

Cloudera Runtime 1.0.0

Using Hue

Date published: 2020-07-28

Date modified: 2023-05-05

CLOUDERA

<https://docs.cloudera.com/>

Legal Notice

© Cloudera Inc. 2024. All rights reserved.

The documentation is and contains Cloudera proprietary information protected by copyright and other intellectual property rights. No license under copyright or any other intellectual property right is granted herein.

Unless otherwise noted, scripts and sample code are licensed under the Apache License, Version 2.0.

Copyright information for Cloudera software may be found within the documentation accompanying each component in a particular release.

Cloudera software includes software from various open source or other third party projects, and may be released under the Apache Software License 2.0 (“ASLv2”), the Affero General Public License version 3 (AGPLv3), or other license terms. Other software included may be released under the terms of alternative open source licenses. Please review the license and notice files accompanying the software for additional licensing information.

Please visit the Cloudera software product page for more information on Cloudera software. For more information on Cloudera support services, please visit either the Support or Sales page. Feel free to contact us directly to discuss your specific needs.

Cloudera reserves the right to change any products at any time, and without notice. Cloudera assumes no responsibility nor liability arising from the use of products, except as expressly agreed to in writing by Cloudera.

Cloudera, Cloudera Altus, HUE, Impala, Cloudera Impala, and other Cloudera marks are registered or unregistered trademarks in the United States and other countries. All other trademarks are the property of their respective owners.

Disclaimer: EXCEPT AS EXPRESSLY PROVIDED IN A WRITTEN AGREEMENT WITH CLOUDERA, CLOUDERA DOES NOT MAKE NOR GIVE ANY REPRESENTATION, WARRANTY, NOR COVENANT OF ANY KIND, WHETHER EXPRESS OR IMPLIED, IN CONNECTION WITH CLOUDERA TECHNOLOGY OR RELATED SUPPORT PROVIDED IN CONNECTION THEREWITH. CLOUDERA DOES NOT WARRANT THAT CLOUDERA PRODUCTS NOR SOFTWARE WILL OPERATE UNINTERRUPTED NOR THAT IT WILL BE FREE FROM DEFECTS NOR ERRORS, THAT IT WILL PROTECT YOUR DATA FROM LOSS, CORRUPTION NOR UNAVAILABILITY, NOR THAT IT WILL MEET ALL OF CUSTOMER’S BUSINESS REQUIREMENTS. WITHOUT LIMITING THE FOREGOING, AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, CLOUDERA EXPRESSLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, QUALITY, NON-INFRINGEMENT, TITLE, AND FITNESS FOR A PARTICULAR PURPOSE AND ANY REPRESENTATION, WARRANTY, OR COVENANT BASED ON COURSE OF DEALING OR USAGE IN TRADE.

Contents

About using Hue.....	4
Accessing and using Hue in Cloudera Data Warehouse.....	4
Viewing Hive query details.....	6
Viewing Hive query history.....	6
Viewing Hive query information.....	6
Viewing explain plan for a Hive query.....	7
Viewing Hive query timeline.....	8
Viewing configurations for a Hive query.....	8
Viewing DAG information for a Hive query.....	10
Viewing Impala query details.....	13
Viewing Impala query history.....	13
Viewing Impala query information.....	14
Viewing the Impala query execution plan.....	14
Viewing the Impala query metrics.....	15
Terminating Hive queries.....	16
Comparing Hive and Impala queries in Hue.....	16
How to run a stored procedure from Hue in Cloudera Data Warehouse.....	19
Enabling stored procedures for Hive in Cloudera Data Warehouse.....	19
Enabling the SQL editor autocompleter.....	20
Using governance-based data discovery.....	21
Searching metadata tags.....	21
Using Amazon S3 with Hue.....	22
Accessing S3 bucket from Hue in CDW with RAZ.....	22
Accessing S3 bucket from Hue in CDW without RAZ.....	23
Creating tables by importing CSV files from AWS S3 in Cloudera Data Warehouse.....	26
Using Azure Data Lake Storage Gen2 with Hue.....	30
Accessing ADLS Gen2 containers from Hue in CDW with RAZ.....	30
Accessing ADLS Gen2 containers from Hue in CDW without RAZ.....	31
Creating tables by importing CSV files from ABFS.....	33
Granting permission to access S3 and ABFS File Browser in Hue.....	34
List of supported non-alphanumeric characters for file and directory names in Hue.....	35

About using Hue

Hue provides a one-stop querying experience in Cloudera Data Warehouse (CDW) to leverage Hive and Impala SQL engines. You can also run stored procedures (HPLSQL) and Unified Analytics queries.

Accessing and using Hue in Cloudera Data Warehouse

Get started using Hue by analyzing and visualizing your data with Impala and Hive SQL query engines.

About this task

To try Hue without having an account, try running sample queries on <http://demo.gethue.com/>.

Before you begin

Hue uses your LDAP credentials that you have configured for the CDP cluster.

Procedure

1. Log into the CDP web interface and navigate to the Data Warehouse service.
2. In the Data Warehouse service, navigate to the **Overview** page.

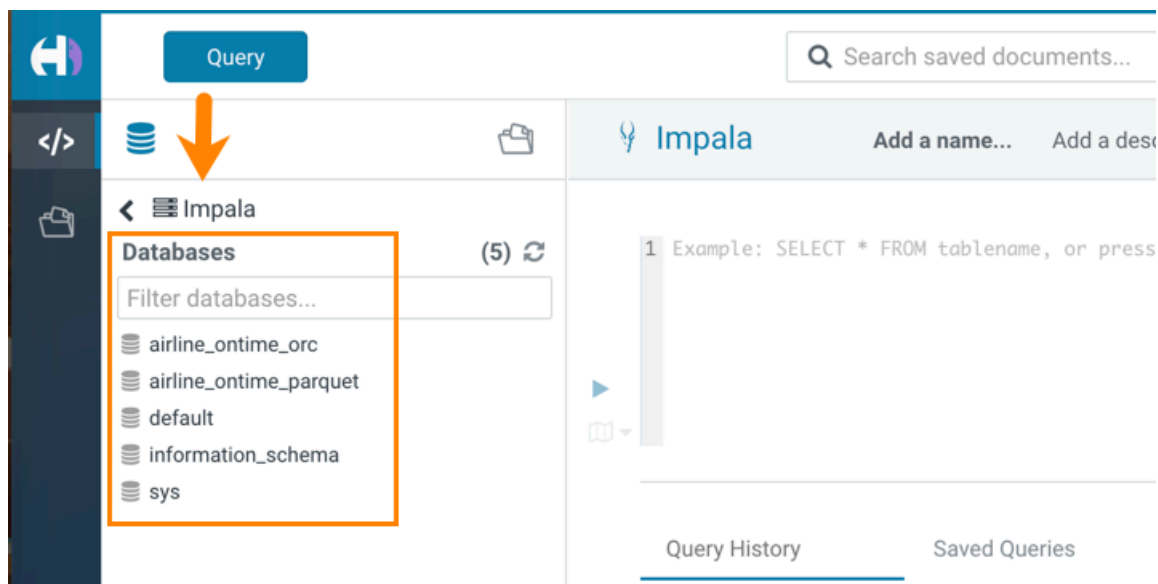


Note: You can also launch Hue from the **Virtual Warehouse** page using the same steps.

3. To run Impala queries:

- a) On the **Overview** page under Virtual Warehouses, click on the Hue button.

The query editor is displayed:



- b) Click a database to view the tables it contains.

When you click a database, it sets it as the target of your query in the main query editor panel.

- c) Type a query in the editor panel and click the run icon ▶ to run the query.

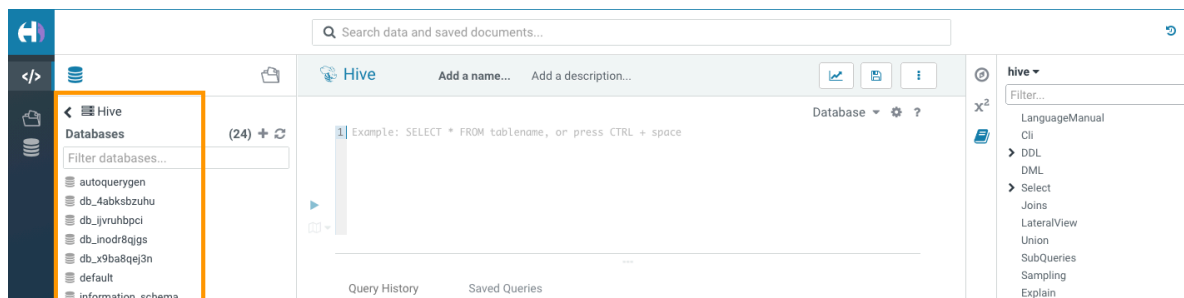


Note: Use the Impala language reference to get information about syntax in addition to the SQL auto-complete feature that is built in. To view the language reference, click the book icon 📖 to the right of the query editor panel.

4. To run Hive queries:

- a) On the **Overview** page under Virtual Warehouses, click on the Hue button.

The Hive query editor is displayed:



- b) Click a database to view the tables it contains.

When you click a database, it sets it as the target of your query in the main query editor panel.

- c) Type a query in the editor panel and click the run icon ▶ to run the query.



Note: Use the Hive language reference to get information about syntax in addition to the SQL auto-complete feature that is built in. To view the language reference, click the book icon 📖 to the right of the query editor panel.

Viewing Hive query details

You can search Hive query history, compare two queries, download debug bundles for troubleshooting, and view query details, a graphical representation of the query execution plan, and DAG information on the Job Browser page in Hue.

Viewing Hive query history

The Queries tab on the Job Browser page in Hue displays all the queries that were run on all Hive Virtual Warehouses within a Database Catalog from various query interfaces, such as Beeline, Hive Warehouse Connector (HWC), Tableau, Hue, and other JDBC BI clients and tools.

About this task

Only Query Processor Administrators can view historical queries of all users to monitor resource utilization and control costs from the Hue Job Browser. Non-admin users can view only their queries.

Queries are retained in the backend database for 30 days by default, after which they are cleaned up. You can change the clean-up interval from the Database Catalog configurations.

Procedure

1. Go to the Cloudera Data Warehouse (CDW) web interface and open Hue from your Virtual Warehouse.
2. Click Jobs from the left assist panel.
The **Job Browser** page is displayed.
3. Click Queries.

The Hive queries that were run for the past seven days are displayed. You can select the time period for which you want to view the historical data.

You can also filter queries by their status.

Related Information

[Adding Query Store Administrator users in CDW](#)

Viewing Hive query information

The Query Info tab provides information such as, the Hive query ID, the user who executed the query, the start time, the end time, the total time taken to execute the query, the tables that were read and written, application ID, Directed Acyclic Graph (DAG) IDs, session ID, LLAP app ID, thread ID, and the queue against which the query was run.

