Universidad de San Carlos de Guatemala
Facultad de Ingeniería
Departamento de Ciencias
Segundo Semestre del 2022
Seminario de Sistemas 2
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Practica 2

Pasos para hadoop

//---- we are going to run the container
sudo docker run --rm -it -v Practica2:/source -p 50070-50080:50070-50080 sequenceiq/hadoop-docker /etc/bootstrap.sh -bash
//---- checkout the file
ls
// we are going to create a folder
mkdir Practica2
// checkout the file
ls
// let's copy the command in other console.
sudo docker cp "/home/tomas/Documentos/Curso_Semi2/Practica2/Correos.txt" epic_nobel:/Practica2
sudo docker cp "/home/tomas/Documentos/Curso_Semi2/Practica2/Puntuacion.txt" epic_nobel:/Practica2
sudo docker cp "/home/tomas/Documentos/Curso_Semi2/Practica2/WordCount.java" epic_nobel:/Practica2
// we go back to previous console.
// let's on folder Practica 2
cd Practica2
// we check the folder
ls
// we go back to previous folder
cd ../

// Command to initialize the HADOOP_HOME variable
export HADOOP_HOME=/usr/local/hadoop
// we check the folder
ls ${HADOOP_HOME}
// Command to initialize the CLASSPATH variable
export CLASSPATH="$HADOOP_HOME/share/hadoop/mapreduce/hadoop-mapreduce-client-core-2.7.0.jar:$HADOOP_HOME/share/hadoop/mapreduce/hadoop-mapreduce-client-common-2.7.0.jar:$HADOOP_HOME/share/hadoop/common/hadoop-common-2.7.0.jar:/Practica2/*:$HADOOP_HOME/lib*"

// let's on folder Practica 2
cd Practica2
// we check the folder
ls
// Command to compile
javac -d . WordCount.java

// we are going to create a file manifest.
cat > manifest.txt

Main-class: WordCount
//Saved with ctrl+d
//verify the content of file
cat manifest.txt
//we create a file jar
jar cfm WordCount.jar manifest.txt *.class
// Verify
ls
// we create a folder with name input
mkdir ~/input
mkdir ~/output
// let's copy the file at the folder.
cp Correos.txt ~/input
cp Puntuacion.txt ~/input
ls ~/input

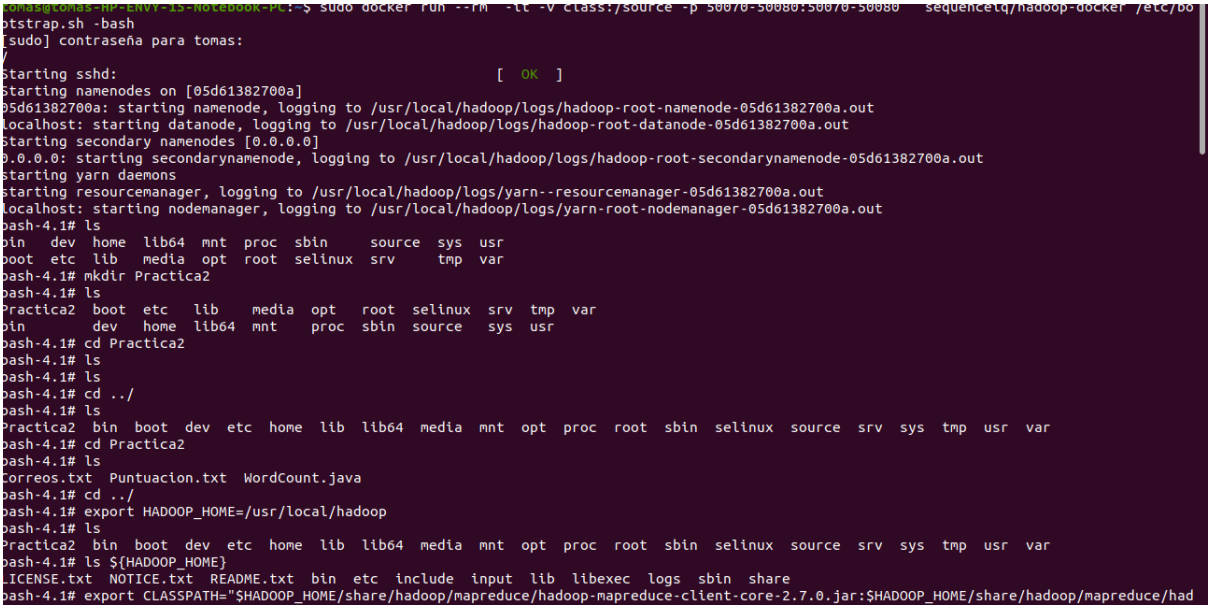
// command to copy the files of input in the system of files of hadoop
${HADOOP_HOME}/bin/hdfs dfs -copyFromLocal ~/input /
// comand to verify the files let us copy at the sistem of hadoop
${HADOOP_HOME}/bin/hdfs dfs -ls /input
// command to make the count of word
${HADOOP_HOME}/bin/hadoop jar WordCount.jar /input /output
// command of output
${HADOOP_HOME}/bin/hdfs dfs -ls /output
// comand to see the file of output
${HADOOP_HOME}/bin/hdfs dfs -cat /output/part-r-00000
// command to rename the file
${HADOOP_HOME}/bin/hdfs dfs -mv /output/part-r-00000 /output/Resultado.txt
// Command to see the file of output rename
${HADOOP_HOME}/bin/hdfs dfs -cat /output/Resultado.txt
//Command to copy the file of output to folder of output from root user home
${HADOOP_HOME}/bin/hdfs dfs -copyToLocal /output/Resultado.txt ~/output

