dremio

Query Analyzer User Guide

June 1st, 2022

Revision History

Version	Date	Author	Comments
1.0	02/24/2020	Mark Hoerth	Initial release
1.1	03/19/2020	Deane Harding	Updated document format.
1.2	03/27/2020	Deane Harding	Added further VDS definitions
1.3	05/22/2020	Deane Harding	Minor update to queries.json scrubbing process.
1.4	07/21/2020	Deane Harding	Addition of functionality to retrieve error messages related to failed queries
1.5	10/08/2020	Deane Harding	Removed reliance on Java. Added more analysis VDSs.
1.6	03/03/2022	Deane Harding	Introduced splitting of error messages into 16k chunks
1.7	5/18/2022	Maz Mohammadi	Added new VDSs for Ntile and hints in the SelectQueryData
2.0	6/1/2022	Maz Mohammadi	Reorganizing the Query Analyzer. All VDSs in the application folder are specified as examples in this doc. Column renaming and casting is now done in the Preparation layer
2.1	10/4/2022	Maz Mohammadi	Adding new VDSs, merging the work back fieldeng
2.5	11/18/2022	Maz Mohammadi	Adding new VDSs for Reflection management
3.0	9/11/2023	Maz Mohammadi	Adding MDRefresh and ReflectionRefresh DailyRreportByOutcomePivoted VDS

Related Documents

Name	Version
semantic_layer_best_practices.pdf	1.0, September 2019

Supported Versions

Name	Version
Dremio	3.2.8 or later
Python	3.5+

Table of Contents

Introduction

Purpose

Dremio provides a log of completed queries called `queries.json` that provides a rich and extensive view of queries on the system. The `queries.json` logs can be queried by Dremio itself or another tool for monitoring and analytics about the queries on the system. Such analytics can reveal new insight into query acceleration opportunities, most frequently run queries, or highest cost queries.

Dremio Query Analyzer is a tool that automates the retrieval, preparation and copying of current and historic `queries.json` files into S3/ADLS/HDFS file storage ready for analysis in Dremio. The tool also provides a set of VDS definitions that can be loaded into Dremio in order to enable immediate analysis of the query data.

Setup and Configuration

Install Dremio Query Analyzer

Dremio Query Analyzer is delivered as a compressed file called `dremio-query-analyzer.tar.gz.`

- Copy the file to the Dremio Coordinator node
- Unpack the file into a location of your choice, here we choose the `dremio` user's home directory

```
tar xvzf dremio-query-analyzer.tar.gz -C /home/dremio
```

- The tool also requires python in order to successfully execute. Therefore, ensure python is present on the Dremio Coordinator; first issue the following command to see if python is already installed.

```
Python -V
```

- If you are not presented with details of the currently installed python version, then you will need to install Python. Version 3.5 or above is recommended. The following site provides an explanation if required:

  https://docs.python-guide.org/starting/installation/

- **(Optional)** If you are going to be using `dremio-query-analyzer` to copy the test results files to Amazon S3, then you may need to install and configure the AWS CLI on the Dremio Coordinator. First issue the following command to see if the AWS CLI is already installed:

```
aws –version
```

  If you are not presented with details of the currently installed AWS CLI version, then use the following links as guidance.

  - To install the AWS CLI, follow these instructions: https://docs.aws.amazon.com/cli/latest/userguide/install-cliv2-linux.html
  - To configure the AWS CLI, follow these instructions:

https://docs.aws.amazon.com/cli/latest/userguide/cli-chap-configure.html#cli-quick-configuration

- **(Optional)** If you are going to be using `dremio-query-analyzer` to copy the test results files to Azure Storage, then you may need to install and configure the Azure CLI on the Dremio Coordinator. First issue the following command to see if the Azure CLI is already installed:

```
az –version
```

  If you are not presented with details of the currently installed Azure CLI version, then use the following links as guidance:
  https://docs.microsoft.com/en-us/cli/azure/install-azure-cli?view=azure-cli-latest

- **(Optional)** If you are going to be using `dremio-query-analyzer` to copy the test results files to Hadoop Storage, then you need to make sure the following command successfully executes on the Dremio Coordinator:

```
hdfs version
```

This `dremio-query-analyzer` package includes scripts for the one-time or continuous preparation of `queries.json` files from Dremio.

The `queries.json` log is located on the cluster coordinator, at the location `/var/log/dremio` and `/var/log/dremio/archive` on most clusters. See the Dremio documentation for additional detail.

`Dremio-query-analyzer` is responsible for cleaning up ("scrubbing") the `queries.json` file prior to its consumption in Dremio, ensuring rules regarding lengths of data fields when they are imported into Dremio are adhered to. The `dremio-query-analyzer` tool is also responsible for copying the scrubbed `queries.json` files into a user-defined cloud storage container (S3, ADLS, HDFS) that is accessible to Dremio in order to analyze the data, the script assumes that there will be two folders available in the designated storage location to store the scrubbed `queries.json` files, one called "`results`" and another called "`chunks`".

The main scripts of this package are defined below:

Script	Description
`gather_queries.sh`	This is the primary driver script for the dremio-query-analyzer. The script can be optionally installed in cron to regularly copy

	queries.json from the Dremio cluster to a location on S3\HDFS\ADLS. Requires customization with your configuration. Once a day is usually suitable for most users.
scrub-queries-json.py	Scrubs a set of queries.json files in a specified directory to truncate the queryText field into a number of equally sized chunks. The first chunk is written back into a header.queries*.json file, all other chunks are written into a chunks.queries*.json file. The scrubbed output files are written to a specified output directory. This is primarily because Dremio VARCHAR fields can be no greater than 32000 characters in length.
get-error-messages.py	Reads each queries.json file, identifies queries that failed and for each failed queries makes an API call to Dremio to retrieve a more descriptive message for why the query failed. Records get written to a new file called errormessages.queries.*.json.
refresh-pds.py	Refreshes metadata for a specified PDS in Dremio. Used in gather_queries.sh to refresh the metadata for results, chunks and errormessages PDSs in Dremio after new files have been uploaded to the data lake storage.

Queries.json analysis scripts provided in the dremio-query-analyzer package from Dremio Professional Services

Configure gather_queries.sh

The driving script of the `dremio-query-analyzer`, called `gather_queries.sh` requires the following variables inside the script to be specified correctly prior to use:

Variable	Description
DREMIO_LOG_DIR	The directory on the Dremio Coordinator where all the Dremio log files are stored. Default value is "/var/log/dremio"
dremio_url	The base URL for accessing the Dremio REST API, e.g. http://localhost:9047. Used when gather_queries.sh calls get-error-messages.py and refresh-pds.py
user_name	Name of an administrative user in Dremio that can access the REST API. Used when gather_queries.sh calls get-error-messages.py
pwd	Password associated with an administrative user in Dremio that can access the REST API. Used when gather_queries.sh calls get-error-messages.py. The password can be entered directly or stored in a file only accessible by the user running gather_queries.sh.

