Install Hadoop 3.3.0 on Windows 10 using WSL

Raymond 14,057 4 2 years ago

Hadoop 3.3.0 was released on July 14 2020. It is the first release of Apache Hadoop 3.3 line. There are significant changes compared with Hadoop 3.2.0, such as Java 11 runtime support, protobuf upgrade to 3.7.1, scheduling of opportunistic containers, non-volatile SCM support in HDFS cache directives, etc.

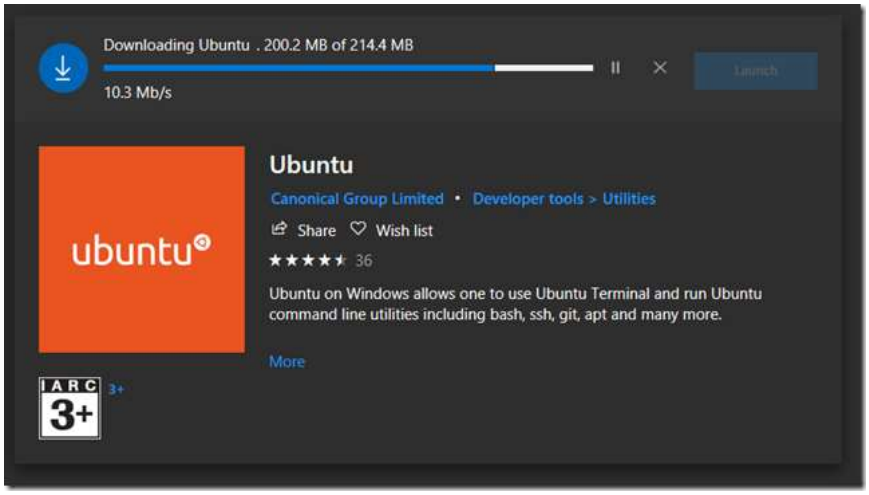
This article provides step-by-step guidance to install Hadoop 3.3.0 on Windows 10 via WSL (Windows Subsystem for Linux). These instructions are also be applied to Linux systems to install Hadoop. Most of the content is based on article Install Hadoop 3.2.0 on Windows 10 using Windows Subsystem for Linux (WSL).

Prerequisites

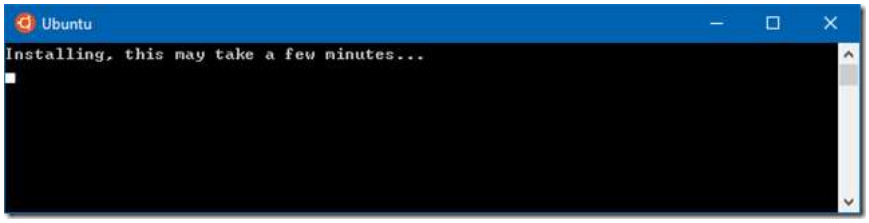
Follow the page below to enable WSL and then install one of the Linux systems from Microsoft Store.

Windows Subsystem for Linux Installation Guide for Windows 10

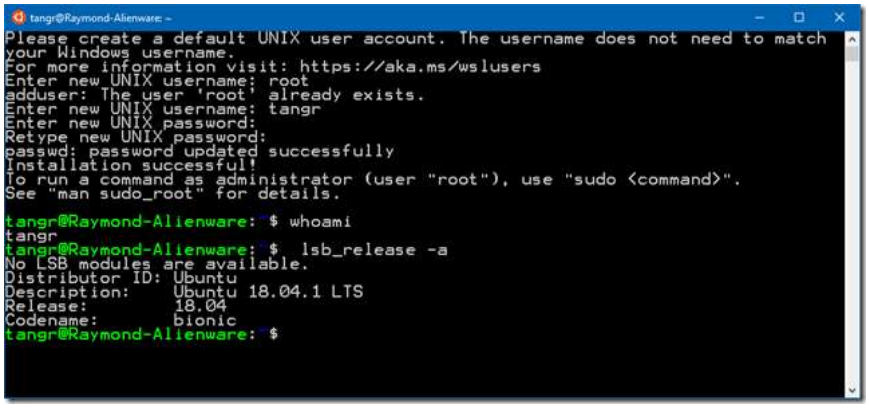
To be specific, enable WSL by running the following PowerShell code as Administrator (or enable it through Control Panel):