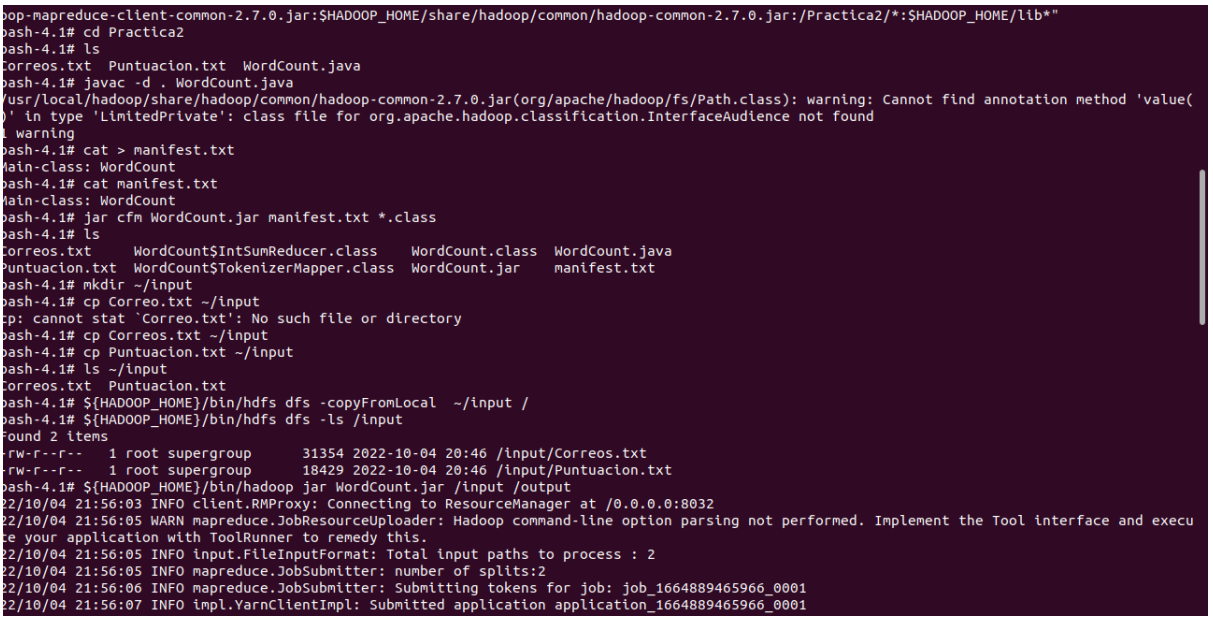
//Command to move the output file to Practica2 folder from container
cp ~/output/Resultado.txt /Practica2
// Command to copy the output file from container to PC (use new console)
sudo docker cp epic_nobel:/Practica2/Resultado.txt /home/tomas/Documentos/Curso_Semi2/Practica2

