

CLOUDERA

DATA FLOW HANDS - ON

STUDENT GUIDE

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Pre-requisites

For the ease of carrying out the workshop and considering the time at hand, we have already taken care of some of the steps that need to be considered before we can start with the actual Lab steps. The prerequisites that need to be in place are:

1. Streams Messaging Data Hub Cluster should be created and running.
2. Stream analytics Data Hub cluster should be created and running.
3. Data provider should be configured in SQL Stream Builder.
4. Have access to the file syslog-to-kafka.json.
5. Environment should be enabled as part of the CDF Data Service.

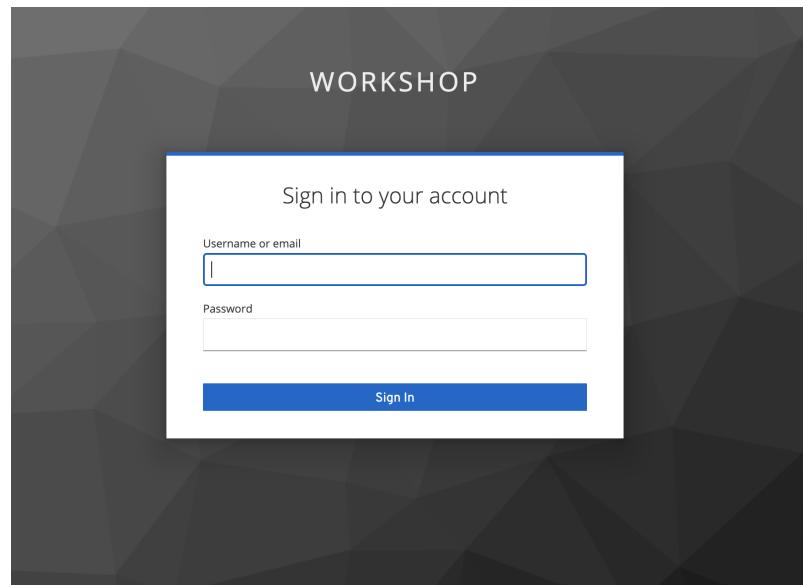
Lab 0 basically talks about verifying different aspects wrt to access and connections before we could begin with the actual steps.

Lab 0 - Introduction and setup

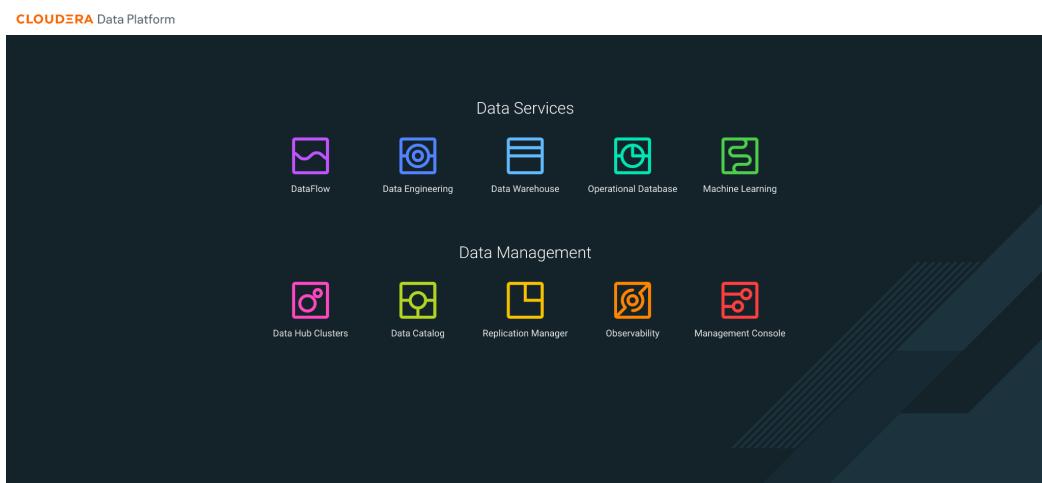
1. Verify access to the workshop environment

- The **INSTRUCTOR** will share the Workshop link and the credentials before the start of the workshop
- Open the shared link and login with the credentials assigned to you.

<Will be shared by the instructor at the start>



- You should land on the CDP Console as shown below.

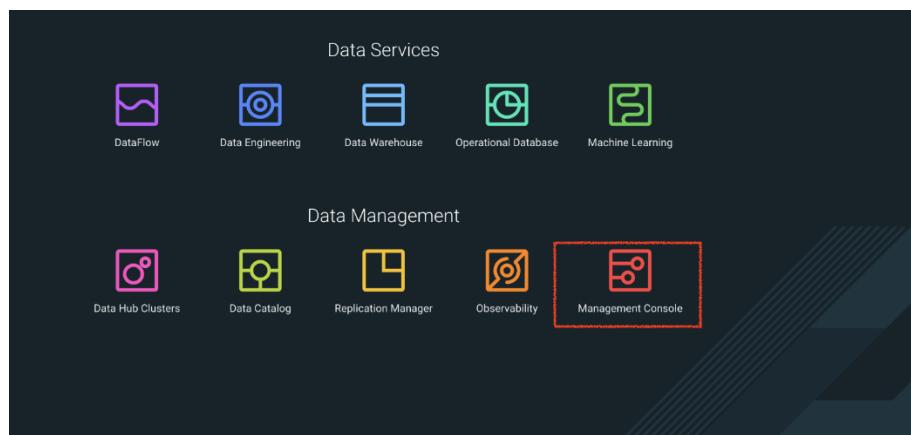


2. Verify permissions in Apache Ranger

NOTE: THESE STEPS HAVE ALREADY BEEN DONE FOR YOU, THIS SECTION WILL WALK YOU THROUGH HOW PERMISSIONS/POLICIES ARE MANAGED IN RANGER.
PLEASE DO NOT EXECUTE THE STEPS IN THIS SECTION OR CHANGE ANYTHING.

2.1 Accessing Apache Ranger

Step 1 : Click on Management Console



Step 2 : Click on Environments on the left tab

The screenshot shows the 'Environments / List' page in the Cloudera Management Console. The left sidebar has a 'Environments' tab selected. The main area displays a table of environments:

Status	Name	Cloud Provider	Region	Data Lake	CDP Runtime Version	Time Created
Available	emeaworkshop-env	aws	Asia Pacific (Mumbai)	Running	7.2.16	4/12/2023, 4:40:07 PM GMT+5:30
Available	dss-workshop-env	aws	US East(N. Virginia)	Running	7.2.16	4/10/2023, 8:37:03 PM GMT+5:30
Environment Stopped	cmi-adb	aws	Asia Pacific (Mumbai)	Stopped	7.2.16	4/4/2023, 5:20:56 PM GMT+5:30
Available	pko-hands-on-workshop-env	aws	Asia Pacific (Mumbai)	Running	7.2.16	3/28/2023, 12:24:09 PM GMT+5:30
Environment Stopped	psse-isv-env	aws	US West (Oregon)	Stopped	7.2.16	3/23/2023, 1:22:31 AM GMT+5:30
Environment Stopped	meta workshop	aws	EU (London)	Stopped	7.2.16	2/24/2023, 10:30:31 PM GMT+5:30
Environment Stopped	vrayker-cdp2	aws	Asia Pacific (Sydney)	Stopped	7.2.15	10/13/2022, 5:13:00 PM GMT+5:30
Environment Stopped	psse-workshop	aws	US East (Ohio)	Stopped	7.2.16	9/16/2022, 12:32:53 AM GMT+5:30

Step 3 : Select the environment that is shared by the instructor and click on the **Ranger** quick link to access the Ranger UI

Data Lake Details

NAME	NODES	SCALE
pko-workshop-dl	2 0 0	Light Duty

STATUS

STATUS	STATUS REASON
Running	Datalake is running

CRN

cm.cdp.datalake.us-west-1:d1a453c-a799-432d-8e54-372cc2ab95f2:datalake:6a9aeed14-c21b-42fe-88c4-e9fe8a51...

QUICK LINKS

- Atlas
- Ranger
- Data Catalog

Data Hubs Data Lake FreelPA Cluster Definitions Summary

Ranger Access Manager Audit Security Zone Settings Last Response Time : 04/20/2023 12:04:09 PM

Service Manager

HDFS	HBASE	HADOOP SQL
cm_hdfs	cm_hbase	Hadoop SQL
YARN	KNOX	SOLR
cm_yarn	cm_knox	cm_solr
flink_wrkshp_cluster_yarn		
ssb_analytics_cluster_yarn		
KAFKA	NIFI	NIFI-REGISTRY
cm_kafka	nifi_flow_mgmt_cluster_nifi_NIFI_BASE	nifi_flow_mgmt_cluster_nifi_registry
flink_wrkshp_cluster.kafka_3306	nifi_wrkshp_cluster_nifi_NIFI_BASE	nifi_wrkshp_cluster_nifiregistry
kafka_smm_cluster.kafka_b3d1		
kafka_wrkshp_cluster.kafka_0919		
ssb_analytics_cluster.kafka_77ef		
ATLAS	ADLS	KUDU
cm_atlas	cm_adls	cm_kudu
OZONE	SCHEMA-REGISTRY	KAFKA-CONNECT
cm_ozone	kafka_smm_cluster_schemaregistry	cm_kafka_connect
	kafka_wrkshp_cluster_schemaregistry	kafka_smm_cluster.kafka_connect

2.2 Kafka Permissions

1. In Ranger, select the Kafka repository that's associated with the stream messaging datahub.

KAFKA

cm_kafka
flink_wrkshp_cluster.kafka_3306
kafka_smm_cluster.kafka_b3d1
ssb_analytics_cluster.kafka_77ef

2. Verify if the user group(**workshop-users**) who will be performing the workshop is present in both **all-consumergroup** and **all-topic**.

Policy ID ▲	Policy Name	Policy Labels	Status	Audit Logging	Roles	Groups	Users	Action
103	all - consumergroup	..	Enabled	Enabled	..	_c_ranger_admins_3e7f87a6	cruisecontrol ssb streamsmsgmgr kafka kafka_mirror_maker streamsrepmgr rangerlookup - Less..	
105	all - topic	..	Enabled	Enabled	..	_c_ranger_admins_3e7f87a6	cruisecontrol ssb streamsmsgmgr kafka kafka_mirror_maker streamsrepmgr rangerlookup - Less..	

- All-consumergroup

Allow Conditions:

Select Role	Select Group	Select User	Policy Conditions	Permissions	Delegate Admin
Select Roles	x _c_ranger_admins_6276838c x workshop-users	x cruisecontrol x ssb x streamsmsgmgr x kafka x kafka_mirror_maker x streamsrepmgr	Add Conditions +	Consume Describe Delete	<input checked="" type="checkbox"/>
Select Roles	Select Groups	x rangerlookup	Add Conditions +	Describe	<input type="checkbox"/>

- all-topic

Policy Details:

Policy Type: Access	Add Validity Period				
Policy ID: 105	Policy Conditions: No Conditions				
Policy Name: all - topic	Enabled: Normal				
Policy Label:					
topic	Included				
Description: Policy for all - topic					
Audit Logging: Yes					
Allow Conditions:					
Select Role	Select Group	Select User	Policy Conditions	Permissions	Delegate Admin
Select Roles	x _c_ranger_admins_6276838c x workshop-users	x cruisecontrol x ssb x streamsmsgmgr x kafka x kafka_mirror_maker	Add Conditions +	PutAll Consume Describe Delete Describe Consume Delete After Consume	<input checked="" type="checkbox"/>

2.3 Schema Registry Permissions

1. In Ranger, select the Schema Registry repository that's associated with the stream messaging datahub.



2. Verify if the user group(**workshop-users**) who will be performing the workshop is present in the Policy : **all - schema-group, schema-metadata, schema-branch, schema-version**.

List of Policies : kafka_smm_cluster_schemaregistry								
Policy ID	Policy Name	Policy Labels	Status	Audit Logging	Roles	Groups	Users	Action
157	all - export-import	--	Enabled	Enabled	--	[c_ranger_admins_6276836c]	[sub streammsgmgr kafka schemaregistry + More...]	[Edit Delete]
160	all - serde	--	Enabled	Enabled	--	[c_ranger_admins_6276836c]	[sub streammsgmgr kafka schemaregistry + More...]	[Edit Delete]
163	all - schema-group, schema-metadata	--	Enabled	Enabled	--	[c_ranger_admins_6276836c]	[sub streammsgmgr kafka schemaregistry + More...]	[Edit Delete]
165	all - schema-group, schema-metadata, sch...	--	Enabled	Enabled	--	[c_ranger_admins_6276836c]	[sub streammsgmgr kafka schemaregistry + More...]	[Edit Delete]
167	all - registry-service	--	Enabled	Enabled	--	[c_ranger_admins_6276836c]	[sub streammsgmgr kafka schemaregistry + More...]	[Edit Delete]
169	all - schema-group, schema-metadata, sch...	--	Enabled	Enabled	--	[c_ranger_admins_6276836c]	[sub streammsgmgr kafka schemaregistry + More...]	[Edit Delete]

Policy Details:

Policy Type	Access		
Policy ID	101		
Policy Name *	all - schema-group, schema-metadata, schema-t	Enabled <input checked="" type="radio"/>	Normal <input type="radio"/>
Policy Label	Policy Label		
schema-grn	<input type="text"/> * <input type="button" value="X"/>	<input type="button" value="Include"/>	
Schema Name	<input type="text"/> * <input type="button" value="X"/>	<input type="button" value="Include"/>	
schema-brn	<input type="text"/> * <input type="button" value="X"/>	<input type="button" value="Include"/>	
schema-ver	<input type="text"/> * <input type="button" value="X"/>	<input type="button" value="Include"/>	
Description	Policy for all - schema-group, schema-metadata, schema-branch, schema-version		
Audit Logging	<input checked="" type="radio"/> Yes		

The screenshot shows the 'Allow Conditions' section of the Ranger Access Manager. It includes fields for 'Select Role', 'Select Group', 'Select User', 'Policy Conditions', 'Permissions', and 'Delegate Admin'. In the 'Select Group' field, the 'workshop-users' group is selected and highlighted with a red box. The 'Permissions' section shows 'Create', 'Read', and 'Update' buttons.

Lastly, add the user group to the Streaming Analytics Data Hub Kafka Cluster Ranger permission as below:

The screenshot shows a list of policies for the 'workshop_asian_stream_analytics_kafka_e2c3' cluster. The table includes columns for Policy ID, Policy Name, Policy Labels, Status, Audit Logging, Roles, Groups, Users, and Action. Policies listed include 'all - consumergroup', 'all - topic', 'all - transactionalid', 'all - cluster', 'all - delegationtoken', and 'connect internal - topic'. The 'Groups' column for policy 118 shows '.c_ranger_admins_6021359e' and 'workshop-asian-group1'.

3. Update workload password

NOTE: THESE STEPS NEED TO BE PERFORMED BEFORE MOVING FORWARD

You will need to define your CDP Workload Password that will be used to access non-SSO interfaces. You may read more about it here. Please keep it with you. If you have forgotten it, you will be able to repeat this process and define another one.

- Click on your user name (Ex: apac00@workshop.com) at the lower left corner.
Click on **Profile**.

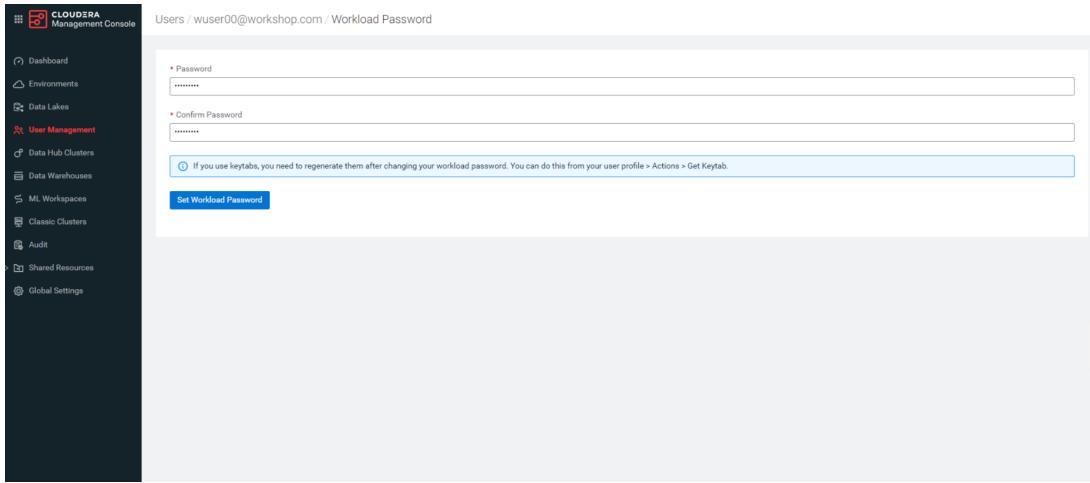
The screenshot shows the Cloudera Data Platform dashboard. At the top, there are icons for Data Services: DataFlow, Data Engineering, Data Warehouse, Operational Database, and Machine Learning. Below that, under Data Management, are icons for Data Hub Clusters, Data Catalog, Replication Manager, Workload Manager, and Management Console. On the left, a sidebar shows a user profile for 'wuser00@workshop.com' with options to 'Profile' and 'Log Out'. The bottom right corner of the dashboard has a 'Powered by Cloudera' watermark.

- Click option **Set Workload Password**.

The screenshot shows the Cloudera Management Console interface. The left sidebar includes sections for Dashboard, Environments, Data Lakes, User Management (which is currently selected), Data Hub Clusters, ML Workspaces, Classic Clusters, Audit, Shared Resources, and Global Settings. The main panel displays user details for 'wuser00@workshop.com', including Name, Email, Workload User Name, CRN, Tenant ID, Identity Provider, Last Interactive Logon, Profile Management, and Workload Password. A red box highlights the 'Workload Password' field, which contains the placeholder 'Workload password is currently set'. Below this, there are tabs for Access Keys, Roles, Resources, Groups, and SSH Keys. The Access Keys tab shows a message: 'No access keys found.' with a 'Generate Access Key' button.

- Enter the shared password.

NOTE: PLEASE ENTER THE SAME PASSWORD THAT WAS SHARED BY THE INSTRUCTOR. FAILING TO DO SO WILL LEAD TO ERRORS IN OUR LAB STEPS LATER ON



- Click the button Set Workload Password.

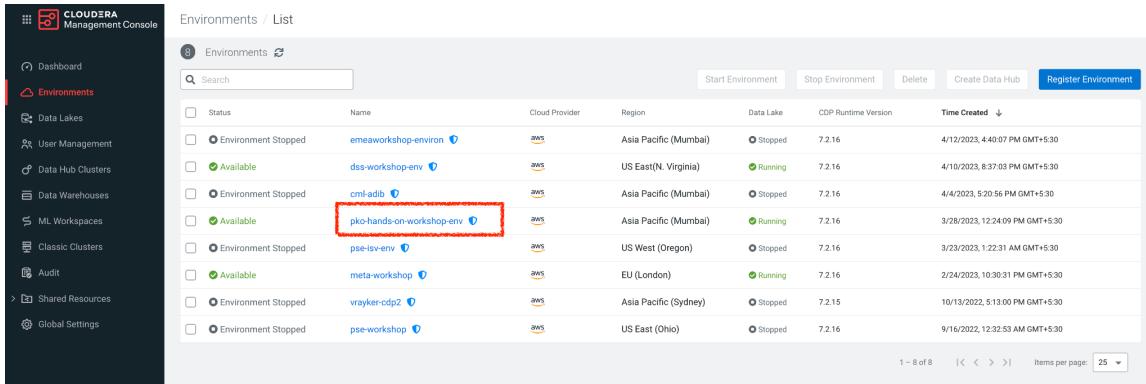
4. Obtain the Kafka Broker List

We will require the broker list to configure our processors to connect to our Kafka brokers which allow consumers to connect and fetch messages by partition, topic or offset.

This information can be found in the Data Hub cluster associated to the Streams Messaging Manager

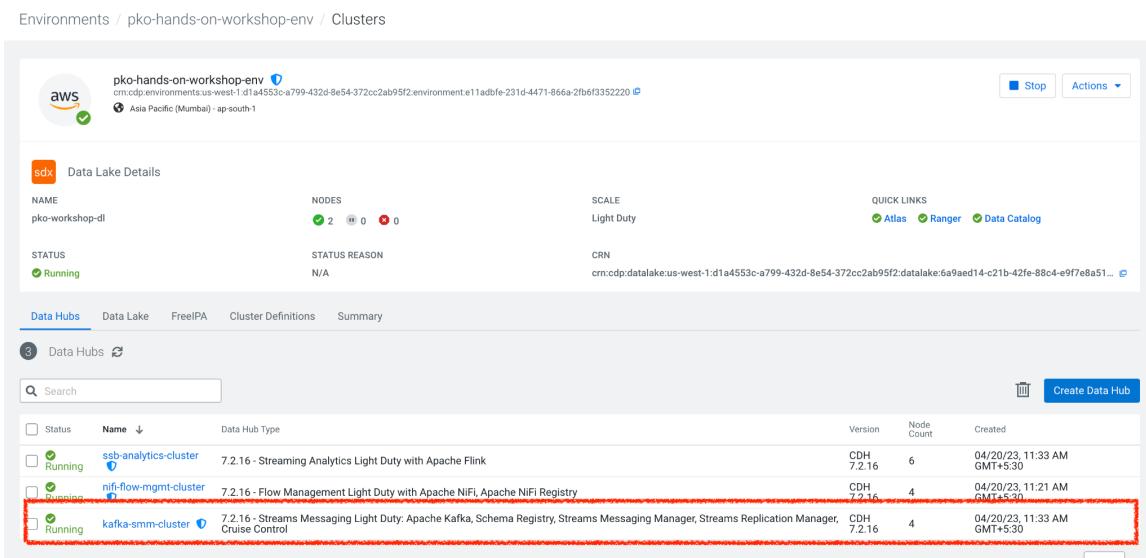
Step 1 : Access the Data Hub

- Go to the environment that is shared by the INSTRUCTOR



The screenshot shows the Cloudera Management Console interface. On the left, there's a sidebar with various navigation options like Dashboard, Environments, Data Lakes, User Management, etc. The main area is titled 'Environments / List'. It displays a table of environments with columns for Status, Name, Cloud Provider, Region, Data Lake, CDP Runtime Version, and Time Created. One row, 'pko-hands-on-workshop-env', is highlighted with a red box. At the bottom right of the table, there are pagination controls (1-8 of 8) and a dropdown for 'Items per page'.

- Click on the Data Hub associated with Streams Messaging Manager (kafka-smm-cluster)



The screenshot shows the 'Data Hub Details' page for the 'pko-hands-on-workshop-env' environment. At the top, it shows the environment name and CRN. Below that, there's a 'Data Lake Details' section with fields for NAME, NODES, SCALE, and QUICK LINKS. Under the 'Data Hubs' tab, there's a table listing three Data Hubs: 'ssb-analytics-cluster', 'nifi-flow-mgmt-cluster', and 'kafka-smm-cluster'. The 'kafka-smm-cluster' row is highlighted with a red box. The table has columns for Status, Name, Data Hub Type, Version, Node Count, and Created.

Step 2 : Go to the Streams Messaging Interface

Data Hubs / kafka-smm-cluster / Event History

The screenshot shows the Kafka Streams Messaging Manager (SMM) interface. At the top, it displays cluster statistics: STATUS (Running), NODES (4 healthy, 0 pending, 0 failed), CREATED AT (04/20/23, 11:33 AM GMT+5:30), and CLUSTER TEMPLATE (7.2.16 - Streams Messaging Light Duty: Apache Kafka, Schema Registry, Streams Messaging Manager, Streams Replication Manager, Cruise Control). Below this, the STATUS REASON indicates "Cluster started". Under Environment Details, it shows NAME (pko-hands-on-workshop-env), DATA LAKE (pko-workshop-dl), CREDENTIAL (pko-hands-on-workshop-cred), REGION (ap-south-1), and AVAILABILITY ZONE (N/A). Services listed include CM UI, Schema Registry, Streams Messaging Manager (highlighted with a red box), Token Integration, and Cloudera Manager Info. The CM URL is https://kafka-smm-cluster-gateway.pko-hand.dp5i-5vkq.cloudera.site/kafka-smm-cluster/cdp-proxy/cm/home/. The Event History tab is selected. At the bottom, there are filters for Events (Show All, Autoscale, Cluster) and a DOWNLOAD button.

