Ex No.:5 Installation of Hive on Ubuntu

Aim:

To Download and install Hive, Understanding Startup scripts, Configuration files.

Procedure:

Step 1: Download and extract it

Download the Apache hive and extract it use tar, the commands given below:

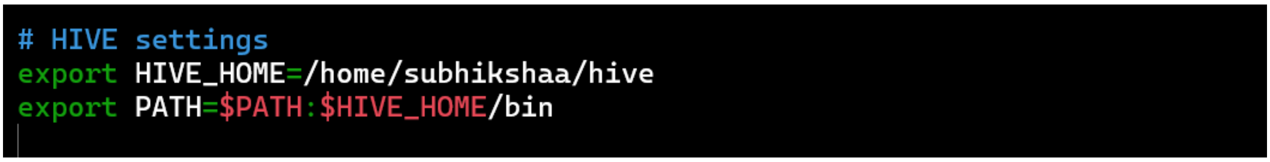
$wgethttps://downloads.apache.org/hive/hive-3.1.2/apache-hive-3.1.2-bin.tar.gz

$ tar –xvf apache-hive-3.1.2-bin.tar.gz

Step 2: Place different configuration properties in Apache Hive

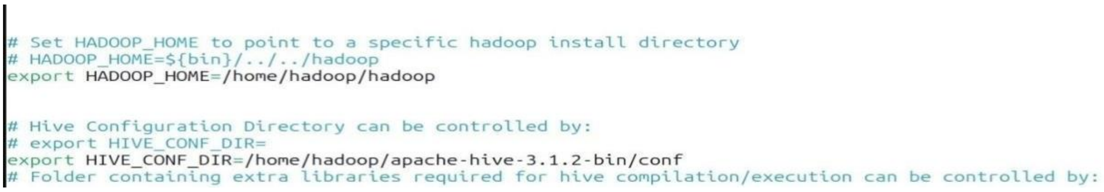
In this step, we are going to do two things ○ Placing
Hive Home path in bashrc file
$*nano .bashrc*

And append the below lines in it



```
# HIVE settings
export HIVE_HOME=/home/subhikshaa/hive
export PATH=$PATH:$HIVE_HOME/bin
```

2. Exporting **Hadoop path in Hive-config.sh** (To communicate with the Hadoop eco system we are defining Hadoop Home path in hive config field) **Open the hiveconfig.sh as shown in below** *$cd apache-hive-3.1.2-bin/bin*
$cp hive-env.sh.template hive-env.sh
$nano hive-env.sh
Append the below commands on it export HADOOP_HOME=/home/Hadoop/Hadoop
export HIVE_CONF_DIR=/home/Hadoop/apache-hive-3.1.2/conf



```
# Set HADOOP_HOME to point to a specific hadoop install directory
# HADOOP_HOME=${bin}/../../hadoop
export HADOOP_HOME=/home/hadoop/hadoop

# Hive Configuration Directory can be controlled by:
# export HIVE_CONF_DIR=
export HIVE_CONF_DIR=/home/hadoop/apache-hive-3.1.2-bin/conf
# Folder containing extra libraries required for hive compilation/execution can be controlled by:
```

Step 3: Install mysql

1. Install mysql in Ubuntu by running this command:

$sudo apt update

$sudo apt install mysql-server

2. *Alter username and password for MySQLby running below commands:*
$sudomysql

Pops command line interface for MySQLand run the below SQL queries to change username and set password

mysql> SELECT user, host, plugin FROM mysql.user WHERE user = 'root';

```
mysql> ALTER USER 'root'@'localhost' IDENTIFIED WITH 'mysql_native_password' BY
'your_new_password';
mysql> FLUSH PRIVILEGES;
```

Step 4:Config hive-site.xml

Config the hive-site.xml by appending this xml code and change the username and password according to your MySQL.

```
$cd apache-hive-3.1.2-bin/bin
$cp hive-default.xml.template hive-site.xml
$nano hive-site.xml
```

