

HBASE ASSIGNMENT

1. Create a Pseudo-distributed mode hbase cluster, with local storage

Prerequisites :

Install and configure a single node hadoop on the machine.

STEPS:-

1. Download a hbase version which supports your hadoop version and extract the tar file using the below commands:

The screenshot shows a terminal window titled 'hduser@hadoop-VirtualBox: ~'. It displays the command 'sudo wget http://dlcdn.apache.org/hbase/2.3.7/hbase-2.3.7-bin.tar.gz' being run, followed by the progress of the download. Once completed, the command 'ls' is run to show the files 'hadoop-2.10.1', 'hadoop-2.10.1.tar.gz', and 'hbase-2.3.7-bin.tar.gz'. Finally, the command 'sudo tar xvzf hbase-2.3.7-bin.tar.gz' is run to extract the contents of the tar file, listing all the sub-directories and files extracted from the archive.

```
hduser@hadoop-VirtualBox:~$ sudo wget http://dlcdn.apache.org/hbase/2.3.7/hbase-2.3.7-bin.tar.gz
--2022-03-11 23:30:52--  http://dlcdn.apache.org/hbase/2.3.7/hbase-2.3.7-bin.tar.gz
Resolving dlcdn.apache.org (dlcdn.apache.org)... 151.101.2.132, 2a04:4e42::644
Connecting to dlcdn.apache.org (dlcdn.apache.org)|151.101.2.132|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 272812222 (260M) [application/x-gzip]
Saving to: 'hbase-2.3.7-bin.tar.gz'

hbase-2.3.7-bin.tar 100%[=====] 260.17M  6.81MB/s    in 37s

2022-03-11 23:31:30 (6.95 MB/s) - 'hbase-2.3.7-bin.tar.gz' saved [272812222/272812222]

hduser@hadoop-VirtualBox:~$ ls
hadoop-2.10.1  hadoop-2.10.1.tar.gz  hbase-2.3.7-bin.tar.gz

hduser@hadoop-VirtualBox:~$ sudo tar xvzf hbase-2.3.7-bin.tar.gz
hbase-2.3.7/LICENSE.txt
hbase-2.3.7/NOTICE.txt
hbase-2.3.7/LEGAL
hbase-2.3.7/docs/
hbase-2.3.7/docs/_chapters/
hbase-2.3.7/docs/_chapters/images/
hbase-2.3.7/docs/apidocs/
hbase-2.3.7/docs/apidocs/com/
hbase-2.3.7/docs/apidocs/com/google/
hbase-2.3.7/docs/apidocs/com/google/protobuf/
hbase-2.3.7/docs/apidocs/org/
hbase-2.3.7/docs/apidocs/org/apache/
hbase-2.3.7/docs/apidocs/org/apache/hadoop/
hbase-2.3.7/docs/apidocs/org/apache/hadoop/hbase/
hbase-2.3.7/docs/apidocs/org/apache/hadoop/hbase/chaos/
hbase-2.3.7/docs/apidocs/org/apache/hadoop/hbase/chaos/class-use/
hbase-2.3.7/docs/apidocs/org/apache/hadoop/hbase/chaos/class-use/
```

2. Move the extracted folder to **/usr/local/hbase** directory and give the hbase directory ownership of your hduser using the below command.

```
sudo mv hbase-2.3.7 /usr/local/hbase
sudo chown -R hduser:hadoop /usr/local/hbase
```

