

EXP. 11 LAUNCH THE HADOOP 2.X AND PERFORM MAPREDUCE PROGRAM FOR A WORD COUNT PROBLEM

AIM:

PROCEDURE:

Step 1 - Open Terminal

```
$ su hduser
```

Password:

Step 2 - Start dfs and mapreduce services

```
$ cd /usr/local/hadoop/hadoop-2.7.2/sbin
```

```
$ start-dfs.sh
```

```
$ start-yarn.sh
```

```
$ jps
```

Step 3 - Check Hadoop through web UI

// Go to browser type <http://localhost:8088> – All Applications Hadoop Cluster

// Go to browser type <http://localhost:50070> – Hadoop Namenode

Step 4 – Open New Terminal

```
$ cd Desktop/
```

```
$ mkdir inputdata
```

```
$ cd inputdata/
```

```
$ echo "Hai, Hello, How are you? How is your health?" >> hello.txt
```

```
$ cat >> hello.txt
```

Step 5 – Go back to old Terminal

```
$ hadoop fs -copyFromLocal /home/hduser/Desktop/inputdata/hello.txt /folder/hduser
```

// Check in hello.txt in Namenode using Web UI

Step 6 – Download and open eclipse by creating workspace

Create a new java project.

Step 7 – Add jar to the project

You need to remove dependencies by adding jar files in the hadoop source folder. Now Click on **Project** tab and go to Properties.Under Libraries tab, click Add External JARs and select all the

jars in the folder (click on 1st jar, and Press Shift and Click on last jar to select all jars in between and click ok)

/usr/local/hadoop/hadoop-2.7.2/share/hadoop/commonand

/usr/local/hadoop/hadoop-2.7.2/share/hadoop/mapreduce folders.

Step -8 – WordCount Program

Create 3 java files named

- **WordCount.java**
- **WordCountMapper.java**
- **WordCountReducer.java**

WordCount.java

```
import org.apache.hadoop.conf.Configured;
import org.apache.hadoop.fs.Path;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.mapred.FileInputFormat;
import org.apache.hadoop.mapred.FileOutputFormat;
import org.apache.hadoop.mapred.JobClient;
import org.apache.hadoop.mapred.JobConf;

import org.apache.hadoop.util.Tool;
import org.apache.hadoop.util.ToolRunner;
import org.apache.hadoop.io.Text;

public class WordCount extends Configured implements Tool {

    @Override
    public int run(String[] arg0) throws Exception {
        // TODO Auto-generated method stub
        if(arg0.length<2)
        {
            System.out.println("check the command line arguments");
        }
        JobConf conf=new JobConf(WordCount.class);
        FileInputFormat.setInputPaths(conf, new Path(arg0[0]));
        FileOutputFormat.setOutputPath(conf, new Path(arg0[1]));
        conf.setMapperClass(WordMapper.class);
        conf.setReducerClass(WordReducer.class);
        conf.setOutputKeyClass(Text.class);
        conf.setOutputValueClass(IntWritable.class);
        conf.setOutputKeyClass(Text.class);
        conf.setOutputValueClass(IntWritable.class);
        JobClient.runJob(conf);

        return 0;
    }
    public static void main(String args[]) throws Exception
    {
        int exitcode=ToolRunner.run(new WordCount(), args);
        System.exit(exitcode);
    }
}
```

```
    }  
}
```

WordCountMapper.java

```
import java.io.IOException;  
  
import org.apache.hadoop.io.IntWritable;  
import org.apache.hadoop.io.LongWritable;  
import org.apache.hadoop.mapred.MapReduceBase;  
import org.apache.hadoop.mapred.OutputCollector;  
import org.apache.hadoop.mapred.Reporter;  
import org.apache.hadoop.io.Text;  
import org.apache.hadoop.mapred.Mapper;  
  
public class WordCountMapper extends MapReduceBase implements  
Mapper<LongWritable,Text,Text,IntWritable>  
{  
    @Override  
    public void map(LongWritable arg0, Text arg1, OutputCollector<Text, IntWritable> arg2,  
Reporter arg3)  
        throws IOException {  
        // TODO Auto-generated method stub  
  
        String s=arg1.toString();  
        for(String word:s.split(" "))  
        {  
            arg2.collect(new Text(word),new IntWritable(1));  
        }  
    }  
}
```