Capturas del Procedimiento

Descripción

En las imágenes se muestra todo el proceso que se realizó con los comandos, además se muestra una página web con los detalles de los archivos de salida y los archivos de entrada.





```
bash-4.1# ${HADOOP_HOME}/bin/hadoop jar WordCount.jar /input /output
22/10/04 21:56:03 INFO client.RMProxy: Connecting to ResourceManager at /0.0.0.0:8032
22/10/04 21:56:05 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. Implement the Tool interface and execu
te your application with ToolRunner to remedy this.
22/10/04 21:56:05 INFO input.FileInputFormat: Total input paths to process : 2
22/10/04 21:56:05 INFO mapreduce.JobSubmitter: number of splits:2
22/10/04 21:56:06 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1664889465966_0001
22/10/04 21:56:07 INFO impl.YarnClientImpl: Submitted application application_1664889465966_0001
22/10/04 21:56:07 INFO mapreduce.Job: The url to track the job: http://05d61382700a:8088/proxy/application_1664889465966_0001/
22/10/04 21:56:07 INFO mapreduce.Job: Running job: job_1664889465966_0001
22/10/04 21:56:19 INFO mapreduce.Job: Job job_1664889465966_0001 running in uber mode : false
22/10/04 21:56:19 INFO mapreduce.Job:  map 0% reduce 0%
22/10/04 21:56:32 INFO mapreduce.Job:  map 100% reduce 0%
22/10/04 21:56:40 INFO mapreduce.Job:  map 100% reduce 100%
22/10/04 21:56:41 INFO mapreduce.Job: Job job_1664889465966_0001 completed successfully
22/10/04 21:56:41 INFO mapreduce.Job: Counters: 49
        File System Counters
                FILE: Number of bytes read=26299
                FILE: Number of bytes written=397267
                FILE: Number of read operations=0
                FILE: Number of large read operations=0
                FILE: Number of write operations=0
                HDFS: Number of bytes read=50000
                HDFS: Number of bytes written=18637
                HDFS: Number of read operations=9
                HDFS: Number of large read operations=0
                HDFS: Number of write operations=2
        Job Counters
                Launched map tasks=2
                Launched reduce tasks=1
                Data-local map tasks=2
                Total time spent by all maps in occupied slots (ms)=19445
                Total time spent by all reduces in occupied slots (ms)=5130
                Total time spent by all map tasks (ms)=19445
                Total time spent by all reduce tasks (ms)=5130
                Total vcore-seconds taken by all map tasks=19445
```

```
        File System Counters
