Installing Hadoop in Ubuntu

1. To update latest distributions of software:

- *sudo apt-get update*

2. Hadoop requires Java 8 to be installed. To install java version 8:

- *sudo apt-get install openssh-server*
- *sudo apt-get install openjdk-8-jdk*

3. Verifying JAVA 8 Installation:

- *java -version*

```
student@student-VirtualBox:~$ java -version
openjdk version "1.8.0_191"
OpenJDK Runtime Environment (build 1.8.0_191-8u191-b12-2ubuntu0.18.04.1-b12)
OpenJDK 64-Bit Server VM (build 25.191-b12, mixed mode)
```

4. Download and extract Hadoop:

- *wget https://www-eu.apache.org/dist/hadoop/common/hadoop-2.7.7/hadoop-2.7.7.tar.gz*

5. Unzip the Hadoop file:

- *tar -xzf hadoop-2.7.7.tar.gz*

```
student@student-VirtualBox:~$ hadoop version
Hadoop 2.7.7
Subversion Unknown -r c1aad84bd27cd79c3d1a7dd58202a8c3ee1ed3ac
Compiled by stevel on 2018-07-18T22:47Z
Compiled with protoc 2.5.0
From source with checksum 792e15d20b12c74bd6f19a1fb886490
This command was run using /home/WQD7007/hadoop/share/hadoop/common/hadoop-commo
n-2.7.7.jar
student@student-VirtualBox:~$
```

6. Move the file to your own directory:

- *sudo mkdir /home/{yourname}*
- *sudo mv hadoop-2.7.7 /home/{yourname}/hadoop/*

7. Set JAVA_HOME in /home/{yourname}/hadoop/etc/hadoop/hadoop-env.sh:

- *nano /home/{yourname}/hadoop/etc/hadoop/hadoop-env.sh*

```
student@student-VirtualBox: /home/WQD7007/hadoop/etc/hadoop
File  Edit  View  Search  Terminal  Help
  GNU nano 2.9.3                    hadoop-env.sh

# set JAVA_HOME in this file, so that it is correctly defined on
# remote nodes.

# The java implementation to use.
# export JAVA_HOME=${JAVA_HOME}
export JAVA_HOME=/usr/lib/jvm/java-8-openjdk-amd64/jre/
```

8. Export path for Hadoop in ~/.bashr to allow easy Hadoop function access:

- *export PATH=$PATH:/home/{yourname}/hadoop/bin*
- *export PATH=$PATH:/home/{yourname}/hadoop/sbin*

```
  GNU nano 2.9.3                    /home/student/.bashrc

if ! shopt -oq posix; then
  if [ -f /usr/share/bash-completion/bash_completion ]; then
    . /usr/share/bash-completion/bash_completion
  elif [ -f /etc/bash_completion ]; then
    . /etc/bash_completion
  fi
fi

export PATH=$PATH:/home/WQD7007/hadoop/bin
export PATH=$PATH:/home/WQD7007/hadoop/sbin
```

9. Run *hadoop*:

```
student@student-VirtualBox:/$ hadoop
Usage: hadoop [--config confdir] [COMMAND | CLASSNAME]
  CLASSNAME            run the class named CLASSNAME
 or
  where COMMAND is one of:
  fs                   run a generic filesystem user client
  version              print the version
  jar <jar>            run a jar file
                       note: please use "yarn jar" to launch
                             YARN applications, not this command.
  checknative [-a|-h]  check native hadoop and compression libraries availabilit
y
  distcp <srcurl> <desturl> copy file or directories recursively
  archive -archiveName NAME -p <parent path> <src>* <dest> create a hadoop archi
ve
  classpath            prints the class path needed to get the
  credential           interact with credential providers
                       Hadoop jar and the required libraries
  daemonlog            get/set the log level for each daemon
  trace                view and modify Hadoop tracing settings

Most commands print help when invoked w/o parameters.
```

10. Update hdfs-site.xml in /home/{yourname}/hadoop/etc/hadoop folder using nano. This file contains the configuration properties that Hadoop uses when starting up. Save and close this file.

