Overview

The package installs HDP2.6 + HiBench package to assist in benchmark tests of various environments and settings. The installer assumes Centos-7 installed on all participating nodes.

Package Content

- hdp_2.6_install.sh – script to install HDP either as single node or cluster
- HiBench_install_config_generator.pl – CFG file generator for HiBench_install.sh installer
- HiBench_install.sh – script to install ML section from the HiBench Package.

Short setup instructions

```
# Download the installer
yum install git -y
git clone https://github.com/lovengulu/hdp26_and_hibench_install.git
cd hdp26_and_hibench_install

# On the master node run the following line.
# To install on a single node run without parameters.
./hdp_2.6_install.sh  [slave1 slave2 … ]

# Generate CFG file for installing HiBench
./HiBench_install_config_generator.pl

# Review the config file. Edit it if needed.
cat HiBench_install.cfg

# Once satisfied, run the installer:
./HiBench_install.sh

# to run tests, login as "hdfs":
su – hdfs

# prepare test sample:
/opt/HiBench/bin/workloads/ml/kmeans/prepare/prepare.sh

# run a test:
/opt/HiBench/bin/workloads/ml/kmeans/spark/run.sh
```

Detailed Instructions

1. **Install HDP using hdp_2.6_install.sh**

The script installs the latest HDP.2.6 environment on the host it run on. To install slaves, write the hostnames of the slaves in the command line.
Example:

```
# installing master + three slaves:
      ./hdp_2.6_install.sh  slave1 slave2 slave3
```

Once the installer completes, one may monitor the installation process using by pointing the browser to the master at port 8080. Example: http://masterhost:8080/
The default username/password is: admin/admin.

Once the install is done, review the default installed configuration and change if needed.
See Instructions below in bullet 5 (Set YARN memory properties) below.

2. Generate CFG file by running: ./HiBench_install_config_generator.pl

   The config file generated should look like the following:
   [root@hdp02 ~]# cat HiBench_install.cfg
   # HIBENCH_SCALE_PROFILE - Available value is tiny, small, large, huge, gigantic and bigdata
   HIBENCH_SCALE_PROFILE= gigantic

   # executor number and cores when running on Yarn
   HIBENCH_YARN_EXECUTOR_NUM=25
   HIBENCH_YARN_EXECUTOR_CORES=5

   # executor and driver memory in standalone & YARN mode
   SPARK_EXECUTOR_MEMORY=35g
   SPARK_DRIVER_MEMORY=2g
   SPARK_YARN_EXECUTOR_MEMORYOVERHEAD=2500
   SPARK_YARN_DRIVER_MEMORYOVERHEAD=400
   SPARK_MEMORY_OFFHEAP_SIZE=1024m

   # Be sure to configure here the correct directory. (remember that spark and spark2 are NOT in the same directory)
   HIBENCH_SPARK_HOME=/usr/hdp/2.6.4.0-91/spark2
   #--

   The used may edit the file carefully. Carefully means not to “beautify” the file by padding spaces or changing to invalid values.
   Instructions for tuning spark in out of the scope of this instructions.

3. Run the HiBench installer: ./HiBench_install.sh

   The Installer performs the following:
   a. Download the HiBench package from github
   b. Download Oracle's Java JDK
   c. Download MVN
   d. Compile/Install the needed JARS for spark1.6 or spark2 – according the settings in the CFG file.
   e. Patch the HiBench package configuration file according the settings in the CFG file.

4. Run K-Means benchmark test:
   # login to hdfs:
   su – hdfs

   # prepare test sample:
   /opt/HiBench/bin/workloads/ml/kmeans/prepare/prepare.sh

   # run a test:
   /opt/HiBench/bin/workloads/ml/kmeans/spark/run.sh

   Once the test (or prepare) is running, it can be monitored with the TBD as follows TBD.