                FILE: Number of bytes read=26299
                FILE: Number of bytes written=397267
                FILE: Number of read operations=0
                FILE: Number of large read operations=0
                FILE: Number of write operations=0
                HDFS: Number of bytes read=50000
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                Launched map tasks=2
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                Data-local map tasks=2
                Total time spent by all maps in occupied slots (ms)=19445
                Total time spent by all reduces in occupied slots (ms)=5130
                Total time spent by all map tasks (ms)=19445
                Total time spent by all reduce tasks (ms)=5130
                Total vcore-seconds taken by all map tasks=19445
                Total vcore-seconds taken by all reduce tasks=5130
                Total megabyte-seconds taken by all map tasks=19911680
                Total megabyte-seconds taken by all reduce tasks=5253120
        Map-Reduce Framework
                Map input records=51
                Map output records=13709
                Map output bytes=104523
                Map output materialized bytes=26305
                Input split bytes=217
                Combine input records=13709
                Combine output records=1928
                Reduce input groups=1923
                Reduce shuffle bytes=26305
                Reduce input records=1928
                Reduce output records=1923
                Spilled Records=3856
```
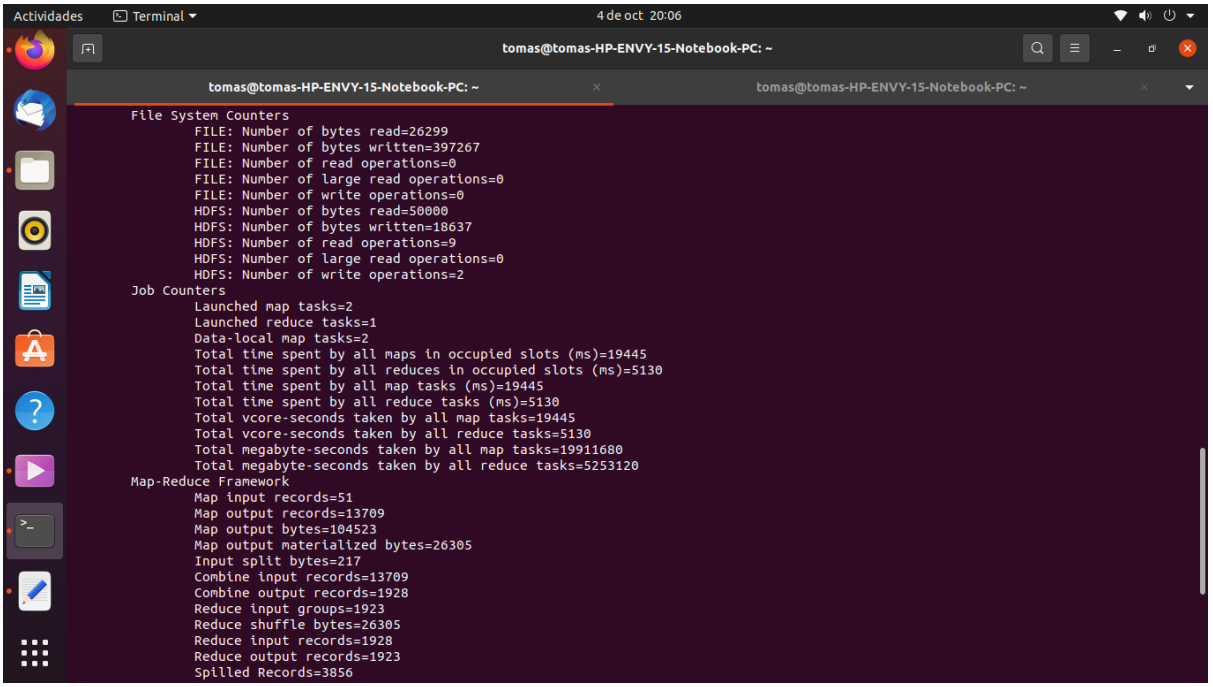

```
                Total vcore-seconds taken by all reduce tasks=5130
                Total megabyte-seconds taken by all map tasks=19911680
                Total megabyte-seconds taken by all reduce tasks=5253120
        Map-Reduce Framework
                Map input records=51
                Map output records=13709
                Map output bytes=104523
                Map output materialized bytes=26305
                Input split bytes=217
                Combine input records=13709
                Combine output records=1928
                Reduce input groups=1923
                Reduce shuffle bytes=26305
                Reduce input records=1928
                Reduce output records=1923
                Spilled Records=3856
                Shuffled Maps =2
                Failed Shuffles=0
                Merged Map outputs=2
                GC time elapsed (ms)=237
                CPU time spent (ms)=4490
