

## Kafka to Apache Iceberg

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## ReadyFlow Overview: Kafka to Iceberg

You can use the Kafka to Apache Iceberg ReadyFlow to move your data from a CDP-managed Kafka topic to a CDP-managed Apache Iceberg table in Cloudera Data Warehouse.

This ReadyFlow consumes JSON, CSV or Avro data from a Kafka topic, parses the schema by looking up the schema name in the CDP Schema Registry and ingests it into an Iceberg table. The flow writes out a file every time its size has either reached 100MB or five minutes have passed. Files can reach a maximum size of 1GB. You can specify the topic you want to read from as well as the target Iceberg table. Failed ingestion operations are retried automatically to handle transient issues. Define a KPI on the failure\_WriteToIceberg connection to monitor failed write operations.

| Kafka to Iceberg ReadyFlow details |                 |
|------------------------------------|-----------------|
| Source                             | Kafka topic     |
| Source Format                      | JSON, CSV, Avro |
| Destination                        | Iceberg         |
| Destination Format                 | Parquet         |

## Prerequisites

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

### For your data ingest source

- You have created a Streams Messaging cluster in CDP 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 at least one Kafka topic.

- Navigate to Management Console > Environments and select your environment.
- Select your Streams Messaging cluster.
- Click on the Streams Messaging Manager icon.
- Navigate to the Topics page.
- Click Add New and provide the following information:

- Topic name
- Number of partitions
- Level of availability
- Cleanup policy



#### Tip:

SMM has automatically set Kafka topic configuration parameters. To manually adjust them, click Advanced.

- Click Save.
- 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 the Kafka broker end points.
  1. From the Management Console, click Data Hub Clusters.
  2. Select the Streams Messaging cluster from which you want to ingest data.
  3. Click the Hardware tab.
  4. Note the Kafka Broker FQDNs for each node in your cluster.
  5. Construct your Kafka Broker Endpoints by using the FQDN and Port number 9093 separated by a colon. Separate endpoints by a comma. For example:

```
broker1.fqdn:9093,broker2.fqdn:9093,broker3.fqdn:9093
```

Kafka broker FQDNs are listed under the **Core\_broker** section.


- You have the Kafka Consumer Group ID.

This ID is defined by the user. Pick an ID and then create a Ranger policy for it. Use the ID when deploying the flow in DataFlow.

- You have assigned the CDP Workload User policies to access the consumer group ID and topic.
  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 **Kafka** folder.
  4. Create a policy to enable your Workload User to access the Kafka source topic.
  5. On the **Create Policy** page, give the policy a name, select topic from the drop-down list, add the user, and assign the Consume permission.
  6. Create another policy to give your Workload User access to the consumer group ID.
  7. On the **Create Policy** page, give the policy a name, select consumergroup from the drop-down list, add the user, and assign the Consume permission.
- You have assigned the CDP 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 DataFlow

- You have enabled DataFlow for an environment.

For information on how to enable DataFlow for an environment, see [Enabling DataFlow for an Environment](#).
  - You have created a Machine User to use as the CDP Workload User.
  - You have given the CDP Workload User the EnvironmentUser role.
    1. From the Management Console, go to the environment for which 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 CDP 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 CDP Public Cloud environment that you enabled for DataFlow.

For information on how to synchronize your user to FreeIPA, see [Performing User Sync](#).

- You have granted your CDP 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.

### For your data ingest target

- In Cloudera Data Warehouse, you have activated the same environment for which DataFlow has been enabled. This will create a default database catalog.
- You have created a Hive Virtual Warehouse referencing the default database catalog.
- You have created the Iceberg table that you want to ingest data into, running in your Hive Virtual Warehouse.

### Related Concepts

[List of required configuration parameters for the Kafka to Iceberg ReadyFlow](#)

## List of required configuration parameters for the Kafka to Iceberg ReadyFlow

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

**Table 1: Kafka to Iceberg ReadyFlow configuration parameters**

| Parameter Name             | Description  |
|----------------------------|--|
| CDP Workload User          | Specify the CDP machine user or workload username that you want to use to authenticate to Kafka and the object store. Ensure this user has the appropriate access rights in Ranger for the Kafka topic and Ranger or IDBroker for Hive access. |
| CDP Workload User Password | Specify the CDP machine user or workload username that you want to use to authenticate to Kafka and Hive. Ensure this user has the appropriate access rights in Ranger for the Kafka topic and ID Broker for Hive access.                      |
| CDPEnvironment             | The CDP Environment configuration resources.   |
| CSV Delimiter              | If your source data is CSV, specify the delimiter here.  |

| Parameter Name           | Description  |
|--------------------------|--|
| Data Input Format        | Specify the format of your input data. Possible values are: <ul style="list-style-type: none"><li>• CSV</li><li>• JSON</li><li>• AVRO</li></ul>  |
| Hive Catalog Namespace   | Specify the Hive Catalog Namespace. The default value is default, which references the database catalog created automatically when you activate an environment in Cloudera Data Warehouse. |
| Iceberg Table Name       | Specify the Iceberg table that you want to write to, running in your Hive Virtual Warehouse.   |
| Kafka Broker Endpoint    | Specify the Kafka bootstrap servers string as a comma separated list.  |
| Kafka Consumer Group ID  | The name of the consumer group used for the source topic you are consuming from.   |
| Kafka Source Topic       | Specify a topic name that you want to read from.   |
| Schema Name              | Specify the schema name to be looked up in the Schema Registry for the source Kafka topic.   |
| 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.                                 |

### Related Concepts

[Prerequisites](#)

### Related Information

[Deploying a ReadyFlow](#)