Step 3 : Select Brokers from the left tab

The screenshot shows the Kafka Streams Messaging Manager interface with the Brokers tab selected. A red box highlights the "Brokers" section. The main table displays 14 Producers, 3 Brokers, 33 Topics, and 3 Consumer Groups. The Brokers table has 3 entries. The right side shows detailed views for Producers (14) and Consumer Groups (3). The Producers table includes columns: NAME, DATA IN, DATA OUT, MESSAGES IN, CONSUMER GROUPS, and CURRENT LOG SIZE. The Consumer Groups table includes columns: ACTIVE, PASSIVE, ALL, and LAG.

Step 4 : Save the broker list

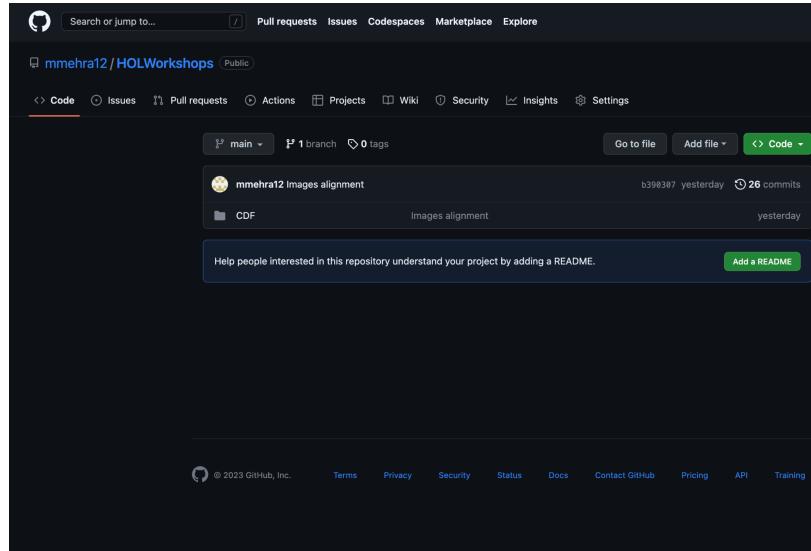
Brokers								Cluster: kafka_b3d1
Total Bytes In	Total Bytes Out	Produced Per Sec	Fetched Per Sec	Active Controllers	Unclean Elections	Request Pool Usage	Remaining Storage	
Brokers (3)								
NAME	THROUGHPUT	MESSAGES IN	PARTITIONS	REPLICAS	LOG SIZE	REMAINING STORAGE		
1546335432 kafka-smn-cluster-corebroker0.kafka-hand-dp5r5kg.cloudera.site:9093	682 MB	2.3m	94	261	2 GB	982 GB		
1546335453 kafka-smn-cluster-corebroker1.kafka-hand-dp5r5kg.cloudera.site:9093	238 KB	3.4k	100	270	6 GB	978 GB		
1546335411 kafka-smn-cluster-corebroker2.kafka-hand-dp5r5kg.cloudera.site:9093	500 KB	6.5k	98	263	4 GB	980 GB		

Example :

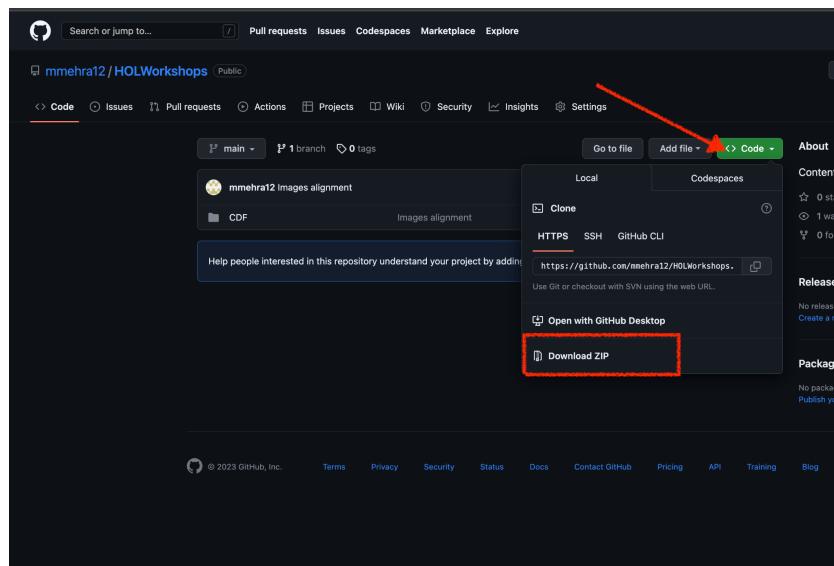
aws-workshop-kl-streams-mess-corebroker2.aws-work.oldk-i9ly.a4.cloudera.site:9093
aws-workshop-kl-streams-mess-corebroker1.aws-work.oldk-i9ly.a4.cloudera.site:9093
aws-workshop-kl-streams-mess-corebroker0.aws-work.oldk-i9ly.a4.cloudera.site:9093

5. Download Resources from GitHub

Step 1 : Access the URL shared by the instructor for GitHub

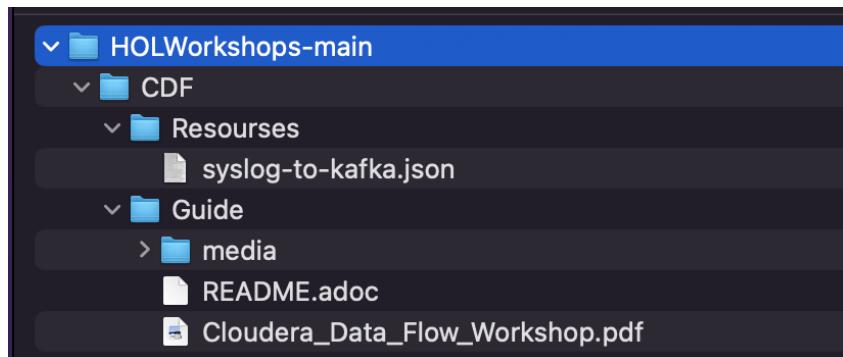


Step 2 : Download the repo as a zip file



Step 3 : Uncompress the Files

Uncompress the Files and you should have the following files and folders within it



We will use this at a later point in our Labs

6. Unlock your KeyTab

To run queries on the SQL Stream Builder you need to have your KeyTab unlocked. This is mainly for authentication purposes. As the credential you are using is sometimes reused as part of other people doing the same lab it is possible that your Keytab is already unlocked. We have shared the steps for both the scenarios:

1. Unlock your Keytab if it is not unlocked already

Step 1 : Go to the SSB Data Hub

Click on Environments on the left tab and select the environment that is shared by the INSTRUCTOR

Status	Name	Cloud Provider	Region	Data Lake	CDP Runtime Version	Time Created
Available	emaworkshop-environ	aws	Asia Pacific (Mumbai)	Running	7.2.16	4/12/2023, 4:00:07 PM GMT+5:30
Available	dss-workshop-env	aws	US East(N. Virginia)	Running	7.2.16	4/10/2023, 8:37:03 PM GMT+5:30
Environment Stopped	cml-adib	aws	Asia Pacific (Mumbai)	Stopped	7.2.16	4/4/2023, 5:20:56 PM GMT+5:30
Available	pko-hands-on-workshop-env	aws	Asia Pacific (Mumbai)	Running	7.2.16	3/28/2023, 12:40:09 PM GMT+5:30
Environment Stopped	pse-isv-env	aws	US West (Oregon)	Stopped	7.2.16	3/23/2023, 1:22:31 AM GMT+5:30
Environment Stopped	meta-workshop	aws	EU (London)	Stopped	7.2.16	2/24/2023, 10:30:31 PM GMT+5:30
Environment Stopped	vrayker-cdp2	aws	Asia Pacific (Sydney)	Stopped	7.2.15	10/13/2022, 5:13:00 PM GMT+5:30
Environment Stopped	pse-workshop	aws	US East (Ohio)	Stopped	7.2.16	9/16/2022, 12:32:53 AM GMT+5:30

Click on the DataHub associated with SQL Stream Builder (ssb-analytics-cluster)

Data Lake Details

NAME: pko-workshop-dl **NODES**: 2 (0 green, 0 yellow, 0 red) **SCALE**: Light Duty

STATUS: Running **STATUS REASON**: N/A **CRN**: crn:cdp:datalake:us-west-1:d1a4553c-a799-432d-8e54-372cc2ab95f2:datalake:6a9aed14-c21b-42fe-88c4-e9f7e8a51...

QUICK LINKS: [Atlas](#) [Ranger](#) [Data Catalog](#)

Data Hubs [Data Lake](#) [FreeIPA](#) [Cluster Definitions](#) [Summary](#)

Data Hubs [Create Data Hub](#)

Status	Name	Data Hub Type	Version	Node Count	Created
Running	ssb-analytics-cluster	7.2.16 - Streaming Analytics Light Duty with Apache Flink	CDH 7.2.16	6	04/20/23, 11:33 AM GMT+5:30
Running	nifi-flow-mgmt-cluster	7.2.16 - Flow Management Light Duty with Apache NiFi, Apache NiFi Registry	CDH 7.2.16	4	04/20/23, 11:21 AM GMT+5:30
Running	kafka-smm-cluster	7.2.16 - Streams Messaging Light Duty: Apache Kafka, Schema Registry, Streams Messaging Manager, Streams Replication Manager, Cruise Control	CDH 7.2.16	4	04/20/23, 11:33 AM GMT+5:30

1 ~ 3 of 3 | < > | Items per page: 25

Step 2 : Open the SSB UI by clicking on **Streaming SQL Console**

ssb-analytics-cluster [Actions](#)

crn:cdp:datahub:us-west-1:d1a4553c-a799-432d-8e54-372cc2ab95f2:cluster:ca4445db-316f-4735-96cc-4eb0ddc5750

STATUS	NODES	CREATED AT	CLUSTER TEMPLATE	STATUS REASON
Running	6 (0 green, 0 yellow, 0 red)	04/20/23, 11:33 AM GMT+5:30	7.2.16 - Streaming Analytics Light Duty with Apache Flink	Cluster started.

aws Environment Details

NAME	DATA LAKE	CREDENTIAL	REGION	AVAILABILITY ZONE
pko-hands-on-workshop-env	pko-workshop-dl	pko-hands-on-workshop-cred	ap-south-1	N/A

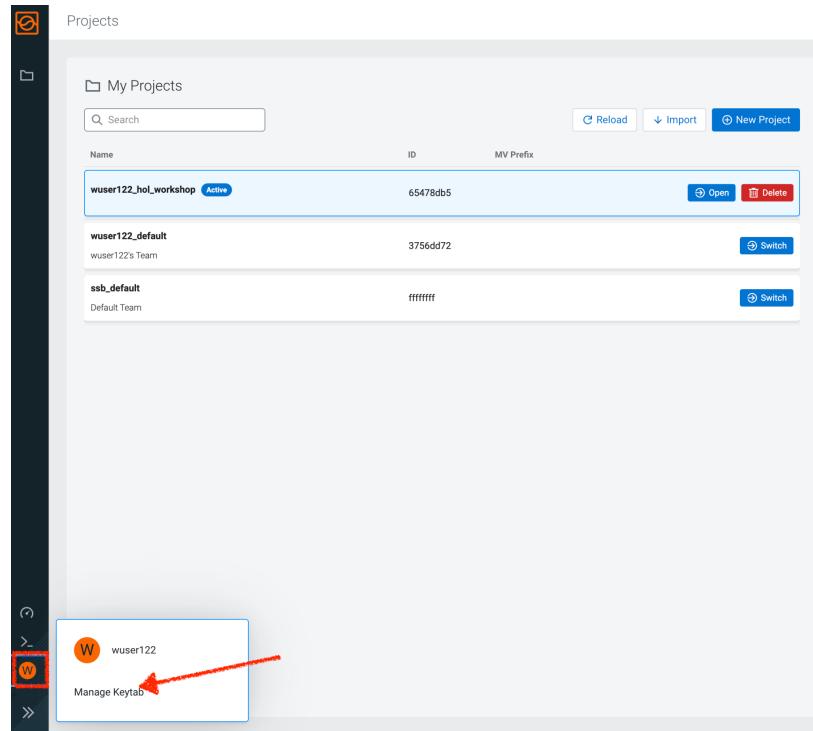
Services

CM-UI	Flink Dashboard	Job History Server	Name Node	Name Node
Queue Manager	Resource Manager	Streaming SQL Console	Token Integration	

Cloudera Manager Info

CM URL	CM VERSION	RUNTIME VERSION	LOGS
https://ssb-analytics-cluster-gateway.pko-hand.dp5i-5vkq.cloudera.site/ssb-analytics-cluster/cdp-proxy/cm/home/	7.9.0	7.2.16-1.cdh7.2.16.p2.38683602	Command logs , Service logs

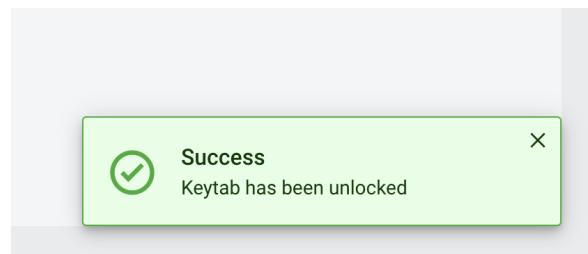
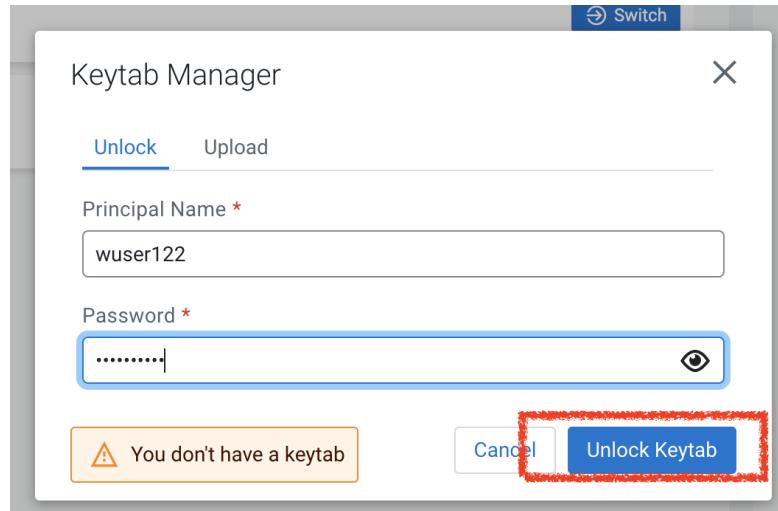
Step 3 : Click on the User name at the bottom left of the screen and select Manage Keytab



Step 4 : Enter your Workload Username (apacXY) and Password.

A screenshot of a 'Keytab Manager' dialog box. At the top, there are tabs for 'Unlock' (which is selected) and 'Upload'. Below these are fields for 'Principal Name *' and 'Password *'. A message box in the center says '⚠ You don't have a keytab'. At the bottom right are 'Cancel' and 'Unlock Keytab' buttons.

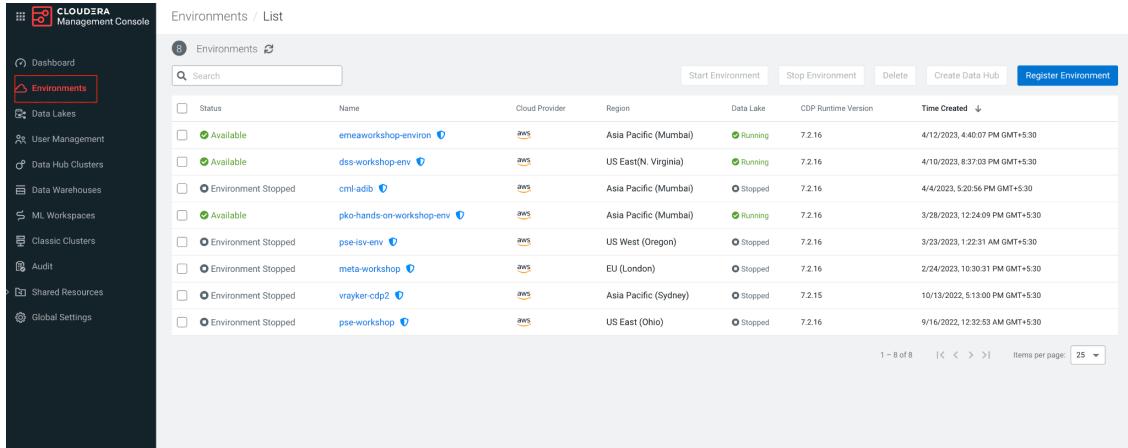
Step 5 : Click on unlock KeyTab



2. Reset your KeyTab if it is already unlocked

Step 1 : Go to the SSB Data Hub

Click on Environments on the left tab and select the environment that is shared by the INSTRUCTOR

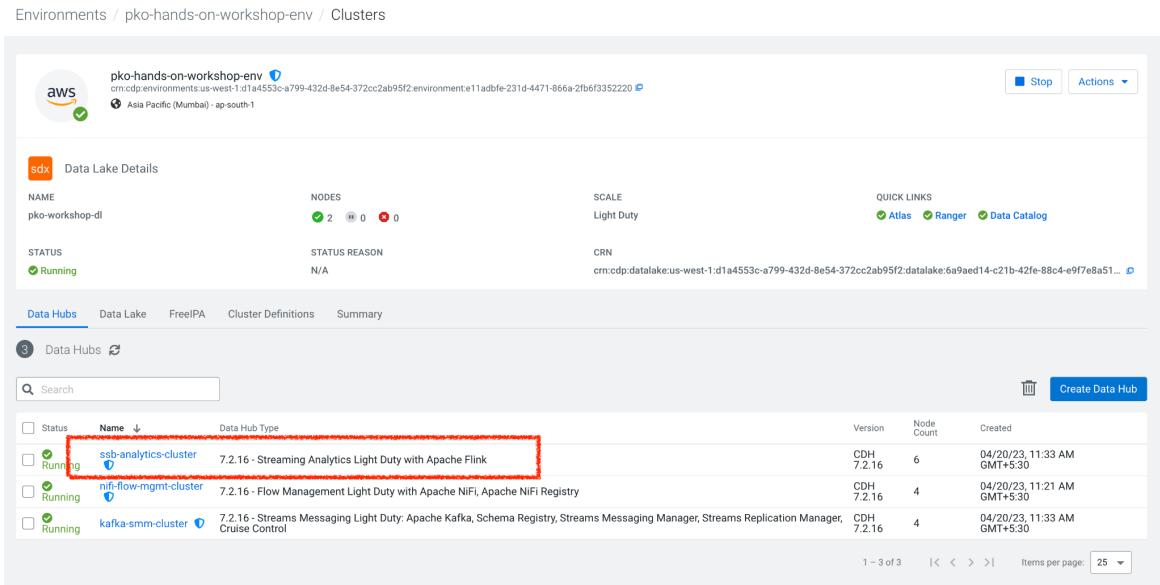


The screenshot shows the CloudERA Management Console interface. On the left, there's a sidebar with various navigation options like Dashboard, Environments (which is selected and highlighted in red), Data Lakes, User Management, Data Hub Clusters, ML Workspaces, Classic Clusters, Audit, Shared Resources, and Global Settings. The main area is titled 'Environments / List' and contains a table with the following data:

Status	Name	Cloud Provider	Region	Data Lake	CDP Runtime Version	Time Created
Available	emeaworkshop-env	aws	Asia Pacific (Mumbai)	Running	7.2.16	4/12/2023, 4:40:07 PM GMT+5:30
Available	dss-workshop-env	aws	US East(N. Virginia)	Running	7.2.16	4/10/2023, 8:37:03 PM GMT+5:30
Environment Stopped	cml-adib	aws	Asia Pacific (Mumbai)	Stopped	7.2.16	4/4/2023, 5:20:56 PM GMT+5:30
Available	pko-hands-on-workshop-env	aws	Asia Pacific (Mumbai)	Running	7.2.16	3/28/2023, 12:24:09 PM GMT+5:30
Environment Stopped	pse-isv-env	aws	US West (Oregon)	Stopped	7.2.16	3/23/2023, 1:22:31 AM GMT+5:30
Environment Stopped	meta-workshop	aws	EU (London)	Stopped	7.2.16	2/24/2023, 10:30:31 PM GMT+5:30
Environment Stopped	vrayker-cdp2	aws	Asia Pacific (Sydney)	Stopped	7.2.15	10/13/2022, 5:13:00 PM GMT+5:30
Environment Stopped	pse-workshop	aws	US East (Ohio)	Stopped	7.2.16	9/16/2022, 12:32:53 AM GMT+5:30

At the bottom right of the table, there are pagination controls (1 - 8 of 8) and a dropdown for 'Items per page' set to 25.

Click on the DataHub associated with SQL Stream Builder (ssb-analytics-cluster)



The screenshot shows the 'Data Hub Details' page for the environment 'pko-hands-on-workshop-env'. At the top, there's a summary card for the environment, followed by tabs for Data Hubs, Data Lake, FreelPA, Cluster Definitions, and Summary. The 'Data Hubs' tab is currently selected. Below the tabs, there's a search bar and a table listing running Data Hubs:

Status	Name	Data Hub Type	Version	Node Count	Created
Running	ssb-analytics-cluster	7.2.16 - Streaming Analytics Light Duty with Apache Flink	CDH 7.2.16	6	04/20/23, 11:33 AM GMT+5:30
Running	nifi-flow-mgmt-cluster	7.2.16 - Flow Management Light Duty with Apache NIFI, Apache NIFI Registry	CDH 7.2.16	4	04/20/23, 11:21 AM GMT+5:30
Running	kafka-smm-cluster	7.2.16 - Streams Messaging Light Duty: Apache Kafka, Schema Registry, Streams Messaging Manager, Streams Replication Manager, Cruise Control	CDH 7.2.16	4	04/20/23, 11:33 AM GMT+5:30

At the bottom right of the table, there are pagination controls (1 - 3 of 3) and a dropdown for 'Items per page' set to 25.

Step 2 : Open the SSB UI by clicking on Streaming SQL Console

Data Hubs / ssb-analytics-cluster / Event History

ssb-analytics-cluster

Actions

STATUS	NODES	CREATED AT	CLUSTER TEMPLATE	STATUS REASON
Running	6 0 0	04/20/23, 11:33 AM GMT+5:30	7.2.16 - Streaming Analytics Light Duty with Apache Flink	Cluster started.

aws Environment Details

NAME pko-hands-on-workshop-env	DATA LAKE pko-workshop-dl	CREDENTIAL pko-hands-on-workshop-cred	REGION ap-south-1	AVAILABILITY ZONE N/A
-----------------------------------	------------------------------	--	----------------------	--------------------------

Services

CM UI	Flink Dashboard	Job History Server	Name Node	Name Node
Queue Manager	Resource Manager	Streaming SQL Console	Token Integration	

Cloudera Manager Info

CM URL https://ssb-analytics-cluster-gateway.pko-hand.dpSi-5vkq.cloudera.site/ssb-analytics-cluster/cdp/proxy/cm/home/	CM VERSION 7.9.0	RUNTIME VERSION 7.2.16-1.cdf7.2.16.p2.38683602	LOGS Command logs , Service logs
---	---------------------	---	---

Step 3 : Click on the User name at the bottom left of the screen and select Manage Keytab

Projects

My Projects

Name	ID	MV Prefix	Actions
wuser122_hol_workshop	65478db5		
wuser122_default	3756d572		
ssb_default	!!!!!!!		

