

# Starburst + Collibra

## *Data Products Integration v1.0.0*

(Python)

|                                  |   |
|----------------------------------|---|
| <b>Name</b>                      | Starburst to Collibra Data Products Integration   |
| <b>Category</b>                  | Integration   |
| <b>Short Description</b>         | A Jupyter notebook that automatically brings business metadata for Starburst Data Products and Data Domains into Collibra and then links that metadata to the appropriate data sets (views and/or materialized views) in Collibra that have been ingested through the Starburst driver. |
| <b>Use Case</b>                  | Increase the visibility and usability of Starburst Data Products in Collibra.   |
| <b>Target Audience</b>           | <ul style="list-style-type: none"><li>• Data Architects</li><li>• Data Engineers</li><li>• Business Analysts</li><li>• Data Analysts</li><li>• Data Scientists</li></ul>  |
| <b>Who can set it up</b>         | Integration Engineer  |
| <b>Target Business Functions</b> | Any   |
| <b>Target Industries</b>         | Any   |
| <b>License Requirements</b>      | <ul style="list-style-type: none"><li>• Collibra Platform</li><li>• Collibra Catalog</li><li>• Starburst Enterprise</li></ul>   |
| <b>Dependencies</b>              | <ul style="list-style-type: none"><li>• Collibra Platform v2021+</li><li>• Starburst Enterprise 380-e LTS+</li><li>• Python 3.9+</li><li>• Jupyter Notebook</li></ul>   |
| <b>Developer</b>                 | Collibra, Starburst   |
| <b>License</b>                   | <a href="#">Binary Code License Agreement</a>   |

|  |           |
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# Overview

A [Starburst data product](#) is a schema that contains one or more data sets, which are represented as views and/or materialized views in the data source where they are located. The [Starburst JDBC driver in the Collibra Marketplace](#) will automatically ingest the following metadata for each Starburst data product:

- Schema name
- Data set name
  - Name of each column in the data set
  - Datatype for each column in the data set

The Starburst JDBC driver does not ingest the following metadata for Starburst data products:

- Data product name
- Data product summary
- Data product description
- Data domain
- Catalog (the data source where the data sets are located)
- Data product owners
- Tags
- SQL query used to create each data set

This integration will do the following:

- Create assets in Collibra for each published data product in Starburst
- Create assets for each domain the data products are associated with
- Extract the aforementioned data products metadata from Starburst
- Add the metadata to the corresponding assets in Collibra
- Link the data domain asset to the appropriate data product asset
- Link the data product asset to the appropriate data sets

# Requirements

To use this integration, you must meet the following requirements:

- Valid license for Collibra Integration Cloud, Collibra Catalog and Starburst Enterprise
- Collibra Integration Cloud v2021+
- Starburst Enterprise 380-e LTS+
- Python 3.9+
- Jupyter Notebook
- Collibra CMA file containing the required operating model

# Constraints

This integration has the following constraints:

## **Starburst**

- The integration is only supported for Starburst Enterprise at this time and is not supported for Starburst Galaxy.
- Only **published** data products in Starburst Enterprise will be ingested into Collibra. Data products that are in draft status will not be ingested.
- Changes made to data domain and data product assets in Collibra will not be reflected in Starburst Enterprise. Any changes that need to be made on data domains or data products should be made in Starburst Enterprise and then brought into Collibra via this integration.

## **Collibra**

- The integration is only supported for Collibra Integration Cloud.
- Requires Collibra Edge Catalog to ingest metadata using the certified Starburst JDBC driver found on the Collibra Marketplace.
- Create Data Domain and Data Product pulled from Starburst and then enrich the metadata created from the previous bullet.
- Associated Dataset of Starburst Data Products are treated as Views and Materialized Views are represented as Database View and Table, respectively, by Collibra.
- Collibra does not currently support spaces in tags, so any spaces in tags that exist in Starburst will be replaced with underscores ('\_') when ingested into Collibra.

# Installation

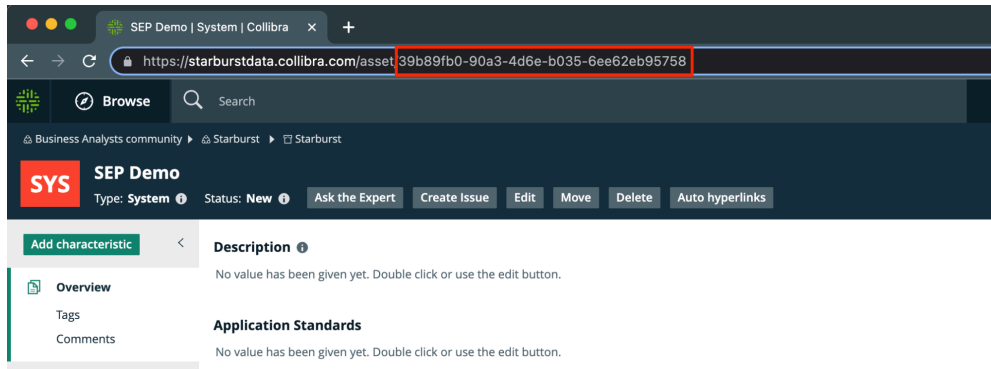


**Python Version:** Use Python 3.9+. Some dependencies in the Jupyter notebook might not be supported if the version is not met.

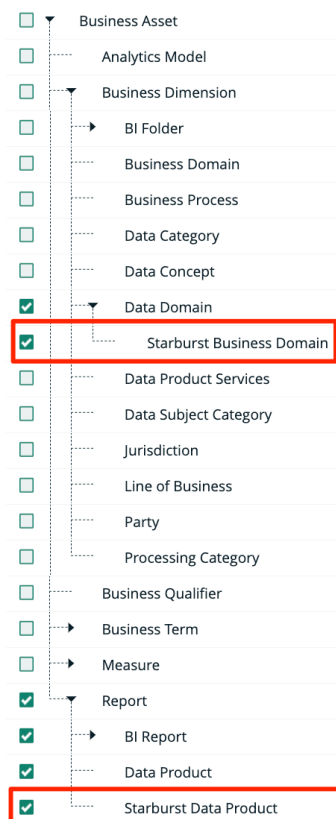
## Prerequisites

- Install Python 3.9+
- Install PIP (Python packages installer)
- Download files from the [starburst-collibra/data\\_products GitHub repo](#)
  - requirements.txt
  - collibra\_starburst\_dataproducts.ipynb
  - helper.py
  - cma/starburst\_collibra\_integration-x.x.x.cma
- You have connected Collibra to your Starburst Enterprise cluster using the Starburst JDBC driver to pull metadata
- You have run metadata extraction for the data sources and schemas where your Starburst data products are located
- You have the URL for your Starburst Enterprise instance
- You have the URL for your Collibra Cloud instance
- Your Starburst Enterprise user must have read access to the data sources and schemas where the data products are located
  - If your Starburst Enterprise cluster has [BIAC](#) enabled, be sure to have the name of the [role](#) with the appropriate permissions
- Your Collibra Cloud user must have admin access or at least permission to create and update assets in a Domain

- The ID of the system asset you created for the connection to your Starburst Enterprise cluster. This ID can be found at the end of the URL on the catalog page for the system in the Collibra DGC.



