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SUBJECT:IT8711-FOSS AND CLOUD COMPUTING LAB

EXERCISE NO:9

PROCEDURAL STEPS

Step 1: Download the following Packages

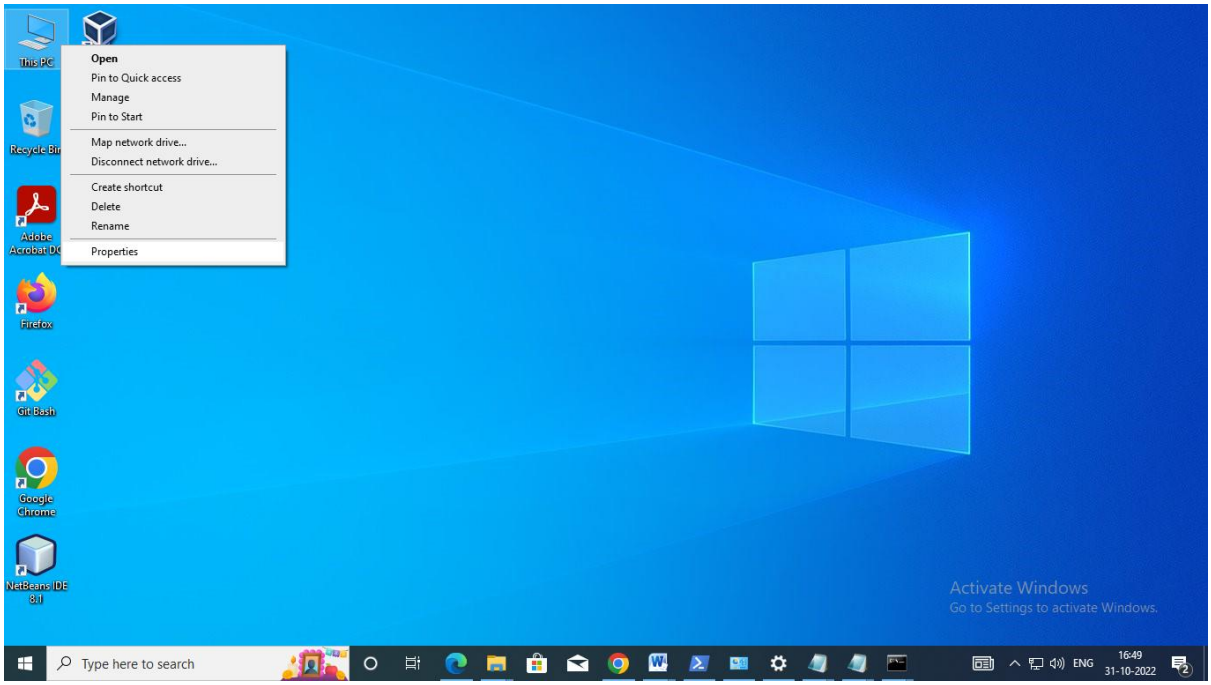
1. hadoop-3.2.2.tar.gz
   Link: https://www.apache.org/dyn/closer.cgi/hadoop/common/hadoop-3.2.2/hadoop-3.2.2.tar.gz
2. 7zip to unzip the tar.gz file
   Link: https://www.7-zip.org/download.html
3. Java 8 (JDK-8U333 & JRE-8U333)
   Link: https://www.oracle.com/java/technologies/javase/javase8u211-later-archive-downloads.html
4. Hadoop dll Files
   Link: https://github.com/cdarlint/winutils/archive/refs/heads/master.zip
5. hadoop-hdfs-3.2.2.jar
   Link: https://jar-download.com/artifacts/org.apache.hadoop/hadoop-hdfs/3.2.2/source-code

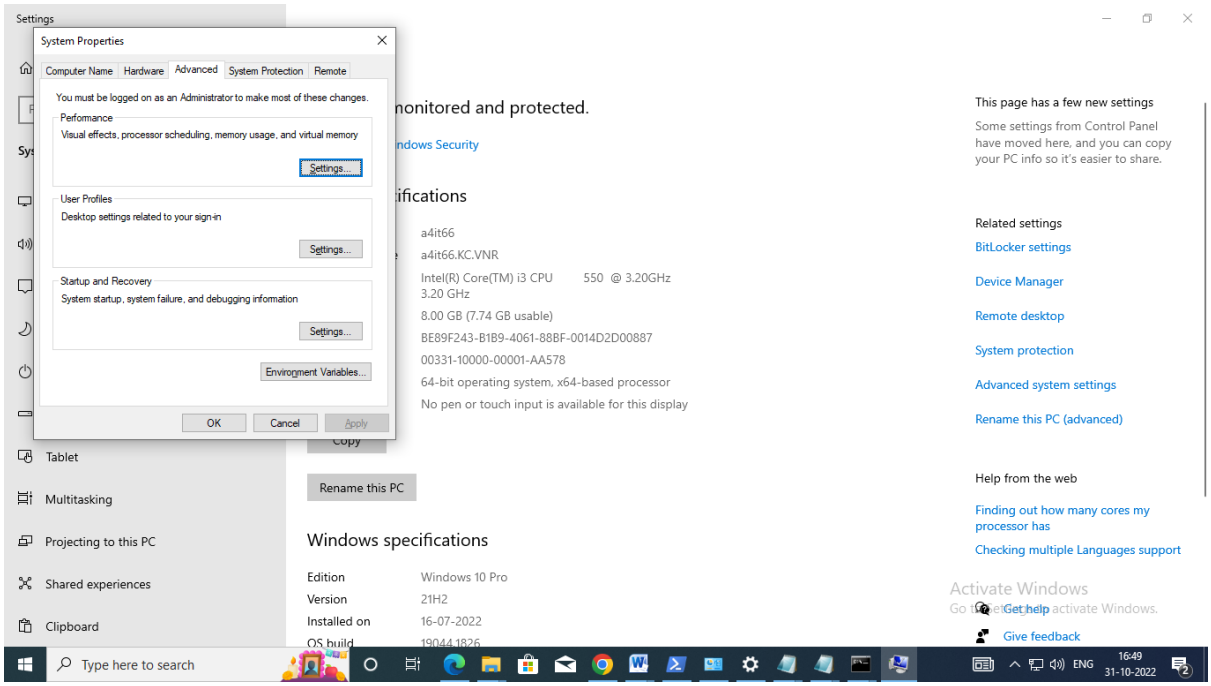
Step 2: Install / Extract the following Packages:

1. Install Java 8 in the location **c:\JAVA**. Also create two folders namely **"jdk1.8.0_333"** and **"jre1.8.0_333"**.
2. Create a folder **"hadoop-env"** in **D:**
3. Paste the downloaded "hadoop-3.2.2.tar.gz" into "d:\ hadoop-env"
4. Unzip the "hadoop-3.2.2.tar.gz" using 7zip (do the unzip function two times)
5. Copy the downloaded Hadoop dll files to the location "D:\hadoop-env\hadoop-3.2.2\bin"
6. Copy the downloaded hadoop-hdfs-3.2.2.jar to "D:\hadoop-env\hadoop-3.2.2\share\hadoop\hdfs"
7. Edit the JAVA_HOME = C:\JAVA\jdk1.8.0_333 in the path "**D:\hadoop-env\hadoop-3.2.2\etc\hadoop\hadoop-env.cmd**

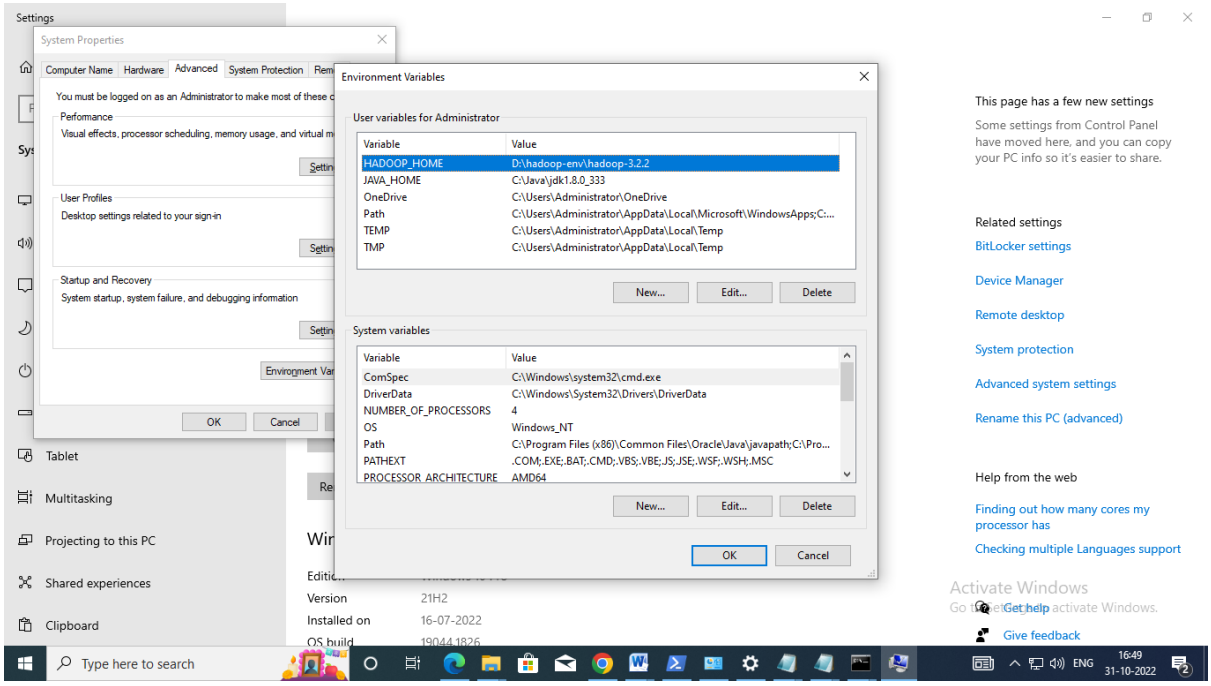
Step 3: Set the path for Java and Hadoop in system environment variables

To edit environment variables, go to Control Panel → System and Security → System (or) right-click “This PC” → Properties (My Computer icon) and click on the “Advanced system settings” link.



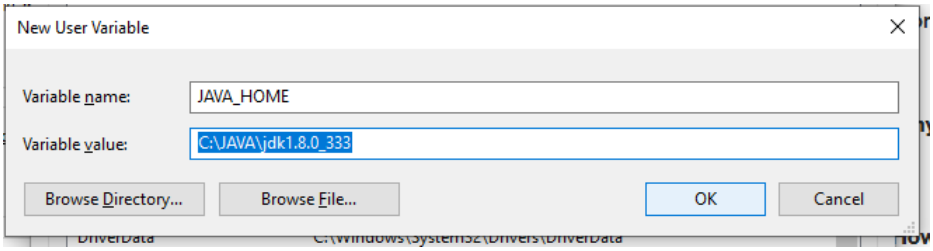


In the “Environment Variables” dialog, press the “New” button to add a new variable.