Procedure

1. Go to the Cloudera Data Warehouse (CDW) web interface and open Hue from your Virtual Warehouse.
2. Click Jobs from the left assist panel.
The **Job Browser** page is displayed.

- Go to the **Queries** tab and click on the query for which you want to view the query details.

The following image shows the **Query Info** tab on the Hue web interface:

The screenshot displays the Hue web interface with the **Job Browser** header and tabs for **Jobs** and **Queries**. The **Queries** tab is active, showing a table with query details. Below the table, the **Query Info** tab is selected, displaying the query text and various execution metrics.

QUERY ID	USER	STATUS
hive_20220509083516_a9d00c94-657a-4d80-9cc2-51851ec711eb		✓ SUCCESS

Buttons: **Queries**, **Kill**, **Download**

Query Info tab selected. Other tabs: Visual Explain, Timeline, Query Config, DAG Info, DAG Flow, DAG Swimlane, DAG Counters, DAG Configurations.

QUERY

```
SELECT
*
FROM
customer
WHERE
c_nationkey = 15
```

START TIME
3 minutes ago

END TIME
2 minutes ago

DURATION
50s

TABLES READ
customer (default)

TABLES WRITTEN
-

APPLICATION ID
application_1652085158072_0001

DAG ID
dag_1652085158072_0001_2

SESSION ID
76e59bed-40e6-4387-8c35-52606ecacaf4

LLAP APP ID

THREAD ID
HiveServer2-Background-Pool: Thread-297

QUEUE
None

Viewing explain plan for a Hive query

The Visual Explain feature provides a graphical representation of the query execution plan. The Explain plan is read from right to left. It provides details about every stage of query execution.

Procedure


- Go to the Cloudera Data Warehouse (CDW) web interface and open Hue from your Virtual Warehouse.
- Click **Jobs** from the left assist panel.
The **Job Browser** page is displayed.
- Go to the **Queries** tab and click on the query for which you want to view the query details.

4. Click on Visual Explain.

The following image shows the **Visual Explain** tab on the Hue web interface:



5.

(Optional) Click  to download the query explain plan in JSON format.

Viewing Hive query timeline

The Timeline tab provides a visual representation of Hive performance logs and shows the time taken by each stage of the query execution.

About this task

Following are the stages in which a query is executed:

- Pre-execution and DAG construction: It is the first phase of query execution and is executed on the Hive engine. It constitutes the time taken to compile, parse, and build the Directed Acyclic Graph (DAG) for the next phase of the query execution.
- DAG submission: It is the second phase in which the DAG that was generated in Hive is submitted to the Tez engine for execution.
- DAG runtime: It shows the time taken by the Tez engine to execute the DAG.
- Post-execution: It is the last phase of query execution in which the files in S3/ABFS are moved or renamed.

Duration data about each phase are distilled into more granular metrics based on query execution logs.

Procedure

1. Go to the Cloudera Data Warehouse (CDW) web interface and open Hue from your Virtual Warehouse.
2. Click Jobs from the left assist panel.
The **Job Browser** page is displayed.
3. Go to the **Queries** tab and click on the query for which you want to view the query details.
4. Click on Timeline.

The following image shows the **Timeline** tab on the Hue web interface:



Viewing configurations for a Hive query

The Query Config tab provides the configuration properties and settings that are used in a Hive query. You can use this tab to verify that configuration property values align with your expectations.

Procedure

1. Go to the Cloudera Data Warehouse (CDW) web interface and open Hue from your Virtual Warehouse.
2. Click Jobs from the left assist panel.
The **Job Browser** page is displayed.
3. Go to the **Queries** tab and click on the query for which you want to view the query details.
4. Click on Query Config.

The following image shows the **Query Config** tab on the Hue web interface:

Query Info	Visual Explain	Timeline	Query Config	DAG Info	DAG Flow	DAG Swimlane
Config Name	Config Value					
hadoop.security.group.mapping.ldap.posix.attr...	uidNumber					
dfs.block.invalidate.limit	1000					
yarn.admin.acl	*					
hive.repl.dump.metadata.only.for.external.table	true					
hive.exec.stagingdir	.hive-staging					
hive.druid.rollup	true					
yarn.federation.enabled	false					
yarn.app.mapreduce.am.job.committer.cancel...	60000					
hive.druid.broker.address.default	localhost:8082					
dfs.disk.balancer.max.disk.throughputInMBper...	10					
dfs.qjournal.select-input-streams.timeout.ms	20000					
hive.llap.io.orc.time.counters	true					
hive.repl.retain.prev.dump.dir	false					
hive.vectorized.execution.mapjoin.native.fast....	true					
dfs.provided.aliasmap.inmemory.leveldb.dir	/tmp					
yarn.nodemanager.process-kill-wait.ms	5000					
yarn.minicluster.use-rpc	false					
io.map.index.interval	128					

Viewing DAG information for a Hive query

Directed Acyclic Graph (DAG) is created by the Hive engine every time you query the Hive Virtual Warehouse. The Hive SQL queries are compiled and converted into a Tez execution graph also known as a DAG. DAG is a collection of vertices where each vertex executes a fragment of the query or script. Hue provides a web interface to view detailed information about DAGs.

About this task

Directed connections between vertices determine the order in which they are executed. For example, the vertex to read a table must be run before a filter can be applied to the rows of that table. As another example, consider a vertex that reads a user table that is very large and distributed across multiple computers and multiple racks. Reading the table is achieved by running many tasks in parallel.



Important: The DAG information tabs (**DAG Info**, **DAG Flow**, **DAG Swimlane**, **DAG Counters**, **DAG Configurations**) are displayed only if the Tez engine is used for query execution. The Tez engine is typically utilized for complex queries.

Procedure

1. Go to the Cloudera Data Warehouse (CDW) web interface and open Hue from your Virtual Warehouse.
2. Click Jobs from the left assist panel.

The **Job Browser** page is displayed.

3. Go to the **Queries** tab and click on the query for which you want to view the query details.
4. Click DAG Info to see the DAG ID, DAG name, the status of the query, the time taken to execute the DAG, start time, and end time.

The following image shows the **DAG Info** tab on the Hue web interface:

The screenshot shows the Hue web interface with the 'DAG Info' tab selected. The top section displays query details: QUERY ID (hive_20220509083516_a9d00c94-657a-4d80-9cc2-51851ec711eb), USER (redacted), and STATUS (SUCCESS). Below this is a navigation bar with tabs: Query Info, Visual Explain, Timeline, Query Config, DAG Info (selected), DAG Flow, DAG Swimlane, DAG Counters, and DAG Configurations. The main content area shows DAG details: DAG ID (dag_1652085158072_0001_2), DAG NAME (SELECT * FROM customer WHERE c_nationke...15 (Stage-1)), STATUS (SUCCEEDED), DURATION (00:00:50), START TIME (3 minutes ago), and END TIME (2 minutes ago).

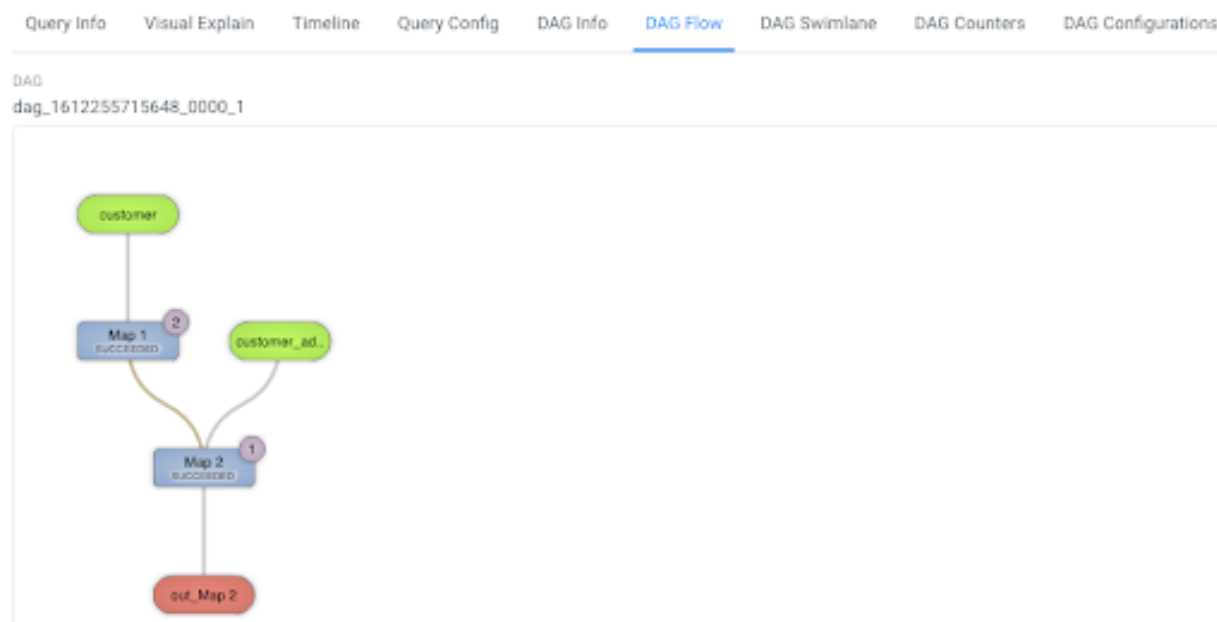
The following table lists and describes the status of the Tez job:

Status	Description
Submitted	The DAG is submitted to Tez but is not running
Running	The DAG is currently running
Succeeded	The DAG was completed successfully
Failed	The DAG failed to complete successfully
Killed	The DAG was stopped manually
Error	An internal error occurred when executing the DAG

5. Click DAG Flow to see the DAG in the form of a flowchart.

You can gain insight into the complexity and the progress of executing jobs, and investigate the vertices that have failures or are taking a long time to complete.

The following image shows the **DAG Flow** tab on the Hue web interface::



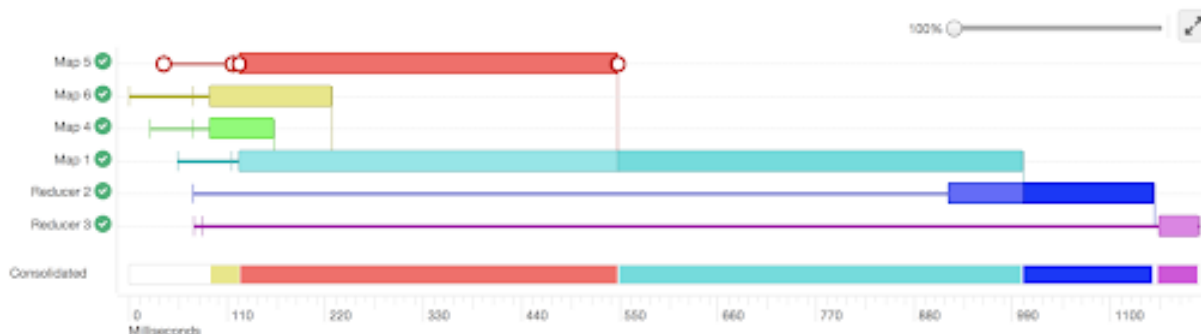
Here, the input to vertices Map 1 and Map 2 are the tables displayed in green boxes. Next, Map 2 depends on the result set generated by Map 1. Map 2 is the last vertex in the DAG flow and after it completes its execution, the query output is written to a file in a filesystem such as S3 or ABFS.

