Hadoop Cluster Setup

# 三台主机：

Host1: 192.168.245.128 root/123

Host2: 192.168.245.129 root/123

Host3: 192.168.245.130 root/123

# Install Java.

## See the [Hadoop Wiki](http://wiki.apache.org/hadoop/HadoopJavaVersions) for known good versions.

## yum search java|grep jdk

## yum install java-1.8.0-openjdk

## yum install java-1.8.0-openjdk-devel.x86\_64

编辑/etc/profile:

export JAVA\_HOME=/etc/alternatives/java\_sdk

export HADOOP\_PREFIX=/Hadoop/hadoop-2.9.2

export SPARK\_HOME=/Spark/spark-2.4.0-bin-hadoop2.7

export CLASSPATH=.:$JAVA\_HOME/jre/lib/rt.jar:$JAVA\_HOME/lib/dt.jar:$JAVA\_HOME/lib/tools.jar

export JAVA\_LIBRARY\_PATH=$HADOOP\_PREFIX/lib/native

export PATH=$PATH:$JAVA\_HOME/jre/bin:$HADOOP\_PREFIX/bin:$HADOOP\_PREFIX/sbin:$SPARK\_HOME/bin

使配置生效，输入命令，source /etc/profile

# /etc/hosts文件

192.168.245.128 Host1

192.168.245.129 Host2

192.168.245.130 Host3

# Installation

## SSH免密码登录

1. CentOS默认没有启动ssh无密登录，去掉/etc/ssh/sshd\_config其中下行的注释，每台服务器都要设置，  
   #PubkeyAuthentication yes
2. 输入命令，ssh-keygen -t rsa，生成key，都不输入密码，一直回车，/root就会生成.ssh文件夹，每台服务器都要设置
3. 合并公钥到authorized\_keys文件，在Host1服务器，进入/root/.ssh目录，通过SSH命令合并，cat id\_rsa.pub>> authorized\_keys
4. 把每台节点上的id\_rsa.pub文件内容都合并到Host1的authorized\_keys文件中
5. 把Host1的authorized\_keys、known\_hosts复制到每台主机的/root/.ssh目录
6. 完成后，ssh root@Host2、ssh root@Host3就不需要输入密码了
7. systemctl restart sshd.service
8. 注意：有时需要关闭SELinux，否则不能连接

查看selinux的状态：**getenforce**

**sestatus –v**

/etc/sysconfig/selinux （实际位置：/etc/selinux/config）

把里边的一行改为 SELINUX=disabled

# 安装Hadoop

* Installing a Hadoop cluster typically involves unpacking the software on all the machines in the cluster
* 下载“hadoop-2.9.2.tar.gz”，放到目录: /Hadoop
* 解压，输入命令，tar -xzvf hadoop-2.9.2.tar.gz
* 在/Hadoop目录下创建数据存放的文件夹: tmp、hdfs、hdfs/data、hdfs/name
* 配置/Hadoop/hadoop-2.9.2/etc/hadoop目录下的core-site.xml

表 3-1

| **Parameter** | **Value** | **Notes** |
| --- | --- | --- |
| fs.defaultFS | hdfs://Host1:9000 |  |
| io.file.buffer.size | 131072 | Size of read/write buffer used in SequenceFiles. |
| hadoop.tmp.dir | file:/Hadoop/tmp |  |

* /Hadoop/hadoop-2.9.2/etc/hadoop/hdfs-site.xml:

表 3-2

| **Parameter** | **Value** | **Notes** |
| --- | --- | --- |
| dfs.namenode.name.dir | file:/Hadoop/hdfs/name | If this is a comma-delimited list of directories then the name table is replicated in all of the directories, for redundancy. |
| dfs.datanode.data.dir | file:/Hadoop/hdfs/data | If this is a comma-delimited list of directories, then data will be stored in all named directories, typically on different devices. |
| dfs.hosts / dfs.hosts.exclude | List of permitted/excluded DataNodes. | If necessary, use these files to control the list of allowable datanodes. |
| dfs.blocksize | 268435456 | HDFS blocksize of 256MB for large file-systems. |
| dfs.namenode.handler.count | 100 | More NameNode server threads to handle RPCs from large number of DataNodes. |
| dfs.replication | 2 |  |
| dfs.namenode.secondary.http-address | Host1:9001 |  |
| dfs.webhdfs.enabled | true |  |

* etc/hadoop/mapred-site.xml

表 3-3

| **Parameter** | **Value** | **Notes** |
| --- | --- | --- |
| mapreduce.framework.name | yarn | Execution framework set to Hadoop YARN. |
| mapreduce.map.memory.mb | 1536 | Larger resource limit for maps. |
| mapreduce.map.java.opts | -Xmx1024M | Larger heap-size for child jvms of maps. |
| mapreduce.reduce.memory.mb | 3072 | Larger resource limit for reduces. |
| mapreduce.reduce.java.opts | -Xmx2560M | Larger heap-size for child jvms of reduces. |
| mapreduce.task.io.sort.mb | 512 | Higher memory-limit while sorting data for efficiency. |
| mapreduce.task.io.sort.factor | 100 | More streams merged at once while sorting files. |
| mapreduce.reduce.shuffle.parallelcopies | 50 | Higher number of parallel copies run by reduces to fetch outputs from very large number of maps. |

|  |  |  |
| --- | --- | --- |
| mapreduce.jobhistory.address | MapReduce JobHistory Server host:port | Default port is 10020. |
| mapreduce.jobhistory.webapp.address | MapReduce JobHistory Server Web UI host:port | Default port is 19888. |
| mapreduce.jobhistory.intermediate-done-dir | /mr-history/tmp | Directory where history files are written by MapReduce jobs. |
| mapreduce.jobhistory.done-dir | /mr-history/done | Directory where history files are managed by the MR JobHistory Server. |

