password in the text box.
5. (Optional) By default, AWS requires the new user to create a new password when first signing in. You can clear the check box next to **User must create a new password at next sign-in** to allow the new user to reset their password after they sign in.
6. Choose **Next: Permissions**.
7. Under **Set permissions**, choose **Add user to group**.
8. Choose **Create group**.
9. In the **Create group** dialog box, for **Group name** enter **Administrators**.
10. Choose **Filter policies**, and then select **AWS managed -job function** to filter the table contents.
11. In the policy list, select the check box for **AdministratorAccess**. Then choose **Create group**.

Note

You must activate IAM user and role access to Billing before you can use the **AdministratorAccess** permissions to access the AWS Billing and Cost Management console. To do this, follow the instructions in [step 1 of the tutorial about delegating access to the billing console](#).

12. Back in the list of groups, select the check box for your new group. Choose **Refresh** if necessary to see the group in the list.
13. Choose **Next: Tags**.
14. (Optional) Add metadata to the user by attaching tags as key-value pairs. For more information about using tags in IAM, see [Tagging IAM Entities](#) in the *IAM User Guide*.
15. Choose **Next: Review** to see the list of group memberships to be added to the new user. When you are ready to proceed, choose **Create user**.

You can use this same process to create more groups and users and to give your users access to your AWS account resources. To learn about using policies that restrict user permissions to specific AWS resources, see [Access Management](#) and [Example Policies](#).

To sign in as the new IAM user

1. Sign out of the AWS Management Console.
2. Use the following URL format to log in to the console:

```
https://aws_account_number.signin.aws.amazon.com/console/
```

The **aws_account_number** is your AWS account ID without hyphen. For example, if your AWS account ID is 1234-5678-9012, your AWS account number is 123456789012. For information about how to find your account number, see [Your AWS Account ID and Its Alias](#) in the *IAM User Guide*.

3. Enter the IAM user name and password that you just created. When you're signed in, the navigation bar displays **your_user_name @ your_aws_account_id**.

If you don't want the URL for your sign-in page to contain your AWS account ID, you can create an account alias.

To create or remove an account alias

1. Sign in to the AWS Management Console and open the IAM console at <https://console.aws.amazon.com/iam/>.
2. On the navigation pane, choose **Dashboard**.
3. Find the IAM users sign-in link.
4. To create the alias, click **Customize**, enter the name you want to use for your alias, and then choose **Yes, Create**.
5. To remove the alias, choose **Customize**, and then choose **Yes, Delete**. The sign-in URL reverts to using your AWS account ID.

To sign in after you create an account alias, use the following URL:

```
https://your_account_alias.signin.aws.amazon.com/console/
```

To verify the sign-in link for IAM users for your account, open the IAM console and check under **IAM users sign-in link** on the dashboard.

For more information about IAM, see the following:

- [AWS Identity and Access Management \(IAM\)](#)
- [Getting Started](#)
- [IAM User Guide](#)

For information about using IAM with S3 Glacier, see [Identity and Access Management in Amazon S3 Glacier](#) (p. 125).

Download the Appropriate AWS SDK

To try the getting started exercise, you must decide which programming language you want to use and download the appropriate AWS SDK for your development platform.

The getting started exercise provides examples in Java and C#.

Downloading the AWS SDK for Java

To test the Java examples in this developer guide, you need the AWS SDK for Java. You have the following download options:

- If you are using Eclipse, you can download and install the AWS Toolkit for Eclipse using the update site <http://aws.amazon.com/eclipse/>. For more information, go to [AWS Toolkit for Eclipse](#).
- If you are using any other IDE to create your application, download the [AWS SDK for Java](#).

Downloading the AWS SDK for .NET

To test the C# examples in this developer guide, you need the AWS SDK for .NET. You have the following download options:

- If you are using Visual Studio, you can install both the AWS SDK for .NET and the AWS Toolkit for Visual Studio. The toolkit provides AWS Explorer for Visual Studio and project templates that you can use for development. To download the AWS SDK for .NET go to <http://aws.amazon.com/sdkfornet>.

By default, the installation script installs both the AWS SDK and the AWS Toolkit for Visual Studio. To learn more about the toolkit, go to [AWS Toolkit for Visual Studio User Guide](#).

- If you are using any other IDE to create your application, you can use the same link provided in the preceding step and install only the AWS SDK for .NET.

Step 2: Create a Vault in Amazon S3 Glacier

A vault is a container for storing archives. Your first step is to create a vault in one of the supported AWS Regions. In this getting started exercise, you create a vault in the US West (Oregon) Region. For a list of the AWS Regions supported by Amazon S3 Glacier (S3 Glacier), go to [Regions and Endpoints](#) in the *AWS General Reference*.

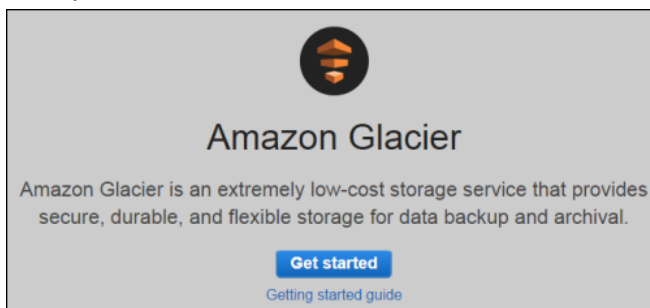
You can create vaults programmatically or by using the S3 Glacier console. This section uses the console to create a vault. In a later step, you will upload an archive to the vault.

To create a vault

1. Sign into the AWS Management Console and open the S3 Glacier console at <https://console.aws.amazon.com/glacier/>.
2. Select an AWS Region from the Region selector.

In this getting started exercise, we use the US West (Oregon) Region.

3. If you are using S3 Glacier for the first time, click **Get started**. (Otherwise, you would click **Create Vault**.)



4. Enter **examplevault** as the vault name in the **Vault Name** field and then click **Next Step**.

There are guidelines for naming a vault. For more information, see [Creating a Vault in Amazon S3 Glacier](#) (p. 25).

A screenshot of the 'Welcome to Amazon Glacier' console screen. The title 'Welcome to Amazon Glacier' is at the top. Below it, there is a paragraph of text explaining that data is stored in 'archives' and can be uploaded as a single file or multiple files. Another paragraph states that a single archive can be as large as 40 terabytes and that vaults allow organizing archives and setting policies. At the bottom, there are two input fields: 'Region*' with the value 'us-west-2' and 'Vault Name*' with the value 'examplevault'. To the right of the 'Region*' field is an information icon. At the bottom right, there are two buttons: 'Cancel' and 'Next Step'.

5. Select **Do not enable notifications**. For this getting started exercise, you will not configure notifications for the vault.

If you wanted to have notifications sent to you or your application whenever certain S3 Glacier jobs complete, you would select **Enable notifications and create a new SNS topic** or **Enable notifications and use an existing SNS topic** to set up Amazon Simple Notification Service (Amazon SNS) notifications. In subsequent steps, you upload an archive and then download it using the high-level API of the AWS SDK. Using the high-level API does not require that you configure vault notification to retrieve your data.

Set Event Notifications

You can choose to have notifications sent to you or your application whenever certain Amazon Glacier jobs complete. Notifications are sent using the Amazon Simple Notifications Service (SNS). To use Amazon SNS, you first need to specify a topic that applications or people can subscribe to. You can then select specific jobs that, on completion, will trigger the notifications. Notifications can be delivered over the protocol of your choice (HTTP, email, etc.).

☒ **Do not enable notifications**
You can enable, set up, and change your notification settings later.

☐ **Enable notifications and create a new SNS topic**
Enable notifications and create a new Amazon SNS topic to send the notifications.

☐ **Enable notifications and use an existing SNS topic**
Enable notifications and enter an existing SNS topic to send the notifications.

Cancel Previous Next Step

6. If the AWS Region and vault name are correct, then click **Submit**.

Review

Make sure the following information is correct before you choose **Submit**. To go back and make changes, choose **Previous**.

Region us-west-2

Vault Name examplevault

Cancel Previous Submit

7. Your new vault is listed on the **S3 Glacier Vaults** page.

Name 1/2	Inventory Last Updated	Size (as of last inventory)	# of Archives (as of last inventory)
examplevault	Not updated yet	--	--

Step 3: Upload an Archive to a Vault in Amazon S3 Glacier

In this step, you'll upload a sample archive to the vault you created in the preceding step (see [Step 2: Create a Vault in Amazon S3 Glacier \(p. 11\)](#)). Depending on the development platform you are using, click one of the links at the end of this section.

Important

Any archive operation, such as upload, download, or deletion, requires that you use the AWS Command Line Interface (CLI) or write code. There is no console support for archive operations.

For example, to upload data, such as photos, videos, and other documents, you must either use the AWS CLI or write code to make requests, using either the REST API directly or by using the AWS SDKs. To install the AWS CLI, see [AWS Command Line Interface](#). For more information about using Amazon S3 Glacier (S3 Glacier) with the AWS CLI, see [AWS CLI Reference for S3 Glacier](#). For examples of using the AWS CLI to upload archives to S3 Glacier, see [Using S3 Glacier with the AWS Command Line Interface](#).

An archive is any object, such as a photo, video, or document that you store in a vault. It is a base unit of storage in S3 Glacier. You can upload an archive in a single request. For large archives, S3 Glacier provides a multipart upload API that enables you to upload an archive in parts. In this getting started section, you upload a sample archive in a single request. For this exercise, you specify a file that is smaller in size. For larger files, multipart upload is suitable. For more information, see [Uploading Large Archives in Parts \(Multipart Upload\)](#) (p. 75).

Topics

- [Upload an Archive to a Vault in Amazon S3 Glacier Using the AWS SDK for Java](#) (p. 13)
- [Upload an Archive to a Vault in Amazon S3 Glacier Using the AWS SDK for .NET](#) (p. 14)

Upload an Archive to a Vault in Amazon S3 Glacier Using the AWS SDK for Java

The following Java code example uses the high-level API of the AWS SDK for Java to upload a sample archive to the vault. In the code example, note the following:

- The example creates an instance of the `AmazonGlacierClient` class.
- The example uses the `upload` method of the `ArchiveTransferManager` class from the high-level API of the AWS SDK for Java.
- The example uses the US West (Oregon) Region (`us-west-2`) to match the location where you created the vault previously in [Step 2: Create a Vault in Amazon S3 Glacier](#) (p. 11).

For step-by-step instructions on how to run this example, see [Running Java Examples for Amazon S3 Glacier Using Eclipse](#) (p. 119). You need to update the code as shown with the name of the archive file you want to upload.

Note

Amazon S3 Glacier (S3 Glacier) keeps an inventory of all the archives in your vaults. When you upload the archive in the following example, it will not appear in a vault in the management console until the vault inventory has been updated. This update usually happens once a day.

Example — Uploading an Archive Using the AWS SDK for Java

```
import java.io.File;
import java.io.IOException;
import java.util.Date;

import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.glacier.AmazonGlacierClient;
import com.amazonaws.services.glacier.transfer.ArchiveTransferManager;
import com.amazonaws.services.glacier.transfer.UploadResult;

public class AmazonGlacierUploadArchive_GettingStarted {

    public static String vaultName = "examplevault2";
    public static String archiveToUpload = "*** provide name of file to upload ***";
```

```
public static AmazonGlacierClient client;

public static void main(String[] args) throws IOException {

    ProfileCredentialsProvider credentials = new ProfileCredentialsProvider();
    client = new AmazonGlacierClient(credentials);
    client.SetEndpoint("https://glacier.us-west-2.amazonaws.com/");

    try {
        ArchiveTransferManager atm = new ArchiveTransferManager(client, credentials);

        UploadResult result = atm.Upload(vaultName, "my archive " + (new Date()), new
        File(archiveToUpload));
        System.out.println("Archive ID: " + result.GetArchiveId());

    } catch (Exception e)
    {
        System.err.println(e);
    }
}
```

Upload an Archive to a Vault in Amazon S3 Glacier Using the AWS SDK for .NET

The following C# code example uses the high-level API of the AWS SDK for .NET to upload a sample archive to the vault. In the code example, note the following:

- The example creates an instance of the `ArchiveTransferManager` class for the specified Amazon S3 Glacier (S3 Glacier) Region endpoint.
- The code example uses the US West (Oregon) Region (`us-west-2`) to match the location where you created the vault previously in [Step 2: Create a Vault in Amazon S3 Glacier \(p. 11\)](#).
- The example uses the `Upload` method of the `ArchiveTransferManager` class to upload your archive. For small archives, this method uploads the archive directly to S3 Glacier. For larger archives, this method uses the multipart upload API in S3 Glacier to split the upload into multiple parts for better error recovery, if any errors are encountered while streaming the data to S3 Glacier.

For step-by-step instructions on how to run the following example, see [Running Code Examples \(p. 121\)](#). You need to update the code as shown with the name of your vault and the name of the archive file to upload.

Note

S3 Glacier keeps an inventory of all the archives in your vaults. When you upload the archive in the following example, it will not appear in a vault in the management console until the vault inventory has been updated. This update usually happens once a day.

Example — Uploading an Archive Using the High-Level API of the AWS SDK for .NET

```
using System;
using Amazon.Glacier;
using Amazon.Glacier.Transfer;
using Amazon.Runtime;

namespace glacier.amazon.com.docsamples
{
    class ArchiveUploadHighLevel_GettingStarted
    {
        static string vaultName = "examplevault";
    }
}
```

```
static string archiveToUpload = "**** Provide file name (with full path) to upload
****";

public static void Main(string[] args)
{
    try
    {
        var manager = new ArchiveTransferManager(Amazon.RegionEndpoint.USSouth1);
        // Upload an archive.
        string archiveId = manager.Upload(vaultName, "getting started archive
test", archiveToUpload).ArchiveId;
        Console.WriteLine("Copy and save the following Archive ID for the next
step.");

        Console.WriteLine("Archive ID: {0}", archiveId);
        Console.WriteLine("To continue, press Enter");
        Console.ReadKey();
    }
    catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
    catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
    catch (Exception e) { Console.WriteLine(e.Message); }
    Console.WriteLine("To continue, press Enter");
    Console.ReadKey();
}
}
```

Step 4: Download an Archive from a Vault in Amazon S3 Glacier

In this step, you'll download the sample archive you uploaded previously in [Step 3: Upload an Archive to a Vault in Amazon S3 Glacier \(p. 12\)](#).

Important

Any archive operation, such as upload, download, or deletion, requires that you use the AWS Command Line Interface (AWS CLI) or write code. There is no console support for archive operations. For example, to upload data, such as photos, videos, and other documents, you must either use the AWS CLI or write code to make requests, using either the REST API directly or the AWS SDKs. For more information about using Amazon S3 Glacier (S3 Glacier) with the AWS CLI, see [AWS CLI Reference for S3 Glacier](#). To install the AWS CLI, see [AWS Command Line Interface](#).

In general, retrieving your data from S3 Glacier is a two-step process:

1. Initiate a retrieval job.
2. After the job completes, download the bytes of data.

To retrieve an archive from S3 Glacier, you first initiate a job. After the job completes, you download the data. For more information about archive retrievals, see [Retrieving S3 Glacier Archives \(p. 83\)](#).

The access time of your request depends on the retrieval option you choose: Expedited, Standard, or Bulk retrievals. For all but the largest archives (250 MB+), data accessed using Expedited retrievals are typically made available within 1–5 minutes. Archives retrieved using Standard retrievals typically complete between 3–5 hours. Bulk retrievals typically complete within 5–12 hours. For more information about the retrieval options, see the [S3 Glacier FAQ](#). For information about data retrieval charges, see the [S3 Glacier detail page](#).

The code examples shown in the following topics initiate the job, wait for it to complete, and then download the archive's data.

Topics

- [Download an Archive from a Vault in Amazon S3 Glacier Using the AWS SDK for Java \(p. 16\)](#)
- [Download an Archive from a Vault in Amazon S3 Glacier Using the AWS SDK for .NET \(p. 17\)](#)

Download an Archive from a Vault in Amazon S3 Glacier Using the AWS SDK for Java

The following Java code example uses the high-level API of the AWS SDK for Java to download the archive you uploaded in the previous step. In the code example, note the following:

- The example creates an instance of the `AmazonGlacierClient` class.
- The code uses the US West (Oregon) Region (`us-west-2`) to match the location where you created the vault in [Step 2: Create a Vault in Amazon S3 Glacier \(p. 11\)](#).
- The example uses the download method of the `ArchiveTransferManager` class from the high-level API of the AWS SDK for Java. The example creates an Amazon SNS topic, and an Amazon Simple Queue Service queue that is subscribed to that topic. If you created an IAM administrative user as instructed in [Step 1: Before You Begin with Amazon S3 Glacier \(p. 7\)](#) your user has the necessary IAM permissions for the creation and use of the Amazon SNS topic and Amazon SQS queue.

For step-by-step instructions on how to run this example, see [Running Java Examples for Amazon S3 Glacier Using Eclipse \(p. 119\)](#). You need to update the code as shown with the archive ID of the file you uploaded in [Step 3: Upload an Archive to a Vault in Amazon S3 Glacier \(p. 12\)](#).

Example — Downloading an Archive Using the AWS SDK for Java

```
import java.io.File;
import java.io.IOException;

import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.glacier.AmazonGlacierClient;
import com.amazonaws.services.glacier.transfer.ArchiveTransferManager;
import com.amazonaws.services.sns.AmazonSNSClient;
import com.amazonaws.services.sqs.AmazonSQSClient;

public class AmazonGlacierDownloadArchive_GettingStarted {
    public static String vaultName = "examplevault";
    public static String archiveId = "*** provide archive ID ***";
    public static String downloadFilePath = "*** provide location to download archive ***";

    public static AmazonGlacierClient glacierClient;
    public static AmazonSQSClient sqsClient;
    public static AmazonSNSClient snsClient;

    public static void main(String[] args) throws IOException {

        ProfileCredentialsProvider credentials = new ProfileCredentialsProvider();

        glacierClient = new AmazonGlacierClient(credentials);
        sqsClient = new AmazonSQSClient(credentials);
        snsClient = new AmazonSNSClient(credentials);

        glacierClient.setEndpoint("glacier.us-west-2.amazonaws.com");
        sqsClient.setEndpoint("sqs.us-west-2.amazonaws.com");
        snsClient.setEndpoint("sns.us-west-2.amazonaws.com");
```

```
        try {  
            ArchiveTransferManager atm = new ArchiveTransferManager(glacierClient,  
sqsClient, snsClient);  
  
            atm.download(vaultName, archiveId, new File(downloadFilePath));  
  
        } catch (Exception e)  
        {  
            System.err.println(e);  
        }  
    }  
}
```

Download an Archive from a Vault in Amazon S3 Glacier Using the AWS SDK for .NET

The following C# code example uses the high-level API of the AWS SDK for .NET to download the archive you uploaded previously in [Upload an Archive to a Vault in Amazon S3 Glacier Using the AWS SDK for .NET](#) (p. 14). In the code example, note the following:

- The example creates an instance of the `ArchiveTransferManager` class for the specified Amazon S3 Glacier (S3 Glacier) Region endpoint.
- The code example uses the US West (Oregon) Region (`us-west-2`) to match the location where you created the vault previously in [Step 2: Create a Vault in Amazon S3 Glacier](#) (p. 11).
- The example uses the `Download` method of the `ArchiveTransferManager` class to download your archive. The example creates an Amazon SNS topic, and an Amazon Simple Queue Service queue that is subscribed to that topic. If you created an IAM administrative user as instructed in [Step 1: Before You Begin with Amazon S3 Glacier](#) (p. 7) your user has the necessary IAM permissions for the creation and use of the Amazon SNS topic and Amazon SQS queue.
- The example then initiates the archive retrieval job and polls the queue for the archive to be available. When the archive is available, download begins. For information about retrieval times, see [Archive Retrieval Options](#) (p. 84)

For step-by-step instructions on how to run this example, see [Running Code Examples](#) (p. 121). You need to update the code as shown with the archive ID of the file you uploaded in [Step 3: Upload an Archive to a Vault in Amazon S3 Glacier](#) (p. 12).

Example — Download an Archive Using the High-Level API of the AWS SDK for .NET

```
using System;  
using Amazon.Glacier;  
using Amazon.Glacier.Transfer;  
using Amazon.Runtime;  
  
namespace glacier.amazon.com.docsamples  
{  
    class ArchiveDownloadHighLevel_GettingStarted  
    {  
        static string vaultName = "examplevault";  
        static string archiveId = "**** Provide archive ID ****";  
        static string downloadFilePath = "**** Provide the file name and path to where to  
store the download ****";  
  
        public static void Main(string[] args)  
        {  
            try  
            {
```



```
        var manager = new ArchiveTransferManager(Amazon.RegionEndpoint.USSouth2);

        var options = new DownloadOptions();
        options.StreamTransferProgress +=
ArchiveDownloadHighLevel_GettingStarted.progress;
        // Download an archive.
        Console.WriteLine("Initiating the archive retrieval job and then polling SQS
queue for the archive to be available.");
        Console.WriteLine("Once the archive is available, downloading will
begin.");
        manager.Download(vaultName, archiveId, downloadFilePath, options);
        Console.WriteLine("To continue, press Enter");
        Console.ReadKey();
    }
    catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
    catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
    catch (Exception e) { Console.WriteLine(e.Message); }
    Console.WriteLine("To continue, press Enter");
    Console.ReadKey();
}

static int currentPercentage = -1;
static void progress(object sender, StreamTransferProgressArgs args)
{
    if (args.PercentDone != currentPercentage)
    {
        currentPercentage = args.PercentDone;
        Console.WriteLine("Downloaded {0}%", args.PercentDone);
    }
}
}
```

Step 5: Delete an Archive from a Vault in Amazon S3 Glacier

In this step, you'll delete the sample archive you uploaded in [Step 3: Upload an Archive to a Vault in Amazon S3 Glacier \(p. 12\)](#).

Important

You cannot delete an archive using the Amazon S3 Glacier (S3 Glacier) console. Any archive operation, such as upload, download, or deletion, requires that you use the AWS Command Line Interface (CLI) or write code. To upload data, such as photos, videos, and other documents, you must either use the AWS CLI or write code to make requests, using either the REST API directly or by using the AWS SDKs.

Delete the sample archive by following one of these SDKs or the AWS CLI:

- [Delete an Archive from a Vault in Amazon S3 Glacier Using the AWS SDK for Java \(p. 19\)](#)
- [Delete an Archive from a Vault in Amazon S3 Glacier Using the AWS SDK for .NET \(p. 20\)](#)
- [Deleting an Archive in Amazon S3 Glacier Using the AWS Command Line Interface \(p. 20\)](#)

Related Sections

- [Step 3: Upload an Archive to a Vault in Amazon S3 Glacier \(p. 12\)](#)
- [Deleting an Archive in Amazon S3 Glacier \(p. 109\)](#)

Delete an Archive from a Vault in Amazon S3 Glacier Using the AWS SDK for Java

The following code example uses the AWS SDK for Java to delete the archive. In the code, note the following:

- The `DeleteArchiveRequest` object describes the delete request, including the vault name where the archive is located and the archive ID.
- The `deleteArchive` method sends the request to Amazon S3 Glacier (S3 Glacier) to delete the archive.
- The example uses the US West (Oregon) Region (`us-west-2`) to match the location where you created the vault in [Step 2: Create a Vault in Amazon S3 Glacier \(p. 11\)](#).

For step-by-step instructions on how to run this example, see [Running Java Examples for Amazon S3 Glacier Using Eclipse \(p. 119\)](#). You need to update the code as shown with the archive ID of the file you uploaded in [Step 3: Upload an Archive to a Vault in Amazon S3 Glacier \(p. 12\)](#).

Example — Deleting an Archive Using the AWS SDK for Java

```
import java.io.IOException;

import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.glacier.AmazonGlacierClient;
import com.amazonaws.services.glacier.model.DeleteArchiveRequest;

public class AmazonGlacierDeleteArchive_GettingStarted {

    public static String vaultName = "examplevault";
    public static String archiveId = "**** provide archive ID****";
    public static AmazonGlacierClient client;

    public static void main(String[] args) throws IOException {

        ProfileCredentialsProvider credentials = new ProfileCredentialsProvider();

        client = new AmazonGlacierClient(credentials);
        client.setEndpoint("https://glacier.us-west-2.amazonaws.com/");

        try {

            // Delete the archive.
            client.deleteArchive(new DeleteArchiveRequest()
                .withVaultName(vaultName)
                .withArchiveId(archiveId));

            System.out.println("Deleted archive successfully.");

        } catch (Exception e) {
            System.err.println("Archive not deleted.");
            System.err.println(e);
        }

    }
}
```

Delete an Archive from a Vault in Amazon S3 Glacier Using the AWS SDK for .NET

The following C# code example uses the high-level API of the AWS SDK for .NET to delete the archive you uploaded in the previous step. In the code example, note the following:

- The example creates an instance of the `ArchiveTransferManager` class for the specified Amazon S3 Glacier (S3 Glacier) Region endpoint.
- The code example uses the US West (Oregon) Region (`us-west-2`) to match the location where you created the vault previously in [Step 2: Create a Vault in Amazon S3 Glacier \(p. 11\)](#).
- The example uses the `Delete` method of the `ArchiveTransferManager` class provided as part of the high-level API of the AWS SDK for .NET.

For step-by-step instructions on how to run this example, see [Running Code Examples \(p. 121\)](#). You need to update the code as shown with the archive ID of the file you uploaded in [Step 3: Upload an Archive to a Vault in Amazon S3 Glacier \(p. 12\)](#).

Example — Deleting an Archive Using the High-Level API of the AWS SDK for .NET

```
using System;
using Amazon.Glacier;
using Amazon.Glacier.Transfer;
using Amazon.Runtime;

namespace glacier.amazon.com.docsamples
{
    class ArchiveDeleteHighLevel_GettingStarted
    {
        static string vaultName = "examplevault";
        static string archiveId = "**** Provide archive ID ****";

        public static void Main(string[] args)
        {
            try
            {
                var manager = new ArchiveTransferManager(Amazon.RegionEndpoint.USSouth1);
                manager.DeleteArchive(vaultName, archiveId);
            }
            catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
            catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
            catch (Exception e) { Console.WriteLine(e.Message); }
            Console.WriteLine("To continue, press Enter");
            Console.ReadKey();
        }
    }
}
```

Deleting an Archive in Amazon S3 Glacier Using the AWS Command Line Interface

You can delete archives in Amazon S3 Glacier (S3 Glacier) using the AWS Command Line Interface (AWS CLI).

Topics

- [\(Prerequisite\) Setting Up the AWS CLI \(p. 21\)](#)

- [Example: Deleting an Archive Using the AWS CLI \(p. 21\)](#)

(Prerequisite) Setting Up the AWS CLI

1. Download and configure the AWS CLI. For instructions, see the following topics in the *AWS Command Line Interface User Guide*.

[Installing the AWS Command Line Interface](#)

[Configuring the AWS Command Line Interface](#)

2. Verify the setup by entering the following commands at the command prompt. These commands don't provide credentials explicitly, so the credentials of the default profile are used.

- Try using the help command.

```
aws help
```

- Use `aws s3 ls` to get a list of buckets on the configured account.

```
aws s3 ls
```

- Use `aws configure list` to see the current configuration data.

```
aws configure list
```

Example: Deleting an Archive Using the AWS CLI

1. Use the `initiate-job` command to start an inventory retrieval job.

```
aws glacier initiate-job --vault-name awsexamplevault --account-id 111122223333 --job-parameters '{"Type": "inventory-retrieval"}'
```

Expected output:

```
{
  "location": "/111122223333/vaults/awsexamplevault/jobs/*** jobid ***",
  "jobId": "*** jobid ***"
}
```

2. Use the `describe-job` command to check status of the previous retrieval job.

```
aws glacier describe-job --vault-name awsexamplevault --account-id 111122223333 --job-id *** jobid ***
```

Expected output:

```
{
  "InventoryRetrievalParameters": {
    "Format": "JSON"
  },
  "VaultARN": "*** vault arn ***",
}
```

```
"Completed": false,
"JobId": "*** jobid ***",
"Action": "InventoryRetrieval",
"CreationDate": "*** job creation date ***",
"StatusCode": "InProgress"
}
```

3. Wait for the job to complete.

You must wait until the job output is ready for you to download. If you set a notification configuration on the vault or specified an Amazon Simple Notification Service (Amazon SNS) topic when you initiated the job, S3 Glacier sends a message to the topic after it completes the job.

You can set notification configuration for specific events on the vault. For more information, see [Configuring Vault Notifications in Amazon S3 Glacier \(p. 51\)](#). S3 Glacier sends a message to the specified SNS topic anytime the specific event occurs.

4. When it's complete, use the `get-job-output` command to download the retrieval job to the file `output.json`.

```
aws glacier get-job-output --vault-name awsexamplevault --account-id 111122223333 --
job-id *** jobid *** output.json
```

This command produces a file with the following fields.

```
{
  "VaultARN": "arn:aws:glacier:region:111122223333:vaults/awsexamplevault",
  "InventoryDate": "*** job completion date ***",
  "ArchiveList": [
    {
      "ArchiveId": "*** archiveid ***",
      "ArchiveDescription": "*** archive description (if set) ***",
      "CreationDate": "*** archive creation date ***",
      "Size": "*** archive size (in bytes) ***",
      "SHA256TreeHash": "*** archive hash ***"
    }
  ]
}
```

5. Use the `delete-archive` command to delete each archive from a vault until none remain.

```
aws glacier delete-archive --vault-name awsexamplevault --account-id 111122223333 --
archive-id *** archiveid ***
```

Step 6: Delete a Vault in Amazon S3 Glacier

A vault is a container for storing archives. To delete an Amazon S3 Glacier (S3 Glacier) vault you must first delete all existing archives in the vault as of the last inventory that S3 Glacier computed.

You can delete a vault programmatically or by using the S3 Glacier console. For information about deleting a vault programmatically, see [Deleting a Vault in Amazon S3 Glacier \(p. 59\)](#).

To delete an empty vault

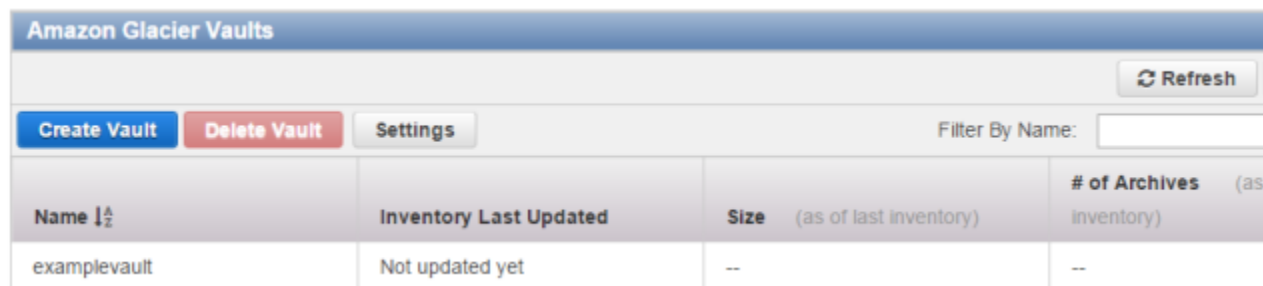
1. Sign into the AWS Management Console and open the S3 Glacier console at <https://console.aws.amazon.com/glacier/>.

2. From the AWS Region selector, select the AWS Region where the vault exists that you want to delete.

In this getting started exercise, we use the US West (Oregon) Region.

3. Select the empty vault that you want to delete. If the vault is not empty you must delete all archives before deleting the vault, see [Deleting an Archive in Amazon S3 Glacier \(p. 109\)](#)

In this getting started exercise, we've been using a vault named **examplevault**.



The screenshot shows the 'Amazon Glacier Vaults' console. At the top, there's a header 'Amazon Glacier Vaults' and a 'Refresh' button. Below the header, there are three buttons: 'Create Vault' (blue), 'Delete Vault' (red), and 'Settings' (grey). To the right of these buttons is a 'Filter By Name:' input field. Below the buttons is a table with four columns: 'Name', 'Inventory Last Updated', 'Size (as of last inventory)', and '# of Archives (as of last inventory)'. The table contains one row with the vault name 'examplevault', 'Not updated yet', '--', and '--'.

Name	Inventory Last Updated	Size (as of last inventory)	# of Archives (as of last inventory)
examplevault	Not updated yet	--	--

4. Click **Delete Vault**.

To delete a nonempty vault

- If deleting a nonempty vault you must first delete all existing archives before deleting the vault. This can be done by writing code to make a delete archive request using either the REST API, the AWS SDK for Java, the AWS SDK for .NET or by using the AWS CLI. For information about deleting archives, see [Step 5: Delete an Archive from a Vault in Amazon S3 Glacier \(p. 18\)](#)

Where Do I Go From Here?

Now that you have tried the getting started exercise, you can explore the following sections to learn more about Amazon S3 Glacier (S3 Glacier).

- [Working with Vaults in Amazon S3 Glacier \(p. 24\)](#)
- [Working with Archives in Amazon S3 Glacier \(p. 67\)](#)

Working with Vaults in Amazon S3 Glacier

A vault is a container for storing archives. When you create a vault, you specify a vault name and the AWS Region in which you want to create the vault. For a list of supported AWS Regions, see [Accessing Amazon S3 Glacier \(p. 5\)](#).

You can store an unlimited number of archives in a vault.

Important

Amazon S3 Glacier (S3 Glacier) provides a management console. You can use the console to create and delete vaults. However, all other interactions with S3 Glacier require that you use the AWS Command Line Interface (CLI) or write code. For example, to upload data, such as photos, videos, and other documents, you must either use the AWS CLI or write code to make requests, using either the REST API directly or by using the AWS SDKs. For more information about using S3 Glacier with the AWS CLI, go to [AWS CLI Reference for S3 Glacier](#). To install the AWS CLI, go to [AWS Command Line Interface](#).

Topics

- [Vault Operations in S3 Glacier \(p. 24\)](#)
- [Creating a Vault in Amazon S3 Glacier \(p. 25\)](#)
- [Retrieving Vault Metadata in Amazon S3 Glacier \(p. 33\)](#)
- [Downloading a Vault Inventory in Amazon S3 Glacier \(p. 37\)](#)
- [Configuring Vault Notifications in Amazon S3 Glacier \(p. 51\)](#)
- [Deleting a Vault in Amazon S3 Glacier \(p. 59\)](#)
- [Tagging Your Amazon S3 Glacier Vaults \(p. 64\)](#)
- [Amazon S3 Glacier Vault Lock \(p. 65\)](#)

Vault Operations in S3 Glacier

S3 Glacier supports various vault operations. Vault operations are specific to particular AWS Regions. In other words, when you create a vault, you create it in a specific AWS Region. When you list vaults, S3 Glacier returns the vault list from the AWS Region you specified in the request.

Creating and Deleting Vaults

An AWS account can create up to 1,000 vaults per AWS Region. For a list of the AWS Regions supported by S3 Glacier, see [Regions and Endpoints](#) in the *AWS General Reference*.

You can delete a vault only if there are no archives in the vault as of the last inventory that S3 Glacier computed and there have been no writes to the vault since the last inventory.

Note

S3 Glacier prepares an inventory for each vault periodically, every 24 hours. Because the inventory might not reflect the latest information, S3 Glacier ensures the vault is indeed empty by checking if there were any write operations since the last vault inventory.

For more information, see [Creating a Vault in Amazon S3 Glacier \(p. 25\)](#) and [Deleting a Vault in Amazon S3 Glacier \(p. 59\)](#).

Retrieving Vault Metadata

You can retrieve vault information such as the vault creation date, number of archives in the vault, and the total size of all the archives in the vault. S3 Glacier provides API calls for you to retrieve this information for a specific vault or all the vaults in a specific AWS Region in your account. For more information, see [Retrieving Vault Metadata in Amazon S3 Glacier \(p. 33\)](#).

Downloading a Vault Inventory

A vault inventory refers to the list of archives in a vault. For each archive in the list, the inventory provides archive information such as archive ID, creation date, and size. S3 Glacier updates the vault inventory approximately once a day, starting on the day the first archive is uploaded to the vault. A vault inventory must exist for you to be able to download it.

Downloading a vault inventory is an asynchronous operation. You must first initiate a job to download the inventory. After receiving the job request, S3 Glacier prepares your inventory for download. After the job completes, you can download the inventory data.

Given the asynchronous nature of the job, you can use Amazon Simple Notification Service (Amazon SNS) notifications to notify you when the job completes. You can specify an Amazon SNS topic for each individual job request or configure your vault to send a notification when specific vault events occur.

S3 Glacier prepares an inventory for each vault periodically, every 24 hours. If there have been no archive additions or deletions to the vault since the last inventory, the inventory date is not updated. When you initiate a job for a vault inventory, S3 Glacier returns the last inventory it generated, which is a point-in-time snapshot and not real-time data. You might not find it useful to retrieve vault inventory for each archive upload. However, suppose you maintain a database on the client-side associating metadata about the archives you upload to S3 Glacier. Then, you might find the vault inventory useful to reconcile information in your database with the actual vault inventory.

For more information about retrieving a vault inventory, see [Downloading a Vault Inventory in Amazon S3 Glacier \(p. 37\)](#).

Configuring Vault Notifications

Retrieving anything from S3 Glacier, such as an archive from a vault or a vault inventory, is a two-step process in which you first initiate a job. After the job completes, you can download the output. You can use S3 Glacier notifications support to know when your job is complete. S3 Glacier sends notification messages to an Amazon Simple Notification Service (Amazon SNS) topic that you provide.

You can configure notifications on a vault and identify vault events and the Amazon SNS topic to be notified when the event occurs. Anytime the vault event occurs, S3 Glacier sends a notification to the specified Amazon SNS topic. For more information, see [Configuring Vault Notifications in Amazon S3 Glacier \(p. 51\)](#).

Creating a Vault in Amazon S3 Glacier

Creating a vault adds a vault to the set of vaults in your account. An AWS account can create up to 1,000 vaults per AWS Region. For a list of the AWS Regions supported by Amazon S3 Glacier (S3 Glacier), see

[Regions and Endpoints](#) in the *AWS General Reference*. For information on creating more vaults, go to the [S3 Glacier product detail page](#).

When you create a vault, you must provide a vault name. The following are the vault naming requirements:

- Names can be between 1 and 255 characters long.
- Allowed characters are a–z, A–Z, 0–9, '_' (underscore), '-' (hyphen), and '.' (period).

Vault names must be unique within an account and the AWS Region in which the vault is being created. That is, an account can create vaults with the same name in different AWS Regions but not in the same AWS Region.

Topics

- [Creating a Vault in Amazon S3 Glacier Using the AWS SDK for Java](#) (p. 26)
- [Creating a Vault in Amazon S3 Glacier Using the AWS SDK for .NET](#) (p. 28)
- [Creating a Vault in Amazon S3 Glacier Using the REST API](#) (p. 31)
- [Creating a Vault Using the Amazon S3 Glacier Console](#) (p. 32)
- [Creating a Vault in Amazon S3 Glacier Using the AWS Command Line Interface](#) (p. 32)

Creating a Vault in Amazon S3 Glacier Using the AWS SDK for Java

The low-level API provides methods for all the vault operations, including creating and deleting vaults, getting a vault description, and getting a list of vaults created in a specific AWS Region. The following are the steps to create a vault using the AWS SDK for Java.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region in which you want to create a vault. All operations you perform using this client apply to that AWS Region.

2. Provide request information by creating an instance of the `CreateVaultRequest` class.

Amazon S3 Glacier (S3 Glacier) requires you to provide a vault name and your account ID. If you don't provide an account ID, then the account ID associated with the credentials you provide to sign the request is used. For more information, see [Using the AWS SDK for Java with Amazon S3 Glacier](#) (p. 117).

3. Run the `createVault` method by providing the request object as a parameter.

The response S3 Glacier returns is available in the `CreateVaultResult` object.

The following Java code snippet illustrates the preceding steps. The snippet creates a vault in the `us-west-2` Region. The `Location` it prints is the relative URI of the vault that includes your account ID, the AWS Region, and the vault name.

```
AmazonGlacierClient client = new AmazonGlacierClient(credentials);
client.setEndpoint("https://glacier.us-west-2.amazonaws.com");

CreateVaultRequest request = new CreateVaultRequest()
    .withVaultName("*** provide vault name ***");
CreateVaultResult result = client.createVault(request);
```

```
System.out.println("Created vault successfully: " + result.getLocation());
```

Note

For information about the underlying REST API, see [Create Vault \(PUT vault\) \(p. 185\)](#).

Example: Creating a Vault Using the AWS SDK for Java

The following Java code example creates a vault in the us-west-2 Region (for more information on AWS Regions, see [Accessing Amazon S3 Glacier \(p. 5\)](#)). In addition, the code example retrieves the vault information, lists all vaults in the same AWS Region, and then deletes the vault created.

For step-by-step instructions on how to run the following example, see [Running Java Examples for Amazon S3 Glacier Using Eclipse \(p. 119\)](#).

Example

```
import java.io.IOException;
import java.util.List;

import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.glacier.AmazonGlacierClient;
import com.amazonaws.services.glacier.model.CreateVaultRequest;
import com.amazonaws.services.glacier.model.CreateVaultResult;
import com.amazonaws.services.glacier.model.DeleteVaultRequest;
import com.amazonaws.services.glacier.model.DescribeVaultOutput;
import com.amazonaws.services.glacier.model.DescribeVaultRequest;
import com.amazonaws.services.glacier.model.DescribeVaultResult;
import com.amazonaws.services.glacier.model.ListVaultsRequest;
import com.amazonaws.services.glacier.model.ListVaultsResult;

public class AmazonGlacierVaultOperations {

    public static AmazonGlacierClient client;

    public static void main(String[] args) throws IOException {

        ProfileCredentialsProvider credentials = new ProfileCredentialsProvider();

        client = new AmazonGlacierClient(credentials);
        client.setEndpoint("https://glacier.us-east-1.amazonaws.com/");

        String vaultName = "examplevaultfordelate";

        try {
            createVault(client, vaultName);
            describeVault(client, vaultName);
            listVaults(client);
            deleteVault(client, vaultName);
        } catch (Exception e) {
            System.err.println("Vault operation failed." + e.getMessage());
        }
    }

    private static void createVault(AmazonGlacierClient client, String vaultName) {
        CreateVaultRequest createVaultRequest = new CreateVaultRequest()
            .withVaultName(vaultName);
        CreateVaultResult createVaultResult = client.createVault(createVaultRequest);

        System.out.println("Created vault successfully: " +
            createVaultResult.getLocation());
    }
}
```

```
private static void describeVault(AmazonGlacierClient client, String vaultName) {
    DescribeVaultRequest describeVaultRequest = new DescribeVaultRequest()
        .withVaultName(vaultName);
    DescribeVaultResult describeVaultResult =
        client.describeVault(describeVaultRequest);

    System.out.println("Describing the vault: " + vaultName);
    System.out.print(
        "CreationDate: " + describeVaultResult.getCreationDate() +
        "\nLastInventoryDate: " + describeVaultResult.getLastInventoryDate() +
        "\nNumberOfArchives: " + describeVaultResult.getNumberOfArchives() +
        "\nSizeInBytes: " + describeVaultResult.getSizeInBytes() +
        "\nVaultARN: " + describeVaultResult.getVaultARN() +
        "\nVaultName: " + describeVaultResult.getVaultName());
}

private static void listVaults(AmazonGlacierClient client) {
    ListVaultsRequest listVaultsRequest = new ListVaultsRequest();
    ListVaultsResult listVaultsResult = client.listVaults(listVaultsRequest);

    List<DescribeVaultOutput> vaultList = listVaultsResult.getVaultList();
    System.out.println("\nDescribing all vaults (vault list):");
    for (DescribeVaultOutput vault : vaultList) {
        System.out.println(
            "\nCreationDate: " + vault.getCreationDate() +
            "\nLastInventoryDate: " + vault.getLastInventoryDate() +
            "\nNumberOfArchives: " + vault.getNumberOfArchives() +
            "\nSizeInBytes: " + vault.getSizeInBytes() +
            "\nVaultARN: " + vault.getVaultARN() +
            "\nVaultName: " + vault.getVaultName());
    }
}

private static void deleteVault(AmazonGlacierClient client, String vaultName) {
    DeleteVaultRequest request = new DeleteVaultRequest()
        .withVaultName(vaultName);
    client.deleteVault(request);
    System.out.println("Deleted vault: " + vaultName);
}
}
```

Creating a Vault in Amazon S3 Glacier Using the AWS SDK for .NET

Both the [high-level and low-level APIs \(p. 116\)](#) provided by the AWS SDK for .NET provide a method to create a vault.

Topics

- [Creating a Vault Using the High-Level API of the AWS SDK for .NET \(p. 28\)](#)
- [Creating a Vault Using the Low-Level API of the AWS SDK for .NET \(p. 29\)](#)

Creating a Vault Using the High-Level API of the AWS SDK for .NET

The `ArchiveTransferManager` class of the high-level API provides the `CreateVault` method you can use to create a vault in an AWS Region.

Example: Vault Operations Using the High-Level API of the AWS SDK for .NET

The following C# code example creates and delete a vault in the US West (Oregon) Region. For a list of AWS Regions in which you can create vaults, see [Accessing Amazon S3 Glacier \(p. 5\)](#).

For step-by-step instructions on how to run the following example, see [Running Code Examples \(p. 121\)](#). You need to update the code as shown with a vault name.

Example

```
using System;
using Amazon.Glacier;
using Amazon.Glacier.Transfer;
using Amazon.Runtime;

namespace glacier.amazon.com.docsamples
{
    class VaultCreateDescribeListVaultsDeleteHighLevel
    {
        static string vaultName = "**** Provide vault name ****";

        public static void Main(string[] args)
        {
            try
            {
                var manager = new ArchiveTransferManager(Amazon.RegionEndpoint.USSouth1);
                manager.CreateVault(vaultName);
                Console.WriteLine("Vault created. To delete the vault, press Enter");
                Console.ReadKey();
                manager.DeleteVault(vaultName);
                Console.WriteLine("\nVault deleted. To continue, press Enter");
                Console.ReadKey();
            }
            catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
            catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
            catch (Exception e) { Console.WriteLine(e.Message); }
            Console.WriteLine("To continue, press Enter");
            Console.ReadKey();
        }
    }
}
```

Creating a Vault Using the Low-Level API of the AWS SDK for .NET

The low-level API provides methods for all the vault operations, including create and delete vaults, get a vault description, and get a list of vaults created in a specific AWS Region. The following are the steps to create a vault using the AWS SDK for .NET.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region in which you want to create a vault. All operations you perform using this client apply to that AWS Region.

2. Provide request information by creating an instance of the `CreateVaultRequest` class.

Amazon S3 Glacier (S3 Glacier) requires you to provide a vault name and your account ID. If you don't provide an account ID, then account ID associated with the credentials you provide to sign the request is assumed. For more information, see [Using the AWS SDK for .NET with Amazon S3 Glacier \(p. 120\)](#).

3. Run the `CreateVault` method by providing the request object as a parameter.

The response S3 Glacier returns is available in the `CreateVaultResponse` object.

Example: Vault Operations Using the Low-Level API of the AWS SDK for .NET

The following C# example illustrates the preceding steps. The example creates a vault in the US West (Oregon) Region. In addition, the code example retrieves the vault information, lists all vaults in the same AWS Region, and then deletes the vault created. The `Location` printed is the relative URI of the vault that includes your account ID, the AWS Region, and the vault name.

Note

For information about the underlying REST API, see [Create Vault \(PUT vault\) \(p. 185\)](#).

For step-by-step instructions on how to run the following example, see [Running Code Examples \(p. 121\)](#). You need to update the code as shown with a vault name.

Example

```
using System;
using Amazon.Glacier;
using Amazon.Glacier.Model;
using Amazon.Runtime;

namespace glacier.amazon.com.docsamples
{
    class VaultCreateDescribeListVaultsDelete
    {
        static string vaultName = "**** Provide vault name ****";
        static AmazonGlacierClient client;

        public static void Main(string[] args)
        {
            try
            {
                using (client = new AmazonGlacierClient(Amazon.RegionEndpoint.USSouth1))
                {
                    Console.WriteLine("Creating a vault.");
                    CreateAVault();
                    DescribeVault();
                    GetVaultsList();
                    Console.WriteLine("\nVault created. Now press Enter to delete the vault...");
                    Console.ReadKey();
                    DeleteVault();
                }
            }
            catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
            catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
            catch (Exception e) { Console.WriteLine(e.Message); }
            Console.WriteLine("To continue, press Enter");
            Console.ReadKey();
        }

        static void CreateAVault()
        {
            CreateVaultRequest request = new CreateVaultRequest()
            {
                VaultName = vaultName
            };
            CreateVaultResponse response = client.CreateVault(request);
            Console.WriteLine("Vault created: {0}\n", response.Location);
        }

        static void DescribeVault()
```

```
{
    DescribeVaultRequest describeVaultRequest = new DescribeVaultRequest()
    {
        VaultName = vaultName
    };

    DescribeVaultResponse describeVaultResponse =
client.DescribeVault(describeVaultRequest);
    Console.WriteLine("\nVault description...");
    Console.WriteLine(
        "\nVaultName: " + describeVaultResponse.VaultName +
        "\nVaultARN: " + describeVaultResponse.VaultARN +
        "\nVaultCreationDate: " + describeVaultResponse.CreationDate +
        "\nNumberOfArchives: " + describeVaultResponse.NumberOfArchives +
        "\nSizeInBytes: " + describeVaultResponse.SizeInBytes +
        "\nLastInventoryDate: " + describeVaultResponse.LastInventoryDate
    );
}

static void GetVaultsList()
{
    string lastMarker = null;
    Console.WriteLine("\n List of vaults in your account in the specific region ...");
    do
    {
        ListVaultsRequest request = new ListVaultsRequest()
        {
            Marker = lastMarker
        };
        ListVaultsResponse response = client.ListVaults(request);

        foreach (DescribeVaultOutput output in response.VaultList)
        {
            Console.WriteLine("Vault Name: {0} \tCreation Date: {1} \t #of archives: {2}",
                output.VaultName, output.CreationDate,
                output.NumberOfArchives);
        }
        lastMarker = response.Marker;
    } while (lastMarker != null);
}

static void DeleteVault()
{
    DeleteVaultRequest request = new DeleteVaultRequest()
    {
        VaultName = vaultName
    };
    DeleteVaultResponse response = client.DeleteVault(request);
}
}
```

Creating a Vault in Amazon S3 Glacier Using the REST API

To create a vault using the REST API, see [Create Vault \(PUT vault\)](#) (p. 185).

Creating a Vault Using the Amazon S3 Glacier Console

To create a vault using the Amazon S3 Glacier (S3 Glacier) console, see [Step 2: Create a Vault in Amazon S3 Glacier \(p. 11\)](#) in the *Getting Started* tutorial.

Creating a Vault in Amazon S3 Glacier Using the AWS Command Line Interface

Follow these steps to create a vault in Amazon S3 Glacier (S3 Glacier) using the AWS Command Line Interface (AWS CLI).

Topics

- [\(Prerequisite\) Setting Up the AWS CLI \(p. 21\)](#)
- [Example: Creating a Vault Using the AWS CLI \(p. 32\)](#)

(Prerequisite) Setting Up the AWS CLI

1. Download and configure the AWS CLI. For instructions, see the following topics in the *AWS Command Line Interface User Guide*.

[Installing the AWS Command Line Interface](#)

[Configuring the AWS Command Line Interface](#)

2. Verify the setup by entering the following commands at the command prompt. These commands don't provide credentials explicitly, so the credentials of the default profile are used.
 - Try using the help command.

```
aws help
```

- Use `aws s3 ls` to get a list of buckets on the configured account.

```
aws s3 ls
```

- Use `aws configure list` to see the current configuration data.

```
aws configure list
```

Example: Creating a Vault Using the AWS CLI

1. Use the `create-vault` command to create a vault named `awsexamplevault` under account `111122223333`.

```
aws glacier create-vault --vault-name awsexamplevault --account-id 111122223333
```

Expected output:

```
{
```

```
}    "location": "/111122223333/vaults/awsexamplevault"
```

2. Verify creation using the `describe-vault` command.

```
aws glacier describe-vault --vault-name awsexamplevault --account-id 111122223333
```

Retrieving Vault Metadata in Amazon S3 Glacier

You can retrieve vault information such as the vault creation date, number of archives in the vault, and the total size of all the archives in the vault. Amazon S3 Glacier (S3 Glacier) provides API calls for you to retrieve this information for a specific vault or all the vaults in a specific AWS Region in your account.

If you retrieve a vault list, S3 Glacier returns the list sorted by the ASCII values of the vault names. The list contains up to 1,000 vaults. You should always check the response for a marker at which to continue the list; if there are no more items the marker field is `null`. You can optionally limit the number of vaults returned in the response. If there are more vaults than are returned in the response, the result is paginated. You need to send additional requests to fetch the next set of vaults.

Topics

- [Retrieving Vault Metadata in Amazon S3 Glacier Using the AWS SDK for Java \(p. 33\)](#)
- [Retrieving Vault Metadata in Amazon S3 Glacier Using the AWS SDK for .NET \(p. 35\)](#)
- [Retrieving Vault Metadata Using the REST API \(p. 36\)](#)
- [Retrieving Vault Metadata in Amazon S3 Glacier Using the AWS Command Line Interface \(p. 37\)](#)

Retrieving Vault Metadata in Amazon S3 Glacier Using the AWS SDK for Java

Topics

- [Retrieve Vault Metadata for a Vault \(p. 33\)](#)
- [Retrieve Vault Metadata for All Vaults in a Region \(p. 34\)](#)
- [Example: Retrieving Vault Metadata Using the AWS SDK for Java \(p. 35\)](#)

Retrieve Vault Metadata for a Vault

You can retrieve metadata for a specific vault or all the vaults in a specific AWS Region. The following are the steps to retrieve vault metadata for a specific vault using the low-level API of the AWS SDK for Java.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region where the vault resides. All operations you perform using this client apply to that AWS Region.

2. Provide request information by creating an instance of the `DescribeVaultRequest` class.

Amazon S3 Glacier (S3 Glacier) requires you to provide a vault name and your account ID. If you don't provide an account ID, then the account ID associated with the credentials you provide to sign the request is assumed. For more information, see [Using the AWS SDK for Java with Amazon S3 Glacier \(p. 117\)](#).

3. Run the `describeVault` method by providing the request object as a parameter.

The vault metadata information that S3 Glacier returns is available in the `DescribeVaultResult` object.

The following Java code snippet illustrates the preceding steps.

```
DescribeVaultRequest request = new DescribeVaultRequest()
    .withVaultName("*** provide vault name***");

DescribeVaultResult result = client.describeVault(request);

System.out.print(
    "\nCreationDate: " + result.getCreationDate() +
    "\nLastInventoryDate: " + result.getLastInventoryDate() +
    "\nNumberOfArchives: " + result.getNumberOfArchives() +
    "\nSizeInBytes: " + result.getSizeInBytes() +
    "\nVaultARN: " + result.getVaultARN() +
    "\nVaultName: " + result.getVaultName());
```

Note

For information about the underlying REST API, see [Describe Vault \(GET vault\) \(p. 194\)](#).

Retrieve Vault Metadata for All Vaults in a Region

You can also use the `listVaults` method to retrieve metadata for all the vaults in a specific AWS Region.

The following Java code snippet retrieves list of vaults in the `us-west-2` Region. The request limits the number of vaults returned in the response to 5. The code snippet then makes a series of `listVaults` calls to retrieve the entire vault list from the AWS Region.

```
AmazonGlacierClient client;
client.setEndpoint("https://glacier.us-west-2.amazonaws.com/");

String marker = null;
do {
    ListVaultsRequest request = new ListVaultsRequest()
        .withLimit("5")
        .withMarker(marker);
    ListVaultsResult listVaultsResult = client.listVaults(request);

    List<DescribeVaultOutput> vaultList = listVaultsResult.getVaultList();
    marker = listVaultsResult.getMarker();
    for (DescribeVaultOutput vault : vaultList) {
        System.out.println(
            "\nCreationDate: " + vault.getCreationDate() +
            "\nLastInventoryDate: " + vault.getLastInventoryDate() +
            "\nNumberOfArchives: " + vault.getNumberOfArchives() +
            "\nSizeInBytes: " + vault.getSizeInBytes() +
            "\nVaultARN: " + vault.getVaultARN() +
            "\nVaultName: " + vault.getVaultName());
    }
} while (marker != null);
```

In the preceding code segment, if you don't specify the `Limit` value in the request, S3 Glacier returns up to 10 vaults, as set by the S3 Glacier API. If there are more vaults to list, the response `marker` field contains the vault Amazon Resource Name (ARN) at which to continue the list with a new request; otherwise, the `marker` field is null.

Note that the information returned for each vault in the list is the same as the information you get by calling the `describeVault` method for a specific vault.

Note

The `listVaults` method calls the underlying REST API (see [List Vaults \(GET vaults\) \(p. 210\)](#)).

Example: Retrieving Vault Metadata Using the AWS SDK for Java

For a working code example, see [Example: Creating a Vault Using the AWS SDK for Java \(p. 27\)](#). The Java code example creates a vault and retrieves the vault metadata.

Retrieving Vault Metadata in Amazon S3 Glacier Using the AWS SDK for .NET

Topics

- [Retrieve Vault Metadata for a Vault \(p. 35\)](#)
- [Retrieve Vault Metadata for All Vaults in a Region \(p. 36\)](#)
- [Example: Retrieving Vault Metadata Using the Low-Level API of the AWS SDK for .NET \(p. 36\)](#)

Retrieve Vault Metadata for a Vault

You can retrieve metadata for a specific vault or all the vaults in a specific AWS Region. The following are the steps to retrieve vault metadata for a specific vault using the low-level API of the AWS SDK for .NET.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region where the vault resides. All operations you perform using this client apply to that AWS Region.

2. Provide request information by creating an instance of the `DescribeVaultRequest` class.

Amazon S3 Glacier (S3 Glacier) requires you to provide a vault name and your account ID. If you don't provide an account ID, then the account ID associated with the credentials you provide to sign the request is assumed. For more information, see [Using the AWS SDK for .NET with Amazon S3 Glacier \(p. 120\)](#).

3. Run the `DescribeVault` method by providing the request object as a parameter.

The vault metadata information that S3 Glacier returns is available in the `DescribeVaultResult` object.

The following C# code snippet illustrates the preceding steps. The snippet retrieves metadata information of an existing vault in the US West (Oregon) Region.

```
AmazonGlacierClient client;
client = new AmazonGlacierClient(Amazon.RegionEndpoint.USSouth1);

DescribeVaultRequest describeVaultRequest = new DescribeVaultRequest()
{
    VaultName = "**** Provide vault name ****"
};
DescribeVaultResponse describeVaultResponse = client.DescribeVault(describeVaultRequest);
Console.WriteLine("\nVault description...");
Console.WriteLine(
    "\nVaultName: " + describeVaultResponse.VaultName +
    "\nVaultARN: " + describeVaultResponse.VaultARN +
```

```
"\nVaultCreationDate: " + describeVaultResponse.CreationDate +  
"\nNumberOfArchives: " + describeVaultResponse.NumberOfArchives +  
"\nSizeInBytes: " + describeVaultResponse.SizeInBytes +  
"\nLastInventoryDate: " + describeVaultResponse.LastInventoryDate  
);
```

Note

For information about the underlying REST API, see [Describe Vault \(GET vault\) \(p. 194\)](#).

Retrieve Vault Metadata for All Vaults in a Region

You can also use the `ListVaults` method to retrieve metadata for all the vaults in a specific AWS Region.

The following C# code snippet retrieves list of vaults in the US West (Oregon) Region. The request limits the number of vaults returned in the response to 5. The code snippet then makes a series of `ListVaults` calls to retrieve the entire vault list from the AWS Region.

```
AmazonGlacierClient client;  
client = new AmazonGlacierClient(Amazon.RegionEndpoint.USSouth1);  
string lastMarker = null;  
Console.WriteLine("\n List of vaults in your account in the specific AWS Region ...");  
do  
{  
    ListVaultsRequest request = new ListVaultsRequest()  
    {  
        Limit = 5,  
        Marker = lastMarker  
    };  
    ListVaultsResponse response = client.ListVaults(request);  
  
    foreach (DescribeVaultOutput output in response.VaultList)  
    {  
        Console.WriteLine("Vault Name: {0} \tCreation Date: {1} \t #of archives: {2}",  
                           output.VaultName, output.CreationDate, output.NumberOfArchives);  
    }  
    lastMarker = response.Marker;  
} while (lastMarker != null);
```

In the preceding code segment, if you don't specify the `Limit` value in the request, S3 Glacier returns up to 10 vaults, as set by the S3 Glacier API.

Note that the information returned for each vault in the list is the same as the information you get by calling the `DescribeVault` method for a specific vault.

Note

The `ListVaults` method calls the underlying REST API (see [List Vaults \(GET vaults\) \(p. 210\)](#)).

Example: Retrieving Vault Metadata Using the Low-Level API of the AWS SDK for .NET

For a working code example, see [Example: Vault Operations Using the Low-Level API of the AWS SDK for .NET \(p. 30\)](#). The C# code example creates a vault and retrieves the vault metadata.

Retrieving Vault Metadata Using the REST API

To list vaults using the REST API, see [List Vaults \(GET vaults\) \(p. 210\)](#). To describe one vault, see [Describe Vault \(GET vault\) \(p. 194\)](#).

Retrieving Vault Metadata in Amazon S3 Glacier Using the AWS Command Line Interface

This example shows how to retrieve vault information and metadata in Amazon S3 Glacier (S3 Glacier) using the AWS Command Line Interface (AWS CLI).

Topics

- [\(Prerequisite\) Setting Up the AWS CLI \(p. 21\)](#)
- [Example: Retrieving Vault Metadata Using the AWS CLI \(p. 37\)](#)

(Prerequisite) Setting Up the AWS CLI

1. Download and configure the AWS CLI. For instructions, see the following topics in the *AWS Command Line Interface User Guide*.

[Installing the AWS Command Line Interface](#)

[Configuring the AWS Command Line Interface](#)

2. Verify the setup by entering the following commands at the command prompt. These commands don't provide credentials explicitly, so the credentials of the default profile are used.

- Try using the help command.

```
aws help
```

- Use `aws s3 ls` to get a list of buckets on the configured account.

```
aws s3 ls
```

- Use `aws configure list` to see the current configuration data.

```
aws configure list
```

Example: Retrieving Vault Metadata Using the AWS CLI

- Use the `describe-vault` command to describe a vault named `awsexamplevault` under account `111122223333`.

```
aws glacier describe-vault --vault-name awsexamplevault --account-id 111122223333
```

Downloading a Vault Inventory in Amazon S3 Glacier

After you upload your first archive to your vault, Amazon S3 Glacier (S3 Glacier) automatically creates a vault inventory and then updates it approximately once a day. After S3 Glacier creates the first inventory, it typically takes half a day and up to a day before that inventory is available for retrieval. You can retrieve a vault inventory from S3 Glacier with the following two-step process:

1. Initiate an inventory retrieval job by using the [Initiate Job \(POST jobs\) \(p. 263\)](#) operation.

Important

A data retrieval policy can cause your initiate retrieval job request to fail with a `PolicyEnforcedException` exception. For more information about data retrieval policies, see [Amazon S3 Glacier Data Retrieval Policies \(p. 151\)](#). For more information about the `PolicyEnforcedException` exception, see [Error Responses \(p. 176\)](#).

2. After the job completes, download the bytes using the [Get Job Output \(GET output\) \(p. 257\)](#) operation.

For example, retrieving an archive or a vault inventory requires you to first initiate a retrieval job. The job request is ran asynchronously. When you initiate a retrieval job, S3 Glacier creates a job and returns a job ID in the response. When S3 Glacier completes the job, you can get the job output, the archive bytes, or the vault inventory data.

The job must complete before you can get its output. To determine the status of the job, you have the following options:

- **Wait for job completion notification**—You can specify an Amazon Simple Notification Service (Amazon SNS) topic to which S3 Glacier can post a notification after the job is completed. You can specify Amazon SNS topic using the following methods:
 - Specify an Amazon SNS topic per job basis.

When you initiate a job, you can optionally specify an Amazon SNS topic.

- Set notification configuration on the vault.

You can set notification configuration for specific events on the vault (see [Configuring Vault Notifications in Amazon S3 Glacier \(p. 51\)](#)). S3 Glacier sends a message to the specified SNS topic any time the specific event occur.

If you have notification configuration set on the vault and you also specify an Amazon SNS topic when you initiate a job, S3 Glacier sends job completion message to both the topics.

You can configure the SNS topic to notify you via email or store the message in an Amazon Simple Queue Service (Amazon SQS) that your application can poll. When a message appears in the queue, you can check if the job is completed successfully and then download the job output.

- **Request job information explicitly**—S3 Glacier also provides a describe job operation ([Describe Job \(GET JobID\) \(p. 250\)](#)) that enables you to poll for job information. You can periodically send this request to obtain job information. However, using Amazon SNS notifications is the recommended option.

Note

The information you get via SNS notification is the same as what you get by calling Describe Job.

Topics

- [About the Inventory \(p. 39\)](#)
- [Downloading a Vault Inventory in Amazon S3 Glacier Using the AWS SDK for Java \(p. 39\)](#)
- [Downloading a Vault Inventory in Amazon S3 Glacier Using the AWS SDK for .NET \(p. 44\)](#)
- [Downloading a Vault Inventory Using the REST API \(p. 49\)](#)
- [Downloading a Vault Inventory in Amazon S3 Glacier Using the AWS Command Line Interface \(p. 49\)](#)

About the Inventory

S3 Glacier updates a vault inventory approximately once a day, starting on the day you first upload an archive to the vault. If there have been no archive additions or deletions to the vault since the last inventory, the inventory date is not updated. When you initiate a job for a vault inventory, S3 Glacier returns the last inventory it generated, which is a point-in-time snapshot and not real-time data. Note that after S3 Glacier creates the first inventory for the vault, it typically takes half a day and up to a day before that inventory is available for retrieval.

You might not find it useful to retrieve a vault inventory for each archive upload. However, suppose you maintain a database on the client-side associating metadata about the archives you upload to S3 Glacier. Then, you might find the vault inventory useful to reconcile information, as needed, in your database with the actual vault inventory. You can limit the number of inventory items retrieved by filtering on the archive creation date or by setting a quota. For more information about limiting inventory retrieval, see [Range Inventory Retrieval \(p. 266\)](#).

The inventory can be returned in two formats, comma-separated values (CSV) or JSON. You can optionally specify the format when you initiate the inventory job. The default format is JSON. For more information about the data fields returned in an inventory job output, see [Response Body \(p. 260\)](#) of the *Get Job Output API*.

Downloading a Vault Inventory in Amazon S3 Glacier Using the AWS SDK for Java

The following are the steps to retrieve a vault inventory using the low-level API of the AWS SDK for Java. The high-level API does not support retrieving a vault inventory.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region where the vault resides. All operations you perform using this client apply to that AWS Region.

2. Initiate an inventory retrieval job by executing the `initiateJob` method.

Run `initiateJob` by providing job information in an `InitiateJobRequest` object.

Note

Note that if an inventory has not been completed for the vault an error is returned. Amazon S3 Glacier (S3 Glacier) prepares an inventory for each vault periodically, every 24 hours.

S3 Glacier returns a job ID in response. The response is available in an instance of the `InitiateJobResult` class.

```
InitiateJobRequest initJobRequest = new InitiateJobRequest()
    .withVaultName("*** provide vault name ***")
    .withJobParameters(
        new JobParameters()
            .withType("inventory-retrieval")
            .withSNSTopic("*** provide SNS topic ARN ****")
    );

InitiateJobResult initJobResult = client.initiateJob(initJobRequest);
String jobId = initJobResult.getJobId();
```

3. Wait for the job to complete.

You must wait until the job output is ready for you to download. If you have either set a notification configuration on the vault, or specified an Amazon Simple Notification Service (Amazon SNS) topic when you initiated the job, S3 Glacier sends a message to the topic after it completes the job.

You can also poll S3 Glacier by calling the `describeJob` method to determine job completion status. However, using an Amazon SNS topic for notification is the recommended approach. The code example given in the following section uses Amazon SNS for S3 Glacier to publish a message.

4. Download the job output (vault inventory data) by executing the `getJobOutput` method.

You provide your account ID, job ID, and vault name by creating an instance of the `GetJobOutputRequest` class. If you don't provide an account ID, then the account ID associated with the credentials you provide to sign the request is used. For more information, see [Using the AWS SDK for Java with Amazon S3 Glacier \(p. 117\)](#).

The output that S3 Glacier returns is available in the `GetJobOutputResult` object.

```
GetJobOutputRequest jobOutputRequest = new GetJobOutputRequest()
    .withVaultName("*** provide vault name ***")
    .withJobId("*** provide job ID ***");
GetJobOutputResult jobOutputResult = client.getJobOutput(jobOutputRequest);
// jobOutputResult.getBody(); provides the output stream.
```

Note

For information about the job related underlying REST API, see [Job Operations \(p. 249\)](#).

Example: Retrieving a Vault Inventory Using the AWS SDK for Java

The following Java code example retrieves the vault inventory for the specified vault.

The example performs the following tasks:

- Creates an Amazon Simple Notification Service (Amazon SNS) topic.

S3 Glacier sends notification to this topic after it completes the job.

- Creates an Amazon Simple Queue Service (Amazon SQS) queue.

The example attaches a policy to the queue to enable the Amazon SNS topic to post messages to the queue.

- Initiates a job to download the specified archive.

In the job request, the Amazon SNS topic that was created is specified so that S3 Glacier can publish a notification to the topic after it completes the job.

- Checks the Amazon SQS queue for a message that contains the job ID.

If there is a message, parse the JSON and check if the job completed successfully. If it did, download the archive.