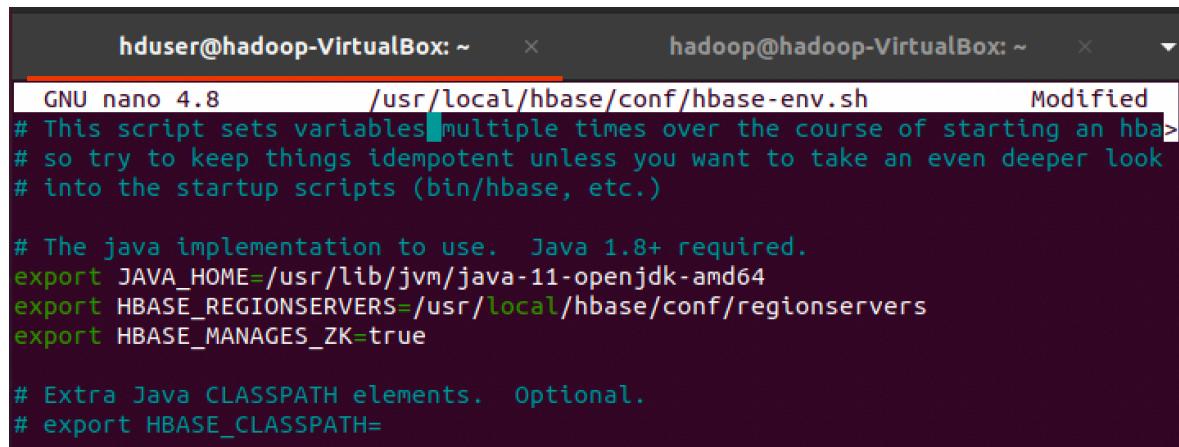
3. Go to .bashrc file and add the following config to that file , After that to apply changes use **source ~/.bashrc** command

```
# HBASE VARIABLES

export HBASE_HOME=/usr/local/hbase
export PATH=$PATH:$HBASE_HOME/bin

# HBASE VARIABLES END
```

4. Add the following configuration to the **/usr/local/hbase/conf/hbase-env.sh**

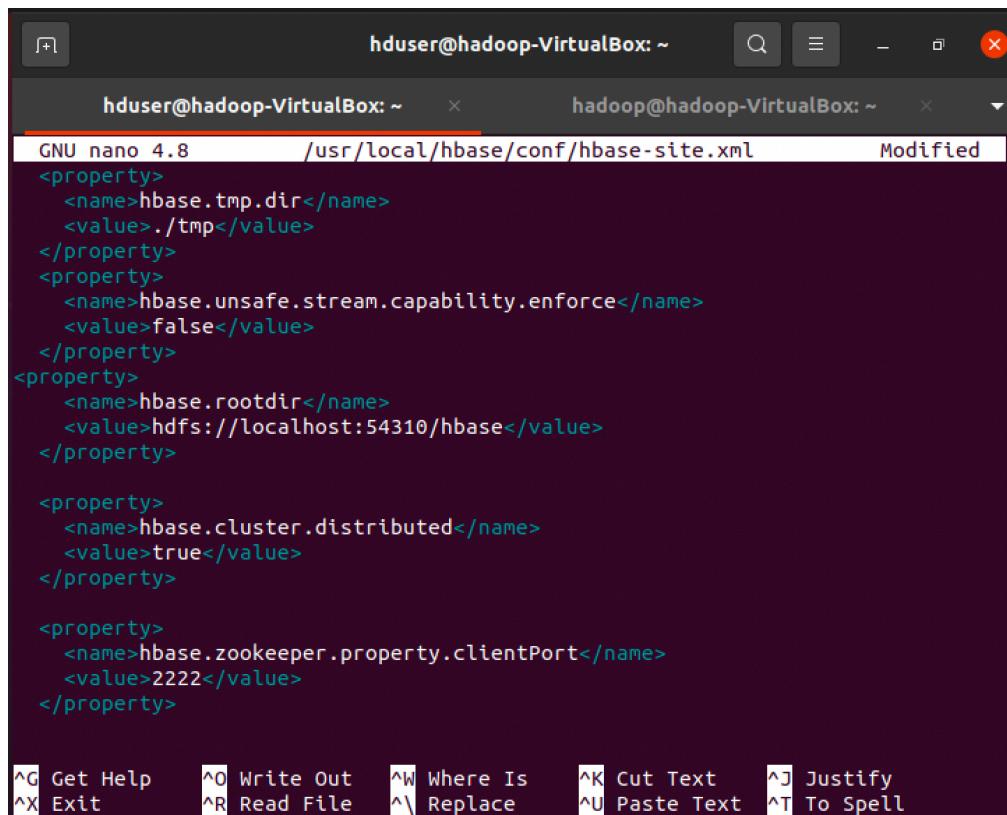


```
GNU nano 4.8      /usr/local/hbase/conf/hbase-env.sh      Modified
# This script sets variables multiple times over the course of starting an hbase cluster
# so try to keep things idempotent unless you want to take an even deeper look
# into the startup scripts (bin/hbase, etc.)

# The java implementation to use. Java 1.8+ required.
export JAVA_HOME=/usr/lib/jvm/java-11-openjdk-amd64
export HBASE_REGIONSERS=/usr/local/hbase/conf/regionservers
export HBASE_MANAGES_ZK=true

# Extra Java CLASSPATH elements. Optional.
# export HBASE_CLASSPATH=
```

