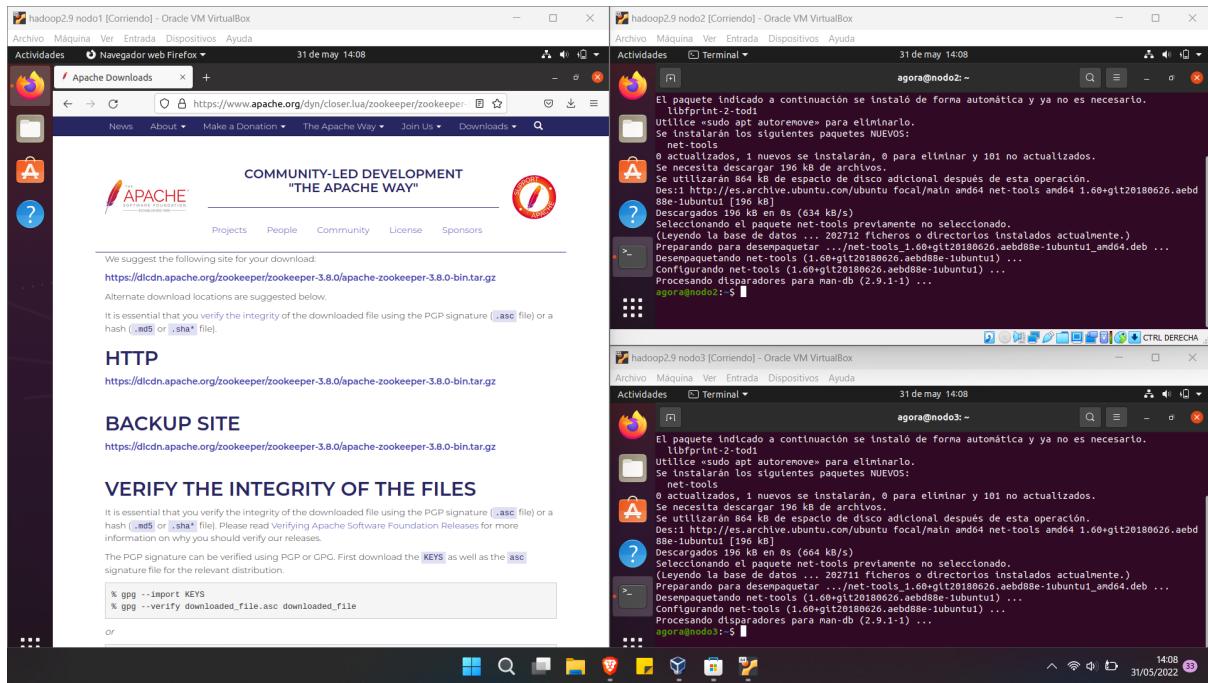


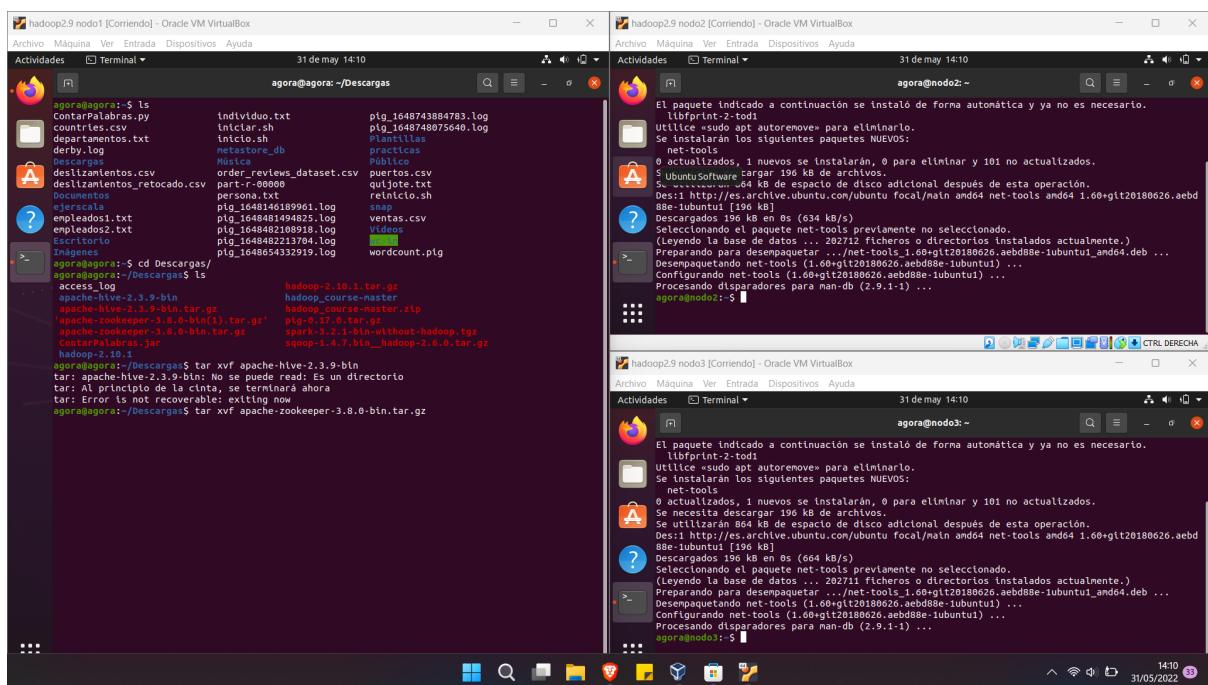
Introducción a Zookeeper y alta disponibilidad

Alfredo Talavera Ramajo

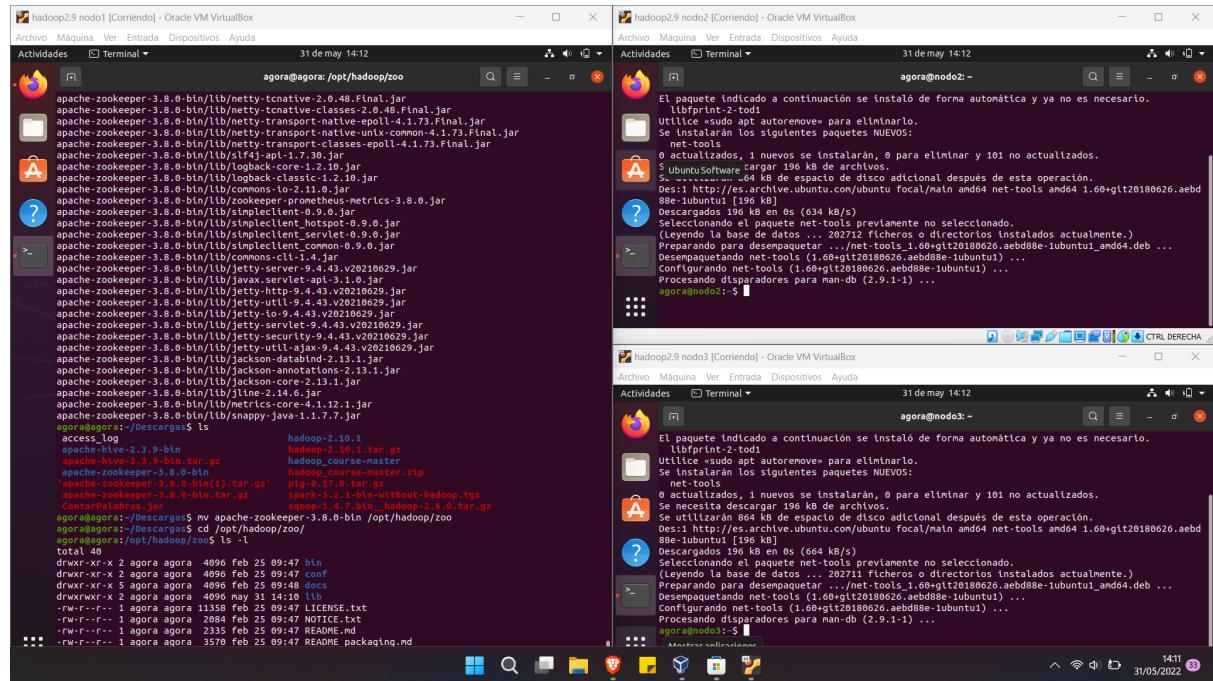
Primero vamos a descargarnos el archivo desde la pagina de apache, solo basta con escribir zookeeper apache y nos mandará a la pagina, pulsamos sobre http e iniciará la descarga