- *nano /home/{yourname}/hadoop/etc/Hadoop/hdfs-site.xml*

```
  GNU nano 2.9.3                    hdfs-site.xml

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-->

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

<configuration>
        <property>
                <name>dfs.namenode.name.dir</name>
                <value>/home/WQD7007/hadoop/data/nameNode</value>
        </property>
        <property>
                <name>dfs.datanode.data.dir</name>
                <value>/home/WQD7007/hadoop/data/dataNode</value>
        </property>
        <property>
                <name>dfs.replication</name>
```

11. Update core-site.xml in /home/{yourname}/hadoop/etc/hadoop using nano. You can change 'localhost' to your PC's IP address. Save and close this file.

- *nano /home/{yourname}/hadoop/etc/Hadoop/core-site.xml*

```
  GNU nano 2.9.3                    core-site.xml

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-->

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

<configuration>
        <property>
                <name>fs.default.name</name>
                <value>hdfs://localhost:9000</value>
        </property>
</configuration>
```

12. Rename/copy the mapred-site.xml.template in /home/{yourname}/hadoop/etc/hadoop to mapred-site.xml. This file is used to specify which framework is being used for MapReduce. Then, update mapred-site.xml. Save and close the file.

- *cp /home/{yourname}/hadoop/etc/hadoop/mapred-site.xml.template /home/{yourname}/hadoop/etc/hadoop/mapred-site.xml*
- *nano /home/{yourname}/hadoop/etc/hadoop/mapred-site.xml*

```
File  Edit  View  Search  Terminal  Help
  GNU nano 2.9.3                                                    mapred-site.xml

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-->

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

<configuration>
        <property>
                <name>mapreduce.framework.name</name>
                <value>yarn</value>
        </property>
        <property>
                <name>yarn.app.mapreduce.am.resource.mb</name>
                <value>512</value>
        </property>
        <property>
                <name>mapreduce.map.memory.mb</name>
                <value>256</value>
        </property>
        <property>
                <name>mapreduce.reduce.memory.mb</name>
                <value>256</value>
        </property>
</configuration>
```

13. Update yarn-site.xml in /home/{yourname}/hadoop/etc/hadoop folder using nano. This file contains the configuration properties that Mapreduce uses when starting up. Save and close this file.

- *nano /home/{yourname}/hadoop/etc/Hadoop/yarn-site.xml*

```
  GNU nano 2.9.3                                                    yarn-site.xml

<?xml version="1.0"?>
<!--
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  WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
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  limitations under the License. See accompanying LICENSE file.
-->
<configuration>

<!-- Site specific YARN configuration properties -->
        <property>
                <name>yarn.acl.enable</name>
                <value>0</value>
        </property>
        <property>
                <name>yarn.resourcemanager.hostname</name>
                <value>localhost</value>
        </property>
        <property>
                <name>yarn.nodemanager.aux-services</name>
                <value>mapreduce_shuffle</value>
        </property>
        <property>
                <name>yarn.nodemanager.resources.memory-mb</name>
                <value>1536</value>
                </property>
        <property>
                <name>yarn.scheduler.maximum -allocation-mb</name>
                <value>1536</value>
        </property>
        <property>
                <name>yarn-scheduler.minimum-allocation-mb</name>
                <value>128</value>
        </property>
```

