SPARK STANALONE APPLICATION ON AWS USING COMMAND LINE METHOD

Note : We are using 'sbt package' to compile and create jar file as explained in the previous document.

Below is the template code (Word count).

```
arunkumar@hadoop: ~/spark
arunkumar@hadoop:~/spark$ cat src/main/scala/WCArg.scala
import org.apache.spark.SparkContext
import org.apache.spark.SparkContext._
import org.apache.spark.SparkConf

object WCArg {
  def main(args: Array[String]) {
   println("Arguments:" +args(0) +"," + args(1));
    if (args.length !=2) {
    println("Arguments should be in the below format")
    println("Usage : WCArg input output")
    }
    val logFile = args(0)
    val conf = new SparkConf().setAppName("Word Count")
    val sc = new SparkContext(conf)
    val logData = sc.textFile(logFile)
    val counts = logData.flatMap(line => line.split(" "))
                  .map(word => (word, 1))
                  .reduceByKey(_ + _)
counts.saveAsTextFile(args(1))
  }
}
arunkumar@hadoop:~/spark$
```

1. Run sbt package and create jar file

```
arunkumar@hadoop: ~/spark
arunkumar@hadoop:~/spark$ ls target/scala-2.10/simple-project_2.10-1.0.jar
target/scala-2.10/simple-project_2.10-1.0.jar
arunkumar@hadoop:~/spark$
```

2. We will be using Amazon CLI for interacting with AWS. To install CLI, please go through the below link to install CLI:

http://aws.amazon.com/cli/

3. Copy the required files to S3 including the jar file using the below command

aws s3 cp ~/spark/target/scala-2.10/simple-project_2.10-1.0.jar s3://sparknpu/Jar/spark.jar

4. Verify the above

aws s3 ls s3://sparknpu/Jar/

```
arunkumar@hadoop: ~/spark
arunkumar@hadoop:~/spark$ aws s3 cp ~/spark/target/scala-2.10/simple-project_2.1
0-1.0.jar s3://sparknpu/Jar/spark.jar
upload: target/scala-2.10/simple-project_2.10-1.0.jar to s3://sparknpu/Jar/spark
.jar
arunkumar@hadoop:~/spark$ aws s3 ls s3://sparknpu/Jar/
2014-10-05 15:58:08          0
2014-11-14 13:50:41       4375 simple-project_2.10-1.0.jar
2014-10-05 15:59:33    9135337 spark-example-project-0.2.0.jar
2014-11-14 16:32:00      17412 spark.jar
arunkumar@hadoop:~/spark$
```

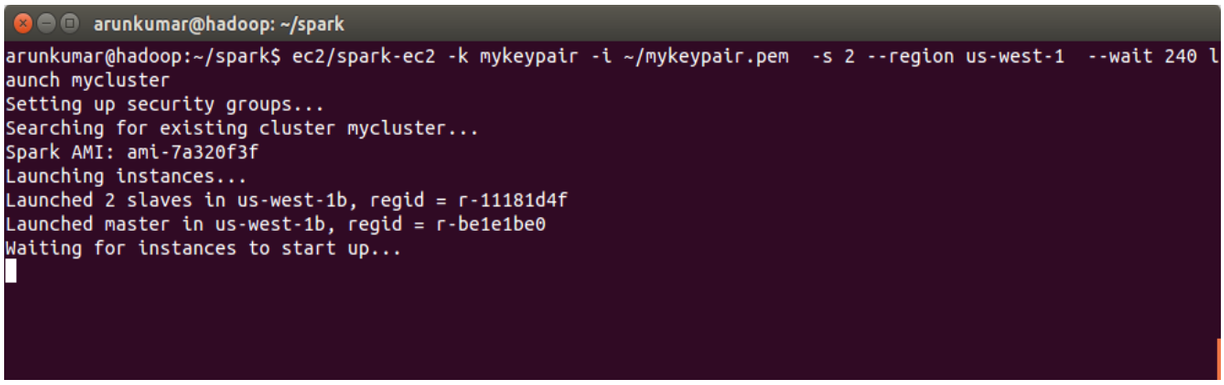
5. Export the AWS credentials

export AWS_ACCESS_KEY_ID = your key

export AWS_SECRET_ACCESS_KEY= your key

6. Create a EC2 spark cluster by using the below command

ec2/spark-ec2 -k mykeypair -i ~/mykeypair.pem -s 2 --region us-west-1 --wait 240 launch mycluster

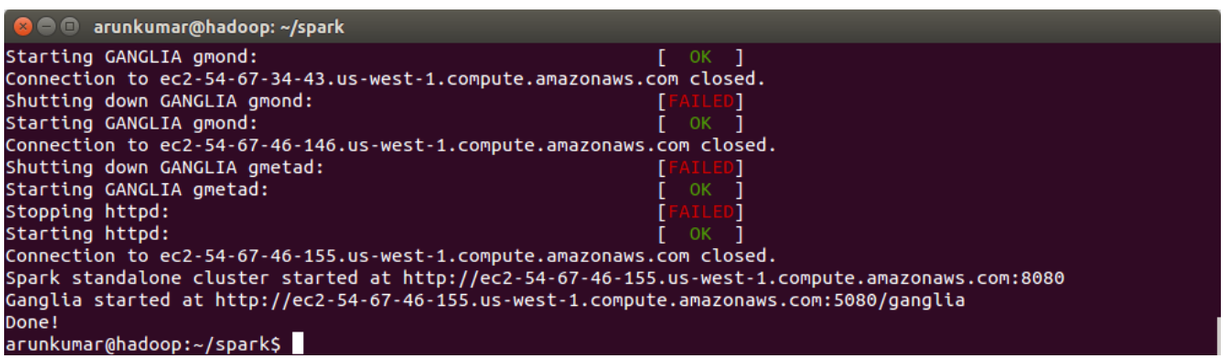


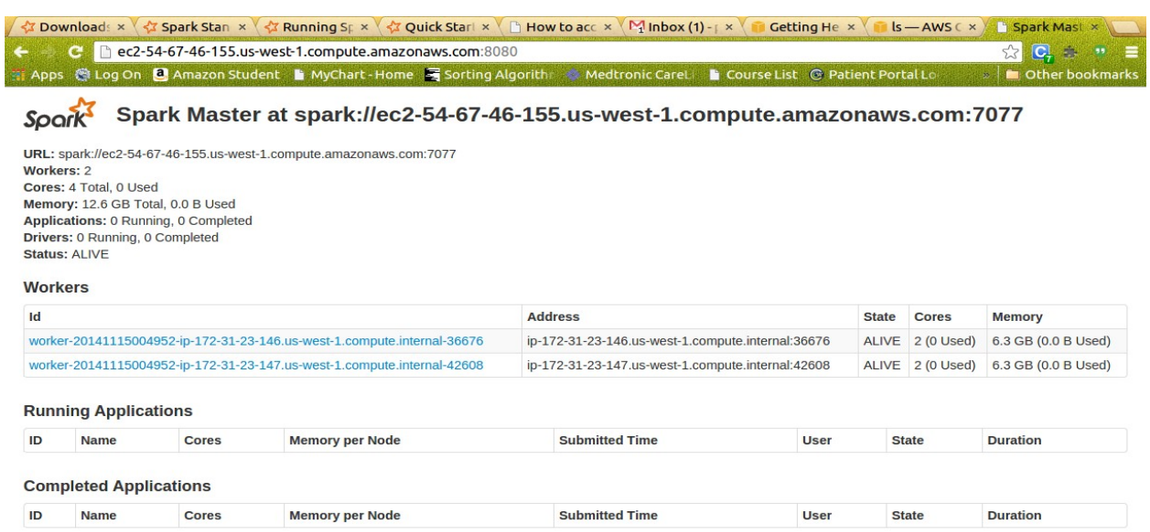
Note : It takes a while to complete.

7. Copy down the spark master URL from the messages. The master URL should look like

http://ec2-54-67-46-155.us-west-1.compute.amazonaws.com:8080/

Open the browser and familiarize with workers/jobs/cores etc.





8. Login to the master node by the below command

ec2/spark-ec2 -k mykeypair -i ~/mykeypair.pem --login mycluster

```
arunkumar@hadoop: ~/spark
arunkumar@hadoop:~/spark$ ec2/spark-ec2 -k mykeypair -i ~/mykeypair.pem --
region us-west-1 login mycluster
Searching for existing cluster mycluster...
Found 1 master(s), 2 slaves
Logging into master ec2-54-67-46-155.us-west-1.compute.amazonaws.com...
Last login: Sat Nov 15 00:46:00 2014 from 67.170.253.177

       __|  __|_  )
       _|  (     /   Amazon Linux AMI
      ___|\___|___|

https://aws.amazon.com/amazon-linux-ami/2013.03-release-notes/
There are 67 security update(s) out of 275 total update(s) available
Run "sudo yum update" to apply all updates.
Amazon Linux version 2014.09 is available.
root@ip-172-31-30-37 ~]$
```