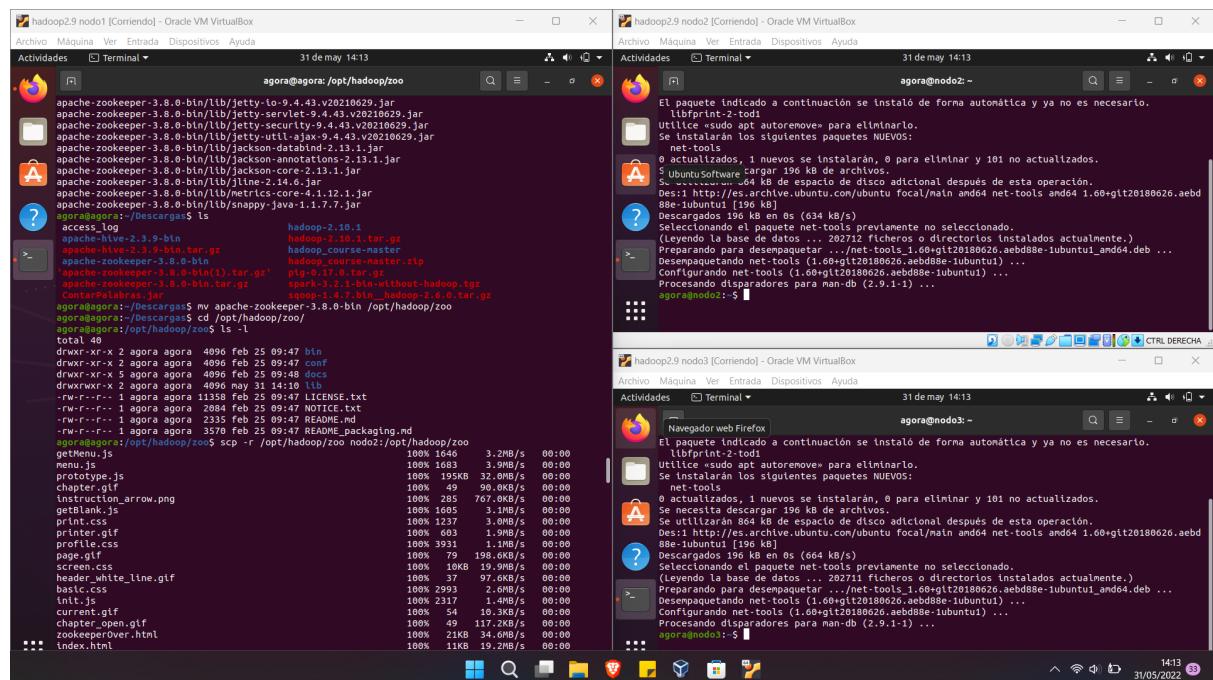
Una vez descargado, en la terminal nos dirigimos donde está el archivo y lo descomprimimos con xvf

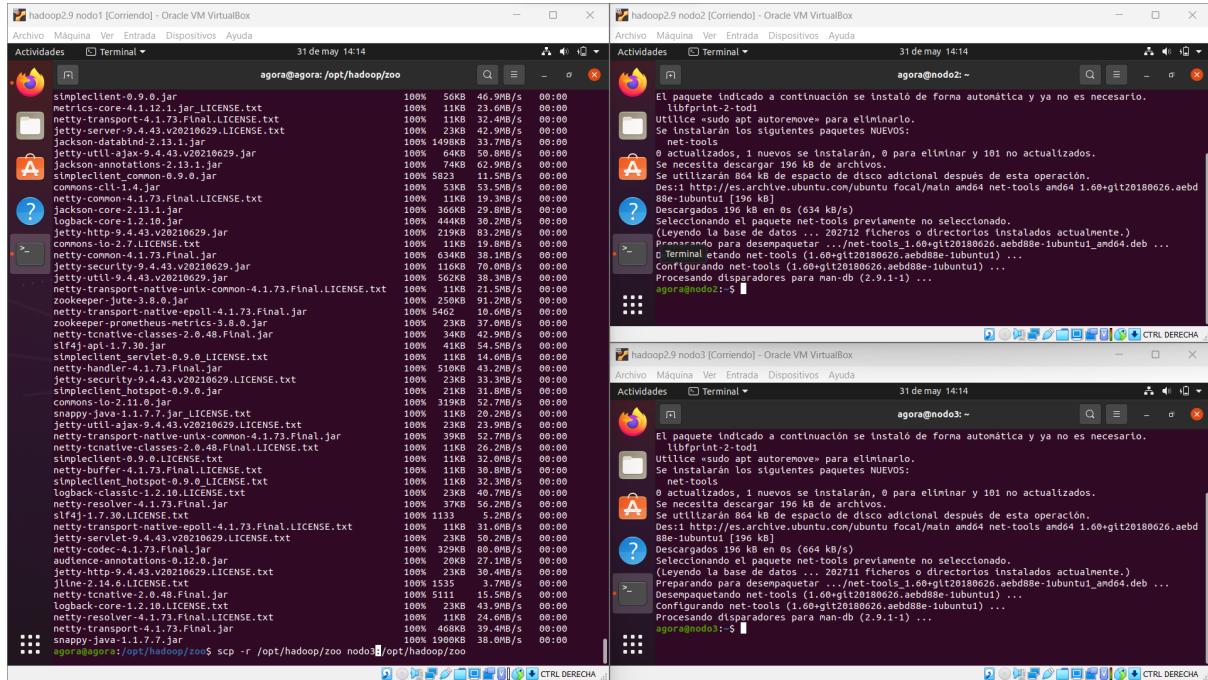


Una vez descomprimido lo movemos a la carpeta /opt/hadoop/zoo, así le cambiamos el nombre a zoo y la ponemos dentro de hadoop

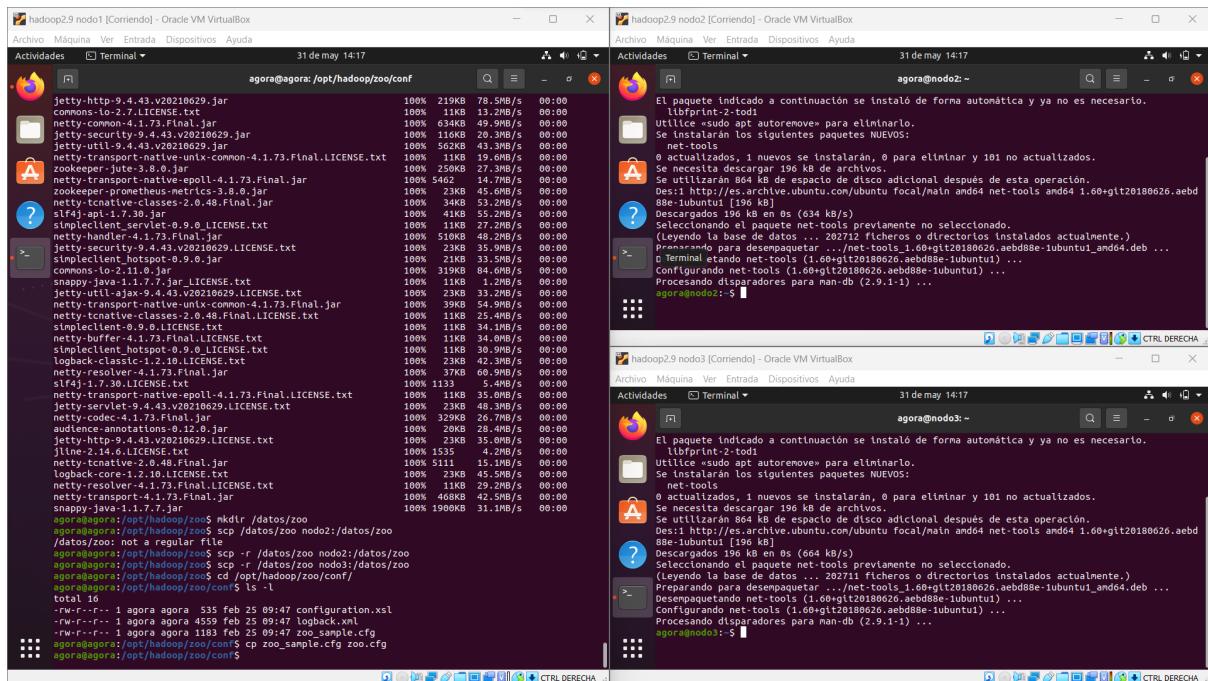


Y mandamos el directorio mediante el comando scp -r origen (dirección de lo que queremos mandar), en este caso /opt/hadoop/zoo y destino, en este caso: nodo2:/opt/hadoop/zoo





Creamos una carpeta en la raíz que se llame /datos/zoo y la mandamos por scp al resto de nodos



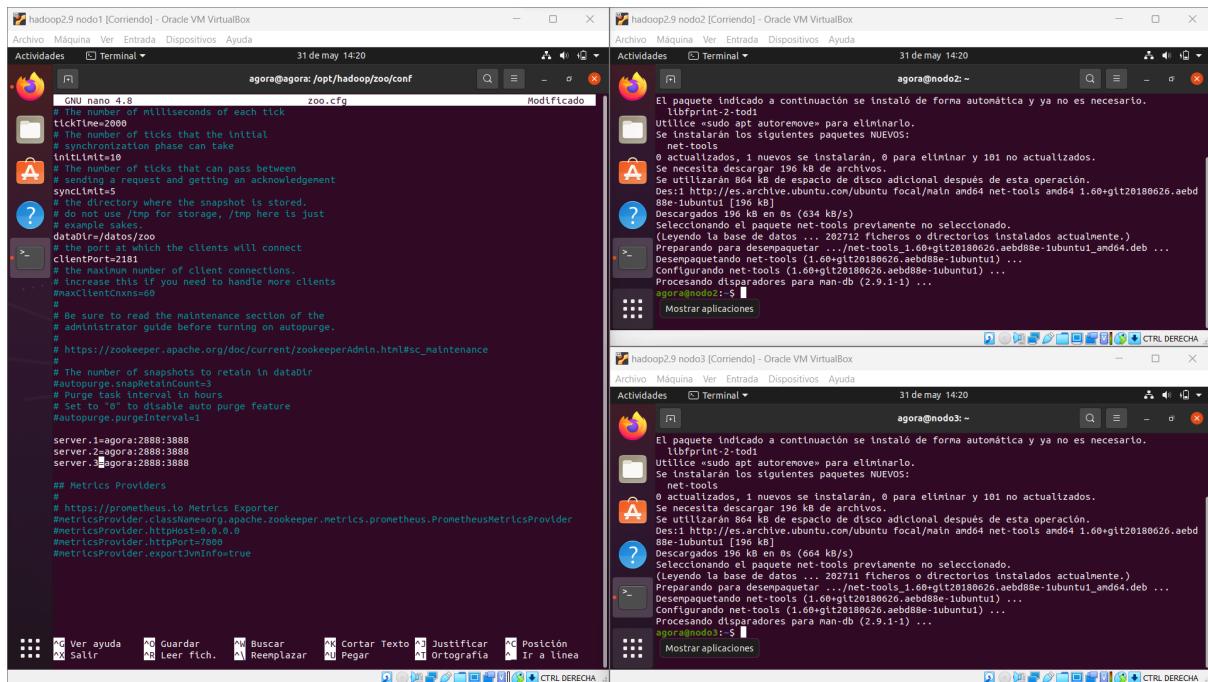
Nos dirigimos a la carpeta conf dentro de zoo, y le cambiamos el nombre de zoo-sample.cfg a zoo.cfg con el comando cp zoo-sample.cfg zoo.cfg