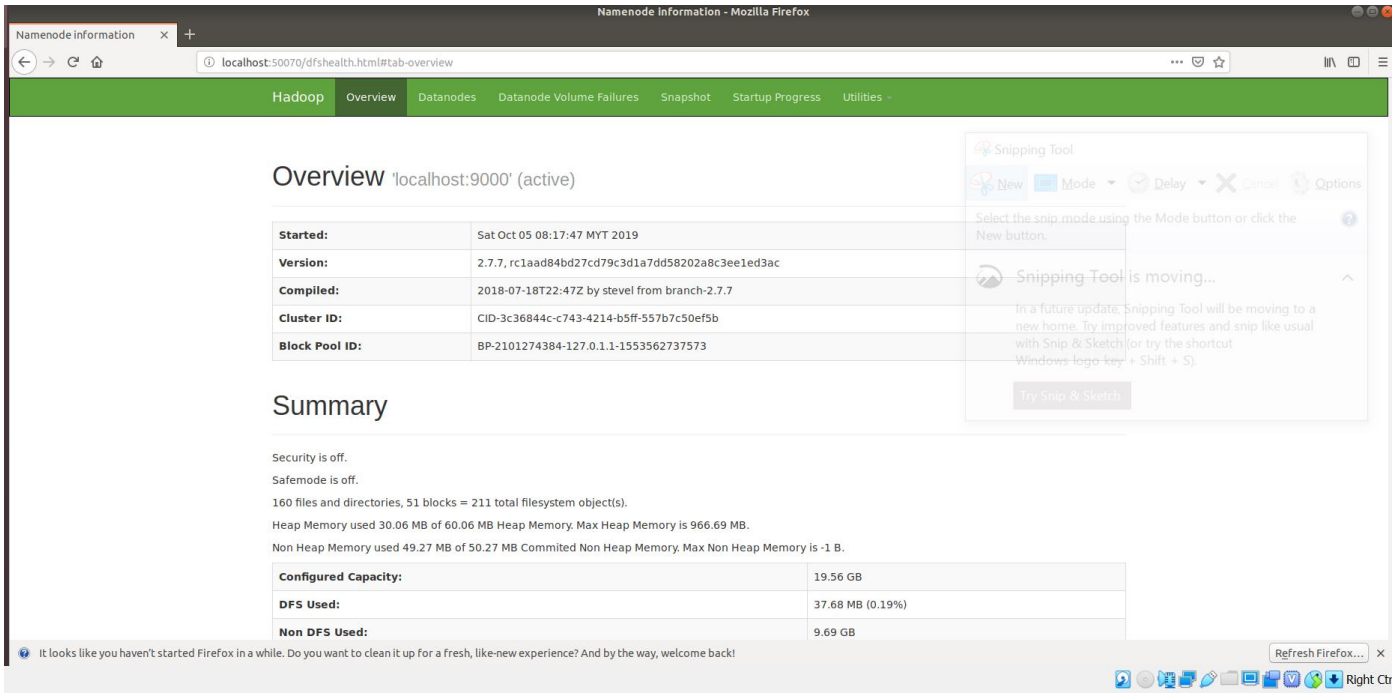
14. Run *hdfs namenode -format.*

```
19/10/12 23:27:26 INFO util.GSet: capacity      = 2^21 = 2097152 entries
19/10/12 23:27:26 INFO blockmanagement.BlockManager: dfs.block.access.token.enable=false
19/10/12 23:27:26 INFO blockmanagement.BlockManager: defaultReplication         = 1
19/10/12 23:27:26 INFO blockmanagement.BlockManager: maxReplication             = 512
19/10/12 23:27:26 INFO blockmanagement.BlockManager: minReplication             = 1
19/10/12 23:27:26 INFO blockmanagement.BlockManager: maxReplicationStreams      = 2
19/10/12 23:27:26 INFO blockmanagement.BlockManager: replicationRecheckInterval = 3000
19/10/12 23:27:26 INFO blockmanagement.BlockManager: encryptDataTransfer        = false
19/10/12 23:27:26 INFO blockmanagement.BlockManager: maxNumBlocksToLog          = 1000
19/10/12 23:27:26 INFO namenode.FSNamesystem: fsOwner             = student (auth:SIMPLE)
19/10/12 23:27:26 INFO namenode.FSNamesystem: supergroup          = supergroup
19/10/12 23:27:26 INFO namenode.FSNamesystem: isPermissionEnabled = true
19/10/12 23:27:26 INFO namenode.FSNamesystem: HA Enabled: false
19/10/12 23:27:26 INFO namenode.FSNamesystem: Append Enabled: true
19/10/12 23:27:26 INFO util.GSet: Computing capacity for map INodeMap
19/10/12 23:27:26 INFO util.GSet: VM type       = 64-bit
19/10/12 23:27:26 INFO util.GSet: 1.0% max memory 966.7 MB = 9.7 MB
19/10/12 23:27:26 INFO util.GSet: capacity      = 2^20 = 1048576 entries
19/10/12 23:27:26 INFO namenode.FSDirectory: ACLs enabled? false
19/10/12 23:27:26 INFO namenode.FSDirectory: XAttrs enabled? true
19/10/12 23:27:26 INFO namenode.FSDirectory: Maximum size of an xattr: 16384
19/10/12 23:27:26 INFO namenode.NameNode: Caching file names occuring more than 10 times
