REPORT

빅데이터 저장 시스템 개발
정기 수행평가

과 목 명	통합구현
능 력 단 위	빅데이터 저장 시스템 개발
성 명	장경준

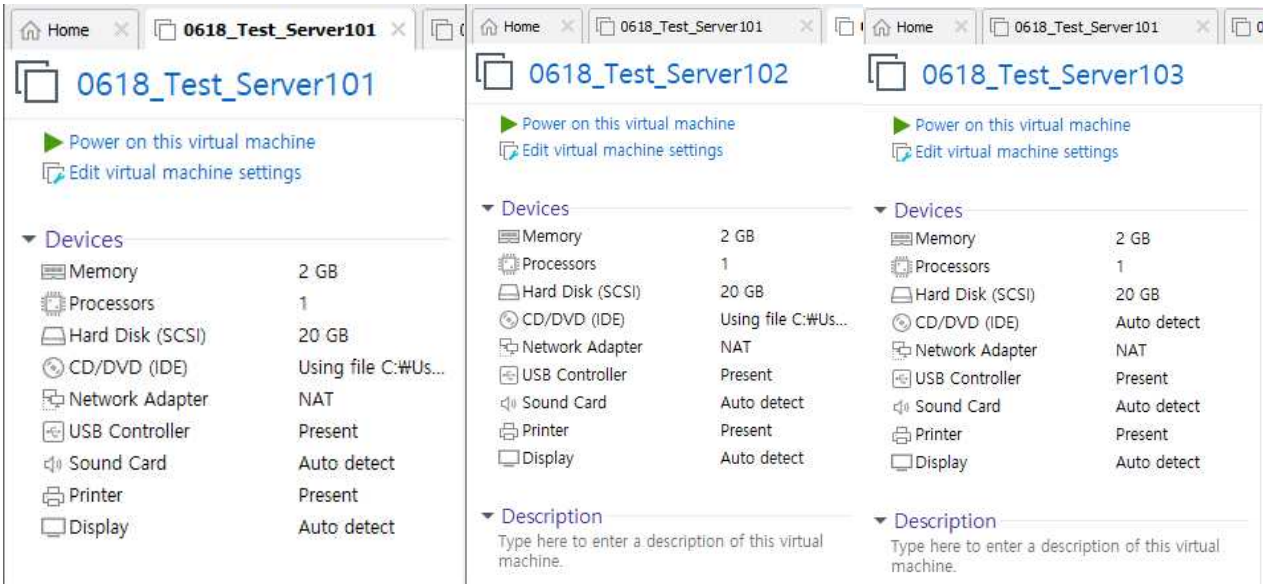
수행평가 실습 보고서			
능력단위 요소	빅데이터 저장 시스템 개발	**작 성 자**	장경준
평가방법	서술형	**작성일자**	
단 계 명	구현	**문서번호**	#1

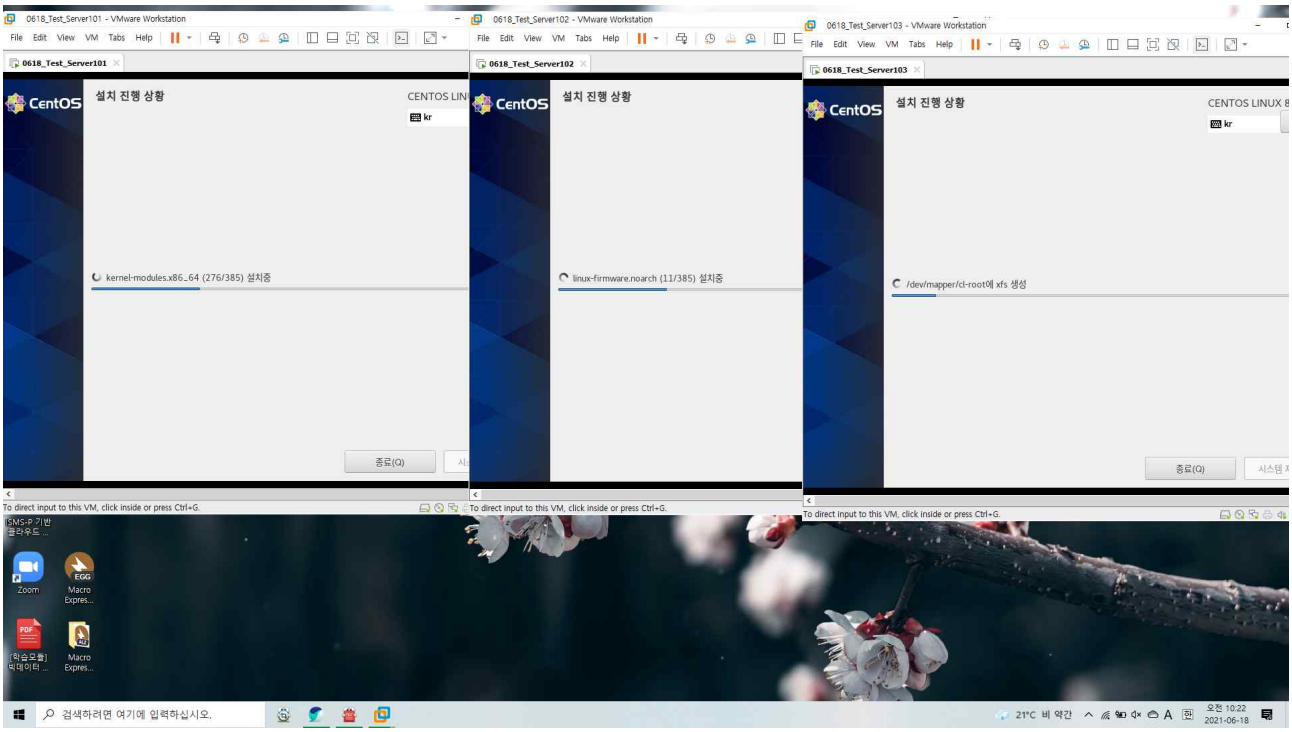
1.SDK(System Development Kit) 또는 개발 도구 정보