Keytab Manager

Lock Upload

Principal Name *

You have a keytab

Lock Keytab

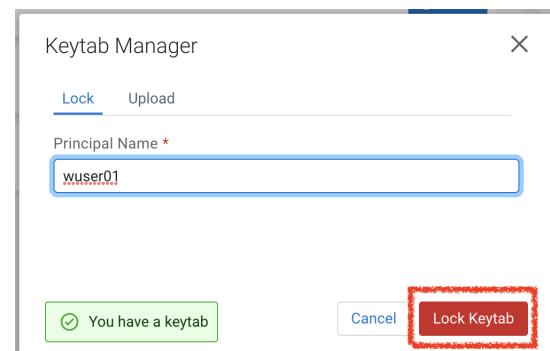
If you get the following dialog box it means that your Keytab is already unlocked. **But it would be necessary to reset here by locking it and unlocking it again using your newly set workload password**

Step 3 : Enter your Principal Name which is the same as your workload username

Example : user0xx

Click on Lock KeyTab

You can now continue from the STEP 3 in
the "[Unlock your KeyTab if not unlocked already](#)"
section above



Lab 1 : Create a Flow using the Flow Designer

1. Overview

Creating a data flow for CDF-PC is the same process as creating any data flow within Nifi with 3 very important steps:

- The data flow that would be used for CDF-PC must be self contained within a process group
- Data flows for CDF-PC must use parameters for any property on a processor that is modifiable, e.g. user names, Kafka topics, etc.
- All queues need to have meaningful names (instead of Success, Fail, and Retry).

These names will be used to define Key Performance Indicators in CDF-PC.

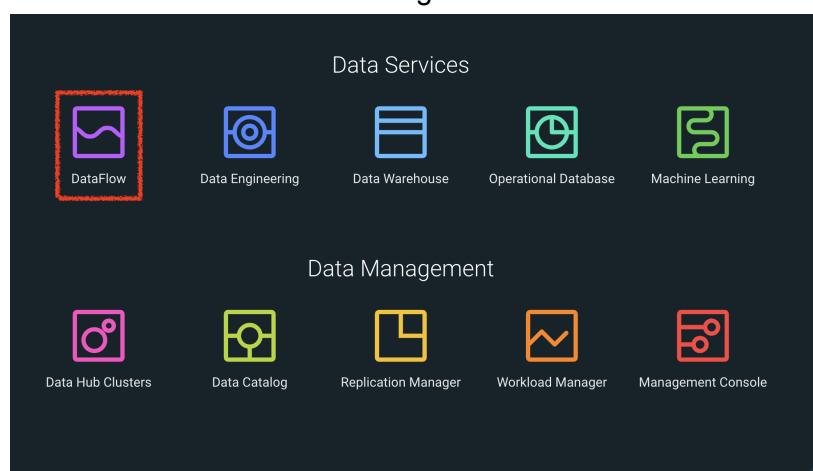
The following is a step by step guide in building a data flow for use within CDF-PC.

2. Building the Data Flow

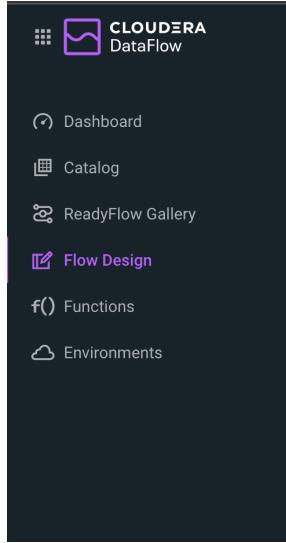
2.1. Create the canvas to design your flow

Step 1: Access the DataFlow Data Service

Access the DataFlow dataservice from the Management Console



Step 2: Go to the Flow Design



Step 3: Create a new Draft

(This will be the main process group of your flow)

Flow Design

All Drafts

Search for a draft by name

Create Draft

REFRESHED: 7 seconds ago

Step 4: Select the appropriate environment

Select the appropriate environment as part of the workspace and give your flow a name and click on CREATE

Workspace Name : **The name of the environment will be shared by the INSTRUCTOR**

Draft Name : {user_id}_datadump_flow

Example : userxxx

Create New Draft X

Select the target workspace

Workspace [?](#)

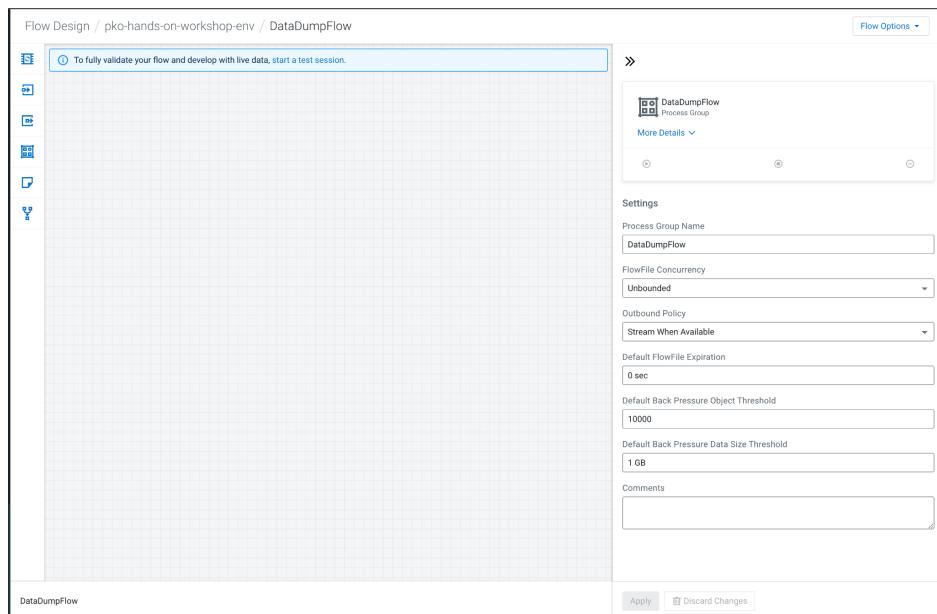
aws aws-workshop-kl 15% (3 of 20)

Draft Name

Draft name is valid

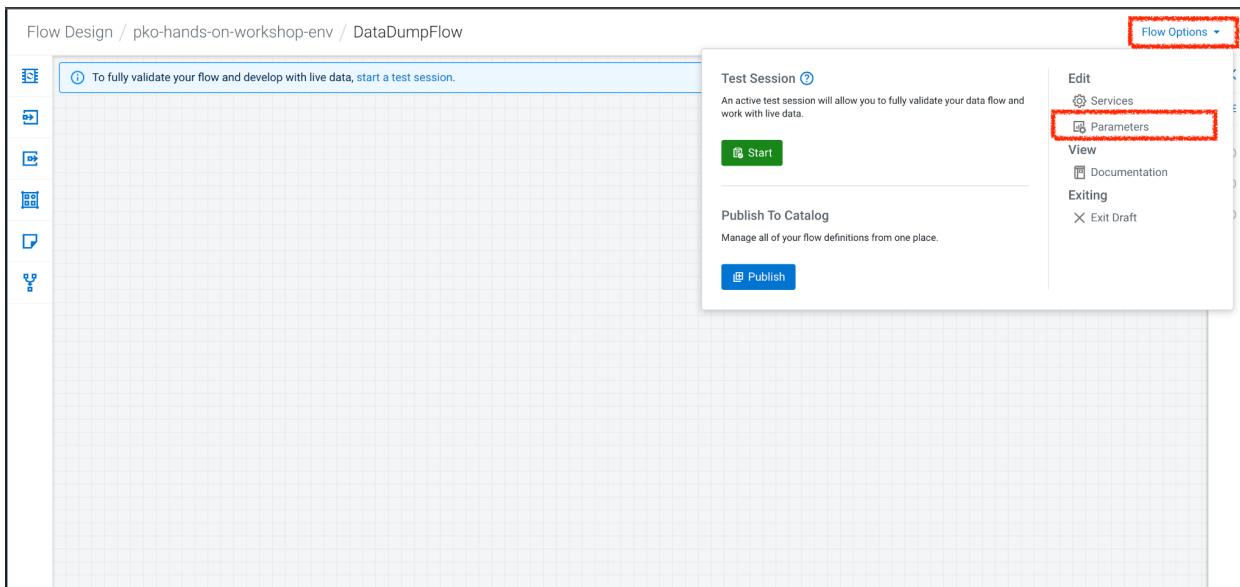
Create Cancel

On successful creation of the Draft, you should now be redirected to the canvas on which you can design your flow



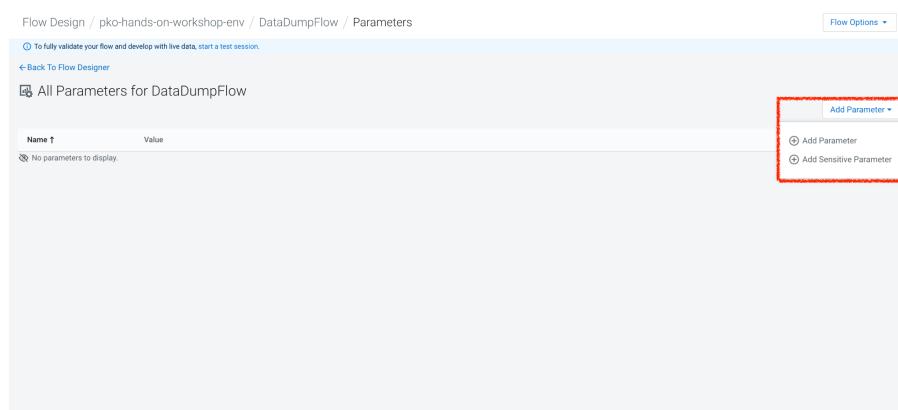
2.2. Adding new parameters

Step 1: Click on the **FLOW OPTIONS** on the top right corner of your canvas and then select **PARAMETERS**



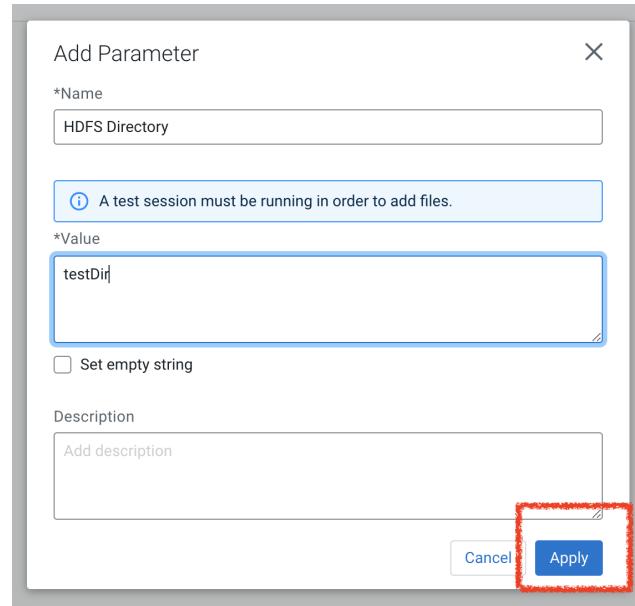
Step 2: Configure Parameters

The next step is to configure what is called a parameter. These parameters are reused within the flow multiple times and will also be configurable at the time of deployment. Click on **ADD PARAMETER** to add non sensitive values, for any sensitive parameter please select **ADD SENSITIVE PARAMETER**.

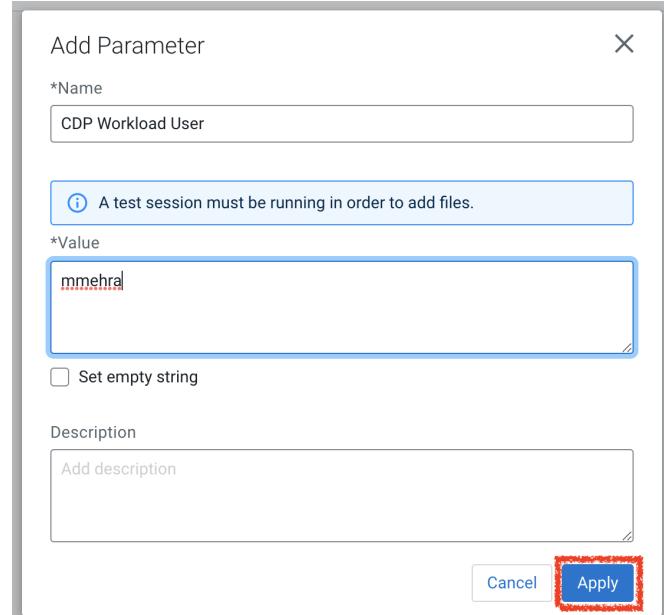


We need to add the following parameters.

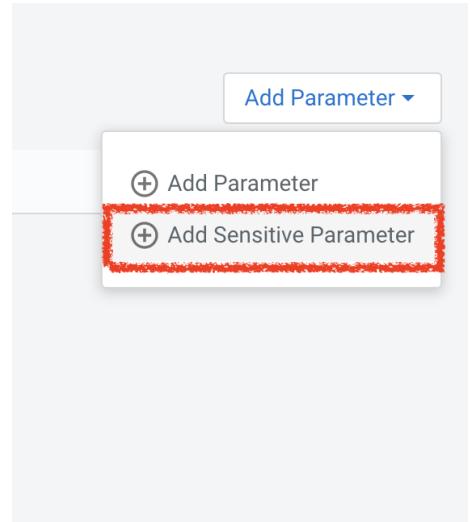
- S3 Directory
 - Selection under Add Parameter : **Add Parameter**
 - Name : S3 Directory
 - Value : LabData or TestDir or **lab1**



- CDP Workload User
 - Selection under Add Parameter : **Add Parameter**
 - Name : CDP Workload User
 - Value : <The username assigned to you>
 - EXAMPLE : user021
 - **IMPORTANT:** do not add the domain '@workload.com'



- CDP Workload User Password - [Sensitive Field]
 - Selection under Add Parameter : **Add Sensitive Parameter**
 - Name : CDP Workload User Password
 - Value : <Workload Password set by yourself in Lab 0>
- EXAMPLE : Cloudera@2023



Add Sensitive Parameter

*Name
CDP Workload User Password

(i) A test session must be running in order to add files.

*Value
.....
 Set empty string

Description
Add description

Cancel Apply

← Back To Flow Designer

All Parameters for hostmm_datadump_flow

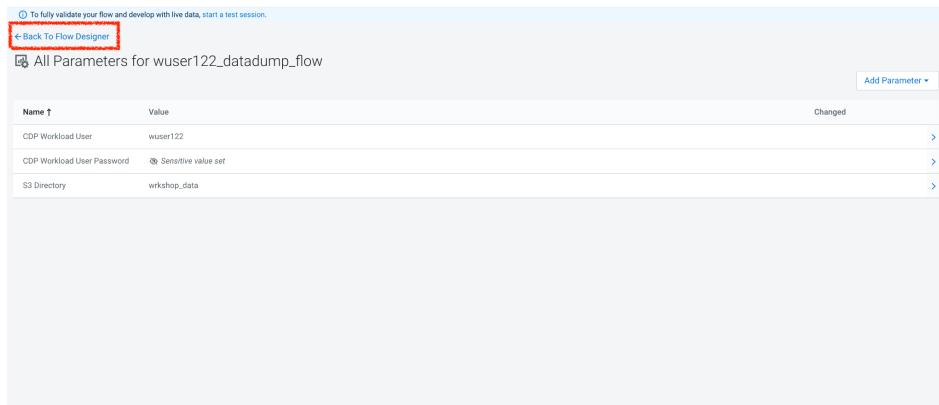
Add Parameter ▾

Name ↑	Value	Changed
CDP Workload User	wuser00	(i) Modified >
CDP Workload User Password	(i) Sensitive value set	>
S3 Directory	LabData	(i) Modified >

Apply Changes Discard Changes

Click **APPLY CHANGES**

Now go back to the Flow Designer. Click ‘Back to Flow Designer’



To fully validate your flow and develop with live data, start a test session.

Back To Flow Designer

All Parameters for wuser122_datadump_flow

Name	Value	Changed
CDP Workload User	wuser122	>
CDP Workload User Password	Sensitive value set	>
S3 Directory	wrkshop_data	>

Add Parameter ▾

Now that we have created these parameters, we can easily search and reuse them within our dataflow. This is especially useful for **CDP Workload User** and **CDP Workload User Password**.

NOTE ONLY:

To search for existing parameters:

1. Open a processor's configuration and proceed to the properties tab.
2. Enter: #{{
3. Hit ‘control+spacebar’

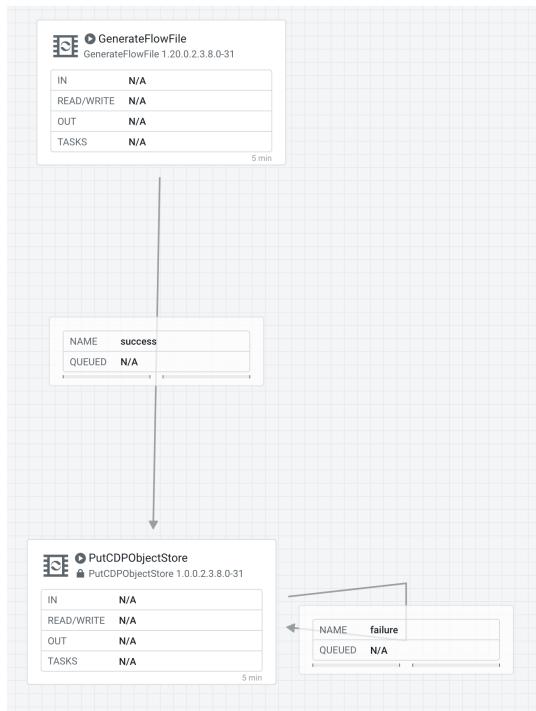
This will bring up a list of existing parameters that are not tagged as sensitive.

2.3. Create the Flow

Let’s go back to the canvas to start designing our flow. This flow will contain 2 Processors:

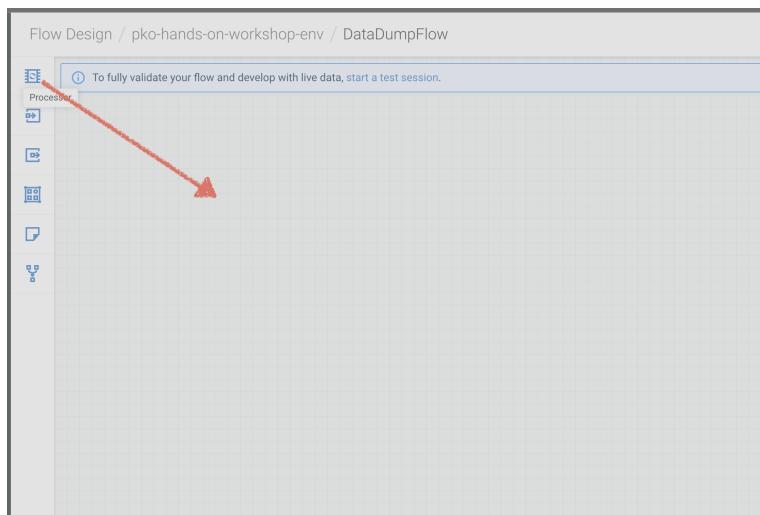
- **GenerateFlowFile** - Generates random data
- **PutCDPObjectStore** - Loads data into HDFS(S3)

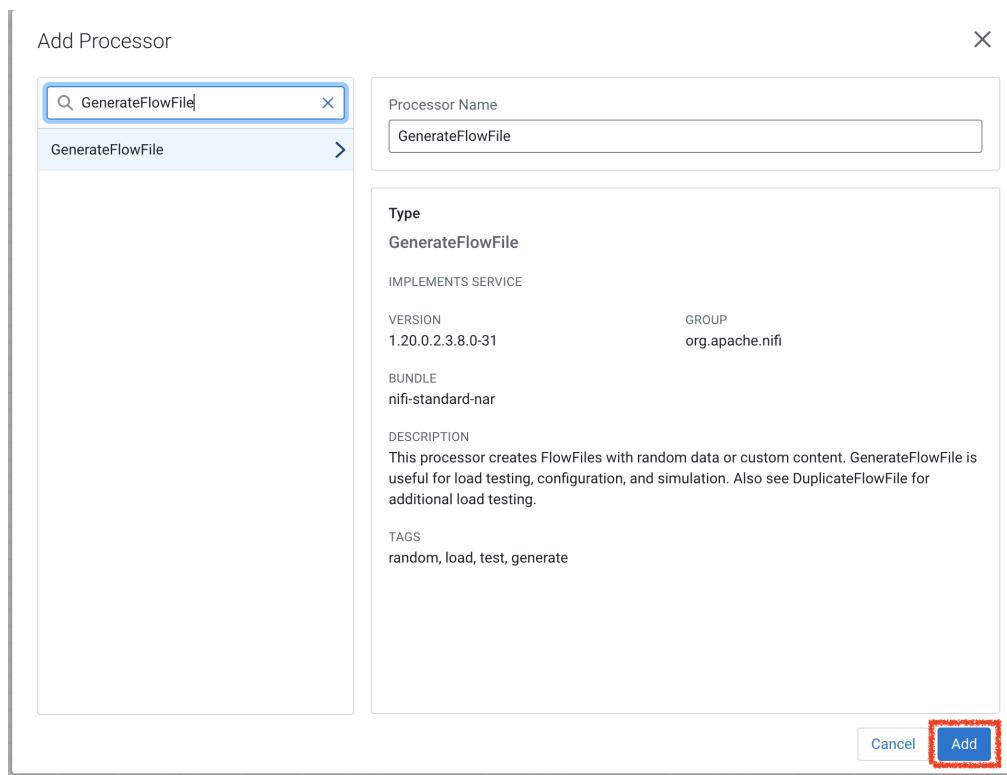
Our final flow will look like this:



Step 1: Add **GenerateFlowFile** processor

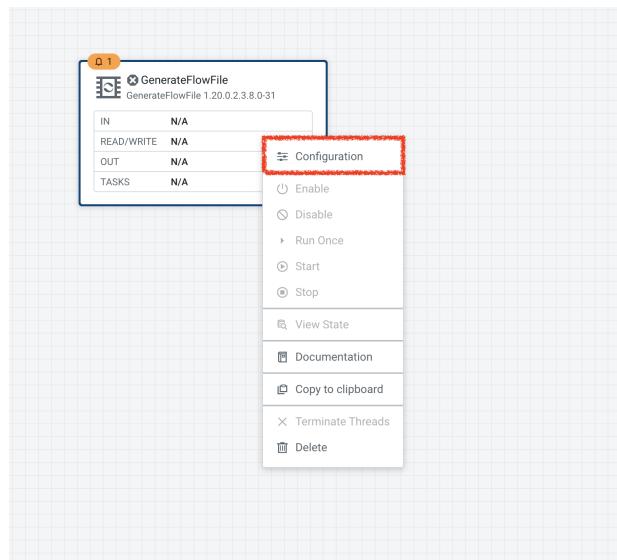
Pull the Processor onto the canvas and select **GenerateFlowFile Processor** and click on **ADD**.





Step 2: Configure GenerateFlowFile processor

The GenerateFlowFile Processor will now be on your canvas and you can configure it in the following way by right clicking and selecting **Configuration**.



Configure the processor in the following way

Property	Value
Processor Name	DataGenerator
Scheduling Strategy(default)	Timer Driven
Run Duration(default)	0 ms
Run Schedule	30 sec
Execution(default)	All Nodes
Custom Text	<26>1 2021-09-21T21:32:43.967Z host1.example.com application4 3064 ID42 [exampleSDID@873 iut="4" eventSource="application" eventId="58"] application4 has stopped unexpectedly

This represents a syslog out in RFC5424 format. Subsequent portions of this workshop will leverage this same syslog format.

