Hadoop Cluster Setup

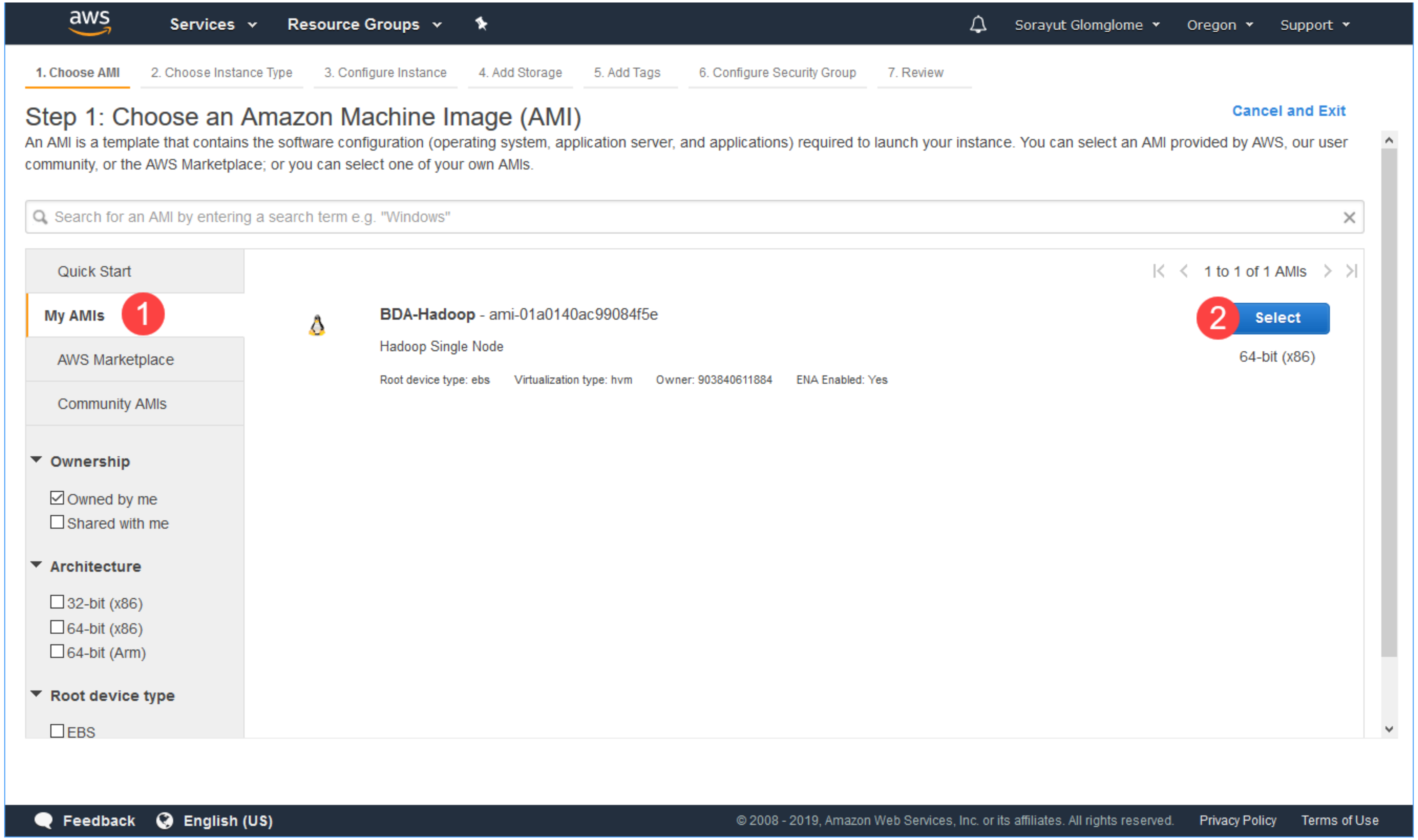
Sorayut Glomglome

Content

1. Create Instances from image
2. Configure Hadoop cluster
3. Run MapReduce

Create 2 new instances from Hadoop image

Choose m5.large



Step 1: Choose an Amazon Machine Image (AMI)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Search for an AMI by entering a search term e.g. "Windows"

Ownership

☑ Owned by me
□ Shared with me

Architecture

□ 32-bit (x86)
□ 64-bit (x86)
□ 64-bit (Arm)

Root device type

□ EBS

BDA-Hadoop - ami-01a0140ac99084f5e

Hadoop Single Node

Root device type: ebs Virtualization type: hvm Owner: 903840611884 ENA Enabled: Yes

64-bit (x86)

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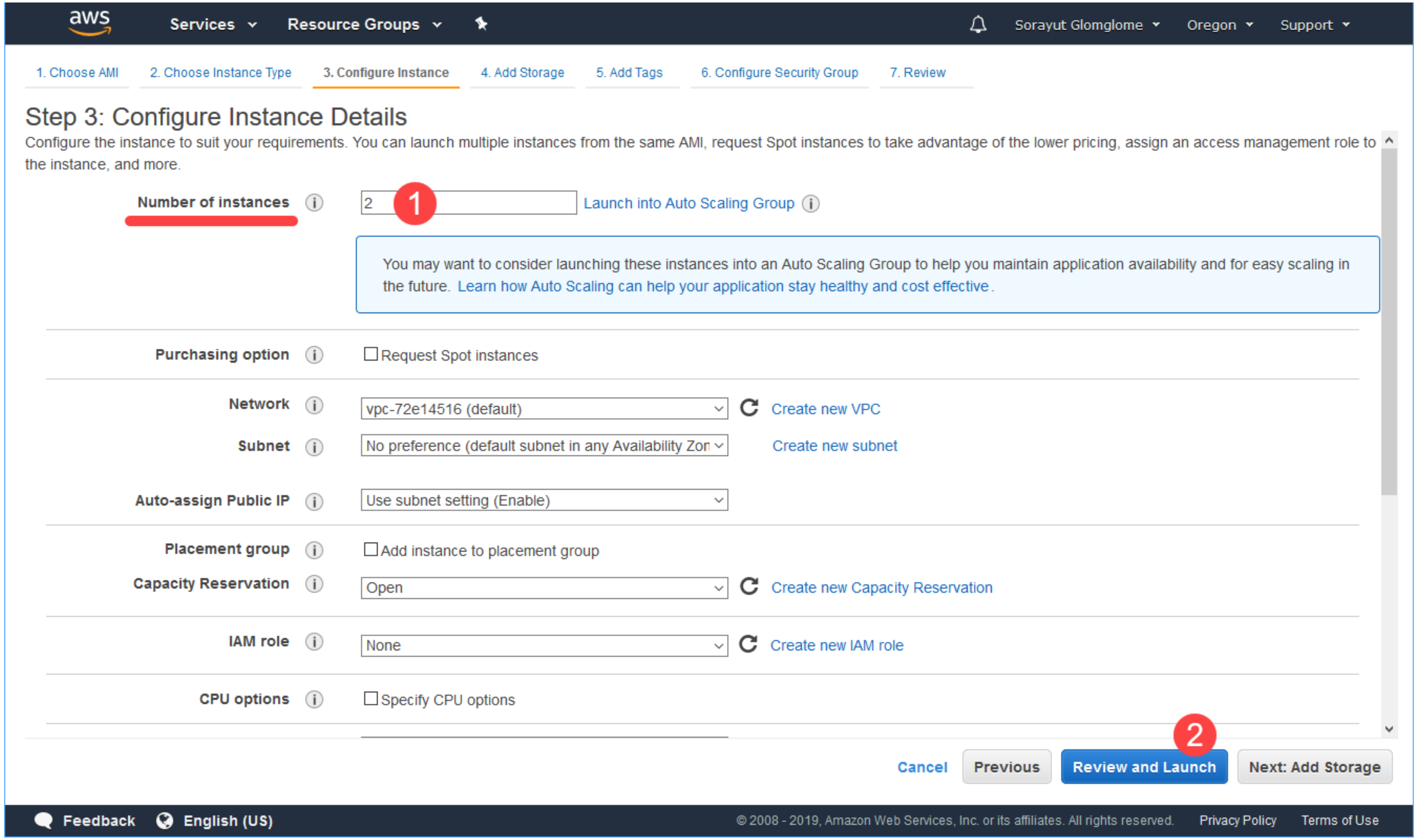
Create 2 new instances from Hadoop image



Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances: 2 — Launch into Auto Scaling Group

You may want to consider launching these instances into an Auto Scaling Group to help you maintain application availability and for easy scaling in the future. Learn how Auto Scaling can help your application stay healthy and cost effective.

Purchasing option: □ Request Spot instances

Network: vpc-72e14516 (default) — Create new VPC

Subnet: No preference (default subnet in any Availability Zon — Create new subnet

Auto-assign Public IP: Use subnet setting (Enable)

Placement group: □ Add instance to placement group

Capacity Reservation: Open — Create new Capacity Reservation

IAM role: None — Create new IAM role

CPU options: □ Specify CPU options

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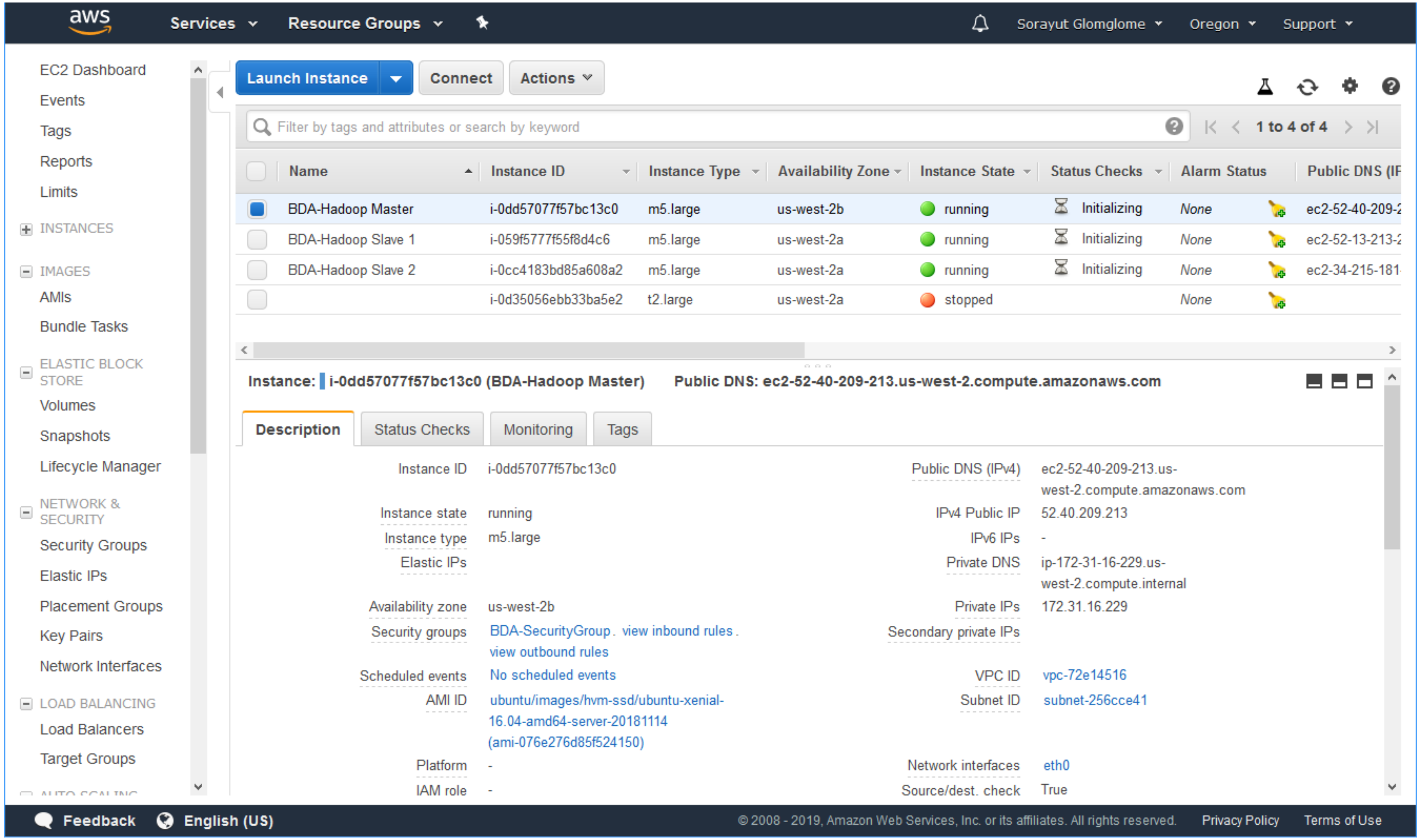
Name new instances as Slave 1 & Slave 2



Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IF
BDA-Hadoop Master	i-0dd57077f57bc13c0	m5.large	us-west-2b	● running	Initializing	None	ec2-52-40-209-2
BDA-Hadoop Slave 1	i-059f5777f55f8d4c6	m5.large	us-west-2a	● running	Initializing	None	ec2-52-13-213-2
BDA-Hadoop Slave 2	i-0cc4183bd85a608a2	m5.large	us-west-2a	● running	Initializing	None	ec2-34-215-181
	i-0d35056ebb33ba5e2	t2.large	us-west-2a	● stopped		None	

Instance: i-0dd57077f57bc13c0 (BDA-Hadoop Master) **Public DNS: ec2-52-40-209-213.us-west-2.compute.amazonaws.com**

Instance ID	i-0dd57077f57bc13c0	Public DNS (IPv4)	ec2-52-40-209-213.us-west-2.compute.amazonaws.com
Instance state	running	IPv4 Public IP	52.40.209.213
Instance type	m5.large	IPv6 IPs	-
Elastic IPs		Private DNS	ip-172-31-16-229.us-west-2.compute.internal
Availability zone	us-west-2b	Private IPs	172.31.16.229
Security groups	BDA-SecurityGroup. view inbound rules. view outbound rules	Secondary private IPs	
Scheduled events	No scheduled events	VPC ID	vpc-72e14516
AMI ID	ubuntu/images/hvm-ssd/ubuntu-xenial-16.04-amd64-server-20181114 (ami-076e276d85f524150)	Subnet ID	subnet-256cce41
Platform	-	Network interfaces	eth0
IAM role	-	Source/dest. check	True