- Add “Starburst Business Domain” and “Starburst Data Product” to the scope for the asset types that are searchable in the Data Marketplace in Collibra (Settings > Scopes > Data Marketplace).




# Install Python on your preferred OS (Unix/Windows) or environment

Refer to this [link](#) to download Python for the operating system of your choice.

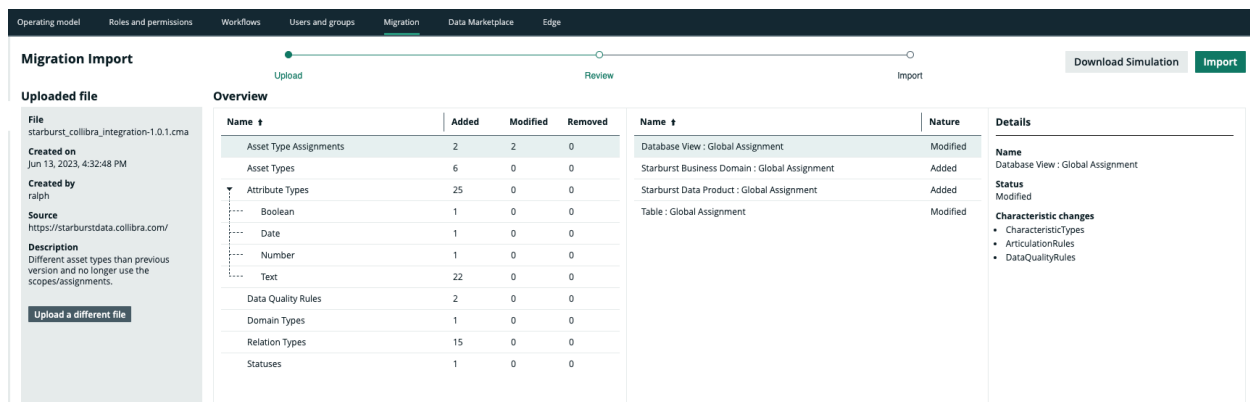
## Install PIP - Python Packages Installer

PIP is a python packages installer that is required in order to install modules specified in the Jupyter notebook. Instructions for installing PIP in your preferred OS can be found [here](#).

## Upload the CMA Migration File to Install the Operating Model

 Remember to run the updated CMA file if you are upgrading from a previous version of the code. If there are any specific errors on the attribute and relation types associated with the Starburst asset types, try to delete it manually then import the CMA again.

To create the operating model dependencies, login to the Collibra DGC and then import the CMA file found in the [CMA folder in the GitHub repository](#). Follow the [Import model objects](#) in the Collibra documentation to import the CMA file. After importing the CMA file, you should see the following summary in Collibra DGC.




The screenshot shows the 'Migration Import' interface in Collibra DGC. The 'Overview' tab is active, displaying a table of imported items. The table has columns for Name, Added, Modified, and Removed. The items are categorized by Name and Nature.

| Name                   | Added | Modified | Removed |
|------------------------|-------|----------|---------|
| Asset Type Assignments | 2     | 2        | 0       |
| Asset Types            | 6     | 0        | 0       |
| Attribute Types        | 25    | 0        | 0       |
| Boolean                | 1     | 0        | 0       |
| Date                   | 1     | 0        | 0       |
| Number                 | 1     | 0        | 0       |
| Text                   | 22    | 0        | 0       |
| Data Quality Rules     | 2     | 0        | 0       |
| Domain Types           | 1     | 0        | 0       |
| Relation Types         | 15    | 0        | 0       |
| Statuses               | 1     | 0        | 0       |

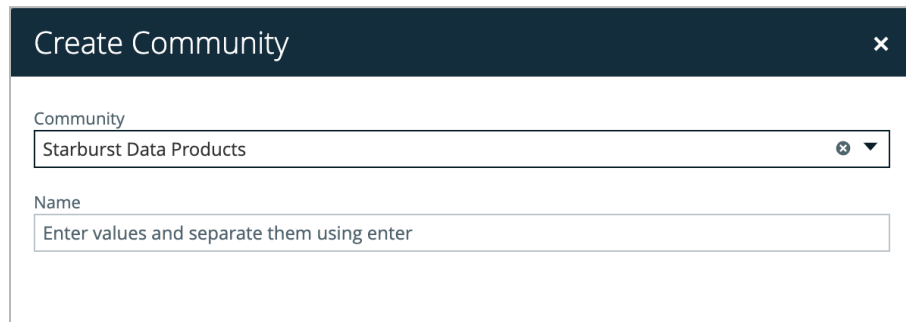
The 'Details' tab is also visible, showing the 'Database View : Global Assignment' with a 'Status' of 'Modified'. The 'Characteristic changes' section lists 'CharacteristicTypes', 'ArticulationRules', and 'DataQualityRules'.

To see the full list of new items that should be imported with the CMA file, refer to the “Added Resources” tab in the **starburst\_collibra-integration-x.x.x\_import\_simulation.xlsx** file found in the [CMA folder in the GitHub repository](#).

 If the numbers from your import overview do not match the screenshot above, then it is likely that some of new items in the CMA file are already in your Collibra environment. To confirm, compare the items in the “Added Resources” tab to the operating model in your Collibra environment.

## Create a Starburst Data Products Community in Collibra

Before you can run the integration, you will need to create a community in Collibra that the Starburst data products will be associated with. Login to the Collibra DGC and follow the [Create a community](#) instructions in the Collibra documentation to create the new community. Be sure to remember the name of the community you created as this will be needed as an input to the Jupyter notebook. You can choose whatever name you want for the community.



The screenshot shows a 'Create Community' dialog box. It has a dark header with the title 'Create Community' and a close button (X). Below the header, there are two input fields. The first field is labeled 'Community' and contains the text 'Starburst Data Products'. The second field is labeled 'Name' and contains the placeholder text 'Enter values and separate them using enter'.

