



# Google Cloud Storage Adapter for SAP Integration Suite

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# 1 Introduction

## 1.1 Objective

This is the official guide for the Google Cloud Storage Adapter for SAP Integration Suite. This guide covers all relevant information for integration developers to start working with the Google Cloud Storage adapter. Read this guide carefully before using the Adapter.

## 1.2 Coding Samples

Any software coding and/or code lines/strings ("Code") included in this documentation are only examples and are not intended to be used in a productive system environment. The Code is only intended to better explain and visualize the syntax and phrasing rules of certain coding. The correctness and completeness of the Code given herein are not guaranteed.

## 1.3 Internet Hyperlinks

The documentation may contain hyperlinks to the Internet. These hyperlinks are intended to serve as a hint about where to find related information. The availability and the correctness of this related information or the ability of this information to serve a particular purpose are not warranted.

## 1.4 Overview

Most Integrations solutions require data storage for different data types as we exchange data between applications or systems. The Google Cloud Storage adapter is a Cloud Integration capability available on SAP Integration Suite that enables access to Google Storage. Leverage the full range of storage options in your integration scenarios using the Google Cloud Storage Adapter.

## 1.5 Features

Google Cloud Storage Adapter has the following features:

- Allows you to access and interact with different entities: **Buckets, Folders,** and **Objects.**
- Sender Adapter provides **Duplicate Check Expiration** option to avoid same object being read within a predefined expiration period and offers multiple **Post-Processing** options: **Delete Object after Processing, Keep Object after Processing,** and **Archive Object after Processing.**
- Archived objects can be named dynamically using Camel expressions or Camel File Expression language.
- Supports reading of encrypted objects with custom encryption and supports encrypted object creation.
- **Create** operation using Receiver Adapter supports existing File Handling scenarios: **Fail, Ignore,** and **Override.** It also allows multiple options for upload using **Upload Type** option: **Media, Multi-Part,** and **Resumable.**
- You can use **Max Results** and **Page Token** to customise your results while using **List** operation.
- Use **Query Parameters** and **Response Fields** to fetch desired results.
- Offers secure authentication via **OAuth2 Service Account** option which uses **Key Pair** authentication.

# 2 Installation and Configuration

This section details the prerequisites to install and configure the Google Cloud Storage adapter.



The Google Cloud Storage adapter is available as part of your SAP Integration Suite license.

## 2.1 Adapter Installation on Cloud Foundry

Before the Google Cloud Storage adapter can be used in the Cloud Foundry environment, it must be deployed to the SAP Integration Suite tenant.

### 2.1.1 Prerequisite

To deploy the Google Cloud Storage adapter, you must have access to *"Google Cloud Storage Adapter for SAP Integration Suite"* as part of your SAP Integration Suite license.

### 2.1.2 Procedure



The below installation procedure is compatible with Apache Camel 2, Apache Camel 3, and Edge Integration Cell (EIC) platform.

You can deploy the adapter using the following methods:

#### 2.1.2.1 Adapter Installation by Creating a New Integration Flow




The Google Cloud Storage adapter is available for selection in the Sender and Receiver adapter list and can be deployed in the **Design** tab directly as you use it in an Integration flow.

#### Purpose

To install an adapter for use in your Integration flow.

#### Procedure


Go to **Design** workspace and select the integration package where you want to create a new Integration flow.

1. Click **Edit** to make the package editable.
2. Go to the **Artifacts** tab. Click **Add** and select **Integration Flow**.
3. Enter the **Name** and **ID** for your flow. Additionally, select **Runtime Profile** from the drop-down and choose **Sender** and **Receiver** systems from the list . Finally, click **Add** to create the integration flow.
4. Go to the newly created integration flow and click **Edit** to make it editable.
  - i) For the Sender, in the integration flow add a **Connector**  between the **Sender box** and the **Start**.
  - ii) For the Receiver, in the integration flow, click **End** to add a **Connector**  between the **End** and the **Receiver Box**.
5. A drop-down with the available adapters appears. The **GoogleCloudStorage** adapter should show up in the list.
6. Select the **GoogleCloudStorage** adapter from the list. The adapter is now imported which *triggers* an adapter deployment.

Once the adapter is deployed, a success message is *displayed*.

After the above steps are done, the Google Cloud Storage Adapter is successfully deployed in your **Design** workspace of the SAP Integration Suite tenant.

### 2.1.2.2 Adapter Installation without Creating a New Integration Flow

 The following procedure describes how the Google Cloud Storage adapter is migrated from the Discover workspace to the Design workspace of the SAP Integration tenant.

This method is useful for scenarios where integration flow packages are migrated from development to a higher environment such as Production. The Google Cloud Storage adapter can be imported into the Design workspace without creating an integration flow. Use the Transport Management Service (TMS) to import/transport the Google Cloud Storage adapter to a higher environment.

Alternatively, if the TMS is not available in the landscape, the adapter package can be imported into the **Design** workspace by copying it from the **Discover** workspace.

## Purpose

To import the Google Cloud Storage adapter to **Design** workspace by copying the integration package from **Discover** workspace.

## Procedure

1. Go to **Discover** workspace.
2. In the search box, search for **Google Cloud Storage Adapter for SAP Integration Suite** package.
3. Select the package and click **Copy**.  
This copies the package from the Discover workspace to Design workspace.
4. Go to Design workspace and select the copied **Google Cloud Storage Adapter for SAP Integration Suite** package.
5. In the **Actions** tab of the selected package, click **Deploy**.

This completes the adapter deployment to **Design** workspace.

## 2.1.3 Monitor the Deployment Status

After the adapter deployment is complete, you can check the status in the **Monitor** section.

## Purpose

To check the status of the deployed adapter.

## Procedure

1. Under the **Monitor** tab, click **Integrations and APIs**. This opens the **Overview** page.
2. On the **Overview** page, go to **Manage Integration Content** section and click **All**.  
This opens **Integration Content** page with a list of all the deployed adapters.



3. Here, you can check and confirm the deployment status of your adapter.

The screenshot shows a web interface for managing integration content. At the top left, it says "Overview / Manage Integration Content". Below this is a search bar with "Integration Content (570)" and a search icon. A table lists the integration adapters, with "GoogleCloudStorage" selected and its status shown as "Started". To the right, the "GoogleCloudStorage" header is displayed with "Undeploy" and "Download" buttons. Below the header, deployment details are shown: "Deployed On: Nov 15, 2024, 17:00:34", "ID:", "Package:", "Deployed By:", and "Version: 1.0.0". A "Status Details" section contains a green message box stating "The Integration Adapter is deployed successfully."

