

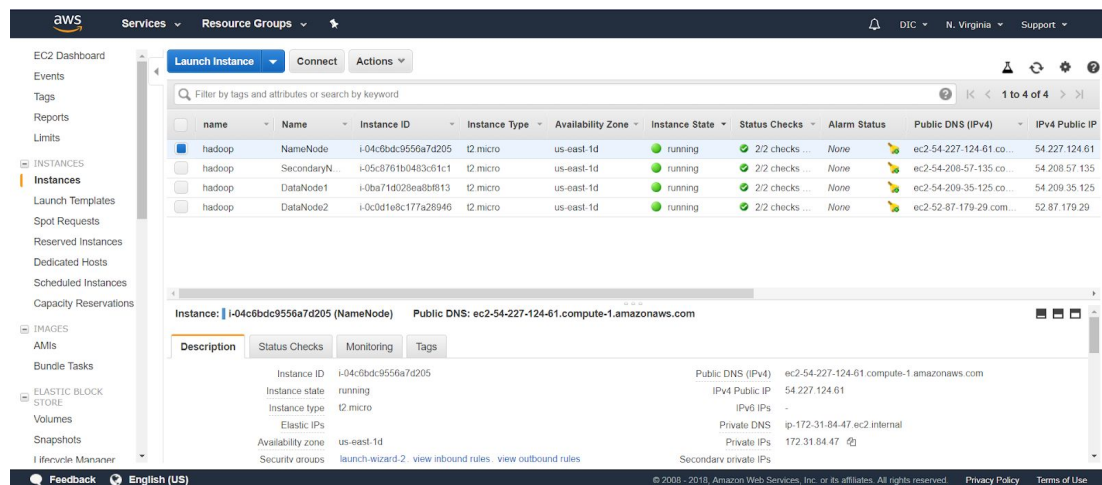
Read Me :

Before starting to evaluate this Project, here are the steps we would like to show.

This is our cluster developed using EC2 instances on Amazon.

The picture below shows that a 4 node cluster - 1 master 1 secondary master and 2 data nodes exists.

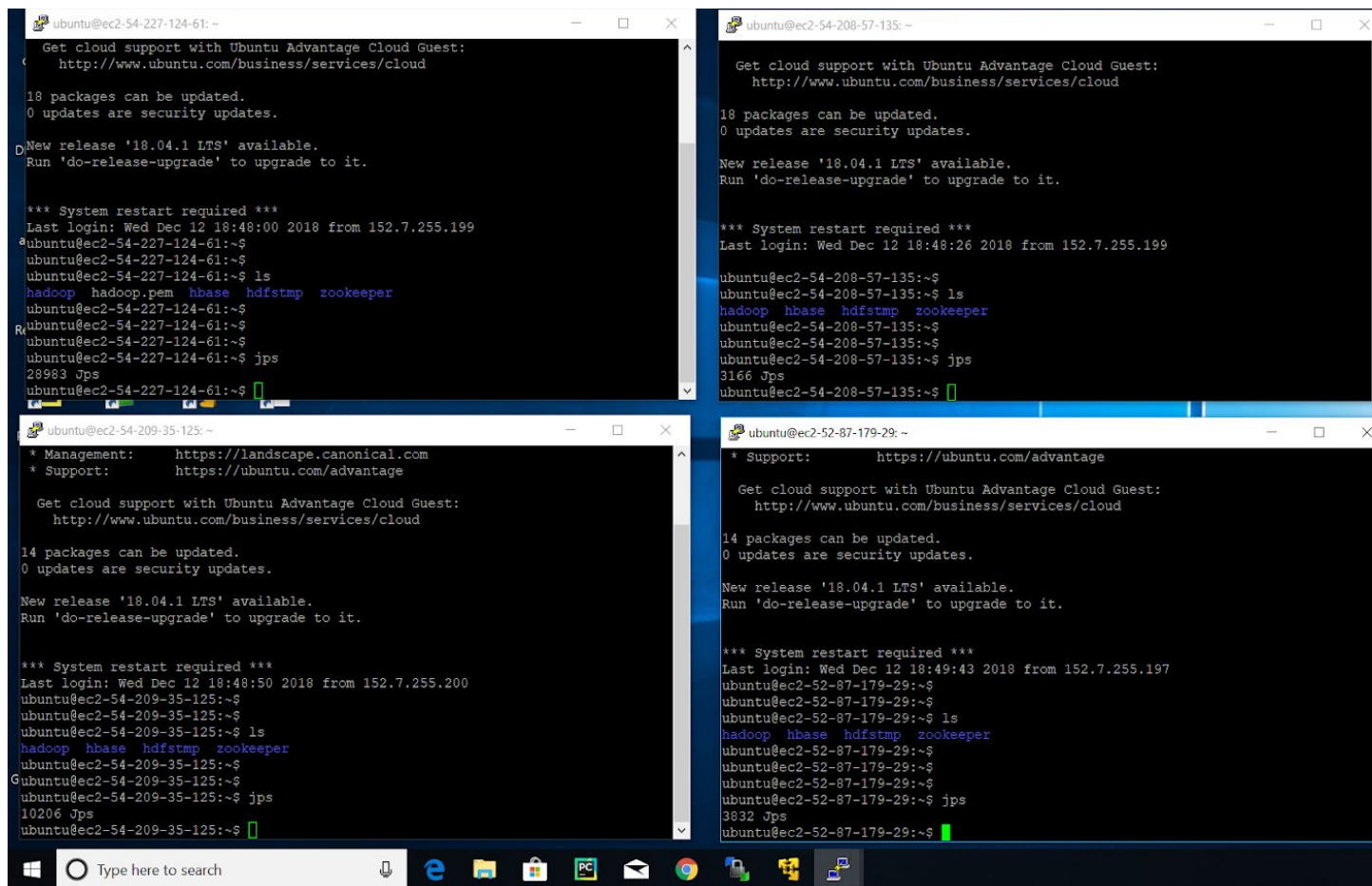
It's a hadoop cluster on top of which Hbase and Spark were installed.



Using Putty and the .pem file which we named hadoop.pem we established the 4 instances.

Before starting any service, here's the screenshot :

When issued > jps on all 4 nodes , initially no service would be running.



Now we start all the services through name node (master) and secondary name node

Here's the screen shot for starting all of them :

```
$> cd /home/ubuntu/hadoop/sbin
$> ./start-dfs.sh
$> ./start-yarn.sh
$> ./hadoop-daemon.sh start namenode
$> ./hadoop-daemon.sh start datanode
$> ./yarn-daemon.sh start resourcemanager
```

```
$> cd /home/ubuntu/hbase/bin
$> ./start-hbase.sh
```

```
$> cd /home/ubuntu/zookeeper/bin
$> ./zkServer.sh start
```

Now, on all the above instances, running the command 'jps' again, we can see that all services have started by following the screen shot.

The image displays four terminal windows from different AWS EC2 instances, showing the output of the 'jps' command and system messages. The instances are identified by their IDs in the top-left corner of each terminal window.