* etc/hadoop/yarn-site.xml

表 3-4

| **Parameter** | **Value** | **Notes** |
| --- | --- | --- |
| yarn.acl.enable | true / false | Enable ACLs? Defaults to *false*. |
| yarn.admin.acl | Admin ACL | ACL to set admins on the cluster. ACLs are of for *comma-separated-usersspacecomma-separated-groups*. Defaults to special value of **\*** which means *anyone*. Special value of just *space* means no one has access. |
| yarn.log-aggregation-enable | *false* | Configuration to enable or disable log aggregation |

|  |  |  |
| --- | --- | --- |
| yarn.resourcemanager.address | ResourceManager host:port for clients to submit jobs. | *host:port* If set, overrides the hostname set in yarn.resourcemanager.hostname. |
| yarn.resourcemanager.scheduler.address | ResourceManager host:port for ApplicationMasters to talk to Scheduler to obtain resources. | *host:port* If set, overrides the hostname set in yarn.resourcemanager.hostname. |
| yarn.resourcemanager.resource-tracker.address | ResourceManager host:port for NodeManagers. | *host:port* If set, overrides the hostname set in yarn.resourcemanager.hostname. |
| yarn.resourcemanager.admin.address | ResourceManager host:port for administrative commands. | *host:port* If set, overrides the hostname set in yarn.resourcemanager.hostname. |
| yarn.resourcemanager.webapp.address | ResourceManager web-ui host:port. | *host:port* If set, overrides the hostname set in yarn.resourcemanager.hostname. |
| yarn.resourcemanager.hostname | ResourceManager host. | *host* Single hostname that can be set in place of setting all yarn.resourcemanager\*address resources. Results in default ports for ResourceManager components. |
| yarn.resourcemanager.scheduler.class | ResourceManager Scheduler class. | CapacityScheduler (recommended), FairScheduler (also recommended), or FifoScheduler |
| yarn.scheduler.minimum-allocation-mb | Minimum limit of memory to allocate to each container request at the Resource Manager. | In MBs |
| yarn.scheduler.maximum-allocation-mb | Maximum limit of memory to allocate to each container request at the Resource Manager. | In MBs |
| yarn.resourcemanager.nodes.include-path / yarn.resourcemanager.nodes.exclude-path | List of permitted/excluded NodeManagers. | If necessary, use these files to control the list of allowable NodeManagers. |

|  |  |  |
| --- | --- | --- |
| yarn.nodemanager.resource.memory-mb | Resource i.e. available physical memory, in MB, for given NodeManager | Defines total available resources on the NodeManager to be made available to running containers |
| yarn.nodemanager.vmem-pmem-ratio | Maximum ratio by which virtual memory usage of tasks may exceed physical memory | The virtual memory usage of each task may exceed its physical memory limit by this ratio. The total amount of virtual memory used by tasks on the NodeManager may exceed its physical memory usage by this ratio. |
| yarn.nodemanager.local-dirs | Comma-separated list of paths on the local filesystem where intermediate data is written. | Multiple paths help spread disk i/o. |
| yarn.nodemanager.log-dirs | Comma-separated list of paths on the local filesystem where logs are written. | Multiple paths help spread disk i/o. |
| yarn.nodemanager.log.retain-seconds | 10800 | Default time (in seconds) to retain log files on the NodeManager Only applicable if log-aggregation is disabled. |
| yarn.nodemanager.remote-app-log-dir | /logs | HDFS directory where the application logs are moved on application completion. Need to set appropriate permissions. Only applicable if log-aggregation is enabled. |
| yarn.nodemanager.remote-app-log-dir-suffix | logs | Suffix appended to the remote log dir. Logs will be aggregated to ${yarn.nodemanager.remote-app-log-dir}/${user}/${thisParam} Only applicable if log-aggregation is enabled. |
| yarn.nodemanager.aux-services | mapreduce\_shuffle | Shuffle service that needs to be set for Map Reduce applications. |
| yarn.log-aggregation.retain-seconds | -1 | How long to keep aggregation logs before deleting them. -1 disables. Be careful, set this too small and you will spam the name node. |
| yarn.log-aggregation.retain-check-interval-seconds | -1 | Time between checks for aggregated log retention. If set to 0 or a negative value then the value is computed as one-tenth of the aggregated log retention time. Be careful, set this too small and you will spam the name node. |

* etc/hadoop/hadoop-env.sh etc/hadoop/mapred-env.sh etc/hadoop/yarn-env.sh

export JAVA\_HOME=/etc/alternatives/java\_sdk

* etc/hadoop/slaves
  + List all slave hostnames or IP addresses in your etc/hadoop/slaves file
* 将配置好的Hadoop复制到各个节点对应位置上，通过scp传送，  
  scp -r /Hadoop Host2:/Hadoop
* 在Master服务器启动hadoop，从节点会自动启动，进入/Hadoop/hadoop-2.9.2目录:

(1)初始化，输入命令，bin/hdfs namenode -format  
(2)全部启动sbin/start-all.sh，也可以分开sbin/start-dfs.sh、sbin/start-yarn.sh  
(3)停止的话，输入命令，sbin/stop-all.sh  
(4)输入命令，jps，可以看到相关信息

* Web访问，要先开放端口或者直接关闭防火墙  
  (1)输入命令，systemctl stop firewalld.service systemctl disable firewalld.service
* firewall-cmd --state #查看默认防火墙状态（关闭后显示notrunning，开启后显示running）  
  (2)浏览器打开http://192.168.43.128:8088/  
  (3)浏览器打开http://192.168. 43.128:50070/