Name	Status
GoogleCloudStorage Integration Adapter	Started

**GoogleCloudStorage** [Undeploy](#) [Download](#)

Deployed On: Nov 15, 2024, 17:00:34 ID:  Package:   
Deployed By:  Version: 1.0.0

**Status Details**

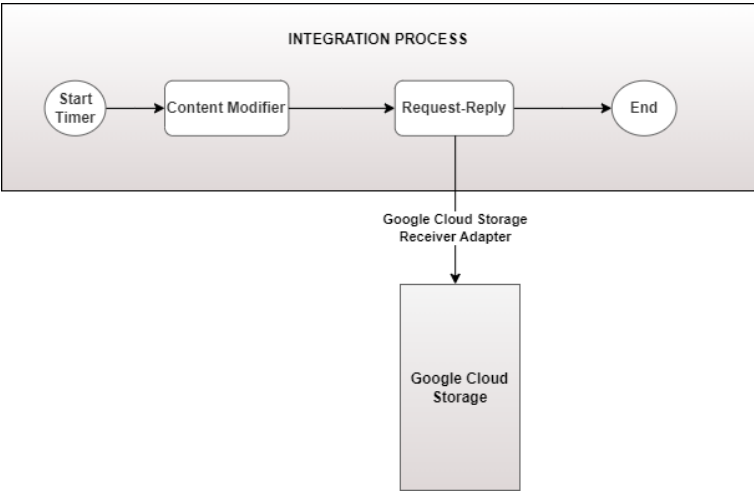
The Integration Adapter is deployed successfully.

# 3 Getting Started: Google Cloud Storage Adapter

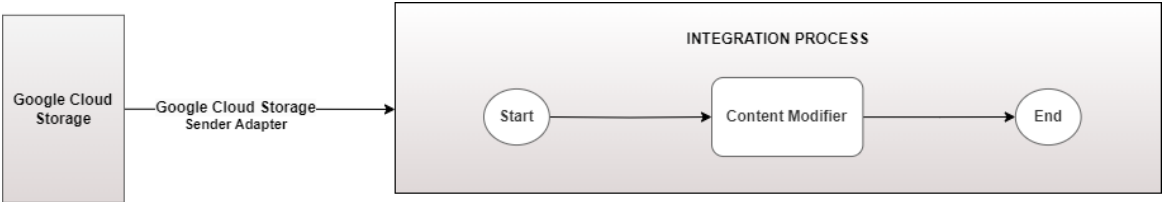
Before you start using the adapter, you can get to know underlying [Architecture](#) for the adapter and [Application Configuration](#) for Google Cloud Storage.

## 3.1 Architecture Overview

**How the Google Cloud Storage Receiver Adapter Works:** The Google Cloud Storage Receiver adapter (as the name suggests) is designed to function as a receiver adapter. In such a scenario where the adapter is used as a receiver adapter, SAP Integration Suite acts as the initiator of the calls.



**How the Google Cloud Storage Sender Adapter Works:** The Google Cloud Storage Sender adapter (as the name suggests) is designed to function as a sender adapter. In such a scenario where the adapter is used as a sender adapter, Google Cloud Storage acts as the initiator of the calls.



## 3.2 Application Configuration

- To get an overview of Google Cloud Storage, see [Google Cloud Storage Overview](#).
- To set up authentication, see [Using OAuth 2.0 for Web Server](#).
- For more information, see [OAuth for Service Accounts](#).

## 3.3 Authentication

The Google Cloud Storage adapter supports authentication using OAuth Service Account. Find more information about how to create service account, see [Create Keys](#).

### 3.3.1 Creating Keys for OAuth2 Service Account

The Security artifact created below is used to connect to the Google Cloud Storage Application by configuring the **Connection tab** of the Adapter.

Login to Google Cloud Storage and generate a key. For more information, see [Create Keys](#). The **Key type** for private key can be either **JSON** or **P12**. Refer the following sections for each Key type usage.

#### 3.3.1.1 Creating Keystore for JSON key

1. After downloading the newly created key, the content in the key needs to be extracted and aligned in a proper format. Follow the below steps:
  - i. Open the key as a text file (preferably notepad++) and delete content so that you only retain the private key content between and inclusive of `BEGIN PRIVATE KEY` and `END PRIVATE KEY`.
  - ii. Remove all occurrences of `\n` from your private key content.
  - iii. Align the content as shown below

```
-----BEGIN PRIVATE KEY-----  
  
*****  
*****  
  
-----END PRIVATE KEY-----
```

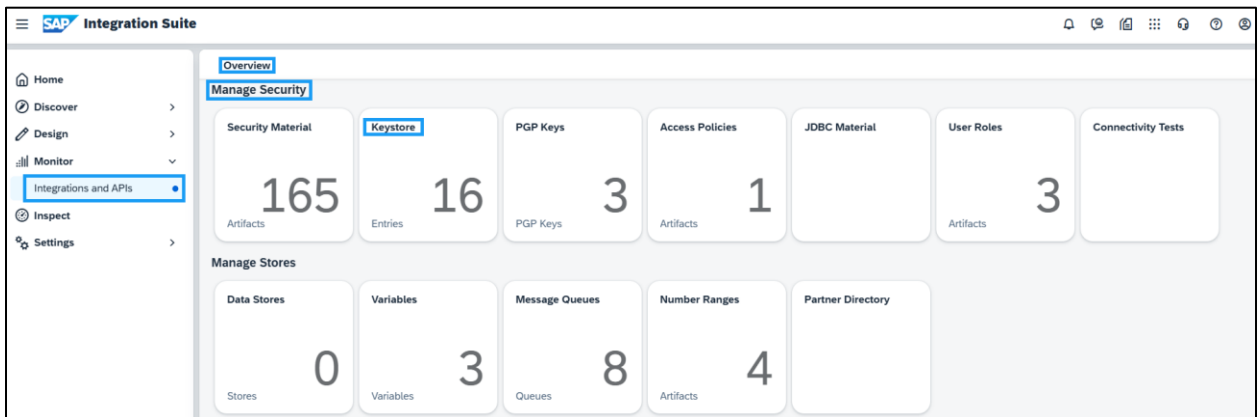
```

1 -----BEGIN PRIVATE KEY-----
2 MIIEvQIBADANBgkqhkiG9w0BAQEFAASCBKcwggSIAQIAggEoAgEBBjEAAAIB
3 -----END PRIVATE KEY-----

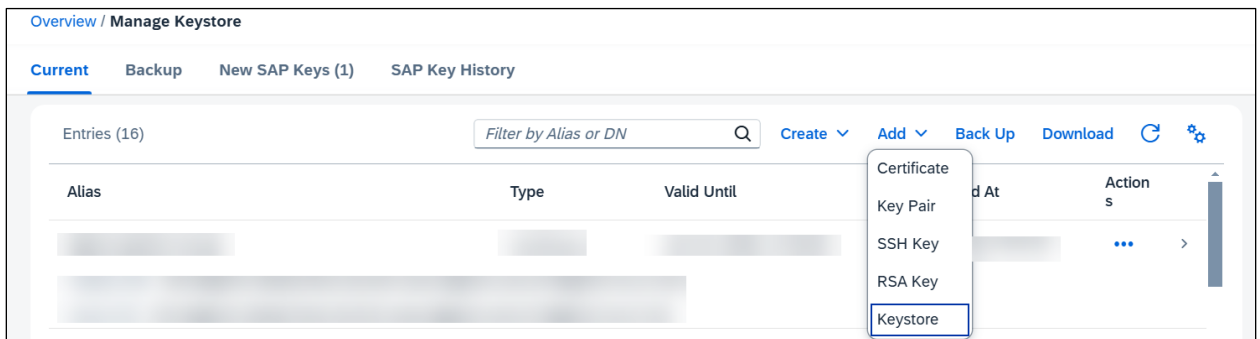
```

iv. Save as `gcs_rsa_key.p8`

2. Create a keystore file with `.jks` extension. For detailed information, see [Keystore Generation \(JKS file creation\)](#).
3. In SAP Integration Suite, navigate to **Monitor** > **Integrations and APIs**. This opens the **Overview** page.
4. On the **Overview** page, go to **Manage Security** section and click **Keystore**.



