STEPS TO INSTALL HADOOP ON UBUNTU

1. Update and Upgrade Ubuntu

sudo apt-get update

sudo apt-get upgrade

2. Install the JDK

sudo apt install default-jdk

Check java version:

java -version

3. Add a user Hadoop

sudo adduser Hadoop

After creating the user, switch to the user.

su –hadoop

4. Install open-SSH and Generate SSH Key pair:

Do not enter the passphrase when generating keys.

apt install openssh-server openssh-client -y

ssh-keygen

```
Enter your directory as: /your_home/.ssh/id_rsa
```

** Replace your home as : /home/XYZ where XYZ is your user

5. Put the public keys to Authorized keys

cat ~/.ssh/id_rsa.pub >> ~/.ssh/authorized_keys

6. Give necessary permissions to SSH folder and authorized key file.

chmod 700 ~/.ssh

chmod 600 ~/.ssh/authorized_keys

7. Allow firewall for SSH access.

sudo ufw allow ssh

8. Download Hadoop (Binary):

You can go to the Apache Hadoop Site, and download the latest stable binary version from site.

Copy the link to the binary file and use the command below:

wget https://dlcdn.apache.org/hadoop/common/hadoop-3.4.0/hadoop-3.4.0.tar.gz

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9. Untar (Unzip) the downloaded file.

tar –xvzf hadoop-3.4.0.tar.gz

10. Now we move the extracted Hadoop directory to the installation folder.

sudo mv hadoop-3.4.0 /usr/local/Hadoop

11. Create a directory for storing the system logs for Hadoop

sudo mkdir /usr/local/hadoop/logs

12. Change the ownership of Hadoop Directory.

sudo chown -R hadoop:hadoop /usr/local/Hadoop

13. Configuring the environment variables for Hadoop.

sudo vi ~/.bashrc

ADD the following lines at the bottom of this file:

export HADOOP_HOME=/usr/local/hadoop

export HADOOP_INSTALL=$HADOOP_HOME

export HADOOP_MAPRED_HOME=$HADOOP_HOME

export HADOOP_COMMON_HOME=$HADOOP_HOME

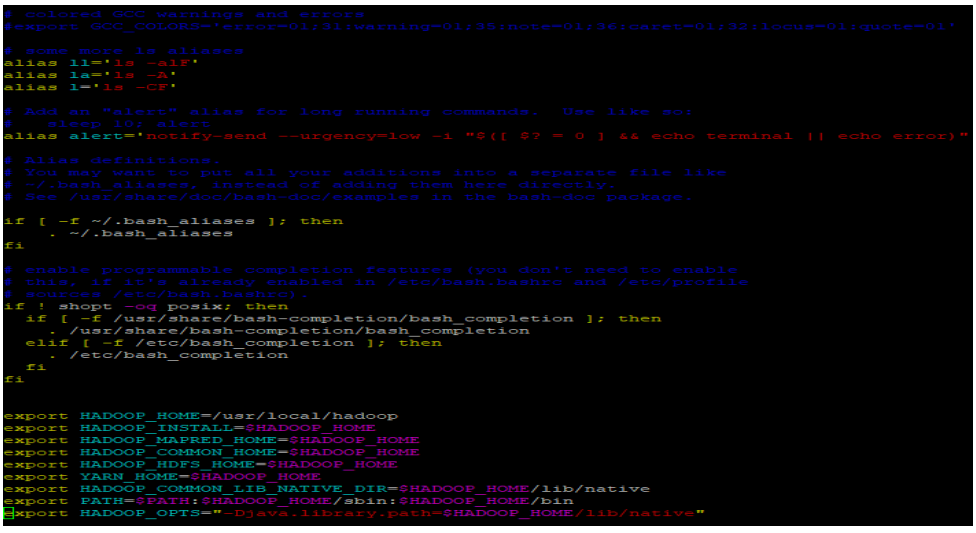
export HADOOP_HDFS_HOME=$HADOOP_HOME

export YARN_HOME=$HADOOP_HOME

export HADOOP_COMMON_LIB_NATIVE_DIR=$HADOOP_HOME/lib/native

export PATH=$PATH:$HADOOP_HOME/sbin:$HADOOP_HOME/bin

export HADOOP_OPTS="-Djava.library.path=$HADOOP_HOME/lib/native"



Save and close the file.