9. Now we are ready to submit the Standalone Application to the cluster. Below is the command.

bin/spark-submit --class WCArg
--master spark://ec2-54-67-46-155.us-west-1.compute.amazonaws.com:7077
--deploy-mode cluster
s3n://AccessKey:Secretkey@sparknpu/Jar/spark.jar
s3n://AccessKey:Secretkey@sparknpu/data/spark.txt
s3n://AccessKey:Secretkey@sparknpu/output/sparkwordcount

```
arunkumar@hadoop: ~/spark
root@ip-172-31-30-37 spark]$ bin/spark-submit   --class  WCArg
             --master spark://ec2-54-67-46-155.us-west-1.compute.amazonaws.com:7077
             --deploy-mode cluster
              s3n://[redacted]knpu/Jar/spark.jar
              s3n://[redacted]knpu/data/spark.txt
         s3n://AKIAI[redacted]utput/sparkwordcount
Spark assembly has been built with Hive, including Datanucleus jars on classpath
Sending launch command to spark://ec2-54-67-46-155.us-west-1.compute.amazonaws.com:7077
Driver successfully submitted as driver-20141115011009-0000
... waiting before polling master for driver state
... polling master for driver state
State of driver-20141115011009-0000 is RUNNING
Driver running on ip-172-31-23-146.us-west-1.compute.internal:36676 (worker-20141115004952-ip-172-31-23-146.
us-west-1.compute.internal-36676)
root@ip-172-31-30-37 spark]$
```

10. Copy the output files from S3 to local and view the result

Useful Commands :

aws s3 cp s3://sparknpu/output/sparkwordcount ~/SparkWorkSpace/awssparkoutput –recursive

```
arunkumar@hadoop: ~
arunkumar@hadoop:~$ aws s3 ls s3://sparknpu/output/sparkwordcount/
2014-11-14 17:10:25          0 _SUCCESS
2014-11-14 17:10:24         15 part-00000
2014-11-14 17:10:24         12 part-00001
arunkumar@hadoop:~$
```

```
arunkumar@hadoop: ~
arunkumar@hadoop:~$ aws s3 cp s3://sparknpu/output/sparkwordcount ~/SparkWorkSpa
ce/awssparkoutput --recursive
download: s3://sparknpu/output/sparkwordcount/_SUCCESS to SparkWorkSpace/awsspar
koutput/_SUCCESS
download: s3://sparknpu/output/sparkwordcount/part-00000 to SparkWorkSpace/awssp
arkoutput/part-00000
download: s3://sparknpu/output/sparkwordcount/part-00001 to SparkWorkSpace/awssp
arkoutput/part-00001
arunkumar@hadoop:~$
```

```
arunkumar@hadoop: ~
arunkumar@hadoop:~$ ls SparkWorkSpace/awssparkoutput/
part-00000  part-00001  _SUCCESS
arunkumar@hadoop:~$ cat SparkWorkSpace/awssparkoutput/part-00000
(2,1)
(Line,3)
arunkumar@hadoop:~$ cat SparkWorkSpace/awssparkoutput/part-00001
(3,1)
(1,1)
arunkumar@hadoop:~$
```

11. Terminating Cluster **(Very Important)**
Note : Double check by browsing through EC2 instances in AWS management console.

ec2/spark-ec2 --region us-west-1 destroy mycluster

```
arunkumar@hadoop: ~/spark
(Line,3)
arunkumar@hadoop:~$ cat SparkWorkSpace/awssparkoutput/part-00001
(3,1)
(1,1)
arunkumar@hadoop:~$ cd spark
arunkumar@hadoop:~/spark$ ec2/spark-ec2 --region us-west-1 destroy mycluster
Are you sure you want to destroy the cluster mycluster?
The following instances will be terminated:
Searching for existing cluster mycluster...
Found 1 master(s), 2 slaves
> ec2-54-67-46-155.us-west-1.compute.amazonaws.com
> ec2-54-67-34-43.us-west-1.compute.amazonaws.com
> ec2-54-67-46-146.us-west-1.compute.amazonaws.com
ALL DATA ON ALL NODES WILL BE LOST!!
Destroy cluster mycluster (y/N): y
Terminating master...
Terminating slaves...
arunkumar@hadoop:~/spark$
```