5. On **Manage Keystore** page, click **Add** to select **Keystore** from the dropdown.



6. In the **Add Keystore** popup, provide the below details.

### Add Keystore

Keystore: \*

Passphrase: \*

Action:  ▾

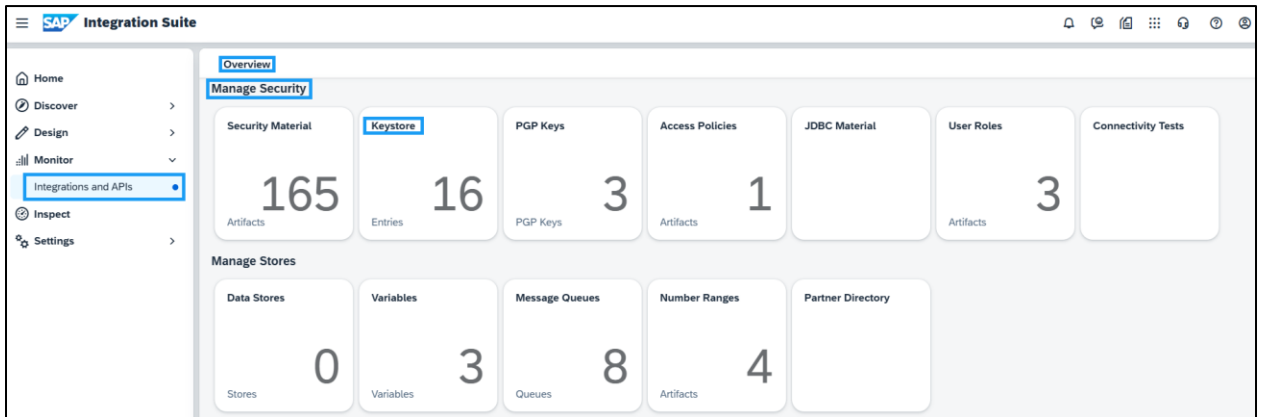
Overwrite existing entries

Parameter	Description
<b>Keystore</b>	Choose a keystore for upload. Select the .jks file. For detailed information, see <a href="#">Keystore Generation (JKS file creation)</a> .
<b>Passphrase</b>	Specify the password used while creating the .jks file.
<b>Action</b>	Specify the action to be performed as <b>Add</b> .
<b>Overwrite Existing Entries</b>	Enable or Disable depending on your need to overwrite existing entries.

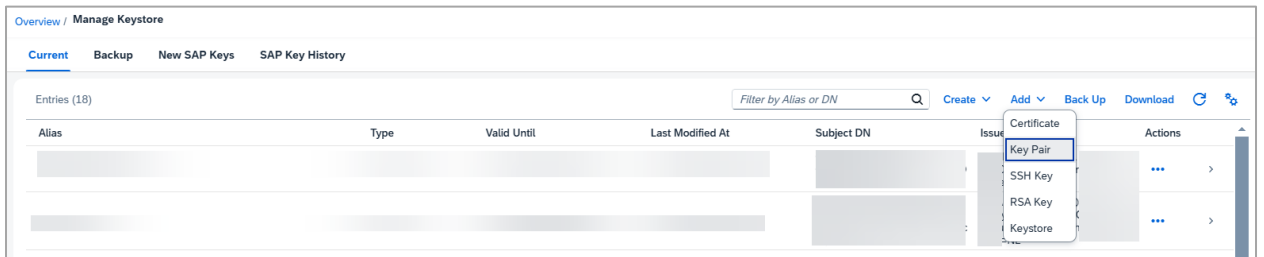
- Click **Deploy** to complete the process.

### 3.3.1.2 Creating Key-Pair for P12 key

1. In SAP Integration Suite, navigate to **Monitor > Integrations and APIs**. This opens the **Overview** page.
2. On the **Overview** page, go to **Manage Security** section and click **Keystore**.



3. On **Manage Keystore** page, click **Add** to select **Key Pair** from the dropdown.



4. In the **Key Pair** popup, provide the below details.

**Add Key Pair**

Alias: \*

File: \*

Password: \*

Parameter	Description
<b>Alias</b>	Specify the alias for the key pair.
<b>File</b>	Select the P12 key for upload.
<b>Password</b>	Specify the password used while creating the .jks file.

5. Click **Deploy** to complete the process.

# 4 Google Cloud Storage Adapter Configuration

This section describes the parameters to be configured for your Google Cloud Storage adapter. You need to configure the **Connection** and **Processing** tabs. A description and example usage for each field has been added.

## 4.1 Sender Adapter

### 4.1.1 Connection Tab

The **Connection** tab contains connection and authentication parameters for Google Cloud Storage adapter. Before you set the connection details, see [Create User Credentials](#).

The screenshot shows the configuration interface for the Google Cloud Storage adapter. The title bar is 'GoogleCloudStorage'. Below it are three tabs: 'General', 'Connection' (which is selected and highlighted with a blue underline), and 'Processing'. The main content area is titled 'CONNECTION DETAILS' and contains the following fields:

Address:*	https://storage.googleapis.com
Authentication Type:	OAuth2 Service Account ▼
OAuth2 Token URL:*	https://www.googleapis.com/oauth2/v4/token
Client Email:*	[Redacted]
Private Key Alias:*	PKA_Credential
Scope:*	https://www.googleapis.com/auth/devstorage.full_control
Polling Interval (in ms):	300000
Reuse Connection:	<input type="checkbox"/>
Connection Timeout (in ms):	60000
Response Timeout (in ms):	60000

The **Connection** tab contains the following fields:






<b>Parameter</b>	<b>Description</b>
<b>Address</b>	Specify the hostname pointing to the Google Cloud Storage service.  Default: <a href="https://storage.googleapis.com">https://storage.googleapis.com</a>
<b>Authentication Type</b>	Select the method for authentication to Google Cloud Storage. Currently OAuth2 Service Account is supported.
<b>OAuth2 Token URL</b>	Specify the OAuth2 Token URL which identifies as the authorization server for producing a JWT token internally.  Default: <a href="https://www.googleapis.com/oauth2/v4/token">https://www.googleapis.com/oauth2/v4/token</a>
<b>Client Email</b>	Specify the Google Service Account Client email.  Example: <a href="mailto:limited-svc-account@192843.iam.gserviceaccount.com">limited-svc-account@192843.iam.gserviceaccount.com</a>
<b>Private Key Alias</b>	Specify the Keystore alias for Google Service Account Private Key.
<b>Scope</b>	Specify the scope of the connection to Google Cloud Storage service.  Default: <code>devstorage.full_control</code>
<b>Polling Interval (in ms)</b>	Specify the Polling Interval (in ms).
<b>Reuse Connection</b>	Enable the reuse of connection objects from the internal connection pool which in turn improves the network turnaround time for multiple communications to a same end point.
<b>Connection Timeout (in ms)</b>	Specify the maximum waiting time (in milliseconds) for the connection to be established with Google Cloud Storage service.
<b>Response Timeout (in ms)</b>	Specify the maximum waiting time (in milliseconds) for a response message to be received with Google Cloud Storage service.