                Physical memory (bytes) snapshot=663838720
                Virtual memory (bytes) snapshot=2216423424
                Total committed heap usage (bytes)=559939584
        Shuffle Errors
                BAD_ID=0
                CONNECTION=0
                IO_ERROR=0
                WRONG_LENGTH=0
                WRONG_MAP=0
                WRONG_REDUCE=0
        File Input Format Counters
                Bytes Read=49783
        File Output Format Counters
                Bytes Written=18637
bash-4.1#
```



```
                Total vcore-seconds taken by all reduce tasks=5130
                Total megabyte-seconds taken by all map tasks=19911680
                Total megabyte-seconds taken by all reduce tasks=5253120
        Map-Reduce Framework
                Map input records=51
                Map output records=13709
                Map output bytes=104523
                Map output materialized bytes=26305
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                Reduce shuffle bytes=26305
                Reduce input records=1928
                Reduce output records=1923
                Spilled Records=3856
                Shuffled Maps =2
                Failed Shuffles=0
                Merged Map outputs=2
                GC time elapsed (ms)=237
                CPU time spent (ms)=4490
                Physical memory (bytes) snapshot=663838720
                Virtual memory (bytes) snapshot=2216423424
                Total committed heap usage (bytes)=559939584
        Shuffle Errors
                BAD_ID=0
                CONNECTION=0
                IO_ERROR=0
                WRONG_LENGTH=0
                WRONG_MAP=0
                WRONG_REDUCE=0
        File Input Format Counters
                Bytes Read=49783
        File Output Format Counters
                Bytes Written=18637
bash-4.1#
```
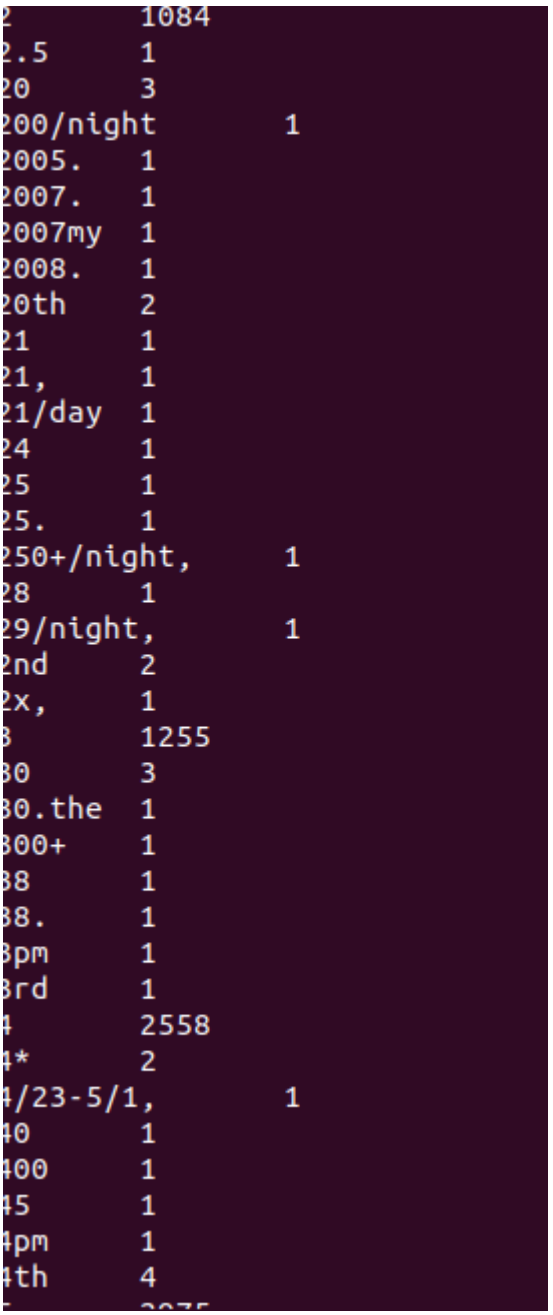
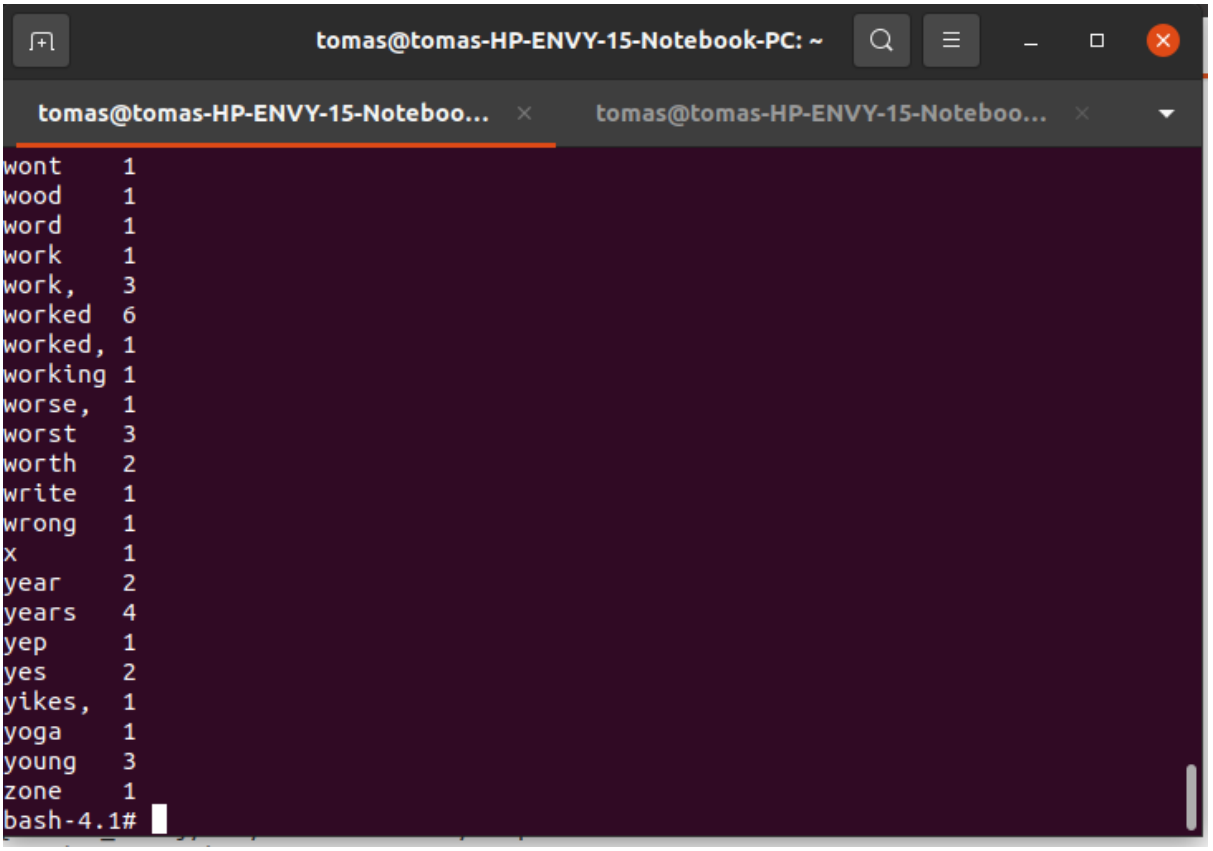
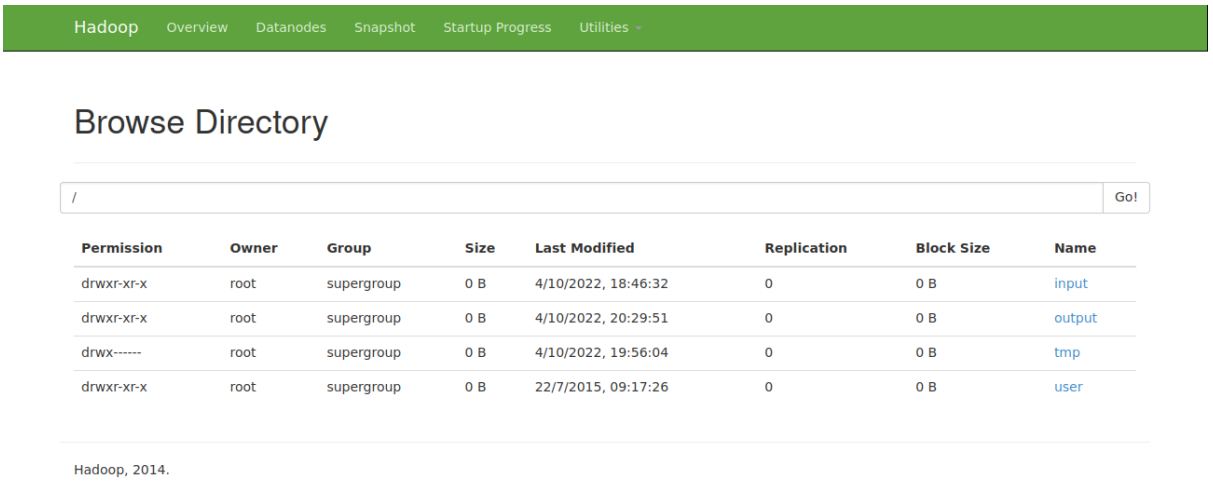
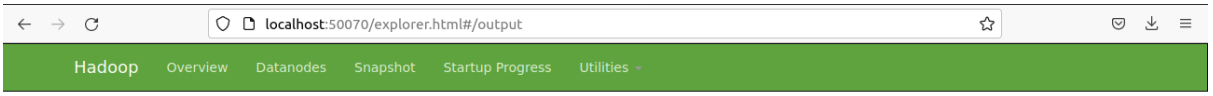

```
-rw-r--r--   1 root supergroup      18637 2022-10-04 21:56 /output/part-r-00000
bash-4.1# ${HADOOP_HOME}/bin/hdfs dfs -cat /output/part-r-00000
1       1386
1,000   1
1/2     1
10      3
100-    1
10am    2
10am,   1
10th    1
11      1
12      2
12/1a   1
125     1
12th    1
150     1
175.    1
17th    2
18      1
18-19   1
1970    1
1:30    1
1st     2
1st,    1
2       1084
2.5     1
20      3
200/night       1
2005.   1
2007.   1
2007my  1
2008.   1
20th    2
21      1
21,     1
21/day  1
```