Y con nano editamos el archivo

Y cambiamos la línea dataDir a la ruta donde esté la carpeta de datos, en este caso al estar en la raíz será /datos/zoo

También encima de # Metrics Providers añadimos:

```
server.1=agora:2888:3888
server.2=nodo2:2888:3888
server.3=nodo3:2888:3888
```



mediante scp mandamos al resto de nodos el archivo zoo.cfg que acabamos de editar

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]

```

```

agora@egora:/opt/hadoop/zoo/conf
agora@egora:/opt/hadoop/zoo/conf$ scp /etc/zookeeper/zoo.cfg agora@nodo2:~/zoo.cfg
      100% 1255     3.4MB/s   0:00
agora@egora:/opt/hadoop/zoo/conf$ scp /etc/zookeeper/zoo.cfg agora@nodo3:~/zoo.cfg
      100% 1255     3.4MB/s   0:00
agora@egora:/opt/hadoop/zoo/conf$ ls -l
total 16
-rw-r--r-- 1 agora agora 535 feb 25 09:47 configuration.xml
-rw-r--r-- 1 agora agora 4559 feb 25 09:47 logback.xml
-rw-r--r-- 1 agora agora 1181 feb 25 09:47 zoo_sample.cfg
agora@egora:/opt/hadoop/zoo/conf$ cp zoo_sample.cfg zoo.cfg
agora@egora:/opt/hadoop/zoo/conf$ scp -r zoo.cfg nodo2:/opt/hadoop/zoo/conf
zoo.cfg                                         100% 1255     2.4MB/s   0:00
zoo.cfg                                         100% 1255     3.4MB/s   0:00
agora@egora:/opt/hadoop/zoo/conf$ 

```

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]

```

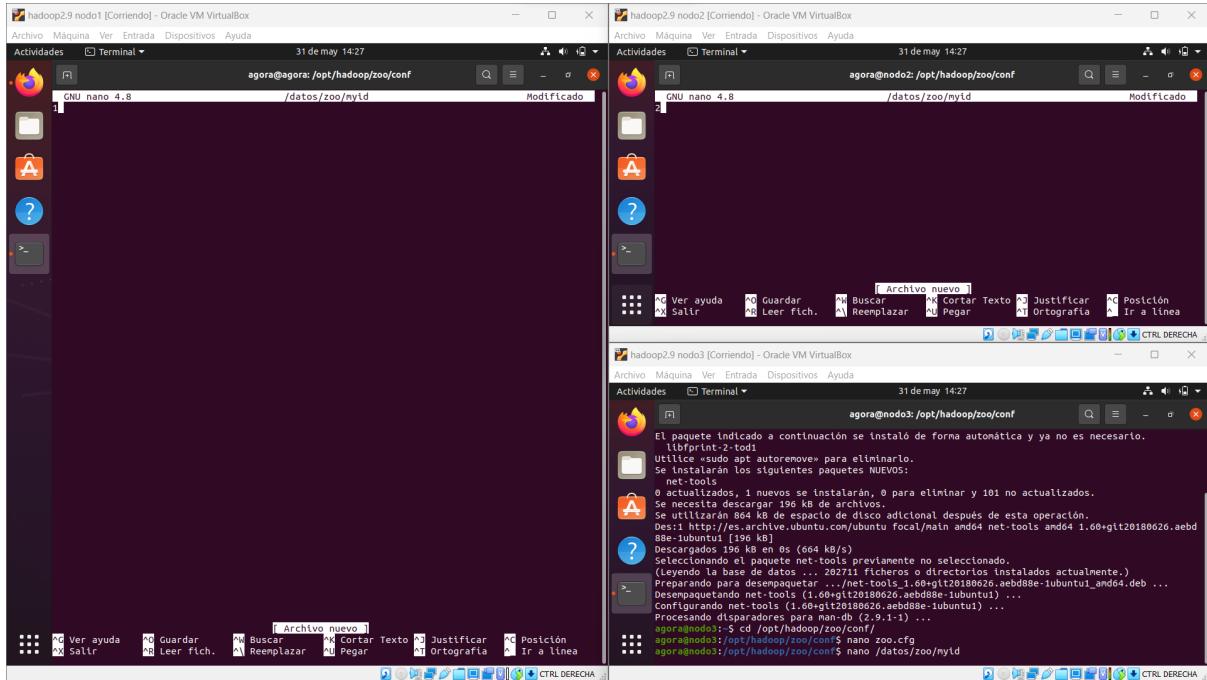
```

agora@egora:/opt/hadoop/zoo/conf
GNU nano 4.8
zoo.cfg
https://zookeeper.apache.org/doc/current/zookeeperAdmin.html#sc_maintenance
# The number of snapshots to retain in dataDir
#autpurge.snapRetainCount=3
# Purge task interval in hours
# Set to "0" to disable auto purge feature
#autpurge.purgeInterval=0

server.1:agora:2888:3888
server.2:agora:2888:3888
server.3:agora:2888:3888
## Metrics Providers
# https://prometheus.io Metrics Exporter
metricsProvider.className=org.apache.zookeeper.metrics.PrometheusMetricsProvider

```

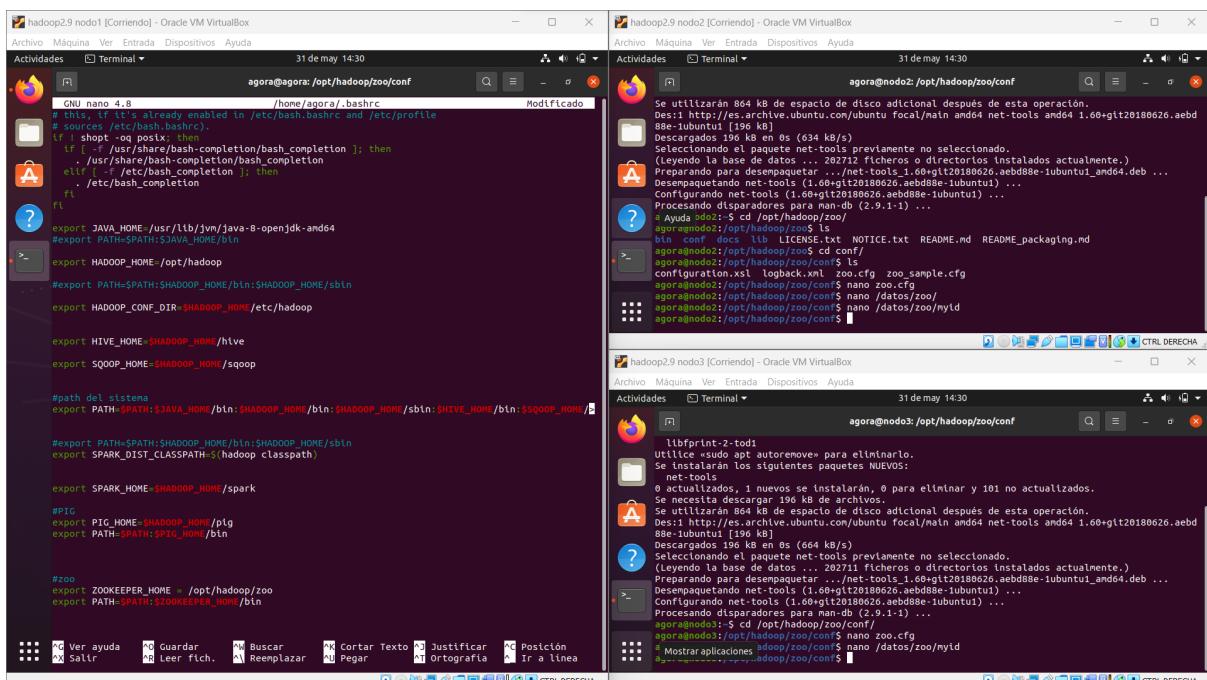
En el directorio /datos/zoo tenemos que incluir un fichero llamado myid, con el número de servidor. Es decir en el agora podremos un fichero myid cuyo contenido será 1, en el nodo 2 su contenido será 2 y en el nodo 3 su contenido será 3. Esto identifica al número de servidor