There are a few options to change the layout of the DAG flow. You can hide the input and the output nodes to view only the task vertices by clicking the Toggle source/sink visibility button. You can switch between the horizontal and vertical orientation by clicking the Toggle orientation button.

6. Click DAG Swimlane to see the DAG of the vertices against time.

Each mapping and reducing task is a vertex. Each horizontal bar of the swimlane represents the total time taken by the vertex to complete the execution. The vertical lines indicate the time when the vertex was initialized, the time when the vertex started, the time when the first task started, the time when the last task was completed, and the time when the vertex finished its execution. When you mouse over the vertical line, the bubble displays the stage of the vertex execution and provides a timestamp. The vertical lines connecting two vertices denote the dependency of a vertex on another vertex.

The following image shows the **DAG Swimlane** tab on the Hue web interface:



In this example, Map 1 depends on the results of Map 5. Map 1 will finish its execution only when Map 5 finishes its execution successfully. Similarly, Reducer 2 depends on Map 1 to complete its execution.

The consolidated timeline shows the percentage of time each vertex took to complete executing.

7. Click DAG Counters to see details such as the number of bytes read and written, number of tasks that initiated and ran successfully, amount of CPU and memory consumed, and so on.

The **DAG Counters** tab provides a way to measure the progress or the number of operations that occur within a generated DAG. Counters are used to gather statistics for quality control purposes or problem diagnosis.

The following image shows the **DAG Counters** tab on the Hue web interface:

Query Info	Visual Explain	Timeline	Query Config	DAG Info	DAG Flow	DAG Swimlane	DAG Counters	DAG Configurations
Group Name		Counter Name		DAG : dag_1652085158072_0001_2				
org.apache.tez.common.counters.DAGCounter		NUM_SUCCEEDED_TASKS		54				
org.apache.tez.common.counters.DAGCounter		TOTAL_LAUNCHED_TASKS		54				
org.apache.tez.common.counters.DAGCounter		DATA_LOCAL_TASKS		54				
org.apache.tez.common.counters.DAGCounter		AM_CPU_MILLISECONDS		5890				
org.apache.tez.common.counters.DAGCounter		AM_GC_TIME_MILLIS		22				
org.apache.tez.common.counters.FileSystem...		FILE_BYTES_WRITTEN		1074416910				
org.apache.tez.common.counters.FileSystem...		S3A_BYTES_READ		6742239795				
org.apache.tez.common.counters.FileSystem...		S3A_READ_OPS		1124				
org.apache.tez.common.counters.TaskCounter		TASK_DURATION_MILLIS		759357				
org.apache.tez.common.counters.TaskCounter		INPUT_RECORDS_PROCESSED		146519				
org.apache.tez.common.counters.TaskCounter		INPUT_SPLIT_LENGTH_BYTES		12387638515				
HIVE		CREATED_FILES		36				
HIVE		RECORDS_IN_Map_1		150000000				
HIVE		RECORDS_OUT_0		6003115				
HIVE		RECORDS_OUT_OPERATOR_FIL_5		6003115				
HIVE		RECORDS_OUT_OPERATOR_FS_7		6003115				
HIVE		RECORDS_OUT_OPERATOR_SEL_6		6003115				
HIVE		RECORDS_OUT_OPERATOR_TS_0		150000000				

8. Click DAG Configurations to see the Tez configuration details for a query that has a DAG associated with it. The following image shows the **DAG Configurations** tab on the Hue web interface:

Query Info	Visual Explain	Timeline	Query Config	DAG Info	DAG Flow	DAG Swimlane	DAG Counters	DAG Configurations
Config Name		DAG : dag_1612255715648_0000_1						
dfs.namenode.fs-limits.max-xattrs-per-inode		32						
dfs.namenode.delegation.token.always-use		false						
yam.nodemanager.runtime.linux.docker.delaye..		false						
yam.timeline-service.handler-thread-count		10						
yam.timeline-service.webapp.rest-csrf.custom..		X-XSRF-Header						
fs.s3a.retry.limit		7						
dfs.client.write.byte-array-manager.count-reset..		10000						
yam.nodemanager.linux-container-executor.cg..		/hadoop-yam						
mapreduce.shuffle.connection-keep-alive.time..		5						
mapreduce.client.libjars.wildcard		true						
hive.zookeeper.kerberos.enabled		false						

Viewing Impala query details

You can view Impala query details, query plan, execution summary, and query metrics on the new Impala Queries tab on the Job Browser page in Hue, and use this information to tune and optimize your queries.

Viewing Impala query history

The Impala Queries tab on the Job Browser page in Hue displays all the queries that were run on all Impala Virtual Warehouses within a Database Catalog from various query interfaces, such as Impala-shell, Impyla, Hue, and other JDBC BI clients and tools.

About this task

Only Query Processor Administrators can view historical queries of all users to monitor resource utilization and control costs from the Hue Job Browser. Non-admin users can view only their queries.

Queries are retained in the backend database for 30 days by default, after which they are cleaned up. You can change the clean-up interval from the Database Catalog configurations.



Note: Impala queries may take up to 25 minutes to appear on the **Impala Queries** tab after they are run. This is a known limitation in CDW.

Procedure

1. Go to the Cloudera Data Warehouse (CDW) web interface and open Hue from your Virtual Warehouse.
2. Click Jobs from the left assist panel.

The **Job Browser** page is displayed.

3. Click Queries.

The Hive queries that were run for the past seven days are displayed. You can select the time period for which you want to view the historical data.

You can also search using the query ID, sort queries by various parameters such as duration, peak memory, and so on, and filter queries by their status.

Viewing Impala query information

The Query Info tab in Hue provides information such as, the Impala query ID, the user who executed the query, the start time, the end time, the total time taken to execute the query, the coordinator that received the query, CPU time, rows produced, peak memory, and HDFS bytes read.

Procedure

1. Go to the Cloudera Data Warehouse (CDW) web interface and open Hue from your Virtual Warehouse.
2. Click Jobs from the left assist panel.
The **Job Browser** page is displayed.
3. Go to the **Impala Queries** tab and click on the query for which you want to view the query details.

The following image shows the **Query Info** tab on the Hue web interface:

The screenshot displays the Hue web interface with the 'Impala Queries' tab selected. Below the navigation bar, there is a 'Queries' section with a 'Refresh' button. A table lists query details, including the query ID, user, and status. The 'Query Info' tab is active, showing the query text on the left and a detailed summary on the right.

QUERY ID	USER	STATUS
e140b4f4df9c2d5:cf78c8f400000000	admin	✓ FINISHED

Query Info | Plan | Exec Summary | Metrics

QUERY
SELECT
*
FROM
`DEFAULT`.`sample_08`
LIMIT
105

START TIME
2 days ago

END TIME
2 days ago

DURATION
3s

QUERY TYPE
QUERY

USER NAME
admin

COORDINATOR
sree-test2-1.sree-test2.root.hwx.site:27000

CPU TIME
1ms

ROWS PRODUCED
105

PEAK MEMORY
4 MB

HDFS BYTES READ
93.9 KB

Viewing the Impala query execution plan

The query execution plan in Hue provides details on how the query will be executed, the operators involved, and other information before the query is submitted to the Impala engine.

Procedure

1. Go to the Cloudera Data Warehouse (CDW) web interface and open Hue from your Virtual Warehouse.
2. Click Jobs from the left assist panel.
The **Job Browser** page is displayed.

- Go to the **Impala Queries** tab and click on the query for which you want to view the execution plan.

The following image shows the **Plan** tab on the Hue web interface:

The screenshot shows the Hue web interface with the 'Impala Queries' tab selected. Below the navigation bar, there is a 'Queries' section with a 'Refresh' button. A table lists query details:

QUERY ID	USER	STATUS
e140b4f4dff9c2d5cf78c8f400000000	admin	✓ FINISHED

Below the table, the 'Plan' tab is selected. The plan details are as follows:

```

-----
Max Per-Host Resource Reservation: Memory=4.06MB Threads=3
Per-Host Resource Estimates: Memory=68MB
Codegen disabled by planner
WARNING: The following tables are missing relevant table and/or column statistics.
default.sample_08
Analyzed query: SELECT * FROM `default`.sample_08 LIMIT CAST(105 AS TINYINT)

F01:PLAN FRAGMENT [UNPARTITIONED] hosts=1 instances=1
| Per-Host Resources: mem-estimate=4.02MB mem-reservation=4.00MB thread-reservation=1
PLAN-ROOT SINK
| output exprs: default.sample_08.code, default.sample_08.description, default.sample_08.total_emp, default.sample_08.salary
| mem-estimate=4.00MB mem-reservation=4.00MB spill-buffer=2.00MB thread-reservation=0
|
01:EXCHANGE [UNPARTITIONED]
| limit: 105
| mem-estimate=16.00KB mem-reservation=0B thread-reservation=0
| tuple-ids=0 row-size=32B cardinality=105
| in pipelines: 00(GETNEXT)
|
F00:PLAN FRAGMENT [RANDOM] hosts=1 instances=1
Per-Host Resources: mem-estimate=64.00MB mem-reservation=64.00KB thread-reservation=2
00:SCAN HDFS [default.sample_08, RANDOM]
HDFS partitions=1/1 files=1 size=47.40KB
stored statistics:
  table: rows=823 size=47.40KB
  
```

Viewing the Impala query metrics

You can view detailed, aggregated metrics for various counters such as `hdfs_bytes_read`, `memory_per_node_peak`, `thread_cpu_time`, and so on, on the Metrics tab in Hue.