2 1084
2.5 1
20 3
200/night 1
2005. 1
2007. 1
2007my 1
2008. 1
20th 2
21 1
21, 1
21/day 1
24 1
25 1
25. 1
250+/night, 1
28 1
29/night, 1
2nd 2
2x, 1
3 1255
30 3
30.the 1
300+ 1
38 1
38. 1
3pm 1
3rd 1
4 2558
4* 2
4/23-5/1, 1
40 1
400 1
45 1
4pm 1
4th 4


tomas@tomas-HP-ENVY-15-Notebook-PC: ~
tomas@tomas-HP-ENVY-15-Noteboo...
tomas@tomas-HP-ENVY-15-Noteboo...
wont 1
wood 1
word 1
work 1
work, 3
worked 6
worked, 1
working 1
worse, 1
worst 3
worth 2
write 1
wrong 1
x 1
year 2
years 4
yep 1
yes 2
yikes, 1
yoga 1
young 3
zone 1
bash-4.1#


Hadoop
Overview
Datanodes
Snapshot
Startup Progress
Utilities
Browse Directory
/
Go!
Permission
Owner
Group
Size
Last Modified
Replication
Block Size
Name
drwxr-xr-x root supergroup 0 B 4/10/2022, 18:46:32 0 0 B input
drwxr-xr-x root supergroup 0 B 4/10/2022, 20:29:51 0 0 B output
drwx------ root supergroup 0 B 4/10/2022, 19:56:04 0 0 B tmp
drwxr-xr-x root supergroup 0 B 22/7/2015, 09:17:26 0 0 B user
Hadoop, 2014.