WordCountReducer.java

```
import java.io.IOException;  
import java.util.Iterator;  
import org.apache.hadoop.io.IntWritable;  
import org.apache.hadoop.mapred.JobConf;  
import org.apache.hadoop.mapred.OutputCollector;  
import org.apache.hadoop.mapred.Reducer;  
import org.apache.hadoop.mapred.Reporter;  
import org.apache.hadoop.io.Text;  
  
public class WordCountReducer implements Reducer<Text,IntWritable,Text,IntWritable> {  
    @Override  
    public void configure(JobConf arg0) {  
        // TODO Auto-generated method stub  
    }  
    @Override  
    public void close() throws IOException {  
        // TODO Auto-generated method stub  
    }  
}
```

```

    }
    @Override
    public void reduce(Text arg0, Iterator<IntWritable> arg1, OutputCollector<Text, IntWritable>
arg2, Reporter arg3)
        throws IOException {
        // TODO Auto-generated method stub
        int count=0;
        while(arg1.hasNext())
        {
            IntWritable i=arg1.next();
            count+=i.get();
        }
        arg2.collect(arg0,new IntWritable(count));
    }
}

```

Step 9 - Create JAR file

Now Click on the Run tab and click Run-Configurations. Click on New Configuration button on the left-top side and Apply after filling the following properties.

Step 10 - Export JAR file

Now click on File tab and select Export. under Java, select Runnable Jar.

In Launch Config – select the config file you created in **Step 9** (WordCountConfig).

Select an export destination (lets say desktop.)

Under Library handling, select Extract Required Libraries into generated JAR and click Finish.

Right-Click the jar file, go to Properties and under **Permission** tab, Check Allow executing file as a program. and give Read and Write access to all the users

Step 11 – Go back to old Terminal for Execution of WordCount Program

Shadoop jar wordcount.jar/usr/local/hadoop/input/usr/local/hadoop/output

permissions	owner	group	size	last modified	replication	block size	name
drwxr-xr-x	hduser	supergroup	0 B	8/12/2016, 12:20:50 AM	0	0 B	cloud
drwxr-xr-x	hduser	supergroup	0 B	8/11/2016, 1:47:41 AM	0	0 B	cse
drwxr-xr-x	hduser	supergroup	0 B	8/4/2016, 11:37:37 PM	0	0 B	folder
drwxr-xr-x	hduser	supergroup	0 B	8/11/2016, 9:52:15 PM	0	0 B	grid
drwxr-xr-x	hduser	supergroup	0 B	8/11/2016, 9:54:38 PM	0	0 B	output
drwxr-xr-x	hduser	supergroup	0 B	8/11/2016, 11:54:23 PM	0	0 B	project
drwx-----	hduser	supergroup	0 B	8/4/2016, 11:40:37 PM	0	0 B	tmp

Step 12 – To view results in old Terminal

\$hdfs dfs -cat /usr/local/hadoop/output/part-r-00000

```
hadoop1@ubuntu-1:~/project$ hadoop fs -cat /output/wordcount4/part-r-00000
. 1
a 1
and 1
as 1
count 1
counts 1
file 2
for 1
input 1
is 1
job 1
job. 1
map 1
returns 1
sample 1
takes 1
```

Browsing HDFS - Mozilla Firefox

Browsing HDFS

localhost:50070/explorer.html#/output

Hadoop Overview Datanodes Snapshot Startup Progress Utilities

Browse Directory

/output Go!

Permission	Owner	Group	Size	Last Modified	Replication	Block Size	Name
-rw-r--r--	hduser	supergroup	0 B	8/11/2016, 9:54:38 PM	1	128 MB	_SUCCESS
-rw-r--r--	hduser	supergroup	44 B	8/11/2016, 9:54:38 PM	1	128 MB	part-00000

Step 13 - To Remove folders created using hdfs

\$ hdfs dfs -rm -R /usr/local/hadoop/output

RESULT: