EX NO:2 210701183

Hadoop Streaming – Wordcount Using Mapreducer in Hadoop

Steps:

1. Open command prompt and run as administrator

Go to hadoop sbin directory

```
C:\>cd C:\Hadoop\sbin

C:\Hadoop\sbin>
```

Note:

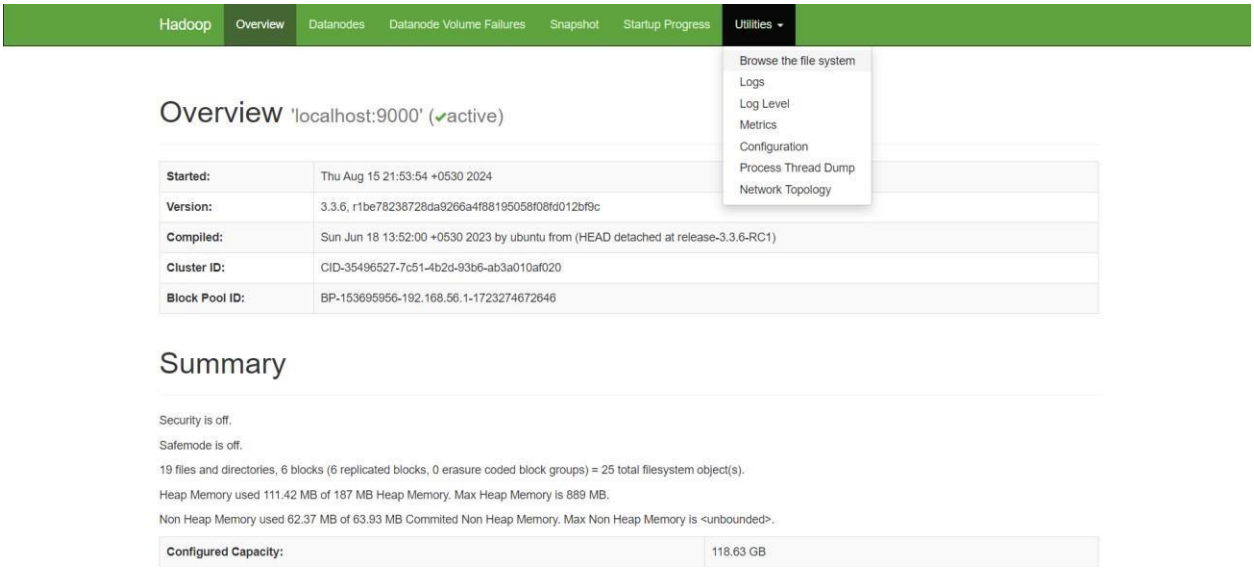
1. Check hadoop/data/datanode and hadoop/data/namenode and if both folders are empty, type “hdfs namenode -format”.
2. Check python version with “python --version”.
3. Check “C:\Python39\” is added in Environment variables > System variables > Path, if not add your python path.
4. Check Environment variables > System variables > HADOOP_HOME is set as “C:\Hadoop”.

```
C:\Hadoop\sbin>echo %HADOOP_HOME%
C:\Hadoop

C:\Hadoop\sbin>python --version
Python 3.11.4
```

2. Start Hadoop Services start-dfs.cmd start-yarn.cmd

```
C:\Hadoop\sbin>start-dfs.cmd

C:\Hadoop\sbin>start-yarn.cmd
starting yarn daemons

C:\Hadoop\sbin>jps
13120 NameNode
2384 NodeManager
4100 DataNode
7956 ResourceManager
9124 Jps
```

3. Open the browser and go to the URL localhost:9870



4. Create a Directory in HDFS hdfs dfs -mkdir -p /user/hadoop/input

```
C:\Hadoop\sbin>hdfs dfs -mkdir -p /user/hadoop/input

C:\Hadoop\sbin>
```

5. Copy the Input File to HDFS hdfs dfs -put C:/Users/Admin/input.txt /user/hadoop/input

```
C:\Hadoop\sbin>hdfs dfs -put C:/Users/Admin/input.txt /user/hadoop/input

C:\Hadoop\sbin>hdfs dfs -ls /user/hadoop/input
Found 1 items
-rw-r--r--   1 Admin supergroup         42 2024-08-18 15:15 /user/hadoop/input/input.txt

C:\Hadoop\sbin>hdfs dfs -cat /user/hadoop/input/input.txt
hello world
hi all
hello all
all the best

C:\Hadoop\sbin>
```

Note: mapper.py:

```python
#! /usr/bin/env python
import sys
for line in sys.stdin:
    line=line.strip()
    words=line.split()

    for word in words:
        print('%s\t%s' % (word,1))
```

reducer.py:

```python
#! /usr/bin/env python
import sys
prev_word=None
prev_count=0

for line in sys.stdin:
    line=line.strip()
    word,count=line.split('\t')
    count=int(count)

    if prev_word==word:
        prev_count+=count
    else:
        if prev_word:
            print('%s\t%s' % (prev_word, prev_count))
        prev_word=word
        prev_count=count
if prev_word==word:
    print('%s\t%s' % (prev_word, prev_count))
```

6. Run the Hadoop Streaming Job hadoop jar

```
hadoop jar C:\hadoop\share\hadoop\tools\lib\hadoop-streaming-3.3.1.jar ^
   -files
/Users/monid/OneDrive/Documents/DataAnalytics/mapper.py,/Users/monid/OneDrive/Documents/DataAnalytics/reducer.py ^
   -input /user/hadoop/input/data.txt ^
```

-output /user/output ^

-mapper "python C:/Users/monid/OneDrive/Documents/DataAnalytics/mapper.py" ^

-reducer "python C:/Users/monid/OneDrive/Documents/DataAnalytics/reducer.py "

```
C:\Hadoop\sbin>hadoop jar %HADOOP_HOME%\share\hadoop\tools\lib\hadoop-streaming-*.jar ^
More? -mapper "python C:\\Users\\Admin\\mapper.py" -reducer "python C:\\Users\\Admin\\reducer.py" ^
More? -input /user/hadoop/input/input.txt -output /user/hadoop/output
packageJobJar: [/C:/Users/Admin/AppData/Local/Temp/hadoop-unjar4352040893517806187/] [] C:\Users\Admin\AppData\Local\Tem
p\streamjob1481680013776791488.jar tmpDir=null
2024-08-18 15:21:35,517 INFO client.DefaultNoHARMFailoverProxyProvider: Connecting to ResourceManager at /0.0.0.0:8032
2024-08-18 15:21:35,949 INFO client.DefaultNoHARMFailoverProxyProvider: Connecting to ResourceManager at /0.0.0.0:8032
2024-08-18 15:21:37,279 INFO mapreduce.JobResourceUploader: Disabling Erasure Coding for path: /tmp/hadoop-yarn/staging/
Admin/.staging/job_1723973693127_0001
2024-08-18 15:21:38,430 INFO mapred.FileInputFormat: Total input files to process : 1
2024-08-18 15:21:38,990 INFO mapreduce.JobSubmitter: number of splits:2
2024-08-18 15:21:39,415 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1723973693127_0001
2024-08-18 15:21:39,416 INFO mapreduce.JobSubmitter: Executing with tokens: []
2024-08-18 15:21:39,723 INFO conf.Configuration: resource-types.xml not found
2024-08-18 15:21:39,724 INFO resource.ResourceUtils: Unable to find 'resource-types.xml'.
2024-08-18 15:21:41,112 INFO impl.YarnClientImpl: Submitted application application_1723973693127_0001
2024-08-18 15:21:41,196 INFO mapreduce.Job: The url to track the job: http://DESKTOP-TF65P79:8088/proxy/application_1723
973693127_0001/
2024-08-18 15:21:41,202 INFO mapreduce.Job: Running job: job_1723973693127_0001
2024-08-18 15:22:04,875 INFO mapreduce.Job: Job job_1723973693127_0001 running in uber mode : false
2024-08-18 15:22:04,905 INFO mapreduce.Job:  map 0% reduce 0%
2024-08-18 15:22:20,569 INFO mapreduce.Job:  map 100% reduce 0%
2024-08-18 15:22:32,773 INFO mapreduce.Job:  map 100% reduce 100%
```

```
        File Input Format Counters
                Bytes Read=63
        File Output Format Counters
                Bytes Written=40
2024-08-18 15:22:34,120 INFO streaming.StreamJob: Output directory: /user/hadoop/output

C:\Hadoop\sbin>
```