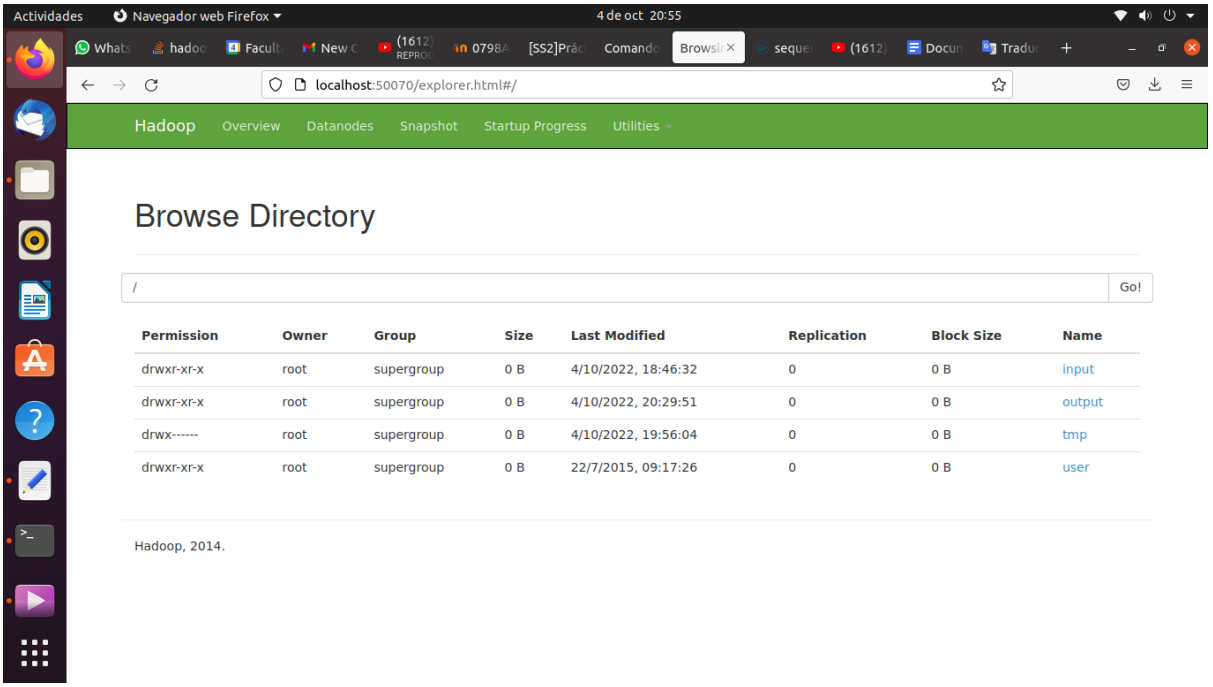


Browse Directory

/output Go!

Permission	Owner	Group	Size	Last Modified	Replication	Block Size	Name
-rw-r--r--	root	supergroup	18.2 KB	4/10/2022, 19:56:38	1	128 MB	Resultado.txt
-rw-r--r--	root	supergroup	0 B	4/10/2022, 19:56:39	1	128 MB	_SUCCESS

Hadoop, 2014.