구분	내용
SDK(개발도구) 명칭	CentOS
SDK(개발도구) 버전	CentOS 8
SDK(개발도구)설명 (주요기능의 설명)	● 리눅스 서버 1인자인 RHEL을 철저하게 반영한 오픈소스 플랫폼. ● 최고의 서버 운영체제.
SDK(개발도구) 사용방법 (가격, 절차 등)	오픈소스

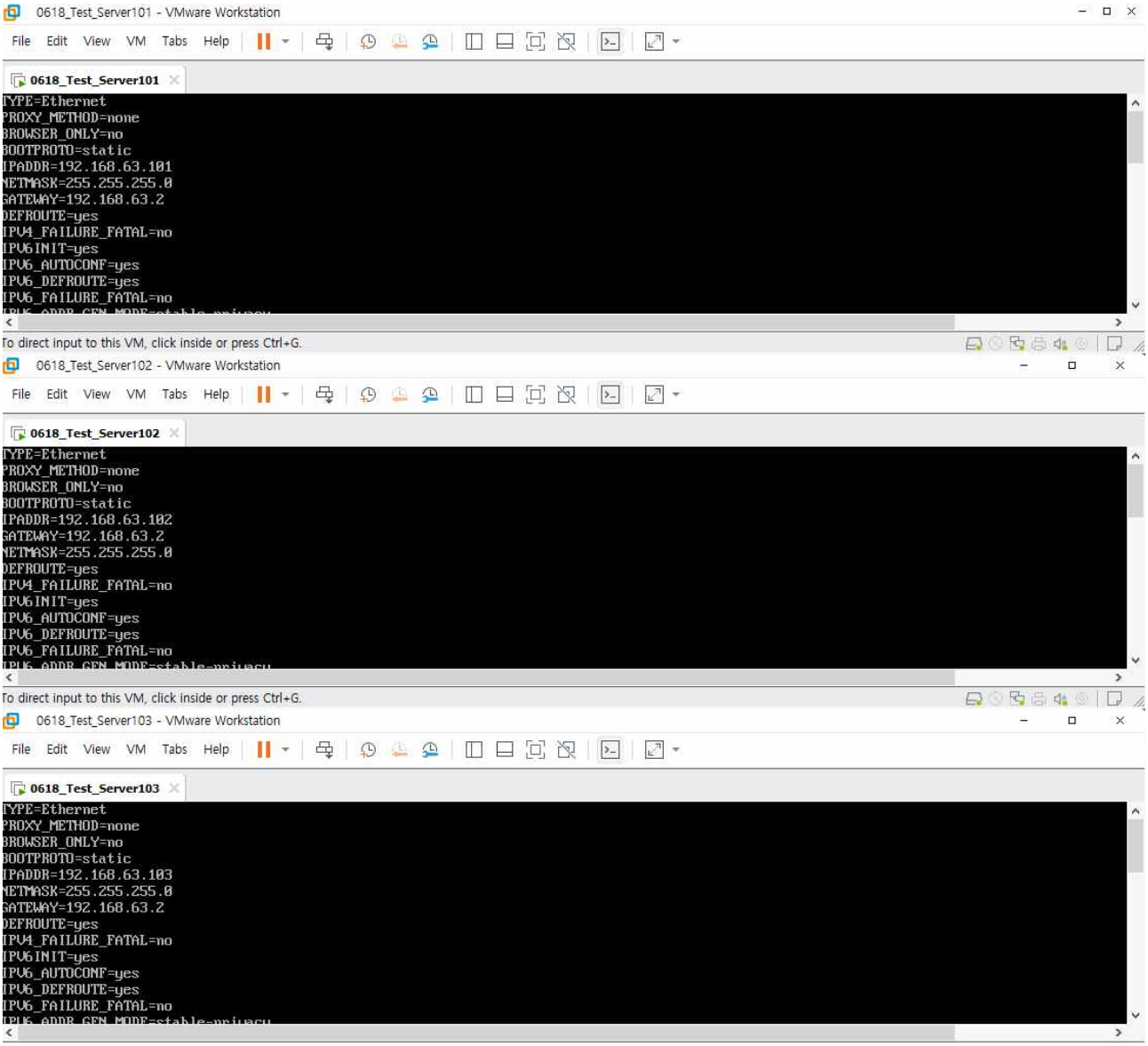
2. 평가문항 풀이

1. 서버 생성 및 설치


Home
0618_Test_Server101
0618_Test_Server101
Power on this virtual machine
Edit virtual machine settings
Devices
Memory 2 GB
Processors 1
Hard Disk (SCSI) 20 GB
CD/DVD (IDE) Using file C:₩Us...
Network Adapter NAT
USB Controller Present
Sound Card Auto detect
Printer Present
Display Auto detect
Description
Type here to enter a description of this virtual machine.
Home
0618_Test_Server101
0618_Test_Server102
Power on this virtual machine
Edit virtual machine settings
Devices
Memory 2 GB
Processors 1
Hard Disk (SCSI) 20 GB
CD/DVD (IDE) Using file C:₩Us...
Network Adapter NAT
USB Controller Present
Sound Card Auto detect
Printer Present
Display Auto detect
Description
Type here to enter a description of this virtual machine.
Home
0618_Test_Server101
0618_Test_Server103
Power on this virtual machine
Edit virtual machine settings
Devices
Memory 2 GB
Processors 1
Hard Disk (SCSI) 20 GB
CD/DVD (IDE) Auto detect
Network Adapter NAT
USB Controller Present
Sound Card Auto detect
Printer Present
Display Auto detect
Description
Type here to enter a description of this virtual machine.