Variables in gather_queries.sh configured prior to use

Execution

At execution time, `gather_queries.sh`, requires the following three parameters as inputs on the command line:

Parameter	Description
`storage_type`	The type of storage where we want to write the scrubbed `queries.json` file to. Valid values are currently **s3**, **adls**, **hdfs**. If no valid value is supplied, then the scrubbed files will remain on the Dremio Coordinator and will need to be manually copied to a storage location.
`storage_path`	The path on the storage to a "results" folder e.g. s3://mybucket
`num_archive_days`	The number of days of archived `queries.json` files to also scrub and copy into storage. If no value is supplied, then only `queries.json` files for the current day will be scrubbed and copied.

Runtime parameters in gather_queries.sh

To make the results available for analysis, execute `gather_queries.sh` on the Dremio coordinator with the desired input parameter values for your chosen storage type, storage location and number of historical `queries.json` files that you wish to process. This script reads the desired `queries.json` and `queries.YYYY-MM-DD.N.json.gz` files and prepares them for analysis. e.g.:

```
cd /home/dremio/dremio-query-analyzer/scripts/
./gather_queries.sh s3 s3://mybucket/dremio 2
```

`gather_queries.sh` copies the `queries.json` and `queries.YYYY-MM-DD.N.json.gz` files locally to the `dremio-query-analyzer` in `/home/dremio/dremio-query-analyzer/scripts/dremio_queries,` it then generates one or more files called `header.<filename>.json`, `chunks.<filename>.json`, `errorheader.<filename>.json` and `errorchunks.<filename>.json` in the `/home/dremio/dremio-query-analyzer/scripts/dremio_queries/scrubbed/` directory.

The scrubbed files then get automatically copied into the desired cloud storage location. By default, the `header.<filename>.json` files will get copied into a `results` sub-directory, the `chunks.<filename>.json` files will get copied into a `chunks` sub-directory and the `errorheader.<filename>.json` files will get copied into an `errormessages` sub-directory and the `errorchunks.<filename>.json` files will get copied into an `errorchunks` sub-directory in the cloud storage.

If a desired cloud storage location is not specified or if the storage type is invalid then the files will remain in the `/home/dremio/dremio-query-analyzer/scripts/dremio_queries/scrubbed/` directory and they will require manually copying to some other storage location that will be accessible to Dremio as a data source.

Query Analysis

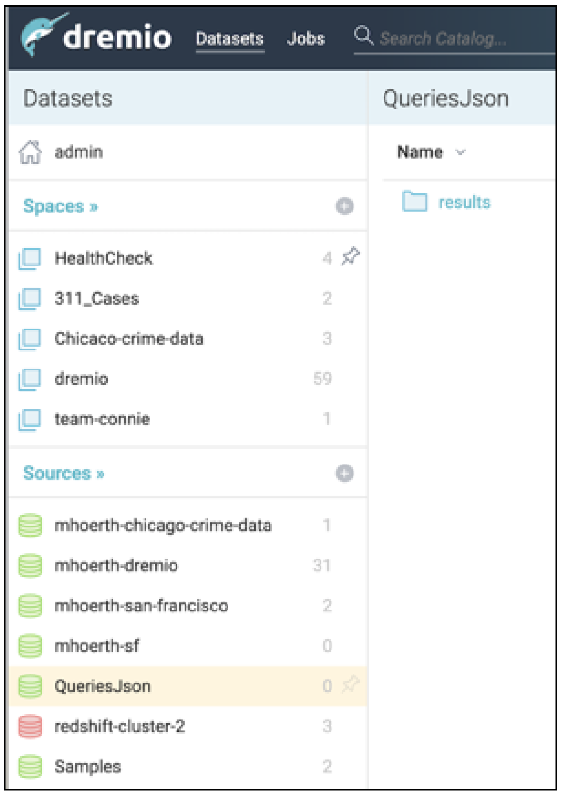
Before analysis begins there are several one-off tasks to perform in order to enable the analysis. Firstly, a data source and Physical Data Set (PDS) needs to be created in Dremio that will connect directly to the `queries.json` files. Secondly, a set of Virtual Data Sets (VDS) need to be created to query and make sense of the data in the PDS.

Create the PDSs

The assumption in this document is that the `queries.json` files have been copied into either S3, ADLS or HDFS storage, although equally they could have been placed on a user's local filesystem and then uploaded into an individual user's home space.

While not required, for the most straightforward integration with the pre-created scripts supplied in `dremio-query-analyzer` Dremio Professional Services recommends the `queries.json` files are placed into a folder called **`results`** in the chosen storage device.

- Create a data source in Dremio applicable to the storage device where the `queries.json` files are stored, e.g. Amazon S3, Azure Storage, HDFS.
- For the chosen data source, enter the relevant connection credentials.
- Navigate to the Advanced Options panel of the data source and enter the Root Path to be the **parent path** of the `results` folder on the storage device.
- Set up the path of the data source to point to the directory immediately above the results directory. The following screenshots show an Amazon S3 data source called QueriesJson configured with access to the results folder in Dremio (left) and also the contents of the results folder (right):



Datasets

admin

Spaces »

HealthCheck	4
311_Cases	2
Chicaco-crime-data	3
dremio	59
team-connie	1

Sources »

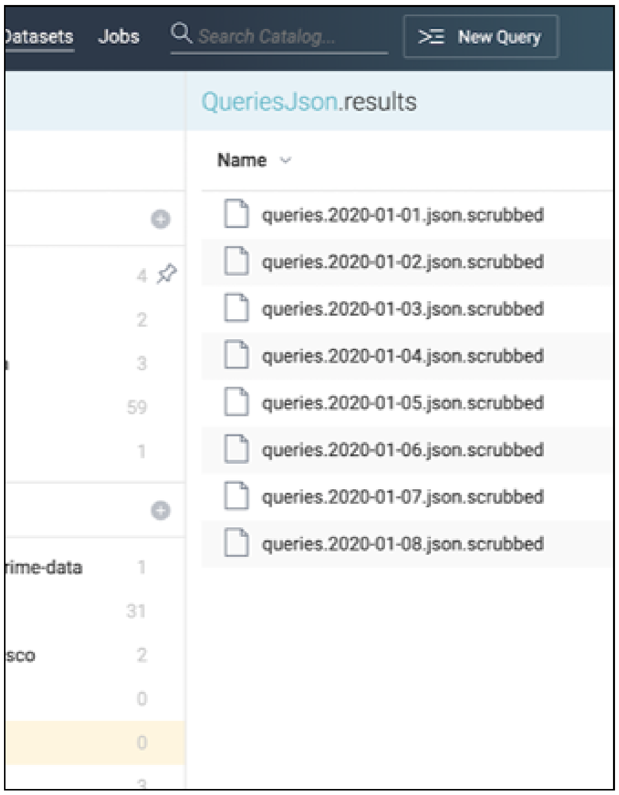
mhoerth-chicago-crime-data	1
mhoerth-dremio	31
mhoerth-san-francisco	2
mhoerth-sf	0
QueriesJson	0
redshift-cluster-2	3
Samples	2

QueriesJson

Name

results

Example integration of queries.json files into Dremio for analysis. QueriesJson is an AWS S3 source that includes a directory called **results**.