Once download is completed, click Launch button to lunch the application. It make take a few minutes to install:



During the installation, you need to input a username and password. Once it is done, you are ready to use the Ubuntu terminal:



Install Java JDK

Run the following command to update package index:

```
java -version
```

Command 'java' not found, but can be installed with:

```
sudo apt install default-jre
sudo apt install openjdk-11-jre-headless
sudo apt install openjdk-8-jre-headless
```

Install OpenJDK via the following command:

```
sudo apt-get install openjdk-8-jdk
```

Check the version installed:

```
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)
```

You can also use Java 11 from this version as it is now supported.

Download Hadoop binary

Go to release page of Hadoop website to find a download URL for Hadoop 3.3.0:

Hadoop Releases

For me, the closest mirror is:

http://mirror.intergrid.com.au/apache/hadoop/common/hadoop-3.3.0/hadoop-3.3.0.tar.gz

Run the following command in Ubuntu terminal to download a binary from the internet:

```
wget http://mirror.intergrid.com.au/apache/hadoop/common/hadoop-3.3.0/hadoop-3.3.0.tar.gz
```

Wait until the download is completed:

Unzip Hadoop binary

Run the following command to create a **hadoop** folder under user home folder:

```
mkdir ~/hadoop
```

And then run the following command to unzip the binary package:

```
tar -xvzf hadoop-3.3.0.tar.gz -C ~/hadoop
```

Once it is unpacked, change the current directory to the Hadoop folder:

```
cd ~/hadoop/hadoop-3.3.0/
```

Configure passphraseless ssh

```
ssh localhost
```

If you cannot ssh to localhost without a passphrase, run the following command to initialize your private and public keys:

```
ssh-keygen -t rsa -P '' -f ~/.ssh/id_rsa
cat ~/.ssh/id_rsa.pub >> ~/.ssh/authorized_keys
chmod 0600 ~/.ssh/authorized_keys
```

If you encounter errors like 'ssh: connect to host localhost port 22: Connection refused', run the following commands:

```
sudo apt-get install ssh
And then restart the service:
sudo service ssh restart
```

If the above commands still don't work, try the solution in this comment.

*The comment link will redirect you to another article for a different version of Hadoop installation.

Configure the pseudo-distributed mode (Single-node mode)

Now, we can follow the official guide to configure a single node:

Pseudo-Distributed Operation

1) Setup environment variables (optional)

Setup environment variables by editing file **~/.bashrc**.

```
vi ~/.bashrc
```

Add the following environment variables:

```
export JAVA_HOME=/usr/lib/jvm/java-1.8.0-openjdk-amd64
export HADOOP_HOME=~/hadoop/hadoop-3.3.0
export PATH=$PATH:$HADOOP_HOME/bin
export HADOOP_CONF_DIR=$HADOOP_HOME/etc/hadoop
```

Run the following command to source the latest variables:

```
source ~/.bashrc
```

2) Edit **etc/hadoop/hadoop-env.sh** file:

```
vi etc/hadoop/hadoop-env.sh
```

Set a JAVA_HOME environment variable:

```
export JAVA_HOME=/usr/lib/jvm/java-8-openjdk-amd64
```

3) Edit **etc/hadoop/core-site.xml**:

```
vi etc/hadoop/core-site.xml
```

Add the following configuration:

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

4) Edit **etc/hadoop/hdfs-site.xml**:

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

5) Edit file **etc/hadoop/mapred-site.xml**:

```
vi etc/hadoop/mapred-site.xml
```

Add the following configuration:

```
<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>
```

6) Edit file **etc/hadoop/yarn-site.xml**:

```
vi etc/hadoop/yarn-site.xml
```

Add the following configuration:

```
<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_M
APRED_HOME</value>
    </property>
</configuration>
```

Format namenode

Run the following command to format the name node:

```
bin/hdfs namenode -format
```

Run DFS daemons

1) Run the following commands to start NameNode and DataNode daemons:

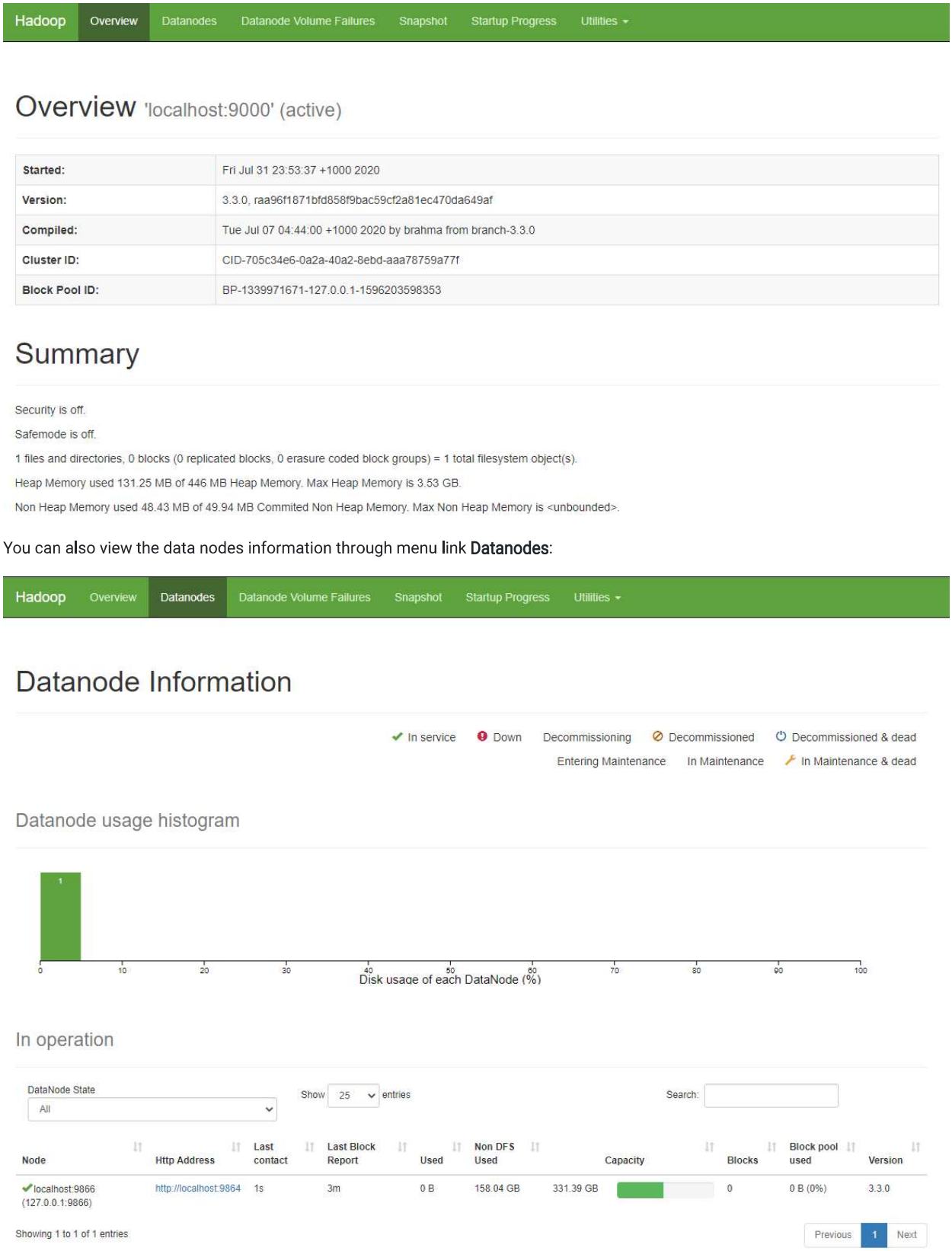
```
tangr@raymond-pc:~/hadoop/hadoop-3.3.0$ sbin/start-dfs.sh
Starting namenodes on [localhost]
Starting datanodes
Starting secondary namenodes [raymond-pc]
```

2) Check status via **jps** command:

```
tangr@raymond-pc:~/hadoop/hadoop-3.3.0$ jps
2212 NameNode
2423 DataNode
2682 SecondaryNameNode
2829 Jps
```

When the services are initiated successfully, you should be able to see these four processes.

