Exp No: 4

Create UDF in PIG

Step-by-step installation of Apache Pig on Hadoop cluster on Ubuntu

Pre-requisite:

· Ubuntu 16.04 or higher version running (I have installed Ubuntu on Oracle VM (Virtual Machine) VirtualBox),

· Run Hadoop on ubuntu (I have installed Hadoop 3.2.1 on Ubuntu 16.04). You may refer to my blog "How to install Hadoop installation" click here for Hadoop installation).

Pig installation steps

Step 1: Login into Ubuntu

Step 2: Go to https://pig.apache.org/releases.html and copy the path of the latest version of pig that you want to install. Run the following comment to download Apache Pig in Ubuntu:

$ wget https://dlcdn.apache.org/pig/pig-0.16.0/pig-0.16.0.tar.gz

Step 3: To untar pig-0.16.0.tar.gz file run the following command:

$ tar xvzf pig-0.16.0.tar.gz

Step 4: To create a pig folder and move pig-0.16.0 to the pig folder, execute the following command:

$ sudo mv /home/hdoop/pig-0.16.0 /home/hdoop/pig

Step 5: Now open the .bashrc file to edit the path and variables/settings for pig. Run the following command:

$ sudo nano .bashrc

Add the below given to .bashrc file at the end and save the file.

#PIG settingsexport PIG_HOME=/home/hdoop/pigexport

PATH=$PATH:$PIG_HOME/binexport

PIG_CLASSPATH=$PIG_HOME/conf:$HADOOP_INSTALL/etc/hadoop/export

PIG_CONF_DIR=$PIG_HOME/confexport JAVA_HOME=/usr/lib/jvm/java-8-openjdkamd64export
PIG_CLASSPATH=$PIG_CONF_DIR:$PATH#PIG setting ends

```
export PIG_HOME=/home/haresh/pig
export PATH=$PATH:$PIG_HOME/bin
export PIG_CLASSPATH=$PIG_HOME/conf:$HADOOP_INSTALL/etc/hadoop/
export PIG_CONF_DIR=$PIG_HOME/conf
export PIG_CLASSPATH=$PIG_CONF_DIR:$PATH
```

Step 6: Run the following command to make the changes effective in the .bashrc file:

$ source .bashrc

Step 7: To start all Hadoop daemons, navigate to the hadoop-3.2.1/sbin folder and run the following commands:

$ ./start-dfs.sh$ ./start-yarn$ jps

```
haresh@fedora:~$ start-all.sh
WARNING: Attempting to start all Apache Hadoop daemons as haresh in 10 seconds.
WARNING: This is not a recommended production deployment configuration.
WARNING: Use CTRL-C to abort.
Starting namenodes on [localhost]
Starting datanodes
Starting secondary namenodes [fedora]
Starting resourcemanager
Starting nodemanagers
haresh@fedora:~$
```

Now you can launch pig by executing the following command:

$ pig

```
haresh@fedora:~$ pig
2024-09-13 09:46:24,963 INFO pig.ExecTypeProvider: Trying ExecType : LOCAL
2024-09-13 09:46:24,964 INFO pig.ExecTypeProvider: Trying ExecType : MAPREDUCE
2024-09-13 09:46:24,964 INFO pig.ExecTypeProvider: Picked MAPREDUCE as the ExecT
ype
2024-09-13 09:46:25,012 [main] INFO  org.apache.pig.Main - Apache Pig version 0.
16.0 (r1746530) compiled Jun 01 2016, 23:10:49
2024-09-13 09:46:25,012 [main] INFO  org.apache.pig.Main - Logging error message
s to: /home/haresh/pig_1726200985006.log
2024-09-13 09:46:25,056 [main] INFO  org.apache.pig.impl.util.Utils - Default bo
otup file /home/haresh/.pigbootup not found
2024-09-13 09:46:25,375 [main] INFO  org.apache.hadoop.conf.Configuration.deprec
ation - mapred.job.tracker is deprecated. Instead, use mapreduce.jobtracker.addr
ess
2024-09-13 09:46:25,375 [main] INFO  org.apache.hadoop.conf.Configuration.deprec
ation - fs.default.name is deprecated. Instead, use fs.defaultFS
2024-09-13 09:46:25,375 [main] INFO  org.apache.pig.backend.hadoop.executionengi
ne.HExecutionEngine - Connecting to hadoop file system at: hdfs://localhost:9000
2024-09-13 09:46:26,058 [main] INFO  org.apache.hadoop.conf.Configuration.deprec
ation - mapred.job.tracker is deprecated. Instead, use mapreduce.jobtracker.addr
```

