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# NSD ARCHITECTURE DAY05

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## 1 案例1：安装Hadoop

### 1.1 问题

本案例要求安装单机模式Hadoop：

* 单机模式安装Hadoop
* 安装JAVA环境
* 设置环境变量，启动运行

### 1.2 步骤

实现此案例需要按照如下步骤进行。

步骤一：环境准备

1）配置主机名为nn01，ip为192.168.1.60，配置yum源（系统源）

备注：由于在之前的案例中这些都已经做过，这里不再重复，不会的学员可以参考之前的案例

2）安装java环境

1. [root@nn01 ~]# yum -y install java-1.8.0-openjdk-devel
2. [root@nn01 ~]# java -version
3. openjdk version "1.8.0\_131"
4. OpenJDK Runtime Environment (build 1.8.0\_131-b12)
5. OpenJDK 64-Bit Server VM (build 25.131-b12, mixed mode)
6. [root@nn01 ~]# jps
7. 1235 Jps

3）安装hadoop

1. [root@nn01 ~]# cd hadoop/
2. [root@nn01 hadoop]# ls
3. hadoop-2.7.7.tar.gz kafka\_2.12-2.1.0.tgz zookeeper-3.4.13.tar.gz
4. [root@nn01 hadoop]# tar -xf hadoop-2.7.7.tar.gz
5. [root@nn01 hadoop]# mv hadoop-2.7.7 /usr/local/hadoop
6. [root@nn01 hadoop]# cd /usr/local/hadoop
7. [root@nn01 hadoop]# ls
8. bin include libexec NOTICE.txt sbin
9. etc lib LICENSE.txt README.txt share
10. [root@nn01 hadoop]# ./bin/hadoop //报错，JAVA\_HOME没有找到
11. Error: JAVA\_HOME is not set and could not be found.
12. [root@nn01 hadoop]#

4）解决报错问题

1. [root@nn01 hadoop]# rpm -ql java-1.8.0-openjdk
2. [root@nn01 hadoop]# cd ./etc/hadoop/
3. [root@nn01 hadoop]# vim hadoop-env.sh
4. 25 export JAVA\_HOME="/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.161-2.b14.el7.x86\_64 /jre"
5. 33 export HADOOP\_CONF\_DIR="/usr/local/hadoop/etc/hadoop"
6. [root@nn01 ~]# cd /usr/local/hadoop/
7. [root@nn01 hadoop]# ./bin/hadoop
8. Usage: hadoop [--config confdir] [COMMAND | CLASSNAME]
9. CLASSNAME run the class named CLASSNAME
10. or
11. where COMMAND is one of:
12. fs run a generic filesystem user client
13. version print the version
14. jar <jar> run a jar file
15. note: please use "yarn jar" to launch
16. YARN applications, not this command.
17. checknative [-a|-h] check native hadoop and compression libraries availability
18. distcp <srcurl> <desturl> copy file or directories recursively
19. archive -archiveName NAME -p <parent path> <src>\* <dest> create a hadoop archive
20. classpath prints the class path needed to get the
21. credential interact with credential providers
22. Hadoop jar and the required libraries
23. daemonlog get/set the log level for each daemon
24. trace view and modify Hadoop tracing settings
25. Most commands print help when invoked w/o parameters.
26. [root@nn01 hadoop]# mkdir /usr/local/hadoop/input
27. [root@nn01 hadoop]# ls
28. bin etc include lib libexec LICENSE.txt NOTICE.txt input README.txt sbin share
29. [root@nn01 hadoop]# cp \*.txt /usr/local/hadoop/input
30. [root@nn01 hadoop]# ./bin/hadoop jar \
31. share/hadoop/mapreduce/hadoop-mapreduce-examples-2.7.7.jar wordcount input output     //wordcount为参数 统计input这个文件夹，存到output这个文件里面（这个文件不能存在，要是存在会报错，是为了防止数据覆盖）
32. [root@nn01 hadoop]# cat output/part-r-00000 //查看

## 2 案例2：安装配置Hadoop

### 2.1 问题

本案例要求：

* 另备三台虚拟机，安装Hadoop
* 使所有节点能够ping通，配置SSH信任关系
* 节点验证

### 2.2 方案

准备四台虚拟机，由于之前已经准备过一台，所以只需再准备三台新的虚拟机即可，安装hadoop，使所有节点可以ping通，配置SSH信任关系，如图-1所示：

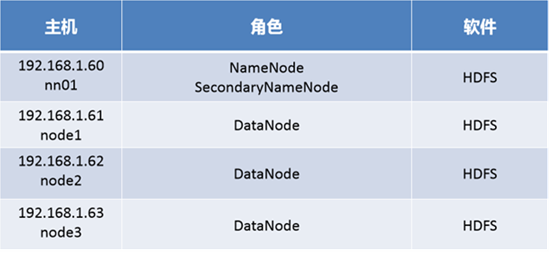


图-1

### 2.3 步骤

实现此案例需要按照如下步骤进行。

步骤一：环境准备

1）三台机器配置主机名为node1、node2、node3，配置ip地址（ip如图-1所示），yum源（系统源）

2）编辑/etc/hosts（四台主机同样操作，以nn01为例）

1. [root@nn01 ~]# vim /etc/hosts
2. 192.168.1.60 nn01
3. 192.168.1.61 node1
4. 192.168.1.62 node2
5. 192.168.1.63 node3