## 4.1.2 Processing Tab


The **Processing** tab contains the operational configurations for the Google Cloud Storage Sender adapter.

The screenshot shows the configuration interface for the Google Cloud Storage Sender adapter, specifically the Processing tab. The interface is divided into three sections: PROCESSING DETAILS, ENCRYPTION DETAILS, and HEADER DETAILS. The PROCESSING DETAILS section includes fields for Bucket Name, Directory, File Name, Include Subdirectories (checked), Query Parameters (delimiter=/), Max Results (5), Duplicate Check Expiration (300000 ms), and Post-Processing (Delete Object after Processing). The ENCRYPTION DETAILS section includes Object Encrypted with Custom Key (checked) and Encryption Key Alias. The HEADER DETAILS section includes Response Headers.

Parameter	Description
<b>Bucket Name</b>	Specify the name of the bucket.
<b>Directory</b>	Specify the directory path.  Example: <code>folder1</code> . When left empty, root folder <code>"/</code> is used.
<b>File Name</b>	Specify the file name or pattern matching the object name.  Example: <code>*.pdf</code>  Default: <code>*</code>

Parameter	Description
<b>Include Subdirectories</b>	Enable to search all subdirectories under the directory.
<b>Query Parameters</b>	<p>Specify the key value pairs (comma separated) to be used as query parameters.</p> <p>Example: <code>prefix=test&amp;delimiter=/</code></p> <div data-bbox="613 541 1377 680" style="background-color: #e6f2ff; padding: 5px; border: 1px solid #add8e6;"> <p> For Create operation for Folders, avoid using <code>recursive</code> query parameter as it conflicts with <b>Create Parent Folders</b> option.</p> </div> <div data-bbox="613 716 1377 854" style="background-color: #e6f2ff; padding: 5px; border: 1px solid #add8e6;"> <p> Don't use <code>alt</code> query parameter as it conflicts with the adapter's response.</p> </div>
<b>Max Results</b>	<p>Specify the maximum number of objects to be returned.</p> <div data-bbox="613 961 1377 1100" style="background-color: #e6f2ff; padding: 5px; border: 1px solid #add8e6;"> <p> The maximum value is 1000. If you want more results, use pagination using the Receiver Adapter.</p> </div>
<b>Duplicate Check Expiration (in ms)</b>	Specify the expiry time in milliseconds (minimum 300000 ms) while handling the Duplicate check. The default value is 300000.
<b>Post-Processing</b>	<p>Select the action to be performed after processing the object:</p> <ul style="list-style-type: none"> <li>• <b>Archive Object after Processing</b></li> <li>• <b>Delete Object after Processing</b></li> <li>• <b>Keep Object after Processing</b></li> </ul>
<b>Archive Wait Time (in ms)</b>  (Only available when <b>Post-Processing</b> is set to <b>Archive Object after Processing</b> .)	Specify the maximum time in milliseconds to archive the object.

Parameter	Description
<b>Move to same Bucket</b> (Only available when <b>Post-Processing</b> is set to <b>Archive Object after Processing</b> .)	Enable to move the object to the same bucket.
<b>Destination Bucket Name</b>  (Only available when <b>Move to same Bucket</b> is disabled.)	Specify the destination bucket name.
<b>Destination Folder</b> (Only available when <b>Post-Processing</b> is set to <b>Archive Object after Processing</b> .)	Specify the destination folder.  Example: <code>test_folder</code> .
<b>Archive Object Name</b> (Only available when <b>Post-Processing</b> is set to <b>Archive Object after Processing</b> .)	Specify the name for the archived object. When left empty existing object name is used.  Camel expressions can be used to name the object dynamically.  Example: <code>\${file:name.noext.single}.\${date:now:yyyy-MM-dd HH:mm:ss}.\${file:name.ext.single}</code>
<b>Object Encrypted with Custom Key</b>	Enable if object is encrypted with custom key.
<b>Encryption Key Alias</b>  (Only available if <b>Object Encrypted with Custom Key</b> is enabled)	Specify the Alias for Encryption Key.
<b>Encrypt Destination Object with Custom Key</b>	Enable to encrypt destination object with custom key.

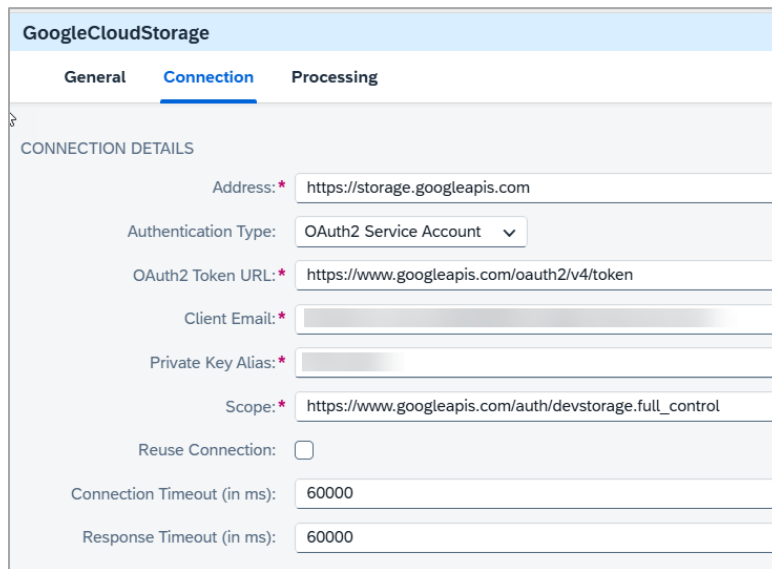
Parameter	Description
<p><b>Destination Encryption Key Type</b></p> <p>(Only available if <b>Encrypt Destination Object with Custom Key</b> is enabled)</p>	<p>Select the type of encryption key to be used for the object that will be archived:</p> <ul style="list-style-type: none"> <li>• <b>Cloud KMS Key</b></li> <li>• <b>Customer-Supplied Encryption Key</b></li> </ul> <div style="background-color: #e6f2ff; padding: 5px; border: 1px solid #d9e1f2;"> <p> For Customer-Supplied Encryption key generation and usage, see <a href="#">Create Custom Encryption Key Alias</a>.</p> </div>
<p><b>Destination Encryption Key Alias</b></p> <p>(Only available when <b>Destination Encryption Key Type</b> is set to <b>Customer-Supplied Encryption Key</b>)</p>	<p>Specify the alias for destination Encryption Key.</p>
<p><b>Destination Cloud KMS Key Name</b></p> <p>(Only available when <b>Destination Encryption Key Type</b> is set to <b>Cloud KMS Key</b>)</p>	<p>Specify the resource name of the destination Cloud KMS key.</p>
<p><b>Response Headers</b></p>	<p>Enter a list of headers coming from the target system's response, separated by a pipe ( ), to be received in the message. Use an * to receive all the headers from the target system, which is also the default value.</p>

## 4.2 Receiver Adapter

In this section, you will learn how to configure the Google Cloud Storage receiver adapter.

### 4.2.1 Connection Tab

The Connection tab contains connection and authentication parameters for Google Cloud Storage adapter. Before you set the connection details, see [Create User Credentials](#).