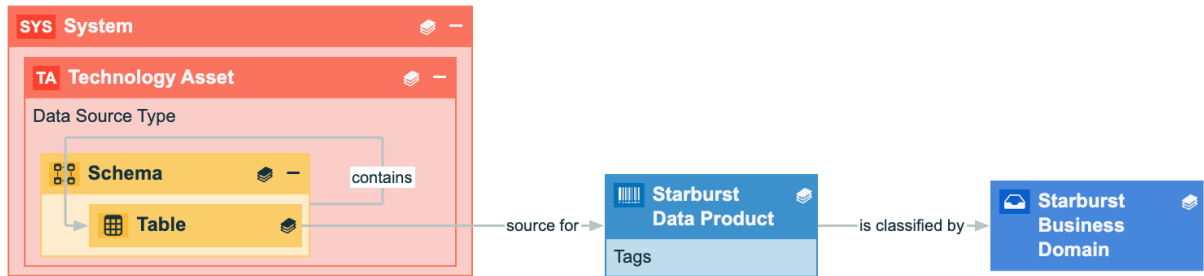
## Add Custom Lineage Views (optional)

Two custom lineage views have been created that show how the Starburst data products are connected to other assets within your Collibra environment. While neither of the lineage views are required to run the integration, they do provide a simplified way to see the relationships that exist around a data product.

### Catalog Lineage (Starburst)

This simple lineage view shows the physical data assets (data sets) connected to the Starburst data product and associated Starburst business domain. These relationships are automatically created when you run this utility, so you should not need to add any relationships manually in order for this lineage view to work. The JSON for this view is available in the GitHub repository ([starburst\\_lineage\\_view.json](#))





## Catalog Lineage - Business & Privacy Context

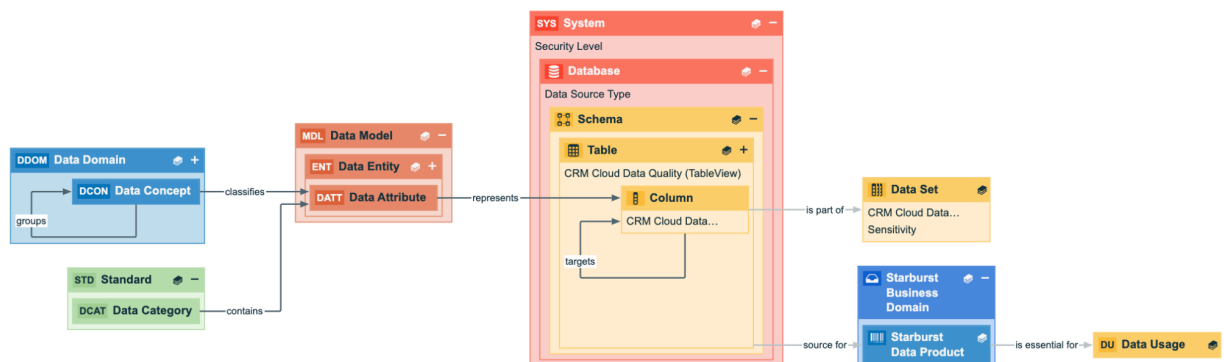
This lineage view expands on the “Catalog Lineage (Starburst)” view by showing the following asset types:

- Data Model
- Data Entity
- Data Attribute
- Data Domain
- Data Concept
- Standard
- Data Category
- Data Usage
- Data Set

Only the relationships between the Starburst data product, Starburst data domain, and corresponding data sets (tables/views) are added through this utility. For the other relationships in this lineage view to show up, you will need to manually add those relationships in Collibra.

The JSON for this view is available in the GitHub repository

([business\\_privacy\\_context\\_lineage\\_view.json](#))



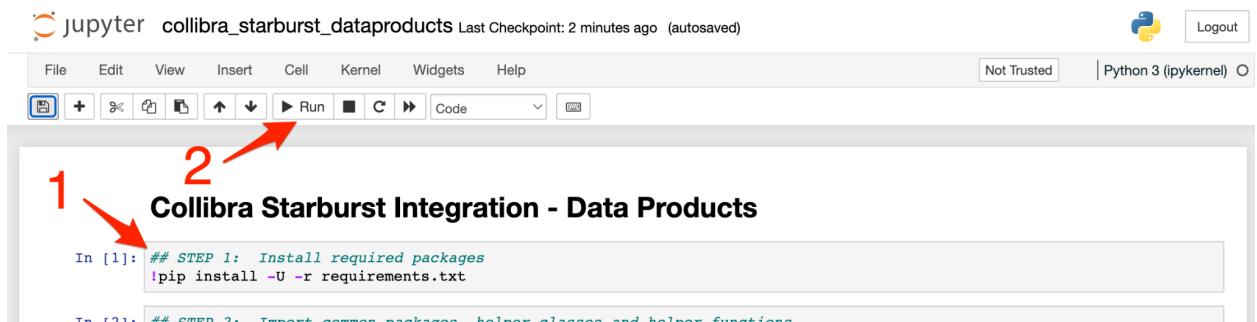
# Configuration

After satisfying the prerequisites and completing the installation instructions, you are ready to run the integration. The Jupyter notebook is self contained and imports all of the required packages for you. No additional configuration is required.

## Usage

The following instructions will walk you through how to run the integration.

- Open the Jupyter notebook
- Select the first cell (1) and click **run** (2).



- After running the cell, you will automatically be moved to the next cell.
- Click **run** for each cell until you reach the end.
  - If you encounter an error when running a cell, correct the error and run the cell again.

Below are guidelines for cells that require input from you or that produce output.

- **## STEP 3 - This cell will prompt you for your Starburst connection information:**
  - Enter the full **URL** of your Starburst Enterprise environment, including the HTTP protocol (example: <https://mycluster.mydomain.com/>)
  - Enter the username to log into Starburst Enterprise with
  - Enter the name of a role your username has access to
    - This is only required if BIAC is enabled in your Starburst Enterprise cluster
    - Leave this blank if BIAC is not enabled in your cluster
  - Enter the password associated with the username you provided
- **## STEP 4 - This cell will prompt you for your Colibra connection information:**
  - Enter the full **URL** of your Colibra Cloud environment, including the HTTP protocol (example: <https://mycatalog.colibra.com/>)

- Enter the **username** to log into Collibra Cloud with
- Enter the **password** associated with the username you provided
- **## STEP 5 - This cell will prompt you for the following information:**
  - A temporary directory where files will be created for the JSON payloads that are needed as input to the Collibra API calls
  - The name of the **Collibra community** where the data domains and data products will be loaded
  - The **system ID** of the data source schema where the data sets for the Starburst data products are located
- **## STEP 6 - This cell is used to run the integration. If everything works correctly, you should see the following output:**

```
About to pull/ingest all the data domains from Starbur to Collibra.
```

```
INFO: Pulling all data domains from Starburst
```

```
INFO: Importing all data domains to Collibra
```

```
About to pull/ingest all the published data products from Starburst to Collibra.
```

```
INFO: Pulling all data products from Starburst
```

```
INFO: About to update Data Product views
```

```
Completed.
```

After running all of the cells in the Jupyter notebook, you can use the [starburst\\_collibra\\_integrations.xlsx](#) file in the GitHub repository as a guideline to confirm all of the expected assets have been added to your Collibra environment.