Step 9: Now you are in pig and can perform your desired tasks on pig. You can come out of the pig by the quit command:

> quit

CREATE USER DEFINED FUNCTION(UDF)

Aim :

To create User Define Function in Apache Pig and execute it on map reduce.

Procedure:

Create a sample text file

hadoop@Ubuntu:~/Documents$ nano sample.txt

Paste the below content to sample.txt

1,John

2,Jane

3,Joe

4,Emma

hadoop@Ubuntu:~/Documents$ hadoop fs -put sample.txt /home/hadoop/piginput/

Create PIG File

hadoop@Ubuntu:~/Documents$ nano demo_pig.pig

paste the below the content to demo_pig.pig

-- Load the data from HDFS

data = LOAD '/home/hadoop/piginput/sample.txt' USING PigStorage(',') AS (id:int>

-- Dump the data to check if it was loaded correctly

DUMP data;

Run the above file

hadoop@Ubuntu:~/Documents$ pig demo_pig.pig

2024-08-07 12:13:08,791 [main] INFO

org.apache.pig.backend.hadoop.executionengine.util.MapRedUtil

- Total input paths to process : 1

(1,John)

(2,Jane)

(3,Joe)

(4,Emma)

Create udf file an save as uppercase_udf.py

uppercase_udf.py

```
def uppercase(text):
return text.upper()
if __name___== "__main__":
import sys
for line in sys.stdin:
line = line.strip()
result = uppercase(line)
print(result)
```

Create the udfs folder on hadoop

hadoop@Ubuntu:~/Documents$ hadoop fs -mkdir /home/hadoop/udfs

put the upppercase_udf.py in to the abv folder

hadoop@Ubuntu:~/Documents$ hdfs dfs -put uppercase_udf.py /home/hadoop/udfs/

---

hadoop@Ubuntu:~/Documents$ nano udf_example.pig

copy and paste the below content on udf_example.pig

```
-- Register the Python UDF script
REGISTER 'hdfs:///home/hadoop/udfs/uppercase_udf.py' USING jython AS udf;
-- Load some data
data = LOAD 'hdfs:///home/hadoop/sample.txt' AS (text:chararray);
-- Use the Python UDF
uppercased_data = FOREACH data GENERATE udf.uppercase(text) AS uppercase_text;
-- Store the result
STORE uppercased_data INTO 'hdfs:///home/hadoop/pig_output_data';
```

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place sample.txt file on hadoop

hadoop@Ubuntu:~/Documents$ hadoop fs -put sample.txt /home/hadoop/

To Run the pig file

hadoop@Ubuntu:~/Documents$ pig -f udf_example.pig

finally u get

Success!

Job Stats (time in seconds):

JobId Maps Reduces MaxMapTimeMinMapTime AvgMapTime MedianMapTime

MaxReduceTime MinReduceTime AvgReduceTime MedianReducetime

Alias Feature Outputs

job_local1786848041_0001 1 0 n/a n/a n/a n/a 00 0 0

data,uppercased_data MAP_ONLY hdfs:///home/hadoop/pig_output_data,

Input(s):

Successfully read 4 records (42778068 bytes) from: "hdfs:///home/hadoop/sample.txt"