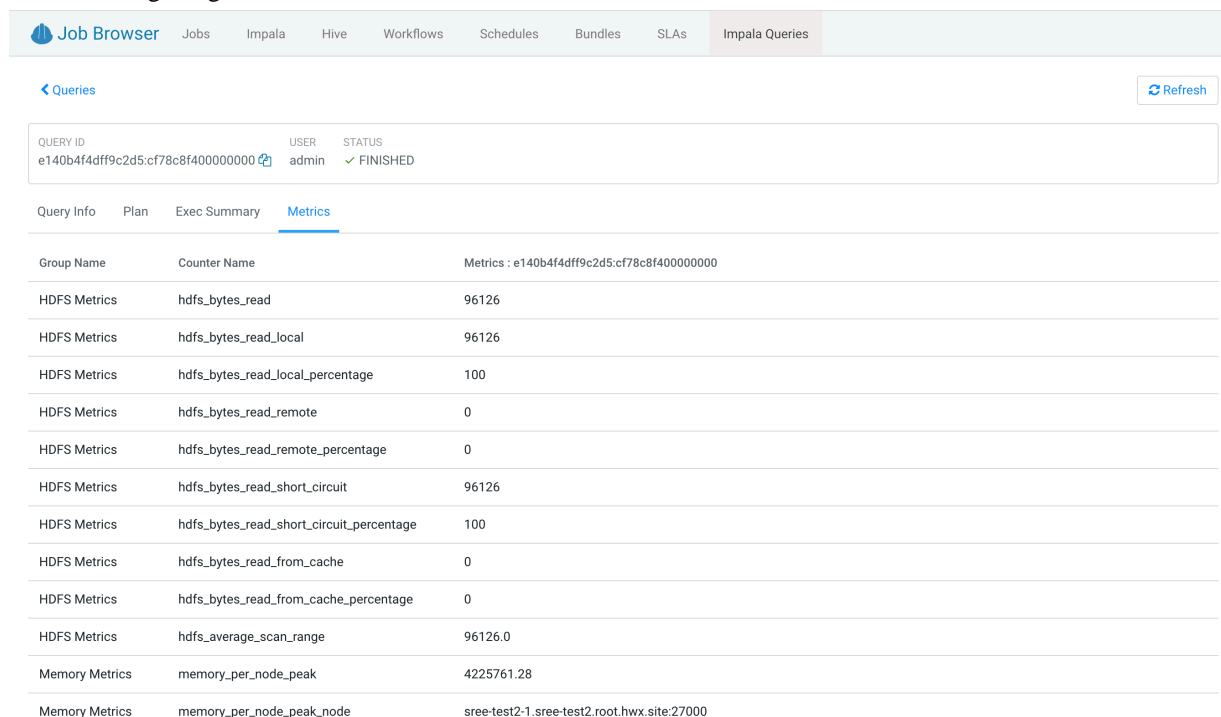
Procedure

- Go to the Cloudera Data Warehouse (CDW) web interface and open Hue from your Virtual Warehouse.
- Click Jobs from the left assist panel.

The **Job Browser** page is displayed.

- Go to the **Impala Queries** tab and click on the query for which you want to view the query metrics.

The following image shows the **Metrics** tab on the Hue web interface:



The screenshot shows the Hue web interface with the 'Impala Queries' tab selected. Below the tabs, there's a 'Queries' section with a 'Refresh' button. A query is listed with ID 'e140b4f4dff9c2d5:cf78c8f400000000', user 'admin', and status 'FINISHED'. The 'Metrics' sub-tab is active, displaying a table of metrics for this query.

Group Name	Counter Name	Metrics : e140b4f4dff9c2d5:cf78c8f400000000
HDFS Metrics	hdfs_bytes_read	96126
HDFS Metrics	hdfs_bytes_read_local	96126
HDFS Metrics	hdfs_bytes_read_local_percentage	100
HDFS Metrics	hdfs_bytes_read_remote	0
HDFS Metrics	hdfs_bytes_read_remote_percentage	0
HDFS Metrics	hdfs_bytes_read_short_circuit	96126
HDFS Metrics	hdfs_bytes_read_short_circuit_percentage	100
HDFS Metrics	hdfs_bytes_read_from_cache	0
HDFS Metrics	hdfs_bytes_read_from_cache_percentage	0
HDFS Metrics	hdfs_average_scan_range	96126.0
Memory Metrics	memory_per_node_peak	4225761.28
Memory Metrics	memory_per_node_peak_node	sree-test2-1.sree-test2.root.hwx.site:27000

Terminating Hive queries

If a query is running for longer than expected, or you have accidentally triggered it, then you can stop the query to free up the resources. Hue also allows you to stop multiple queries at once.

About this task



Note: This feature is available only for Hive queries. Only admin users or Hue superusers can stop running queries.

Procedure

- Go to the Cloudera Data Warehouse (CDW) web interface and open Hue from your Virtual Warehouse.
- Click Jobs from the left assist panel.
The **Job Browser** page is displayed.
- Go to the **Queries** tab.
A list of queries that were run is displayed.
- Select the queries that you want to stop and click Kill.

Comparing Hive and Impala queries in Hue

You can compare two queries to know how each query is performing in terms of speed and cost-effectiveness. Hue compares various aspects of the two queries, based on which you can identify what changed between the executions of those two queries, and you can debug performance-related issues between different runs of the same query.

About this task

The query comparison report provides you a detailed side-by-side comparison of your queries.

For Hive queries, it includes recommendations for optimizing each query, metadata about the queries, visual explain for each query, query timeline, query configuration, Directed Acyclic Graph (DAG) information, DAG flows, DAG swimlanes, DAG counters, and DAG configurations.

For Impala queries, the query comparison report includes query details, execution plan details, and the aggregated metrics for both the queries and provides a variance between the two.

Procedure

1. Go to the Cloudera Data Warehouse (CDW) web interface and open Hue from your Virtual Warehouse.
2. Click Jobs from the left assist panel.
The **Job Browser** page is displayed.
3. Go to the **Queries** tab.
A list of queries that were run is displayed.

4. Select the two queries you want to compare and click Compare.

Query comparison report for Hive queries:

Queries

QUERY ID
hive_20220509083516_a9d00c94-657a-4d80-9cc2-51851ec711eb

USER
...

Query Info

Visual Explain

Timeline

Query Config

DAG Info

DAG Flow

DAG Swimlane

DAG Counters

DAG Configurations

QUERY
SELECT
*
FROM
customer
WHERE
c_nationkey = 15

START TIME
2 hours ago
END TIME
2 hours ago
DURATION
50s
TABLES READ
customer (default)
TABLES WRITTEN
-
APPLICATION ID
application_1652085158072_0001
DAG ID
dag_1652085158072_0001_2
SESSION ID
76e59bed-40e6-4387-8c35-52606ecacaf4

QUERY ID
hive_20220509083138_56c823bb-c635-4d1e-b5e4-b031b5c0e21e

USER
...

QUERY
SELECT
*
FROM
customer

START TIME
2 hours ago
END TIME
2 hours ago
DURATION
148ms
TABLES READ
customer (default)
TABLES WRITTEN
-
APPLICATION ID
DAG ID
SESSION ID
1ac06098-d5cb-46ca-8d11-4e19d938871c
LLAP APP ID
THREAD ID
HiveServer2-Background-Pool: Thread-245

Query comparison report for Impala queries:

Job Browser

Jobs

Impala

Hive

Workflows

Schedules

Bundles

SLAs

Impala Queries

Queries

QUERY ID
e140b4f4df9c2d5:cf78c8f400000000

USER
admin

STATUS
FINISHED

QUERY ID
cb4137379d658f7a:b9c3488400000000

USER
admin

STATUS
FINISHED

Query Info

Plan

Exec Summary

Metrics

Group Name	Counter Name	Metrics : e140b4f4df9c2d5:cf78c8f400000000	Metrics : cb4137379d658f7a:b9c3488400000000	Variance
HDFS Metrics	hdfs_bytes_read	96126	96126	1x
HDFS Metrics	hdfs_bytes_read_local	96126	96126	1x
HDFS Metrics	hdfs_bytes_read_local_percentage	100	100	1x
HDFS Metrics	hdfs_bytes_read_remote	0	0	
HDFS Metrics	hdfs_bytes_read_remote_percentage	0	0	
HDFS Metrics	hdfs_bytes_read_short_circuit	96126	96126	1x
HDFS Metrics	hdfs_bytes_read_short_circuit_percentage	100	100	1x
HDFS Metrics	hdfs_bytes_read_from_cache	0	0	
HDFS Metrics	hdfs_bytes_read_from_cache_percentage	0	0	
HDFS Metrics	hdfs_average_scan_range	96126.0	96126.0	1x
Memory Metrics	memory_per_node_peak	4225761.28	4225761.28	1x
Memory Metrics	memory_per_node_peak_node	sree-test2-1.sree-test2.root.hwx.site:27000	sree-test2-1.sree-test2.root.hwx.site:27000	
Thread Time Metrics	thread_total_time	9	33	3.67x

18

How to run a stored procedure from Hue in Cloudera Data Warehouse

HPL/SQL allows you to implement business logic using variables, expressions, flow-of-control statements, and iterations. HPL/SQL makes SQL-on-Hadoop more dynamic. You can leverage your existing procedural SQL skills, and use functions and statements to make your typical ETL development more productive. In Cloudera Data Warehouse, Hue provides a smart interface to run stored procedures.



Note: This feature is available only for Hive queries.

To run stored procedures from Hue, create a Hive Virtual Warehouse in CDW and enable the `hpsql` option in the `hue-safety-valve` field.

The following example creates a procedure and returns records by passing a cursor:

```
print 'Hello world';/
CREATE PROCEDURE greet(name STRING)
BEGIN
  PRINT 'Hello ' || name;
END;/
CREATE PROCEDURE even(cur OUT SYS_REFCURSOR)
BEGIN
  OPEN cur FOR
  SELECT n FROM NUMBERS
  WHERE MOD(n, 2) == 0;
END;/
CREATE PROCEDURE set_message(IN name STRING, OUT result STRING)
BEGIN
  SET result = 'Hello, ' || name || '!';
END;
-- Call the procedure and print the results
DECLARE str STRING;
CALL set_message('world', str);
PRINT str;
```



Attention: In the `hpsql` mode, you must terminate the commands using the forward slash (/). The semicolon (;) is used throughout procedure declarations and can no longer be relied upon to terminate a query in the editor.



Note: HPL/SQL does not support all types of Hive statements, such as `JOIN` or `EXPLAIN`. Refer to the [HPL/SQL Reference](#) for more information.

Related Information

[Enabling stored procedures for Hive in Cloudera Data Warehouse](#)

Enabling stored procedures for Hive in Cloudera Data Warehouse

To create, edit, and drop procedures and functions that are written in Hive Hybrid Procedural SQL (HPL/SQL) using the Hue query editor in CDW, you must enable the `hpsql` option in the `hue-safety-valve` field.

About this task



Important: Hue enables you to switch between Hive and HPL/SQL interpreters. By default, the regular Hive interpreter is enabled when you create a Hive Virtual Warehouse. To enable the HPL/SQL interpreter, you must update the configuration in the `hue-safety-valve` field in your Hive Virtual Warehouse. However, updating the `hue-safety-valve` overrides the default configuration. Therefore, to use both Hive and HPL/SQL interpreters, you must enable both by updating the configuration in the `hue-safety-valve` field.