- Cleans up by deleting the Amazon SNS topic and the Amazon SQS queue that it created.

```
import java.io.BufferedReader;
import java.io.BufferedWriter;
import java.io.File;
import java.io.FileWriter;
import java.io.IOException;
import java.io.InputStreamReader;
import java.util.HashMap;
import java.util.List;
import java.util.Map;
```

```
import com.fasterxml.jackson.core.JsonFactory;
import com.fasterxml.jackson.core.JsonParseException;
import com.fasterxml.jackson.core.JsonParser;
import com.fasterxml.jackson.databind.JsonNode;
import com.fasterxml.jackson.databind.ObjectMapper;

import com.amazonaws.AmazonClientException;
import com.amazonaws.auth.policy.Policy;
import com.amazonaws.auth.policy.Principal;
import com.amazonaws.auth.policy.Resource;
import com.amazonaws.auth.policy.Statement;
import com.amazonaws.auth.policy.Statement.Effect;
import com.amazonaws.auth.policy.actions.SQSActions;
import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.glacier.AmazonGlacierClient;
import com.amazonaws.services.glacier.model.GetJobOutputRequest;
import com.amazonaws.services.glacier.model.GetJobOutputResult;
import com.amazonaws.services.glacier.model.InitiateJobRequest;
import com.amazonaws.services.glacier.model.InitiateJobResult;
import com.amazonaws.services.glacier.model.JobParameters;
import com.amazonaws.services.sns.AmazonSNSClient;
import com.amazonaws.services.sns.model.CreateTopicRequest;
import com.amazonaws.services.sns.model.CreateTopicResult;
import com.amazonaws.services.sns.model.DeleteTopicRequest;
import com.amazonaws.services.sns.model.SubscribeRequest;
import com.amazonaws.services.sns.model.SubscribeResult;
import com.amazonaws.services.sns.model.UnsubscribeRequest;
import com.amazonaws.services.sqs.AmazonSQSClient;
import com.amazonaws.services.sqs.model.CreateQueueRequest;
import com.amazonaws.services.sqs.model.CreateQueueResult;
import com.amazonaws.services.sqs.model.DeleteQueueRequest;
import com.amazonaws.services.sqs.model.GetQueueAttributesRequest;
import com.amazonaws.services.sqs.model.GetQueueAttributesResult;
import com.amazonaws.services.sqs.model.Message;
import com.amazonaws.services.sqs.model.ReceiveMessageRequest;
import com.amazonaws.services.sqs.model.SetQueueAttributesRequest;

public class AmazonGlacierDownloadInventoryWithSQSPolling {

    public static String vaultName = "*** provide vault name ***";
    public static String snsTopicName = "*** provide topic name ***";
    public static String sqsQueueName = "*** provide queue name ***";
    public static String sqsQueueARN;
    public static String sqsQueueURL;
    public static String snsTopicARN;
    public static String snsSubscriptionARN;
    public static String fileName = "*** provide file name ***";
    public static String region = "*** region ***";
    public static long sleepTime = 600;
    public static AmazonGlacierClient client;
    public static AmazonSQSClient sqsClient;
    public static AmazonSNSClient snsClient;

    public static void main(String[] args) throws IOException {

        ProfileCredentialsProvider credentials = new ProfileCredentialsProvider();

        client = new AmazonGlacierClient(credentials);
        client.setEndpoint("https://glacier." + region + ".amazonaws.com");
        sqsClient = new AmazonSQSClient(credentials);
        sqsClient.setEndpoint("https://sqs." + region + ".amazonaws.com");
        snsClient = new AmazonSNSClient(credentials);
        snsClient.setEndpoint("https://sns." + region + ".amazonaws.com");

        try {
```



```
        setupSQS();

        setupSNS();

        String jobId = initiateJobRequest();
        System.out.println("Jobid = " + jobId);

        Boolean success = waitForJobToComplete(jobId, sqsQueueURL);
        if (!success) { throw new Exception("Job did not complete successfully."); }

        downloadJobOutput(jobId);

        cleanup();

    } catch (Exception e) {
        System.err.println("Inventory retrieval failed.");
        System.err.println(e);
    }
}

private static void setupSQS() {
    CreateQueueRequest request = new CreateQueueRequest()
        .withQueueName(sqsQueueName);
    CreateQueueResult result = sqsClient.createQueue(request);
    sqsQueueURL = result.getQueueUrl();

    GetQueueAttributesRequest qRequest = new GetQueueAttributesRequest()
        .withQueueUrl(sqsQueueURL)
        .withAttributeNames("QueueArn");

    GetQueueAttributesResult qResult = sqsClient.getQueueAttributes(qRequest);
    sqsQueueARN = qResult.getAttributes().get("QueueArn");

    Policy sqsPolicy =
        new Policy().withStatements(
            new Statement(Effect.Allow)
                .withPrincipals(Principal.AllUsers)
                .withActions(SQSActions.SendMessage)
                .withResources(new Resource(sqsQueueARN)));
    Map<String, String> queueAttributes = new HashMap<String, String>();
    queueAttributes.put("Policy", sqsPolicy.toJson());
    sqsClient.setQueueAttributes(new SetQueueAttributesRequest(sqsQueueURL,
        queueAttributes));
}

private static void setupSNS() {
    CreateTopicRequest request = new CreateTopicRequest()
        .withName(snsTopicName);
    CreateTopicResult result = snsClient.createTopic(request);
    snsTopicARN = result.getTopicArn();

    SubscribeRequest request2 = new SubscribeRequest()
        .withTopicArn(snsTopicARN)
        .withEndpoint(sqsQueueARN)
        .withProtocol("sqs");
    SubscribeResult result2 = snsClient.subscribe(request2);

    snsSubscriptionARN = result2.getSubscriptionArn();
}

private static String initiateJobRequest() {

    JobParameters jobParameters = new JobParameters()
        .withType("inventory-retrieval")
        .withSNSTopic(snsTopicARN);

    InitiateJobRequest request = new InitiateJobRequest()
```

```
.withVaultName(vaultName)
.withJobParameters(jobParameters);

InitiateJobResult response = client.initiateJob(request);

return response.getJobId();
}

private static Boolean waitForJobToComplete(String jobId, String sqsQueueUrl) throws
InterruptedException, JsonParseException, IOException {

    Boolean messageFound = false;
    Boolean jobSuccessful = false;
    ObjectMapper mapper = new ObjectMapper();
    JsonFactory factory = mapper.getFactory();

    while (!messageFound) {
        List<Message> msgs = sqsClient.receiveMessage(
            new
ReceiveMessageRequest(sqsQueueUrl).withMaxNumberOfMessages(10)).getMessages();

        if (msgs.size() > 0) {
            for (Message m : msgs) {
                JsonParser jpMessage = factory.createJsonParser(m.getBody());
                JsonNode jobMessageNode = mapper.readTree(jpMessage);
                String jobMessage = jobMessageNode.get("Message").textValue();

                JsonParser jpDesc = factory.createJsonParser(jobMessage);
                JsonNode jobDescNode = mapper.readTree(jpDesc);
                String retrievedJobId = jobDescNode.get("JobId").textValue();
                String statusCode = jobDescNode.get("StatusCode").textValue();
                if (retrievedJobId.equals(jobId)) {
                    messageFound = true;
                    if (statusCode.equals("Succeeded")) {
                        jobSuccessful = true;
                    }
                }
            }
        }
        else {
            Thread.sleep(sleepTime * 1000);
        }
    }
    return (messageFound && jobSuccessful);
}

private static void downloadJobOutput(String jobId) throws IOException {

    GetJobOutputRequest getJobOutputRequest = new GetJobOutputRequest()
        .withVaultName(vaultName)
        .withJobId(jobId);
    GetJobOutputResult getJobOutputResult = client.getJobOutput(getJobOutputRequest);

    FileWriter fstream = new FileWriter(fileName);
    BufferedWriter out = new BufferedWriter(fstream);
    BufferedReader in = new BufferedReader(new
InputStreamReader(getJobOutputResult.getBody()));
    String inputLine;
    try {
        while ((inputLine = in.readLine()) != null) {
            out.write(inputLine);
        }
    } catch (IOException e) {
        throw new AmazonClientException("Unable to save archive", e);
    } finally {
        try {in.close();} catch (Exception e) {}
    }
}
```

```
        try {out.close();} catch (Exception e) {}  
    }  
    System.out.println("Retrieved inventory to " + fileName);  
}  
  
private static void cleanUp() {  
    snsClient.unsubscribe(new UnsubscribeRequest(snsSubscriptionARN));  
    snsClient.deleteTopic(new DeleteTopicRequest(snsTopicARN));  
    sqsClient.deleteQueue(new DeleteQueueRequest(sqsQueueURL));  
}  
}
```

Downloading a Vault Inventory in Amazon S3 Glacier Using the AWS SDK for .NET

The following are the steps to retrieve a vault inventory using the low-level API of the AWS SDK for .NET. The high-level API does not support retrieving a vault inventory.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region where the vault resides. All operations you perform using this client apply to that AWS Region.

2. Initiate an inventory retrieval job by executing the `InitiateJob` method.

You provide job information in an `InitiateJobRequest` object. Amazon S3 Glacier (S3 Glacier) returns a job ID in response. The response is available in an instance of the `InitiateJobResponse` class.

```
AmazonGlacierClient client;  
client = new AmazonGlacierClient(Amazon.RegionEndpoint.USSouth1);  
  
InitiateJobRequest initJobRequest = new InitiateJobRequest()  
{  
    VaultName = vaultName,  
    JobParameters = new JobParameters()  
    {  
        Type = "inventory-retrieval",  
        SNSTopic = "*** Provide Amazon SNS topic **",  
    }  
};  
InitiateJobResponse initJobResponse = client.InitiateJob(initJobRequest);  
string jobId = initJobResponse.JobId;
```

3. Wait for the job to complete.

You must wait until the job output is ready for you to download. If you have either set a notification configuration on the vault identifying an Amazon Simple Notification Service (Amazon SNS) topic, or specified an Amazon SNS topic when you initiated a job, S3 Glacier sends a message to that topic after it completes the job. The code example given in the following section uses Amazon SNS for S3 Glacier to publish a message.

You can also poll S3 Glacier by calling the `DescribeJob` method to determine job completion status. Although using Amazon SNS topic for notification is the recommended approach.

4. Download the job output (vault inventory data) by executing the `GetJobOutput` method.

You provide your account ID, vault name, and the job ID information by creating an instance of the `GetJobOutputRequest` class. If you don't provide an account ID, then the account ID associated with the credentials you provide to sign the request is assumed. For more information, see [Using the AWS SDK for .NET with Amazon S3 Glacier \(p. 120\)](#).

The output that S3 Glacier returns is available in the `GetJobOutputResponse` object.

```
GetJobOutputRequest getJobOutputRequest = new GetJobOutputRequest()
{
    JobId = jobId,
    VaultName = vaultName
};

GetJobOutputResponse getJobOutputResponse = client.GetJobOutput(getJobOutputRequest);
using (Stream webStream = getJobOutputResponse.Body)
{
    using (Stream fileToSave = File.OpenWrite(fileName))
    {
        CopyStream(webStream, fileToSave);
    }
}
```

Note

For information about the job related underlying REST API, see [Job Operations \(p. 249\)](#).

Example: Retrieving a Vault Inventory Using the Low-Level API of the AWS SDK for .NET

The following C# code example retrieves the vault inventory for the specified vault.

The example performs the following tasks:

- Set up an Amazon SNS topic.

S3 Glacier sends notification to this topic after it completes the job.

- Set up an Amazon SQS queue.

The example attaches a policy to the queue to enable the Amazon SNS topic to post messages.

- Initiate a job to download the specified archive.

In the job request, the example specifies the Amazon SNS topic so that S3 Glacier can send a message after it completes the job.

- Periodically check the Amazon SQS queue for a message.

If there is a message, parse the JSON and check if the job completed successfully. If it did, download the archive. The code example uses the JSON.NET library (see [JSON.NET](#)) to parse the JSON.

- Clean up by deleting the Amazon SNS topic and the Amazon SQS queue it created.

Example

```
using System;
using System.Collections.Generic;
using System.IO;
using System.Threading;
using Amazon.Glacier;
using Amazon.Glacier.Model;
using Amazon.Glacier.Transfer;
using Amazon.Runtime;
using Amazon.SimpleNotificationService;
using Amazon.SimpleNotificationService.Model;
using Amazon.SQS;
```

```
using Amazon.SQS.Model;
using Newtonsoft.Json;

namespace glacier.amazon.com.docsamples
{
    class VaultInventoryJobLowLevelUsingSNSQS
    {
        static string topicArn;
        static string queueUrl;
        static string queueArn;
        static string vaultName = "**** Provide vault name ****";
        static string fileName = "**** Provide file name and path where to store inventory ****";
        static AmazonSimpleNotificationServiceClient snsClient;
        static AmazonSQSClient sqsClient;
        const string SQS_POLICY =
            "{" +
            "    \"Version\" : \"2012-10-17\", " +
            "    \"Statement\" : [ " +
            "        { " +
            "            \"Sid\" : \"sns-rule\", " +
            "            \"Effect\" : \"Allow\", " +
            "            \"Principal\" : { \"AWS\" : \"arn:aws:iam::123456789012:root\" }, " +
            "            \"Action\" : \"sqs:SendMessage\", " +
            "            \"Resource\" : \"{QuernArn}\", " +
            "            \"Condition\" : { " +
            "                \"ArnLike\" : { " +
            "                    \"aws:SourceArn\" : \"{TopicArn}\" " +
            "                } " +
            "            } " +
            "        } " +
            "    ] " +
            "};";

        public static void Main(string[] args)
        {
            AmazonGlacierClient client;
            try
            {
                using (client = new AmazonGlacierClient(Amazon.RegionEndpoint.USWest2))
                {
                    Console.WriteLine("Setup SNS topic and SQS queue.");
                    SetupTopicAndQueue();
                    Console.WriteLine("To continue, press Enter"); Console.ReadKey();

                    Console.WriteLine("Retrieve Inventory List");
                    GetVaultInventory(client);
                }
                Console.WriteLine("Operations successful.");
                Console.WriteLine("To continue, press Enter"); Console.ReadKey();
            }
            catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
            catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
            catch (Exception e) { Console.WriteLine(e.Message); }
            finally
            {
                // Delete SNS topic and SQS queue.
                snsClient.DeleteTopic(new DeleteTopicRequest() { TopicArn = topicArn });
                sqsClient.DeleteQueue(new DeleteQueueRequest() { QueueUrl = queueUrl });
            }
        }

        static void SetupTopicAndQueue()
        {
            long ticks = DateTime.Now.Ticks;
```

```
// Setup SNS topic.
snsClient = new AmazonSimpleNotificationServiceClient(Amazon.RegionEndpoint.USSouth2);
sqsClient = new AmazonSQSClient(Amazon.RegionEndpoint.USSouth2);

topicArn = snsClient.CreateTopic(new CreateTopicRequest { Name = "GlacierDownload-" +
ticks }).TopicArn;
Console.WriteLine("topicArn: "); Console.WriteLine(topicArn);

CreateQueueRequest createQueueRequest = new CreateQueueRequest();
createQueueRequest.QueueName = "GlacierDownload-" + ticks;
CreateQueueResponse createQueueResponse = sqsClient.CreateQueue(createQueueRequest);
queueUrl = createQueueResponse.QueueUrl;
Console.WriteLine("QueueURL: "); Console.WriteLine(queueUrl);

GetQueueAttributesRequest getQueueAttributesRequest = new
GetQueueAttributesRequest();
getQueueAttributesRequest.AttributeNames = new List<string> { "QueueArn" };
getQueueAttributesRequest.QueueUrl = queueUrl;
GetQueueAttributesResponse response =
sqsClient.GetQueueAttributes(getQueueAttributesRequest);
queueArn = response.QueueArn;
Console.WriteLine("QueueArn: "); Console.WriteLine(queueArn);

// Setup the Amazon SNS topic to publish to the SQS queue.
snsClient.Subscribe(new SubscribeRequest()
{
    Protocol = "sqs",
    Endpoint = queueArn,
    TopicArn = topicArn
});

// Add the policy to the queue so SNS can send messages to the queue.
var policy = SQS_POLICY.Replace("{TopicArn}", topicArn).Replace("{QueueArn}",
queueArn);

sqsClient.SetQueueAttributes(new SetQueueAttributesRequest()
{
    QueueUrl = queueUrl,
    Attributes = new Dictionary<string, string>
    {
        { QueueAttributeName.Policy, policy }
    }
});

}

static void GetVaultInventory(AmazonGlacierClient client)
{
    // Initiate job.
    InitiateJobRequest initJobRequest = new InitiateJobRequest()
    {
        VaultName = vaultName,
        JobParameters = new JobParameters()
        {
            Type = "inventory-retrieval",
            Description = "This job is to download a vault inventory.",
            SNSTopic = topicArn,
        }
    };

    InitiateJobResponse initJobResponse = client.InitiateJob(initJobRequest);
    string jobId = initJobResponse.JobId;

    // Check queue for a message and if job completed successfully, download inventory.
    ProcessQueue(jobId, client);
}
```

```

    private static void ProcessQueue(string jobId, AmazonGlacierClient client)
    {
        ReceiveMessageRequest receiveMessageRequest = new ReceiveMessageRequest() { QueueUrl
= queueUrl, MaxNumberOfMessages = 1 };
        bool jobDone = false;
        while (!jobDone)
        {
            Console.WriteLine("Poll SQS queue");
            ReceiveMessageResponse receiveMessageResponse =
sqsClient.ReceiveMessage(receiveMessageRequest);
            if (receiveMessageResponse.Messages.Count == 0)
            {
                Thread.Sleep(10000 * 60);
                continue;
            }
            Console.WriteLine("Got message");
            Message message = receiveMessageResponse.Messages[0];
            Dictionary<string, string> outerLayer =
JsonConvert.DeserializeObject<Dictionary<string, string>>(message.Body);
            Dictionary<string, object> fields =
JsonConvert.DeserializeObject<Dictionary<string, object>>(outerLayer["Message"]);
            string statusCode = fields["StatusCode"] as string;

            if (string.Equals(statusCode, GlacierUtils.JOB_STATUS_SUCCEEDED,
StringComparison.InvariantCultureIgnoreCase))
            {
                Console.WriteLine("Downloading job output");
                DownloadOutput(jobId, client); // Save job output to the specified file location.
            }
            else if (string.Equals(statusCode, GlacierUtils.JOB_STATUS_FAILED,
StringComparison.InvariantCultureIgnoreCase))
            {
                Console.WriteLine("Job failed... cannot download the inventory.");
            }

            jobDone = true;
            sqsClient.DeleteMessage(new DeleteMessageRequest() { QueueUrl = queueUrl,
ReceiptHandle = message.ReceiptHandle });
        }
    }

    private static void DownloadOutput(string jobId, AmazonGlacierClient client)
    {
        GetJobOutputRequest getJobOutputRequest = new GetJobOutputRequest()
        {
            JobId = jobId,
            VaultName = vaultName
        };

        GetJobOutputResponse getJobOutputResponse =
client.GetJobOutput(getJobOutputRequest);
        using (Stream webStream = getJobOutputResponse.Body)
        {
            using (Stream fileToSave = File.OpenWrite(fileName))
            {
                CopyStream(webStream, fileToSave);
            }
        }
    }

    public static void CopyStream(Stream input, Stream output)
    {
        byte[] buffer = new byte[65536];
        int length;
        while ((length = input.Read(buffer, 0, buffer.Length)) > 0)
        {
            output.Write(buffer, 0, length);
        }
    }

```

```
}  
}  
}  
}
```

Downloading a Vault Inventory Using the REST API

To download a vault inventory using the REST API

Downloading a vault inventory is a two-step process.

1. Initiate a job of the `inventory-retrieval` type. For more information, see [Initiate Job \(POST jobs\)](#) (p. 263).
2. After the job completes, download the inventory data. For more information, see [Get Job Output \(GET output\)](#) (p. 257).

Downloading a Vault Inventory in Amazon S3 Glacier Using the AWS Command Line Interface

Follow these steps to download a vault inventory in Amazon S3 Glacier (S3 Glacier) using the AWS Command Line Interface (AWS CLI).

Topics

- [\(Prerequisite\) Setting Up the AWS CLI](#) (p. 21)
- [Example: Downloading a Vault Inventory Using the AWS CLI](#) (p. 50)

(Prerequisite) Setting Up the AWS CLI

1. Download and configure the AWS CLI. For instructions, see the following topics in the *AWS Command Line Interface User Guide*.

[Installing the AWS Command Line Interface](#)

[Configuring the AWS Command Line Interface](#)

2. Verify the setup by entering the following commands at the command prompt. These commands don't provide credentials explicitly, so the credentials of the default profile are used.
 - Try using the help command.

```
aws help
```

- Use `aws s3 ls` to get a list of buckets on the configured account.

```
aws s3 ls
```

- Use `aws configure list` to see the current configuration data.

```
aws configure list
```


Example: Downloading a Vault Inventory Using the AWS CLI

1. Use the `initiate-job` command to start an inventory retrieval job.

```
aws glacier initiate-job --vault-name awsexamplevault --account-id 111122223333 --job-parameters '{"Type": "inventory-retrieval"}'
```

Expected output:

```
{
  "location": "/111122223333/vaults/awsexamplevault/jobs/*** jobid ***",
  "jobId": "*** jobid ***"
}
```

2. Use the `describe-job` command to check status of the previous retrieval job.

```
aws glacier describe-job --vault-name awsexamplevault --account-id 111122223333 --job-id *** jobid ***
```

Expected output:

```
{
  "InventoryRetrievalParameters": {
    "Format": "JSON"
  },
  "VaultARN": "*** vault arn ***",
  "Completed": false,
  "JobId": "*** jobid ***",
  "Action": "InventoryRetrieval",
  "CreationDate": "*** job creation date ***",
  "StatusCode": "InProgress"
}
```

3. Wait for the job to complete.

You must wait until the job output is ready for you to download. The job ID does not expire for at least 24 hours after S3 Glacier completes the job. If you have either set a notification configuration on the vault, or specified an Amazon Simple Notification Service (Amazon SNS) topic when you initiated the job, S3 Glacier sends a message to the topic after it completes the job.

You can set the notification configuration for specific events on the vault. For more information, see [Configuring Vault Notifications in Amazon S3 Glacier \(p. 51\)](#). S3 Glacier sends a message to the specified SNS topic anytime the specific events occur.

4. When it's complete, use the `get-job-output` command to download the retrieval job to the file `output.json`.

```
aws glacier get-job-output --vault-name awsexamplevault --account-id 111122223333 --job-id *** jobid *** output.json
```

This command produces a file with the following fields.

```
{
```

```
"VaultARN": "arn:aws:glacier:region:111122223333:vaults/awsexamplevault",
"InventoryDate": "*** job completion date ***",
"ArchiveList": [
  {
    "ArchiveId": "*** archiveid ***",
    "ArchiveDescription": "*** archive description (if set) ***",
    "CreationDate": "*** archive creation date ***",
    "Size": "*** archive size (in bytes) ***",
    "SHA256TreeHash": "*** archive hash ***"
  }
  ...
]
```

Configuring Vault Notifications in Amazon S3 Glacier

Retrieving anything from Amazon S3 Glacier (S3 Glacier), such as an archive from a vault or a vault inventory, is a two-step process.

1. Initiate a retrieval job.
2. After the job completes, download the job output.

You can set a notification configuration on a vault so that when a job completes a message is sent to an Amazon Simple Notification Service (Amazon SNS) topic.

Topics

- [Configuring Vault Notifications in S3 Glacier: General Concepts \(p. 51\)](#)
- [Configuring Vault Notifications in Amazon S3 Glacier Using the AWS SDK for Java \(p. 52\)](#)
- [Configuring Vault Notifications in Amazon S3 Glacier Using the AWS SDK for .NET \(p. 54\)](#)
- [Configuring Vault Notifications in S3 Glacier Using the REST API \(p. 56\)](#)
- [Configuring Vault Notifications Using the Amazon S3 Glacier Console \(p. 56\)](#)

Configuring Vault Notifications in S3 Glacier: General Concepts

A S3 Glacier retrieval job request is ran asynchronously. You must wait until S3 Glacier completes the job before you can get its output. You can periodically poll S3 Glacier to determine the job status, but that is not an optimal approach. S3 Glacier also supports notifications. When a job completes, it can post a message to an Amazon Simple Notification Service (Amazon SNS) topic. This requires you to set notification configuration on the vault. In the configuration, you identify one or more events and an Amazon SNS topic to which you want S3 Glacier to send a message when the event occurs.

S3 Glacier defines events specifically related to job completion (`ArchiveRetrievalCompleted`, `InventoryRetrievalCompleted`) that you can add to the vault's notification configuration. When a specific job completes, S3 Glacier publishes a notification message to the SNS topic.

The notification configuration is a JSON document as shown in the following example.

```
{
```

```
"Topic": "arn:aws:sns:us-west-2:012345678901:mytopic",  
"Events": ["ArchiveRetrievalCompleted", "InventoryRetrievalCompleted"]  
}
```

Note that you can configure only one Amazon SNS topic for a vault.

Note

Adding a notification configuration to a vault causes S3 Glacier to send a notification each time the event specified in the notification configuration occurs. You can also optionally specify an Amazon SNS topic in each job initiation request. If you add both the notification configuration on the vault and also specify an Amazon SNS topic in your initiate job request, S3 Glacier sends both notifications.

The job completion message S3 Glacier sends include information such as the type of job (InventoryRetrieval, ArchiveRetrieval), job completion status, SNS topic name, job status code, and the vault ARN. The following is an example notification S3 Glacier sent to an SNS topic after an InventoryRetrieval job completed.

```
{  
  "Action": "InventoryRetrieval",  
  "ArchiveId": null,  
  "ArchiveSizeInBytes": null,  
  "Completed": true,  
  "CompletionDate": "2012-06-12T22:20:40.790Z",  
  "CreationDate": "2012-06-12T22:20:36.814Z",  
  "InventorySizeInBytes": 11693,  
  "JobDescription": "my retrieval job",  
  "JobId": "HkF9p6o7yjhFx-  
K3CGl6fuSm6VzW9T7esGQfco8nUXVYws0jlb5gq1JZ55yHgt5vP54ZShjoQzQVvh7vEXAMPLEjobID",  
  "SHA256TreeHash": null,  
  "SNSTopic": "arn:aws:sns:us-west-2:012345678901:mytopic",  
  "StatusCode": "Succeeded",  
  "StatusMessage": "Succeeded",  
  "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault"  
}
```

If the Completed field is true, you must also check the StatusCode to check if the job completed successfully or failed.

Note that the Amazon SNS topic must allow the vault to publish a notification. By default, only the SNS topic owner can publish a message to the topic. However, if the SNS topic and the vault are owned by different AWS accounts, then you must configure the SNS topic to accept publications from the vault. You can configure the SNS topic policy in the Amazon SNS console.

For more information about Amazon SNS, see [Getting Started with Amazon SNS](#).

Configuring Vault Notifications in Amazon S3 Glacier Using the AWS SDK for Java

The following are the steps to configure notifications on a vault using the low-level API of the AWS SDK for Java.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region where the vault resides. All operations you perform using this client apply to that AWS Region.

2. Provide notification configuration information by creating an instance of the `SetVaultNotificationsRequest` class.

You need to provide the vault name, notification configuration information, and account ID. In specifying a notification configuration, you provide the Amazon Resource Name (ARN) of an existing Amazon SNS topic and one or more events for which you want to be notified. For a list of supported events, see [Set Vault Notification Configuration \(PUT notification-configuration\)](#) (p. 219)).

3. Run the `setVaultNotifications` method by providing the request object as a parameter.

The following Java code snippet illustrates the preceding steps. The snippet sets a notification configuration on a vault. The configuration requests Amazon S3 Glacier (S3 Glacier) to send a notification to the specified Amazon SNS topic when either the `ArchiveRetrievalCompleted` event or the `InventoryRetrievalCompleted` event occurs.

```
SetVaultNotificationsRequest request = new SetVaultNotificationsRequest()
    .withAccountId("-")
    .withVaultName("*** provide vault name ***")
    .withVaultNotificationConfig(
        new VaultNotificationConfig()
            .withSNSTopic("*** provide SNS topic ARN ***")
            .withEvents("ArchiveRetrievalCompleted", "InventoryRetrievalCompleted")
    );
client.setVaultNotifications(request);
```

Note

For information about the underlying REST API, see [Vault Operations](#) (p. 180).

Example: Setting the Notification Configuration on a Vault Using the AWS SDK for Java

The following Java code example sets a vault's notifications configuration, deletes the configuration, and then restores the configuration. For step-by-step instructions on how to run the following example, see [Using the AWS SDK for Java with Amazon S3 Glacier](#) (p. 117).

Example

```
import java.io.IOException;

import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.glacier.AmazonGlacierClient;
import com.amazonaws.services.glacier.model.DeleteVaultNotificationsRequest;
import com.amazonaws.services.glacier.model.GetVaultNotificationsRequest;
import com.amazonaws.services.glacier.model.GetVaultNotificationsResult;
import com.amazonaws.services.glacier.model.SetVaultNotificationsRequest;
import com.amazonaws.services.glacier.model.VaultNotificationConfig;

public class AmazonGlacierVaultNotifications {

    public static AmazonGlacierClient client;
    public static String vaultName = "*** provide vault name ***";
    public static String snsTopicARN = "*** provide sns topic ARN ***";

    public static void main(String[] args) throws IOException {

        ProfileCredentialsProvider credentials = new ProfileCredentialsProvider();

        client = new AmazonGlacierClient(credentials);
        client.setEndpoint("https://glacier.us-east-1.amazonaws.com/");

        try {
```

```
        System.out.println("Adding notification configuration to the vault.");
        setVaultNotifications();
        getVaultNotifications();
        deleteVaultNotifications();

    } catch (Exception e) {
        System.err.println("Vault operations failed." + e.getMessage());
    }
}

private static void setVaultNotifications() {
    VaultNotificationConfig config = new VaultNotificationConfig()
        .withSNSTopic(snsTopicARN)
        .withEvents("ArchiveRetrievalCompleted", "InventoryRetrievalCompleted");

    SetVaultNotificationsRequest request = new SetVaultNotificationsRequest()
        .withVaultName(vaultName)
        .withVaultNotificationConfig(config);

    client.setVaultNotifications(request);
    System.out.println("Notification configured for vault: " + vaultName);
}

private static void getVaultNotifications() {
    VaultNotificationConfig notificationConfig = null;
    GetVaultNotificationsRequest request = new GetVaultNotificationsRequest()
        .withVaultName(vaultName);
    GetVaultNotificationsResult result = client.getVaultNotifications(request);
    notificationConfig = result.getVaultNotificationConfig();

    System.out.println("Notifications configuration for vault: "
        + vaultName);
    System.out.println("Topic: " + notificationConfig.getSNSTopic());
    System.out.println("Events: " + notificationConfig.getEvents());
}

private static void deleteVaultNotifications() {
    DeleteVaultNotificationsRequest request = new DeleteVaultNotificationsRequest()
        .withVaultName(vaultName);
    client.deleteVaultNotifications(request);
    System.out.println("Notifications configuration deleted for vault: " +
vaultName);
}
}
```

Configuring Vault Notifications in Amazon S3 Glacier Using the AWS SDK for .NET

The following are the steps to configure notifications on a vault using the low-level API of the AWS SDK for .NET.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region where the vault resides. All operations you perform using this client apply to that AWS Region.

2. Provide notification configuration information by creating an instance of the `SetVaultNotificationsRequest` class.

You need to provide the vault name, notification configuration information, and account ID. If you don't provide an account ID, then the account ID associated with the credentials you provide to sign

the request is assumed. For more information, see [Using the AWS SDK for .NET with Amazon S3 Glacier \(p. 120\)](#).

In specifying a notification configuration, you provide the Amazon Resource Name (ARN) of an existing Amazon SNS topic and one or more events for which you want to be notified. For a list of supported events, see [Set Vault Notification Configuration \(PUT notification-configuration\) \(p. 219\)](#).

3. Run the `SetVaultNotifications` method by providing the request object as a parameter.
4. After setting notification configuration on a vault, you can retrieve configuration information by calling the `GetVaultNotifications` method, and remove it by calling the `DeleteVaultNotifications` method provided by the client.

Example: Setting the Notification Configuration on a Vault Using the AWS SDK for .NET

The following C# code example illustrates the preceding steps. The example sets the notification configuration on the vault ("examplevault") in the US West (Oregon) Region, retrieves the configuration, and then deletes it. The configuration requests Amazon S3 Glacier (S3 Glacier) to send a notification to the specified Amazon SNS topic when either the `ArchiveRetrievalCompleted` event or the `InventoryRetrievalCompleted` event occurs.

Note

For information about the underlying REST API, see [Vault Operations \(p. 180\)](#).

For step-by-step instructions to run the following example, see [Running Code Examples \(p. 121\)](#). You need to update the code as shown and provide an existing vault name and an Amazon SNS topic.

Example

```
using System;
using System.Collections.Generic;
using Amazon.Glacier;
using Amazon.Glacier.Model;
using Amazon.Runtime;

namespace glacier.amazon.com.docsamples
{
    class VaultNotificationSetGetDelete
    {
        static string vaultName = "examplevault";
        static string snsTopicARN = "*** Provide Amazon SNS topic ARN ***";

        static IAmazonGlacier client;

        public static void Main(string[] args)
        {
            try
            {
                using (client = new AmazonGlacierClient(Amazon.RegionEndpoint.USSouth1))
                {
                    Console.WriteLine("Adding notification configuration to the vault.");
                    SetVaultNotificationConfig();
                    GetVaultNotificationConfig();
                    Console.WriteLine("To delete vault notification configuration, press Enter");
                    Console.ReadKey();
                    DeleteVaultNotificationConfig();
                }
            }
            catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
            catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
            catch (Exception e) { Console.WriteLine(e.Message); }
        }
    }
}
```

```
        Console.WriteLine("To continue, press Enter");
        Console.ReadKey();
    }

    static void SetVaultNotificationConfig()
    {
        SetVaultNotificationsRequest request = new SetVaultNotificationsRequest()
        {
            VaultName = vaultName,
            VaultNotificationConfig = new VaultNotificationConfig()
            {
                Events = new List<string>() { "ArchiveRetrievalCompleted",
                "InventoryRetrievalCompleted" },
                SNSTopic = snsTopicARN
            }
        };
        SetVaultNotificationsResponse response = client.SetVaultNotifications(request);
    }

    static void GetVaultNotificationConfig()
    {
        GetVaultNotificationsRequest request = new GetVaultNotificationsRequest()
        {
            VaultName = vaultName,
            AccountId = "-"
        };
        GetVaultNotificationsResponse response = client.GetVaultNotifications(request);
        Console.WriteLine("SNS Topic ARN: {0}", response.VaultNotificationConfig.SNSTopic);
        foreach (string s in response.VaultNotificationConfig.Events)
        {
            Console.WriteLine("Event : {0}", s);
        }
    }

    static void DeleteVaultNotificationConfig()
    {
        DeleteVaultNotificationsRequest request = new DeleteVaultNotificationsRequest()
        {
            VaultName = vaultName
        };
        DeleteVaultNotificationsResponse response = client.DeleteVaultNotifications(request);
    }
}
```

Configuring Vault Notifications in S3 Glacier Using the REST API

To configure vault notifications using the REST API, see [Set Vault Notification Configuration \(PUT notification-configuration\)](#) (p. 219). Additionally, you can also get vault notifications ([Get Vault Notifications \(GET notification-configuration\)](#) (p. 203)) and delete vault notifications ([Delete Vault Notifications \(DELETE notification-configuration\)](#) (p. 193)).

Configuring Vault Notifications Using the Amazon S3 Glacier Console

This section describes how to configure vault notifications using the Amazon S3 Glacier (S3 Glacier) console. When you configure notifications, you specify job completion events that trigger notification to an Amazon Simple Notification Service (Amazon SNS) topic. In addition to configuring notifications for the vault, you can also specify a topic to publish notification to when you initiate a job. If your vault

is configured to notify for a specific event and you specify notification in the job initiation request, then two notifications are sent.

To configure a vault notification

1. Sign into the AWS Management Console and open the S3 Glacier console at <https://console.aws.amazon.com/glacier>.
2. Select a vault in the vault list.

The screenshot shows the 'Amazon Glacier Vaults' console. At the top, there are buttons for 'Create Vault' and 'Delete Vault'. Below is a table listing vaults:

Name	Inventory Last Updated	Size as of last inventory	# of Archives as of last inventory
archives	Thu, August 09, 2012 06:51:58 AM UTC-7	60.00 MiB	2
example-vault	Tue, August 07, 2012 04:50:55 AM UTC-7	5.65 MiB	3
examplevault	Fri, August 17, 2012 02:58:04 PM UTC-7	1.19 TiB	326
example-vault	Not updated yet	--	--

Below the table, the 'Vault Name: examplevault' is selected. The 'Details' tab is active, showing the following information:

- Region:** US East (Virginia)
- Created on:** Tue, July 31, 2012 12:34:52 PM UTC-7
- ARN:** (Highlight ARN to copy to clipboard) `arn:aws:glacier:us-east-1:123412341234:vaults/examplevault`
- Inventory Last Updated:** Fri, August 17, 2012 02:58:04 PM UTC-7

Below this, it says 'Vault details as of the last inventory update:'

- Size:** 1.19 TiB
- # of Archives:** 326

3. Select the **Notifications** tab.
4. Select the **enabled** in the **Notifications** field.

The screenshot shows the 'Vault Name: examplevault' page with the 'Notifications' tab selected. The page contains the following information:

You can choose to have notifications sent to you or your application whenever certain Amazon Glacier jobs complete. Notifications are sent using the Amazon Simple Notifications Service (SNS). To use Amazon SNS, you first need to specify a topic that applications or people can subscribe to. You can then select specific jobs that, on completion, will trigger the notifications. Notifications can be delivered over the protocol of your choice (HTTP, email, etc.).

Notifications: ☒ enabled ☐ disabled

Amazon SNS Topic ARN: or create a new SNS topic

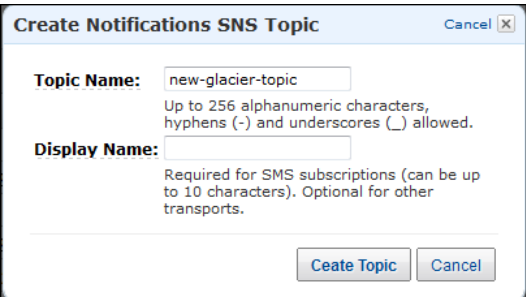
Select the job type(s) you want to trigger your notifications:

☐ Archive Retrieval Job Complete ☐ Vault Inventory Retrieval Job Complete

At the bottom right, there are 'Save' and 'Cancel' buttons.

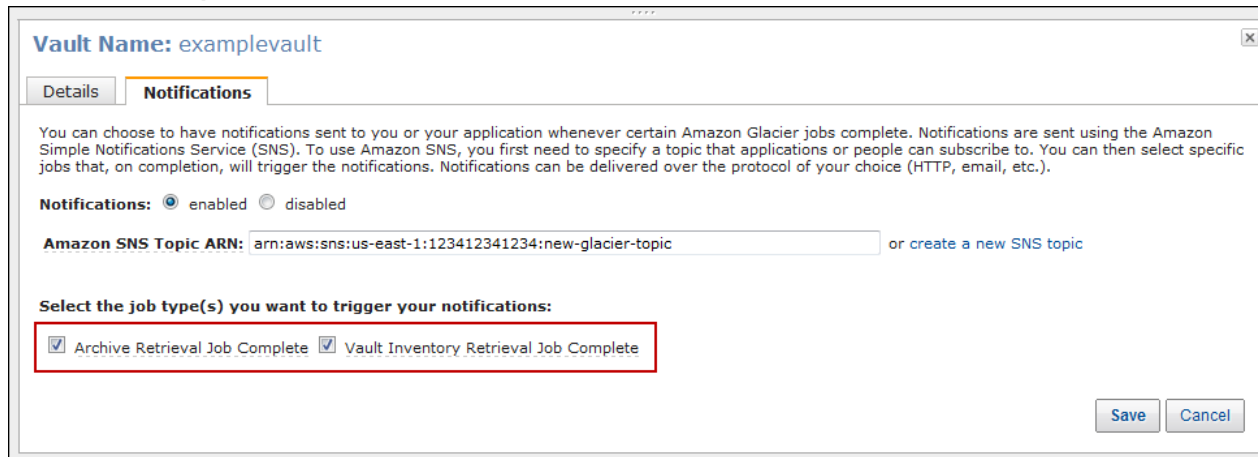
5. On the **Notifications** tab, do one of the following:

To...	Do this...
Specify an existing Amazon SNS topic	Enter the Amazon SNS topic in the Amazon SNS Topic ARN text box.

To...	Do this...
	<p>The topic is an Amazon Resource Name (ARN) that has the form shown below.</p> <pre>arn:aws:sns:region:accountId:topicname</pre> <p>You can find the an Amazon SNS topic ARN from the Amazon Simple Notification Service (Amazon SNS) console.</p>
Create a new Amazon SNS topic	<p>a. Click create a new SNS topic.</p> <p>A Create Notifications SNS Topic dialog box appears.</p> <p>b. In the Topic Name field, specify the name of the new topic.</p> <p>If you will subscribe to the topic using SMS subscriptions, put a name in the Display Name field.</p>  <p>c. Click Create Topic.</p> <p>The Amazon SNS Topic ARN text box is populated with the ARN of the new topic.</p>

6. Select the events that trigger notification.

For example, to trigger notification when only archive retrieval jobs are complete, check only **Get Archive Job Complete**.



7. Click **Save**.

Important

By default, a new topic does not have any subscriptions associated with it. To receive notifications published to this topic, you must subscribe to the topic. Follow the steps in [Subscribe to a Topic](#) in the *Amazon Simple Notification Service Getting Started Guide* to subscribe to a new topic.

Deleting a Vault in Amazon S3 Glacier

Amazon S3 Glacier (S3 Glacier) deletes a vault only if there are no archives in the vault as of the last inventory it computed and there have been no writes to the vault since the last inventory. For information about deleting archives, see [Deleting an Archive in Amazon S3 Glacier \(p. 109\)](#). For information about downloading a vault inventory, [Downloading a Vault Inventory in Amazon S3 Glacier \(p. 37\)](#).

Note

S3 Glacier prepares an inventory for each vault periodically, every 24 hours. Because the inventory might not reflect the latest information, S3 Glacier ensures the vault is indeed empty by checking if there were any write operations since the last vault inventory.

Topics

- [Deleting a Vault in Amazon S3 Glacier Using the AWS SDK for Java \(p. 59\)](#)
- [Deleting a Vault in Amazon S3 Glacier Using the AWS SDK for .NET \(p. 60\)](#)
- [Deleting a Vault in S3 Glacier Using the REST API \(p. 61\)](#)
- [Deleting an Empty Vault Using the Amazon S3 Glacier Console \(p. 61\)](#)
- [Deleting a Vault in Amazon S3 Glacier Using the AWS Command Line Interface \(p. 61\)](#)

Deleting a Vault in Amazon S3 Glacier Using the AWS SDK for Java

The following are the steps to delete a vault using the low-level API of the AWS SDK for Java.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region from where you want to delete a vault. All operations you perform using this client apply to that AWS Region.

2. Provide request information by creating an instance of the `DeleteVaultRequest` class.

You need to provide the vault name and account ID. If you don't provide an account ID, then account ID associated with the credentials you provide to sign the request is assumed. For more information, see [Using the AWS SDK for Java with Amazon S3 Glacier \(p. 117\)](#).

3. Run the `deleteVault` method by providing the request object as a parameter.

Amazon S3 Glacier (S3 Glacier) deletes the vault only if it is empty. For more information, see [Delete Vault \(DELETE vault\) \(p. 189\)](#).

The following Java code snippet illustrates the preceding steps.

```
try {
    DeleteVaultRequest request = new DeleteVaultRequest()
        .withVaultName("*** provide vault name ***");
```

```
client.deleteVault(request);
System.out.println("Deleted vault: " + vaultName);
} catch (Exception e) {
    System.err.println(e.getMessage());
}
```

Note

For information about the underlying REST API, see [Delete Vault \(DELETE vault\)](#) (p. 189).

Example: Deleting a Vault Using the AWS SDK for Java

For a working code example, see [Example: Creating a Vault Using the AWS SDK for Java](#) (p. 27). The Java code example shows basic vault operations including create and delete vault.

Deleting a Vault in Amazon S3 Glacier Using the AWS SDK for .NET

Both the [high-level and low-level APIs](#) (p. 116) provided by the AWS SDK for .NET provide a method to delete a vault.

Topics

- [Deleting a Vault Using the High-Level API of the AWS SDK for .NET](#) (p. 60)
- [Deleting a Vault Using the Low-Level API of the AWS SDK for .NET](#) (p. 60)

Deleting a Vault Using the High-Level API of the AWS SDK for .NET

The `ArchiveTransferManager` class of the high-level API provides the `DeleteVault` method you can use to delete a vault.

Example: Deleting a Vault Using the High-Level API of the AWS SDK for .NET

For a working code example, see [Example: Vault Operations Using the High-Level API of the AWS SDK for .NET](#) (p. 29). The C# code example shows basic vault operations including create and delete vault.

Deleting a Vault Using the Low-Level API of the AWS SDK for .NET

The following are the steps to delete a vault using the AWS SDK for .NET.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region from where you want to delete a vault. All operations you perform using this client apply to that AWS Region.

2. Provide request information by creating an instance of the `DeleteVaultRequest` class.

You need to provide the vault name and account ID. If you don't provide an account ID, then account ID associated with the credentials you provide to sign the request is assumed. For more information, see [Using the AWS SDK for .NET with Amazon S3 Glacier](#) (p. 120).

3. Run the `DeleteVault` method by providing the request object as a parameter.

Amazon S3 Glacier (S3 Glacier) deletes the vault only if it is empty. For more information, see [Delete Vault \(DELETE vault\)](#) (p. 189).

The following C# code snippet illustrates the preceding steps. The snippet retrieves metadata information of a vault that exists in the default AWS Region.

```
AmazonGlacier client;  
client = new AmazonGlacierClient(Amazon.RegionEndpoint.USEast1);  
  
DeleteVaultRequest request = new DeleteVaultRequest()  
{  
    VaultName = "*** provide vault name ***"  
};  
  
DeleteVaultResponse response = client.DeleteVault(request);
```

Note

For information about the underlying REST API, see [Delete Vault \(DELETE vault\) \(p. 189\)](#).

Example: Deleting a Vault Using the Low-Level API of the AWS SDK for .NET

For a working code example, see [Example: Vault Operations Using the Low-Level API of the AWS SDK for .NET \(p. 30\)](#). The C# code example shows basic vault operations including create and delete vault.

Deleting a Vault in S3 Glacier Using the REST API

To delete a vault using the REST API, see [Delete Vault \(DELETE vault\) \(p. 189\)](#).

Deleting an Empty Vault Using the Amazon S3 Glacier Console

Amazon S3 Glacier (S3 Glacier) deletes a vault only if there are no archives in the vault as of the last inventory it computed and there have been no writes to the vault since the last inventory. For information about deleting archives, see [Deleting an Archive in Amazon S3 Glacier \(p. 109\)](#). For information about downloading a vault inventory, [Downloading a Vault Inventory in Amazon S3 Glacier \(p. 37\)](#).

The following are the steps to delete an empty vault using the S3 Glacier console.

1. Sign into the AWS Management Console and open the S3 Glacier console at <https://console.aws.amazon.com/glacier>.
2. From the AWS Region selector, select the AWS Region where the vault exists.
3. Select the vault.
4. Click **Delete Vault**.

Deleting a Vault in Amazon S3 Glacier Using the AWS Command Line Interface

You can delete empty and nonempty vaults in Amazon S3 Glacier (S3 Glacier) using the AWS Command Line Interface (AWS CLI).

Topics

- [\(Prerequisite\) Setting Up the AWS CLI \(p. 21\)](#)
- [Example: Deleting an Empty Vault Using the AWS CLI \(p. 62\)](#)

- [Example: Deleting a Nonempty Vault Using the AWS CLI \(p. 62\)](#)

(Prerequisite) Setting Up the AWS CLI

1. Download and configure the AWS CLI. For instructions, see the following topics in the *AWS Command Line Interface User Guide*.

[Installing the AWS Command Line Interface](#)

[Configuring the AWS Command Line Interface](#)

2. Verify the setup by entering the following commands at the command prompt. These commands don't provide credentials explicitly, so the credentials of the default profile are used.

- Try using the help command.

```
aws help
```

- Use `aws s3 ls` to get a list of buckets on the configured account.

```
aws s3 ls
```

- Use `aws configure list` to see the current configuration data.

```
aws configure list
```

Example: Deleting an Empty Vault Using the AWS CLI

- Use the `delete-vault` command to delete a vault that contains no archives.

```
aws glacier delete-vault --vault-name awsexamplevault --account-id 111122223333
```

Example: Deleting a Nonempty Vault Using the AWS CLI

S3 Glacier deletes a vault only if there are no archives in the vault as of the last inventory it computed, and there have been no writes to the vault since the last inventory. Deleting a nonempty vault is a three-step process: retrieving archive IDs from a vault's inventory report, deleting each archive, and then deleting the vault.

1. Use the `initiate-job` command to start an inventory retrieval job.

```
aws glacier initiate-job --vault-name awsexamplevault --account-id 111122223333 --job-parameters '{"Type": "inventory-retrieval"}
```

Expected output:

```
{
  "location": "/111122223333/vaults/awsexamplevault/jobs/*** jobid ***",
  "jobId": *** jobid ***"
}
```

2. Use the `describe-job` command to check status of the previous retrieval job.

```
aws glacier describe-job --vault-name awsexamplevault --account-id 111122223333 --job-id *** jobid ***
```

Expected output:

```
{
  "InventoryRetrievalParameters": {
    "Format": "JSON"
  },
  "VaultARN": "*** vault arn ***",
  "Completed": false,
  "JobId": "*** jobid ***",
  "Action": "InventoryRetrieval",
  "CreationDate": "*** job creation date ***",
  "StatusCode": "InProgress"
}
```

3. Wait for the job to complete.

You must wait until the job output is ready for you to download. If you set a notification configuration on the vault or specified an Amazon Simple Notification Service (Amazon SNS) topic when you initiated the job, S3 Glacier sends a message to the topic after it completes the job.

You can set notification configuration for specific events on the vault. For more information, see [Configuring Vault Notifications in Amazon S3 Glacier \(p. 51\)](#). S3 Glacier sends a message to the specified SNS topic anytime the specific event occurs.

4. When it's complete, use the `get-job-output` command to download the retrieval job to the file `output.json`.

```
aws glacier get-job-output --vault-name awsexamplevault --account-id 111122223333 --job-id *** jobid *** output.json
```

This command produces a file with the following fields.

```
{
  "VaultARN": "arn:aws:glacier:region:111122223333:vaults/awsexamplevault",
  "InventoryDate": "*** job completion date ***",
  "ArchiveList": [
    {
      "ArchiveId": "*** archiveid ***",
      "ArchiveDescription": "*** archive description (if set) ***",
      "CreationDate": "*** archive creation date ***",
      "Size": "*** archive size (in bytes) ***",
      "SHA256TreeHash": "*** archive hash ***"
    }
    ...
  ]
}
```

5. Use the `delete-archive` command to delete each archive from a vault until none remain.

```
aws glacier delete-archive --vault-name awsexamplevault --account-id 111122223333 --archive-id *** archiveid ***
```

6. Use the `initiate-job` command to start a new inventory retrieval job.

```
aws glacier initiate-job --vault-name awsexamplevault --account-id 111122223333 --job-parameters '{"Type": "inventory-retrieval"}'
```

7. When it's complete, use the `delete-vault` command to delete a vault with no archives.

```
aws glacier delete-vault --vault-name awsexamplevault --account-id 111122223333
```

Tagging Your Amazon S3 Glacier Vaults

You can assign your own metadata to Amazon S3 Glacier (S3 Glacier) vaults in the form of tags. A *tag* is a key-value pair that you define for a vault. For basic information about tagging, including restrictions on tags, see [Tagging Amazon S3 Glacier Resources \(p. 155\)](#).

The following topics describe how you can add, list, and remove tags for vaults.

Topics

- [Tagging Vaults Using the Amazon S3 Glacier Console \(p. 64\)](#)
- [Tagging Vaults Using the Amazon S3 Glacier API \(p. 65\)](#)
- [Related Sections \(p. 65\)](#)

Tagging Vaults Using the Amazon S3 Glacier Console

You can add, list, and remove tags using the S3 Glacier console as described in the following procedures.

To view the tags for a vault

1. Sign in to the AWS Management Console and open the S3 Glacier console at <https://console.aws.amazon.com/glacier>.
2. From the AWS Region selector, choose an AWS Region.
3. On the **Amazon S3 Glacier Vaults** page, choose a vault.
4. Choose the **Tags** tab. The tags for that vault will appear.

To add a tag to a vault

1. Open the S3 Glacier console, and then choose a Region from the AWS Region selector.
2. On the **Amazon S3 Glacier Vaults** page, choose a vault.
3. Choose the **Tags** tab.
4. Specify the tag key in the **Key** field, optionally specify a tag value in the **Value** field, and then choose **Save**.

If the **Save** button is not enabled, either the tag key or the tag value that you specified does not meet the tag restrictions. For more about tag restrictions, see [Tag Restrictions \(p. 155\)](#).

To remove a tag from a vault

1. Open the S3 Glacier console, and then choose a Region from the AWS Region selector.
2. On the **Amazon S3 Glacier Vaults** page, choose a vault.
3. Choose the **Tags** tab, and then choose the **x** at the end of the row that describes the tag you want to delete.

4. Choose **Delete**.

Tagging Vaults Using the Amazon S3 Glacier API

You can add, list, and remove tags using the S3 Glacier API. For examples, see the following documentation:

[Add Tags To Vault \(POST tags add\) \(p. 182\)](#)

Adds or updates tags for the specified vault.

[List Tags For Vault \(GET tags\) \(p. 208\)](#)

Lists the tags for the specified vault.

[Remove Tags From Vault \(POST tags remove\) \(p. 215\)](#)

Removes tags from the specified vault.

Related Sections

- [Tagging Amazon S3 Glacier Resources \(p. 155\)](#)

Amazon S3 Glacier Vault Lock

The following topics describe how to lock a vault in Amazon S3 Glacier and how to use Vault Lock policies.

Topics

- [Vault Locking Overview \(p. 65\)](#)
- [Locking a Vault by Using the Amazon S3 Glacier API \(p. 66\)](#)

Vault Locking Overview

S3 Glacier Vault Lock allows you to easily deploy and enforce compliance controls for individual S3 Glacier vaults with a vault lock policy. You can specify controls such as “write once read many” (WORM) in a vault lock policy and lock the policy from future edits. Once locked, the policy can no longer be changed.

S3 Glacier enforces the controls set in the vault lock policy to help achieve your compliance objectives, for example, for data retention. You can deploy a variety of compliance controls in a vault lock policy using the AWS Identity and Access Management (IAM) policy language. For more information about vault lock policies, see [Amazon S3 Glacier Access Control with Vault Lock Policies \(p. 136\)](#).

A vault lock policy is different than a vault access policy. Both policies govern access controls to your vault. However, a vault lock policy can be locked to prevent future changes, providing strong enforcement for your compliance controls. You can use the vault lock policy to deploy regulatory and compliance controls, which typically require tight controls on data access. In contrast, you use a vault access policy to implement access controls that are not compliance related, temporary, and subject to frequent modification. Vault lock and vault access policies can be used together. For example, you can implement time-based data retention rules in the vault lock policy (deny deletes), and grant read access to designated third parties or your business partners (allow reads).

Locking a vault takes two steps:

1. Initiate the lock by attaching a vault lock policy to your vault, which sets the lock to an in-progress state and returns a lock ID. While in the in-progress state, you have 24 hours to validate your vault lock policy before the lock ID expires.
2. Use the lock ID to complete the lock process. If the vault lock policy doesn't work as expected, you can stop the lock and restart from the beginning. For information on how to use the S3 Glacier API to lock a vault, see [Locking a Vault by Using the Amazon S3 Glacier API](#) (p. 66).

Locking a Vault by Using the Amazon S3 Glacier API

To lock your vault with the Glacier API, you first call [Initiate Vault Lock \(POST lock-policy\)](#) (p. 205) with a vault lock policy that specifies the controls you want to deploy. [Initiate Vault Lock \(POST lock-policy\)](#) (p. 205) attaches the policy to your vault, transitions the vault lock to the in-progress state, and returns a unique lock ID. After the vault lock enters the in-progress state, you have 24 hours to complete the lock by calling [Complete Vault Lock \(POST lockId\)](#) (p. 187) with the lock ID returned from [Initiate Vault Lock \(POST lock-policy\)](#) (p. 205). After the vault is locked it cannot be unlocked.

If you don't complete the vault lock process within 24 hours after entering the in-progress state, your vault automatically exits the in-progress state, and the vault lock policy is removed. You can call [Initiate Vault Lock \(POST lock-policy\)](#) (p. 205) again to install a new vault lock policy and transition into the in-progress state.

The in-progress state provides the opportunity to test your vault lock policy before you lock it. Your vault lock policy takes full effect during the in-progress state just as if the vault has been locked, except that you can remove the policy by calling [Abort Vault Lock \(DELETE lock-policy\)](#) (p. 180). To fine-tune your policy, you can repeat the [Abort Vault Lock \(DELETE lock-policy\)](#) (p. 180)/[Initiate Vault Lock \(POST lock-policy\)](#) (p. 205) combination as many times as necessary to validate your vault lock policy changes.

After you validate the vault lock policy, you can call [Complete Vault Lock \(POST lockId\)](#) (p. 187) with the most recent lock ID to complete the vault locking process. Your vault transitions to a locked state where the vault lock policy is unchangeable and can no longer be removed by calling [Abort Vault Lock \(DELETE lock-policy\)](#) (p. 180).

Related Sections

- [Amazon S3 Glacier Access Control with Vault Lock Policies](#) (p. 136)
- [Abort Vault Lock \(DELETE lock-policy\)](#) (p. 180)
- [Complete Vault Lock \(POST lockId\)](#) (p. 187)
- [Get Vault Lock \(GET lock-policy\)](#) (p. 200)
- [Initiate Vault Lock \(POST lock-policy\)](#) (p. 205)

Working with Archives in Amazon S3 Glacier

An archive is any object, such as a photo, video, or document, that you store in a vault. It is a base unit of storage in Amazon S3 Glacier (S3 Glacier). Each archive has a unique ID and an optional description. When you upload an archive, S3 Glacier returns a response that includes an archive ID. This archive ID is unique in the AWS Region in which the archive is stored. The following is an example archive ID.

```
TJgHcrOSfAkV6hdPqOATYfp_0ZaxL1pIBOc02iZ0gDPMr2ig-  
nhwd_PafstdIf6HSrjHnP-3p6LCJClYtFT_CBhT9CwNxbRaM5MetS3I-GqwxI3Y8QtgbJbhEQPs0mJ3KExample
```

Archive IDs are 138 bytes long. When you upload an archive, you can provide an optional description. You can retrieve an archive using its ID but not its description.

Important

S3 Glacier provides a management console. You can use the console to create and delete vaults. However, all other interactions with S3 Glacier require that you use the AWS Command Line Interface (CLI) or write code. For example, to upload data, such as photos, videos, and other documents, you must either use the AWS CLI or write code to make requests, using either the REST API directly or by using the AWS SDKs. For more information about using S3 Glacier with the AWS CLI, go to [AWS CLI Reference for S3 Glacier](#). To install the AWS CLI, go to [AWS Command Line Interface](#).

Topics

- [Archive Operations in Amazon S3 Glacier](#) (p. 67)
- [Maintaining Client-Side Archive Metadata](#) (p. 68)
- [Uploading an Archive in Amazon S3 Glacier](#) (p. 68)
- [Downloading an Archive in Amazon S3 Glacier](#) (p. 83)
- [Deleting an Archive in Amazon S3 Glacier](#) (p. 109)
- [Querying an Archives in Amazon S3 Glacier](#) (p. 115)

Archive Operations in Amazon S3 Glacier

S3 Glacier supports the following basic archive operations: upload, download, and delete. Downloading an archive is an asynchronous operation.

Uploading an Archive in Amazon S3 Glacier

You can upload an archive in a single operation or upload it in parts. The API call you use to upload an archive in parts is referred as Multipart Upload. For more information, see [Uploading an Archive in Amazon S3 Glacier](#) (p. 68).

Important

S3 Glacier provides a management console. You can use the console to create and delete vaults. However, all other interactions with S3 Glacier require that you use the AWS Command Line Interface (CLI) or write code. For example, to upload data, such as photos, videos, and other documents, you must either use the AWS CLI or write code to make requests, using either the REST API directly or by using the AWS SDKs. For more information about using S3 Glacier with the AWS CLI, go to [AWS CLI Reference for S3 Glacier](#). To install the AWS CLI, go to [AWS Command Line Interface](#).

Finding an Archive ID in Amazon S3 Glacier

You can get the archive ID by downloading the vault inventory for the vault that contains the archive. For more information about downloading the vault inventory, see [Downloading a Vault Inventory in Amazon S3 Glacier](#) (p. 37).

Downloading an Archive in Amazon S3 Glacier

Downloading an archive is an asynchronous operation. You must first initiate a job to download a specific archive. After receiving the job request, S3 Glacier prepares your archive for download. After the job completes, you can download your archive data. Because of the asynchronous nature of the job, you can request S3 Glacier to send a notification to an Amazon Simple Notification Service (Amazon SNS) topic when the job completes. You can specify an SNS topic for each individual job request or configure your vault to send a notification when specific events occur. For more information about downloading an archive, see [Downloading an Archive in Amazon S3 Glacier](#) (p. 83).

Deleting an Archive in Amazon S3 Glacier

S3 Glacier provides an API call that you can use to delete one archive at a time. For more information, see [Deleting an Archive in Amazon S3 Glacier](#) (p. 109).

Updating an Archive in S3 Glacier

After you upload an archive, you cannot update its content or its description. The only way you can update the archive content or its description is by deleting the archive and uploading another archive. Note that each time you upload an archive, S3 Glacier returns to you a unique archive ID.

Maintaining Client-Side Archive Metadata

Except for the optional archive description, S3 Glacier does not support any additional metadata for the archives. When you upload an archive S3 Glacier assigns an ID, an opaque sequence of characters, from which you cannot infer any meaning about the archive. You might maintain metadata about the archives on the client-side. The metadata can include archive name and some other meaningful information about the archive.

Note

If you are an Amazon Simple Storage Service (Amazon S3) customer, you know that when you upload an object to a bucket, you can assign the object an object key such as `MyDocument.txt` or `SomePhoto.jpg`. In S3 Glacier, you cannot assign a key name to the archives you upload.

If you maintain client-side archive metadata, note that S3 Glacier maintains a vault inventory that includes archive IDs and any descriptions you provided during the archive upload. You might occasionally download the vault inventory to reconcile any issues in your client-side database you maintain for the archive metadata. However, S3 Glacier takes vault inventory approximately daily. When you request a vault inventory, S3 Glacier returns the last inventory it prepared, a point in time snapshot.

Uploading an Archive in Amazon S3 Glacier

Amazon S3 Glacier (S3 Glacier) provides a management console, which you can use to create and delete vaults. However, you cannot upload archives to S3 Glacier by using the management console. To upload data, such as photos, videos, and other documents, you must either use the AWS CLI or write code to make requests, by using either the REST API directly or by using the AWS SDKs.

For information about using S3 Glacier with the AWS CLI, go to [AWS CLI Reference for S3 Glacier](#). To install the AWS CLI, go to [AWS Command Line Interface](#). The following **Uploading** topics describe how to upload archives to S3 Glacier by using the AWS SDK for Java, the AWS SDK for .NET, and the REST API.

Topics

- [Options for Uploading an Archive to Amazon S3 Glacier](#) (p. 69)
- [Uploading an Archive in a Single Operation](#) (p. 69)
- [Uploading Large Archives in Parts \(Multipart Upload\)](#) (p. 75)

Options for Uploading an Archive to Amazon S3 Glacier

Depending on the size of the data you are uploading, S3 Glacier offers the following options:

- **Upload archives in a single operation** – In a single operation, you can upload archives from 1 byte to up to 4 GB in size. However, we encourage S3 Glacier customers to use multipart upload to upload archives greater than 100 MB. For more information, see [Uploading an Archive in a Single Operation](#) (p. 69).
- **Upload archives in parts** – Using the multipart upload API, you can upload large archives, up to about 40,000 GB (10,000 * 4 GB).

The multipart upload API call is designed to improve the upload experience for larger archives. You can upload archives in parts. These parts can be uploaded independently, in any order, and in parallel. If a part upload fails, you only need to upload that part again and not the entire archive. You can use multipart upload for archives from 1 byte to about 40,000 GB in size. For more information, see [Uploading Large Archives in Parts \(Multipart Upload\)](#) (p. 75).

Important

The S3 Glacier vault inventory is only updated once a day. When you upload an archive, you will not immediately see the new archive added to your vault (in the console or in your downloaded vault inventory list) until the vault inventory has been updated.

Using the AWS Snowball Service

AWS Snowball accelerates moving large amounts of data into and out of AWS using Amazon-owned devices, bypassing the internet. For more information, see [AWS Snowball](#) detail page.

To upload existing data to Amazon S3 Glacier (S3 Glacier), you might consider using one of the AWS Snowball device types to import data into Amazon S3, and then move it to the S3 Glacier storage class for archival using lifecycle rules. When you transition Amazon S3 objects to the S3 Glacier storage class, Amazon S3 internally uses S3 Glacier for durable storage at lower cost. Although the objects are stored in S3 Glacier, they remain Amazon S3 objects that you manage in Amazon S3, and you cannot access them directly through S3 Glacier.

For more information about Amazon S3 lifecycle configuration and transitioning objects to the S3 Glacier storage class, see [Object Lifecycle Management](#) and [Transitioning Objects](#) in the *Amazon Simple Storage Service Developer Guide*.

Uploading an Archive in a Single Operation

As described in [Uploading an Archive in Amazon S3 Glacier](#) (p. 68), you can upload smaller archives in a single operation. However, we encourage Amazon S3 Glacier (S3 Glacier) customers to use Multipart Upload to upload archives greater than 100 MB.

Topics

- [Uploading an Archive in a Single Operation Using the AWS SDK for Java \(p. 70\)](#)
- [Uploading an Archive in a Single Operation Using the AWS SDK for .NET in Amazon S3 Glacier \(p. 72\)](#)
- [Uploading an Archive in a Single Operation Using the REST API \(p. 75\)](#)

Uploading an Archive in a Single Operation Using the AWS SDK for Java

Both the [high-level and low-level APIs \(p. 116\)](#) provided by the AWS SDK for Java provide a method to upload an archive.

Topics

- [Uploading an Archive Using the High-Level API of the AWS SDK for Java \(p. 70\)](#)
- [Uploading an Archive in a Single Operation Using the Low-Level API of the AWS SDK for Java \(p. 71\)](#)

Uploading an Archive Using the High-Level API of the AWS SDK for Java

The `ArchiveTransferManager` class of the high-level API provides the `upload` method, which you can use to upload an archive to a vault.

Note

You can use the `upload` method to upload small or large archives. Depending on the archive size you are uploading, this method determines whether to upload it in a single operation or use the multipart upload API to upload the archive in parts.

Example: Uploading an Archive Using the High-Level API of the AWS SDK for Java

The following Java code example uploads an archive to a vault (`examplevault`) in the US West (Oregon) Region (`us-west-2`). For a list of supported AWS Regions and endpoints, see [Accessing Amazon S3 Glacier \(p. 5\)](#).

For step-by-step instructions on how to run this example, see [Running Java Examples for Amazon S3 Glacier Using Eclipse \(p. 119\)](#). You need to update the code as shown with the name of the vault you want to upload to and the name of the file you want to upload.

Example

```
import java.io.File;
import java.io.IOException;
import java.util.Date;

import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.glacier.AmazonGlacierClient;
import com.amazonaws.services.glacier.transfer.ArchiveTransferManager;
import com.amazonaws.services.glacier.transfer.UploadResult;

public class ArchiveUploadHighLevel {
    public static String vaultName = "*** provide vault name ***";
    public static String archiveToUpload = "*** provide name of file to upload ***";

    public static AmazonGlacierClient client;

    public static void main(String[] args) throws IOException {
```

```
ProfileCredentialsProvider credentials = new ProfileCredentialsProvider();

client = new AmazonGlacierClient(credentials);
client.setEndpoint("https://glacier.us-west-2.amazonaws.com/");

try {
    ArchiveTransferManager atm = new ArchiveTransferManager(client, credentials);

    UploadResult result = atm.upload(vaultName, "my archive " + (new Date()), new
File(archiveToUpload));
    System.out.println("Archive ID: " + result.getArchiveId());

} catch (Exception e)
{
    System.err.println(e);
}
}
```

Uploading an Archive in a Single Operation Using the Low-Level API of the AWS SDK for Java

The low-level API provides methods for all the archive operations. The following are the steps to upload an archive using the AWS SDK for Java.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region where you want to upload the archive. All operations you perform using this client apply to that AWS Region.

2. Provide request information by creating an instance of the `UploadArchiveRequest` class.

In addition to the data you want to upload, you need to provide a checksum (SHA-256 tree hash) of the payload, the vault name, the content length of the data, and your account ID.

If you don't provide an account ID, then the account ID associated with the credentials you provide to sign the request is assumed. For more information, see [Using the AWS SDK for Java with Amazon S3 Glacier \(p. 117\)](#).

3. Run the `uploadArchive` method by providing the request object as a parameter.

In response, Amazon S3 Glacier (S3 Glacier) returns an archive ID of the newly uploaded archive.

The following Java code snippet illustrates the preceding steps.

```
AmazonGlacierClient client;

UploadArchiveRequest request = new UploadArchiveRequest()
    .withVaultName("*** provide vault name ***")
    .withChecksum(checksum)
    .withBody(new ByteArrayInputStream(body))
    .withContentLength((long)body.length);

UploadArchiveResult uploadArchiveResult = client.uploadArchive(request);

System.out.println("Location (includes ArchiveID): " + uploadArchiveResult.getLocation());
```

Example: Uploading an Archive in a Single Operation Using the Low-Level API of the AWS SDK for Java

The following Java code example uses the AWS SDK for Java to upload an archive to a vault (examplevault). For step-by-step instructions on how to run this example, see [Running Java Examples](#)

for [Amazon S3 Glacier Using Eclipse \(p. 119\)](#). You need to update the code as shown with the name of the vault you want to upload to and the name of the file you want to upload.

```
import java.io.ByteArrayInputStream;
import java.io.File;
import java.io.FileInputStream;
import java.io.IOException;
import java.io.InputStream;

import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.glacier.AmazonGlacierClient;
import com.amazonaws.services.glacier.TreeHashGenerator;
import com.amazonaws.services.glacier.model.UploadArchiveRequest;
import com.amazonaws.services.glacier.model.UploadArchiveResult;
public class ArchiveUploadLowLevel {

    public static String vaultName = "*** provide vault name ***";
    public static String archiveFilePath = "*** provide to file upload ***";
    public static AmazonGlacierClient client;

    public static void main(String[] args) throws IOException {

        ProfileCredentialsProvider credentials = new ProfileCredentialsProvider();

        client = new AmazonGlacierClient(credentials);
        client.setEndpoint("https://glacier.us-east-1.amazonaws.com/");

        try {
            // First open file and read.
            File file = new File(archiveFilePath);
            InputStream is = new FileInputStream(file);
            byte[] body = new byte[(int) file.length()];
            is.read(body);

            // Send request.
            UploadArchiveRequest request = new UploadArchiveRequest()
                .withVaultName(vaultName)
                .withChecksum(TreeHashGenerator.calculateTreeHash(new
                    File(archiveFilePath)))
                .withBody(new ByteArrayInputStream(body))
                .withContentLength((long)body.length);

            UploadArchiveResult uploadArchiveResult = client.uploadArchive(request);

            System.out.println("ArchiveID: " + uploadArchiveResult.getArchiveId());

        } catch (Exception e)
        {
            System.err.println("Archive not uploaded.");
            System.err.println(e);
        }
    }
}
```

Uploading an Archive in a Single Operation Using the AWS SDK for .NET in Amazon S3 Glacier

Both the [high-level and low-level APIs \(p. 116\)](#) provided by the AWS SDK for .NET provide a method to upload an archive in a single operation.

Topics

- [Uploading an Archive Using the High-Level API of the AWS SDK for .NET \(p. 73\)](#)

- [Uploading an Archive in a Single Operation Using the Low-Level API of the AWS SDK for .NET \(p. 73\)](#)

Uploading an Archive Using the High-Level API of the AWS SDK for .NET

The `ArchiveTransferManager` class of the high-level API provides the `Upload` method that you can use to upload an archive to a vault.

Note

You can use the `Upload` method to upload small or large files. Depending on the file size you are uploading, this method determines whether to upload it in a single operation or use the multipart upload API to upload the file in parts.

Example: Uploading an Archive Using the High-Level API of the AWS SDK for .NET

The following C# code example uploads an archive to a vault (`examplevault`) in the US West (Oregon) Region.

For step-by-step instructions on how to run this example, see [Running Code Examples \(p. 121\)](#). You need to update the code as shown with the name of the file you want to upload.

Example

```
using System;
using Amazon.Glacier;
using Amazon.Glacier.Transfer;
using Amazon.Runtime;

namespace glacier.amazon.com.docsamples
{
    class ArchiveUploadHighLevel
    {
        static string vaultName = "examplevault";
        static string archiveToUpload = "**** Provide file name (with full path) to upload ****";

        public static void Main(string[] args)
        {
            try
            {
                var manager = new ArchiveTransferManager(Amazon.RegionEndpoint.USWest2);
                // Upload an archive.
                string archiveId = manager.Upload(vaultName, "upload archive test",
                    archiveToUpload).ArchiveId;
                Console.WriteLine("Archive ID: (Copy and save this ID for use in other
                    examples.) : {0}", archiveId);
                Console.WriteLine("To continue, press Enter");
                Console.ReadKey();
            }
            catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
            catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
            catch (Exception e) { Console.WriteLine(e.Message); }
            Console.WriteLine("To continue, press Enter");
            Console.ReadKey();
        }
    }
}
```

Uploading an Archive in a Single Operation Using the Low-Level API of the AWS SDK for .NET

The low-level API provides methods for all the archive operations. The following are the steps to upload an archive using the AWS SDK for .NET.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region where you want to upload the archive. All operations you perform using this client apply to that AWS Region.

2. Provide request information by creating an instance of the `UploadArchiveRequest` class.

In addition to the data you want to upload, You need to provide a checksum (SHA-256 tree hash) of the payload, the vault name, and your account ID.

If you don't provide an account ID, then the account ID associated with the credentials you provide to sign the request is assumed. For more information, see [Using the AWS SDK for .NET with Amazon S3 Glacier](#) (p. 120).

3. Run the `UploadArchive` method by providing the request object as a parameter.

In response, S3 Glacier returns an archive ID of the newly uploaded archive.

Example: Uploading an Archive in a Single Operation Using the Low-Level API of the AWS SDK for .NET

The following C# code example illustrates the preceding steps. The example uses the AWS SDK for .NET to upload an archive to a vault (examplevault).

Note

For information about the underlying REST API to upload an archive in a single request, see [Upload Archive \(POST archive\)](#) (p. 224).

For step-by-step instructions on how to run this example, see [Running Code Examples](#) (p. 121). You need to update the code as shown with the name of the file you want to upload.

