

S3 to Databricks

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ReadyFlow: S3 to Databricks

You can use the S3 to Databricks ReadyFlow to retrieve CSV files from a source S3 location and write them as Parquet files to a destination S3 location and Databricks table.

This ReadyFlow consumes CSV data from a source S3 location, parses the data using schema(s) provided by the Cloudera Schema Registry, converts it to Parquet format and writes the data to a destination S3 bucket and Databricks table. The flow supports either a non-partitioned table or a partitioned table (single column only).

**Note:**

By default, the flow is configured for a partitioned Databricks table. This ReadyFlow leverages Cloudera's centralized access control for cloud storage access. Make sure to either set up an IDBroker mapping or Ranger policies when using fine-grained object store access allowing your workload user access to the source and destination S3 locations.

S3 to Databricks ReadyFlow details	
Source	Cloudera managed Amazon S3
Source Format	CSV
Destination	Cloudera managed Amazon S3 and Databricks
Destination Format	Parquet

Prerequisites

Learn how to collect the information you need to deploy the S3 to Databricks ReadyFlow, and meet other prerequisites.

For your data ingest source

- You have the source S3 bucket and path.

- You have performed one of the following to configure access to the source S3 bucket:
 - You have configured access to the S3 bucket with a RAZ enabled environment.

It is a best practice to enable RAZ to control access to your object store buckets. This allows you to use your Cloudera on cloud credentials to access S3 buckets, increases auditability, and makes object store data ingest workflows portable across cloud providers.

1. Ensure that Fine-grained access control is enabled for your Cloudera Data Flow environment.
2. From the Ranger UI, navigate to the S3 repository.
3. Create a policy to govern access to the S3 bucket and path used in your ingest workflow.



Tip:

The Path field must begin with a forward slash (/).

4. Add the machine user that you have created for your ingest workflow to the policy you just created.

For more information, see *Creating Ranger policy to use in RAZ-enabled AWS environment*.

- You have configured access to the S3 bucket using ID Broker mapping.

If your environment is not RAZ-enabled, you can configure access to the S3 bucket using ID Broker mapping.

1. Access IDBroker mappings.
 - a. To access IDBroker mappings in your environment, click **Actions Manage Access**.
 - b. Choose the IDBroker Mappings tab where you can provide mappings for users or groups and click **Edit**.
2. Add your Cloudera Workload User and the corresponding AWS role that provides write access to your folder in your S3 bucket to the **Current Mappings** section by clicking the blue + sign.



Note: You can get the AWS IAM role ARN from the Roles Summary page in AWS and can copy it into the IDBroker role field. The selected AWS IAM role must have a trust policy allowing IDBroker to assume this role.

3. Click **Save and Sync**.
- You have created a Streams Messaging cluster in Cloudera on cloud to host your Schema Registry.

For information on how to create a Streams Messaging cluster, see [Setting up your Streams Messaging Cluster](#).

- You have created a schema for your data and have uploaded it to the Schema Registry in the Streams Messaging cluster.

For information on how to create a new schema, see [Creating a new schema](#). For example:

```
{
  "type": "record",
  "name": "SensorReading",
  "namespace": "com.cloudera.example",
  "doc": "This is a sample sensor reading",
  "fields": [
    {
      "name": "sensor_id",
      "doc": "Sensor identification number.",
      "type": "int"
    },
    {
      "name": "sensor_ts",
      "doc": "Timestamp of the collected readings.",
      "type": "long"
    },
    {
      "name": "sensor_0",
      "doc": "Reading #0.",
      "type": "int"
    }
  ]
}
```


```

        "name": "sensor_1",
        "doc": "Reading #1.",
        "type": "int"
      },
      {
        "name": "sensor_2",
        "doc": "Reading #2.",
        "type": "int"
      },
      {
        "name": "sensor_3",
        "doc": "Reading #3.",
        "type": "int"
      }
    ]
  }
}


```


- You have the Schema Registry Host Name.
 1. From the Management Console, go to Data Hub Clusters and select the Streams Messaging cluster you are using.
 2. Navigate to the **Hardware** tab to locate the Master Node FQDN. Schema Registry is always running on the Master node, so copy the Master node FQDN.
- You have assigned the Cloudera Workload User read-access to the schema.
 1. Navigate to Management Console Environments , and select the environment where you have created your cluster.
 2. Select Ranger. You are redirected to the Ranger **Service Manager** page.
 3. Select your Streams Messaging cluster under the **Schema Registry** folder.
 4. Click Add New Policy.
 5. On the **Create Policy** page, give the policy a name, specify the schema details, add the user, and assign the Read permission.

For Cloudera Data Flow

- You have enabled Cloudera Data Flow for an environment.
For information on how to enable Cloudera Data Flow for an environment, see [Enabling Cloudera Data Flow for an Environment](#).
 - You have created a Machine User to use as the Cloudera Workload User.
 - You have given the Cloudera Workload User the EnvironmentUser role.
 1. From the Management Console, go to the environment for which Cloudera Data Flow is enabled.
 2. From the Actions drop down, click Manage Access.
 3. Identify the user you want to use as a Workload User.
-  **Note:** The Cloudera Workload User can be a machine user or your own user name. It is best practice to create a dedicated Machine user for this.
4. Give that user EnvironmentUser role.
- You have synchronized your user to the Cloudera on cloud environment that you enabled for Cloudera Data Flow.
For information on how to synchronize your user to FreeIPA, see [Performing User Sync](#).

