# Hadoop 集群安装部署记录(3.1.2)

2019.07.02 Dzer0 服务器运维

## 简介

公司另一个项目团队在做大数据分析。然后需要使用到flink。然后就有了今天这篇文章。

## 操作思路

配置系统相关信息、安装java环境、配置免密登陆、配置Hadoop相关信息。

| ip地址 | 作用 | 主机名 |
| --- | --- | --- |
| 10.10.76.227 | master | hadoop01 |
| 10.10.76.228 | worker | hadoop02 |
| 10.10.76.229 | worker | hadoop03 |

## 配置系统相关信息

### 关闭selinux

```
setenforce 0
sed -i -E 's/^(SELINUX=)enforcing/\1disabled/' /etc/selinux/config
```

### 关闭虚拟内存

```
swapoff -a
sed -i 's/.*swap.*/#&/' /etc/fstab
```

### 更改时区

```
echo 'change system time zone to ShangHai...'
cp -af /usr/share/zoneinfo/Asia/Shanghai /etc/localtime
which ntpdate
[ $? = 1 ] && yum install ntpdate -y
ntpdate cn.ntp.org.cn && hwclock -w
```

关闭防火墙、安装网络工具

```
iptables –F
systemctl stop firewalld
systemctl disable firewalld
yum install net–tools –y
```

系统调优

```
echo 'change open file limit numbers '
ulimit –n 65535
echo –e '* soft nofile 65535\n* hard nofile 65535' >>
/etc/security/limits.conf
echo 'set TCP somaxconn...'
echo 'net.core.somaxconn = 20480' >> /etc/sysctl.conf
echo 20480 > /proc/sys/net/core/somaxconn
sysctl –p
```

更改主机名并配置hosts

```
 echo 'hadoop01' > /etc/hostname
 hostname hadoop01
 echo 'hadoop02' > /etc/hostname
 hostname hadoop02
 echo 'hadoop03' > /etc/hostname
 hostname hadoop03
 #cat /etc/hosts
 127.0.0.1   localhost localhost.localdomain localhost4
 localhost4.localdomain4
 ::1         localhost localhost.localdomain localhost6
 localhost6.localdomain6
 10.10.76.227 hadoop01
 10.10.76.228 hadoop02
 10.10.76.229 hadoop03
```

配置java环境

```
# tar –zxf jdk–8u191–linux–x64.tar.gz
# mv jdk1.8.0_191 /usr/java
# vim /etc/profile
添加
export JAVA_HOME=/usr/java
export JRE_HOME=${JAVA_HOME}/jre
export CLASSPATH=.:${JAVA_HOME}/lib:${JRE_HOME}/lib
export PATH=${JAVA_HOME}/bin:$PATH
# source /etc/profile
```

### 配置ssh免密登陆

```
ssh-keygen
ssh-copy-id -i hadoop01
ssh-copy-id -i hadoop02
ssh-copy-id -i hadoop03
```

备注：三台机器都要执行包含本机

## Hadoop 配置文件介绍与配置

配置文件介绍

| 文件名 | 格式 | 描述 |
| --- | --- | --- |
| hadoop-env.sh | bash脚本 | 在运行Hadoop的脚本中使用的环境变量 |
| core-site.xml | hadoop配置XML | Hadoop核心配置，例如HDFS和MapReduce中很普遍的I/O设置 |
| hdfs-site.xml | hadoop配置XML | HDFS后台程序设置的配置：名称节点，第二名称节点和数据节点 |
| mapred-site.xml | hadoop配置XML | MapReduce后台程序设置的配置jobtracker和tasktracker |
| masters | 纯文本 | 记录运行第二名称节点的机器（一行一个）的列表 |
| slaves | 纯文本 | 记录运行数据节点和tasktracker的器（一行一个）的列表 |

### 配置/etc/profile

```
export HADOOP_HOME="/data/hadoop-3.1.2"
export PATH="$HADOOP_HOME/bin:$PATH"
export HADOOP_CONF_DIR=$HADOOP_HOME/etc/hadoop
# export YARN_CONF_DIR=$HADOOP_HOME/etc/hadoop
```

注：如果不注释掉”export YARN_CONF_DIR=$HADOOP_HOME/etc/hadoop”启动和关闭时会提示 WARNING: YARN_CONF_DIR has been replaced by HADOOP_CONF_DIR. Using value of YARN_CONF_DIR.报错。