Example

```
using System;
using System.IO;
using Amazon.Glacier;
using Amazon.Glacier.Model;
using Amazon.Runtime;

namespace glacier.amazon.com.docsamples
{
    class ArchiveUploadSingleOpLowLevel
    {
        static string vaultName      = "examplevault";
        static string archiveToUpload = "**** Provide file name (with full path) to upload ****";

        public static void Main(string[] args)
        {
            AmazonGlacierClient client;
            try
            {
                using (client = new AmazonGlacierClient(Amazon.RegionEndpoint.USSouth2))
                {
                    Console.WriteLine("Uploading an archive.");
                    string archiveId = UploadAnArchive(client);
                    Console.WriteLine("Archive ID: {0}", archiveId);
                }
            }
            catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
            catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
            catch (Exception e) { Console.WriteLine(e.Message); }
            Console.WriteLine("To continue, press Enter");
            Console.ReadKey();
        }
    }
}
```

```
static string UploadAnArchive(AmazonGlacierClient client)
{
    using (FileStream fileStream = new FileStream(archiveToUpload, FileMode.Open,
        FileAccess.Read))
    {
        string treeHash = TreeHashGenerator.CalculateTreeHash(fileStream);
        UploadArchiveRequest request = new UploadArchiveRequest()
        {
            VaultName = vaultName,
            Body = fileStream,
            Checksum = treeHash
        };
        UploadArchiveResponse response = client.UploadArchive(request);
        string archiveID = response.ArchiveId;
        return archiveID;
    }
}
```

Uploading an Archive in a Single Operation Using the REST API

You can use the Upload Archive API call to upload an archive in a single operation. For more information, see [Upload Archive \(POST archive\)](#) (p. 224).

Uploading Large Archives in Parts (Multipart Upload)

Topics

- [Multipart Upload Process](#) (p. 75)
- [Quick Facts](#) (p. 76)
- [Uploading Large Archives in Parts Using the AWS SDK for Java](#) (p. 77)
- [Uploading Large Archives Using the AWS SDK for .NET](#) (p. 80)
- [Uploading Large Archives in Parts Using the REST API](#) (p. 83)

Multipart Upload Process

As described in [Uploading an Archive in Amazon S3 Glacier](#) (p. 68), we encourage Amazon S3 Glacier (S3 Glacier) customers to use Multipart Upload to upload archives greater than 100 MB.

1. Initiate Multipart Upload

When you send a request to initiate a multipart upload, S3 Glacier returns a multipart upload ID, which is a unique identifier for your multipart upload. Any subsequent multipart upload operations require this ID. This ID doesn't expire for at least 24 hours after S3 Glacier completes the job.

In your request to start a multipart upload, specify the part size in number of bytes. Each part you upload, except the last part, must be this size.

Note

You don't need to know the overall archive size when using multipart uploads. This means that you can use multipart uploads in cases where you don't know the archive size when you start uploading the archive. You only need to decide the part size at the time you start the multipart upload.

In the initiate multipart upload request, you can also provide an optional archive description.

2. Upload Parts

For each part upload request, you must include the multipart upload ID you obtained in step 1. In the request, you must also specify the content range, in bytes, identifying the position of the part in the final archive. S3 Glacier later uses the content range information to assemble the archive in proper sequence. Because you provide the content range for each part that you upload, it determines the part's position in the final assembly of the archive, and therefore you can upload parts in any order. You can also upload parts in parallel. If you upload a new part using the same content range as a previously uploaded part, the previously uploaded part is overwritten.

3. Complete (or stop) Multipart Upload

After uploading all the archive parts, you use the complete operation. Again, you must specify the upload ID in your request. S3 Glacier creates an archive by concatenating parts in ascending order based on the content range you provided. S3 Glacier response to a Complete Multipart Upload request includes an archive ID for the newly created archive. If you provided an optional archive description in the Initiate Multipart Upload request, S3 Glacier associates it with the assembled archive. After you successfully complete a multipart upload, you cannot refer to the multipart upload ID. That means you cannot access parts associated with the multipart upload ID.

If you stop a multipart upload, you cannot upload any more parts using that multipart upload ID. All storage consumed by any parts associated with the stopped multipart upload is freed. If any part uploads were in-progress, they can still succeed or fail even after stopped.

Additional Multipart Upload Operations

Amazon S3 Glacier (S3 Glacier) provides the following additional multipart upload API calls.

- **List Parts**—Using this operation, you can list the parts of a specific multipart upload. It returns information about the parts that you have uploaded for a multipart upload. For each list parts request, S3 Glacier returns information for up to 1,000 parts. If there are more parts to list for the multipart upload, the result is paginated and a marker is returned in the response at which to continue the list. You need to send additional requests to retrieve subsequent parts. Note that the returned list of parts doesn't include parts that haven't completed uploading.
- **List Multipart Uploads**—Using this operation, you can obtain a list of multipart uploads in progress. An in-progress multipart upload is an upload that you have initiated, but have not yet completed or stopped. For each list multipart uploads request, S3 Glacier returns up to 1,000 multipart uploads. If there are more multipart uploads to list, then the result is paginated and a marker is returned in the response at which to continue the list. You need to send additional requests to retrieve the remaining multipart uploads.

Quick Facts

The following table provides multipart upload core specifications.

Item	Specification
Maximum archive size	10,000 x 4 GB
Maximum number of parts per upload	10,000
Part size	1 MB to 4 GB, last part can be < 1 MB. You specify the size value in bytes. The part size must be a megabyte (1024 KB) multiplied by a power of 2. For example, 1048576 (1 MB), 2097152 (2 MB), 4194304 (4 MB), 8388608 (8 MB).

Item	Specification
Maximum number of parts returned for a list parts request	1,000
Maximum number of multipart uploads returned in a list multipart uploads request	1,000

Uploading Large Archives in Parts Using the AWS SDK for Java

Both the [high-level and low-level APIs \(p. 116\)](#) provided by the AWS SDK for Java provide a method to upload a large archive (see [Uploading an Archive in Amazon S3 Glacier \(p. 68\)](#)).

- The high-level API provides a method that you can use to upload archives of any size. Depending on the file you are uploading, the method either uploads an archive in a single operation or uses the multipart upload support in Amazon S3 Glacier (S3 Glacier) to upload the archive in parts.
- The low-level API maps close to the underlying REST implementation. Accordingly, it provides a method to upload smaller archives in one operation and a group of methods that support multipart upload for larger archives. This section explains uploading large archives in parts using the low-level API.

For more information about the high-level and low-level APIs, see [Using the AWS SDK for Java with Amazon S3 Glacier \(p. 117\)](#).

Topics

- [Uploading Large Archives in Parts Using the High-Level API of the AWS SDK for Java \(p. 77\)](#)
- [Upload Large Archives in Parts Using the Low-Level API of the AWS SDK for Java \(p. 77\)](#)

Uploading Large Archives in Parts Using the High-Level API of the AWS SDK for Java

You use the same methods of the high-level API to upload small or large archives. Based on the archive size, the high-level API methods decide whether to upload the archive in a single operation or use the multipart upload API provided by S3 Glacier. For more information, see [Uploading an Archive Using the High-Level API of the AWS SDK for Java \(p. 70\)](#).

Upload Large Archives in Parts Using the Low-Level API of the AWS SDK for Java

For granular control of the upload you can use the low-level API where you can configure the request and process the response. The following are the steps to upload large archives in parts using the AWS SDK for Java.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region where you want to save the archive. All operations you perform using this client apply to that AWS Region.

2. Initiate multipart upload by calling the `initiateMultipartUpload` method.

You need to provide vault name in which you want to upload the archive, part size you want to use to upload archive parts, and an optional description. You provide this information by creating an instance of the `InitiateMultipartUploadRequest` class. In response, S3 Glacier returns an upload ID.

3. Upload parts by calling the `uploadMultipartPart` method.

For each part you upload, You need to provide the vault name, the byte range in the final assembled archive that will be uploaded in this part, the checksum of the part data, and the upload ID.

4. Complete multipart upload by calling the `completeMultipartUpload` method.

You need to provide the upload ID, the checksum of the entire archive, the archive size (combined size of all parts you uploaded), and the vault name. S3 Glacier constructs the archive from the uploaded parts and returns an archive ID.

Example: Uploading a Large Archive in a Parts Using the AWS SDK for Java

The following Java code example uses the AWS SDK for Java to upload an archive to a vault (examplevault). For step-by-step instructions on how to run this example, see [Running Java Examples for Amazon S3 Glacier Using Eclipse \(p. 119\)](#). You need to update the code as shown with the name of the file you want to upload.

Note

This example is valid for part sizes from 1 MB to 1 GB. However, S3 Glacier supports part sizes up to 4 GB.

Example

```
import java.io.ByteArrayInputStream;
import java.io.File;
import java.io.FileInputStream;
import java.io.IOException;
import java.security.NoSuchAlgorithmException;
import java.util.Arrays;
import java.util.Date;
import java.util.LinkedList;
import java.util.List;

import com.amazonaws.AmazonClientException;
import com.amazonaws.AmazonServiceException;
import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.glacier.AmazonGlacierClient;
import com.amazonaws.services.glacier.TreeHashGenerator;
import com.amazonaws.services.glacier.model.CompleteMultipartUploadRequest;
import com.amazonaws.services.glacier.model.CompleteMultipartUploadResult;
import com.amazonaws.services.glacier.model.InitiateMultipartUploadRequest;
import com.amazonaws.services.glacier.model.InitiateMultipartUploadResult;
import com.amazonaws.services.glacier.model.UploadMultipartPartRequest;
import com.amazonaws.services.glacier.model.UploadMultipartPartResult;
import com.amazonaws.util.BinaryUtils;

public class ArchiveMPU {

    public static String vaultName = "examplevault";
    // This example works for part sizes up to 1 GB.
    public static String partSize = "1048576"; // 1 MB.
    public static String archiveFilePath = "*** provide archive file path ***";
    public static AmazonGlacierClient client;

    public static void main(String[] args) throws IOException {

        ProfileCredentialsProvider credentials = new ProfileCredentialsProvider();

        client = new AmazonGlacierClient(credentials);
        client.setEndpoint("https://glacier.us-west-2.amazonaws.com/");

        try {
            System.out.println("Uploading an archive.");
            String uploadId = initiateMultipartUpload();
```

```

        String checksum = uploadParts(uploadId);
        String archiveId = CompleteMultiPartUpload(uploadId, checksum);
        System.out.println("Completed an archive. ArchiveId: " + archiveId);

    } catch (Exception e) {
        System.err.println(e);
    }

}

private static String initiateMultipartUpload() {
    // Initiate
    InitiateMultipartUploadRequest request = new InitiateMultipartUploadRequest()
        .withVaultName(vaultName)
        .withArchiveDescription("my archive " + (new Date()))
        .withPartSize(partSize);

    InitiateMultipartUploadResult result = client.initiateMultipartUpload(request);

    System.out.println("ArchiveID: " + result.getUploadId());
    return result.getUploadId();
}

private static String uploadParts(String uploadId) throws AmazonServiceException,
NoSuchAlgorithmException, AmazonClientException, IOException {

    int filePosition = 0;
    long currentPosition = 0;
    byte[] buffer = new byte[Integer.valueOf(partSize)];
    List<byte[]> binaryChecksums = new LinkedList<byte[]>();

    File file = new File(archiveFilePath);
    FileInputStream fileToUpload = new FileInputStream(file);
    String contentRange;
    int read = 0;
    while (currentPosition < file.length())
    {
        read = fileToUpload.read(buffer, filePosition, buffer.length);
        if (read == -1) { break; }
        byte[] bytesRead = Arrays.copyOf(buffer, read);

        contentRange = String.format("bytes %s-%s/*", currentPosition, currentPosition
+ read - 1);
        String checksum = TreeHashGenerator.calculateTreeHash(new
ByteArrayInputStream(bytesRead));
        byte[] binaryChecksum = BinaryUtils.fromHex(checksum);
        binaryChecksums.add(binaryChecksum);
        System.out.println(contentRange);

        //Upload part.
        UploadMultipartPartRequest partRequest = new UploadMultipartPartRequest()
            .withVaultName(vaultName)
            .withBody(new ByteArrayInputStream(bytesRead))
            .withChecksum(checksum)
            .withRange(contentRange)
            .withUploadId(uploadId);

        UploadMultipartPartResult partResult = client.uploadMultipartPart(partRequest);
        System.out.println("Part uploaded, checksum: " + partResult.getChecksum());

        currentPosition = currentPosition + read;
    }
    fileToUpload.close();
    String checksum = TreeHashGenerator.calculateTreeHash(binaryChecksums);
    return checksum;
}

```

```
private static String CompleteMultiPartUpload(String uploadId, String checksum) throws
NoSuchAlgorithmException, IOException {

    File file = new File(archiveFilePath);

    CompleteMultipartUploadRequest compRequest = new CompleteMultipartUploadRequest()
        .withVaultName(vaultName)
        .withUploadId(uploadId)
        .withChecksum(checksum)
        .withArchiveSize(String.valueOf(file.length()));

    CompleteMultipartUploadResult compResult =
client.completeMultipartUpload(compRequest);
    return compResult.getLocation();
}
}
```

Uploading Large Archives Using the AWS SDK for .NET

Both the [high-level and low-level APIs \(p. 116\)](#) provided by the AWS SDK for .NET provide a method to upload large archives in parts (see [Uploading an Archive in Amazon S3 Glacier \(p. 68\)](#)).

- The high-level API provides a method that you can use to upload archives of any size. Depending on the file you are uploading, the method either uploads archive in a single operation or uses the multipart upload support in Amazon S3 Glacier (S3 Glacier) to upload the archive in parts.
- The low-level API maps close to the underlying REST implementation. Accordingly, it provides a method to upload smaller archives in one operation and a group of methods that support multipart upload for larger archives. This section explains uploading large archives in parts using the low-level API.

For more information about the high-level and low-level APIs, see [Using the AWS SDK for .NET with Amazon S3 Glacier \(p. 120\)](#).

Topics

- [Uploading Large Archives in Parts Using the High-Level API of the AWS SDK for .NET \(p. 80\)](#)
- [Uploading Large Archives in Parts Using the Low-Level API of the AWS SDK for .NET \(p. 80\)](#)

Uploading Large Archives in Parts Using the High-Level API of the AWS SDK for .NET

You use the same methods of the high-level API to upload small or large archives. Based on the archive size, the high-level API methods decide whether to upload the archive in a single operation or use the multipart upload API provided by S3 Glacier. For more information, see [Uploading an Archive Using the High-Level API of the AWS SDK for .NET \(p. 73\)](#).

Uploading Large Archives in Parts Using the Low-Level API of the AWS SDK for .NET

For granular control of the upload, you can use the low-level API, where you can configure the request and process the response. The following are the steps to upload large archives in parts using the AWS SDK for .NET.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region where you want to save the archive. All operations you perform using this client apply to that AWS Region.

2. Initiate multipart upload by calling the `InitiateMultipartUpload` method.

You need to provide the vault name to which you want to upload the archive, the part size you want to use to upload archive parts, and an optional description. You provide this information by creating an instance of the `InitiateMultipartUploadRequest` class. In response, S3 Glacier returns an upload ID.

3. Upload parts by calling the `UploadMultipartPart` method.

For each part you upload, You need to provide the vault name, the byte range in the final assembled archive that will be uploaded in this part, the checksum of the part data, and the upload ID.

4. Complete the multipart upload by calling the `CompleteMultipartUpload` method.

You need to provide the upload ID, the checksum of the entire archive, the archive size (combined size of all parts you uploaded), and the vault name. S3 Glacier constructs the archive from the uploaded parts and returns an archive ID.

Example: Uploading a Large Archive in Parts Using the AWS SDK for .NET

The following C# code example uses the AWS SDK for .NET to upload an archive to a vault (examplevault). For step-by-step instructions on how to run this example, see [Running Code Examples \(p. 121\)](#). You need to update the code as shown with the name of a file you want to upload.

Example

```
using System;
using System.Collections.Generic;
using System.IO;
using Amazon.Glacier;
using Amazon.Glacier.Model;
using Amazon.Runtime;

namespace glacier.amazon.com.docsamples
{
    class ArchiveUploadMPU
    {
        static string vaultName      = "examplevault";
        static string archiveToUpload = "*** Provide file name (with full path) to upload ***";
        static long partSize         = 4194304; // 4 MB.

        public static void Main(string[] args)
        {
            AmazonGlacierClient client;
            List<string> partChecksumList = new List<string>();
            try
            {
                using (client = new AmazonGlacierClient(Amazon.RegionEndpoint.USWest2))
                {
                    Console.WriteLine("Uploading an archive.");
                    string uploadId = InitiateMultipartUpload(client);
                    partChecksumList = UploadParts(uploadId, client);
                    string archiveId = CompleteMPU(uploadId, client, partChecksumList);
                    Console.WriteLine("Archive ID: {0}", archiveId);
                }
                Console.WriteLine("Operations successful. To continue, press Enter");
                Console.ReadKey();
            }
            catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
            catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
            catch (Exception e) { Console.WriteLine(e.Message); }
            Console.WriteLine("To continue, press Enter");
            Console.ReadKey();
        }
    }
}
```



```

    }

    static string InitiateMultipartUpload(AmazonGlacierClient client)
    {
        InitiateMultipartUploadRequest initiateMPUrequest = new
        InitiateMultipartUploadRequest()
        {
            VaultName = vaultName,
            PartSize = partSize,
            ArchiveDescription = "Test doc uploaded using MPU."
        };

        InitiateMultipartUploadResponse initiateMPUresponse =
        client.InitiateMultipartUpload(initiateMPUrequest);

        return initiateMPUresponse.UploadId;
    }

    static List<string> UploadParts(string uploadID, AmazonGlacierClient client)
    {
        List<string> partChecksumList = new List<string>();
        long currentPosition = 0;
        var buffer = new byte[Convert.ToInt32(partSize)];

        long fileLength = new FileInfo(archiveToUpload).Length;
        using (FileStream fileToUpload = new FileStream(archiveToUpload, FileMode.Open,
        FileAccess.Read))
        {
            while (fileToUpload.Position < fileLength)
            {
                Stream uploadPartStream = GlacierUtils.CreatePartStream(fileToUpload, partSize);
                string checksum = TreeHashGenerator.CalculateTreeHash(uploadPartStream);
                partChecksumList.Add(checksum);
                // Upload part.
                UploadMultipartPartRequest uploadMPUrequest = new UploadMultipartPartRequest()
                {
                    VaultName = vaultName,
                    Body = uploadPartStream,
                    Checksum = checksum,
                    UploadId = uploadID
                };
                uploadMPUrequest.SetRange(currentPosition, currentPosition +
                uploadPartStream.Length - 1);
                client.UploadMultipartPart(uploadMPUrequest);

                currentPosition = currentPosition + uploadPartStream.Length;
            }
        }
        return partChecksumList;
    }

    static string CompleteMPU(string uploadID, AmazonGlacierClient client, List<string>
    partChecksumList)
    {
        long fileLength = new FileInfo(archiveToUpload).Length;
        CompleteMultipartUploadRequest completeMPUrequest = new
        CompleteMultipartUploadRequest()
        {
            UploadId = uploadID,
            ArchiveSize = fileLength.ToString(),
            Checksum = TreeHashGenerator.CalculateTreeHash(partChecksumList),
            VaultName = vaultName
        };
    }

```

```
        CompleteMultipartUploadResponse completeMPUresponse =  
        client.CompleteMultipartUpload(completeMPUrequest);  
        return completeMPUresponse.ArchiveId;  
    }  
}
```

Uploading Large Archives in Parts Using the REST API

As described in [Uploading Large Archives in Parts \(Multipart Upload\)](#) (p. 75), multipart upload refers to a set of operations that enable you to upload an archive in parts and perform related operations. For more information about these operations, see the following API reference topics:

- [Initiate Multipart Upload \(POST multipart-uploads\)](#) (p. 233)
- [Upload Part \(PUT uploadID\)](#) (p. 246)
- [Complete Multipart Upload \(POST uploadID\)](#) (p. 230)
- [Abort Multipart Upload \(DELETE uploadID\)](#) (p. 228)
- [List Parts \(GET uploadID\)](#) (p. 236)
- [List Multipart Uploads \(GET multipart-uploads\)](#) (p. 241)

Downloading an Archive in Amazon S3 Glacier

Amazon S3 Glacier (S3 Glacier) provides a management console, which you can use to create and delete vaults. However, you cannot download archives from S3 Glacier by using the management console. To download data, such as photos, videos, and other documents, you must either use the AWS CLI or write code to make requests, by using either the REST API directly or by using the AWS SDKs.

For information about using S3 Glacier with the AWS CLI, see [AWS CLI Reference for S3 Glacier](#). To install the AWS CLI, see [AWS Command Line Interface](#). The following **Downloading an Archive** topics describe how to download archives to S3 Glacier by using the AWS SDK for Java, the AWS SDK for .NET, and the REST API.

Retrieving S3 Glacier Archives

Retrieving an archive from Amazon S3 Glacier (S3 Glacier) is an asynchronous operation in which you first initiate a job, and then download the output after the job completes. To initiate an archive retrieval job you use the [Initiate Job \(POST jobs\)](#) (p. 263) REST API or the equivalent in the AWS CLI, or AWS SDKs.

Topics

- [Archive Retrieval Options](#) (p. 84)
- [Ranged Archive Retrievals](#) (p. 86)

Retrieving an archive from S3 Glacier is a two-step process.

To retrieve an archive

1. Initiate an archive retrieval job.
 - a. Get the ID of the archive that you want to retrieve. You can get the archive ID from an inventory of the vault. For more information, see [Downloading a Vault Inventory in Amazon S3 Glacier](#) (p. 37).
 - b. Initiate a job requesting S3 Glacier to prepare an entire archive or a portion of the archive for subsequent download by using the [Initiate Job \(POST jobs\)](#) (p. 263) operation.

When you initiate a job, S3 Glacier returns a job ID in the response and runs the job asynchronously. (You cannot download the job output until after the job completes as described in Step 2.)

Important

For Standard retrievals only, a data retrieval policy can cause your initiate retrieval job request to fail with a `PolicyEnforcedException` exception. For more information about data retrieval policies, see [Amazon S3 Glacier Data Retrieval Policies \(p. 151\)](#). For more information about the `PolicyEnforcedException` exception, see [Error Responses \(p. 176\)](#).

When required, you can restore large segments of the data stored in S3 Glacier. For example, you might want to restore data for a secondary copy. However, if you need to restore a large amount of data, keep in mind that S3 Glacier is designed for 35 random restore requests per pebibyte (PiB) stored per day.

For more information about restoring data from these storage classes, see [Amazon S3 Storage Classes for Archiving Objects](#) in the *Amazon Simple Storage Service Developer Guide*.

2. After the job completes, download the bytes using the [Get Job Output \(GET output\) \(p. 257\)](#) operation.

You can download all bytes or specify a byte range to download only a portion of the job output. For larger output, downloading the output in chunks helps in the event of a download failure, such as a network failure. If you get job output in a single request and there is a network failure, you have to restart downloading the output from the beginning. However, if you download the output in chunks, in the event of any failure, you need only restart the download of the smaller portion and not the entire output.

S3 Glacier must complete a job before you can get its output. After completion, a job will not expire for at least 24 hours after completion, which means you can download the output within the 24-hour period after the job is completed. To determine if your job is complete, check its status by using one of the following options:

- **Wait for a job completion notification** — You can specify an Amazon Simple Notification Service (Amazon SNS) topic to which S3 Glacier can post a notification after the job is completed. S3 Glacier sends notification only after it completes the job.

You can specify an Amazon SNS topic for a job when you initiate the job. In addition to specifying an Amazon SNS topic in your job request, if your vault has notifications configuration set for archive retrieval events, then S3 Glacier also publishes a notification to that SNS topic. For more information, see [Configuring Vault Notifications in Amazon S3 Glacier \(p. 51\)](#).

- **Request job information explicitly** — You can also use the S3 Glacier describe job operation ([Describe Job \(GET JobID\) \(p. 250\)](#)) to periodically poll for job information. However, we recommend using Amazon SNS notifications.

Note

The information you get by using SNS notification is the same as what you get by calling `Describe Job`.

Archive Retrieval Options

You can specify one of the following when initiating a job to retrieve an archive based on your access time and cost requirements. For information about retrieval pricing, see the [S3 Glacier Pricing](#).

- **Expedited** — Expedited retrievals allow you to quickly access your data when occasional urgent requests for a subset of archives are required. For all but the largest archives (250 MB+), data accessed

using Expedited retrievals are typically made available within 1–5 minutes. Provisioned Capacity ensures that retrieval capacity for Expedited retrievals is available when you need it. For more information, see [Provisioned Capacity \(p. 85\)](#).

- **Standard** — Standard retrievals allow you to access any of your archives within several hours. Standard retrievals typically complete within 3–5 hours. This is the default option for retrieval requests that do not specify the retrieval option.
- **Bulk** — Bulk retrievals are S3 Glacier's lowest-cost retrieval option, which you can use to retrieve large amounts, even petabytes, of data inexpensively in a day. Bulk retrievals typically complete within 5–12 hours.

To make an Expedited, Standard, or Bulk retrieval, set the `Tier` parameter in the [Initiate Job \(POST jobs\) \(p. 263\)](#) REST API request to the option you want, or the equivalent in the AWS CLI or AWS SDKs. If you have purchased provisioned capacity, then all expedited retrievals are automatically served through your provisioned capacity.

Provisioned Capacity

Provisioned capacity helps ensure that your retrieval capacity for expedited retrievals is available when you need it. Each unit of capacity provides that at least three expedited retrievals can be performed every five minutes and provides up to 150 MB/s of retrieval throughput.

You should purchase provisioned retrieval capacity if your workload requires highly reliable and predictable access to a subset of your data in minutes. Without provisioned capacity Expedited retrievals are accepted, except for rare situations of unusually high demand. However, if you require access to Expedited retrievals under all circumstances, you must purchase provisioned retrieval capacity.

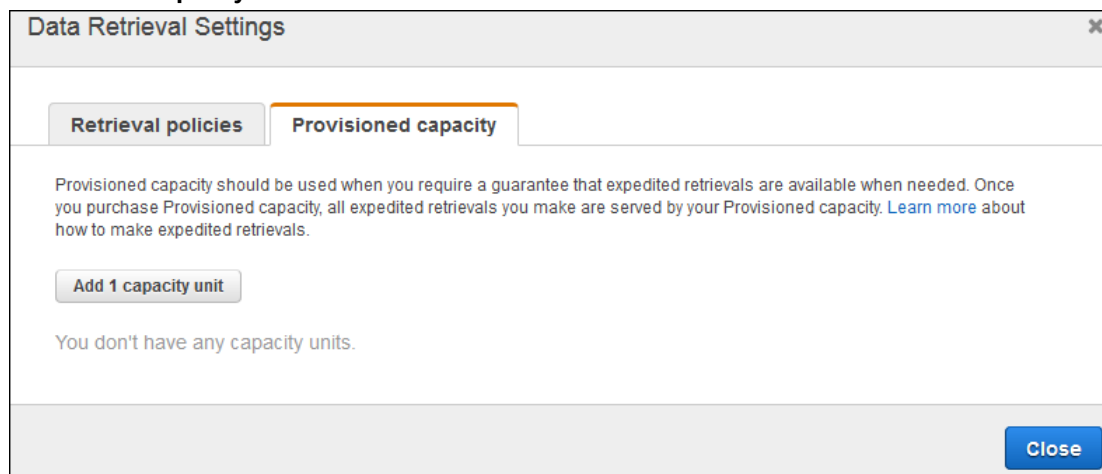
Purchasing Provisioned Capacity

You can purchase provisioned capacity units by using the S3 Glacier console, the [Purchase Provisioned Capacity \(POST provisioned-capacity\) \(p. 297\)](#) REST API, the AWS SDKs, or the AWS CLI. For provisioned capacity pricing information, see [S3 Glacier Pricing](#).

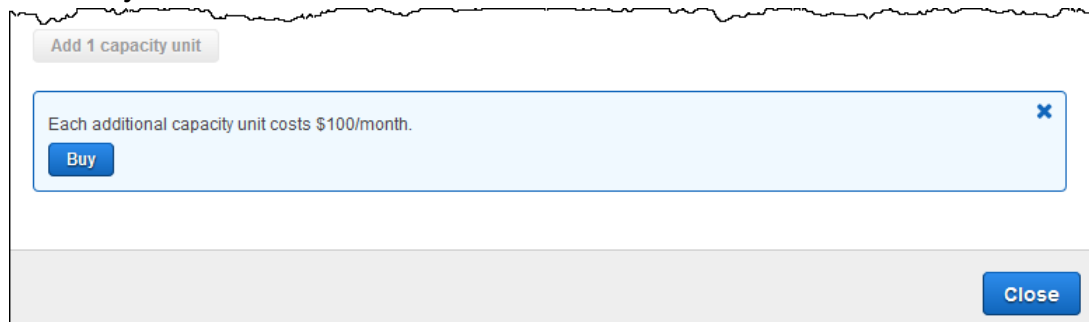
A provisioned capacity unit lasts for one month starting at the date and time of purchase, which is the start date. The unit expires on the expiration date, which is exactly one month after the start date to the nearest second.

If the start date is on the 31st day of a month, the expiration date is the last day of the next month. For example, if the start date is August 31, the expiration date is September 30. If the start date is January 31, the expiration date is February 28.

To use the S3 Glacier console to purchase provisioned capacity, choose **Settings** and then choose **Provisioned capacity**.



If you don't have any provisioned capacity, but you want to buy it, choose **Add 1 capacity unit**, and then choose **Buy**.



After your purchase has succeeded, you can choose **Buy** again to purchase additional capacity units. When you are finished, choose **Close**.

Ranged Archive Retrievals

When you retrieve an archive from S3 Glacier, you can optionally specify a range, or portion, of the archive to retrieve. The default is to retrieve the whole archive. Specifying a range of bytes can be helpful when you want to do the following:

- **Manage your data downloads** – S3 Glacier allows retrieved data to be downloaded for 24 hours after the retrieval request completes. Therefore, you might want to retrieve only portions of the archive so that you can manage the schedule of downloads within the given download window.
- **Retrieve a targeted part of a large archive** – For example, suppose you have previously aggregated many files and uploaded them as a single archive, and now you want to retrieve a few of the files. In this case, you can specify a range of the archive that contains the files you are interested in by using one retrieval request. Or, you can initiate multiple retrieval requests, each with a range for one or more files.

When initiating a retrieval job using range retrievals, you must provide a range that is megabyte aligned. In other words, the byte range can start at zero (the beginning of your archive), or at any 1 MB interval thereafter (1 MB, 2 MB, 3 MB, and so on).

The end of the range can either be the end of your archive or any 1 MB interval greater than the beginning of your range. Furthermore, if you want to get checksum values when you download the data (after the retrieval job completes), the range you request in the job initiation must also be tree-hash aligned. Checksums are a way you can ensure that your data was not corrupted during transmission. For more information about megabyte alignment and tree-hash alignment, see [Receiving Checksums When Downloading Data](#) (p. 175).

Downloading an Archive in Amazon S3 Glacier Using the AWS SDK for Java

Both the [high-level and low-level APIs](#) (p. 116) provided by the AWS SDK for Java provide a method to download an archive.

Topics

- [Downloading an Archive Using the High-Level API of the AWS SDK for Java](#) (p. 87)
- [Downloading an Archive Using the Low-Level API of the AWS SDK for Java](#) (p. 88)

Downloading an Archive Using the High-Level API of the AWS SDK for Java

The `ArchiveTransferManager` class of the high-level API provides the download method you can use to download an archive.

Important

The `ArchiveTransferManager` class creates an Amazon Simple Notification Service (Amazon SNS) topic, and an Amazon Simple Queue Service (Amazon SQS) queue that is subscribed to that topic. It then initiates the archive retrieval job and polls the queue for the archive to be available. When the archive is available, download begins. For information about retrieval times, see [Archive Retrieval Options](#) (p. 84).

Example: Downloading an Archive Using the High-Level API of the AWS SDK for Java

The following Java code example downloads an archive from a vault (`examplevault`) in the US West (Oregon) Region (`us-west-2`).

For step-by-step instructions to run this sample, see [Running Java Examples for Amazon S3 Glacier Using Eclipse](#) (p. 119). You need to update the code as shown with an existing archive ID and the local file path where you want to save the downloaded archive.

Example

```
import java.io.File;
import java.io.IOException;

import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.glacier.AmazonGlacierClient;
import com.amazonaws.services.glacier.transfer.ArchiveTransferManager;
import com.amazonaws.services.sns.AmazonSNSClient;
import com.amazonaws.services.sqs.AmazonSQSClient;

public class ArchiveDownloadHighLevel {
    public static String vaultName = "examplevault";
    public static String archiveId = "*** provide archive ID ***";
    public static String downloadFilePath = "*** provide location to download archive ***";

    public static AmazonGlacierClient glacierClient;
    public static AmazonSQSClient sqsClient;
    public static AmazonSNSClient snsClient;

    public static void main(String[] args) throws IOException {
        ProfileCredentialsProvider credentials = new ProfileCredentialsProvider();

        glacierClient = new AmazonGlacierClient(credentials);

        sqsClient = new AmazonSQSClient(credentials);
        snsClient = new AmazonSNSClient(credentials);
        glacierClient.setEndpoint("glacier.us-west-2.amazonaws.com");
        sqsClient.setEndpoint("sqs.us-west-2.amazonaws.com");
        snsClient.setEndpoint("sns.us-west-2.amazonaws.com");

        try {
            ArchiveTransferManager atm = new ArchiveTransferManager(glacierClient,
                sqsClient, snsClient);
```

```
        atm.download(vaultName, archiveId, new File(downloadFilePath));
        System.out.println("Downloaded file to " + downloadFilePath);

    } catch (Exception e)
    {
        System.err.println(e);
    }
}
}
```

Downloading an Archive Using the Low-Level API of the AWS SDK for Java

The following are the steps to retrieve a vault inventory using the AWS SDK for Java low-level API.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region from where you want to download the archive. All operations you perform using this client apply to that AWS Region.

2. Initiate an archive-retrieval job by executing the `initiateJob` method.

You provide job information, such as the archive ID of the archive you want to download and the optional Amazon SNS topic to which you want Amazon S3 Glacier (S3 Glacier) to post a job completion message, by creating an instance of the `InitiateJobRequest` class. S3 Glacier returns a job ID in response. The response is available in an instance of the `InitiateJobResult` class.

```
JobParameters jobParameters = new JobParameters()
    .withArchiveId("*** provide an archive id ***")
    .withDescription("archive retrieval")
    .withRetrievalByteRange("*** provide a retrieval range***") // optional
    .withType("archive-retrieval");

InitiateJobResult initiateJobResult = client.initiateJob(new InitiateJobRequest()
    .withJobParameters(jobParameters)
    .withVaultName(vaultName));

String jobId = initiateJobResult.getJobId();
```

You can optionally specify a byte range to request S3 Glacier to prepare only a portion of the archive. For example, you can update the preceding request by adding the following statement to request S3 Glacier to prepare only the 1 MB to 2 MB portion of the archive.

```
int ONE_MEG = 1048576;
String retrievalByteRange = String.format("%s-%s", ONE_MEG, 2*ONE_MEG -1);

JobParameters jobParameters = new JobParameters()
    .withType("archive-retrieval")
    .withArchiveId(archiveId)
    .withRetrievalByteRange(retrievalByteRange)
    .withSNSTopic(snsTopicARN);

InitiateJobResult initiateJobResult = client.initiateJob(new InitiateJobRequest()
    .withJobParameters(jobParameters)
    .withVaultName(vaultName));

String jobId = initiateJobResult.getJobId();
```

3. Wait for the job to complete.

You must wait until the job output is ready for you to download. If you have either set a notification configuration on the vault identifying an Amazon Simple Notification Service (Amazon SNS) topic or specified an Amazon SNS topic when you initiated a job, S3 Glacier sends a message to that topic after it completes the job.

You can also poll S3 Glacier by calling the `describeJob` method to determine the job completion status. Although, using an Amazon SNS topic for notification is the recommended approach.

4. Download the job output (archive data) by executing the `getJobOutput` method.

You provide the request information such as the job ID and vault name by creating an instance of the `GetJobOutputRequest` class. The output that S3 Glacier returns is available in the `GetJobOutputResult` object.

```
GetJobOutputRequest jobOutputRequest = new GetJobOutputRequest()
    .withJobId("*** provide a job ID ***")
    .withVaultName("*** provide a vault name ****");
GetJobOutputResult jobOutputResult = client.getJobOutput(jobOutputRequest);

// jobOutputResult.getBody() // Provides the input stream.
```

The preceding code snippet downloads the entire job output. You can optionally retrieve only a portion of the output, or download the entire output in smaller chunks by specifying the byte range in your `GetJobOutputRequest`.

```
GetJobOutputRequest jobOutputRequest = new GetJobOutputRequest()
    .withJobId("*** provide a job ID ***")
    .withRange("bytes=0-1048575") // Download only the first 1 MB of the output.
    .withVaultName("*** provide a vault name ****");
```

In response to your `GetJobOutput` call, S3 Glacier returns the checksum of the portion of the data you downloaded, if certain conditions are met. For more information, see [Receiving Checksums When Downloading Data \(p. 175\)](#).

To verify there are no errors in the download, you can then compute the checksum on the client-side and compare it with the checksum S3 Glacier sent in the response.

For an archive retrieval job with the optional range specified, when you get the job description, it includes the checksum of the range you are retrieving (SHA256TreeHash). You can use this value to further verify the accuracy of the entire byte range that you later download. For example, if you initiate a job to retrieve a tree-hash aligned archive range and then download output in chunks such that each of your `GetJobOutput` requests return a checksum, then you can compute checksum of each portion you download on the client-side and then compute the tree hash. You can compare it with the checksum S3 Glacier returns in response to your `describeJob` request to verify that the entire byte range you have downloaded is the same as the byte range that is stored in S3 Glacier.

For a working example, see [Example 2: Retrieving an Archive Using the Low-Level API of the AWS SDK for Java—Download Output in Chunks \(p. 93\)](#).

Example 1: Retrieving an Archive Using the Low-Level API of the AWS SDK for Java

The following Java code example downloads an archive from the specified vault. After the job completes, the example downloads the entire output in a single `getJobOutput` call. For an example of downloading output in chunks, see [Example 2: Retrieving an Archive Using the Low-Level API of the AWS SDK for Java—Download Output in Chunks \(p. 93\)](#).

The example performs the following tasks:

- Creates an Amazon Simple Notification Service (Amazon SNS) topic.

S3 Glacier sends a notification to this topic after it completes the job.

- Creates an Amazon Simple Queue Service (Amazon SQS) queue.

The example attaches a policy to the queue to enable the Amazon SNS topic to post messages to the queue.

- Initiates a job to download the specified archive.

In the job request, the Amazon SNS topic that was created is specified so that S3 Glacier can publish a notification to the topic after it completes the job.

- Periodically checks the Amazon SQS queue for a message that contains the job ID.

If there is a message, parse the JSON and check if the job completed successfully. If it did, download the archive.

- Cleans up by deleting the Amazon SNS topic and the Amazon SQS queue that it created.

```
import java.io.BufferedInputStream;
import java.io.BufferedOutputStream;
import java.io.BufferedReader;
import java.io.BufferedWriter;
import java.io.FileOutputStream;
import java.io.FileWriter;
import java.io.IOException;
import java.io.InputStream;
import java.io.InputStreamReader;
import java.io.OutputStream;
import java.util.HashMap;
import java.util.List;
import java.util.Map;

import org.codehaus.jackson.JsonFactory;
import org.codehaus.jackson.JsonNode;
import org.codehaus.jackson.JsonParseException;
import org.codehaus.jackson.JsonParser;
import org.codehaus.jackson.map.ObjectMapper;

import com.amazonaws.AmazonClientException;
import com.amazonaws.auth.policy.Policy;
import com.amazonaws.auth.policy.Principal;
import com.amazonaws.auth.policy.Resource;
import com.amazonaws.auth.policy.Statement;
import com.amazonaws.auth.policy.Statement.Effect;
import com.amazonaws.auth.policy.actions.SQSActions;
import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.glacier.AmazonGlacierClient;
import com.amazonaws.services.glacier.model.GetJobOutputRequest;
import com.amazonaws.services.glacier.model.GetJobOutputResult;
import com.amazonaws.services.glacier.model.InitiateJobRequest;
import com.amazonaws.services.glacier.model.InitiateJobResult;
import com.amazonaws.services.glacier.model.JobParameters;
import com.amazonaws.services.sns.AmazonSNSClient;
import com.amazonaws.services.sns.model.CreateTopicRequest;
import com.amazonaws.services.sns.model.CreateTopicResult;
import com.amazonaws.services.sns.model.DeleteTopicRequest;
import com.amazonaws.services.sns.model.SubscribeRequest;
import com.amazonaws.services.sns.model.SubscribeResult;
import com.amazonaws.services.sns.model.UnsubscribeRequest;
import com.amazonaws.services.sqs.AmazonSQSClient;
```

```
import com.amazonaws.services.sqs.model.CreateQueueRequest;
import com.amazonaws.services.sqs.model.CreateQueueResult;
import com.amazonaws.services.sqs.model.DeleteQueueRequest;
import com.amazonaws.services.sqs.model.GetQueueAttributesRequest;
import com.amazonaws.services.sqs.model.GetQueueAttributesResult;
import com.amazonaws.services.sqs.model.Message;
import com.amazonaws.services.sqs.model.ReceiveMessageRequest;
import com.amazonaws.services.sqs.model.SetQueueAttributesRequest;

public class AmazonGlacierDownloadArchiveWithSQSPolling {

    public static String archiveId = "*** provide archive ID ***";
    public static String vaultName = "*** provide vault name ***";
    public static String snsTopicName = "*** provide topic name ***";
    public static String sqsQueueName = "*** provide queue name ***";
    public static String sqsQueueARN;
    public static String sqsQueueURL;
    public static String snsTopicARN;
    public static String snsSubscriptionARN;
    public static String fileName = "*** provide file name ***";
    public static String region = "*** region ***";
    public static long sleepTime = 600;
    public static AmazonGlacierClient client;
    public static AmazonSQSClient sqsClient;
    public static AmazonSNSClient snsClient;

    public static void main(String[] args) throws IOException {

        ProfileCredentialsProvider credentials = new ProfileCredentialsProvider();

        client = new AmazonGlacierClient(credentials);
        client.setEndpoint("https://glacier." + region + ".amazonaws.com");
        sqsClient = new AmazonSQSClient(credentials);
        sqsClient.setEndpoint("https://sqs." + region + ".amazonaws.com");
        snsClient = new AmazonSNSClient(credentials);
        snsClient.setEndpoint("https://sns." + region + ".amazonaws.com");

        try {
            setupSQS();

            setupSNS();

            String jobId = initiateJobRequest();
            System.out.println("Jobid = " + jobId);

            Boolean success = waitForJobToComplete(jobId, sqsQueueURL);
            if (!success) { throw new Exception("Job did not complete successfully."); }

            downloadJobOutput(jobId);

            cleanup();

        } catch (Exception e) {
            System.err.println("Archive retrieval failed.");
            System.err.println(e);
        }
    }

    private static void setupSQS() {
        CreateQueueRequest request = new CreateQueueRequest()
            .withQueueName(sqsQueueName);
        CreateQueueResult result = sqsClient.createQueue(request);
        sqsQueueURL = result.getQueueUrl();

        GetQueueAttributesRequest qRequest = new GetQueueAttributesRequest()
```

```

        .withQueueUrl(sqsQueueURL)
        .withAttributeNames("QueueArn");

    GetQueueAttributesResult qResult = sqsClient.getQueueAttributes(qRequest);
    sqsQueueARN = qResult.getAttributes().get("QueueArn");

    Policy sqsPolicy =
        new Policy().withStatements(
            new Statement(Effect.Allow)
                .withPrincipals(Principal.AllUsers)
                .withActions(SQSActions.SendMessage)
                .withResources(new Resource(sqsQueueARN)));
    Map<String, String> queueAttributes = new HashMap<String, String>();
    queueAttributes.put("Policy", sqsPolicy.toJson());
    sqsClient.setQueueAttributes(new SetQueueAttributesRequest(sqsQueueURL,
        queueAttributes));
    }
    private static void setupSNS() {
        CreateTopicRequest request = new CreateTopicRequest()
            .withName(snsTopicName);
        CreateTopicResult result = snsClient.createTopic(request);
        snsTopicARN = result.getTopicArn();

        SubscribeRequest request2 = new SubscribeRequest()
            .withTopicArn(snsTopicARN)
            .withEndpoint(sqsQueueARN)
            .withProtocol("sqs");
        SubscribeResult result2 = snsClient.subscribe(request2);

        snsSubscriptionARN = result2.getSubscriptionArn();
    }
    private static String initiateJobRequest() {

        JobParameters jobParameters = new JobParameters()
            .withType("archive-retrieval")
            .withArchiveId(archiveId)
            .withSNSTopic(snsTopicARN);

        InitiateJobRequest request = new InitiateJobRequest()
            .withVaultName(vaultName)
            .withJobParameters(jobParameters);

        InitiateJobResult response = client.initiateJob(request);

        return response.getJobId();
    }

    private static Boolean waitForJobToComplete(String jobId, String sqsQueueUrl) throws
    InterruptedException, JsonParseException, IOException {

        Boolean messageFound = false;
        Boolean jobSuccessful = false;
        ObjectMapper mapper = new ObjectMapper();
        JsonFactory factory = mapper.getJsonFactory();

        while (!messageFound) {
            List<Message> msgs = sqsClient.receiveMessage(
                new
                ReceiveMessageRequest(sqsQueueUrl).withMaxNumberOfMessages(10)).getMessages();

            if (msgs.size() > 0) {
                for (Message m : msgs) {
                    JsonParser jpMessage = factory.createJsonParser(m.getBody());
                    JsonNode jobMessageNode = mapper.readTree(jpMessage);
                    String jobMessage = jobMessageNode.get("Message").getTextValue();

```

```

        JsonParser jpDesc = factory.createJsonParser(jobMessage);
        JsonNode jobDescNode = mapper.readTree(jpDesc);
        String retrievedJobId = jobDescNode.get("JobId").getTextValue();
        String statusCode = jobDescNode.get("StatusCode").getTextValue();
        if (retrievedJobId.equals(jobId)) {
            messageFound = true;
            if (statusCode.equals("Succeeded")) {
                jobSuccessful = true;
            }
        }
    }
} else {
    Thread.sleep(sleepTime * 1000);
}
}
return (messageFound && jobSuccessful);
}

private static void downloadJobOutput(String jobId) throws IOException {
    GetJobOutputRequest getJobOutputRequest = new GetJobOutputRequest()
        .withVaultName(vaultName)
        .withJobId(jobId);
    GetJobOutputResult getJobOutputResult = client.getJobOutput(getJobOutputRequest);

    InputStream input = new BufferedInputStream(getJobOutputResult.getBody());
    OutputStream output = null;
    try {
        output = new BufferedOutputStream(new FileOutputStream(fileName));

        byte[] buffer = new byte[1024 * 1024];

        int bytesRead = 0;
        do {
            bytesRead = input.read(buffer);
            if (bytesRead <= 0) break;
            output.write(buffer, 0, bytesRead);
        } while (bytesRead > 0);
    } catch (IOException e) {
        throw new AmazonClientException("Unable to save archive", e);
    } finally {
        try {input.close();} catch (Exception e) {}
        try {output.close();} catch (Exception e) {}
    }
    System.out.println("Retrieved archive to " + fileName);
}

private static void cleanUp() {
    snsClient.unsubscribe(new UnsubscribeRequest(snsSubscriptionARN));
    snsClient.deleteTopic(new DeleteTopicRequest(snsTopicARN));
    sqsClient.deleteQueue(new DeleteQueueRequest(sqsQueueURL));
}
}

```

Example 2: Retrieving an Archive Using the Low-Level API of the AWS SDK for Java—Download Output in Chunks

The following Java code example retrieves an archive from S3 Glacier. The code example downloads the job output in chunks by specifying byte range in a `GetJobOutputRequest` object.

```

import java.io.BufferedInputStream;
import java.io.ByteArrayInputStream;

```

```
import java.io.FileOutputStream;
import java.io.IOException;
import java.util.HashMap;
import java.util.List;
import java.util.Map;

import com.fasterxml.jackson.core.JsonFactory;
import com.fasterxml.jackson.core.JsonParseException;
import com.fasterxml.jackson.core.JsonParser;
import com.fasterxml.jackson.databind.JsonNode;
import com.fasterxml.jackson.databind.ObjectMapper;

import com.amazonaws.auth.policy.Policy;
import com.amazonaws.auth.policy.Principal;
import com.amazonaws.auth.policy.Resource;
import com.amazonaws.auth.policy.Statement;
import com.amazonaws.auth.policy.Statement.Effect;
import com.amazonaws.auth.policy.actions.SQSActions;
import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.glacier.AmazonGlacierClient;
import com.amazonaws.services.glacier.TreeHashGenerator;
import com.amazonaws.services.glacier.model.GetJobOutputRequest;
import com.amazonaws.services.glacier.model.GetJobOutputResult;
import com.amazonaws.services.glacier.model.InitiateJobRequest;
import com.amazonaws.services.glacier.model.InitiateJobResult;
import com.amazonaws.services.glacier.model.JobParameters;
import com.amazonaws.services.sns.AmazonSNSClient;
import com.amazonaws.services.sns.model.CreateTopicRequest;
import com.amazonaws.services.sns.model.CreateTopicResult;
import com.amazonaws.services.sns.model.DeleteTopicRequest;
import com.amazonaws.services.sns.model.SubscribeRequest;
import com.amazonaws.services.sns.model.SubscribeResult;
import com.amazonaws.services.sns.model.UnsubscribeRequest;
import com.amazonaws.services.sqs.AmazonSQSClient;
import com.amazonaws.services.sqs.model.CreateQueueRequest;
import com.amazonaws.services.sqs.model.CreateQueueResult;
import com.amazonaws.services.sqs.model.DeleteQueueRequest;
import com.amazonaws.services.sqs.model.GetQueueAttributesRequest;
import com.amazonaws.services.sqs.model.GetQueueAttributesResult;
import com.amazonaws.services.sqs.model.Message;
import com.amazonaws.services.sqs.model.ReceiveMessageRequest;
import com.amazonaws.services.sqs.model.SetQueueAttributesRequest;

public class ArchiveDownloadLowLevelWithRange {

    public static String vaultName = "*** provide vault name ***";
    public static String archiveId = "*** provide archive id ***";
    public static String snsTopicName = "glacier-temp-sns-topic";
    public static String sqsQueueName = "glacier-temp-sqs-queue";
    public static long downloadChunkSize = 4194304; // 4 MB
    public static String sqsQueueARN;
    public static String sqsQueueURL;
    public static String snsTopicARN;
    public static String snsSubscriptionARN;
    public static String fileName = "*** provide file name to save archive to ***";
    public static String region = "*** region ***";
    public static long sleepTime = 600;

    public static AmazonGlacierClient client;
    public static AmazonSQSClient sqsClient;
    public static AmazonSNSClient snsClient;

    public static void main(String[] args) throws IOException {

        ProfileCredentialsProvider credentials = new ProfileCredentialsProvider();
```

```
client = new AmazonGlacierClient(credentials);
client.setEndpoint("https://glacier." + region + ".amazonaws.com");
sqsClient = new AmazonSQSClient(credentials);
sqsClient.setEndpoint("https://sqs." + region + ".amazonaws.com");
snsClient = new AmazonSNSClient(credentials);
snsClient.setEndpoint("https://sns." + region + ".amazonaws.com");

try {
    setupSQS();

    setupSNS();

    String jobId = initiateJobRequest();
    System.out.println("Jobid = " + jobId);

    long archiveSizeInBytes = waitForJobToComplete(jobId, sqsQueueURL);
    if (archiveSizeInBytes== -1) { throw new Exception("Job did not complete
successfully."); }

    downloadJobOutput(jobId, archiveSizeInBytes);

    cleanup();

} catch (Exception e) {
    System.err.println("Archive retrieval failed.");
    System.err.println(e);
}

}

private static void setupSQS() {
    CreateQueueRequest request = new CreateQueueRequest()
        .withQueueName(sqsQueueName);
    CreateQueueResult result = sqsClient.createQueue(request);
    sqsQueueURL = result.getQueueUrl();

    GetQueueAttributesRequest qRequest = new GetQueueAttributesRequest()
        .withQueueUrl(sqsQueueURL)
        .withAttributeNames("QueueArn");

    GetQueueAttributesResult qResult = sqsClient.getQueueAttributes(qRequest);
    sqsQueueARN = qResult.getAttributes().get("QueueArn");

    Policy sqsPolicy =
        new Policy().withStatements(
            new Statement(Effect.Allow)
                .withPrincipals(Principal.AllUsers)
                .withActions(SQSActions.SendMessage)
                .withResources(new Resource(sqsQueueARN)));
    Map<String, String> queueAttributes = new HashMap<String, String>();
    queueAttributes.put("Policy", sqsPolicy.toJson());
    sqsClient.setQueueAttributes(new SetQueueAttributesRequest(sqsQueueURL,
queueAttributes));
}

private static void setupSNS() {
    CreateTopicRequest request = new CreateTopicRequest()
        .withName(snsTopicName);
    CreateTopicResult result = snsClient.createTopic(request);
    snsTopicARN = result.getTopicArn();

    SubscribeRequest request2 = new SubscribeRequest()
        .withTopicArn(snsTopicARN)
        .withEndpoint(sqsQueueARN)
        .withProtocol("sqs");
    SubscribeResult result2 = snsClient.subscribe(request2);
```

```

    snsSubscriptionARN = result2.getSubscriptionArn();
}
private static String initiateJobRequest() {

    JobParameters jobParameters = new JobParameters()
        .withType("archive-retrieval")
        .withArchiveId(archiveId)
        .withSNSTopic(snsTopicARN);

    InitiateJobRequest request = new InitiateJobRequest()
        .withVaultName(vaultName)
        .withJobParameters(jobParameters);

    InitiateJobResult response = client.initiateJob(request);

    return response.getJobId();
}

private static long waitForJobToComplete(String jobId, String sqsQueueUrl) throws
InterruptedException, JsonParseException, IOException {

    Boolean messageFound = false;
    Boolean jobSuccessful = false;
    long archiveSizeInBytes = -1;
    ObjectMapper mapper = new ObjectMapper();
    JsonFactory factory = mapper.getFactory();

    while (!messageFound) {
        List<Message> msgs = sqsClient.receiveMessage(
            new
ReceiveMessageRequest(sqsQueueUrl).withMaxNumberOfMessages(10)).getMessages();

        if (msgs.size() > 0) {
            for (Message m : msgs) {
                JsonParser jpMessage = factory.createJsonParser(m.getBody());
                JsonNode jobMessageNode = mapper.readTree(jpMessage);
                String jobMessage = jobMessageNode.get("Message").textValue();

                JsonParser jpDesc = factory.createJsonParser(jobMessage);
                JsonNode jobDescNode = mapper.readTree(jpDesc);
                String retrievedJobId = jobDescNode.get("JobId").textValue();
                String statusCode = jobDescNode.get("StatusCode").textValue();
                archiveSizeInBytes = jobDescNode.get("ArchiveSizeInBytes").longValue();
                if (retrievedJobId.equals(jobId)) {
                    messageFound = true;
                    if (statusCode.equals("Succeeded")) {
                        jobSuccessful = true;
                    }
                }
            }
        }
        else {
            Thread.sleep(sleepTime * 1000);
        }
    }
    return (messageFound && jobSuccessful) ? archiveSizeInBytes : -1;
}

private static void downloadJobOutput(String jobId, long archiveSizeInBytes) throws
IOException {

    if (archiveSizeInBytes < 0) {
        System.err.println("Nothing to download.");
        return;
    }
}

```

```

    System.out.println("archiveSizeInBytes: " + archiveSizeInBytes);
    FileOutputStream fstream = new FileOutputStream(fileName);
    long startRange = 0;
    long endRange = (downloadChunkSize > archiveSizeInBytes) ? archiveSizeInBytes - 1 :
downloadChunkSize - 1;

    do {

        GetJobOutputRequest getJobOutputRequest = new GetJobOutputRequest()
            .withVaultName(vaultName)
            .withRange("bytes=" + startRange + "-" + endRange)
            .withJobId(jobId);
        GetJobOutputResult getJobOutputResult =
client.getJobOutput(getJobOutputRequest);

        BufferedInputStream is = new BufferedInputStream(getJobOutputResult.getBody());

        byte[] buffer = new byte[(int)(endRange - startRange + 1)];

        System.out.println("Checksum received: " + getJobOutputResult.getChecksum());
        System.out.println("Content range " + getJobOutputResult.getContentRange());

        int totalRead = 0;
        while (totalRead < buffer.length) {
            int bytesRemaining = buffer.length - totalRead;
            int read = is.read(buffer, totalRead, bytesRemaining);
            if (read > 0) {
                totalRead = totalRead + read;
            } else {
                break;
            }
        }

        System.out.println("Calculated checksum: " +
TreeHashGenerator.calculateTreeHash(new ByteArrayInputStream(buffer)));
        System.out.println("read = " + totalRead);
        fstream.write(buffer);

        startRange = startRange + (long)totalRead;
        endRange = ((endRange + downloadChunkSize) > archiveSizeInBytes) ?
archiveSizeInBytes : (endRange + downloadChunkSize);
        is.close();
    } while (endRange <= archiveSizeInBytes && startRange < archiveSizeInBytes);

    fstream.close();
    System.out.println("Retrieved file to " + fileName);

}

private static void cleanUp() {
    snsClient.unsubscribe(new UnsubscribeRequest(snsSubscriptionARN));
    snsClient.deleteTopic(new DeleteTopicRequest(snsTopicARN));
    sqsClient.deleteQueue(new DeleteQueueRequest(sqsQueueURL));
}
}

```


Downloading an Archive in Amazon S3 Glacier Using the AWS SDK for .NET

Both the [high-level and low-level APIs \(p. 116\)](#) provided by the AWS SDK for .NET provide a method to download an archive.

Topics

- [Downloading an Archive Using the High-Level API of the AWS SDK for .NET \(p. 98\)](#)
- [Downloading an Archive Using the Low-Level API of the AWS SDK for .NET \(p. 99\)](#)

Downloading an Archive Using the High-Level API of the AWS SDK for .NET

The `ArchiveTransferManager` class of the high-level API provides the `Download` method you can use to download an archive.

Important

The `ArchiveTransferManager` class creates an Amazon Simple Notification Service (Amazon SNS) topic, and an Amazon Simple Queue Service (Amazon SQS) queue that is subscribed to that topic. It then initiates the archive retrieval job and polls the queue for the archive to be available. When the archive is available, download begins. For information about retrieval times, see [Archive Retrieval Options \(p. 84\)](#)

Example: Downloading an Archive Using the High-Level API of the AWS SDK for .NET

The following C# code example downloads an archive from a vault (`examplevault`) in the US West (Oregon) Region.

For step-by-step instructions on how to run this example, see [Running Code Examples \(p. 121\)](#). You need to update the code as shown with an existing archive ID and the local file path where you want to save the downloaded archive.

```
using System;
using Amazon.Glacier;
using Amazon.Glacier.Transfer;
using Amazon.Runtime;

namespace glacier.amazon.com.docsamples
{
    class ArchiveDownloadHighLevel
    {
        static string vaultName      = "examplevault";
        static string archiveId      = "*** Provide archive ID ***";
        static string downloadFilePath = "*** Provide the file name and path to where to store the download ***";

        public static void Main(string[] args)
        {
            try
            {
                var manager = new ArchiveTransferManager(Amazon.RegionEndpoint.USSouth1);

                var options = new DownloadOptions();
                options.StreamTransferProgress += ArchiveDownloadHighLevel.progress;
                // Download an archive.
            }
            catch { }
        }
    }
}
```

```
        Console.WriteLine("Initiating the archive retrieval job and then polling SQS queue  
for the archive to be available.");  
        Console.WriteLine("Once the archive is available, downloading will begin.");  
        manager.Download(vaultName, archiveId, downloadFilePath, options);  
        Console.WriteLine("To continue, press Enter");  
        Console.ReadKey();  
    }  
    catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }  
    catch (AmazonServiceException e) { Console.WriteLine(e.Message); }  
    catch (Exception e) { Console.WriteLine(e.Message); }  
    Console.WriteLine("To continue, press Enter");  
    Console.ReadKey();  
}  
  
static int currentPercentage = -1;  
static void progress(object sender, StreamTransferProgressArgs args)  
{  
    if (args.PercentDone != currentPercentage)  
    {  
        currentPercentage = args.PercentDone;  
        Console.WriteLine("Downloaded {0}%", args.PercentDone);  
    }  
}  
}
```

Downloading an Archive Using the Low-Level API of the AWS SDK for .NET

The following are the steps for downloading an Amazon S3 Glacier (S3 Glacier) archive using the low-level API of the AWS SDK for .NET.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region from where you want to download the archive. All operations you perform using this client apply to that AWS Region.

2. Initiate an archive-retrieval job by executing the `InitiateJob` method.

You provide job information, such as the archive ID of the archive you want to download and the optional Amazon SNS topic to which you want S3 Glacier to post a job completion message, by creating an instance of the `InitiateJobRequest` class. S3 Glacier returns a job ID in response. The response is available in an instance of the `InitiateJobResponse` class.

```
AmazonGlacierClient client;  
client = new AmazonGlacierClient(Amazon.RegionEndpoint.USWest2);  
  
InitiateJobRequest initJobRequest = new InitiateJobRequest()  
{  
    VaultName = vaultName,  
    JobParameters = new JobParameters()  
    {  
        Type = "archive-retrieval",  
        ArchiveId = "*** Provide archive id ***",  
        SNSTopic = "*** Provide Amazon SNS topic ARN ***",  
    }  
};  
  
InitiateJobResponse initJobResponse = client.InitiateJob(initJobRequest);  
string jobId = initJobResponse.JobId;
```

You can optionally specify a byte range to request S3 Glacier to prepare only a portion of the archive as shown in the following request. The request specifies S3 Glacier to prepare only the 1 MB to 2 MB portion of the archive.

```
AmazonGlacierClient client;
client = new AmazonGlacierClient(Amazon.RegionEndpoint.USSouth2);

InitiateJobRequest initJobRequest = new InitiateJobRequest()
{
    VaultName = vaultName,
    JobParameters = new JobParameters()
    {
        Type = "archive-retrieval",
        ArchiveId = "*** Provide archive id ***",
        SNSTopic = "*** Provide Amazon SNS topic ARN ***",
    }
};
// Specify byte range.
int ONE_MEG = 1048576;
initJobRequest.JobParameters.RetrievalByteRange = string.Format("{0}-{1}", ONE_MEG, 2 *
    ONE_MEG - 1);

InitiateJobResponse initJobResponse = client.InitiateJob(initJobRequest);
string jobId = initJobResponse.JobId;
```

3. Wait for the job to complete.

You must wait until the job output is ready for you to download. If you have either set a notification configuration on the vault identifying an Amazon Simple Notification Service (Amazon SNS) topic or specified an Amazon SNS topic when you initiated a job, S3 Glacier sends a message to that topic after it completes the job. The code example given in the following section uses Amazon SNS for S3 Glacier to publish a message.

You can also poll S3 Glacier by calling the `DescribeJob` method to determine the job completion status. Although, using an Amazon SNS topic for notification is the recommended approach.

4. Download the job output (archive data) by executing the `GetJobOutput` method.

You provide the request information such as the job ID and vault name by creating an instance of the `GetJobOutputRequest` class. The output that S3 Glacier returns is available in the `GetJobOutputResponse` object.

```
GetJobOutputRequest getJobOutputRequest = new GetJobOutputRequest()
{
    JobId = jobId,
    VaultName = vaultName
};

GetJobOutputResponse getJobOutputResponse = client.GetJobOutput(getJobOutputRequest);
using (Stream webStream = getJobOutputResponse.Body)
{
    using (Stream fileToSave = File.OpenWrite(fileName))
    {
        CopyStream(webStream, fileToSave);
    }
}
```

The preceding code snippet downloads the entire job output. You can optionally retrieve only a portion of the output, or download the entire output in smaller chunks by specifying the byte range in your `GetJobOutputRequest`.

```
GetJobOutputRequest getJobOutputRequest = new GetJobOutputRequest()
{
    JobId = jobId,
    VaultName = vaultName
};
getJobOutputRequest.SetRange(0, 1048575); // Download only the first 1 MB chunk of the
output.
```

In response to your `GetJobOutput` call, S3 Glacier returns the checksum of the portion of the data you downloaded, if certain conditions are met. For more information, see [Receiving Checksums When Downloading Data](#) (p. 175).

To verify there are no errors in the download, you can then compute the checksum on the client-side and compare it with the checksum S3 Glacier sent in the response.

For an archive retrieval job with the optional range specified, when you get the job description, it includes the checksum of the range you are retrieving (SHA256TreeHash). You can use this value to further verify the accuracy of the entire byte range that you later download. For example, if you initiate a job to retrieve a tree-hash aligned archive range and then download output in chunks such that each of your `GetJobOutput` requests return a checksum, then you can compute checksum of each portion you download on the client-side and then compute the tree hash. You can compare it with the checksum S3 Glacier returns in response to your describe job request to verify that the entire byte range you have downloaded is the same as the byte range that is stored in S3 Glacier.

For a working example, see [Example 2: Retrieving an Archive Using the Low-Level API of the AWS SDK for .NET—Download Output in Chunks](#) (p. 105).

Example 1: Retrieving an Archive Using the Low-Level API of the AWS SDK for .NET

The following C# code example downloads an archive from the specified vault. After the job completes, the example downloads the entire output in a single `GetJobOutput` call. For an example of downloading output in chunks, see [Example 2: Retrieving an Archive Using the Low-Level API of the AWS SDK for .NET—Download Output in Chunks](#) (p. 105).

The example performs the following tasks:

- Sets up an Amazon Simple Notification Service (Amazon SNS) topic

S3 Glacier sends a notification to this topic after it completes the job.

- Sets up an Amazon Simple Queue Service (Amazon SQS) queue.

The example attaches a policy to the queue to enable the Amazon SNS topic to post messages.

- Initiates a job to download the specified archive.

In the job request, the example specifies the Amazon SNS topic so that S3 Glacier can send a message after it completes the job.

- Periodically checks the Amazon SQS queue for a message.

If there is a message, parse the JSON and check if the job completed successfully. If it did, download the archive. The code example uses the JSON.NET library (see [JSON.NET](#)) to parse the JSON.