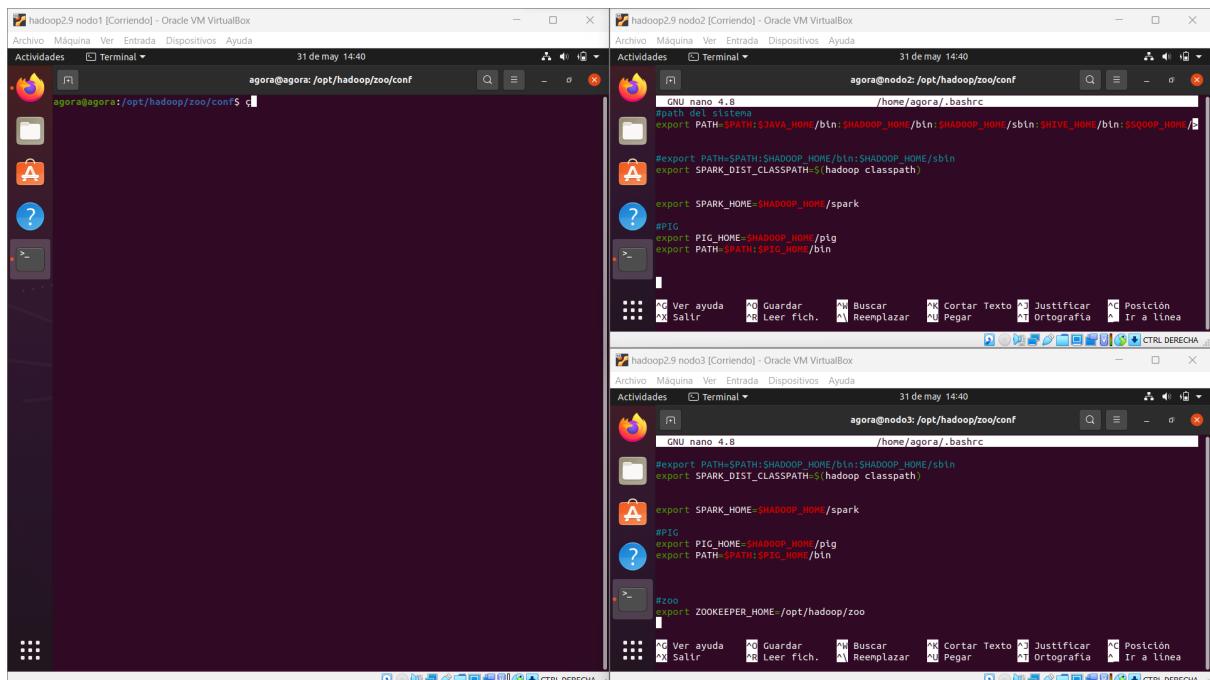
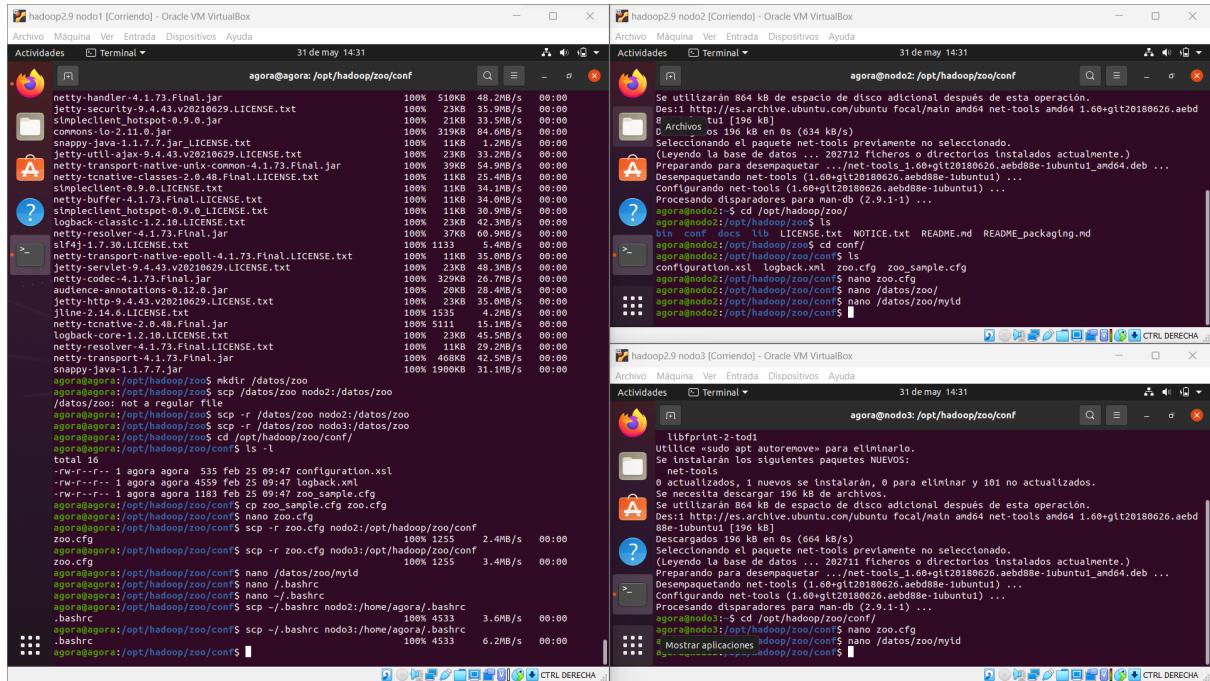
Incluimos el directorio de zookeeper al PATH del sistema editando el archivo `~/.bashrc` con nano

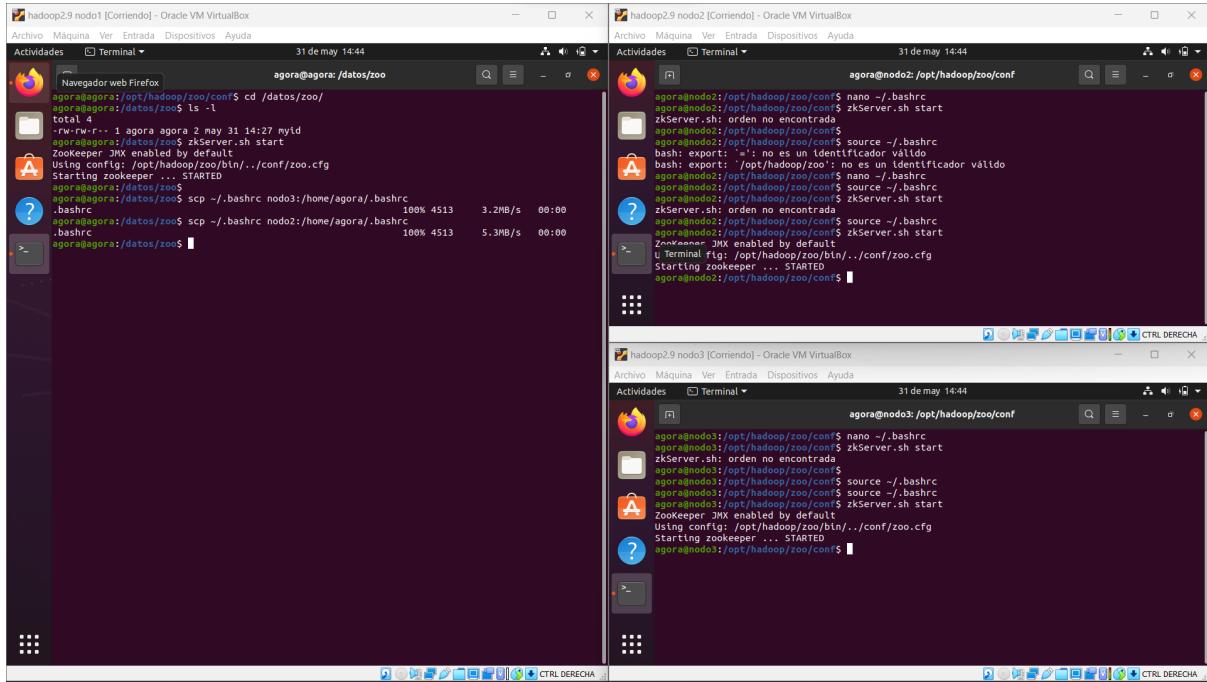
```
export ZOOKEEPER_HOME = /opt/hadoop/zoo
export PATH=$PATH:$ZOOKEEPER_HOME/bin
```

Y despues recargamos el archivo bashrc con source `~/.bashrc`

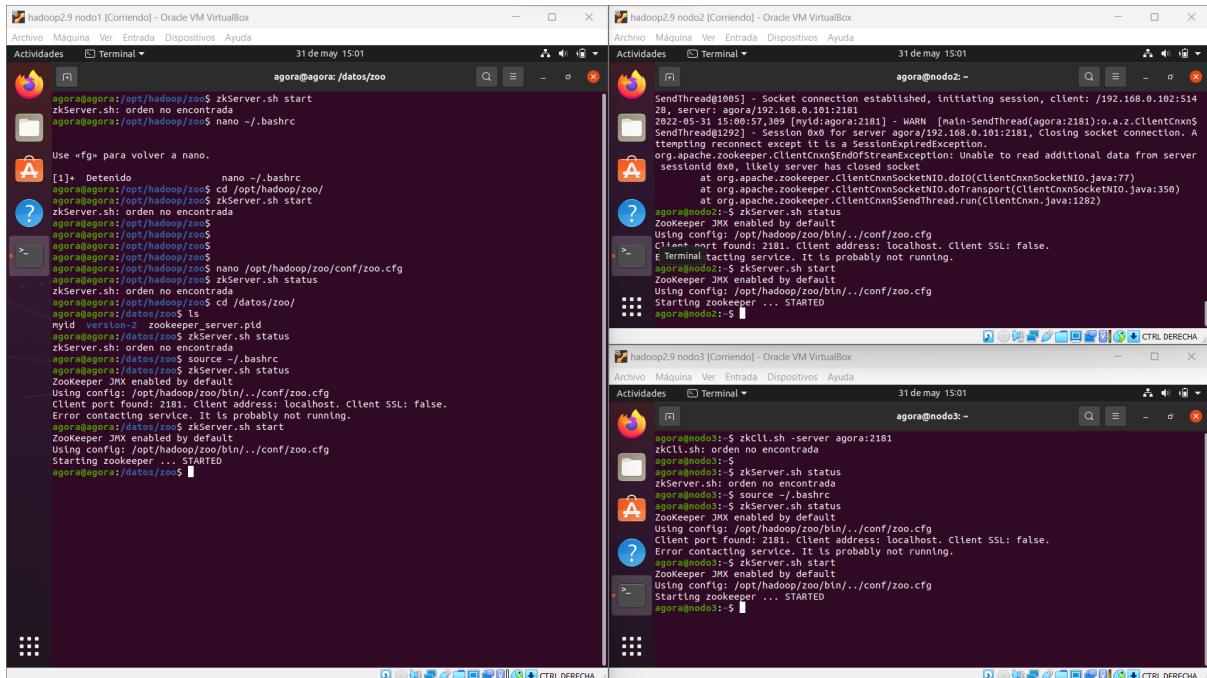


Y con scp otra vez mandamos el archivo al resto de nodos





Como tenemos zookeeper en el path lo podremos arrancar desde cualquier sitio ejecutando zkServer.sh start en el nodo agora y el nodo2 y nos indicará que se ha iniciado porque pone started



Y con zkCli.sh -server agora:2181 arrancamos el cliente en el nodo agora

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]

```

The terminal outputs show the client connecting to each node's port 2181, indicating successful connection establishment.

Y vemos que ya podremos ejecutar comandos, Creamos un nodo con el siguiente comando create /n1 valor1, Comprobamos que se ha creado con ls /

Para comprobar el contenido ejecutamos el comando get /n1

Para comprobarlo desde el resto de nodos simplemente ejecutamos el cliente y vemos con un ls / que se ha ejecutado todo correctamente

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]

```

The terminal outputs show the creation of node /n1 with value1 on node1, and its retrieval via get /n1 on nodes 2 and 3, confirming the successful creation and propagation of the node across the cluster.

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]

```

Logs from the three nodes:

- Node 1 (nodo1):**

```

2022-06-01 14:43:44,422 [myid:1] - INFO  [main:o.a.z.Environment@98] - Client environment:os.version=Ubuntu, 20.04.1-generc
2022-06-01 14:43:44,422 [myid:1] - INFO  [main:o.a.z.Environment@98] - Client environment:user.name=agora
2022-06-01 14:43:44,423 [myid:1] - INFO  [main:o.a.z.Environment@98] - Client environment:user.home=/home/agora
2022-06-01 14:43:44,423 [myid:1] - INFO  [main:o.a.z.Environment@98] - Client environment:user.dir=/home/agora
2022-06-01 14:43:44,423 [myid:1] - INFO  [main:o.a.z.Environment@98] - Client environment:mem.free=469M
2022-06-01 14:43:44,423 [myid:1] - INFO  [main:o.a.z.Environment@98] - Client environment:mem.total=599M
2022-06-01 14:43:44,423 [myid:1] - INFO  [main:o.a.z.Environment@98] - Client environment:os.mem.rv.total=599M
2022-06-01 14:43:44,423 [myid:1] - INFO  [main:o.a.z.ZooKeeper@637] - Initiating client connect
n, connectString=agora:2181 sessionTimeout=30000 watcher=org.apache.zookeeper.ZooKeeperMain$MyW
atcher@108000179ad0006
2022-06-01 14:43:44,452 [myid:1] - INFO  [main:o.a.z.c.X509Util@777] - Setting -D jdk.tls.rejectCl
ientInitiatedDtlsNegotiation=true to disable client-initiated TLS renegotiation
2022-06-01 14:43:44,465 [myid:1] - INFO  [main:o.a.z.ClientCnxnSocket@239] - jute.maxbuffer value
is 1048576 Bytes
2022-06-01 14:43:44,475 [myid:1] - INFO  [main:o.a.z.ClientCnxn@1732] - zookeeper.request.timeout
value is 0, feature.enabled=false
Welcome to ZooKeeper!
2022-06-01 14:43:44,502 [myid:agora:2181] - INFO  [main:SendThread(agora:2181):o.a.z.ClientCnxnS
ocket@10800179ad0006] - Socket connection established, initiating session, client: /192.168.0.101:331
34->agora:2181
2022-06-01 14:43:44,634 [myid:agora:2181] - INFO  [main:SendThread(agora:2181):o.a.z.ClientCnxnS
ocketThread@1444] - Session establishment complete on server agora/192.168.0.101:2181, session id
= 0x10000179ad0007, negotiated timeout = 30000
WATCHER:

```
- Node 2 (nodo2):**

```

2022-06-01 14:43:44,502 [myid:agora:2181] - INFO  [main:SendThread(agora:2181):o.a.z.ClientCnxnS
ocket@10800179ad0006] - Socket connection established, initiating session, client: /192.168.0.101:331
34->agora:2181
2022-06-01 14:43:44,503 [myid:agora:2181] - INFO  [main:SendThread(agora:2181):o.a.z.ClientCnxnS
ocketThread@1444] - Session establishment complete on server agora/192.168.0.101:2181, session id
= 0x10000179ad0007, negotiated timeout = 30000
WATCHER:

```
- Node 3 (nodo3):**

```

2022-06-01 14:43:44,503 [myid:agora:2181] - INFO  [main:SendThread(agora:2181):o.a.z.ClientCnxnS
ocket@10800179ad0006] - Socket connection established, initiating session, client: /192.168.0.101:331
34->agora:2181
2022-06-01 14:43:44,505 [myid:agora:2181] - INFO  [main:SendThread(agora:2181):o.a.z.ClientCnxnS
ocketThread@1444] - Session establishment complete on server agora/192.168.0.101:2181, session id
= 0x10000179ad0007, negotiated timeout = 30000
WATCHER:

```

Editamos el archivo core-site.xml con nano el valor de dfs.defaultFS indicamos el valor hdfs://ha-cluster

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]

```

Logs from the three nodes:

- Node 1 (nodo1):**

```

4 de jun 13:22
GNU nano 4.8 core-site.xml
<xml version='1.0' encoding='UTF-8'>
<!--$Id: configuration.xml,v 1.1 2005/07/04 17:03:00 jason Exp $-->
<!-- Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at
http://www.apache.org/licenses/LICENSE-2.0.

Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
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>fs.defaultFS</name>
        <value>hdfs://agora:9000/ha-cluster</value>
    </property>
</configuration>

```
- Node 2 (nodo2):**

```

4 de jun 13:22
GNU nano 4.8 core-site.xml
<!--$Id: configuration.xml,v 1.1 2005/07/04 17:03:00 jason Exp $-->
<!-- Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at
http://www.apache.org/licenses/LICENSE-2.0.

Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
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>fs.defaultFS</name>
        <value>hdfs://agora:9000/ha-cluster</value>
    </property>
</configuration>

```
- Node 3 (nodo3):**

```

4 de jun 13:22
GNU nano 4.8 core-site.xml
<!--$Id: configuration.xml,v 1.1 2005/07/04 17:03:00 jason Exp $-->
<!-- Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at
http://www.apache.org/licenses/LICENSE-2.0.

Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
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>fs.defaultFS</name>
        <value>hdfs://agora:9000/ha-cluster</value>
    </property>
</configuration>

```

Y el archivo hdfs-site.xml en el que introduciremos:

```
<property>
    <name>dfs.nameservices</name>
    <value>ha-cluster</value>
</property>
<property>
    <name>dfs.ha.namenodes.ha-cluster</name>
    <value>agora,nodo2</value>
</property>
<property>
    <name>dfs.permissions</name>
    <value>false</value>
</property>
<property>
    <name>dfs.namenode.rpc-address.ha-cluster.agora</name>
    <value>agora:9000</value>
</property>
<property>
    <name>dfs.namenode.rpc-address.ha-cluster.nodo2</name>
    <value>nodo2:9000</value>
</property>
<property>
    <name>dfs.namenode.http-address.ha-cluster.agora</name>
    <value>agora:50070</value>
</property>
<property>
    <name>dfs.namenode.http-address.ha-cluster.nodo2</name>
    <value>nodo2:50070</value>
</property>
<property>
    <name>dfs.namenode.shared.edits.dir</name>
    <value>qjournal://nodo3:8485;nodo2:8485;agora:8485/ha-cluster</value>
</property>
<property>
    <name>dfs.journalnode.edits.dir</name>
    <value>datos/jn</value>
</property>
<property>
    <name>dfs.client.failover.proxy.provider.ha-cluster</name>
<value>org.apache.hadoop.hdfs.server.namenode.ha.ConfiguredFailoverProxyProvider</value>
</property>
<property>
    <name>dfs.ha.automatic-failover.enabled</name>
    <value>true</value>
</property>
<property>
```

```
<name>ha.zookeeper.quorum</name>
<value>agora:2181,nodo2:2181,nodo3:2181</value>
</property>
<property>
<name>dfs.ha.fencing.methods</name>
<value>sshfence</value>
</property>
<property>
<name>dfs.ha.fencing.ssh.private-key-files</name>
<value>/home/agora/.ssh/id_rsa</value>
</property>
```

Mediante el comando scp hdfs-site.xml nodo2:/opt/hadoop/etc/hadoop lo mandaremos al nodo2 y al nodo3

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]

```

The screenshot shows three terminal windows side-by-side. The left window (nodo1) shows the command being run: `agora@agora:~/opt/hadoop/etc/hadoop\$ scp hdfs-site.xml nodo2:/opt/hadoop/etc/hadoop`. The middle window (nodo2) shows the file being received: `agora@nodo2:~/opt/hadoop/etc/hadoop\$ ls` followed by a list of files including `hdfs-site.xml`. The right window (nodo3) shows the file being received: `agora@nodo3:~/opt/hadoop/etc/hadoop\$ ls` followed by a list of files including `hdfs-site.xml`.

Nos dirigimos a /opt/hadoop/sbin y arrancamos el journal en los tres nodos, que es el demonio que va a recibir los cambios que se realizan dentro del cluster

hadoop-daemon.sh start journalnode (nos permite arrancar y parar procesos individualmente)

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]

```

The screenshot shows three terminal windows side-by-side. The left window (nodo1) shows the command being run: `agora@agora:~/datos\$./hadoop-daemon.sh start journalnode`. The middle window (nodo3) shows the command being run: `agora@nodo3:~/datos\$./hadoop-daemon.sh start journalnode`. The right window (nodo2) shows the command being run: `agora@nodo2:~/datos\$./hadoop-daemon.sh start journalnode`. All three windows show the output of the command, which includes logs and file paths related to the start of the journalnode service.