### hadoop-env.sh配置

文件目录为：hadoop-3.1.2/etc/hadoop/hadoop-env.sh

54行

修改成

export JAVA_HOME=/usr/java

```
53 # variable is REQUIRED on ALL platforms except OS X!
54 export JAVA_HOME=/usr/java
55
```

core-site.xml配置

文件目录为：hadoop-3.1.2/etc/hadoop/

新增

```
    <property>
        <name>fs.defaultFS</name>
        <value>hdfs://hadoop01:9000</value>
    </property>

    <property>
        <name>io.file.buffer.size</name>
        <value>131072</value>
    </property>
```

```
<configuration>
  <property>
       <name>fs.defaultFS</name>
       <value>hdfs://hadoop01:9000</value>
  </property>

  <property>
       <name>io.file.buffer.size</name>
       <value>131072</value>
  </property>
</configuration>
```

hdfs-site.xml配置

文件目录为：hadoop-3.1.2/etc/hadoop/

新增:

```
<property>
  <name>dfs.namenode.name.dir</name>
  <value>/var/lib/hadoop/hdfs/name/</value>
</property>

<property>
  <name>dfs.blocksize</name>
  <value>268435456</value>
</property>

<property>
  <name>dfs.namenode.handler.count  </name>
  <value>100</value>
</property>

<!-- Configurations for DataNode: -->

<property>
  <name>dfs.datanode.data.dir</name>
  <value>/data/hadoop/hdfs/data/</value
> </property>

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

描述：

dfs.data.dir：指定数据节点要存放的数据的目录

dfs.replication：在分布式节点里面要把这个数据块复制多少份，我这里是3台应该改为3，控制最多要写多少份（若模拟伪分布式写1即可）

(备注：replication 是数据副本数量，默认为3，salve少于3台就会报错)

```
<!-- Put site-specific property overrides in this file. -->

<configuration>
<property>
  <name>dfs.namenode.name.dir</name>
  <value>/var/lib/hadoop/hdfs/name/</value>
</property>

<property>
  <name>dfs.blocksize</name>
  <value>268435456</value>
</property>

<property>
  <name>dfs.namenode.handler.count  </name>
  <value>100</value>
</property>

<!-- Configurations for DataNode: -->

<property>
  <name>dfs.datanode.data.dir</name>
  <value>/data/hadoop/hdfs/data/</value>
</property>

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

yarn-site.xml配置

文件目录为：hadoop-3.1.2/etc/hadoop/

新增:

```
  <property>
        <name>yarn.resourcemanager.hostname</name>
        <value>hadoop01</value>
  </property>
  <!-- 配置外网只需要替换外网ip为真实ip，否则默认为
localhost:8088 -->
  <property>
        <name>yarn.resourcemanager.webapp.address</name>
        <value>10.10.76.227:8088</value>
  </property>
<!-- Configurations for NodeManager: -->
  <property>
        <name>yarn.nodemanager.aux-services</name>
        <value>mapreduce_shuffle</value>
  </property>
```

Captured with Xnip

```
<configuration>

<!-- Site specific YARN configuration properties -->
<!-- Configurations for ResourceManager: -->
  <property>
          <name>yarn.resourcemanager.hostname</name>
          <value>hadoop01</value>
  </property>
  <!-- 配置外网只需要替换外网ip为真实ip，否则默认为 localhost:8088 -->
  <property>
          <name>yarn.resourcemanager.webapp.address</name>
          <value>10.10.76.229:8088</value>
  </property>
<!-- Configurations for NodeManager: -->
  <property>
          <name>yarn.nodemanager.aux-services</name>
          <value>mapreduce_shuffle</value>
  </property>
</configuration>
~
```

mapred-site.xml配置

文件目录为：hadoop-3.1.2/etc/hadoop/

新增:

```
1       <property>
2           <name>mapreduce.framework.name</name>
3           <value>yarn</value>
4       </property>
```

```
<configuration>
  <property>
        <name>mapreduce.framework.name</name>
        <value>yarn</value>
   </property>
</configuration>
~
```

workers配置

文件目录为：hadoop-3.1.2/etc/hadoop/

新增:

```
1       # cat workers
2       hadoop02
3       hadoop03
```

复制到其他俩个节点 hadoop02、hadoop03

```
scp -r ./* hadoop03:/data/hadoop-3.1.2/etc/hadoop/
scp -r ./* hadoop02:/data/hadoop-3.1.2/etc/hadoop/
```