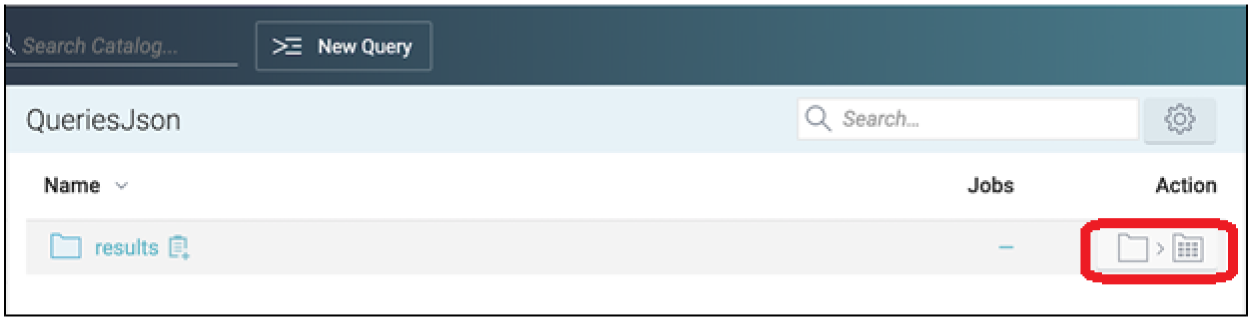
QueriesJson.results

Name

queries.2020-01-01.json.scrubbed
queries.2020-01-02.json.scrubbed
queries.2020-01-03.json.scrubbed
queries.2020-01-04.json.scrubbed
queries.2020-01-05.json.scrubbed
queries.2020-01-06.json.scrubbed
queries.2020-01-07.json.scrubbed
queries.2020-01-08.json.scrubbed

After scrubbing queries.json from several days of cluster operation, the files were uploaded to the **results** *directory on S3.*

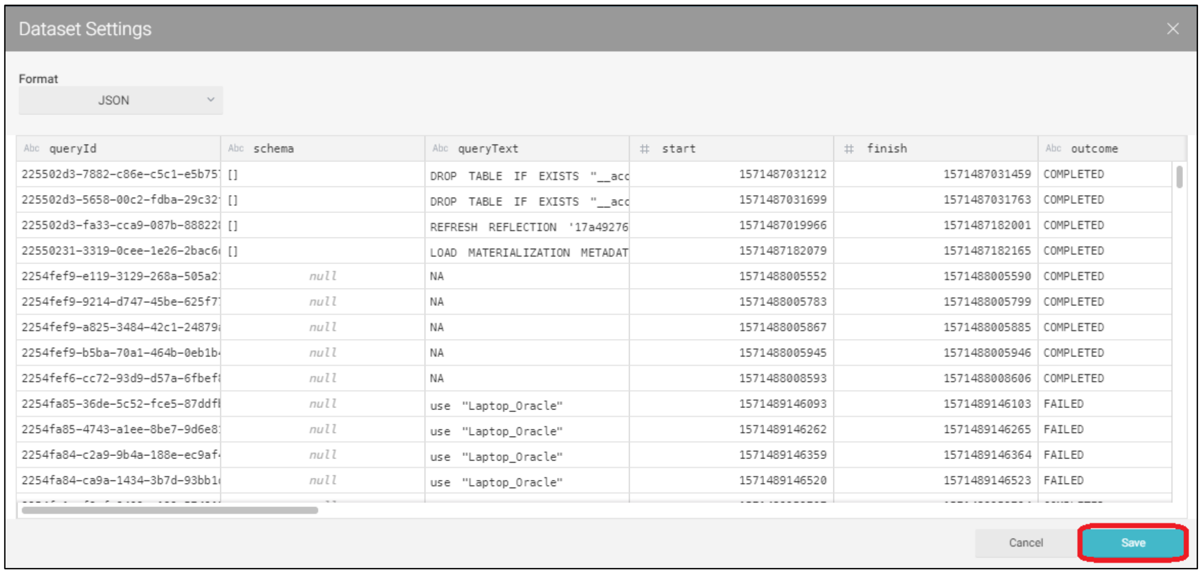
- Use the Folder Format button to convert the results directory to a PDS



QueriesJson

Name	Jobs	Action
results	–	

- In the resulting dialog, notice that Dremio automatically recognizes the format of the file inside this folder as JSON and has formatted the data table appropriately. Click Save.


Dataset Settings

Format: JSON

queryId	schema	queryText	start	finish	outcome
225502d3-7882-c86e-c5c1-e5b75	[]	DROP TABLE IF EXISTS "__acc	1571487031212	1571487031459	COMPLETED
225502d3-5658-00c2-fdba-29c32	[]	DROP TABLE IF EXISTS "__acc	1571487031699	1571487031763	COMPLETED
225502d3-fa33-cca9-087b-88822	[]	REFRESH REFLECTION '17a49276	1571487019966	1571487182001	COMPLETED
22550231-3319-0cee-1e26-2bac6	[]	LOAD MATERIALIZATION METADAT	1571487182079	1571487182165	COMPLETED
2254fef9-e119-3129-268a-505a2	*null*	NA	1571488005552	1571488005590	COMPLETED
2254fef9-9214-d747-45be-625f7	*null*	NA	1571488005783	1571488005799	COMPLETED
2254fef9-a825-3484-42c1-24879	*null*	NA	1571488005867	1571488005885	COMPLETED
2254fef9-b5ba-70a1-464b-0eb1b	*null*	NA	1571488005945	1571488005946	COMPLETED
2254fef6-cc72-93d9-d57a-6fbef	*null*	NA	1571488008593	1571488008606	COMPLETED
2254fa85-36de-5c52-fce5-87ddf	*null*	use "Laptop_Oracle"	1571489146093	1571489146103	FAILED
2254fa85-4743-a1ee-8be7-9d6e8	*null*	use "Laptop_Oracle"	1571489146262	1571489146265	FAILED
2254fa84-c2a9-9b4a-188e-ec9af	*null*	use "Laptop_Oracle"	1571489146359	1571489146364	FAILED
2254fa84-ca9a-1434-3b7d-93bb1	*null*	use "Laptop_Oracle"	1571489146520	1571489146523	FAILED

- The same steps can be followed to convert the `chunks`, `errormessages` and `errorchunks` folders into PDSs in the same data source.

Create the VDSs

Create a set of VDSs that will be used to analyze the data in the `queries.json` files. There are two approaches to this, automated VDS creation, or manual. Both options are described in the sections below. Dremio recommends the automated approach.

Automated VDS creation

The primary file that is used to automatically create the relevant spaces, folders and VDSs in Dremio is called `run_vdscreator.sh`. This file is located at `/home/dremio/dremio-query-analyzer/scripts/vdscreator/run_vdscreator.sh` and has several parameters that need to be specified before VDSs can be created.

- Specify the following in `run_vdscreator.sh`. All other parameters in the file must not be edited.

Variable	Description
`dremio_host`	The hostname or IP address of the Dremio Coordinator
`dremio_port`	The HTTP port used by Dremio, default is 9047.
`user_name`	The name of an administrative user in Dremio that can create spaces, folders and VDSs.
`pwd`	The password for the user user_name above, read from `local.pwd` or embedded directly. This password will be used to log into Dremio via the REST API and issue calls to create the relevant objects.

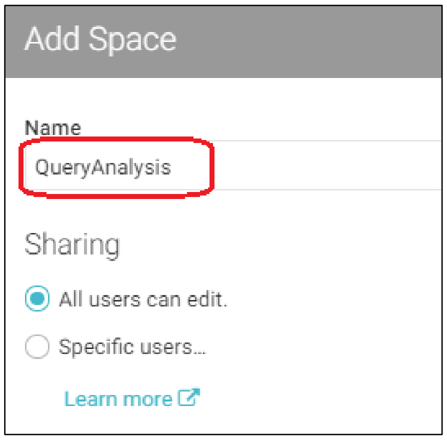
Variables in run_vdscreator.sh

- Execute `run_vdscreator.sh` to generate the required space, folders and VDSs in Dremio

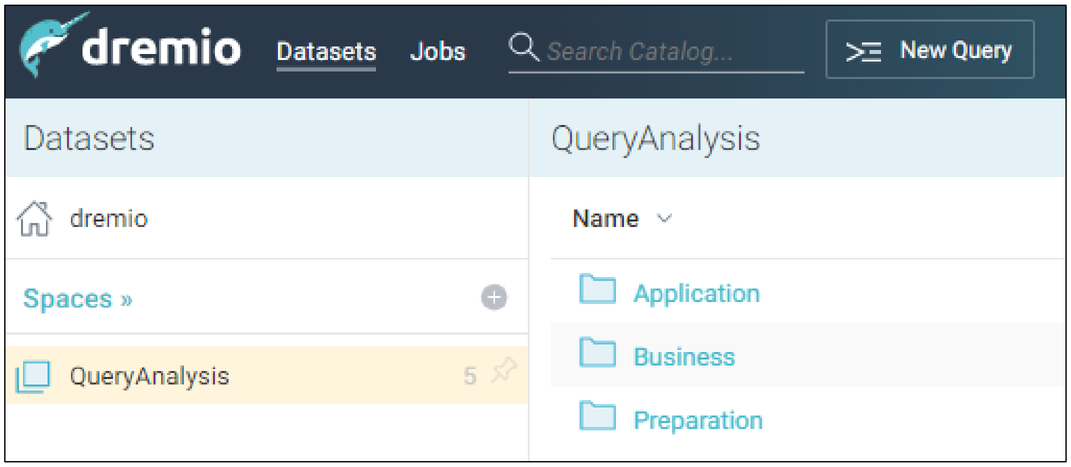
```
# Change user if necessary
su - dremio
cd /home/dremio/dremio-query-analyzer/scripts/vdscreator/
./run_vdscreator.sh
```

Manual VDS creation

- Create a new Space in Dremio called `QueryAnalysis`



- Inside the `QueryAnalysis` space create three new sub-folders: `Application, Business, and Preparation`



- On the Dremio Coordinator, navigate to the `vdsdefinition` directory:

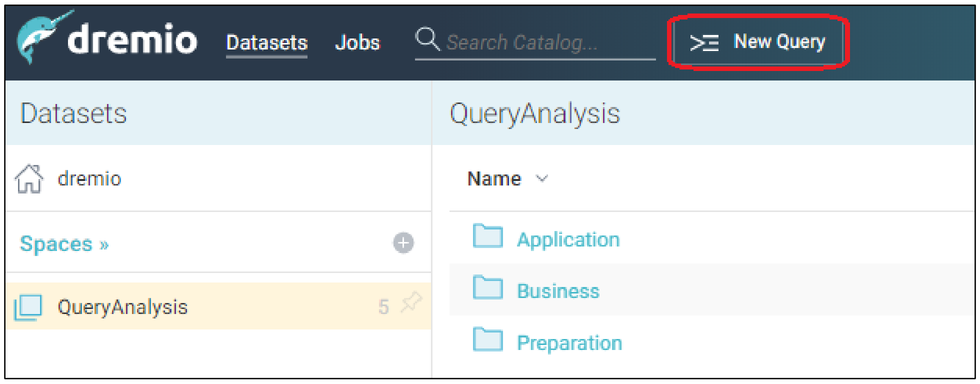
```
cd /home/dremio/dremio-query-analyzer/vdsdefinition
```

This directory contains the following `sql` files:

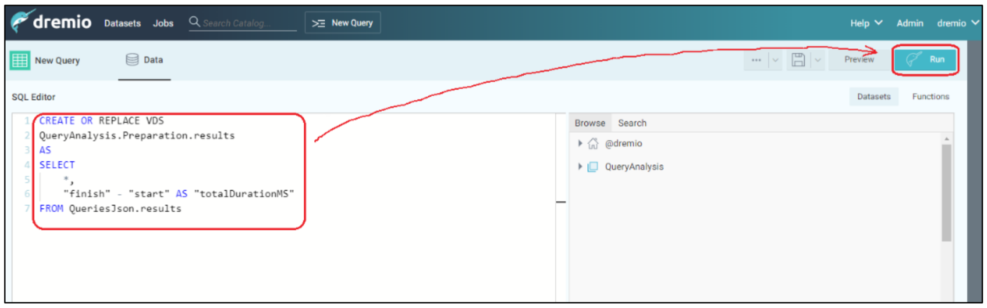
```
01_QueryAnalysis.Preparation.chunks.sql
01_QueryAnalysis.Preparation.errorchunks.sql
01_QueryAnalysis.Preparation.errormessages.sql
01_QueryAnalysis.Preparation.results.sql
02_QueryAnalysis.Business.MDRefreshData.sql
02_QueryAnalysis.Business.QueryErrorMessages.sql
02_QueryAnalysis.Business.QueryTextChunks.sql
02_QueryAnalysis.Business.ReflectionRefreshData.sql
02_QueryAnalysis.Business.SelectQueryData.sql
04_QueryAnalysis.Application.AcceleratedSelects.sql
09_QueryAnalysis.Application.Top20ExecutionTimes.sql
15_QueryAnalysis.Application.PctAccelerated.sql
19_QueryAnalysis.Application.ActiveUsers.sql
20_QueryAnalysis.Application.DailyRreportByOutcomePivoted.sql
29_QueryAnalysis.Application.SummaryByOutcome.sql
30_QueryAnalysis.Application.Range_EnQueuedTime.sql
30_QueryAnalysis.Application.SummaryQueryExecTimeByQueue.sql
31_QueryAnalysis.Application.Top20DataSetsQueried.sql
32_QueryAnalysis.Application.NtileQueryCost.sql
33_QueryAnalysis.Application.NtileQueryDuration.sql
```

For each of the files above in numeric order do the following:

- Copy the SQL out of the file
- In the Dremio UI, click on New Query



- Paste the SQL into the SQL Editor and click Run. This will create the VDS.



```
CREATE OR REPLACE VDS
QueryAnalysis.Preparation.results
AS
SELECT
    *,
    "finish" - "start" AS "totalDurationMS"
FROM QueriesJson.results
```

Analyze Results

Dremio is now available to query the VDSs in order to start analyzing the queries that have been flowing through your Dremio cluster. The VDSs supplied in this package are common examples of the sorts of questions a Dremio DBA might ask about the platform usage. Dremio encourages you to create your own VDSs as well in order to gain further insights.

Details of each of the VDSs in this package are shown below:

Create Order	VDS in QueryAnalysis space	Description
1a	Preparation.results	Directly queries the QueriesJson.results PDS. *Important: You may need to alter the FROM clause to point to the PDS on your system containing your scrubbed query data if the name is different than **QueriesJson.results***

Create Order	VDS in QueryAnalysis space	Description
1b	Preparation.chunks	Directly queries the QueriesJson.chunks PDS. *Important: You may need to alter the FROM clause to point to the PDS on your system containing your chunks of query text data if the name is different than* ***QueriesJson.chunks***
1c	Preparation.errormessages	Directly queries the QueriesJson.errormessages PDS. *Important: You may need to alter the FROM clause to point to the PDS on your system containing your query error message data if the name is different than* ***QueriesJson.errormessages***
1d	Preparation.errorchunks	Directly queries the QueriesJson.errorchunks PDS. *Important: You may need to alter the FROM clause to point to the PDS on your system containing your query error message data if the name is different than* ***QueriesJson.errorchunks***
2a	Business.SelectQueryData	Builds upon the results VDS, it filters out all except SELECT queries. *Important: Replace <DREMIO_HOST> in the query with the DNS name or IP address of the cluster. This is to identify this cluster in queries*
2b	MDRefreshData	All METADATA_REFRESH jobs. JSON, CSV, deltallake tables do not have MDREFRESH jobs... they are all processed on the coordinator node. ONLY parquet based datasets have MD refresh jobs.
2c	ReflectionRefreshData	All refresh refresh jobs. All LOAD MATERIALIZATION jobs are excluded.
2d	Business.QueryTextChunks	Builds upon the chunks VDS and selects all fields from it. Can be joined with other VDSs via the queryId field in order to present the entire queryText for a query if it is longer than 4000 characters.
2e	Business.QueryErrorMessages	Builds upon the errormessages VDS and selects all fields from it. Can be joined with other VDSs via the queryId field.
3	Application.AcceleratedSelects	All accelerated queries
9	Application.Top20Execution Times	List of the top 20 queries with the highest execution times
15	Application.PctAccelerated	Summary of the percentage of completed queries that were accelerated by reflections
19	Application.ActiveUsers	Summary per day of the total number of queries executed by each user and the total wall clock time spent running those queries.

Create Order	VDS in QueryAnalysis space	Description
20	`DailyRreportByOutcomePivoted`	Daily count of completed, failed and canceled queries across all job types (user queries, reflections and metadata refresh)
32	Application.NtileQueryCost	100 percentile buckets of all queries by QueryCost

VDS definitions in this package

Note: These VDS are designed to be examples. Consider modifications or additional datasets you could create:

- QueryAnalysis.Business.SelectQueryData is an example of how to filter out INSERTS, UPDATES, and DELETES. Use other fields of the Preparation.results VDS to filter on selected query types, durations, user names, or other characteristics.
- The application layer VDSs are typical of the datasets for end-users and could be analyzed with Tableau or other front-end tools.
- Please share your new VDS and query analysis insights with others by contacting Dremio Professional Services.

Examples

1 AcceleratedSelect

```
SELECT *
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "accelerated" = TRUE
```

2 ActiveUsers

```
SELECT "TO_DATE"("startTime") AS "queryStartDate", "username",
COUNT(*) AS "totalQueries", SUM("totalDurationMS") AS
"totalWallclockMS"
FROM "QueryAnalysis"."Business"."SelectQueryData"
GROUP BY "username", "queryStartDate"
ORDER BY "queryStartDate" DESC, "totalQueries" DESC,
"totalWallclockMS" DESC
```

3 FailedQueriesPerUser

```
SELECT "TO_DATE"("startTime") AS "queryStartDate",
"username", COUNT(*) AS "failedQueries"
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "OUTCOME" = 'FAILED'
GROUP BY "username", "queryStartDate"
ORDER BY "queryStartDate" DESC, "failedQueries" DESC
```

4 HighCostSelects

```
SELECT *
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "queueName" = 'High Cost User Queries'
```

5 MostUsedDatasetsPerDay

```
SELECT "queryStartDate", "dataset",
COUNT(*) AS "totalQueries",
COUNT(DISTINCT "username") AS "totalUsers"
FROM (SELECT "queryStartDate",
    CAST("convert_from"("convert_to"("dataset", 'JSON'), 'UTF8') AS
VARCHAR) AS "dataset", "username"
    FROM (
    SELECT CAST(startTime as DATE) AS queryStartDate,
    "FLATTEN"("parentsList") AS "dataset", "username"
    FROM "QueryAnalysis"."Business"."SelectQueryData"
    ) AS "nested_0") AS "RawFlattenDataset"
GROUP BY "dataset", "queryStartDate"
ORDER BY "queryStartDate" DESC, "totalQueries" DESC
```

6 NonAcceleratedSelects

```
SELECT *
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "accelerated" = FALSE AND "totalDurationMS" > 1000
ORDER BY "totalDurationMS" DESC
```

7 NtileQueryCost

```
SELECT "pct", MAX("queryCost") AS "maxQueryCost"
FROM (SELECT "queryCost",
      NTILE(100) OVER (ORDER BY "queryCost") AS "pct"
FROM "QueryAnalysis"."Business"."SelectQueryData") AS "a"
GROUP BY "pct"
ORDER BY "pct"
```

8 NtileQueryDuration

```
SELECT "pct", MAX("totalDurationMS") AS "maxTotalDurationMS"
FROM (SELECT "totalDurationMS",
    NTILE(100) OVER (ORDER BY "totalDurationMS") AS "pct"
FROM "QueryAnalysis"."Business"."SelectQueryData") AS "a"
GROUP BY "pct"
ORDER BY "pct"
```

9 OverallWorkloadDistribution

```
SELECT "pct", MAX("queryCost") AS "maxQueryCost"
FROM (SELECT "queryCost",
      NTILE(100) OVER (ORDER BY "queryCost") AS "pct"
FROM "QueryAnalysis"."Business"."SelectQueryData") AS "a"
GROUP BY "pct"
ORDER BY "pct"
```

10 PctQueueUsageAllSartedQueries

```
SELECT "queueName", COUNT("queueName") AS "numQueriesPerQueue",
CAST(COUNT("queueName") * 100 AS FLOAT) / (SELECT COUNT(*)
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "outcome" IN ('COMPLETED', 'FAILED', 'CANCELED')
    AND "executionTime" IS NOT NULL AND "queryCost" > 10)  As
pctOfTotal
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "outcome" IN ('COMPLETED', 'FAILED', 'CANCELED')
    AND "executionTime" IS NOT NULL AND "queryCost" > 10
GROUP BY "queueName"
```

11 QueriesNotCompleted

```
SELECT *
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "outcome" NOT IN ('COMPLETED')
```

12 QueryConcurrency

```
SELECT "this"."queryId" AS "thisQueryId", "this"."queryText" AS
"thisQueryText",
    "this"."startTime" AS "thisStartTime", "this"."finishTime" AS
"thisFinishTime",
    "others"."queryId" AS "otherQueryId", "others"."startTime" AS
"otherStartTime",
    "others"."FinishTime" AS "otherFinishTime",
    CASE WHEN "others"."StartTime" < "this"."startTime"
        AND "others"."finishTime" > "this"."finishTime" THEN 'Other
Started Before This and Finished After This'
    WHEN "others"."StartTime" < "this"."startTime"
        AND "others"."finishTime" <= "this"."finishTime" THEN 'Other
Started Before This and Finished During This'
    WHEN "others"."StartTime" >= "this"."startTime"
        AND "others"."finishTime" <= "this"."FinishTime" THEN 'Other
Ran During This'
    WHEN "others"."StartTime" >= "this"."startTime"
        AND "others"."finishTime" > "this"."FinishTime" THEN 'Other
Started During This and Finished After This'
    ELSE NULL END AS "relation"
FROM "QueryAnalysis"."Business"."SelectQueryData" AS "this"
LEFT JOIN "QueryAnalysis"."Business"."SelectQueryData" AS "others" ON
"others"."startTime" < "this"."startTime"
AND "others"."FinishTime" > "this"."StartTime" OR "others"."StartTime"
>= "this"."startTime"
AND "others"."startTime" <= "this"."FinishTime" AND "this"."queryId"
<> "others"."queryId"
AND "this"."outcome" IN ('COMPLETED', 'FAILED')
```

13 QueryConcurrencyCount

```
SELECT "thisQueryId", COUNT("thisQueryId") AS "concurrency"
FROM "QueryAnalysis"."Application"."QueryConcurrency"
GROUP BY "thisQueryId"
ORDER BY "concurrency" DESC
```

14 QueryCostVsExecutionTime

```
SELECT "queryId", "queryText", "executionTime", "queryCost",
"accelerated"
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "outcome" = 'COMPLETED'
```

15 QueueMaxQueriesPerSecond

```
SELECT "qc"."queueName", MAX("qc"."queriesPerSecond") AS "maxQPS"
FROM (SELECT "queueName", "DATE_TRUNC"('second', "startTime") AS
"startSecond",
    COUNT(*) AS "queriesPerSecond"
    FROM "QueryAnalysis"."Business"."SelectQueryData"
    WHERE "queueName" <> '' AND "queueName" <> 'UI Previews'
    GROUP BY "queueName", "startSecond"
    ORDER BY "queueName", "startSecond") AS "qc"
GROUP BY "qc"."queueName"
```

16 Range_EnQueuedTime

```
WITH "T1" AS (SELECT CASE WHEN "enqueuedTime" <= 1000 THEN 'R00 <
1000ms  i.e Less than 1 sec'
WHEN "enqueuedTime" <= 10000 THEN 'R01 < 10000ms i.e Less than 10
secs'
WHEN "enqueuedTime" <= 60000 THEN 'R02 < 60000ms i.e. Less than 60
secs'
WHEN "enqueuedTime" <= 120000 THEN 'R03 < 120000ms i.e. Less than 2
minutes'
WHEN "enqueuedTime" <= 180000 THEN 'R04 < 180000ms i.e. Less than 3
minutes'
WHEN "enqueuedTime" <= 300000 THEN 'R05 < 300000ms i.e. Less than 5
minutes'
WHEN "enqueuedTime" <= 600000 THEN 'R06 < 600000ms i.e. Less than 10
minutes'
WHEN "enqueuedTime" <= 1200000 THEN 'R07 < 1200000ms i.e. Less than 20
minutes'
WHEN "enqueuedTime" <= 1800000 THEN 'R08 < 1800000ms i.e. Less than 30
minutes'
WHEN "enqueuedTime" <= 3600000 THEN 'R09 < 1800000ms i.e. Less than 60
minutes (1 hour)'
ELSE 'R10 > 1800000ms i.e. Greater than 60 minutes(1 hours)' END AS
"RangeEnQueuedTime"
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "enqueuedTime" IS NOT NULL), "T2" AS (SELECT SUM(1) AS "TotalQ"
FROM "T1") (SELECT "RangeEnQueuedTime", COUNT(*) AS "querycount",
            CAST(COUNT(*) * 100.00 / "T2"."TotalQ" AS DECIMAL(5, 2))
AS "PerCentQs"
FROM "T1",
"T2"
GROUP BY "RangeEnQueuedTime", "T2"."TotalQ")
ORDER BY "RangeEnQueuedTime"
```