Output(s):

```
2024-09-13 10:19:39,234 [main] INFO  org.apache.hadoop.ipc.Client - Retrying connect to server: 
.0.0.0/0.0.0.0:10020. Already tried 4 time(s); retry policy is RetryUpToMaximumCountWithFixedSlee
p(maxRetries=10, sleepTime=1000 MILLISECONDS)
2024-09-13 10:19:40,251 [main] INFO  org.apache.hadoop.ipc.Client - Retrying connect to server: 
.0.0.0/0.0.0.0:10020. Already tried 5 time(s); retry policy is RetryUpToMaximumCountWithFixedSlee
p(maxRetries=10, sleepTime=1000 MILLISECONDS)
2024-09-13 10:19:41,252 [main] INFO  org.apache.hadoop.ipc.Client - Retrying connect to server: 
.0.0.0/0.0.0.0:10020. Already tried 6 time(s); retry policy is RetryUpToMaximumCountWithFixedSlee
p(maxRetries=10, sleepTime=1000 MILLISECONDS)
2024-09-13 10:19:42,255 [main] INFO  org.apache.hadoop.ipc.Client - Retrying connect to server: 
.0.0.0/0.0.0.0:10020. Already tried 7 time(s); retry policy is RetryUpToMaximumCountWithFixedSlee
p(maxRetries=10, sleepTime=1000 MILLISECONDS)
2024-09-13 10:19:43,259 [main] INFO  org.apache.hadoop.ipc.Client - Retrying connect to server: 
.0.0.0/0.0.0.0:10020. Already tried 8 time(s); retry policy is RetryUpToMaximumCountWithFixedSlee
p(maxRetries=10, sleepTime=1000 MILLISECONDS)
2024-09-13 10:19:44,277 [main] INFO  org.apache.hadoop.ipc.Client - Retrying connect to server: 
.0.0.0/0.0.0.0:10020. Already tried 9 time(s); retry policy is RetryUpToMaximumCountWithFixedSlee
p(maxRetries=10, sleepTime=1000 MILLISECONDS)
2024-09-13 10:19:44,396 [main] WARN  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer
.MapReduceLauncher - Unable to retrieve job to compute warning aggregation.
2024-09-13 10:19:44,397 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer
.MapReduceLauncher - Success!
2024-09-13 10:19:44,490 [main] INFO  org.apache.pig.Main - Pig script completed in 2 minutes, 57
seconds and 220 milliseconds (177220 ms)
```

Successfully stored 4 records (42777870 bytes) in: "hdfs:///home/hadoop/pig_output_data"

Counters:

Total records written : 4

Total bytes written : 42777870

Spillable Memory Manager spill count : 0

Total bags proactively spilled: 0

Total records proactively spilled: 0

Job DAG:

job_local1786848041_0001

2024-08-07 13:33:04,631 [main] WARN

org.apache.hadoop.metrics2.impl.MetricsSystemImpl -

JobTracker metrics system already initialized!

2024-08-07 13:33:04,639 [main] WARN

org.apache.hadoop.metrics2.impl.MetricsSystemImpl -

JobTracker metrics system already initialized!

2024-08-07 13:33:04,644 [main] WARN

org.apache.hadoop.metrics2.impl.MetricsSystemImpl -

JobTracker metrics system already initialized!

2024-08-07 13:33:04,667 [main] INFO

org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher -

Success!

Note :

If any error check jython package is installed and check the path specified on the above steps are give correctly

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To check the output file is created

hadoop@Ubuntu:~/Documents$ hdfs dfs -ls /home/hadoop/pig_output_data

Found 2 items

If you need to examine the files in the output folder, use:

To view the output

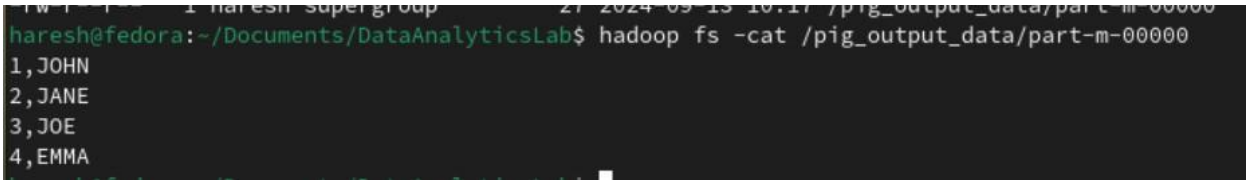
hadoop@Ubuntu:~/Documents$ hdfs dfs -cat /home/hadoop/pig_output_data/part-m00000

1,JOHN

2,JANE

3,JOE

4,EMMA



Result:

Thus, the program is executed successfully