Append these lines into it
Replace root as your username of MySQL
Replaceyour_new_password as with your password of MySQL

```
<configuration>
<property>
        <name>javax.jdo.option.ConnectionURL</name>
        <value>jdbc:mysql://localhost/metastore?createDatabaseIfNotExist=true</value>
        </property>

        <property>
        <name>javax.jdo.option.ConnectionDriverName</name>
        <value>com.mysql.cj.jdbc.Driver</value>
        </property>

        <property>
        <name>javax.jdo.option.ConnectionUserName</name>
        <value>root</value>
        </property>

        <property>
        <name>javax.jdo.option.ConnectionPassword</name>
        <value>your_new_password</value>
        </property>

        <property>
        <name>datanucleus.autoCreateSchema</name>
        <value>true</value>
        </property>

        <property>
        <name>datanucleus.fixedDatastore</name>
        <value>true</value>
        </property>

        <property>
        <name>datanucleus.autoCreateTables</name>
        <value>True</value>
```

</property>

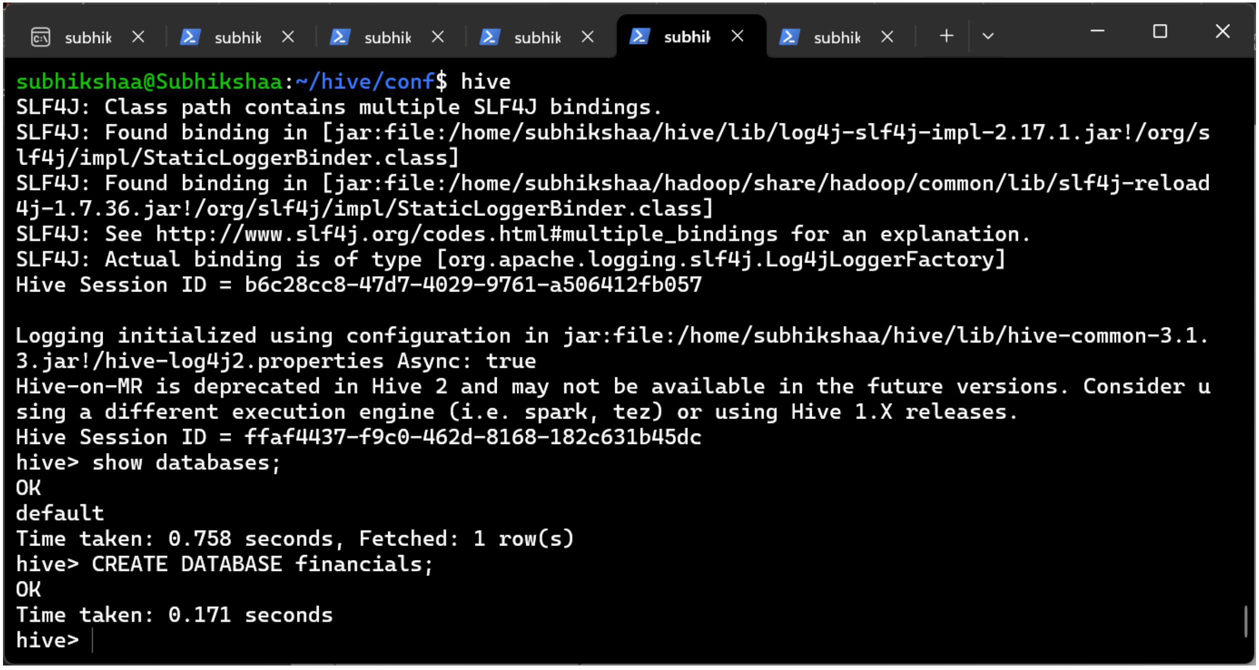
</configuration>

Step 5: Setup MySQL java connector:
First, you'll need to download the MySQL Connector/J, which is the JDBC driver for MySQL. You can download it from the below link
https://drive.google.com/file/d/1QFhB7Kvcat7a4LzDRe6GcmZva1yAxKz/view?usp=drive_link
Copy the downloaded MySQL Connector/J JAR file to the Hive library directory. By default, the Hive library directory is usually located at*/path/to/apache-hive-3.1.2/lib/*on Ubuntu. Use the following command to copy the JAR file:
$sudo cp /path/to/mysql-connector-java-8.0.15.jar /path/to/apache-hive-3.1.2/lib/ Replace /path/to/ with the actual path to the JAR file.