17 Range_ExecutionTime

```
WITH "T1" AS
(SELECT CASE WHEN "executionTime" <= 1000 THEN 'R00 < 1000ms  i.e Less
than 1 sec'
    WHEN "executionTime" <= 10000 THEN 'R01 < 10000ms i.e Less than 10
secs'
    WHEN "executionTime" <= 60000 THEN 'R02 < 60000ms i.e. Less than
60 secs'
    WHEN "executionTime" <= 120000 THEN 'R03 < 120000ms i.e. Less than
2 minutes'
    WHEN "executionTime" <= 180000 THEN 'R04 < 180000ms i.e. Less than
3 minutes'
    WHEN "executionTime" <= 300000 THEN 'R05 < 300000ms i.e. Less than
5 minutes'
    WHEN "executionTime" <= 600000 THEN 'R06 < 600000ms i.e. Less than
10 minutes'
    WHEN "executionTime" <= 1200000 THEN 'R07 < 1200000ms i.e. Less
than 20 minutes'
    WHEN "executionTime" <= 1800000 THEN 'R08 < 1800000ms i.e. Less
than 30 minutes'
    WHEN "executionTime" <= 3600000 THEN 'R09 < 3600000ms i.e. Less
than 60 minutes (1 hour)'
    ELSE 'R10 > 3600000ms i.e. Greater than 60 minutes(1 hours)'
    END AS "RangeExecutionTime"
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "executionTime" IS NOT NULL), "T2" AS (SELECT SUM(1) AS "TotalQ"
FROM "T1") (SELECT "RangeExecutionTime", COUNT(*) AS "querycount",
    CAST(COUNT(*) * 100.00 / "T2"."TotalQ" AS DECIMAL(5, 2)) AS
"PerCentQs"
FROM "T1",
"T2"
GROUP BY "RangeExecutionTime", "T2"."TotalQ")
ORDER BY "RangeExecutionTime"
```

18 SelectWorkloadDistribution

```
WITH "t1" AS (SELECT "TO_DATE"("startTime") AS "queryStartDate",
    "DATE_PART"('hour', "StartTime") AS "queryStartHour",
    "DATE_TRUNC"('second', "startTime") AS "queryStartSecond",
    COUNT(*) AS "queriesPerSecond"
FROM "QueryAnalysis"."Business"."SelectQueryData"
GROUP BY "queryStartDate", "queryStartHour", "queryStartSecond")
    (SELECT "queryStartDate", "queryStartHour",
    SUM("queriesPerSecond") AS "queriesPerHour",
    MAX("queriesPerSecond") AS "peakQueriesPerSecond"
FROM "t1"
GROUP BY "queryStartDate", "queryStartHour")
ORDER BY "queryStartDate" DESC, "queryStartHour"
```

19 SummaryQueueExecTimeByQueue

```
WITH "T1" AS (SELECT "queueName", 1 AS "QueryCount",
        CASE WHEN COALESCE("enqueuedTime") / 1000 <= 0 THEN 0 ELSE 1
END AS "WaitQuery",
        COALESCE("enqueuedTime", 0) / 1000 AS "QueueTimeSec",
        COALESCE("executionTime", 0) / 1000 AS "ExecTimeSec"
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "queueName" <> '' AND "outcome" = 'COMPLETED')
(SELECT "queueName", SUM("QueryCount") AS "TotalQueryCount",
    SUM("WaitQuery") AS "QueuedQueries",
    100 * SUM("WaitQuery") / SUM("QueryCount") AS "PercentageQueued",
    MAX("QueueTimeSec") AS "MaxQueueTimeSec",
    MAX("ExecTimeSec") AS "MaxExecTimeSec",
    MAX("QueueTimeSec") / 60 AS "MaxQueueTimeMinutes",
    MAX("ExecTimeSec") / 60 AS "MaxExecTimeMinutes"
FROM "T1"
GROUP BY "queueName")
ORDER BY 2 DESC
```

20 Top20DataSetsQueried

```
SELECT "dataSet", "dataSetType", COUNT(*) AS "countTimesQueried"
FROM (
    SELECT
"list_to_delimited_string"("nested_0"."parentsList"."datasetPathList",
'.') AS "dataSet",
    "nested_0"."parentsList"."type" AS "dataSetType"
    FROM (
        SELECT "FLATTEN"("parentsList") AS "parentsList"
        FROM "QueryAnalysis"."Business"."SelectQueryData"
        WHERE "parentsList" IS NOT NULL
        ) AS "nested_0"
        ) AS "nested_1"
GROUP BY "dataSet", "dataSetType"
ORDER BY "countTimesQueried" DESC
FETCH NEXT 20 ROWS ONLY
```

Note: in Dremio v21, *datasetPathList* has changed to *datasetPath*

21 Top20ExecutionTimes

```
SELECT *
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "executionTime" IS NOT NULL
ORDER BY "executionTime" DESC
FETCH NEXT 20 ROWS ONLY
```

22 Top20PlanningTimes

```
SELECT *
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "planningTime" IS NOT NULL
ORDER BY "planningTime" DESC
FETCH NEXT 20 ROWS ONLY
```

23 Top20TotalDurationTimes

```
SELECT *
FROM "QueryAnalysis"."Business"."SelectQueryData"
ORDER BY "totalDurationMS" DESC
FETCH NEXT 20 ROWS ONLY
```

24 TopQueriesPerMinute

```
SELECT "DATE_TRUNC"('minute', "startTime") AS "startMinute",
    COUNT(*) AS "queriesPerMinute"
FROM "QueryAnalysis"."Business"."SelectQueryData"
GROUP BY "startMinute"
ORDER BY "startMinute"
```

25 TotalQueriesPerMinutePerUser

```
SELECT "DATE_TRUNC"('minute', "startTime") AS "startMinute",
"username", "outcome", COUNT(*) AS "queriesPerMinute"
FROM "QueryAnalysis"."Business"."SelectQueryData"
GROUP BY "startMinute", "username", "outcome"
ORDER BY "startMinute", "username", "outcome"
```

26 TopQueriesPerMinutePerQueue

```
SELECT "DATE_TRUNC"('minute', "startTime") AS "startMinute",
"queueName", COUNT(*) AS "queriesPerMinute"
FROM "QueryAnalysis"."Business"."SelectQueryData"
WHERE "queueName" <> ''
GROUP BY "startMinute", "queueName"
ORDER BY "queriesPerMinute" DESC, "startMinute"
```