Procedure

1. Log in to the Data Warehouse service as an administrator.
2. Go to Virtual Warehouse Edit CONFIGURATIONS Hue and select hue-safety-valve from the Configuration files drop-down list.
3. Add the following lines in the hue-safety-valve:

```
[notebook]
[[interpreters]]
  [[[hive]]]
    name=Hive
    interface=hiveserver2
  [[[hplsql]]]
    name=Hplsql
    interface=hiveserver2
```

4. Click APPLY.
5. Restart the Virtual Warehouse.

Enabling the SQL editor autocompleter

Autocompleter provides finely tuned SQL suggestions for Hive and Impala dialects while you enter queries into the editor window. See [Brand new Autocompleter for Hive and Impala](#) in the Hue blog.

About this task

Autocompleter is enabled by default. To manually enable or disable it, open the editor configuration panel and edit settings as follows:

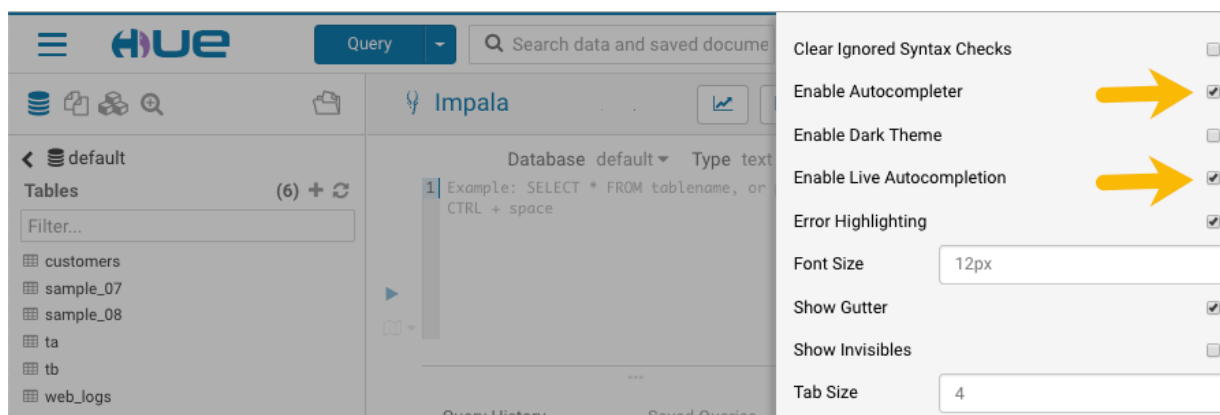
Procedure

1. Log in to Hue and go to either the Hive or Impala editor.
2. Place your cursor in the editor window and then use one of the following keyboard shortcuts to open the editor configuration panel:
 - On a Mac system, use the Command key followed by a hyphen and then a comma:
Command-,
 - On a Windows system, use the Ctrl key followed by a hyphen and then a comma:
Ctrl-,



Tip: Type a question mark (?) anywhere but in the active editor window to open a menu of editor keyboard shortcuts.

- To enable autocompletion, check the box adjacent to Enable Autocompleter. When you check Enable Autocompleter, Enable Live Autocompletion is automatically enabled as well. Place your cursor in the editor window to close the configuration panel.



- To disable autocompletion:
 - Uncheck Enable Live Autocompletion but leave Enable Autocompleter checked, and then place your cursor in the editor window to close the configuration panel. This disables live autocompletion, but if you want to use autocompletion while building your queries in the editor, enter the following key stroke sequence to activate autocompletion: Ctrl + Space Key
 - Uncheck both Enable Autocompleter and Enable Live Autocompletion, and then click in the editor to close the configuration panel. This disables all autocompletion functionality.

Using governance-based data discovery

Hue can use the metadata tagging, indexing, and search features available in Apache Atlas data management. After integrating Hue with Atlas, classifications and indexed entities can be accessed and viewed in Hue. This topic shows you how to use metadata classifications in Hue.

Integration between Hue and Atlas is enabled by default, but if your administrator has disabled it, it must be re-enabled before you can use governance-based data discovery.

In Cloudera Data Warehouse, you can only view tags that are created in Atlas in Hue. You must create tags in Atlas.

Searching metadata tags

The SQL Editor in Hue provides a search text box where you can search on the metadata tags or classifications that are associated with your databases, tables, and columns.

About this task

You can search for tags or classifications in either the Hive or the Impala editors.

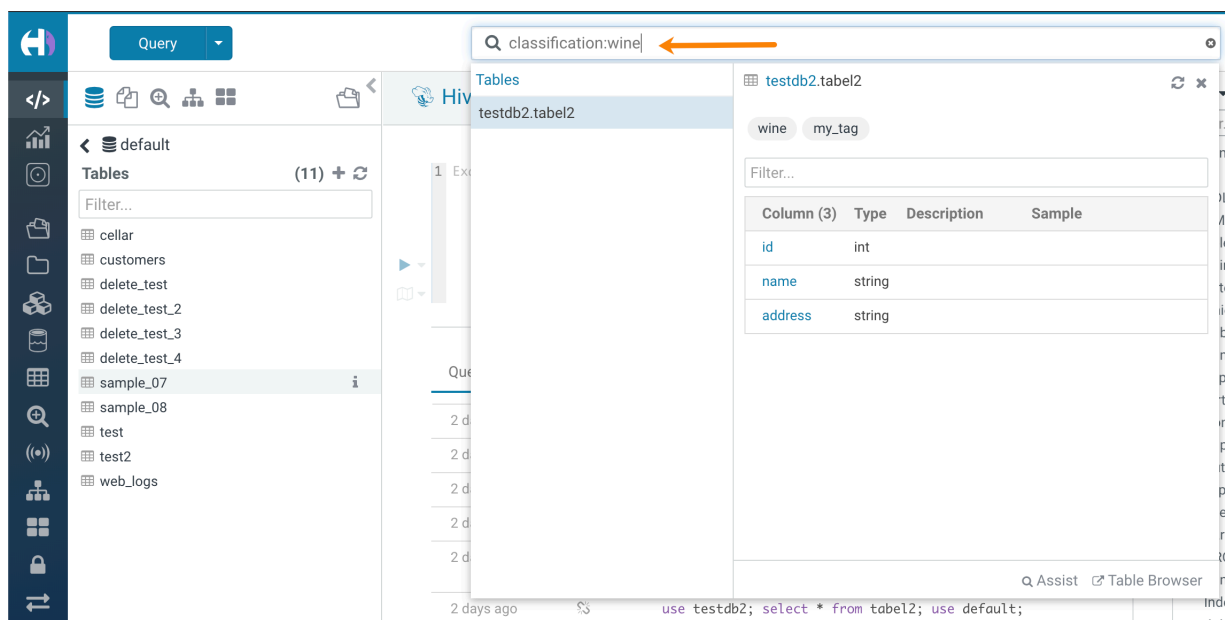


Note: On clusters that use Apache Ranger for role-based access control, the Search mechanism does not display counts of popular values. Ranger ensures that Hue users can view only entities to which their user role (as configured and managed by Ranger) has been granted specific permissions.

Procedure

- Go to Query Editor Impala or Hive.

- To locate the tags or classifications in Apache Atlas, in the metadata search box located just to the right of the Query drop-down menu, type a tag: or classification: facet followed by its name. For example, type classification: wine as shown in the following image:



After you type the search facet and the tag or classification name in the search box, the `<database>.<table>` where the tag or classification is found is returned. Click the `<database>.<table>` to view the tags and classifications that have been defined for it.

Using Amazon S3 with Hue

Hue can read to and write to an Amazon S3 bucket.



Note:

In Cloudera Data Warehouse (CDW), you can browse Amazon S3 buckets from Hue in the following ways:

- With Ranger Authorization Service (RAZ)
- Without Ranger Authorization Service (RAZ)

If you have registered your CDP Public Cloud environment using RAZ, policies attached to the Ranger RAZ Service role at the Data Lake-level can control access to external S3 buckets. If your Virtual Warehouse predates the capability to use RAZ configurations and policies, then you must manually enable RAZ for CDW and then configure Hue to access S3 buckets. Your Data Lake must be RAZ-enabled to manually enable RAZ exclusively for CDW.

Related Information

[Registering a RAZ-enabled AWS environment](#)

[Enabling RAZ manually in CDW Public Cloud](#)

Accessing S3 bucket from Hue in CDW with RAZ

Hue offers you the capability to browse S3 buckets, upload files to S3, and create tables by importing files from S3. With Ranger Authorization (RAZ), you can grant fine-grained access to per-user home directories.

About this task

If you have enabled RAZ while registering your AWS environment with CDP, then Hue uses RAZ as the default mechanism for enabling the S3 File Browser. Before you can enable the S3 File Browser in Hue, you must complete the following prerequisites:

Procedure

1. Follow the instructions listed in [Introduction to RAZ on AWS environments](#) to register an AWS environment with the Enable Ranger authorization for AWS S3 option enabled. You can use the CDP web interface or the CDP CLI to complete this task.



Note: You must enable RAZ while registering your environment with CDP.

2. Log in to the CDP Management Console as a DWAdmin or DWUser and go to the Cloudera Data Warehouse service.
3. Click Open Ranger on your Database Catalog.
4. Create the following Ranger policies:
 - a) Hadoop SQL policy (all - database, table, column, all - url).
You must grant permissions to individual users or groups in these Ranger policies. To grant permissions to all users, you can specify {USER} in the Permission section.
 - b) S3 (cm_S3) policy (Default: User Home)
You must grant permissions to the following users in the Permissions section for the user home directory (/user/{USER}): {USER}.
Specify the bucket name in the S3 Bucket field and the directory path in the Path field of the cm_S3 Ranger policy.
 - c) S3 (cm_S3) policy (Default: user)
You must grant permissions to the following users in the Permissions section for the root directory (/user/): hive, impala.
5. You must also grant appropriate permissions to the users in CDP User Management Service (UMS). For example, EnvironmentUser.

Enabling the S3 File Browser for Hue in CDW with RAZ

The S3 File Browser in Hue is enabled by default. However, you must set the path to your S3 directory in the hue-safety-valve field to avoid a 403 error when you click on the S3 File Browser.

Procedure

1. Sign in to Cloudera Data Warehouse DWAdmin or DWUser.
2. Go to the Virtual Warehouse from which you want to access the S3 buckets and click .
3. Go to CONFIGURATIONS Hue and select hue-safety-valve from the Configuration files drop-down menu.
4. Add the path to your S3 bucket under the [filebrowser] section as follows:

```
[filebrowser]
remote_storage_home=s3a://[***S3-BUCKET-NAME***]/user
```

(Optional) Per-user home directories are created by default. To disable automatic user directory creation, you can add the following lines in the hue-safety-valve as follows:

```
[desktop]
[[raz]]
autocreate_user_dir=false
```

5. Click APPLY.
You should be able to view the icon for the S3 File Browser on the left assist panel on the Hue web interface.