Ejecutamos jps y comprobamos que los demonios están activos

comprobamos que se ha creado el /datos/jn

En el nodo2 vamos a sincronizar con el nodo agora

hdfs namenode -bootstrapStandby

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]

```

The image shows four terminal windows from a Linux desktop environment. Each window has a title bar indicating the host name and status (e.g., 'Corriendo'). The terminals are running the 'jps' command to list active Java processes. The output shows various Hadoop daemons running, such as DataNode, NameNode, and TaskTracker. The fourth terminal window on the right shows the command being run on the 'nodo2' host.

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]

```

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]

```

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]

```

The image shows four terminal windows from a Linux desktop environment. Each window has a title bar indicating the host name and status (e.g., 'Corriendo'). The terminals are running the 'jps' command to list active Java processes. The output shows various Hadoop daemons running, such as DataNode, NameNode, and TaskTracker. The fourth terminal window on the right shows the command being run on the 'nodo2' host.

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]

```

```
En el nodo agora hacemos lo siguiente:  
hdfs zkfc -formatZK  
hadoop-daemon.sh start zkfc
```

Y repetimos la operación en el nodo2

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo4 [Corriendo] - Oracle VM VirtualBox]

```

The image shows four terminal windows from Oracle VM VirtualBox, each representing a different node (nodo1, nodo2, nodo3, and nodo4) running Hadoop 2.9. The terminals are displaying command-line outputs related to the configuration and startup of Hadoop services.

- nodo1:** Shows the configuration of ZooKeeper and the start of various daemons. It includes commands like `bin conf`, `hadoop-daemon.sh start`, and logs for `journalnode` and `zkfc`.
- nodo2:** Shows the configuration of ZooKeeper and the start of various daemons. It includes commands like `bin conf`, `hadoop-daemon.sh start`, and logs for `journalnode` and `zkfc`.
- nodo3:** Shows the configuration of ZooKeeper and the start of various daemons. It includes commands like `bin conf`, `hadoop-daemon.sh start`, and logs for `journalnode` and `zkfc`.
- nodo4:** Shows the configuration of ZooKeeper and the start of various daemons. It includes commands like `bin conf`, `hadoop-daemon.sh start`, and logs for `journalnode` and `zkfc`.

The output in each terminal window is identical, indicating a successful configuration and startup of the Hadoop cluster across all four nodes.

Paramos todo con stop-dfs.sh

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]

```

Output from the terminals:

```

[hadoop2.9 nodo1]
[hadoop2.9 nodo3]
[hadoop2.9 nodo2]

```

Y lo arrancamos con start-dfs.sh

```

[hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox]
[hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox]

```

Output from the terminals:

```

[hadoop2.9 nodo1]
[hadoop2.9 nodo3]
[hadoop2.9 nodo2]

```

Y escribimos en el navegador: <http://agora:50070> y en otra pestaña <http://nodo2:50075> y vemos el estado de ambos

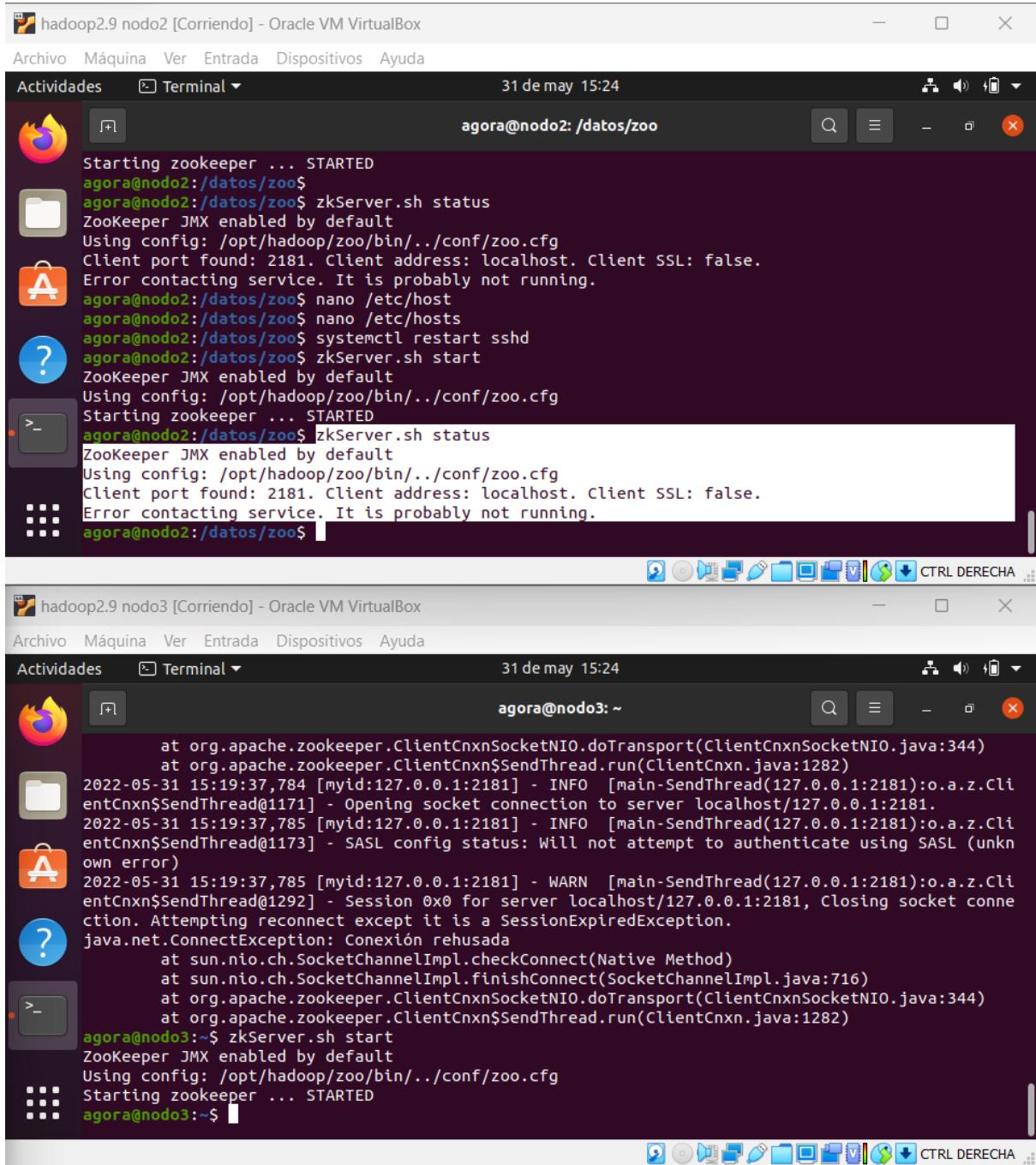
The screenshot shows a Linux desktop environment with three windows open:

- Firefox Browser (Top Left):** Title: "Namenode information". URL: "agora:50070/dfshealth.html#tab-overview". Content: "Overview 'agora:9000' (standby)".

Namespace:	ha-cluster
Namenode ID:	agora
Started:	Sat Jun 04 14:04:27 +0200 2022
Version:	2.10.1, 187247c9a56f133025f8557bc2c562d78e816
Compiled:	Mon Sep 14 15:17:00 +0200 2020 by centos from branch-2.10.1
Cluster ID:	CID-8df33d31-390c-401a-7bdc-0598bb455ce5
Block Pool ID:	BP-44050586-192.168.0.101-1650473874513
- Firefox Browser (Bottom Left):** Title: "DataNode Information". URL: "nodo2:50075/datanode.html#tab-overview". Content: "Summary".

Namenode Address	Block Pool ID	Actor State	Last Heartbeat	Last Block Report	Last Block Report Size (Max Size)
agora:9000	BP-44050586-192.168.0.101-1650473874513	RUNNING	1s	3	142 B minutes (64 MB)
nodo2:9000	BP-44050586-192.168.0.101-1650473874513	CONNECTING	190s	3	0 B (64 minutes MB)
- Terminal Window (Right):** Title: "hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox". Command: "agora@nodo3:~\$".

Posibles errores:



The image shows two terminal windows side-by-side, both titled "hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox" and "hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox". Both windows have a dark theme and show a terminal session with the user "agora".

Terminal on nodo2:

```
Starting zookeeper ... STARTED
agora@nodo2:/datos/zoo$ zkServer.sh status
ZooKeeper JMX enabled by default
Using config: /opt/hadoop/zoo/bin/../conf/zoo.cfg
Client port found: 2181. Client address: localhost. Client SSL: false.
Error contacting service. It is probably not running.
agora@nodo2:/datos/zoo$ nano /etc/host
agora@nodo2:/datos/zoo$ nano /etc/hosts
agora@nodo2:/datos/zoo$ systemctl restart sshd
agora@nodo2:/datos/zoo$ zkServer.sh start
ZooKeeper JMX enabled by default
Using config: /opt/hadoop/zoo/bin/../conf/zoo.cfg
Starting zookeeper ... STARTED
agora@nodo2:/datos/zoo$ zkServer.sh status
ZooKeeper JMX enabled by default
Using config: /opt/hadoop/zoo/bin/../conf/zoo.cfg
Client port found: 2181. Client address: localhost. Client SSL: false.
Error contacting service. It is probably not running.
agora@nodo2:/datos/zoo$
```

Terminal on nodo3:

```
at org.apache.zookeeper.ClientCnxnSocketNIO.doTransport(ClientCnxnSocketNIO.java:344)
at org.apache.zookeeper.ClientCnxn$SendThread.run(ClientCnxn.java:1282)
2022-05-31 15:19:37,784 [myid:127.0.0.1:2181] - INFO  [main-SendThread(127.0.0.1:2181):o.a.z.ClientCnxn$SendThread@1171] - Opening socket connection to server localhost/127.0.0.1:2181.
2022-05-31 15:19:37,785 [myid:127.0.0.1:2181] - INFO  [main-SendThread(127.0.0.1:2181):o.a.z.ClientCnxn$SendThread@1173] - SASL config status: Will not attempt to authenticate using SASL (unknown error)
2022-05-31 15:19:37,785 [myid:127.0.0.1:2181] - WARN  [main-SendThread(127.0.0.1:2181):o.a.z.ClientCnxn$SendThread@1292] - Session 0x0 for server localhost/127.0.0.1:2181, Closing socket connection. Attempting reconnect except it is a SessionExpiredException.
java.net.ConnectException: Conexión rehusada
at sun.nio.ch.SocketChannelImpl.checkConnect(Native Method)
at sun.nio.ch.SocketChannelImpl.finishConnect(SocketChannelImpl.java:716)
at org.apache.zookeeper.ClientCnxnSocketNIO.doTransport(ClientCnxnSocketNIO.java:344)
at org.apache.zookeeper.ClientCnxn$SendThread.run(ClientCnxn.java:1282)
agora@nodo3:~$ zkServer.sh start
ZooKeeper JMX enabled by default
Using config: /opt/hadoop/zoo/bin/../conf/zoo.cfg
Starting zookeeper ... STARTED
agora@nodo3:~$
```

hadoop2.9 nodo1 [Corriendo] - Oracle VM VirtualBox

Actividades Terminal 31 de may 15:27

agora@agora:~\$ cd /datos/zoo

```
entCnxnSendThread@1173] - SASL config status: Will not attempt to authenticate using SASL (unkn own error)
2022-05-31 15:19:11,827 [myid:127.0.0.1:2181] - INFO [main-SendThread(127.0.0.1:2181):o.a.z.Cli entCnxnSendThread@1005] - Socket connection established, initiating session, client: /127.0.0.1:39128 server: localhost/127.0.0.1:2181
2022-05-31 15:19:11,830 [myid:127.0.0.1:2181] - WARN [main-SendThread(127.0.0.1:2181):o.a.z.Cli entCnxnSendThread@1292] - Session 0x0 for server localhost@127.0.0.1:2181, Closing socket connection. Attempting reconnect except it is a SessionExpiredException
org.apache.zookeeper.ClientCnxnSendOrDieFromException: Unable to read additional data from server sessionid 0x0, likely server has closed socket
at org.apache.zookeeper.ClientCnxnSendOrDieFromRead(ClientCnxnSocketNIO.java:77)
at org.apache.zookeeper.ClientCnxnSocketNIO.doTransport(ClientCnxnSocketNIO.java:350)
at org.apache.zookeeper.ClientCnxnSocketNIO.readThread.run(ClientCnxn.java:1282)
```

2022-05-31 15:19:13,554 [myid:127.0.0.1:2181] - INFO [main-SendThread(127.0.0.1:2181):o.a.z.Cli entCnxnSendThread@1171] - Opening socket connection to server localhost/127.0.0.1:2181
2022-05-31 15:19:13,554 [myid:127.0.0.1:2181] - INFO [main-SendThread(127.0.0.1:2181):o.a.z.Cli entCnxnSendThread@1292] - SASL config status: Will not attempt to authenticate using SASL (unkn own error)
2022-05-31 15:19:13,555 [myid:127.0.0.1:2181] - INFO [main-SendThread(127.0.0.1:2181):o.a.z.Cli entCnxnSendThread@1005] - Socket connection established, initiating session, client: /127.0.0.1:39128 server: localhost/127.0.0.1:2181
2022-05-31 15:19:13,555 [myid:127.0.0.1:2181] - WARN [main-SendThread(127.0.0.1:2181):o.a.z.Cli entCnxnSendThread@1292] - Session 0x0 for server localhost@127.0.0.1:2181, Closing socket connection. Attempting reconnect except it is a SessionExpiredException
org.apache.zookeeper.ClientCnxnSendOrDieFromException: Unable to read additional data from server sessionid 0x0, likely server has closed socket
at org.apache.zookeeper.ClientCnxnSocketNIO.do0(ClientCnxnSocketNIO.java:77)
at org.apache.zookeeper.ClientCnxnSocketNIO.doTransport(ClientCnxnSocketNIO.java:350)
at org.apache.zookeeper.ClientCnxnSendThread.run(ClientCnxn.java:1282)

2022-05-31 15:19:15,182 [myid:127.0.0.1:2181] - INFO [main-SendThread(127.0.0.1:2181):o.a.z.Cli entCnxnSendThread@1171] - Opening socket connection to server localhost/127.0.0.1:2181
2022-05-31 15:19:15,183 [myid:127.0.0.1:2181] - INFO [main-SendThread(127.0.0.1:2181):o.a.z.Cli entCnxnSendThread@1173] - SASL config status: Will not attempt to authenticate using SASL (unkn own error)
2022-05-31 15:19:15,182 [myid:127.0.0.1:2181] - INFO [main-SendThread(127.0.0.1:2181):o.a.z.Cli entCnxnSendThread@1292] - Session 0x0 for server localhost@127.0.0.1:2181, Closing socket connection. Attempting reconnect except it is a SessionExpiredException
org.apache.zookeeper.ClientCnxnSendOrDieFromException: Unable to read additional data from server sessionid 0x0, likely server has closed socket
at org.apache.zookeeper.ClientCnxnSocketNIO.do0(ClientCnxnSocketNIO.java:77)
at org.apache.zookeeper.ClientCnxnSocketNIO.doTransport(ClientCnxnSocketNIO.java:350)
at org.apache.zookeeper.ClientCnxnSendThread.run(ClientCnxn.java:1282)

agora@agora:~\$./zkServer.sh start

Zookeeper JMX enabled by default

Using config: /opt/hadoop/zoo/bin/../conf/zoo.cfg

Starting zookeeper ... already running as process 3852.

hadoop2.9 nodo2 [Corriendo] - Oracle VM VirtualBox

Actividades Terminal 31 de may 15:27

agora@nodo2:~\$ cd /datos/zoo

```
Starting zookeeper ... STARTED
agora@nodo2:~$ ./zksServer.sh status
Zookeeper JMX enabled by default
Using config: /opt/hadoop/zoo/bin/../conf/zoo.cfg
Client port found: 2181. Client address: localhost. Client SSL: false.
Error contacting service. It is probably not running.
agora@nodo2:~$ ./zksServer.sh nano /etc/host
agora@nodo2:~$ ./zksServer.sh nano /etc/hosts
agora@nodo2:~$ ./zksServer.sh systemctl restart sshd
agora@nodo2:~$ ./zksServer.sh nano /etc/hosts
Zookeeper JMX enabled by default
Using config: /opt/hadoop/zoo/bin/../conf/zoo.cfg
Starting zookeeper ... STARTED
agora@nodo2:~$ ./zksServer.sh status
Zookeeper JMX enabled by default
Using config: /opt/hadoop/zoo/bin/../conf/zoo.cfg
Client port found: 2181. Client address: localhost. Client SSL: false.
E Mostrar aplicaciones e rvclece. It is probably not running.
agora@nodo2:~$ ./zksServer.sh status
[1] + 0: ./zksServer.sh status
```

hadoop2.9 nodo3 [Corriendo] - Oracle VM VirtualBox

Actividades Terminal 31 de may 15:27

agora@nodo3:~\$

```
at org.apache.zookeeper.ClientCnxnSocketNIO.doTransport(ClientCnxnSocketNIO.java:344)
at org.apache.zookeeper.ClientCnxnSendThread.run(ClientCnxn.java:1282)
2022-05-31 15:19:37,784 [myid:127.0.0.1:2181] - INFO [main-SendThread@1171] - Opening socket connection to server localhost/127.0.0.1:2181
2022-05-31 15:19:37,785 [myid:127.0.0.1:2181] - INFO [main-SendThread(127.0.0.1:2181):o.a.z.Cli entCnxnSendThread@1173] - SASL config status: Will not attempt to authenticate using SASL (unkn own error)
2022-05-31 15:19:37,785 [myid:127.0.0.1:2181] - WARN [main-SendThread(127.0.0.1:2181):o.a.z.Cli entCnxnSendThread@1292] - Session 0x0 for server localhost@127.0.0.1:2181, Closing socket connection. Attempting reconnect except it is a SessionExpiredException.
java.net.ConnectException: Connection refused
at sun.nio.ch.SocketChannelImpl.finishConnect(Native Method)
at sun.nio.ch.SocketChannelImpl.finishConnect(SocketChannelImpl.java:16)
at org.apache.zookeeper.ClientCnxnSocketNIO.doTransport(ClientCnxnSocketNIO.java:344)
at org.apache.zookeeper.ClientCnxnSendThread.run(ClientCnxn.java:1282)
agora@nodo3:~$ ./zksServer.sh start
Zookeeper JMX enabled by default
Using config: /opt/hadoop/zoo/bin/../conf/zoo.cfg
Starting zookeeper ... STARTED
agora@nodo3:~$
```