5. Add the following configuration to **/usr/local/hbase/conf/hbase-site.xml**



```
GNU nano 4.8      /usr/local/hbase/conf/hbase-site.xml      Modified
<property>
  <name>hbase.tmp.dir</name>
  <value>./tmp</value>
</property>
<property>
  <name>hbase.unsafe.stream.capability.enforce</name>
  <value>false</value>
</property>
<property>
  <name>hbase.rootdir</name>
  <value>hdfs://localhost:54310/hbase</value>
</property>

<property>
  <name>hbase.cluster.distributed</name>
  <value>true</value>
</property>

<property>
  <name>hbase.zookeeper.property.clientPort</name>
  <value>2222</value>
</property>
```

```
<property>
  <name>hbase.zookeeper.property.dataDir</name>
  <value>/home/hduser/zookeeper</value>
</property>
</configuration>
```

6. Start the **dfs** using the below command:

```
hduser@hadoop-VirtualBox:~$ start-dfs.sh
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by org.apache.hadoop.security.authentication
.util.KerberosUtil (file:/usr/local/hadoop/share/hadoop/common/lib/hadoop-auth-
2.10.1.jar) to method sun.security.krb5.Config.getInstance()
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop
.security.authentication.util.KerberosUtil
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflec-
tive access operations
WARNING: All illegal access operations will be denied in a future release
22/03/11 23:59:28 WARN util.NativeCodeLoader: Unable to load native-hadoop libr-
ary for your platform... using builtin-java classes where applicable
Starting namenodes on [localhost]
localhost: starting namenode, logging to /usr/local/hadoop/logs/hadoop-hduser-n-
amenode-hadoop-VirtualBox.out
localhost: WARNING: An illegal reflective access operation has occurred
localhost: WARNING: Illegal reflective access by org.apache.hadoop.security.aut-
hentication.util.KerberosUtil (file:/usr/local/hadoop/share/hadoop/common/lib/h-
adoop-auth-2.10.1.jar) to method sun.security.krb5.Config.getInstance()
localhost: WARNING: Please consider reporting this to the maintainers of org.an-
```

7. Start hbase using the below command:

```
hduser@hadoop-VirtualBox:~$ start-hbase.sh
SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/usr/local/hadoop/share/hadoop/common/lib/slf
4j-log4j12-1.7.25.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in [jar:file:/usr/local/hbase/lib/client-facing-thirdparty
/slf4j-log4j12-1.7.30.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings for an explanation
.
SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]
SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/usr/local/hadoop/share/hadoop/common/lib/slf
4j-log4j12-1.7.25.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in [jar:file:/usr/local/hbase/lib/client-facing-thirdparty
/slf4j-log4j12-1.7.30.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings for an explanation
.
SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by org.apache.hadoop.hbase.util.UnsafeAvailC
hecker (file:/usr/local/hbase/lib/hbase-common-2.3.7.jar) to method java.nio.Bi
ts.unaligned()
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop
.hbase.util.UnsafeAvailChecker
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflec-
tive access operations
WARNING: All illegal access operations will be denied in a future release
127.0.0.1: running zookeeper, logging to /usr/local/hbase/bin/..../logs/hbase-hdu
ser-zookeeper-hadoop-VirtualBox.out
127.0.0.1: WARNING: An illegal reflective access operation has occurred
127.0.0.1: WARNING: Illegal reflective access by org.apache.hadoop.hbase.util.Unsa
```