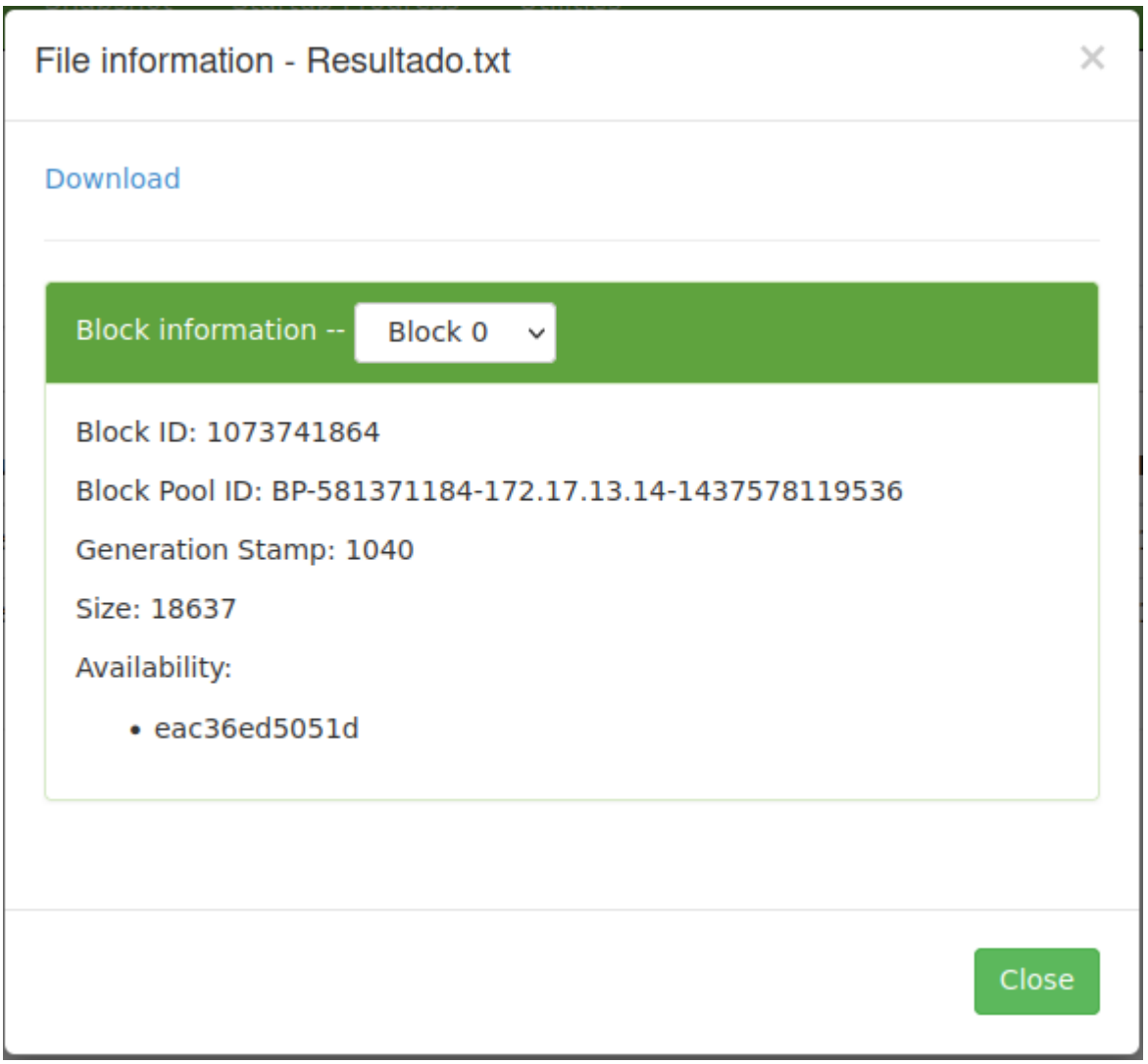


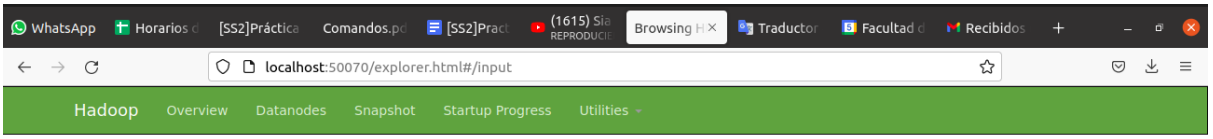
Browse Directory

/ Go!

Permission	Owner	Group	Size	Last Modified	Replication	Block Size	Name
drwxr-xr-x	root	supergroup	0 B	4/10/2022, 18:46:32	0	0 B	input
drwxr-xr-x	root	supergroup	0 B	4/10/2022, 20:29:51	0	0 B	output
drwx------	root	supergroup	0 B	4/10/2022, 19:56:04	0	0 B	tmp
drwxr-xr-x	root	supergroup	0 B	22/7/2015, 09:17:26	0	0 B	user

Hadoop, 2014.


File information - Resultado.txt
Download
Block information -- Block 0
Block ID: 1073741864
Block Pool ID: BP-581371184-172.17.13.14-1437578119536
Generation Stamp: 1040
Size: 18637
Availability:
eac36ed5051d
Close



Hadoop Overview Datanodes Snapshot Startup Progress Utilities

Browse Directory

/input Go!

Permission	Owner	Group	Size	Last Modified	Replication	Block Size	Name
-rw-r--r--	root	supergroup	30.62 KB	5/10/2022, 13:12:18	1	128 MB	Correos.txt
-rw-r--r--	root	supergroup	18 KB	5/10/2022, 13:12:19	1	128 MB	Puntuacion.txt

Hadoop, 2014.

Conclusiones acerca de los resultados de cada archivo

Muestra el resultado del conteo de cada palabra donde indica cual es son las palabras que se repiten más y muestra el total de palabra en cada archivo que hay.

Conclusiones acerca del uso de Hadoop en BigData.

para simples solicitudes de información y problemas que se pueden dividir en unidades independientes, pero no es eficiente para realizar tareas analíticas iterativas e interactivas. MapReduce trabaja con muchos archivos. Como los nodos no se intercomunican salvo a través de procesos de clasificación y mezcla, los algoritmos iterativos requieren múltiples fases de mapeo-mezcla/clasificación-reducción para completarse. Esto da origen a múltiples archivos entre fases de MapReduce y no es eficiente para el cómputo analítico avanzado.