Management and Processing of Big Data

Level-I

session-5

Recap

- Hive
- Impala

Commands

- SHOW
- CREATE
- DROP
- ALTER
- SELECT
- INSERT
- INSERT OVERWRITE

SHOW

- SHOW DATABASES
- SHOW TABLES
- SHOW CREATE TABLE movie;

CREATE

- CREATE DATABASE mydb;
- CREATE DATABASE mydb LOCATION '/data/mydb’;
- CREATE TABLE movie (movieId INT, movieName STRING);
- CREATE TABLE movie (movieId INT, movieName STRING) LOCATION '/data/mydb/movie' ;
- CREATE TABLE movie (movieId INT, movieName STRING) ROW FORMAT DELIMITED FIELDS TERMINATED BY ‘,’;
- CREATE TABLE movie_stage LIKE movie;
- CREATE TABLE movie_stage AS SELECT * FROM movie LIMIT 0;

DROP

- DROP DATABASE mydb

- DROP TABLE movie

ALTER

- ALTER TABLE movie SET LOCATION ‘/data/mydb/movie2’

- ALTER TABLE movie SET TBLPROPERTIES ('field.delim'=",")

- ALTER TABLE movie CHANGE movieId movieId DECIMAL(12,0);

SELECT

- SELECT * FROM movie t LEFT JOIN movie_stage s ON t.movieId = s.movieId

- SELECT * FROM movie t RIGHT JOIN movie_stage s ON t.movieId = s.movieId

- SELECT * FROM movie t JOIN movie_stage s ON t.movieId = s.movieId

- SELECT * FROM movie t FULL OUTER JOIN movie_stage s ON t.movieId = s.movieId

INSERT

- INSERT INTO TABLE movie VALUES (1,”Avengers”)
- INSERT INTO TABLE movie SELECT * FROM movie_stage
- INSERT INTO TABLE movie VALUES (1,”Avengers”), (2,”Ironman”)
- INSERT INTO TABLE movie (movieName, movieId) SELECT movieName, movieId FROM movie_stage

INSERT OVERWRITE: update/delete

- INSERT OVERWRITE TABLE movie_stage SELECT movieId, CASE movieId WHEN 1 THEN ‘Transformers’ ELSE movieName END FROM movie_stage
- INSERT OVERWRITE TABLE movie_stage SELECT * FROM movie_stage WHERE movieId != null;
- INSERT OVERWRITE TABLE movie_stage SELECT * FROM movie_stage LIMIT 0;

Miscellaneous

- DESCRIBE movie
- DESCRIBE FORMATTED movie
- TRUNCATE TABLE movie
- LOAD DATA INPATH ‘/hdfs_location/’ INTO TABLE TABLE movie
- LOAD DATA LOCAL INPATH ‘/local_location/’ INTO TABLE TABLE movie

Agenda for today

- Data warehousing using Hive/Impala
    - Data ingestion process
    - Integrity checks in Hive tables
    - ETL
    - Run Hive/Impala scripts
    - Export data from Impala table to local file system
    - Connectivity with RDBMS

Data Ingestion

- Ingesting source file
  - Optionally, remove header record if present using sed command as *sed –i ‘1d’ source_file_with_header.csv*
  - Get the table location from describe formatted
  - Copy source file to that location using copyFromLocal command
  - Gzip the source file on local system
  - Move compressed file to Archival location on HDFS

Integrity checks

- Make sure about duplicates, null and unique violation while ingesting the file as well as populating final target table

- You may check in following order
  - Unique Primary Index (UPI)
  - NULL
  - Absolute duplicates

- You may prefer to automate this validation process

Run Commands as Script

- hive –f script_file_name.hql
- hive –d default_db –f script_file_name.hql
- hive –e “HQL”

- impala-shell –f script_file_name.hql
- impala-shell –q “HQL”
- impala-shell –d default_db –f script_file_name.hql
- impala-shell –o output_file.csv script_file_name.hql
- impala-shell --output_delimiter=‘,’ –o output_file.csv –f script_file_name.hql