19/10/12 23:27:26 INFO util.GSet: Computing capacity for map cachedBlocks
19/10/12 23:27:26 INFO util.GSet: VM type       = 64-bit
19/10/12 23:27:26 INFO util.GSet: 0.25% max memory 966.7 MB = 2.4 MB
19/10/12 23:27:26 INFO util.GSet: capacity      = 2^18 = 262144 entries
19/10/12 23:27:26 INFO namenode.FSNamesystem: dfs.namenode.safemode.threshold-pct = 0.9990000128746033
19/10/12 23:27:26 INFO namenode.FSNamesystem: dfs.namenode.safemode.min.datanodes = 0
19/10/12 23:27:26 INFO namenode.FSNamesystem: dfs.namenode.safemode.extension     = 30000
19/10/12 23:27:26 INFO metrics.TopMetrics: NNTop conf: dfs.namenode.top.window.num.buckets = 10
19/10/12 23:27:26 INFO metrics.TopMetrics: NNTop conf: dfs.namenode.top.num.users = 10
19/10/12 23:27:26 INFO metrics.TopMetrics: NNTop conf: dfs.namenode.top.windows.minutes = 1,5,25
19/10/12 23:27:26 INFO namenode.FSNamesystem: Retry cache on namenode is enabled
19/10/12 23:27:26 INFO namenode.FSNamesystem: Retry cache will use 0.03 of total heap and retry cache entry expiry time is 600000 millis
19/10/12 23:27:26 INFO util.GSet: Computing capacity for map NameNodeRetryCache
19/10/12 23:27:26 INFO util.GSet: VM type       = 64-bit
19/10/12 23:27:26 INFO util.GSet: 0.029999999329447746% max memory 966.7 MB = 297.0 KB
19/10/12 23:27:26 INFO util.GSet: capacity      = 2^15 = 32768 entries
Re-format filesystem in Storage Directory /home/WQD7007/hadoop/data/nameNode ? (Y or N) N
Format aborted in Storage Directory /home/WQD7007/hadoop/data/nameNode
19/10/12 23:27:35 INFO util.ExitUtil: Exiting with status 1
19/10/12 23:27:35 INFO namenode.NameNode: SHUTDOWN_MSG:
/************************************************************
SHUTDOWN_MSG: Shutting down NameNode at student-VirtualBox/127.0.1.1
************************************************************/
student@student-VirtualBox:/$
```