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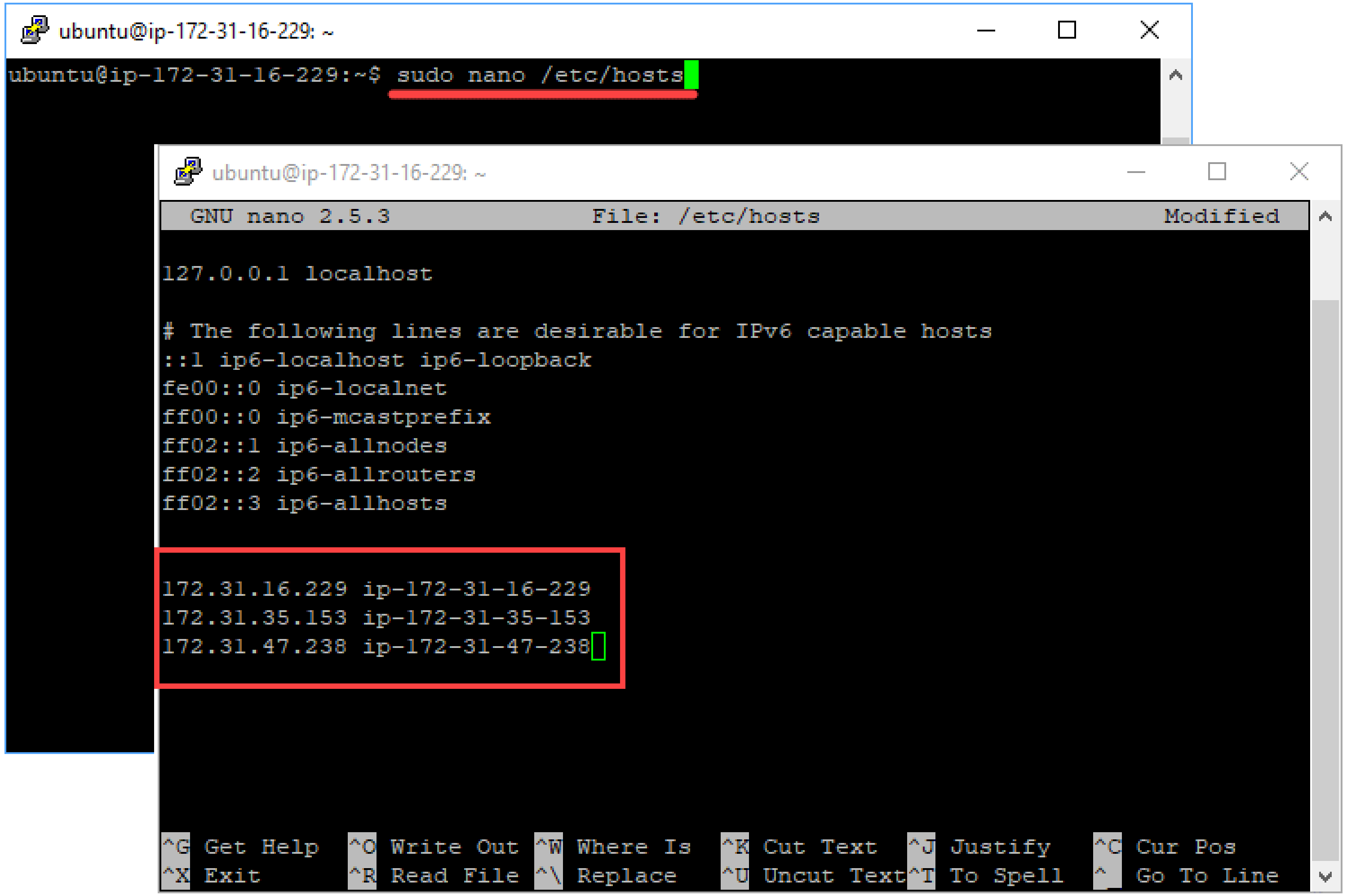
Private IPs

Name	Private IP	Private DNS
BDA-Hadoop Master	172.31.16.229	ip-172-31-16-229.us-west-2.compute.internal
BDA-Hadoop Slave 1	172.31.35.153	ip-172-31-35-153.us-west-2.compute.internal
BDA-Hadoop Slave 2	172.31.47.238	ip-172-31-47-238.us-west-2.compute.internal

At master node : Edit host file

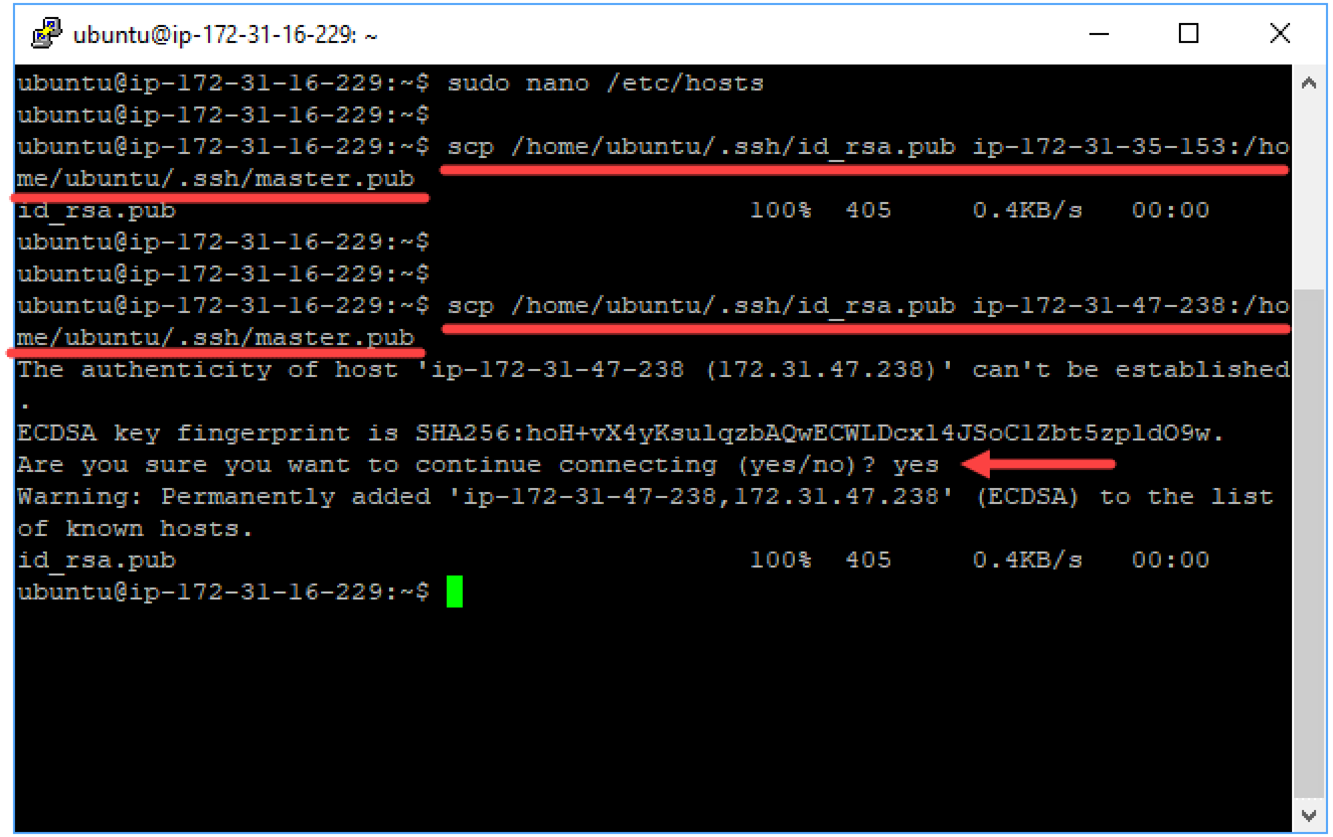


```
ubuntu@ip-172-31-16-229:~$ sudo nano /etc/hosts
```

```
  GNU nano 2.5.3              File: /etc/hosts                        Modified

127.0.0.1 localhost

# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
ff02::3 ip6-allhosts


172.31.16.229 ip-172-31-16-229
172.31.35.153 ip-172-31-35-153
172.31.47.238 ip-172-31-47-238







^G Get Help   ^O Write Out  ^W Where Is   ^K Cut Text   ^J Justify    ^C Cur Pos
^X Exit       ^R Read File  ^\ Replace    ^U Uncut Text^T To Spell    ^_ Go To Line
```

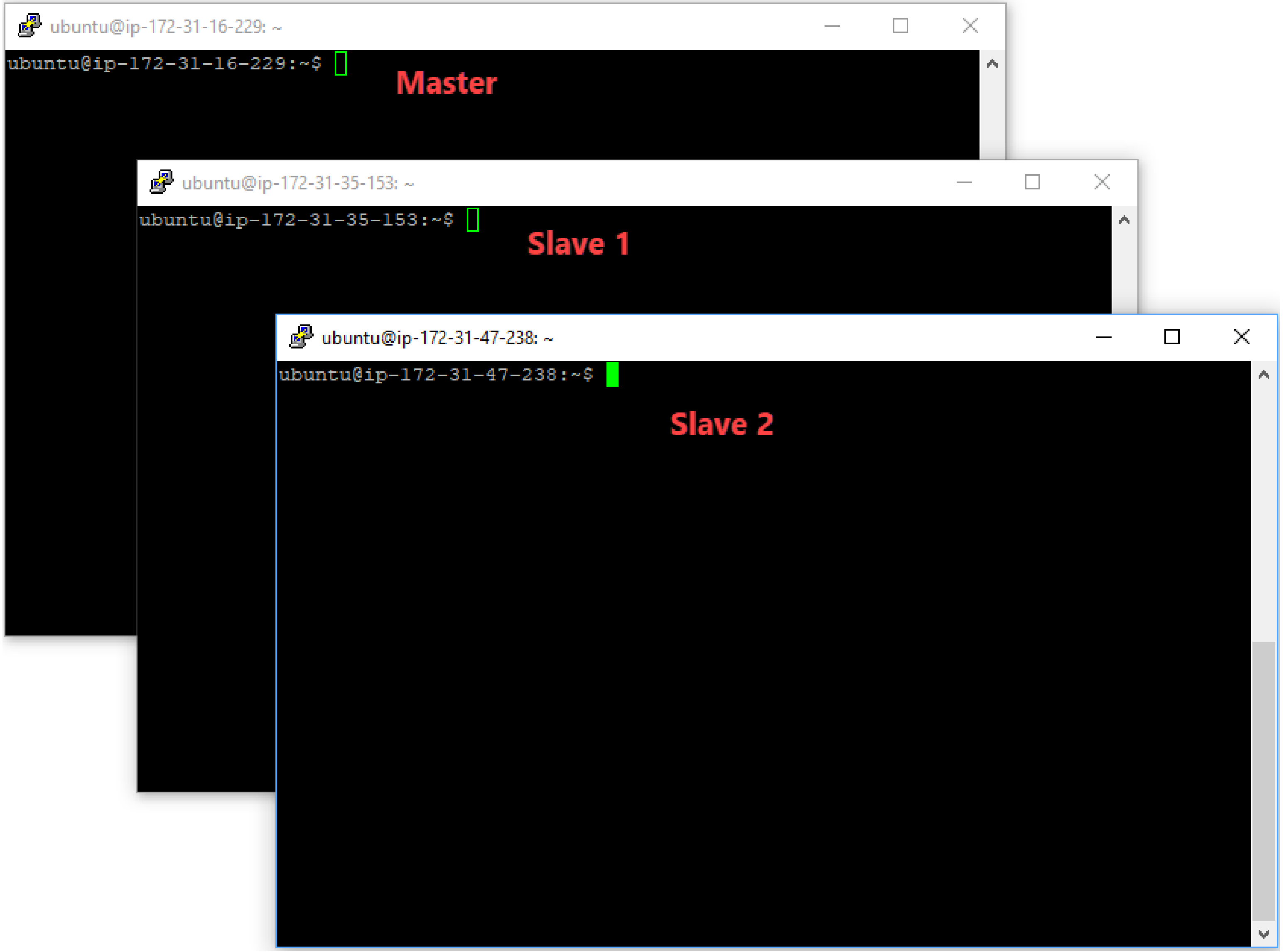
At master node : Copy key file to Slave 1 & Slave 2

```
$scp /home/ubuntu/.ssh/id_rsa.pub ip-172-31-35-153:/home/ubuntu/.ssh/master.pub
$scp /home/ubuntu/.ssh/id_rsa.pub ip-172-31-47-238:/home/ubuntu/.ssh/master.pub
```



```
ubuntu@ip-172-31-16-229:~$ sudo nano /etc/hosts
ubuntu@ip-172-31-16-229:~$
ubuntu@ip-172-31-16-229:~$ scp /home/ubuntu/.ssh/id_rsa.pub ip-172-31-35-153:/ho
me/ubuntu/.ssh/master.pub
id_rsa.pub                                    100%  405     0.4KB/s   00:00
ubuntu@ip-172-31-16-229:~$
ubuntu@ip-172-31-16-229:~$
ubuntu@ip-172-31-16-229:~$ scp /home/ubuntu/.ssh/id_rsa.pub ip-172-31-47-238:/ho
me/ubuntu/.ssh/master.pub
The authenticity of host 'ip-172-31-47-238 (172.31.47.238)' can't be established
.
ECDSA key fingerprint is SHA256:hoH+vX4yKsulqzbAQwECWLDcxl4JSoClZbt5zpldO9w.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ip-172-31-47-238,172.31.47.238' (ECDSA) to the list
of known hosts.
id_rsa.pub                                    100%  405     0.4KB/s   00:00
ubuntu@ip-172-31-16-229:~$
```

Arrange SSH terminals



ubuntu@ip-172-31-16-229: ~

```
ubuntu@ip-172-31-16-229:~$
```

Master

ubuntu@ip-172-31-35-153: ~

```
ubuntu@ip-172-31-35-153:~$
```

Slave 1

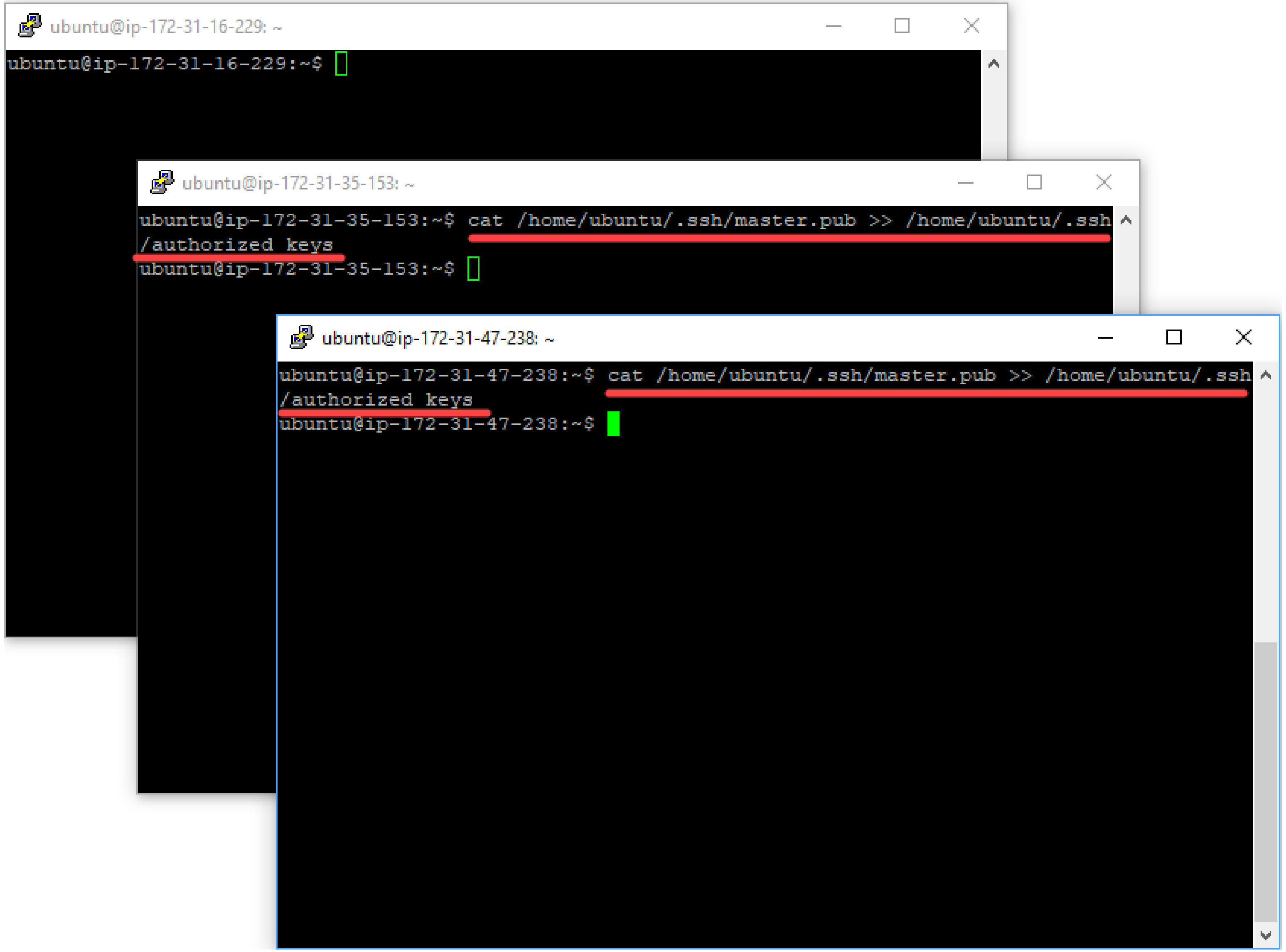
ubuntu@ip-172-31-47-238: ~

```
ubuntu@ip-172-31-47-238:~$
```

Slave 2

At Slave1 & Slave2 : Append new key to key file

```
$cat /home/ubuntu/.ssh/master.pub >> /home/ubuntu/.ssh/authorized_keys
```



ubuntu@ip-172-31-16-229: ~

```
ubuntu@ip-172-31-16-229:~$
```

ubuntu@ip-172-31-35-153: ~

```
ubuntu@ip-172-31-35-153:~$ cat /home/ubuntu/.ssh/master.pub >> /home/ubuntu/.ssh
/authorized_keys
ubuntu@ip-172-31-35-153:~$
```

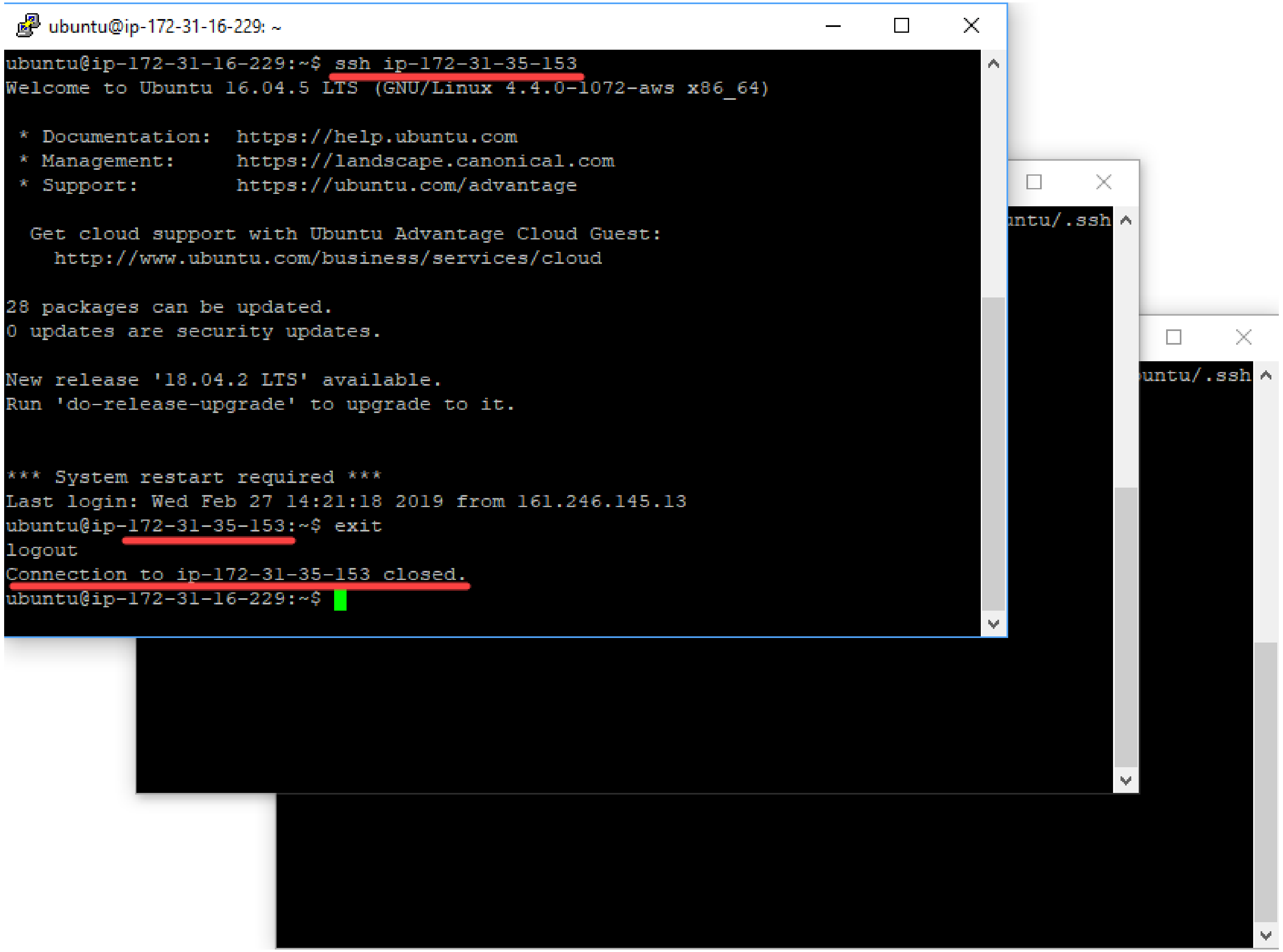
ubuntu@ip-172-31-47-238: ~

```
ubuntu@ip-172-31-47-238:~$ cat /home/ubuntu/.ssh/master.pub >> /home/ubuntu/.ssh
/authorized_keys
ubuntu@ip-172-31-47-238:~$
```

At Master : Test ssh to Slave1 & Slave2

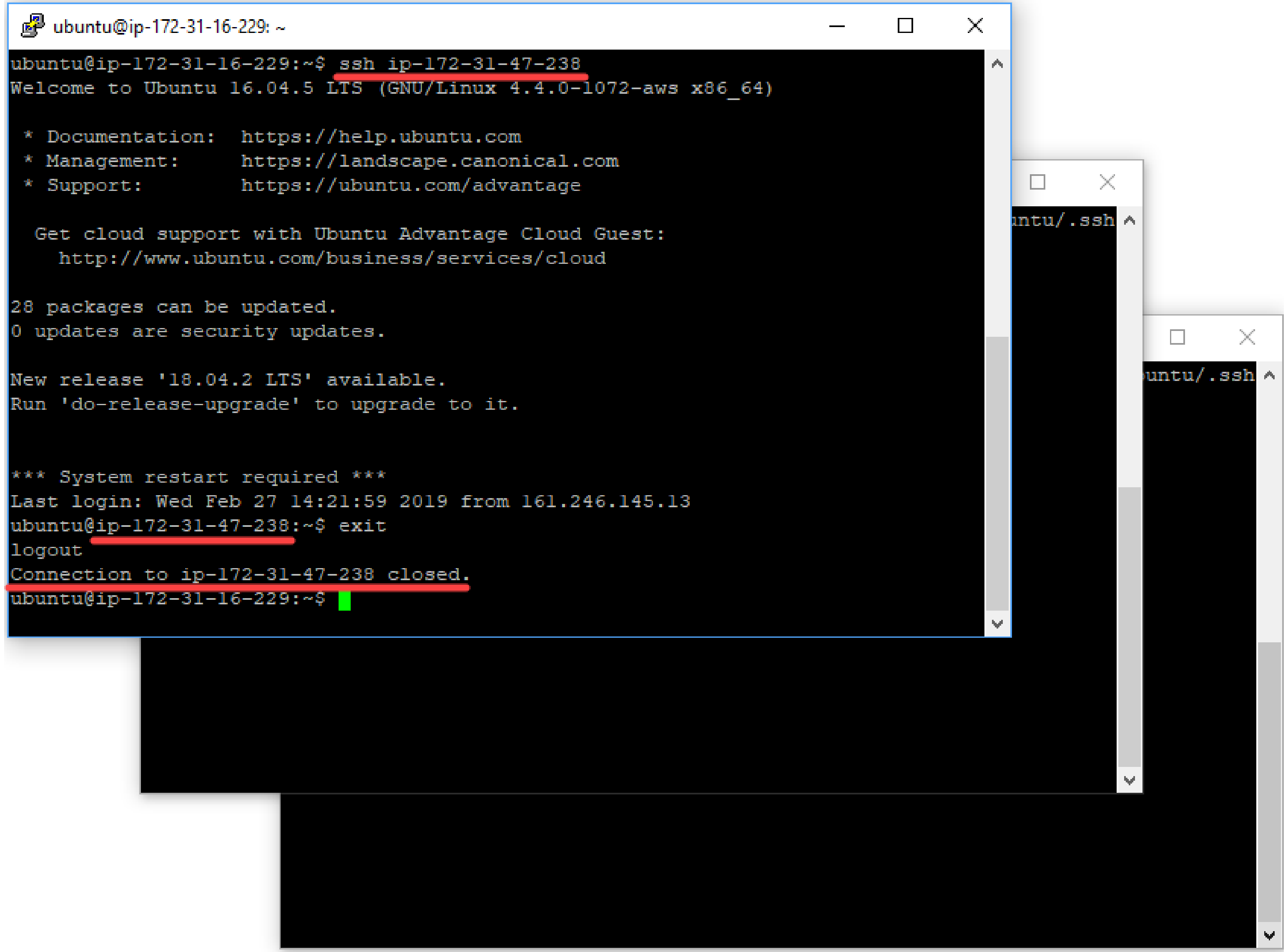
```
$ssh ip-172-31-35-153
$exit
$ssh ip-172-31-47-238
$exit
```

At Master : Test ssh to Slave1



```
ubuntu@ip-172-31-16-229:~$ ssh ip-172-31-35-153
Welcome to Ubuntu 16.04.5 LTS (GNU/Linux 4.4.0-1072-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  Get cloud support with Ubuntu Advantage Cloud Guest:
    http://www.ubuntu.com/business/services/cloud

28 packages can be updated.
0 updates are security updates.

New release '18.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


*** System restart required ***
Last login: Wed Feb 27 14:21:18 2019 from 161.246.145.13
ubuntu@ip-172-31-35-153:~$ exit
logout
Connection to ip-172-31-35-153 closed.
ubuntu@ip-172-31-16-229:~$
```

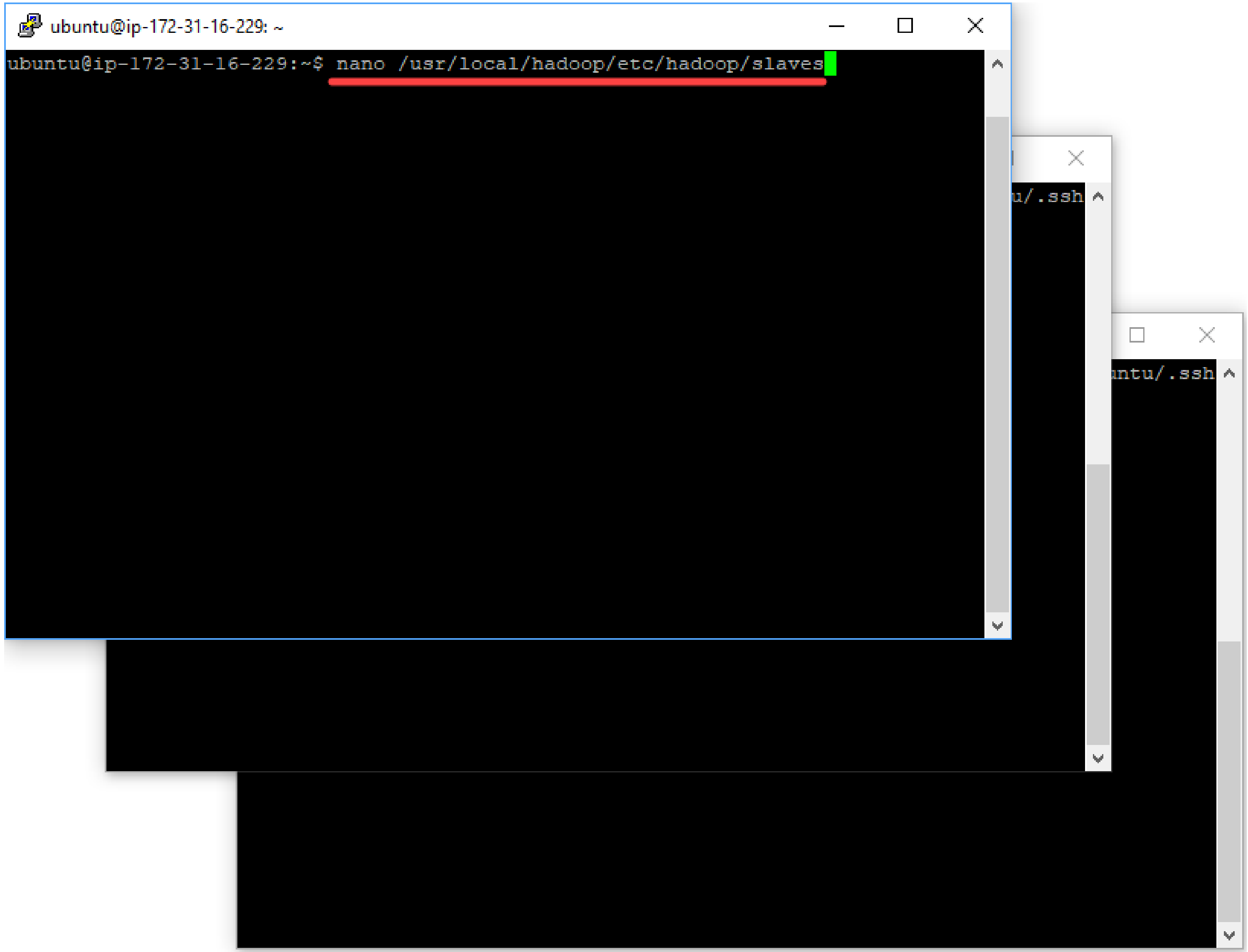
At Master : Test ssh to Slave2



```
ubuntu@ip-172-31-16-229:~$ ssh ip-172-31-47-238
Welcome to Ubuntu 16.04.5 LTS (GNU/Linux 4.4.0-1072-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  Get cloud support with Ubuntu Advantage Cloud Guest:
    http://www.ubuntu.com/business/services/cloud

28 packages can be updated.
0 updates are security updates.

New release '18.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


*** System restart required ***
Last login: Wed Feb 27 14:21:59 2019 from 161.246.145.13
ubuntu@ip-172-31-47-238:~$ exit
logout
Connection to ip-172-31-47-238 closed.
ubuntu@ip-172-31-16-229:~$
```

At Master : Add Slave1 & Slave2 to Hadoop slave file

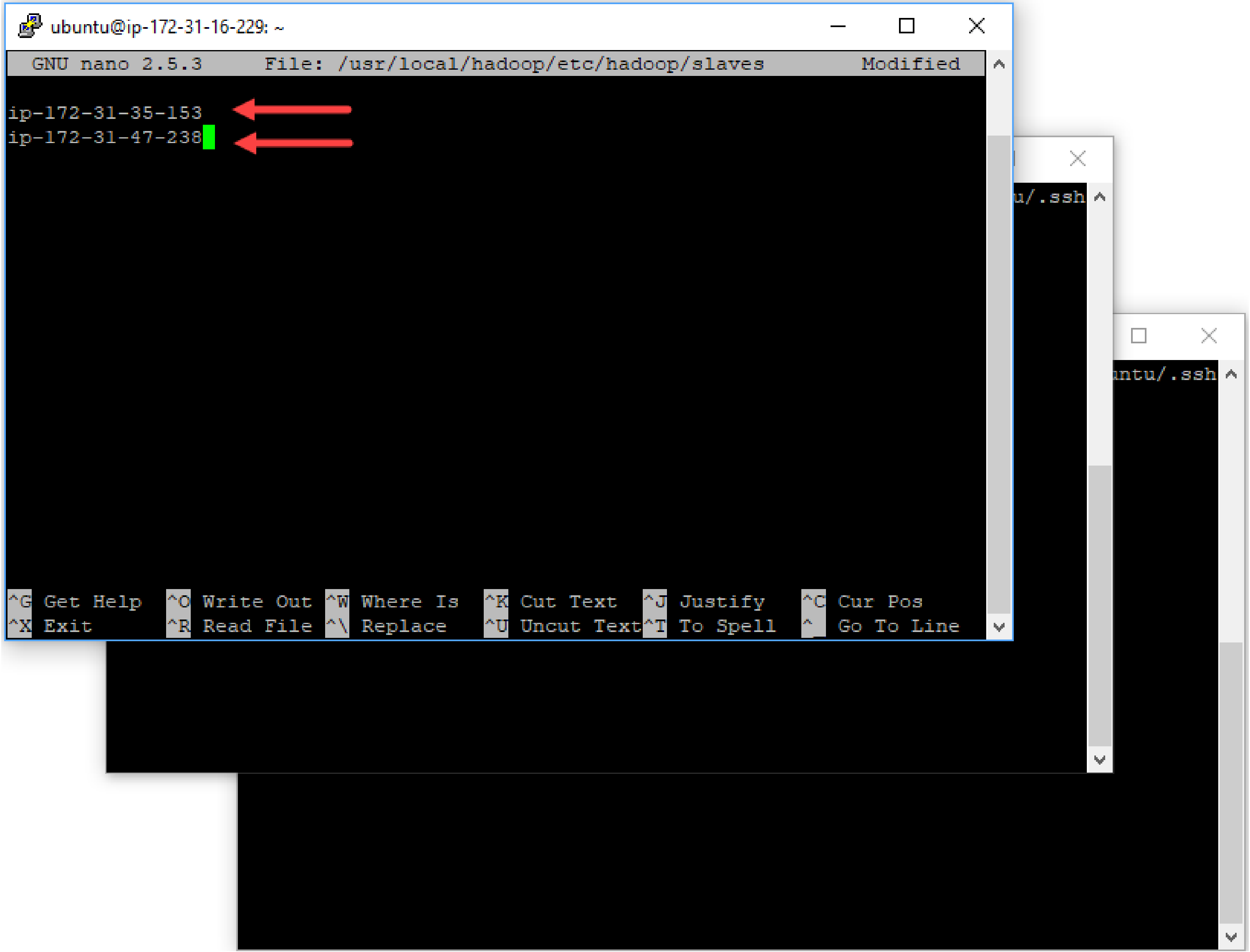
$nano /usr/local/hadoop/etc/hadoop/slaves



```
ubuntu@ip-172-31-16-229:~$ nano /usr/local/hadoop/etc/hadoop/slaves
```

At Master : Add Slave1 & Slave2 to Hadoop slave file

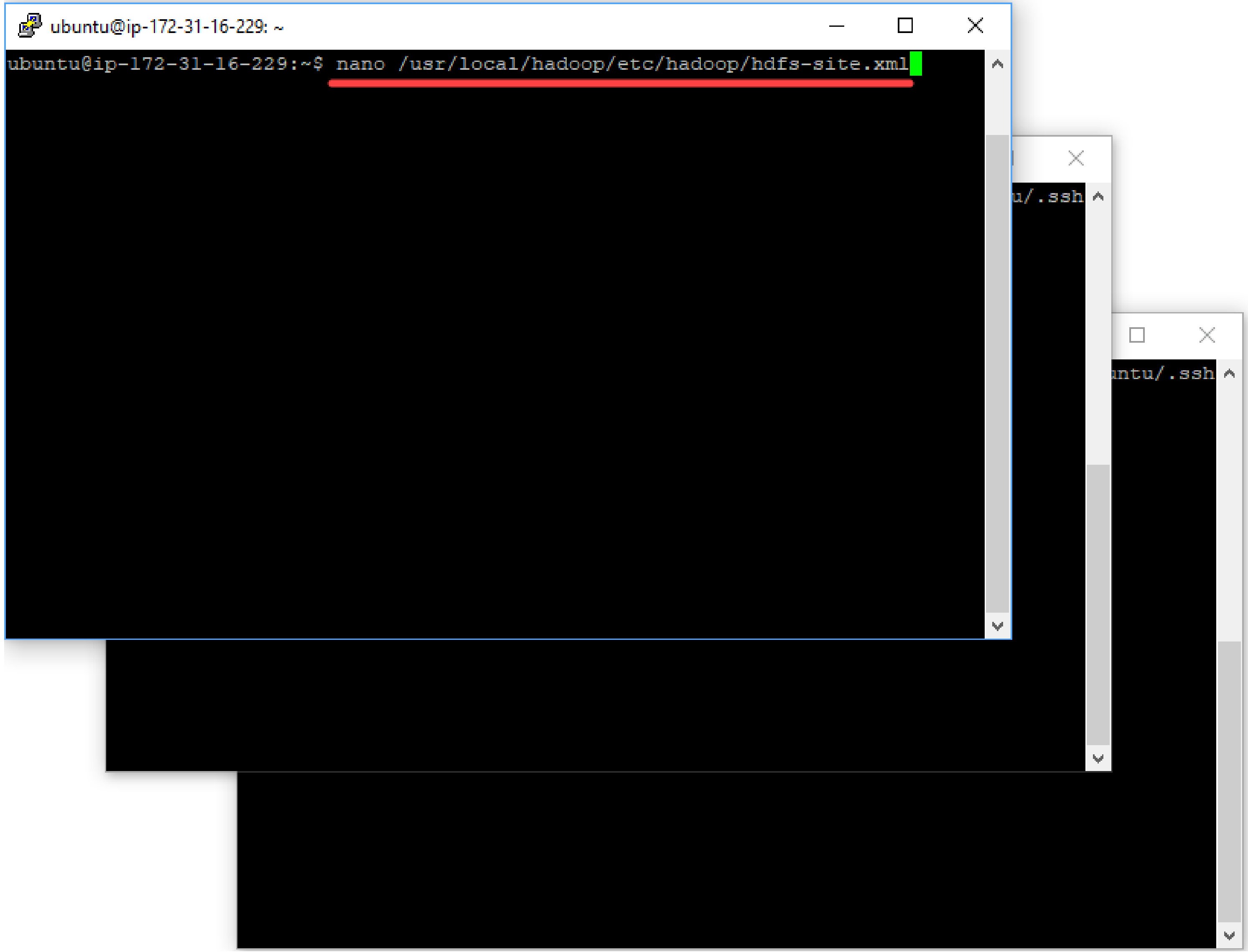
Add slave private DNS



```
  GNU nano 2.5.3       File: /usr/local/hadoop/etc/hadoop/slaves            Modified

ip-172-31-35-153
ip-172-31-47-238

^G Get Help   ^O Write Out  ^W Where Is   ^K Cut Text   ^J Justify    ^C Cur Pos
^X Exit       ^R Read File  ^\ Replace    ^U Uncut Text ^T To Spell   ^_ Go To Line
```

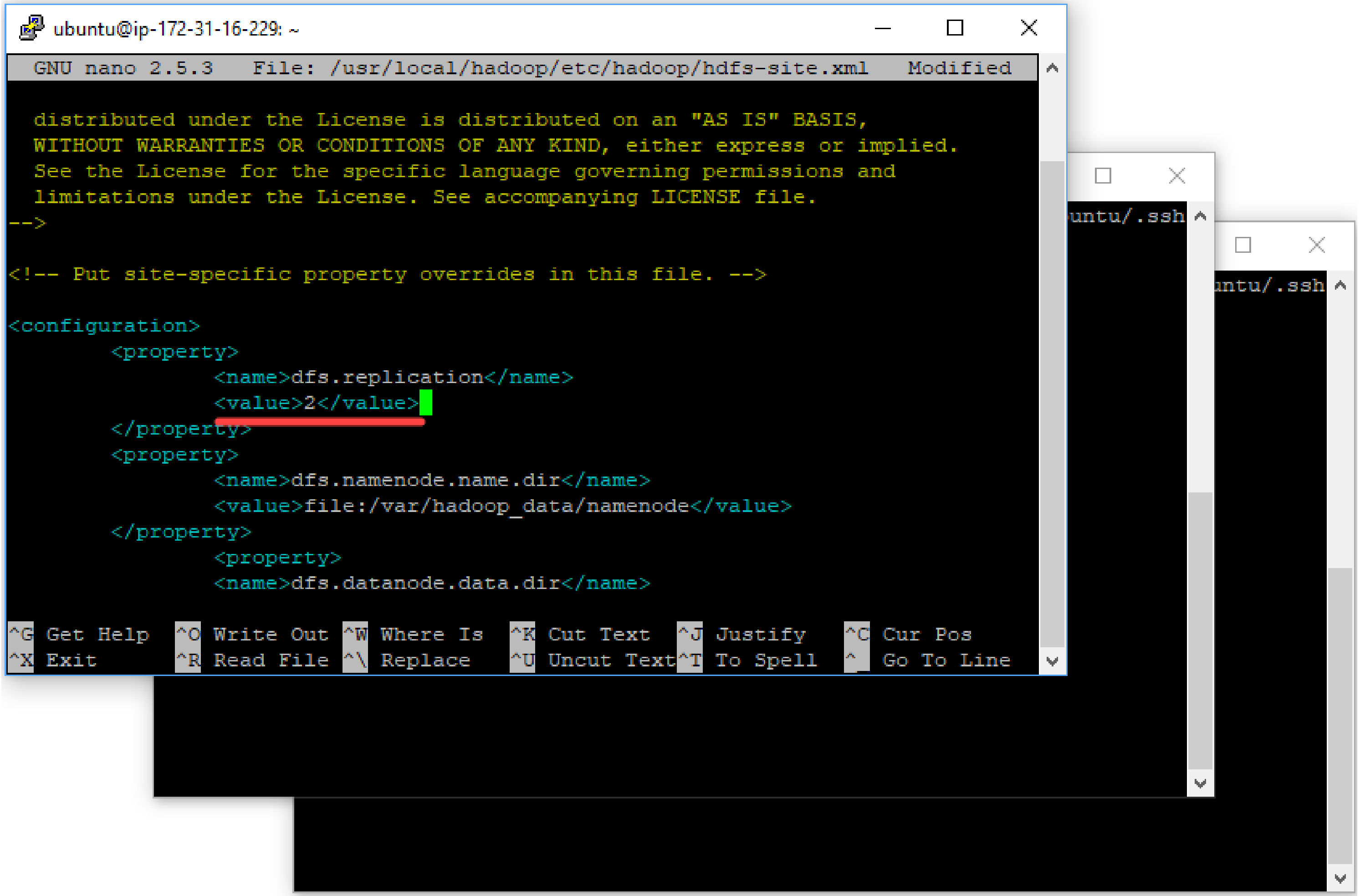
At Master : Edit hdfs-site.xml

```
$nano /usr/local/hadoop/etc/hadoop/hdfs-site.xml
```



```
ubuntu@ip-172-31-16-229:~$ nano /usr/local/hadoop/etc/hadoop/hdfs-site.xml
```

At Master : Edit replication to 2



```
  GNU nano 2.5.3    File: /usr/local/hadoop/etc/hadoop/hdfs-site.xml   Modified

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  WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
  See the License for the specific language governing permissions and
  limitations under the License. See accompanying LICENSE file.
-->

<!-- Put site-specific property overrides in this file. -->

<configuration>
        <property>
                <name>dfs.replication</name>
                <value>2</value>
        </property>
        <property>
                <name>dfs.namenode.name.dir</name>
                <value>file:/var/hadoop_data/namenode</value>
        </property>
                <property>
                <name>dfs.datanode.data.dir</name>

^G Get Help   ^O Write Out  ^W Where Is   ^K Cut Text   ^J Justify    ^C Cur Pos
^X Exit       ^R Read File  ^\ Replace    ^U Uncut Text^T To Spell    ^_ Go To Line
```
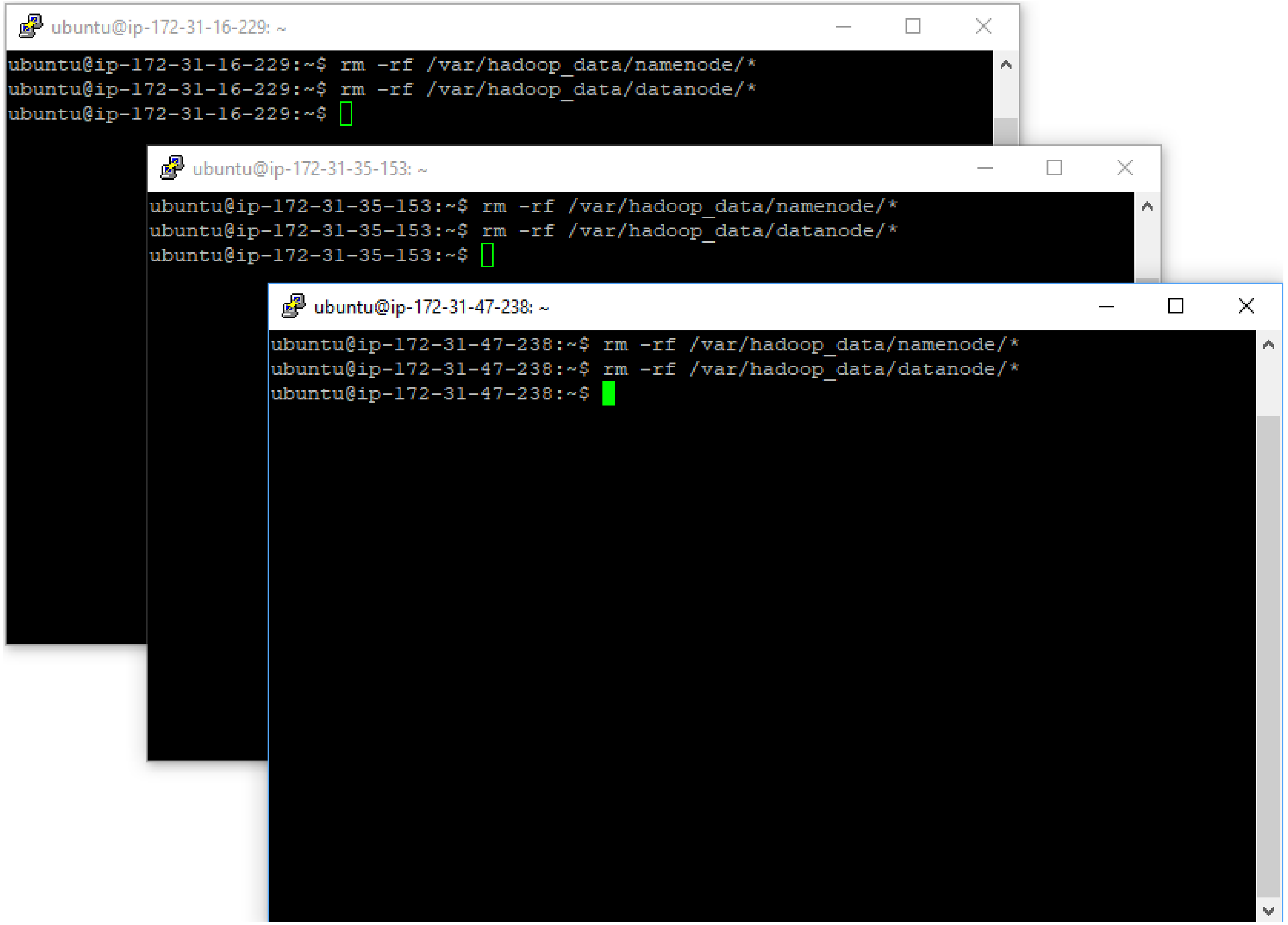

At all nodes : Remove directories of namenode and datanode

```
$rm -rf /var/hadoop_data/namenode/*
$rm -rf /var/hadoop_data/datanode/*
```


ubuntu@ip-172-31-16-229: ~
ubuntu@ip-172-31-35-153: ~
ubuntu@ip-172-31-47-238: ~

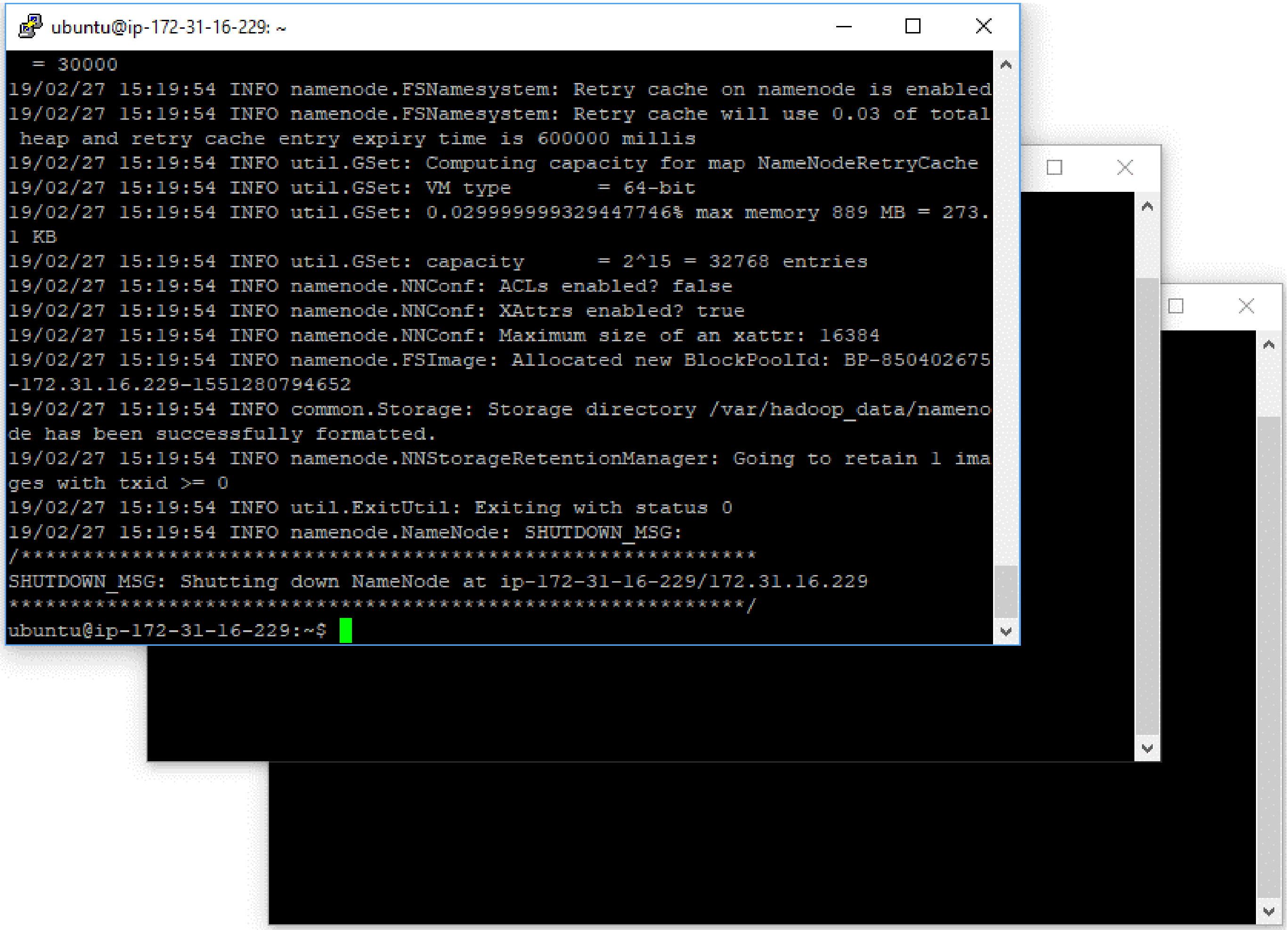
```
ubuntu@ip-172-31-16-229:~$ rm -rf /var/hadoop_data/namenode/*
ubuntu@ip-172-31-16-229:~$ rm -rf /var/hadoop_data/datanode/*
ubuntu@ip-172-31-16-229:~$
```

```
ubuntu@ip-172-31-35-153:~$ rm -rf /var/hadoop_data/namenode/*
ubuntu@ip-172-31-35-153:~$ rm -rf /var/hadoop_data/datanode/*
ubuntu@ip-172-31-35-153:~$
```

```
ubuntu@ip-172-31-47-238:~$ rm -rf /var/hadoop_data/namenode/*
ubuntu@ip-172-31-47-238:~$ rm -rf /var/hadoop_data/datanode/*
ubuntu@ip-172-31-47-238:~$
```

At Master: Format namenode

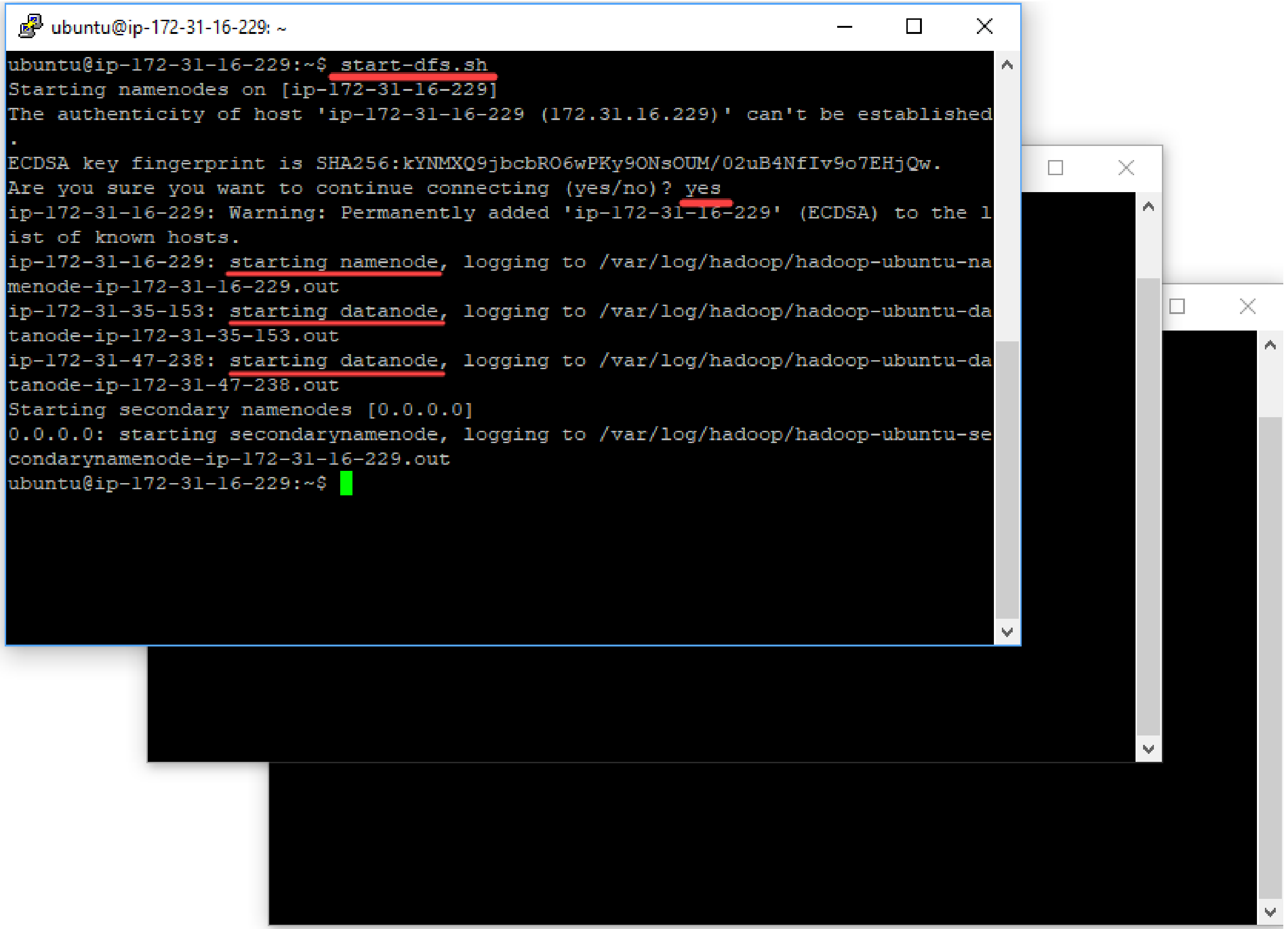
```
$hdfs namenode -format
```



```
 = 30000
19/02/27 15:19:54 INFO namenode.FSNamesystem: Retry cache on namenode is enabled
19/02/27 15:19:54 INFO namenode.FSNamesystem: Retry cache will use 0.03 of total
 heap and retry cache entry expiry time is 600000 millis
19/02/27 15:19:54 INFO util.GSet: Computing capacity for map NameNodeRetryCache
19/02/27 15:19:54 INFO util.GSet: VM type       = 64-bit
19/02/27 15:19:54 INFO util.GSet: 0.029999999329447746% max memory 889 MB = 273.
1 KB
19/02/27 15:19:54 INFO util.GSet: capacity      = 2^15 = 32768 entries
19/02/27 15:19:54 INFO namenode.NNConf: ACLs enabled? false
19/02/27 15:19:54 INFO namenode.NNConf: XAttrs enabled? true
19/02/27 15:19:54 INFO namenode.NNConf: Maximum size of an xattr: 16384
19/02/27 15:19:54 INFO namenode.FSImage: Allocated new BlockPoolId: BP-850402675
-172.31.16.229-1551280794652
19/02/27 15:19:54 INFO common.Storage: Storage directory /var/hadoop_data/nameno
de has been successfully formatted.
19/02/27 15:19:54 INFO namenode.NNStorageRetentionManager: Going to retain 1 ima
ges with txid >= 0
19/02/27 15:19:54 INFO util.ExitUtil: Exiting with status 0
19/02/27 15:19:54 INFO namenode.NameNode: SHUTDOWN_MSG:
/************************************************************
SHUTDOWN_MSG: Shutting down NameNode at ip-172-31-16-229/172.31.16.229
************************************************************/
ubuntu@ip-172-31-16-229:~$
```