The screenshot shows the 'GoogleCloudStorage' configuration window with the 'Connection' tab selected. The 'CONNECTION DETAILS' section includes the following fields:

- Address:
- Authentication Type:
- OAuth2 Token URL:
- Client Email:
- Private Key Alias:
- Scope:
- Reuse Connection:
- Connection Timeout (in ms):
- Response Timeout (in ms):

The **Connection** tab contains the following fields:

Parameter	Description
<b>Address</b>	Specify the hostname pointing to the Google Cloud Storage service. Default: <a href="https://storage.googleapis.com">https://storage.googleapis.com</a>
<b>Authentication Type</b>	Select the method for authentication to Google Cloud Storage. Currently <b>OAuth2 Service Account</b> is supported.
<b>OAuth2 Token URL</b>	Specify the OAuth2 Token URL which identifies as the authorization server for producing a JWT token internally. Default: <a href="https://www.googleapis.com/oauth2/v4/token">https://www.googleapis.com/oauth2/v4/token</a>

Parameter	Description
<b>Client Email</b>	Specify the Google Service Account Client Email.  Example: <a href="mailto:limited-svc-account@192843.iam.gserviceaccount.com">limited-svc-account@192843.iam.gserviceaccount.com</a>
<b>Private Key Alias</b>	Specify the Keystore alias for Google Service Account Private Key.
<b>Scope</b>	Specify the scope of the connection to Google Cloud Storage service.  Default: <a href="https://storage.googleapis.com/auth/devstorage.full_control">https://storage.googleapis.com/auth/devstorage.full_control</a>
<b>Reuse Connection</b>	Enable the reuse of connection objects from the internal connection pool which in turn improves the network turnaround time for multiple communications to a same end point.
<b>Connection Timeout (in ms)</b>	Specify the maximum waiting time (in milliseconds) for the connection to be established with Google Cloud Storage service.
<b>Response Timeout (in ms)</b>	Specify the maximum waiting time (in milliseconds) for a response message to be received with Google Cloud Storage service.

## 4.2.2 Processing Tab

This section lists the configurations for Google Cloud Storage Receiver Adapter.

The screenshot shows the configuration interface for the Google Cloud Storage Receiver Adapter. The interface is titled "GoogleCloudStorage" and has three tabs: "General", "Connection", and "Processing". The "Processing" tab is selected and highlighted with a blue underline. Below the tabs, the configuration is organized into two sections: "PROCESSING DETAILS" and "HEADER DETAILS".

**PROCESSING DETAILS**

- Resource Type: Buckets (dropdown menu)
- Operation: List (dropdown menu)
- Project ID: \* \${property,pid} (text input)
- Max Results: 10 (text input)
- Page Token: \${property,pageToken} (text input)
- Query Parameters: prefix=test (text input)
- Response Fields: name (text input)

**HEADER DETAILS**

- Request Headers: (empty text input)
- Response Headers: \* (text input)



Parameter	Description
<b>Resource Type</b>	Select the resource type from the available dropdown: <ul style="list-style-type: none"><li>• <b>Buckets</b></li><li>• <b>Folders</b></li><li>• <b>Objects</b></li></ul>
<b>Operation</b>	Select the operation to be performed.
<b>Project ID</b>	Specify the Project ID.
<b>Bucket Name</b>	Specify the bucket name.



Parameter	Description
<b>Destination Directory Name</b>	Specify the destination directory path. Example: <code>dir</code>  When left empty, root folder "/" will be used.
<b>Folder Name</b>	Specify the folder name.
<b>Create Parent Folders</b>  (Only available when <b>Resource Type</b> is set to <b>Folders</b> and <b>Operation</b> is set to <b>Create</b> .)	Enable to create non-existing parent folders.  Example: If <b>Folder Name</b> is parent/child, enabling creates <code>parent</code> folder if not already present, and then creates <code>child</code> .
<b>Existing Folder Name</b>  (Only available when <b>Resource Type</b> is set to <b>Folders</b> and <b>Operation</b> is set to <b>Rename</b> .)	Specify the name of the source folder.
<b>New Folder Name</b>  (Only available when <b>Resource Type</b> is set to <b>Folders</b> and <b>Operation</b> is set to <b>Rename</b> .)	Specify the name of the destination folder.
<b>Directory</b>	Specify the directory path. Example: <code>dir</code>  When left empty, root folder "/" will be used.
<b>File Name</b>  (Only available when <b>Resource Type</b> is set to <b>Objects</b> and <b>Operation</b> is set to <b>List</b> .)	Specify the file name or pattern matching the object name.  Example: <code>*.pdf</code>
<b>Include Subdirectories</b>  (Only available when <b>Resource Type</b> is set to <b>Objects</b> and <b>Operation</b> is set to <b>List</b> .)	Enable to search all subdirectories.
<b>Object Name</b>	Specify the object name.

Parameter	Description
<p><b>Existing File Handling</b></p> <p>(Only available when <b>Resource Type</b> is set to <b>Objects</b> and <b>Operation</b> is set to <b>Create</b>.)</p>	<p>Select action in case file to be created already exists:</p> <ul style="list-style-type: none"> <li>• <b>Fail</b></li> <li>• <b>Ignore</b></li> <li>• <b>Override</b></li> </ul>
<p><b>Upload Type</b></p> <p>(Only available when <b>Resource Type</b> is set to <b>Objects</b> and <b>Operation</b> is set to <b>Create</b>.)</p>	<p>Select the type of upload request to be used for object creation:</p> <ul style="list-style-type: none"> <li>• <b>Media</b></li> <li>• <b>Multi-Part</b></li> <li>• <b>Resumable</b></li> </ul>
<p><b>Content Type</b></p> <p>(Only available when <b>Resource Type</b> is set to <b>Objects</b> and <b>Operation</b> is set to <b>Create</b>.)</p>	<p>Specify the content type of the object data.</p> <p>Example:</p> <ul style="list-style-type: none"> <li>• <code>text/html</code></li> <li>• <code>media-type</code></li> </ul>
<p><b>Object Metadata</b></p> <p>(Only available when <b>Upload Type</b> is set to <b>Multi-Part</b>.)</p>	<p>Specify the metadata of the object.</p>
<p><b>Upload in Multiple Chunks</b></p> <p>(Only available when <b>Upload Type</b> is set to <b>Resumable</b>.)</p>	<p>Enable to create object in multiple chunks.</p>
<p><b>Chunk Size</b></p> <p>(Only available when <b>Upload in Multiple Chunks</b> is enabled.)</p>	<p>Specify the chunk size to be used for object creation. The chunk size should be a multiple of 256 KiB (256 x 1024 bytes).</p>