- Instance: ubuntu@ec2-54-227-124-61: ~**

```
SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]
ec2-52-87-179-29.compute-1.amazonaws.com: running regionserver, logging to /home/ubuntu/hbase/bin/./logs/hbase-ubuntu-regionserver-ec2-52-87-179-29.compute-1.amazonaws.com.out
ec2-54-209-35-125.compute-1.amazonaws.com: running regionserver, logging to /home/ubuntu/hbase/bin/./logs/hbase-ubuntu-regionserver-ec2-54-209-35-125.compute-1.amazonaws.com.out
ubuntu@ec2-54-227-124-61:~/hbase/bin$
ubuntu@ec2-54-227-124-61:~/hbase/bin$
ubuntu@ec2-54-227-124-61:~/hbase/bin$
ubuntu@ec2-54-227-124-61:~/hbase/bin$ cd
ubuntu@ec2-54-227-124-61:~$
ubuntu@ec2-54-227-124-61:~$
ubuntu@ec2-54-227-124-61:~$
ubuntu@ec2-54-227-124-61:~$ jps
30304 QuorumPeerMain
29585 DataNode
29833 ResourceManager
29673 NameNode
30585 Jps
30475 HMaster
ubuntu@ec2-54-227-124-61:~$
```
- Instance: ubuntu@ec2-54-208-57-135: ~**

```
SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]
running master, logging to /home/ubuntu/hbase/logs/hbase-8-57-135.compute-1.amazonaws.com.out
SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/home/ubuntu/hbase/lib/r!org.slf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in [jar:file:/home/ubuntu/hadoop/share/hadoop-common/lib/!org.slf4j/impl/StaticLoggerBinder.class]
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings
ec2-52-87-179-29.compute-1.amazonaws.com: Permission denied
ec2-54-209-35-125.compute-1.amazonaws.com: Permission denied
ubuntu@ec2-54-208-57-135:~/hbase/bin$
ubuntu@ec2-54-208-57-135:~/hbase/bin$
ubuntu@ec2-54-208-57-135:~/hbase/bin$
ubuntu@ec2-54-208-57-135:~/hbase/bin$ cd
ubuntu@ec2-54-208-57-135:~$
ubuntu@ec2-54-208-57-135:~$ jps
4306 Jps
4196 HMaster
3988 DataNode
3655 ResourceManager
ubuntu@ec2-54-208-57-135:~$
```
- Instance: ubuntu@ec2-54-209-35-125: ~**

```
New release '18.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

*** System restart required ***
Last login: Wed Dec 12 18:48:50 2018 from 152.7.255.200
ubuntu@ec2-54-209-35-125:~$
ubuntu@ec2-54-209-35-125:~$
ubuntu@ec2-54-209-35-125:~$ ls
hadoop hbase hdfstmp zookeeper
ubuntu@ec2-54-209-35-125:~$
ubuntu@ec2-54-209-35-125:~$
ubuntu@ec2-54-209-35-125:~$ jps
10206 Jps
ubuntu@ec2-54-209-35-125:~$
ubuntu@ec2-54-209-35-125:~$
ubuntu@ec2-54-209-35-125:~$
ubuntu@ec2-54-209-35-125:~$ jps
10736 Jps
10433 NodeManager
10278 DataNode
10633 HRegionServer
ubuntu@ec2-54-209-35-125:~$
```
- Instance: ubuntu@ec2-52-87-179-29: ~**

```
Run 'do-release-upgrade' to upgrade to it.

*** System restart required ***
Last login: Wed Dec 12 18:49:43 2018 from 152.7.255.19
ubuntu@ec2-52-87-179-29:~$
ubuntu@ec2-52-87-179-29:~$
ubuntu@ec2-52-87-179-29:~$ ls
hadoop hbase hdfstmp zookeeper
ubuntu@ec2-52-87-179-29:~$
ubuntu@ec2-52-87-179-29:~$
ubuntu@ec2-52-87-179-29:~$
ubuntu@ec2-52-87-179-29:~$ jps
3832 Jps
ubuntu@ec2-52-87-179-29:~$
ubuntu@ec2-52-87-179-29:~$
ubuntu@ec2-52-87-179-29:~$
ubuntu@ec2-52-87-179-29:~$
ubuntu@ec2-52-87-179-29:~$ jps
3904 DataNode
4259 HRegionServer
4362 Jps
4059 NodeManager
ubuntu@ec2-52-87-179-29:~$
```

Now, after loading the data into Hbase, we fire the following command :

Experimenting with nodes :

1. Stopped the instance : Name Node
2. Stopped the instance : Data Node 1