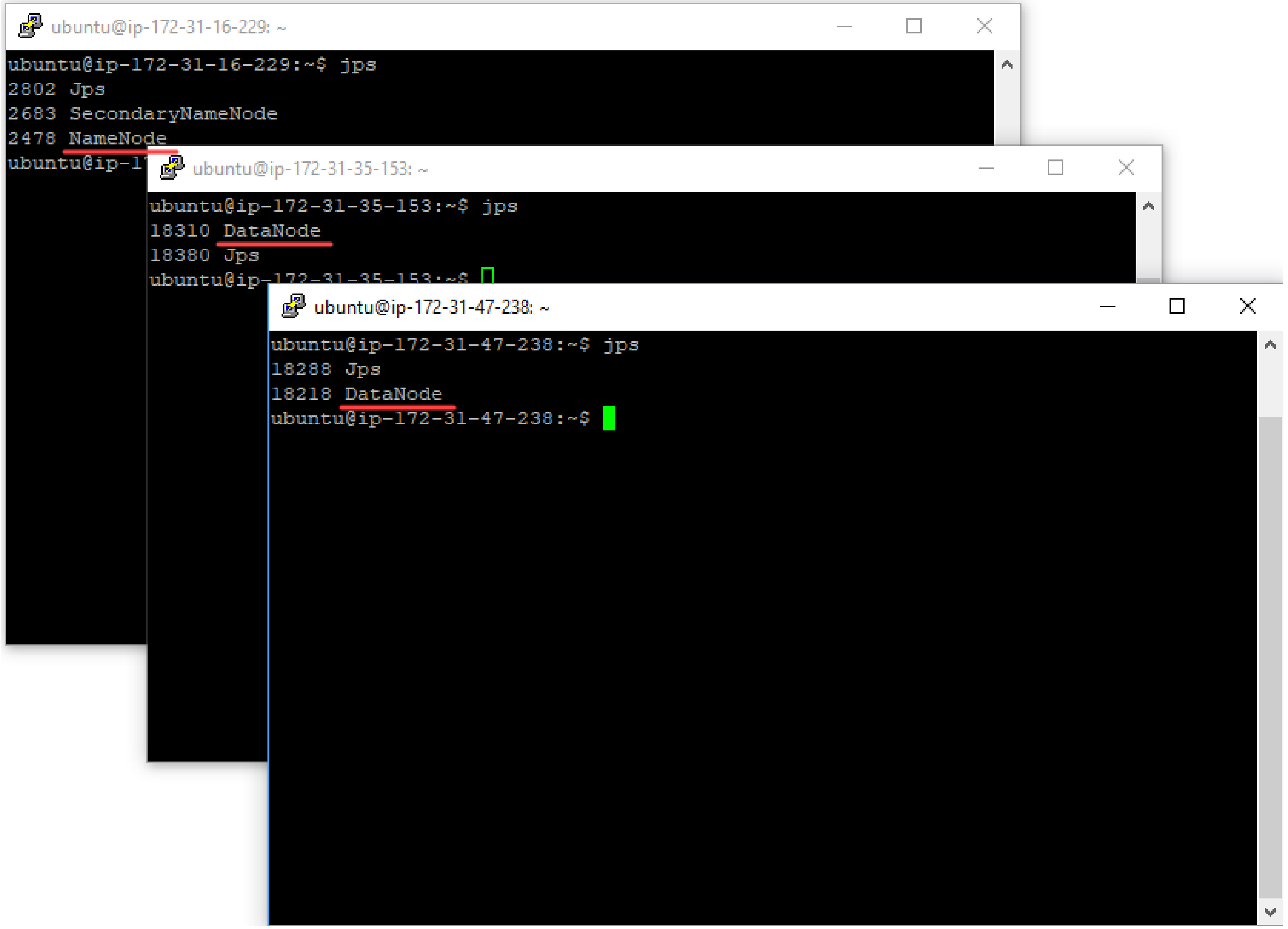
At Master: Execute start-dfs.sh

$start-dfs.sh



```
ubuntu@ip-172-31-16-229:~$ start-dfs.sh
Starting namenodes on [ip-172-31-16-229]
The authenticity of host 'ip-172-31-16-229 (172.31.16.229)' can't be established
.
ECDSA key fingerprint is SHA256:kYNMXQ9jbcbRO6wPKy9ONsOUM/02uB4NfIv9o7EHjQw.
Are you sure you want to continue connecting (yes/no)? yes
ip-172-31-16-229: Warning: Permanently added 'ip-172-31-16-229' (ECDSA) to the l
ist of known hosts.
ip-172-31-16-229: starting namenode, logging to /var/log/hadoop/hadoop-ubuntu-na
menode-ip-172-31-16-229.out
ip-172-31-35-153: starting datanode, logging to /var/log/hadoop/hadoop-ubuntu-da
tanode-ip-172-31-35-153.out
ip-172-31-47-238: starting datanode, logging to /var/log/hadoop/hadoop-ubuntu-da
tanode-ip-172-31-47-238.out
Starting secondary namenodes [0.0.0.0]
0.0.0.0: starting secondarynamenode, logging to /var/log/hadoop/hadoop-ubuntu-se
condarynamenode-ip-172-31-16-229.out
ubuntu@ip-172-31-16-229:~$
```

At all nodes: Use `jps` to check result, should see NameNode started on Master and DataNode started on both Slave1&Slave2



ubuntu@ip-172-31-16-229: ~

```
ubuntu@ip-172-31-16-229:~$ jps
2802 Jps
2683 SecondaryNameNode
2478 NameNode
ubuntu@ip-1
```

ubuntu@ip-172-31-35-153: ~

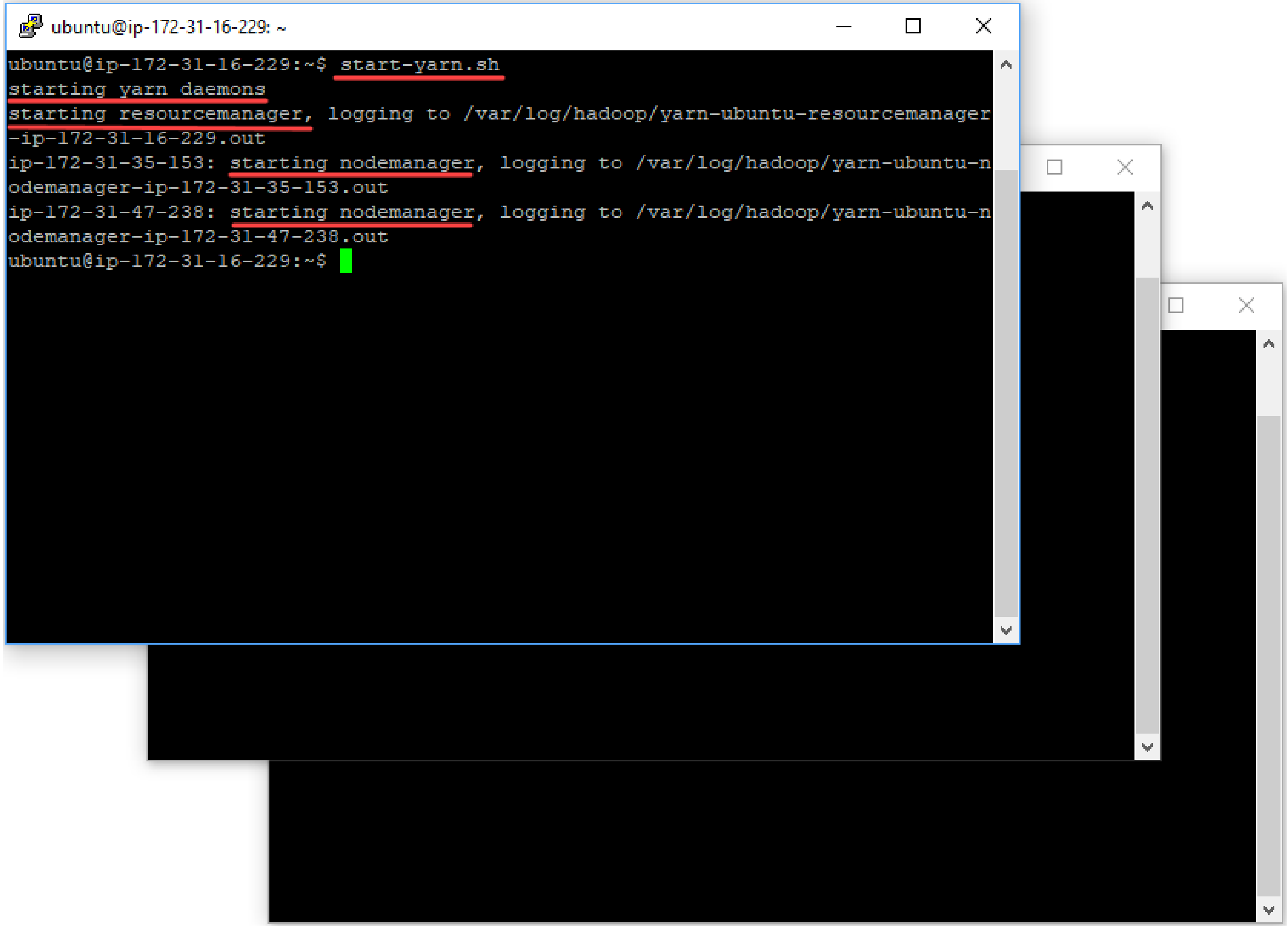
```
ubuntu@ip-172-31-35-153:~$ jps
18310 DataNode
18380 Jps
ubuntu@ip-172-31-35-153:~$
```

ubuntu@ip-172-31-47-238: ~

```
ubuntu@ip-172-31-47-238:~$ jps
18288 Jps
18218 DataNode
ubuntu@ip-172-31-47-238:~$
```

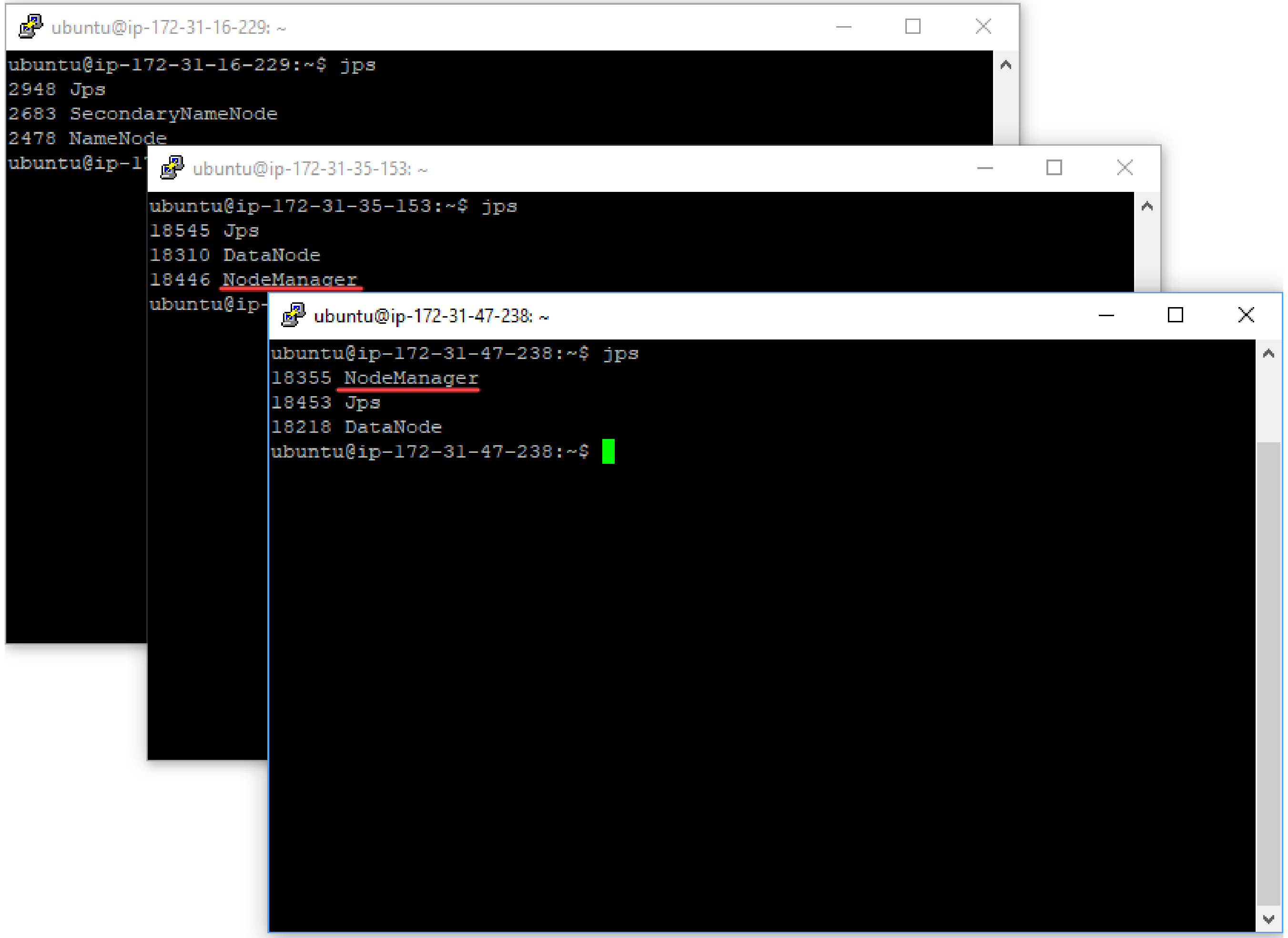
At Master: Execute start-yarn.sh

$start-yarn.sh



```
ubuntu@ip-172-31-16-229:~$ start-yarn.sh
starting yarn daemons
starting resourcemanager, logging to /var/log/hadoop/yarn-ubuntu-resourcemanager
-ip-172-31-16-229.out
ip-172-31-35-153: starting nodemanager, logging to /var/log/hadoop/yarn-ubuntu-n
odemanager-ip-172-31-35-153.out
ip-172-31-47-238: starting nodemanager, logging to /var/log/hadoop/yarn-ubuntu-n
odemanager-ip-172-31-47-238.out
ubuntu@ip-172-31-16-229:~$
```

