

**Exp.No: 1**

**Downloading and installing Hadoop, Understanding different Hadoop modes,  
Startup scripts, Configuration files.**

**AIM:**

To Download and install Hadoop, Understanding different Hadoop modes,  
Startup scripts, Configuration files.

**PROCEDURE:**

**Step 1:** Install java jdk 8 First of all you must install Java JDK 8 on your system. You can just type this command to install java jdk on your system.

**sudo apt install openjdk-8-jdk**

To check it's there cd /usr/lib/jvm

**Step 2:** Add this configuration on you bash file Now just open .bashrc file and paste these commands.

```
export JAVA_HOME=/usr/lib/jvm/java-8-openjdk-amd64
export PATH=$PATH:/usr/lib/jvm/java-8-openjdk-amd64/bin
export HADOOP_HOME=~/.hadoop-3.2.3/
export PATH=$PATH:$HADOOP_HOME/bin
export PATH=$PATH:$HADOOP_HOME/sbin
export HADOOP_MAPRED_HOME=$HADOOP_HOME
export YARN_HOME=$HADOOP_HOME
export HADOOP_CONF_DIR=$HADOOP_HOME/etc/hadoop
export HADOOP_COMMON_LIB_NATIVE_DIR=$HADOOP_HOME/lib/native
export HADOOP_OPTS="-Djava.library.path=$HADOOP_HOME/lib/native"
export HADOOP_STREAMING=$HADOOP_HOME/share/hadoop/tools/lib/hadoop
  pstreaming-3.2.3.jar
export HADOOP_LOG_DIR=$HADOOP_HOME/logs
export PDSH_RCMD_TYPE=ssh
```

(ssh — secure shell — protocol used to securely connect to remote server/system  
— transfers data in encrypted form)

**sudo apt-get install ssh**

Now go to [hadoop.apache.org](http://hadoop.apache.org) website download the tar file ([hadoop.apache.org](http://hadoop.apache.org) — download tar file of hadoop.)

**tar -zxvf ~/Downloads/hadoop-3.2.3.tar.gz (Extract the tar file)**

**cd hadoop-3.2.3/etc/hadoop**

Now open hadoop-env.h

**sudo nano hadoop-env.h**

**JAVA\_HOME=/usr/lib/jvm/java-8-openjdk-amd64** (set the path for JAVA\_HOME).

**Step 3: Add this file in core-site.xml :**

Now add this configuration in core-site.xml file.

**core-site.xml**

```
<configuration>
  <property>
    <name>fs.defaultFS</name>
    <value>hdfs://localhost:9000</value> </property>
  <property>
    <name>hadoop.proxyuser.dataflair.groups</name> <value>*</value>
  </property>
  <property>
    <name>hadoop.proxyuser.dataflair.hosts</name> <value>*</value>
  </property>
  <property>
    <name>hadoop.proxyuser.server.hosts</name> <value>*</value>
  </property>
  <property>
    <name>hadoop.proxyuser.server.groups</name> <value>*</value>
  </property>
</configuration>
```

**Step 4: Add this file in hdfs-site.xml**

Now add this configuration in hdfs-site.xml file.

**hdfs-site.xml**

```
<configuration>
  <property>
    <name>dfs.replication</name>
```

```

    <value>1</value>
  </property>
</configuration>

```

### Step 5: Add this file in mapred-site.xml

Now add this configuration in mapred-site.xml file.

**mapred-site.xml**

```

<configuration>
  <property>
    <name>mapreduce.framework.name</name> <value>yarn</value>
  </property>
  <property>
    <name>mapreduce.application.classpath</name>
    <value>$HADOOP_MAPRED_HOME/share/hadoop/mapreduce/*:$HADOOP_MAPRED_HOME/share/hadoop/mapreduce/lib/*</value>
  </property>
</configuration>

```

### Step 6: Add this file in yarn-site.xml

Now add this configuration in yarn-site.xml file.

**yarn-site.xml**

```

<configuration>
  <property>
    <name>yarn.nodemanager.aux-services</name>
    <value>mapreduce_shuffle</value>
  </property>
  <property>
    <name>yarn.nodemanager.env-whitelist</name>
    <value>JAVA_HOME,HADOOP_COMMON_HOME,HADOOP_HDFS_HOME,HADOOP_CONF_DIR,CLASSPATH_PREPEND_DISTCACHE,HADOOP_YARN_HOME,HADOOP_MAPRED_HOME</value>
  </property>
</configuration>

```

**ssh**

**ssh localhost**

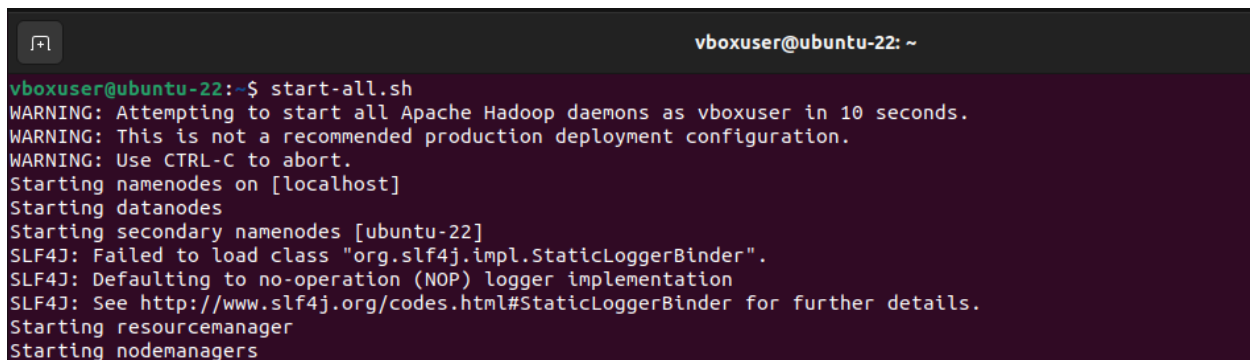
**ssh-keygen -t rsa -P "" -f ~/.ssh/id\_rsa**

```
cat ~/.ssh/id_rsa.pub >> ~/.ssh/authorized_keys
chmod 0600 ~/.ssh/authorized_keys
hadoop-3.2.3/bin/hdfs namenode -format
Format the file system
export PDSH_RCMD_TYPE=ssh
```

### Step 7: Start hadoop

To start, type the command below:

**start-all.sh** (Start NameNode daemon and DataNode daemon)

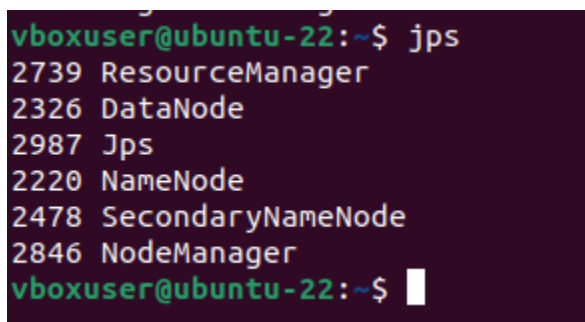
A terminal window with a dark background and light green text. The prompt is 'vboxuser@ubuntu-22: ~'. The command 'start-all.sh' has been executed. The output shows several warning messages about starting Hadoop daemons as vboxuser, followed by status messages for starting namenodes, datanodes, secondary namenodes, resource manager, and node managers. There are also SLF4J logging messages.

```
vboxuser@ubuntu-22: ~
vboxuser@ubuntu-22:~$ start-all.sh
WARNING: Attempting to start all Apache Hadoop daemons as vboxuser in 10 seconds.
WARNING: This is not a recommended production deployment configuration.
WARNING: Use CTRL-C to abort.
Starting namenodes on [localhost]
Starting datanodes
Starting secondary namenodes [ubuntu-22]
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
Starting resource manager
Starting node managers
```

This is how you can install hadoop on your ubuntu operating system and start using on your system.

### Step 8: Check the status using jps

**jps**

A terminal window with a dark background and light green text. The prompt is 'vboxuser@ubuntu-22: ~'. The command 'jps' has been executed. The output lists the running Hadoop processes with their PID and class names: ResourceManager, DataNode, Jps, NameNode, SecondaryNameNode, and NodeManager.

```
vboxuser@ubuntu-22:~$ jps
2739 ResourceManager
2326 DataNode
2987 Jps
2220 NameNode
2478 SecondaryNameNode
2846 NodeManager
vboxuser@ubuntu-22:~$
```

Namenode information

localhost:9870/dfshealth.html#tab-overview

Hadoop

Overview

Datanodes

Datanode Volume Failures

Snapshot

Startup Progress

Utilities

## Overview 'localhost:9000' (active)

<b>Started:</b>	Sun Sep 22 11:02:55 +0530 2024
<b>Version:</b>	3.2.3, rabe5358143720085498613d399be3bbf01e0f131
<b>Compiled:</b>	Sun Mar 20 06:48:00 +0530 2022 by ubuntu from branch-3.2.3
<b>Cluster ID:</b>	CID-43828b74-e7ba-464b-9bb1-e2dd039d2f08
<b>Block Pool ID:</b>	BP-305058674-127.0.1.1-1726117174333

## Summary

Security is off.

Safemode is off.

168 files and directories, 66 blocks (66 replicated blocks, 0 erasure coded block groups) = 234 total filesystem object(s).

Heap Memory used 21.71 MB of 43.05 MB Heap Memory. Max Heap Memory is 477.56 MB.

Non Heap Memory used 53 MB of 54.02 MB Committed Non Heap Memory. Max Non Heap Memory is <unbounded>.

<b>Configured Capacity:</b>	23.94 GB
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NodeManager information

localhost:8042/node



## NodeManager information

- ResourceManager
- NodeManager
  - Node Information
  - List of Applications
  - List of Containers
- Tools

NodeManager information	
<b>Total Vmem allocated for Containers</b>	16.80 GB
<b>Vmem enforcement enabled</b>	true
<b>Total Pmem allocated for Container</b>	8 GB
<b>Pmem enforcement enabled</b>	true
<b>Total VCores allocated for Containers</b>	8
<b>Resource types</b>	memory-mb (unit=Mi), vcores
<b>NodeHealthyStatus</b>	true
<b>LastNodeHealthTime</b>	Sun Sep 22 11:45:58 IST 2024
<b>NodeHealthReport</b>	
<b>NodeManager started on</b>	Sun Sep 22 11:03:43 IST 2024
<b>NodeManager Version:</b>	3.2.3 from abe5358143720085498613d399be3bbf01e0f131 by ubuntu source checksum cd5fc22f993469a5d67fe8bb2902e43 on 2022-03-20T01:27Z
<b>Hadoop Version:</b>	3.2.3 from abe5358143720085498613d399be3bbf01e0f131 by ubuntu source checksum 39bb14faec14b3aa25388a6d7c345fe8 on 2022-03-20T01:18Z

## Step 9: Stop Hadoop Cluster

To stop the Hadoop all services, run the following command:

**stop-all.sh**

```
vboxuser@ubuntu-22:~$ stop-all.sh
WARNING: Stopping all Apache Hadoop daemons as vboxuser in 10 seconds.
WARNING: Use CTRL-C to abort.
Stopping namenodes on [localhost]
Stopping datanodes
localhost: WARNING: datanode did not stop gracefully after 5 seconds: Trying to kill with kill -9
Stopping secondary namenodes [ubuntu-22]
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
Stopping nodemanagers
localhost: WARNING: nodemanager did not stop gracefully after 5 seconds: Trying to kill with kill -9
Stopping resourcemanager
WARNING: resourcemanager did not stop gracefully after 5 seconds: Trying to kill with kill -9
vboxuser@ubuntu-22:~$
```

## RESULT:

The step-by-step installation and configuration of Hadoop on Ubuntu system have been successfully completed.