### **Warnings/Errors**

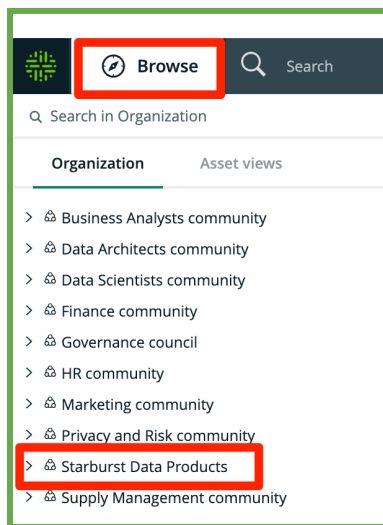
You may see one of the messages below if an issue was encountered when running this cell.  
Please refer to the appropriate message for steps to resolve the issue.

| <b>Message</b>  | <b>Reason</b>   | <b>Resolution</b>   |
|---|---|---|
| WARN: Missing catalog schema...   | You did not ingest metadata into Collibra for a schema that is used by one or more of your published Starburst data products. | Run metadata extraction for the schemas that are used by your published Starburst data products, then run the Jupyter notebook again. |
| WARN: No columns found in Collibra for view/materialized view →...                              | You did not ingest metadata into Collibra for any columns in the specified view/materialized view.                            | Run metadata extraction for the columns that are contained in the view/materialized view, then run the Jupyter notebook again.        |
| ERROR: Unable to import data domains due to missing “community” parameter.                      | The “community” input parameter was skipped when running the notebook.  | Rerun the cell #5 and ensure you provide a community name.  |
| ERROR: Unable to import data products due to missing “community” and/or “system ID” parameters. | The “community” and/or the “system ID” input parameters were skipped when running the notebook.                               | Rerun the cell #5 and ensure you provide a community name and system ID.  |

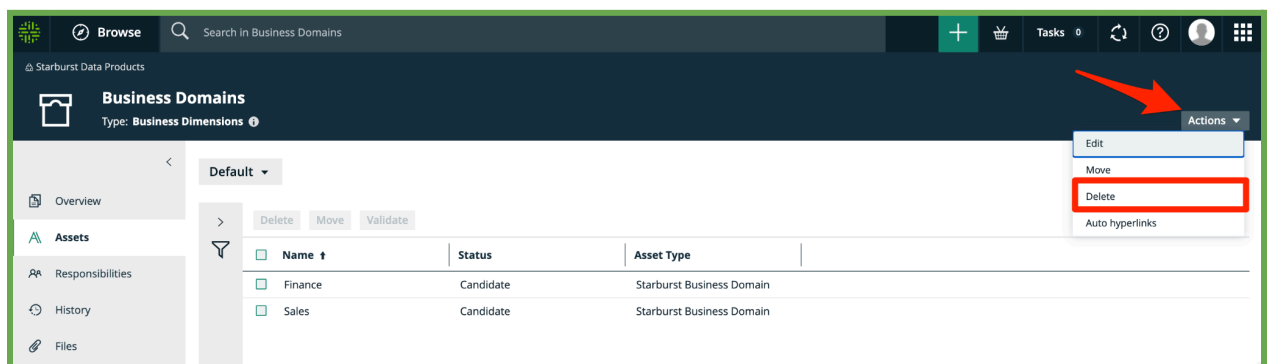
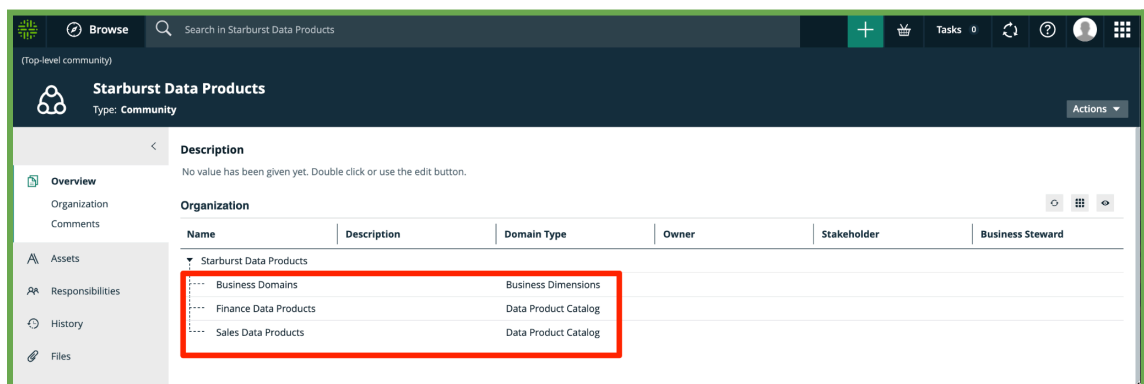
# Delete Integration Artifacts

Follow the steps below to remove the artifacts that are created by the integration in Collibra.

1. In your Collibra DGC environment, go to **Browse** and then click on the name of the community you created for your Starburst Data products.



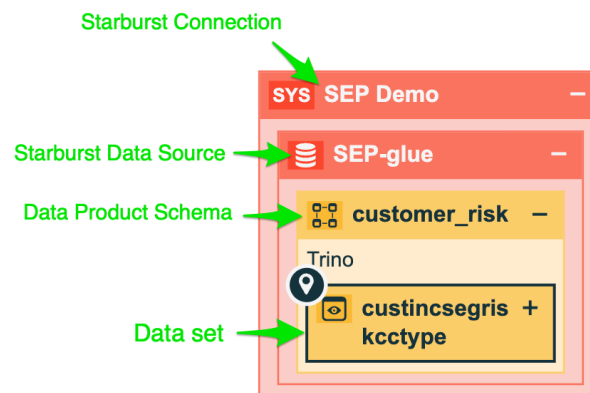
2. Delete “Business Domains” as well as any other items in the community by clicking on the name of the item and then selecting **Delete** from the **Actions** menu.



3. All artifacts of the integration have now been cleared out.

# Functional Design

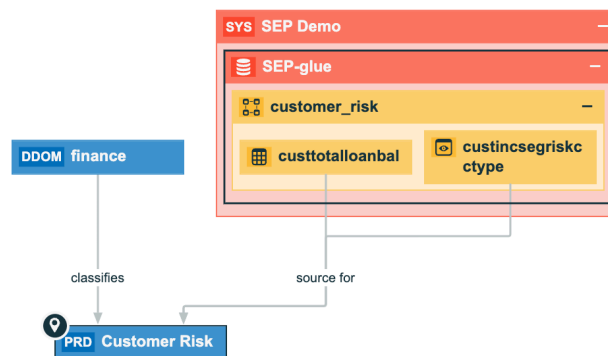
Before you run the integration, you will need to have already ingested metadata into Collibra from Starburst for the data sources (“catalogs”) and schemas where your data products are located. For example, the image below depicts a data set (view) and data product schema that were automatically ingested using the certified Starburst JDBC driver.