At all nodes: Use `jps` to check result, should see <u>NameManager</u> started on both Slave1&Slave2


ubuntu@ip-172-31-16-229: ~
ubuntu@ip-172-31-35-153: ~
ubuntu@ip-172-31-47-238: ~

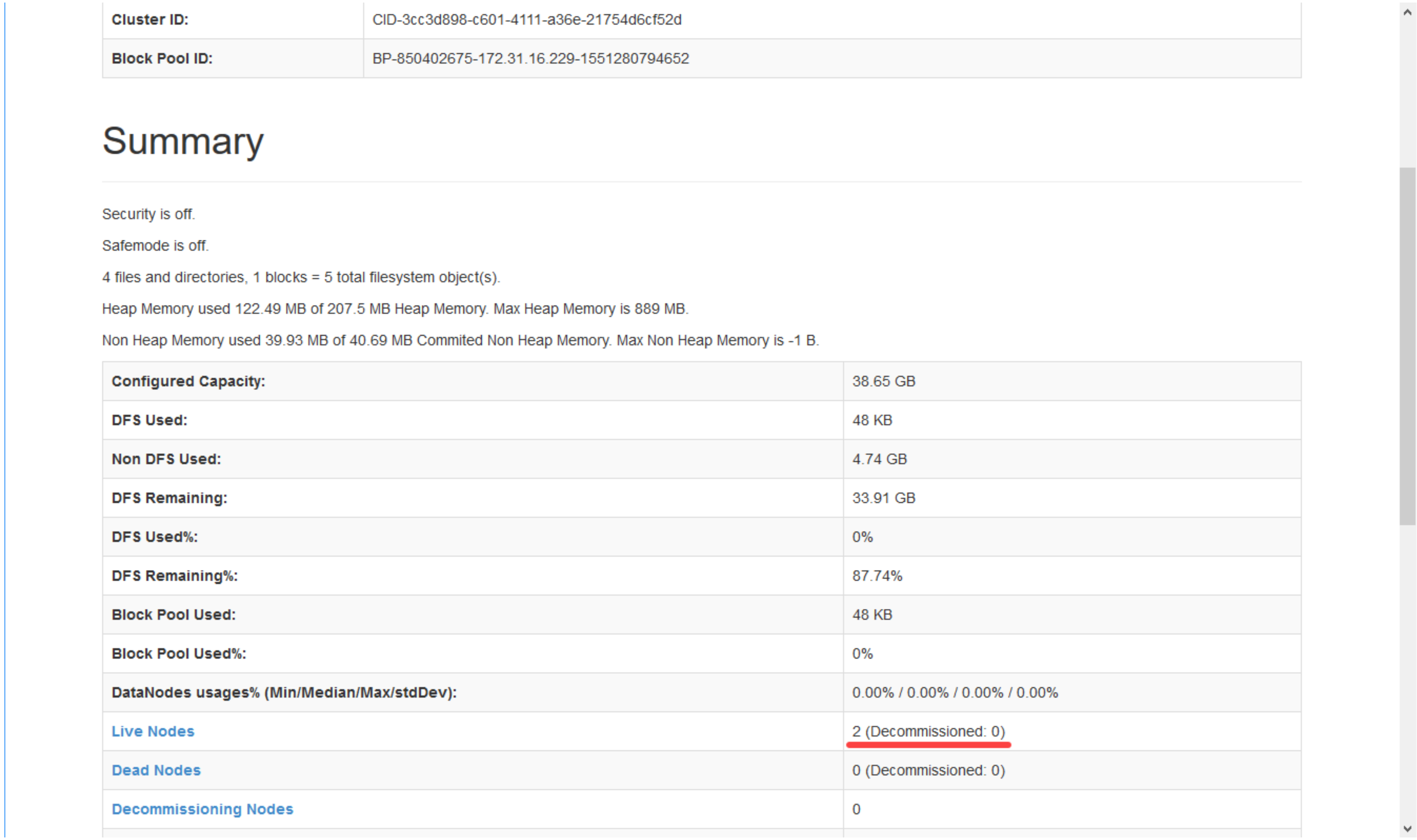
```
ubuntu@ip-172-31-16-229:~$ jps
2948 Jps
2683 SecondaryNameNode
2478 NameNode
ubuntu@ip-1
```

```
ubuntu@ip-172-31-35-153:~$ jps
18545 Jps
18310 DataNode
18446 NodeManager
ubuntu@ip-
```

```
ubuntu@ip-172-31-47-238:~$ jps
18355 NodeManager
18453 Jps
18218 DataNode
ubuntu@ip-172-31-47-238:~$
```

Namenode Information:

http://52.26.15.54:50070



Cluster ID:	CID-3cc3d898-c601-4111-a36e-21754d6cf52d
Block Pool ID:	BP-850402675-172.31.16.229-1551280794652

Summary

Security is off.

Safemode is off.

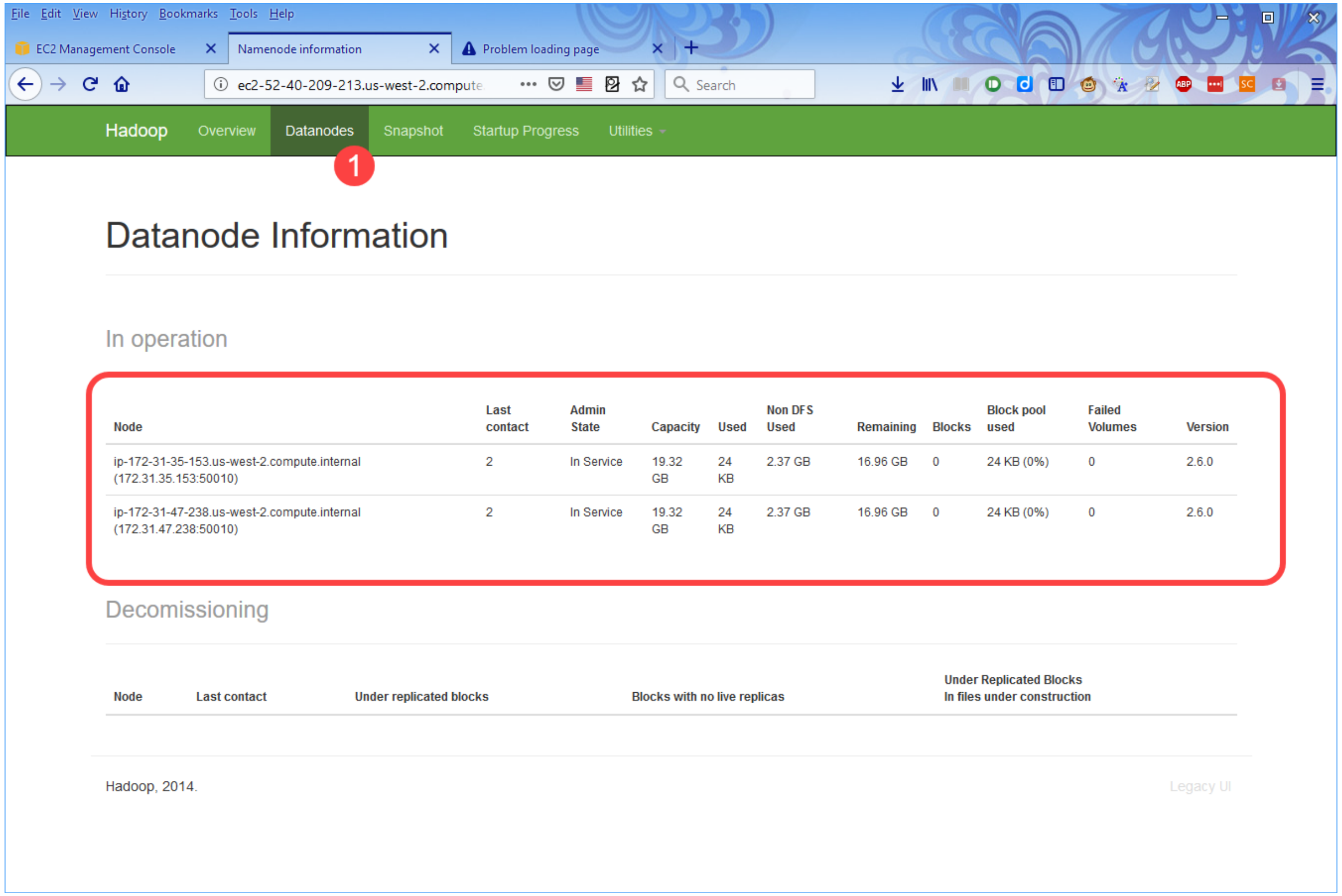
4 files and directories, 1 blocks = 5 total filesystem object(s).

Heap Memory used 122.49 MB of 207.5 MB Heap Memory. Max Heap Memory is 889 MB.

Non Heap Memory used 39.93 MB of 40.69 MB Commited Non Heap Memory. Max Non Heap Memory is -1 B.

Configured Capacity:	38.65 GB
DFS Used:	48 KB
Non DFS Used:	4.74 GB
DFS Remaining:	33.91 GB
DFS Used%:	0%
DFS Remaining%:	87.74%
Block Pool Used:	48 KB
Block Pool Used%:	0%
DataNodes usages% (Min/Median/Max/stdDev):	0.00% / 0.00% / 0.00% / 0.00%
Live Nodes	2 (Decommissioned: 0)
Dead Nodes	0 (Decommissioned: 0)
Decommissioning Nodes	0

Datanode Information



Datanode Information

In operation

Node	Last contact	Admin State	Capacity	Used	Non DFS Used	Remaining	Blocks	Block pool used	Failed Volumes	Version
ip-172-31-35-153.us-west-2.compute.internal (172.31.35.153:50010)	2	In Service	19.32 GB	24 KB	2.37 GB	16.96 GB	0	24 KB (0%)	0	2.6.0
ip-172-31-47-238.us-west-2.compute.internal (172.31.47.238:50010)	2	In Service	19.32 GB	24 KB	2.37 GB	16.96 GB	0	24 KB (0%)	0	2.6.0

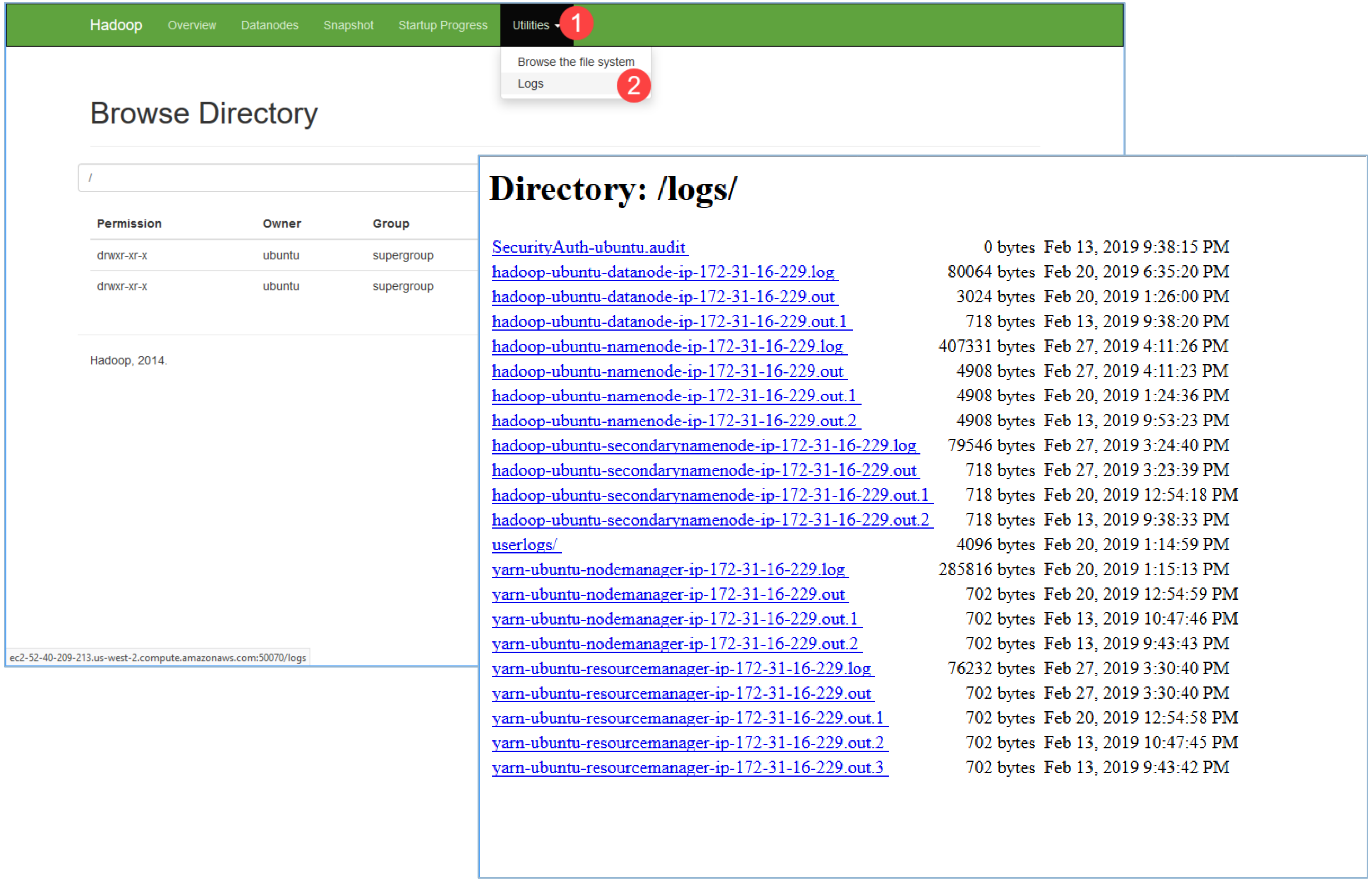
Decomissioning

Node	Last contact	Under replicated blocks	Blocks with no live replicas	Under Replicated Blocks In files under construction

Hadoop, 2014.

Legacy UI

Log Files



Browse Directory

/

Permission	Owner	Group
drwxr-xr-x	ubuntu	supergroup
drwxr-xr-x	ubuntu	supergroup

Hadoop, 2014.

ec2-52-40-209-213.us-west-2.compute.amazonaws.com:50070/logs

Directory: /logs/

```
SecurityAuth-ubuntu.audit                                  0 bytes  Feb 13, 2019 9:38:15 PM
hadoop-ubuntu-datanode-ip-172-31-16-229.log            80064 bytes  Feb 20, 2019 6:35:20 PM
hadoop-ubuntu-datanode-ip-172-31-16-229.out             3024 bytes  Feb 20, 2019 1:26:00 PM
hadoop-ubuntu-datanode-ip-172-31-16-229.out.1            718 bytes  Feb 13, 2019 9:38:20 PM
hadoop-ubuntu-namenode-ip-172-31-16-229.log           407331 bytes  Feb 27, 2019 4:11:26 PM
hadoop-ubuntu-namenode-ip-172-31-16-229.out             4908 bytes  Feb 27, 2019 4:11:23 PM
hadoop-ubuntu-namenode-ip-172-31-16-229.out.1           4908 bytes  Feb 20, 2019 1:24:36 PM
hadoop-ubuntu-namenode-ip-172-31-16-229.out.2           4908 bytes  Feb 13, 2019 9:53:23 PM
hadoop-ubuntu-secondarynamenode-ip-172-31-16-229.log   79546 bytes  Feb 27, 2019 3:24:40 PM
hadoop-ubuntu-secondarynamenode-ip-172-31-16-229.out     718 bytes  Feb 27, 2019 3:23:39 PM
hadoop-ubuntu-secondarynamenode-ip-172-31-16-229.out.1   718 bytes  Feb 20, 2019 12:54:18 PM
hadoop-ubuntu-secondarynamenode-ip-172-31-16-229.out.2   718 bytes  Feb 13, 2019 9:38:33 PM
userlogs/                                               4096 bytes  Feb 20, 2019 1:14:59 PM
yarn-ubuntu-nodemanager-ip-172-31-16-229.log          285816 bytes  Feb 20, 2019 1:15:13 PM
yarn-ubuntu-nodemanager-ip-172-31-16-229.out             702 bytes  Feb 20, 2019 12:54:59 PM
yarn-ubuntu-nodemanager-ip-172-31-16-229.out.1           702 bytes  Feb 13, 2019 10:47:46 PM
yarn-ubuntu-nodemanager-ip-172-31-16-229.out.2           702 bytes  Feb 13, 2019 9:43:43 PM
yarn-ubuntu-resourcemanager-ip-172-31-16-229.log       76232 bytes  Feb 27, 2019 3:30:40 PM
yarn-ubuntu-resourcemanager-ip-172-31-16-229.out         702 bytes  Feb 27, 2019 3:30:40 PM
yarn-ubuntu-resourcemanager-ip-172-31-16-229.out.1       702 bytes  Feb 20, 2019 12:54:58 PM
yarn-ubuntu-resourcemanager-ip-172-31-16-229.out.2       702 bytes  Feb 13, 2019 10:47:45 PM
yarn-ubuntu-resourcemanager-ip-172-31-16-229.out.3       702 bytes  Feb 13, 2019 9:43:42 PM
```