Accessing S3 bucket from Hue in CDW without RAZ

To enable access to S3 buckets from Hue without RAZ, you must have onboarded to CDP Public Cloud and must meet the requirements listed in this section.

Only Hue superusers can view and access the S3 File Browser.

Creating roles and synchronizing users to FreeIPA

You must be an EnvironmentAdmin or EnvironmentUser to browse S3 buckets and create tables by importing CSV files. You must also synchronize users to FreeIPA. This is required for users accessing the Data Lake.

About this task

To assign roles to users, see Assigning resource roles to users in the *Management Console* documentation.

To synchronize users to FreeIPA, see Performing user sync in the *Management Console* documentation.

Related Information

[Assigning resource roles to users](#)

[Performing user sync](#)

Adding an external S3 bucket to your CDW environment

If you try to access an external S3 bucket from the Hue web interface without adding it to the CDW environment, then Impala or Hive may display the “AccessDeniedException 403” exception. Make sure that your Cloudera Data Warehouse (CDW) environment has access to the S3 buckets that you want to access from Hue.

About this task

When you create a Virtual Warehouse in the CDW service, a cluster is created in your AWS account. This cluster has two buckets. One bucket is used for managed data and the other is used for external data. Access to these two buckets is controlled by AWS instance profiles.

To add read/write access to external S3 buckets that reside in the same AWS account as the CDW service cluster or that are different from the account where the CDW service cluster resides, see the corresponding links in the Related information section.

Procedure

1. Sign in to the CDP Management Console as an administrator.
2. Go to Data Warehouse service Environments and click the More... menu.
3. Search and locate the environment in which you want to add the S3 bucket and click the edit icon.
The **Environment Details** page is displayed.
4. Specify the name of the S3 bucket you want to configure access to in the Add External S3 Bucket text box.
If the bucket belongs to another AWS account, then select the Bucket belongs to different AWS account option.
5. Select the access mode.
Read-only access is sufficient to import data in Hue.
6. Click Add Bucket to save the configuration.
A success message is displayed.
7. Click APPLY to update the CDW environment.



Tip: If you configure read only access to an external S3 bucket, there is no need to restart Virtual Warehouses. However, if you configure read/write access to an external S3 bucket, you must restart Virtual Warehouses by suspending them and starting them again.

Related Information

[Adding Cloudera Data Warehouse cluster access to external S3 buckets in the same AWS account](#)


[Adding Cloudera Data Warehouse cluster access to external S3 buckets in a different AWS account](#)

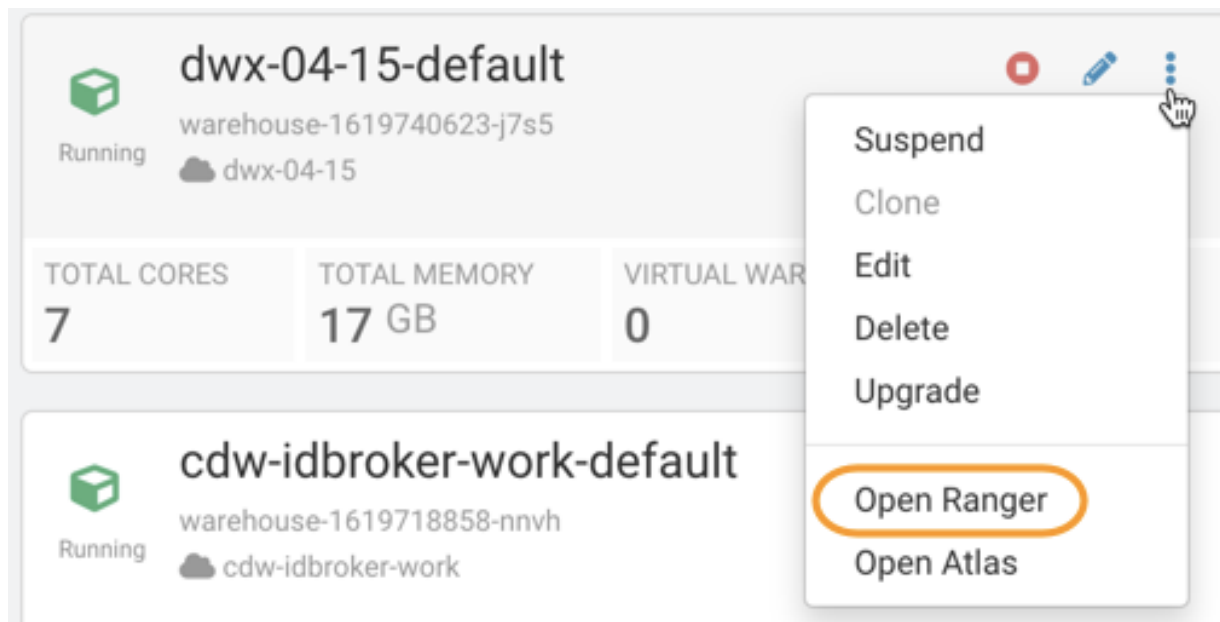
[AWS instance profiles](#)

Adding users to Hadoop SQL Ranger policies

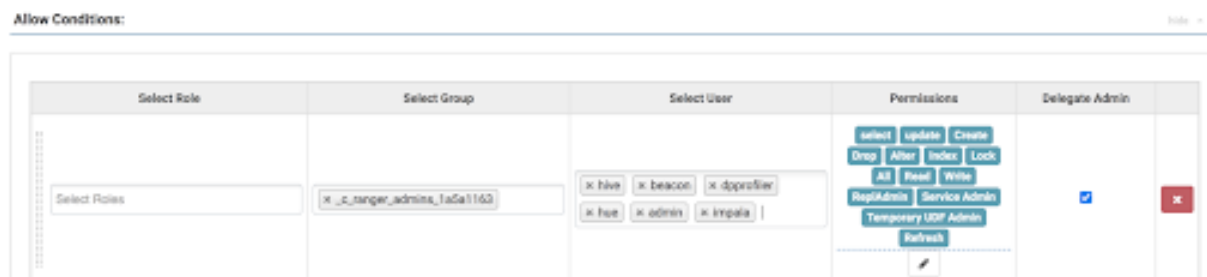
You must grant the Hadoop SQL Ranger permissions to enable your users to access specific tables and secure your data from unauthorized access.

Procedure

1. Sign in to Cloudera Data Warehouse.
2. Click the  Open Ranger option on your Database Catalog.



3. On the **Ranger Service Manager** page, click Hadoop SQL.
4. Select the all - url policy.
The **Edit Policy** page is displayed.
5. Under the Add Conditions section, add the users under the Select User column and add permissions such as Create, Alter, Drop, Select, and so on from the Permissions column.




Tip: To grant permissions to all users, you can specify {USER} in the Select User column.

6. Scroll to the bottom of the page and click Save.

Enabling the S3 File Browser for Hue in CDW without RAZ

To enable access to S3 buckets from the Hue web interface in a non-RAZ environment, you must add the AWS environment details in the hue-safety-valve configuration from your Virtual Warehouse. After enabling the S3 File Browser, you can browse the S3 buckets, create folders, and upload files from your computer, and import files to create tables.

Procedure

1. Sign in to Cloudera Data Warehouse.
2. Go to the Virtual Warehouse from which you want to access the S3 buckets and click .

3. On the **Virtual Warehouses** detail page, click the Hue tab and select hue-safety-valve from the drop-down menu.
4. Add the following configuration for Hive or Impala Virtual Warehouse in the space provided:

For the Hive Virtual Warehouse:

```
[desktop]
# Remove the file browser from the blocked list of apps.
# Tweak the app_blacklist property to suit your app configuration.
app_blacklist=oozie,search,hbase,security,pig,sqoop,spark,impala

[aws]
[[aws_accounts]]
[[[default]]]
access_key_id=[**AWS-ACCESS-KEY**]
secret_access_key=[**SECRET-ACCESS-KEY**]
region=[**AWS-REGION**]
[filebrowser]
# (Optional) To set a specific home directory path:
remote_storage_home=s3a://[**S3-BUCKET-NAME**]
```

For Impala Virtual Warehouse:

```
[desktop]
# Remove the file browser from the blocked list of apps.
# Tweak the app_blacklist property to suit your app configuration.
app_blacklist=spark,zookeeper,hive,hbase,search,oozie,jobsub,pig,sqoop,security

[aws]
[[aws_accounts]]
[[[default]]]
access_key_id=[**AWS-ACCESS-KEY**]
secret_access_key=[**SECRET-ACCESS-KEY**]
region=[**AWS-REGION**]

[filebrowser]
# (Optional) To set a specific home directory path:
remote_storage_home=s3a://[**S3-BUCKET-NAME**]
```

5. Click APPLY.
The S3 File Browser icon appears on the left Assist panel on the Hue web interface after the Virtual Warehouse restarts.

Creating tables by importing CSV files from AWS S3 in Cloudera Data Warehouse

You can create tables in Hue by importing CSV files stored in S3 buckets. Hue automatically detects the schema and the column types, thus helping you to create tables without using the CREATE TABLE syntax.

About this task

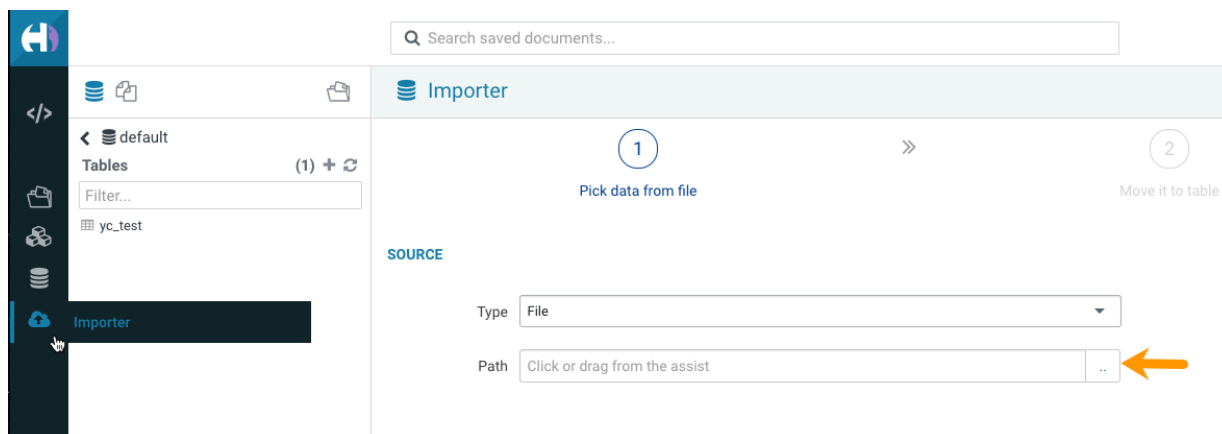
The maximum file size supported is three gigabytes.