»

 **GenerateFlowFile**
GenerateFlowFile 1.20.0.2.3.8.0-31

[More Details ▾](#)

↶ ↷ ⟳ ⟲ ⟳ ⟲ ⋮

Settings

*Processor Name:

*Penalty Duration ?:

*Yield Duration ?:

*Bulletin Level ?:

Comments:

Scheduling

*Scheduling Strategy ?:

*Concurrent Tasks ?:

*Run Duration ?:

*Run Schedule ?:

*Execution ?:

⊕ ⊖ ✖ ✖ ✖ ✖ ⋮

Properties

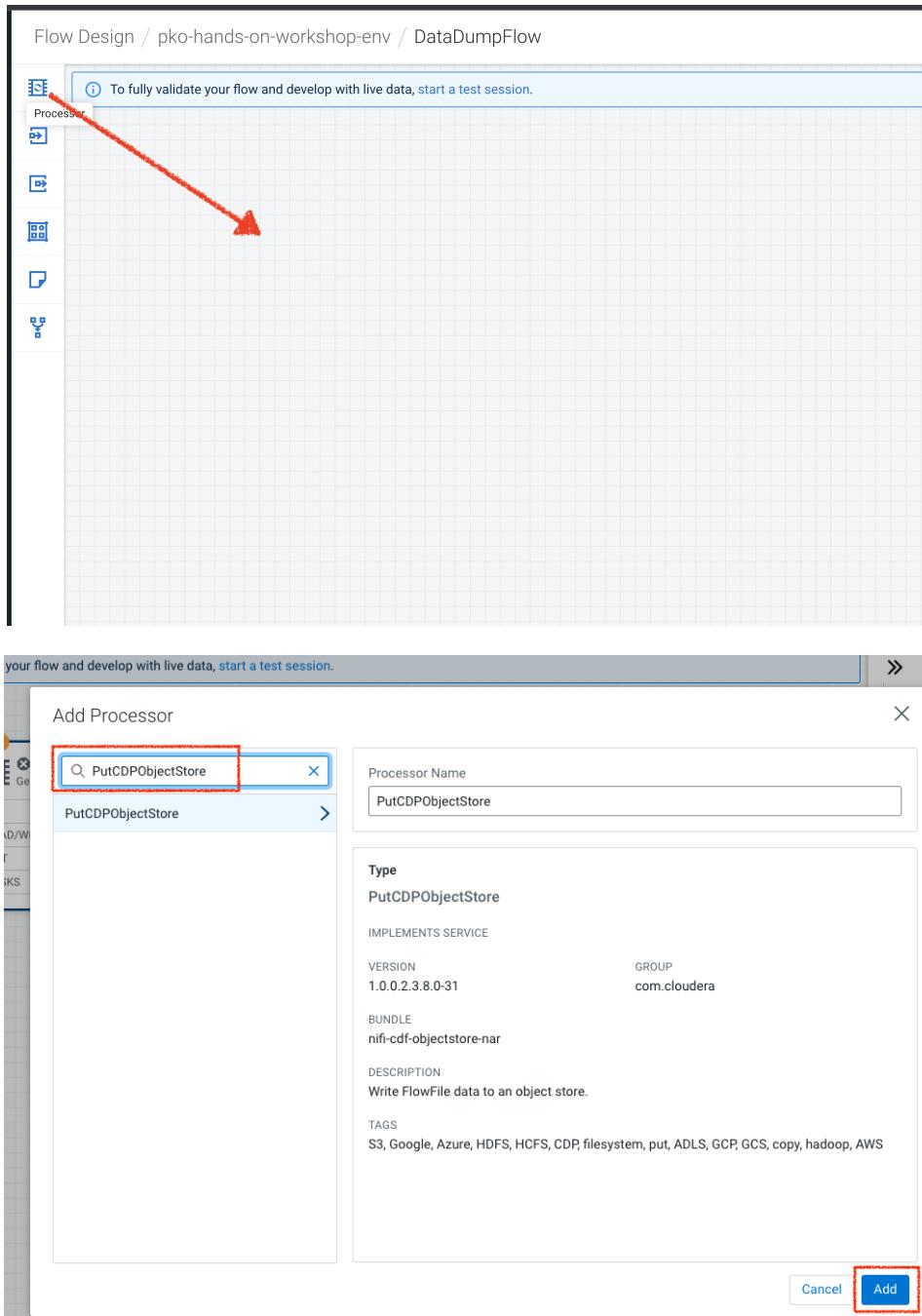
⊕ Add Property

Property	Value	⋮
File Size ?	0B	⋮
Batch Size ?	1	⋮
Data Format ?	Text	⋮
Unique FlowFiles ?	false	⋮
Custom Text ?	<26>1 2021-09-21T21:32:43.967Z ...	⋮
Character Set ?	UTF-8	⋮
Mime Type ?	No value set	⋮

Click on **APPLY**.

Step 3: Add PutCDPObjectStore processor

Pull a new Processor onto the canvas and select **PutCDPObjectStore** Processor and click on **ADD**.



Step 4: Configure PutCDPObjectStore processor

The PutCDPObjectStore Processor needs to be configured as follows:

Property	Value
Processor Name	Move2S3
Scheduling Strategy(default)	Timer Driven
Run Duration(default)	0 ms
Run Schedule(default)	0 sec
Execution(default)	All Nodes
Directory	#{{S3 Directory}}
CDP Username	#{{CDP Workload User}}
CDP Password	#{{CDP Workload User Password}}
Auto Terminate Relationships:	Check the “Terminate” box under “success”

More Details ▾



Settings

*Processor Name

Move2S3

*Penalty Duration ②

30 sec

*Yield Duration ②

1 sec

*Bulletin Level ②

WARN

Comments

Scheduling

*Scheduling Strategy ②

Timer Driven

*Concurrent Tasks ②

1

success ②

Terminate

Retry

*Run Duration ②

0ms

*Run Schedule ②

0 sec

failure ②

Terminate

Retry

*Execution ②

All Nodes

Retry logic specified below will apply to all relationships for this processor that are set to retry.

*Number of Retry Attempts ②

10

You can choose to automatically terminate and/or retry FlowFiles sent to a given relationship if it is not defined elsewhere. If both terminate and retry are selected, retry logic will occur first, followed by termination.

success ②

Terminate Retry

failure ②

Terminate Retry

Retry logic specified below will apply to all relationships for this processor that are set to retry.

*Number of Retry Attempts ②

10

*Retry Back Off Policy ②

Penalize Yield

*Retry Maximum Back Off Period ②

10 mins

Apply

 Discard Changes

Click APPLY

Properties

 Add Property

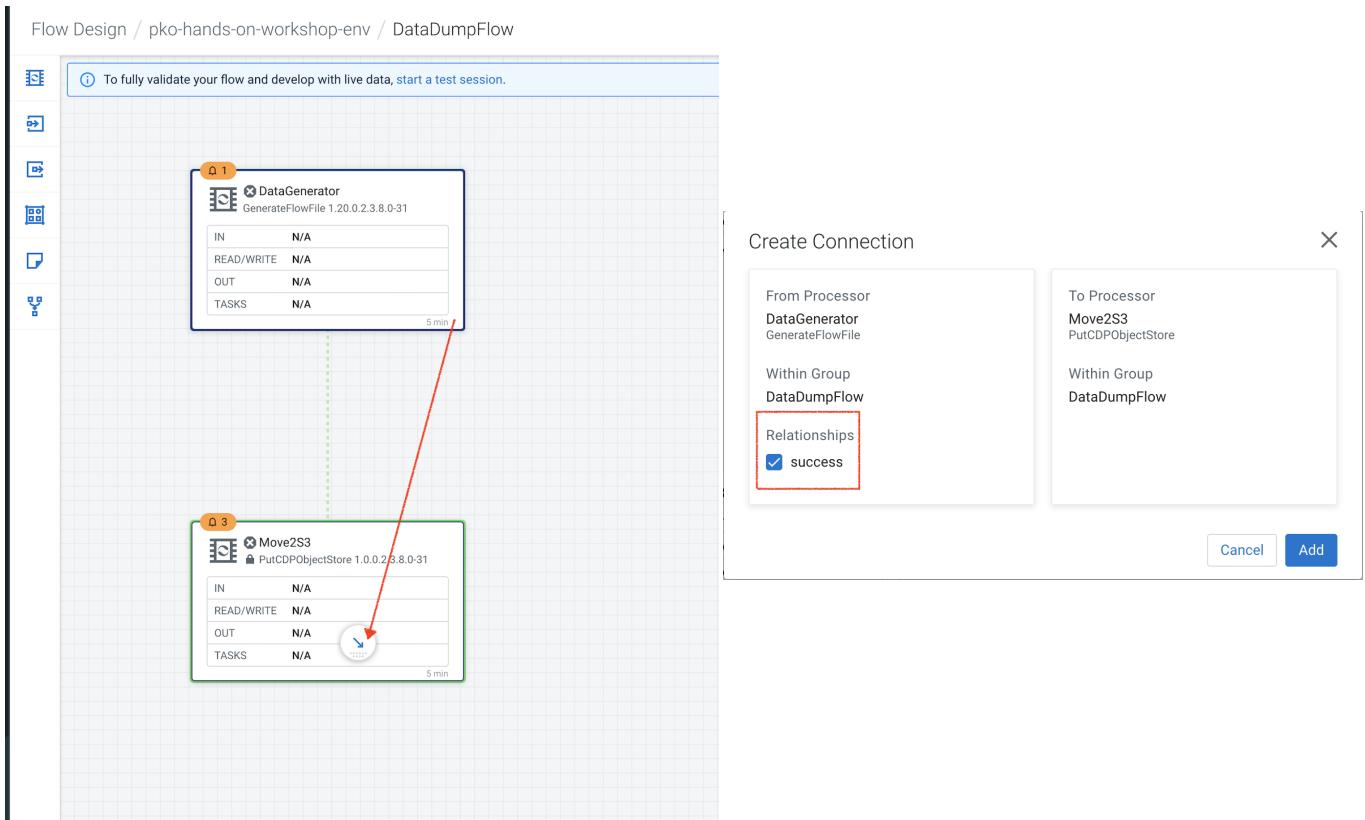
Property	Value	⋮
Storage Location ②	No value set	⋮
Directory ②	#{HDFS Directory}	⋮
Conflict Resolution Strategy ②	fail	⋮
Kerberos Credentials Service ②	No value set	⋮
CDP Username ②	#{CDP Workload User}	⋮
CDP Password ②	#{CDP Workload User Password}	⋮
Writing Strategy ②	Simple write	⋮
cdp.configuration.resources ②	#{CDPEnvironment}	⋮

Relationships

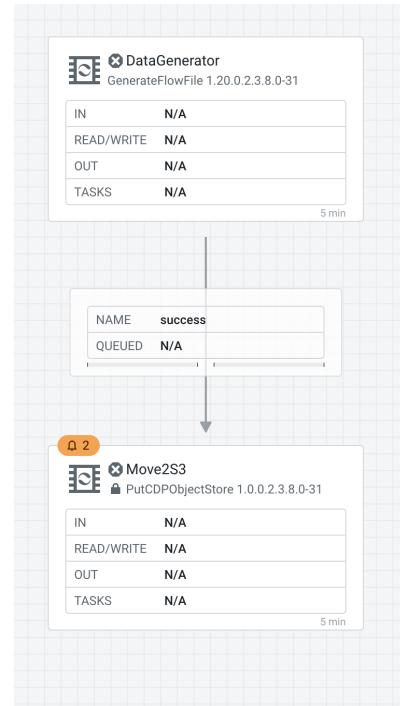
You can choose to automatically terminate and/or retry FlowFiles sent to a given relationship if it is not defined elsewhere. If both terminate and retry are selected, retry logic will occur first, followed by termination.

Step 5: Create connection between processors

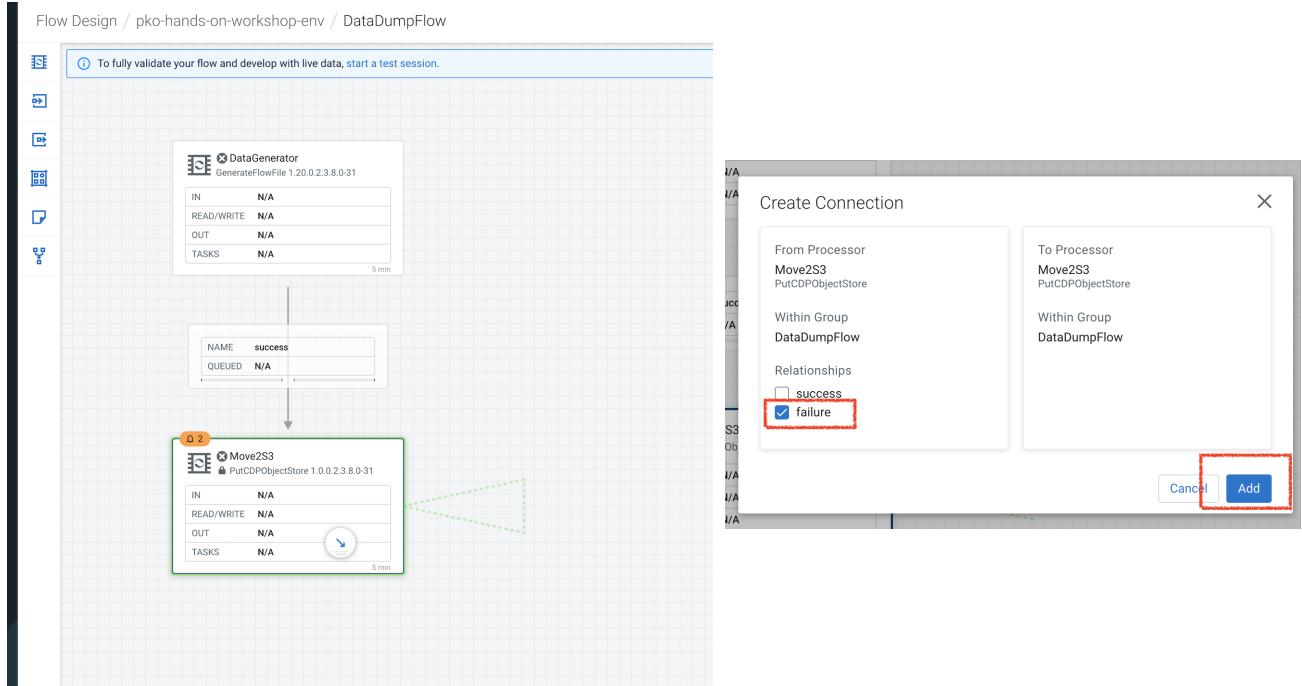
Connect the two processors by dragging the arrow from **DataGenerator** processor to the **Move2S3** processor and select on **SUCCESS** relation and click **ADD**



Your flow will now look something like this:



The Move2S3 processor does not know what to do in case of a failure, let's add a retry queue to it. This can be done by dragging the arrow on the processor outwards then back to itself, as below:

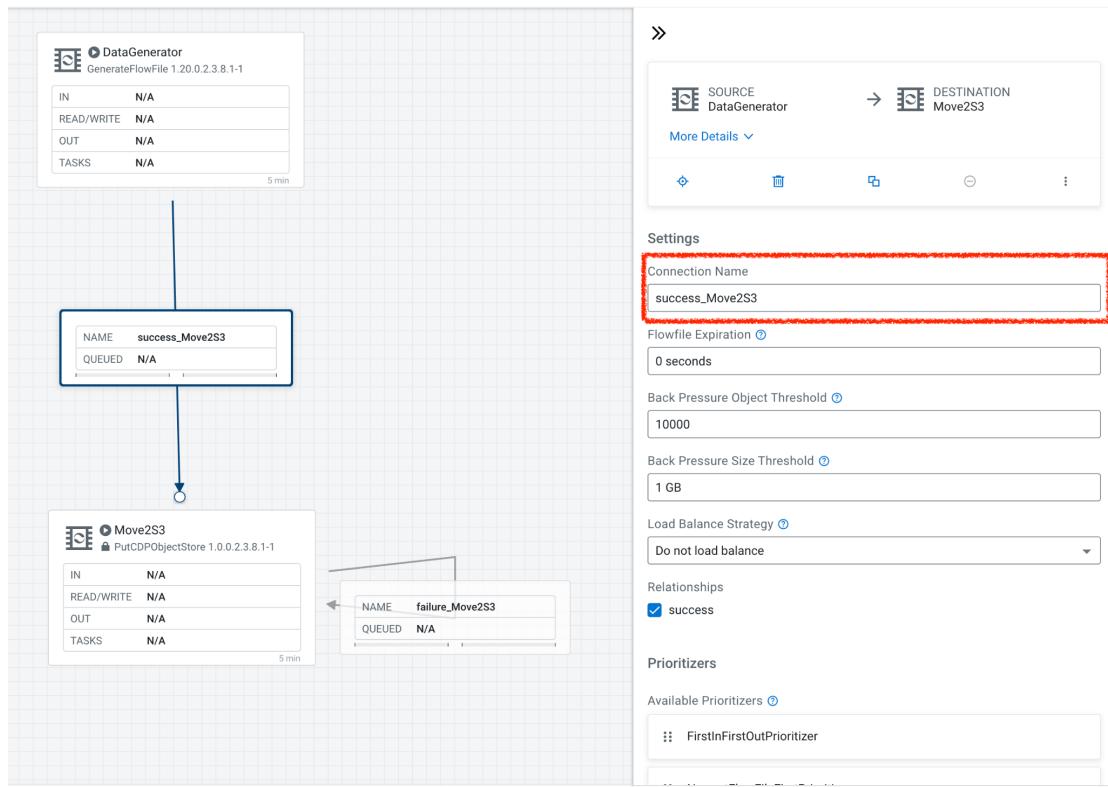


2.4. Naming the queues

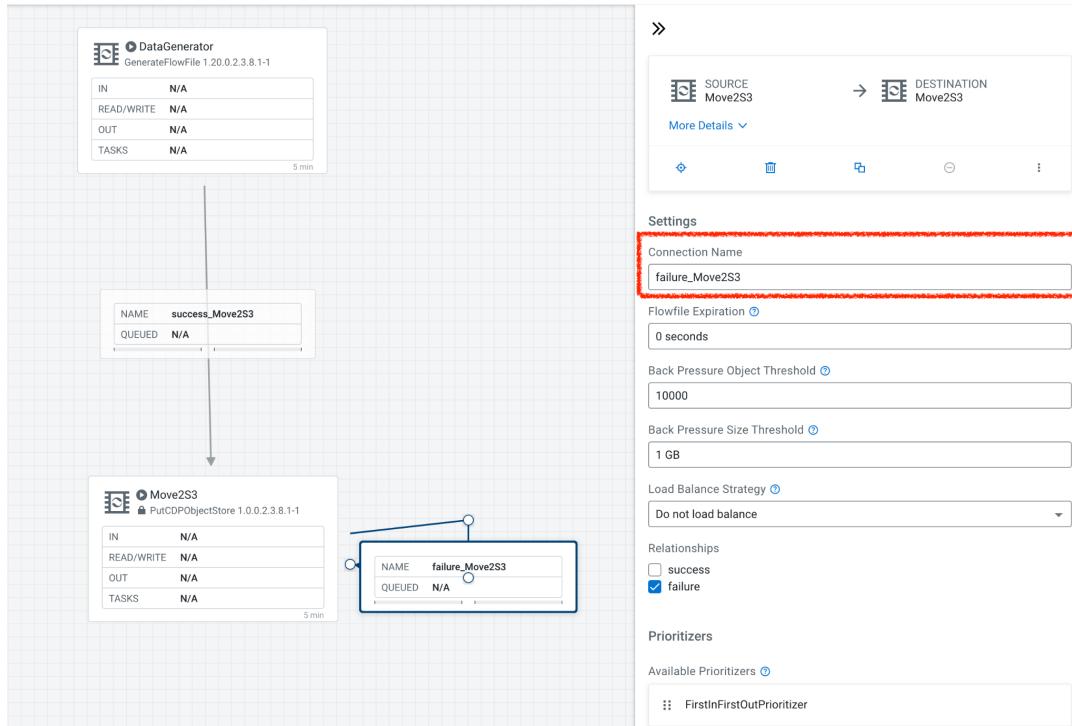
Providing unique names to all queues is very important as they are used to define Key Performance Indicators upon which CDF-PC will auto-scale.

To name a queue, double-click the queue and give it a unique name. A best practice here is to start the existing queue name (i.e. success, failure, retry, etc...) and add the source and destination processor information.

For example, the success queue between **DataGenerator** and **Move2S3** is named **success_Move2S3**.



The failure queue for **Move2S3** is named **failure_Move2S3**.

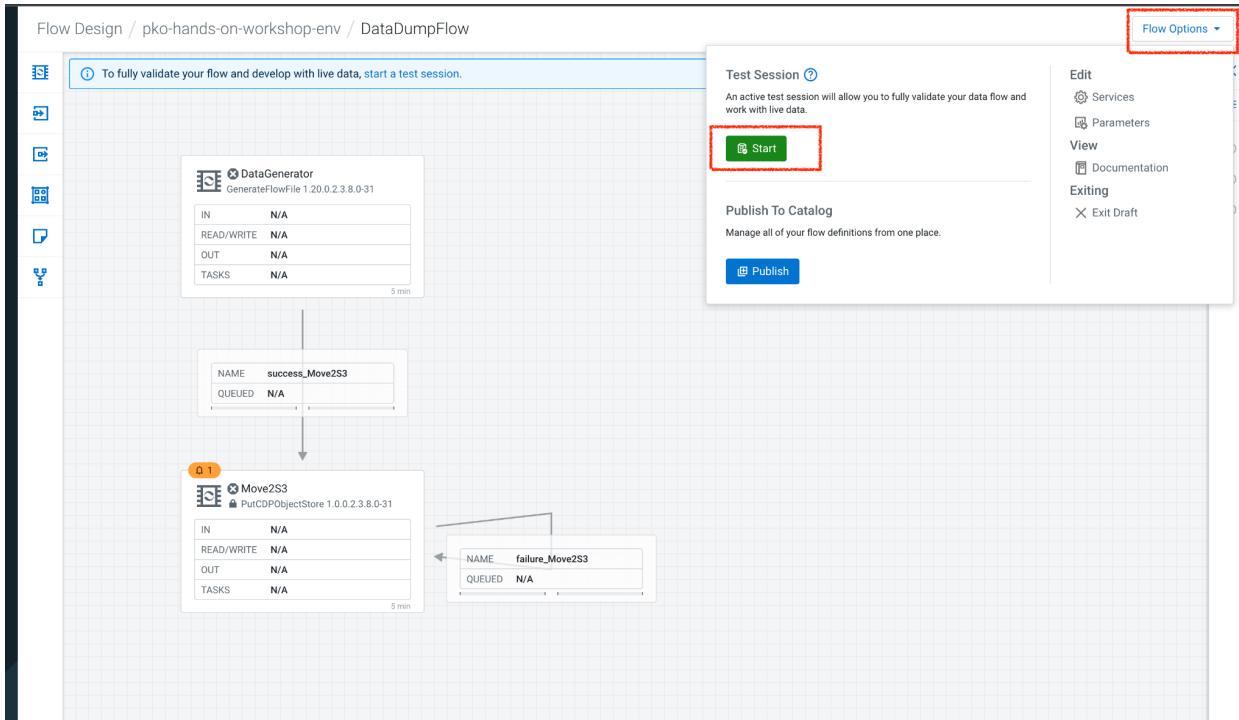


3. Testing the Data Flow

Step 1: Start test session

To test your flow we need to first start the test session

Click on **FLOW OPTIONS** and then select **START** on TEST SESSION



In the next window, click **START SESSION**

NiFi Configuration

NiFi Runtime Version

CURRENT VERSION
Latest Version (1.20.0.2.3.8.0-31)

Review the Cloudera DataFlow and CDP Runtime support matrix to ensure the selected NiFi Runtime Version is compatible.