When you run the integration, you will iterate through each cell in the Jupyter notebook starting at the top of the notebook and working your way to the bottom. Provided below is a high-level overview of the operations that are performed by running the Jupyter notebook.

1. Prompt user for Starburst and Collibra connection information (URL, username, password)
2. Prompt user for the type of pull they want to perform
  - a. *Valid values:* data domains, data products
3. Prompt user for the Collibra community and system where the data products and data domains will be added
4. Retrieve all data domains and their metadata from Starburst and create a domain asset for each one in Collibra
5. Retrieve all “published” data products and their from Starburst and create a data product asset for each one in Collibra
6. Update the views/materialized views associated with each data product in Collibra with the definition SQL queries from Starburst
7. Link the data domain asset and data set(s) (views/materialized views) to the appropriate data product asset in Collibra

After running the integration, you will see a data product asset in Collibra for each published data product that exists in your Starburst Enterprise environment. You will also see a data domain asset in Collibra for each domain that was extracted from the published data products in Starburst Enterprise. Each data product asset in Collibra will be linked to the appropriate data domain asset and the data set(s) that are part of the data product. The example below shows the result of ingesting the **Customer Risk** data product from Starburst Enterprise into Collibra using this integration.



- These assets were created through the Starburst JDBC driver and were not created through this integration:
  - SEP Demo (*system*)
  - SEP-glue (*data source*)
  - customer\_risk (*schema*)
  - custtotalloanbal (*materialized view, represented as a table*)
  - custincsegriskcctype (*view*)
- These assets were created after running this integration:
  - finance (*data domain*)
  - Customer Risk (*data product*)

The table below shows the mapping between the metadata fields for Starburst Enterprise data products and the corresponding fields on the catalog page for the data product in Collibra.

| # | Starburst Enterprise   | Collibra                            |
|---|--|-------------------------------------|
| 1 | Name   | Name                                |
| 2 | Catalog  | Catalog Name                        |
| 3 | <i>The schema name is automatically generated from the name of the data product.</i> | Schema Name                         |
| 4 | Summary  | Definition                          |
| 5 | Description  | Description                         |
| 6 | Data product owners  | Product Owner                       |
| 7 | Tags   | Tags                                |
| 8 | Domain   | is classified by Business Dimension |
| 9 | Datasets   | Is target of Data Structure         |

## Starburst Enterprise

The screenshot shows the Starburst Enterprise interface for the 'Customer Risk' data product. The interface is divided into several sections:

- Left Sidebar:** Contains navigation options like 'Query editor', 'Data products', 'Domain management', and 'INSIGHTS'.
- Main Content Area:** Displays the 'Customer Risk' data product details.
  - 1 & 3:** The product name 'Customer Risk'.
  - 2:** The catalog name 'glue'.
  - 4:** The summary text: 'Customer financial profile data to assess risk for inclusion in upsell/cross-sell campaigns.'
  - 5:** The description text: 'This data product contains the financial profile data for each customer, which will help identify the degree of risk associated with that customer when considering them as a candidate for upsell and cross-sell campaigns. This data product contains the following data:
    - Segmentation
    - Income
    - Risk appetite
    - Mortgage balance(s)
    - Auto loan balance(s)
    - Credit card type
  - 6:** The 'Data product owners' section, listing Ben Lumbert and Shaun Van Staden.
  - 7:** The 'Tags' section, showing 'customer', 'risk', 'finance', and 'PII'.
  - 8:** The 'Domain' section, showing 'finance'.
  - 9:** The 'Datasets' section, showing the dataset 'custincsegriskcctype'.
- Right Sidebar:** Contains additional information like 'Relevant links' and 'Details'.



# Colibra Cloud

Starburst Data 2 > finance Data Products

PRD

Customer Risk

1

Data Product

Candidate

4

0

0%

Add to Data Basket

Actions

Add characteristic

Details

Tags (4)

Comments

Diagram

Pictures

Quality

Responsibilities

References

History

Files

Description

This data product contains the financial profile data for each customer, which will help identify the degree of risk associated with that customer when considering them as a candidate for upsell and cross-sell campaigns. This data product contains the following data:

- Segmentation
- Income
- Risk appetite
- Mortgage balance(s)
- Auto loan balance(s)
- Credit card type

Definition

Customer financial profile data to assess risk for inclusion in upsell/cross-sell campaigns.

Catalog Name

glue

Schema Name

customer\_risk

Product Owner

Ben Lumbert (ben.lumbert@starburstdata.com)

Shaun Van Staden (shaun.vanstaden@starburstdata.com)

4

5

2

3

6

is classified by Business Dimension

Add

| Name    | Domain       | Description |
|---------|--------------|-------------|
| finance | Data Domains |             |

1

is target of Data Structure

Add

| Name                 | Domain                         | Description |
|----------------------|--------------------------------|-------------|
| custincsegriskcctype | SEP Demo > glue > customer_... |             |
| custtotalloanbal     | SEP Demo > glue > customer_... |             |

