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Big Data Frameworks CSE6701

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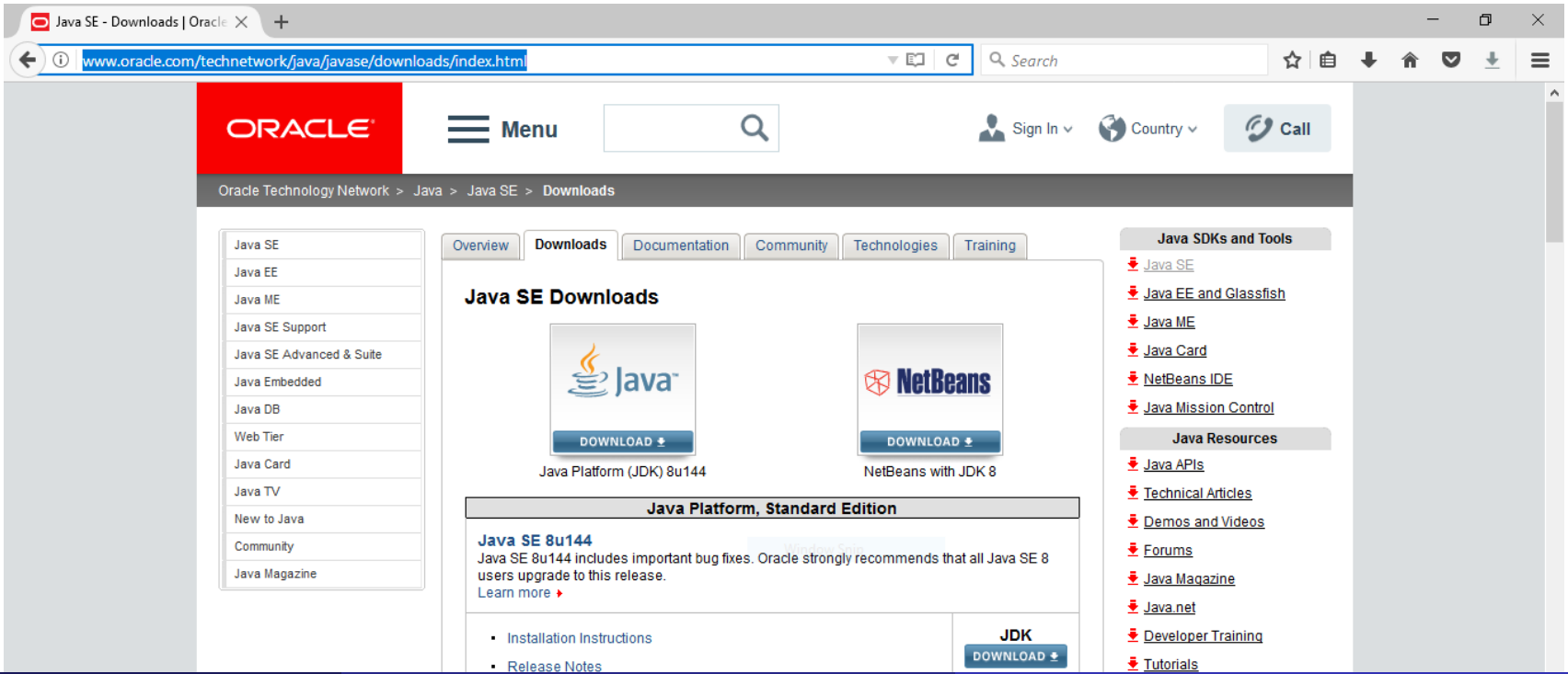
- **ssh**
  - **Check whether ssh is working or not**
  - $ **ssh localhost**
  - if the result like connection refused on port 22 then start **sshd** service
  - command to start sshd service in fedora
    - $ sudo systemctl start sshd → it asks password
    - check ssh
    - $ **ssh localhost** → if it shows any error, then install ssh
    - command to install ssh
    - $ **sudo dnf install openssh-server***
    - check the ssh in machine

- **java**
  - **Check java version on your local machine**
  - command is $ **java -version**
  - if the java version is **openjdk**, then install oracle JDK
  - **procedure to install oracle java**
  - Download JDK from Oracle jdk website
    http://www.oracle.com/technetwork/java/javase/downloads/index.html



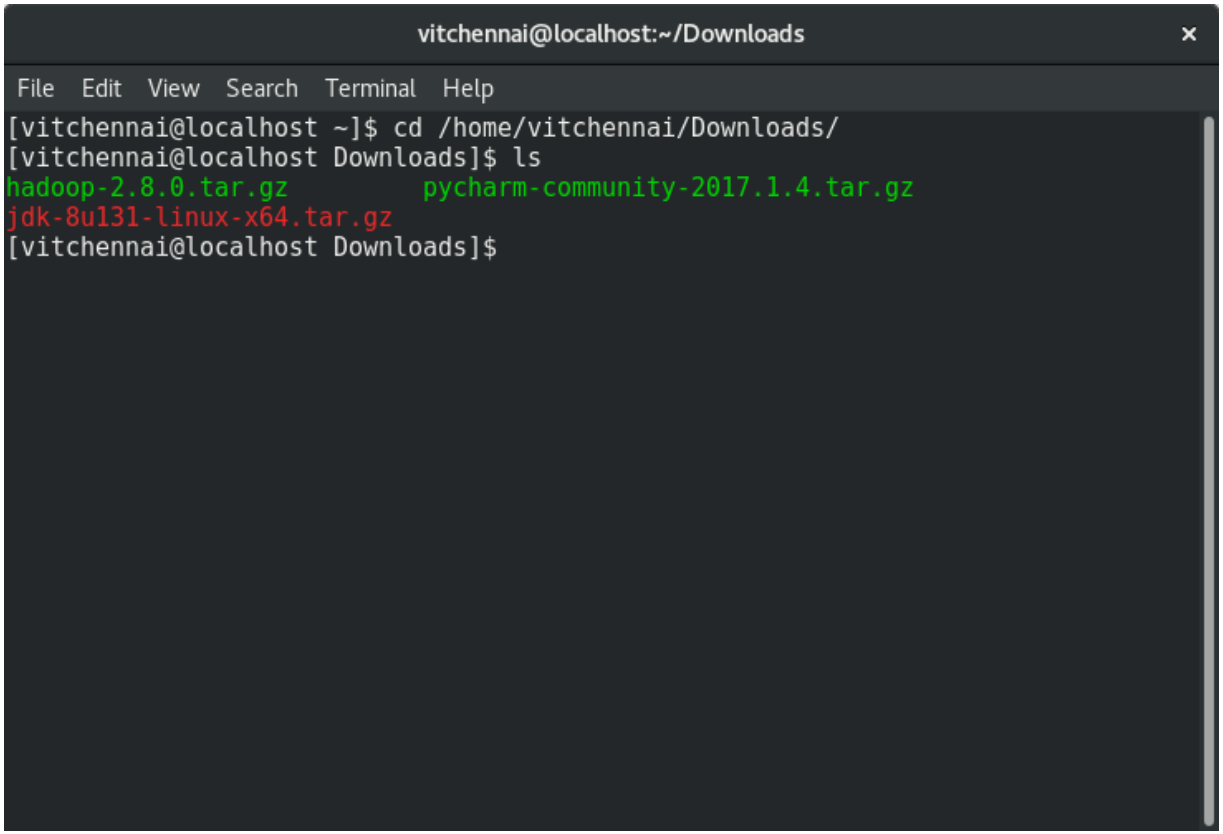
Hadoop Installation

- create a directory **in** /opt directory
  - command is $ **sudo mkdir -p /opt/java8**
- change the permission of the directory
  - command is $ **sudo chmod 777 -R java**
- copy the jdk-x.x.x.gz into /opt/java8 directory
  - command is $ **cp /home/vitchennai/Downloads/jdk-x.x.x.gz /opt/java8**
- untar the jdk file
  - command is $ **tar -xvzf jdk-x.x.x.gz**
- change the permission of java directory
  - command is $ **sudo chmod 777 -R /opt/java8/jdk-x.x.x**

- set the path set for java in /etc/profile
  - command is $ **gedit /etc/profile**
- Append the following lines in /etc/profile
  - **export JAVA_HOME=/opt/java8/jdk-x.x.x**
  - **export PATH=$JAVA_HOME/bin:$PATH**
- restart the terminal
  - command is $ **sudo source /etc/profile**