Inbound Connections

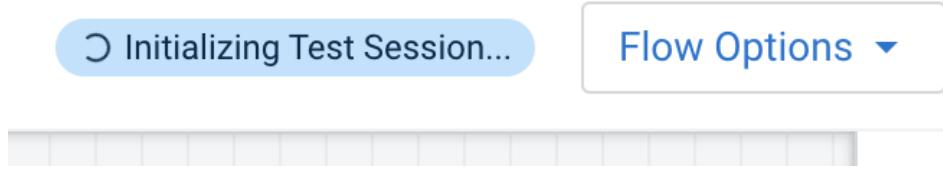
Allow NiFi to receive data

Custom NAR Configuration

This flow deployment uses custom NARs

Start Test Session

The activation should take about a couple of minutes. While this happens you will see this at the top right corner of your screen

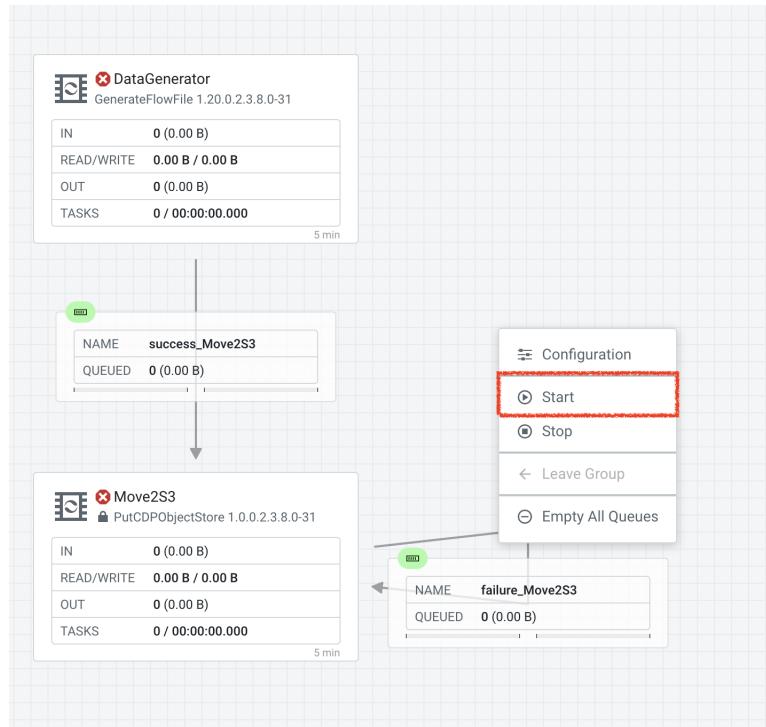


Once the Test Session is ready you will see the following message on the top right corner of your screen.

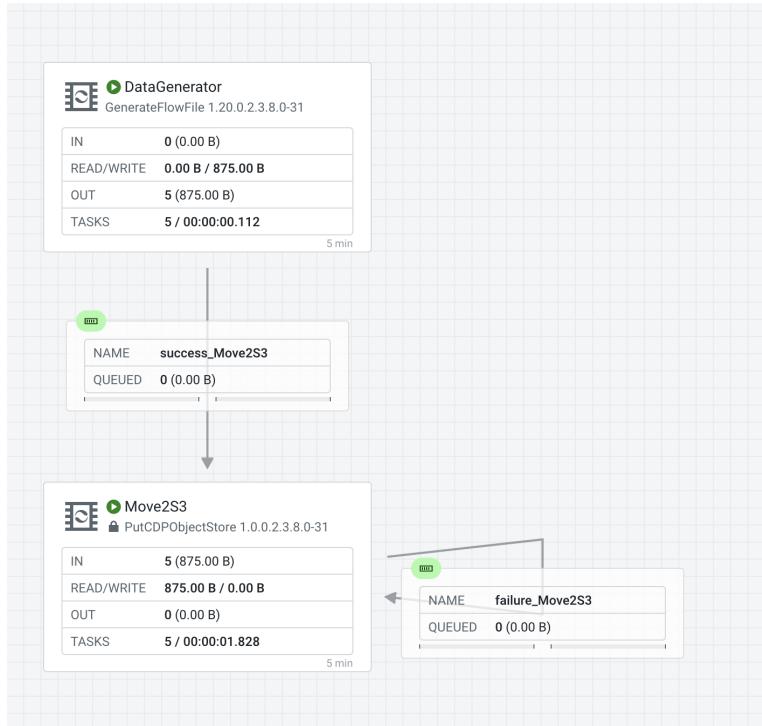


Step 2: Run the flow

Right click on the empty part of the canvas and select START.



Both the processors should now be in the START state.



You will now see files coming into the folder which was specified as the Directory on the S3 bucket which is the Base data store for this environment.

Name ↑	Value
CDP Workload User	mmehra
CDP Workload User Password	☒ Sensitive value set
CDPEnvironment	hive-site.xml, core-site.xml, ssl-client.xml
Default SSL Context Keystore	/home/nifi/additional/secret/ssl_keystore/ssl-keystore.jks
Default SSL Context Keystore Password	☒ Sensitive value set
Default SSL Context Keystore Type	JKS
Default SSL Context Truststore	/home/nifi/additional/secret/ssl_truststore/ssl-truststore.jks
Default SSL Context Truststore Password	☒ Sensitive value set
Default SSL Context Truststore Type	JKS
HDFS Directory	newtest

Amazon S3 > Buckets > handsonworkshop > user/ > mmehra/ > newtest/

newtest/

Objects (9)

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

[Copy S3 URI](#) [Copy URL](#) [Download](#) [Open](#) [Delete](#) [Actions](#) [Create folder](#) [Upload](#)

Find objects by prefix

Name	Type	Last modified	Size	Storage class
2d08ec54-124d-4f39-8536-655589724752	-	March 29, 2023, 20:51:27 (UTC+05:30)	175.0 B	Standard
3158ab72-5344-469c-966d-76f3a5e81170	-	March 29, 2023, 20:53:27 (UTC+05:30)	175.0 B	Standard
3a530f32-fec7-4821-83b8-ca79c4e11e21	-	March 29, 2023, 20:53:57 (UTC+05:30)	175.0 B	Standard
5e6348d5-0100-4568-ac99-0c6127968dff	-	March 29, 2023, 20:52:27 (UTC+05:30)	175.0 B	Standard
69814fcf-9e21-414e-b08c-10895e7fd08b	-	March 29, 2023, 20:52:57 (UTC+05:30)	175.0 B	Standard
8bf998a-21d1-4f8b-8072-5ad350b74135	-	March 29, 2023, 20:54:27 (UTC+05:30)	175.0 B	Standard
acc85d58-9aaa-4451-816a-7901ef6b65bf	-	March 29, 2023, 20:54:57 (UTC+05:30)	175.0 B	Standard
cba5becb-6d4e-430c-9dfc-c477d992e30c	-	March 29, 2023, 20:51:24 (UTC+05:30)	175.0 B	Standard
cab44364-b35f-4cad-a0f8-b2b885873eb	-	March 29, 2023, 20:51:57 (UTC+05:30)	175.0 B	Standard

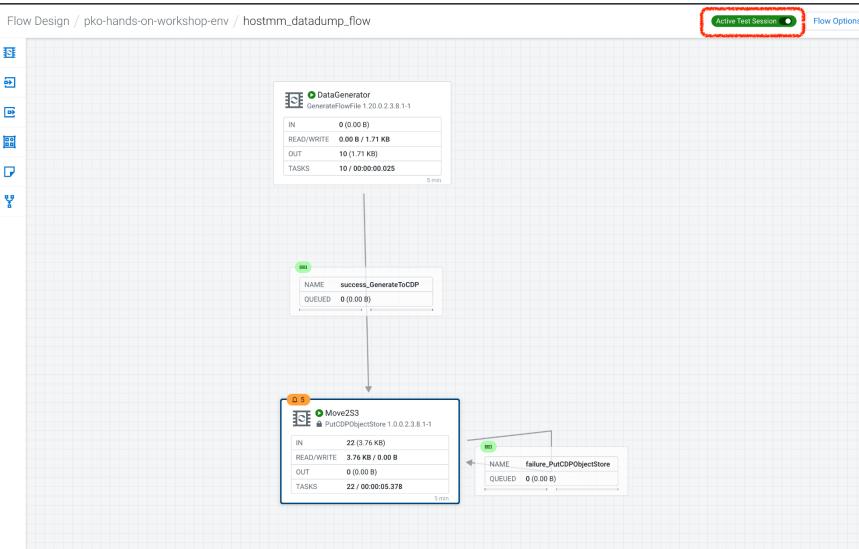
[You will not be able to access this S3 bucket by yourself but the instructor will show you where everyone's data is moving to]

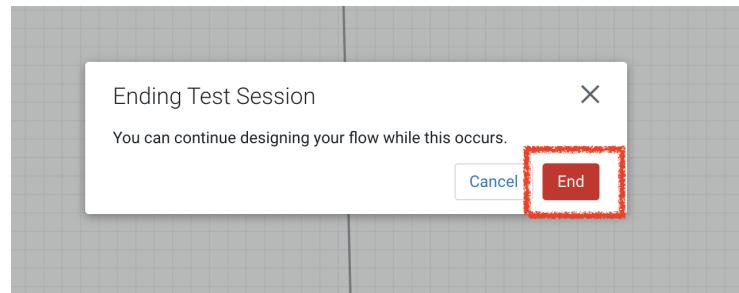
4. Move the Flow to the Flow Catalog

After the flow has been created and tested we can now PUBLISH the flow to the Flow Catalog

Step 1: STOP the current test session

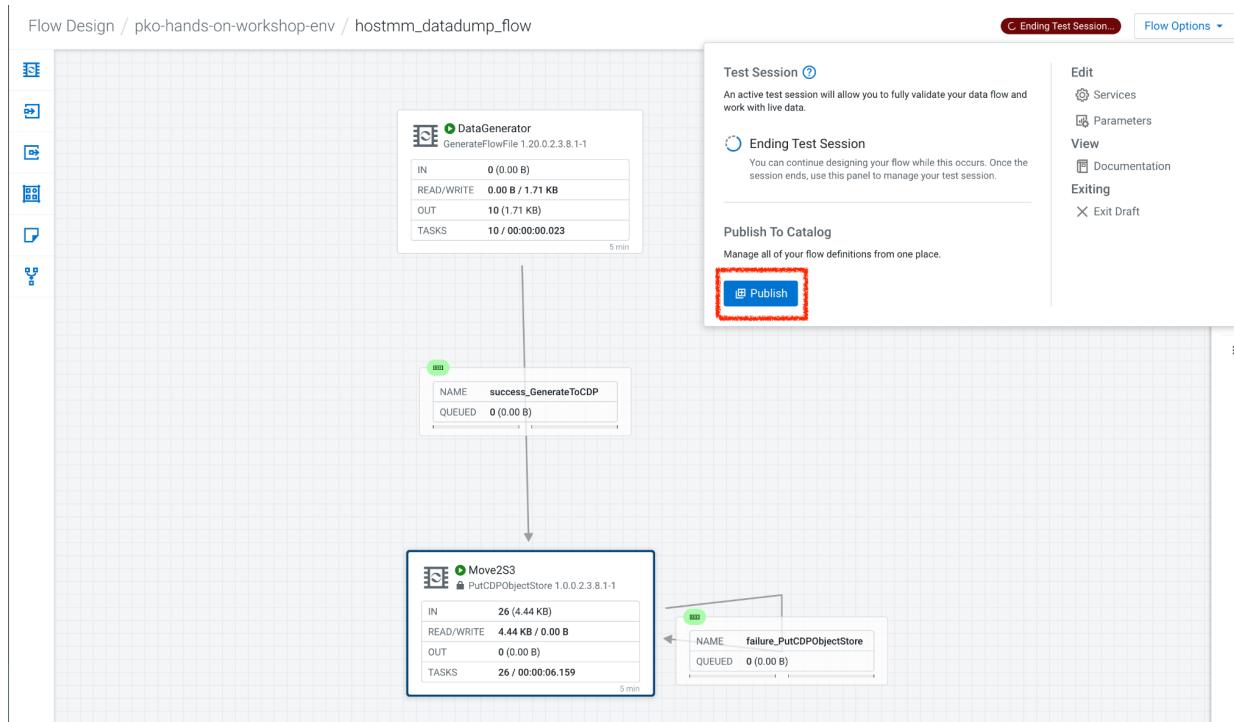
STOP the current test session by clicking on the green tab on top right and click END





Step 2: PUBLISH the flow

Once the session stops, click on **FLOW OPTION** on the top right corner of your screen and click on **PUBLISH**



Step 3: Give your flow a name and click on **PUBLISH**

Flow Name : {user_id}_datadump_flow

Custom Flow Definition

Publish A New Flow

Flow Name 12/200
DataDumpFlow

Flow Description 0/1K
Add description

Version Comments 15/1K
Initial Version

Cancel Publish

The flow will now be visible on the **FLOW CATALOG** and is ready to be deployed

»

DataDumpFlow Updated 3 seconds ago by Manick Mehra

SUCCESS! Flow "DataDumpFlow" published successfully.

FLOW DESCRIPTION
No description specified
CRN # [crn:cdp:df:us-west-1:d1a4553c-a799-432d-8e54-372cc2ab95f2:flow:DataDumpFlow](#)

Only show deployed versions

Version	Deployments	Associated Drafts
1	0	1

Deploy → [Download](#) [Create New Draft](#)

ASSOCIATED DRAFTS (1)
[aws_pko-hands-on-workshop-env](#)
• DataDumpFlow

CRN # [crn:cdp:df:us-west-1:d1a4553c-a799-432d-8e54-372cc2ab95f2:flow:DataDumpFlow/v.1](#)

CREATED
2023-03-29 20:58 IST by Manick Mehra
"Initial Version"

5. Deploying the Flow

Step 1: Search for the flow in the Flow Catalog

The screenshot shows a search interface for a 'Flow Catalog'. A search bar at the top contains the text 'DataDumpFlow'. Below the search bar, a list header 'Name ↑' is followed by a single item: 'DataDumpFlow'. The background of the catalog page is light gray.

Click on the Flow, you should see the following:

The screenshot shows the details page for the 'DataDumpFlow' flow. At the top left is the flow icon and the name 'DataDumpFlow'. To the right is a 'Actions' dropdown menu. Below this is a 'FLOW DESCRIPTION' section with the note 'No description specified'. Underneath is a 'CRN #' field containing 'crn:cdp:df:us-west-1:d1a4553c-a799-432d-8e54-372cc2ab95f2:flow:DataDumpFlow'. At the bottom left is a checkbox for 'Only show deployed versions'. The main area features a table with three columns: 'Version', 'Deployments', and 'Associated Drafts'. The first row shows '1', '0', and '1'. At the bottom are buttons for 'Deploy →', 'Download', and 'Create New Draft'.

Version	Deployments	Associated Drafts
1	0	1

Step 2: Deploy the flow

Click on **Version 1**, you should see a **Deploy** Option appear shortly. Then click on **Deploy**.

The screenshot shows a table with two columns: 'Version' and 'Deployments'. Version 1 has 0 deployments. A red box highlights the 'Deploy' button next to Version 1. Below the table, there is a section for 'LAST UPDATE' and another for 'CRN #'. A download icon is also present.

Version	Deployments
1	0

Deploy → Download

LAST UPDATE
2021-09-23 11:52 CDT by Nasheb Ismaily
"Initial Version"

CRN #
crn:cdp:df:us-west-1:558bc1d2-8867-4357-8524-311d51259233:flow:syslog-to-kafka...

Step 3: Select the CDP environment

Select the CDP environment where this flow will be deployed and click on **CONTINUE**

NOTE: THE NAME OF THE ENVIRONMENT WILL BE SHARED BY THE INSTRUCTOR

New Deployment X

Select the target environment

- ⓘ Sensitive data never leaves the environment. Changing the environment after this step requires restarting the deployment process.

Selected Flow Definition

NAME
user023

VERSION
1

Target Environment

aws aws-workshop-kl

15% (3 of 20)

Continue →

Cancel

Step 4: Deployment Name

Give the deployment a unique name, then click Next.

Example : user21_flow

Overview

Deployment Name

user23_flow

Deployment name is valid

Selected Flow Definition



NAME

user023

VERSION

1

Target Environment



NAME

aws-workshop-kl

Click NEXT

Step 5: Set the NiFi Configuration

We can let everything be the default here and click
NEXT

NiFi Configuration

NiFi Runtime Version [Change Version](#)

CURRENT VERSION Latest Version (1.20.0.2.3.8.0-31)

Review the Cloudera DataFlow and CDP Runtime support matrix to ensure the selected NiFi Runtime Version is compatible.

Autostart Behavior Automatically start flow upon successful deployment

Inbound Connections Allow NiFi to receive data [?](#)

Custom NAR Configuration This flow deployment uses custom NARs [?](#)

[Cancel](#) [Previous](#) [Next →](#)

Step 6: Set the Parameters

Set the Username, Password and the Directory name and click NEXT

CDP Workload User: user0xx

CDP Workload User Password: Cloudera@2023

S3 Directory: lab2

[The CDP Environment parameter that shows here is used at the time we perform a test run on our test session. It holds the CDP Environment configuration resources files such as ssl-client.xml, hive-site.xml and core-site.xml. You do not have to specify these to deploy your flow from the flow catalog as it automatically picks up those files,hence we give a dummy value to this. To avoid giving a dummy value, this parameter can be deleted before we publish the flow]

Parameters

Data entered here never leaves the environment in your cloud account.
Provide parameter values directly in the text input or upload a file for parameters that expect a file.

SHOW: Sensitive No value

user023 (3)

CDP Workload User

7/100K

user023

CDP Workload User Password

13/100K

.....



S3 Directory

4/100K

lab2

Sizing & Scaling
Select the NiFi node size and the number of nodes provisioned for your flow.

NiFi Node Sizing

<input checked="" type="radio"/> Extra Small 2 vCores Per Node 4 GB Per Node	<input type="radio"/> Small 3 vCores Per Node 6 GB Per Node	<input type="radio"/> Medium 6 vCores Per Node 12 GB Per Node	<input type="radio"/> Large 12 vCores Per Node 24 GB Per Node
--	---	---	---

Number of NiFi Nodes

Auto Scaling Enabled Disabled

Nodes: 32

Cancel **← Previous** **Next →**

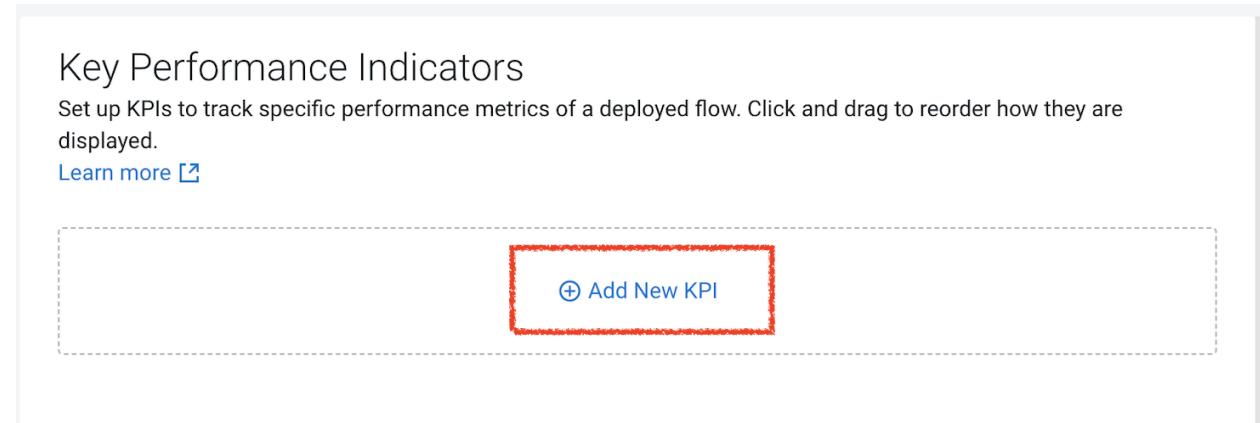
Step 7: Set the cluster size

Select the Extra Small size and click NEXT. In this step you can configure how your flow will autoscale, but keep it disabled for this lab.

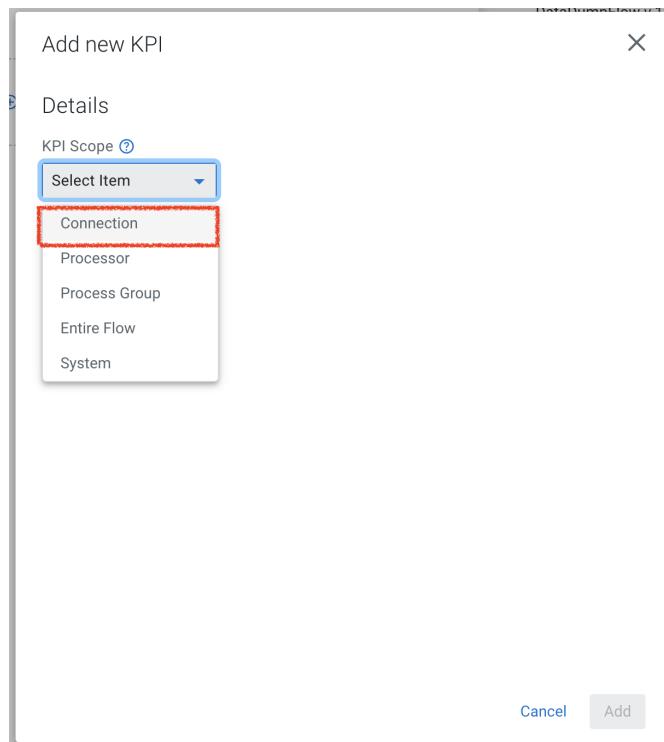
Step 8: Add Key Performance indicators

Set up KPIs to track specific performance metrics of a deployed flow.

Click on “Add New KPI”



In the KPI Scope drop-down list, choose “Connection”



In the “Add New KPI” window, add an alert as below

Add new KPI

Details

KPI Scope [?](#) Connection Name [?](#)

Connection failure_Move2S3

Metric to Track [?](#)

Percent Full

METRIC DESCRIPTION:
The percentage of connection that is full

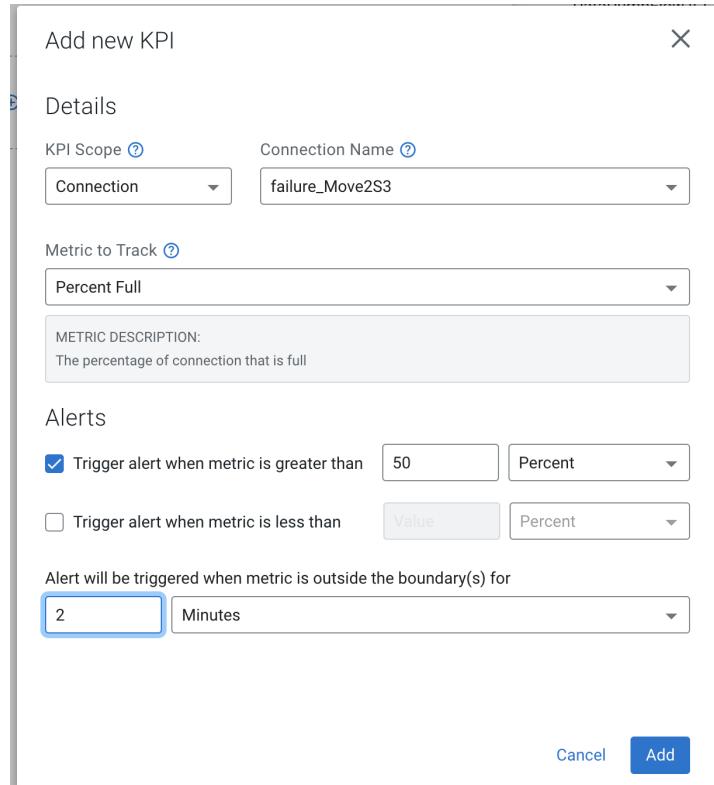
Alerts

Trigger alert when metric is greater than 50 Percent

Trigger alert when metric is less than Value Percent

Alert will be triggered when metric is outside the boundary(s) for 2 Minutes

Cancel Add



Click Add and then Click Next

Key Performance Indicators

Set up KPIs to track specific performance metrics of a deployed flow. Click and drag to reorder how they are displayed.