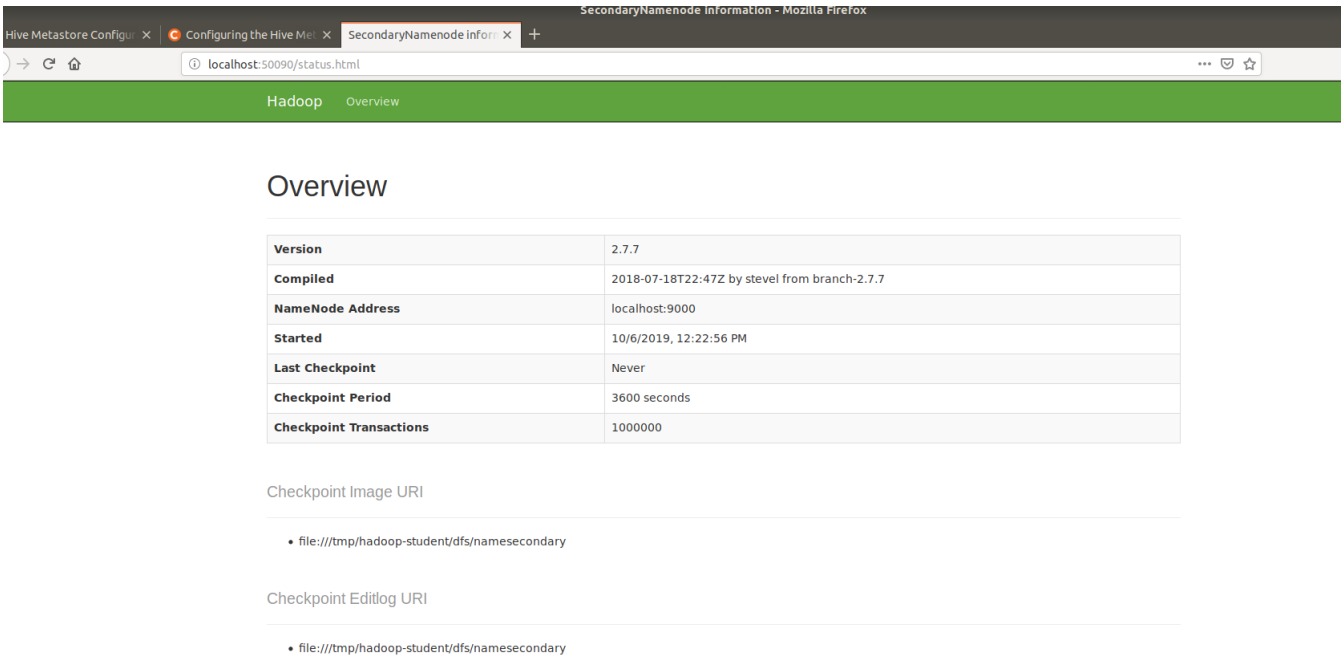
15. Run *start-all.sh* (or run *start-dfs.sh* and *start-yarn.sh* separately).

```
student@student-VirtualBox:/$ start-all.sh
This script is Deprecated. Instead use start-dfs.sh and start-yarn.sh
Starting namenodes on [localhost]
student@localhost's password:
localhost: starting namenode, logging to /home/WQD7007/hadoop/logs/hadoop-student-namenode-student-VirtualBox.out
student@localhost's password:
localhost: datanode running as process 1956. Stop it first.
Starting secondary namenodes [0.0.0.0]
student@0.0.0.0's password:
0.0.0.0: secondarynamenode running as process 2168. Stop it first.
starting yarn daemons
resourcemanager running as process 2324. Stop it first.
student@localhost's password:
localhost: nodemanager running as process 2605. Stop it first.
```