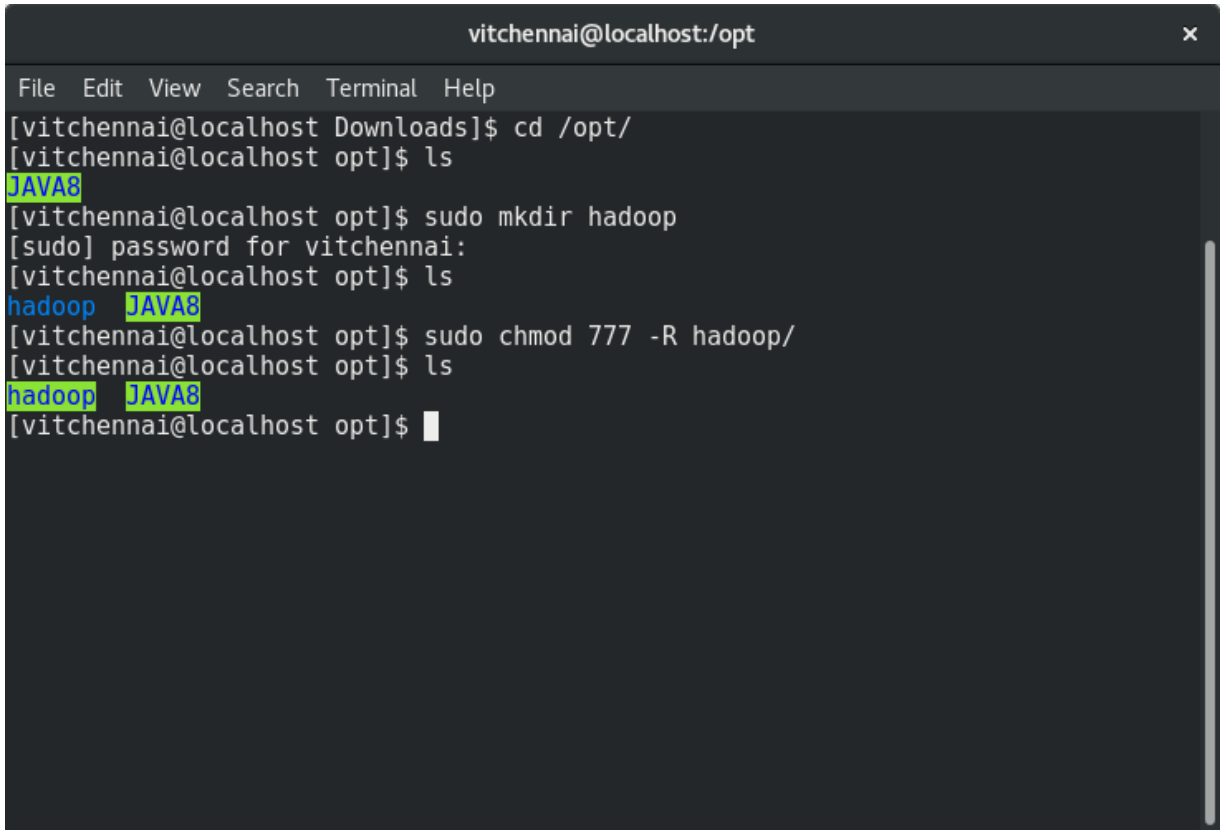
Hadoop Installation steps

- Download latest hadoop binary file from **http://hadoop.apache.org/releases.html**
- Let us assume it have downloaded in Download directory

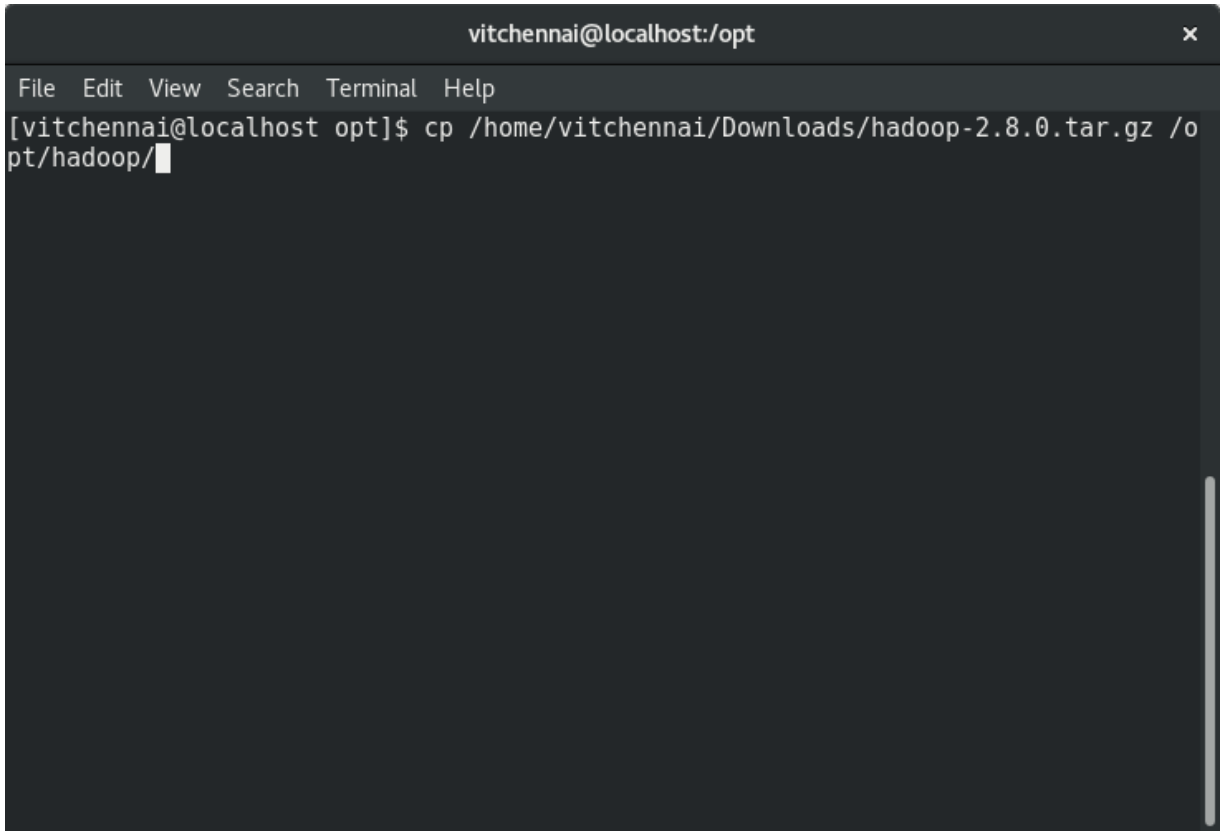


Hadoop Installation steps

- create hadoop directory in /opt directory

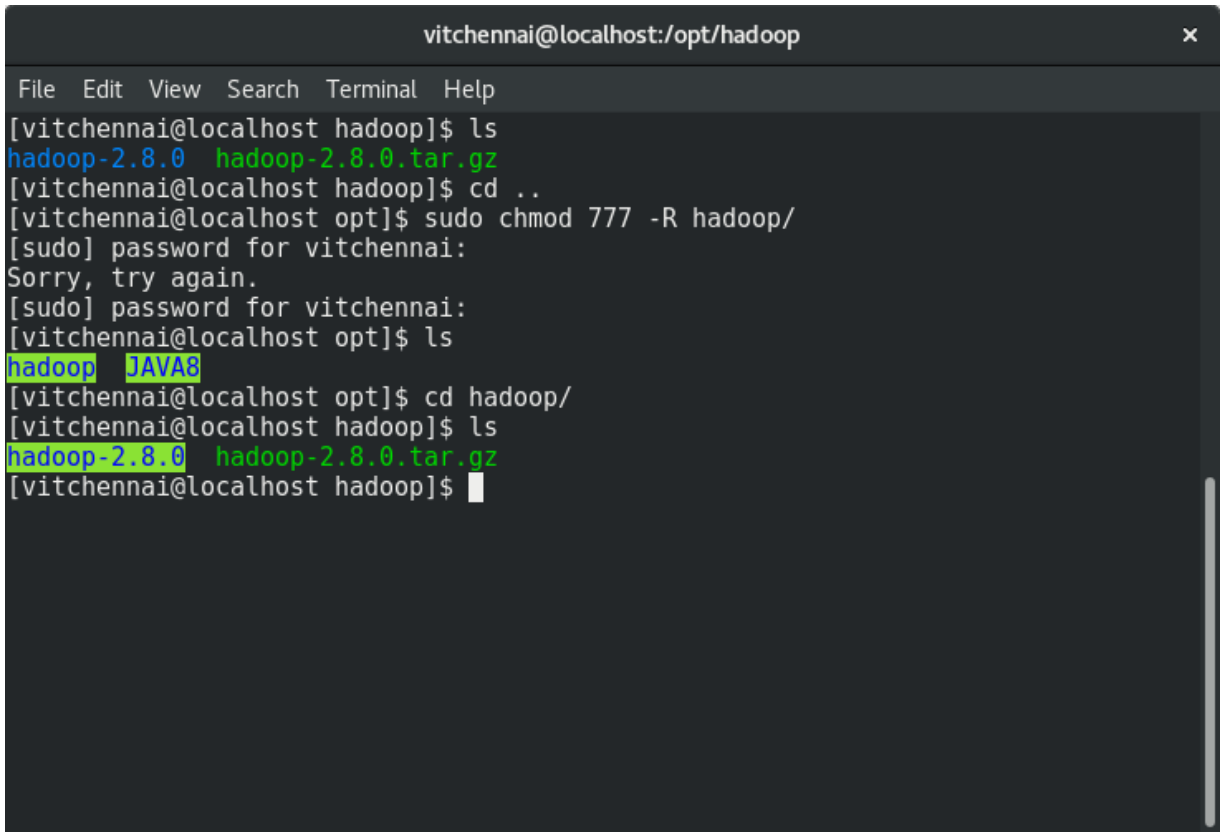


- change the permission of this directory
  - command is $ **sudo chmod 777 -R /opt/hadoop**
- copy the hadoop-2.8.0.tar.gz into /opt/hadoop directory
  - command is $ **cp /home/vitchennai/Downloads/hadoop-2.8.0.tar.gz /opt/hadoop/**

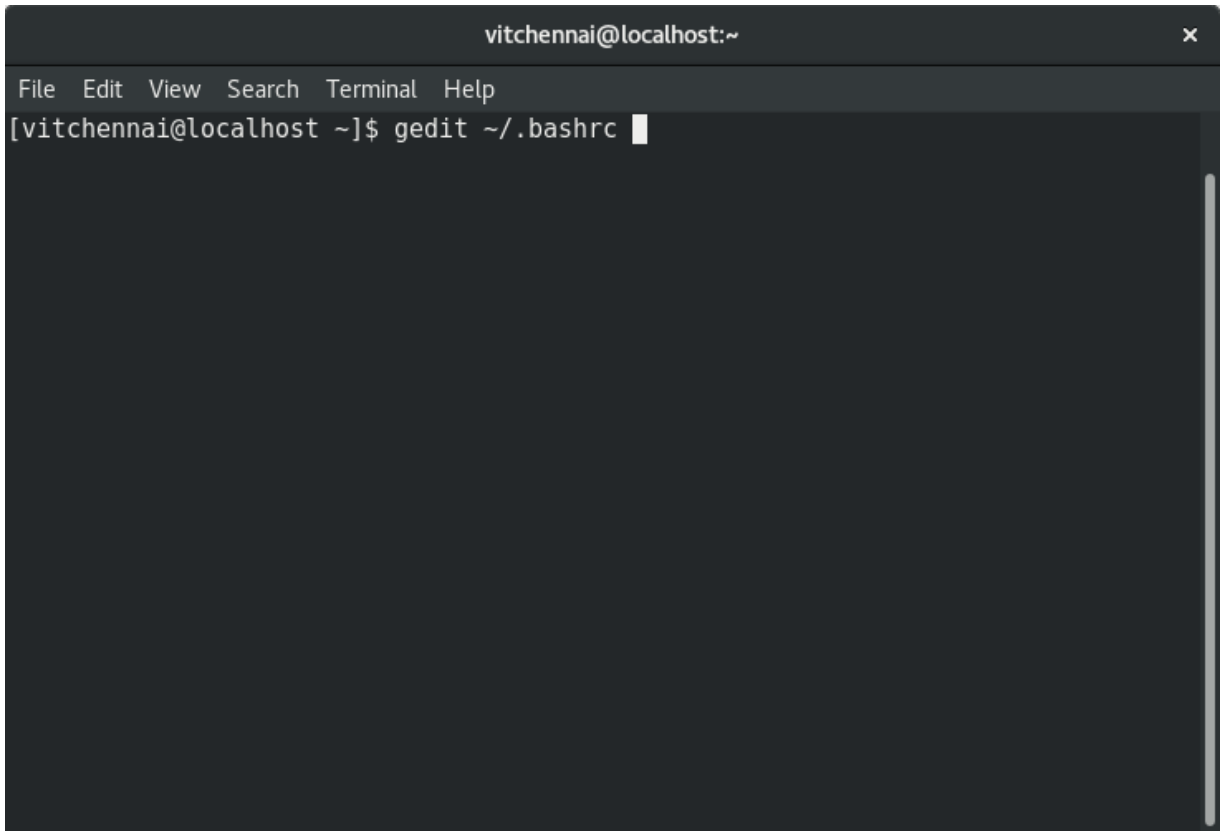


Hadoop Installation steps

- untar the file
  - command is $ **tar -xvzf hadoop-2.8.0.tar.gz**
- change the permission of **hadoop** directory
  - command is $ **sudo chmod 777 -R /opt/hadoop**



- open bashrc file for hadoop path setting
  - command is $ **gedit ~/.bashrc**



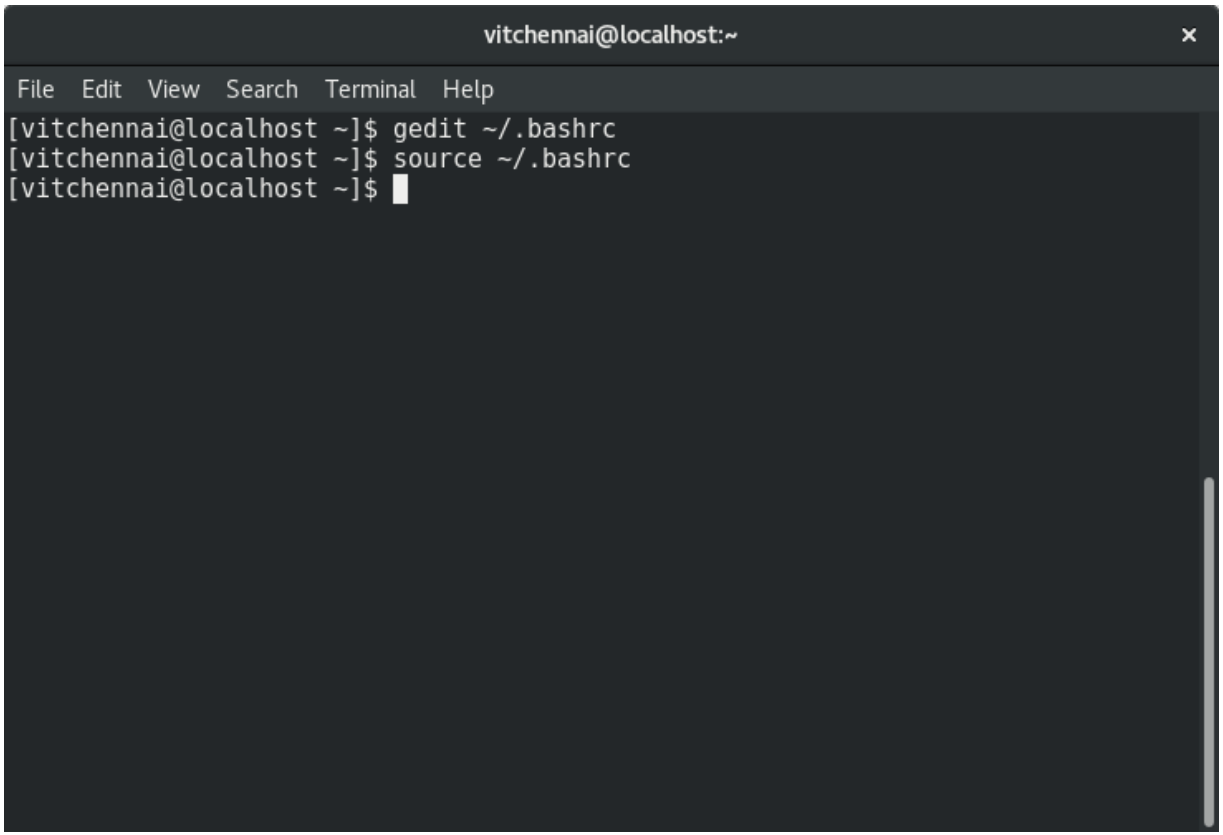
- Append the Hadoop and java paths

Open .bashrc ~/ Save

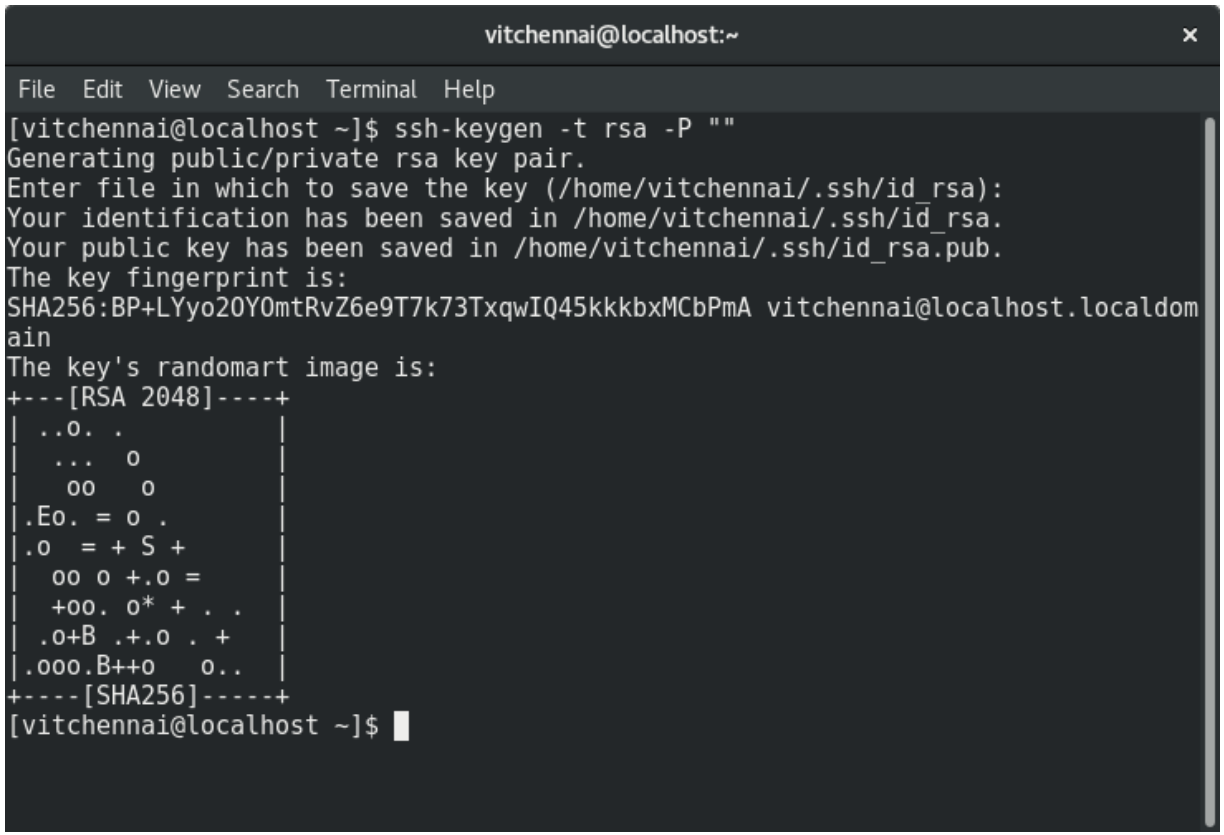
```
# .bashrc

# Source global definitions
if [ -f /etc/bashrc ]; then
        . /etc/bashrc
fi

# Uncomment the following line if you don't like systemctl's auto-paging feature:
# export SYSTEMD_PAGER=

# User specific aliases and functions

# hadoop path setting
export HADOOP_HOME=/opt/hadoop/hadoop-2.8.0
export HADOOP_COMMON_HOME=$HADOOP_HOME
export HADOOP_MAPRED_HOME=$HADOOP_HOME
export HADOOP_HDFS_HOME=$HADOOP_HOME
export HADOOP_YARN_HOME=$HADOOP_HOME
export HADOOP_OPTS="-Djava.library.path=$HADOOP_HOME/lib/native"
export HADOOP_COMMON_LIB_NATIVE_DIR=$HADOOP_HOME/lib/native
export PATH=$PATH:$HADOOP_HOME/sbin:$HADOOP_HOME/bin
```

sh Tab Width: 8 Ln 21, Col 53 INS

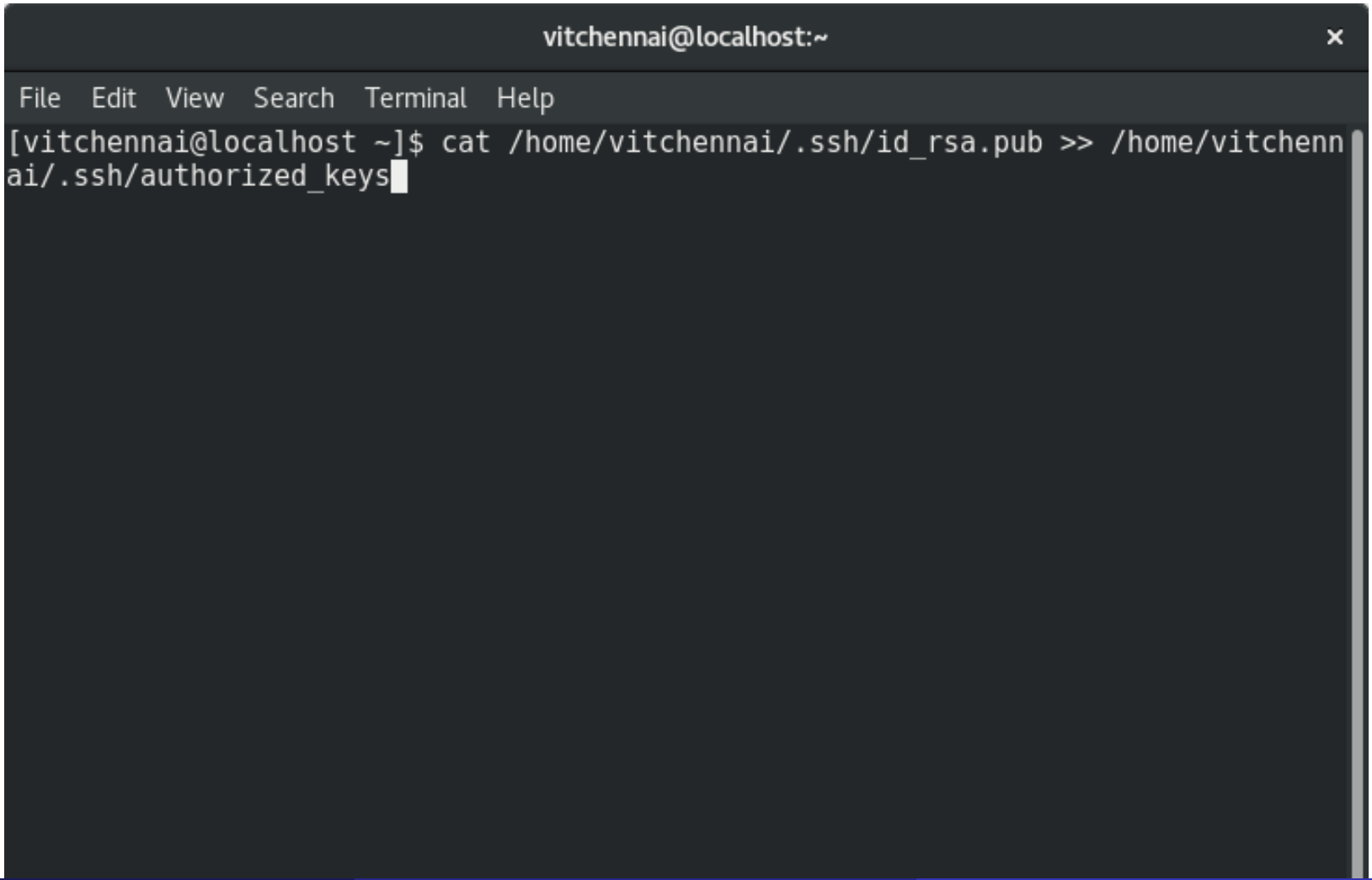
- Restart the terminal
  - command to restart is $**source ~/.bashrc**



- Hadoop requires SSH access to manage its nodes, i.e. remote machines plus your local machine if you want to use Hadoop on it
- Commands is to create an RSA key pair with an empty password.



- we have to enable SSH access to local machine with this newly created key.
- Commands is



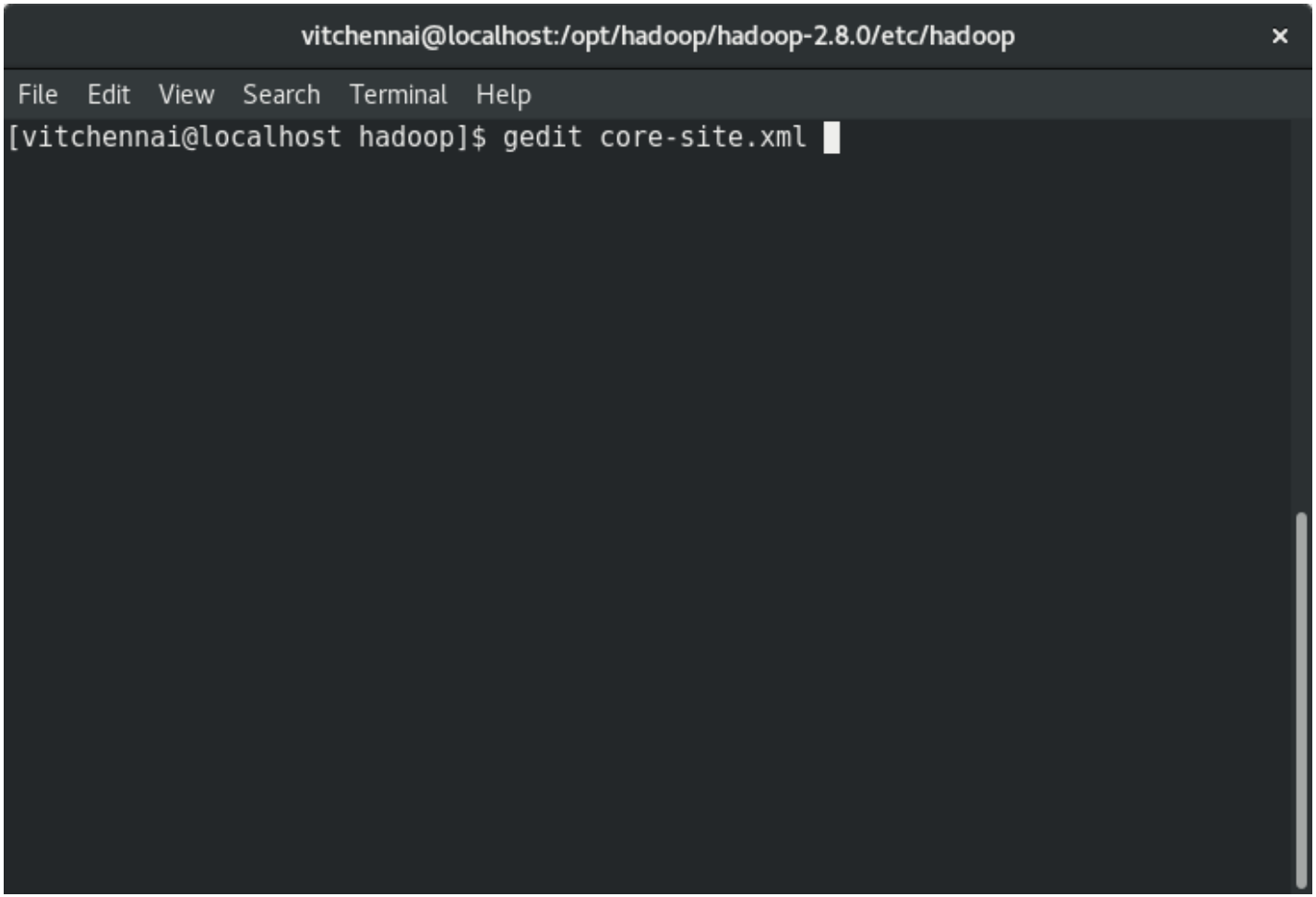
- Go to hadoop directory for Configuration purpose
- add java path in **hadoop_env.sh** file
- command to open hadoop_env.sh is $ **gedit hadoop_env.sh**

Open | hadoop-env.sh | /opt/hadoop/hadoop-2.8.0/etc/hadoop | Save

```
# Set Hadoop-specific environment variables here.

# The only required environment variable is JAVA_HOME.  All others are
# optional.  When running a distributed configuration it is best to
# set JAVA_HOME in this file, so that it is correctly defined on
# remote nodes.

# The java implementation to use.
export JAVA_HOME=/opt/JAVA8/jdk1.8.0_131

# The jsvc implementation to use. Jsvc is required to run secure datanodes
# that bind to privileged ports to provide authentication of data transfer
# protocol.  Jsvc is not required if SASL is configured for authentication of
# data transfer protocol using non-privileged ports.
#export JSVC_HOME=${JSVC_HOME}

export HADOOP_CONF_DIR=${HADOOP_CONF_DIR:-"/etc/hadoop"}

# Extra Java CLASSPATH elements.  Automatically insert capacity-scheduler.
for f in $HADOOP_HOME/contrib/capacity-scheduler/*.jar; do
  if [ "$HADOOP_CLASSPATH" ]; then
    export HADOOP_CLASSPATH=$HADOOP_CLASSPATH:$f
  else
    export HADOOP_CLASSPATH=$f
  fi
done

# The maximum amount of heap to use, in MB. Default is 1000.
```

sh | Tab Width: 8 | Ln 25, Col 18 | INS

- open **core-site.xml** for configuration purpose
- command to open core-site.xml is



- do the modification in core-site.xml as shown below, save and exit

Open | core-site.xml — /opt/hadoop/hadoop-2.8.0/etc/hadoop | Save

```
<?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://localhost:9000</value>
</property>
</configuration>
```
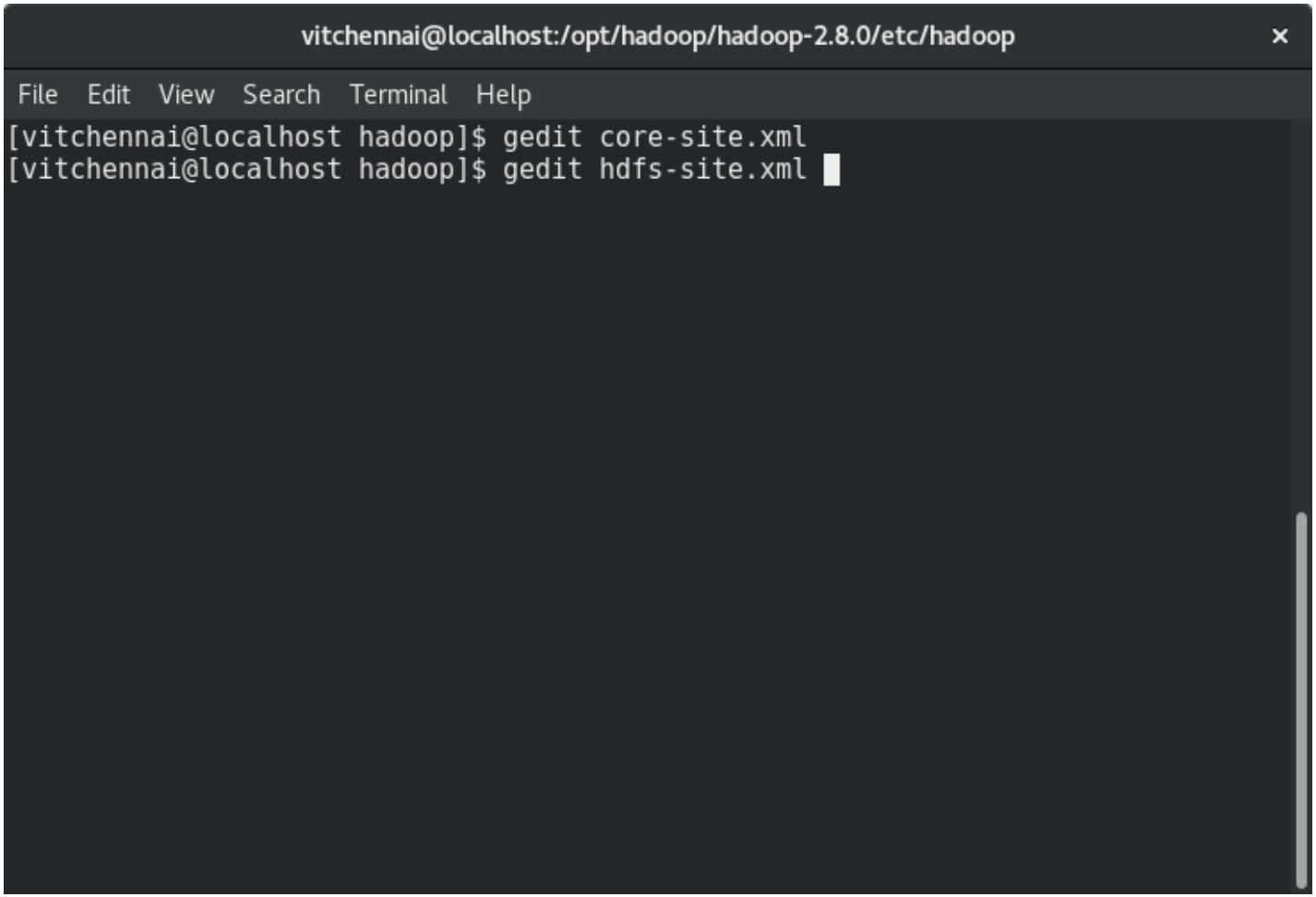

XML | Tab Width: 8 | Ln 23, Col 12 | INS

- open **hdfs-site.xml** for configuration purpose
- command to open hdfs-site.xml is



- do the modification in hdfs-site.xml as shown below, save and exit

Open | hdfs-site.xml /opt/hadoop/hadoop-2.8.0/etc/hadoop | Save

```
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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:///opt/hadoop/hadoop_tmp/hdfs/namenode</value>
</property>

<property>
  <name>dfs.data.dir</name>
    <value>file:///opt/hadoop/hadoop_tmp/hdfs/datanode</value>
</property>

</configuration>
```
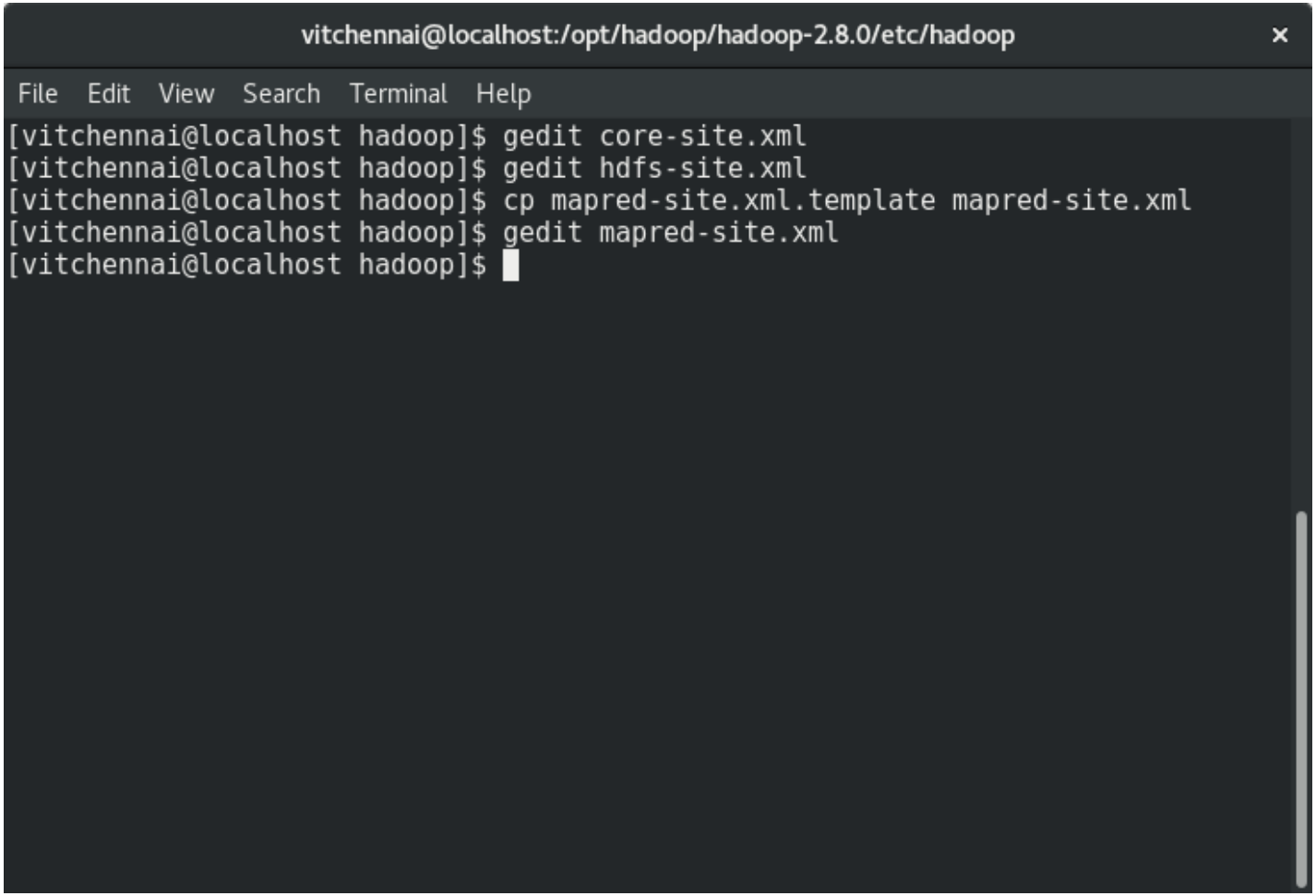

XML | Tab Width: 8 | Ln 32, Col 23 | INS

- create **mapred-site.xml** from **mapred-site.xml.template** configuration purpose
- command to open mapred-site.xml is



- do the modification in mapred-site.xml as shown below, save and exit

Open | mapred-site.xml /opt/hadoop/hadoop-2.8.0/etc/hadoop | Save

```
<?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>
```
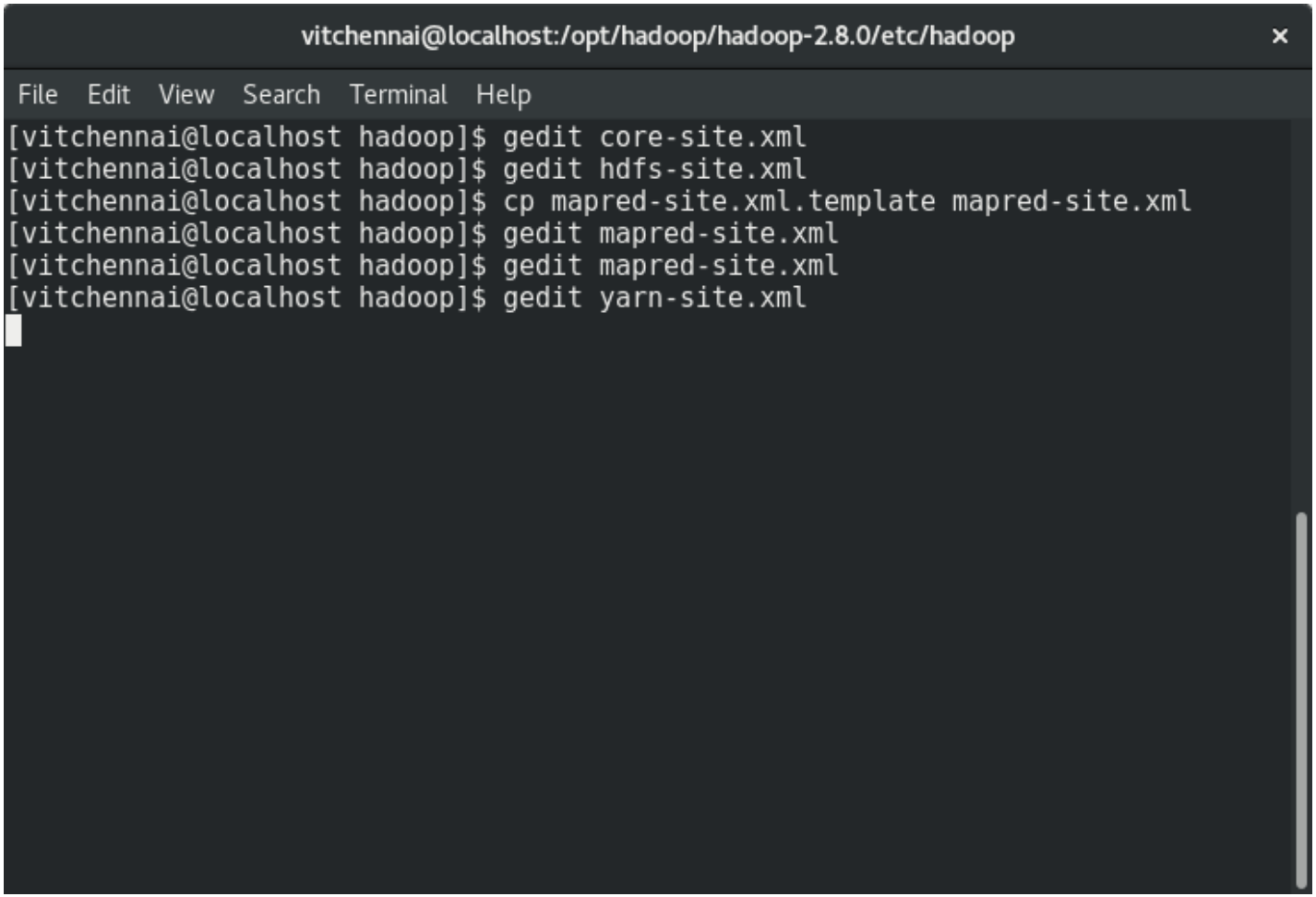

XML | Tab Width: 8 | Ln 23, Col 13 | INS

- open **yarn-site.xml** for configuration purpose
- command to open yarn-site.xml is



- do the modification in yarn-site.xml as shown below, save and exit

Open *yarn-site.xml /opt/hadoop/hadoop-2.8.0/etc/hadoop Save

```
<?xml version="1.0"?>
<!--
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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.
-->
<configuration>
 <property>
  <name>yarn.nodemanager.aux-services</name>
    <value>mapreduce_shuffle</value>
 </property>
</configuration>
```
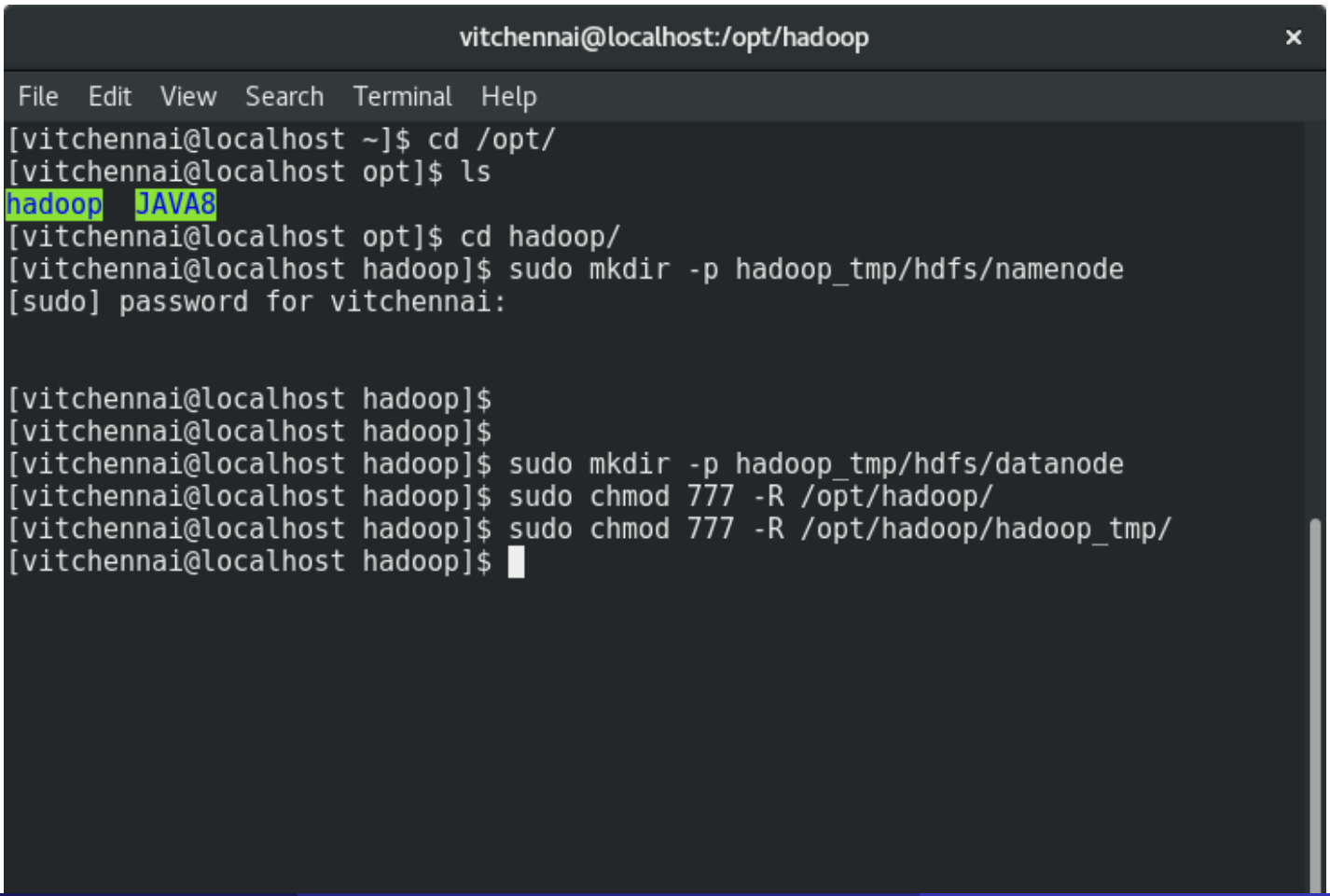
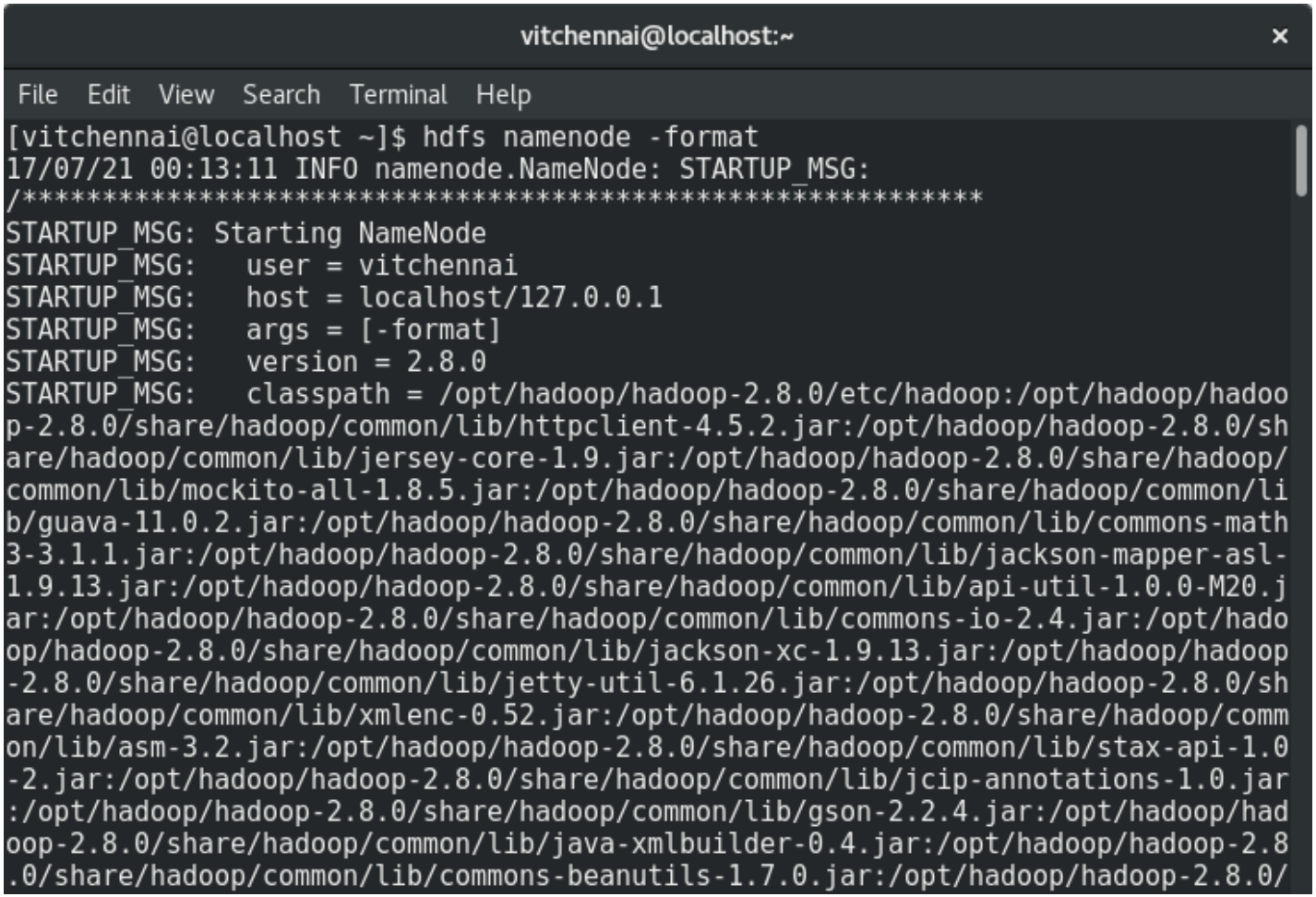

XML Tab Width: 8 Ln 19, Col 13 INS

- we need to create directories for namenode and datanode, which are specified in hdfs-site.xml
- The following commands are for creating namenode, Datanode and permission settings



- Now we need to format the namenode
- The following commands is used to format the namenode



- **Hadoop-2.8.0 installation has completed**
- **Check the Hadoop status**

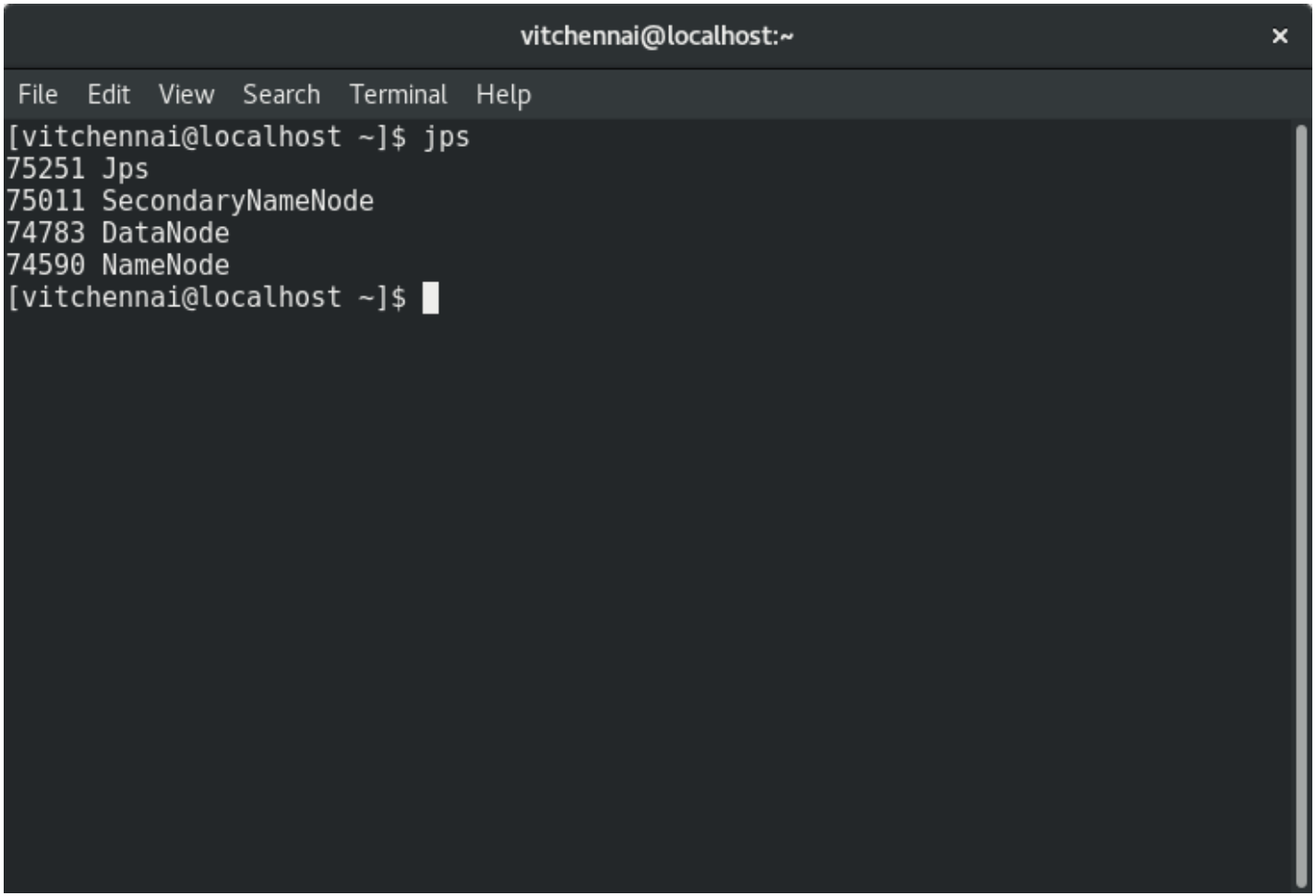
- Now start the Hadoop Distributed File System
- The following commands (**start-dfs.sh**) is used for this

```
vitchennai@localhost:~
File  Edit  View  Search  Terminal  Help
SHUTDOWN_MSG: Shutting down NameNode at localhost/127.0.0.1
************************************************************/
[vitchennai@localhost ~]$ clear

[vitchennai@localhost ~]$ start-dfs.sh
Starting namenodes on [localhost]
The authenticity of host 'localhost (::1)' can't be established.
ECDSA key fingerprint is SHA256:T+LJOwDpd/6JnpGRbHJo0pru46r8l7kYDJM+tomWm3E.
ECDSA key fingerprint is MD5:bb:a4:e7:bb:13:1f:59:f1:18:41:9f:c8:60:93:5f:bd.
Are you sure you want to continue connecting (yes/no)? yes
localhost: Warning: Permanently added 'localhost' (ECDSA) to the list of known hosts.
vitchennai@localhost's password:
localhost: starting namenode, logging to /opt/hadoop/hadoop-2.8.0/logs/hadoop-vitchenna
i-namenode-localhost.localdomain.out
vitchennai@localhost's password:
localhost: starting datanode, logging to /opt/hadoop/hadoop-2.8.0/logs/hadoop-vitchenna
i-datanode-localhost.localdomain.out
Starting secondary namenodes [0.0.0.0]
The authenticity of host '0.0.0.0 (0.0.0.0)' can't be established.
ECDSA key fingerprint is SHA256:T+LJOwDpd/6JnpGRbHJo0pru46r8l7kYDJM+tomWm3E.
ECDSA key fingerprint is MD5:bb:a4:e7:bb:13:1f:59:f1:18:41:9f:c8:60:93:5f:bd.
Are you sure you want to continue connecting (yes/no)? yes
0.0.0.0: Warning: Permanently added '0.0.0.0' (ECDSA) to the list of known hosts.
vitchennai@0.0.0.0's password:

0.0.0.0: starting secondarynamenode, logging to /opt/hadoop/hadoop-2.8.0/logs/hadoop-vi
tchennai-secondarynamenode-localhost.localdomain.out
[vitchennai@localhost ~]$
```

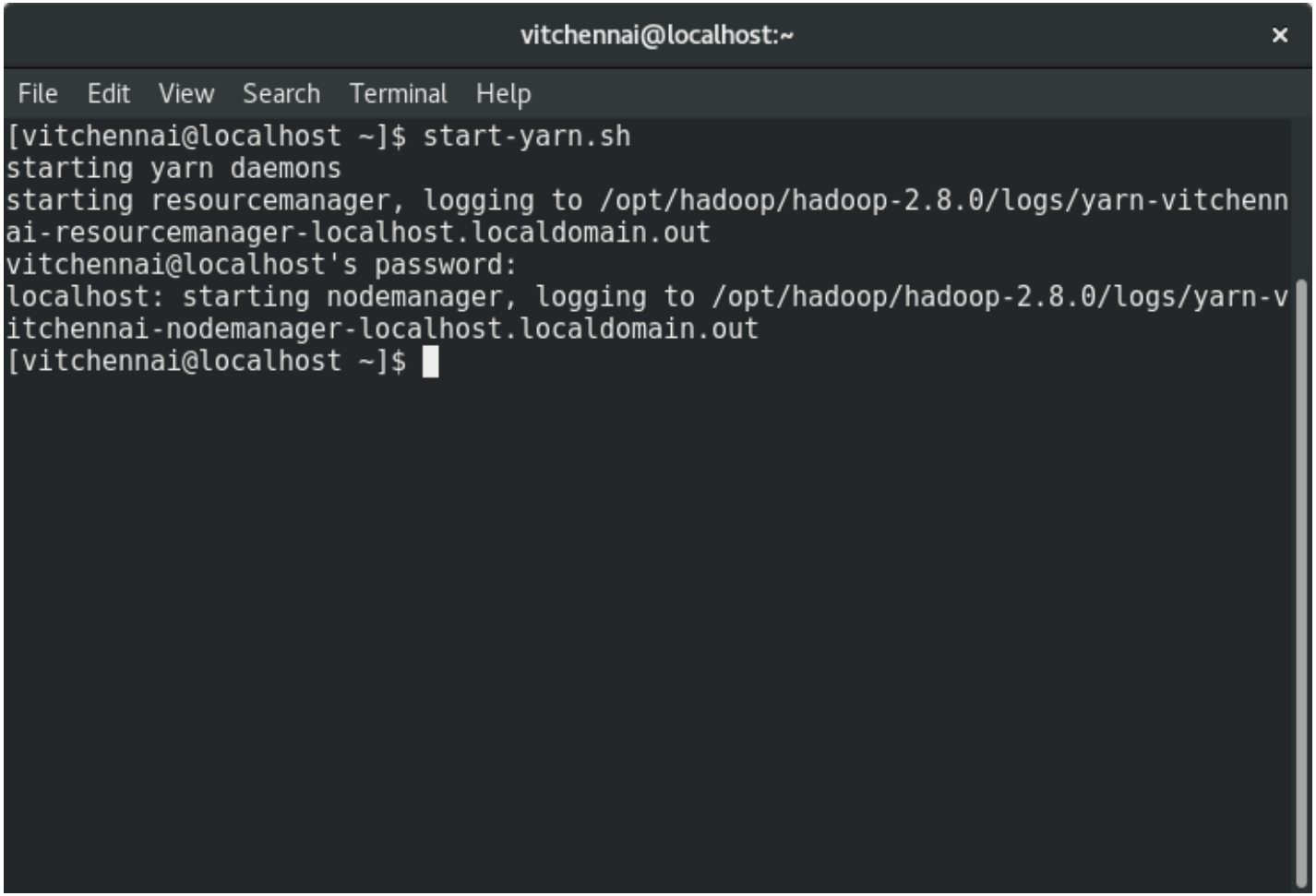
- If Datanode is not started, then change the permissions of datanode
- The following command is used