```
agora@agora:/opt/hadoop/zoo/conf$ zkCli.sh -server agora:2181
Connecting to agora:2181
2022-05-31 15:36:56,295 [myid:] - INFO  [main:o.a.z.Environment@98] - Client environment:zookeeper.version=3.8.0-5a02a05edd59aee6ac762f7ea82e92a68eb9c0f, built on 2022-02-25 08:49 UTC
2022-05-31 15:36:56,300 [myid:] - INFO  [main:o.a.z.Environment@98] - Client environment:host.name=agora
2022-05-31 15:36:56,301 [myid:] - INFO  [main:o.a.z.Environment@98] - Client environment:java.version=1.8.0_312
2022-05-31 15:36:56,301 [myid:] - INFO  [main:o.a.z.Environment@98] - Client environment:java.vendor=Private Build
2022-05-31 15:36:56,301 [myid:] - INFO  [main:o.a.z.Environment@98] - Client environment:java.home=/usr/lib/jvm/java-8-openjdk-amd64/jre
2022-05-31 15:36:56,302 [myid:] - INFO  [main:o.a.z.Environment@98] - Client environment:java.class.path=/opt/hadoop/zoo/bin/../zookeeper-server/target/classes:/opt/hadoop/zoo/bin/../build/classes:/opt/hadoop/zoo/bin/../zookeeper-server/target/lib/*.jar:/opt/hadoop/zoo/bin/../build/lib/*.jar:/opt/hadoop/zoo/bin/../lib/zookeeper-prometheus-metrics-3.8.0.jar:/opt/hadoop/zoo/bin/../lib/zookeeper-jute-3.8.0.jar:/opt/hadoop/zoo/bin/../lib/zookeeper-3.8.0.jar:/opt/hadoop/zoo/bin/../lib/snappy-java-1.1.7.7.jar:/opt/hadoop/zoo/bin/../lib/slf4j-api-1.7.30.jar:/opt/hadoop/zoo/bin/../lib/simpleclient_servlet-0.9.0.jar:/opt/hadoop/zoo/bin/../lib/simpleclient_hotspot-0.9.0.jar:/opt/hadoop/zoo/bin/../lib/simpleclient_common-0.9.0.jar:/opt/hadoop/zoo/bin/../lib/simpleclient-0.9.0.jar:/opt/hadoop/zoo/bin/../lib/netty-transport-native-unix-common-4.1.73.Final.jar:/opt/hadoop/zoo/bin/../lib/netty-transport-native-epoll-4.1.73.Final.jar:/opt/hadoop/zoo/bin/../lib/netty-transport-classes-epoll-4.1.73.Final.jar:/opt/hadoop/zoo/bin/../lib/netty-transport-4.1.73.Final.jar:/opt/hadoop/zoo/bin/../lib/netty-tcnative-classes-2.0.48.Final.jar:/opt/hadoop/zoo/bin/../lib/netty-tcnative-2.0.48.Final.jar:/opt/hadoop/zoo/bin/../lib/netty-resolver-4.1.73.Final.jar:/opt/hadoop/zoo/bin/../lib/netty-handler-4.1.73.Final.jar:/opt/hadoop/zoo/bin/../lib/netty-common-4.1.73.Final.jar:/opt/hadoop/zoo/bin/../lib/netty-codec-4.1.73.Final.jar:/opt/hadoop/zoo/bin/../lib/netty-buffer-4.1.73.Final.jar:/opt/hadoop/zoo/bin/../lib/metrics-core-4.1.12.1.jar:/opt/hadoop/zoo/bin/../lib/logback-core-1.2.10.jar:/opt/hadoop/zoo/bin/../lib/logback-classic-1.2.10.jar:/opt/hadoop/zoo/bin/../lib/jline-2.14.6.jar:/opt/hadoop/zoo/bin/../lib/jetty-util-ajax-9.4.43.v20210629.jar:/opt/hadoop/zoo/bin/../lib/jetty-util-9.4.43.v20210629.jar:/opt/hadoop/zoo/bin/../lib/jetty-servlet-9.4.43.v20210629.jar:/opt/hadoop/zoo/bin/../lib/jetty-server-9.4.43.v20210629.jar:/opt/hadoop/zoo/bin/../lib/jetty-security-9.4.43.v20210629.jar:/opt/hadoop/zoo/bin/../lib/jetty-io-9.4.43.v20210629.jar:/opt/hadoop/zoo/bin/../lib/jetty-http-9.4.43.v20210629.jar:/opt/hadoop/zoo/bin/../lib/javax.servlet-api-3.1.0.jar:/opt/hadoop/zoo/bin/../lib/jackson-databind-2.13.1.jar:/opt/hadoop/zoo/bin/../lib/jackson-core-2.13.1.jar:/opt/hadoop/zoo/bin/../lib/jackson-annotations-2.13.1.jar:/opt/hadoop/zoo/bin/../lib/commons-io-2.11.0.jar:/opt/hadoop/zoo/bin/../lib/commons-cli-1.4.jar:/opt/hadoop/zoo/bin/../lib/audience-annotations-0.12.0.jar:/opt/hadoop/zoo/bin/../zookeeper-*.jar:/opt/hadoop/zoo/bin/../zookeeper-server/src/main/resources/lib/*.jar:/opt/hadoop/zoo/bin/../conf:
2022-05-31 15:36:56,302 [myid:] - INFO  [main:o.a.z.Environment@98] - Client environment:java.library.path=/usr/java/packages/lib/amd64:/usr/lib/x86_64-linux-gnu/jni:/lib/x86_64-linux-gnu:/usr
```

```

2022-05-31 15:37:03,348 [myid:agora:2181]  INFO  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1171] - Opening socket connection to server agora/192.168.0.101:2181
2022-05-31 15:37:03,348 [myid:agora:2181]  INFO  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1173] - SASL config status: Will not attempt to authenticate using SASL (unknown error)
2022-05-31 15:37:03,348 [myid:agora:2181]  INFO  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1065] - Socket connection established, initiating session, client: /192.168.0.101:50920, server: agora/192.168.0.101:2181
2022-05-31 15:37:03,350 [myid:agora:2181]  WARN  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1292] - Session 0x0 for server agora/192.168.0.101:2181, Closing socket connection. Attempting r
econnect except it is a SessionExpiredException.
org.apache.zookeeper.ClientCnxn$EndOfStreamException: Unable to read additional data from server sessionid 0x0, likely server has closed socket
at org.apache.zookeeper.ClientCnxnSocketNIO.doTransport(ClientCnxnSocketNIO.java:350)
at org.apache.zookeeper.ClientCnxn$SendThread.run(ClientCnxn.java:1282)
2022-05-31 15:37:04,350 [myid:agora:2181]  INFO  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1171] - Opening socket connection to server agora/192.168.0.101:2181
2022-05-31 15:37:04,949 [myid:agora:2181]  INFO  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1173] - SASL config status: Will not attempt to authenticate using SASL (unknown error)
2022-05-31 15:37:04,951 [myid:agora:2181]  INFO  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1065] - Socket connection established, initiating session, client: /192.168.0.101:50924, server: agora/192.168.0.101:2181
2022-05-31 15:37:04,951 [myid:agora:2181]  WARN  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1292] - Session 0x0 for server agora/192.168.0.101:2181, Closing socket connection. Attempting r
econnect except it is a SessionExpiredException.
org.apache.zookeeper.ClientCnxn$EndOfStreamException: Unable to read additional data from server sessionid 0x0, likely server has closed socket
at org.apache.zookeeper.ClientCnxnSocketNIO.doIO(ClientCnxnSocketNIO.java:77)
at org.apache.zookeeper.ClientCnxnSocketNIO.doTransport(ClientCnxnSocketNIO.java:350)
at org.apache.zookeeper.ClientCnxn$SendThread.run(ClientCnxn.java:1282)
2022-05-31 15:37:06,597 [myid:agora:2181]  INFO  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1171] - Opening socket connection to server agora/192.168.0.101:2181
2022-05-31 15:37:06,597 [myid:agora:2181]  INFO  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1173] - SASL config status: Will not attempt to authenticate using SASL (unknown error)
2022-05-31 15:37:06,597 [myid:agora:2181]  INFO  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1065] - Socket connection established, initiating session, client: /192.168.0.101:50926, server: agora/192.168.0.101:2181
2022-05-31 15:37:06,608 [myid:agora:2181]  WARN  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1292] - Session 0x0 for server agora/192.168.0.101:2181, Closing socket connection. Attempting r
econnect except it is a SessionExpiredException.
org.apache.zookeeper.ClientCnxn$EndOfStreamException: Unable to read additional data from server sessionid 0x0, likely server has closed socket
at org.apache.zookeeper.ClientCnxnSocketNIO.doIO(ClientCnxnSocketNIO.java:77)
at org.apache.zookeeper.ClientCnxn$SendThread.run(ClientCnxn.java:1282)
2022-05-31 15:37:07,766 [myid:agora:2181]  INFO  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1171] - Opening socket connection to server agora/192.168.0.101:2181
2022-05-31 15:37:07,767 [myid:agora:2181]  INFO  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1173] - SASL config status: Will not attempt to authenticate using SASL (unknown error)
2022-05-31 15:37:07,767 [myid:agora:2181]  INFO  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1065] - Socket connection established, initiating session, client: /192.168.0.101:50928, server: agora/192.168.0.101:2181
2022-05-31 15:37:07,712 [myid:agora:2181]  WARN  [main-SendThread(agora:2181):o.a.z.ClientCnxn$SendThread@1292] - Session 0x0 for server agora/192.168.0.101:2181, Closing socket connection. Attempting r
econnect except it is a SessionExpiredException.

```

Estos errores se pueden dar en mas de una ocasión, y la manera de solucionarlos son:

- 1.- Editando el PATH y comprobando que está todo correcto
- 2.- Reiniciando los equipos
- 3.- Una posible causa es que a la hora de hacer scp no se han pasado bien los archivos, por eso es mejor que antes de hacer el scp de nada se configure primero bien hasta la parte de hacer el status del zk, si el estatus no da error es que esta todo correcto, si no habría que reinstalarlo
- 4.- Darle permisos de chmod 777 sobre la carpeta zoo
- 5.- Instalarlo individualmente todo sin scp en cada nodo
- 6.- borrar la carpeta zoo y volver a empezar