(Non-RAZ deployment) Only Hue Superusers can access S3 buckets and import files to create tables. To create tables by importing files from S3, you must assign and authorize use of a specific bucket on S3 bucket for your environment. The bucket then appears like a home directory on the Hue web interface.

Procedure

1. Sign in to the Cloudera Data Warehouse service.
2. On the **Overview** page, select the Virtual Warehouse in which you want to create the table and click on Hue.
3. From the left assist panel, click on Importer.

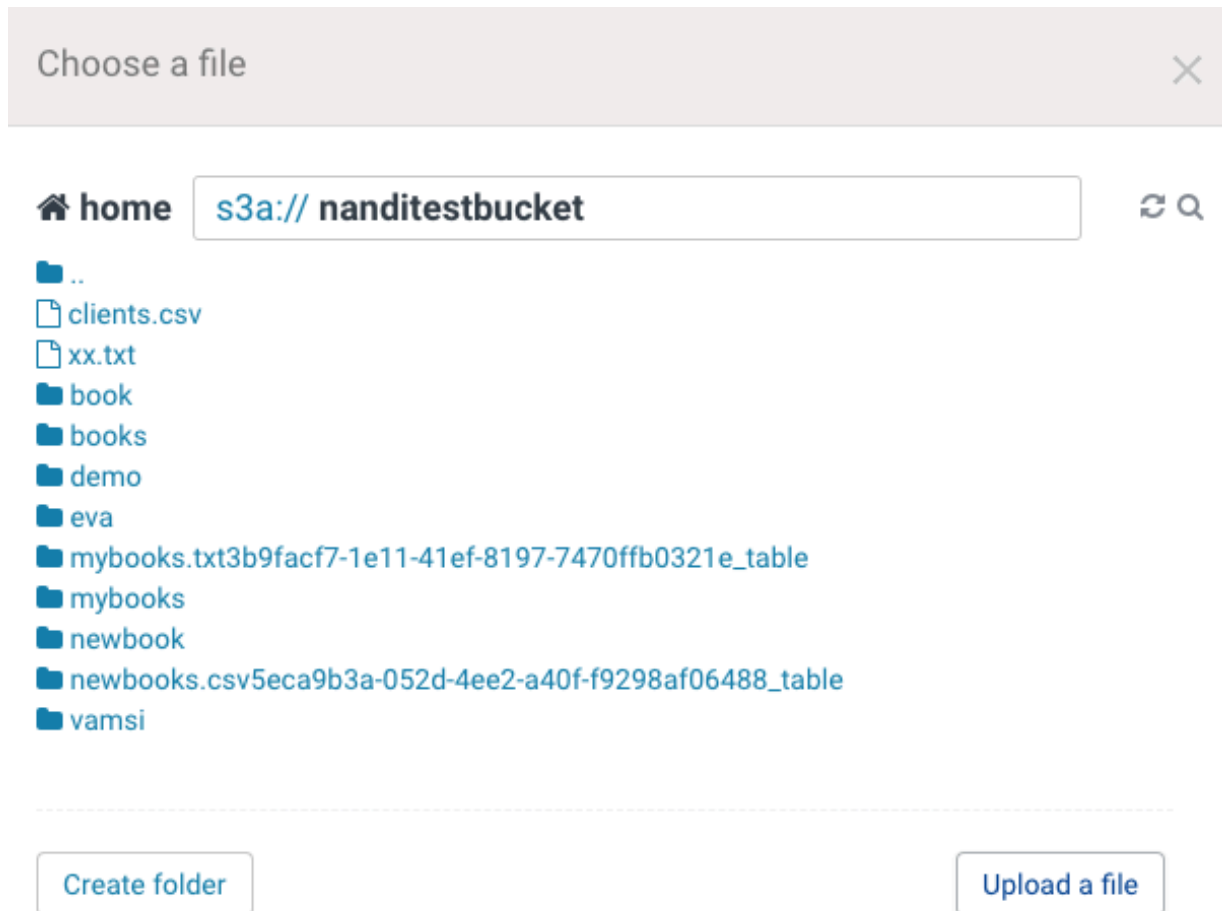
4. On the Importer screen, click .. at the end of the Path field:



Choose a file pop-up is displayed.

5. (Non-RAZ deployment) Type `s3a://` in the address text box and press enter.

The S3 buckets associated with the CDW environment are displayed. You can narrow down the list of results using the search option.




If the file is present on your computer, then you can upload it to S3 by clicking Upload a file. To do this, you must have enabled read/write access to the S3 bucket from the CDW environment.

6. Select the CSV file that you want to import into Hue.

Hue displays the preview of the table along with the format:

SOURCE

Type

Path .. 

FORMAT


File Type

Field Separator Record Separator Quote Character

☒ Has Header

PREVIEW

id	isbn	category	publish_date	publisher	price
510493	6-14037-480-9	HUMOR	1999-12-29 00:00:00	Shinchosha	112.989997864
510494	9-12014-783-7	POLITICAL-SCIENCE	1989-04-19 00:00:00	McGraw-Hill Educatio...	183.990005493
510495	8-36694-192-0	ARCHITECTURE	2014-09-18 00:00:00	Mondadori	14.9899997711
510496	7-93947-907-7	PHOTOGRAPHY	1972-03-22 00:00:00	Wolters Kluwer	136.990005493
510497	2-17003-891-2	HEALTH-FITNESS	1970-07-07 00:00:00	Gakken	27.9899997711



Hue automatically detects the field separator, record separator, and the quote character from the CSV file. If you want to override a specific setting, then you can change it by selecting a different value from the drop-down menu.

7. Click Next.

On this page, you can set the table destination, partitions, and change the column data types.


DESTINATION

Type Table

Name default.books

PROPERTIES

Format Text

Extras 

☐ Store in Default location

☒ Transactional table ☒ Insert only

External location s3a://nanditestbucket/eva/books.csv ..


☒ Import data



Description Description

☒ Use first row as header

☐ Custom char delimiters

Partitions [+ Add partition](#)

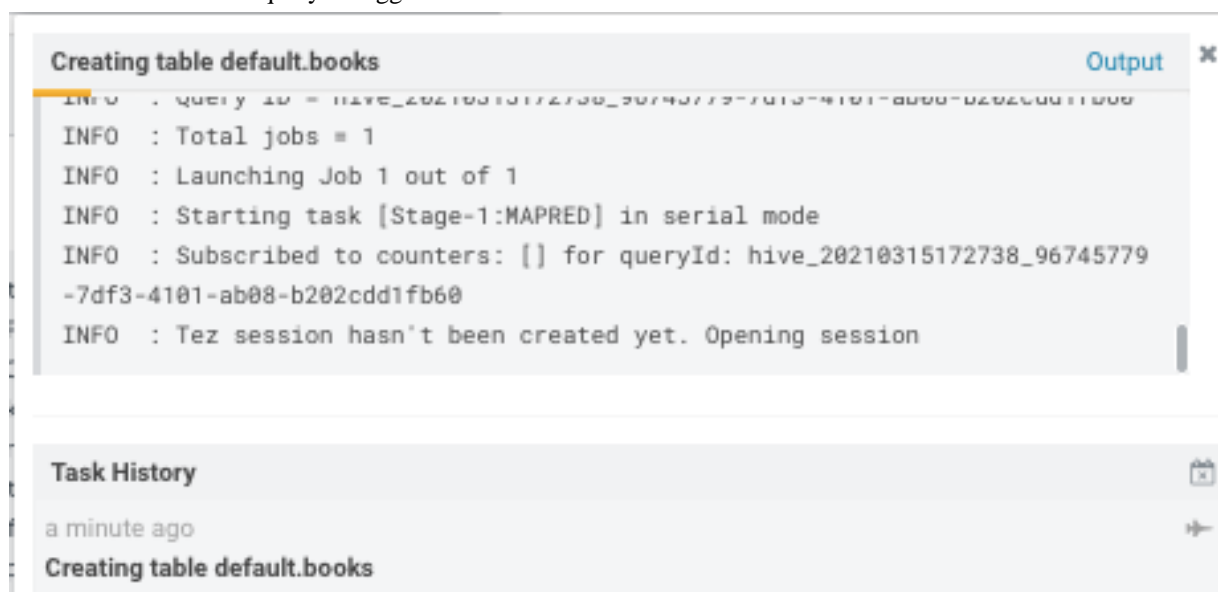
FIELDS 

Name	id	Type	bigint		510493	510494
Name	isbn	Type	string		6-14037-480-9	9-12014-783-7
..						

Back Submit

8. Verify the settings and click Submit to create the table.

The CREATE TABLE query is triggered:



Hue displays the logs and opens the **Table Browser** from which you can view the newly created table when the operation completes successfully.

Using Azure Data Lake Storage Gen2 with Hue

Hue can read to and write to an Azure Data Lake Storage (ADLS) Gen2.



Note:

Only Hue superusers can view and access the ABFS file browser.

In Cloudera Data Warehouse (CDW), you can browse ADLS Gen2 storage from Hue in the following ways:

- With Ranger Authorization Service (RAZ)
- Without Ranger Authorization Service (RAZ)

Related Information

[Registering a RAZ-enabled Azure environment](#)

Accessing ADLS Gen2 containers from Hue in CDW with RAZ

Hue offers you the capability to browse ADLS Gen2 containers, upload files to ADLS Gen2 containers, and create tables by importing files from ABFS. With Ranger Authorization (RAZ), you can grant fine-grained access to per-user home directories.

About this task

If you have enabled RAZ while registering your AWS environment with CDP, then Hue uses RAZ as the default mechanism for enabling the ABFS File Browser. Before you can enable the ABFS File Browser in Hue, you must complete the following prerequisites:

Procedure

1. Follow the instructions listed in [Introduction to RAZ on Azure environments](#) to register an Azure environment with the Enable Ranger authorization for ADLS Gen2 option enabled. You can use the CDP web interface or the CDP CLI to complete this task.



Note: You must enable RAZ while registering your environment with CDP.

2. Log in to the CDP Management Console as a DWAdmin or DWUser and go to the Cloudera Data Warehouse service.
3. Click Open Ranger on your Database Catalog.
4. Create the following Ranger policies:
 - a) Hadoop SQL policy (all - database, table, column, all - url).
You must grant permissions to individual users or groups in these Ranger policies. To grant permissions to all users, you can specify {USER} in the Permission section.
 - b) ABFS (cm_ADLS) policy (Default: User Home)
You must grant permissions to the following users in the Permissions section for the user home directory: {USER}.
 - c) ABFS (cm_ADLS) policy (Default: user)
You must grant permissions to the following users in the Permissions section for the root directory (/user/): hive, impala.
5. You must also grant appropriate permissions to the users in CDP User Management Service (UMS). For example, EnvironmentUser.
6. Specify the storage account name in the Storage Account field and the directory path of the container and its sub-directories in the Storage Account Container field of the cm_ADLS Ranger policy.

Enabling the ABFS File Browser for Hue in CDW with RAZ

The ABFS File Browser in Hue is enabled by default. However, you must set the path to your ADLS Gen2 container in the hue-safety-valve field to avoid a 403 error when you click on the ABFS File Browser.

Procedure

1. Sign in to Cloudera Data Warehouse DWAdmin or DWUser.
2. Go to the Virtual Warehouse from which you want to access the S3 buckets and click .
3. Go to CONFIGURATIONS Hue and select hue-safety-valve from the Configuration files drop-down menu.
4. Add the path to your ADLS Gen2 container under the [filebrowser] section as follows:

```
[filebrowser]
remote_storage_home==abfs://[***CONTAINER-FOR-DATA-ACCESS**]/user
```

(Optional) Per-user home directories are created by default. To disable automatic user directory creation, you can add the following lines in the hue-safety-valve as follows:

```
[desktop]
[[raz]]
autocreate_user_dir=false
```

5. Click APPLY.
You should be able to view the icon for the ABFS File Browser on the left assist panel on the Hue web interface.

Accessing ADLS Gen2 containers from Hue in CDW without RAZ

To enable access to Azure Data Lake Storage (ADLS) Gen2 containers from Hue, you must have onboarded to CDP Public Cloud and must meet the requirements listed in this section.

Only Hue superusers can view and access the ABFS File Browser.

Creating an Azure storage account

You need an Azure storage account to use ABFS with Hue.

Procedure

1. Sign in to the Microsoft Azure portal as an administrator.
2. On the **Create storage account Advanced** page, enable Data Lake Storage Gen2 so that the objects and files within your account can be organized into a hierarchy of directories and nested subdirectories in the same way that the file system on your computer is organized.

Setting storage location base

You must specify the Storage Location Base to configure a default ADLS Gen2 base storage location for the CDP environment when you register your Azure environment with CDP.

About this task

While registering an Azure environment in CDP Management Console, set the Storage Location Base in the Data Access section as follows:


```
abfs://storage-fs@[***AZURE-STORAGE-ACCOUNT-NAME***].dfs.core.windows.net
```

This location is used to read and store data.

Enabling the ABFS File Browser

To enable access to ADLS Gen2 containers from the Hue web interface, you must add the Azure environment details in the hue-safety-valve configuration from your Virtual Warehouse. After enabling the ABFS File Browser, you can browse the ADLS Gen2 containers, create folders, and upload files from your computer, and import files to create tables.

Procedure

1. Sign in to Cloudera Data Warehouse.
2. Go to the Virtual Warehouse from which you want to access the ADLS Gen2 containers and click .
3. On the **Virtual Warehouses** detail page, click the Hue tab and select hue-safety-valve from the drop-down menu.
4. Add the following configuration for Hive or Impala Virtual Warehouse in the space provided:

For the Hive Virtual Warehouse:

```
[desktop]
# Remove the file browser from the blocked list of apps.
# Tweak the app_blacklist property to suit your app configuration.
app_blacklist=oozie,search,hbase,security,pig,sqoop,spark,impala
[azure]
  [[azure_accounts]]
    [[[default]]]
      client_id=[***AZURE-ACCOUNT-CLIENT-ID***]
      client_secret=[***AZURE-ACCOUNT-CLIENT-SECRET***]
      tenant_id=[***AZURE-ACCOUNT-TENANT-ID***]

  [[abfs_clusters]]
    [[[default]]]
      fs_defaultfs=abfs://[***CONTAINER-NAME***]@[***AZURE-STORAGE-ACCOUNT-N
AME***]>.dfs.core.windows.net
```



```
webhdfs_url=https://[***AZURE-STORAGE-ACCOUNT-NAME***].dfs.c
ore.windows.net/
```

For Impala Virtual Warehouse:

```
[desktop]
# Remove the file browser from the blocked list of apps.
# Tweak the app_blacklist property to suit your app configuration.
app_blacklist=spark,zookeeper,hive,hbase,search,oozie,jobsub,pig,sqoop,security
[azure]
  [[azure_accounts]]
    [[default]]
      client_id=[***AZURE-ACCOUNT-CLIENT-ID***]
      client_secret=[***AZURE-ACCOUNT-CLIENT-SECRET***]
      tenant_id=[***AZURE-ACCOUNT-TENANT-ID***]

  [[abfs_clusters]]
    [[default]]
      fs_defaultfs=abfs://[***CONTAINER-NAME***]@[***AZURE-STORAGE-ACCOUNT-NAME***]>.dfs.core.windows.net
      webhdfs_url=https://[***AZURE-STORAGE-ACCOUNT-NAME***].dfs.core.windows.net/
```

Make sure that the container name and the Azure storage account name that you specify under the `abfs_clusters` section is same as what you specified under `Data Access Storage Location Base` while activating the Azure environment, so that Hive or Impala has permission to access the uploaded files.

5. Click **APPLY**.

The ABFS File Browser icon appears on the left Assist panel on the Hue web interface after the Virtual Warehouse restarts.

Creating tables by importing CSV files from ABFS

You can create tables in Hue by importing CSV files stored in ABFS. Hue automatically detects the schema and the column types, thus helping you to create tables without using the `CREATE TABLE` syntax.

About this task

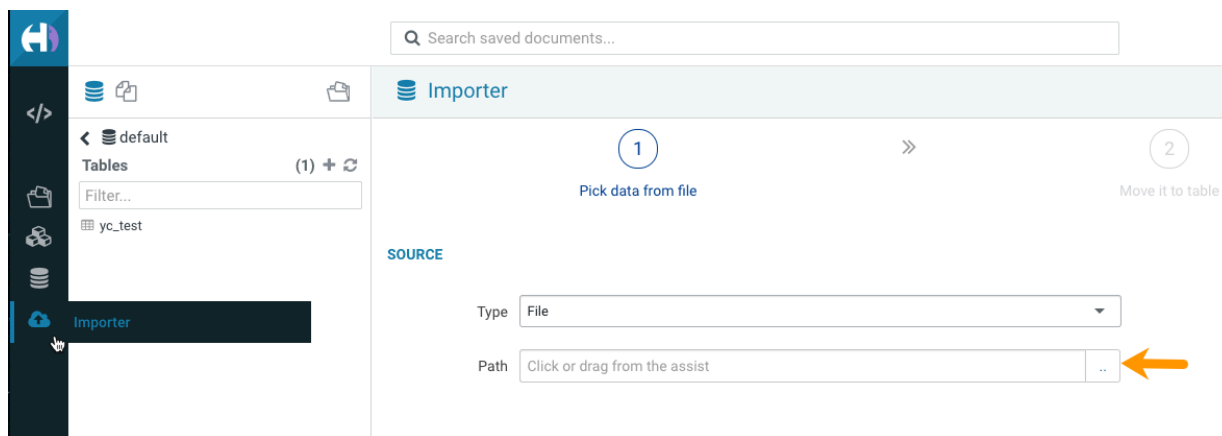
The maximum file size supported is three gigabytes.

(Non-RAZ deployment) Only Hue Superusers can access ADLS Gen2 containers and import files to create tables. To create tables by importing files from ADLS, you must assign and authorize use of a specific bucket on ADLS Gen2 containers for your environment. The bucket then appears like a home directory on the Hue web interface.

Procedure

1. In the CDW service **Overview** page, select the Virtual Warehouse in which you want to create the table, click the options menu in the upper right corner and click **Open Hue**.
2. From the left assist panel, click on **Importer**.

- On the **Importer** screen, click **..** at the end of the Path field:



Choose a file pop-up is displayed.

- (Non-RAZ deployment) Type `abfs://[***CONTAINER-NAME***]` in the address text box and press enter. The ABFS containers created under the Azure storage account are displayed. You can narrow down the list of results using the search option. If the file is present on your computer, then you can upload it to ABFS by clicking Upload a file.
- Select the CSV file that you want to import into Hue. Hue displays the preview of the table along with the format. Hue automatically detects the field separator, record separator, and the quote character from the CSV file. If you want to override a specific setting, then you can change it by selecting a different value from the drop-down menu.
- Click Next. On this page, you can set the table destination, partitions, and change the column data types.
- Verify the settings and click Submit to create the table. The CREATE TABLE query is triggered. Hue displays the logs and opens the **Table Browser** from which you can view the newly created table when the operation completes successfully.

Granting permission to access S3 and ABFS File Browser in Hue

Only admin users can view and access S3 or ABFS File Browser in Hue after enabling it. You must manually grant application permissions to non-admin users and groups for them to be able to view and access S3 and ABFS File Browsers in Hue.

About this task

The following table lists the application permissions for each cloud storage type:

Cloud storage	Hue application permission
S3	filebrowser.s3_access:Access to S3 from filebrowser and filepicker.
ABFS (ADLS Gen2)	filebrowser.abfs_access:Access to ABFS from filebrowser and filepicker.
ADLS (Gen1)	filebrowser.adls_access:Access to ADLS from filebrowser and filepicker.
GS	Access to GS from filebrowser and filepicker.

Before you begin

You can only assign Hue application permissions to groups or users within a group. Add the users to a group to whom you want to grant access to the S3 or ABFS File Browsers.



Important: The "default" group in Hue does not have the permissions required to view S3 or ABFS File Browsers, by default. If your users belong to the default group, then you must manually grant the required permissions.

Procedure

1. Open Hue from Cloudera Data Warehouse Virtual Warehouse as an EnvironmentAdmin.
2. Go to admin Manage Users Groups .
3. Click on the group to whom you want to grant the filebrowser application permissions.
4. On the **Edit [***GROUP-NAME***]** page, select the required permission under the permission section and click Update group.

List of supported non-alphanumeric characters for file and directory names in Hue

Auto-generated files may often introduce non-alphanumeric characters in the filenames which are not supported by Hue. This might cause the files or directories to not appear on the Hue File Browser. Review the list of non-alphanumeric characters supported in Hue to avoid running into this issue.

Table 1: Non-alphanumeric characters supported in Hue

Special character symbol	Description
~	Tilde
@	Ampersat
#	Hash
\$	Dollar sign
&	Ampersand
(Left paranthesis
)	Right paranthesis
*	Asterisk
!	Exclamation mark
+	Plus
=	Equal
:	Colon Not supported with Knox.
;	Semicolon
,	Comma
.	Period
?	Question mark Not supported with Knox.
/	Forward slash Not supported with Knox.
\	Backslash

Special character symbol	Description
'	Apostrophe or single quote