- You have granted your Cloudera user the DFCatalogAdmin and DFFlowAdmin roles to enable your user to add the ReadyFlow to the Catalog and deploy the flow definition.
 1. Give a user permission to add the ReadyFlow to the Catalog.
 - a. From the Management Console, click User Management.
 - b. Enter the name of the user or group you wish to authorize in the Search field.
 - c. Select the user or group from the list that displays.
 - d. Click Roles Update Roles .
 - e. From Update Roles, select DFCatalogAdmin and click Update.



Note: If the ReadyFlow is already in the Catalog, then you can give your user just the DFCatalogViewer role.
 2. Give your user or group permission to deploy flow definitions.
 - a. From the Management Console, click Environments to display the Environment List page.
 - b. Select the environment to which you want your user or group to deploy flow definitions.
 - c. Click Actions Manage Access to display the Environment Access page.
 - d. Enter the name of your user or group you wish to authorize in the Search field.
 - e. Select your user or group and click Update Roles.
 - f. Select DFFlowAdmin from the list of roles.
 - g. Click Update Roles.
 3. Give your user or group access to the Project where the ReadyFlow will be deployed.
 - a. Go to DataFlow Projects .
 - b. Select the project where you want to manage access rights and click  More Manage Access .
 4. Start typing the name of the user or group you want to add and select them from the list.
 5. Select the Resource Roles you want to grant.
 6. Click Update Roles.
 7. Click Synchronize Users.

For your data ingest target

- You have created a Databricks table, non-partitioned or partitioned (single column only).
- You have the Storage Location of your Databricks Table, which consists of the S3 Bucket, Path and Table Id.

- You have performed one of the following to configure access to the target S3 bucket:
 - You have configured access to the S3 bucket with a RAZ enabled environment.

It is a best practice to enable RAZ to control access to your object store buckets. This allows you to use your Cloudera on cloud credentials to access S3 buckets, increases auditability, and makes object store data ingest workflows portable across cloud providers.

- Ensure that Fine-grained access control is enabled for your Cloudera Data Flow environment.
- From the Ranger UI, navigate to the S3 repository.
- Create a policy to govern access to the S3 bucket and path used in your ingest workflow.



Tip:

The Path field must begin with a forward slash (/).

- Add the machine user that you have created for your ingest workflow to the policy you just created.

For more information, see *Creating Ranger policy to use in RAZ-enabled AWS environment*.

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- Access IDBroker mappings.
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Note: You can get the AWS IAM role ARN from the Roles Summary page in AWS and can copy it into the IDBroker role field. The selected AWS IAM role must have a trust policy allowing IDBroker to assume this role.

- Click **Save and Sync**.

Related Concepts

[Required parameters](#)

Required parameters

When deploying the S3 to Databricks ReadyFlow, you have to provide the following parameters. Use the information you collected in *Prerequisites*.

Table 1: S3 to Databricks ReadyFlow configuration parameters

Parameter Name	Description
CDP Workload User	Specify the Cloudera machine user or workload user name that you want to use to authenticate to the object stores and to the schema registry. Ensure this user has the appropriate access rights to the object store locations and to the schema registry in Ranger or IDBroker.
CDP Workload User Password	Specify the password of the Cloudera machine user or workload user you are using to authenticate against the object stores and the schema registry.
CDPEnvironment	The Cloudera Environment configuration resources.
Destination S3 Bucket	Specify the name of the destination S3 bucket you want to write to. The full path will be constructed out of s3a://#{Destination S3 Bucket}/#{Destination S3 Path}

Parameter Name	Description
Destination S3 Path	Specify the path within the destination bucket where you want to write to. Make sure that the path starts with "/". The path must end with the destination Databricks Table Id. The full path is constructed out of s3a: <code>/{Destination S3 Bucket}/{Destination S3 Path}</code>
Partition Column	Specify the name of the column used to partition your destination Databricks table. This ReadyFlow only supports a single partition column.
Partition Column Exists	Specify whether the destination Databricks column is partitioned. The default value is YES.
Schema Name	Specify the schema name to be looked up in the Schema Registry used to parse the source files.
Schema Name 2	If your Databricks table is partitioned, specify the name of the modified schema to be looked up in the Schema Registry. This schema should not include the partition column field.
Schema Registry Hostname	Specify the hostname of the Schema Registry you want to connect to. This must be the direct hostname of the Schema Registry itself, not the Knox Endpoint.
Source S3 Bucket	Specify the name of the source S3 bucket you want to read from.
Source S3 Path	Specify the path within the source bucket where you want to read files from.

Related Concepts

[Prerequisites](#)

Related Information

[Deploying a ReadyFlow](#)