Export Data

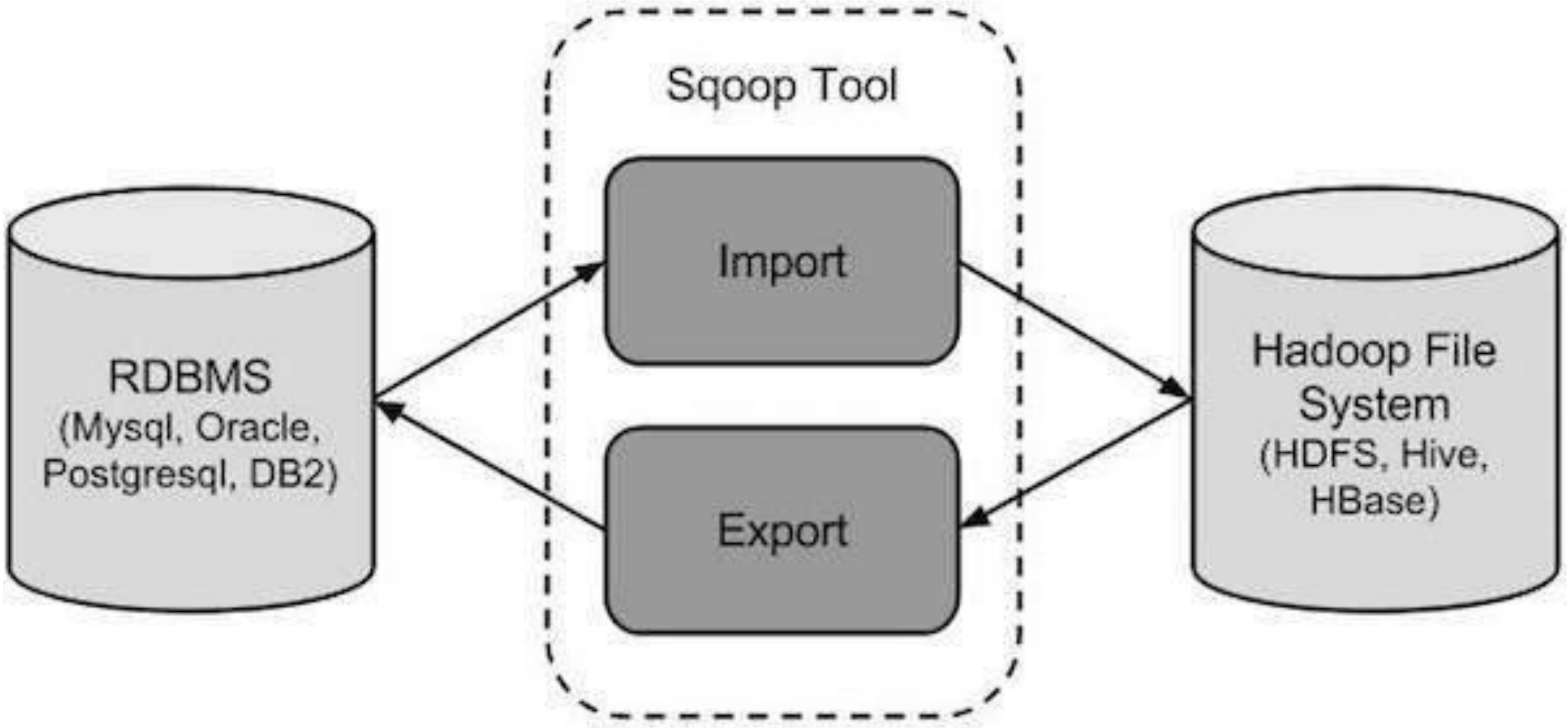
- Export whole table

hadoop fs -getmerge <HDFS Path> <Local Path>

- Use –o {output_file} option of impala-shell to export ad-hoc data by joining multiple tables

Connectivity with RDBMS

- SQOOP



Sqoop Export

```
sqoop export --connect jdbc:mysql://localhost:3306/<DB name>
                    --username <User name>
                    --password <Password>
                    --table <Table name>
                    --fields-terminated-by ‘,’
                    --export-dir <HDFS directory name>
```

Sqoop Import

```
sqoop import --connect jdbc:mysql://localhost:3306/retail_db
             --username retail_dba
             -p
             --table test
             --m 1
             --target-dir /data/mydb/test
```

Sqoop: How to handle null?

- --null-string '\N’

- --null-non-string '\N’

References

- Reference Book
  - Hadoop: The definitive guide by Tom White (Weblink)
- Impala SQL guide
  - https://www.cloudera.com/documentation/enterprise/5-8-x/topics/impala_langref_sql.html
- Impala shell options
  - https://www.cloudera.com/documentation/enterprise/5-9-x/topics/impala_shell_options.html
- Sqoop User’s guide
  - https://sqoop.apache.org/docs/1.4.6/SqoopUserGuide.html