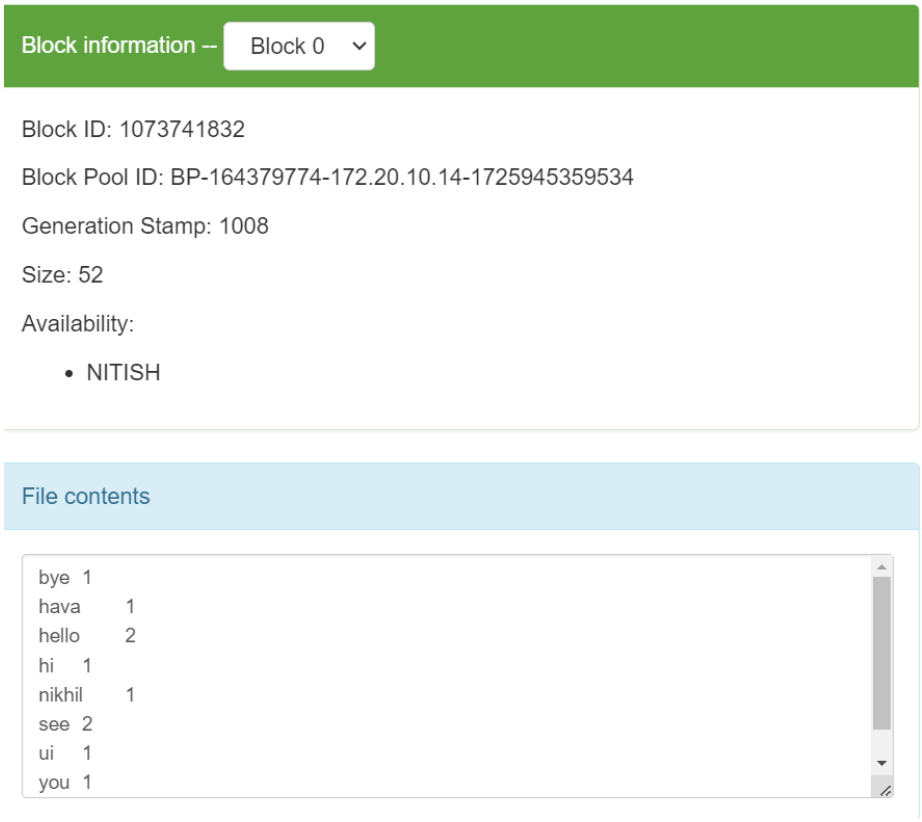
7. View the Output

hadoop dfs -cat /user/output/part-00000

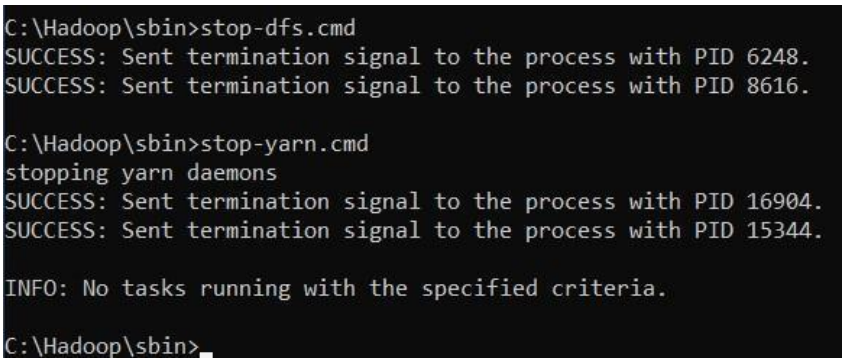
```
C:\Windows\System32>hadoop fs -cat /user/ex1/output/part-00000
bye     1
hava    1
hello   2
hi      1
nikhil  1
see     2
ui      1
you     1

C:\Windows\System32>
```

8. Once the map reduce operations are performed successfully, the output will be present in the specified directory.

"/user/output/part-00000"



9. Stop Hadoop Services stop-dfs.cmd stop-yarn.cmd



10. Stop Hadoop Services stop-dfs.cmd stop-yarn.cmd

```
C:\Hadoop\sbin>stop-dfs.cmd
SUCCESS: Sent termination signal to the process with PID 6248.
SUCCESS: Sent termination signal to the process with PID 8616.

C:\Hadoop\sbin>stop-yarn.cmd
stopping yarn daemons
SUCCESS: Sent termination signal to the process with PID 16904.
SUCCESS: Sent termination signal to the process with PID 15344.

INFO: No tasks running with the specified criteria.

C:\Hadoop\sbin>
```

RESULT:

Thus the implementation of the python mapper and reducer programs using MapReduce to count the words in a text file using Hadoop is executed successfully.