- Cleans up by deleting the Amazon SNS topic and the Amazon SQS queue it created.

```
using System;
```

```

using System.Collections.Generic;
using System.IO;
using System.Threading;
using Amazon.Glacier;
using Amazon.Glacier.Model;
using Amazon.Runtime;
using Amazon.SimpleNotificationService;
using Amazon.SimpleNotificationService.Model;
using Amazon.SQS;
using Amazon.SQS.Model;
using Newtonsoft.Json;

namespace glacier.amazon.com.docsamples
{
    class ArchiveDownloadLowLevelUsingSNSQS
    {
        static string topicArn;
        static string queueUrl;
        static string queueArn;
        static string vaultName = "**** Provide vault name ****";
        static string archiveID = "**** Provide archive ID ****";
        static string fileName = "**** Provide the file name and path to where to store
downloaded archive ****";
        static AmazonSimpleNotificationServiceClient snsClient;
        static AmazonSQSClient sqsClient;
        const string SQS_POLICY =
            "{" +
            "    \"Version\" : \"2012-10-17\", " +
            "    \"Statement\" : [ " +
            "        { " +
            "            \"Sid\" : \"sns-rule\", " +
            "            \"Effect\" : \"Allow\", " +
            "            \"Principal\" : { \"Service\" : \"sns.amazonaws.com\" }, " +
            "            \"Action\" : \"sqs:SendMessage\", " +
            "            \"Resource\" : \"{QueueArn}\", " +
            "            \"Condition\" : { " +
            "                \"ArnLike\" : { " +
            "                    \"aws:SourceArn\" : \"{TopicArn}\" " +
            "                } " +
            "            } " +
            "        } " +
            "    ] " +
            "    }";

        public static void Main(string[] args)
        {
            AmazonGlacierClient client;
            try
            {
                using (client = new AmazonGlacierClient(Amazon.RegionEndpoint.USSouth2))
                {
                    Console.WriteLine("Setup SNS topic and SQS queue.");
                    SetupTopicAndQueue();
                    Console.WriteLine("To continue, press Enter"); Console.ReadKey();
                    Console.WriteLine("Retrieving...");
                    RetrieveArchive(client);
                }
                Console.WriteLine("Operations successful. To continue, press Enter");
                Console.ReadKey();
            }
            catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
            catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
            catch (Exception e) { Console.WriteLine(e.Message); }
            finally
            {
                // Delete SNS topic and SQS queue.
            }
        }
    }
}

```

```

    snsClient.DeleteTopic(new DeleteTopicRequest() { TopicArn = topicArn });
    sqsClient.DeleteQueue(new DeleteQueueRequest() { QueueUrl = queueUrl });
}
}

static void SetupTopicAndQueue()
{
    snsClient = new AmazonSimpleNotificationServiceClient(Amazon.RegionEndpoint.USSouth1);
    sqsClient = new AmazonSQSClient(Amazon.RegionEndpoint.USSouth1);

    long ticks = DateTime.Now.Ticks;
    topicArn = snsClient.CreateTopic(new CreateTopicRequest { Name = "GlacierDownload-" +
ticks }).TopicArn;
    Console.WriteLine("topicArn: "); Console.WriteLine(topicArn);

    CreateQueueRequest createQueueRequest = new CreateQueueRequest();
    createQueueRequest.QueueName = "GlacierDownload-" + ticks;
    CreateQueueResponse createQueueResponse = sqsClient.CreateQueue(createQueueRequest);
    queueUrl = createQueueResponse.QueueUrl;
    Console.WriteLine("QueueURL: "); Console.WriteLine(queueUrl);

    GetQueueAttributesRequest getQueueAttributesRequest = new
GetQueueAttributesRequest();
    getQueueAttributesRequest.AttributeNames = new List<string> { "QueueArn" };
    getQueueAttributesRequest.QueueUrl = queueUrl;
    GetQueueAttributesResponse response =
sqsClient.GetQueueAttributes(getQueueAttributesRequest);
    queueArn = response.QueueArn;
    Console.WriteLine("QueueArn: "); Console.WriteLine(queueArn);

    // Setup the Amazon SNS topic to publish to the SQS queue.
    snsClient.Subscribe(new SubscribeRequest()
    {
        Protocol = "sqs",
        Endpoint = queueArn,
        TopicArn = topicArn
    });

    // Add policy to the queue so SNS can send messages to the queue.
    var policy = SQS_POLICY.Replace("{TopicArn}", topicArn).Replace("{QueueArn}",
queueArn);

    sqsClient.SetQueueAttributes(new SetQueueAttributesRequest()
    {
        QueueUrl = queueUrl,
        Attributes = new Dictionary<string, string>
        {
            { QueueAttributeName.Policy, policy }
        }
    });
}

static void RetrieveArchive(AmazonGlacierClient client)
{
    // Initiate job.
    InitiateJobRequest initJobRequest = new InitiateJobRequest()
    {
        VaultName = vaultName,
        JobParameters = new JobParameters()
        {
            Type = "archive-retrieval",
            ArchiveId = archiveID,
            Description = "This job is to download archive.",
            SNSTopic = topicArn,
        }
    };
};

```

```

    InitiateJobResponse initJobResponse = client.InitiateJob(initJobRequest);
    string jobId = initJobResponse.JobId;

    // Check queue for a message and if job completed successfully, download archive.
    ProcessQueue(jobId, client);
}

private static void ProcessQueue(string jobId, AmazonGlacierClient client)
{
    ReceiveMessageRequest receiveMessageRequest = new ReceiveMessageRequest() { QueueUrl
= queueUrl, MaxNumberOfMessages = 1 };
    bool jobDone = false;
    while (!jobDone)
    {
        Console.WriteLine("Poll SQS queue");
        ReceiveMessageResponse receiveMessageResponse =
sqsClient.ReceiveMessage(receiveMessageRequest);
        if (receiveMessageResponse.Messages.Count == 0)
        {
            Thread.Sleep(10000 * 60);
            continue;
        }
        Console.WriteLine("Got message");
        Message message = receiveMessageResponse.Messages[0];
        Dictionary<string, string> outerLayer =
JsonConvert.DeserializeObject<Dictionary<string, string>>(message.Body);
        Dictionary<string, object> fields =
JsonConvert.DeserializeObject<Dictionary<string, object>>(outerLayer["Message"]);
        string statusCode = fields["StatusCode"] as string;

        if (string.Equals(statusCode, GlacierUtils.JOB_STATUS_SUCCEEDED,
StringComparison.InvariantCultureIgnoreCase))
        {
            Console.WriteLine("Downloading job output");
            DownloadOutput(jobId, client); // Save job output to the specified file location.
        }
        else if (string.Equals(statusCode, GlacierUtils.JOB_STATUS_FAILED,
StringComparison.InvariantCultureIgnoreCase))
            Console.WriteLine("Job failed... cannot download the archive.");

        jobDone = true;
        sqsClient.DeleteMessage(new DeleteMessageRequest() { QueueUrl = queueUrl,
ReceiptHandle = message.ReceiptHandle });
    }
}

private static void DownloadOutput(string jobId, AmazonGlacierClient client)
{
    GetJobOutputRequest getJobOutputRequest = new GetJobOutputRequest()
    {
        JobId = jobId,
        VaultName = vaultName
    };

    GetJobOutputResponse getJobOutputResponse = client.GetJobOutput(getJobOutputRequest);
    using (Stream webStream = getJobOutputResponse.Body)
    {
        using (Stream fileToSave = File.OpenWrite(fileName))
        {
            CopyStream(webStream, fileToSave);
        }
    }
}

public static void CopyStream(Stream input, Stream output)
{

```

```

    byte[] buffer = new byte[65536];
    int length;
    while ((length = input.Read(buffer, 0, buffer.Length)) > 0)
    {
        output.Write(buffer, 0, length);
    }
  }
}
}

```

Example 2: Retrieving an Archive Using the Low-Level API of the AWS SDK for .NET—Download Output in Chunks

The following C# code example retrieves an archive from S3 Glacier. The code example downloads the job output in chunks by specifying the byte range in a `GetJobOutputRequest` object.

```

using System;
using System.Collections.Generic;
using System.IO;
using System.Threading;
using Amazon.Glacier;
using Amazon.Glacier.Model;
using Amazon.Glacier.Transfer;
using Amazon.Runtime;
using Amazon.SimpleNotificationService;
using Amazon.SimpleNotificationService.Model;
using Amazon.SQS;
using Amazon.SQS.Model;
using Newtonsoft.Json;
using System.Collections.Specialized;

namespace glacier.amazon.com.docsamples
{
    class ArchiveDownloadLowLevelUsingSQSNSOutputUsingRange
    {
        static string topicArn;
        static string queueUrl;
        static string queueArn;
        static string vaultName = "**** Provide vault name ****";
        static string archiveId = "**** Provide archive ID ****";
        static string fileName = "**** Provide the file name and path to where to store
downloaded archive ****";
        static AmazonSimpleNotificationServiceClient snsClient;
        static AmazonSQSClient sqsClient;
        const string SQS_POLICY =
            "{" +
            "  \"Version\" : \"2012-10-17\", \" +
            "  \"Statement\" : [\" +
            "    {\" +
            "      \"Sid\" : \"sns-rule\", \" +
            "      \"Effect\" : \"Allow\", \" +
            "      \"Principal\" : {\"AWS\" : \"arn:aws:iam::123456789012:root\" }, \" +
            "      \"Action\" : \"sqs:SendMessage\", \" +
            "      \"Resource\" : \"{QuernArn}\", \" +
            "      \"Condition\" : {\" +
            "        \"ArnLike\" : {\" +
            "          \"aws:SourceArn\" : \"{TopicArn}\" \" +
            "        }\" +
            "      }\" +
            "    }\" +
            "  ]\" +
            "}";

        public static void Main(string[] args)

```



```

{
    AmazonGlacierClient client;

    try
    {
        using (client = new AmazonGlacierClient(Amazon.RegionEndpoint.USSouth2))
        {
            Console.WriteLine("Setup SNS topic and SQS queue.");
            SetupTopicAndQueue();
            Console.WriteLine("To continue, press Enter"); Console.ReadKey();

            Console.WriteLine("Download archive");
            DownloadAnArchive(archiveId, client);
        }
        Console.WriteLine("Operations successful. To continue, press Enter");
        Console.ReadKey();
    }
    catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
    catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
    catch (Exception e) { Console.WriteLine(e.Message); }
    finally
    {
        // Delete SNS topic and SQS queue.
        snsClient.DeleteTopic(new DeleteTopicRequest() { TopicArn = topicArn });
        sqsClient.DeleteQueue(new DeleteQueueRequest() { QueueUrl = queueUrl });
    }
}

static void SetupTopicAndQueue()
{
    long ticks = DateTime.Now.Ticks;

    // Setup SNS topic.
    snsClient = new AmazonSimpleNotificationServiceClient(Amazon.RegionEndpoint.USSouth2);
    sqsClient = new AmazonSQSClient(Amazon.RegionEndpoint.USSouth2);

    topicArn = snsClient.CreateTopic(new CreateTopicRequest { Name = "GlacierDownload-" +
ticks }).TopicArn;
    Console.WriteLine("topicArn: "); Console.WriteLine(topicArn);

    CreateQueueRequest createQueueRequest = new CreateQueueRequest();
    createQueueRequest.QueueName = "GlacierDownload-" + ticks;
    CreateQueueResponse createQueueResponse = sqsClient.CreateQueue(createQueueRequest);
    queueUrl = createQueueResponse.QueueUrl;
    Console.WriteLine("QueueURL: "); Console.WriteLine(queueUrl);

    GetQueueAttributesRequest getQueueAttributesRequest = new
GetQueueAttributesRequest();
    getQueueAttributesRequest.AttributeNames = new List<string> { "QueueArn" };
    getQueueAttributesRequest.QueueUrl = queueUrl;
    GetQueueAttributesResponse response =
sqsClient.GetQueueAttributes(getQueueAttributesRequest);
    queueArn = response.QueueARN;
    Console.WriteLine("QueueArn: "); Console.WriteLine(queueArn);

    // Setup the Amazon SNS topic to publish to the SQS queue.
    snsClient.Subscribe(new SubscribeRequest()
    {
        Protocol = "sqs",
        Endpoint = queueArn,
        TopicArn = topicArn
    });

    // Add the policy to the queue so SNS can send messages to the queue.
    var policy = SQS_POLICY.Replace("{TopicArn}", topicArn).Replace("{QueueArn}",
queueArn);

```

```

    sqsClient.SetQueueAttributes(new SetQueueAttributesRequest()
    {
        QueueUrl = queueUrl,
        Attributes = new Dictionary<string, string>
        {
            { QueueAttributeName.Policy, policy }
        }
    });
}

static void DownloadAnArchive(string archiveId, AmazonGlacierClient client)
{
    // Initiate job.
    InitiateJobRequest initJobRequest = new InitiateJobRequest()
    {
        VaultName = vaultName,
        JobParameters = new JobParameters()
        {
            Type = "archive-retrieval",
            ArchiveId = archiveId,
            Description = "This job is to download the archive.",
            SNSTopic = topicArn,
        }
    };
    InitiateJobResponse initJobResponse = client.InitiateJob(initJobRequest);
    string jobId = initJobResponse.JobId;

    // Check queue for a message and if job completed successfully, download archive.
    ProcessQueue(jobId, client);
}

private static void ProcessQueue(string jobId, AmazonGlacierClient client)
{
    var receiveMessageRequest = new ReceiveMessageRequest() { QueueUrl = queueUrl,
    MaxNumberOfMessages = 1 };
    bool jobDone = false;
    while (!jobDone)
    {
        Console.WriteLine("Poll SQS queue");
        ReceiveMessageResponse receiveMessageResponse =
        sqsClient.ReceiveMessage(receiveMessageRequest);
        if (receiveMessageResponse.Messages.Count == 0)
        {
            Thread.Sleep(10000 * 60);
            continue;
        }
        Console.WriteLine("Got message");
        Message message = receiveMessageResponse.Messages[0];
        Dictionary<string, string> outerLayer =
        JsonConvert.DeserializeObject<Dictionary<string, string>>(message.Body);
        Dictionary<string, object> fields =
        JsonConvert.DeserializeObject<Dictionary<string, object>>(outerLayer["Message"]);
        string statusCode = fields["StatusCode"] as string;
        if (string.Equals(statusCode, GlacierUtils.JOB_STATUS_SUCCEEDED,
        StringComparison.InvariantCultureIgnoreCase))
        {
            long archiveSize = Convert.ToInt64(fields["ArchiveSizeInBytes"]);
            Console.WriteLine("Downloading job output");
            DownloadOutput(jobId, archiveSize, client); // This where we save job
            output to the specified file location.
        }
        else if (string.Equals(statusCode, GlacierUtils.JOB_STATUS_FAILED,
        StringComparison.InvariantCultureIgnoreCase))
        {
            Console.WriteLine("Job failed... cannot download the archive.");
        }
    }
}

```

```

        jobDone = true;
        sqsClient.DeleteMessage(new DeleteMessageRequest() { QueueUrl = queueUrl,
ReceiptHandle = message.ReceiptHandle });
    }
}

private static void DownloadOutput(string jobId, long archiveSize, AmazonGlacierClient
client)
{
    long partSize = 4 * (long)Math.Pow(2, 20); // 4 MB.
    using (Stream fileToSave = new FileStream(fileName, FileMode.Create,
FileAccess.Write))
    {
        long currentPosition = 0;
        do
        {
            GetJobOutputRequest getJobOutputRequest = new GetJobOutputRequest()
            {
                JobId = jobId,
                VaultName = vaultName
            };

            long endPosition = currentPosition + partSize - 1;
            if (endPosition > archiveSize)
                endPosition = archiveSize;

            getJobOutputRequest.SetRange(currentPosition, endPosition);
            GetJobOutputResponse getJobOutputResponse =
client.GetJobOutput(getJobOutputRequest);

            using (Stream webStream = getJobOutputResponse.Body)
            {
                CopyStream(webStream, fileToSave);
            }
            currentPosition += partSize;
        } while (currentPosition < archiveSize);
    }
}

public static void CopyStream(Stream input, Stream output)
{
    byte[] buffer = new byte[65536];
    int length;
    while ((length = input.Read(buffer, 0, buffer.Length)) > 0)
    {
        output.Write(buffer, 0, length);
    }
}
}

```

Downloading an Archive Using the REST API

To download an archive using the REST API

Downloading an archive is a two-step process.

1. Initiate a job of the archive-retrieval type. For more information, see [Initiate Job \(POST jobs\)](#) (p. 263).
2. After the job completes, download the archive data. For more information, see [Get Job Output \(GET output\)](#) (p. 257).

Deleting an Archive in Amazon S3 Glacier

You cannot delete an archive using the Amazon S3 Glacier (S3 Glacier) management console. To delete an archive you must use the AWS Command Line Interface (CLI) or write code to make a delete request using either the REST API directly or the AWS SDK for Java and .NET wrapper libraries. The following topics explain how to use the AWS SDK for Java and .NET wrapper libraries, the REST API, and the AWS CLI.

Topics

- [Deleting an Archive in Amazon S3 Glacier Using the AWS SDK for Java \(p. 109\)](#)
- [Deleting an Archive in Amazon S3 Glacier Using the AWS SDK for .NET \(p. 111\)](#)
- [Deleting an Amazon S3 Glacier Archive Using the REST API \(p. 113\)](#)
- [Deleting an Archive in Amazon S3 Glacier Using the AWS Command Line Interface \(p. 113\)](#)

You can delete one archive at a time from a vault. To delete the archive you must provide its archive ID in your delete request. You can get the archive ID by downloading the vault inventory for the vault that contains the archive. For more information about downloading the vault inventory, see [Downloading a Vault Inventory in Amazon S3 Glacier \(p. 37\)](#).

After you delete an archive, you might still be able to make a successful request to initiate a job to retrieve the deleted archive, but the archive retrieval job will fail.

Archive retrievals that are in progress for an archive ID when you delete the archive might or might not succeed according to the following scenarios:

- If the archive retrieval job is actively preparing the data for download when S3 Glacier receives the delete archive request, then the archival retrieval operation might fail.
- If the archive retrieval job has successfully prepared the archive for download when S3 Glacier receives the delete archive request, then you will be able to download the output.

For more information about archive retrieval, see [Downloading an Archive in Amazon S3 Glacier \(p. 83\)](#).

This operation is idempotent. Deleting an already-deleted archive does not result in an error.

After you delete an archive, if you immediately download the vault inventory, it might include the deleted archive in the list because S3 Glacier prepares vault inventory only about once a day.

Deleting an Archive in Amazon S3 Glacier Using the AWS SDK for Java

The following are the steps to delete an archive using the AWS SDK for Java low-level API.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region where the archive you want to delete is stored. All operations you perform using this client apply to that AWS Region.

2. Provide request information by creating an instance of the `DeleteArchiveRequest` class.

You need to provide an archive ID, a vault name, and your account ID. If you don't provide an account ID, then account ID associated with the credentials you provide to sign the request is assumed. For more information, see [Using the AWS SDK for Java with Amazon S3 Glacier \(p. 117\)](#).

3. Run the `deleteArchive` method by providing the request object as a parameter.

The following Java code snippet illustrates the preceding steps.

```
AmazonGlacierClient client;

DeleteArchiveRequest request = new DeleteArchiveRequest()
    .withVaultName("*** provide a vault name ***")
    .withArchiveId("*** provide an archive ID ***");

client.deleteArchive(request);
```

Note

For information about the underlying REST API, see [Delete Archive \(DELETE archive\)](#) (p. 222).

Example: Deleting an Archive Using the AWS SDK for Java

The following Java code example uses the AWS SDK for Java to delete an archive. For step-by-step instructions on how to run this example, see [Running Java Examples for Amazon S3 Glacier Using Eclipse](#) (p. 119). You need to update the code as shown with a vault name and the archive ID of the archive you want to delete.

Example

```
import java.io.IOException;

import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.glacier.AmazonGlacierClient;
import com.amazonaws.services.glacier.model.DeleteArchiveRequest;

public class ArchiveDelete {

    public static String vaultName = "*** provide vault name ***";
    public static String archiveId = "*** provide archive ID***";
    public static AmazonGlacierClient client;

    public static void main(String[] args) throws IOException {

        ProfileCredentialsProvider credentials = new ProfileCredentialsProvider();

        client = new AmazonGlacierClient(credentials);
        client.setEndpoint("https://glacier.us-east-1.amazonaws.com/");

        try {

            // Delete the archive.
            client.deleteArchive(new DeleteArchiveRequest()
                .withVaultName(vaultName)
                .withArchiveId(archiveId));

            System.out.println("Deleted archive successfully.");

        } catch (Exception e) {
            System.err.println("Archive not deleted.");
            System.err.println(e);
        }
    }
}
```

Deleting an Archive in Amazon S3 Glacier Using the AWS SDK for .NET

Both the [high-level and low-level APIs](#) (p. 116) provided by the AWS SDK for .NET provide a method to delete an archive.

Topics

- [Deleting an Archive Using the High-Level API of the AWS SDK for .NET](#) (p. 111)
- [Deleting an Archive Using the Low-Level API AWS SDK for .NET](#) (p. 111)

Deleting an Archive Using the High-Level API of the AWS SDK for .NET

The `ArchiveTransferManager` class of the high-level API provides the `DeleteArchive` method you can use to delete an archive.

Example: Deleting an Archive Using the High-Level API of the AWS SDK for .NET

The following C# code example uses the high-level API of the AWS SDK for .NET to delete an archive. For step-by-step instructions on how to run this example, see [Running Code Examples](#) (p. 121). You need to update the code as shown with the archive ID of the archive you want to delete.

Example

```
using System;
using Amazon.Glacier;
using Amazon.Glacier.Transfer;
using Amazon.Runtime;

namespace glacier.amazon.com.docsamples
{
    class ArchiveDeleteHighLevel
    {
        static string vaultName = "examplevault";
        static string archiveId = "**** Provide archive ID ****";

        public static void Main(string[] args)
        {
            try
            {
                var manager = new ArchiveTransferManager(Amazon.RegionEndpoint.USWest2);
                manager.DeleteArchive(vaultName, archiveId);
                Console.ReadKey();
            }
            catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
            catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
            catch (Exception e) { Console.WriteLine(e.Message); }
            Console.WriteLine("To continue, press Enter");
            Console.ReadKey();
        }
    }
}
```

Deleting an Archive Using the Low-Level API AWS SDK for .NET

The following are the steps to delete an using the AWS SDK for .NET.

1. Create an instance of the `AmazonGlacierClient` class (the client).

You need to specify an AWS Region where the archive you want to delete is stored. All operations you perform using this client apply to that AWS Region.

2. Provide request information by creating an instance of the `DeleteArchiveRequest` class.

You need to provide an archive ID, a vault name, and your account ID. If you don't provide an account ID, then account ID associated with the credentials you provide to sign the request is assumed. For more information, see [Using the AWS SDKs with Amazon S3 Glacier \(p. 116\)](#).

3. Run the `DeleteArchive` method by providing the request object as a parameter.

Example: Deleting an Archive Using the Low-Level API of the AWS SDK for .NET

The following C# example illustrates the preceding steps. The example uses the low-level API of the AWS SDK for .NET to delete an archive.

Note

For information about the underlying REST API, see [Delete Archive \(DELETE archive\) \(p. 222\)](#).

For step-by-step instructions on how to run this example, see [Running Code Examples \(p. 121\)](#). You need to update the code as shown with the archive ID of the archive you want to delete.

Example

```
using System;
using Amazon.Glacier;
using Amazon.Glacier.Model;
using Amazon.Runtime;

namespace glacier.amazon.com.docsamples
{
    class ArchiveDeleteLowLevel
    {
        static string vaultName = "examplevault";
        static string archiveId = "**** Provide archive ID ****";

        public static void Main(string[] args)
        {
            AmazonGlacierClient client;
            try
            {
                using (client = new AmazonGlacierClient(Amazon.RegionEndpoint.USSouth1))
                {
                    Console.WriteLine("Deleting the archive");
                    DeleteAnArchive(client);
                }
                Console.WriteLine("Operations successful. To continue, press Enter");
                Console.ReadKey();
            }
            catch (AmazonGlacierException e) { Console.WriteLine(e.Message); }
            catch (AmazonServiceException e) { Console.WriteLine(e.Message); }
            catch (Exception e) { Console.WriteLine(e.Message); }
            Console.WriteLine("To continue, press Enter");
            Console.ReadKey();
        }

        static void DeleteAnArchive(AmazonGlacierClient client)
        {
            DeleteArchiveRequest request = new DeleteArchiveRequest()
            {
                VaultName = vaultName,
                ArchiveId = archiveId
            }
        }
    }
}
```

```
};  
DeleteArchiveResponse response = client.DeleteArchive(request);  
}  
}  
}
```

Deleting an Amazon S3 Glacier Archive Using the REST API

You can use the Delete Archive API to delete an archive.

- For information about the Delete Archive API, see [Delete Archive \(DELETE archive\)](#) (p. 222).
- For information about using the REST API, see [API Reference for Amazon S3 Glacier](#) (p. 160).

Deleting an Archive in Amazon S3 Glacier Using the AWS Command Line Interface

You can delete archives in Amazon S3 Glacier (S3 Glacier) using the AWS Command Line Interface (AWS CLI).

Topics

- [\(Prerequisite\) Setting Up the AWS CLI](#) (p. 21)
- [Example: Deleting an Archive Using the AWS CLI](#) (p. 113)

(Prerequisite) Setting Up the AWS CLI

1. Download and configure the AWS CLI. For instructions, see the following topics in the *AWS Command Line Interface User Guide*.

[Installing the AWS Command Line Interface](#)

[Configuring the AWS Command Line Interface](#)

2. Verify the setup by entering the following commands at the command prompt. These commands don't provide credentials explicitly, so the credentials of the default profile are used.
 - Try using the help command.

```
aws help
```

- Use `aws s3 ls` to get a list of buckets on the configured account.

```
aws s3 ls
```

- Use `aws configure list` to see the current configuration data.

```
aws configure list
```

Example: Deleting an Archive Using the AWS CLI

1. Use the `initiate-job` command to start an inventory retrieval job.


```
aws glacier initiate-job --vault-name awsexamplevault --account-id 111122223333 --job-parameters '{"Type": "inventory-retrieval"}'
```

Expected output:

```
{
  "location": "/111122223333/vaults/awsexamplevault/jobs/*** jobid ***",
  "jobId": "*** jobid ***"
}
```

2. Use the `describe-job` command to check status of the previous retrieval job.

```
aws glacier describe-job --vault-name awsexamplevault --account-id 111122223333 --job-id *** jobid ***
```

Expected output:

```
{
  "InventoryRetrievalParameters": {
    "Format": "JSON"
  },
  "VaultARN": "*** vault arn ***",
  "Completed": false,
  "JobId": "*** jobid ***",
  "Action": "InventoryRetrieval",
  "CreationDate": "*** job creation date ***",
  "StatusCode": "InProgress"
}
```

3. Wait for the job to complete.

You must wait until the job output is ready for you to download. If you set a notification configuration on the vault or specified an Amazon Simple Notification Service (Amazon SNS) topic when you initiated the job, S3 Glacier sends a message to the topic after it completes the job.

You can set notification configuration for specific events on the vault. For more information, see [Configuring Vault Notifications in Amazon S3 Glacier \(p. 51\)](#). S3 Glacier sends a message to the specified SNS topic anytime the specific event occurs.

4. When it's complete, use the `get-job-output` command to download the retrieval job to the file `output.json`.

```
aws glacier get-job-output --vault-name awsexamplevault --account-id 111122223333 --job-id *** jobid *** output.json
```

This command produces a file with the following fields.

```
{
  "VaultARN": "arn:aws:glacier:region:111122223333:vaults/awsexamplevault",
  "InventoryDate": "*** job completion date ***",
  "ArchiveList": [
    { "ArchiveId": "*** archiveid ***",
      "ArchiveDescription": *** archive description (if set) ***,

```

```
"CreationDate": "*** archive creation date ***",  
"Size": "*** archive size (in bytes) ***",  
"SHA256TreeHash": "*** archive hash ***"  
}  
{"ArchiveId":  
...  
]}
```

5. Use the `delete-archive` command to delete each archive from a vault until none remain.

```
aws glacier delete-archive --vault-name awsexamplevault --account-id 111122223333 --  
archive-id *** archiveid ***
```

Querying an Archives in Amazon S3 Glacier

For information about querying Amazon S3 Glacier (S3 Glacier) archives with SQL, see [Querying Archives with S3 Glacier Select](#) (p. 148).

Using the AWS SDKs with Amazon S3 Glacier

Amazon Web Services provides SDKs for you to develop applications for Amazon S3 Glacier (S3 Glacier). The SDK libraries wrap the underlying S3 Glacier API, simplifying your programming tasks. For example, for each request sent to S3 Glacier, you must include a signature to authenticate your requests. When you use the SDK libraries, you need to provide only your AWS security credentials in your code and the libraries compute the necessary signature and include it in the request sent to S3 Glacier. The AWS SDKs provide libraries that map to the underlying REST API and provide objects that you can use to easily construct requests and process responses.

Topics

- [AWS SDKs that Support S3 Glacier](#) (p. 116)
- [AWS SDK Libraries for Java and .NET](#) (p. 116)
- [Using the AWS SDK for Java with Amazon S3 Glacier](#) (p. 117)
- [Using the AWS SDK for .NET with Amazon S3 Glacier](#) (p. 120)

AWS SDKs that Support S3 Glacier

S3 Glacier is supported by the following AWS SDKs:

- [AWS SDK for C++](#)
- [AWS SDK for Go](#)
- [AWS SDK for Java](#)
- [AWS SDK for JavaScript in Node.js](#)
- [AWS SDK for .NET](#)
- [AWS SDK for PHP](#)
- [AWS SDK for Python \(Boto\)](#)
- [AWS SDK for Ruby](#)

You can find examples of working with S3 Glacier using the Java and .NET SDKs throughout this developer guide. For libraries and sample code in all languages, see [Sample Code & Libraries](#).

The AWS Command Line Interface (AWS CLI) is a unified tool to manage your AWS services, including S3 Glacier. For information about downloading the AWS CLI, see [AWS Command Line Interface](#). For a list of the S3 Glacier CLI commands, see [AWS CLI Command Reference](#).

AWS SDK Libraries for Java and .NET

The AWS SDKs for Java and .NET offer high-level and low-level wrapper libraries.

What Is the Low-Level API?

The low-level wrapper libraries map closely the underlying REST API ([API Reference for Amazon S3 Glacier](#) (p. 160)) supported by S3 Glacier. For each S3 Glacier REST operations, the low-level API

provides a corresponding method, a request object for you to provide request information and a response object for you to process S3 Glacier response. The low-level wrapper libraries are the most complete implementation of the underlying S3 Glacier operations.

For information about these SDK libraries, see [Using the AWS SDK for Java with Amazon S3 Glacier \(p. 117\)](#) and [Using the AWS SDK for .NET with Amazon S3 Glacier \(p. 120\)](#).

What Is the High-Level API?

To further simplify application development, these libraries offer a higher-level abstraction for some of the operations. For example,

- **Uploading an archive**—To upload an archive using the low-level API in addition to the file name and the vault name where you want to save the archive, You need to provide a checksum (SHA-256 tree hash) of the payload. However, the high-level API computes the checksum for you.
- **Downloading an archive or vault inventory**—To download an archive using the low-level API you first initiate a job, wait for the job to complete, and then get the job output. You need to write additional code to set up an Amazon Simple Notification Service (Amazon SNS) topic for S3 Glacier to notify you when the job is complete. You also need some polling mechanism to check if a job completion message was posted to the topic. The high-level API provides a method to download an archive that takes care of all these steps. You only specify an archive ID and a folder path where you want to save the downloaded data.

For information about these SDK libraries, see [Using the AWS SDK for Java with Amazon S3 Glacier \(p. 117\)](#) and [Using the AWS SDK for .NET with Amazon S3 Glacier \(p. 120\)](#).

When to Use the High-Level and Low-Level API

In general, if the high-level API provides methods you need to perform an operation, you should use the high-level API because of the simplicity it provides. However, if the high-level API does not offer the functionality, you can use the low-level API. Additionally, the low-level API allows granular control of the operation such as retry logic in the event of a failure. For example, when uploading an archive the high-level API uses the file size to determine whether to upload the archive in a single operation or use the multipart upload API. The API also has built-in retry logic in case an upload fails. However, your application might need granular control over these decisions, in which case you can use the low-level API.

Using the AWS SDK for Java with Amazon S3 Glacier

The AWS SDK for Java provides both high-level and low-level APIs for Amazon S3 Glacier (S3 Glacier) as described in [Using the AWS SDKs with Amazon S3 Glacier \(p. 116\)](#). For information about downloading the AWS SDK for Java, see [AWS SDK for Java](#).

Note

The AWS SDK for Java provides thread-safe clients for accessing S3 Glacier. As a best practice, your applications should create one client and reuse the client between threads.

Topics

- [Using the Low-Level API \(p. 118\)](#)
- [Using the High-Level API \(p. 118\)](#)

- [Running Java Examples for Amazon S3 Glacier Using Eclipse \(p. 119\)](#)
- [Setting the Endpoint \(p. 119\)](#)

Using the Low-Level API

The low-level `AmazonGlacierClient` class provides all the methods that map to the underlying REST operations of S3 Glacier ([API Reference for Amazon S3 Glacier \(p. 160\)](#)). When calling any of these methods, you must create a corresponding request object and provide a response object in which the method can return the S3 Glacier response to the operation.

For example, the `AmazonGlacierClient` class provides the `createVault` method to create a vault. This method maps to the underlying Create Vault REST operation (see [Create Vault \(PUT vault\) \(p. 185\)](#)). To use this method, you must create instances of the `CreateVaultResult` object that receives the S3 Glacier response as shown in the following Java code snippet:

```
AmazonGlacierClient client = new AmazonGlacierClient(credentials);
client.setEndpoint("https://glacier.us-west-2.amazonaws.com/");

CreateVaultRequest request = new CreateVaultRequest()
    .withAccountId("-")
    .withVaultName(vaultName);
CreateVaultResult result = client.createVault(createVaultRequest);
```

All the low-level samples in the guide use this pattern.

Note

The preceding code segment specifies `AccountId` when creating the request. However, when using the AWS SDK for Java, the `AccountId` in the request is optional, and therefore all the low-level examples in this guide don't set this value. The `AccountId` is the AWS Account ID. This value must match the AWS Account ID associated with the credentials used to sign the request. You can specify either the AWS Account ID or optionally a '-', in which case S3 Glacier uses the AWS Account ID associated with the credentials used to sign the request. If you specify your Account ID, do not include hyphens in it. When using AWS SDK for Java, if you don't provide the account ID, the library sets the account ID to '-'.

Using the High-Level API

To further simplify your application development, the AWS SDK for Java provides the `ArchiveTransferManager` class that implements a higher-level abstraction for some of the methods in the low-level API. It provides useful methods, such as the `upload` and `download` methods for archive operations.

For example, the following Java code snippet uses the `upload` high-level method to upload an archive.

```
String vaultName = "examplevault";
String archiveToUpload = "c:/folder/exampleArchive.zip";

ArchiveTransferManager atm = new ArchiveTransferManager(client, credentials);
String archiveId = atm.upload(vaultName, "Tax 2012 documents", new
    File(archiveToUpload)).getArchiveId();
```

Note that any operations you perform apply to the AWS Region you specified when creating the `ArchiveTransferManager` object. If you don't specify any AWS Region, the AWS SDK for Java sets `us-east-1` as the default AWS Region.

All the high-level examples in this guide use this pattern.

Note

The high-level `ArchiveTransferManager` class can be constructed with an `AmazonGlacierClient` instance or an `AWSCredentials` instance.

Running Java Examples for Amazon S3 Glacier Using Eclipse

The easiest way to get started with the Java code examples is to install the latest AWS Toolkit for Eclipse. For information on installing or updating to the latest toolkit, go to <http://aws.amazon.com/eclipse>. The following tasks guide you through the creation and testing of the Java code examples provided in this section.

General Process of Creating Java Code Examples

1	Create a default credentials profile for your AWS credentials as described in the AWS SDK for Java topic Providing AWS Credentials in the AWS SDK for Java .
2	Create a new AWS Java project in Eclipse. The project is pre-configured with the AWS SDK for Java.
3	Copy the code from the section you are reading to your project.
4	Update the code by providing any required data. For example, if uploading a file, provide the file path and the bucket name.
5	Run the code. Verify that the object is created by using the AWS Management Console. For more information about the AWS Management Console, go to http://aws.amazon.com/console/ .

Setting the Endpoint

By default, the AWS SDK for Java uses the endpoint `https://glacier.us-east-1.amazonaws.com`. You can set the endpoint explicitly as shown in the following Java code snippets.

The following snippet shows how to set the endpoint to the US West (Oregon) Region (`us-west-2`) in the low-level API.

Example

```
client = new AmazonGlacierClient(credentials);
client.setEndpoint("glacier.us-west-2.amazonaws.com");
```

The following snippet shows how to set the endpoint to the US West (Oregon) Region in the high-level API.

```
glacierClient = new AmazonGlacierClient(credentials);
sqsClient = new AmazonSQSClient(credentials);
snsClient = new AmazonSNSClient(credentials);

glacierClient.setEndpoint("glacier.us-west-2.amazonaws.com");
sqsClient.setEndpoint("sqs.us-west-2.amazonaws.com");
snsClient.setEndpoint("sns.us-west-2.amazonaws.com");

ArchiveTransferManager atm = new ArchiveTransferManager(glacierClient, sqsClient,
    snsClient);
```

For a list of supported AWS Regions and endpoints, see [Accessing Amazon S3 Glacier \(p. 5\)](#).

Using the AWS SDK for .NET with Amazon S3 Glacier

The AWS SDK for .NET API is available in `AWSSDK.dll`. For information about downloading the AWS SDK for .NET, go to [Sample Code Libraries](#). As described in [Using the AWS SDKs with Amazon S3 Glacier \(p. 116\)](#), the AWS SDK for .NET provides both the high-level and low-level APIs.

Note

The low-level API and high-level API provide thread-safe clients for accessing S3 Glacier. As a best practice, your applications should create one client and reuse the client between threads.

Topics

- [Using the Low-Level API \(p. 120\)](#)
- [Using the High-Level API \(p. 121\)](#)
- [Running Code Examples \(p. 121\)](#)
- [Setting the Endpoint \(p. 121\)](#)

Using the Low-Level API

The low-level `AmazonGlacierClient` class provides all the methods that map to the underlying REST operations of Amazon S3 Glacier (S3 Glacier) ([API Reference for Amazon S3 Glacier \(p. 160\)](#)). When calling any of these methods, you must create a corresponding request object and provide a response object in which the method can return a S3 Glacier response to the operation.

For example, the `AmazonGlacierClient` class provides the `CreateVault` method to create a vault. This method maps to the underlying Create Vault REST operation (see [Create Vault \(PUT vault\) \(p. 185\)](#)). To use this method, you must create instances of the `CreateVaultRequest` and `CreateVaultResponse` classes to provide request information and receive a S3 Glacier response as shown in the following C# code snippet:

```
AmazonGlacierClient client;  
client = new AmazonGlacierClient(Amazon.RegionEndpoint.USEast1);  
  
CreateVaultRequest request = new CreateVaultRequest()  
{  
    AccountId = "-",  
    VaultName = "*** Provide vault name ***"  
};  
  
CreateVaultResponse response = client.CreateVault(request);
```

All the low-level samples in the guide use this pattern.

Note

The preceding code segment specifies `AccountId` when creating the request. However, when using the AWS SDK for .NET, the `AccountId` in the request is optional, and therefore all the low-level examples in this guide don't set this value. The `AccountId` is the AWS Account ID. This value must match the AWS Account ID associated with the credentials used to sign the request. You can specify either the AWS Account ID or optionally a '-', in which case S3 Glacier uses the AWS Account ID associated with the credentials used to sign the request. If you specify

your Account ID, do not include hyphens in it. When using AWS SDK for .NET, if you don't provide the account ID, the library sets the account ID to '-'.

Using the High-Level API

To further simplify your application development, the AWS SDK for .NET provides the `ArchiveTransferManager` class that implements a higher-level abstraction for some of the methods in the low-level API. It provides useful methods, such as `Upload` and `Download`, for the archive operations.

For example, the following C# code snippet uses the `Upload` high-level method to upload an archive.

```
string vaultName = "examplevault";
string archiveToUpload = "c:\\folder\\exampleArchive.zip";

var manager = new ArchiveTransferManager(Amazon.RegionEndpoint.USEast1);
string archiveId = manager.Upload(vaultName, "archive description",
    archiveToUpload).ArchiveId;
```

Note that any operations you perform apply to the AWS Region you specified when creating the `ArchiveTransferManager` object. All the high-level examples in this guide use this pattern.

Note

The high-level `ArchiveTransferManager` class still needs the low-level `AmazonGlacierClient` client, which you can pass either explicitly or the `ArchiveTransferManager` creates the client.

Running Code Examples

The easiest way to get started with the .NET code examples is to install the AWS SDK for .NET. For more information, go to [AWS SDK for .NET](#).

The following procedure outlines steps for you to test the code examples provided in this guide.

General Process of Creating .NET Code Examples (Using Visual Studio)

1	Create a credentials profile for your AWS credentials as described in the AWS SDK for .NET topic Configuring AWS Credentials .
2	Create a new Visual Studio project using the <i>AWS Empty Project</i> template.
3	Replace the code in the project file, <code>Program.cs</code> , with the code in the section you are reading.
4	Run the code. Verify that the object is created using the AWS Management Console. For more information about AWS Management Console, go to http://aws.amazon.com/console/ .

Setting the Endpoint

By default, the AWS SDK for .NET sets the endpoint to the US West (Oregon) Region (`https://glacier.us-west-2.amazonaws.com`). You can set the endpoint to other AWS Regions as shown in the following C# snippets.

The following snippet shows how to set the endpoint to the US West (Oregon) Region (`us-west-2`) in the low-level API.

Example

```
AmazonGlacierClient client = new AmazonGlacierClient(Amazon.RegionEndpoint.USSouth2);
```

The following snippet shows how to set the endpoint to the US West (Oregon) Region in the high-level API.

```
var manager = new ArchiveTransferManager(Amazon.RegionEndpoint.USSouth2);
```

For a current list of supported AWS Regions and endpoints, see [Accessing Amazon S3 Glacier \(p. 5\)](#).

Security in Amazon S3 Glacier

Cloud security at AWS is the highest priority. As an AWS customer, you benefit from a data center and network architecture that are built to meet the requirements of the most security-sensitive organizations.

Security is a shared responsibility between AWS and you. The [shared responsibility model](#) describes this as security *of* the cloud and security *in* the cloud:

- **Security of the cloud** – AWS is responsible for protecting the infrastructure that runs AWS services in the AWS Cloud. AWS also provides you with services that you can use securely. The effectiveness of our security is regularly tested and verified by third-party auditors as part of the [AWS compliance programs](#). To learn about the compliance programs that apply to Amazon S3 Glacier (S3 Glacier), see [AWS Services in Scope by Compliance Program](#).
- **Security in the cloud** – Your responsibility is determined by the AWS service that you use. You are also responsible for other factors including the sensitivity of your data, your organization's requirements, and applicable laws and regulations.

This documentation will help you understand how to apply the shared responsibility model when using S3 Glacier. The following topics show you how to configure S3 Glacier to meet your security and compliance objectives. You'll also learn how to use other AWS services that can help you to monitor and secure your S3 Glacier resources.

Topics

- [Data Protection in Amazon S3 Glacier \(p. 123\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)
- [Logging and Monitoring in Amazon S3 Glacier \(p. 144\)](#)
- [Compliance Validation for Amazon S3 Glacier \(p. 145\)](#)
- [Resilience in Amazon S3 Glacier \(p. 146\)](#)
- [Infrastructure Security in Amazon S3 Glacier \(p. 147\)](#)

Data Protection in Amazon S3 Glacier

Amazon S3 Glacier (S3 Glacier) provides highly durable cloud storage for data archiving and long-term backup. S3 Glacier is designed to deliver 99.999999999 percent durability and provides comprehensive security and compliance capabilities that can help you meet stringent regulatory requirements. S3 Glacier redundantly stores data in multiple AWS Availability Zones (AZ) and on multiple devices within each AZ. To increase durability, S3 Glacier synchronously stores your data across multiple AZs before confirming a successful upload.

For more information about the AWS global cloud infrastructure, see [Global Infrastructure](#).

For data protection purposes, we recommend that you protect AWS account credentials and set up individual user accounts with AWS Identity and Access Management (IAM), so that each user is given only the permissions necessary to fulfill their job duties.

If you require FIPS 140-2 validated cryptographic modules when accessing AWS through a command line interface or an API, use a FIPS endpoint. For more information about the available FIPS endpoints, see [Federal Information Processing Standard \(FIPS\) 140-2](#).

Topics

- [Data Encryption](#) (p. 124)
- [Key Management](#) (p. 124)
- [Internet Traffic Privacy](#) (p. 124)

Data Encryption

Data protection refers to protecting data while in-transit (as it travels to and from Amazon S3 Glacier) and at rest (while it is stored in AWS data centers). You can protect data in transit that is uploaded directly to S3 Glacier using Secure Sockets Layer (SSL) or client-side encryption.

You can also access S3 Glacier through Amazon Simple Storage Service (Amazon S3). Amazon S3 supports lifecycle configuration on an Amazon S3 bucket, which enables you to transition objects to the Amazon S3 S3 Glacier storage class for archival. Data in transit between Amazon S3 and S3 Glacier via lifecycle policies is encrypted using SSL.

Data at rest stored in S3 Glacier is automatically server-side encrypted using 256-bit Advanced Encryption Standard (AES-256) with keys maintained by AWS. If you prefer to manage your own keys, you can also use client-side encryption before storing data in S3 Glacier. For more information about how to setup default encryption for Amazon S3, see [Amazon S3 Default Encryption](#) in the *Amazon Simple Storage Service Developer Guide*.

Key Management

Server-side encryption addresses data encryption at rest—that is, Amazon S3 Glacier encrypts your data as it writes it to its data centers and decrypts it for you when you access it. As long as you authenticate your request and you have access permissions, there is no difference in the way you access encrypted or unencrypted data.

Data at rest stored in S3 Glacier is automatically server-side encrypted using AES-256, using keys maintained by AWS. As an additional safeguard, AWS encrypts the key itself with a master key that we regularly rotate.

Internet Traffic Privacy

Access to Amazon S3 Glacier via the network is through AWS published APIs. Clients must support Transport Layer Security (TLS) 1.0. We recommend TLS 1.2 or later. Clients must also support cipher suites with Perfect Forward Secrecy (PFS), such as Ephemeral Diffie-Hellman (DHE) or Elliptic Curve Diffie-Hellman Ephemeral (ECDHE). Most modern systems such as Java 7 and later support these modes. Additionally, you must sign requests using an access key ID and a secret access key that are associated with an IAM principal, or you can use the [AWS Security Token Service \(AWS STS\)](#) to generate temporary security credentials to sign requests.

VPC Endpoints

A virtual private cloud (VPC) endpoint enables you to privately connect your VPC to supported AWS services and VPC endpoint services powered by AWS PrivateLink without requiring an internet gateway, NAT device, VPN connection, or AWS Direct Connect connection. Although S3 Glacier does not support VPC endpoints directly, you can take advantage of Amazon Simple Storage Service (Amazon S3) VPC endpoints if you access S3 Glacier as a storage tier integrated with Amazon S3.

For more information about Amazon S3 lifecycle configuration and transitioning objects to the S3 Glacier storage class, see [Object Lifecycle Management](#) and [Transitioning Objects](#) in the *Amazon Simple Storage Service Developer Guide*. For more information about VPC endpoints, see [VPC Endpoints](#) in the *Amazon VPC User Guide*.

Identity and Access Management in Amazon S3 Glacier

Access to Amazon S3 Glacier (S3 Glacier) requires credentials that AWS can use to authenticate your requests. Those credentials must have permissions to access AWS resources, such as a S3 Glacier vault or an Amazon S3 bucket. The following sections provide details on how you can use [AWS Identity and Access Management \(IAM\)](#) and S3 Glacier to help secure your resources by controlling who can access them:

- [Authentication](#) (p. 125)
- [Access Control](#) (p. 126)

Authentication

You can access AWS as any of the following types of identities:

- **AWS account root user** – When you first create an AWS account, you begin with a single sign-in identity that has complete access to all AWS services and resources in the account. This identity is called the AWS account *root user* and is accessed by signing in with the email address and password that you used to create the account. We strongly recommend that you do not use the root user for your everyday tasks, even the administrative ones. Instead, adhere to the [best practice of using the root user only to create your first IAM user](#). Then securely lock away the root user credentials and use them to perform only a few account and service management tasks.
- **IAM user** – An [IAM user](#) is an identity within your AWS account that has specific custom permissions (for example, permissions to create a vault in S3 Glacier). You can use an IAM user name and password to sign in to secure AWS webpages like the [AWS Management Console](#), [AWS Discussion Forums](#), or the [AWS Support Center](#).

In addition to a user name and password, you can also generate [access keys](#) for each user. You can use these keys when you access AWS services programmatically, either through [one of the several SDKs](#) or by using the [AWS Command Line Interface \(CLI\)](#). The SDK and CLI tools use the access keys to cryptographically sign your request. If you don't use AWS tools, you must sign the request yourself. S3 Glacier supports *Signature Version 4*, a protocol for authenticating inbound API requests. For more information about authenticating requests, see [Signature Version 4 Signing Process](#) in the *AWS General Reference*.

- **IAM role** – An [IAM role](#) is an IAM identity that you can create in your account that has specific permissions. An IAM role is similar to an IAM user in that it is an AWS identity with permissions policies that determine what the identity can and cannot do in AWS. However, instead of being uniquely associated with one person, a role is intended to be assumable by anyone who needs it. Also, a role does not have standard long-term credentials such as a password or access keys associated with it. Instead, when you assume a role, it provides you with temporary security credentials for your role session. IAM roles with temporary credentials are useful in the following situations:
- **Federated user access** – Instead of creating an IAM user, you can use existing identities from AWS Directory Service, your enterprise user directory, or a web identity provider. These are known as *federated users*. AWS assigns a role to a federated user when access is requested through an [identity provider](#). For more information about federated users, see [Federated Users and Roles](#) in the *IAM User Guide*.

- **AWS service access** – A service role is an IAM role that a service assumes to perform actions in your account on your behalf. When you set up some AWS service environments, you must define a role for the service to assume. This service role must include all the permissions that are required for the service to access the AWS resources that it needs. Service roles vary from service to service, but many allow you to choose your permissions as long as you meet the documented requirements for that service. Service roles provide access only within your account and cannot be used to grant access to services in other accounts. You can create, modify, and delete a service role from within IAM. For example, you can create a role that allows Amazon Redshift to access an Amazon S3 bucket on your behalf and then load data from that bucket into an Amazon Redshift cluster. For more information, see [Creating a Role to Delegate Permissions to an AWS Service](#) in the *IAM User Guide*.
- **Applications running on Amazon EC2** – You can use an IAM role to manage temporary credentials for applications that are running on an EC2 instance and making AWS CLI or AWS API requests. This is preferable to storing access keys within the EC2 instance. To assign an AWS role to an EC2 instance and make it available to all of its applications, you create an instance profile that is attached to the instance. An instance profile contains the role and enables programs that are running on the EC2 instance to get temporary credentials. For more information, see [Using an IAM Role to Grant Permissions to Applications Running on Amazon EC2 Instances](#) in the *IAM User Guide*.

Access Control

You can have valid credentials to authenticate your requests, but unless you have permissions you cannot create or access S3 Glacier resources. For example, you must have permissions to create a S3 Glacier vault.

The following sections describe how to manage permissions. We recommend that you read the overview first.

- [Overview of Managing Access Permissions to Your Amazon S3 Glacier Resources](#) (p. 126)
- [Using Identity-Based Policies for Amazon S3 Glacier \(IAM Policies\)](#) (p. 130)
- [Using Resource-Based Policies for Amazon S3 Glacier \(Vault Policies\)](#) (p. 134)

Overview of Managing Access Permissions to Your Amazon S3 Glacier Resources

Every AWS resource is owned by an AWS account, and permissions to create or access a resource are governed by permissions policies. An account administrator can attach permissions policies to IAM identities (that is, users, groups, and roles) and some services (such as Amazon S3 Glacier (S3 Glacier)) also support attaching permissions policies to resources.

Note

An *account administrator* (or administrator user) is a user with administrator privileges. For more information, see [IAM Best Practices](#) in the *IAM User Guide*.

When granting permissions, you decide who is getting the permissions, the resources they get permissions for, and the specific actions that you want to allow on those resources.

Topics

- [Amazon S3 Glacier Resources and Operations](#) (p. 127)
- [Understanding Resource Ownership](#) (p. 127)

- [Managing Access to Resources \(p. 127\)](#)
- [Specifying Policy Elements: Actions, Effects, Resources, and Principals \(p. 129\)](#)
- [Specifying Conditions in a Policy \(p. 130\)](#)

Amazon S3 Glacier Resources and Operations

In S3 Glacier, the primary resource is a *vault*. S3 Glacier supports policies only at the vault level. That is, in an IAM policy, the `Resource` value that you specify can be a specific vault or a set of vaults in a specific AWS Region. S3 Glacier doesn't support archive-level permissions.

For all S3 Glacier actions, `Resource` specifies the vault on which you want to grant the permissions. These resources have unique Amazon Resource Names (ARNs) associated with them as shown in the following table, and you can use a wildcard character (*) in the ARN to match any vault name.

S3 Glacier provides a set of operations to work with the S3 Glacier resources. For information on the available operations, see [API Reference for Amazon S3 Glacier \(p. 160\)](#).

Understanding Resource Ownership

A *resource owner* is the AWS account that created the resource. That is, the resource owner is the AWS account of the *principal entity* (the root account, an IAM user, or an IAM role) that authenticates the request that creates the resource. The following examples illustrate how this works:

- If you use the root account credentials of your AWS account to create a S3 Glacier vault, your AWS account is the owner of the resource (in S3 Glacier, the resource is the S3 Glacier vault).
- If you create an IAM user in your AWS account and grant permissions to create a S3 Glacier vault to that user, the user can create a S3 Glacier vault. However, your AWS account, to which the user belongs, owns the S3 Glacier vault resource.
- If you create an IAM role in your AWS account with permissions to create a S3 Glacier vault, anyone who can assume the role can create a S3 Glacier vault. Your AWS account, to which the role belongs, owns the S3 Glacier vault resource.

Managing Access to Resources

A *permissions policy* describes who has access to what. The following section explains the available options for creating permissions policies.

Note

This section discusses using IAM in the context of S3 Glacier. It doesn't provide detailed information about the IAM service. For complete IAM documentation, see [What Is IAM?](#) in the *IAM User Guide*. For information about IAM policy syntax and descriptions, see [AWS IAM Policy Reference](#) in the *IAM User Guide*.

Policies attached to an IAM identity are referred to as *identity-based* policies (IAM policies) and policies attached to a resource are referred to as *resource-based* policies. S3 Glacier supports both identity-based (IAM policies) and resource-based policies.

Topics

- [Identity-Based Policies \(IAM policies\) \(p. 127\)](#)
- [Resource-Based Policies \(Amazon S3 Glacier Vault Policies\) \(p. 128\)](#)

Identity-Based Policies (IAM policies)

You can attach policies to IAM identities. For example you can do the following:

- **Attach a permissions policy to a user or a group in your account** – An account administrator can use a permissions policy that is associated with a particular user to grant permissions for that user to create a S3 Glacier vault.
- **Attach a permissions policy to a role (grant cross-account permissions)** – You can attach an identity-based permissions policy to an IAM role to grant cross-account permissions. For example, the administrator in Account A can create a role to grant cross-account permissions to another AWS account (for example, Account B) or an AWS service as follows:
 1. Account A administrator creates an IAM role and attaches a permissions policy to the role that grants permissions on resources in Account A.
 2. Account A administrator attaches a trust policy to the role identifying Account B as the principal who can assume the role.
 3. Account B administrator can then delegate permissions to assume the role to any users in Account B. Doing this allows users in Account B to create or access resources in Account A. The principal in the trust policy can also be an AWS service principal if you want to grant an AWS service permissions to assume the role.

For more information about using IAM to delegate permissions, see [Access Management](#) in the *IAM User Guide*.

The following is an example policy that grants permissions for three S3 Glacier vault-related actions (`glacier:CreateVault`, `glacier:DescribeVault` and `glacier:ListVaults`) on a resource, using the Amazon Resource Name (ARN) that identifies all of the vaults in the `us-west-2` AWS Region. ARNs uniquely identify AWS resources. For more information about ARNs used with S3 Glacier, see [Amazon S3 Glacier Resources and Operations](#) (p. 127).

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "glacier:CreateVault",
        "glacier:DescribeVault",
        "glacier:ListVaults"
      ],
      "Resource": "arn:aws:glacier:us-west-2:123456789012:vaults/*"
    }
  ]
}
```

The policy grants permissions to create, list, and obtain descriptions of vaults in the `us-west-2` Region. The wildcard character (*) at the end of the ARN means that this statement can match any vault name.

Important

When you grant permissions to create a vault using the `glacier:CreateVault` operation, you must specify a wildcard character (*) because you don't know the vault name until after you create the vault.

For more information about using identity-based policies with S3 Glacier, see [Using Identity-Based Policies for Amazon S3 Glacier \(IAM Policies\)](#) (p. 130). For more information about users, groups, roles, and permissions, see [Identities \(Users, Groups, and Roles\)](#) in the *IAM User Guide*.

Resource-Based Policies (Amazon S3 Glacier Vault Policies)

Each S3 Glacier vault can have resource-based permissions policies associated with it. For S3 Glacier, a S3 Glacier vault is the primary resource and resource-based policies are referred to as *vault policies*.

You use S3 Glacier vault policies to manage permissions in the following ways:

- Manage user permissions in your account in a single vault policy, instead of individual user policies.
- Manage cross-account permissions as an alternative to using IAM roles.

A S3 Glacier vault can have one vault access policy and one Vault Lock policy associated with it. A S3 Glacier *vault access policy* is a resource-based policy that you can use to manage permissions to your vault. A *Vault Lock policy* is a vault access policy that can be locked. After you lock a Vault Lock policy, the policy cannot be changed. You can use a Vault Lock policy to enforce compliance controls.

You can use vault policies to grant permissions to all users, or you can limit access to a vault to a few AWS accounts by attaching a policy directly to a vault resource. For example, you can use a S3 Glacier vault policy to grant read-only permissions to all AWS accounts or to grant permissions to upload archives to a few AWS accounts.

Vault policies make it easy to grant cross-account access when you need to share your vault with other AWS accounts. You can specify controls such as “write once read many” (WORM) in a vault lock policy and lock the policy from future edits. For example, you can grant read-only access on a vault to a business partner with a different AWS account by simply including that account and allowed actions in the vault policy. You can grant cross-account access to multiple users in this fashion and have a single location to view all users with cross-account access in the vault access policy. For an example of a vault policy for cross-account access, see [Example 1: Grant Cross-Account Permissions for Specific Amazon S3 Glacier Actions](#) (p. 135).

For more information about using vault policies with S3 Glacier, see [Using Resource-Based Policies for Amazon S3 Glacier \(Vault Policies\)](#) (p. 134). For additional information about IAM roles (identity-based policies) as opposed to resource-based policies, see [How IAM Roles Differ from Resource-based Policies](#) in the *IAM User Guide*.

Specifying Policy Elements: Actions, Effects, Resources, and Principals

For each type of S3 Glacier resource, the service defines a set of API operations (see [API Reference for Amazon S3 Glacier](#) (p. 160)). To grant permissions for these API operations S3 Glacier defines a set of actions that you can specify in a policy. Note that, performing an API operation can require permissions for more than one action. When granting permissions for specific actions, you also identify the resource on which the actions are allowed or denied.

The following are the most basic policy elements:

- **Resource** – In a policy, you use an Amazon Resource Name (ARN) to identify the resource to which the policy applies. For more information, see [Amazon S3 Glacier Resources and Operations](#) (p. 127).
- **Actions** – You use action keywords to identify resource operations that you want to allow or deny.

For example, the `glacier:CreateVault` permission allows the user permissions to perform the S3 Glacier `Create Vault` operation.

- **Effect** – You specify the effect when the user requests the specific action—this can be either allow or deny. If you don't explicitly grant access to (allow) a resource, access is implicitly denied. You can also explicitly deny access to a resource, which you might do to make sure that a user cannot access it, even if a different policy grants access.
- **Principal** – In identity-based policies (IAM policies), the user that the policy is attached to is the implicit principal. For resource-based policies, you specify the user, account, service, or other entity that you want to receive permissions (applies to resource-based policies only).

To learn more about the IAM policy syntax, and descriptions, see [AWS IAM Policy Reference](#) in the *IAM User Guide*.

For a table showing all of the S3 Glacier API actions and the resources that they apply to, see [Amazon S3 Glacier API Permissions: Actions, Resources, and Conditions Reference \(p. 138\)](#).

Specifying Conditions in a Policy

When you grant permissions, you can use the IAM policy language to specify the conditions when a policy should take effect. For example, you might want a policy to be applied only after a specific date. For more information about specifying conditions in a policy language, see [Condition](#) in the *IAM User Guide*.

AWS provides a set of predefined condition keys, called *AWS-wide condition keys*, for all AWS services that support IAM for access control. AWS-wide condition keys use the prefix `aws:`. S3 Glacier supports all AWS-wide condition keys in vault access and Vault Lock policies. For example, you can use the `aws:MultiFactorAuthPresent` condition key to require multi-factor authentication (MFA) when requesting an action. For more information and a list of the AWS-wide condition keys, see [Available Keys for Conditions](#) in the *IAM User Guide*.

In addition, S3 Glacier also provides its own condition keys that you can include in `Condition` elements in an IAM permissions policy. S3 Glacier–specific condition keys are applicable only when granting S3 Glacier–specific permissions. S3 Glacier condition key names have the prefix `glacier:`. The following table shows the S3 Glacier condition keys that apply to S3 Glacier resources.

S3 Glacier Condition Key	Description	Value Type
<code>glacier:ArchiveAgeInDays</code>	Used to evaluate how long an archive has been stored in the vault, in days.	Integer
<code>glacier:ResourceTagKey</code>	Allows you to use a tag in your policy. For information about resource tagging, see Managing Access Control with Tagging (p. 156) .	String

For examples of using the S3 Glacier–specific condition keys, see [Amazon S3 Glacier Access Control with Vault Lock Policies \(p. 136\)](#).

Related Topics

- [Using Identity-Based Policies for Amazon S3 Glacier \(IAM Policies\) \(p. 130\)](#)
- [Using Resource-Based Policies for Amazon S3 Glacier \(Vault Policies\) \(p. 134\)](#)
- [Amazon S3 Glacier API Permissions: Actions, Resources, and Conditions Reference \(p. 138\)](#)

Using Identity-Based Policies for Amazon S3 Glacier (IAM Policies)

This topic provides examples of identity-based policies in which an account administrator can attach permissions policies to IAM identities (that is, users, groups, and roles).

Important

We recommend that you first review the introductory topics that explain the basic concepts and options available for you to manage access to your Amazon S3 Glacier (S3 Glacier) resources. For more information, see [Overview of Managing Access Permissions to Your Amazon S3 Glacier Resources \(p. 126\)](#).

The sections in this topic cover the following:

- [Permissions Required to Use the Amazon S3 Glacier Console \(p. 131\)](#)
- [AWS Managed Policies \(Predefined Policies\) for Amazon S3 Glacier \(p. 131\)](#)
- [Customer Managed Policy Examples \(p. 132\)](#)

The following shows an example of a permissions policy.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "glacier:CreateVault",
        "glacier:DescribeVault",
        "glacier:ListVaults"
      ],
      "Resource": "arn:aws:glacier:us-west-2:123456789012:vaults/*"
    }
  ]
}
```

The policy grants permissions for three S3 Glacier vault-related actions (`glacier:CreateVault`, `glacier:DescribeVault` and `glacier:ListVaults`), on a resource using the Amazon Resource Name (ARN) that identifies all of the vaults in the `us-west-2` AWS Region.

The wildcard character (*) at the end of the ARN means that this statement can match any vault name. The statement allows the `glacier:DescribeVault` action on any vault in the specified AWS Region, `us-west-2`. If you want to limit permissions for this action to a specific vault only, you replace the wildcard character (*) with a vault name.

Permissions Required to Use the Amazon S3 Glacier Console

The S3 Glacier console provides an integrated environment for you to create and manage S3 Glacier vaults. At a minimum IAM users that you create must be granted permissions for the `glacier:ListVaults` action to view the S3 Glacier console as shown in the following example.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Action": [
        "glacier:ListVaults"
      ],
      "Effect": "Allow",
      "Resource": "*"
    }
  ]
}
```

Both of the S3 Glacier AWS Managed policies discussed in the next section grant permissions for `glacier:ListVaults`.

AWS Managed Policies (Predefined Policies) for Amazon S3 Glacier

AWS addresses many common use cases by providing standalone IAM policies that are created and administered by AWS. Managed policies grant necessary permissions for common use cases so you can

avoid having to investigate what permissions are needed. For more information, see [AWS Managed Policies](#) in the *IAM User Guide*.

The following AWS managed policies, which you can attach to users in your account, are specific to S3 Glacier:

- **AmazonGlacierReadOnlyAccess** – Grants read only access to S3 Glacier through the AWS Management Console.
- **AmazonGlacierFullAccess** – Grants full access to S3 Glacier through the AWS Management Console.

Note

You can review these permissions policies by signing in to the IAM console and searching for specific policies there.

You can also create your own custom IAM policies to allow permissions for S3 Glacier API actions and resources. You can attach these custom policies to the IAM users or groups that require those permissions or to custom execution roles (IAM roles) that you create for your S3 Glacier vaults.

Customer Managed Policy Examples

In this section, you can find example user policies that grant permissions for various S3 Glacier actions. These policies work when you are using S3 Glacier REST API, the AWS SDKs, the AWS CLI, or, if applicable, the S3 Glacier management console.

Note

All examples use the US West (Oregon) Region (`us-west-2`) and contain fictitious account IDs.

Examples

- [Example 1: Allow a User to Download Archives from a Vault \(p. 132\)](#)
- [Example 2: Allow a User to Create a Vault and Configure Notifications \(p. 133\)](#)
- [Example 3: Allow a User to Upload Archives to a Specific Vault \(p. 133\)](#)
- [Example 4: Allow a User Full Permissions on a Specific Vault \(p. 133\)](#)

Example 1: Allow a User to Download Archives from a Vault

To download an archive, you first initiate a job to retrieve the archive. After the retrieval job is complete, you can download the data. The following example policy grants permissions for the `glacier:InitiateJob` action to initiate a job (which allows the user to retrieve an archive or a vault inventory from the vault), and permissions for the `glacier:GetJobOutput` action to download the retrieved data. The policy also grants permissions to perform the `glacier:DescribeJob` action so that the user can get the job status. For more information, see [Initiate Job \(POST jobs\) \(p. 263\)](#).

The policy grants these permissions on a vault named `examplevault`. You can get the vault ARN from the [Amazon S3 Glacier console](#), or programmatically by calling either the [Describe Vault \(GET vault\) \(p. 194\)](#) or the [List Vaults \(GET vaults\) \(p. 210\)](#) API actions.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Resource": "arn:aws:glacier:us-west-2:123456789012:vaults/examplevault",
      "Action": [
        "glacier:InitiateJob",
        "glacier:GetJobOutput",
        "glacier:DescribeJob"
      ]
    }
  ]
}
```

```
}  
]  
}
```

Example 2: Allow a User to Create a Vault and Configure Notifications

The following example policy grants permissions to create a vault in the us-west-2 Region as specified in the `Resource` element and configure notifications. For more information about working with notifications, see [Configuring Vault Notifications in Amazon S3 Glacier \(p. 51\)](#). The policy also grants permissions to list vaults in the AWS Region and get a specific vault description.

Important

When you grant permissions to create a vault using the `glacier:CreateVault` operation, you must specify a wildcard character (*) in the `Resource` value because you don't know the vault name until after you create the vault.

```
{  
  "Version": "2012-10-17",  
  "Statement": [  
    {  
      "Effect": "Allow",  
      "Resource": "arn:aws:glacier:us-west-2:123456789012:vaults/*",  
      "Action": ["glacier:CreateVault",  
                 "glacier:SetVaultNotifications",  
                 "glacier:GetVaultNotifications",  
                 "glacier>DeleteVaultNotifications",  
                 "glacier:DescribeVault",  
                 "glacier:ListVaults"]  
    }  
  ]  
}
```

Example 3: Allow a User to Upload Archives to a Specific Vault

The following example policy grants permissions to upload archives to a specific vault in the us-west-2 Region. These permissions allow a user to upload an archive all at once using the [Upload Archive \(POST archive\) \(p. 224\)](#) API operation or in parts using the [Initiate Multipart Upload \(POST multipart-uploads\) \(p. 233\)](#) API operation.

```
{  
  "Version": "2012-10-17",  
  "Statement": [  
    {  
      "Effect": "Allow",  
      "Resource": "arn:aws:glacier:us-west-2:123456789012:vaults/examplevault",  
      "Action": ["glacier:UploadArchive",  
                 "glacier:InitiateMultipartUpload",  
                 "glacier:UploadMultipartPart",  
                 "glacier:ListParts",  
                 "glacier:ListMultipartUploads",  
                 "glacier:CompleteMultipartUpload"]  
    }  
  ]  
}
```

Example 4: Allow a User Full Permissions on a Specific Vault

The following example policy grants permissions for all S3 Glacier actions on a vault named `examplevault`.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Resource": "arn:aws:glacier:us-west-2:123456789012:vaults/examplevault",
      "Action": ["glacier:*"]
    }
  ]
}
```

Using Resource-Based Policies for Amazon S3 Glacier (Vault Policies)

An Amazon S3 Glacier (S3 Glacier) vault is the primary resource in S3 Glacier. You can add permissions to the policy associated with a S3 Glacier vault. Permissions policies attached to S3 Glacier vaults are referred to as *resource-based policies* (or *vault policies* in S3 Glacier). Each S3 Glacier vault can have resource-based permissions policies associated with it. For information about available permissions policy options, see [Managing Access to Resources](#) (p. 127).

Important

Before you create resource-based policies, we recommend that you first review the introductory topics that explain the basic concepts and options available for you to manage access to your S3 Glacier resources. For more information, see [Overview of Managing Access Permissions to Your Amazon S3 Glacier Resources](#) (p. 126).

A S3 Glacier vault can have one vault access policy and one Vault Lock policy associated with it. An Amazon S3 Glacier *vault access policy* is a resource-based policy that you can use to manage permissions to your vault. A *Vault Lock policy* is vault access policy that can be locked. After you lock a Vault Lock policy, the policy can't be changed. You can use a Vault Lock Policy to enforce compliance controls.

For more information, see the following topics.

Topics

- [Amazon S3 Glacier Access Control with Vault Access Policies](#) (p. 134)
- [Amazon S3 Glacier Access Control with Vault Lock Policies](#) (p. 136)

Amazon S3 Glacier Access Control with Vault Access Policies

An Amazon S3 Glacier vault access policy is a resource-based policy that you can use to manage permissions to your vault. For information about the different permissions policy options available, see [Managing Access to Resources](#) (p. 127).

You can create one vault access policy for each vault to manage *permissions*. You can modify permissions in a vault access policy at any time. S3 Glacier also supports a Vault Lock policy on each vault that, after you lock it, cannot be altered. For more information about working with Vault Lock policies, see [Amazon S3 Glacier Access Control with Vault Lock Policies](#) (p. 136).

You can use the Glacier API, AWS SDKs, AWS CLI, or the S3 Glacier console to create and manage vault access policies. For a list of operations allowed for vault access resource-based policies, see [Amazon S3 Glacier API Permissions: Actions, Resources, and Conditions Reference](#) (p. 138).

Examples

- [Example 1: Grant Cross-Account Permissions for Specific Amazon S3 Glacier Actions](#) (p. 135)
- [Example 2: Grant Cross-Account Permissions for MFA Delete Operations](#) (p. 135)

Example 1: Grant Cross-Account Permissions for Specific Amazon S3 Glacier Actions

The following example policy grants cross-account permissions to two AWS accounts for a set of S3 Glacier operations on a vault named `examplevault`.

Note

The account that owns the vault is billed for all costs associated with the vault. All requests, data transfer, and retrieval costs made by allowed external accounts are billed to the account that owns the vault.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "cross-account-upload",
      "Principal": {
        "AWS": [
          "arn:aws:iam::123456789012:root",
          "arn:aws:iam::444455556666:root"
        ]
      },
      "Effect": "Allow",
      "Action": [
        "glacier:UploadArchive",
        "glacier:InitiateMultipartUpload",
        "glacier:AbortMultipartUpload",
        "glacier:CompleteMultipartUpload"
      ],
      "Resource": [
        "arn:aws:glacier:us-west-2:999999999999:vaults/examplevault"
      ]
    }
  ]
}
```

Example 2: Grant Cross-Account Permissions for MFA Delete Operations

You can use multi-factor authentication (MFA) to protect your S3 Glacier resources. To provide an extra level of security, MFA requires users to prove physical possession of an MFA device by providing a valid MFA code. For more information about configuring MFA access, see [Configuring MFA-Protected API Access](#) in the *IAM User Guide*.

The example policy grants an AWS account with temporary credentials permission to delete archives from a vault named `examplevault`, provided the request is authenticated with an MFA device. The policy uses the `aws:MultiFactorAuthPresent` condition key to specify this additional requirement. For more information, see [Available Keys for Conditions](#) in the *IAM User Guide*.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "add-mfa-delete-requirement",
      "Principal": {
        "AWS": [
          "arn:aws:iam::123456789012:root"
        ]
      },
      "Effect": "Allow",
      "Action": [
```

```
        "glacier:Delete*"
      ],
      "Resource": [
        "arn:aws:glacier:us-west-2:999999999999:vaults/examplevault"
      ],
      "Condition": {
        "Bool": {
          "aws:MultiFactorAuthPresent": true
        }
      }
    }
  ]
}
```

Related Sections

- [Delete Vault Access Policy \(DELETE access-policy\) \(p. 191\)](#)
- [Get Vault Access Policy \(GET access-policy\) \(p. 197\)](#)
- [Set Vault Access Policy \(PUT access-policy\) \(p. 217\)](#)

Amazon S3 Glacier Access Control with Vault Lock Policies

An Amazon S3 Glacier (S3 Glacier) vault can have one resource-based vault access policy and one Vault Lock policy attached to it. A *Vault Lock policy* is a vault access policy that you can lock. Using a Vault Lock policy can help you enforce regulatory and compliance requirements. Amazon S3 Glacier provides a set of API operations for you to manage the Vault Lock policies, see [Locking a Vault by Using the Amazon S3 Glacier API \(p. 66\)](#).

As an example of a Vault Lock policy, suppose that you are required to retain archives for one year before you can delete them. To implement this requirement, you can create a Vault Lock policy that denies users permissions to delete an archive until the archive has existed for one year. You can test this policy before locking it down. After you lock the policy, the policy becomes immutable. For more information about the locking process, see [Amazon S3 Glacier Vault Lock \(p. 65\)](#). If you want to manage other user permissions that can be changed, you can use the vault access policy (see [Amazon S3 Glacier Access Control with Vault Access Policies \(p. 134\)](#)).

You can use the S3 Glacier API, AWS SDKs, AWS CLI, or the S3 Glacier console to create and manage Vault Lock policies. For a list of S3 Glacier actions allowed for vault resource-based policies, see [Amazon S3 Glacier API Permissions: Actions, Resources, and Conditions Reference \(p. 138\)](#).

Examples

- [Example 1: Deny Deletion Permissions for Archives Less Than 365 Days Old \(p. 136\)](#)
- [Example 2: Deny Deletion Permissions Based on a Tag \(p. 137\)](#)

Example 1: Deny Deletion Permissions for Archives Less Than 365 Days Old

Suppose that you have a regulatory requirement to retain archives for up to one year before you can delete them. You can enforce that requirement by implementing the following Vault Lock policy. The policy denies the `glacier:DeleteArchive` action on the `examplevault` vault if the archive being deleted is less than one year old. The policy uses the S3 Glacier-specific condition key `ArchiveAgeInDays` to enforce the one-year retention requirement.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
```

```
    "Sid": "deny-based-on-archive-age",
    "Principal": "*",
    "Effect": "Deny",
    "Action": "glacier:DeleteArchive",
    "Resource": [
        "arn:aws:glacier:us-west-2:123456789012:vaults/examplevault"
    ],
    "Condition": {
        "NumericLessThan": {
            "glacier:ArchiveAgeInDays": "365"
        }
    }
}
]
```

Example 2: Deny Deletion Permissions Based on a Tag

Suppose that you have a time-based retention rule that an archive can be deleted if it is less than a year old. At the same time, suppose that you need to place a legal hold on your archives to prevent deletion or modification for an indefinite duration during a legal investigation. In this case, the legal hold takes precedence over the time-based retention rule specified in the Vault Lock policy.