Step 6:Initialize the Hive Metastore Schema:
Run the following command to initialize the Hive metastore schema:
$$HIVE_HOME/bin/schematool -initSchema -dbTypemysql

Step 7: Start hive:

You can test Hive by running the Hive shell: Copy code hive You should be able to run Hive queries, and metadata will be stored in your MySQL database. *$hive*



```
subhikshaa@Subhikshaa:~/hive/conf$ hive
SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/home/subhikshaa/hive/lib/log4j-slf4j-impl-2.17.1.jar!/org/s
lf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in [jar:file:/home/subhikshaa/hadoop/share/hadoop/common/lib/slf4j-reload
4j-1.7.36.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings for an explanation.
SLF4J: Actual binding is of type [org.apache.logging.slf4j.Log4jLoggerFactory]
Hive Session ID = b6c28cc8-47d7-4029-9761-a506412fb057

Logging initialized using configuration in jar:file:/home/subhikshaa/hive/lib/hive-common-3.1.
3.jar!/hive-log4j2.properties Async: true
Hive-on-MR is deprecated in Hive 2 and may not be available in the future versions. Consider u
sing a different execution engine (i.e. spark, tez) or using Hive 1.X releases.
Hive Session ID = ffaf4437-f9c0-462d-8168-182c631b45dc
hive> show databases;
OK
default
Time taken: 0.758 seconds, Fetched: 1 row(s)
hive> CREATE DATABASE financials;
OK
Time taken: 0.171 seconds
hive>
```

Result:

Thus, the Apache Hive installation is completed successfully on Ubuntu.

Ex No.: 5a

Design and test various schema models to optimize data storage and retrieval Using Hive

Aim:

To Design and test various schema models to optimize data storage and retrieval Using Hbase.

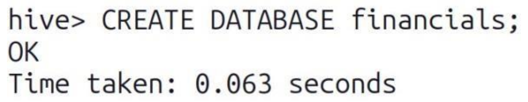
Procedure:

Step 1: Start Hive

Open a terminal and start Hive by running:
$hive

Step 2: Create a Database

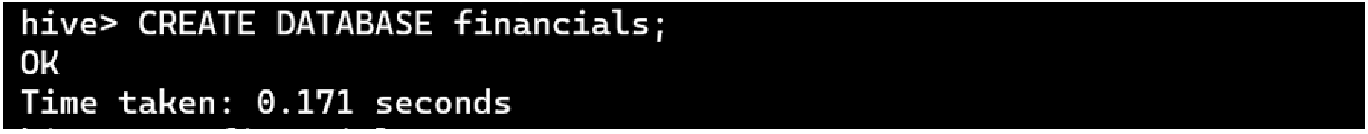
Create a new database in Hive: hive>CREATE DATABASE financials;



```
hive> CREATE DATABASE financials;
OK
Time taken: 0.063 seconds
```

***Step 3: Use the Database**:*

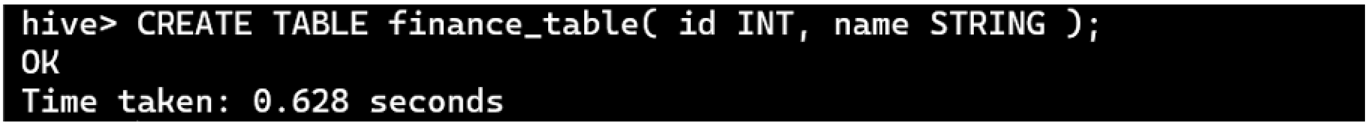
Switch to the newly created database: hive>use financials;



```
hive> CREATE DATABASE financials;
OK
Time taken: 0.171 seconds
```

Step 4: Create a Table:

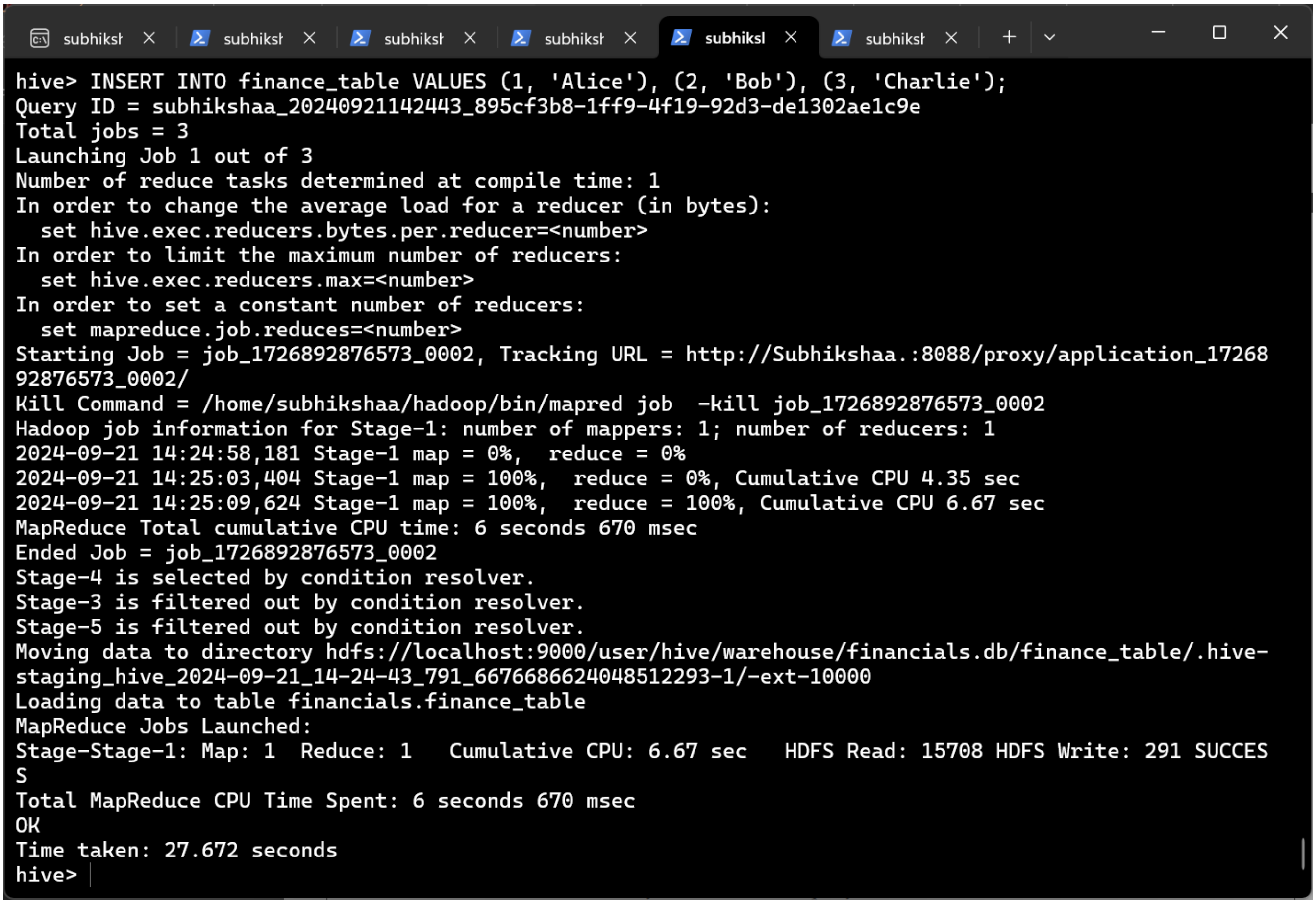
Create a simple table in your database:
hive>CREATE TABLE finance_table(id INT,   name STRING);



```
hive> CREATE TABLE finance_table( id INT, name STRING );
OK
Time taken: 0.628 seconds
```

Step 5: Load Sample Data:

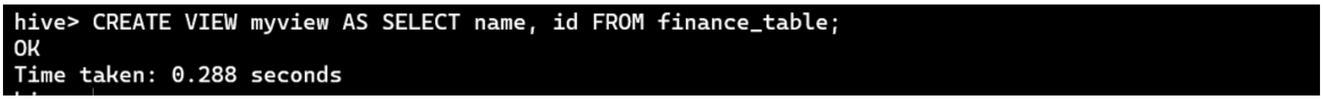
You can insert sample data into the table:
hive>INSERT INTO finance_tableVALUES (1, 'Alice'),   (2, 'Bob'),   (3, 'Charlie');



```
hive> INSERT INTO finance_table VALUES (1, 'Alice'), (2, 'Bob'), (3, 'Charlie');
Query ID = subhikshaa_20240921142443_895cf3b8-1ff9-4f19-92d3-de1302ae1c9e
Total jobs = 3
Launching Job 1 out of 3
Number of reduce tasks determined at compile time: 1
In order to change the average load for a reducer (in bytes):
  set hive.exec.reducers.bytes.per.reducer=<number>
In order to limit the maximum number of reducers:
  set hive.exec.reducers.max=<number>
In order to set a constant number of reducers:
  set mapreduce.job.reduces=<number>
Starting Job = job_1726892876573_0002, Tracking URL = http://Subhikshaa.:8088/proxy/application_17268
92876573_0002/
Kill Command = /home/subhikshaa/hadoop/bin/mapred job  -kill job_1726892876573_0002
Hadoop job information for Stage-1: number of mappers: 1; number of reducers: 1
2024-09-21 14:24:58,181 Stage-1 map = 0%,  reduce = 0%
2024-09-21 14:25:03,404 Stage-1 map = 100%,  reduce = 0%, Cumulative CPU 4.35 sec
2024-09-21 14:25:09,624 Stage-1 map = 100%,  reduce = 100%, Cumulative CPU 6.67 sec
MapReduce Total cumulative CPU time: 6 seconds 670 msec
Ended Job = job_1726892876573_0002
Stage-4 is selected by condition resolver.
Stage-3 is filtered out by condition resolver.
Stage-5 is filtered out by condition resolver.
Moving data to directory hdfs://localhost:9000/user/hive/warehouse/financials.db/finance_table/.hive-
staging_hive_2024-09-21_14-24-43_791_6676686624048512293-1/-ext-10000
Loading data to table financials.finance_table
MapReduce Jobs Launched:
Stage-Stage-1: Map: 1  Reduce: 1   Cumulative CPU: 6.67 sec   HDFS Read: 15708 HDFS Write: 291 SUCCES
S
Total MapReduce CPU Time Spent: 6 seconds 670 msec
OK
Time taken: 27.672 seconds
hive>
```