Next Steps

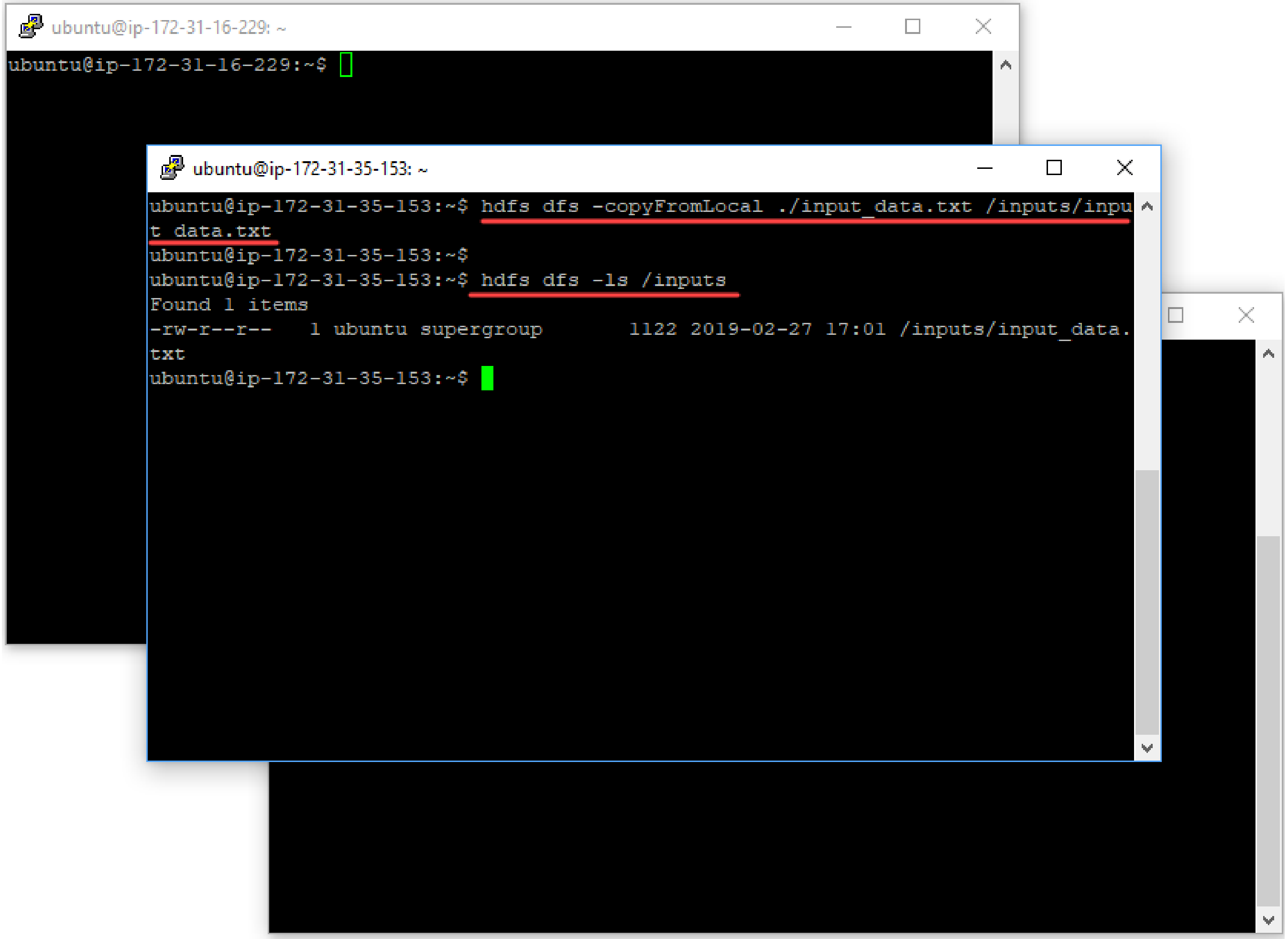
- Import data to Hadoop cluster
- Execute MapReduce
- Compare result
- Stop Yarn & Stop DFS

Use the same commands as single node Hadoop

At Slave1: Import data to Hadoop cluster

$hdfs dfs -copyFromLocal ./input_data.txt /inputs/input_data.txt

$hdfs dfs -ls /inputs

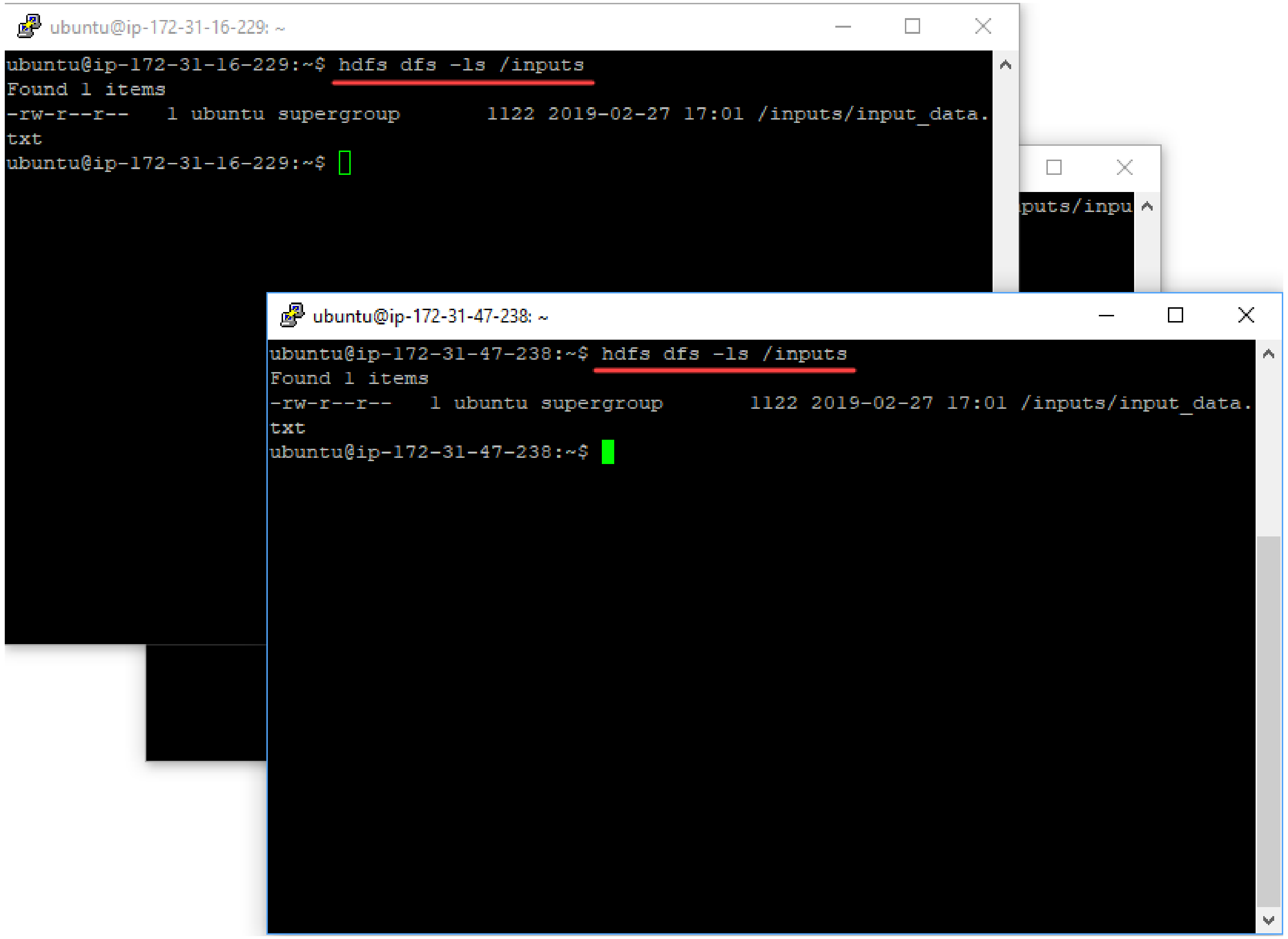


```
ubuntu@ip-172-31-16-229:~$
```

```
ubuntu@ip-172-31-35-153:~$ hdfs dfs -copyFromLocal ./input_data.txt /inputs/inpu
t_data.txt
ubuntu@ip-172-31-35-153:~$
ubuntu@ip-172-31-35-153:~$ hdfs dfs -ls /inputs
Found 1 items
-rw-r--r--   1 ubuntu supergroup       1122 2019-02-27 17:01 /inputs/input_data.
txt
ubuntu@ip-172-31-35-153:~$
```

At Master & Slave2: Check imported file

$hdfs dfs –ls /inputs

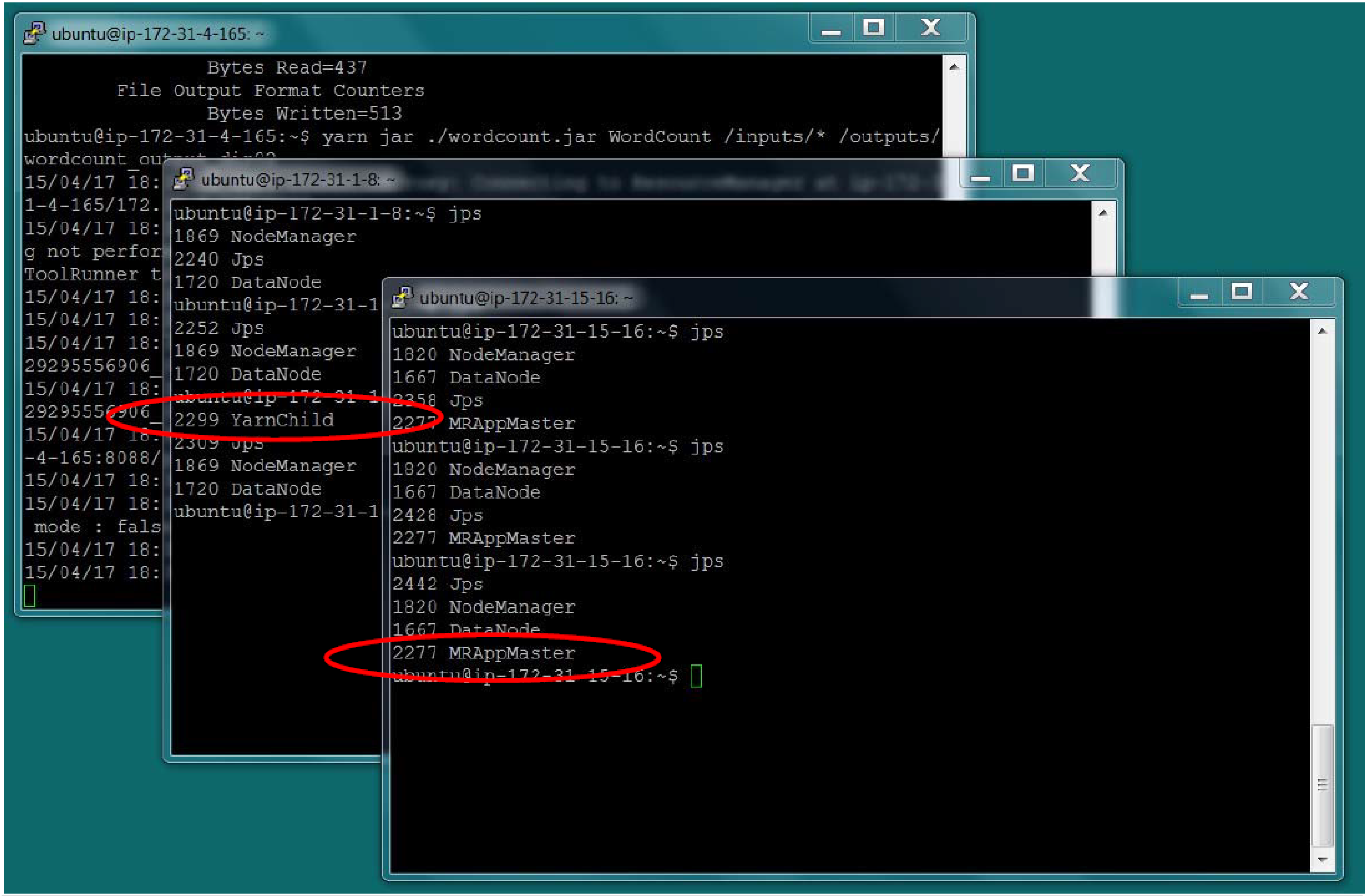


```
ubuntu@ip-172-31-16-229:~$ hdfs dfs -ls /inputs
Found 1 items
-rw-r--r--   1 ubuntu supergroup       1122 2019-02-27 17:01 /inputs/input_data.
txt
ubuntu@ip-172-31-16-229:~$ 
```

```
puts/inpu
```

```
ubuntu@ip-172-31-47-238:~$ hdfs dfs -ls /inputs
Found 1 items
-rw-r--r--   1 ubuntu supergroup       1122 2019-02-27 17:01 /inputs/input_data.
txt
ubuntu@ip-172-31-47-238:~$ 
```

At Slave1 & Slave2: Use `jps` to see Application Master and Yarn Child Container



```
                Bytes Read=437
        File Output Format Counters
                Bytes Written=513
ubuntu@ip-172-31-4-165:~$ yarn jar ./wordcount.jar WordCount /inputs/* /outputs/
wordcount_output_dir02
15/04/17 18:
1-4-165/172.
15/04/17 18:
g not perfor
ToolRunner t
15/04/17 18:
15/04/17 18:
15/04/17 18:
29295556906_
15/04/17 18:
29295556906_
15/04/17 18:
-4-165:8088/
15/04/17 18:
15/04/17 18:
 mode : fals
15/04/17 18:
15/04/17 18:
```

```
ubuntu@ip-172-31-1-8:~$ jps
1869 NodeManager
2240 Jps
1720 DataNode
ubuntu@ip-172-31-1
2252 Jps
1869 NodeManager
1720 DataNode
ubuntu@ip-172-31-1
2299 YarnChild
2309 Jps
1869 NodeManager
1720 DataNode
ubuntu@ip-172-31-1
```

```
ubuntu@ip-172-31-15-16:~$ jps
1820 NodeManager
1667 DataNode
2358 Jps
2277 MRAppMaster
ubuntu@ip-172-31-15-16:~$ jps
1820 NodeManager
1667 DataNode
2428 Jps
2277 MRAppMaster
ubuntu@ip-172-31-15-16:~$ jps
2442 Jps
1820 NodeManager
1667 DataNode
2277 MRAppMaster
ubuntu@ip-172-31-15-16:~$
```

Don’t Forget to SUSPEND/TERMINATE Instance !!!!