27 TotalQueriesPerUser

```
SELECT "username", "outcome", COUNT("outcome") AS "countQueries"
FROM "QueryAnalysis"."Business"."SelectQueryData"
GROUP BY "username", "outcome"
ORDER BY "username", "outcome"
```

28 TotalQueriesStartedPerSecond

```
SELECT "DATE_TRUNC"('second', "startTime") AS "startSecond",
COUNT(*) AS "queriesPerSecond"
FROM "QueryAnalysis"."Business"."SelectQueryData"
GROUP BY "startSecond"
ORDER BY "startSecond"
```

29 ReflectionRefreshData

```
SELECT queryId, queryText, reflection_id, queryChunkSizeBytes,
nrQueryChunks, startTime, finishTime, totalDurationMinutes,
totalDurationSeconds, totalDurationMS, rownumByTotalDurationMS,
outcome, username, requestType, queryType, parentsList, queueName,
poolWaitTime, planningTime, context, engineName, enqueuedTime,
executionTime, accelerated, inputRecords, inputBytes, outputRecords,
outputBytes, queryCost, memoryAllocated, outcomereason, profileUrl
FROM (
  SELECT *
  FROM (SELECT "queryId", "queryText", CASE WHEN
length(substr(queryText, 21, 36)) > 0 THEN substr(queryText, 21, 36)
ELSE NULL END AS reflection_id,"queryChunkSizeBytes", "nrQueryChunks",
"startTime", "finishTime", CAST("totalDurationMS" / 60000.000 AS
DECIMAL(10, 3)) AS "totalDurationMinutes", CAST("totalDurationMS" /
1000.000 AS DECIMAL(10, 3)) AS "totalDurationSeconds",
"totalDurationMS", ROW_NUMBER() OVER (ORDER BY "totalDurationMS" DESC)
AS "rownumByTotalDurationMS", "outcome", "username", "requestType",
"queryType", "parentsList", "queueName", "poolWaitTime",
"planningTime", "context", "engineName", "enqueuedTime",
"executionTime", "accelerated", "inputRecords", "inputBytes",
"outputRecords", "outputBytes", "queryCost",memoryAllocated,
"outcomereason", "CONCAT"('http://<DREMIO_HOST>:9047/jobs?#',
"queryId") AS "profileUrl"
  FROM "QueryAnalysis"."Preparation"."results" AS "results"
  --WHERE "SUBSTR"(UPPER("queryText"), "STRPOS"(UPPER("queryText"),
'SELECT')) LIKE 'SELECT%' AND UPPER("queryText") NOT LIKE 'CREATE
TABLE%' AND "requestType" IN ('RUN_SQL', 'EXECUTE_PREPARE')) AS "t"
  WHERE "SUBSTR"(UPPER("queryText"), "STRPOS"(UPPER("queryText"),
'REFRESH REFLECTION')) LIKE 'REFRESH REFLECTION%')  AS "t"

  WHERE "rownumByTotalDurationMS" > 0
  and startTime > '2022-11-11'
) nested_0
```

30 ReflectionThresholds_2Queues

```
SELECT MAX(CASE WHEN "a"."pct" = 80 THEN "a"."queryCost" ELSE 0 END)
AS "upper_low_cost_threshold"
FROM (SELECT "queryCost", NTILE(100) OVER (ORDER BY "queryCost") AS
"pct"
FROM QueryAnalysis.Business.SelectQueryDataReflections
WHERE "outcome" = 'COMPLETED' AND "requestType" IN ('RUN_SQL',
'EXECUTE_PREPARE') AND "queryCost" > 10 AND "queueName" <> 'UI
Previews') AS "a"
```

31 ReflectionThresholds_3Queues

```
SELECT MAX(CASE WHEN "a"."pct" = 75 THEN "a"."queryCost" ELSE 0 END)
AS "upper_low_cost_threshold", MAX(CASE WHEN "a"."pct" = 90 THEN
"a"."queryCost" ELSE 0 END) AS "upper_medium_cost_threshold"
FROM (SELECT "queryCost", NTILE(100) OVER (ORDER BY "queryCost") AS
"pct"
FROM QueryAnalysis.Business.SelectQueryDataReflections
WHERE "outcome" = 'COMPLETED' AND "requestType" IN ('RUN_SQL',
'EXECUTE_PREPARE') AND "queryCost" > 10 AND "queueName" <> 'UI
Previews') AS "a"
```

32 applcation.SummaryDurationByReflection

```
select ReflectionRefreshData.reflection_id,
    ReflectionRefreshData.queueName,
    count(*) as refresh_cnt,
    AVG(ReflectionRefreshData.enqueuedTime / 1000) avgQueueTimeSec,
    AVG(ReflectionRefreshData.executionTime / 1000) avgExecTimeSec,
    AVG(ReflectionRefreshData.queryCost)
    AVGReflectionCost,
    AVG(memoryAllocated) as avgMemoryAllocated
FROM QueryAnalysis.Business.ReflectionRefreshData
where outcome = 'COMPLETED'
group by ReflectionRefreshData.reflection_id,
ReflectionRefreshData.queueName
order by avgMemoryAllocated
```

33 applcation.SummaryReflectionExecTimeByQueue

```
WITH "T1" AS (SELECT "queueName", 1 AS "QueryCount", (CASE WHEN
(((COALESCE("enqueuedTime")) / 1000) <= 0) THEN 0 ELSE 1 END) AS
"WaitQuery",
    ((COALESCE("enqueuedTime", 0)) / 1000) AS "QueueTimeSec",
    ((COALESCE("executionTime", 0)) / 1000) AS "ExecTimeSec"
FROM QueryAnalysis.Business.ReflectionRefreshData
WHERE (("queueName" <> '') AND ("outcome" = 'COMPLETED'))) (
    SELECT "queueName", SUM("QueryCount") AS "TotalQueryCount",
    SUM("WaitQuery") AS "QueuedQueries", ((100 * SUM("WaitQuery")) /
SUM("QueryCount")) AS "PercentageQueued",
    MAX("QueueTimeSec") AS "MaxQueueTimeSec", MAX("ExecTimeSec") AS
"MaxExecTimeSec",
    (AVG("QueueTimeSec")) AS "AvgQueueTimeSec", (AVG("ExecTimeSec"))
AS "AvgExecTimeSec"
FROM "T1"
GROUP BY "queueName")
ORDER BY 2 DESC
```

Getting Support

Dremio Query Analyzer is provided by Dremio Professional Services. Issues should be directed to Dremio Professional Services, who provide support during the engagement on a best-effort basis.