Step 6: Query Your Data

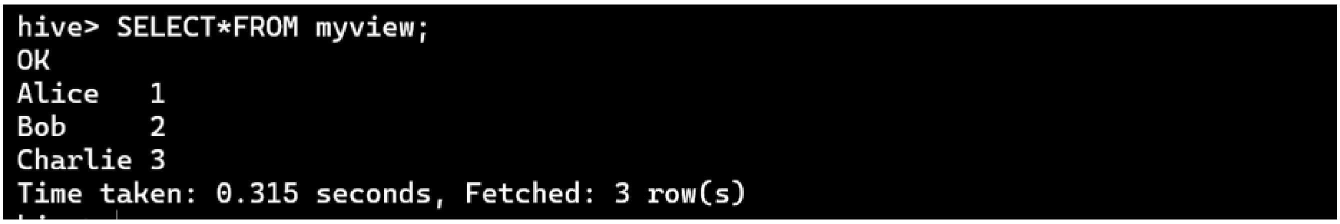
Use SQL-like queries to retrieve data from your table:
hive>CREATE VIEW myview AS SELECT name, id FROM finance_table;



```
hive> CREATE VIEW myview AS SELECT name, id FROM finance_table;
OK
Time taken: 0.288 seconds
```

Step 7: View the data:

*To see the data in the view, you would need to query the view hive>SELECT*FROM myview;*



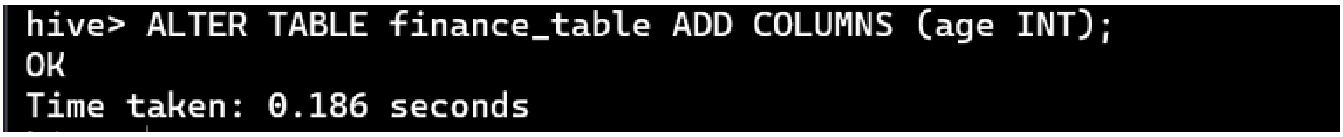
```
hive> SELECT*FROM myview;
OK
Alice   1
Bob     2
Charlie 3
Time taken: 0.315 seconds, Fetched: 3 row(s)
```

Step 8: Describe a Table:

You can describe the structure of a table using the DESCRIBE command:
hive>DESCRIBE finance_table;

Step 9: Alter a Table:

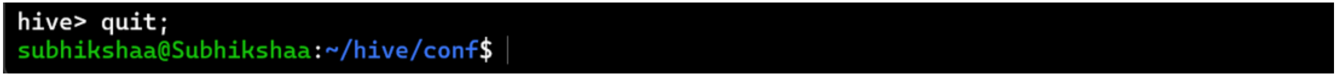
You can alter the table structure by adding a new column: hive>ALTER TABLE finance_table ADD COLUMNS (age INT);



```
hive> ALTER TABLE finance_table ADD COLUMNS (age INT);
OK
Time taken: 0.186 seconds
```

Step 10: Quit Hive:

To exit the Hive CLI, simply type: hive>quit;



```
hive> quit;
subhikshaa@Subhikshaa:~/hive/conf$
```

Result:

Thus, the usage of various commands in Hive has been successfully completed.