[Learn more](#)

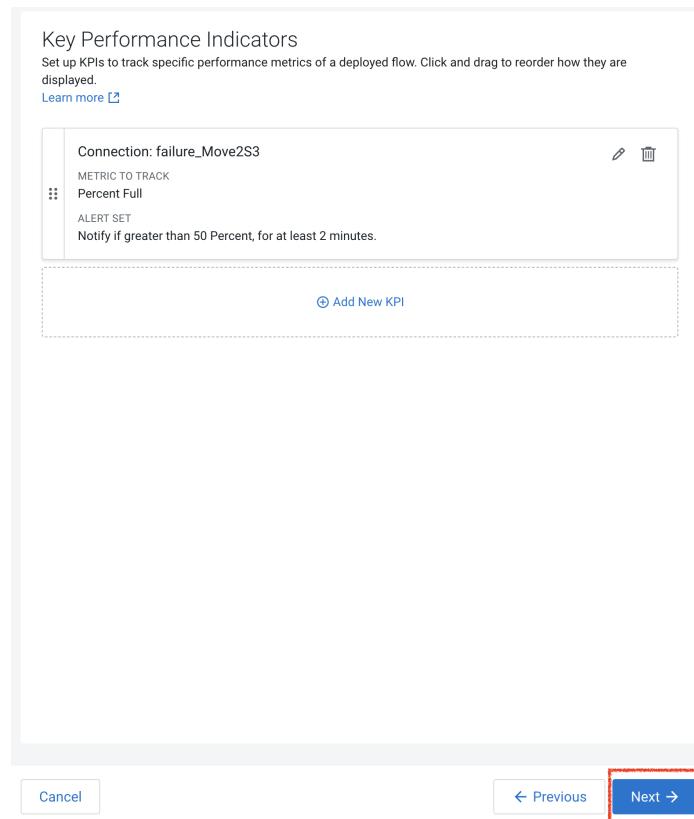
Connection: failure_Move2S3

METRIC TO TRACK
Percent Full

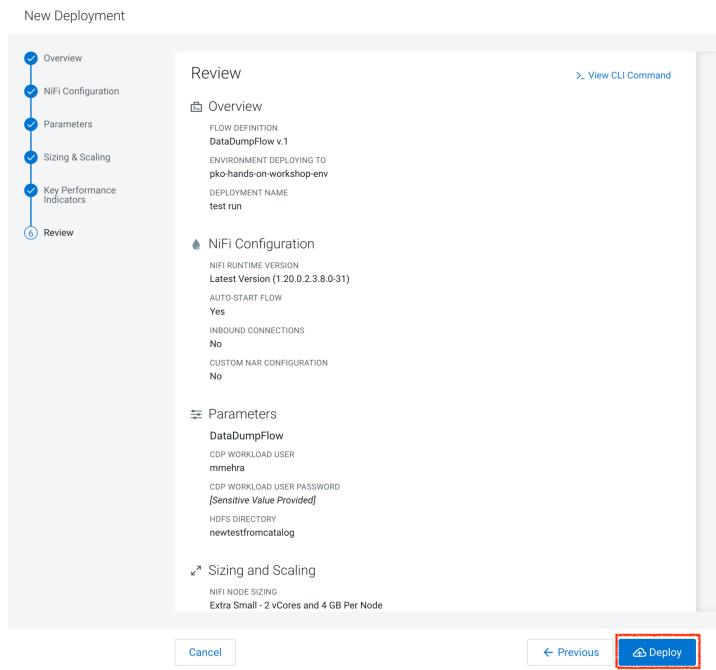
ALERT SET
Notify if greater than 50 Percent, for at least 2 minutes.

Add New KPI

Cancel ← Previous Next →



Step 9: Click Deploy



The “Deployment Initiated” message will be displayed. Wait until the flow deployment is completed, which might take a few minutes.

When deployed, the flow will show up on the Data flow dashboard, as below:

The screenshot shows the Data Flow Dashboard with the following filters applied: Filter By: STATUS All - 15, ENVIRONMENTS All - 4, DEPLOYMENTS All - 2, PROCESSOR TYPES All - 41, and METRICS WINDOW 30 Minutes. The dashboard lists three flows: gf-tbr-stocks-deployment (Suspended), hostmm_dataflow_prod (Good Health), and wuser00-syslog-to-kafka (Suspended). The hostmm_dataflow_prod flow is highlighted with a red box. Its details show Current Received at 0 B/s and Current Sent at 5 B/s. A chart displays Data Throughput (Received/Sent) over 30 Minutes, with a current value of 10.00 Bi/s. The bottom right corner of the dashboard interface has a red box around the 'Manage Deployment' button.

6. Viewing details of the deployed flow

Click on the flow in the Dashboard and select Manage Deployment

The screenshot shows the 'Deployment Information' section for the wuser122_flow_prod flow. It includes the following details:

- Flow Definition: wuser122_datadump_flow V.1
- Deployed By: wuser122
- Node Count: Up to 3 nodes
- Created On: 2023-04-25 11:41 IST
- Last Updated: 2023-04-25 11:43 IST
- NIFI Version: 1.20.2.3.8.2-2
- CRN #: CRM.CDP.US.WEST-1.D1A4553C-A799-432D-8E54-372CC2AB95...

Below this, there is a 'Percent Full' section for 'failure_Move2S3' with metrics: CURRENT 0.00%, AVERAGE 0.00%, and BOUNDARY > 50.00%. The bottom right corner of the deployment information panel has a red box around the 'Manage Deployment' button.

Step 1 : Manage KPI and Alerts

Click on the KPI tab to get the list of KPIs that have been set. You also have an option to modify or add more KPIs to your flow here.

[← Back to Deployment Details](#)

Deployment Manager

REFRESHED: 27 seconds ago

[Actions ▾](#)

STATUS Good Health	DEPLOYMENT NAME wuser122_flow_prod	FLOW DEFINITION wuser122_datadump_flow V.1	DEPLOYED BY wuser122
NODE COUNT 1	AUTO SCALING Up to 3 nodes	CREATED ON 2023-04-25 11:41 IST	LAST UPDATED 2023-04-25 11:43 IST
ENVIRONMENT aws pko-hands-on-workshop-env	REGION Asia Pacific (Mumbai)	NIFI RUNTIME VERSION 1.20.0.2.3.8.2-2	CRN # crm:cdp:df:us-west-1:d1a4553c-a799-432d-8e54-372...

[Recreate Deployment CLI Command](#)

Deployment Settings

KPIs and Alerts Sizing and Scaling Parameters NiFi Configuration

Key Performance Indicators

Set up KPIs to track specific performance metrics of a deployed flow. Click and drag to reorder how they are displayed.

[Learn more](#)

Connection: failure_Move2S3

METRIC TO TRACK
Percent Full

ALERT SET
Notify if greater than 50 Percent, for at least 2 minutes.

[Edit](#) [Delete](#)

[Add New KPI](#)

Step 2 : Manage Sizing and Scaling

Click on the Sizing and Scaling tab to get detailed information

Dashboard / wuser122_flow_prod / Deployment Manager

STATUS Good Health	DEPLOYMENT NAME wuser122_flow_prod	FLOW DEFINITION wuser122_datadump_flow V.1	DEPLOYED BY wuser122
NODE COUNT 1	AUTO SCALING Up to 3 nodes	CREATED ON 2023-04-25 11:41 IST	LAST UPDATED 2023-04-25 11:43 IST
ENVIRONMENT aws pko-hands-on-workshop-env	REGION Asia Pacific (Mumbai)	NIFI RUNTIME VERSION 1.20.0.2.3.8.2-2	CRN # crm:cdp:df:us-west-1:d1a4553c-a799-432d-8e54-372...

[Recreate Deployment CLI Command](#)

Deployment Settings

KPIs and Alerts Sizing and Scaling Parameters NiFi Configuration

Sizing & Scaling

Select the NiFi node size and the number of nodes provisioned for your flow.

NiFi Node Sizing [?](#)

Extra Small

2 vCores Per Node
4 GB Per Node

Number of NiFi Nodes

Auto Scaling [?](#)
 Enabled

Min. Nodes:

Max. Nodes:

Step 3 : Manage Parameters

The parameters that we earlier created can be managed from the Parameters tab. Click on Parameters.

The screenshot shows the 'Parameters' tab of the Deployment Settings interface. It displays three parameter entries:

- wuser122_datadump_flow (4)**: CDP Workload User. Value: wuser122. Status: 8/100K.
- CDP Workload User Password**: Sensitive value provided. Status: 0/100K.
- CDPEnvironment**: DummyValue. Status: 10/100K.

Each entry includes checkboxes for 'Sensitive' and 'No value'.

Step 4 : NiFi Configurations

If you have set any configuration wrt to Nifi they will show up on the 'NiFi Configuration' tab

The screenshot shows the 'NiFi Configuration' tab of the Deployment Settings interface. It contains two sections:

- Inbound Connection Details**: A message states: "Inbound Connection has not been configured for this deployment."
- Custom NAR Configuration**: A message states: "Custom NAR has not been configured for this deployment."

Step 5 : View the deployed flow in NiFi

- Select ACTIONS on the Deployment Manager page and then click on ‘View in NiFi’

Dashboard / wuser122_flow_prod / Deployment Manager

[← Back to Deployment Details](#)

Deployment Manager

Deployment Name		Flow Definition	Deployed By
wuser122_flow_prod	wuser122_datadump_flow V.1	wuser122	
Status	Node Count	Created On	Last Updated
Good Health	1	2023-04-25 11:41 IST	2023-04-25 11:43 IST
Environment	Auto Scaling	Nifi Runtime Version	CRN #
aws pk0-hands-on-workshop-env	Up to 3 nodes	1.20.0.2.3.8.2-2	cnr:cdp:df-us-west-2
Region			
Asia Pacific (Mumbai)			

Actions

- View in NiFi
- (i) Suspend flow
- (i) Change NiFi Runtime Version
- (i) Restart Deployment
- Terminate

[Recreate Deployment CLI Command](#)

Deployment Settings

KPIs and Alerts Sizing and Scaling Parameters NiFi Configuration

NiFi Configuration

Inbound Connection Details

? Inbound Connection has not been configured for this deployment.

Custom NAR Configuration

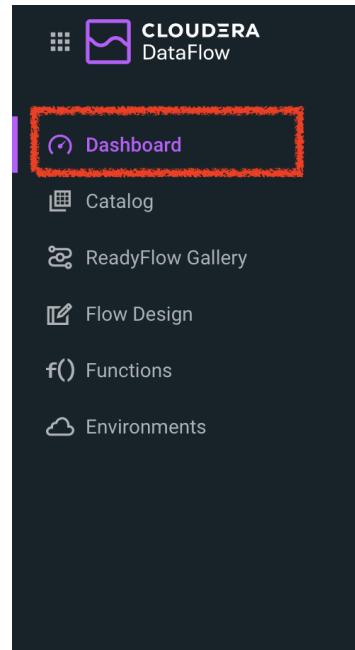
? Custom NAR has not been configured for this deployment.

This will open the flow in the NiFi UI.

The screenshot shows the Cloudera Flow Management interface. At the top, there's a toolbar with various icons for operations like start, stop, pause, and refresh. Below the toolbar, a navigation bar includes a 'Navigate' button and search/filter options. The main workspace displays a process flow with a single step represented by a blue square icon. On the left, the 'Operate' panel shows a process named 'wuser122_flow_prod' with ID 'b70b3491-0187-1000-cf74-60ec3b41e85e'. It lists several actions: Create, Start, Stop, Pause, Resume, Delete, and Refresh. To the right, a detailed view of the flow 'wuser122_datadump_flow' is shown. This view includes a summary table with metrics: Queued (0 bytes), In (0 / 0 bytes), Read/Write (1.71 KB / 1.71 KB), and Out (0 → 0 bytes). Below the summary are counters for various metrics: ✓ 0, * 0, ⚡ 0, 0, 0, 0, ?, 0, and 0.

Step 6 : Terminate the flow

As we have completed the Lab, it is best to terminate this flow. Follow the below given procedure to terminate your flow.



Select Dashboard from the Cloudera Data Flow UI

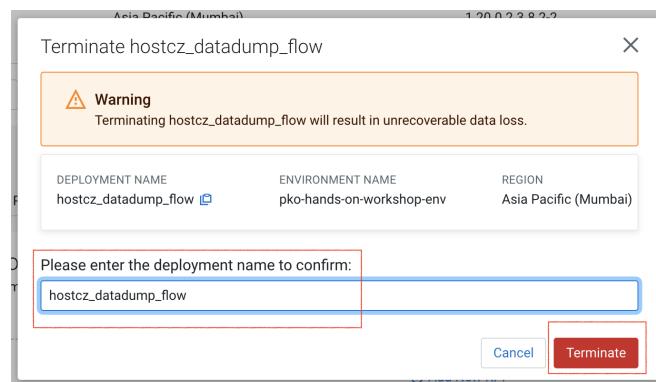
Select your flow and go to Manage Deployment

A screenshot of the Cloudera DataFlow UI dashboard. On the left, there's a sidebar with 'Dashboard', 'Catalog', 'ReadyFlow Gallery', 'Flow Design', 'Functions', and 'Environments'. The main area shows a table with a single row: 'hostcz_datadump_flow' (Status: Deploying). A red box highlights this row. To the right, there's a detailed view of the flow 'hostcz_datadump_flow' in environment 'pk0-hands-on-workshop-env'. It shows 'KPIs', 'System Metrics', and 'Alerts' tabs. The 'Alerts' tab is active, showing 'No alerts to display.' A red arrow points from the 'Manage Deployment' button at the top right of this section to the 'Event History' table below. The 'Event History' table lists deployment events with timestamps: Deployment Successful (2023-04-29 23:58 IST), NIFI Flow Started (2023-04-29 23:58 IST), KPI Alert Rules Activated (2023-04-29 23:58 IST), Activating KPI Alert Rules (2023-04-29 23:58 IST), Starting NIFI Flow (2023-04-29 23:58 IST), Default Alert Rules Activated (2023-04-29 23:58 IST), Activating Default Alert Rules (2023-04-29 23:58 IST), NIFI Flow Imported (2023-04-29 23:58 IST), Importing NIFI Flow (2023-04-29 23:57 IST), and NIFI Cluster Provisioned (2023-04-29 23:57 IST). A 'Load More' button is at the bottom right of the table.

On the Deployment Manager Page, Select **Actions** and click on **Terminate**

The screenshot shows the Cloudera DataFlow Deployment Manager interface. On the left, there's a sidebar with options like Dashboard, Catalog, ReadyFlow Gallery, Flow Design, Functions, and Environments. The main area displays deployment details for 'hostcz_datadump_flow V1'. It includes fields for STATUS (Good Health), NODE COUNT (1), ENVIRONMENT (aws pko-hands-on-workshop-env), and various runtime details like FLOW DEFINITION, CREATED ON, LAST UPDATED, and REGION (Asia Pacific (Mumbai)). On the right, there's an 'Actions' dropdown menu with options like View in NiFi, Suspend flow, Change NiFi Runtime Version, Restart Deployment, and Terminate. A red box highlights the 'Actions' button and the 'Terminate' option.

In the next dialog box, enter the name of the flow we are trying to terminate and click on **Terminate**



You will now see that the termination process has started.

The screenshot shows the Cloudera DataFlow Alerts page. It displays a list of events under 'Event History'. The first event, 'Deployment Termination Initiated', is highlighted with a red box. Other events listed include 'Deployment Successful', 'NiFi Flow Started', 'KPI Alert Rules Activated', 'Activating KPI Alert Rules', 'Starting NiFi Flow', 'Default Alert Rules Activated', 'Activating Default Alert Rules', 'NiFi Flow Imported', and 'Importing NiFi Flow'. At the bottom, there's a 'Load More' button.

Lab 2 : Migrating Existing Data Flows to CDF-PC

1. Overview

The purpose of this workshop is to demonstrate how existing NiFi flows can be migrated to the Data Flow Experience. This workshop will leverage an existing NiFi flow template that has been designed with the best practices for CDF-PC flow deployment.

The existing NiFi Flow will perform the following actions:

1. Generate random syslogs in 5424 Format
2. convert the incoming data to a JSON using record writers
3. Apply a SQL filter to the JSON records
4. Send the transformed syslog messages to Kafka

Note that a parameter context has already been defined in the flow and the queues have been uniquely named.

For this we will be leveraging the DataHubs which have already been created, namely:

- aws-workshop-kl-streams-mess
- aws-workshop-kl-stream-analytics

2. Pre-requisites

2.1. Create a Kafka Topic

1. Login to Streams Messaging Manager by clicking the appropriate hyperlink in the Streams Messaging Datahub (workshop-asean-streams-mess)

The screenshot shows the Cloudera Management Console interface. On the left, the sidebar has 'Environments' selected. The main area displays the 'Environments' page for 'pko-hands-on-workshop-env'. It shows a cluster named 'aws' with 2 nodes and a status of 'Running'. Below this is a table of Data Hubs, with one row for 'kafka-smm-cluster' highlighted with a red box. At the bottom right of the table, there is a 'Create Data Hub' button.

The screenshot shows the 'Services' page in the Cloudera Data Platform. It lists several services: CM UI, Schema Registry, and Streams Messaging Manager. The 'Streams Messaging Manager' service is highlighted with a red box.

2. Click on Topics in the left tab

The screenshot shows the 'Overview' page of the Streams Messaging Manager. The left sidebar has 'Topics' selected. The main area displays a table of topics. One row for 'consumer_offsets' is highlighted with a red box. The table includes columns for NAME, DATA IN, DATA OUT, and METRICS.

NAME	DATA IN	DATA OUT	METRICS
consumer_offsets	13 KB	13 KB	10
CruiseControlMetrics	775 KB	775 KB	7
KafkaCruiseControlModelTrainingSamples	30 KB	0B	90
KafkaCruiseControlPartitionMetricSamples	155 KB	0B	8
smm_alert_notifications	0B	0B	0
smm_consumer_metrics	0B	0B	0

3. Click on Add New

The screenshot shows the Apache Kafka UI's Topics page. At the top, there are various metrics: Bytes In (1 MB), Bytes Out (917 KB), Produced Per Sec (2), Fetched Per Sec (1,784), In Sync Replicas (788), Out Of Sync (0), Under Replicated (0), and Offline Partitions (0). Below these are search and filter options. A prominent red box highlights the "Add New" button in the top right corner of the header.

NAME	DATA IN	DATA OUT	MESSAGES IN	CONSUMER GROUPS	CURRENT LOG SIZE
__smm-app-smm-producer-table-30s-repartition	0B	0B	0	1	0B
__smm-app-smm-producer-table-15m-changelog	0B	0B	0	0	0B
heartbeats	172 KB	0B	1.8k	0	6 MB
srm-service-status-connector-metrics-minutes-store-changelog	18 KB	0B	90	0	661 KB
__smm-app-smm-producer-table-15m-repartition	0B	0B	0	1	0B
srm-service-cluster-metrics-minutes-store-changelog	0B	0B	0	0	0B
__smm-app-smm-consumer-table-15m-repartition	0B	0B	0	1	0B
__smm-app-smm-consumer-table-30s-repartition	0B	0B	0	1	0B

4. Create a Topic with the following parameters then click Save:

- Name:** <username>-syslog
- Partitions:** 1
- Availability:** Moderate
- Cleanup Policy:** Delete

The screenshot shows the "Add Topic" dialog box. It includes fields for Topic Name (set to "workshop001-syslog"), Partitions (set to 1), and Availability (set to MODERATE). Below these are sections for Replication Factor (set to 3) and Cleanup Policy (set to "delete"). At the bottom, there are "Advanced", "Cancel", and "Save" buttons.

TOPIC NAME		PARTITIONS	
workshop001-syslog		1	▼

Availability

MAXIMUM	HIGH	MODERATE	LOW	CUSTOM

Limits

CLEANUP.POLICY

Advanced **Cancel** **Save**

Note: The Flow will not work if you set the Cleanup Policy to anything other than **Delete**. This is because we are not specifying keys when writing to Kafka.

2.2. Create a Schema in Schema Registry

1. Login to Schema Registry by clicking the appropriate hyperlink in the Streams Messaging Datahub(kafka-smm-cluster)

Status	Name	Type	Version	Node Count	Created
Running	sst-analytics-cluster	7.2.16 - Streaming Analytics Light Duty with Apache Flink	CDH 7.2.16	6	04/20/23, 04:03 PM GMT+10
Running	nifi-flow-mgmt-cluster	7.2.16 - Flow Management Light Duty with Apache NIFI, Apache NIFI Registry	CDH 7.2.16	4	04/20/23, 03:51 PM GMT+10
Running	kafka-smm-cluster	7.2.16 - Streams Messaging Light Duty: Apache Kafka, Schema Registry, Streams Messaging Manager, Streams Replication Manager, Cruise Control	CDH 7.2.16	4	04/20/23, 04:03 PM GMT+10

2. Click on the + button on the top right to create a new schema.

3. Create a new schema with the following information:

- **Name:** <username>-syslog
- **Description:** syslog schema for dataflow workshop
- **Type:** Avro schema provider
- **Schema Group:** Kafka
- **Compatibility:** Backward
- **Evolve:** True
- **Schema Text:** Copy and paste the schema text below into the “Schema Text” field

```
{
  "name": "syslog",
  "type": "record",
  "namespace": "com.cloudera",
  "fields": [
    {
      "name": "priority",
      "type": "int"
    },
    {
      "name": "severity",
      "type": "int"
    },
    {
      "name": "facility",
      "type": "int"
    },
    {
      "name": "version",
      "type": "int"
    },
    {
      "name": "timestamp",
      "type": "long"
    },
    {
      "name": "hostname",
      "type": "string"
    },
    {
      "name": "body",
      "type": "string"
    }
  ]
}
```

```
 },
{
  "name": "appName",
  "type": "string"
},
{
  "name": "procid",
  "type": "string"
},
{
  "name": "messageid",
  "type": "string"
},
{
  "name": "structuredData",
  "type": {
    "name": "structuredData",
    "type": "record",
    "fields": [
      {
        "name": "SDID",
        "type": {
          "name": "SDID",
          "type": "record",
          "fields": [
            {
              "name": "eventId",
              "type": "string"
            },
            {
              "name": "eventSource",
              "type": "string"
            },
            {
              "name": "iut",
              "type": "string"
            }
          ]
        }
      ]
    }
  }
}
```

Note: The name of the Kafka Topic you previously created and the Schema Name must be the same.

Click on **SAVE.**

Add New Schema

NAME *

DESCRIPTION *

TYPE *

SCHEMA GROUP *

COMPATIBILITY

EVOLVE

SCHEMA TEXT *

```
61 },
62 {
63   "name": "eventSource",
64   "type": "string"
65 },
66 {
67   "name": "iut",
68   "type": "string"
69 }
70 ]
71 }
72 }
73 ]
74 }
75 ]
76 }
77 }
```

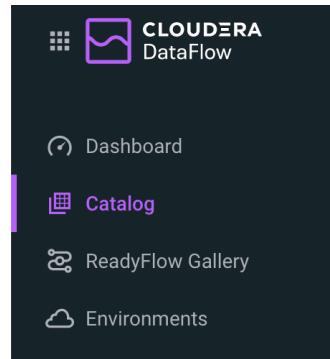
CANCEL **SAVE**

All Schemas	
 workshop001-syslog BACKWARD	TYPE: avro GROUP: Kafka BRANCH: 1 SERIALIZER & DESERIALIZER: 0

Lab 3 : Operationalizing Externally Developed Data Flows with CDF-PC

1. Import the Flow into the CDF-PC Catalog

- Open the CDF-PC data service and click on Catalog in the left tab.