*注意* 1、修改yarn-site.xml中的yarn.resourcemanager.webapp.address对于的value值

2、修改core-site.xml中的fs.defaultFS对应的值

###启动hadoop

1、格式化HDFS [只有首次部署才可使用]【谨慎操作，只在master节点上操作，我这里就是hadoop01上】

```
[root@hadoop01 hadoop]# cd /data/hadoop-3.1.2/bin
[root@hadoop01 bin]# ./hdfs namenode -format myhadoop
```

2、启动

```
/data/hadoop-3.1.2/sbin/start-dfs.sh
/data/hadoop-3.1.2/sbin/start-yarn.sh
```

3、检查，分别在三台执行jps

```
[root@hadoop01 sbin]# jps
22647 Jps
21928 SecondaryNameNode
21563 NameNode
22254 ResourceManager

[root@hadoop02 ~]# jps
6004 Jps
5605 DataNode
5823 NodeManager

[root@hadoop03 ~]# jps
5825 NodeManager
5988 Jps
5607 DataNode
```

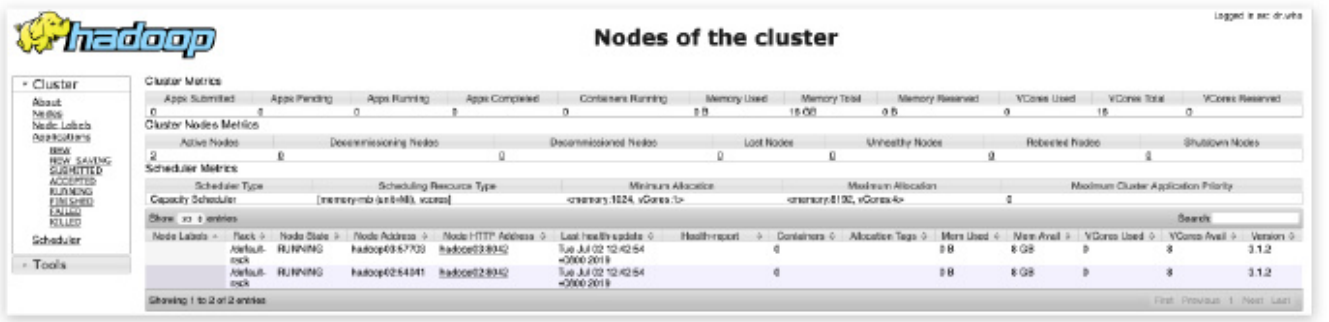
```
[root@hadoop01 sbin]# jps
22647 Jps
21928 SecondaryNameNode
21563 NameNode
22254 ResourceManager
[root@hadoop01 sbin]#
```

```
[root@hadoop02 ~]# jps
6004 Jps
5605 DataNode
5823 NodeManager
[root@hadoop02 ~]#
```

```
[root@hadoop03 ~]# jps
5825 NodeManager
5988 Jps
5607 DataNode
[root@hadoop03 ~]#
```

4、web端检查

在浏览器访问10.10.76.227:8088接口




关闭hadoop 【只在master节点上操作】

```
1    /data/hadoop-3.1.2/sbin/stop-dfs.sh
2    /data/hadoop-3.1.2/sbin/stop-yarn.sh
```

重置hadoop环境 [移除hadoop hdfs log文件] 【谨慎操作，只在master上操作】

rm -rf /data/hadoop-3.1.2/logs/*

rm -rf /var/lib/hadoop/

计算验证

```
1    [root@hadoop02 bin]# /data/hadoop-3.1.2/bin/hadoop jar
     /data/hadoop-3.1.2/share/hadoop/mapreduce/hadoop-
```

mapreduce-examples-3.1.2.jar pi 10 100

```
        Shuffle Errors
                BAD_ID=0
                CONNECTION=0
                IO_ERROR=0
                WRONG_LENGTH=0
                WRONG_MAP=0
                WRONG_REDUCE=0
        File Input Format Counters
                Bytes Read=1180
        File Output Format Counters
                Bytes Written=97
Job Finished in 38.946 seconds
Estimated value of Pi is 3.14800000000000000000
[root@hadoop02 bin]#
```

表示hadoop集群正常运行