sudo chown vitchennai :root
/opt/Hadoop/hadoop_tmp/hdfs/datanode

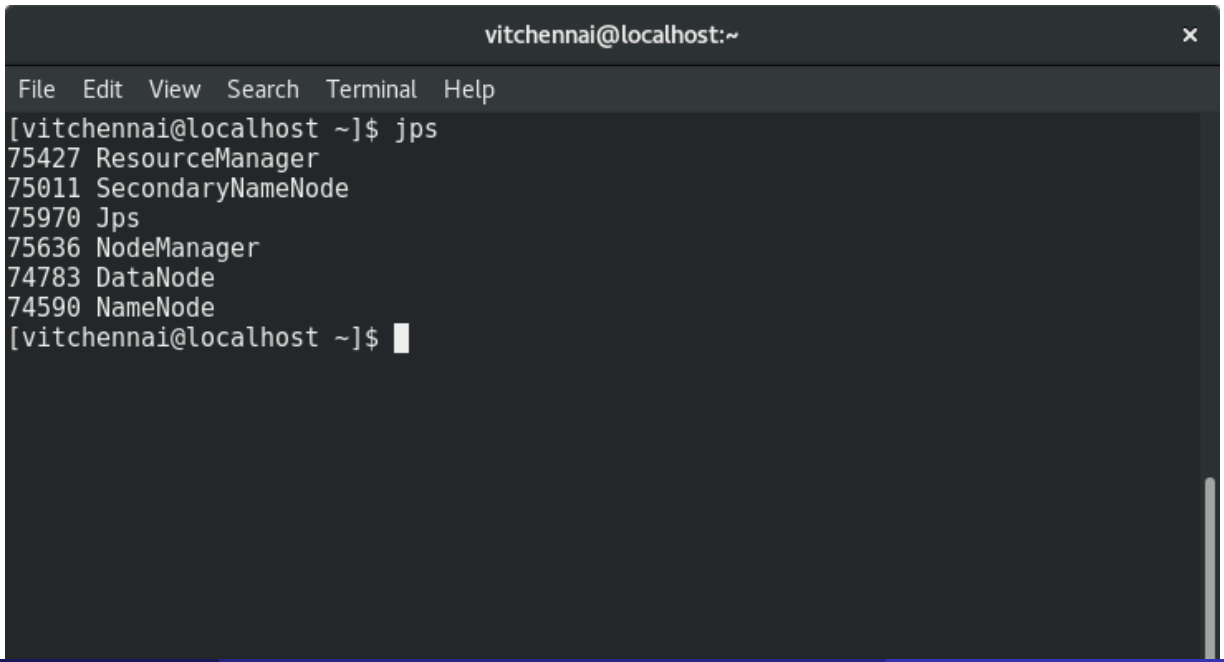
- Now check the background process for hadoop distributed file system



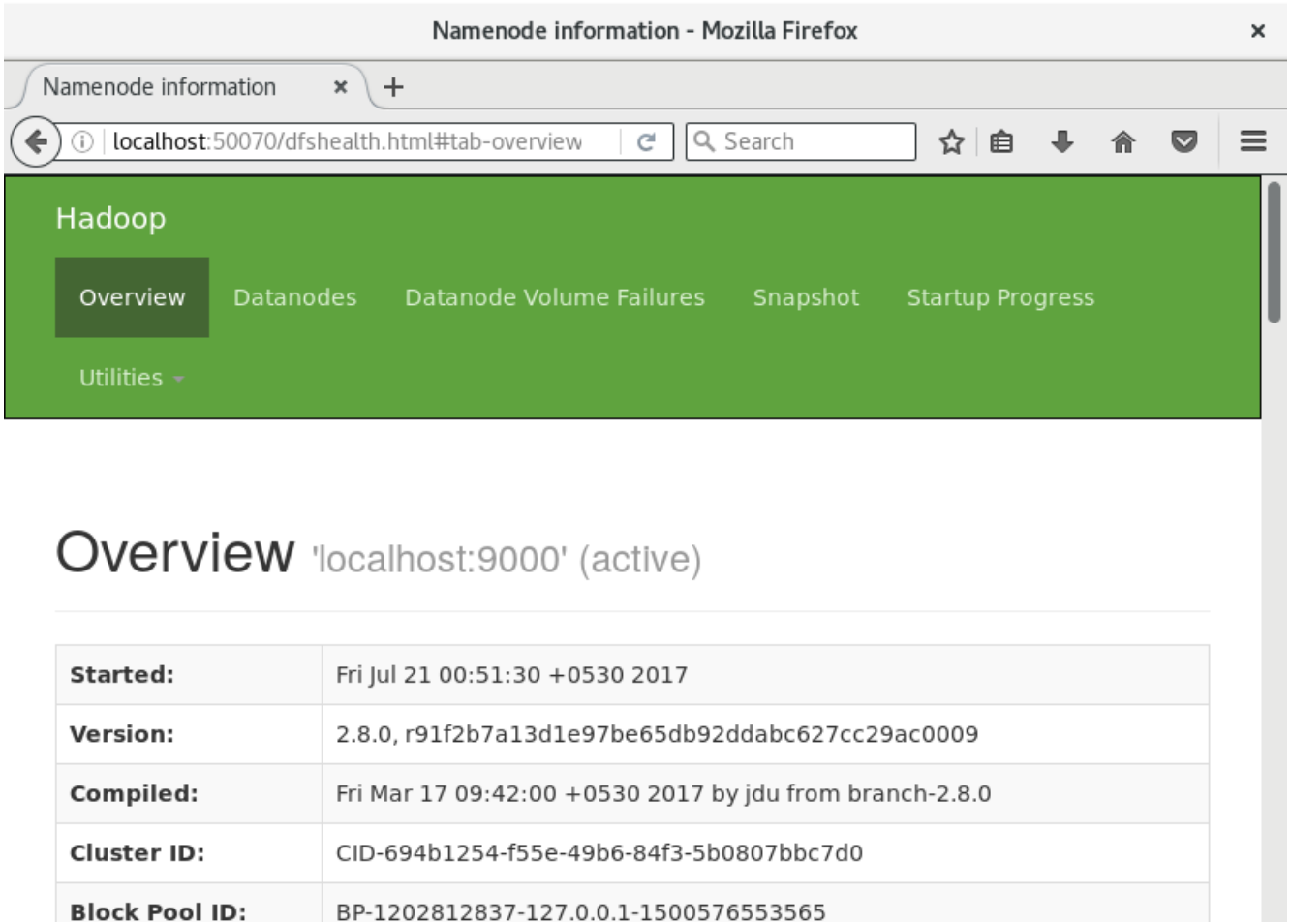
- Now start yarn resources for hadoop
- The following commands (**start-yarn.sh**) is used for this



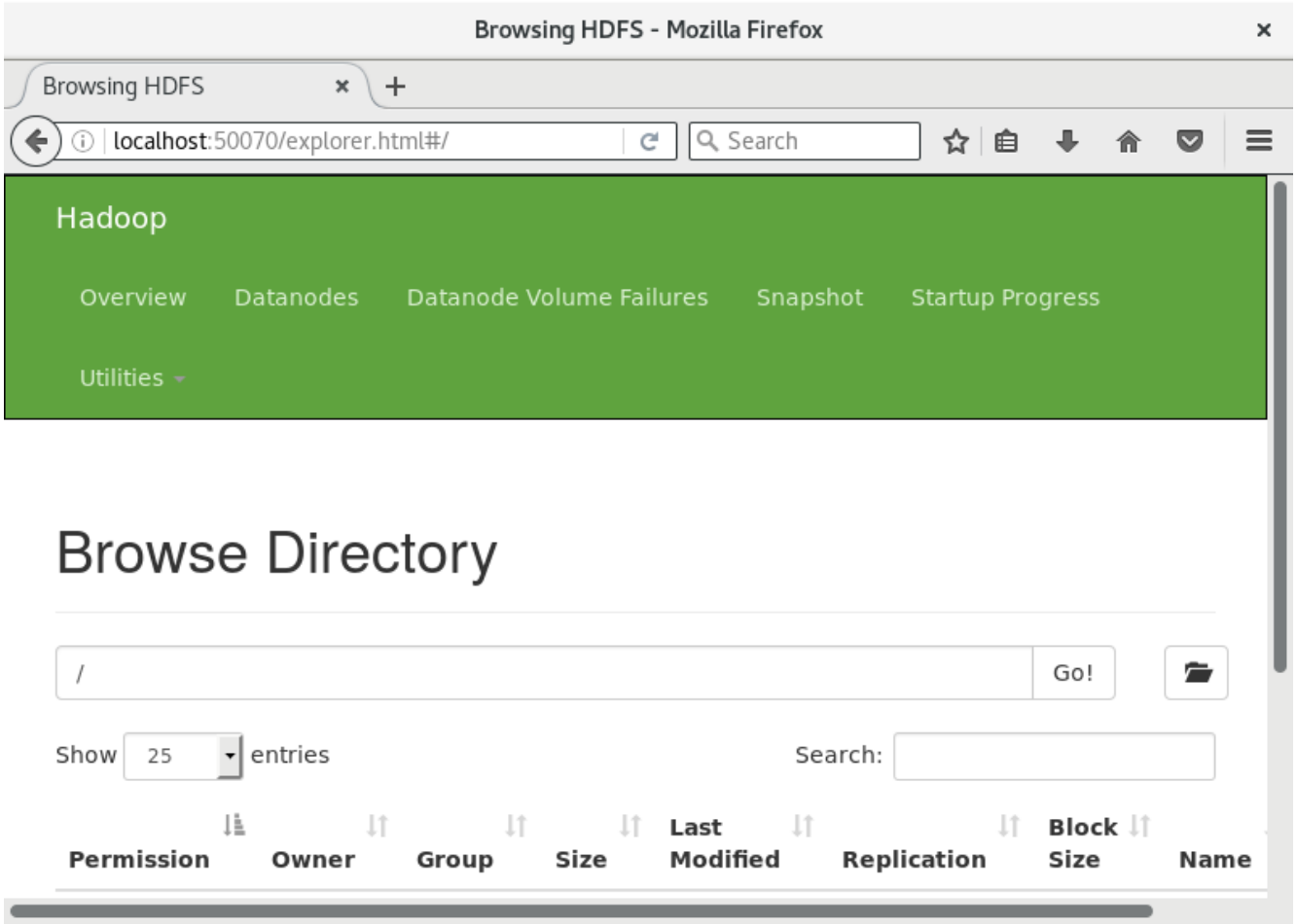
- The total number of daemons to execute hadoop-2.8 on local machine are
- **NameNode**
- **DataNode**
- **SecondaryNameNode**
- **NodeManager**
- **ResourceManager**
- we have to use **jps** command to check



- **UI view of Hadoop**
- Open **http://localhost:50070** in browser → Namenode



- Click on **Utilities** menu bar and then click on **Browse File System**



- command to stop hadoop are $**stop-dfs.sh** and $**stop-yarn.sh**