Parameter	Description
<p><b>Get Metadata only</b></p> <p>(Only available when <b>Resource Type</b> is set to <b>Objects</b> and <b>Operation</b> is set to <b>Get</b>.)</p>	<p>Enable to get the metadata of the object.</p>
<p><b>Source Bucket Name</b></p> <p>(Only available when <b>Resource Type</b> is set to <b>Objects</b> and <b>Operation</b> is set to <b>Rewrite</b>.)</p>	<p>Specify the source bucket name.</p>
<p><b>Source Directory Name</b></p> <p>(Only available when <b>Resource Type</b> is set to <b>Objects</b> and <b>Operation</b> is set to <b>Rewrite</b>.)</p>	<p>Specify the source directory path. Example: "dir". When left empty, root folder "/" will be used.</p>
<p><b>Existing Object Name</b></p> <p>(Only available when <b>Resource Type</b> is set to <b>Objects</b> and <b>Operation</b> is set to <b>Rewrite</b>.)</p>	<p>Specify the source object name.</p>
<p><b>Destination Bucket Name</b></p> <p>(Only available when <b>Resource Type</b> is set to <b>Objects</b> and <b>Operation</b> is set to <b>Rewrite</b>.)</p>	<p>Specify the destination bucket name.</p>
<p><b>New Object Name</b></p> <p>(Only available when <b>Resource Type</b> is set to <b>Objects</b> and <b>Operation</b> is set to <b>Rewrite</b>.)</p>	<p>Specify the destination object name.</p>
<p><b>Rewrite Token</b></p> <p>(Only available when <b>Resource Type</b> is set to <b>Objects</b> and <b>Operation</b> is set to <b>Rewrite</b>.)</p>	<p>Specify the rewrite token if present.</p>

Parameter	Description
<b>Object Encrypted with Custom Key</b>	Enable if object is encrypted with custom key.
<b>Encryption Key Type</b> (Only available when <b>Object Encrypted with Custom Key</b> is enabled.)	Select the type of encryption to be used: <ul style="list-style-type: none"> <li>• <b>Cloud KMS Key</b></li> <li>• <b>Customer-Supplied Encryption Key</b></li> </ul> <div style="background-color: #e6f2ff; padding: 5px; margin-top: 10px;">  For Customer-Supplied Encryption key generation and usage, see <a href="#">Create Custom Encryption Key Alias</a>.         </div>
<b>Encryption Key Alias</b> (Only available when <b>Encryption Key Type</b> is set to <b>Customer-Supplied Encryption Key</b> )	Specify the encryption key alias.
<b>Cloud KMS Key Name</b> (Only available when <b>Encryption Key Type</b> is set to <b>Cloud KMS Key Name</b> )	Specify the resource name of the Cloud KMS key.
<b>Encrypt Destination Object with Custom Key</b>	Enable if destination object is to be encrypted with custom key.
<b>Destination Encryption Key Type</b> (Only available when <b>Resource Type</b> is set to <b>Objects</b> and <b>Operation</b> is set to <b>Rewrite</b> .)	Select the type of encryption to be used: <ul style="list-style-type: none"> <li>• <b>Cloud KMS Key</b></li> <li>• <b>Customer-Supplied Encryption Key</b></li> </ul> <div style="background-color: #e6f2ff; padding: 5px; margin-top: 10px;">  For Customer-Supplied Encryption key generation and usage, see <a href="#">Create Custom Encryption Key Alias</a>.         </div>

Parameter	Description
<p><b>Destination Encryption Key Alias</b></p> <p>(Only available when <b>Destination Encryption Key Type</b> is set to <b>Customer-Supplied Encryption Key</b>)</p>	<p>Specify the destination encryption key alias.</p>
<p><b>Destination Cloud KMS Key Name</b></p> <p>(Only available when <b>Destination Encryption Key Type</b> is set to <b>Cloud KMS Key Name</b>)</p>	<p>Specify the resource name of the destination Cloud KMS key.</p>
<p><b>Max Results</b></p>	<p>Specify the maximum number of items to be returned.</p>
<p><b>Page Token</b></p>	<p>Specify the next page token.</p>
<p><b>Query Parameters</b></p>	<p>Specify the key value pairs (&amp; separated) to be used as query parameters.</p> <p>Example: <code>prefix=test&amp;delimiter=/</code></p>
<p><b>Response Fields</b></p>	<p>Specify the fields (comma separated) to be returned in the response.</p> <p>For information about syntax of response fields, see <a href="https://cloud.google.com/storage/docs/json_api#partial-response">https://cloud.google.com/storage/docs/json_api#partial-response</a>.</p> <p>Example:</p> <ul style="list-style-type: none"> <li>• <code>name,generation,size</code></li> <li>• <code>items/id</code></li> </ul>

<b>Parameter</b>	<b>Description</b>
<b>Request Headers</b>	<p>Enter a list of custom headers, separated by a pipe ( ), to send to the target system. By default, no custom headers are sent. Use an asterisk (*) to send all custom headers to the target system.</p> <p>Alternatively, you can dynamically pass the values by defining a property that includes a list of headers.</p>
<b>Response Headers</b>	<p>Enter a list of headers coming from the target system's response, separated by a pipe ( ), to be received in the message. Use an * to receive all the headers from the target system, which is also the default value.</p>

# 5 Google Cloud Storage Adapter Operations

This section describes some of the CRUD (Create, Read, Update, Delete) operations supported by the Google Cloud Storage adapter.

## 5.1 Sender Adapter

While reading, the Sender adapter provides three **Post-Processing** options. Here, we will be demonstrating an example for **Archive Object after Processing**.

The screenshot shows the configuration interface for the Google Cloud Storage adapter, specifically the 'Processing' tab. The interface is divided into two main sections: 'PROCESSING DETAILS' and 'ENCRYPTION DETAILS'.

**PROCESSING DETAILS:**

- Bucket Name: [Redacted]
- Directory: [Redacted]
- File Name: \*
- Include Subdirectories:
- Query Parameters: delimiter=/  
Max Results: 5
- Duplicate Check Expiration (in ms): 300000
- Post-Processing: Archive Object after Processing (dropdown)
- Archive Wait Time (in ms): 300000
- Move to same Bucket:
- Destination Folder: [Redacted]
- Archive Object Name: \${file.name.noext.single}.\${date.now:yyyy-MM-dd HH:mm:ss}.\${file.name.ext.single}

**ENCRYPTION DETAILS:**

- Object Encrypted with Custom Key:
- Encryption Key Alias: E\_KEY
- Encrypt Destination Object with Custom Key:
- Destination Encryption Key Type: Customer-Supplied Encryption Key (dropdown)
- Destination Encryption Key Alias: D\_KEY

Parameter	Value
<b>Bucket Name</b>	Set <code>parent_bkt</code> as the name of the bucket.
<b>Directory</b>	Set directory path as <code>test</code>
<b>File Name</b>	Set pattern as <code>*.json</code>
<b>Include Subdirectories</b>	Enable to search all subdirectories for objects.
<b>Query Parameters</b>	Set <code>prefix=pre</code>
<b>Max Results</b>	Set value to 10

Parameter	Value
<b>Duplicate Check Expiration (in ms)</b>	Set value to 300000
<b>Post-Processing</b>	Select action as <b>Archive Object after Processing</b> .
<b>Archive Wait Time (in ms)</b>	Set value as 300000.
<b>Move to same Bucket</b>	Enable
<b>Archive Object Name</b>	Set as <code>\${file:name.noext.single}.\${date:now:yyyy-MM-dd HH:mm:ss}.\${file:name.ext.single}</code>
<b>Destination Folder</b>	Specify the destination folder as <code>dest</code> .
<b>Object Encrypted with Custom Key</b>	Enable
<b>Encryption Key Alias</b>	Specify alias as <code>E_KEY</code>
<b>Encrypt Destination Object with Custom Key</b>	Enable
<b>Destination Encryption Key Type</b>	Select as <b>Customer-Supplied Encryption Key</b>
<b>Destination Encryption Key Alias</b>	Specify alias as <code>D_KEY</code>