14. Make the variables effective

source ~/.bashrc

15. Find path to Java Compiler

which javac

16. Determine the open JDK location by using the location from the output of above command.

readlink -f /usr/bin/javac

17. Copy the path found in the output of above command (upto open-jdk directory) and open the file:

vi $HADOOP_HOME/etc/hadoop/hadoop-env.shop/hadoop-env.sh

and write the below lines at the bottom:

export JAVA_HOME=/usr/lib/jvm/java-11-openjdk-amd64

export HADOOP_CLASSPATH+=" $HADOOP_HOME/lib/*.jar"

Remember your JAVA_HOME variable should be the one you copied(upto open-jdk directory as shown above)

SAVE AND CLOSE THE FILE.

18. Navigate to Hadoop lib directory

cd /usr/local/hadoop/lib

19. Use the wget command to download the Javax activation file:

sudo wget https://jcenter.bintray.com/javax/activation/javax.activation-api/1.2.0/javax.activation-api-1.2.0.jar

20. Verify the Hadoop installation

hadoop version

You shall get output as:

```
hadoop@hadoop-iims:~$ hadoop version
Hadoop 3.4.0
Source code repository git@github.com:apache/hadoop.git -r bd8b77f398f626bb7791783192ee7a5dfaeec760
Compiled by root on 2024-03-04T06:35Z
Compiled on platform linux-x86_64
Compiled with protoc 3.21.12
From source with checksum f7fe694a3613358b38812ae9c31114e
This command was run using /usr/local/hadoop/share/hadoop/common/hadoop-common-3.4.0.jar
hadoop@hadoop-iims:~$
```

21. Make necessary configuration settings to specify the URL of Namenode.

sudo vi $HADOOP_HOME/etc/hadoop/core-site.xml

Add the following lines inside configuration part:

<configuration>

  <property>

    <name>fs.default.name</name>

    <value>hdfs://0.0.0.0:9000</value>

    <description>The default file system URI</description>

  </property>

</configuration>

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl" href="configuration.xsl"?>
<!--
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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>fs.default.name</name>
        <value>hdfs://0.0.0.0:9000</value>
        <description>The default file system URI</description>
    </property>
</configuration>
```

22. Create a directory for storing node metadata and change the ownership to Hadoop

sudo mkdir -p /home/hadoop/hdfs/{namenode,datanode}

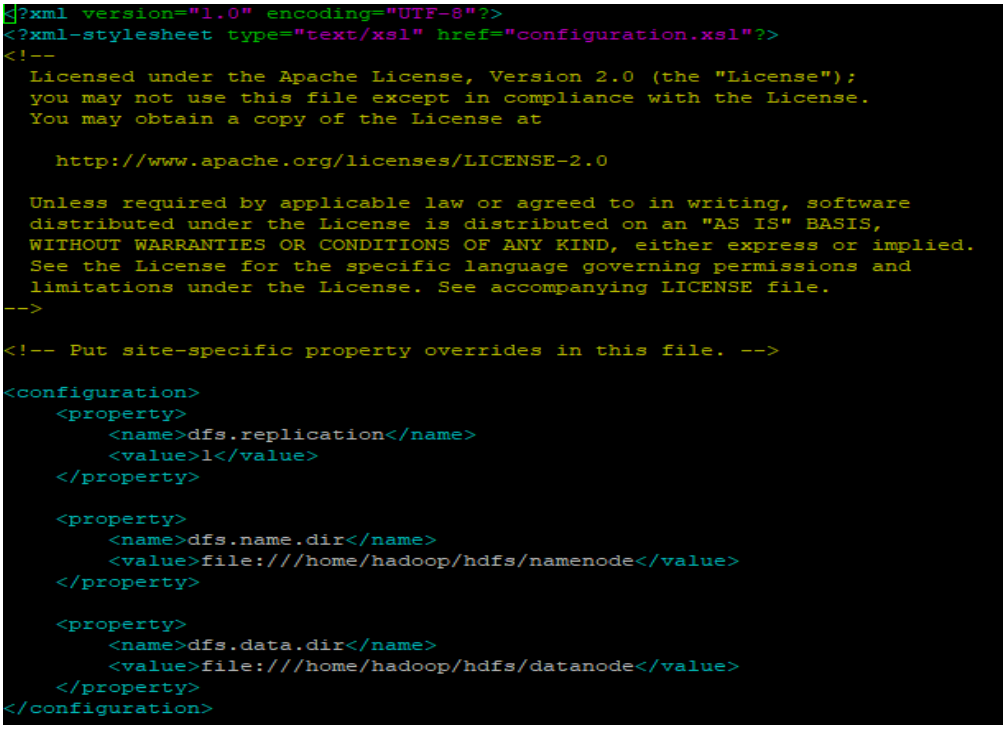
sudo chown -R hadoop:hadoop /home/hadoop/hdfs

23. Edit the hdfs-site.xml configuration file to define the location for storing node metadata and the replication factor

sudo vi $HADOOP_HOME/etc/hadoop/hdfs-site.xml and add the following lines:

Add the following lines inside configuration part:

```
<configuration>
  <property>
    <name>dfs.replication</name>
    <value>1</value>
  </property>
  <property>
    <name>dfs.name.dir</name>
    <value>file:///home/hadoop/hdfs/namenode</value>
  </property>
  <property>
    <name>dfs.data.dir</name>
    <value>file:///home/hadoop/hdfs/datanode</value>
  </property>
</configuration>
```



```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl" href="configuration.xsl"?>
<!--
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  limitations under the License. See accompanying LICENSE file.
-->

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

<configuration>
    <property>
        <name>dfs.replication</name>
        <value>1</value>
    </property>

    <property>
        <name>dfs.name.dir</name>
        <value>file:///home/hadoop/hdfs/namenode</value>
    </property>

    <property>
        <name>dfs.data.dir</name>
        <value>file:///home/hadoop/hdfs/datanode</value>
    </property>
</configuration>
```

24. Edit the mapred-site.xml configuration file to define MapReduce values.

Add the following lines inside configuration part:

sudo vi $HADOOP_HOME/etc/hadoop/mapred-site.xml

And add the following lines:

<configuration>

  <property>

    <name>mapreduce.framework.name</name>

    <value>yarn</value>

  </property>

</configuration>

```
<?xml version="1.0"?>
<?xml-stylesheet type="text/xsl" href="configuration.xsl"?>
<!--
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  limitations under the License. See accompanying LICENSE file.
-->

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

<configuration>
    <property>
        <name>mapreduce.framework.name</name>
        <value>yarn</value>
    </property>
</configuration>
```

25. Edit the yarn-site.xml configuration file and define YARN-related settings.

sudo vi $HADOOP_HOME/etc/hadoop/yarn-site.xml

And add the following lines:

```
<configuration>
  <property>
    <name>yarn.nodemanager.aux-services</name>
    <value>mapreduce_shuffle</value>
  </property>
</configuration>
```

```
<?xml version="1.0"?>
<!--
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-->

<configuration>
    <property>
        <name>yarn.nodemanager.aux-services</name>
        <value>mapreduce_shuffle</value>
    </property>
</configuration>
```

26. Validate Hadoop Configuration. This command wipes out all existing data in the Namenode, effectively setting up a new HDFS file system. As a result, it also deletes the file system metadata, including files, directories, and block locations.

hdfs namenode –format

27. Start the Namenode and Datanode:

start-dfs.sh

THE OUTPUT SHOULD LOOK SOMEWHAT LIKE THIS:

Starting namenode on [namenode_host]... started

Starting secondarynamenode on [secondarynamenode_host]... started

Starting datanode on [datanode_host1]... started

... (similar messages for all datanodes)

28. Start YARN

start-yarn.sh

You should get something like:

```
starting yarn daemons
starting resourcemanager, logging to /path/to/yarn-resourcemanager.log ...
started
starting nodemanager on [nodemanager_host1]... started
... (similar messages for all nodemanagers)
```

29. Verify all the running components

jps

You should get something like:

```
3214 SecondaryNameNode
4320 Jps
3854 Resourcemanager
3456 DataNode
4084 NodeManager
3274 NameNode
```

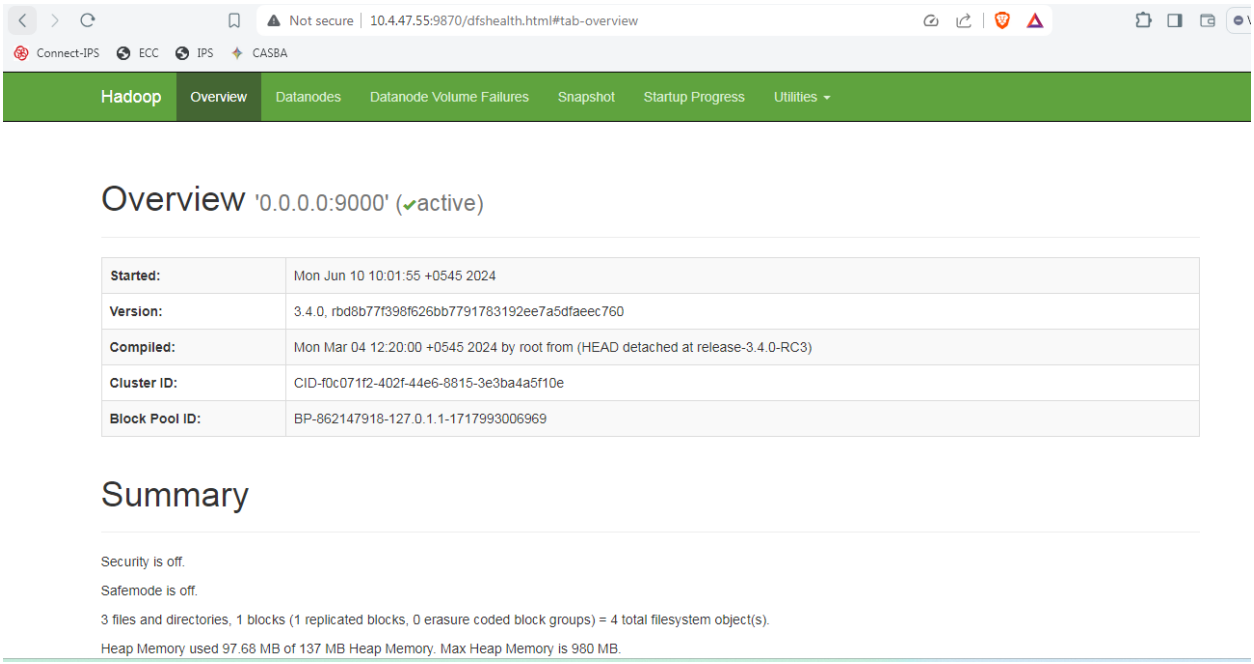
30. Access HDFS on command line

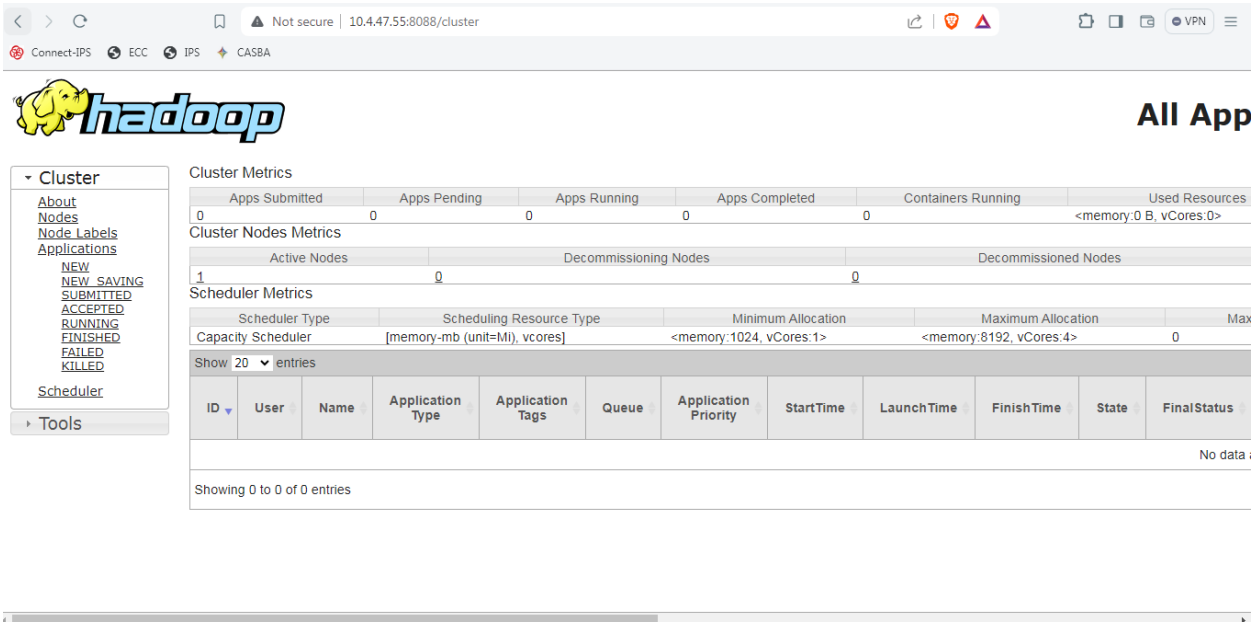
a. *ssh localhost*

b. Start by:

hdfs dfs –mkdir /xyz

31. You can open a Web browser to access Hadoop's NameNode (*http://localhost:9870*) and ResourceManager (*http://localhost:8088*) interfaces





****END OF MANUAL****

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