- Select Import Flow Definition on the Top Right

Import Flow Definition

- Add the following information:

- Flow Name:** <username>-syslog-to-kafka
- Flow Description:**

Reads Syslog in RFC 5424 format, applies a SQL filter, transforms the data into JSON records, and publishes to Kafka

- NiFi Flow Configuration:** syslog-to-kafka.json (From the resources downloaded earlier)
- Version Comments:** Initial Version

Import Flow Definition

Flow Name
syslog-to-kafka

Flow Description
Generates Syslog in RFC 5424 format, applies a SQL filter, transforms the data into JSON records, and publishes to Kafka
120/1000

NiFi Flow Configuration
syslog-to-kafka.json

Version Comments
Initial Version
15/1000

Click **IMPORT**

2. Deploy the Flow in CDF-PC

1. Search for the flow in the Flow Catalog

Flow Catalog

Q syslog-to-kafka

REFRESHED 20 seconds ago

Name ↑	Type	Versions	Last Updated
syslog-to-kafka	Custom Flow Definition	1	3 minutes ago >

2. Click on the Flow, you should see the following:

» REFRESHED 7 seconds ago

syslog-to-kafka Updated 4 minutes ago by Nasheb Ismaily

FLOW DESCRIPTION
Generates Syslog in RFC 5424 format, applies a SQL filter, transforms the data into JSON records, and publishes to Kafka
CRN # [crn:cdf:us-west-1:558bc1d2-8867-4357-8524-311d51259233:flow:syslog-to-kafka](#)

Only show deployed versions

Version	Deployments
1	0

3. Click on **Version 1**, you should see a **Deploy** Option appear shortly. Then click on **Deploy**.

The screenshot shows the AWS Lambda console. At the top left is a checkbox labeled "Only show deployed versions". Below it is a table with two columns: "Version" and "Deployments". A single row is present, showing "1" in the Version column and "0" in the Deployments column. A red box highlights the "Deploy →" button in a blue box at the bottom left of the table. To the right of the table are two buttons: "Download" and an upward-pointing arrow icon.

Version	Deployments
1	0

Deploy →

Last Update
2021-09-23 11:52 CDT by Nasheb Ismaily
"Initial Version"

CRN #
crn:cdp:df:us-west-1:558bc1d2-8867-4357-8524-311d51259233:flow:syslog-to-kafka...

4. Select the CDP environment where this flow will be deployed, then click **Continue**.

NOTE: THE NAME OF THE ENVIRONMENT WILL BE SHARED BY THE INSTRUCTOR

New Deployment X

Select the target environment

ⓘ Sensitive data never leaves the environment. Changing the environment after this step requires restarting the deployment process.

Selected Flow Definition

NAME	VERSION
wave icon user023-syslog-too-kafka	1

Target Environment

aws aws-workshop-kl 15% (3 of 20) ▼

Continue → Cancel

5. Give the deployment a unique name, then click **Next**.

Example : {user_id}-syslog-to-kafka

New Deployment

The screenshot shows the 'New Deployment' process at step 1: Overview. The deployment name is set to 'workshop001-syslog-to-kafka', which is valid. The selected flow definition is 'workshop001-syslog-to-kafka' version 1. The target environment is 'workshop-asean' on the AWS provider.

Deployment Name
workshop001-syslog-to-kafka
✓ Deployment name is valid

Selected Flow Definition

NAME	VERSION
workshop001-syslog-to-kafka	1

Target Environment

NAME
aws workshop-asean

6. In the NiFi Configuration screen, click **Next**.

The screenshot shows the 'NiFi Configuration' screen at step 2. It displays the NiFi Runtime Version (CURRENT VERSION: Latest Version (1.20.0.2.3.8.1-1)) and an informational message about compatibility with the Cloudera DataFlow and CDP Runtime support matrix. It also shows settings for Autostart Behavior (Automatically start flow upon successful deployment checked) and Inbound Connections (Allow NiFi to receive data unchecked). The 'Next' button is highlighted with a red box.

NiFi Configuration

NiFi Runtime Version
CURRENT VERSION
Latest Version (1.20.0.2.3.8.1-1)
Change Version

Review the Cloudera DataFlow and CDP Runtime support matrix to ensure the selected NiFi Runtime Version is compatible.

Autostart Behavior
 Automatically start flow upon successful deployment

Inbound Connections
 Allow NiFi to receive data

Custom NAR Configuration
 This flow deployment uses custom NARs

Cancel ← Previous **Next →**

7. Add the Flow Parameters as below, then click **Next**.

- **CDP Workload User** - The workload username for the current user
 - Example : user0xx
- **CDP Workload Password** - The workload password for the current user
Cloudera@2023
- **Filtre Rule** - SELECT * FROM FLOWFILE
- **Kafka Broker Endpoint** - A comma separated list of Kafka Brokers.

[Obtained in Lab 0, section 4]

Example:

aws-workshop-kl-streams-mess-corebroker2.aws-work.oldk-i9ly.a4.cloudera.site:9093,aws-workshop-kl-streams-mess-corebroker1.aws-work.oldk-i9ly.a4.cloudera.site:9093,aws-workshop-kl-streams-mess-corebroker0.aws-work.oldk-i9ly.a4.cloudera.site:9093

- **Kafka Destination Topic** - <username>-syslog (Ex: user0xx-syslog)
- **Kafka Producer ID** - nifi_dfx_p1
- **Schema Name** - <username>-syslog (Ex: user0xx-syslog)
- **Schema Registry Hostname** - The hostname of the master server in the Kafka Datahub (aws-workshop-kl-streams-mess)[Refer screenshot below]

The screenshot shows the Cloudera Manager interface for the 'Data Hubs / kafka-smm-cluster / Nodes' section. The node 'kafka-smm-cluster' is highlighted with a red box. Below it, the node details are shown: Status (Running), Nodes (4), Created At (04/20/23, 11:33 AM GMT+5:30), Cluster Template (7.2.16 - Streams Messaging Light Duty: Apache Kafka, Schema Registry, Streams Messaging Manager, Streams Replication Manager, Cruise Control). The 'Status Reason' indicates 'Cluster started'. Under 'Environment Details', it shows the AWS environment (NAME: pko-hands-on-workshop-env, DATA LAKE: pko-workshop-dl, CREDENTIAL: pko-hands-on-workshop-cred, REGION: ap-south-1, AVAILABILITY ZONE: N/A). The 'Services' section includes CM-UI, Schema Registry, Streams Messaging Manager, and Token Integration. The 'Cloudera Manager Info' section shows the CM URL (https://kafka-smm-cluster-gateway.pko-hand.dp5i-Svkq.cloudera.site/kafka-smm-cluster/cdpsync/conf/home/), CM VERSION (7.9.0), RUNTIME VERSION (7.2.16-1.cdh7.2.16.p2.38683602), and LOGS (Command logs, Service logs). The 'Nodes' tab is selected. In the 'Master' section, the node 'kafka-smm-cluster-master0.pko-hand.dp5i-Svkq.cloudera.site' is highlighted with a red box. The 'Broker' section shows other nodes: 'i0db4b6eff7be50080' (Status: Running).

Example:

aws-workshop-kl-streams-mess-master0.aws-work.oldk-i9ly.a4.cloudera.site

Parameters

Data entered here never leaves the environment in your cloud account.
Provide parameter values directly in the text input or upload a file for
parameters that expect a file.

 The selected flow definition references an external Default NiFi SSL Context Service. Hence, DataFlow will automatically create a matching SSL Context Service with a keystore and truststore generated from the target environment's FreeIPA certificate.

SHOW: Sensitive No value

syslog-to-kafka (8)

CDP Workload User  11/100K

workshop001

CDP Workload User Password  13/100K

Filter Rule  22/100K

SELECT * FROM FLOWFILE

Kafka Broker Endpoint  233/100K

workshop-asean-streams-mess-corebroker2.workshop.dp5i-5vkq.cloudera.site:9093,workshop-asean-streams-mess-corebroker0.workshop.dp5i-5vkq.cloudera.site:9093,workshop-asean-streams-mess-corebroker1.workshop.dp5i-5vkq.cloudera.site:9093

Kafka Destination Topic  18/100K

workshop001-syslog

Kafka Producer ID  11/100K

nifi_dfx_p1

Schema Name  18/100K

workshop001-syslog

Schema Registry Hostname  68/100K

workshop-asean-streams-mess-master0.workshop.dp5i-5vkq.cloudera.site

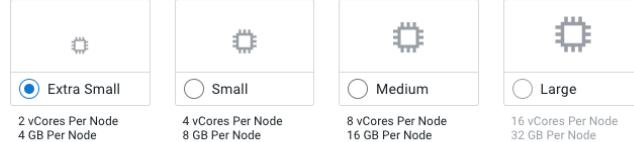
8. On the next page, define the Sizing and Scaling as follows, then click **Next**.

- **Size:** Extra Small
- **Enable Auto Scaling:** True
- **Min Nodes:** 1
- **Max Nodes:** 3

Sizing & Scaling

Select the NiFi node size and the number of nodes provisioned for your flow.

NiFi Node Sizing ?



Number of NiFi Nodes

Auto Scaling ?

Enabled

Min. Nodes - Max. Nodes

9. Skip the KPI page by clicking **Next** and Review your deployment. Then Click **Deploy**.

The screenshot shows the 'Review' step of a deployment process. It displays the following information:

- Overview:**
 - FLOW DEFINITION: mmehra_test v.1
 - ENVIRONMENT DEPLOYING TO: pko-hands-on-workshop-env
 - DEPLOYMENT NAME: mmehra_test
- NiFi Configuration:**
 - NIFI RUNTIME VERSION: Latest Version (1.20.0.2.3.8.1-1)
 - AUTO-START FLOW: Yes
 - INBOUND CONNECTIONS: No
 - CUSTOM NAR CONFIGURATION: No
- Parameters:**

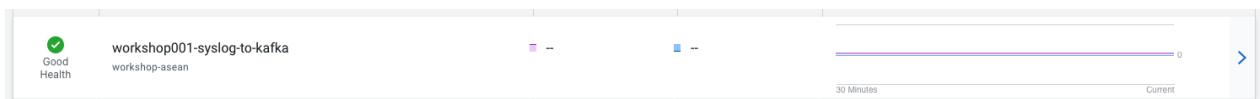
```

syslog-to-kafka
CDP WORKLOAD USER
host_mmehra
CDP WORKLOAD USER PASSWORD
[Sensitive Value Provided]
FILTER RULE
SELECT * FROM FLOWFILE
KAFKA BROKER ENDPOINT
kafka-smm-cluster-corebroker1.pko-hand.dp5i-5vkq.cloudera.site:9093,kafka-smm-cluster-corebroker0.pko-
hand.dp5i-5vkq.cloudera.site:9093,kafka-smm-cluster-corebroker2.pko-hand.dp5i-5vkq.cloudera.site:9093
KAFKA DESTINATION TOPIC
mmehra_test

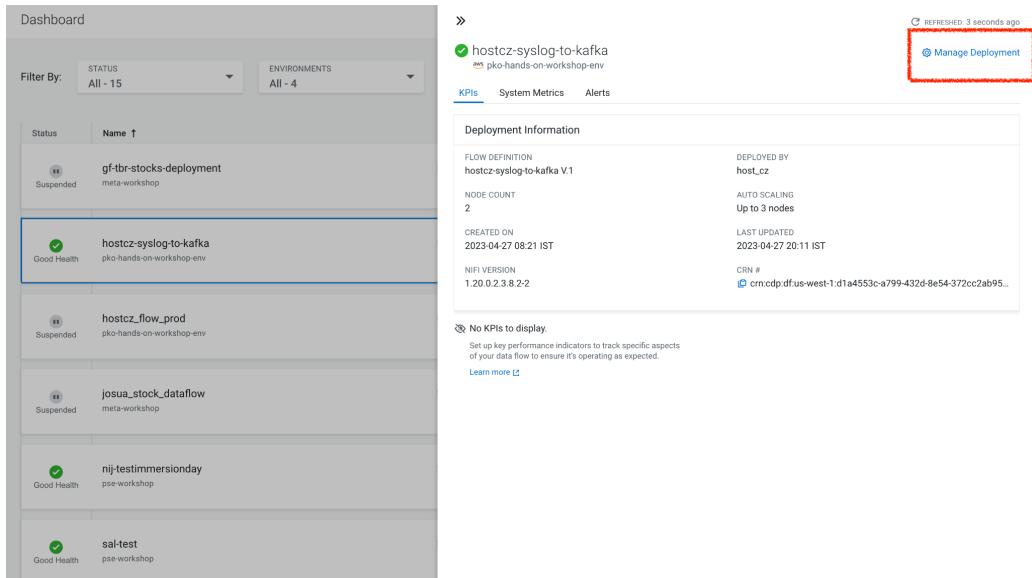
```

At the bottom right, there are three buttons: 'Cancel', '< Previous', and a large blue button with a cloud icon labeled 'Deploy'. The 'Deploy' button is highlighted with a red rectangle.

10. Proceed to the CDF-PC Dashboard and wait for your flow deployment to complete, which might take a few minutes. A Green Check Mark will appear once complete, which might take a few minutes.



11. Click into your deployment and then Click **Manage Deployment** on the top right to view your flow in NiFi.



The screenshot shows the NiFi Dashboard interface. On the left, a list of deployments is displayed:

- gf-tbr-stocks-deployment (Suspended, meta-workshop)
- hostcz-syslog-to-kafka** (Good Health, pko-hands-on-workshop-env) - This deployment is selected and highlighted with a blue border.
- hostcz_flow_prod (Suspended, pko-hands-on-workshop-env)
- josua_stock_dataflow (Suspended, meta-workshop)
- nij-testimmersionday (Good Health, pse-workshop)
- sai-test (Good Health, pse-workshop)

On the right, detailed information for the selected deployment is shown:

- KPIs** (highlighted with a red box)
- System Metrics**
- Alerts**

Deployment Information (for hostcz-syslog-to-kafka V.1):

- FLOW DEFINITION: hostcz-syslog-to-kafka V.1
- DEPLOYED BY: host_cz
- NODE COUNT: 2
- AUTO SCALING: Up to 3 nodes
- CREATED ON: 2023-04-27 08:21 IST
- LAST UPDATED: 2023-04-27 20:11 IST
- NIFI VERSION: 1.20.0-2.3.8-2-2
- CRN #: crn:cdp:df:us-west-1:d1a4553c-a799-432d-8e54-372cc2ab95...

No KPIs to display. Set up key performance indicators to track specific aspects of your data flow to ensure it's operating as expected. [Learn more](#)

Now click on **ACTIONS** and select **View in NiFi**

[← Back to Deployment Details](#)

Deployment Manager

STATUS Good Health	DEPLOYMENT NAME hostcz-syslog-to-kafka	FLOW DEFINITION hostcz-syslog-to-kafka V.1	DEPLOYED BY host_cz
NODE COUNT 2	AUTO SCALING Up to 3 nodes	CREATED ON 2023-04-27 08:21 IST	LAST UPDATED 2023-04-27 20:11 IST
ENVIRONMENT pko-hands-on-workshop-env	REGION Asia Pacific (Mumbai)	NIFI RUNTIME VERSION 1.20.0.2.3.8.2-2	CRN # crn:cnp:df:us-wes

[Actions ▾](#)

- View in NiFi
- Suspend flow
- Change NiFi Runtime Version
- Restart Deployment
- Terminate

[Recreate Deployment CLI Command](#)

Deployment Settings

KPIs and Alerts Sizing and Scaling Parameters NiFi Configuration

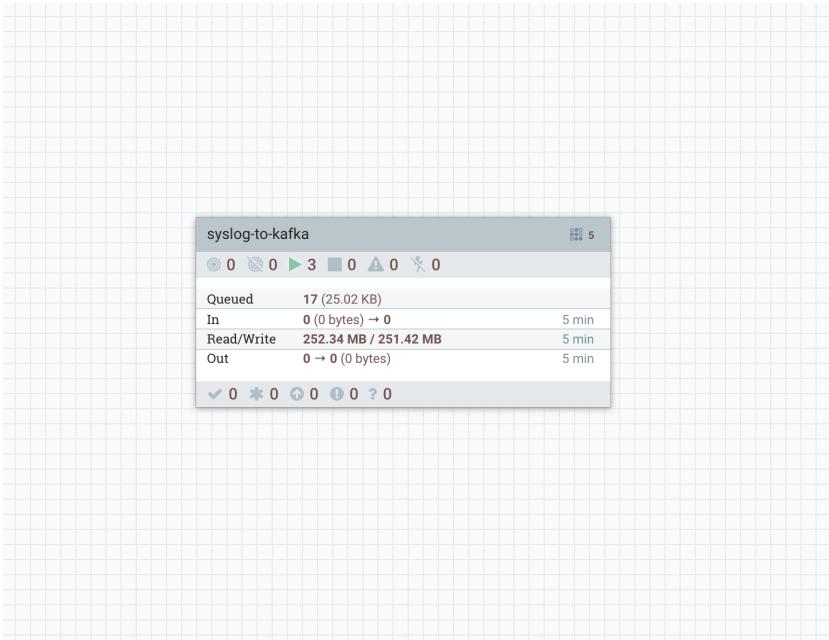
Key Performance Indicators

Set up KPIs to track specific performance metrics of a deployed flow. Click and drag to reorder how they are displayed.

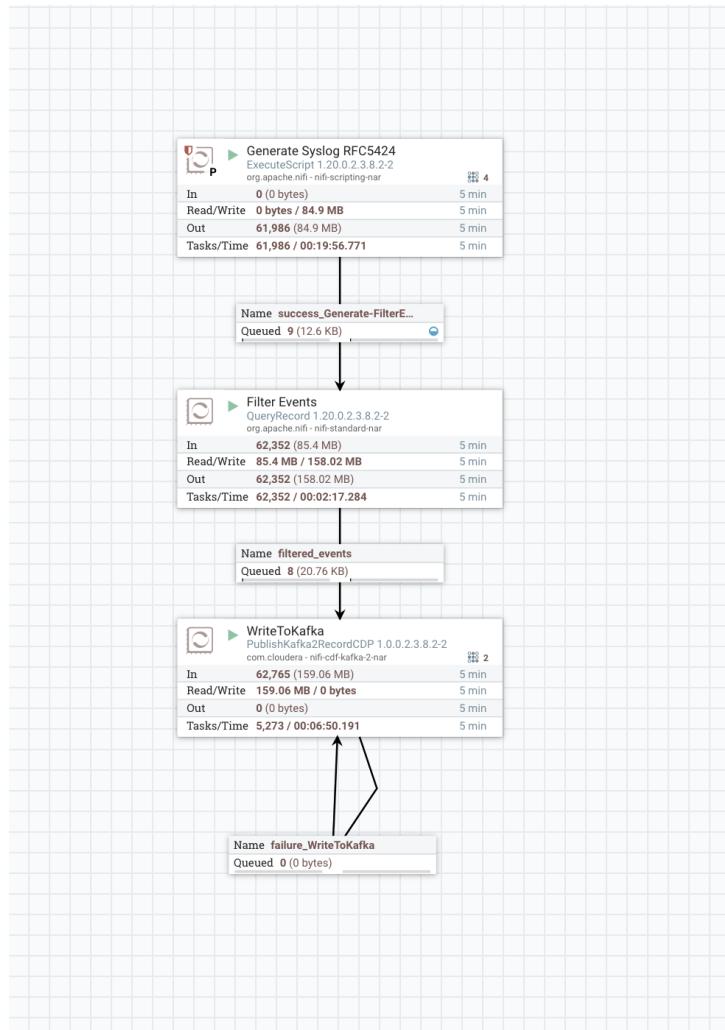
[Learn more ↗](#)

[Add New KPI](#)

The flow that you just deployed will look something like this on NiFi



Double click on the Process Group to see the flow



Lab 4 : SQL Stream Builder

1. Overview

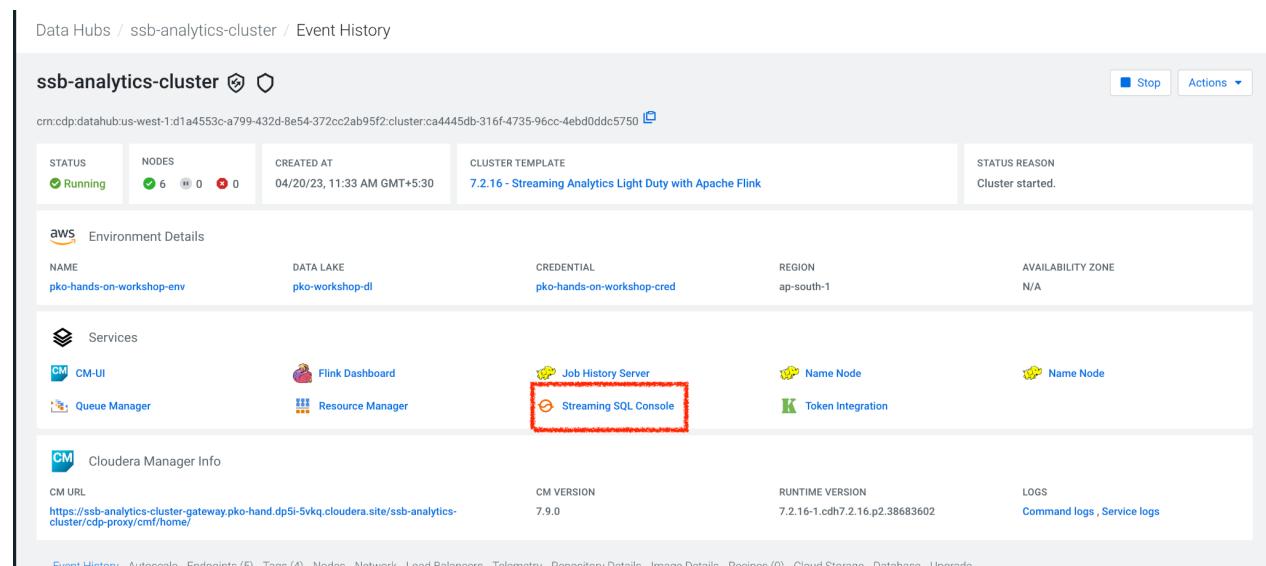
The purpose of this workshop is to demonstrate streaming analytic capabilities using Cloudera SQL Stream Builder. We will leverage the NiFi Flow deployed in CDF-PC from the previous lab and demonstrate how to query live data and subsequently sink it to another location. The SQL query will leverage the existing syslog schema in Schema Registry.

2. Creating a Project

Step 1: Go to the SQL Stream Builder UI

SSB Interface can be reached from the Data Hub that is running the Streams Analytics, in our case - `ssb-analytics-cluster`

Within the Data Hub, click on **Streaming SQL Console**



The screenshot shows the Data Hub interface for the `ssb-analytics-cluster` cluster. At the top, there's a navigation bar with links for Data Hubs, `ssb-analytics-cluster`, and Event History. Below the navigation is a cluster summary card with the following details:

STATUS	NODES	CREATED AT	CLUSTER TEMPLATE	STATUS REASON
Running	6 / 0	04/20/23, 11:33 AM GMT+5:30	7.2.16 - Streaming Analytics Light Duty with Apache Flink	Cluster started.