To put these two rules in place, the following example policy has two statements:

- The first statement denies deletion permissions for everyone, locking the vault. This lock is performed by using the LegalHold tag.
- The second statement grants deletion permissions when the archive is less than 365 days old. But even when archives are less than 365 days old, no one can delete them when the condition in the first statement is met.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "lock-vault",
      "Principal": "*",
      "Effect": "Deny",
      "Action": [
        "glacier:DeleteArchive"
      ],
      "Resource": [
        "arn:aws:glacier:us-west-2:123456789012:vaults/examplevault"
      ],
      "Condition": {
        "StringLike": {
          "glacier:ResourceTag/LegalHold": [
            "true",
            ""
          ]
        }
      }
    },
    {
      "Sid": "you-can-delete-archive-less-than-1-year-old",
      "Principal": {
        "AWS": "arn:aws:iam::123456789012:root"
      },
      "Effect": "Allow",
      "Action": [
        "glacier:DeleteArchive"
      ],
    }
  ]
}
```



```
"Resource": [
  "arn:aws:glacier:us-west-2:123456789012:vaults/examplevault"
],
"Condition": {
  "NumericLessThan": {
    "glacier:ArchiveAgeInDays": "365"
  }
}
}
```

Related Sections

- [Amazon S3 Glacier Vault Lock \(p. 65\)](#)
- [Abort Vault Lock \(DELETE lock-policy\) \(p. 180\)](#)
- [Complete Vault Lock \(POST lockId\) \(p. 187\)](#)
- [Get Vault Lock \(GET lock-policy\) \(p. 200\)](#)
- [Initiate Vault Lock \(POST lock-policy\) \(p. 205\)](#)

Amazon S3 Glacier API Permissions: Actions, Resources, and Conditions Reference

When you are setting up [Access Control \(p. 126\)](#) and writing a permissions policy that you can attach to an IAM identity (identity-based policies) or a resource (resource-based policies), you can use the following table as a reference. The list includes each S3 Glacier API operation, the corresponding actions for which you can grant permissions to perform the action, and the AWS resource for which you can grant the permissions.

You specify the actions in the policy's `Action` element, and you specify the resource value in the policy's `Resource` element. Also, you can use the IAM policy language `Condition` element to specify when a policy should take effect.

To specify an action, use the `glacier:` prefix followed by the API operation name (for example, `glacier:CreateVault`). For most S3 Glacier actions, `Resource` is the vault on which you want to grant the permissions. You specify a vault as the `Resource` value by using the vault ARN. To express conditions, you use predefined condition keys. For more information, see [Overview of Managing Access Permissions to Your Amazon S3 Glacier Resources \(p. 126\)](#).

The following table lists actions that can be used with identity-based policies and resource-based policies.

Note

Some actions can only be used with identity-based policies. These actions are marked by a red asterisk (*) after the name of the API operation in the first column.

S3 Glacier API and Required Permissions for Actions

[Abort Multipart Upload \(DELETE uploadID\) \(p. 228\)](#)

Required Permissions (API Actions): `glacier:AbortMultipartUpload`

Resources: `arn:aws:glacier:region:account-id:vaults/vault-name`, `arn:aws:glacier:region:account-id:vaults/example*`, `arn:aws:glacier:region:account-id:vaults/*`

S3 Glacier Condition Keys:

[Abort Vault Lock \(DELETE lock-policy\) \(p. 180\)](#)

Required Permissions (API Actions): glacier:AbortVaultLock

Resources:

S3 Glacier Condition Keys:

[Add Tags To Vault \(POST tags add\) \(p. 182\)](#)

Required Permissions (API Actions): glacier:AddTagsToVault

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys: glacier:ResourceTag/*TagKey*

[Complete Multipart Upload \(POST uploadID\) \(p. 230\)](#)

Required Permissions (API Actions): glacier:CompleteMultipartUpload

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys: glacier:ResourceTag/*TagKey*

[Complete Vault Lock \(POST lockId\) \(p. 187\)](#)

Required Permissions (API Actions): glacier:CompleteVaultLock

Resources:

S3 Glacier Condition Keys: glacier:ResourceTag/*TagKey*

[Create Vault \(PUT vault\) \(p. 185\) *](#)

Required Permissions (API Actions): glacier:CreateVault

Resources:

S3 Glacier Condition Keys:

[Delete Archive \(DELETE archive\) \(p. 222\)](#)

Required Permissions (API Actions): glacier>DeleteArchive

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys: glacier:ArchiveAgeInDays, glacier:ResourceTag/*TagKey*

[Delete Vault \(DELETE vault\) \(p. 189\)](#)

Required Permissions (API Actions): glacier>DeleteVault

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys: glacier:ResourceTag/*TagKey*

[Delete Vault Access Policy \(DELETE access-policy\) \(p. 191\)](#)

Required Permissions (API Actions): glacier>DeleteVaultAccessPolicy

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys: glacier:ResourceTag/*TagKey*

[Delete Vault Notifications \(DELETE notification-configuration\) \(p. 193\)](#)

Required Permissions (API Actions):glacier:DeleteVaultNotifications

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys: glacier:ResourceTag/*TagKey*

[Describe Job \(GET JobID\) \(p. 250\)](#)

Required Permissions (API Actions):glacier:DescribeJob

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys:

[Describe Vault \(GET vault\) \(p. 194\)](#)

Required Permissions (API Actions):glacier:DescribeVault

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys:

[Get Data Retrieval Policy \(GET policy\) \(p. 292\) *](#)

Required Permissions (API Actions):glacier:GetDataRetrievalPolicy

Resources: arn:aws:glacier:*region*:*account-id*:policies/retrieval-limit-policy

S3 Glacier Condition Keys:

[Get Job Output \(GET output\) \(p. 257\)](#)

Required Permissions (API Actions):glacier:GetJobOutput

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys:

[Get Vault Access Policy \(GET access-policy\) \(p. 197\)](#)

Required Permissions (API Actions):glacier:GetVaultAccessPolicy

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys:

[Get Vault Lock \(GET lock-policy\) \(p. 200\)](#)

Required Permissions (API Actions):glacier:GetVaultLock

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys:

[Get Vault Notifications \(GET notification-configuration\) \(p. 203\)](#)

Required Permissions (API Actions):glacier:GetVaultNotifications

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys:

[Initiate Job \(POST jobs\) \(p. 263\)](#)

Required Permissions (API Actions):glacier:InitiateJob

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys: glacier:ArchiveAgeInDays, glacier:ResourceTag/*TagKey*

[Initiate Multipart Upload \(POST multipart-uploads\) \(p. 233\)](#)

Required Permissions (API Actions):glacier:InitiateMultipartUpload

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys: glacier:ResourceTag/*TagKey*

[Initiate Vault Lock \(POST lock-policy\) \(p. 205\)](#)

Required Permissions (API Actions):glacier:InitiateVaultLock

Resources:

S3 Glacier Condition Keys: glacier:ResourceTag/*TagKey*

[List Jobs \(GET jobs\) \(p. 273\)](#)

Required Permissions (API Actions):glacier:ListJobs

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys:

[List Multipart Uploads \(GET multipart-uploads\) \(p. 241\)](#)

Required Permissions (API Actions):glacier:ListMultipartUploads

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys:

[List Parts \(GET uploadID\) \(p. 236\)](#)

Required Permissions (API Actions):glacier:ListParts

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys:

[List Tags For Vault \(GET tags\) \(p. 208\)](#)

Required Permissions (API Actions):glacier:ListTagsForVault

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys:

[List Vaults \(GET vaults\) \(p. 210\)](#)

Required Permissions (API Actions):glacier:ListVaults

Resources:

S3 Glacier Condition Keys:

[Remove Tags From Vault \(POST tags remove\) \(p. 215\)](#)

Required Permissions (API Actions):glacier:RemoveTagsFromVault

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys: glacier:ResourceTag/*TagKey*

[Set Data Retrieval Policy \(PUT policy\) \(p. 299\) *](#)

Required Permissions (API Actions):glacier:SetDataRetrievalPolicy

Resources:arn:aws:glacier:*region*:*account-id*:policies/retrieval-limit-policy

S3 Glacier Condition Keys:

[Set Vault Access Policy \(PUT access-policy\) \(p. 217\)](#)

Required Permissions (API Actions):glacier:SetVaultAccessPolicy

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys: glacier:ResourceTag/*TagKey*

[Set Vault Notification Configuration \(PUT notification-configuration\) \(p. 219\)](#)

Required Permissions (API Actions):glacier:SetVaultNotifications

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys: glacier:ResourceTag/*TagKey*

[Upload Archive \(POST archive\) \(p. 224\)](#)

Required Permissions (API Actions):glacier:UploadArchive

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys: glacier:ResourceTag/*TagKey*

[Upload Part \(PUT uploadID\) \(p. 246\)](#)

Required Permissions (API Actions): glacier:UploadMultipartPart

Resources: arn:aws:glacier:*region*:*account-id*:vaults/vault-name, arn:aws:glacier:*region*:*account-id*:vaults/example*, arn:aws:glacier:*region*:*account-id*:vaults/*

S3 Glacier Condition Keys: glacier:ResourceTag/*TagKey*

Logging and Monitoring in Amazon S3 Glacier

Monitoring is an important part of maintaining the reliability, availability, and performance of Amazon S3 Glacier (S3 Glacier) and your AWS solutions. You should collect monitoring data from all of the parts of your AWS solution so that you can more easily identify and debug the source of a failure if one occurs. AWS provides the following tools for monitoring your S3 Glacier resources and responding to potential incidents:

Amazon CloudWatch Alarms

When using S3 Glacier via Amazon S3, you can use Amazon CloudWatch alarms to watch a single metric over a time period that you specify. If the metric exceeds a given threshold, a notification is sent to an Amazon SNS topic or AWS Auto Scaling policy. CloudWatch alarms do not invoke actions because they are in a particular state. Rather the state must have changed and been maintained for a specified number of periods. For more information, see [Monitoring Metrics with Amazon CloudWatch](#).

AWS CloudTrail Logs

CloudTrail provides a record of actions taken by a user, role, or an AWS service in S3 Glacier. CloudTrail captures all API calls for S3 Glacier as events, including calls from the S3 Glacier console and from code calls to the S3 Glacier APIs. For more information, see [Logging Amazon S3 Glacier API Calls with AWS CloudTrail \(p. 157\)](#).

AWS Trusted Advisor

Trusted Advisor draws upon best practices learned from serving hundreds of thousands of AWS customers. Trusted Advisor inspects your AWS environment and then makes recommendations when opportunities exist to save money, improve system availability and performance, or help close security gaps. All AWS customers have access to five Trusted Advisor checks. Customers with a Business or Enterprise support plan can view all Trusted Advisor checks.

For more information, see [AWS Trusted Advisor](#) in the *AWS Support User Guide*.

Compliance Validation for Amazon S3 Glacier

The security and compliance of Amazon S3 Glacier (S3 Glacier) is assessed by third-party auditors as part of multiple AWS compliance programs, including the following:

- System and Organization Controls (SOC)
- Payment Card Industry Data Security Standard (PCI DSS)
- Federal Risk and Authorization Management Program (FedRAMP)
- Health Insurance Portability and Accountability Act (HIPAA)

AWS provides a frequently updated list of AWS services in scope of specific compliance programs at [AWS Services in Scope by Compliance Program](#).

Third-party audit reports are available for you to download using AWS Artifact. For more information, see [Downloading Reports in AWS Artifact](#) in the *AWS Artifact User Guide*.

For more information about AWS compliance programs, see [AWS Compliance Programs](#).

Your compliance responsibility when using S3 Glacier is determined by the sensitivity of your data, your organization's compliance objectives, and applicable laws and regulations. If your use of S3 Glacier is subject to compliance with standards like HIPAA, PCI, or FedRAMP, AWS provides resources to help:

- [Amazon S3 Glacier Vault Lock \(p. 65\)](#) allows you to easily deploy and enforce compliance controls for individual S3 Glacier vaults with a vault lock policy. You can specify controls such as "write once read many" (WORM) in a vault lock policy and lock the policy from future edits. After the policy is locked, it can no longer be changed. Vault lock policies can help you comply with regulatory frameworks such as SEC17a-4 and HIPAA.
- [Security and Compliance Quick Start Guides](#) discuss architectural considerations and steps for deploying security- and compliance-focused baseline environments on AWS.
- [Architecting for HIPAA Security and Compliance](#) whitepaper outlines how companies use AWS to help them meet HIPAA requirements.
- [The AWS Well-Architected Tool \(AWS WA Tool\)](#) is a service in the cloud that provides a consistent process for you to review and measure your architecture using AWS best practices. The AWS WA Tool provides recommendations for making your workloads more reliable, secure, efficient, and cost-effective.
- [AWS Compliance Resources](#) provide several different workbooks and guides that might apply to your industry and location.
- [AWS Config](#) can help you assess how well your resource configurations comply with internal practices, industry guidelines, and regulations.
- [AWS Security Hub](#) provides you with a comprehensive view of your security state within AWS and helps you check your compliance with security industry standards and best practices.

Resilience in Amazon S3 Glacier

The AWS global infrastructure is built around Regions and Availability Zones. AWS Regions provide multiple, physically separated and isolated Availability Zones that are connected with low latency, high throughput, and highly redundant networking. These Availability Zones offer you an effective way to design and operate applications and databases. They are more highly available, fault tolerant, and scalable than traditional single data center infrastructures or multi-data center infrastructures. S3 Glacier redundantly stores data in multiple AWS Availability Zones (AZ) and on multiple devices within each AZ. To increase durability, S3 Glacier synchronously stores your data across multiple AZs before confirming a successful upload.

For more information about AWS Regions and Availability Zones, see [AWS Global Infrastructure](#).

Infrastructure Security in Amazon S3 Glacier

As a managed service, Amazon S3 Glacier (S3 Glacier) is protected by the AWS global network security procedures that are described in the [Amazon Web Services: Overview of Security Processes](#) whitepaper.

Access to S3 Glacier via the network is through AWS published APIs. Clients must support Transport Layer Security (TLS) 1.0. We recommend TLS 1.2 or later. Clients must also support cipher suites with Perfect Forward Secrecy (PFS) such as Ephemeral Diffie-Hellman (DHE) or Elliptic Curve Diffie-Hellman Ephemeral (ECDHE). Most modern systems such as Java 7 and later support these modes. Additionally, requests must be signed using an access key ID and a secret access key that is associated with an IAM principal, or you can use the [AWS Security Token Service \(AWS STS\)](#) to generate temporary security credentials to sign requests.

VPC Endpoints

A virtual private cloud (VPC) endpoint enables you to privately connect your VPC to supported AWS services and VPC endpoint services powered by AWS PrivateLink without requiring an internet gateway, NAT device, VPN connection, or AWS Direct Connect connection. Although S3 Glacier does not support VPC endpoints directly, you can take advantage of Amazon S3 VPC endpoints if you access S3 Glacier as a storage tier integrated with Amazon S3.

For more information about Amazon S3 lifecycle configuration and transitioning objects to the S3 Glacier storage class, see [Object Lifecycle Management](#) and [Transitioning Objects](#) in the *Amazon Simple Storage Service Developer Guide*. For more information about VPC endpoints, see [VPC Endpoints](#) in the *Amazon VPC User Guide*.

Querying Archives with S3 Glacier Select

With S3 Glacier Select, you can perform filtering operations using simple Structured Query Language (SQL) statements directly on your data in S3 Glacier. When you provide an SQL query for a S3 Glacier archive object, S3 Glacier Select runs the query in place and writes the output results to Amazon S3. With S3 Glacier Select, you can run queries and custom analytics on your data that is stored in S3 Glacier, without having to restore your data to a hotter tier like Amazon S3.

When you perform select queries, S3 Glacier provides three data access tiers—*expedited*, *standard*, and *bulk*. All of these tiers provide different data access times and costs, and you can choose any one of them depending on how quickly you want your data to be available. For all but the largest archives (250 MB +), data that is accessed using the expedited tier is typically made available within 1–5 minutes. The standard tier finishes within 3–5 hours. The bulk retrievals finish within 5–12 hours. For information about tier pricing, see [S3 Glacier Pricing](#).

You can use S3 Glacier Select with the AWS SDKs, the S3 Glacier REST API, and the AWS Command Line Interface (AWS CLI).

Topics

- [S3 Glacier Select Requirements and Quotas](#) (p. 148)
- [How Do I Query Data Using S3 Glacier Select?](#) (p. 148)
- [Error Handling](#) (p. 150)
- [More Info](#) (p. 150)

S3 Glacier Select Requirements and Quotas

The following are requirements for using S3 Glacier Select:

- Archive objects that are queried by S3 Glacier Select must be formatted as uncompressed comma-separated values (CSV).
- You must have an S3 bucket to work with. In addition, the AWS account that you use to initiate a S3 Glacier Select job must have write permissions for the S3 bucket. The Amazon S3 bucket must be in the same AWS Region as the vault that contains the archive object that is being queried.
- You must have permission to call [Get Job Output \(GET output\)](#) (p. 257).

The following quotas apply when using S3 Glacier Select:

- There are no quotas on the number of records that S3 Glacier Select can process. An input or output record must not exceed 1 MB; otherwise, the query fails. There is a quota of 1,048,576 columns per record.
- There is no quota on the size of your final result. However, your results are broken into multiple parts.
- An SQL expression is limited to 128 KB.

How Do I Query Data Using S3 Glacier Select?

Using S3 Glacier Select, you can use SQL commands to query S3 Glacier archive objects that are in uncompressed CSV format. With this restriction, you can perform simple query operations on your text-

based data in S3 Glacier. For example, you might look for a specific name or ID among a set of archive text files.

To query your S3 Glacier data, create a select *job* using the [Initiate Job \(POST jobs\)](#) (p. 263) operation. When initiating a select job, you provide the SQL expression, the archive to query, and the location to store the results in Amazon S3.

The following example expression returns all records from the archive specified by the archive ID in [Initiate Job \(POST jobs\)](#) (p. 263).

```
SELECT * FROM archive
```

S3 Glacier Select supports a subset of the ANSI SQL language. It supports common filtering SQL clauses like SELECT, FROM, and WHERE. It does not support SUM, COUNT, GROUP BY, JOINS, DISTINCT, UNION, ORDER BY, and LIMIT. For more information about support for SQL, see [SQL Reference for Amazon S3 Select and S3 Glacier Select](#) (p. 304).

S3 Glacier Select Output

When you initiate a select job, you define an output location for the results of your select query. This location must be an Amazon S3 bucket in the same AWS Region as the vault that contains the archive object that is being queried. The AWS account that initiates the job must have permissions to write to the S3 bucket.

You can specify the S3 storage class and encryption for the output objects stored in Amazon S3. S3 Glacier Select supports SSE-KMS and SSE-S3 encryption. S3 Glacier Select doesn't support SSE-C and client-side encryption. For more information about Amazon S3 storage classes and encryption, see [Storage Classes](#) and [Protecting Data Using Server-Side Encryption](#) in the *Amazon Simple Storage Service Developer Guide*.

S3 Glacier Select results are stored in the S3 bucket using the prefix provided in the output location specified in [Initiate Job \(POST jobs\)](#) (p. 263). From this information, S3 Glacier Select creates a unique prefix referring to the job ID. This job ID prefix is returned in the `x-amz-job-output-path` header in an [Initiate Job \(POST jobs\)](#) (p. 263) response. (Prefixes are used to group S3 objects together by beginning object names with a common string.) Under this unique prefix, there are two new prefixes created, `results` for results and `errors` for logs and errors. Upon completion of the job, a result manifest is written which contains the location of all results.

There is also a placeholder file named `job.txt` that is written to the output location. After it is written it is never updated. The placeholder file is used for the following:

- Validation of the write permission and majority of SQL syntax errors synchronously.
- Provides a static output similar to [Describe Job \(GET JobID\)](#) (p. 250) that you can easily reference whenever you want.

For example, suppose that you initiate a S3 Glacier Select job with the output location for the results specified as `s3://example-bucket/my-prefix`, and the job response returns the job ID as `examplekne1209ualkdjh812elkassdu9012e`. After the select job finishes, you can see the following Amazon S3 objects in your bucket:

```
s3://example-bucket/my-prefix/examplekne1209ualkdjh812elkassdu9012e/job.txt
s3://example-bucket/my-prefix/examplekne1209ualkdjh812elkassdu9012e/results/abc
s3://example-bucket/my-prefix/examplekne1209ualkdjh812elkassdu9012e/results/def
s3://example-bucket/my-prefix/examplekne1209ualkdjh812elkassdu9012e/results/ghi
s3://example-bucket/my-prefix/examplekne1209ualkdjh812elkassdu9012e/result_manifest.txt
```

The select query results are broken into multiple parts. In the example, S3 Glacier Select uses the prefix that you specified when setting the output location and appends the job ID and the `results` prefix. It then writes the results in three parts, with the object names ending in `abc`, `def`, and `ghi`. The result manifest contains all the three files to allow programmatic retrieval. If the job fails with any error, then a file is visible under the error prefix and an `error_manifest.txt` is produced.

Presence of a `result_manifest.txt` file along with the absence of `error_manifest.txt` guarantees that the job finished successfully. There is no guarantee provided on how results are ordered.

Note

The length of an Amazon S3 object name, also referred to as the *key*, can be no more than 1024 bytes. S3 Glacier reserves 128 bytes for prefixes. And, the length of your Amazon S3 location path cannot be more than 512 bytes. A request with a length greater than 512 bytes returns an exception, and the request is not accepted.

Error Handling

S3 Glacier Select notifies you of two kinds of errors. The first set of errors is sent to you synchronously when you submit the query in [Initiate Job \(POST jobs\) \(p. 263\)](#). These errors are sent to you as part of the HTTP response. Another set of errors can occur after the query has been accepted successfully, but they happen during query execution. In this case, the errors are written to the specified output location under the `errors` prefix.

S3 Glacier Select will stop executing the query after encountering an error. To run the query successfully, you must resolve all errors. You can check the logs to identify which records caused a failure.

Because queries run in parallel across multiple compute nodes, the errors that you get are not in sequential order. For example, if your query fails with an error in row 6234, it does not mean that all rows before row 6234 were successfully processed. The next run of the query might show an error in a different row.

More Info

- [Initiate Job \(POST jobs\) \(p. 263\)](#)
- [Describe Job \(GET JobID\) \(p. 250\)](#)
- [List Jobs \(GET jobs\) \(p. 273\)](#)
- [Working with Archives in Amazon S3 Glacier \(p. 67\)](#)

Amazon S3 Glacier Data Retrieval Policies

With Amazon S3 Glacier (S3 Glacier) data retrieval policies, you can easily set data retrieval quotas and manage the data retrieval activities across your AWS account in each AWS Region. For more information about S3 Glacier data retrieval charges, see [S3 Glacier pricing](#).

Important

A data retrieval policy applies to standard retrievals only and manages retrieval requests made directly to S3 Glacier. It does not manage data restore requests for the Amazon Simple Storage Service (Amazon S3) S3 Glacier storage class. For more information about the S3 Glacier storage class, see [S3 Glacier Storage Class](#) and [Transitioning Objects](#) in the *Amazon Simple Storage Service Developer Guide*.

Topics

- [Choosing an Amazon S3 Glacier Data Retrieval Policy \(p. 151\)](#)
- [Using the Amazon S3 Glacier Console to Set Up a Data Retrieval Policy \(p. 152\)](#)
- [Using the Amazon S3 Glacier API to Set Up a Data Retrieval Policy \(p. 153\)](#)

Choosing an Amazon S3 Glacier Data Retrieval Policy

You can choose from three types of S3 Glacier data retrieval policies: *No Retrieval Limit*, *Free Tier Only*, and *Max Retrieval Rate*. No Retrieval Limit is the default data retrieval policy used for retrievals. If you use the No Retrieval Limit policy, no retrieval quota is set and all valid data retrieval requests are accepted.

By using a Free Tier Only policy, you can keep your retrievals within your daily free tier allowance and not incur any data retrieval cost. If you want to retrieve more data than the free tier, you can use a Max Retrieval Rate policy to set a bytes-per-hour retrieval rate quota. The Max Retrieval Rate policy ensures that the peak retrieval rate from all retrieval jobs across your account in an AWS Region does not exceed the bytes-per-hour quota you set.

With both Free Tier Only and Max Retrieval Rate policies, data retrieval requests that would exceed the retrieval quotas you specified will not be accepted. If you use a Free Tier Only policy, S3 Glacier will synchronously reject retrieval requests that would exceed your free tier allowance. If you use a Max Retrieval Rate policy, S3 Glacier will reject retrieval requests that would cause the peak retrieval rate of the in progress jobs to exceed the bytes-per-hour quota set by the policy. These policies help you simplify data retrieval cost management.

The following are some useful facts about data retrieval policies:

- Data retrieval policy settings do not change the 3 to 5 hour period that it takes to retrieve data from S3 Glacier using standard retrievals.
- Setting a new data retrieval policy does not affect previously accepted retrieval jobs that are already in progress.

- If a retrieval job request is rejected because of a data retrieval policy, you will not be charged for the job or the request.
- You can set one data retrieval policy for each AWS Region, which will govern all data retrieval activities in the AWS Region under your account. A data retrieval policy is specific to a particular AWS Region because data retrieval costs vary across AWS Regions. For more information, see [S3 Glacier pricing](#).

Free Tier Only Policy

You can set a data retrieval policy to Free Tier Only to ensure that your retrievals will always stay within your free tier allowance, so you don't incur data retrieval charges. If a retrieval request is rejected, you will receive an error message stating that the request has been denied by the current data retrieval policy.

You set the data retrieval policy to Free Tier Only for a particular AWS Region. Once the policy is set, you cannot retrieve more data in a day than your prorated daily free retrieval allowance for that AWS Region and you will not incur data retrieval fees.

You can switch to a Free Tier Only policy after you have incurred data retrieval charges within a month. The Free Tier Only policy will take effect for new retrieval requests, but will not affect past requests. You will be billed for the previously incurred charges.

Max Retrieval Rate Policy

You can set your data retrieval policy to Max Retrieval Rate to control the peak retrieval rate by specifying a data retrieval quota that has a bytes-per-hour maximum. When you set the data retrieval policy to Max Retrieval Rate, a new retrieval request will be rejected if it would cause the peak retrieval rate of the in progress jobs to exceed the bytes-per-hour quota specified by the policy. If a retrieval job request is rejected, you will receive an error message stating that the request has been denied by the current data retrieval policy.

Setting your data retrieval policy to the Max Retrieval Rate policy can affect how much free tier you can use in a day. For example, suppose you set Max Retrieval Rate to 1 MB per hour. This is less than the free tier policy rate of 14 MB per hour. To ensure you make good use of the daily free tier allowance, you can first set your policy to Free Tier Only and then switch to the Max Retrieval Rate policy later if you need to. or more information on how your retrieval allowance is calculated, go to [S3 Glacier FAQs](#).

No Retrieval Limit Policy

If your data retrieval policy is set to No Retrieval Limit, all valid data retrieval requests will be accepted and your data retrieval costs will vary based on your usage.

Using the Amazon S3 Glacier Console to Set Up a Data Retrieval Policy

You can view and update the data retrieval policies in the S3 Glacier console or by using the S3 Glacier API. To setup a data retrieval policy in the console, choose an AWS Region and then click **Settings**.

Data Retrieval Settings

Retrieval policies | Provisioned capacity

Using Amazon Glacier data retrieval policies, you can manage retrieval costs by setting limits on retrieval activities across your AWS account in each region. Retrieval policies apply to standard retrievals.

☒ **Free Tier Only**
Only retrieve data within the free tier. Data retrieval requests that exceed the free tier will not be accepted.
Retrieval Cost
Free

☐ **Max Retrieval Rate**
Max Retrieval Rate
1 GB/Hour
Retrieval Cost
\$7.20 / month or less

☐ **No Retrieval Limit**
All valid data retrieval requests will be accepted. Data Retrieval cost will vary based on your usage.
Visit the [pricing page](#) for data retrieval pricing information

Note: Data retrieval policies govern all retrieval activities in a region. The retrieval cost estimates may not reflect previously incurred usage or charges in the month. [Learn more](#)

Cancel Save

You can select one of the three data retrieval policies: **Free Tier Only**, **Max Retrieval Rate**, or **No Retrieval Limit**. If you click **Max Retrieval Rate**, you'll need to specify a value in the **GB/Hour** box. When you type a value in **GB/Hour**, the console will calculate an estimated cost for you. Click **No Retrieval Limit** if you don't want any restrictions placed on the rate of your data retrievals.

You can configure a data retrieval policy for each AWS Region. Each policy will take effect within a few minutes after you click **Save**.

Using the Amazon S3 Glacier API to Set Up a Data Retrieval Policy

You can view and set a data retrieval policy by using the S3 Glacier REST API or by using the AWS SDKs.

Using the Amazon S3 Glacier REST API to Set Up a Data Retrieval Policy

You can view and set a data retrieval policy by using the S3 Glacier REST API. You can view an existing data retrieval policy by using the [Get Data Retrieval Policy \(GET policy\)](#) (p. 292) operation. You set a data retrieval policy using the [Set Data Retrieval Policy \(PUT policy\)](#) (p. 299) operation.

When using the PUT policy operation you select the data retrieval policy type by setting the JSON `Strategy` field value to `BytesPerHour`, `FreeTier`, or `None`. `BytesPerHour` is equivalent to selecting **Max Retrieval Rate** in the console, `FreeTier` to selecting **Free Tier Only**, and `None` to selecting **No Retrieval Policy**.

When you use the [Initiate Job \(POST jobs\)](#) (p. 263) operation to initiate a data retrieval job that will exceed the maximum retrieval rate set in your data retrieval policy, the Initiate Job operation will stop and throw an exception.

Using the AWS SDKs to Set Up a Data Retrieval Policy

AWS provides SDKs for you to develop applications for S3 Glacier. These SDKs provide libraries that map to underlying REST API and provide objects that enable you to easily construct requests and process responses. For more information, see [Using the AWS SDKs with Amazon S3 Glacier \(p. 116\)](#).

Tagging Amazon S3 Glacier Resources

A *tag* is a label that you assign to an AWS resource. Each tag consists of a *key* and a *value*, both of which you define. You can assign the tags that you define to Amazon S3 Glacier (S3 Glacier) vault resources. Using tags is a simple yet powerful way to manage AWS resources and organize data, including billing data.

Topics

- [Tagging Basics \(p. 155\)](#)
- [Tag Restrictions \(p. 155\)](#)
- [Tracking Costs Using Tagging \(p. 156\)](#)
- [Managing Access Control with Tagging \(p. 156\)](#)
- [Related Sections \(p. 156\)](#)

Tagging Basics

You use the S3 Glacier console, AWS Command Line Interface (AWS CLI), or S3 Glacier API to complete the following tasks:

- Adding tags to a vault
- Listing the tags for a vault
- Removing tags from a vault

For information about how to add, list, and remove tags, see [Tagging Your Amazon S3 Glacier Vaults \(p. 64\)](#).

You can use tags to categorize your vaults. For example, you can categorize vaults by purpose, owner, or environment. Because you define the key and value for each tag, you can create a custom set of categories to meet your specific needs. For example, you might define a set of tags that helps you track vaults by owner and purpose for the vault. Following are a few examples of tags:

- Owner: Name
- Purpose: Video archives
- Environment: Production

Tag Restrictions

Basic tag restrictions are as follows:

- The maximum number of tags for a resource (vault) is 50.
- Tag keys and values are case-sensitive.

Tag key restrictions are as follows:

- Within a set of tags for a vault, each tag key must be unique. If you add a tag with a key that's already in use, your new tag overwrites the existing key-value pair.
- Tag keys cannot start with `aws :` because this prefix is reserved for use by AWS. AWS can create tags that begin with this prefix on your behalf, but you can't edit or delete them.
- Tag keys must be from 1 to 128 Unicode characters in length.
- Tag keys must consist of the following characters: Unicode letters, digits, white space, and the following special characters: `_ . / = + - @`.

Tag value restrictions are as follows:

- Tag values must be from 0 to 255 Unicode characters in length.
- Tag values can be blank. Otherwise, they must consist of the following characters: Unicode letters, digits, white space, and any of the following special characters: `_ . / = + - @`.

Tracking Costs Using Tagging

You can use tags to categorize and track your AWS costs. When you apply tags to any AWS resources, including vaults, your AWS cost allocation report includes usage and costs aggregated by tags. You can apply tags that represent business categories (such as cost centers, application names, and owners) to organize your costs across multiple services. For more information, see [Use Cost Allocation Tags for Custom Billing Reports](#) in the *AWS Billing and Cost Management User Guide*.

Managing Access Control with Tagging

You can use tags as a condition in an access policy statement. For example, you can set up a legal hold tag and include it as a condition in a data retention policy that states that “archive deletion from everyone will be denied if the legal hold tag value is set to `True`.” You can deploy the data retention policy and set the legal hold tag to `False` under normal conditions. If your data must be put on hold to assist an investigation, you can easily turn on the legal hold by setting the tag value to `True` and removing the hold in a similar way later on. For more information, see [Controlling Access Using Tags](#) in the *IAM User Guide*.

Related Sections

- [Tagging Your Amazon S3 Glacier Vaults \(p. 64\)](#)

Logging Amazon S3 Glacier API Calls with AWS CloudTrail

Amazon S3 Glacier (S3 Glacier) is integrated with AWS CloudTrail, a service that provides a record of actions taken by a user, role, or an AWS service in S3 Glacier. CloudTrail captures all API calls for S3 Glacier as events, including calls from the S3 Glacier console and from code calls to the S3 Glacier APIs. If you create a trail, you can enable continuous delivery of CloudTrail events to an Amazon S3 bucket, including events for S3 Glacier. If you don't configure a trail, you can still view the most recent events in the CloudTrail console in **Event history**. Using the information collected by CloudTrail, you can determine the request that was made to S3 Glacier, the IP address from which the request was made, who made the request, when it was made, and additional details.

To learn more about CloudTrail, see the [AWS CloudTrail User Guide](#).

Amazon S3 Glacier Information in CloudTrail

CloudTrail is enabled on your AWS account when you create the account. When activity occurs in S3 Glacier, that activity is recorded in a CloudTrail event along with other AWS service events in **Event history**. You can view, search, and download recent events in your AWS account. For more information, see [Viewing Events with CloudTrail Event History](#).

For an ongoing record of events in your AWS account, including events for S3 Glacier, create a trail. A trail enables CloudTrail to deliver log files to an Amazon S3 bucket. By default, when you create a trail in the console, the trail applies to all AWS Regions. The trail logs events from all AWS Regions in the AWS partition and delivers the log files to the Amazon S3 bucket that you specify. Additionally, you can configure other AWS services to further analyze and act upon the event data collected in CloudTrail logs. For more information, see:

- [Overview for Creating a Trail](#)
- [CloudTrail Supported Services and Integrations](#)
- [Configuring Amazon SNS Notifications for CloudTrail](#)
- [Receiving CloudTrail Log Files from Multiple Regions](#) and [Receiving CloudTrail Log Files from Multiple Accounts](#)

All S3 Glacier actions are logged by CloudTrail and are documented in the [API Reference for Amazon S3 Glacier](#) (p. 160). For example, calls to the [Create Vault \(PUT vault\)](#) (p. 185), [Delete Vault \(DELETE vault\)](#) (p. 189), and [List Vaults \(GET vaults\)](#) (p. 210) actions generate entries in the CloudTrail log files.

Every event or log entry contains information about who generated the request. The identity information helps you determine the following:

- Whether the request was made with root or IAM user credentials.
- Whether the request was made with temporary security credentials for a role or federated user.
- Whether the request was made by another AWS service.

For more information, see the [CloudTrail userIdentity Element](#).

Understanding Amazon S3 Glacier Log File Entries

A trail is a configuration that enables delivery of events as log files to an Amazon S3 bucket that you specify. CloudTrail log files contain one or more log entries. An event represents a single request from any source and includes information about the requested action, the date and time of the action, request parameters, and so on. CloudTrail log files are not an ordered stack trace of the public API calls, so they do not appear in any specific order.

The following example shows a CloudTrail log entry that demonstrates the [Create Vault \(PUT vault\) \(p. 185\)](#), [Delete Vault \(DELETE vault\) \(p. 189\)](#), [List Vaults \(GET vaults\) \(p. 210\)](#), and [Describe Vault \(GET vault\) \(p. 194\)](#) actions.

```
{
  "Records": [
    {
      "awsRegion": "us-east-1",
      "eventID": "52f8c821-002e-4549-857f-8193a15246fa",
      "eventName": "CreateVault",
      "eventSource": "glacier.amazonaws.com",
      "eventTime": "2014-12-10T19:05:15Z",
      "eventType": "AwsApiCall",
      "eventVersion": "1.02",
      "recipientAccountId": "999999999999",
      "requestID": "HJiLgvfXCY88QJAC6rRoexS9ThvI21Q1Nqukfly02hcUPPo",
      "requestParameters": {
        "accountId": "-",
        "vaultName": "myVaultName"
      },
      "responseElements": {
        "location": "/999999999999/vaults/myVaultName"
      },
      "sourceIPAddress": "127.0.0.1",
      "userAgent": "aws-sdk-java/1.9.6 Mac_OS_X/10.9.5 Java_HotSpot(TM)_64-Bit_Server_VM/25.25-b02/1.8.0_25",
      "userIdentity": {
        "accessKeyId": "AKIAIOSFODNN7EXAMPLE",
        "accountId": "999999999999",
        "arn": "arn:aws:iam::999999999999:user/myUserName",
        "principalId": "A1B2C3D4E5F6G7EXAMPLE",
        "type": "IAMUser",
        "userName": "myUserName"
      }
    },
    {
      "awsRegion": "us-east-1",
      "eventID": "cdd33060-4758-416a-b7b9-dafd3afcec90",
      "eventName": "DeleteVault",
      "eventSource": "glacier.amazonaws.com",
      "eventTime": "2014-12-10T19:05:15Z",
      "eventType": "AwsApiCall",
      "eventVersion": "1.02",
      "recipientAccountId": "999999999999",
      "requestID": "GGdw-VfhVfLCFwAM6iVUvMQ6-fMwSqS09FmRd0eRSa_Fc7c",
      "requestParameters": {
        "accountId": "-",
        "vaultName": "myVaultName"
      },
      "responseElements": null,
      "sourceIPAddress": "127.0.0.1",
      "userAgent": "aws-sdk-java/1.9.6 Mac_OS_X/10.9.5 Java_HotSpot(TM)_64-Bit_Server_VM/25.25-b02/1.8.0_25",
      "userIdentity": {
        "accessKeyId": "AKIAIOSFODNN7EXAMPLE",
```

```
        "accountId": "999999999999",
        "arn": "arn:aws:iam::999999999999:user/myUserName",
        "principalId": "A1B2C3D4E5F6G7EXAMPLE",
        "type": "IAMUser",
        "userName": "myUserName"
    },
    {
        "awsRegion": "us-east-1",
        "eventID": "355750b4-e8b0-46be-9676-e786b1442470",
        "eventName": "ListVaults",
        "eventSource": "glacier.amazonaws.com",
        "eventTime": "2014-12-10T19:05:15Z",
        "eventType": "AwsApiCall",
        "eventVersion": "1.02",
        "recipientAccountId": "999999999999",
        "requestID": "yPTs22ghTsWprFivb-2u30FAaDALIZP17t4jM_xL9QJQyVA",
        "requestParameters": {
            "accountId": "-"
        },
        "responseElements": null,
        "sourceIPAddress": "127.0.0.1",
        "userAgent": "aws-sdk-java/1.9.6 Mac_OS_X/10.9.5 Java_HotSpot(TM)_64-Bit_Server_VM/25.25-b02/1.8.0_25",
        "userIdentity": {
            "accessKeyId": "AKIAIOSFODNN7EXAMPLE",
            "accountId": "999999999999",
            "arn": "arn:aws:iam::999999999999:user/myUserName",
            "principalId": "A1B2C3D4E5F6G7EXAMPLE",
            "type": "IAMUser",
            "userName": "myUserName"
        }
    },
    {
        "awsRegion": "us-east-1",
        "eventID": "569e830e-b075-4444-a826-aa8b0acad6c7",
        "eventName": "DescribeVault",
        "eventSource": "glacier.amazonaws.com",
        "eventTime": "2014-12-10T19:05:15Z",
        "eventType": "AwsApiCall",
        "eventVersion": "1.02",
        "recipientAccountId": "999999999999",
        "requestID": "QRt1ZdFLGn0TCm784HmKafBmcB2lVaV81UU3fsOR3PtoIiM",
        "requestParameters": {
            "accountId": "-",
            "vaultName": "myVaultName"
        },
        "responseElements": null,
        "sourceIPAddress": "127.0.0.1",
        "userAgent": "aws-sdk-java/1.9.6 Mac_OS_X/10.9.5 Java_HotSpot(TM)_64-Bit_Server_VM/25.25-b02/1.8.0_25",
        "userIdentity": {
            "accessKeyId": "AKIAIOSFODNN7EXAMPLE",
            "accountId": "999999999999",
            "arn": "arn:aws:iam::999999999999:user/myUserName",
            "principalId": "A1B2C3D4E5F6G7EXAMPLE",
            "type": "IAMUser",
            "userName": "myUserName"
        }
    }
]
```

API Reference for Amazon S3 Glacier

Amazon S3 Glacier (S3 Glacier) supports a set of operations—specifically, a set of RESTful API calls—that enable you to interact with the service.

You can use any programming library that can send HTTP requests to send your REST requests to S3 Glacier. When sending a REST request, S3 Glacier requires that you authenticate every request by signing the request. Additionally, when uploading an archive, you must also compute the checksum of the payload and include it in your request. For more information, see [Signing Requests \(p. 163\)](#).

If an error occurs, you need to know what S3 Glacier sends in an error response so that you can process it. This section provides all this information, in addition to documenting the REST operations, so that you can make REST API calls directly.

You can either use the REST API calls directly or use the AWS SDKs that provide wrapper libraries to simplify your coding task. These libraries sign each request you send and compute the checksum of the payload in your request. Therefore, using the AWS SDKs simplifies your coding task. This developer guide provides working examples of basic S3 Glacier operations using the AWS SDK for Java and .NET. For more information see, [Using the AWS SDKs with Amazon S3 Glacier \(p. 116\)](#).

Topics

- [Common Request Headers \(p. 160\)](#)
- [Common Response Headers \(p. 162\)](#)
- [Signing Requests \(p. 163\)](#)
- [Computing Checksums \(p. 166\)](#)
- [Error Responses \(p. 176\)](#)
- [Vault Operations \(p. 180\)](#)
- [Archive Operations \(p. 222\)](#)
- [Multipart Upload Operations \(p. 228\)](#)
- [Job Operations \(p. 249\)](#)
- [Data Types Used in Job Operations \(p. 279\)](#)
- [Data Retrieval Operations \(p. 292\)](#)

Common Request Headers

Amazon S3 Glacier (S3 Glacier) REST requests include headers that contain basic information about the request. The following table describes headers that can be used by all S3 Glacier REST requests.

Header Name	Description	Required
Authorization	The header that is required to sign requests. S3 Glacier requires Signature Version 4. For more information, see Signing Requests (p. 163) . Type: String	Yes
Content-Length	The length of the request body (without the headers). Type: String Condition: Required only for the Upload Archive (POST archive) (p. 224) API.	Conditional

Header Name	Description	Required
Date	<p>The date that can be used to create the signature contained in the <code>Authorization</code> header. If the <code>Date</code> header is to be used for signing it must be specified in the ISO 8601 basic format. In this case, the <code>x-amz-date</code> header is not needed. Note that when <code>x-amz-date</code> is present, it always overrides the value of the <code>Date</code> header.</p> <p>If the <code>Date</code> header is not used for signing, it can be one of the full date formats specified by RFC 2616, section 3.3. For example, the following date/time <code>Wed, 10 Feb 2017 12:00:00 GMT</code> is a valid date/time header for use with S3 Glacier.</p> <p>If you are using the <code>Date</code> header for signing, then it must be in the ISO 8601 basic <code>YYYYMMDD'T'HHMMSS'Z'</code> format.</p> <p>Type: String</p> <p>Condition: If <code>Date</code> is specified but is not in ISO 8601 basic format, then you must also include the <code>x-amz-date</code> header. If <code>Date</code> is specified in ISO 8601 basic format, then this is sufficient for signing requests and you do not need the <code>x-amz-date</code> header. For more information, see Handling Dates in Signature Version 4 in the <i>Amazon Web Services Glossary</i>.</p>	Conditional
Host	<p>This header specifies the service endpoint to which you send your requests. The value must be of the form <code>"glacier.<i>region</i>.amazonaws.com"</code>, where <i>region</i> is replaced with an AWS Region designation such as <code>us-west-2</code>.</p> <p>Type: String</p>	Yes
x-amz-content-sha256	<p>The computed SHA256 checksum of an entire payload that is uploaded with either Upload Archive (POST archive) (p. 224) or Upload Part (PUT uploadID) (p. 246). This header is not the same as the <code>x-amz-sha256-tree-hash</code> header, though, for some small payloads the values are the same. When <code>x-amz-content-sha256</code> is required, both <code>x-amz-content-sha256</code> and <code>x-amz-sha256-tree-hash</code> must be specified.</p> <p>Type: String</p> <p>Condition: Required for streaming API, Upload Archive (POST archive) (p. 224) and Upload Part (PUT uploadID) (p. 246).</p>	Conditional

Header Name	Description	Required
x-amz-date	<p>The date used to create the signature in the Authorization header. The format must be ISO 8601 basic in the YYYYMMDD'T'HHMMSS'Z' format. For example, the following date/time 20170210T120000Z is a valid x-amz-date for use with S3 Glacier.</p> <p>Type: String</p> <p>Condition: x-amz-date is optional for all requests; it can be used to override the date used for signing requests. If the Date header is specified in the ISO 8601 basic format, then x-amz-date is not needed. When x-amz-date is present, it always overrides the value of the Date header. For more information, see Handling Dates in Signature Version 4 in the <i>Amazon Web Services Glossary</i>.</p>	Conditional
x-amz-glacier-version	<p>The S3 Glacier API version to use. The current version is 2012-06-01.</p> <p>Type: String</p>	Yes
x-amz-sha256-tree-hash	<p>The computed SHA256 tree-hash checksum for an uploaded archive (Upload Archive (POST archive) (p. 224)) or archive part (Upload Part (PUT uploadID) (p. 246)). For more information about calculating this checksum, see Computing Checksums (p. 166).</p> <p>Type: String</p> <p>Default: None</p> <p>Condition: Required for Upload Archive (POST archive) (p. 224) and Upload Part (PUT uploadID) (p. 246).</p>	Conditional

Common Response Headers

The following table describes response headers that are common to most API responses.

Name	Description
Content-Length	<p>The length in bytes of the response body.</p> <p>Type: String</p>
Date	<p>The date and time Amazon S3 Glacier (S3 Glacier) responded, for example, Wed, 10 Feb 2017 12:00:00 GMT. The format of the date must be one of the full date formats specified by RFC 2616, section 3.3. Note that Date returned may drift slightly from other dates, so for example, the date returned from an Upload Archive (POST archive) (p. 224) request may not match the date shown for the archive in an inventory list for the vault.</p>

Name	Description
	Type: String
x-amzn-RequestId	A value created by S3 Glacier that uniquely identifies your request. In the event that you have a problem with S3 Glacier, AWS can use this value to troubleshoot the problem. It is recommended that you log these values. Type: String
x-amz-sha256-tree-hash	The SHA256 tree-hash checksum of the archive or inventory body. For more information about calculating this checksum, see Computing Checksums (p. 166) . Type: String

Signing Requests

S3 Glacier requires that you authenticate every request you send by signing the request. To sign a request, you calculate a digital signature using a cryptographic hash function. A cryptographic hash is a function that returns a unique hash value based on the input. The input to the hash function includes the text of your request and your secret access key. The hash function returns a hash value that you include in the request as your signature. The signature is part of the `Authorization` header of your request.

After receiving your request, S3 Glacier recalculates the signature using the same hash function and input that you used to sign the request. If the resulting signature matches the signature in the request, S3 Glacier processes the request. Otherwise, the request is rejected.

S3 Glacier supports authentication using [AWS Signature Version 4](#). The process for calculating a signature can be broken into three tasks:

- [Task 1: Create a Canonical Request](#)

Rearrange your HTTP request into a canonical format. Using a canonical form is necessary because S3 Glacier uses the same canonical form when it recalculates a signature to compare with the one you sent.

- [Task 2: Create a String to Sign](#)

Create a string that you will use as one of the input values to your cryptographic hash function. The string, called the *string to sign*, is a concatenation of the name of the hash algorithm, the request date, a *credential scope* string, and the canonicalized request from the previous task. The *credential scope* string itself is a concatenation of date, AWS Region, and service information.

- [Task 3: Create a Signature](#)

Create a signature for your request by using a cryptographic hash function that accepts two input strings: your *string to sign* and a *derived key*. The *derived key* is calculated by starting with your secret access key and using the *credential scope* string to create a series of hash-based message authentication codes (HMACs). Note that the hash function used in this signing step is not the tree-hash algorithm used in S3 Glacier APIs that upload data.

Topics

- [Example Signature Calculation \(p. 164\)](#)
- [Calculating Signatures for the Streaming Operations \(p. 165\)](#)

Example Signature Calculation

The following example walks you through the details of creating a signature for [Create Vault \(PUT vault\) \(p. 185\)](#). The example could be used as a reference to check your signature calculation method. Other reference calculations are included in the [Signature Version 4 Test Suite](#) of the Amazon Web Services Glossary.

The example assumes the following:

- The time stamp of the request is `Fri, 25 May 2012 00:24:53 GMT`.
- The endpoint is US East (N. Virginia) Region `us-east-1`.

The general request syntax (including the JSON body) is:

```
PUT /-/vaults/examplevault HTTP/1.1
Host: glacier.us-east-1.amazonaws.com
Date: Fri, 25 May 2012 00:24:53 GMT
Authorization: SignatureToBeCalculated
x-amz-glacier-version: 2012-06-01
```

The canonical form of the request calculated for [Task 1: Create a Canonical Request \(p. 163\)](#) is:

```
PUT
/-/vaults/examplevault

host:glacier.us-east-1.amazonaws.com
x-amz-date:20120525T002453Z
x-amz-glacier-version:2012-06-01

host;x-amz-date;x-amz-glacier-version
e3b0c44298fc1c149afb4c8996fb92427ae41e4649b934ca495991b7852b855
```

The last line of the canonical request is the hash of the request body. Also, note the empty third line in the canonical request. This is because there are no query parameters for this API.

The *string to sign* for [Task 2: Create a String to Sign \(p. 163\)](#) is:

```
AWS4-HMAC-SHA256
20120525T002453Z
20120525/us-east-1/glacier/aws4_request
5f1da1a2d0feb614dd03d71e87928b8e449ac87614479332aced3a701f916743
```

The first line of the *string to sign* is the algorithm, the second line is the time stamp, the third line is the *credential scope*, and the last line is a hash of the canonical request from [Task 1: Create a Canonical Request \(p. 163\)](#). The service name to use in the credential scope is `glacier`.

For [Task 3: Create a Signature \(p. 163\)](#), the *derived key* can be represented as:

```
derived key = HMAC(HMAC(HMAC(HMAC("AWS4" + YourSecretAccessKey, "20120525"), "us-east-1"), "glacier"), "aws4_request")
```

If the secret access key, `wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY`, is used, then the calculated signature is:

```
3ce5b2f2fffac9262b4da9256f8d086b4aaf42eba5f111c21681a65a127b7c2a
```

The final step is to construct the Authorization header. For the demonstration access key AKIAIOSFODNN7EXAMPLE, the header (with line breaks added for readability) is:

```
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20120525/us-east-1/glacier/
aws4_request,
SignedHeaders=host;x-amz-date;x-amz-glacier-version,
Signature=3ce5b2f2fffac9262b4da9256f8d086b4aaf42eba5f111c21681a65a127b7c2a
```

Calculating Signatures for the Streaming Operations

[Upload Archive \(POST archive\) \(p. 224\)](#) and [Upload Part \(PUT uploadID\) \(p. 246\)](#) are streaming operations that require you to include an additional header `x-amz-content-sha256` when signing and sending your request. The signing steps for the streaming operations are exactly the same as those for other operations, with the addition of the streaming header.

The calculation of the streaming header `x-amz-content-sha256` is based on the SHA256 hash of the entire content (payload) that is to be uploaded. Note that this calculation is different from the SHA256 tree hash ([Computing Checksums \(p. 166\)](#)). Besides trivial cases, the SHA 256 hash value of the payload data will be different from the SHA256 tree hash of the payload data.

If the payload data is specified as a byte array, you can use the following Java code snippet to calculate the SHA256 hash.

```
public static byte[] computePayloadSHA256Hash2(byte[] payload) throws
NoSuchAlgorithmException, IOException {
    BufferedInputStream bis =
        new BufferedInputStream(new ByteArrayInputStream(payload));
    MessageDigest messageDigest = MessageDigest.getInstance("SHA-256");
    byte[] buffer = new byte[4096];
    int bytesRead = -1;
    while ( (bytesRead = bis.read(buffer, 0, buffer.length)) != -1 ) {
        messageDigest.update(buffer, 0, bytesRead);
    }
    return messageDigest.digest();
}
```

Similarly, in C# you can calculate the SHA256 hash of the payload data as shown in the following code snippet.

```
public static byte[] CalculateSHA256Hash(byte[] payload)
{
    SHA256 sha256 = System.Security.Cryptography.SHA256.Create();
    byte[] hash = sha256.ComputeHash(payload);

    return hash;
}
```

Example Signature Calculation for Streaming API

The following example walks you through the details of creating a signature for [Upload Archive \(POST archive\) \(p. 224\)](#), one of the two streaming APIs in S3 Glacier. The example assumes the following:

- The time stamp of the request is Mon, 07 May 2012 00:00:00 GMT.
- The endpoint is the US East (N. Virginia) Region, us-east-1.
- The content payload is a string "Welcome to S3 Glacier."

The general request syntax (including the JSON body) is shown in the example below. Note that the `x-amz-content-sha256` header is included. In this simplified example, the `x-amz-sha256-tree-hash` and `x-amz-content-sha256` are the same value. However, for archive uploads greater than 1 MB, this is not the case.

```
POST /-/vaults/examplevault HTTP/1.1
Host: glacier.us-east-1.amazonaws.com
Date: Mon, 07 May 2012 00:00:00 GMT
x-amz-archive-description: my archive
x-amz-sha256-tree-hash: SHA256 tree hash
x-amz-content-sha256: SHA256 payload hash
Authorization: SignatureToBeCalculated
x-amz-glacier-version: 2012-06-01
```

The canonical form of the request calculated for [Task 1: Create a Canonical Request \(p. 163\)](#) is shown below. Note that the streaming header `x-amz-content-sha256` is included with its value. This means you must read the payload and calculate the SHA256 hash first and then compute the signature.

```
POST
/-/vaults/examplevault

host:glacier.us-east-1.amazonaws.com
x-amz-content-sha256:726e392cb4d09924dbad1cc0ba3b00c3643d03d14cb4b823e2f041cff612a628
x-amz-date:20120507T000000Z
x-amz-glacier-version:2012-06-01

host;x-amz-content-sha256;x-amz-date;x-amz-glacier-version
726e392cb4d09924dbad1cc0ba3b00c3643d03d14cb4b823e2f041cff612a628
```

The remainder of the signature calculation follows the steps outlined in [Example Signature Calculation \(p. 164\)](#). The Authorization header using the secret access key `wJalrXUtnFEMI/K7MDENG/bPxrFiCYEXAMPLEKEY` and the access key `AKIAIOSFODNN7EXAMPLE` is shown below (with line breaks added for readability):

```
Authorization=AWS4-HMAC-SHA256
Credential=AKIAIOSFODNN7EXAMPLE/20120507/us-east-1/glacier/aws4_request,
SignedHeaders=host;x-amz-content-sha256;x-amz-date;x-amz-glacier-version,
Signature=b092397439375d59119072764a1e9a144677c43d9906fd98a5742c57a2855de6
```

Computing Checksums

When uploading an archive, you must include both the `x-amz-sha256-tree-hash` and `x-amz-content-sha256` headers. The `x-amz-sha256-tree-hash` header is a checksum of the payload in your request body. This topic describes how to calculate the `x-amz-sha256-tree-hash` header. The `x-amz-content-sha256` header is a hash of the entire payload and is required for authorization. For more information, see [Example Signature Calculation for Streaming API \(p. 165\)](#).

The payload of your request can be an:

- **Entire archive**— When uploading an archive in a single request using the Upload Archive API, you send the entire archive in the request body. In this case, you must include the checksum of the entire archive.
- **Archive part**— When uploading an archive in parts using the multipart upload API, you send only a part of the archive in the request body. In this case, you include the checksum of the archive part. And after you upload all the parts, you send a Complete Multipart Upload request, which must include the checksum of the entire archive.

The checksum of the payload is a SHA-256 tree hash. It is called a tree hash because in the process of computing the checksum you compute a tree of SHA-256 hash values. The hash value at the root is the checksum for the entire archive.

Note

This section describes a way to compute the SHA-256 tree hash. However, you may use any procedure as long as it produces the same result.

You compute the SHA-256 tree hash as follows:

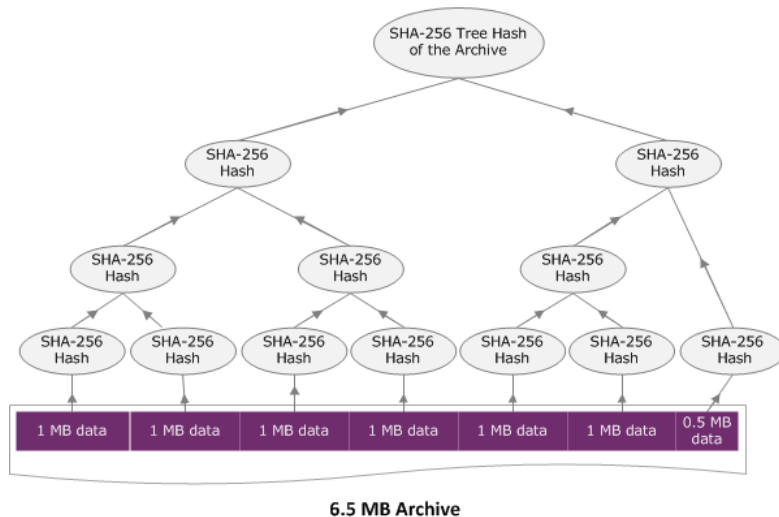
1. For each 1 MB chunk of payload data, compute the SHA-256 hash. The last chunk of data can be less than 1 MB. For example, if you are uploading a 3.2 MB archive, you compute the SHA-256 hash values for each of the first three 1 MB chunks of data, and then compute the SHA-256 hash of the remaining 0.2 MB data. These hash values form the leaf nodes of the tree.
2. Build the next level of the tree.
 - a. Concatenate two consecutive child node hash values and compute the SHA-256 hash of the concatenated hash values. This concatenation and generation of the SHA-256 hash produces a parent node for the two child nodes.
 - b. When only one child node remains, you promote that hash value to the next level in the tree.
3. Repeat step 2 until the resulting tree has a root. The root of the tree provides a hash of the entire archive and a root of the appropriate subtree provides the hash for the part in a multipart upload.

Topics

- [Tree Hash Example 1: Uploading an archive in a single request \(p. 167\)](#)
- [Tree Hash Example 2: Uploading an archive using a multipart upload \(p. 168\)](#)
- [Computing the Tree Hash of a File \(p. 169\)](#)
- [Receiving Checksums When Downloading Data \(p. 175\)](#)

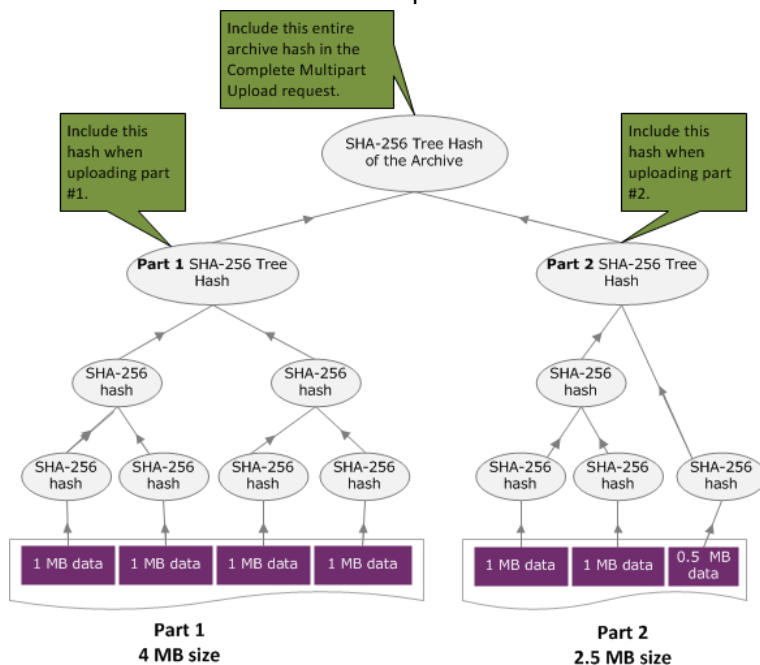
Tree Hash Example 1: Uploading an archive in a single request

When you upload an archive in a single request using the Upload Archive API (see [Upload Archive \(POST archive\) \(p. 224\)](#)), the request payload includes the entire archive. Accordingly, you must include the tree hash of the entire archive in the `x-amz-sha256-tree-hash` request header. Suppose you want to upload a 6.5 MB archive. The following diagram illustrates the process of creating the SHA-256 hash of the archive. You read the archive and compute the SHA-256 hash for each 1 MB chunk. You also compute the hash for the remaining 0.5 MB data and then build the tree as outlined in the preceding procedure.



Tree Hash Example 2: Uploading an archive using a multipart upload

The process of computing the tree hash when uploading an archive using multipart upload is the same when uploading the archive in a single request. The only difference is that in a multipart upload you upload only a part of the archive in each request (using the [Upload Part \(PUT uploadID\)](#) (p. 246) API), and therefore you provide the checksum of only the part in the `x-amz-sha256-tree-hash` request header. However, after you upload all parts, you must send the Complete Multipart Upload (see [Complete Multipart Upload \(POST uploadID\)](#) (p. 230)) request with a tree hash of the entire archive in the `x-amz-sha256-tree-hash` request header.



Computing the Tree Hash of a File

The algorithms shown here are selected for demonstration purposes. You can optimize the code as needed for your implementation scenario. If you are using an AWS SDK to program against Amazon S3 Glacier (S3 Glacier), the tree hash calculation is done for you and you only need to provide the file reference.

Example 1: Java Example

The following example shows how to calculate the SHA256 tree hash of a file using Java. You can run this example by either supplying a file location as an argument or you can use the `TreeHashExample.computeSHA256TreeHash` method directly from your code.

```
import java.io.File;
import java.io.FileInputStream;
import java.io.IOException;
import java.security.MessageDigest;
import java.security.NoSuchAlgorithmException;

public class TreeHashExample {

    static final int ONE_MB = 1024 * 1024;

    /**
     * Compute the Hex representation of the SHA-256 tree hash for the specified
     * File
     *
     * @param args
     *      args[0]: a file to compute a SHA-256 tree hash for
     */
    public static void main(String[] args) {

        if (args.length < 1) {
            System.err.println("Missing required filename argument");
            System.exit(-1);
        }

        File inputFile = new File(args[0]);
        try {

            byte[] treeHash = computeSHA256TreeHash(inputFile);
            System.out.printf("SHA-256 Tree Hash = %s\n", toHex(treeHash));

        } catch (IOException ioe) {
            System.err.format("Exception when reading from file %s: %s", inputFile,
                ioe.getMessage());
            System.exit(-1);
        } catch (NoSuchAlgorithmException nsae) {
            System.err.format("Cannot locate MessageDigest algorithm for SHA-256: %s",
                nsae.getMessage());
            System.exit(-1);
        }
    }

    /**
     * Computes the SHA-256 tree hash for the given file
     *
     * @param inputFile
     *      a File to compute the SHA-256 tree hash for
     * @return a byte[] containing the SHA-256 tree hash
     * @throws IOException
     *      Thrown if there's an issue reading the input file
     */
}
```



```

    * @throws NoSuchAlgorithmException
    */
    public static byte[] computeSHA256TreeHash(File inputFile) throws IOException,
        NoSuchAlgorithmException {

        byte[][] chunkSHA256Hashes = getChunkSHA256Hashes(inputFile);
        return computeSHA256TreeHash(chunkSHA256Hashes);
    }

    /**
     * Computes a SHA256 checksum for each 1 MB chunk of the input file. This
     * includes the checksum for the last chunk even if it is smaller than 1 MB.
     *
     * @param file
     *      A file to compute checksums on
     * @return a byte[][] containing the checksums of each 1 MB chunk
     * @throws IOException
     *      Thrown if there's an IOException when reading the file
     * @throws NoSuchAlgorithmException
     *      Thrown if SHA-256 MessageDigest can't be found
     */
    public static byte[][] getChunkSHA256Hashes(File file) throws IOException,
        NoSuchAlgorithmException {

        MessageDigest md = MessageDigest.getInstance("SHA-256");

        long numChunks = file.length() / ONE_MB;
        if (file.length() % ONE_MB > 0) {
            numChunks++;
        }

        if (numChunks == 0) {
            return new byte[][] { md.digest() };
        }

        byte[][] chunkSHA256Hashes = new byte[(int) numChunks][];
        FileInputStream fileStream = null;

        try {
            fileStream = new FileInputStream(file);
            byte[] buff = new byte[ONE_MB];

            int bytesRead;
            int idx = 0;

            while ((bytesRead = fileStream.read(buff, 0, ONE_MB)) > 0) {
                md.reset();
                md.update(buff, 0, bytesRead);
                chunkSHA256Hashes[idx++] = md.digest();
            }

            return chunkSHA256Hashes;
        } finally {
            if (fileStream != null) {
                try {
                    fileStream.close();
                } catch (IOException ioe) {
                    System.err.printf("Exception while closing %s.\n %s", file.getName(),
                        ioe.getMessage());
                }
            }
        }
    }

    /**

```

```

* Computes the SHA-256 tree hash for the passed array of 1 MB chunk
* checksums.
*
* This method uses a pair of arrays to iteratively compute the tree hash
* level by level. Each iteration takes two adjacent elements from the
* previous level source array, computes the SHA-256 hash on their
* concatenated value and places the result in the next level's destination
* array. At the end of an iteration, the destination array becomes the
* source array for the next level.
*
* @param chunkSHA256Hashes
*       An array of SHA-256 checksums
* @return A byte[] containing the SHA-256 tree hash for the input chunks
* @throws NoSuchAlgorithmException
*       Thrown if SHA-256 MessageDigest can't be found
*/
public static byte[] computeSHA256TreeHash(byte[][] chunkSHA256Hashes)
    throws NoSuchAlgorithmException {

    MessageDigest md = MessageDigest.getInstance("SHA-256");

    byte[][] prevLvlHashes = chunkSHA256Hashes;

    while (prevLvlHashes.length > 1) {

        int len = prevLvlHashes.length / 2;
        if (prevLvlHashes.length % 2 != 0) {
            len++;
        }

        byte[][] currLvlHashes = new byte[len][];

        int j = 0;
        for (int i = 0; i < prevLvlHashes.length; i = i + 2, j++) {

            // If there are at least two elements remaining
            if (prevLvlHashes.length - i > 1) {

                // Calculate a digest of the concatenated nodes
                md.reset();
                md.update(prevLvlHashes[i]);
                md.update(prevLvlHashes[i + 1]);
                currLvlHashes[j] = md.digest();

            } else { // Take care of remaining odd chunk
                currLvlHashes[j] = prevLvlHashes[i];
            }

        }

        prevLvlHashes = currLvlHashes;
    }

    return prevLvlHashes[0];
}

/**
* Returns the hexadecimal representation of the input byte array
*
* @param data
*       a byte[] to convert to Hex characters
* @return A String containing Hex characters
*/
public static String toHex(byte[] data) {
    StringBuilder sb = new StringBuilder(data.length * 2);

    for (int i = 0; i < data.length; i++) {

```

```

        String hex = Integer.toHexString(data[i] & 0xFF);

        if (hex.length() == 1) {
            // Append leading zero.
            sb.append("0");
        }
        sb.append(hex);
    }
    return sb.toString().toLowerCase();
}
}

```

Example 2: C# .NET Example

The following example shows how to calculate the SHA256 tree hash of a file. You can run this example by supplying a file location as an argument.

```

using System;
using System.IO;

using System.Security.Cryptography;

namespace ExampleTreeHash
{
    class Program
    {
        static int ONE_MB = 1024 * 1024;

        /**
         * Compute the Hex representation of the SHA-256 tree hash for the
         * specified file
         *
         * @param args
         *      args[0]: a file to compute a SHA-256 tree hash for
         */
        public static void Main(string[] args)
        {
            if (args.Length < 1)
            {
                Console.WriteLine("Missing required filename argument");
                Environment.Exit(-1);
            }
            FileStream inputFile = File.Open(args[0], FileMode.Open, FileAccess.Read);
            try
            {
                byte[] treeHash = ComputeSHA256TreeHash(inputFile);
                Console.WriteLine("SHA-256 Tree Hash = {0}",
                    BitConverter.ToString(treeHash).Replace("-", " ").ToLower());
                Console.ReadLine();
                Environment.Exit(-1);
            }
            catch (IOException ioe)
            {
                Console.WriteLine("Exception when reading from file {0}: {1}",
                    inputFile, ioe.Message);
                Console.ReadLine();
                Environment.Exit(-1);
            }
            catch (Exception e)
            {
                Console.WriteLine("Cannot locate MessageDigest algorithm for SHA-256: {0}",
                    e.Message);
                Console.WriteLine(e.GetType());
                Console.ReadLine();
            }
        }
    }
}

```

```

        Environment.Exit(-1);
    }
    Console.ReadLine();
}

/**
 * Computes the SHA-256 tree hash for the given file
 *
 * @param inputFile
 *      A file to compute the SHA-256 tree hash for
 * @return a byte[] containing the SHA-256 tree hash
 */
public static byte[] ComputeSHA256TreeHash(FileStream inputFile)
{
    byte[][] chunkSHA256Hashes = GetChunkSHA256Hashes(inputFile);
    return ComputeSHA256TreeHash(chunkSHA256Hashes);
}

/**
 * Computes a SHA256 checksum for each 1 MB chunk of the input file. This
 * includes the checksum for the last chunk even if it is smaller than 1 MB.
 *
 * @param file
 *      A file to compute checksums on
 * @return a byte[][] containing the checksums of each 1MB chunk
 */
public static byte[][] GetChunkSHA256Hashes(FileStream file)
{
    long numChunks = file.Length / ONE_MB;
    if (file.Length % ONE_MB > 0)
    {
        numChunks++;
    }

    if (numChunks == 0)
    {
        return new byte[][] { CalculateSHA256Hash(null, 0) };
    }
    byte[][] chunkSHA256Hashes = new byte[(int)numChunks][];

    try
    {
        byte[] buff = new byte[ONE_MB];

        int bytesRead;
        int idx = 0;

        while ((bytesRead = file.Read(buff, 0, ONE_MB)) > 0)
        {
            chunkSHA256Hashes[idx++] = CalculateSHA256Hash(buff, bytesRead);
        }
        return chunkSHA256Hashes;
    }
    finally
    {
        if (file != null)
        {
            try
            {
                file.Close();
            }
            catch (IOException ioe)
            {
                throw ioe;
            }
        }
    }
}

```

```

    }
    }
}

/**
 * Computes the SHA-256 tree hash for the passed array of 1MB chunk
 * checksums.
 *
 * This method uses a pair of arrays to iteratively compute the tree hash
 * level by level. Each iteration takes two adjacent elements from the
 * previous level source array, computes the SHA-256 hash on their
 * concatenated value and places the result in the next level's destination
 * array. At the end of an iteration, the destination array becomes the
 * source array for the next level.
 *
 * @param chunkSHA256Hashes
 *        An array of SHA-256 checksums
 * @return A byte[] containing the SHA-256 tree hash for the input chunks
 */
public static byte[] ComputeSHA256TreeHash(byte[][] chunkSHA256Hashes)
{
    byte[][] prevLvlHashes = chunkSHA256Hashes;
    while (prevLvlHashes.GetLength(0) > 1)
    {
        int len = prevLvlHashes.GetLength(0) / 2;
        if (prevLvlHashes.GetLength(0) % 2 != 0)
        {
            len++;
        }

        byte[][] currLvlHashes = new byte[len][];

        int j = 0;
        for (int i = 0; i < prevLvlHashes.GetLength(0); i = i + 2, j++)
        {
            // If there are at least two elements remaining
            if (prevLvlHashes.GetLength(0) - i > 1)
            {
                // Calculate a digest of the concatenated nodes
                byte[] firstPart = prevLvlHashes[i];
                byte[] secondPart = prevLvlHashes[i + 1];
                byte[] concatenation = new byte[firstPart.Length +
secondPart.Length];
                System.Buffer.BlockCopy(firstPart, 0, concatenation, 0,
firstPart.Length);
                System.Buffer.BlockCopy(secondPart, 0, concatenation,
firstPart.Length, secondPart.Length);

                currLvlHashes[j] = CalculateSHA256Hash(concatenation,
concatenation.Length);
            }
            else
            {
                // Take care of remaining odd chunk
                currLvlHashes[j] = prevLvlHashes[i];
            }
        }

        prevLvlHashes = currLvlHashes;
    }
}

```

```
        return prevLvlHashes[0];
    }

    public static byte[] CalculateSHA256Hash(byte[] inputBytes, int count)
    {
        SHA256 sha256 = System.Security.Cryptography.SHA256.Create();
        byte[] hash = sha256.ComputeHash(inputBytes, 0, count);
        return hash;
    }
}
```

Receiving Checksums When Downloading Data

When you retrieve an archive using the Initiate Job API (see [Initiate Job \(POST jobs\) \(p. 263\)](#)), you can optionally specify a range to retrieve of the archive. Similarly, when you download your data using the Get Job Output API (see [Get Job Output \(GET output\) \(p. 257\)](#)), you can optionally specify a range of data to download. There are two characteristics of these ranges that are important to understand when you are retrieving and downloading your archive's data. The range to retrieve is required to be *megabyte aligned* to the archive. Both the range to retrieve and the range to download must be *tree hash aligned* in order to receive checksum values when you download your data. The definition of these two types of range alignments are as follows:

- **Megabyte aligned** - A range [*StartByte*, *EndBytes*] is megabyte (1024*1024) aligned when *StartBytes* is divisible by 1 MB and *EndBytes* plus 1 is divisible by 1 MB or is equal to the end of the archive specified (archive byte size minus 1). A range used in the Initiate Job API, if specified, is required to be megabyte aligned.
- **Tree-hash aligned** - A range [*StartBytes*, *EndBytes*] is tree hash aligned with respect to an archive if and only if the root of the tree hash built over the range is equivalent to a node in the tree hash of the whole archive. Both the range to retrieve and range to download must be tree hash aligned in order to receive checksum values for the data you download. For an example of ranges and their relationship to the archive tree hash, see [Tree Hash Example: Retrieving an archive range that is tree-hash aligned \(p. 176\)](#).

Note that a range that is tree-hash aligned is also megabyte aligned. However, a megabyte aligned range is not necessarily tree-hash aligned.

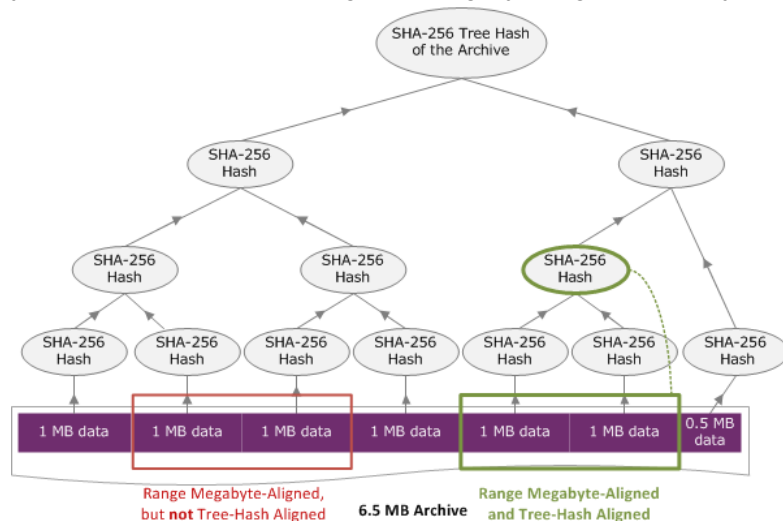
The following cases describe when you receive a checksum value when you download your archive data:

- If you do not specify a range to retrieve in the Initiate Job request and you download the whole archive in the Get Job Request.
- If you do not specify a range to retrieve in the Initiate Job request and you do specify a tree-hash aligned range to download in the Get Job Request.
- If you specify a tree-hash aligned range to retrieve in the Initiate Job request and you download the whole range in the Get Job Request.
- If you specify a tree-hash aligned range to retrieve in the Initiate Job request and you specify a tree-hash aligned range to download in the Get Job Request.

If you specify a range to retrieve in the Initiate Job request that is not tree hash aligned, then you can still get your archive data but no checksum values are returned when you download data in the Get Job Request.

Tree Hash Example: Retrieving an archive range that is tree-hash aligned

Suppose you have a 6.5 MB archive in your vault and you want to retrieve 2 MB of the archive. How you specify the 2 MB range in the Initiate Job request determines if you receive data checksum values when you download your data. The following diagram illustrates two 2 MB ranges for the 6.5 MB archive that you could download. Both ranges are megabyte aligned, but only one is tree-hash aligned.



Tree-Hash Aligned Range Specification

This section gives the exact specification for what constitutes a tree-hash aligned range. Tree-hash aligned ranges are important when you are downloading a portion of an archive and you specify the range of data to retrieve and the range to download from the retrieved data. If both of these ranges are tree-hash aligned, then you will receive checksum data when you download the data.

A range $[A, B]$ is *tree-hash aligned* with respect to an archive if and only if when a new tree hash is built over $[A, B]$, the root of the tree hash of that range is equivalent to a node in the tree hash of the whole archive. You can see this shown in the diagram in [Tree Hash Example: Retrieving an archive range that is tree-hash aligned](#) (p. 176). In this section, we provide the specification for tree-hash alignment.

Consider $[P, Q]$ as the range query for an archive of N megabytes (MB) and P and Q are multiples of one MB. Note that the actual inclusive range is $[P \text{ MB}, Q \text{ MB} - 1 \text{ byte}]$, but for simplicity, we show it as $[P, Q]$. With these considerations, then

- If P is an odd number, there is only one possible tree-hash aligned range—that is $[P, P + 1 \text{ MB}]$.
- If P is an even number and k is the maximum number, where P can be written as $2^k * X$, then there are at most k tree-hash aligned ranges that start with P . X is an integer greater than 0. The tree-hash aligned ranges fall in the following categories:
 - For each i , where $(0 \leq i \leq k)$ and where $P + 2^i < N$, then $[P, P + 2^i]$ is a tree-hash aligned range.
 - $P = 0$ is the special case where $A = 2^{\lceil \lg N \rceil} * 0$

Error Responses

In the event of an error, the API returns one of the following exceptions:

Code	Description	HTTP Status Code	Type
<code>AccessDeniedException</code>	Returned if there was an attempt to access a resource not allowed by an AWS Identity and Access Management (IAM) policy, or the incorrect AWS Account ID was used in the request URI. For more information, see Identity and Access Management in Amazon S3 Glacier (p. 125).	403 Forbidden	Client
<code>BadRequest</code>	Returned if the request cannot be processed.	400 Bad Request	Client
<code>ExpiredTokenException</code>	Returned if the security token used in the request has expired.	403 Forbidden	Client
<code>InsufficientCapacityException</code>	Returned if there is insufficient capacity to process the expedited request. This error only applies to expedited retrievals and not to standard or bulk retrievals.	503 Service Unavailable	Server
<code>InvalidParameterValueException</code>	Returned if a parameter of the request is incorrectly specified.	400 Bad Request	Client
<code>InvalidSignatureException</code>	Returned if the request signature is invalid.	403 Forbidden	Client
<code>LimitExceededException</code>	Returned if the request results in one of the following limits being exceeded, a vault limit, a tags limit, or the provisioned capacity limit.	400 Bad Request	Client
<code>MissingAuthenticationTokenException</code>	Returned if no authentication data is found for the request.	400 Bad Request	Client
<code>MissingParameterValueException</code>	Returned if a required header or parameter is missing from the request.	400 Bad Request	Client
<code>PolicyEnforcedException</code>	Returned if a retrieval job will exceed the current data policy's retrieval rate limit. For more information about data retrieval policies, see Amazon S3 Glacier Data Retrieval Policies (p. 151).	400 Bad Request	Client
<code>ResourceNotFoundException</code>	Returned if the specified resource such as a vault, upload ID, or job ID does not exist.	404 Not Found	Client
<code>RequestTimeoutException</code>	Returned if uploading an archive and Amazon S3 Glacier (S3 Glacier) times out while receiving the upload.	408 Request Timeout	Client

Code	Description	HTTP Status Code	Type
SerializationException	Returned if the body of the request is invalid. If including a JSON payload, check that it is well-formed.	400 Bad Request	Client
ServiceUnavailableException	Returned if the service cannot complete the request.	500 Internal Server Error	Server
ThrottlingException	Returned if you need to reduce your rate of requests to S3 Glacier.	400 Bad Request	Client
UnrecognizedClientException	Returned if the Access Key ID or security token is invalid.	400 Bad Request	Client

Various S3 Glacier APIs return the same exception, but with different exception messages to help you troubleshoot the specific error encountered.

S3 Glacier returns error information in the response body. The following examples show some of the error responses.

Example 1: Describe Job request with a job ID that does not exist

Suppose you send a [Describe Job \(GET JobID\)](#) (p. 250) request for a job that does not exist. That is, you specify a job ID that does not exist.