## 5.2 Receiver Adapter

### 5.2.1 Bucket: Create

**Create** allows you to create a bucket as part of the specified project.

The screenshot shows the configuration interface for GoogleCloudStorage. The 'Processing' tab is selected. Under 'PROCESSING DETAILS', the following settings are visible:

- Resource Type: Buckets (dropdown)
- Operation: Create (dropdown)
- Project ID: \* \${property.pid} (text input)
- Query Parameters: (empty text input)
- Response Fields: (empty text input)

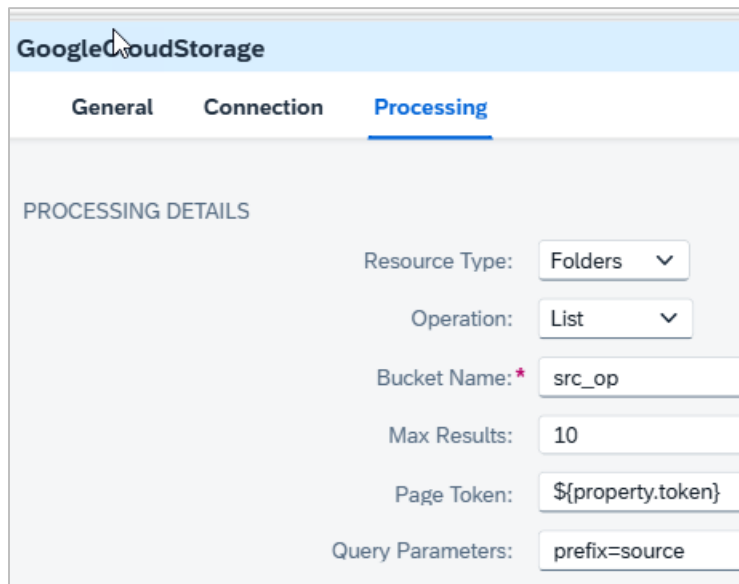
You must provide name of the bucket in the payload:

```
{
  "name": "partition_5",
  "hierarchicalNamespace": {
    "enabled": true
  },
  "labels": {
    "bucketType": "sales bucket"
  }
}
```

Parameter	Values
Resource Type	Select <b>Buckets</b>
Operation	Select <b>Create</b>
Project ID	Specify bucket name as <code>\${property.pid}</code>

## 5.2.2 Folders: List

**List** returns a list of folders which are available in the specified bucket. You can use **Query Parameters** and **Max Results** to customise your search results.



The screenshot shows the 'Processing' tab of the Google Cloud Storage configuration interface. Under the 'PROCESSING DETAILS' section, the following settings are visible:

- Resource Type: Folders (dropdown menu)
- Operation: List (dropdown menu)
- Bucket Name: \* src\_op (text input)
- Max Results: 10 (text input)
- Page Token: \${property.token} (text input)
- Query Parameters: prefix=source (text input)

Parameter	Values
Resource Type	Select <b>Folders</b>
Operation	Select <b>List</b>
Bucket Name	Specify bucket name as <code>src_op</code>
Max Results	Set as 10
Page Token	Select value as <code>\${property.token}</code>
Query Parameters	Set as <code>prefix=source</code>

## 5.2.3 Object: Rewrite

Rewrite allows you to copy an object to a different location.

**GoogleCloudStorage**

General
Connection
Processing

PROCESSING DETAILS

Resource Type: Objects ▾

Operation: Rewrite ▾

Source Bucket Name: \*

Source Directory Name:

Existing Object Name: \*

Destination Bucket Name: \*

Destination Directory Name:

New Object Name: \*

Rewrite Token:

Object Encrypted with Custom Key:

Encryption Key Alias: \*

Encrypt Destination Object with Custom Key:

Destination Encryption Key Type: \* Customer-Supplied Encryption Key ▾

Destination Encryption Key Alias: \*

Query Parameters:

Response Fields:

Parameter	Value
<b>Resource Type</b>	Select <b>Objects</b>
<b>Operation</b>	Select <b>Rewrite</b>
<b>Source Bucket Name</b>	Set as <code>src_op</code>
<b>Source Directory Name</b>	Set as <code>src_dir</code>
<b>Existing Object Name</b>	Set as <code>obj_first</code>
<b>Destination Bucket Name</b>	Set as <code>tgt_op</code>
<b>Destination Directory Name</b>	Set as <code>tgt_dir</code>
<b>New Object Name</b>	Set as <code>obj_final</code>

<b>Parameter</b>	<b>Value</b>
<b>Object Encrypted with Custom Key</b>	Enable
<b>Encryption Key Alias</b>	Set as SRC_ENCRYPT
<b>Encrypt Destination Object with Custom Key</b>	Enable
<b>Destination Encryption Key Type</b>	Select as <b>Customer-Supplied Encryption Key</b>
<b>Destination Encryption Key Alias</b>	Set as DEST_ENCRYPT

# 6 References

## 6.1 Create Custom Encryption Key Alias

You will require a Customer-Supplied Encryption key for encrypting or decrypting data. For more information, see [Customer-supplied encryption keys](#).

### Procedure

1. To create an encryption key, see [Generate your own encryption key](#) or you can run this command using OpenSSL: `openssl rand -base64 32`. This generates a 256-bit (32 bytes) AES Base64 encoded encryption key.
2. The encryption key created above needs to be saved as a **Secure Parameter** in **Security Material**. For more information, see [Deploying a Secure Parameter Artifact](#).

## 6.2 Keystore Generation (JKS File Creation)

1. Generate a certificate signing request by using the `gcs_rsa_key.p8` file and store it in a file called `gcs_server.csr`.

OpenSSL Command:

```
openssl req -new -key <source_path>/gcs_rsa_key.p8 -out  
<target_path>/gcs_server.csr
```

You are about to be asked to enter information that will be incorporated into your certificate request.

What you are about to enter is what is called a Distinguished Name or a DN.

There are quite a few fields but you can leave some blank

For some fields there will be a default value,

If you enter '.', the field will be left blank.

Country Name (2 letter code) [AU]:<enter\_country\_code>

State or Province Name (full name) [Some-State]:<enter\_city\_name>

Locality Name (eg, city) []:<enter\_locality\_name>

Organization Name (eg, company) [Internet Widgits Pty Ltd]:<enter\_org\_name>

Organizational Unit Name (eg, section) []:<enter\_org\_unit\_name>

Common Name (e.g. server FQDN or YOUR name) []:<enter\_common\_name>

Email Address []:<enter\_email\_address>

Please enter the following 'extra' attributes to be sent with your certificate request

A challenge password []:<password>

An optional company name []:<company\_name>

2. It is possible to sign the certificate using a self-signing mechanism or via CA.



Please refer to your organisation policy to choose a suitable signing mechanism for the certificate.

You can generate a self-signed digital certificate using our private key (`gcs_rsa_key.p8`) and certificate signing request (`gcs_server.csr`) file and store the certificate in a file called (`gcs_server.crt`).

This `gcs_server.crt` is uploaded when creating the jks file.