2

Data Source

Starburst

Tags

customer risk PII finance

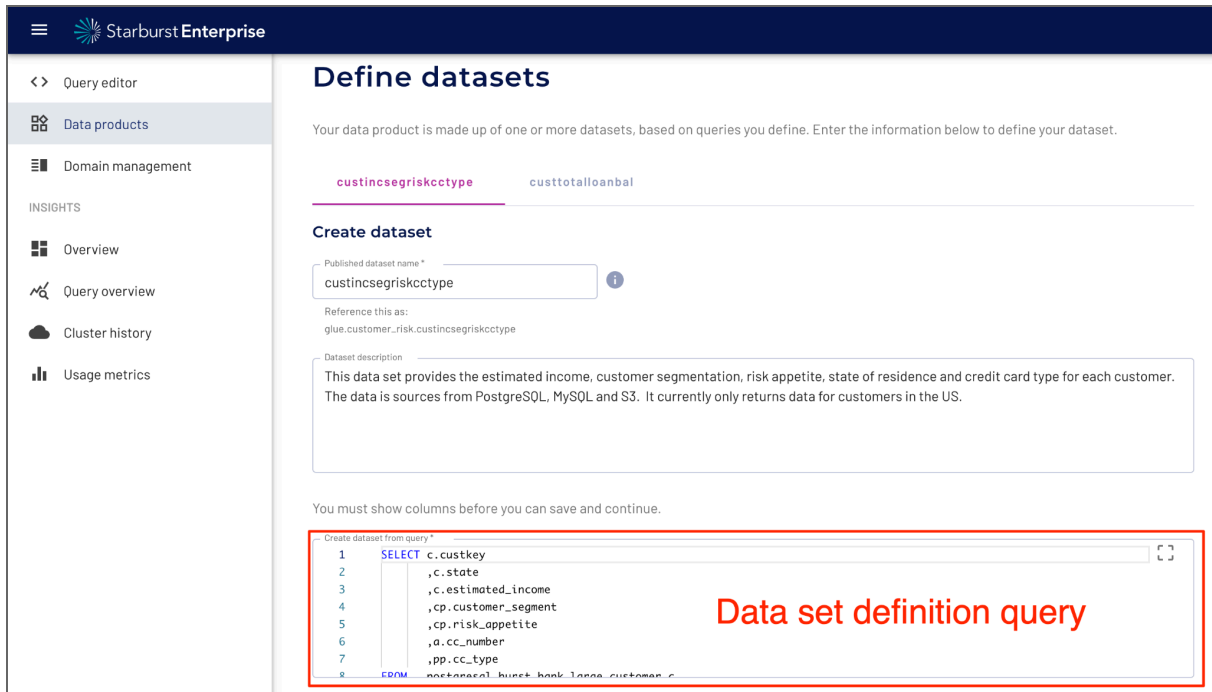
8

9

7

Additionally, the definition query for each data set in the data product will be extracted from Starburst Enterprise and added to the **Definition Query** field on the **Details** page for the corresponding view/materialized view in Colibra Cloud.

## Starburst Enterprise



The screenshot shows the 'Define datasets' page in Starburst Enterprise. The left sidebar contains navigation links: Query editor, Data products, Domain management, and INSIGHTS (Overview, Query overview, Cluster history, Usage metrics). The main content area is titled 'Define datasets' and includes a sub-header 'Create dataset'. A 'Published dataset name' field contains 'custincsegriskcctype'. Below it, a 'Reference this as' field shows 'glue.customer\_risk.custincsegriskcctype'. A 'Dataset description' box contains text about estimated income, customer segmentation, risk appetite, and data sources. At the bottom, a 'Create dataset from query' section shows a SQL query, which is highlighted with a red box and labeled 'Data set definition query'.

**Define datasets**

Your data product is made up of one or more datasets, based on queries you define. Enter the information below to define your dataset.

**custincsegriskcctype** **custtotalloanbal**

**Create dataset**

Published dataset name \*

custincsegriskcctype

Reference this as:

glue.customer\_risk.custincsegriskcctype

Dataset description

This data set provides the estimated income, customer segmentation, risk appetite, state of residence and credit card type for each customer. The data is sources from PostgreSQL, MySQL and S3. It currently only returns data for customers in the US.

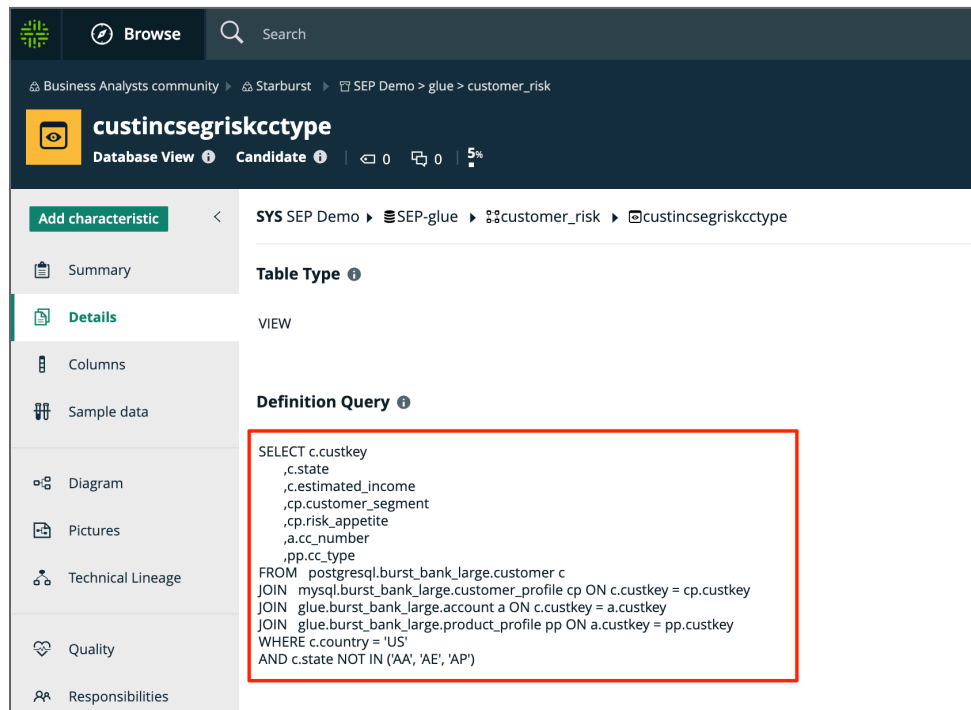
You must show columns before you can save and continue.

Create dataset from query \*

```
1 SELECT c.custkey
2       ,c.state
3       ,c.estimated_income
4       ,cp.customer_segment
5       ,cp.risk_appetite
6       ,a.cc_number
7       ,pp.cc_type
8 FROM postgresql.burst_bank_large.customer c
```

**Data set definition query**

## Colibra Cloud



The screenshot shows the 'custincsegriskcctype' details page in Colibra Cloud. The top navigation bar includes 'Browse' and 'Search'. The breadcrumb trail is 'Business Analysts community > Starburst > SEP Demo > glue > customer\_risk'. The page title is 'custincsegriskcctype' with a 'Database View' icon. Below the title, there are tabs for 'Summary', 'Details', 'Columns', and 'Sample data'. The 'Details' tab is active. The 'Table Type' is 'VIEW'. The 'Definition Query' is shown in a red box, containing a SQL query that joins data from PostgreSQL, MySQL, and glue sources.