```
GET /-/vaults/examplevault/jobs/HkF9p6o7yjhFx-
K3CGL6fuSm6VzW9T7esGQfco8nUXVYws0jlb5gq1JZ55yHgt5vP54ZShjoQzQVVEXAMPLEbadJobID HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

In response, S3 Glacier returns the following error response.

```
HTTP/1.1 404 Not Found
x-amzn-RequestId: AAABaZ9N92Iiyv4N7sru3ABEpSQkuFtmH3NP6aAC51ixfjg
Content-Type: application/json
Content-Length: 185
Date: Wed, 10 Feb 2017 12:00:00 GMT
{
  "code": "ResourceNotFoundException",
  "message": "The job ID was not found: HkF9p6o7yjhFx-
K3CGL6fuSm6VzW9T7esGQfco8nUXVYws0jlb5gq1JZ55yHgt5vP54ZShjoQzQVVEXAMPLEbadJobID",
  "type": "Client"
}
```

Where:

Code

One of the general exceptions.

Type: String

Message

A generic description of the error condition specific to the API that returns the error.

Type: String

Type

The source of the error. The field can be one of the following values: `Client`, `Server`, or `Unknown`.

Type: String.

Note the following in the preceding response:

- For the error response, S3 Glacier returns status code values of 4xx and 5xx. In this example, the status code is 404 `Not Found`.
- The `Content-Type` header value `application/json` indicates JSON in the body
- The JSON in the body provides the error information.

In the previous request, instead of a bad job ID, suppose you specify a vault that does not exist. The response returns a different message.

```
HTTP/1.1 404 Not Found
x-amzn-RequestId: AAABBeC9Zw0rp_5D0L8VfB3FA_WlTupqTKAUehMcPhdgni0
Content-Type: application/json
Content-Length: 154
Date: Wed, 10 Feb 2017 12:00:00 GMT
{
  "code": "ResourceNotFoundException",
  "message": "Vault not found for ARN: arn:aws:glacier:us-west-2:012345678901:vaults/
examplevault",
  "type": "Client"
}
```

Example 2: List Jobs request with an invalid value for the request parameter

In this example you send a [List Jobs \(GET jobs\) \(p. 273\)](#) request to retrieve vault jobs with a specific `statuscode`, and you provide an incorrect `statuscode` value `finished`, instead of the acceptable values `InProgress`, `Succeeded`, or `Failed`.

```
GET /-/vaults/examplevault/jobs?statuscode=finished HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

S3 Glacier returns the `InvalidParameterValueException` with an appropriate message.

```
HTTP/1.1 400 Bad Request
x-amzn-RequestId: AAABaZ9N92Iiyv4N7sru3ABEpSQkuFtmH3NP6aAC51ixfjg
Content-Type: application/json
```

```
Content-Length: 141
Date: Wed, 10 Feb 2017 12:00:00 GMT
{
  "code": "InvalidParameterValueException",
  "message": "The job status code is not valid: finished",
  "type": "Client"
}
```

Vault Operations

The following are the vault operations available in S3 Glacier.

Topics

- [Abort Vault Lock \(DELETE lock-policy\) \(p. 180\)](#)
- [Add Tags To Vault \(POST tags add\) \(p. 182\)](#)
- [Create Vault \(PUT vault\) \(p. 185\)](#)
- [Complete Vault Lock \(POST lockId\) \(p. 187\)](#)
- [Delete Vault \(DELETE vault\) \(p. 189\)](#)
- [Delete Vault Access Policy \(DELETE access-policy\) \(p. 191\)](#)
- [Delete Vault Notifications \(DELETE notification-configuration\) \(p. 193\)](#)
- [Describe Vault \(GET vault\) \(p. 194\)](#)
- [Get Vault Access Policy \(GET access-policy\) \(p. 197\)](#)
- [Get Vault Lock \(GET lock-policy\) \(p. 200\)](#)
- [Get Vault Notifications \(GET notification-configuration\) \(p. 203\)](#)
- [Initiate Vault Lock \(POST lock-policy\) \(p. 205\)](#)
- [List Tags For Vault \(GET tags\) \(p. 208\)](#)
- [List Vaults \(GET vaults\) \(p. 210\)](#)
- [Remove Tags From Vault \(POST tags remove\) \(p. 215\)](#)
- [Set Vault Access Policy \(PUT access-policy\) \(p. 217\)](#)
- [Set Vault Notification Configuration \(PUT notification-configuration\) \(p. 219\)](#)

Abort Vault Lock (DELETE lock-policy)

Description

This operation stops the vault locking process if the vault lock is not in the `Locked` state. If the vault lock is in the `Locked` state when this operation is requested, the operation returns an `AccessDeniedException` error. Stopping the vault locking process removes the vault lock policy from the specified vault.

A vault lock is put into the `InProgress` state by calling [Initiate Vault Lock \(POST lock-policy\) \(p. 205\)](#). A vault lock is put into the `Locked` state by calling [Complete Vault Lock \(POST lockId\) \(p. 187\)](#). You can get the state of a vault lock by calling [Get Vault Lock \(GET lock-policy\) \(p. 200\)](#). For more information about the vault locking process, see [Amazon S3 Glacier Vault Lock \(p. 65\)](#). For more information about vault lock policies, see [Amazon S3 Glacier Access Control with Vault Lock Policies \(p. 136\)](#).

This operation is idempotent. You can successfully invoke this operation multiple times, if the vault lock is in the `InProgress` state or if there is no policy associated with the vault.

Requests

To delete the vault lock policy, send an HTTP `DELETE` request to the URI of the vault's lock-policy subresource.

Syntax

```
DELETE /AccountId/vaults/vaultName/lock-policy HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID. This value must match the AWS account ID associated with the credentials used to sign the request. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you specify your account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

This operation does not have a request body.

Responses

If the policy is successfully deleted, S3 Glacier returns an HTTP 204 No Content response.

Syntax

```
HTTP/1.1 204 No Content
x-amzn-RequestId: x-amzn-RequestId
Date: Date
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

The following example demonstrates how to stop the vault locking process.

Example Request

In this example, a `DELETE` request is sent to the `lock-policy` subresource of the vault named **examplevault**.

```
DELETE /-/vaults/examplevault/lock-policy HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
x-amz-glacier-version: 2012-06-01
```

Example Response

If the policy is successfully deleted S3 Glacier returns an `HTTP 204 No Content` response, as shown in the following example.

```
HTTP/1.1 204 No Content
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
```

Related Sections

- [Complete Vault Lock \(POST lockId\) \(p. 187\)](#)
- [Get Vault Lock \(GET lock-policy\) \(p. 200\)](#)
- [Initiate Vault Lock \(POST lock-policy\) \(p. 205\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Add Tags To Vault (POST tags add)

This operation adds the specified tags to a vault. Each tag is composed of a key and a value. Each vault can have up to 50 tags. If your request would cause the tag limit for the vault to be exceeded, the operation throws the `LimitExceededException` error.

If a tag already exists on the vault under a specified key, the existing key value will be overwritten. For more information about tags, see [Tagging Amazon S3 Glacier Resources \(p. 155\)](#).

Request Syntax

To add tags to a vault, send an HTTP POST request to the tags URI as shown in the following syntax example.

```
POST /AccountId/vaults/vaultName/tags?operation=add HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
Content-Length: Length
x-amz-glacier-version: 2012-06-01

{
  "Tags":
  {
    "string": "string",
    "string": "string"
  }
}
```

Note

The *AccountId* value is the AWS account ID. This value must match the AWS account ID associated with the credentials used to sign the request. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you specify your account ID, do not include any hyphens ('-') in the ID.

Request Parameters

Name	Description	Required
operation=add	A single query string parameter <i>operation</i> with a value of <i>add</i> to distinguish it from Remove Tags From Vault (POST tags remove) (p. 215).	Yes

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers](#) (p. 160).

Request Body

The request body contains the following JSON fields.

Tags

The tags to add to the vault. Each tag is composed of a key and a value. The value can be an empty string.

Type: String to String map

Length constraints: Minimum length of 1. Maximum length 10.

Required: Yes

Responses

If the operation request is successful, the service returns an HTTP 204 No Content response.

Syntax

```
HTTP/1.1 204 No Content
```

```
x-amzn-RequestId: x-amzn-RequestId  
Date: Date
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers](#) (p. 162).

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses](#) (p. 176).

Examples

Example Request

The following example sends an HTTP POST request with the tags to add to the vault.

```
POST /-/vaults/examplevault/tags?operation=add HTTP/1.1  
Host: glacier.us-west-2.amazonaws.com  
x-amz-Date: 20170210T120000Z  
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/  
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-  
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2  
Content-Length: length  
x-amz-glacier-version: 2012-06-01  
  
{  
  "Tags":  
  {  
    "examplekey1": "examplevalue1",  
    "examplekey2": "examplevalue2"  
  }  
}
```

Example Response

If the request was successful S3 Glacier returns a HTTP 204 No Content as shown in the following example.

```
HTTP/1.1 204 No Content  
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q  
Date: Wed, 10 Feb 2017 12:02:00 GMT
```

Related Sections

- [List Tags For Vault \(GET tags\)](#) (p. 208)
- [Remove Tags From Vault \(POST tags remove\)](#) (p. 215)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Create Vault (PUT vault)

Description

This operation creates a new vault with the specified name. The name of the vault must be unique within an AWS Region for an AWS account. You can create up to 1,000 vaults per account. For information on creating more vaults, go to the [Amazon S3 Glacier product detail page](#).

You must use the following guidelines when naming a vault.

- Names can be between 1 and 255 characters long.
- Allowed characters are a–z, A–Z, 0–9, '_' (underscore), '-' (hyphen), and '.' (period).

This operation is idempotent, you can send the same request multiple times and it has no further effect after the first time Amazon S3 Glacier (S3 Glacier) creates the specified vault.

Requests

Syntax

To create a vault, send an HTTP PUT request to the URI of the vault to be created.

```
PUT /AccountId/vaults/VaultName HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
Content-Length: Length
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID. This value must match the AWS account ID associated with the credentials used to sign the request. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you specify your account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

The request body for this operation must be empty (0 bytes).

Responses

Syntax

```
HTTP/1.1 201 Created
```



```
x-amzn-RequestId: x-amzn-RequestId  
Date: Date  
Location: Location
```

Response Headers

A successful response includes the following response headers, in addition to the response headers that are common to all operations. For more information about common response headers, see [Common Response Headers \(p. 162\)](#).

Name	Description
Location	The relative URI path of the vault that was created. Type: String

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

Example Request

The following example sends an HTTP PUT request to create a vault named `examplevault`.

```
PUT /-/vaults/examplevault HTTP/1.1  
Host: glacier.us-west-2.amazonaws.com  
x-amz-Date: 20170210T120000Z  
x-amz-glacier-version: 2012-06-01  
Content-Length: 0  
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/  
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-  
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dc540091b12966f2a2
```

Example Response

S3 Glacier creates the vault and returns the relative URI path of the vault in the `Location` header. The account ID is always displayed in the `Location` header regardless of whether the account ID or a hyphen ('-') was specified in the request.

```
HTTP/1.1 201 Created  
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q  
Date: Wed, 10 Feb 2017 12:02:00 GMT  
Location: /111122223333/vaults/examplevault
```

Related Sections

- [List Vaults \(GET vaults\) \(p. 210\)](#)
- [Delete Vault \(DELETE vault\) \(p. 189\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Complete Vault Lock (POST lockId)

Description

This operation completes the vault locking process by transitioning the vault lock from the `InProgress` state to the `Locked` state, which causes the vault lock policy to become unchangeable. A vault lock is put into the `InProgress` state by calling [Initiate Vault Lock \(POST lock-policy\)](#) (p. 205). You can obtain the state of the vault lock by calling [Get Vault Lock \(GET lock-policy\)](#) (p. 200). For more information about the vault locking process, see [Amazon S3 Glacier Vault Lock](#) (p. 65).

This operation is idempotent. This request is always successful if the vault lock is in the `Locked` state and the provided lock ID matches the lock ID originally used to lock the vault.

If an invalid lock ID is passed in the request when the vault lock is in the `Locked` state, the operation returns an `AccessDeniedException` error. If an invalid lock ID is passed in the request when the vault lock is in the `InProgress` state, the operation throws an `InvalidParameter` error.

Requests

To complete the vault locking process, send an HTTP POST request to the URI of the vault's lock-policy subresource with a valid lock ID.

Syntax

```
POST /AccountId/vaults/vaultName/lock-policy/lockId HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
Content-Length: Length
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID. This value must match the AWS account ID associated with the credentials used to sign the request. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you specify your account ID, do not include any hyphens ('-') in the ID.

The `lockId` value is the lock ID obtained from a [Initiate Vault Lock \(POST lock-policy\)](#) (p. 205) request.

Request Parameters

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers](#) (p. 160).

Request Body

This operation does not have a request body.

Responses

If the operation request is successful, the service returns an HTTP 204 No Content response.

Syntax

```
HTTP/1.1 204 No Content
x-amzn-RequestId: x-amzn-RequestId
Date: Date
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

Example Request

The following example sends an HTTP POST request with the lock ID to complete the vault locking process.

```
POST /-/vaults/examplevault/lock-policy/AE863rKkWZU53SLW5be4DUcW HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
Content-Length: length
x-amz-glacier-version: 2012-06-01
```

Example Response

If the request was successful, Amazon S3 Glacier (S3 Glacier) returns an HTTP 204 No Content response, as shown in the following example.

```
HTTP/1.1 204 No Content
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q
Date: Wed, 10 Feb 2017 12:02:00 GMT
```

Related Sections

- [Abort Vault Lock \(DELETE lock-policy\) \(p. 180\)](#)
- [Get Vault Lock \(GET lock-policy\) \(p. 200\)](#)
- [Initiate Vault Lock \(POST lock-policy\) \(p. 205\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Delete Vault (DELETE vault)

Description

This operation deletes a vault. Amazon S3 Glacier (S3 Glacier) will delete a vault only if there are no archives in the vault as per the last inventory and there have been no writes to the vault since the last inventory. If either of these conditions is not satisfied, the vault deletion fails (that is, the vault is not removed) and S3 Glacier returns an error.

You can use the [Describe Vault \(GET vault\) \(p. 194\)](#) operation that provides vault information, including the number of archives in the vault; however, the information is based on the vault inventory S3 Glacier last generated.

This operation is idempotent.

Note

When you delete a vault, the vault access policy attached to the vault is also deleted. For more information about vault access policies, see [Amazon S3 Glacier Access Control with Vault Access Policies \(p. 134\)](#).

Requests

To delete a vault, send a DELETE request to the vault resource URI.

Syntax

```
DELETE /AccountId/vaults/VaultName HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The *AccountId* value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

This operation does not have a request body.

Responses

Syntax

```
HTTP/1.1 204 No Content
x-amzn-RequestId: x-amzn-RequestId
Date: Date
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

Example Request

The following example deletes a vault named `examplevault`. The example request is a `DELETE` request to the URI of the resource (the vault) to delete.

```
DELETE /-/vaults/examplevault HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dc540091b12966f2a2
```

Example Response

```
HTTP/1.1 204 No Content
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q
Date: Wed, 10 Feb 2017 12:02:00 GMT
```

Related Sections

- [Create Vault \(PUT vault\) \(p. 185\)](#)
- [List Vaults \(GET vaults\) \(p. 210\)](#)
- [Initiate Job \(POST jobs\) \(p. 263\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Delete Vault Access Policy (DELETE access-policy)

Description

This operation deletes the access policy associated with the specified vault. The operation is eventually consistent—that is, it might take some time for Amazon S3 Glacier (S3 Glacier) to completely remove the access policy, and you might still see the effect of the policy for a short time after you send the delete request.

This operation is idempotent. You can invoke delete multiple times, even if there is no policy associated with the vault. For more information about vault access policies, see [Amazon S3 Glacier Access Control with Vault Access Policies](#) (p. 134).

Requests

To delete the current vault access policy, send an HTTP `DELETE` request to the URI of the vault's `access-policy` subresource.

Syntax

```
DELETE /AccountId/vaults/vaultName/access-policy HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers](#) (p. 160).

Request Body

This operation does not have a request body.

Responses

In response, S3 Glacier returns `204 No Content` if the policy is successfully deleted.

Syntax

```
HTTP/1.1 204 No Content
```

```
x-amzn-RequestId: x-amzn-RequestId  
Date: Date
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

The following example demonstrates how to delete a vault access policy.

Example Request

In this example, a DELETE request is sent to the `access-policy` subresource of the vault named **examplevault**.

```
DELETE /-/vaults/examplevault/access-policy HTTP/1.1  
Host: glacier.us-west-2.amazonaws.com  
x-amz-Date: 20170210T120000Z  
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/  
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-  
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2  
x-amz-glacier-version: 2012-06-01
```

Example Response

In response, if the policy is successfully deleted S3 Glacier returns a 204 No Content as shown in the following example.

```
HTTP/1.1 204 No Content  
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q  
Date: Wed, 10 Feb 2017 12:00:00 GMT
```

Related Sections

- [Get Vault Access Policy \(GET access-policy\) \(p. 197\)](#)
- [Set Vault Access Policy \(PUT access-policy\) \(p. 217\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Delete Vault Notifications (DELETE notification-configuration)

Description

This operation deletes the notification configuration set for a vault [Set Vault Notification Configuration \(PUT notification-configuration\)](#) (p. 219). The operation is eventually consistent—that is, it might take some time for Amazon S3 Glacier (S3 Glacier) to completely disable the notifications, and you might still receive some notifications for a short time after you send the delete request.

Requests

To delete a vault's notification configuration, send a `DELETE` request to the vault's notification-configuration subresource.

Syntax

```
DELETE /AccountId/vaults/VaultName/notification-configuration HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers](#) (p. 160).

Request Body

This operation does not have a request body.

Responses

Syntax

```
HTTP/1.1 204 No Content
x-amzn-RequestId: x-amzn-RequestId
Date: Date
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers](#) (p. 162).

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses](#) (p. 176).

Examples

The following example demonstrates how to remove notification configuration for a vault.

Example Request

In this example, a DELETE request is sent to the notification-configuration subresource of the vault called `examplevault`.

```
DELETE /111122223333/vaults/examplevault/notification-configuration HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

```
HTTP/1.1 204 No Content
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
```

Related Sections

- [Get Vault Notifications \(GET notification-configuration\)](#) (p. 203)
- [Set Vault Notification Configuration \(PUT notification-configuration\)](#) (p. 219)
- [Identity and Access Management in Amazon S3 Glacier](#) (p. 125)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Describe Vault (GET vault)

Description

This operation returns information about a vault, including the vault Amazon Resource Name (ARN), the date the vault was created, the number of archives contained within the vault, and the total size of all the archives in the vault. The number of archives and their total size are as of the last vault inventory Amazon S3 Glacier (S3 Glacier) generated (see [Working with Vaults in Amazon S3 Glacier](#) (p. 24)). S3 Glacier generates vault inventories approximately daily. This means that if you add or remove an archive

from a vault, and then immediately send a Describe Vault request, the response might not reflect the changes.

Requests

To get information about a vault, send a `GET` request to the URI of the specific vault resource.

Syntax

```
GET /AccountId/vaults/VaultName HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

This operation does not have a request body.

Responses

Syntax

```
HTTP/1.1 200 OK
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Content-Type: application/json
Content-Length: Length

{
  "CreationDate" : String,
  "LastInventoryDate" : String,
  "NumberOfArchives" : Number,
  "SizeInBytes" : Number,
  "VaultARN" : String,
  "VaultName" : String
}
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

The response body contains the following JSON fields.

CreationDate

The UTC date when the vault was created.

Type: A string representation in the ISO 8601 date format, for example
2013-03-20T17:03:43.221Z.

LastInventoryDate

The UTC date when S3 Glacier completed the last vault inventory. For information about initiating an inventory for a vault, see [Initiate Job \(POST jobs\)](#) (p. 263).

Type: A string representation in the ISO 8601 date format, for example
2013-03-20T17:03:43.221Z.

NumberOfArchives

The number of archives in the vault as per the last vault inventory. This field will return null if an inventory has not yet run on the vault, for example, if you just created the vault.

Type: Number

SizeInBytes

The total size in bytes of the archives in the vault including any per-archive overhead, as of the last inventory date. This field will return null if an inventory has not yet run on the vault, for example, if you just created the vault.

Type: Number

VaultARN

The Amazon Resource Name (ARN) of the vault.

Type: String

VaultName

The vault name that was specified at creation time. The vault name is also included in the vault's ARN.

Type: String

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses](#) (p. 176).

Examples

Example Request

The following example demonstrates how to get information about the vault named `examplevault`.

```
GET /-/vaults/examplevault HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
```

```
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q
Date: Wed, 10 Feb 2017 12:02:00 GMT
Content-Type: application/json
Content-Length: 260

{
  "CreationDate" : "2012-02-20T17:01:45.198Z",
  "LastInventoryDate" : "2012-03-20T17:03:43.221Z",
  "NumberOfArchives" : 192,
  "SizeInBytes" : 78088912,
  "VaultARN" : "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault",
  "VaultName" : "examplevault"
}
```

Related Sections

- [Create Vault \(PUT vault\) \(p. 185\)](#)
- [List Vaults \(GET vaults\) \(p. 210\)](#)
- [Delete Vault \(DELETE vault\) \(p. 189\)](#)
- [Initiate Job \(POST jobs\) \(p. 263\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Get Vault Access Policy (GET access-policy)

Description

This operation retrieves the `access-policy` subresource set on the vault—for more information on setting this subresource, see [Set Vault Access Policy \(PUT access-policy\) \(p. 217\)](#). If there is no access policy set on the vault, the operation returns a 404 `Not found` error. For more information about vault access policies, see [Amazon S3 Glacier Access Control with Vault Access Policies \(p. 134\)](#).

Requests

To return the current vault access policy, send an HTTP `GET` request to the URI of the vault's `access-policy` subresource.

Syntax

```
GET /AccountId/vaults/vaultName/access-policy HTTP/1.1
Host: glacier.Region.amazonaws.com
```

```
Date: Date  
Authorization: SignatureValue  
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

This operation does not have a request body.

Responses

In response, Amazon S3 Glacier (S3 Glacier) returns the vault access policy in JSON format in the body of the response.

Syntax

```
HTTP/1.1 200 OK  
x-amzn-RequestId: x-amzn-RequestId  
Date: Date  
Content-Type: application/json  
Content-Length: length  
  
{  
  "Policy": "string"  
}
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

The response body contains the following JSON fields.

Policy

The vault access policy as a JSON string, which uses "\" as an escape character.

Type: String

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

The following example demonstrates how to get a vault access policy.

Example Request

In this example, a GET request is sent to the URI of a vault's access-policy subresource.

```
GET /-/vaults/examplevault/access-policy HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

If the request was successful, S3 Glacier returns the vault access policy as a JSON string in the body of the response. The returned JSON string uses "\" as an escape character, as shown in the [Set Vault Access Policy \(PUT access-policy\) \(p. 217\)](#) examples. However, the following example shows the returned JSON string without escape characters for readability.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Type: application/json
Content-Length: length

{
  "Policy": "
    {
      "Version": "2012-10-17",
      "Statement": [
        {
          "Sid": "allow-time-based-deletes",
          "Principal": {
            "AWS": "999999999999"
          },
          "Effect": "Allow",
          "Action": "glacier:Delete*",
          "Resource": [
            "arn:aws:glacier:us-west-2:999999999999:vaults/examplevault"
          ],
          "Condition": {
            "DateGreaterThan": {
              "aws:CurrentTime": "2018-12-31T00:00:00Z"
            }
          }
        }
      ]
    }
  "
}
```

Related Sections

- [Delete Vault Access Policy \(DELETE access-policy\) \(p. 191\)](#)
- [Set Vault Access Policy \(PUT access-policy\) \(p. 217\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Get Vault Lock (GET lock-policy)

Description

This operation retrieves the following attributes from the `lock-policy` subresource set on the specified vault:

- The vault lock policy set on the vault.
- The state of the vault lock, which is either `InProgress` or `Locked`.
- When the lock ID expires. The lock ID is used to complete the vault locking process.
- When the vault lock was initiated and put into the `InProgress` state.

A vault lock is put into the `InProgress` state by calling [Initiate Vault Lock \(POST lock-policy\)](#) (p. 205). A vault lock is put into the `Locked` state by calling [Complete Vault Lock \(POST lockId\)](#) (p. 187). You can stop the vault locking process by calling [Abort Vault Lock \(DELETE lock-policy\)](#) (p. 180). For more information about the vault locking process, see [Amazon S3 Glacier Vault Lock](#) (p. 65).

If there is no vault lock policy set on the vault, the operation returns a 404 `Not found` error. For more information about vault lock policies, see [Amazon S3 Glacier Access Control with Vault Lock Policies](#) (p. 136).

Requests

To return the current vault lock policy and other attributes, send an HTTP `GET` request to the URI of the vault's `lock-policy` subresource as shown in the following syntax example.

Syntax

```
GET /AccountId/vaults/vaultName/lock-policy HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers](#) (p. 160).

Request Body

This operation does not have a request body.

Responses

In response, Amazon S3 Glacier (S3 Glacier) returns the vault access policy in JSON format in the body of the response.

Syntax

```
HTTP/1.1 200 OK
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Content-Type: application/json
Content-Length: length

{
  "Policy": "string",
  "State": "string",
  "ExpirationDate": "string",
  "CreationDate": "string"
}
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

The response body contains the following JSON fields.

Policy

The vault lock policy as a JSON string, which uses "\" as an escape character.

Type: String

State

The state of the vault lock.

Type: String

Valid values: `InProgress` | `Locked`

ExpirationDate

The UTC date and time at which the lock ID expires. This value can be `null` if the vault lock is in a `Locked` state.

Type: A string representation in the ISO 8601 date format, for example
`2013-03-20T17:03:43.221Z`.

CreationDate

The UTC date and time at which the vault lock was put into the `InProgress` state.

Type: A string representation in the ISO 8601 date format, for example
`2013-03-20T17:03:43.221Z`.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

The following example demonstrates how to get a vault lock policy.

Example Request

In this example, a GET request is sent to the URI of a vault's lock-policy subresource.

```
GET /-/vaults/examplevault/lock-policy HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

If the request was successful, S3 Glacier returns the vault access policy as a JSON string in the body of the response. The returned JSON string uses "\" as an escape character, as shown in the [Initiate Vault Lock \(POST lock-policy\) \(p. 205\)](#) example request. However, the following example shows the returned JSON string without escape characters for readability.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Type: application/json
Content-Length: length

{
  "Policy": "
    {
      "Version": "2012-10-17",
      "Statement": [
        {
          "Sid": "Define-vault-lock",
          "Principal": {
            "AWS": "arn:aws:iam::999999999999:root"
          },
          "Effect": "Deny",
          "Action": "glacier:DeleteArchive",
          "Resource": [
            "arn:aws:glacier:us-west-2:999999999999:vaults/examplevault"
          ],
          "Condition": {
            "NumericLessThanEquals": {
              "glacier:ArchiveAgeInDays": "365"
            }
          }
        }
      ]
    }
  ",
  "State": "InProgress",
  "ExpirationDate": "exampledate",
  "CreationDate": "exampledate"
}
```

Related Sections

- [Abort Vault Lock \(DELETE lock-policy\) \(p. 180\)](#)
- [Complete Vault Lock \(POST lockId\) \(p. 187\)](#)
- [Initiate Vault Lock \(POST lock-policy\) \(p. 205\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Get Vault Notifications (GET notification-configuration)

Description

This operation retrieves the notification-configuration subresource set on the vault (see [Set Vault Notification Configuration \(PUT notification-configuration\) \(p. 219\)](#)). If notification configuration for a vault is not set, the operation returns a 404 Not Found error. For more information about vault notifications, see [Configuring Vault Notifications in Amazon S3 Glacier \(p. 51\)](#).

Requests

To retrieve the notification configuration information, send a GET request to the URI of a vault's notification-configuration subresource.

Syntax

```
GET /AccountId/vaults/VaultName/notification-configuration HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The AccountId value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

This operation does not have a request body.

Responses

Syntax

```
HTTP/1.1 200 OK
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Content-Type: application/json
Content-Length: length
{
  "Events": [
    String,
    ...
  ],
  "SNSTopic": String
}
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers](#) (p. 162).

Response Body

The response body contains the following JSON fields.

Events

A list of one or more events for which Amazon S3 Glacier (S3 Glacier) will send a notification to the specified Amazon SNS topic. For information about vault events for which you can configure a vault to publish notifications, see [Set Vault Notification Configuration \(PUT notification-configuration\)](#) (p. 219).

Type: Array

SNSTopic

The Amazon Simple Notification Service (Amazon SNS) topic Amazon Resource Name (ARN). For more information, see [Getting Started with Amazon SNS](#) in the *Amazon Simple Notification Service Getting Started Guide*.

Type: String

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses](#) (p. 176).

Examples

The following example demonstrates how to retrieve the notification configuration for a vault.

Example Request

In this example, a GET request is sent to the `notification-configuration` subresource of a vault.

```
GET /-/vaults/examplevault/notification-configuration HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

A successful response shows the audit logging configuration document in the body of the response in JSON format. In this example, the configuration shows that notifications for two events (`ArchiveRetrievalCompleted` and `InventoryRetrievalCompleted`) are sent to the Amazon SNS topic `arn:aws:sns:us-west-2:012345678901:mytopic`.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Type: application/json
Content-Length: 150

{
  "Events": [
    "ArchiveRetrievalCompleted",
    "InventoryRetrievalCompleted"
  ],
  "SNSTopic": "arn:aws:sns:us-west-2:012345678901:mytopic"
}
```

Related Sections

- [Delete Vault Notifications \(DELETE notification-configuration\) \(p. 193\)](#)
- [Set Vault Notification Configuration \(PUT notification-configuration\) \(p. 219\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Initiate Vault Lock (POST lock-policy)

Description

This operation initiates the vault locking process by doing the following:

- Installing a vault lock policy on the specified vault.
- Setting the lock state of vault lock to `InProgress`.
- Returning a lock ID, which is used to complete the vault locking process.

You can set one vault lock policy for each vault and this policy can be up to 20 KB in size. For more information about vault lock policies, see [Amazon S3 Glacier Access Control with Vault Lock Policies \(p. 136\)](#).

You must complete the vault locking process within 24 hours after the vault lock enters the `InProgress` state. After the 24 hour window ends, the lock ID expires, the vault automatically exits the `InProgress` state, and the vault lock policy is removed from the vault. You call [Complete Vault Lock \(POST lockid\)](#) (p. 187) to complete the vault locking process by setting the state of the vault lock to `Locked`.

Note

After a vault lock is in the `Locked` state, you cannot initiate a new vault lock for the vault.

You can stop the vault locking process by calling [Abort Vault Lock \(DELETE lock-policy\)](#) (p. 180). You can get the state of the vault lock by calling [Get Vault Lock \(GET lock-policy\)](#) (p. 200). For more information about the vault locking process, see [Amazon S3 Glacier Vault Lock](#) (p. 65).

If this operation is called when the vault lock is in the `InProgress` state, the operation returns an `AccessDeniedException` error. When the vault lock is in the `InProgress` state you must call [Abort Vault Lock \(DELETE lock-policy\)](#) (p. 180) before you can initiate a new vault lock policy.

Requests

To initiate the vault locking process, send an HTTP `POST` request to the URI of the `lock-policy` subresource of the vault, as shown in the following syntax example.

Syntax

```
POST /AccountId/vaults/vaultName/lock-policy HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
Content-Length: Length
x-amz-glacier-version: 2012-06-01

{
  "Policy": "string"
}
```

Note

The `AccountId` value is the AWS account ID. This value must match the AWS account ID associated with the credentials used to sign the request. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you specify your account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers](#) (p. 160).

Request Body

The request body contains the following JSON fields.

Policy

The vault lock policy as a JSON string, which uses `"\"` as an escape character.

Type: String

Required: Yes

Responses

Amazon S3 Glacier (S3 Glacier) returns an HTTP 201 Created response, if the policy is accepted.

Syntax

```
HTTP/1.1 201 Created
x-amzn-RequestId: x-amzn-RequestId
Date: Date
x-amz-lock-id: lockId
```

Response Headers

A successful response includes the following response headers, in addition to the response headers that are common to all operations. For more information about common response headers, see [Common Response Headers](#) (p. 162).

Name	Description
x-amz-lock-id	The lock ID, which is used to complete the vault locking process. Type: String

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses](#) (p. 176).

Examples

Example Request

The following example sends an HTTP PUT request to the URI of the vault's lock-policy subresource. The Policy JSON string uses "\" as an escape character.

```
PUT /-/vaults/examplevault/lock-policy HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
Content-Length: length
x-amz-glacier-version: 2012-06-01

{"Policy":{"Version\":\"2012-10-17\",\"Statement\":[{\"Sid\":\"Define-vault-lock\",
\"Effect\":\"Deny\",\"Principal\":{\"AWS\":\"arn:aws:iam::999999999999:root\"},\"Action
\":\"glacier:DeleteArchive\",\"Resource\":\"arn:aws:glacier:us-west-2:999999999999:vaults/
```

```
examplevault\", \"Condition\": { \"NumericLessThanEquals\": { \"glacier:ArchiveAgeInDays\":  
  \"365\" } } } ] } }
```

Example Response

If the request was successful, S3 Glacier returns an HTTP 201 Created response, as shown in the following example.

```
HTTP/1.1 201 Created  
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q  
Date: Wed, 10 Feb 2017 12:02:00 GMT  
x-amz-lock-id: AE863rKkWZU53SLW5be4DUcW
```

Related Sections

- [Abort Vault Lock \(DELETE lock-policy\) \(p. 180\)](#)
- [Complete Vault Lock \(POST lockId\) \(p. 187\)](#)
- [Get Vault Lock \(GET lock-policy\) \(p. 200\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

List Tags For Vault (GET tags)

This operation lists all the tags attached to a vault. The operation returns an empty map if there are no tags. For more information about tags, see [Tagging Amazon S3 Glacier Resources \(p. 155\)](#).

Request Syntax

To list the tags for a vault, send an HTTP GET request to the tags URI as shown in the following syntax example.

```
GET /AccountId/vaults/vaultName/tags HTTP/1.1  
Host: glacier.Region.amazonaws.com  
Date: Date  
Authorization: SignatureValue  
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID. This value must match the AWS account ID associated with the credentials used to sign the request. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you specify your account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

This operation does not have a request body.

Responses

If the operation is successful, the service sends back an HTTP 200 OK response.

Response Syntax

```
HTTP/1.1 200 OK
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Content-Type: application/json
Content-Length: Length
{
  "Tags":
  {
    "string" : "string",
    "string" : "string"
  }
}
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

The response body contains the following JSON fields.

Tags

The tags attached to the vault. Each tag is composed of a key and a value.

Type: String to String map

Required: Yes

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

Example: List Tags For a Vault

The following example lists the tags for a vault.

Example Request

In this example, a GET request is sent to retrieve a list of tags from the specified vault.

```
GET /-/vaults/examplevault/tags HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

If the request was successful, Amazon S3 Glacier (S3 Glacier) returns a HTTP 200 OK with a list of tags for the vault as shown in the following example.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:02:00 GMT
Content-Type: application/json
Content-Length: length

{
  "Tags",
  {
    "examplekey1": "examplevalue1",
    "examplekey2": "examplevalue2"
  }
}
```

Related Sections

- [Add Tags To Vault \(POST tags add\) \(p. 182\)](#)
- [Remove Tags From Vault \(POST tags remove\) \(p. 215\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

List Vaults (GET vaults)

Description

This operation lists all vaults owned by the calling user's account. The list returned in the response is ASCII-sorted by vault name.

By default, this operation returns up to 10 items per request. If there are more vaults to list, the `marker` field in the response body contains the vault Amazon Resource Name (ARN) at which to continue the list with a new List Vaults request; otherwise, the `marker` field is `null`. In your next List Vaults request you set the `marker` parameter to the value Amazon S3 Glacier (S3 Glacier) returned in the responses to your previous List Vaults request. You can also limit the number of vaults returned in the response by specifying the `limit` parameter in the request.

Requests

To get a list of vaults, you send a `GET` request to the *vaults* resource.

Syntax

```
GET /AccountId/vaults HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The *AccountId* value is the AWS account ID. This value must match the AWS account ID associated with the credentials used to sign the request. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you specify your account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation uses the following request parameters.

Name	Description	Required
<code>limit</code>	The maximum number of vaults to be returned. The default limit is 10. The number of vaults returned might be fewer than the specified limit, but the number of returned vaults never exceeds the limit. Type: String Constraints: Minimum integer value of 1. Maximum integer value of 10.	No
<code>marker</code>	A string used for pagination. <code>marker</code> specifies the vault ARN after which the listing of vaults should begin. (The vault specified by <code>marker</code> is not included in the returned list.) Get the <code>marker</code> value from a previous List Vaults response. You need to include the <code>marker</code> only if you are continuing the pagination of results started in a previous List Vaults request. Specifying an empty value ("") for the marker returns a list of vaults starting from the first vault. Type: String Constraints: None	No

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

This operation does not have a request body.

Responses

Syntax

```
HTTP/1.1 200 OK
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Content-Type: application/json
Content-Length: Length

{
  "Marker": String
  "VaultList": [
    {
      "CreationDate": String,
      "LastInventoryDate": String,
      "NumberOfArchives": Number,
      "SizeInBytes": Number,
      "VaultARN": String,
      "VaultName": String
    },
    ...
  ]
}
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

The response body contains the following JSON fields.

CreationDate

The date the vault was created, in Coordinated Universal Time (UTC).

Type: String. A string representation in the ISO 8601 date format, for example
2013-03-20T17:03:43.221Z.

LastInventoryDate

The date of the last vault inventory, in Coordinated Universal Time (UTC). This field can be null if an inventory has not yet run on the vault, for example, if you just created the vault. For information about initiating an inventory for a vault, see [Initiate Job \(POST jobs\) \(p. 263\)](#).

Type: A string representation in the ISO 8601 date format, for example
2013-03-20T17:03:43.221Z.

Marker

The vaultARN that represents where to continue pagination of the results. You use the marker in another List Vaults request to obtain more vaults in the list. If there are no more vaults, this value is null.

Type: String

NumberOfArchives

The number of archives in the vault as of the last inventory date.

Type: Number

SizeInBytes

The total size, in bytes, of all the archives in the vault including any per-archive overhead, as of the last inventory date.

Type: Number

VaultARN

The Amazon Resource Name (ARN) of the vault.

Type: String

VaultList

An array of objects, with each object providing a description of a vault.

Type: Array

VaultName

The vault name.

Type: String

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses](#) (p. 176).

Examples

Example: List All Vaults

The following example lists vaults. Because the `marker` and `limit` parameters are not specified in the request, up to 10 vaults are returned.

Example Request

```
GET /-/vaults HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

The `Marker` is `null` indicating there are no more vaults to list.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q
Date: Wed, 10 Feb 2017 12:02:00 GMT
Content-Type: application/json
Content-Length: 497

{
  "Marker": null,
  "VaultList": [
    {
      "CreationDate": "2012-03-16T22:22:47.214Z",
      "LastInventoryDate": "2012-03-21T22:06:51.218Z",
```

```

    "NumberOfArchives": 2,
    "SizeInBytes": 12334,
    "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault1",
    "VaultName": "examplevault1"
  },
  {
    "CreationDate": "2012-03-19T22:06:51.218Z",
    "LastInventoryDate": "2012-03-21T22:06:51.218Z",
    "NumberOfArchives": 0,
    "SizeInBytes": 0,
    "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault2",
    "VaultName": "examplevault2"
  },
  {
    "CreationDate": "2012-03-19T22:06:51.218Z",
    "LastInventoryDate": "2012-03-25T12:14:31.121Z",
    "NumberOfArchives": 0,
    "SizeInBytes": 0,
    "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault3",
    "VaultName": "examplevault3"
  }
]
}

```

Example: Partial List of Vaults

The following example returns two vaults starting at the vault specified by the marker.

Example Request

```

GET /-/vaults?limit=2&marker=arn:aws:glacier:us-west-2:012345678901:vaults/examplevault1
HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2

```

Example Response

Two vaults are returned in the list. The Marker contains the vault ARN to continue pagination in another List Vaults request.

```

HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:02:00 GMT
Content-Type: application/json
Content-Length: 497

{
  "Marker": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault3",
  "VaultList": [
    {
      "CreationDate": "2012-03-16T22:22:47.214Z",
      "LastInventoryDate": "2012-03-21T22:06:51.218Z",
      "NumberOfArchives": 2,
      "SizeInBytes": 12334,
      "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault1",
      "VaultName": "examplevault1"
    },
    {

```

```
"CreationDate": "2012-03-19T22:06:51.218Z",  
"LastInventoryDate": "2012-03-21T22:06:51.218Z",  
"NumberOfArchives": 0,  
"SizeInBytes": 0,  
"VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault2",  
"VaultName": "examplevault2"  
}  
]  
}
```

Related Sections

- [Create Vault \(PUT vault\) \(p. 185\)](#)
- [Delete Vault \(DELETE vault\) \(p. 189\)](#)
- [Initiate Job \(POST jobs\) \(p. 263\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Remove Tags From Vault (POST tags remove)

This operation removes one or more tags from the set of tags attached to a vault. For more information about tags, see [Tagging Amazon S3 Glacier Resources \(p. 155\)](#).

This operation is idempotent. The operation will be successful, even if there are no tags attached to the vault.

Request Syntax

To remove tags from a vault, send an HTTP POST request to the tags URI as shown in the following syntax example.

```
POST /AccountId/vaults/vaultName/tags?operation=remove HTTP/1.1  
Host: glacier.Region.amazonaws.com  
Date: Date  
Authorization: SignatureValue  
Content-Length: Length  
x-amz-glacier-version: 2012-06-01  
{  
  "TagKeys": [  
    "string",  
    "string"  
  ]  
}
```

Note

The `AccountId` value is the AWS account ID. This value must match the AWS account ID associated with the credentials used to sign the request. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you specify your account ID, do not include any hyphens ('-') in the ID.

Request Parameters

Name	Description	Required
operation=remove	A single query string parameter operation with a value of remove to distinguish it from Add Tags To Vault (POST tags add) (p. 182).	Yes

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers](#) (p. 160).

Request Body

The request body contains the following JSON fields.

TagKeys

A list of tag keys. Each corresponding tag is removed from the vault.

Type: array of Strings

Length constraint: Minimum of 1 item in the list. Maximum of 10 items in the list.

Required: Yes

Responses

If the action is successful, the service sends back an HTTP 204 No Content response with an empty HTTP body.

Syntax

```
HTTP/1.1 204 No Content
x-amzn-RequestId: x-amzn-RequestId
Date: Date
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers](#) (p. 162).

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses](#) (p. 176).

Examples

Example Request

The following example sends an HTTP POST request to remove the specified tags.

```
POST /-/vaults/examplevault/tags?operation=remove HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
Content-Length: length
x-amz-glacier-version: 2012-06-01

{
  "TagsKeys": [
    "examplekey1",
    "examplekey2"
  ]
}
```

Example Response

If the request was successful Amazon S3 Glacier (S3 Glacier) returns a HTTP 204 No Content as shown in the following example.

```
HTTP/1.1 204 No Content
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:02:00 GMT
```

Related Sections

- [Add Tags To Vault \(POST tags add\) \(p. 182\)](#)
- [List Tags For Vault \(GET tags\) \(p. 208\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Set Vault Access Policy (PUT access-policy)

Description

This operation configures an access policy for a vault and will overwrite an existing policy. To configure a vault access policy, send a PUT request to the `access-policy` subresource of the vault. You can set one access policy per vault and the policy can be up to 20 KB in size. For more information about vault access policies, see [Amazon S3 Glacier Access Control with Vault Access Policies \(p. 134\)](#).

Requests

Syntax

To set a vault access policy, send an HTTP PUT request to the URI of the vault's `access-policy` subresource as shown in the following syntax example.

```
PUT /AccountId/vaults/vaultName/access-policy HTTP/1.1
```



```
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
Content-Length: Length
x-amz-glacier-version: 2012-06-01
```

```
{
  "Policy": "string"
}
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

The request body contains the following JSON fields.

Policy

The vault access policy as a JSON string, which uses "\" as an escape character.

Type: String

Required: Yes

Responses

In response, S3 Glacier returns 204 No Content if the policy is accepted.

Syntax

```
HTTP/1.1 204 No Content
x-amzn-RequestId: x-amzn-RequestId
Date: Date
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

Example Request

The following example sends an HTTP PUT request to the URI of the vault's access-policy subresource. The Policy JSON string uses "\" as an escape character.

```
PUT /-/vaults/examplevault/access-policy HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
Content-Length: length
x-amz-glacier-version: 2012-06-01

{"Policy":{"Version\":\"2012-10-17\",\"Statement\":[{\"Sid\":\"Define-owner-access-rights
\",\"Effect\":\"Allow\",\"Principal\":{\"AWS\":\"arn:aws:iam:999999999999:root\"},\"Action
\":\"glacier:DeleteArchive\",\"Resource\":\"arn:aws:glacier:us-west-2:999999999999:vaults/
examplevault\"}]}}
```

Example Response

If the request was successful, Amazon S3 Glacier (S3 Glacier) returns a HTTP 204 No Content as shown in the following example.

```
HTTP/1.1 204 No Content
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:02:00 GMT
```

Related Sections

- [Delete Vault Access Policy \(DELETE access-policy\) \(p. 191\)](#)
- [Get Vault Access Policy \(GET access-policy\) \(p. 197\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Set Vault Notification Configuration (PUT notification-configuration)

Description

Retrieving an archive and a vault inventory are asynchronous operations in Amazon S3 Glacier (S3 Glacier) for which you must first initiate a job and wait for the job to complete before you can download the job output. You can configure a vault to post a message to an Amazon Simple Notification Service (Amazon SNS) topic when these jobs complete. You can use this operation to set notification configuration on the vault. For more information, see [Configuring Vault Notifications in Amazon S3 Glacier \(p. 51\)](#).

To configure vault notifications, send a PUT request to the `notification-configuration` subresource of the vault. A notification configuration is specific to a vault; therefore, it is also referred to as a vault subresource. The request should include a JSON document that provides an Amazon Simple Notification Service (Amazon SNS) topic and the events for which you want S3 Glacier to send notifications to the topic.

You can configure a vault to publish a notification for the following vault events:

- **ArchiveRetrievalCompleted**— This event occurs when a job that was initiated for an archive retrieval is completed ([Initiate Job \(POST jobs\) \(p. 263\)](#)). The status of the completed job can be `Succeeded` or `Failed`. The notification sent to the SNS topic is the same output as returned from [Describe Job \(GET JobID\) \(p. 250\)](#).
- **InventoryRetrievalCompleted**— This event occurs when a job that was initiated for an inventory retrieval is completed ([Initiate Job \(POST jobs\) \(p. 263\)](#)). The status of the completed job can be `Succeeded` or `Failed`. The notification sent to the SNS topic is the same output as returned from [Describe Job \(GET JobID\) \(p. 250\)](#).

Amazon SNS topics must grant permission to the vault to be allowed to publish notifications to the topic.

Requests

To set notification configuration on your vault, send a PUT request to the URI of the vault's `notification-configuration` subresource. You specify the configuration in the request body. The configuration includes the Amazon SNS topic name and an array of events that trigger notification to each topic.

Syntax

```
PUT /AccountId/vaults/VaultName/notification-configuration HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01

{
  "SNSTopic": String,
  "Events": [String, ...]
}
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

The JSON in the request body contains the following fields.

Events

An array of one or more events for which you want S3 Glacier to send notification.

Valid Values: ArchiveRetrievalCompleted | InventoryRetrievalCompleted

Required: yes

Type: Array

SNSTopic

The Amazon SNS topic ARN. For more information, go to [Getting Started with Amazon SNS](#) in the *Amazon Simple Notification Service Getting Started Guide*.

Required: yes

Type: String

Responses

In response, Amazon S3 Glacier (S3 Glacier) returns 204 No Content if the notification configuration is accepted.

Syntax

```
HTTP/1.1 204 No Content
x-amzn-RequestId: x-amzn-RequestId
Date: Date
```

Response Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers](#) (p. 160).

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses](#) (p. 176).

Examples

The following example demonstrates how to configure vault notification.

Example Request

The following request sets the `examplevault` notification configuration so that notifications for two events (`ArchiveRetrievalCompleted` and `InventoryRetrievalCompleted`) are sent to the Amazon SNS topic `arn:aws:sns:us-west-2:012345678901:mytopic`.

```
PUT /-/vaults/examplevault/notification-policy HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

```
{
  "Events": ["ArchiveRetrievalCompleted", "InventoryRetrievalCompleted"],
  "SNSTopic": "arn:aws:sns:us-west-2:012345678901:mytopic"
}
```

Example Response

A successful response returns a 204 No Content.

```
HTTP/1.1 204 No Content
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
```

Related Sections

- [Get Vault Notifications \(GET notification-configuration\) \(p. 203\)](#)
- [Delete Vault Notifications \(DELETE notification-configuration\) \(p. 193\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)

Archive Operations

The following are the archive operations available for use in S3 Glacier.

Topics

- [Delete Archive \(DELETE archive\) \(p. 222\)](#)
- [Upload Archive \(POST archive\) \(p. 224\)](#)

Delete Archive (DELETE archive)

Description

This operation deletes an archive from a vault. You can delete one archive at a time from a vault. To delete the archive you must provide its archive ID in the delete request. You can get the archive ID by downloading the vault inventory for the vault that contains the archive. For more information about downloading the vault inventory, see [Downloading a Vault Inventory in Amazon S3 Glacier \(p. 37\)](#).

After you delete an archive, you might still be able to make a successful request to initiate a job to retrieve the deleted archive, but the archive retrieval job will fail.

Archive retrievals that are in progress for an archive ID when you delete the archive might or might not succeed according to the following scenarios:

- If the archive retrieval job is actively preparing the data for download when Amazon S3 Glacier (S3 Glacier) receives the delete archive request, the archival retrieval operation might fail.

- If the archive retrieval job has successfully prepared the archive for download when S3 Glacier receives the delete archive request, you will be able to download the output.

For more information about archive retrieval, see [Downloading an Archive in Amazon S3 Glacier \(p. 83\)](#).

This operation is idempotent. Attempting to delete an already-deleted archive does not result in an error.

Requests

To delete an archive you send a `DELETE` request to the archive resource URI.

Syntax

```
DELETE /AccountId/vaults/VaultName/archives/ArchiveID HTTP/1.1
Host: glacier.Region.amazonaws.com
x-amz-Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

This operation does not have a request body.

Responses

Syntax

```
HTTP/1.1 204 No Content
x-amzn-RequestId: x-amzn-RequestId
Date: Date
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

The following example demonstrates how to delete an archive from the vault named `examplevault`.

Example Request

The ID of the archive to be deleted is specified as a subresource of `archives`.

```
DELETE /-/vaults/examplevault/archives/NkbByEejwEggmBz2fTHgJrg0XBoDfjP4q6iu87-  
TjhgG6eGoOY9Z8i1_AUyUsuhPAdTqLHy8pTl5nfCFJmDl2yEZONi5L26Omw12vcs01MNGntHEQL8MBfG1qrEXAMPLEArchiveId  
HTTP/1.1  
Host: glacier.us-west-2.amazonaws.com  
x-amz-Date: 20170210T120000Z  
x-amz-glacier-version: 2012-06-01  
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/  
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-  
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dc540091b12966f2a2
```

Example Response

If the request is successful, S3 Glacier responds with `204 No Content` to indicate that the archive is deleted.

```
HTTP/1.1 204 No Content  
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q  
Date: Wed, 10 Feb 2017 12:00:00 GMT
```

Related Sections

- [Initiate Multipart Upload \(POST multipart-uploads\) \(p. 233\)](#)
- [Upload Archive \(POST archive\) \(p. 224\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

Upload Archive (POST archive)

Description

This operation adds an archive to a vault. For a successful upload, your data is durably persisted. In response, Amazon S3 Glacier (S3 Glacier) returns the archive ID in the `x-amz-archive-id` header of the response. You should save the archive ID returned so that you can access the archive later.

You must provide a SHA256 tree hash of the data you are uploading. For information about computing a SHA256 tree hash, see [Computing Checksums \(p. 166\)](#).

When uploading an archive, you can optionally specify an archive description of up to 1,024 printable ASCII characters. S3 Glacier returns the archive description when you either retrieve the archive or get the vault inventory. S3 Glacier does not interpret the description in any way. An archive description does not need to be unique. You cannot use the description to retrieve or sort the archive list.

Except for the optional archive description, S3 Glacier does not support any additional metadata for the archives. The archive ID is an opaque sequence of characters from which you cannot infer any meaning about the archive. So you might maintain metadata about the archives on the client-side. For more information, see [Working with Archives in Amazon S3 Glacier \(p. 67\)](#).

Archives are immutable. After you upload an archive, you cannot edit the archive or its description.

Requests

To upload an archive, you use the HTTP `POST` method and scope the request to the archives subresource of the vault in which you want to save the archive. The request must include the archive payload size, checksum (SHA256 tree hash), and can optionally include a description of the archive.

Syntax

```
POST /AccountId/vaults/VaultName/archives
Host: glacier.Region.amazonaws.com
x-amz-glacier-version: 2012-06-01
Date: Date
Authorization: SignatureValue
x-amz-archive-description: Description
x-amz-sha256-tree-hash: SHA256 tree hash
x-amz-content-sha256: SHA256 linear hash
Content-Length: Length

<Request body.>
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This implementation of the operation does not use request parameters.

Request Headers

This operation uses the following request headers, in addition to the request headers that are common to all operations. For more information about the common request headers, see [Common Request Headers](#) (p. 160).

Name	Description	Required
Content-Length	The size of the object, in bytes. For more information, go to http://www.w3.org/Protocols/rfc2616/rfc2616-sec14.html#sec14.13 . Type: Number Default: None Constraints: None	Yes
x-amz-archive-description	The optional description of the archive you are uploading. It can be a plain language description or some identifier you choose to assign. The description need not be unique across archives. When you retrieve a vault inventory (see Initiate Job (POST jobs) (p. 263)), it includes this description for each of the archives it returns in response. Type: String Default: None	No

Name	Description	Required
	Constraints: The description must be less than or equal to 1,024 characters. The allowable characters are 7-bit ASCII without control codes, specifically ASCII values 32—126 decimal or 0x20—0x7E hexadecimal.	
x-amz-content-sha256	<p>The SHA256 checksum (a linear hash) of the payload. This is not the same value as you specify in the x-amz-sha256-tree-hash header.</p> <p>Type: String</p> <p>Default: None</p> <p>Constraints: None</p>	Yes
x-amz-sha256-tree-hash	<p>The user-computed checksum, SHA256 tree hash, of the payload. For information on computing the SHA256 tree hash, see Computing Checksums (p. 166). If S3 Glacier computes a different checksum of the payload, it will reject the request.</p> <p>Type: String</p> <p>Default: None</p> <p>Constraints: None</p>	Yes

Request Body

The request body contains the data to upload.

Responses

In response, S3 Glacier durably stores the archive and returns a URI path to the archive ID.

Syntax

```
HTTP/1.1 201 Created
x-amzn-RequestId: x-amzn-RequestId
Date: Date
x-amz-sha256-tree-hash: ChecksumComputedByAmazonGlacier
Location: Location
x-amz-archive-id: ArchiveId
```

Response Headers

A successful response includes the following response headers, in addition to the response headers that are common to all operations. For more information about common response headers, see [Common Response Headers \(p. 162\)](#).

Name	Description
Location	<p>The relative URI path of the newly added archive resource.</p> <p>Type: String</p>

Name	Description
x-amz-archive-id	The ID of the archive. This value is also included as part of the Location header. Type: String
x-amz-sha256-tree-hash	The checksum of the archive computed by S3 Glacier. Type: String

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

Example Request

The following example shows a request to upload an archive.

```
POST /-/vaults/examplevault/archives HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-sha256-tree-hash: beb0fe31a1c7ca8c6c04d574ea906e3f97b31fdca7571defb5b44dca89b5af60
x-amz-content-sha256: 7f2fe580edb35154041fa3d4b41dd6d3adaef0c85d2ff6309f1d4b520eeecda3
Content-Length: 2097152
x-amz-glacier-version: 2012-06-01
Authorization: Authorization=AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-content-sha256;x-amz-date;x-amz-
glacier-version,Signature=16b9a9e220a37e32f2e7be196b4ebb87120ca7974038210199ac5982e792cace

<Request body (2097152 bytes).>
```

Example Response

The successful response below has a Location header where you can get the ID that S3 Glacier assigned to the archive.

```
HTTP/1.1 201 Created
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
x-amz-sha256-tree-hash: beb0fe31a1c7ca8c6c04d574ea906e3f97b31fdca7571defb5b44dca89b5af60
Location: /111122223333/vaults/examplevault/archives/
NkbByEejwEggmBz2fTHgJrg0XBoDfjP4q6iu87-
TjhqG6eGoOY9Z8i1_AUyUsuhPAdTqLHy8pTl5nfcFJmDl2yEZONi5L26Omw12vcs01MNGntHEQL8MBfG1qrEXAMPLEArchiveId
x-amz-archive-id: NkbByEejwEggmBz2fTHgJrg0XBoDfjP4q6iu87-
TjhqG6eGoOY9Z8i1_AUyUsuhPAdTqLHy8pTl5nfcFJmDl2yEZONi5L26Omw12vcs01MNGntHEQL8MBfG1qrEXAMPLEArchiveId
```

Related Sections

- [Working with Archives in Amazon S3 Glacier \(p. 67\)](#)
- [Uploading Large Archives in Parts \(Multipart Upload\) \(p. 75\)](#)

- [Delete Archive \(DELETE archive\) \(p. 222\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

Multipart Upload Operations

The following are the multipart upload operations available for use in S3 Glacier.

Topics

- [Abort Multipart Upload \(DELETE uploadID\) \(p. 228\)](#)
- [Complete Multipart Upload \(POST uploadID\) \(p. 230\)](#)
- [Initiate Multipart Upload \(POST multipart-uploads\) \(p. 233\)](#)
- [List Parts \(GET uploadID\) \(p. 236\)](#)
- [List Multipart Uploads \(GET multipart-uploads\) \(p. 241\)](#)
- [Upload Part \(PUT uploadID\) \(p. 246\)](#)

Abort Multipart Upload (DELETE uploadID)

Description

This multipart upload operation stops a multipart upload identified by the upload ID.

After the Abort Multipart Upload request succeeds, you cannot use the upload ID to upload any more parts or perform any other operations. Stopping a completed multipart upload fails. However, stopping an already-stopped upload will succeed, for a short time.

This operation is idempotent.

For information about multipart upload, see [Uploading Large Archives in Parts \(Multipart Upload\) \(p. 75\)](#).

Requests

To stop a multipart upload, send an HTTP DELETE request to the URI of the multipart-uploads subresource of the vault and identify the specific multipart upload ID as part of the URI.

Syntax

```
DELETE /AccountId/vaults/VaultName/multipart-uploads/uploadID HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The AccountId value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

This operation does not have a request body.

Responses

Syntax

```
HTTP/1.1 204 No Content
x-amzn-RequestId: x-amzn-RequestId
Date: Date
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Example

Example Request

In the following example, a DELETE request is sent to the URI of a multipart upload ID resource.

```
DELETE /-/vaults/examplevault/multipart-uploads/
OW2fM5iVylEpFEMM9_HpKowRapC3vn5sSL39_396UW9zLFUWVrnRHaPjUJddQ50xSHVXjYtrN47NBZ-
khxOjyEXAMPLE HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

```
HTTP/1.1 204 No Content
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
```

Related Sections

- [Initiate Multipart Upload \(POST multipart-uploads\) \(p. 233\)](#)
- [Upload Part \(PUT uploadID\) \(p. 246\)](#)

- [Complete Multipart Upload \(POST uploadID\)](#) (p. 230)
- [List Multipart Uploads \(GET multipart-uploads\)](#) (p. 241)
- [List Parts \(GET uploadID\)](#) (p. 236)
- [Uploading Large Archives in Parts \(Multipart Upload\)](#) (p. 75)
- [Identity and Access Management in Amazon S3 Glacier](#) (p. 125)

Complete Multipart Upload (POST uploadID)

Description

You call this multipart upload operation to inform Amazon S3 Glacier (S3 Glacier) that all the archive parts have been uploaded and S3 Glacier can now assemble the archive from the uploaded parts.

For information about multipart upload, see [Uploading Large Archives in Parts \(Multipart Upload\)](#) (p. 75).

After assembling and saving the archive to the vault, S3 Glacier returns the archive ID of the newly created archive resource. After you upload an archive, you should save the archive ID returned to retrieve the archive at a later point.

In the request, you must include the computed SHA256 tree hash of the entire archive you have uploaded. For information about computing a SHA256 tree hash, see [Computing Checksums](#) (p. 166). On the server side, S3 Glacier also constructs the SHA256 tree hash of the assembled archive. If the values match, S3 Glacier saves the archive to the vault; otherwise, it returns an error, and the operation fails. The [List Parts \(GET uploadID\)](#) (p. 236) operation returns list of parts uploaded for a specific multipart upload. It includes checksum information for each uploaded part that can be used to debug a bad checksum issue.

Additionally, S3 Glacier also checks for any missing content ranges. When uploading parts, you specify range values identifying where each part fits in the final assembly of the archive. When assembling the final archive S3 Glacier checks for any missing content ranges and if there are any missing content ranges, S3 Glacier returns an error and the Complete Multipart Upload operation fails.

Complete Multipart Upload is an idempotent operation. After your first successful complete multipart upload, if you call the operation again within a short period, the operation will succeed and return the same archive ID. This is useful in the event you experience a network issue or receive a 500 server error, in which case you can repeat your Complete Multipart Upload request and get the same archive ID without creating duplicate archives. Note, however, that after the multipart upload completes, you cannot call the List Parts operation and the multipart upload will not appear in List Multipart Uploads response, even if idempotent complete is possible.

Requests

To complete a multipart upload, you send an HTTP POST request to the URI of the upload ID that S3 Glacier created in response to your Initiate Multipart Upload request. This is the same URI you used when uploading parts. In addition to the common required headers, you must include the result of the SHA256 tree hash of the entire archive and the total size of the archive in bytes.

Syntax

```
POST /AccountId/vaults/VaultName/multipart-uploads/uploadID
Host: glacier.Region.amazonaws.com
Date: date
Authorization: SignatureValue
x-amz-sha256-tree-hash: SHA256 tree hash of the archive
x-amz-archive-size: ArchiveSize in bytes
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses the following request headers, in addition to the request headers that are common to all operations. For more information about the common request headers, see [Common Request Headers](#) (p. 160).

Name	Description	Required
<code>x-amz-archive-size</code>	The total size, in bytes, of the entire archive. This value should be the sum of all the sizes of the individual parts that you uploaded. Type: String Default: None Constraints: None	Yes
<code>x-amz-sha256-tree-hash</code>	The SHA256 tree hash of the entire archive. It is the tree hash of SHA256 tree hash of the individual parts. If the value you specify in the request does not match the SHA256 tree hash of the final assembled archive as computed by S3 Glacier, S3 Glacier returns an error and the request fails. Type: String Default: None Constraints: None	Yes

Request Elements

This operation does not use request elements.

Responses

Amazon S3 Glacier (S3 Glacier) creates a SHA256 tree hash of the entire archive. If the value matches the SHA256 tree hash of the entire archive you specified in the request, S3 Glacier adds the archive to the vault. In response it returns the `HTTP Location` header with the URL path of the newly added archive resource. If the archive size or SHA256 that you sent in the request does not match, S3 Glacier will return an error and the upload remains in the incomplete state. It is possible to retry the Complete Multipart Upload operation later with correct values, at which point you can successfully create an archive. If a multipart upload does not complete, then eventually S3 Glacier will reclaim the upload ID.

Syntax

```
HTTP/1.1 201 Created
```

```
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Location: Location
x-amz-archive-id: ArchiveId
```

Response Headers

A successful response includes the following response headers, in addition to the response headers that are common to all operations. For more information about common response headers, see [Common Response Headers \(p. 162\)](#).

Name	Description
Location	The relative URI path of the newly created archive. This URL includes the archive ID that is generated by S3 Glacier. Type: String
x-amz-archive-id	The ID of the archive. This value is also included as part of the Location header. Type: String

Response Fields

This operation does not return a response body.

Example

Example Request

In this example, an HTTP POST request is sent to the URI that was returned by an Initiate Multipart Upload request. The request specifies both the SHA256 tree hash of the entire archive and the total archive size.

```
POST /-/vaults/examplevault/multipart-uploads/
OW2fM5iVylEpFEMM9_HpKowRapC3vn5sSL39_396UW9zLFUWVrnRHaPjUJddQ50xSHVXjYtrN47NBZ-
khxOjyEXAMPLE HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
z-amz-Date: 20170210T120000Z
x-amz-sha256-tree-hash:1ffc0f54dd5fdd66b62da70d25edacd0
x-amz-archive-size:8388608
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

The following example response shows that S3 Glacier successfully created an archive from the parts you uploaded. The response includes the archive ID with complete path.

```
HTTP/1.1 201 Created
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Location: /11112223333/vaults/examplevault/archives/
NkbByEejwEggmBz2fTHgJrg0XBoDfjP4q6iu87-
TjhqG6eGoY9Z8i1_AuyUshpAdTqLHy8pTl5nfCFJmDl2yEZONi5L26Omw12vcs01MNGntHEQL8MBfG1qrEXAMPLEArchiveId
```

```
x-amz-archive-id: NkbByEejwEggmBz2fTHgJrg0XBoDfjP4q6iu87-  
TjhqG6eGoOY9Z8i1_AUyUsuhPAdTqLHy8pTl5nfCFJmDl2yEZONi5L26Omwl2vcs01MNGntHEQL8MBfG1qrEXAMPLEArchiveId
```

You can now send HTTP requests to the URI of the newly added resource/archive. For example, you can send a GET request to retrieve the archive.

Related Sections

- [Initiate Multipart Upload \(POST multipart-uploads\) \(p. 233\)](#)
- [Upload Part \(PUT uploadID\) \(p. 246\)](#)
- [Abort Multipart Upload \(DELETE uploadID\) \(p. 228\)](#)
- [List Multipart Uploads \(GET multipart-uploads\) \(p. 241\)](#)
- [List Parts \(GET uploadID\) \(p. 236\)](#)
- [Uploading Large Archives in Parts \(Multipart Upload\) \(p. 75\)](#)
- [Delete Archive \(DELETE archive\) \(p. 222\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

Initiate Multipart Upload (POST multipart-uploads)

Description

This operation initiates a multipart upload (see [Uploading Large Archives in Parts \(Multipart Upload\) \(p. 75\)](#)). Amazon S3 Glacier (S3 Glacier) creates a multipart upload resource and returns its ID in the response. You use this Upload ID in subsequent multipart upload operations.

When you initiate a multipart upload, you specify the part size in number of bytes. The part size must be a megabyte (1024 KB) multiplied by a power of 2—for example, 1048576 (1 MB), 2097152 (2 MB), 4194304 (4 MB), 8388608 (8 MB), and so on. The minimum allowable part size is 1 MB, and the maximum is 4 GB.

Every part you upload using this upload ID, except the last one, must have the same size. The last one can be the same size or smaller. For example, suppose you want to upload a 16.2 MB file. If you initiate the multipart upload with a part size of 4 MB, you will upload four parts of 4 MB each and one part of 0.2 MB.

Note

You don't need to know the size of the archive when you start a multipart upload because S3 Glacier does not require you to specify the overall archive size.

After you complete the multipart upload, S3 Glacier removes the multipart upload resource referenced by the ID. S3 Glacier will also remove the multipart upload resource if you cancel the multipart upload or it may be removed if there is no activity for a period of 24 hours. The ID may still be available after 24 hours, but applications should not expect this behavior.

Requests

To initiate a multipart upload, you send an HTTP POST request to the URI of the `multipart-uploads` subresource of the vault in which you want to save the archive. The request must include the part size and can optionally include a description of the archive.

Syntax

```
POST /AccountId/vaults/VaultName/multipart-uploads
```



```
Host: glacier.us-west-2.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
x-amz-archive-description: ArchiveDescription
x-amz-part-size: PartSize
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses the following request headers, in addition to the request headers that are common to all operations. For more information about the common request headers, see [Common Request Headers](#) (p. 160).