   If error occurs, log lines like the following shows:

```
ERROR: Spark job com.intel.hibench.sparkbench.ml.DenseKMeans failed to run
successfully.
Hint: You can goto /opt/HiBench/report/kmeans/spark/conf/../bench.log to
check for detailed log.
Opening log tail for you:

        at
sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:62)
        at
sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.
java:43)
        at java.lang.reflect.Method.invoke(Method.java:498)
        at
org.apache.spark.deploy.SparkSubmit$.org$apache$spark$deploy$SparkSubmit$$run
Main(SparkSubmit.scala:782)
        at
org.apache.spark.deploy.SparkSubmit$.doRunMain$1(SparkSubmit.scala:180)
        at org.apache.spark.deploy.SparkSubmit$.submit(SparkSubmit.scala:205)
        at org.apache.spark.deploy.SparkSubmit$.main(SparkSubmit.scala:119)
        at org.apache.spark.deploy.SparkSubmit.main(SparkSubmit.scala)
```

Most likely the "tailed log" is useless. Follow the "hint" in the lines above and open the detailed log at:

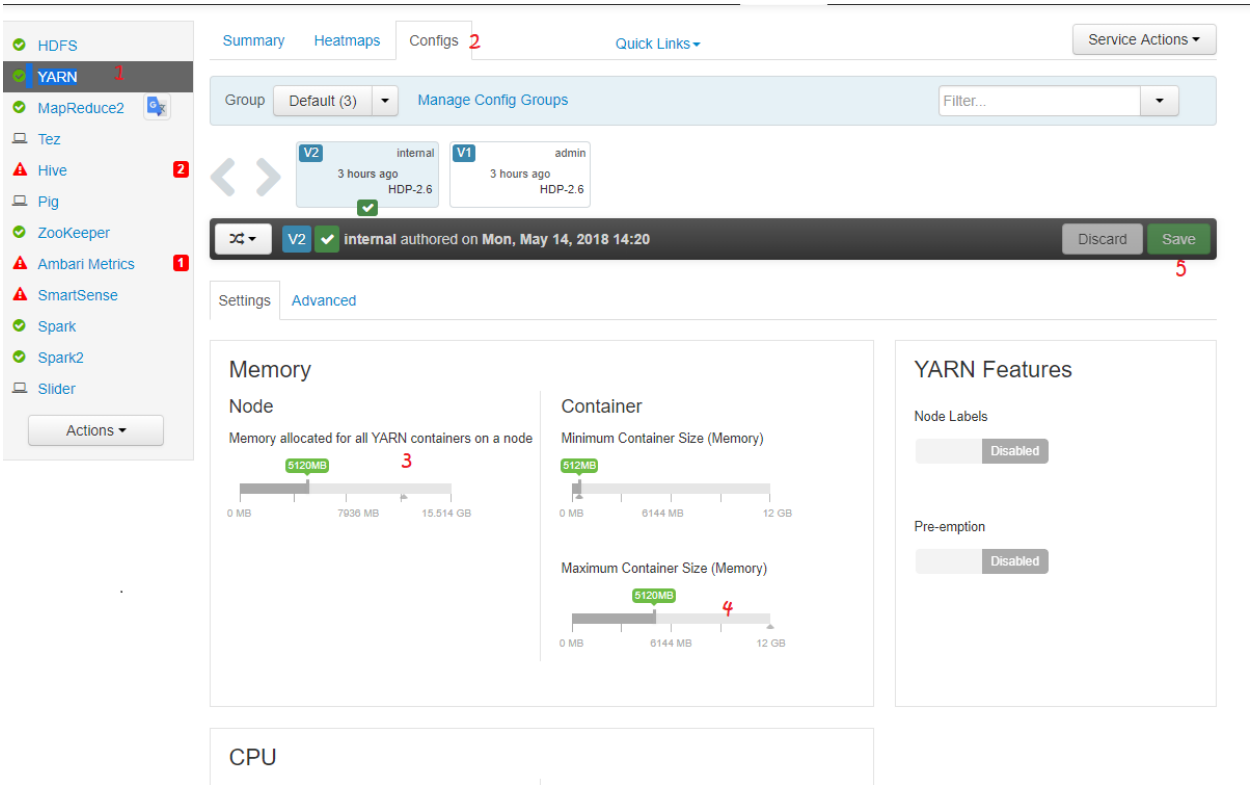
```
/opt/HiBench/report/kmeans/spark/conf/../bench.log
```

