

## ADLS to Databricks

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## ReadyFlow: ADLS to Databricks

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

This ReadyFlow consumes CSV data from a source ADLS 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 ADLS location 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 Public Cloud'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 ADLS locations.

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

### Moving data to object stores

Cloud environments offer numerous deployment options and services. There are many ways to store data in the cloud, but the easiest option is to use object stores. Object stores are extremely robust and cost-effective storage solutions with multiple levels of durability and availability. You can include them in your data pipeline, both as an intermediate step and as an end state. Object stores are accessible to many tools and connecting systems, and you have a variety of options to control access.

## Prerequisites

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

### For your ADLS data source

- You have your ADLS container, storage account, and path from which you want to ingest data.

- You have performed one of the following to configure access to the ADLS folders:
  - You have configured access to the ADLS folders with a RAZ enabled environment.

It is a best practice to enable RAZ to control access to your object store folders. This allows you to use your Cloudera Public Cloud credentials to access ADLS folders, 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 DataFlow environment.
2. From the Ranger UI, navigate to the ADLS repository.
3. Create a policy to govern access to the ADLS container and path used in your ingest workflow. For example: adls-to-adls-avro-ingest



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

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

For more information, see *Ranger policies for RAZ-enabled Azure environment*.

- You have configured access to ADLS folders using ID Broker mapping.

If your environment is not RAZ-enabled, you can configure access to ADLS folders 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 Azure role that provides write access to your folder in ADLS to the Current Mappings section by clicking the blue + sign.



**Note:** You can get the Azure Managed Identity Resource ID from the Azure Portal by navigating to **Managed Identities Your Managed Identity Properties Resource ID**. The selected Azure MSI 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 Public 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 DataFlow

- You have enabled Cloudera DataFlow for an environment.  
For information on how to enable Cloudera DataFlow for an environment, see [Enabling Cloudera DataFlow 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 DataFlow 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 Public Cloud environment that you enabled for Cloudera DataFlow.

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.

### Databricks target requirements

- 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 ADLS Container, Storage Account, Path and Table Id.

### Related Concepts

[List of required configuration parameters for the ADLS to Databricks ReadyFlow](#)

## List of required configuration parameters for the ADLS to Databricks ReadyFlow

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

**Table 1: ADLS 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.

Parameter Name	Description
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 ADLS File System	Specify the name of the ADLS data container you want to write to. The full path is constructed from: <code>abfs://[***Destination ADLS File System***]@[***Destination ADLS Storage Account***].dfs.core.windows.net/[***Destination ADLS Path***]</code>
Destination ADLS Path	Specify the path within the ADLS data container where you want to write to. Make sure that the path starts with <code>"/"</code> . The path has to end with the destination Databricks Table Id. The full path is constructed from: <code>abfs://[***Destination ADLS File System***]@[***Destination ADLS Storage Account***].dfs.core.windows.net/[***Destination ADLS Path***]</code>
Destination ADLS Storage Account	Specify the destination ADLS storage account name.
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 ADLS File System	Specify the name of the ADLS data container you want to read from. The full path is constructed from: <code>abfs://[***Source ADLS File System***]@[***Source ADLS Storage Account***].dfs.core.windows.net/[***Source ADLS Path***]</code>
Source ADLS Path	The full path will be constructed from: <code>abfs://[***Source ADLS File System***]@[***Source ADLS Storage Account***].dfs.core.windows.net/[***Source ADLS Path***]</code>
Source ADLS Storage Account	Specify the source ADLS storage account name.

**Related Concepts**[Prerequisites](#)**Related Information**[Deploying a ReadyFlow](#)