16. Browse localhost:50070 in your browser for namenode:



17. Browse localhost:50090 in your browser for secondary namenode:



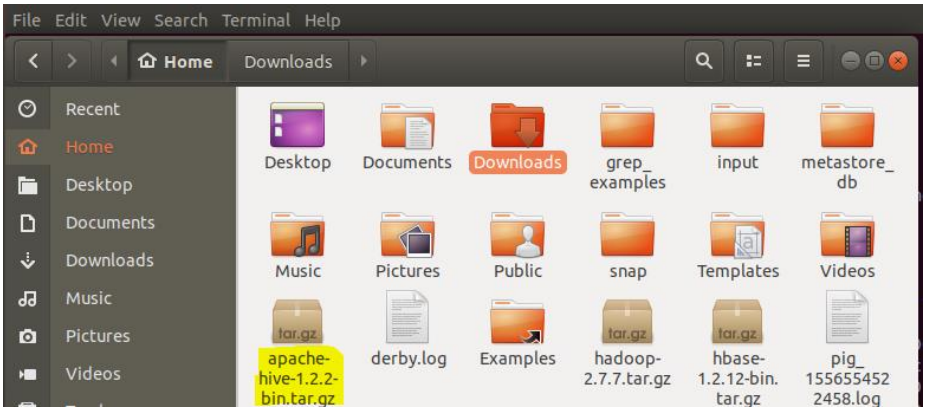
17. You can run *jps* to show all the packages installed in your terminal.

```
student@student-VirtualBox:~$ jps
3664 HRegionServer
3760 JobHistoryServer
3488 HQuorumPeer
2146 NameNode
2771 ResourceManager
2935 NodeManager
5066 Jps
2589 SecondaryNameNode
3551 HMaster
2319 DataNode
```

Installing Hive in Ubuntu

1. Download and install hive using:

- *wget https://www.apache.org/dist/hive/hive-1.2.2/apache-hive-1.2.2-bin.tar.gz*



2. Unzip the hive folder:

- *tar -xzf apache-hive-1.2.2-bin.tar.gz*

3. Move the hive folder to your own directory:

- *mv apache-hive-1.2.2-bin /home/{yourname}/hive/*

4. In *nano ~/.bashrc*, set export PATH=$PATH:/home/{yourname}/hive/bin

```
File  Edit  View  Search  Terminal  Help
  GNU nano 2.9.3                                        /home/student/.bashrc

fi

# enable programmable completion features (you don't need to enable
# this, if it's already enabled in /etc/bash.bashrc and /etc/profile
# sources /etc/bash.bashrc).
if ! shopt -oq posix; then
  if [ -f /usr/share/bash-completion/bash_completion ]; then
    . /usr/share/bash-completion/bash_completion
  elif [ -f /etc/bash_completion ]; then
    . /etc/bash_completion
  fi
fi

export PATH=$PATH:/home/WQD7007/hadoop/bin
export PATH=$PATH:/home/WQD7007/hadoop/sbin

export PATH=$PATH:/home/WQD7007/hbase/bin

export PATH=$PATH:/home/WQD7007/hive/bin
```

5. In hive bin folder, *nano hive-config.sh* and add export HADOOP_HOME=/home/wlhoo/hadoop at the end of the file to connect hive with Hadoop.

```
File  Edit  View  Search  Terminal  Help
  GNU nano 2.9.3                                                    hive-config.sh

while [ $# -gt 0 ]; do    # Until you run out of parameters . . .
  case "$1" in
    --config)
        shift
        confdir=$1
        shift
        HIVE_CONF_DIR=$confdir
        ;;
    --auxpath)
        shift
        HIVE_AUX_JARS_PATH=$1
        shift
        ;;
    *)
        break;
        ;;
  esac
done


# Allow alternate conf dir location.
HIVE_CONF_DIR="${HIVE_CONF_DIR:-$HIVE_HOME/conf}"

export HIVE_CONF_DIR=$HIVE_CONF_DIR
export HIVE_AUX_JARS_PATH=$HIVE_AUX_JARS_PATH

# Default to use 256MB
export HADOOP_HEAPSIZE=${HADOOP_HEAPSIZE:-256}

export HADOOP_HOME=/home/WQD7007/hadoop
```

6. Run Hive and hive is successfully installed.

```
student@student-VirtualBox:~$ hive
ls: cannot access '/home/WQD7007/spark/lib/spark-assembly-*.jar': No such file o
r directory

Logging initialized using configuration in jar:file:/home/WQD7007/hive/lib/hive-
common-1.2.2.jar!/hive-log4j.properties
hive>
```