8. Use Java Virtual Machine Process Status Tool to check what all process are running using the below command:

```
hduser@hadoop-VirtualBox:~$ jps
28993 HMaster
29169 HRegionServer
28162 DataNode
27986 NameNode
28376 SecondaryNameNode
29322 Jps
28879 HQuorumPeer
```

2. Create a table.

1. Log into your hbase database using **hbase shell** command:

```
hduser@hadoop-VirtualBox:~$ hbase shell
SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/usr/local/hadoop/share/hadoop/common/lib/slf4j-log4j12-1.7.25.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in [jar:file:/usr/local/hbase/lib/client-facing-thirdparty/slf4j-log4j12-1.7.30.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings for an explanation
.
SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by org.apache.hadoop.hbase.util.UnsafeAvailC
hecker (file:/usr/local/hbase/lib/hbase-common-2.3.7.jar) to method java.nio.Bi
ts.unaligned()
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop
.hbase.util.UnsafeAvailChecker
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflec
tive access operations
WARNING: All illegal access operations will be denied in a future release
2022-03-12 00:13:30,328 WARN  [main] util.NativeCodeLoader: Unable to load nati
ve-hadoop library for your platform... using builtin-java classes where applica
ble
HBase Shell
Use "help" to get list of supported commands.
Use "exit" to quit this interactive shell.
For Reference, please visit: http://hbase.apache.org/2.0/book.html#shell
Version 2.3.7, r8b2f5141e900c851a2b351fccd54b13bcac5e2ed, Tue Oct 12 16:38:55 U
TC 2021
Took 0.0017 seconds
hbase(main):001:0> █
```

2. Create a table in hbase using the create 'table-name' 'column-family-name'

```
hbase(main):001:0> create 'employee', 'details'
Created table employee
Took 1.2709 seconds
=> Hbase::Table - employee
hbase(main):002:0> █
```

3. Insert data into the table

Insert the data into the table with the help of **put ‘table-name’ , ‘id’ ,’column-family-region’,’column-family-region-value’**

```
hbase(main):002:0> put 'employee', '1' , 'details:name', 'Prabhjot'
Took 0.2110 seconds
hbase(main):003:0> put 'employee', '1' , 'details:address', 'zirakpur,punjab'
Took 0.0121 seconds
hbase(main):004:0> put 'employee', '1' , 'details:age', '22'
Took 0.0170 seconds
hbase(main):005:0> scan 'employee'
ROW                         COLUMN+CELL
 1                           column=details:address, timestamp=2022-03-12T00:43:40.661,
                             value=zirakpur,punjab
 1                           column=details:age, timestamp=2022-03-12T00:44:08.212, val
                             ue=22
 1                           column=details:name, timestamp=2022-03-12T00:42:30.385, va
                             lue=Prabhjot
1 row(s)
Took 0.0733 seconds
hbase(main):006:0> ■
```

4. Split the table.

Splitting a table is only possible during the creation of a table if we try to split an existing table it will give an error

```
hbase(main):006:0> create 'employee', 'details', SPLIT=>['a','b','c']
ERROR: Table already exists: employee!
For usage try 'help "create"'
Took 0.6424 seconds
hbase(main):007:0> ■
```

Creating a new table with splits this is called pre-splitting.

```
hbase(main):007:0> create 'teacher', 'details', SPLIT=>['a','b','c']
Created table teacher
Took 1.1776 seconds
=> Hbase::Table - teacher
```

To list the number of tables use the below command:

```
hbase(main):008:0> list
TABLE
employee
teacher
2 row(s)
Took 0.0343 seconds
=> ["employee", "teacher"]
hbase(main):009:0> ■
```