Name	Description	Required
x-amz-part-size	<p>The size of each part except the last, in bytes. The last part can be smaller than this part size.</p> <p>Type: String</p> <p>Default: None</p> <p>Constraints: The part size must be a megabyte (1024 KB) multiplied by a power of 2—for example, 1048576 (1 MB), 2097152 (2 MB), 4194304 (4 MB), 8388608 (8 MB), and so on. The minimum allowable part size is 1 MB, and the maximum is 4 GB (4096 MB).</p>	Yes
x-amz-archive-description	<p>Archive description you are uploading in parts. It can be a plain-language description or some unique identifier you choose to assign. When you retrieve a vault inventory (see Initiate Job (POST jobs) (p. 263)), the inventory includes this description for each of the archives it returns in response. Leading whitespace in archive descriptions is removed.</p> <p>Type: String</p> <p>Default: None</p> <p>Constraints: The description must be less than or equal to 1024 bytes. The allowable characters are 7 bit ASCII without control codes, specifically ASCII values 32-126 decimal or 0x20-0x7E hexadecimal.</p>	No

Request Body

This operation does not have a request body.

Responses

In the response, S3 Glacier creates a multipart upload resource identified by an ID and returns the relative URI path of the multipart upload ID.

Syntax

```
HTTP/1.1 201 Created
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Location: Location
x-amz-multipart-upload-id: multiPartUploadId
```

Response Headers

A successful response includes the following response headers, in addition to the response headers that are common to all operations. For more information about common response headers, see [Common Response Headers](#) (p. 162).

Name	Description
Location	The relative URI path of the multipart upload ID S3 Glacier created. You use this URI path to scope your requests to upload parts, and to complete the multipart upload. Type: String
x-amz-multipart-upload-id	The ID of the multipart upload. This value is also included as part of the Location header. Type: String

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses](#) (p. 176).

Example

Example Request

The following example initiates a multipart upload by sending an HTTP `POST` request to the URI of the `multipart-uploads` subresource of a vault named `examplevault`. The request includes headers to specify the part size of 4 MB (4194304 bytes) and the optional archive description.

```
POST /-/vaults/examplevault/multipart-uploads
Host: glacier.us-west-2.amazonaws.com
```

```
x-amz-Date: 20170210T120000Z
x-amz-archive-description: MyArchive-101
x-amz-part-size: 4194304
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dc540091b12966f2a2
```

Example Response

S3 Glacier creates a multipart upload resource and adds it to the `multipart-uploads` subresource of the vault. The `Location` response header includes the relative URI path to the multipart upload ID.

```
HTTP/1.1 201 Created
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Location: /11112223333/vaults/examplevault/multipart-uploads/
OW2fM5iVylEpFEMM9_HpKowRapC3vn5sSL39_396UW9zLFUWVrnRHApjUJddQ50xSHVXjYtrN47NBZ-
khxOjyEXAMPLE
x-amz-multipart-upload-id:
  OW2fM5iVylEpFEMM9_HpKowRapC3vn5sSL39_396UW9zLFUWVrnRHApjUJddQ50xSHVXjYtrN47NBZ-
khxOjyEXAMPLE
```

For information about uploading individual parts, see [Upload Part \(PUT uploadID\)](#) (p. 246).

Related Sections

- [Upload Part \(PUT uploadID\)](#) (p. 246)
- [Complete Multipart Upload \(POST uploadID\)](#) (p. 230)
- [Abort Multipart Upload \(DELETE uploadID\)](#) (p. 228)
- [List Multipart Uploads \(GET multipart-uploads\)](#) (p. 241)
- [List Parts \(GET uploadID\)](#) (p. 236)
- [Delete Archive \(DELETE archive\)](#) (p. 222)
- [Uploading Large Archives in Parts \(Multipart Upload\)](#) (p. 75)
- [Identity and Access Management in Amazon S3 Glacier](#) (p. 125)

List Parts (GET uploadID)

Description

This multipart upload operation lists the parts of an archive that have been uploaded in a specific multipart upload identified by an upload ID. For information about multipart upload, see [Uploading Large Archives in Parts \(Multipart Upload\)](#) (p. 75).

You can make this request at any time during an in-progress multipart upload before you complete the multipart upload. S3 Glacier returns the part list sorted by range you specified in each part upload. If you send a List Parts request after completing the multipart upload, Amazon S3 Glacier (S3 Glacier) returns an error.

The List Parts operation supports pagination. You should always check the `Marker` field in the response body for a marker at which to continue the list. If there are no more items the `marker` field is `null`. If the `marker` is not null, to fetch the next set of parts you sent another List Parts request with the `marker` request parameter set to the marker value S3 Glacier returned in response to your previous List Parts request.

You can also limit the number of parts returned in the response by specifying the `limit` parameter in the request.

Requests

Syntax

To list the parts of an in-progress multipart upload, you send a `GET` request to the URI of the multipart upload ID resource. The multipart upload ID is returned when you initiate a multipart upload ([Initiate Multipart Upload \(POST multipart-uploads\) \(p. 233\)](#)). You may optionally specify `marker` and `limit` parameters.

```
GET /AccountId/vaults/VaultName/multipart-uploads/uploadID HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

Name	Description	Required
<code>limit</code>	The maximum number of parts to be returned. The default limit is 50. The number of parts returned might be fewer than the specified limit, but the number of returned parts never exceeds the limit. Type: String Constraints: Minimum integer value of 1. Maximum integer value of 50.	No
<code>marker</code>	An opaque string used for pagination. <code>marker</code> specifies the part at which the listing of parts should begin. Get the <code>marker</code> value from the response of a previous List Parts response. You need only include the <code>marker</code> if you are continuing the pagination of results started in a previous List Parts request. Type: String Constraints: None	No

Request Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Request Body

This operation does not have a request body.

Responses

Syntax

```
HTTP/1.1 200 OK
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Content-Type: application/json
Content-Length: Length

{
  "ArchiveDescription" : String,
  "CreationDate" : String,
  "Marker": String,
  "MultipartUploadId" : String,
  "PartSizeInBytes" : Number,
  "Parts" :
  [ {
    "RangeInBytes" : String,
    "SHA256TreeHash" : String
  },
  ...
  ],
  "VaultARN" : String
}
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

The response body contains the following JSON fields.

ArchiveDescription

The description of the archive that was specified in the Initiate Multipart Upload request. This field is `null` if no archive description was specified in the Initiate Multipart Upload operation.

Type: String

CreationDate

The UTC time that the multipart upload was initiated.

Type: String. A string representation in the ISO 8601 date format, for example
2013-03-20T17:03:43.221Z.

Marker

An opaque string that represents where to continue pagination of the results. You use the `marker` in a new List Parts request to obtain more jobs in the list. If there are no more parts, this value is `null`.

Type: String

MultipartUploadId

The ID of the upload to which the parts are associated.

Type: String

PartSizeInBytes

The part size in bytes. This is the same value that you specified in the Initiate Multipart Upload request.

Type: Number

Parts

A list of the part sizes of the multipart upload. Each object in the array contains a `RangeBytes` and `sha256-tree-hash` name/value pair.

Type: Array

RangeInBytes

The byte range of a part, inclusive of the upper value of the range.

Type: String

SHA256TreeHash

The SHA256 tree hash value that S3 Glacier calculated for the part. This field is never `null`.

Type: String

VaultARN

The Amazon Resource Name (ARN) of the vault to which the multipart upload was initiated.

Type: String

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses](#) (p. 176).

Examples

Example: List Parts of a Multipart Upload

The following example lists all the parts of an upload. The example sends an HTTP `GET` request to the URI of the specific multipart upload ID of an in-progress multipart upload and returns up to 1,000 parts.

Example Request

```
GET /-/vaults/examplevault/multipart-uploads/  
OW2fM5iVylEpFEMM9_HpKowRapC3vn5sSL39_396UW9zLFUWVrnRHApjUJddQ50xSHVXjYtrN47NBZ-  
khxOjyEXAMPLE HTTP/1.1  
Host: glacier.us-west-2.amazonaws.com  
x-amz-Date: 20170210T120000Z  
x-amz-glacier-version: 2012-06-01  
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/  
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-  
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

In the response, S3 Glacier returns a list of uploaded parts associated with the specified multipart upload ID. In this example, there are only two parts. The returned `Marker` field is `null` indicating that there are no more parts of the multipart upload.

```
HTTP/1.1 200 OK
```

```
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Type: application/json
Content-Length: 412

{
  "ArchiveDescription" : "archive description",
  "CreationDate" : "2012-03-20T17:03:43.221Z",
  "Marker": null,
  "MultipartUploadId" :
    "OW2fM5iVylEpFEMM9_HpKowRapC3vn5sSL39_396UW9zLFUWVrnRHaPjUJddQ5OxSHVXjYtrN47NBZ-
    khxOjyEXAMPLE",
  "PartSizeInBytes" : 4194304,
  "Parts" :
    [ {
      "RangeInBytes" : "0-4194303",
      "SHA256TreeHash" : "01d34dabf7be316472c93b1ef80721f5d4"
    },
    {
      "RangeInBytes" : "4194304-8388607",
      "SHA256TreeHash" : "0195875365afda349fc21c84c099987164"
    }
  ],
  "VaultARN" : "arn:aws:glacier:us-west-2:012345678901:vaults/demo1-vault"
}
```

Example: List Parts of a Multipart Upload (Specify the Marker and the Limit Request Parameters)

The following example demonstrates how to use pagination to get a limited number of results. The example sends an HTTP GET request to the URI of the specific multipart upload ID of an in-progress multipart upload to return one part. A starting `marker` parameter specifies at which part to start the part list. You can get the marker value from the response of a previous request for a part list. Furthermore, in this example, the `limit` parameter is set to 1 and returns one part. Note that the `Marker` field is not null, indicating that there is at least one more part to obtain.

Example Request

```
GET /-/vaults/examplevault/multipart-uploads/
OW2fM5iVylEpFEMM9_HpKowRapC3vn5sSL39_396UW9zLFUWVrnRHaPjUJddQ5OxSHVXjYtrN47NBZ-
khxOjyEXAMPLE?marker=1001&limit=1 HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

In the response, S3 Glacier returns a list of uploaded parts that are associated with the specified in-progress multipart upload ID.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Type: text/json
Content-Length: 412

{
  "ArchiveDescription" : "archive description 1",
  "CreationDate" : "2012-03-20T17:03:43.221Z",
```

```
{
  "Marker": "MfgsKHVjbQ6EldVl72bn3_n5h2TaGZQUO-Qb3B9j3TITf7WajQ",
  "MultipartUploadId" :
  "OW2fM5iVylEpFEMM9_HpKowRapC3vn5sSL39_396UW9zLFUWVrnRHAPjUJddQ5OxSHVXjYtrN47NBZ-
  khxOjyEXAMPLE",
  "PartSizeInBytes" : 4194304,
  "Parts" :
  [ {
    "RangeInBytes" : "4194304-8388607",
    "SHA256TreeHash" : "01d34dabf7be316472c93b1ef80721f5d4"
  } ],
  "VaultARN" : "arn:aws:glacier:us-west-2:012345678901:vaults/demo1-vault"
}
```

Related Sections

- [Initiate Multipart Upload \(POST multipart-uploads\) \(p. 233\)](#)
- [Upload Part \(PUT uploadID\) \(p. 246\)](#)
- [Complete Multipart Upload \(POST uploadID\) \(p. 230\)](#)
- [Abort Multipart Upload \(DELETE uploadID\) \(p. 228\)](#)
- [List Multipart Uploads \(GET multipart-uploads\) \(p. 241\)](#)
- [Uploading Large Archives in Parts \(Multipart Upload\) \(p. 75\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

List Multipart Uploads (GET multipart-uploads)

Description

This multipart upload operation lists in-progress multipart uploads for the specified vault. An in-progress multipart upload is a multipart upload that has been initiated by an [Initiate Multipart Upload \(POST multipart-uploads\) \(p. 233\)](#) request, but has not yet been completed or stopped. The list returned in the List Multipart Upload response has no guaranteed order.

The List Multipart Uploads operation supports pagination. By default, this operation returns up to 50 multipart uploads in the response. You should always check the `marker` field in the response body for a marker at which to continue the list; if there are no more items the `marker` field is `null`.

If the `marker` is not null, to fetch the next set of multipart uploads you sent another List Multipart Uploads request with the `marker` request parameter set to the marker value Amazon S3 Glacier (S3 Glacier) returned in response to your previous List Multipart Uploads request.

Note the difference between this operation and the [List Parts \(GET uploadID\) \(p. 236\)](#) operation. The List Multipart Uploads operation lists all multipart uploads for a vault. The List Parts operation returns parts of a specific multipart upload identified by an Upload ID.

For information about multipart upload, see [Uploading Large Archives in Parts \(Multipart Upload\) \(p. 75\)](#).

Requests

Syntax

To list multipart uploads, send a GET request to the URI of the `multipart-uploads` subresource of the vault. You may optionally specify `marker` and `limit` parameters.

```
GET /AccountId/vaults/VaultName/multipart-uploads HTTP/1.1
Host: glacier.Region.amazonaws.com
```



```
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

Name	Description	Required
<code>limit</code>	Specifies the maximum number of uploads returned in the response body. If not specified, the List Uploads operation returns up to 50 uploads. Type: String Constraints: Minimum integer value of 1. Maximum integer value of 50.	No
<code>marker</code>	An opaque string used for pagination. <code>marker</code> specifies the upload at which the listing of uploads should begin. Get the <code>marker</code> value from a previous List Uploads response. You need only include the <code>marker</code> if you are continuing the pagination of results started in a previous List Uploads request. Type: String Constraints: None	No

Request Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Request Body

This operation does not have a request body.

Responses

Syntax

```
HTTP/1.1 200 OK
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Content-Type: application/json
Content-Length: Length

{
  "Marker": String,
  "UploadsList" : [
    {
      "ArchiveDescription": String,
```

```
    "CreationDate": String,  
    "MultipartUploadId": String,  
    "PartSizeInBytes": Number,  
    "VaultARN": String  
  },  
  ...  
]  
}
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers](#) (p. 162).

Response Body

The response body contains the following JSON fields.

ArchiveDescription

The description of the archive that was specified in the Initiate Multipart Upload request. This field is `null` if no archive description was specified in the Initiate Multipart Upload operation.

Type: String

CreationDate

The UTC time that the multipart upload was initiated.

Type: String. A string representation in the ISO 8601 date format, for example
`2013-03-20T17:03:43.221Z`.

Marker

An opaque string that represents where to continue pagination of the results. You use the `marker` in a new List Multipart Uploads request to obtain more uploads in the list. If there are no more uploads, this value is `null`.

Type: String

PartSizeInBytes

The part size specified in the [Initiate Multipart Upload \(POST multipart-uploads\)](#) (p. 233) request. This is the size of all the parts in the upload except the last part, which may be smaller than this size.

Type: Number

MultipartUploadId

The ID of the multipart upload.

Type: String

UploadsList

A list of metadata about multipart upload objects. Each item in the list contains a set of name-value pairs for the corresponding upload, including `ArchiveDescription`, `CreationDate`, `MultipartUploadId`, `PartSizeInBytes`, and `VaultARN`.

Type: Array

VaultARN

The Amazon Resource Name (ARN) of the vault that contains the archive.

Type: String

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses](#) (p. 176).

Examples

Example: List All Multipart Uploads

The following example lists all the multipart uploads in progress for the vault. The example shows an HTTP GET request to the URI of the multipart-uploads subresource of a specified vault. Because the marker and limit parameters are not specified in the request, up to 1,000 in-progress multipart uploads are returned.

Example Request

```
GET /-/vaults/examplevault/multipart-uploads HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

In the response S3 Glacier returns a list of all in-progress multipart uploads for the specified vault. The marker field is null, which indicates that there are no more uploads to list.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Type: application/json
Content-Length: 1054

{
  "Marker": null,
  "UploadsList": [
    {
      "ArchiveDescription": "archive 1",
      "CreationDate": "2012-03-19T23:20:59.130Z",
      "MultipartUploadId":
        "xsQdFIRsfJr20CW2AbZBKpRZAFTZSJIMtL2hYf8mvp8dM0m4RUzlaqoEye6g3h3ecqB_zqwB7zLDMeSWhwo65re4C4Ev",
      "PartSizeInBytes": 4194304,
      "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault"
    },
    {
      "ArchiveDescription": "archive 2",
      "CreationDate": "2012-04-01T15:00:00.000Z",
      "MultipartUploadId": "nPyGOnyFcX67qqX7E-0tSGiRi88hMOWOxR-
        _jNyM6RjVMFfV29lFqZ3rNsSaWBugg6OP92pRtufeHdQH7ClIpSF6uJc",
      "PartSizeInBytes": 4194304,
      "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault"
    },
    {
      "ArchiveDescription": "archive 3",
      "CreationDate": "2012-03-20T17:03:43.221Z",
      "MultipartUploadId": "qt-RBst_7yO8gVIonIBsAxr2t-dbOpE4s8MNeGjKjGdNpuU-
        cdSAcqG62guwV9r5jh5mLyFPzFEitTpNE7iQfHiulXoV",
      "PartSizeInBytes": 4194304,

```

```
    "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault"
  }
}
```

Example: Partial List of Multipart Uploads

The following example demonstrates how to use pagination to get a limited number of results. The example shows an HTTP GET request to the URI of the multipart-uploads subresource for a specified vault. In this example, the `limit` parameter is set to 1, which means that only one upload is returned in the list, and the `marker` parameter indicates the multipart upload ID at which the returned list begins.

Example Request

```
GET /-/vaults/examplevault/multipart-uploads?
limit=1&marker=xsQdFIRsfJr20CW2AbZBKpRZAFTZSJIMtL2hYf8mvp8dM0m4RUzlaqoEye6g3h3ecqB_zqwB7zLDMesWhwo65re4
HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

In the response, Amazon S3 Glacier (S3 Glacier) returns a list of no more than two in-progress multipart uploads for the specified vault, starting at the specified marker and returning two results.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Type: application/json
Content-Length: 470

{
  "Marker": "qt-RBst_7yO8gVIonIBsAxr2t-db0pE4s8MNeGjKjGdNpuU-
cdSACqG62guwV9r5jh5mLyFPzFEitTpNE7iQfHiu1XoV",
  "UploadsList" : [
    {
      "ArchiveDescription": "archive 2",
      "CreationDate": "2012-04-01T15:00:00.000Z",
      "MultipartUploadId": "nPyGOnyFcX67qqX7E-0tSGiRi88hHMOWOxR-
_jNyM6RjVMFfV29lFqZ3rNsSaWBugG6OP92pRtufeHdQH7ClIpSF6uJc",
      "PartSizeInBytes": 4194304,
      "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault"
    }
  ]
}
```

Related Sections

- [Initiate Multipart Upload \(POST multipart-uploads\) \(p. 233\)](#)
- [Upload Part \(PUT uploadID\) \(p. 246\)](#)
- [Complete Multipart Upload \(POST uploadID\) \(p. 230\)](#)
- [Abort Multipart Upload \(DELETE uploadID\) \(p. 228\)](#)
- [List Parts \(GET uploadID\) \(p. 236\)](#)
- [Uploading Large Archives in Parts \(Multipart Upload\) \(p. 75\)](#)

- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

Upload Part (PUT uploadID)

Description

This multipart upload operation uploads a part of an archive. You can upload archive parts in any order because in your Upload Part request you specify the range of bytes in the assembled archive that will be uploaded in this part. You can also upload these parts in parallel. You can upload up to 10,000 parts for a multipart upload.

For information about multipart upload, see [Uploading Large Archives in Parts \(Multipart Upload\) \(p. 75\)](#).

Amazon S3 Glacier (S3 Glacier) rejects your upload part request if any of the following conditions is true:

- **SHA256 tree hash does not match**—To ensure that part data is not corrupted in transmission, you compute a SHA256 tree hash of the part and include it in your request. Upon receiving the part data, S3 Glacier also computes a SHA256 tree hash. If the two hash values don't match, the operation fails. For information about computing a SHA256 tree hash, see [Computing Checksums \(p. 166\)](#).
- **SHA256 linear hash does not match**—Required for authorization, you compute a SHA256 linear hash of the entire uploaded payload and include it in your request. For information about computing a SHA256 linear hash, see [Computing Checksums \(p. 166\)](#).
- **Part size does not match**—The size of each part except the last must match the size that is specified in the corresponding [Initiate Multipart Upload \(POST multipart-uploads\) \(p. 233\)](#) request. The size of the last part must be the same size as, or smaller than, the specified size.

Note

If you upload a part whose size is smaller than the part size you specified in your initiate multipart upload request and that part is not the last part, then the upload part request will succeed. However, the subsequent Complete Multipart Upload request will fail.

- **Range does not align**—The byte range value in the request does not align with the part size specified in the corresponding initiate request. For example, if you specify a part size of 4194304 bytes (4 MB), then 0 to 4194303 bytes (4 MB — 1) and 4194304 (4 MB) to 8388607 (8 MB — 1) are valid part ranges. However, if you set a range value of 2 MB to 6 MB, the range does not align with the part size and the upload will fail.

This operation is idempotent. If you upload the same part multiple times, the data included in the most recent request overwrites the previously uploaded data.

Requests

You send this HTTP `PUT` request to the URI of the upload ID that was returned by your Initiate Multipart Upload request. S3 Glacier uses the upload ID to associate part uploads with a specific multipart upload. The request must include a SHA256 tree hash of the part data (`x-amz-sha256-tree-hash` header), a SHA256 linear hash of the entire payload (`x-amz-content-sha256` header), the byte range (`Content-Range` header), and the length of the part in bytes (`Content-Length` header).

Syntax

```
PUT /AccountId/vaults/VaultName/multipart-uploads/uploadID HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
Content-Range: ContentRange
Content-Length: PayloadSize
```

```
Content-Type: application/octet-stream
x-amz-sha256-tree-hash: Checksum of the part
x-amz-content-sha256: Checksum of the entire payload
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses the following request headers, in addition to the request headers that are common to all operations. For more information about the common request headers, see [Common Request Headers](#) (p. 160).

Name	Description	Required
<code>Content-Length</code>	Identifies the length of the part in bytes. Type: String Default: None Constraints: None	No
<code>Content-Range</code>	Identifies the range of bytes in the assembled archive that will be uploaded in this part. S3 Glacier uses this information to assemble the archive in the proper sequence. The format of this header follows RFC 2616 . An example header is <code>Content-Range:bytes 0-4194303/*</code> . Type: String Default: None Constraints: The range cannot be greater than the part size that you specified when you initiated the multipart upload.	Yes
<code>x-amz-content-sha256</code>	The SHA256 checksum (a linear hash) of the uploaded payload. This is not the same value as you specify in the <code>x-amz-sha256-tree-hash</code> header. Type: String Default: None Constraints: None	Yes
<code>x-amz-sha256-tree-hash</code>	Specifies a SHA256 tree hash of the data being uploaded. For information about computing a SHA256 tree hash, see Computing Checksums (p. 166).	Yes

Name	Description	Required
	Type: String Default: None Constraints: None	

Request Body

The request body contains the data to upload.

Responses

Upon a successful part upload, S3 Glacier returns a 204 No Content response.

Syntax

```
HTTP/1.1 204 No Content
x-amzn-RequestId: x-amzn-RequestId
Date: Date
x-amz-sha256-tree-hash: ChecksumComputedByAmazonGlacier
```

Response Headers

A successful response includes the following response headers, in addition to the response headers that are common to all operations. For more information about common response headers, see [Common Response Headers \(p. 162\)](#).

Name	Description
x-amz-sha256-tree-hash	The SHA256 tree hash that S3 Glacier computed for the uploaded part. Type: String

Response Body

This operation does not return a response body.

Example

The following request uploads a 4 MB part. The request sets the byte range to make this the first part in the archive.

Example Request

The example sends an HTTP PUT request to upload a 4 MB part. The request is sent to the URI of the Upload ID that was returned by the Initiate Multipart Upload request. The Content-Range header identifies the part as the first 4 MB data part of the archive.

```
PUT /-/vaults/examplevault/multipart-uploads/
OW2fM5iVylEpFEMM9_HpKowRapC3vn5sSL39_396UW9zLFUWVrnRHApjUJddQ50xSHVXjYtrN47NBZ-
khxOjyEXAMPLE HTTP/1.1
```

```
Host: glacier.us-west-2.amazonaws.com
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Range:bytes 0-4194303/*
x-amz-sha256-tree-hash:c06f7cd4baacb087002a99a5f48bf953
x-amz-content-sha256:726e392cb4d09924dbad1cc0ba3b00c3643d03d14cb4b823e2f041cff612a628
Content-Length: 4194304
Authorization: Authorization=AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-content-sha256;x-amz-date;x-amz-
glacier-version,Signature=16b9a9e220a37e32f2e7be196b4ebb87120ca7974038210199ac5982e792cace
```

To upload the next part, the procedure is the same; however, you must calculate a new SHA256 tree hash of the part you are uploading and also specify a new byte range to indicate where the part will go in the final assembly. The following request uploads another part using the same upload ID. The request specifies the next 4 MB of the archive after the previous request and a part size of 4 MB.

```
PUT /-/vaults/examplevault/multipart-uploads/
OW2fM5iVylEpFEMM9_HpKowRapC3vn5sSL39_396UW9zLFUWVrnRHApjUJddQ5OxSHVXjYtrN47NBZ-
khxOjyEXAMPLE HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Range:bytes 4194304-8388607/*
Content-Length: 4194304
x-amz-sha256-tree-hash:f10e02544d651e2c3ce90a4307427493
x-amz-content-sha256:726e392cb4d09924dbad1cc0ba3b00c3643d03d14cb4b823e2f041cff612a628
x-amz-glacier-version: 2012-06-01
Authorization: Authorization=AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20120525/
us-west-2/glacier/aws4_request, SignedHeaders=host;x-amz-content-sha256;x-amz-date;x-amz-
glacier-version, Signature=16b9a9e220a37e32f2e7be196b4ebb87120ca7974038210199ac5982e792cace
```

The parts can be uploaded in any order; S3 Glacier uses the range specification for each part to determine the order in which to assemble them.

Example Response

```
HTTP/1.1 204 No Content
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
x-amz-sha256-tree-hash: c06f7cd4baacb087002a99a5f48bf953
Date: Wed, 10 Feb 2017 12:00:00 GMT
```

Related Sections

- [Initiate Multipart Upload \(POST multipart-uploads\) \(p. 233\)](#)
- [Upload Part \(PUT uploadID\) \(p. 246\)](#)
- [Complete Multipart Upload \(POST uploadID\) \(p. 230\)](#)
- [Abort Multipart Upload \(DELETE uploadID\) \(p. 228\)](#)
- [List Multipart Uploads \(GET multipart-uploads\) \(p. 241\)](#)
- [List Parts \(GET uploadID\) \(p. 236\)](#)
- [Uploading Large Archives in Parts \(Multipart Upload\) \(p. 75\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

Job Operations

The following are the job operations available in S3 Glacier.

Topics

- [Describe Job \(GET JobID\)](#) (p. 250)
- [Get Job Output \(GET output\)](#) (p. 257)
- [Initiate Job \(POST jobs\)](#) (p. 263)
- [List Jobs \(GET jobs\)](#) (p. 273)

Describe Job (GET JobID)

Description

This operation returns information about a job you previously initiated, including the job initiation date, the user who initiated the job, the job status code/message, and the Amazon Simple Notification Service (Amazon SNS) topic to notify after Amazon S3 Glacier (S3 Glacier) completes the job. For more information about initiating a job, see [Initiate Job \(POST jobs\)](#) (p. 263).

Note

This operation enables you to check the status of your job. However, we strongly recommend that you set up an Amazon SNS topic and specify it in your initiate job request so that S3 Glacier can notify the topic after it completes the job.

A job ID will not expire for at least 24 hours after S3 Glacier completes the job.

Requests

Syntax

To obtain information about a job, you use the HTTP GET method and scope the request to the specific job. Note that the relative URI path is the same one that S3 Glacier returned to you when you initiated the job.

```
GET /AccountID/vaults/VaultName/jobs/JobID HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: date
Authorization: signatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Note

In the request, if you omit the `JobID`, the response returns a list of all active jobs on the specified vault. For more information about listing jobs, see [List Jobs \(GET jobs\)](#) (p. 273).

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers](#) (p. 160).

Request Body

This operation does not have a request body.

Responses

Syntax

```
HTTP/1.1 201 Created
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Content-Type: application/json
Content-Length: Length

{
  "Action": "string",
  "ArchiveId": "string",
  "ArchiveSHA256TreeHash": "string",
  "ArchiveSizeInBytes": number,
  "Completed": boolean,
  "CompletionDate": "string",
  "CreationDate": "string",
  "InventoryRetrievalParameters": {
    "EndDate": "string",
    "Format": "string",
    "Limit": "string",
    "Marker": "string",
    "StartDate": "string"
  },
  "InventorySizeInBytes": number,
  "JobDescription": "string",
  "JobId": "string",
  "JobOutputPath": "string",
  "OutputLocation": {
    "S3": {
      "AccessControlList": [
        {
          "Grantee": {
            "DisplayName": "string",
            "EmailAddress": "string",
            "ID": "string",
            "Type": "string",
            "URI": "string"
          },
          "Permission": "string"
        }
      ],
      "BucketName": "string",
      "CannedACL": "string",
      "Encryption": {
        "EncryptionType": "string",
        "KMSSContext": "string",
        "KMSKeyId": "string"
      },
      "Prefix": "string",
      "StorageClass": "string",
      "Tagging": {
        "string": "string"
      },
      "UserMetadata": {
        "string": "string"
      }
    }
  },
}
```

```
"RetrievalByteRange": "string",
"SelectParameters": {
  "Expression": "string",
  "ExpressionType": "string",
  "InputSerialization": {
    "csv": {
      "Comments": "string",
      "FieldDelimiter": "string",
      "FileHeaderInfo": "string",
      "QuoteCharacter": "string",
      "QuoteEscapeCharacter": "string",
      "RecordDelimiter": "string"
    }
  },
  "OutputSerialization": {
    "csv": {
      "FieldDelimiter": "string",
      "QuoteCharacter": "string",
      "QuoteEscapeCharacter": "string",
      "QuoteFields": "string",
      "RecordDelimiter": "string"
    }
  }
},
"SHA256TreeHash": "string",
"SNSTopic": "string",
"StatusCode": "string",
"StatusMessage": "string",
"Tier": "string",
"VaultARN": "string"
}
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers](#) (p. 162).

Response Body

The response body contains the following JSON fields.

Action

The job type. It is either `ArchiveRetrieval`, `InventoryRetrieval`, or `Select`.

Type: String

ArchiveId

The archive ID requested for a select or archive retrieval job. Otherwise, this field is null.

Type: String

ArchiveSHA256TreeHash

The SHA256 tree hash of the entire archive for an archive retrieval job. For inventory retrieval jobs, this field is null.

Type: String

ArchiveSizeInBytes

For an `ArchiveRetrieval` job, this is the size in bytes of the archive being requested for download. For the `InventoryRetrieval` job, the value is null.

Type: Number

Completed

The job status. When an archive or inventory retrieval job is completed, you get the job's output using the [Get Job Output \(GET output\)](#) (p. 257).

Type: Boolean

CompletionDate

The Universal Coordinated Time (UTC) time that the job request completed. While the job is in progress, the value is null.

Type: String

CreationDate

The UTC time that the job was created.

Type: A string representation in the ISO 8601 date format, for example
2013-03-20T17:03:43.221Z.

InventoryRetrievalParameters

Input parameters used for a range inventory retrieval.

Type: [InventoryRetrievalJobInput](#) (p. 286) object

InventorySizeInBytes

For an `InventoryRetrieval` job, this is the size in bytes of the inventory requested for download. For the `ArchiveRetrieval` or `Select` job, the value is null.

Type: Number

JobDescription

The job description you provided when you initiated the job.

Type: String

JobId

The ID that identifies the job in S3 Glacier.

Type: String

JobOutputPath

Contains the job output location.

Type: String

OutputLocation

An object that contains information about the location where the select job results and errors are stored.

Type: [OutputLocation](#) (p. 289) object

RetrievalByteRange

The retrieved byte range for archive retrieval jobs in the form "*StartByteValue-EndByteValue*." If you don't specify a range in the archive retrieval, then the whole archive is retrieved; also

StartByteValue equals 0, and *EndByteValue* equals the size of the archive minus 1. For inventory retrieval or select jobs, this field is `null`.

Type: String

SelectParameters

An object that contains information about the parameters used for a select.

Type: [SelectParameters](#) (p. 291) object

SHA256TreeHash

The SHA256 tree hash value for the requested range of an archive. If the [Initiate Job \(POST jobs\)](#) (p. 263) request for an archive specified a tree-hash aligned range, then this field returns a value. For more information about tree-hash alignment for archive range retrievals, see [Receiving Checksums When Downloading Data](#) (p. 175).

For the specific case when the whole archive is retrieved, this value is the same as the `ArchiveSHA256TreeHash` value.

This field is `null` in the following situations:

- Archive retrieval jobs that specify a range that is not tree-hash aligned.
- Archival jobs that specify a range that is equal to the whole archive and the job status is `InProgress`.
- Inventory jobs.
- Select jobs.

Type: String

SNSTopic

An Amazon SNS topic that receives notification.

Type: String

StatusCode

The code indicating the status of the job.

Valid Values: `InProgress` | `Succeeded` | `Failed`

Type: String

StatusMessage

A friendly message that describes the job status.

Type: String

Tier

The data access tier to use for the select or archive retrieval.

Valid Values: `Bulk` | `Expedited` | `Standard`

Type: String

VaultARN

The Amazon Resource Name (ARN) of the vault of which the job is a subresource.

Type: String

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses](#) (p. 176).

Examples

The following example shows the request for a job that retrieves an archive.

Example Request: Get job description

```
GET /-/vaults/examplevault/jobs/HkF9p6o7yjhFx-
K3CGl6fuSm6VzW9T7esGQfco8nUXVYws0jlb5gq1JZ55yHgt5vP54ZShjoQzQVVh7vEXAMPLEjobID HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

The response body includes JSON that describes the specified job. Note that for both the inventory retrieval and archive retrieval jobs, the JSON fields are the same. However, when a field doesn't apply to the type of job, its value is null. The following is an example response for an archive retrieval job. Note the following:

- The Action field value is ArchiveRetrieval.
- The ArchiveSizeInBytes field shows the size of the archive requested in the archive retrieval job.
- The ArchiveSHA256TreeHash field shows the SHA256 tree hash for the entire archive.
- The RetrievalByteRange field shows the range requested in the Initiate Job request. In this example, the whole archive is requested.
- The SHA256TreeHash field shows the SHA256 tree hash for the range requested in the Initiate Job request. In this example, it is the same as the ArchiveSHA256TreeHash field, which means that the whole archive was requested.
- The InventorySizeInBytes field value is null because it does not apply to an archive retrieval job.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Type: application/json
Content-Length: 419
{
  "Action": "ArchiveRetrieval",
  "ArchiveId": "NkbByEejwEggmBz2fTHgJrg0XBoDfjP4q6iu87-
TjhqG6eGoOY9Z8i1_AUyUsuhPAdTqLHy8pTl5nfcFJmDl2yEZONi5L26Omw12vcs01MNGntHEQL8MBfG1qrEXAMPLEArchiveId",
  "ArchiveSizeInBytes": 16777216,
  "ArchiveSHA256TreeHash":
"beb0fe31a1c7ca8c6c04d574ea906e3f97b31fdca7571defb5b44dca89b5af60",
  "Completed": false,
  "CompletionDate": null,
  "CreationDate": "2012-05-15T17:21:39.339Z",
  "InventorySizeInBytes": null,
  "JobDescription": "My ArchiveRetrieval Job",
```

```
{
  "JobId": "HkF9p6o7yjhFx-
K3CGl6fuSm6VzW9T7esGQfco8nUXVYwS0jlb5gq1JZ55yHgt5vP54ZShjoQzQVvH7vEXAMPLEjobID",
  "RetrievalByteRange": "0-16777215",
  "SHA256TreeHash": "beb0fe31a1c7ca8c6c04d574ea906e3f97b31fdca7571defb5b44dca89b5af60",
  "SNSTopic": "arn:aws:sns:us-west-2:012345678901:mytopic",
  "StatusCode": "InProgress",
  "StatusMessage": "Operation in progress.",
  "Tier": "Bulk",
  "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault"
}
```

The following is an example response for an inventory retrieval job. Note the following:

- The `Action` field value is `InventoryRetrieval`.
- The `ArchiveSizeInBytes`, `ArchiveSHA256TreeHash`, and `RetrievalByteRange` field values are null because these fields do not apply to an inventory retrieval job.
- The `InventorySizeInBytes` field value is null because the job is still in progress, and has not fully prepared the inventory for download. If the job was completed before your describe job request, this field would give you the size of the output.

```
{
  "Action": "InventoryRetrieval",
  "ArchiveId": null,
  "ArchiveSizeInBytes": null,
  "ArchiveSHA256TreeHash": null,
  "Completed": false,
  "CompletionDate": null,
  "CreationDate": "2012-05-15T23:18:13.224Z",
  "InventorySizeInBytes": null,
  "JobDescription": "Inventory Description",
  "JobId": "HkF9p6o7yjhFx-
K3CGl6fuSm6VzW9T7esGQfco8nUXVYwS0jlb5gq1JZ55yHgt5vP54ZShjoQzQVvH7vEXAMPLEjobID",
  "RetrievalByteRange": null,
  "SHA256TreeHash": null,
  "SNSTopic": "arn:aws:sns:us-west-2:012345678901:mytopic",
  "StatusCode": "InProgress",
  "StatusMessage": "Operation in progress.",
  "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault"
}
```

The following is an example response for a completed inventory retrieval job that contains a marker used to continue pagination of the vault inventory retrieval.

```
{
  "Action": "InventoryRetrieval",
  "ArchiveId": null,
  "ArchiveSHA256TreeHash": null,
  "ArchiveSizeInBytes": null,
  "Completed": true,
  "CompletionDate": "2013-12-05T21:51:13.591Z",
  "CreationDate": "2013-12-05T21:51:12.281Z",
  "InventorySizeInBytes": 777062,
  "JobDescription": null,
  "JobId": "sCC2RZNBf2nildYD_roe0J9bHRdPQubDRkmTdg-mXi2u3lc49uW6TcEhDF2D9pB2phx-
BN30JaBru7PMY0lfXHdStzu8",
  "NextInventoryRetrievalMarker": null,
  "RetrievalByteRange": null,
  "SHA256TreeHash": null,
  "SNSTopic": null,
  "StatusCode": "Succeeded",
}
```

```
"StatusMessage": "Succeeded",
"Tier": "Bulk",
"VaultARN": "arn:aws:glacier-dev:us-west-2:836579025725:vaults/inventory-icecube-2",
"InventoryRetrievalParameters": {
  "StartDate": "2013-11-12T13:43:12Z",
  "EndDate": "2013-11-20T08:12:45Z",
  "Limit": "120000",
  "Format": "JSON",
  "Marker":
    "vyS0t2jHQe5qbcDggIeD50chS1SXwYMrkVKo0KHITUjEYxBGCqRLKaiySzdN7QXGVVV5XZpNVG67pCZ_uykQXFMLaxOSu2hO_-5CC",
  },
}
```

Related Sections

- [Get Job Output \(GET output\) \(p. 257\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

Get Job Output (GET output)

Description

This operation downloads the output of the job you initiated using [Initiate Job \(POST jobs\) \(p. 263\)](#). Depending on the job type you specified when you initiated the job, the output will be either the content of an archive or a vault inventory.

You can download all the job output or download a portion of the output by specifying a byte range. For both archive and inventory retrieval jobs, you should verify the downloaded size against the size returned in the headers from the **Get Job Output** response.

For archive retrieval jobs, you should also verify that the size is what you expected. If you download a portion of the output, the expected size is based on the range of bytes you specified. For example, if you specify a range of `bytes=0-1048575`, you should verify your download size is 1,048,576 bytes. If you download an entire archive, the expected size is the size of the archive when you uploaded it to Amazon S3 Glacier (S3 Glacier). The expected size is also returned in the headers from the **Get Job Output** response.

In the case of an archive retrieval job, depending on the byte range you specify, S3 Glacier returns the checksum for the portion of the data. To ensure the portion you downloaded is the correct data, compute the checksum on the client, verify that the values match, and verify that the size is what you expected.

A job ID does not expire for at least 24 hours after S3 Glacier completes the job. That is, you can download the job output within the 24-hour period after S3 Glacier completes the job.

Requests

Syntax

To retrieve a job output, you send the HTTP `GET` request to the URI of the output of the specific job.

```
GET /AccountId/vaults/VaultName/jobs/JobID/output HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
```


Range: *ByteRangeToRetrieve*
x-amz-glacier-version: 2012-06-01

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses the following request headers, in addition to the request headers that are common to all operations. For more information about the common request headers, see [Common Request Headers](#) (p. 160).

Name	Description	Required
Range	<p>The range of bytes to retrieve from the output. For example, if you want to download the first 1,048,576 bytes, specify the range as <code>bytes=0-1048575</code>. For more information, go to Range Header Field Definition. The range is relative to any range specified in the Initiate Job request. By default, this operation downloads the entire output.</p> <p>If the job output is large, then you can use the <code>Range</code> request header to retrieve a portion of the output. This allows you to download the entire output in smaller chunks of bytes. For example, suppose you have 1 GB job output you want to download and you decide to download 128 MB chunks of data at a time, a total of eight Get Job Output requests. You will use the following process to download the job output:</p> <ol style="list-style-type: none">1. Download a 128 MB chunk of output by specifying the appropriate byte range using the <code>Range</code> header. Verify that all 128 MB of data was received.2. Along with the data, the response will include a checksum of the payload. You compute the checksum of the payload on the client and compare it with the checksum you received in the response to ensure you received all the expected data.3. Repeat steps 1 and 2 for all the eight 128 MB chunks of output data, each time specifying the appropriate byte range.4. After downloading all the parts of the job output, you have a list of eight checksum values. Compute the tree hash of these values to find the checksum of the entire output. Using the Describe Job (GET JobID) (p. 250) operation, obtain job information of the job that provided you the output. The response includes the checksum of the entire archive stored in S3 Glacier. You compare this value with the checksum you computed to ensure you have downloaded the entire archive content with no errors. <p>Type: String</p>	No

Name	Description	Required
	Default: None Constraints: None	

Request Body

This operation does not have a request body.

Responses

Syntax

For a retrieval request that returns all of the job data, the job output response returns a 200 OK response code. When partial content is requested, for example, if you specified the Range header in the request, then the response code 206 Partial Content is returned.

```
HTTP/1.1 200 OK
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Content-Type: ContentType
Content-Length: Length
x-amz-sha256-tree-hash: ChecksumComputedByAmazonGlacier

[Body containing job output.]
```

Response Headers

Header	Description
Content-Range	<p>The range of bytes returned by S3 Glacier. If only partial output is downloaded, the response provides the range of bytes S3 Glacier returned.</p> <p>For example, bytes 0-1048575/8388608 returns the first 1 MB from 8 MB.</p> <p>For more information about the Content-Range header, go to Content-Range Header Field Definition.</p> <p>Type: String</p>
Content-Type	<p>The Content-Type depends on whether the job output is an archive or a vault inventory.</p> <ul style="list-style-type: none"> For archive data, the Content-Type is <code>application/octet-stream</code>. For vault inventory, if you requested CSV format when you initiated the job, the Content-Type is <code>text/csv</code>. Otherwise, by default, vault inventory is returned as JSON, and the Content-Type is <code>application/json</code>. <p>Type: String</p>
x-amz-sha256-tree-hash	<p>The checksum of the data in the response. This header is returned only when retrieving the output for an archive retrieval job. Furthermore, this header appears when the retrieved data range requested in the Initiate Job request is tree hash aligned and the range to download in</p>

Header	Description
	<p>the Get Job Output is also tree hash aligned. For more information about tree hash aligned ranges, see Receiving Checksums When Downloading Data (p. 175).</p> <p>For example, if in your Initiate Job request you specified a tree hash aligned range to retrieve (which includes the whole archive), then you will receive the checksum of the data you download under the following conditions:</p> <ul style="list-style-type: none"> • You get the entire range of the retrieved data. • You request a byte range of the retrieved data that has a size of a megabyte (1024 KB) multiplied by a power of 2 and that starts and ends on a multiple of the size of the requested range. For example, if you have 3.1 MB of retrieved data and you specify a range to return that starts at 1 MB and ends at 2 MB, then the <code>x-amz-sha256-tree-hash</code> is returned as a response header. • You request a range to return of the retrieved data that goes to the end of the data, and the start of the range is a multiple of the size of the range to retrieve rounded up to the next power of two but not smaller than one megabyte (1024 KB). For example, if you have 3.1 MB of retrieved data and you specify a range that starts at 2 MB and ends at 3.1 MB (the end of the data), then the <code>x-amz-sha256-tree-hash</code> is returned as a response header. <p>Type: String</p>

Response Body

S3 Glacier returns the job output in the response body. Depending on the job type, the output can be the archive contents or the vault inventory. In case of a vault inventory, by default the inventory list is returned as the following JSON body.

```
{
  "VaultARN": String,
  "InventoryDate": String,
  "ArchiveList": [
    {
      "ArchiveId": String,
      "ArchiveDescription": String,
      "CreationDate": String,
      "Size": Number,
      "SHA256TreeHash": String
    },
    ...
  ]
}
```

If you requested the comma-separated values (CSV) output format when you initiated the vault inventory job, then the vault inventory is returned in CSV format in the body. The CSV format has five columns "ArchiveId", "ArchiveDescription", "CreationDate", "Size", and "SHA256TreeHash" with the same definitions as the corresponding JSON fields.

Note

In the returned CSV format, fields may be returned with the whole field enclosed in double-quotes. Fields that contain a comma or double-quotes are always returned enclosed in double-quotes. For example, `my archive description,1` is returned as `"my archive description,1"`. Double-quote characters that are within returned double-quote enclosed

fields are *escaped* by preceding them with a backslash character. For example, `my archive description,1"2` is returned as `"my archive description,1\"2"` and `my archive description,1\"2` is returned as `"my archive description,1\\\"2"`. The backslash character is not escaped.

The JSON response body contains the following JSON fields.

ArchiveDescription

The description of an archive.

Type: String

ArchiveId

The ID of an archive.

Type: String

ArchiveList

An array of archive metadata. Each object in the array represents metadata for one archive contained in the vault.

Type: Array

CreationDate

The UTC date and time the archive was created.

Type: A string representation in the ISO 8601 date format, for example
`2013-03-20T17:03:43.221Z`.

InventoryDate

The UTC date and time of the last inventory for the vault that was completed after changes to the vault. Even though S3 Glacier prepares a vault inventory once a day, the inventory date is only updated if there have been archive additions or deletions to the vault since the last inventory.

Type: A string representation in the ISO 8601 date format, for example
`2013-03-20T17:03:43.221Z`.

SHA256TreeHash

The tree hash of the archive.

Type: String

Size

The size in bytes of the archive.

Type: Number

VaultARN

The Amazon Resource Name (ARN) resource from which the archive retrieval was requested.

Type: String

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses](#) (p. 176).

Examples

The following example shows the request for a job that retrieves an archive.

Example 1: Download output

This example retrieves data prepared by S3 Glacier in response to your initiate archive retrieval job request.

Example Request

```
GET /-/vaults/examplevault/jobs/HkF9p6o7yjhFx-
K3CGl6fuSm6VzW9T7esGQfco8nUXVYwS0jlb5gq1JZ55yHgt5vP54ZShjoQzQVvH7vEXAMPLEjobID/output
HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

The following is an example response of an archive retrieval job. Note that the Content-Type header is application/octet-stream and that x-amz-sha256-tree-hash header is included in the response, which means that all the job data is returned.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
x-amz-sha256-tree-hash: beb0fe31a1c7ca8c6c04d574ea906e3f97b31fdca7571defb5b44dca89b5af60
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Type: application/octet-stream
Content-Length: 1048576

[Archive data.]
```

The following is an example response of an inventory retrieval job. Note that the Content-Type header is application/json. Also note that the response does not include the x-amz-sha256-tree-hash header.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Type: application/json
Content-Length: 906

{
  "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault",
  "InventoryDate": "2011-12-12T14:19:01Z",
  "ArchiveList": [
    {
      "ArchiveId": "DMTmICA2n5Tdqq5BV2z7og-
A20xnpAPKt3UXWxdWsn_D6auTUrW6kwy5Qy9jd1MCE1mBYvMQ63LWaT8yTMzMxCxB_9VBWrW4Jw4zsvg5kehAPDVKcppUD1X7b24J
oA",
      "ArchiveDescription": "my archive1",
      "CreationDate": "2012-05-15T17:19:46.700Z",
      "Size": 2140123,
      "SHA256TreeHash": "6b9d4cf8697bd3af6aa1b590a0b27b337da5b18988dbcc619a3e608a554a1e62"
    },
    {
      "ArchiveId": "2lHzwhKhgF2JHvCS-
ZRuF08IQLuyB4265Hs3AXj9MoAIhz7tbXAvFeHusGU_hViO1WeCBe0N5lsYYHRyZ7rrmRkNRuYrXUs_sjl2K8ume_7mKO_0i7C-
uHE1oHqaW9d37pabXrSA",
      "ArchiveDescription": "my archive2",
      "CreationDate": "2012-05-15T17:21:39.339Z",
```

```

    "Size": 2140123,
    "SHA256TreeHash": "7f2fe580edb35154041fa3d4b41dd6d3adaef0c85d2ff6309f1d4b520eeecda3"
  }
]
}

```

Example 2: Download only partial output

This example retrieves only a portion of the archive prepared by S3 Glacier in response to your initiate archive retrieval job request. The request uses the optional Range header to retrieve only the first 1,024 bytes.

Example Request

```

GET /-/vaults/examplevault/jobs/HkF9p6o7yjhFx-
K3CGl6fuSm6VzW9T7esGQfco8nUXVYws0jlb5gq1JZ55yHgt5vP54ZShjoQzQVvh7vEXAMPLEjobID/output
HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
Range: bytes=0-1023
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2

```

Example Response

The following successful response shows the 206 Partial Content response. In this case, the response also includes a Content-Range header that specifies the range of bytes S3 Glacier returns.

```

HTTP/1.1 206 Partial Content
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Range: bytes 0-1023/8388608
Content-Type: application/octet-stream
Content-Length: 1024

[Archive data.]

```

Related Sections

- [Describe Job \(GET JobID\) \(p. 250\)](#)
- [Initiate Job \(POST jobs\) \(p. 263\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

Initiate Job (POST jobs)

This operation initiates the following types of Amazon S3 Glacier (S3 Glacier) jobs:

- **select**— Perform a select query on an archive
- **archive-retrieval**— Retrieve an archive
- **inventory-retrieval**— Inventory a vault

Topics

- [Working with Amazon S3 Glacier Select Jobs \(p. 264\)](#)

- [Initializing an Archive or Vault Inventory Retrieval Job](#) (p. 265)
- [Requests](#) (p. 267)
- [Responses](#) (p. 269)
- [Examples](#) (p. 270)
- [Related Sections](#) (p. 273)

Working with Amazon S3 Glacier Select Jobs

You use a S3 Glacier Select job to perform SQL queries on archive objects. The archive objects being queried by the select job must be formatted as uncompressed comma-separated values (CSV) files. For overview information about S3 Glacier Select jobs, see [Querying Archives with S3 Glacier Select](#) (p. 148).

When initiating a select job, you do the following:

- Define an output location for the output of your select query. This location must be an Amazon S3 bucket in the same AWS Region as the vault containing the archive object being queried. The AWS account that initiates the job must have permissions to write to the S3 bucket. You can specify the storage class and encryption for the output objects stored in Amazon S3. When setting [S3Location](#) (p. 290), it might be helpful to read the following topics in the Amazon S3 documentation:
 - [PUT Object](#) in the *Amazon Simple Storage Service API Reference*
 - [Managing Access with ACLs](#) in the *Amazon Simple Storage Service Developer Guide*
 - [Protecting Data Using Server-Side Encryption](#) in the *Amazon Simple Storage Service Developer Guide*
- Define the SQL expression to use for the SELECT for your query in [SelectParameters](#) (p. 291). For example, you can use expressions like the following examples:
 - The following example expression returns all records from the specified object.

```
SELECT * FROM archive
```

- Assuming you are not using any headers for data stored in the object, you can specify columns using positional headers.

```
SELECT s._1, s._2 FROM archive s WHERE s._3 > 100
```

- If you have headers and you set the `fileHeaderInfo` in [CSVInput](#) (p. 279) to `Use`, you can specify headers in the query. (If you set the `fileHeaderInfo` field to `Ignore`, the first row is skipped for the query.) You cannot mix ordinal positions with header column names.

```
SELECT s.Id, s.FirstName, s.SSN FROM archive s
```

For more information about using SQL with S3 Glacier Select, see [SQL Reference for Amazon S3 Select and S3 Glacier Select](#) (p. 304).

When initiating a select job, you can also do the following:

- Specify the `Expedited` tier to expedite your queries. For more information, see [Expedited, Standard, and Bulk Tiers](#) (p. 266).
- Specify details about the data serialization format of both the input object being queried and the serialization of the CSV-encoded query results.
- Specify an Amazon Simple Notification Service (Amazon SNS) topic to which S3 Glacier can post a notification after the job is completed. You can specify an SNS topic for each job request. The notification is sent only after S3 Glacier completes the job.

- You can use [Describe Job \(GET JobID\)](#) (p. 250) to obtain job status information while a job is in progress. However, it is more efficient to use an Amazon SNS notification to determine when a job is complete.

When working with a select job, you cannot do the following:

- Call the **GetJobOutput** operation. Job output is written to the output location.
- Use ranged selection.

For an example of initiating a select job, see [Example Request: Initiate a select job](#) (p. 271).

Initializing an Archive or Vault Inventory Retrieval Job

Retrieving an archive or a vault inventory are asynchronous operations that require you to initiate a job. Once started, job cannot be cancelled. Retrieval is a two-step process:

1. Initiate a retrieval job by using the [Initiate Job \(POST jobs\)](#) (p. 263) operation.

Important

A data retrieval policy can cause your initiate retrieval job request to fail with a `PolicyEnforcedException`. For more information about data retrieval policies, see [Amazon S3 Glacier Data Retrieval Policies](#) (p. 151). For more information about the `PolicyEnforcedException` exception, see [Error Responses](#) (p. 176).

2. After the job completes, download the bytes using the [Get Job Output \(GET output\)](#) (p. 257) operation.

The retrieval request is ran asynchronously. When you initiate a retrieval job, S3 Glacier creates a job and returns a job ID in the response. When S3 Glacier completes the job, you can get the job output (archive or inventory data). For information about getting job output, see the [Get Job Output \(GET output\)](#) (p. 257) operation.

The job must complete before you can get its output. To determine when a job is complete, you have the following options:

- **Use an Amazon SNS notification**— You can specify an Amazon SNS topic to which S3 Glacier can post a notification after the job is completed. You can specify an SNS topic per job request. The notification is sent only after S3 Glacier completes the job. In addition to specifying an SNS topic per job request, you can configure vault notifications for a vault so that job notifications are sent for all retrievals. For more information, see [Set Vault Notification Configuration \(PUT notification-configuration\)](#) (p. 219).
- **Get job details**— You can make a [Describe Job \(GET JobID\)](#) (p. 250) request to obtain job status information while a job is in progress. However, it is more efficient to use an Amazon SNS notification to determine when a job is complete.

Note

The information you get via notification is same that you get by calling [Describe Job \(GET JobID\)](#) (p. 250).

If for a specific event, you add both the notification configuration on the vault and also specify an SNS topic in your initiate job request, S3 Glacier sends both notifications. For more information, see [Set Vault Notification Configuration \(PUT notification-configuration\)](#) (p. 219).

The Vault Inventory

S3 Glacier updates a vault inventory approximately once a day, starting on the day you first upload an archive to the vault. If there have been no archive additions or deletions to the vault since the last

inventory, the inventory date is not updated. When you initiate a job for a vault inventory, S3 Glacier returns the last inventory it generated, which is a point-in-time snapshot and not real-time data.

After S3 Glacier creates the first inventory for the vault, it typically takes half a day and up to a day before that inventory is available for retrieval.

You might not find it useful to retrieve a vault inventory for each archive upload. However, suppose that you maintain a database on the client-side associating metadata about the archives you upload to S3 Glacier. Then, you might find the vault inventory useful to reconcile information, as needed, in your database with the actual vault inventory. For more information about the data fields returned in an inventory job output, see [Response Body \(p. 260\)](#).

Range Inventory Retrieval

You can limit the number of inventory items retrieved by filtering on the archive creation date or by setting a limit.

Filtering by Archive Creation Date

You can retrieve inventory items for archives created between `StartDate` and `EndDate` by specifying values for these parameters in the **Initiate Job** request. Archives created on or after the `StartDate` and before the `EndDate` are returned. If you provide only the `StartDate` without the `EndDate`, you retrieve the inventory for all archives created on or after the `StartDate`. If you provide only the `EndDate` without the `StartDate`, you get back the inventory for all archives created before the `EndDate`.

Limiting Inventory Items per Retrieval

You can limit the number of inventory items returned by setting the `Limit` parameter in the **Initiate Job** request. The inventory job output contains inventory items up to the specified `Limit`. If there are more inventory items available, the result is paginated. After a job is complete, you can use the [Describe Job \(GET JobID\) \(p. 250\)](#) operation to get a marker that you use in a subsequent **Initiate Job** request. The marker indicates the starting point to retrieve the next set of inventory items. You can page through your entire inventory by repeatedly making **Initiate Job** requests with the marker from the previous **Describe Job** output. You do so until you get a marker from **Describe Job** that returns null, indicating that there are no more inventory items available.

You can use the `Limit` parameter together with the date range parameters.

Ranged Archive Retrieval

You can initiate archive retrieval for the whole archive or a range of the archive. In the case of ranged archive retrieval, you specify a byte range to return or the whole archive. The range specified must be megabyte (MB) aligned. In other words, the range start value must be divisible by 1 MB and the range end value plus 1 must be divisible by 1 MB or equal the end of the archive. If the ranged archive retrieval is not megabyte-aligned, this operation returns a 400 response. Furthermore, to ensure that you get checksum values for data you download using **Get Job Output (Get Job Output (GET output) (p. 257))**, the range must be tree-hash aligned. For more information about tree-hash aligned ranges, see [Receiving Checksums When Downloading Data \(p. 175\)](#).

Expedited, Standard, and Bulk Tiers

When initiating a select or an archive retrieval job, you can specify one of the following options in the `Tier` field of the request body:

- **Expedited** – Expedited allows you to quickly access your data when occasional urgent requests for a subset of archives are required. For all but the largest archives (250 MB+), data accessed using the Expedited tier is typically made available within 1–5 minutes.

- **Standard** – Standard allows you to access any of your archives within several hours. Data accessed using the Standard tier typically made available within 3–5 hours. This option is the default one for job requests that don't specify the tier option.
- **Bulk** – Bulk is the lowest-cost tier for S3 Glacier, enabling you to retrieve large amounts, even petabytes, of data inexpensively in a day. Data accessed using the Bulk tier is typically made available within 5–12 hours.

For more information about expedited and bulk retrievals, see [Retrieving S3 Glacier Archives \(p. 83\)](#).

Requests

To initiate a job, you use the HTTP POST method and scope the request to the vault's `jobs` subresource. You specify details of the job request in the JSON document of your request. The job type is specified with the `Type` field. Optionally, you can specify an `SNSTopic` field to indicate an Amazon SNS topic to which S3 Glacier can post notification after it completes the job.

Note

To post a notification to Amazon SNS, you must create the topic yourself if it doesn't already exist. S3 Glacier doesn't create the topic for you. The topic must have permissions to receive publications from a S3 Glacier vault. S3 Glacier doesn't verify if the vault has permission to publish to the topic. If the permissions are not configured appropriately, you might not receive notification even after the job completes.

Syntax

The following is the request syntax for initiating a job.

```
POST /AccountId/vaults/VaultName/jobs HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

```
{
  "jobParameters": {
    "ArchiveId": "string",
    "Description": "string",
    "Format": "string",
    "InventoryRetrievalParameters": {
      "EndDate": "string",
      "Limit": "string",
      "Marker": "string",
      "StartDate": "string"
    },
    "OutputLocation": {
      "S3": {
        "AccessControlList": [
          {
            "Grantee": {
              "DisplayName": "string",
              "EmailAddress": "string",
              "ID": "string",
              "Type": "string",
              "URI": "string"
            },
            "Permission": "string"
          }
        ],
        "BucketName": "string",
        "CannedACL": "string",
```

```

        "Encryption": {
            "EncryptionType": "string",
            "KMSSContext": "string",
            "KMSSKeyId": "string"
        },
        "Prefix": "string",
        "StorageClass": "string",
        "Tagging": {
            "string" : "string"
        },
        "UserMetadata": {
            "string" : "string"
        }
    },
    "RetrievalByteRange": "string",
    "SelectParameters": {
        "Expression": "string",
        "ExpressionType": "string",
        "InputSerialization": {
            "csv": {
                "Comments": "string",
                "FieldDelimiter": "string",
                "FileHeaderInfo": "string",
                "QuoteCharacter": "string",
                "QuoteEscapeCharacter": "string",
                "RecordDelimiter": "string"
            }
        },
        "OutputSerialization": {
            "csv": {
                "FieldDelimiter": "string",
                "QuoteCharacter": "string",
                "QuoteEscapeCharacter": "string",
                "QuoteFields": "string",
                "RecordDelimiter": "string"
            }
        }
    },
    "SNSTopic": "string",
    "Tier": "string",
    "Type": "string"
}

```

Note

The AccountId value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Body

The request accepts the following data in JSON format in the body of the request.

jobParameters

Provides options for specifying job information.

Type: [jobParameters](#) (p. 287) object

Required: Yes

Responses

S3 Glacier creates the job. In the response, it returns the URI of the job.

Syntax

```
HTTP/1.1 202 Accepted
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Location: location
x-amz-job-id: jobId
x-amz-job-output-path: jobOutputPath
```

Response Headers

Header	Description
Location	The relative URI path of the job. You can use this URI path to find the job status. For more information, see Describe Job (GET JobID) (p. 250) . Type: String Default: None
x-amz-job-id	The ID of the job. This value is also included as part of the Location header. Type: String Default: None
x-amz-job-output-path	This header is only returned for select job types. The path to the location of where the select results are stored. Type: String Default: None

Response Body

This operation does not return a response body.

Errors

This operation includes the following error or errors, in addition to the possible errors common to all Amazon S3 Glacier operations. For information about Amazon S3 Glacier errors and a list of error codes, see [Error Responses \(p. 176\)](#).

Code	Description	HTTP Status Code	Type
InsufficientCapacityException	Returned if there is insufficient capacity to process this expedited request. This error only applies to expedited retrievals and not to standard or bulk retrievals.	503 Service Unavailable	Server

Examples

Example Request: Initiate an archive retrieval job

```
POST /-/vaults/examplevault/jobs HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2

{
  "Type": "archive-retrieval",
  "ArchiveId": "NkbByEejwEggmBz2fTHgJrg0XBoDfjP4q6iu87-
TjhgG6eGoOY9Z8i1_AUyUsuhPAdTqLHy8pTl5nfCFJmDl2yEZONi5L26Omwl2vcs01MNGntHEQL8MBfG1qrEXAMPLEArchiveId",
  "Description": "My archive description",
  "SNSTopic": "arn:aws:sns:us-west-2:111111111111:Glacier-ArchiveRetrieval-topic-Example",
  "Tier" : "Bulk"
}
```

The following is an example of the body of a request that specifies a range of the archive to retrieve using the `RetrievalByteRange` field.

```
{
  "Type": "archive-retrieval",
  "ArchiveId": "NkbByEejwEggmBz2fTHgJrg0XBoDfjP4q6iu87-
TjhgG6eGoOY9Z8i1_AUyUsuhPAdTqLHy8pTl5nfCFJmDl2yEZONi5L26Omwl2vcs01MNGntHEQL8MBfG1qrEXAMPLEArchiveId",
  "Description": "My archive description",
  "RetrievalByteRange": "2097152-4194303",
  "SNSTopic": "arn:aws:sns:us-west-2:111111111111:Glacier-ArchiveRetrieval-topic-Example",
  "Tier" : "Bulk"
}
```

Example Response

```
HTTP/1.1 202 Accepted
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Location: /111122223333/vaults/examplevault/jobs/HkF9p6o7yjhFx-
K3CGl6fuSm6VzW9T7esGQfco8nUXVYws0jlb5gq1JZ55yHgt5vP54ZShjoQzQVVh7vEXAMPLEjobID
x-amz-job-id: HkF9p6o7yjhFx-
K3CGl6fuSm6VzW9T7esGQfco8nUXVYws0jlb5gq1JZ55yHgt5vP54ZShjoQzQVVh7vEXAMPLEjobID
```

Example Request: Initiate an inventory retrieval job

The following request initiates an inventory retrieval job to get a list of archives from the `examplevault` vault. The `Format` set to `CSV` in the body of the request indicates that the inventory is returned in CSV format.

```
POST /-/vaults/examplevault/jobs HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
Content-Type: application/x-www-form-urlencoded
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2

{
```

```
{
  "Type": "inventory-retrieval",
  "Description": "My inventory job",
  "Format": "CSV",
  "SNSTopic": "arn:aws:sns:us-west-2:111111111111:Glacier-InventoryRetrieval-topic-Example"
}
```

Example Response

```
HTTP/1.1 202 Accepted
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Location: /11112223333/vaults/examplevault/jobs/HkF9p6o7yjhFx-K3CGl6fuSm6VzW9T7esGQfco8nUXVYws0jlb5gq1JZ55yHgt5vP54ZShjoQzQVVh7vEXAMPLEjobID
x-amz-job-id: HkF9p6o7yjhFx-K3CGl6fuSm6VzW9T7esGQfco8nUXVYws0jlb5gq1JZ55yHgt5vP54ZShjoQzQVVh7vEXAMPLEjobID
```

Example Requests: Initiate an inventory retrieval job by using date filtering with a set limit, and a subsequent request to retrieve the next page of inventory items.

The following request initiates a vault inventory retrieval job by using date filtering and setting a limit.

```
{
  "ArchiveId": null,
  "Description": null,
  "Format": "CSV",
  "RetrievalByteRange": null,
  "SNSTopic": null,
  "Type": "inventory-retrieval",
  "InventoryRetrievalParameters": {
    "StartDate": "2013-12-04T21:25:42Z",
    "EndDate": "2013-12-05T21:25:42Z",
    "Limit": "10000"
  },
}
```

The following request is an example of a subsequent request to retrieve the next page of inventory items using a marker obtained from [Describe Job \(GET JobID\)](#) (p. 250).

```
{
  "ArchiveId": null,
  "Description": null,
  "Format": "CSV",
  "RetrievalByteRange": null,
  "SNSTopic": null,
  "Type": "inventory-retrieval",
  "InventoryRetrievalParameters": {
    "StartDate": "2013-12-04T21:25:42Z",
    "EndDate": "2013-12-05T21:25:42Z",
    "Limit": "10000",
    "Marker":
      "vyS0t2jHqE5qbcDggIeD50chS1SXwYMrkVKo0KHITUjEYxBGCqRLKaiySzdn7QXGVV5XZpNVG67pCZ_uykQXFMLaxOSu2hO_-5CC"
  },
}
```

Example Request: Initiate a select job

The following request initiates a select job.

```
POST /-/vaults/examplevault/jobs HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
Content-Type: application/x-www-form-urlencoded
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2

{
  "Type": "select",
  "ArchiveId": "NkbByEejwEggmBz2fTHgJrg0XBoDfjP4q6iu87-
TjhgG6eGoOY9Z8i1_AUyUsuhPAdTqLHy8pTl5nfCFJmDl2yEZONi5L26Omwl2vcs01MNGntHEQL8MBfG1qrEXAMPLEArchiveId",
  "Description": null,
  "SNSTopic": null,

  "Tier": "Bulk",
  "SelectParameters": {
    "Expression": "select * from archive",
    "ExpressionType": "SQL",
    "InputSerialization": {
      "csv": {
        "Comments": null,
        "FileHeaderInfo": "None",
        "QuoteEscapeCharacter": "\"\"",
        "RecordDelimiter": "\n",
        "FieldDelimiter": ",",
        "QuoteCharacter": "\""
      }
    },
    "OutputSerialization": {
      "csv": {
        "QuoteFields": "AsNeeded",
        "QuoteEscapeCharacter": null,
        "RecordDelimiter": "\n",
        "FieldDelimiter": ",",
        "QuoteCharacter": "\""
      }
    }
  },
  "OutputLocation": {
    "S3": {
      "BucketName": "bucket-name",
      "Prefix": "test",
      "Encryption": {
        "EncryptionType": "AES256"
      },
      "CannedACL": "private",
      "StorageClass": "STANDARD"
    }
  }
}
```

Example Response

```
HTTP/1.1 202 Accepted
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Location: /111122223333/vaults/examplevault/jobs/HkF9p6o7yjhFx-
K3CGl6fuSm6VzW9T7esGQfco8nUXVYws0jlb5gq1JZ55yHgt5vP54ZShjoQzQVVh7vEXAMPLEjobID
x-amz-job-id: HkF9p6o7yjhFx-
K3CGl6fuSm6VzW9T7esGQfco8nUXVYws0jlb5gq1JZ55yHgt5vP54ZShjoQzQVVh7vEXAMPLEjobID
```

```
x-amz-job-output-path: test/HkF9p6o7yjhFx-  
K3CGl6fuSm6VzW9T7esGQfco8nUXVYwS0jlb5gq1JZ55yHgt5vP54ZShjoQzQVvh7vEXAMPLEjobID/
```

Related Sections

- [Describe Job \(GET JobID\) \(p. 250\)](#)
- [Get Job Output \(GET output\) \(p. 257\)](#)
- [SQL Reference for Amazon S3 Select and S3 Glacier Select \(p. 304\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

List Jobs (GET jobs)

Description

This operation lists jobs for a vault, including jobs that are in-progress and jobs that have recently finished.

Note

Amazon S3 Glacier (S3 Glacier) retains recently completed jobs for a period before deleting them; however, it eventually removes completed jobs. The output of completed jobs can be retrieved. Retaining completed jobs for a period of time after they have completed enables you to get a job output in the event you miss the job completion notification, or your first attempt to download it fails. For example, suppose that you start an archive retrieval job to download an archive. After the job completes, you start to download the archive but encounter a network error. In this scenario, you can retry and download the archive while the job exists.

The `List Jobs` operation supports pagination. You should always check the response `Marker` field. If there are no more jobs to list, the `Marker` field is set to `null`. If there are more jobs to list, the `Marker` field is set to a non-null value, which you can use to continue the pagination of the list. To return a list of jobs that begins at a specific job, set the `marker` request parameter to the `Marker` value for that job that you obtained from a previous `List Jobs` request.

You can set a maximum limit for the number of jobs returned in the response by specifying the `limit` parameter in the request. The default limit is 50. The number of jobs returned might be fewer than the limit, but the number of returned jobs never exceeds the limit.

Additionally, you can filter the jobs list returned by specifying the optional `statuscode` parameter or `completed` parameter, or both. Using the `statuscode` parameter, you can specify to return only jobs that match either the `InProgress`, `Succeeded`, or `Failed` status. Using the `completed` parameter, you can specify to return only jobs that were completed (`true`) or jobs that were not completed (`false`).