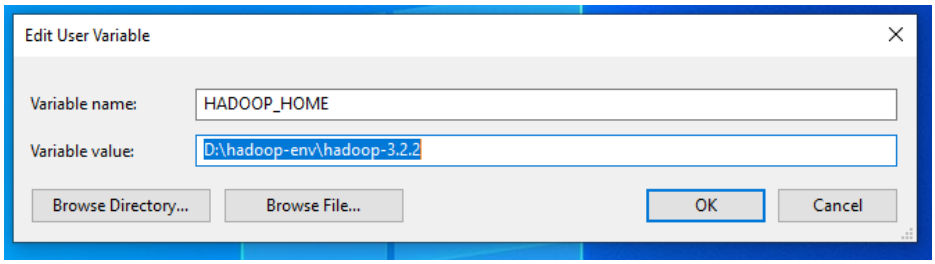


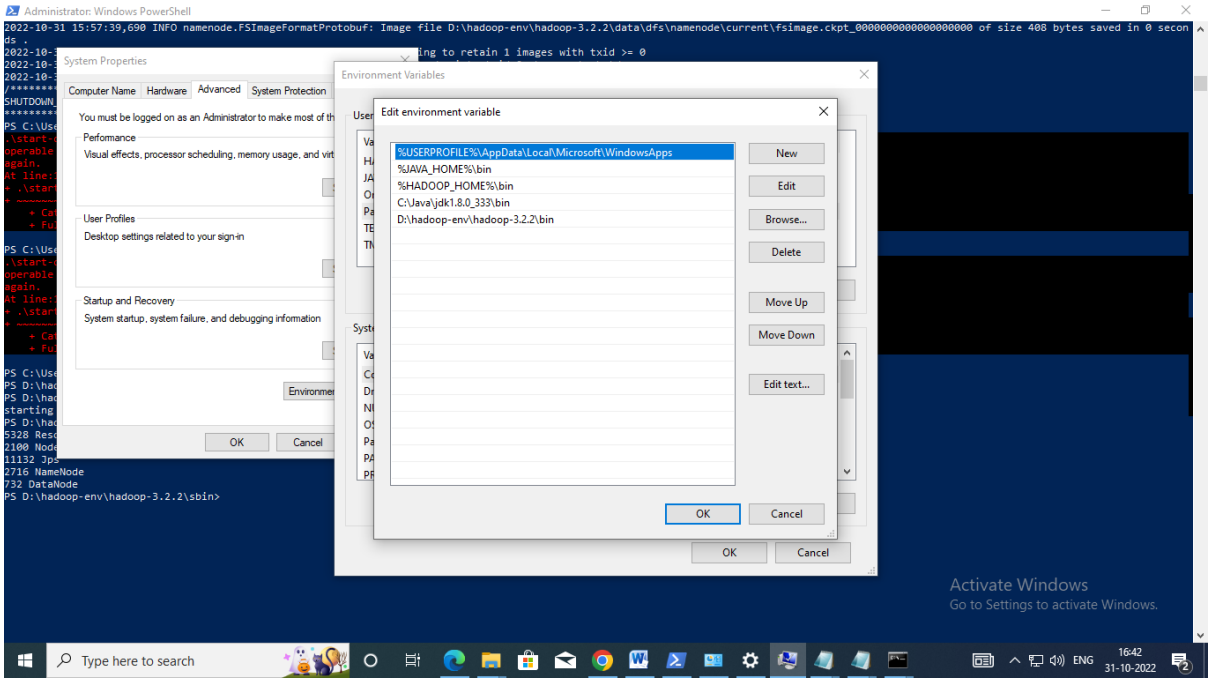
Now, Edit the PATH variable to add the Java and Hadoop binaries paths as shown in the following screenshots.

JAVA_HOME: JDK installation folder path



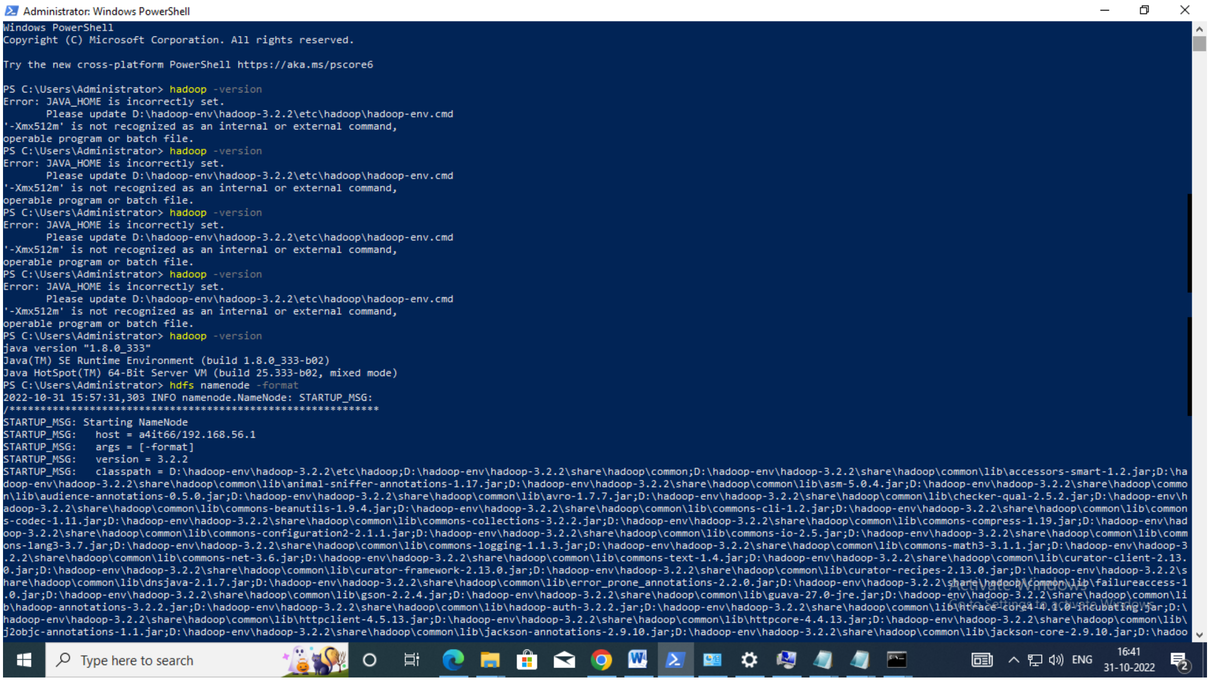
HADOOP_HOME: Hadoop installation folder path





Step 4: Open Command Prompt as Administrator and run the following command:

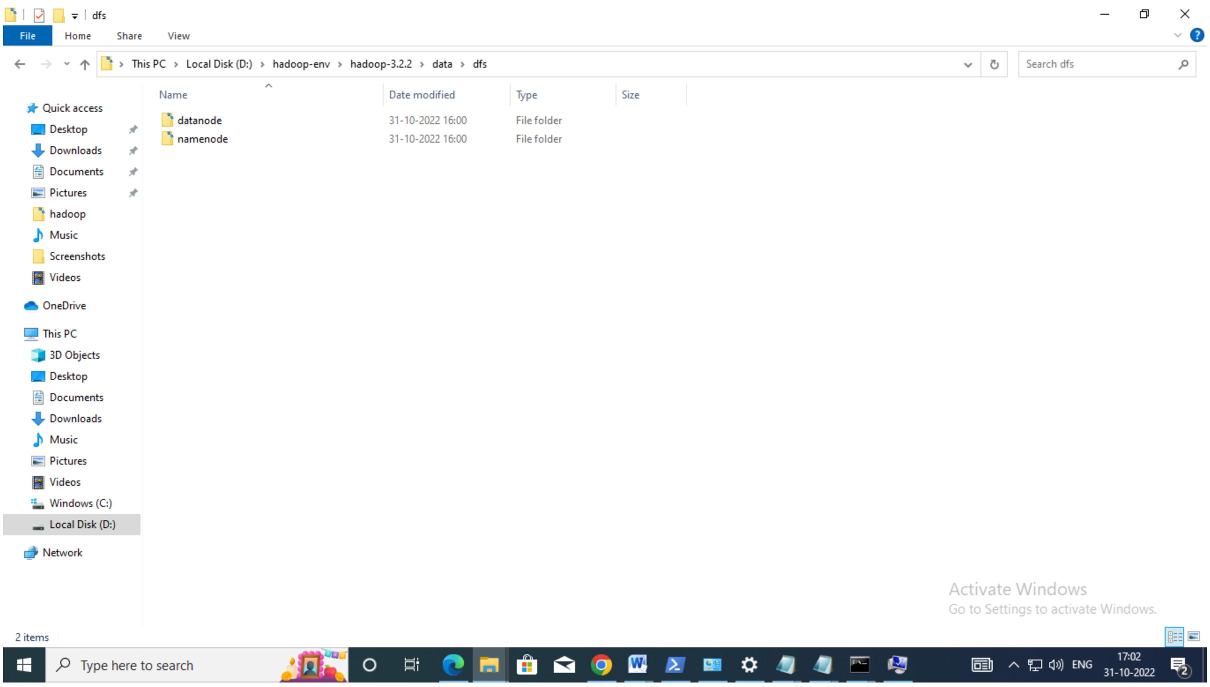
hadoop –version



Step 4: Create the following folders

D:\hadoop-env\hadoop-3.2.2**data\dfs\namenode**

D:\hadoop-env\hadoop-3.2.2**data\dfs\datanode**



Step 5: Configuring Hadoop cluster

There are **four files** to configure Hadoop cluster:

Location of the File: **"D:\hadoop-env\hadoop-3.2.2\etc\hadoop"**

File Name: “hdfs-site.xml”

Add the following properties within the <configuration></configuration> element:

<property>

<name>dfs.replication</name>

<value>1</value>

</property>

<property>

<name>dfs.namenode.name.dir</name>

*<value>**file:///D:/hadoop-env/hadoop-3.2.2/data/dfs/namenode**</value>*

</property>

<property>

<name>dfs.datanode.data.dir</name>

*<value>**file:///D:/hadoop-env/hadoop-3.2.2/data/dfs/datanode**</value>*

</property>

File Name: “core-site.xml”

Add the following properties within the <configuration></configuration> element:

<property>

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

*<value>**hdfs://localhost:9820**</value>*

</property>

File Name: “mapred-site.xml”

Add the following properties within the <configuration></configuration> element:

<property>

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

<value>yarn</value>

<description>MapReduce framework name</description>

</property>

File Name: “yarn-site.xml”

Add the following properties within the <configuration></configuration> element:

<property>

<name>*yarn.nodemanager.aux-services*</name>

<value>*mapreduce_shuffle*</value>

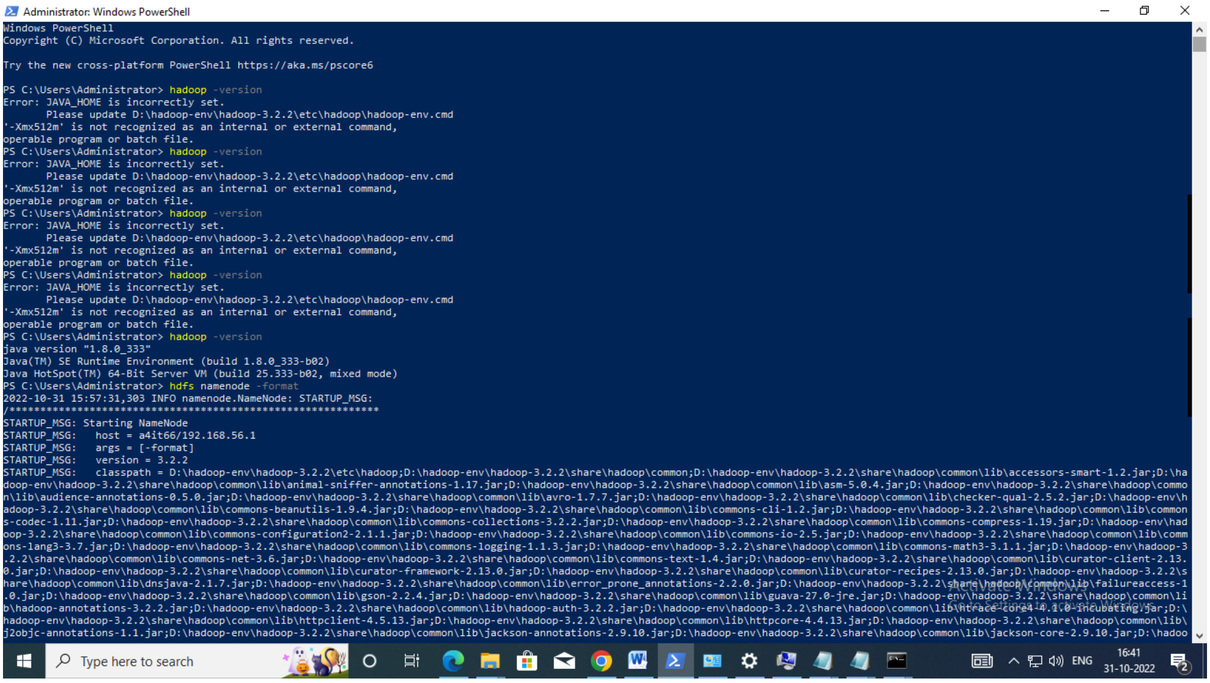
<description>*Yarn Node Manager Aux Service*</description>