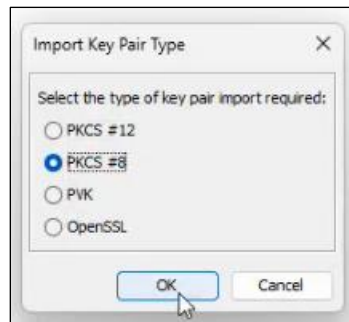
OpenSSL Command:

```
openssl x509 -req -sha256 -days 365 -in  
<source_path>/gcs_server.csr -signkey  
<source_path>/gcs_rsa_key.p8 -out <target/path>/gcs_server.crt
```

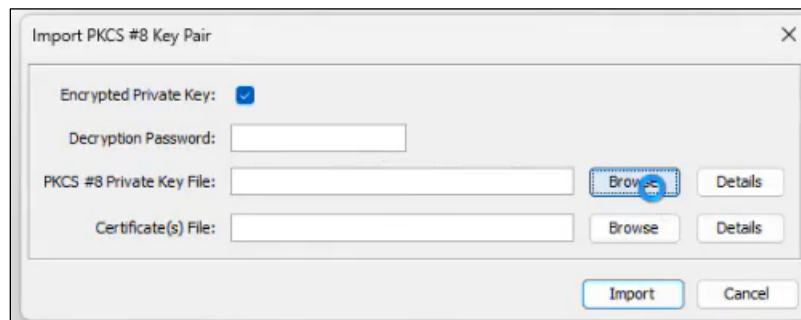
3. To create a JKS file using Keystore follow the below steps:
  - i. Go to Keystore and **Import key Pair**.

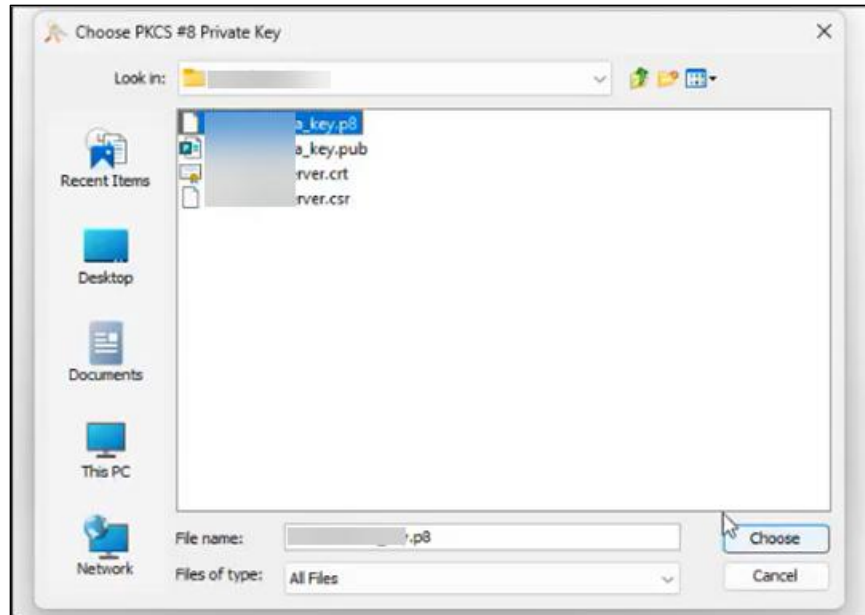


ii. Select the type of key pair as **PKCS #8**.

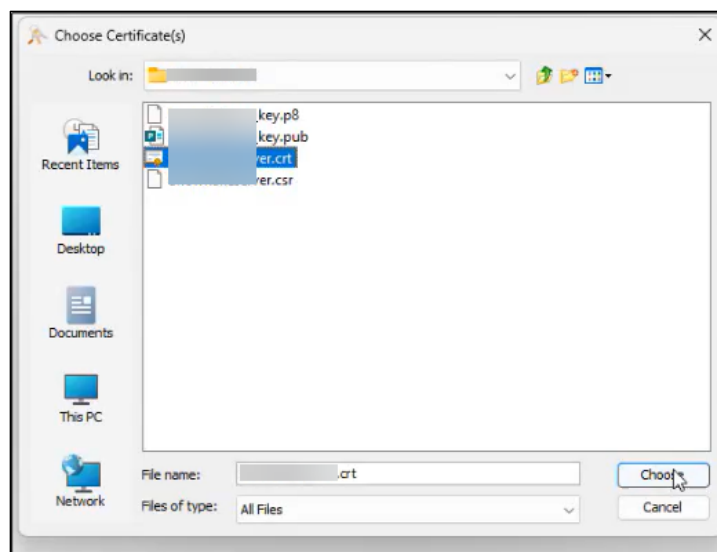
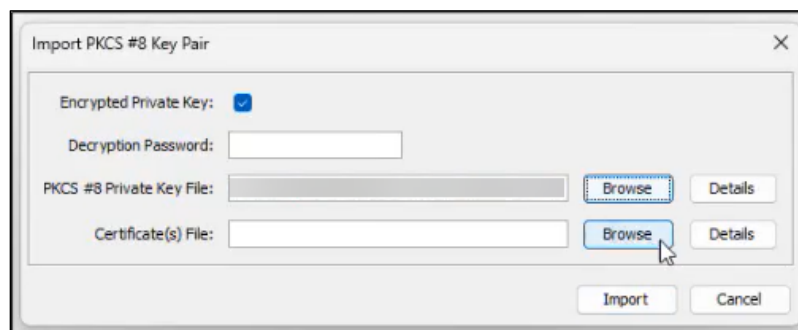


iii. Add the private key file by uploading the PKCS **Private Key** file.



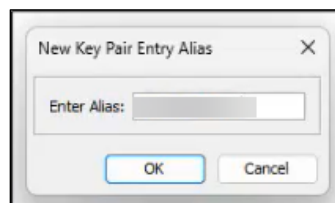
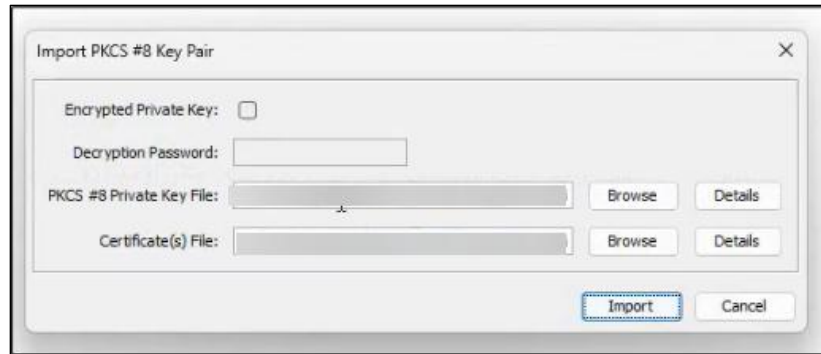


iv. Add the Google Cloud Storage **Certificate(s) File** created above.





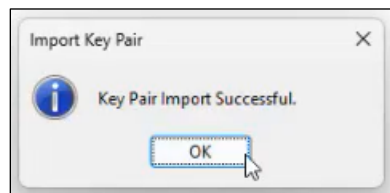
- v. Click **Import** and provide the **Alias**.



- vi. Provide a **New Key Pair Entry Password**.



- vii. You will get a message that indicates key pair import was successful.



viii. Provide the **KeyStore Password**.



ix. Finally, save the jks file.