Requests

Syntax

To return a list of jobs of all types, send a `GET` request to the URI of the vault's jobs subresource.

```
GET /AccountId/vaults/VaultName/jobs HTTP/1.1  
Host: glacier.Region.amazonaws.com  
Date: Date  
Authorization: SignatureValue  
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID of the account that owns the vault. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier

uses the AWS account ID associated with the credentials used to sign the request. If you use an account ID, do not include any hyphens ('-') in the ID.

Request Parameters

Name	Description	Required
<code>completed</code>	The state of the jobs to return. You can specify <code>true</code> or <code>false</code> . Type: Boolean Constraints: None	No
<code>limit</code>	The maximum number of jobs to be returned. The default limit is 50. The number of jobs returned might be fewer than the specified limit, but the number of returned jobs never exceeds the limit. Type: String Constraints: Minimum integer value of 1. Maximum integer value of 50.	No
<code>marker</code>	An opaque string used for pagination that specifies the job at which the listing of jobs should begin. You get the <code>marker</code> value from a previous <code>List Jobs</code> response. You only need to include the <code>marker</code> if you are continuing the pagination of the results started in a previous <code>List Jobs</code> request. Type: String Constraints: None	No
<code>statuscode</code>	The type of job status to return. Type: String Constraints: One of the values <code>InProgress</code> , <code>Succeeded</code> , or <code>Failed</code> .	No

Request Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Request Body

This operation does not have a request body.

Responses

Syntax

```
HTTP/1.1 200 OK
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Location: Location
Content-Type: application/json
Content-Length: Length
```

```
{
  "JobList": [
    {
      "Action": "string",
      "ArchiveId": "string",
      "ArchiveSHA256TreeHash": "string",
      "ArchiveSizeInBytes": number,
      "Completed": boolean,
      "CompletionDate": "string",
      "CreationDate": "string",
      "InventoryRetrievalParameters": {
        "EndDate": "string",
        "Format": "string",
        "Limit": "string",
        "Marker": "string",
        "StartDate": "string"
      },
      "InventorySizeInBytes": number,
      "JobDescription": "string",
      "JobId": "string",
      "JobOutputPath": "string",
      "OutputLocation": {
        "S3": {
          "AccessControlList": [
            {
              "Grantee": {
                "DisplayName": "string",
                "EmailAddress": "string",
                "ID": "string",
                "Type": "string",
                "URI": "string"
              },
              "Permission": "string"
            }
          ],
          "BucketName": "string",
          "CannedACL": "string",
          "Encryption": {
            "EncryptionType": "string",
            "KMSContext": "string",
            "KMSKeyId": "string"
          },
          "Prefix": "string",
          "StorageClass": "string",
          "Tagging": {
            "string": "string"
          },
          "UserMetadata": {
            "string": "string"
          }
        }
      },
      "RetrievalByteRange": "string",
      "SelectParameters": {
        "Expression": "string",
        "ExpressionType": "string",
        "InputSerialization": {
          "csv": {
            "Comments": "string",
            "FieldDelimiter": "string",
            "FileHeaderInfo": "string",
            "QuoteCharacter": "string",
            "QuoteEscapeCharacter": "string",
            "RecordDelimiter": "string"
          }
        }
      }
    }
  ]
}
```

```

    },
    "OutputSerialization": {
      "csv": {
        "FieldDelimiter": "string",
        "QuoteCharacter": "string",
        "QuoteEscapeCharacter": "string",
        "QuoteFields": "string",
        "RecordDelimiter": "string"
      }
    },
    "SHA256TreeHash": "string",
    "SNSTopic": "string",
    "StatusCode": "string",
    "StatusMessage": "string",
    "Tier": "string",
    "VaultARN": "string"
  },
  "Marker": "string"
}

```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

The response body contains the following JSON fields.

JobList

A list of job objects. Each job object contains metadata describing the job.

Type: Array of [GlacierJobDescription \(p. 282\)](#) objects

Marker

An opaque string that represents where to continue pagination of the results. You use the `marker` value in a new `ListJobs` request to obtain more jobs in the list. If there are no more jobs to list, this value is `null`.

Type: String

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

The following examples demonstrate how to return information about vault jobs. The first example returns a list of two jobs, and the second example returns a subset of jobs.

Example: Return All Jobs

Example Request

The following `GET` request returns the jobs for a vault.

```

GET /-/vaults/examplevault/jobs HTTP/1.1
Host: glacier.us-west-2.amazonaws.com

```

```
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

The following response includes an archive retrieval job and an inventory retrieval job that contains a marker used to continue pagination of the vault inventory retrieval. The response also shows the Marker field set to null, which indicates there are no more jobs to list.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJC1-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Type: application/json
Content-Length: 1444

{
  "JobList": [
    {
      "Action": "ArchiveRetrieval",
      "ArchiveId": "BDfaUQul0dVzYwAMr8YSa_6_8abbhZq-
i1oT69g8ByClfJyBgAGBkWL2QbF5os851P7Y7KdZDOHWJIn4rh1ZHaOYD3MgFhK_g0oDPesW34uHQoVGwoIqubf6BgUEfQm_wrU4Jl",
      "ArchiveSizeInBytes": 1048576,
      "ArchiveSHA256TreeHash":
"25499381569ab2f85e1fd0eb93c5406a178ab77c5933056eb5d6e7d4adda609b",
      "Completed": true,
      "CompletionDate": "2012-05-01T00:00:09.304Z",
      "CreationDate": "2012-05-01T00:00:06.663Z",
      "InventorySizeInBytes": null,
      "JobDescription": null,
      "JobId": "hDe9t9DTHXqFw8sBGpLQQOmIM0-
JrGtu1O_YFKLnzQ64548qJc667BRWTwBLZC76Ygy1jHYruqXkdcAhRsh0hYv4eVRU",
      "RetrievalByteRange": "0-1048575",
      "SHA256TreeHash": "25499381569ab2f85e1fd0eb93c5406a178ab77c5933056eb5d6e7d4adda609b",
      "SNSTopic": null,
      "StatusCode": "Succeeded",
      "StatusMessage": "Succeeded",
      "Tier": "Bulk",
      "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault"
    },
    {
      "Action": "InventoryRetrieval",
      "ArchiveId": null,
      "ArchiveSizeInBytes": null,
      "ArchiveSHA256TreeHash": null,
      "Completed": true,
      "CompletionDate": "2013-05-11T00:25:18.831Z",
      "CreationDate": "2013-05-11T00:25:14.981Z",
      "InventorySizeInBytes": 1988,
      "JobDescription": null,
      "JobId":
"2cvVOnBL36btzyP3pobwIceiaJebM1bx9vZOOutmNAr0KaVZ4WkWgVjiPldJ73VU7imlmOpnZriBVBebnqaAcirZq_C5",
      "RetrievalByteRange": null,
      "SHA256TreeHash": null,
      "SNSTopic": null,
      "StatusCode": "Succeeded",
      "StatusMessage": "Succeeded",
      "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault"
      "InventoryRetrievalParameters": {
        "StartDate": "2013-11-12T13:43:12Z",
        "EndDate": "2013-11-20T08:12:45Z",
        "Limit": "120000",
      }
    }
  ]
}
```

```

        "Format": "JSON",
        "Marker":
"vyS0t2jHQe5qbcDggIeD50chS1SXwYMrkVKo0KHITUjEYxBGCqRLKaiySzdN7QXGVV5XZpNVG67pCZ_uykQXFMLaxOSu2hO_-5CC
    }
  ],
  "Marker": null
}

```

Example: Return a Partial List of Jobs

Example Request

The following GET request returns the job specified by the marker parameter. Setting the limit parameter as 2 specifies that up to two jobs are returned.

```

GET /-/vaults/examplevault/jobs?marker=HkF9p6o7yjhFx-
K3CGl6fuSm6VzW9T7esGQfco8nUXVYwS0jlb5gq1JZ55yHgt5vP54ZShjoQzQVVh7vEXAMPLEjobID&limit=2
HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dc540091b12966f2a2

```

Example Response

The following response shows two jobs returned and the Marker field set to a non-null value that can be used to continue pagination of the job list.

```

HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Type: application/json
Content-Length: 1744

{
  "JobList": [
    {
      "Action": "ArchiveRetrieval",
      "ArchiveId": "58-3KpZfcMPUznvMZNPaKyJx9wODCsWTnqcjtx2CjKZ6b-
XgxEuA8yvZYOYTPQfd7gWR4GRm2XR08gcnWbLV4VPV_kDWtZJKi0TFhKKVPzwrZnA4-
FXuIBfViYUIVveeiBE51FO4bvg",
      "ArchiveSizeInBytes": 8388608,
      "ArchiveSHA256TreeHash":
"106086b256ddf0fedf3d9e72f461d5983a2566247ebe7e1949246bc61359b4f4",
      "Completed": true,
      "CompletionDate": "2012-05-01T00:25:20.043Z",
      "CreationDate": "2012-05-01T00:25:16.344Z",
      "InventorySizeInBytes": null,
      "JobDescription": "aaabbbccc",
      "JobId": "s4MvaNHih6mOa1f8iY4ioG2921SDPihXxh3Kv0FBX-
JbNPctPrvE4c2_BifuhdGLqEhGBNGeB6Ub-JMunR9JoVa8y1hQ",
      "RetrievalByteRange": "0-8388607",
      "SHA256TreeHash": "106086b256ddf0fedf3d9e72f461d5983a2566247ebe7e1949246bc61359b4f4",
      "SNSTopic": null,
      "StatusCode": "Succeeded",
      "StatusMessage": "Succeeded",
      "Tier": "Bulk",
      "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault"
    },
    {
      "Action": "ArchiveRetrieval",

```

```
    "ArchiveId": "2NVGpf83U6qB9M2u-Ihh61yoFLRDEoh7YLZWKBn80A2i1xG8uieBwGjAr4RkzOHA0E07ZjtI267R03Z-6Hxd8pyGQkBdciCSH1-Lw63Kx9qKpZbPCdU0uTW_WAdwF6lR6w8iSyKdvw",
    "ArchiveSizeInBytes": 1048576,
    "ArchiveSHA256TreeHash":
      "3d2ae052b2978727e0c51c0a5e32961c6a56650d1f2e4ceccab6472a5ed4a0",
    "Completed": true,
    "CompletionDate": "2012-05-01T16:59:48.444Z",
    "CreationDate": "2012-05-01T16:59:42.977Z",
    "InventorySizeInBytes": null,
    "JobDescription": "aaabbbccc",
    "JobId":
      "CQ_tf6fOR4jrJCL61Mfk6VM03oY8lmnWK93KK4gLig1UPAbZiN3UV4G_5nq4AfmJHQ_dOMLOX5k8ItFv0wCPN0oaz5dG",
    "RetrievalByteRange": "0-1048575",
    "SHA256TreeHash": "3d2ae052b2978727e0c51c0a5e32961c6a56650d1f2e4ceccab6472a5ed4a0",
    "SNSTopic": null,
    "StatusCode": "Succeeded",
    "StatusMessage": "Succeeded",
    "Tier": "Standard",
    "VaultARN": "arn:aws:glacier:us-west-2:012345678901:vaults/examplevault"
  },
  "Marker":
    "CQ_tf6fOR4jrJCL61Mfk6VM03oY8lmnWK93KK4gLig1UPAbZiN3UV4G_5nq4AfmJHQ_dOMLOX5k8ItFv0wCPN0oaz5dG"
}
```

Related Sections

- [Describe Job \(GET JobID\) \(p. 250\)](#)
- [Identity and Access Management in Amazon S3 Glacier \(p. 125\)](#)

Data Types Used in Job Operations

The following are data types used with the job operations in S3 Glacier.

Topics

- [CSVInput \(p. 279\)](#)
- [CSVOutput \(p. 280\)](#)
- [Encryption \(p. 281\)](#)
- [GlacierJobDescription \(p. 282\)](#)
- [Grant \(p. 285\)](#)
- [Grantee \(p. 285\)](#)
- [InputSerialization \(p. 286\)](#)
- [InventoryRetrievalJobInput \(p. 286\)](#)
- [jobParameters \(p. 287\)](#)
- [OutputLocation \(p. 289\)](#)
- [OutputSerialization \(p. 290\)](#)
- [S3Location \(p. 290\)](#)
- [SelectParameters \(p. 291\)](#)

CSVInput

Contains information about the comma-separated values (CSV) file.

Contents

Comments

A single character used to indicate that a row should be ignored when the character is present at the start of that row.

Type: String

Required: no

FieldDelimiter

A single character used to separate individual fields from each other within a record. The character must be a `\n`, `\r`, or an ASCII character in the range 32–126. The default is a comma (,).

Type: String

Default: ,

Required: no

FileHeaderInfo

A value that describes what to do with the first line of the input.

Type: String

Valid Values: Use | Ignore | None

Required: no

QuoteCharacter

A single character used as an escape character where the field delimiter is part of the value.

Type: String

Required: no

QuoteEscapeCharacter

A single character used for escaping the quotation-mark character inside an already escaped value.

Type: String

Required: no

RecordDelimiter

A single character used to separate individual records from each other.

Type: String

Required: no

More Info

- [Initiate Job \(POST jobs\) \(p. 263\)](#)

CSVOutput

Contains information about the comma-separated values (CSV) format that the job results are stored in.

Contents

FieldDelimiter

A single character used to separate individual fields from each other within a record.

Type: String

Required: no

QuoteCharacter

A single character used as an escape character where the field delimiter is part of the value.

Type: String

Required: no

QuoteEscapeCharacter

A single character used for escaping the quotation-mark character inside an already escaped value.

Type: String

Required: no

QuoteFields

A value that indicates whether all output fields should be contained within quotation marks.

Valid Values: ALWAYS | ASNEEDED

Type: String

Required: no

RecordDelimiter

A single character used to separate individual records from each other.

Type: String

Required: no

More Info

- [Initiate Job \(POST jobs\) \(p. 263\)](#)

Encryption

Contains information about the encryption used to store the job results in Amazon S3.

Contents

Encryption

The server-side encryption algorithm used when storing job results in Amazon S3. The default is no encryption.

Type: String

Valid Values: `aws:kms` | `AES256`

Required: no

KMSContext

Optional. If the encryption type is `aws:kms`, you can use this value to specify the encryption context for the job results.

Type: String

Required: no

KMSKeyId

The AWS Key Management Service (AWS KMS) key ID to use for object encryption.

Type: String

Required: no

More Info

- [Initiate Job \(POST jobs\)](#) (p. 263)

GlacierJobDescription

Contains the description of an Amazon S3 Glacier (S3 Glacier) job.

Contents

Action

The job type. It is either `ArchiveRetrieval`, `InventoryRetrieval`, or `Select`.

Type: String

ArchiveId

The archive ID requested for a select or archive retrieval job. Otherwise, this field is `null`.

Type: String

ArchiveSHA256TreeHash

The SHA256 tree hash of the entire archive for an archive retrieval. For inventory retrieval jobs, this field is `null`.

Type: String

ArchiveSizeInBytes

For an `ArchiveRetrieval` job, this is the size in bytes of the archive being requested for download. For the `InventoryRetrieval` job, the value is `null`.

Type: Number

Completed

`true` if the job is completed; `false` otherwise.

Type: Boolean

CompletionDate

The date when the job completed.

The Universal Coordinated Time (UTC) time that the job request completed. While the job is in progress, the value is null.

Type: A string representation in the ISO 8601 date format, for example
2013-03-20T17:03:43.221Z.

CreationDate

The Universal Coordinated Time (UTC) date the job started.

Type: A string representation in the ISO 8601 date format, for example
2013-03-20T17:03:43.221Z.

InventoryRetrievalParameters

Input parameters used for a range inventory retrieval.

Type: [InventoryRetrievalJobInput](#) (p. 286) object

InventorySizeInBytes

For an `InventoryRetrieval` job, this is the size in bytes of the inventory requested for download. For the `ArchiveRetrieval` or `Select` job, the value is null.

Type: Number

JobDescription

The job description that you provided when you initiated the job.

Type: String

JobId

The ID that identifies the job in S3 Glacier.

Type: String

JobOutputPath

Contains the job output location.

Type: String

OutputLocation

An object that contains information about the location where the select job results and errors are stored.

Type: [OutputLocation](#) (p. 289) object

RetrievalByteRange

The retrieved byte range for archive retrieval jobs in the form "*StartByteValue-EndByteValue*." If no range was specified in the archive retrieval, then the whole archive is retrieved and *StartByteValue* equals 0 and *EndByteValue* equals the size of the archive minus 1. For inventory retrieval jobs, this field is null.

Type: String

SelectParameters

An object that contains information about the parameters used for a select.

Type: [SelectParameters](#) (p. 291) object

SHA256TreeHash

The SHA256 tree hash value for the requested range of an archive. If the [Initiate Job \(POST jobs\)](#) (p. 263) request for an archive specified a tree-hash aligned range, then this field returns a value. For more information about tree-hash alignment for archive range retrievals, see [Receiving Checksums When Downloading Data](#) (p. 175).

For the specific case in which the whole archive is retrieved, this value is the same as the `ArchiveSHA256TreeHash` value.

This field is `null` in the following situations:

- Archive retrieval jobs that specify a range that is not tree-hash aligned.
- Archival jobs that specify a range that is equal to the whole archive and the job status is `InProgress`.
- Inventory jobs.
- Select jobs.

Type: String

SNSTopic

The Amazon Resource Name (ARN) that represents an Amazon SNS topic where notification of job completion or failure is sent, if notification was configured in the job initiation ([Initiate Job \(POST jobs\)](#) (p. 263)).

Type: String

StatusCode

The code indicating the status of the job.

Valid Values: `InProgress` | `Succeeded` | `Failed`

Type: String

StatusMessage

The job status message.

Type: String

Tier

The data access tier to use for the select or archive retrieval.

Valid Values: `Expedited` | `Standard` | `Bulk`

Type: String

VaultARN

The ARN of the vault of which the job is a subresource.

Type: String

More Info

- [Initiate Job \(POST jobs\)](#) (p. 263)

Grant

Contains information about a grant.

Contents

Grantee

The grantee.

Type: [Grantee \(p. 285\)](#) object

Required: no

Permission

The permission given to the grantee.

Type: String

Valid Values: FULL_CONTROL | WRITE | WRITE_ACP | READ | READ_ACP

Required: no

More Info

- [Initiate Job \(POST jobs\) \(p. 263\)](#)

Grantee

Contains information about a grantee.

Contents

DisplayName

The screen name of the grantee.

Type: String

Required: no

EmailAddress

The email address of the grantee.

Type: String

Required: no

ID

The canonical user ID of the grantee.

Type: String

Required: no

Type

The type of the grantee.

Type: String

Valid Values: AmazonCustomerByEmail | CanonicalUser | Group

Required: no

URI

The URI of the grantee group.

Type: String

Required: no

More Info

- [Initiate Job \(POST jobs\) \(p. 263\)](#)

InputSerialization

Describes how the archive is serialized.

Contents

CSV

An object that describes the serialization of a CSV-encoded object.

Type: [CSVInput \(p. 279\)](#) object

Required: no

More Info

- [Initiate Job \(POST jobs\) \(p. 263\)](#)

InventoryRetrievalJobInput

Provides options for specifying a range inventory retrieval job.

Contents

EndDate

The end of the date range, in UTC time, for a vault inventory retrieval that includes archives created before this date.

Valid Values: A string representation in the ISO 8601 date format (YYYY-MM-DDThh:mm:ssTZD) in seconds, for example 2013-03-20T17:03:43Z.

Type: String. A string representation in the ISO 8601 date format (YYYY-MM-DDThh:mm:ssTZD) in seconds, for example 2013-03-20T17:03:43Z.

Required: no

Format

The output format for the vault inventory list, which is set by the [Initiate Job \(POST jobs\) \(p. 263\)](#) request when initiating a job to retrieve a vault inventory.

Valid Values: CSV | JSON

Required: no

Type: String

Limit

The maximum number of inventory items that can be returned for each vault inventory retrieval request.

Valid Values: An integer value greater than or equal to 1.

Type: String

Required: no

Marker

An opaque string that represents where to continue pagination of the vault inventory retrieval results. You use this marker in a new `Initiate Job` request to obtain additional inventory items. If there are no more inventory items, this value is null.

Type: String

Required: no

StartDate

The start of the date range, in UTC time, for a vault inventory retrieval that includes archives created on or after this date.

Valid Values: A string representation in the ISO 8601 date format (YYYY-MM-DDThh:mm:ssTZD) in seconds, for example 2013-03-20T17:03:43Z.

Type: String. A string representation in the ISO 8601 date format (YYYY-MM-DDThh:mm:ssTZD) in seconds, for example 2013-03-20T17:03:43Z.

Required: no

More Info

- [Initiate Job \(POST jobs\) \(p. 263\)](#)

jobParameters

Provides options for defining a job.

Contents

ArchiveId

The ID of the archive that you want. This field is required if the `Type` field is set to `select` or `archive-retrieval`. An error occurs if you specify this field for an inventory retrieval job request.

Valid Values: Must be a valid archive ID that you obtained from a previous request to Amazon S3 Glacier (S3 Glacier).

Type: String

Required: Yes when `Type` is set to `select` or `archive-retrieval`.

Description

The optional description for the job.

Valid Values: The description must be less than or equal to 1,024 bytes. The allowable characters are 7-bit ASCII without control codes—specifically, ASCII values 32–126 decimal or 0x20–0x7E hexadecimal.

Type: String

Required: no

Format

(Optional) The output format, when initiating a job to retrieve a vault inventory. If you are initiating an inventory job and don't specify a `Format` field, JSON is the default format.

Valid Values: CSV | JSON

Type: String

Required: no

InventoryRetrievalParameters

Input parameters used for a range inventory retrieval.

Type: [InventoryRetrievalJobInput](#) (p. 286) object

Required: no

OutputLocation

An object that contains information about the location where the select job results are stored.

Type: [OutputLocation](#) (p. 289) object

Required: Yes, for select jobs.

RetrievalByteRange

The byte range to retrieve for an `archive-retrieval`, in the form "*StartByteValue-EndByteValue*". If this field isn't specified, the whole archive is retrieved. If this field is specified, the byte range must be megabyte (1024*1024) aligned. Megabyte-aligned means that *StartByteValue* must be divisible by 1 MB, and *EndByteValue* plus 1 must be divisible by 1 MB or be the end of the archive specified as the archive byte size value minus 1. If **RetrievalByteRange** is not megabyte-aligned, this operation returns a 400 response.

An error occurs if you specify this field for an `inventory-retrieval` or `select` job request.

Type: String

Required: no

SelectParameters

An object that contains information about the parameters used for a select.

Type: [SelectParameters](#) (p. 291) object

Required: no

SNSTopic

The Amazon Resource Name (ARN) of the Amazon SNS topic where S3 Glacier sends a notification when the job is completed and output is ready for you to download. The specified topic publishes the notification to its subscribers.

The SNS topic must exist. If it doesn't, S3 Glacier doesn't create it for you. Additionally, the SNS topic must have a policy that allows the account that created the job to publish messages to the topic. For information about SNS topic names, see [CreateTopic](#) in the *Amazon Simple Notification Service API Reference*.

Type: String

Required: no

Tier

The tier to use for a select or an archive retrieval job. `Standard` is the default value used.

Valid Values: `Expedited` | `Standard` | `Bulk`

Type: String

Required: no

Type

The job type. You can initiate a job to perform a select query on an archive, retrieve an archive, or get an inventory of a vault.

Valid Values: `select` | `archive-retrieval` | `inventory-retrieval`

Type: String

Required: yes

More Info

- [Initiate Job \(POST jobs\) \(p. 263\)](#)

OutputLocation

Contains information about the location where the job results and errors are stored.

Contents

S3

An object that describes an Amazon S3 location to receive the results of the restore request.

Type: [S3Location \(p. 290\)](#)

Required: yes

More Info

- [Initiate Job \(POST jobs\) \(p. 263\)](#)

OutputSerialization

Describes how the output is serialized.

Contents

CSV

An object that describes the serialization of the comma-separated values (CSV)-encoded query results.

Type: [CSVOutput \(p. 280\)](#) object

Required: no

More Info

- [Initiate Job \(POST jobs\) \(p. 263\)](#)

S3Location

Contains information about the location in Amazon S3 where the job results are stored.

Contents

AccessControlList

A list of grants that control access to the stored results.

Type: Array of [Grant \(p. 285\)](#) objects

Required: no

BucketName

The name of the Amazon S3 bucket where the job results are stored. The bucket must be in the same AWS Region as the vault that contains the input archive object.

Type: String

Required: yes

CannedACL

The canned access control list (ACL) to apply to the job results.

Type: String

Valid Values: `private` | `public-read` | `public-read-write` | `aws-exec-read` | `authenticated-read` | `bucket-owner-read` | `bucket-owner-full-control`

Required: no

Encryption

An object that contains information about the encryption used to store the job results in Amazon S3.

Type: [Encryption \(p. 281\)](#) object

Required: no

Prefix

The prefix that is prepended to the results for this request. The maximum length for the prefix is 512 bytes.

Type: String

Required: yes

StorageClass

The class of storage used to store the job results.

Type: String

Valid Values: STANDARD | REDUCED_REDUNDANCY | STANDARD_IA

Required: no

Tagging

The tag set that is applied to the job results.

Type: String to string map

Required: no

UserMetadata

A map of metadata to store with the job results in Amazon S3.

Type: String to string map

Required: no

More Info

- [Initiate Job \(POST jobs\) \(p. 263\)](#)

SelectParameters

Contains information about the parameters used for the select.

Contents

Expression

The expression that is used to select the object. The expression must not exceed the quota of 128,000 characters.

Type: String

Required: yes

ExpressionType

The type of the provided expression, for example `SQL`.

Valid Values: `SQL`

Type: String

Required: yes

InputSerialization

Describes the serialization format of the object in the select.

Type: [InputSerialization \(p. 286\)](#) object

Required: no

OutputSerialization

Describes how the results of the select job are serialized.

Required: no

Type: [OutputSerialization \(p. 290\)](#) object

More Info

- [Initiate Job \(POST jobs\) \(p. 263\)](#)

Data Retrieval Operations

The following are the data retrieval–related operations available in S3 Glacier.

Topics

- [Get Data Retrieval Policy \(GET policy\) \(p. 292\)](#)
- [List Provisioned Capacity \(GET provisioned-capacity\) \(p. 295\)](#)
- [Purchase Provisioned Capacity \(POST provisioned-capacity\) \(p. 297\)](#)
- [Set Data Retrieval Policy \(PUT policy\) \(p. 299\)](#)

Get Data Retrieval Policy (GET policy)

Description

This operation returns the current data retrieval policy for the AWS account and AWS Region specified in the `GET` request. For more information about data retrieval policies, see [Amazon S3 Glacier Data Retrieval Policies \(p. 151\)](#).

Requests

To return the current data retrieval policy, send an HTTP `GET` request to the data retrieval policy URI as shown in the following syntax example.

Syntax

```
GET /AccountId/policies/data-retrieval HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
```

```
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID. This value must match the AWS account ID associated with the credentials used to sign the request. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you specify your account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

This operation does not have a request body.

Responses

Syntax

```
HTTP/1.1 200 OK
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Content-Type: application/json
Content-Length: length
{
  "Policy":
  {
    "Rules":[
      {
        "BytesPerHour": Number,
        "Strategy": String
      }
    ]
  }
}
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

The response body contains the following JSON fields.

BytesPerHour

The maximum number of bytes that can be retrieved in an hour.

This field will be present only if the value of the **Strategy** field is `BytesPerHour`.

Type: Number

Rules

The policy rule. Although this is a list type, currently there will be only one rule, which contains a `Strategy` field and optionally a `BytesPerHour` field.

Type: Array

Strategy

The type of data retrieval policy.

Type: String

Valid values: `BytesPerHour`|`FreeTier`|`None`. `BytesPerHour` is equivalent to selecting **Max Retrieval Rate** in the console. `FreeTier` is equivalent to selecting **Free Tier Only** in the console. `None` is equivalent to selecting **No Retrieval Policy** in the console. For more information about selecting data retrieval policies in the console, see [Amazon S3 Glacier Data Retrieval Policies \(p. 151\)](#).

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

The following example demonstrates how to get a data retrieval policy.

Example Request

In this example, a `GET` request is sent to the URI of a policy's location.

```
GET /-/policies/data-retrieval HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dc540091b12966f2a2
```

Example Response

A successful response shows the data retrieval policy in the body of the response in JSON format.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:00:00 GMT
Content-Type: application/json
Content-Length: 85

{
  "Policy": {
    "Rules": [
      {
        "BytesPerHour": 10737418240,
        "Strategy": "BytesPerHour"
      }
    ]
  }
}
```

Related Sections

- [Set Data Retrieval Policy \(PUT policy\) \(p. 299\)](#)
- [Initiate Job \(POST jobs\) \(p. 263\)](#)

List Provisioned Capacity (GET provisioned-capacity)

This operation lists the provisioned capacity units for the specified AWS account. For more information about provisioned capacity, see [Archive Retrieval Options \(p. 84\)](#).

A provisioned capacity unit lasts for one month starting at the date and time of purchase, which is the start date. The unit expires on the expiration date, which is exactly one month after the start date to the nearest second.

If the start date is on the 31st day of a month, the expiration date is the last day of the next month. For example, if the start date is August 31, the expiration date is September 30. If the start date is January 31, the expiration date is February 28. You can see this functionality in the [Example Response \(p. 297\)](#).

Request Syntax

To list the provisioned retrieval capacity for an account, send an HTTP GET request to the provisioned-capacity URI as shown in the following syntax example.

```
GET /AccountId/provisioned-capacity HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
x-amz-glacier-version: 2012-06-01
```

Note

The *AccountId* value is the AWS account ID. This value must match the AWS account ID associated with the credentials used to sign the request. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you specify your account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

This operation does not have a request body.

Responses

If the operation is successful, the service sends back an HTTP 200 OK response.

Response Syntax

```
HTTP/1.1 200 OK
x-amzn-RequestId: x-amzn-RequestId
Date: Date
Content-Type: application/json
Content-Length: Length
{
  "ProvisionedCapacityList":
  {
    "CapacityId" : "string",
    "StartDate" : "string"
    "ExpirationDate" : "string"
  }
}
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

The response body contains the following JSON fields.

CapacityId

The ID that identifies the provisioned capacity unit.

Type: String.

StartDate

The date that the provisioned capacity unit was purchased, in Coordinated Universal Time (UTC).

Type: String. A string representation in the ISO 8601 date format, for example
2013-03-20T17:03:43.221Z.

ExpirationDate

The date that the provisioned capacity unit expires, in Coordinated Universal Time (UTC).

Type: String. A string representation in the ISO 8601 date format, for example
2013-03-20T17:03:43.221Z.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

The following example lists the provisioned capacity units for an account.

Example Request

In this example, a GET request is sent to retrieve a list of the provisioned capacity units for the specified account.

```
GET /123456789012/priority-capacity HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
```

```
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
```

Example Response

If the request was successful, Amazon S3 Glacier (S3 Glacier) returns a `HTTP 200 OK` with a list of provisioned capacity units for the account as shown in the following example.

The provisioned capacity unit listed first is an example of a unit with a start date of January 31, 2017 and expiration date of February 28, 2017. As stated earlier, if the start date is on the 31st day of a month, the expiration date is the last day of the next month.

```
HTTP/1.1 200 OK
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:02:00 GMT
Content-Type: application/json
Content-Length: length

{
  "ProvisionedCapacityList",
  {
    "CapacityId": "zSaq7NzHFQDANTfQkDen4V7z",
    "StartDate": "2017-01-31T14:26:33.031Z",
    "ExpirationDate": "2017-02-28T14:26:33.000Z",
  },
  {
    "CapacityId": "yXaq7NzHFQDANTfQkDen4V7z",
    "StartDate": "2016-12-13T20:11:51.095Z",
    "ExpirationDate": "2017-01-13T20:11:51.000Z",
  },
  ...
}
```

Related Sections

- [Purchase Provisioned Capacity \(POST provisioned-capacity\) \(p. 297\)](#)

Purchase Provisioned Capacity (POST provisioned-capacity)

This operation purchases a provisioned capacity unit for an AWS account.

A provisioned capacity unit lasts for one month starting at the date and time of purchase, which is the start date. The unit expires on the expiration date, which is exactly one month after the start date to the nearest second.

If the start date is on the 31st day of a month, the expiration date is the last day of the next month. For example, if the start date is August 31, the expiration date is September 30. If the start date is January 31, the expiration date is February 28.

Provisioned capacity helps ensure that your retrieval capacity for expedited retrievals is available when you need it. Each unit of capacity ensures that at least three expedited retrievals can be performed every five minutes and provides up to 150 MB/s of retrieval throughput. For more information about provisioned capacity, see [Archive Retrieval Options \(p. 84\)](#).

Requests

To purchase provisioned capacity unit for an AWS account send an HTTP `POST` request to the provisioned-capacity URI.

Syntax

```
POST /AccountId/provisioned-capacity HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
Content-Length: Length
x-amz-glacier-version: 2012-06-01
```

Note

The `AccountId` value is the AWS account ID. This value must match the AWS account ID associated with the credentials used to sign the request. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you specify your account ID, do not include any hyphens ('-') in the ID.

Request Parameters

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

This operation does not have a request body.

Responses

If the operation request is successful, the service returns an HTTP `201 Created` response.

Syntax

```
HTTP/1.1 201 Created
x-amzn-RequestId: x-amzn-RequestId
Date: Date
x-amz-capacity-id: CapacityId
```

Response Headers

A successful response includes the following response headers, in addition to the response headers that are common to all operations. For more information about common response headers, see [Common Response Headers \(p. 162\)](#).

Name	Description
<code>x-amz-capacity-id</code>	The ID that identifies the provisioned capacity unit. Type: String

Response Body

This operation does not return a response body.

Errors

This operation includes the following error or errors, in addition to the possible errors common to all Amazon S3 Glacier operations. For information about Amazon S3 Glacier errors and a list of error codes, see [Error Responses](#) (p. 176).

Code	Description	HTTP Status Code	Type
LimitExceededException	Returned if the given request would exceed the account's limit of provisioned capacity units.	400 Bad Request	Client

Examples

The following example purchases provisioned capacity for an account.

Example Request

The following example sends an HTTP POST request to purchase a provisioned capacity unit.

```
POST /123456789012/provisioned-capacity HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dcb540091b12966f2a2
Content-Length: length
x-amz-glacier-version: 2012-06-01
```

Example Response

If the request was successful, Amazon S3 Glacier (S3 Glacier) returns an HTTP 201 Created response, as shown in the following example.

```
HTTP/1.1 201 Created
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
Date: Wed, 10 Feb 2017 12:02:00 GMT
x-amz-capacity-id: zSaq7NzHFQDANTfQkDen4V7z
```

Related Sections

- [List Provisioned Capacity \(GET provisioned-capacity\)](#) (p. 295)

Set Data Retrieval Policy (PUT policy)

Description

This operation sets and then enacts a data retrieval policy in the AWS Region specified in the `PUT` request. You can set one policy per AWS Region for an AWS account. The policy is enacted within a few minutes of a successful `PUT` operation.

The set policy operation does not affect retrieval jobs that were in progress before the policy was enacted. For more information about data retrieval policies, see [Amazon S3 Glacier Data Retrieval Policies \(p. 151\)](#).

Requests

Syntax

To set a data retrieval policy, send an HTTP PUT request to the data retrieval policy URI as shown in the following syntax example.

```
PUT /AccountId/policies/data-retrieval HTTP/1.1
Host: glacier.Region.amazonaws.com
Date: Date
Authorization: SignatureValue
Content-Length: Length
x-amz-glacier-version: 2012-06-01

{
  "Policy":
  {
    "Rules": [
      {
        "Strategy": String,
        "BytesPerHour": Number
      }
    ]
  }
}
```

Note

The *AccountId* value is the AWS account ID. This value must match the AWS account ID associated with the credentials used to sign the request. You can either specify an AWS account ID or optionally a single '-' (hyphen), in which case Amazon S3 Glacier uses the AWS account ID associated with the credentials used to sign the request. If you specify your account ID, do not include any hyphens ('-') in the ID.

Request Parameters

This operation does not use request parameters.

Request Headers

This operation uses only request headers that are common to all operations. For information about common request headers, see [Common Request Headers \(p. 160\)](#).

Request Body

The request body contains the following JSON fields.

BytesPerHour

The maximum number of bytes that can be retrieved in an hour.

This field is required only if the value of the *Strategy* field is *BytesPerHour*. Your PUT operation will be rejected if the *Strategy* field is not set to *BytesPerHour* and you set this field.

Type: Number

Required: Yes, if the *Strategy* field is set to *BytesPerHour*. Otherwise, no.

Valid Values: Minimum integer value of 1. Maximum integer value of $2^{63} - 1$ inclusive.

Rules

The policy rule. Although this is a list type, currently there must be only one rule, which contains a Strategy field and optionally a BytesPerHour field.

Type: Array

Required: Yes

Strategy

The type of data retrieval policy to set.

Type: String

Required: Yes

Valid values: BytesPerHour|FreeTier|None. BytesPerHour is equivalent to selecting **Max Retrieval Rate** in the console. FreeTier is equivalent to selecting **Free Tier Only** in the console. None is equivalent to selecting **No Retrieval Policy** in the console. For more information about selecting data retrieval policies in the console, see [Amazon S3 Glacier Data Retrieval Policies \(p. 151\)](#).

Responses

Syntax

```
HTTP/1.1 204 No Content
x-amzn-RequestId: x-amzn-RequestId
Date: Date
```

Response Headers

This operation uses only response headers that are common to most responses. For information about common response headers, see [Common Response Headers \(p. 162\)](#).

Response Body

This operation does not return a response body.

Errors

For information about Amazon S3 Glacier exceptions and error messages, see [Error Responses \(p. 176\)](#).

Examples

Example Request

The following example sends an HTTP PUT request with the Strategy field set to BytesPerHour.

```
PUT /-/policies/data-retrieval HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dc540091b12966f2a2
```

```
{
  "Policy":
  {
    "Rules":[
      {
        "Strategy":"BytesPerHour",
        "BytesPerHour":10737418240
      }
    ]
  }
}
```

The following example sends an HTTP PUT request with the Strategy field set to FreeTier.

```
PUT /-/policies/data-retrieval HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dc540091b12966f2a2

{
  "Policy":
  {
    "Rules":[
      {
        "Strategy":"FreeTier"
      }
    ]
  }
}
```

The following example sends an HTTP PUT request with the Strategy field set to None.

```
PUT /-/policies/data-retrieval HTTP/1.1
Host: glacier.us-west-2.amazonaws.com
x-amz-Date: 20170210T120000Z
x-amz-glacier-version: 2012-06-01
Authorization: AWS4-HMAC-SHA256 Credential=AKIAIOSFODNN7EXAMPLE/20141123/
us-west-2/glacier/aws4_request,SignedHeaders=host;x-amz-date;x-amz-glacier-
version,Signature=9257c16da6b25a715ce900a5b45b03da0447acf430195dc540091b12966f2a2

{
  "Policy":
  {
    "Rules":[
      {
        "Strategy":"None"
      }
    ]
  }
}
```

Example Response

If the request was successful Amazon S3 Glacier (S3 Glacier) sets the policy and returns a HTTP 204 No Content as shown in the following example.

```
HTTP/1.1 204 No Content
x-amzn-RequestId: AAABZpJrTyioDC_HsOmHae8EZp_uBSJr6cnGOLKp_XJCl-Q
```

Date: Wed, 10 Feb 2017 12:02:00 GMT

Related Sections

- [Get Data Retrieval Policy \(GET policy\) \(p. 292\)](#)
- [Initiate Job \(POST jobs\) \(p. 263\)](#)

SQL Reference for Amazon S3 Select and S3 Glacier Select

This reference contains a description of the structured query language (SQL) elements that are supported by Amazon S3 Select and S3 Glacier Select.

Topics

- [SELECT Command](#) (p. 304)
- [Data Types](#) (p. 311)
- [Operators](#) (p. 311)
- [Reserved Keywords](#) (p. 313)
- [SQL Functions](#) (p. 317)

SELECT Command

Amazon S3 Select and S3 Glacier Select support only the `SELECT` SQL command. The following ANSI standard clauses are supported for `SELECT`:

- `SELECT` list
- `FROM` clause
- `WHERE` clause
- `LIMIT` clause (Amazon S3 Select only)

Note

Amazon S3 Select and S3 Glacier Select queries currently do not support subqueries or joins.

SELECT List

The `SELECT` list names the columns, functions, and expressions that you want the query to return. The list represents the output of the query.

```
SELECT *  
SELECT projection [ AS column_alias | column_alias ] [, ...]
```

The first form with `*` (asterisk) returns every row that passed the `WHERE` clause, as-is. The second form creates a row with user-defined output scalar expressions *projection* for each column.

FROM Clause

Amazon S3 Select and S3 Glacier Select support the following forms of the `FROM` clause:

```
FROM table_name  
FROM table_name alias  
FROM table_name AS alias
```

Where `table_name` is one of `S3Object` (for Amazon S3 Select) or `ARCHIVE` or `OBJECT` (for S3 Glacier Select) referring to the archive being queried over. Users coming from traditional relational databases can think of this as a database schema that contains multiple views over a table.

Following standard SQL, the `FROM` clause creates rows that are filtered in the `WHERE` clause and projected in the `SELECT` list.

For JSON objects that are stored in Amazon S3 Select, you can also use the following forms of the `FROM` clause:

```
FROM S3Object[*].path
FROM S3Object[*].path alias
FROM S3Object[*].path AS alias
```

Using this form of the `FROM` clause, you can select from arrays or objects within a JSON object. You can specify `path` using one of the following forms:

- By name (in an object): `.name` or `['name']`
- By index (in an array): `[index]`
- By wildcard (in an object): `.*`
- By wildcard (in an array): `[*]`

Note

- This form of the `FROM` clause works only with JSON objects.
- Wildcards always emit at least one record. If no record matches, then Amazon S3 Select emits the value `MISSING`. During output serialization (after the query is complete), Amazon S3 Select replaces `MISSING` values with empty records.
- Aggregate functions (`AVG`, `COUNT`, `MAX`, `MIN`, and `SUM`) skip `MISSING` values.
- If you don't provide an alias when using a wildcard, you can refer to the row using the last element in the path. For example, you could select all prices from a list of books using the query `SELECT price FROM S3Object[*].books[*].price`. If the path ends in a wildcard rather than a name, then you can use the value `_1` to refer to the row. For example, instead of `SELECT price FROM S3Object[*].books[*].price`, you could use the query `SELECT _1.price FROM S3Object[*].books[*]`.
- Amazon S3 Select always treats a JSON document as an array of root-level values. Thus, even if the JSON object that you are querying has only one root element, the `FROM` clause must begin with `S3Object[*]`. However, for compatibility reasons, Amazon S3 Select allows you to omit the wildcard if you don't include a path. Thus, the complete clause `FROM S3Object` is equivalent to `FROM S3Object[*] as S3Object`. If you include a path, you must also use the wildcard. So `FROM S3Object` and `FROM S3Object[*].path` are both valid clauses, but `FROM S3Object.path` is not.

Example

Examples:

Example #1

This example shows results using the following dataset and query:

```
{
  "Rules": [
    {"id": "id-1", "condition": "x < 20"},
    {"condition": "y > x"},
    {"id": "id-2", "condition": "z = DEBUG"}
  ]
}
```



```
    ]
  },
  {
    "created": "June 27",
    "modified": "July 6"
  }
}
```

```
SELECT id FROM S3Object[*].Rules[*].id
```

```
{ "id": "id-1" },
{ },
{ "id": "id-2" },
{ }
```

Amazon S3 Select produces each result for the following reasons:

- `{"id": "id-1"}` — `S3Object[0].Rules[0].id` produced a match.
- `{ }` — `S3Object[0].Rules[1].id` did not match a record, so Amazon S3 Select emitted `MISSING`, which was then changed to an empty record during output serialization and returned.
- `{"id": "id-2"}` — `S3Object[0].Rules[2].id` produced a match.
- `{ }` — `S3Object[1]` did not match on `Rules`, so Amazon S3 Select emitted `MISSING`, which was then changed to an empty record during output serialization and returned.

If you don't want Amazon S3 Select to return empty records when it doesn't find a match, you can test for the value `MISSING`. The following query returns the same results as the previous query, but with the empty values omitted:

```
SELECT id FROM S3Object[*].Rules[*].id WHERE id IS NOT MISSING
```

```
{ "id": "id-1" },
{ "id": "id-2" }
```

Example #2

This example shows results using the following dataset and queries:

```
{
  "created": "936864000",
  "dir_name": "important_docs",
  "files": [
    {
      "name": "."
    },
    {
      "name": ".."
    },
    {
      "name": ".aws"
    },
    {
      "name": "downloads"
    }
  ],
  "owner": "AWS S3"
},
{
  "created": "936864000",
```

```
"dir_name": "other_docs",
"files": [
  {
    "name": "."
  },
  {
    "name": ".."
  },
  {
    "name": "my stuff"
  },
  {
    "name": "backup"
  }
],
"owner": "User"
}
```

```
SELECT d.dir_name, d.files FROM S3Object[*] d
```

```
{
  "dir_name": "important_docs",
  "files": [
    {
      "name": "."
    },
    {
      "name": ".."
    },
    {
      "name": ".aws"
    },
    {
      "name": "downloads"
    }
  ]
},
{
  "dir_name": "other_docs",
  "files": [
    {
      "name": "."
    },
    {
      "name": ".."
    },
    {
      "name": "my stuff"
    },
    {
      "name": "backup"
    }
  ]
}
```

```
SELECT _1.dir_name, _1.owner FROM S3Object[*]
```

```
{
  "dir_name": "important_docs",
  "owner": "AWS S3"
},
```

```
{  
  "dir_name": "other_docs",  
  "owner": "User"  
}
```

WHERE Clause

The `WHERE` clause follows this syntax:

```
WHERE condition
```

The `WHERE` clause filters rows based on the *condition*. A condition is an expression that has a Boolean result. Only rows for which the condition evaluates to `TRUE` are returned in the result.

LIMIT Clause (Amazon S3 Select only)

The `LIMIT` clause follows this syntax:

```
LIMIT number
```

The `LIMIT` clause limits the number of records that you want the query to return based on *number*.

Note

S3 Glacier Select does not support the `LIMIT` clause.

Attribute Access

The `SELECT` and `WHERE` clauses can refer to record data using one of the methods in the following sections, depending on whether the file that is being queried is in CSV or JSON format.

CSV

- **Column Numbers** – You can refer to the *Nth* column of a row with the column name `_N`, where *N* is the column position. The position count starts at 1. For example, the first column is named `_1` and the second column is named `_2`.

You can refer to a column as `_N` or `alias._N`. For example, `_2` and `myAlias._2` are both valid ways to refer to a column in the `SELECT` list and `WHERE` clause.

- **Column Headers** – For objects in CSV format that have a header row, the headers are available to the `SELECT` list and `WHERE` clause. In particular, as in traditional SQL, within `SELECT` and `WHERE` clause expressions, you can refer to the columns by `alias.column_name` or `column_name`.

JSON (Amazon S3 Select only)

- **Document** – You can access JSON document fields as `alias.name`. Nested fields can also be accessed; for example, `alias.name1.name2.name3`.
- **List** – You can access elements in a JSON list using zero-based indexes with the `[]` operator. For example, you can access the second element of a list as `alias[1]`. Accessing list elements can be combined with fields as `alias.name1.name2[1].name3`.
- **Examples:** Consider this JSON object as a sample dataset:

```
{"name": "Susan Smith",  
  "org": "engineering",  
  "projects":
```

```
[
  {"project_name":"project1", "completed":false},
  {"project_name":"project2", "completed":true}
]
```

Example #1

The following query returns these results:

```
Select s.name from S3Object s
```

```
{"name":"Susan Smith"}
```

Example #2

The following query returns these results:

```
Select s.projects[0].project_name from S3Object s
```

```
{"project_name":"project1"}
```

Case Sensitivity of Header/Attribute Names

With Amazon S3 Select and S3 Glacier Select, you can use double quotation marks to indicate that column headers (for CSV objects) and attributes (for JSON objects) are case sensitive. Without double quotation marks, object headers/attributes are case insensitive. An error is thrown in cases of ambiguity.

The following examples are either 1) Amazon S3 or S3 Glacier objects in CSV format with the specified column header(s), and with `FileHeaderInfo` set to "Use" for the query request; or 2) Amazon S3 objects in JSON format with the specified attributes.

Example #1: The object being queried has header/attribute "NAME".

- The following expression successfully returns values from the object (no quotation marks: case insensitive):

```
SELECT s.name from S3Object s
```

- The following expression results in a 400 error `MissingHeaderName` (quotation marks: case sensitive):

```
SELECT s."name" from S3Object s
```

Example #2: The Amazon S3 object being queried has one header/attribute with "NAME" and another header/attribute with "name".

- The following expression results in a 400 error `AmbiguousFieldName` (no quotation marks: case insensitive, but there are two matches):

```
SELECT s.name from S3Object s
```

- The following expression successfully returns values from the object (quotation marks: case sensitive, so it resolves the ambiguity).

```
SELECT s."NAME" from S3Object s
```

Using Reserved Keywords as User-Defined Terms

Amazon S3 Select and S3 Glacier Select have a set of reserved keywords that are needed to run the SQL expressions used to query object content. Reserved keywords include function names, data types, operators, and so on. In some cases, user-defined terms like the column headers (for CSV files) or attributes (for JSON object) may clash with a reserved keyword. When this happens, you must use double quotation marks to indicate that you are intentionally using a user-defined term that clashes with a reserved keyword. Otherwise a 400 parse error will result.

For the full list of reserved keywords see [Reserved Keywords \(p. 313\)](#).

The following example is either 1) an Amazon S3 or S3 Glacier object in CSV format with the specified column headers, with `FileHeaderInfo` set to "Use" for the query request, or 2) an Amazon S3 object in JSON format with the specified attributes.

Example: The object being queried has header/attribute named "CAST", which is a reserved keyword.

- The following expression successfully returns values from the object (quotation marks: use user-defined header/attribute):

```
SELECT s."CAST" from S3Object s
```

- The following expression results in a 400 parse error (no quotation marks: clash with reserved keyword):

```
SELECT s.CAST from S3Object s
```

Scalar Expressions

Within the `WHERE` clause and the `SELECT` list, you can have SQL *scalar expressions*, which are expressions that return scalar values. They have the following form:

- ***literal***

An SQL literal.

- ***column_reference***

A reference to a column in the form *column_name* or *alias.column_name*.

- ***unary_op expression***

Where ***unary_op*** unary is an SQL unary operator.

- ***expression binary_op expression***

Where ***binary_op*** is an SQL binary operator.

- ***func_name***

Where ***func_name*** is the name of a scalar function to invoke.

- ***expression*** [`NOT`] ***BETWEEN expression AND expression***
- ***expression*** ***LIKE expression*** [`ESCAPE expression`]

Data Types

Amazon S3 Select and S3 Glacier Select support several primitive data types.

Data Type Conversions

The general rule is to follow the `CAST` function if defined. If `CAST` is not defined, then all input data is treated as a string. It must be cast into the relevant data types when necessary.

For more information about the `CAST` function, see [CAST \(p. 319\)](#).

Supported Data Types

Amazon S3 Select and S3 Glacier Select support the following set of primitive data types.

Name	Description	Examples
bool	TRUE or FALSE	FALSE
int, integer	8-byte signed integer in the range -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807.	100000
string	UTF8-encoded variable-length string. The default limit is one character. The maximum character limit is 2,147,483,647.	'xyz '
float	8-byte floating point number.	CAST(0.456 AS FLOAT)
decimal, numeric	Base-10 number, with maximum precision of 38 (that is, the maximum number of significant digits), and with scale within the range of -2^{31} to $2^{31}-1$ (that is, the base-10 exponent).	123.456
timestamp	<p>Time stamps represent a specific moment in time, always include a local offset, and are capable of arbitrary precision.</p> <p>In the text format, time stamps follow the W3C note on date and time formats, but they must end with the literal "T" if not at least whole-day precision. Fractional seconds are allowed, with at least one digit of precision, and an unlimited maximum. Local-time offsets can be represented as either hour:minute offsets from UTC, or as the literal "Z" to denote a local time of UTC. They are required on time stamps with time and are not allowed on date values.</p>	CAST('2007-04-05T14:30Z' AS TIMESTAMP)

Operators

Amazon S3 Select and S3 Glacier Select support the following operators.

Logical Operators

- AND
- NOT

- OR

Comparison Operators

- <
- >
- <=
- >=
- =
- <>
- !=
- BETWEEN
- IN – For example: IN ('a' , 'b' , 'c')

Pattern Matching Operators

- LIKE

Math Operators

Addition, subtraction, multiplication, division, and modulo are supported.

- +
- -
- *
- %

Operator Precedence

The following table shows the operators' precedence in decreasing order.

Operator/ Element	Associativity	Required
-	right	unary minus
*, /, %	left	multiplication, division, modulo
+, -	left	addition, subtraction
IN		set membership
BETWEEN		range containment
LIKE		string pattern matching

Operator/ Element	Associativity	Required
<>		less than, greater than
=	right	equality, assignment
NOT	right	logical negation
AND	left	logical conjunction
OR	left	logical disjunction

Reserved Keywords

Below is the list of reserved keywords for Amazon S3 Select and S3 Glacier Select. These include function names, data types, operators, etc., that needed to run the SQL expressions used to query object content.

```
absolute
action
add
all
allocate
alter
and
any
are
as
asc
assertion
at
authorization
avg
bag
begin
between
bit
bit_length
blob
bool
boolean
both
by
cascade
cascaded
case
cast
catalog
char
char_length
character
character_length
check
clob
close
coalesce
```


collate
collation
column
commit
connect
connection
constraint
constraints
continue
convert
corresponding
count
create
cross
current
current_date
current_time
current_timestamp
current_user
cursor
date
day
deallocate
dec
decimal
declare
default
deferrable
deferred
delete
desc
describe
descriptor
diagnostics
disconnect
distinct
domain
double
drop
else
end
end-exec
escape
except
exception
exec
execute
exists
external
extract
false
fetch
first
float
for
foreign
found
from
full
get
global
go
goto
grant
group
having

hour
identity
immediate
in
indicator
initially
inner
input
insensitive
insert
int
integer
intersect
interval
into
is
isolation
join
key
language
last
leading
left
level
like
limit
list
local
lower
match
max
min
minute
missing
module
month
names
national
natural
nchar
next
no
not
null
nullif
numeric
octet_length
of
on
only
open
option
or
order
outer
output
overlaps
pad
partial
pivot
position
precision
prepare
preserve
primary
prior

privileges
procedure
public
read
real
references
relative
restrict
revoke
right
rollback
rows
schema
scroll
second
section
select
session
session_user
set
sexp
size
smallint
some
space
sql
sqlcode
sqlerror
sqlstate
string
struct
substring
sum
symbol
system_user
table
temporary
then
time
timestamp
timezone_hour
timezone_minute
to
trailing
transaction
translate
translation
trim
true
tuple
union
unique
unknown
unpivot
update
upper
usage
user
using
value
values
varchar
varying
view
when
whenever

```
where
with
work
write
year
zone
```

SQL Functions

Amazon S3 Select and S3 Glacier Select support several SQL functions.

Topics

- [Aggregate Functions \(Amazon S3 Select only\) \(p. 317\)](#)
- [Conditional Functions \(p. 318\)](#)
- [Conversion Functions \(p. 319\)](#)
- [Date Functions \(p. 319\)](#)
- [String Functions \(p. 325\)](#)

Aggregate Functions (Amazon S3 Select only)

Amazon S3 Select supports the following aggregate functions.

Note

S3 Glacier Select does not support aggregate functions.

Function	Argument Type	Return Type
AVG(expression)	INT, FLOAT, DECIMAL	DECIMAL for an INT argument, FLOAT for a floating-point argument; otherwise the same as the argument data type.
COUNT	-	INT
MAX(expression)	INT, DECIMAL	Same as the argument type.
MIN(expression)	INT, DECIMAL	Same as the argument type.
SUM(expression)	INT, FLOAT, DOUBLE, DECIMAL	INT for INT argument, FLOAT for a floating-point argument; otherwise, the same as the argument data type.

Conditional Functions

Amazon S3 Select and S3 Glacier Select support the following conditional functions.

Topics

- [COALESCE \(p. 318\)](#)
- [NULLIF \(p. 318\)](#)

COALESCE

Evaluates the arguments in order and returns the first non-unknown, that is, the first non-null or non-missing. This function does not propagate null and missing.

Syntax

```
COALESCE ( expression, expression, ... )
```

Parameters

expression

The target expression that the function operates on.

Examples

```
COALESCE(1)                -- 1
COALESCE(null)             -- null
COALESCE(null, null)       -- null
COALESCE(missing)          -- null
COALESCE(missing, missing) -- null
COALESCE(1, null)          -- 1
COALESCE(null, null, 1)    -- 1
COALESCE(null, 'string')   -- 'string'
COALESCE(missing, 1)       -- 1
```

NULLIF

Given two expressions, returns NULL if the two expressions evaluate to the same value; otherwise, returns the result of evaluating the first expression.

Syntax

```
NULLIF ( expression1, expression2 )
```

Parameters

expression1, expression2

The target expressions that the function operates on.

Examples

```
NULLIF(1, 1)                -- null
```

```
NULLIF(1, 2)           -- 1
NULLIF(1.0, 1)         -- null
NULLIF(1, '1')         -- 1
NULLIF([1], [1])       -- null
NULLIF(1, NULL)        -- 1
NULLIF(NULL, 1)        -- null
NULLIF(null, null)     -- null
NULLIF(missing, null)  -- null
NULLIF(missing, missing) -- null
```

Conversion Functions

Amazon S3 Select and S3 Glacier Select support the following conversion functions.

Topics

- [CAST \(p. 319\)](#)

CAST

The CAST function converts an entity, such as an expression that evaluates to a single value, from one type to another.

Syntax

```
CAST ( expression AS data_type )
```

Parameters

expression

A combination of one or more values, operators, and SQL functions that evaluate to a value.

data_type

The target data type, such as INT, to cast the expression to. For a list of supported data types, see [Data Types \(p. 311\)](#).

Examples

```
CAST('2007-04-05T14:30Z' AS TIMESTAMP)
CAST(0.456 AS FLOAT)
```

Date Functions

Amazon S3 Select and S3 Glacier Select support the following date functions.

Topics

- [DATE_ADD \(p. 320\)](#)
- [DATE_DIFF \(p. 320\)](#)
- [EXTRACT \(p. 321\)](#)
- [TO_STRING \(p. 322\)](#)
- [TO_TIMESTAMP \(p. 324\)](#)

- [UTCNOW \(p. 325\)](#)

DATE_ADD

Given a date part, a quantity, and a time stamp, returns an updated time stamp by altering the date part by the quantity.

Syntax

```
DATE_ADD( date_part, quantity, timestamp )
```

Parameters

date_part

Specifies which part of the date to modify. This can be one of the following:

- year
- month
- day
- hour
- minute
- second

quantity

The value to apply to the updated time stamp. Positive values for quantity add to the time stamp's date_part, and negative values subtract.

timestamp

The target time stamp that the function operates on.

Examples

```
DATE_ADD(year, 5, `2010-01-01T`)           -- 2015-01-01 (equivalent to 2015-01-01T)
DATE_ADD(month, 1, `2010T`)                -- 2010-02T (result will add precision as
necessary)
DATE_ADD(month, 13, `2010T`)                -- 2011-02T
DATE_ADD(day, -1, `2017-01-10T`)            -- 2017-01-09 (equivalent to 2017-01-09T)
DATE_ADD(hour, 1, `2017T`)                  -- 2017-01-01T01:00-00:00
DATE_ADD(hour, 1, `2017-01-02T03:04Z`)      -- 2017-01-02T04:04Z
DATE_ADD(minute, 1, `2017-01-02T03:04:05.006Z`) -- 2017-01-02T03:05:05.006Z
DATE_ADD(second, 1, `2017-01-02T03:04:05.006Z`) -- 2017-01-02T03:04:06.006Z
```

DATE_DIFF

Given a date part and two valid time stamps, returns the difference in date parts. The return value is a negative integer when the date_part value of timestamp1 is greater than the date_part value of timestamp2. The return value is a positive integer when the date_part value of timestamp1 is less than the date_part value of timestamp2.

Syntax

```
DATE_DIFF( date_part, timestamp1, timestamp2 )
```

Parameters

date_part

Specifies which part of the time stamps to compare. For the definition of *date_part*, see [DATE_ADD \(p. 320\)](#).

timestamp1

The first time stamp to compare.

timestamp2

The second time stamp to compare.

Examples

```
DATE_DIFF(year, `2010-01-01T`, `2011-01-01T`)           -- 1
DATE_DIFF(year, `2010T`, `2010-05T`)                     -- 4 (2010T is equivalent to
  2010-01-01T00:00:00.000Z)
DATE_DIFF(month, `2010T`, `2011T`)                       -- 12
DATE_DIFF(month, `2011T`, `2010T`)                       -- -12
DATE_DIFF(day, `2010-01-01T23:00T`, `2010-01-02T01:00T`) -- 0 (need to be at least 24h
  apart to be 1 day apart)
```

EXTRACT

Given a date part and a time stamp, returns the time stamp's date part value.

Syntax

```
EXTRACT( date_part FROM timestamp )
```

Parameters

date_part

Specifies which part of the time stamps to extract. This can be one of the following:

- year
- month
- day
- hour
- minute
- second
- timezone_hour
- timezone_minute

timestamp

The target time stamp that the function operates on.

Examples

```
EXTRACT(YEAR FROM `2010-01-01T`)           -- 2010
EXTRACT(MONTH FROM `2010T`)                 -- 1 (equivalent to
  2010-01-01T00:00:00.000Z)
```



```
EXTRACT(MONTH FROM `2010-10T`) -- 10
EXTRACT(HOUR FROM `2017-01-02T03:04:05+07:08`) -- 3
EXTRACT(MINUTE FROM `2017-01-02T03:04:05+07:08`) -- 4
EXTRACT(TIMEZONE_HOUR FROM `2017-01-02T03:04:05+07:08`) -- 7
EXTRACT(TIMEZONE_MINUTE FROM `2017-01-02T03:04:05+07:08`) -- 8
```

TO_STRING

Given a time stamp and a format pattern, returns a string representation of the time stamp in the given format.

Syntax

```
TO_STRING ( timestamp time_format_pattern )
```

Parameters

timestamp

The target time stamp that the function operates on.

time_format_pattern

A string that has the following special character interpretations.

Format	Example	Description
yy	69	2-digit year
y	1969	4-digit year
yyyy	1969	Zero-padded 4-digit year
M	1	Month of year
MM	01	Zero-padded month of year
MMM	Jan	Abbreviated month year name
MMMM	January	Full month of year name
MMMMM	J	Month of year first letter (NOTE: not valid for use with to_timestamp function)
d	2	Day of month (1-31)
dd	02	Zero-padded day of month (01-31)

Format	Example	Description
a	AM	AM or PM of day
h	3	Hour of day (1-12)
hh	03	Zero-padded hour of day (01-12)
H	3	Hour of day (0-23)
HH	03	Zero-padded hour of day (00-23)
m	4	Minute of hour (0-59)
mm	04	Zero-padded minute of hour (00-59)
s	5	Second of minute (0-59)
ss	05	Zero-padded second of minute (00-59)
S	0	Fraction of second (precision: 0.1, range: 0.0-0.9)
SS	6	Fraction of second (precision: 0.01, range: 0.0-0.99)
SSS	60	Fraction of second (precision: 0.001, range: 0.0-0.999)
...
SSSSSSSSS	60000000	Fraction of second (maximum precision: 1 nanosecond, range: 0.0-0.999999999)
n	600000000	Nano of second

Format	Example	Description
X	+07 or Z	Offset in hours or "Z" if the offset is 0
XX or XXXX	+0700 or Z	Offset in hours and minutes or "Z" if the offset is 0
XXX or XXXXX	+07:00 or Z	Offset in hours and minutes or "Z" if the offset is 0
x	7	Offset in hours
xx or xxxx	700	Offset in hours and minutes
xxx or xxxxx	+07:00	Offset in hours and minutes

Examples

```

TO_STRING(`1969-07-20T20:18Z`, 'MMMM d, y')           -- "July 20, 1969"
TO_STRING(`1969-07-20T20:18Z`, 'MMM d, yyyy')         -- "Jul 20, 1969"
TO_STRING(`1969-07-20T20:18Z`, 'M-d-yy')              -- "7-20-69"
TO_STRING(`1969-07-20T20:18Z`, 'MM-d-y')              -- "07-20-1969"
TO_STRING(`1969-07-20T20:18Z`, 'MMMM d, y h:m a')     -- "July 20, 1969 8:18 PM"
TO_STRING(`1969-07-20T20:18Z`, 'y-MM-dd'T' 'H:m:ssX') -- "1969-07-20T20:18:00Z"
TO_STRING(`1969-07-20T20:18+08:00Z`, 'y-MM-dd'T' 'H:m:ssX') -- "1969-07-20T20:18:00Z"
TO_STRING(`1969-07-20T20:18+08:00`, 'y-MM-dd'T' 'H:m:ssXXXX') --
  "1969-07-20T20:18:00+0800"
TO_STRING(`1969-07-20T20:18+08:00`, 'y-MM-dd'T' 'H:m:ssXXXXX') --
  "1969-07-20T20:18:00+08:00"

```

TO_TIMESTAMP

Given a string, converts it to a time stamp. This is the inverse operation of TO_STRING.

Syntax

```
TO_TIMESTAMP ( string )
```

Parameters

string

The target string that the function operates on.

Examples

```
TO_TIMESTAMP('2007T')           -- `2007T`
```

```
TO_TIMESTAMP('2007-02-23T12:14:33.079-08:00') -- `2007-02-23T12:14:33.079-08:00`
```

UTCNOW

Returns the current time in UTC as a time stamp.

Syntax

```
UTCNOW()
```

Parameters

none

Examples

```
UTCNOW() -- 2017-10-13T16:02:11.123Z
```

String Functions

Amazon S3 Select and S3 Glacier Select support the following string functions.

Topics

- [CHAR_LENGTH, CHARACTER_LENGTH \(p. 325\)](#)
- [LOWER \(p. 326\)](#)
- [SUBSTRING \(p. 326\)](#)
- [TRIM \(p. 327\)](#)
- [UPPER \(p. 327\)](#)

CHAR_LENGTH, CHARACTER_LENGTH

Counts the number of characters in the specified string.

Note

CHAR_LENGTH and CHARACTER_LENGTH are synonyms.

Syntax

```
CHAR_LENGTH ( string )
```

Parameters

string

The target string that the function operates on.

Examples

```
CHAR_LENGTH('') -- 0
```

```
CHAR_LENGTH('abcdefg')  -- 7
```

LOWER

Given a string, converts all uppercase characters to lowercase characters. Any non-uppercased characters remain unchanged.

Syntax

```
LOWER ( string )
```

Parameters

string

The target string that the function operates on.

Examples

```
LOWER('AbCdEfG!@#') -- 'abcdefg!@#'
```

SUBSTRING

Given a string, a start index, and optionally a length, returns the substring from the start index up to the end of the string, or up to the length provided.

Note

The first character of the input string has index 1. If *start* is < 1, it is set to 1.

Syntax

```
SUBSTRING( string FROM start [ FOR length ] )
```

Parameters

string

The target string that the function operates on.

start

The start position of the string.

length

The length of the substring to return. If not present, proceed to the end of the string.

Examples

```
SUBSTRING("123456789", 0)      -- "123456789"
SUBSTRING("123456789", 1)      -- "123456789"
SUBSTRING("123456789", 2)      -- "23456789"
SUBSTRING("123456789", -4)     -- "123456789"
SUBSTRING("123456789", 0, 999) -- "123456789"
SUBSTRING("123456789", 1, 5)   -- "12345"
```

TRIM

Trims leading or trailing characters from a string. The default character to remove is ' '.

Syntax

```
TRIM ( [[LEADING | TRAILING | BOTH remove_chars] FROM] string )
```

Parameters

string

The target string that the function operates on.

LEADING | TRAILING | BOTH

Whether to trim leading or trailing characters, or both leading and trailing characters.

remove_chars

The set of characters to remove. Note that *remove_chars* can be a string with length > 1. This function returns the string with any character from *remove_chars* found at the beginning or end of the string that was removed.

Examples

```
TRIM('      foobar      ')           -- 'foobar'
TRIM('      \tfoobar\t      ')       -- '\tfoobar\t'
TRIM(LEADING FROM '      foobar      ') -- 'foobar'
TRIM(TRAILING FROM '      foobar      ') -- '      foobar'
TRIM(BOTH FROM '      foobar      ')  -- 'foobar'
TRIM(BOTH '12' FROM '1112211foobar22211122') -- 'foobar'
```

UPPER

Given a string, converts all lowercase characters to uppercase characters. Any non-lowercased characters remain unchanged.

Syntax

```
UPPER ( string )
```

Parameters

string

The target string that the function operates on.

Examples

```
UPPER('AbCdEfG!@#$$') -- 'ABCDEFG!@#$$'
```

Document History

- **Latest documentation update:** November 20, 2018
- **Current product version:** 2012-06-01

The following table describes the important changes in each release of the *Amazon S3 Glacier Developer Guide* from July 5, 2018, onward. For notification about updates to this documentation, you can subscribe to an RSS feed.

update-history-change	update-history-description	update-history-date
Amazon Glacier name change (p. 328)	Amazon Glacier is now Amazon S3 Glacier to better reflect Glacier's integration with Amazon S3.	November 20, 2018
Updates now available over RSS (p. 328)	You can now subscribe to an RSS feed to receive notifications about updates to the Amazon S3 Glacier Developer Guide guide.	July 5, 2018

Earlier Updates

The following table describes the important changes in each release of the *Amazon S3 Glacier Developer Guide* before July 5, 2018.

Change	Description	Release Date
Querying archives with SQL	S3 Glacier now supports querying data archives with SQL. For more information, see Querying Archives with S3 Glacier Select (p. 148) . The following APIs are updated accordingly: <ul style="list-style-type: none">• Describe Job (GET JobID) (p. 250)• Initiate Job (POST jobs) (p. 263)• List Jobs (GET jobs) (p. 273)	November 29, 2017
Expedited and Bulk Data Retrievals	S3 Glacier now supports Expedited and Bulk data retrievals in addition to Standard retrievals. For more information, see Archive Retrieval Options (p. 84) .	November 21, 2016
Vault Lock	S3 Glacier now supports Vault Lock, which allows you to easily deploy and enforce compliance controls on individual S3 Glacier vaults with a Vault Lock policy. For more information, see Amazon S3 Glacier Vault Lock (p. 65) and Amazon S3 Glacier Access Control with Vault Lock Policies (p. 136) .	July 8, 2015
Vault tagging	S3 Glacier now allows you to tag your S3 Glacier vaults for easier resource and cost management. Tags are labels	June 22, 2015

Change	Description	Release Date
	that you can define and associate with your vaults, and using tags adds filtering capabilities to operations such as AWS cost reports. For more information, see Tagging Amazon S3 Glacier Resources (p. 155) and Tagging Your Amazon S3 Glacier Vaults (p. 64) .	
Vault access policies	S3 Glacier now supports managing access to your individual S3 Glacier vaults by using vault access policies. You can now define an access policy directly on a vault, making it easier to grant vault access to users and business groups internal to your organization, as well as to your external business partners. For more information, see Amazon S3 Glacier Access Control with Vault Access Policies (p. 134) .	April 27, 2015
Data retrieval policies and audit logging	<p>S3 Glacier now supports data retrieval policies and audit logging. Data retrieval policies allow you to easily set data retrieval limits and simplify data retrieval cost management. You can define your own data retrieval limits with a few clicks in the AWS console or by using the S3 Glacier API. For more information, see Amazon S3 Glacier Data Retrieval Policies (p. 151).</p> <p>In addition, S3 Glacier now supports audit logging with AWS CloudTrail, which records S3 Glacier API calls for your account and delivers the log files to an Amazon S3 bucket that you specify. For more information, see Logging Amazon S3 Glacier API Calls with AWS CloudTrail (p. 157).</p>	December 11, 2014
Updates to Java samples	Updated the Java code samples in this guide that use the AWS SDK for Java.	June 27, 2014
Limiting vault inventory retrieval	You can now limit the number of vault inventory items retrieved by filtering on the archive creation date or by setting a limit. For more information about limiting inventory retrieval, see Range Inventory Retrieval (p. 266) in the Initiate Job (POST jobs) (p. 263) topic.	December 31, 2013
Removed outdated URLs	Removed the URLs that pointed to the old security credentials page from code examples.	July 26, 2013
Support for range retrievals	<p>S3 Glacier now supports retrieval of specific ranges of your archives. You can initiate a job requesting S3 Glacier to prepare an entire archive or a portion of the archive for subsequent download. When an archive is very large, you may find it cost effective to initiate several sequential jobs to prepare your archive.</p> <p>For more information, see Downloading an Archive in Amazon S3 Glacier (p. 83).</p> <p>For pricing information, go to the S3 Glacier detail page.</p>	November 13, 2012
New Guide	This is the first release of the <i>Amazon S3 Glacier Developer Guide</i> .	August 20, 2012

AWS glossary

For the latest AWS terminology, see the [AWS glossary](#) in the *AWS General Reference*.