The log (in this example) shows the following error:

```
18/05/14 07:56:19 ERROR SparkContext: Error initializing SparkContext.
java.lang.IllegalArgumentException: Required executor memory (35+2.5
GB) is above the max threshold (5120 MB) of this cluster! Please check
the values of 'yarn.scheduler.maximum-allocation-mb' and/or
'yarn.nodemanager.resource.memory-mb'.
```

This error is because the job requires more memory than the default YARN settings. Change YARN memory properties and repeat the test.

5. Set YARN memory properties
   The default YARN properties are set by default for minimal values.
   If you are familiar with Hadoop and its setting, set it up. If not, follow the instruction below for setting “good enough” configuration:

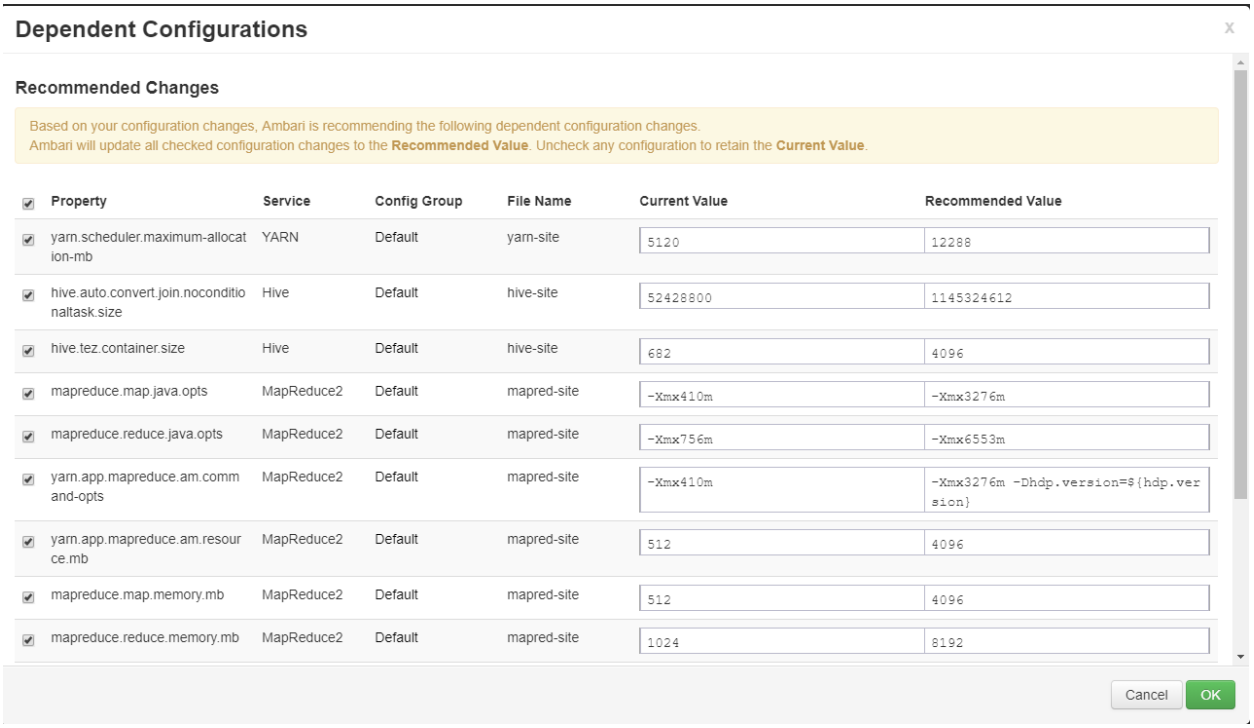


The Number in parenthesis in the instructions below refer to the red number in the picture above.

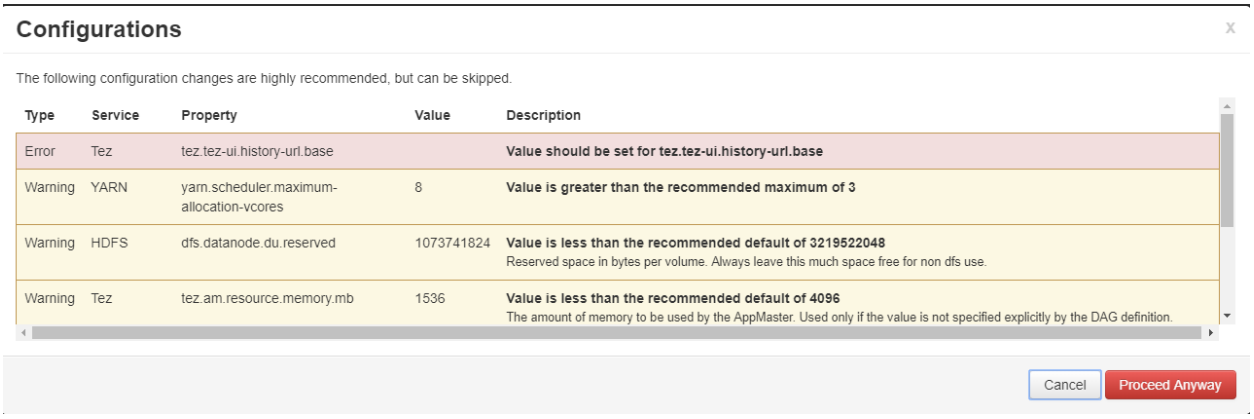
a. Open the “Yarn config” tab by clicking on “YARN” (1) and then clicking “configs” (2)
b. Adjust the memory by clicking on the Node memory bar near the recommendation mark (3)

c. Verify that the “Maximum container Size” adjusted accordingly to the same value (4)
d. Press “save” (5)
e. Approve the change by clicking on “Save” once again

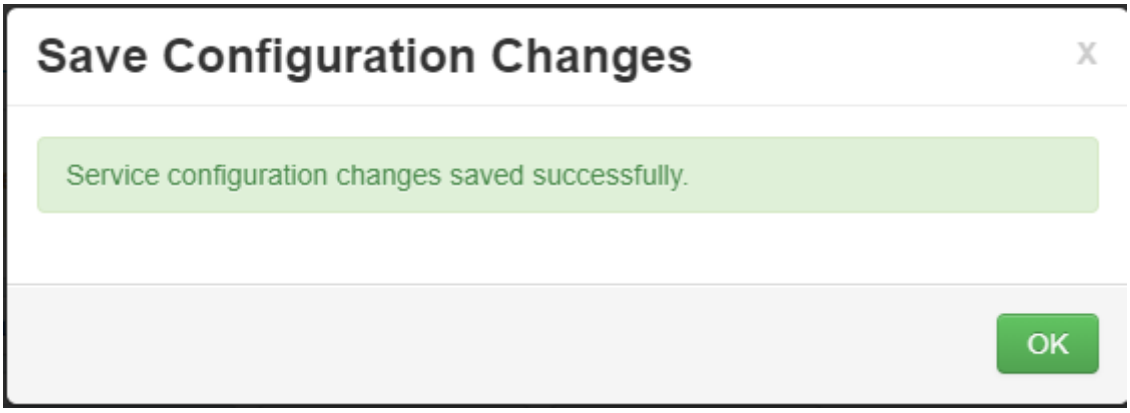
Dependent Configuration screen opens – click on the green “OK” button:



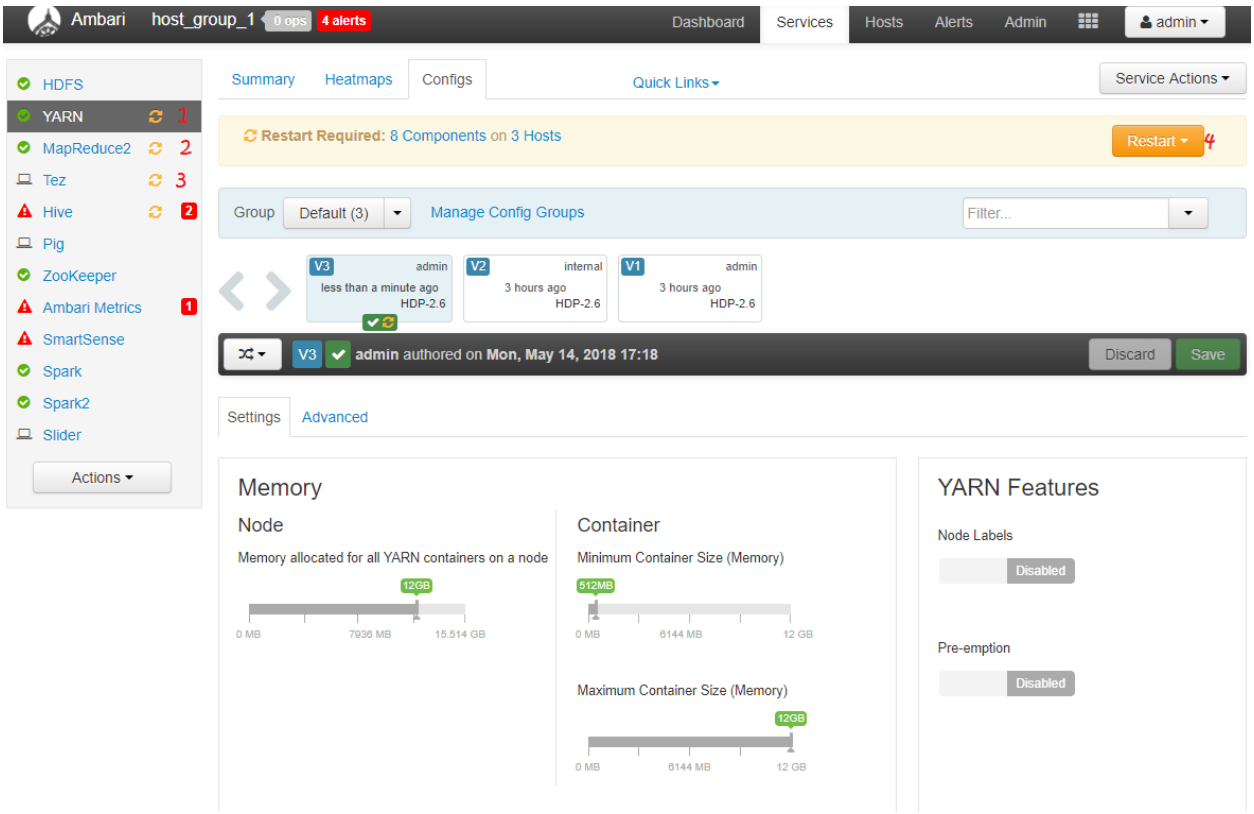
Configuration warning appears. Click on the “Proceed anyway” red button:



“Save Configuration Changes” notice appears. Click on the “OK” green button:



The “Services” page open once again. The yellow “Restart” button indicates that few services requires restart for the new setup to be in effect:



To restart, click on a service to restart. In the picture above, “YARN” is selected. Once service is selected, click on the yellow “Restart” button. (It is not mandatory to restart “Hive” as this test doesn’t use it.

Your system should now be ready.

Happy Benchmarking….