**custincsegriskcctype**

Database View Candidate 0 0 5%

**Add characteristic** < **SYS SEP Demo** > **SEP-glue** > **customer\_risk** > **custincsegriskcctype**

**Table Type**

VIEW

**Definition Query**

```
SELECT c.custkey
       ,c.state
       ,c.estimated_income
       ,cp.customer_segment
       ,cp.risk_appetite
       ,a.cc_number
       ,pp.cc_type
FROM postgresql.burst_bank_large.customer c
JOIN mysql.burst_bank_large.customer_profile cp ON c.custkey = cp.custkey
JOIN glue.burst_bank_large.account a ON c.custkey = a.custkey
JOIN glue.burst_bank_large.product_profile pp ON a.custkey = pp.custkey
WHERE c.country = 'US'
AND c.state NOT IN ('AA', 'AE', 'AP')
```

The table below shows the mapping between the metadata fields for Starburst Enterprise domains and the corresponding fields on the catalog page for the data domain in Collibra.

| # | Starburst Enterprise | Collibra |
|---|----------------------|----------|
| 1 | Domain Name          | Name     |
| 2 | Schema location URI  | Location |

## Starburst Enterprise

Starburst Enterprise

sa ben.lumbert

Query editor

Data products

Domain management

INSIGHTS

Overview

Query overview

Cluster history

Usage metrics

Domain management

Create new domain

8 domains

| Domain name  | # of data products | Data products assigned to this domain                             |
|--------------|--------------------|---|
| SK Telecom   | 0                  | No data assigned  |
| customer     | 4                  | Customers, marketing_metrics, Truist Insurance Customer, gregoust |
| finance      | 4                  | Customer Risk, Test, rev_unit_margin, Customer Risk2              |
| logistics    | 0                  | No data assigned  |
| product      | 0                  | No data assigned  |
| risk         | 1                  | dp_1  |
| sales        | 0                  | No data assigned  |
| transactions | 0                  | No data assigned  |

Edit: finance

Changes to domain will effect all data products listed below.

Domain name \*  
finance

Domain description

2048 character remaining

Data Products under this domain will be created as schemas in this location.

Schema location URI  
s3://[redacted]/data\_products/financ

Data products assigned to this domain (4)

Customer Risk Reassign

Test Reassign

rev\_unit\_margin Reassign

Customer Risk2 Reassign

Cancel Save changes

## Collibra Cloud

Browse

Search

Starburst Data 2

Data Domains

DDOM

finance

1

Type: Data Domain

Status: Candidate

Ask the Expert

Create Issue

Delete Lake Formation Tags With Asset

Add characteristic

Overview

Tags

Comments

Diagram

Description

No value has been given yet. Double click or use the edit button.

Location

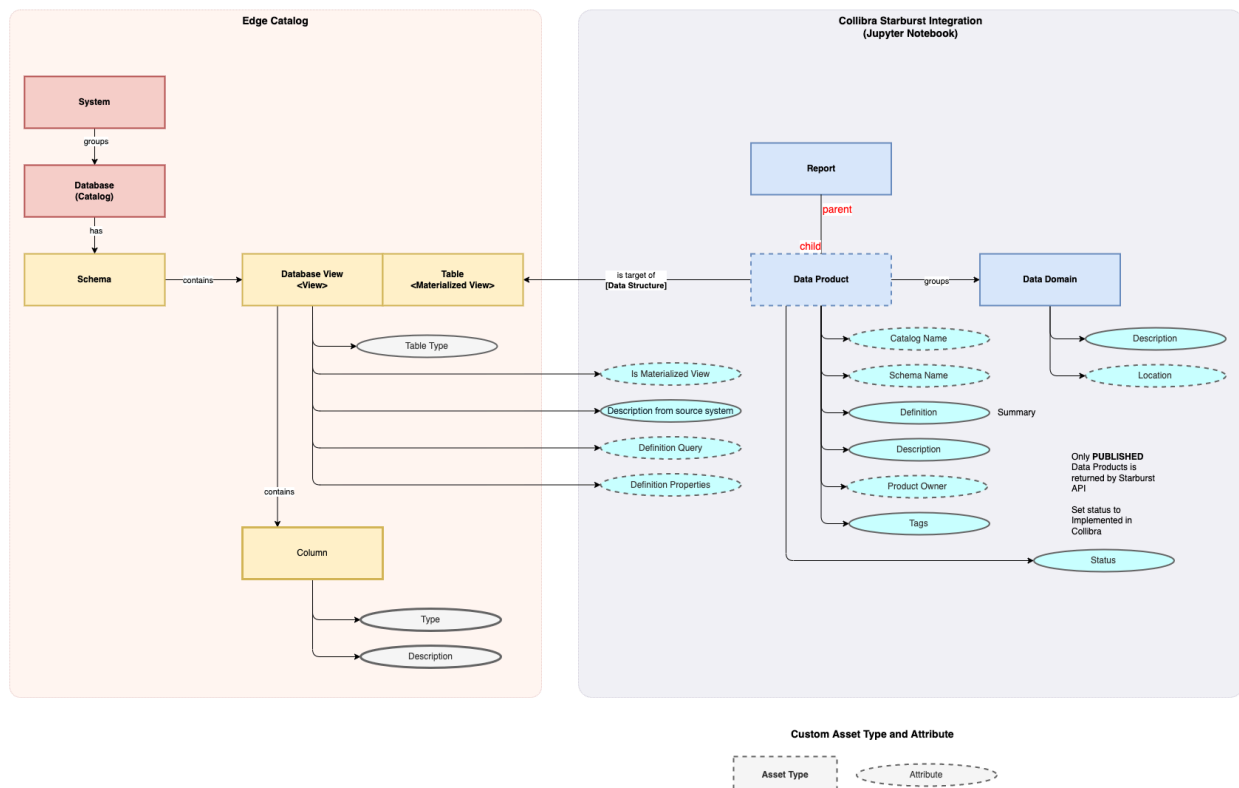
2

s3://[redacted]/data\_products/finance/

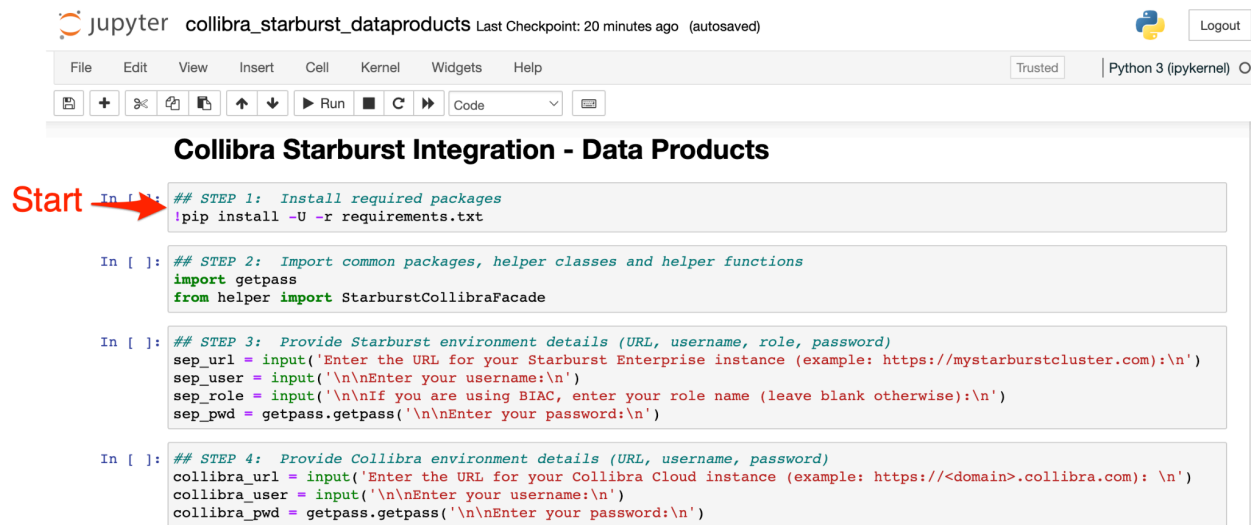
# Technical Design

Below is the operating model for this integration. On the left are the asset types and attributes that are ingested by the Edge Catalog. On the right are the metadata that are ingested and linked to the Edge Catalog metadata. To be able to create the custom asset types, attribute types and the Starburst scope on the environment, make sure that you imported the provided CMA file.