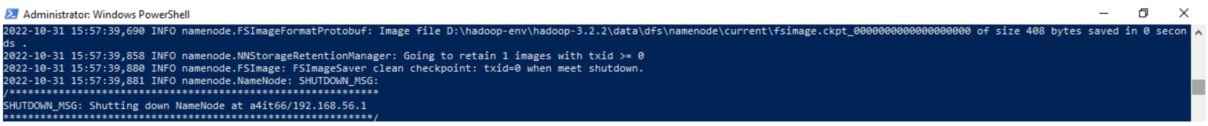
</property>

Step 6: Format the namenode

After finishing the configuration, format the name using the following command

hdfs namenode –format

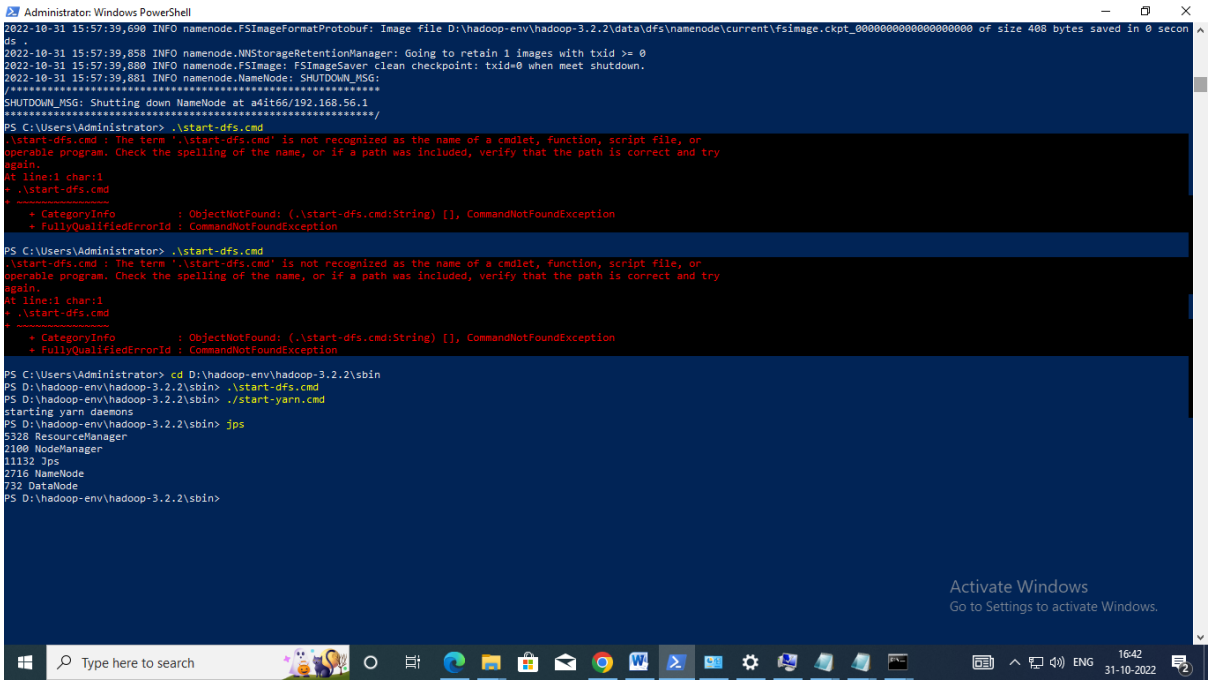




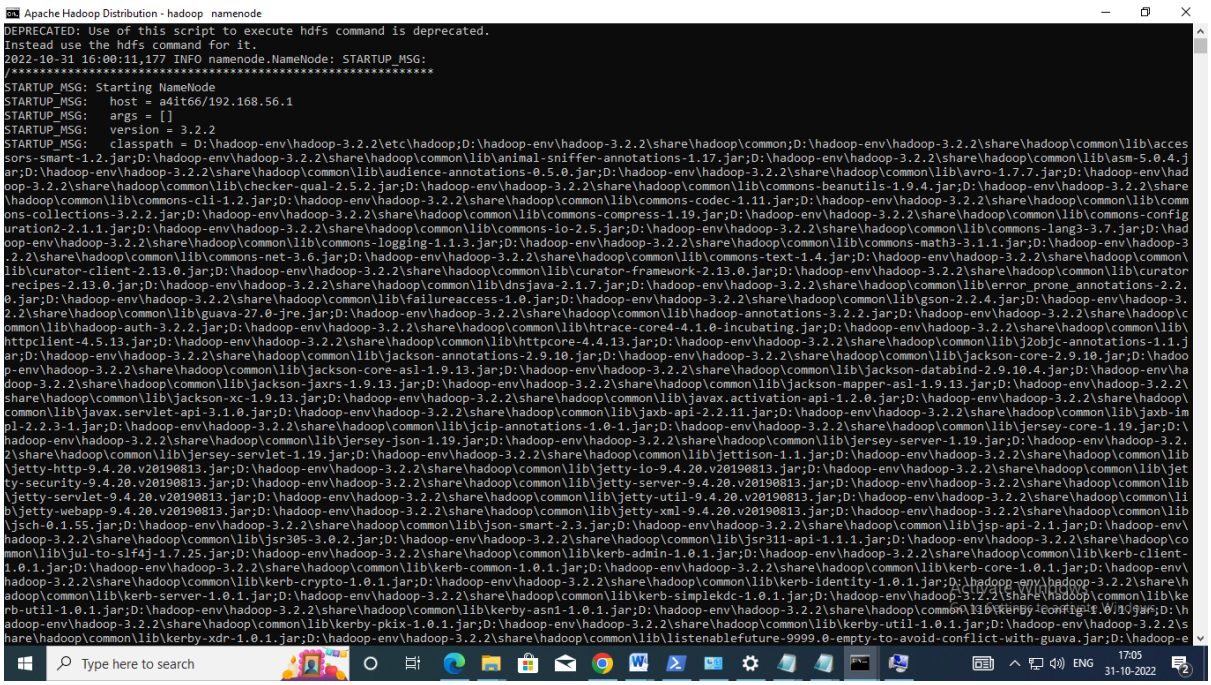
Step 7: Start the Hadoop nodes

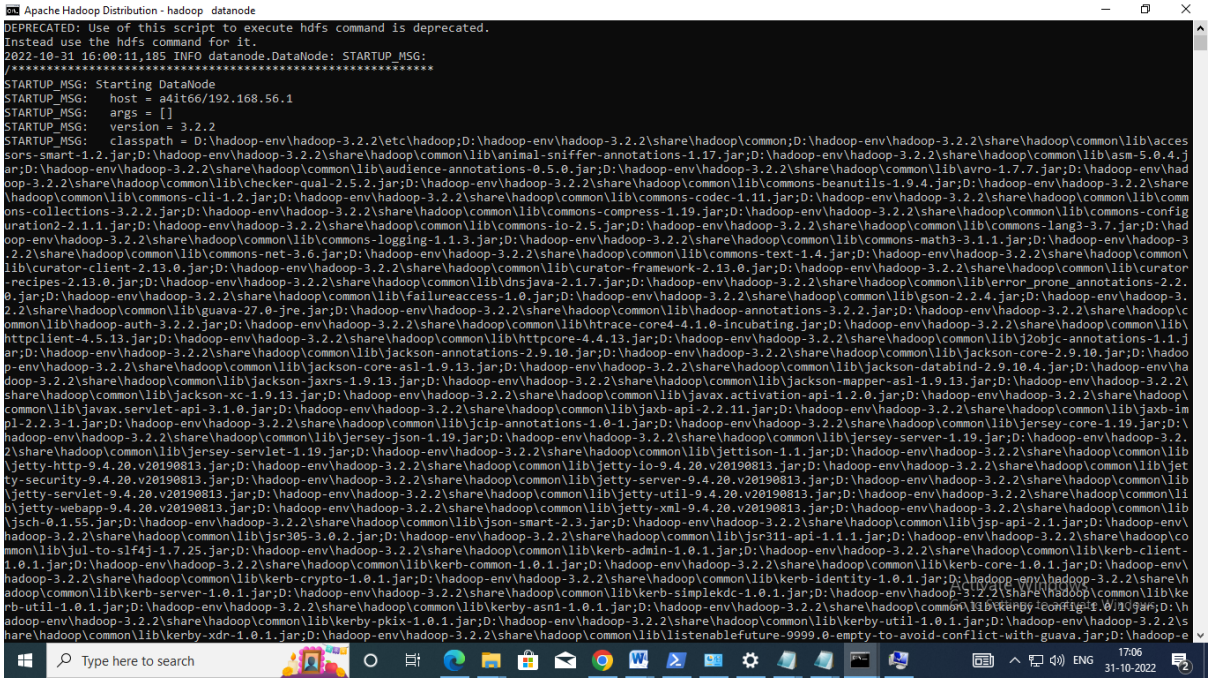
Now navigate to the location "D:\hadoop-env\hadoop-3.2.2\sbin" in powershell and then run the following command to start the Hadoop nodes:

.\start-dfs.cmd



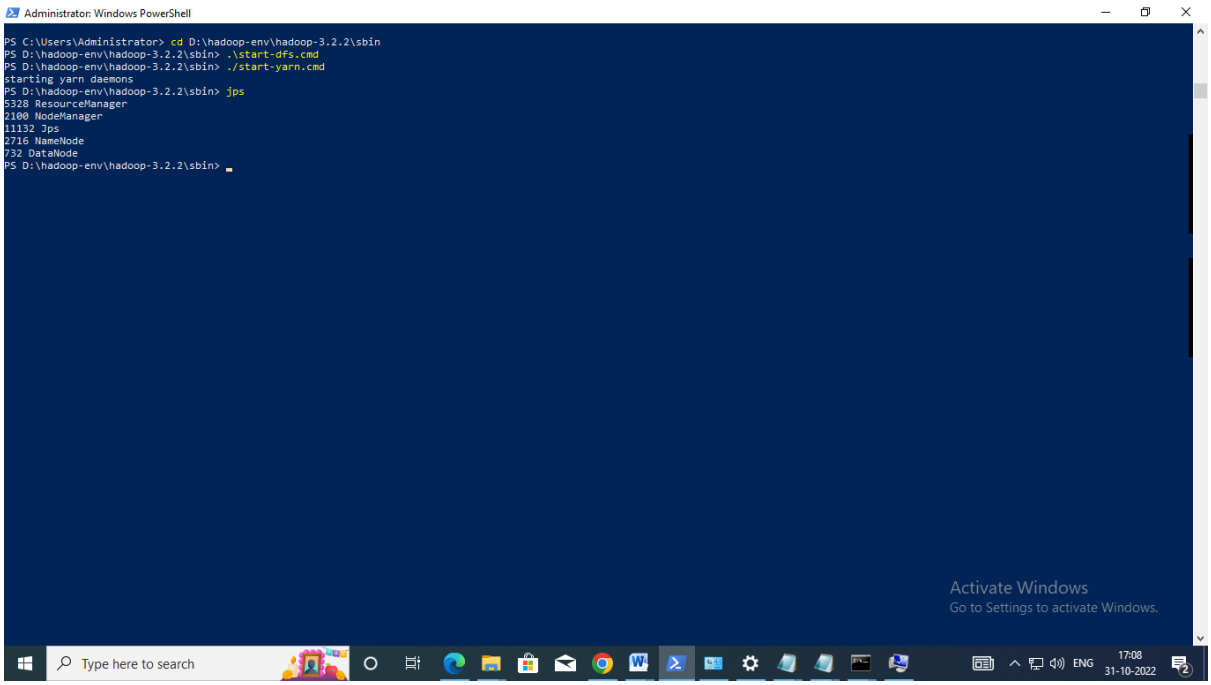
Two command prompt windows will open (one for the **namenode** and one for the **datanode**) as follows:



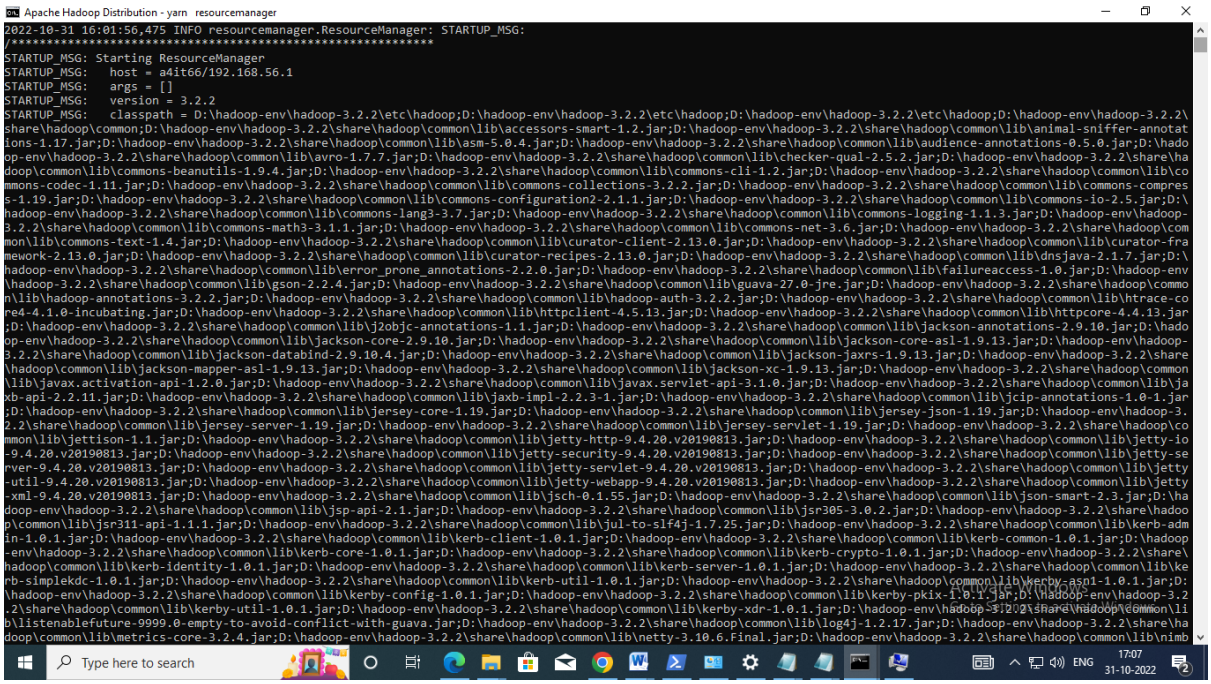


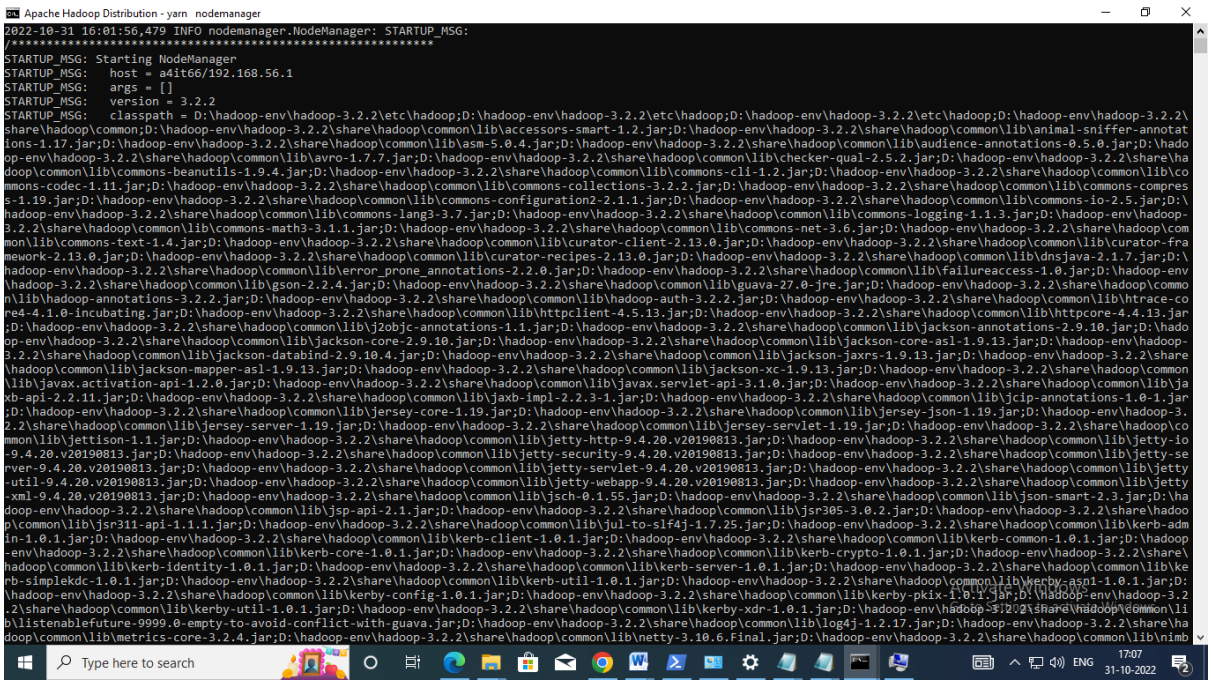
Next, Start the Hadoop Yarn service using the following command:

./start-yarn.cmd



Two command prompt windows will open (one for the **resource manager** and one for the **node manager**) as follows:





To make sure that all services started successfully, Run the following command:

jps

It should display the following services:

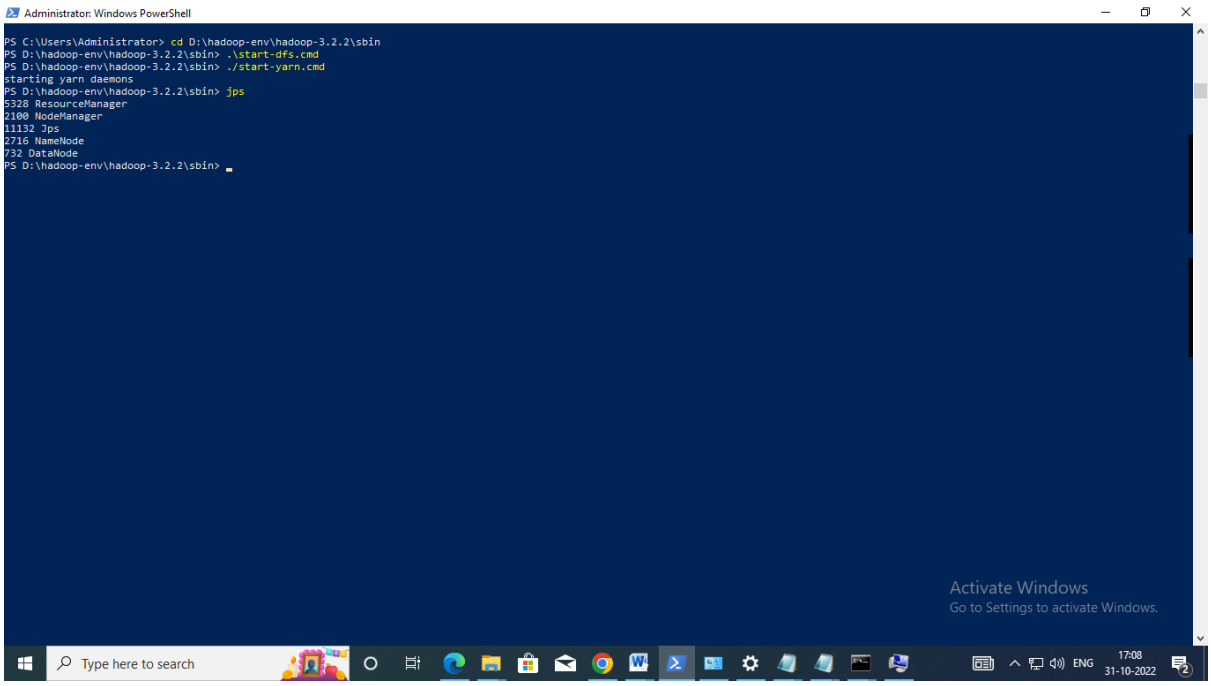
14560 DataNode

4960 ResourceManager

5936 NameNode

768 NodeManager

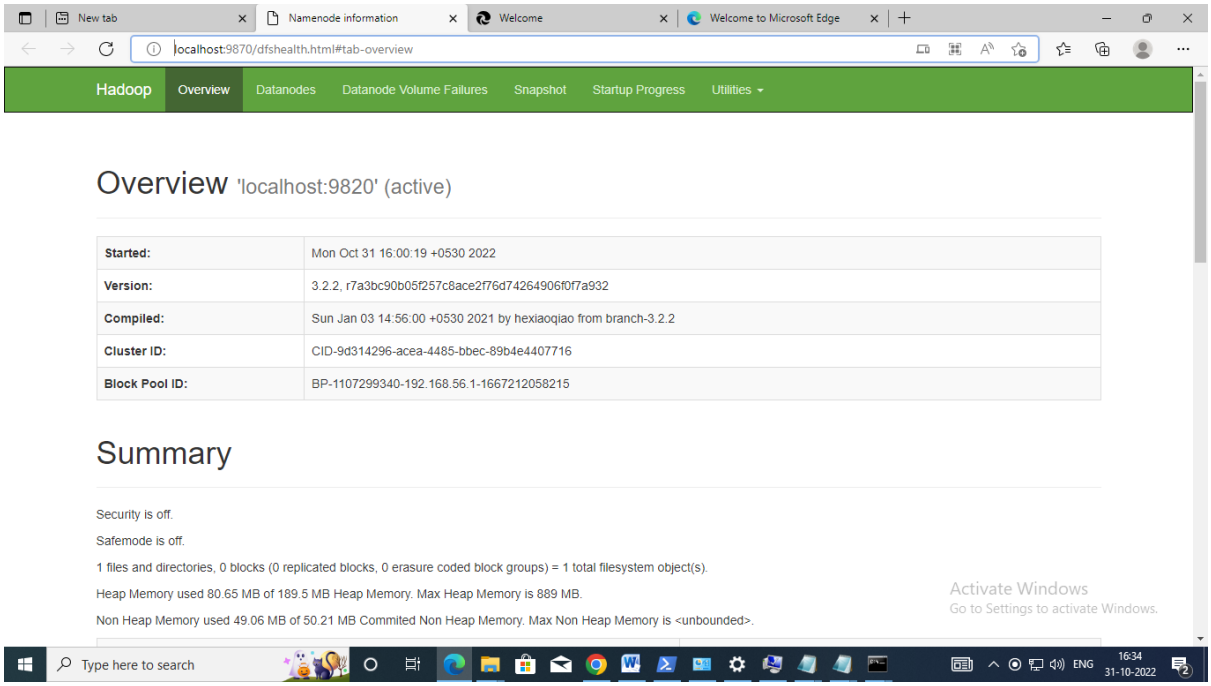
14636 Jps



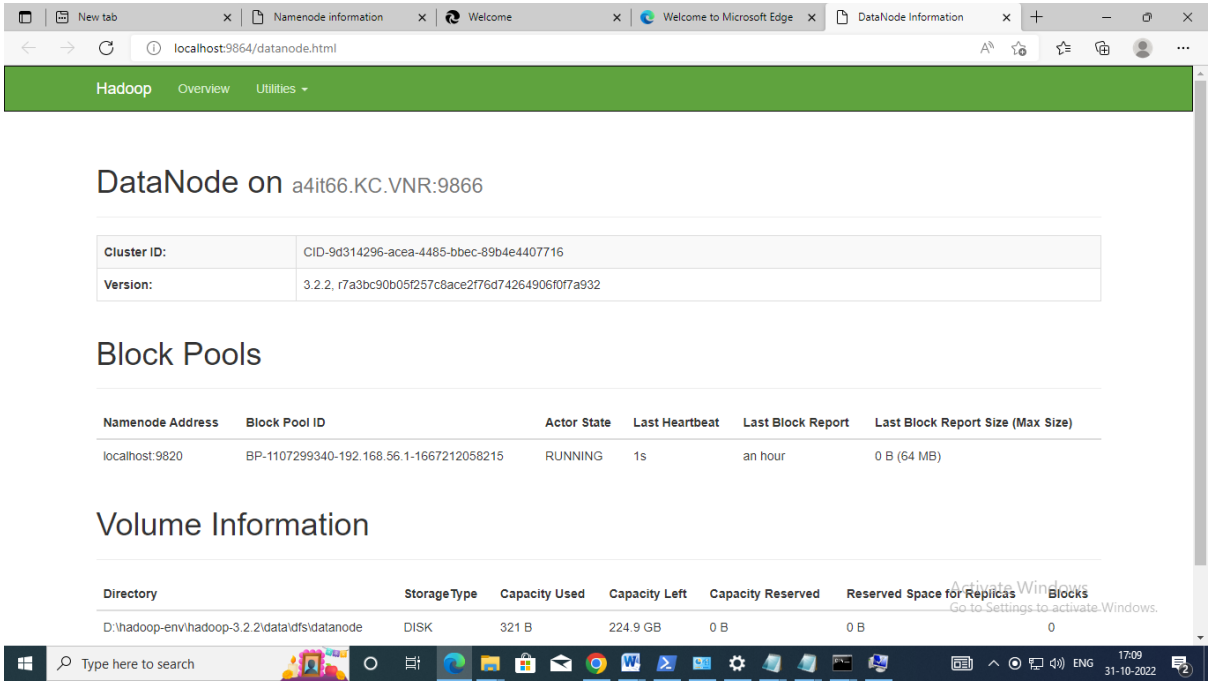
Output

Hadoop Web UI

http://localhost:9870/dfshealth.html



http://localhost:9864/datanode.html



http://localhost:8088/cluster