The web UI looks like the following:



You can also view the data nodes information through menu link **Datanodes**:

Run YARN daemon

1) Run the following command to start YARN daemon:

```
sbin/start-yarn.sh
```

```
WARNING: YARN_CONF_DIR has been replaced by HADOOP_CONF_DIR. Using value of YARN_CONF_DIR.
```

2) Check status via **jps** command

```
tangr@raymond-pc:~/hadoop/hadoop-3.3.0$ jps
2212 NameNode
5189 NodeManager
2423 DataNode
5560 Jps
5001 ResourceManager
2682 SecondaryNameNode
```

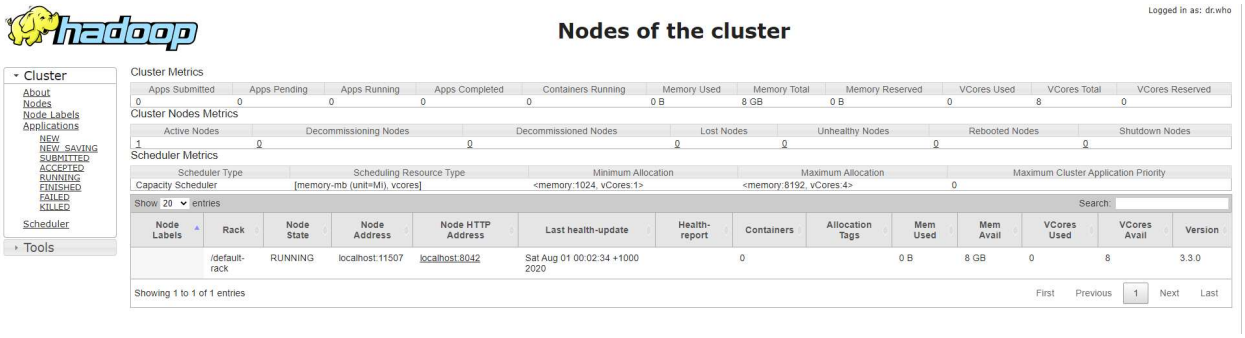
Once the services are started, you can see two more processes for **NodeManager** and **ResourceManager**.

3) View YARN web portal

You can view the YARN resource manager web UI through the following URL:

http://localhost:8088/cluster

The web UI looks like the following:



You can view all the applications through this web portal.

Shutdown services

Once you've completed explorations, you can use the following command to shutdown those daemons:

```
sbin/stop-yarn.sh
sbin/stop-dfs.sh
```

You can verify through jps command which will only show one process now:

```
tangr@raymond-pc:~/hadoop/hadoop-3.3.0$ jps
6593 Jps
```

Summary

Congratulations! Now you have successfully installed a single node Hadoop 3.3.0 cluster in your Ubuntu subsystem of Windows 10. It's relatively easier compared with native Windows installation as we don't need to download or build native Hadoop HDFS libraries.

Have fun with Hadoop 3.3.0.

If you encounter any issues, please post a comment and I will try my best to help.

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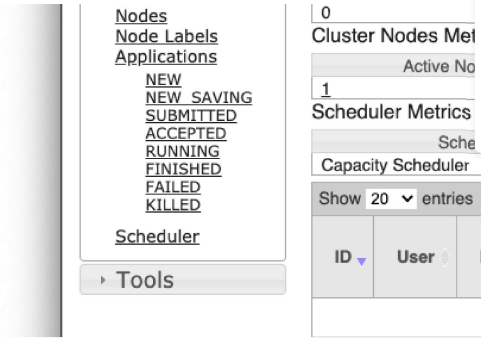

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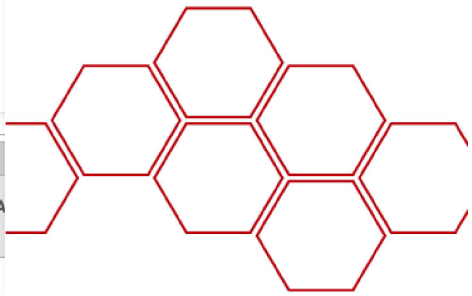

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