Operating Model



To use the integration, you will run each cell in the Jupyter notebook in sequence, starting at the first cell at the top and working your way down.



```
jupyter collibra_starburst_dataproducts Last Checkpoint: 20 minutes ago (autosaved)
File Edit View Insert Cell Kernel Widgets Help Trusted Python 3 (ipykernel)
Start In [ ]: ## STEP 1: Install required packages
!pip install -U -r requirements.txt

In [ ]: ## STEP 2: Import common packages, helper classes and helper functions
import getpass
from helper import StarburstCollibraFacade

In [ ]: ## STEP 3: Provide Starburst environment details (URL, username, role, password)
sep_url = input('Enter the URL for your Starburst Enterprise instance (example: https://mystarburstcluster.com):\n')
sep_user = input('\n\nEnter your username:\n')
sep_role = input('\n\nIf you are using BIAC, enter your role name (leave blank otherwise):\n')
sep_pwd = getpass.getpass('\n\nEnter your password:\n')

In [ ]: ## STEP 4: Provide Collibra environment details (URL, username, password)
collibra_url = input('Enter the URL for your Collibra Cloud instance (example: https://<domain>.collibra.com): \n')
collibra_user = input('\n\nEnter your username:\n')
collibra_pwd = getpass.getpass('\n\nEnter your password:\n')
```

Provided below is an overview of the operations that are performed in each of the cells you see in the notebook.

### ## STEP 1: Install required packages

- Installs common Python packages and Collibra Python packages in your local environment

### ## STEP 2: Import common packages, helper classes and helper functions

- Imports common Python packages
- Imports Collibra Python packages
- Imports helper classes for Starburst and Collibra
- Imports helper functions

### ## STEP 3: Provide Starburst environment details (URL, username, role, password)

- Prompts user for Starburst information
  - Starburst Enterprise URL
  - Starburst username
  - Starburst role (only required if [BIAC](#) is enabled)
  - Starburst password

### ## STEP 4: Provide Collibra environment details (URL, username, password)

- Prompts user for Collibra information
  - Collibra Cloud URL
  - Collibra username
  - Collibra password

### **## STEP 5: Provide temp directory, Collibra community name and system ID**

- *Temp directory* - This will be used by the notebook to generate JSON payloads for the Collibra API calls
  - This directory will automatically be created for you in the location where you run the Jupyter notebook from
- *Collibra Community* - The name of the Collibra community where the data products and data domains from Starburst will be added
- *System ID* - The ID of the Starburst Enterprise system in Collibra where the data sets for the data products in Starburst are cataloged

### **## STEP 6: Import Starburst data domains and data products into Collibra**

- Instantiates the facade class in order to use the classes and functions defined in `helper.py`
- Calls the function to extract all data domains from Starburst and import them into Collibra
- Calls the function to extract all “published” data products from Starburst and import them into Collibra

The Jupyter notebook requires 2 additional files for it to operate correctly. These files need to be located in the same directory as the Jupyter notebook.

#### ***requirements.txt***

This file contains the Python packages that need to be installed in your local environment in order for the Jupyter notebook to operate correctly. These packages will be installed for you when you run the first cell (“##STEP 1: Install required packages”) in the notebook.

#### ***helper.py***

This file ensures the appropriate packages are imported into your local environment and defines the helper classes and functions required for the Jupyter notebook to operate correctly. The packages will be imported to your local environment and the helper classes and functions will be defined for you when you run the second cell (“## STEP 2: Import common packages, helper classes and helper functions”) in the notebook.

Provided below is an overview of what is contained in this file:

- Import common Python packages
- Import Collibra Python packages
- Define a reusable *CollibraService* class with functions that:
  - Import assets
  - Delete files
  - Read files
  - Write files
- Defines a reusable *ImportCommand* class to generate Import API requests in JSON format
- Defines a reusable *StarburstService* class with functions that:

- Execute an API call to Starburst to retrieve all data domains
- Execute an API call to Starburst to retrieve all tags for a data product
- Execute an API call to Starburst to retrieve all of the metadata for a data product
- Execute an API call to Starburst to retrieve the list of all 'published' data products in Starburst
- Defines a reusable *StarburstCollibraFacade* class
  - This class is used in the Jupyter notebook to call the other classes defined in this file
  - It also defines the following functions:
    - Query and import data domains
      - Pull all domains from Starburst via an API call
      - Create *Starburst Domain* Import Command and then send to Collibra Import API to create as assets
    - Update data product views
      - Link the data products to their respective views and/or materialized views in Collibra
    - Query and import data products
      - Export all "published" data products from Starburst via an API call
      - Create *Starburst Data Product* Import Command and then send to Collibra Import API to create as assets
    - Update data product view columns
      - Update descriptions in Collibra for columns in the views/materialized views that are associated with the data products

# Release History

- Version 1.0.0 - Initial release of this integration.

## What's Next?

The initial release of this integration focuses on extracting data domains and data products from Starburst Enterprise, then importing them as assets into Collibra and connecting them to the appropriate data sets (views and/or materialized views). The next phase of this integration will focus on creating a bi-directional sharing of data product and data domain metadata between Starburst Enterprise and Collibra. In that phase, Collibra users will be able to initiate the creation of data products from within Collibra Cloud.

A Collibra user will start the process by providing the following information:

- Select the view(s) and/or materialized view(s) in Collibra that will be used as data sets for the data product.
- Provide metadata (including the data domain) about the data product
- Provide notes regarding any operations (transformations, aggregations, etc) that need to be applied to the data sets

A designated admin in Collibra will be notified when the request has been made. Some of the information above will be used to create a draft data product in Starburst Enterprise. The admin will then use the provided notes to finish creating the data product in Starburst. Once that has been done, the metadata for the newly created data product will be automatically exported from Starburst and imported into Collibra using the functionality provided by the initial release of this integration.