3）安装java环境，在node1，node2，node3上面操作（以node1为例）

1. [root@node1 ~]# yum -y install java-1.8.0-openjdk-devel

4）布置SSH信任关系

1. [root@nn01 ~]# vim /etc/ssh/ssh\_config //第一次登陆不需要输入yes
2. Host \*
3. GSSAPIAuthentication yes
4. StrictHostKeyChecking no
5. [root@nn01 .ssh]# ssh-keygen
6. Generating public/private rsa key pair.
7. Enter file in which to save the key (/root/.ssh/id\_rsa):
8. Enter passphrase (empty for no passphrase):
9. Enter same passphrase again:
10. Your identification has been saved in /root/.ssh/id\_rsa.
11. Your public key has been saved in /root/.ssh/id\_rsa.pub.
12. The key fingerprint is:
13. SHA256:Ucl8OCezw92aArY5+zPtOrJ9ol1ojRE3EAZ1mgndYQM root@nn01
14. The key's randomart image is:
15. +---[RSA 2048]----+
16. | o\*E\*=. |
17. | +XB+. |
18. | ..=Oo. |
19. | o.+o... |
20. | .S+.. o |
21. | + .=o |
22. | o+oo |
23. | o+=.o |
24. | o==O. |
25. +----[SHA256]-----+
26. [root@nn01 .ssh]# for i in 61 62 63 64 ; do ssh-copy-id 192.168.1.$i; done
27. //部署公钥给nn01，node1，node2，node3

5）测试信任关系

1. [root@nn01 .ssh]# ssh node1
2. Last login: Fri Sep 7 16:52:00 2018 from 192.168.1.60
3. [root@node1 ~]# exit
4. logout
5. Connection to node1 closed.
6. [root@nn01 .ssh]# ssh node2
7. Last login: Fri Sep 7 16:52:05 2018 from 192.168.1.60
8. [root@node2 ~]# exit
9. logout
10. Connection to node2 closed.
11. [root@nn01 .ssh]# ssh node3

步骤二：配置hadoop

1）修改slaves文件

1. [root@nn01 ~]# cd /usr/local/hadoop/etc/hadoop
2. [root@nn01 hadoop]# vim slaves
3. node1
4. node2
5. node3

2）hadoop的核心配置文件core-site

1. [root@nn01 hadoop]# vim core-site.xml
2. <configuration>
3. <property>
4. <name>fs.defaultFS</name>
5. <value>hdfs://nn01:9000</value>
6. </property>
7. <property>
8. <name>hadoop.tmp.dir</name>
9. <value>/var/hadoop</value>
10. </property>
11. </configuration>
12. [root@nn01 hadoop]# mkdir /var/hadoop        //hadoop的数据根目录

3）配置hdfs-site文件

1. [root@nn01 hadoop]# vim hdfs-site.xml
2. <configuration>
3. <property>
4. <name>dfs.namenode.http-address</name>
5. <value>nn01:50070</value>
6. </property>
7. <property>
8. <name>dfs.namenode.secondary.http-address</name>
9. <value>nn01:50090</value>
10. </property>
11. <property>
12. <name>dfs.replication</name>
13. <value>2</value>
14. </property>
15. </configuration>

4）同步配置到node1，node2，node3

1. [root@nn01 hadoop]# for i in 62 63 64 ; do rsync -aSH --delete /usr/local/hadoop/
2. \ 192.168.1.$i:/usr/local/hadoop/ -e 'ssh' & done
3. [1] 23260
4. [2] 23261
5. [3] 23262

5）查看是否同步成功

1. [root@nn01 hadoop]# ssh node1 ls /usr/local/hadoop/
2. bin
3. etc
4. include
5. lib
6. libexec
7. LICENSE.txt
8. NOTICE.txt
9. output
10. README.txt
11. sbin
12. share
13. input
14. [root@nn01 hadoop]# ssh node2 ls /usr/local/hadoop/
15. bin
16. etc
17. include
18. lib
19. libexec
20. LICENSE.txt
21. NOTICE.txt
22. output
23. README.txt
24. sbin
25. share
26. input
27. [root@nn01 hadoop]# ssh node3 ls /usr/local/hadoop/
28. bin
29. etc
30. include
31. lib
32. libexec
33. LICENSE.txt
34. NOTICE.txt
35. output
36. README.txt
37. sbin
38. share
39. input

步骤三：格式化

1. [root@nn01 hadoop]# cd /usr/local/hadoop/
2. [root@nn01 hadoop]# ./bin/hdfs namenode -format         //格式化 namenode
3. [root@nn01 hadoop]# ./sbin/start-dfs.sh        //启动
4. [root@nn01 hadoop]# jps        //验证角色
5. 23408 NameNode
6. 23700 Jps
7. 23591 SecondaryNameNode
8. [root@nn01 hadoop]# ./bin/hdfs dfsadmin -report        //查看集群是否组建成功
9. Live datanodes (3):        //有三个角色成功