

**Exp.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:

```
$ wget https://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/hadoop/apache-hive-3.1.2
export PATH=$PATH:$HIVE_HOME/bin
#HIVE settings end
```

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 MySQL by running below commands:

```
$ sudo mysql
```

Pops command line interface for MySQL and 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*

*Replace your\_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/1QFhB7Kvcat7a4LzDRe6GcmZvalyAxKz/view?usp=drive\\_link](https://drive.google.com/file/d/1QFhB7Kvcat7a4LzDRe6GcmZvalyAxKz/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
```

```
thrisha@ubuntu20:~$ hive
SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/home/vboxuser/hive/lib/log4j-slf4j-impl-2.10.0.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in [jar:file:/home/vboxuser/hadoop-3.3.6/share/hadoop/common/lib/slf4j-reload4j-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 = 7cfc2efe-cfed-41a5-a581-4680c377dd1f

Logging initialized using configuration in jar:file:/home/vboxuser/hive/lib/hive-common-3.1.2.jar!/hive-log4j2.properties Async: true
Hive-on-MR is deprecated in Hive 2 and may not be available in the future versions. Consider using a different execution engine (i.e. spark, tez) or using Hive 1.X releases.Hive Session ID = 2919a55f-a8f1-45f6-a4a4-507e49c82bd8

hive> use financials
> CREATE TABLE finance_table( id INT, name STRING );
FAILED: ParseException line 2:0 missing EOF at 'CREATE' near 'financials'
hive> CREATE TABLE finance_table( id INT, name STRING );
OK
Time taken: 0.986 seconds
```

### 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*

```
hive> INSERT INTO finance_table VALUES (1, 'Alice'), (2, 'Bob'), (3, 'Charlie');
Query ID = thrisha_20240920121215_32be2580-f50e-449d-837d-98ce57457154
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>
Job running in-process (local Hadoop)
2024-09-20 12:12:20,528 Stage-1 map = 0%, reduce = 0%
2024-09-20 12:12:21,567 Stage-1 map = 100%, reduce = 0%
2024-09-20 12:12:22,575 Stage-1 map = 100%, reduce = 100%
Ended Job = job_local420641002_0001
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/finance_table/.hive-staging_hive_2024-09-20_12-12-15_163_16230488
85858798969-1/-ext-10000
Loading data to table default.finance_table
MapReduce Jobs Launched:
Stage-Stage-1:  HDFS Read: 0 HDFS Write: 202 SUCCESS
Total MapReduce CPU Time Spent: 0 msec
OK
Time taken: 8.139 seconds
hive> █
```

**Result:**

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

**Exp. 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> use financials;
OK
Time taken: 0.57 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: 2.013 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 = hadoop_20240911171244_304f3e60-6937-434c-acb2-d71be2797182
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>
Job running in-process (local Hadoop)
2024-09-11 17:12:54,138 Stage-1 map = 0%,  reduce = 0%
2024-09-11 17:12:57,541 Stage-1 map = 100%,  reduce = 100%
Ended Job = job_local1825573535_0001
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-
9-11_17-12-44_558_5675160086864575725-1/-ext-10000
Loading data to table financials.finance_table
MapReduce Jobs Launched:
Stage-Stage-1:  HDFS Read: 0 HDFS Write: 208 SUCCESS
Total MapReduce CPU Time Spent: 0 msec
OK
Time taken: 13.965 seconds

```

### 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: 0.244 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: 0.22 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;

```

hive> DESCRIBE finance_table;
OK
id          int
name        string
age         int
Time taken: 0.729 seconds, Fetched: 3 row(s)

```

**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: 0.188 seconds
```

**Step 10: Quit Hive:**

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

```
hive> quit;
```

**Result:**

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