Below the summary card, there are sections for AWS Environment Details and Services. The Services section includes links for CM-UI, Flink Dashboard, Job History Server, Name Node, Token Integration, Queue Manager, Resource Manager, and Streaming SQL Console. The `Streaming SQL Console` link is highlighted with a red box. At the bottom, there's a Cloudera Manager Info section with a CM URL, CM Version (7.9.0), Runtime Version (7.2.16-1.cdh7.2.16.p2.38683602), and Logs (Command logs, Service logs). The footer contains links for Event History, Autoscale, Endpoints (5), Tasks (4), Nodes, Network, Load Balancers, Telemetry, Repository Details, Image Details, Recipes (0), Cloud Storage, Database, and Uninstall.

The screenshot shows the 'Projects' page in the Cloudera Streaming SQL Console. On the left, there's a sidebar with a 'Projects' icon. The main area has a header 'Projects' with a 'Session' button. Below it is a 'My Projects' section with a search bar and a table. The table has columns 'Name', 'ID', and 'MV Prefix'. It lists 'ssb_default' (Active, Default Team) with ID 'fffffff' and 'Open' and 'Delete' buttons, and 'host_mmehra_default' (host_mmehra's Team) with ID '422a48de' and a 'Switch' button. To the right is a 'My Invitations' section with a message 'You don't have any invitations'.

Step 2: Creation of a Project

Create a SSB Project by clicking “**New Project**” using the following details and click “**Create**”

Name : {user-id}_hol_workshop

Description : SSB Project to analyze streaming data

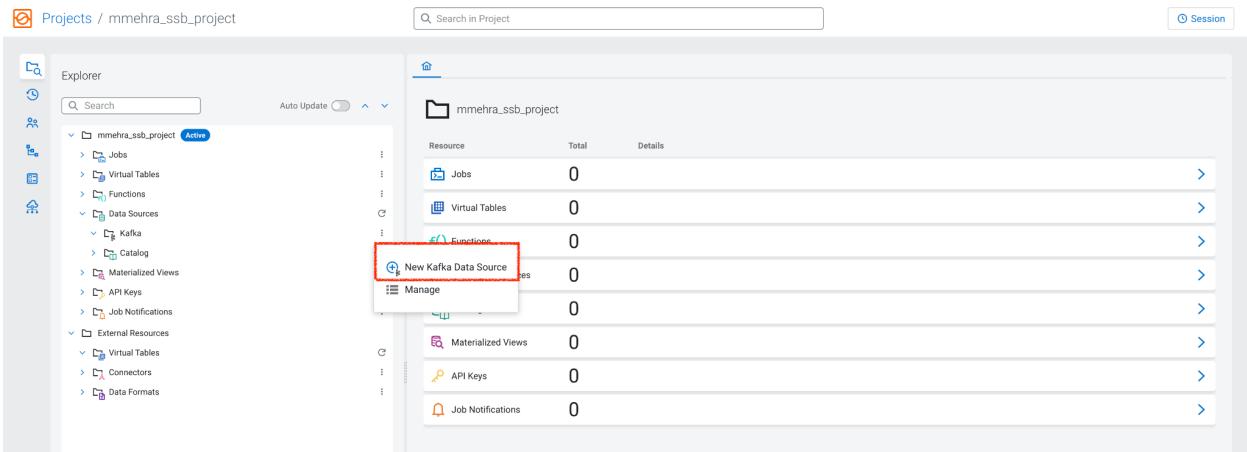
The screenshot shows the 'Create Project' dialog. It has a 'Name *' field containing 'hostmm_hol_workshop', a 'Description' field containing 'SSB Project to analysis streaming data', and a note 'Override Materialized View Table Name Prefix ⓘ'. Under 'Source Settings', there's a 'Clone URL' field with 'https://github.com/cloudera/ssb-examples.git' and a 'Branch' field with 'main'. At the bottom, there are two toggle switches: 'Allow deletions on import' (on) and 'Authentication' (off). The 'Create' button at the bottom right is highlighted with a red box.

Switch to the created project. Click on **Switch**

The screenshot shows the details for the 'hostmm_hol_workshop' project. It displays the project name, description, ID '95d4615b', and a 'Switch' button. The 'Switch' button is highlighted with a red box.

Step 3 : Create Kafka Data Store

Create Kafka Data Store by selecting “**Data Sources**” in the left pane, clicking on the three-dotted icon next to “**Kafka**”, then selecting “**New Kafka Data Source**”.



Name : {user-id}_cdp_kafka

Brokers (Comma-separated List)

workshop-asean-streams-mess-corebroker2.workshop.dp5i-5vkq.cloudera.site:9093,workshop-asean-streams-mess-corebroker0.workshop.dp5i-5vkq.cloudera.site:9093,workshop-asean-streams-mess-corebroker1.workshop.dp5i-5vkq.cloudera.site:9093

Protocol : SASL/SSL

SASL Username :

<workload-username>

Example : workshop001

SASL Password : <Set in Lab

0 Section 3> P@ssw0rd@2023

SASL Mechanism : PLAIN

A screenshot of the 'Kafka Data Source' configuration dialog. It has fields for Name (njay-demo-ssb-kafka-ds), Brokers (Comma-separated List) containing 'njay-demo-kafka-corebroker2.njay-dem.a465-9q4k.cloudera.site:9093,njay-demo-kafka-corebroker1.njay-dem.a465-9q4k.cloudera.site:9093,njay-demo-kafka-corebroker0.njay-dem.a465-9q4k.cloudera.site:9093', Protocol (SASL/SSL), Kafka TrustStore (Optional) set to '/var/lib/cloudera-scm-agent/agent-cert/cm-auto-global_truststore.jks', and SASL Mechanism (PLAIN). Red arrows point from the text descriptions to the corresponding configuration fields in the dialog.

SASL Mechanism

PLAIN

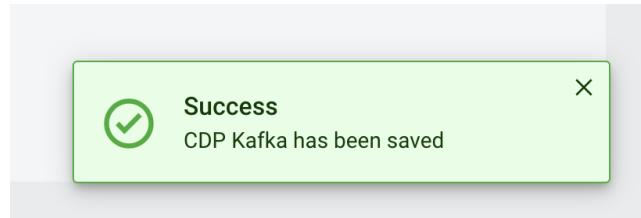
SASL Username

njayakumar

SASL Password

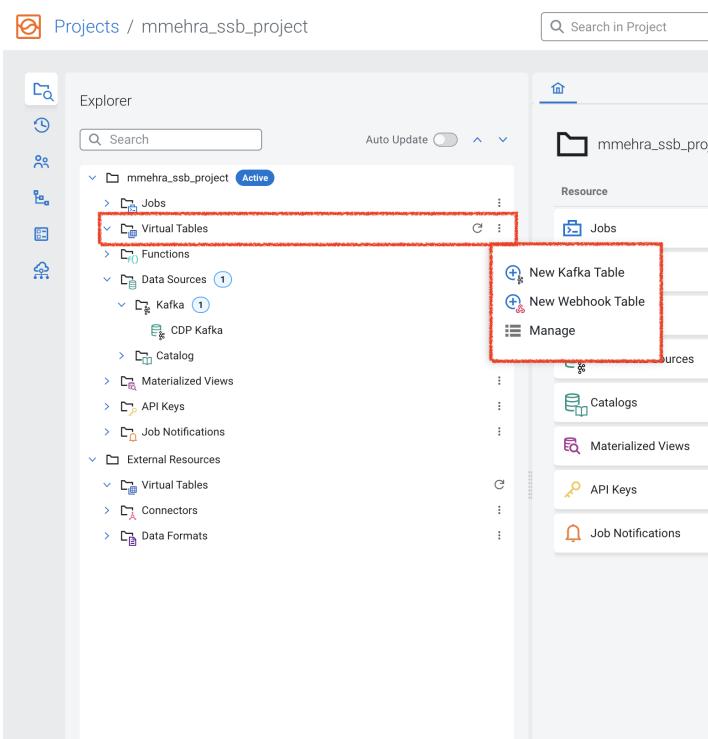
..... 

Click on **VALIDATE** to test the connections once successful click on **CREATE**



Step 4: Create Kafka Table

Create Kafka Table, by selecting “**Virtual Tables**” in the left pane, clicking on the three-dotted icon next to it, then clicking on “**New Kafka Table**”.



Step 5: Configure the Kafka Table

1. Enter the following details in the Kafka Table dialog box:
 - Table Name: **{user-id}_syslog_data**
 - Kafka Cluster: <select the Kafka data source you created previously>
 - Data Format: **JSON**
 - Topic Name: <select the topic created in Schema Registry>

Kafka Table

Table Name *	workshop001_syslog_data
Kafka Cluster *	workshop001_cdp_kafka
Data Format *	JSON
Topic Name *	workshop001 syslog

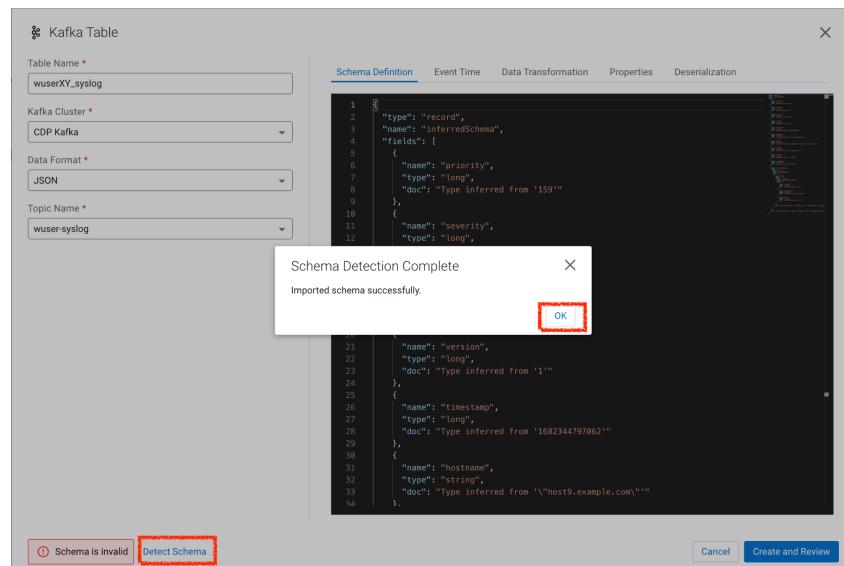
Schema Validation: (✓) Schema is valid Detect Schema

- When you select Data Format as AVRO, you must provide the correct Schema Definition when creating the table for SSB to be able to successfully process the topic data.

For JSON tables, though, SSB can look at the data flowing through the topic and try to infer the schema automatically, which is quite handy at times. Obviously, there must be data in the topic already for this feature to work correctly.

Note: SSB tries its best to infer the schema correctly, but this is not always possible and sometimes data types are inferred incorrectly. You should always review the inferred schemas to check if it's correctly inferred and make the necessary adjustments.

Since you are reading data from a JSON topic, go ahead and click on **Detect Schema** to get the schema inferred. You should see the schema be updated in the **Schema Definition** tab.



- You will also notice that a "Schema is invalid" message appears upon the schema detection. If you hover over the message it shows the reason:

The schema contains a column called 'timestamp'. This is a reserved word used for Kafka internal timestamps. Disable Kafka Timestamps in the Event Time tab, or remove the 'timestamp' column from the schema.

 Schema is invalid

[Detect Schema](#)

You will fix this in the next step.

4. Each record read from Kafka by SSB has an associated timestamp column of data type TIMESTAMP ROWTIME. By default, this timestamp is sourced from the internal timestamp of the Kafka message and is exposed through a column called eventTimestamp.

However, if your message payload already contains a timestamp associated with the event (event time), you may want to use that instead of the Kafka internal timestamp.

In this case, the syslog message has a field called "**timestamp**" that contains the timestamp you should use. You want to expose this field as the table's "**event_time**" column. To do this, click on the Event Time tab and enter the following properties:

- Use Kafka Timestamps: **Disable**
- Input Timestamp Column: **timestamp**
- Event Time Column: **event_time**
- Watermark Seconds: **3**

 Kafka Table X

Table Name *

Kafka Cluster *

Data Format *

Topic Name *

[Schema Definition](#) [Event Time](#) [Data Transformation](#) [Properties](#)

Input Timestamp Column

Event Time Column

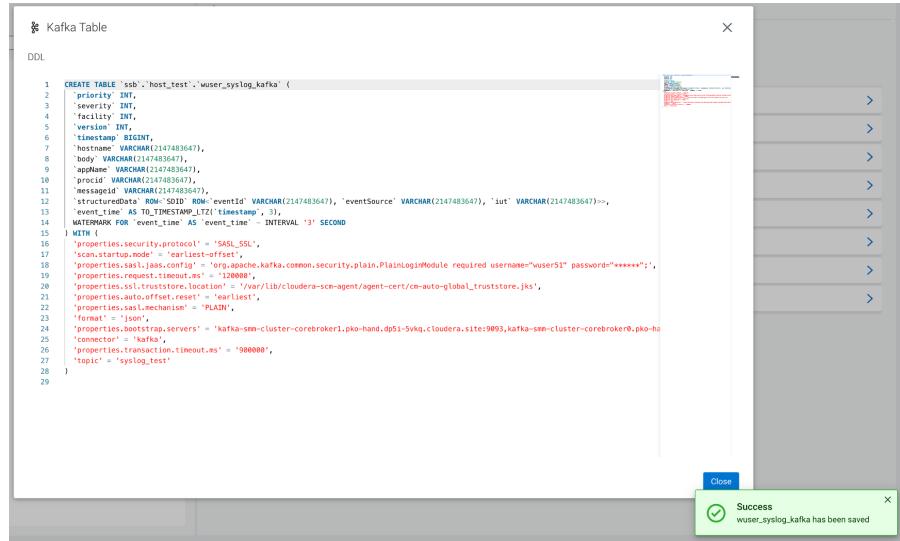
Watermark Seconds

Use Kafka Timestamps

5. Now that you have configured the event time column, click on **Detect Schema** again. You should see the schema turn valid:

 Schema is valid

6. Click the **Create and Review** button to create the table.



The screenshot shows a 'Kafka Table' editor window with the title 'Kafka Table'. The main area displays the DDL code for creating a table named 'wuser_syslog_kafka'. The code includes columns for priority, severity, facility, version, timestamp, host, host_ip, appname, procid, message_id, event_id, event_time, and a watermark. A success message at the bottom right indicates 'Success wuser.syslog.kafka has been saved'.

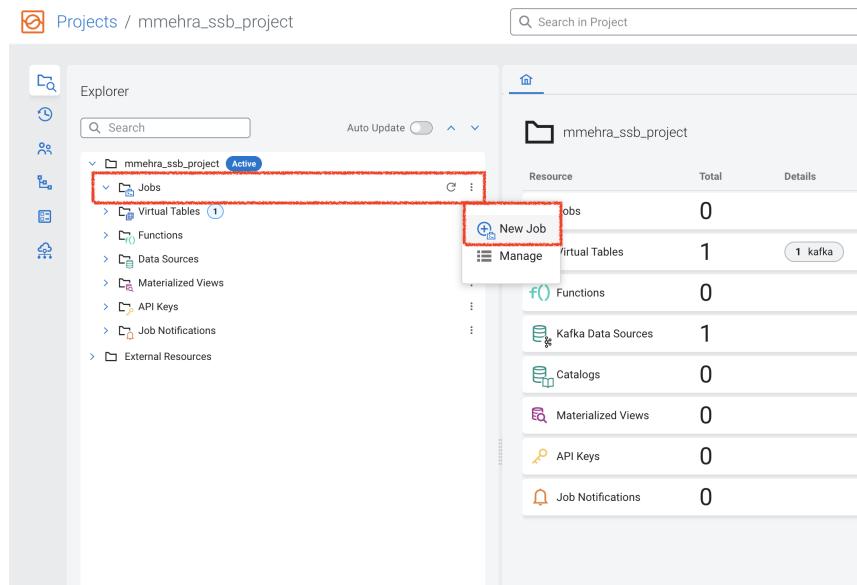
```

CREATE TABLE `ssb`.`host_test`.`wuser_syslog_kafka` (
  `priority` INT,
  `severity` INT,
  `facility` INT,
  `version` INT,
  `timestamp` BIGINT,
  `host` VARCHAR(255),
  `host_ip` VARCHAR(255),
  `appname` VARCHAR(255),
  `procid` VARCHAR(255),
  `message_id` VARCHAR(255),
  `event_id` VARCHAR(255),
  `event_time` AS TO_TIMESTAMP_LTZ(`timestamp` - INTERVAL '3' SECOND)
  WITH (
    properties.security.protocol = 'SSL',
    `scn.startup.node` = 'earliest-offset',
    `properties.sasl.jaas.config` = 'org.apache.kafka.common.security.plain.PlainLoginModule required username="wuser51" password="*****";',
    `properties.read.timeout.ms` = '120000',
    `properties.truststore.location` = '/etc/cloudera-scm-agent/conf/cm-auto-global_truststore.jks',
    `properties.auto.offset.reset` = 'earliest',
    `properties.sasl.mechanism` = 'PLAIN',
    `format` = 'json',
    `properties.bootstrap.servers` = 'kafka-smn-cluster-corebroker0,pko-hand-dp51-SVKA,cloudera-site:9092,kafka-smn-cluster-corebroker0,pko-h',
    `connector` = 'kafka',
    `properties.transaction.timeout.ms` = '900000',
    `topic` = 'syslog_test'
  )
  
```

Review the table's DDL and click **Close**.

Step 6: Create a Flink Job

Create a Flink Job, by selecting “**Jobs**” in the left pane, clicking on the three-dotted icon next to it, then clicking on “**New Job**”.



Give a job name and click **CREATE**

Create New Job

Job Name *

[Generate Job Name](#)

[Create](#)

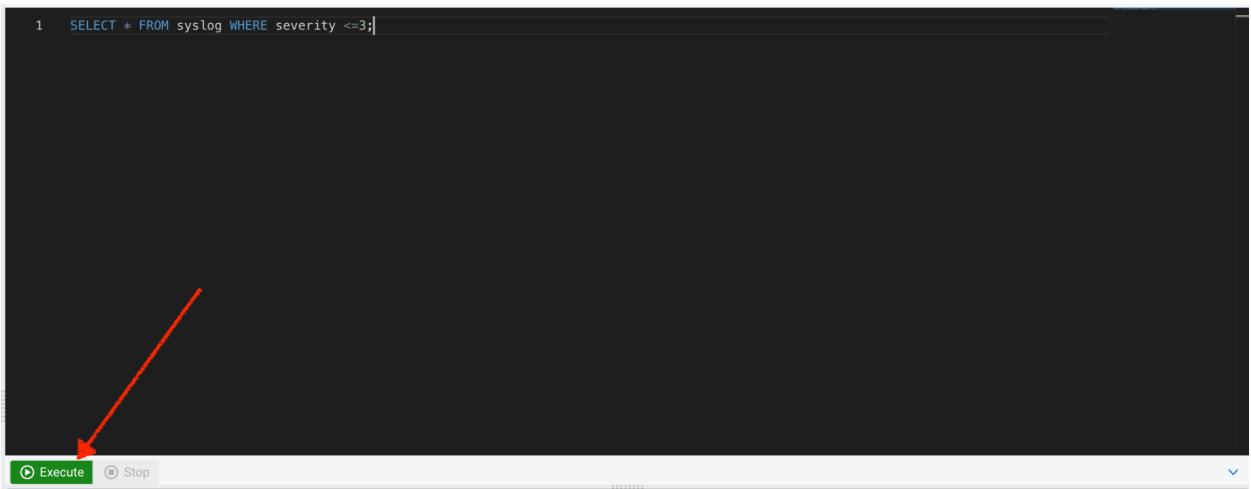
The Query Editor should now show up

Add the following SQL Statement in the Editor

```
SELECT * FROM {user-id}_syslog_data WHERE severity <=3
```

NOTE : Replace {user-id} with your assigned username

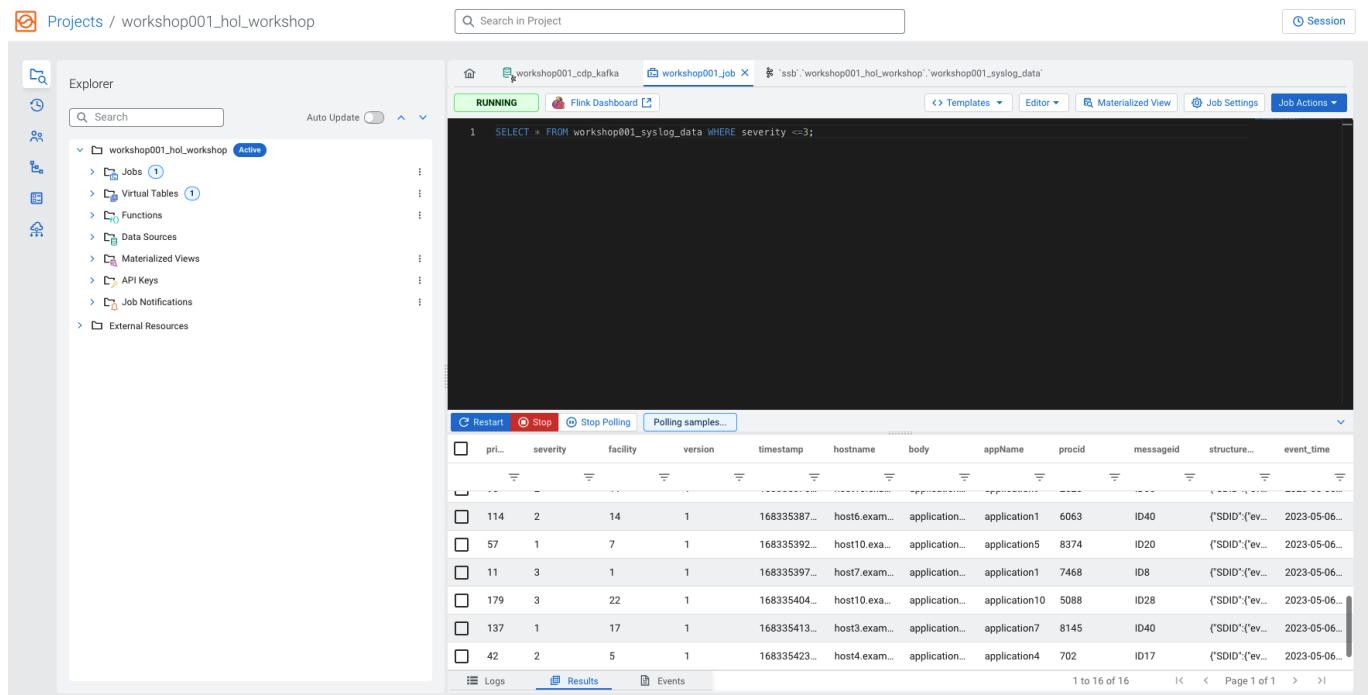
Run the Streaming SQL Job by clicking **Execute**. Also, ensure your {user_id}-syslog-to-kafka flow is running in CDF-PC.



```
1  SELECT * FROM syslog WHERE severity <=3;
```

Execute Stop

In the Results tab, you should see syslog messages with severity levels ≤ 3



Projects / workshop001_hol_workshop

Search in Project

Session

Explorer

Auto Update

RUNNING

Restart Stop Stop Polling Polling samples...

pri...	severity	facility	version	timestamp	hostname	body	appName	procid	messageId	structure...	event_time
114	2	14	1	168335387...	host6.exam...	application...	application1	6063	ID40	{"\$ID": "event_1"},	2023-05-06...
57	1	7	1	168335392...	host10.exa...	application...	application5	8374	ID20	{"\$ID": "event_2"},	2023-05-06...
11	3	1	1	168335397...	host7.exam...	application...	application1	7468	ID8	{"\$ID": "event_3"},	2023-05-06...
179	3	22	1	168335404...	host10.exa...	application...	application10	5088	ID28	{"\$ID": "event_4"},	2023-05-06...
137	1	17	1	168335413...	host3.exam...	application...	application7	8145	ID40	{"\$ID": "event_5"},	2023-05-06...
42	2	5	1	168335423...	host4.exam...	application...	application4	702	ID17	{"\$ID": "event_6"},	2023-05-06...

Logs Results Events

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