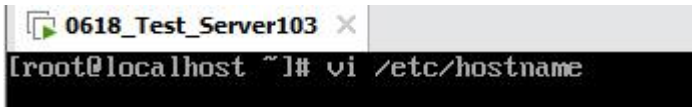

0618_Test_Server101 - VMware Workstation
0618_Test_Server102 - VMware Workstation
0618_Test_Server103 - VMware Workstation
CentOS
설치 진행 상황
kernel-modules.x86_64 (276/385) 설치중
linux-firmware.noarch (11/385) 설치중
/dev/mapper/cl-root에 xfs 생성
종료(Q)
To direct input to this VM, click inside or press Ctrl+G.
검색하려면 여기에 입력하십시오.

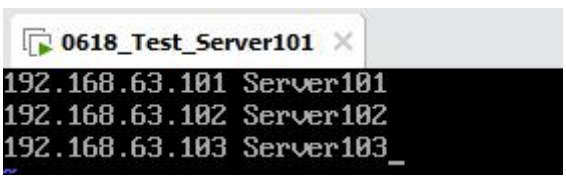
2. 고정 IP 설정



3. 호스트네임 및 호스트 설정

(지금부터 Server102와 Server103도 같이 진행하지만 Server101사진만 첨부)





4. 자바 설치

```
root@Server101:~
login as: root
root@192.168.63.101's password:
Last login: Thu Jun 17 21:35:10 2021
[root@Server101 ~]# dnf install java-1.8* vim net-tools wget vsftpd -y
```

5. 셀리눅스 해제

```
[root@Server101 ~]# vi /etc/selinux/config
[root@Server101 ~]#
```

6. 키젠 생성 및 교환

```
[root@Server101 ~]# ssh-keygen -t rsa
```

```
Now try logging into the machine, with:   "ssh 'root@Server102'"
and check to make sure that only the key(s) you wanted were added.

[root@Server101 ~]# ssh-copy-id -i /root/.ssh/id_rsa.pub root@Server103
```

7. 패스워드 없이 ssh 접속 가능 확인

```
[root@Server101 ~]# ssh root@Server102
Last login: Thu Jun 17 21:44:18 2021 from 192.168.63.1
[root@Server102 ~]# exit
logout
Connection to server102 closed.
[root@Server101 ~]# ssh root@Server103
Last login: Thu Jun 17 21:44:32 2021 from 192.168.63.1
[root@Server103 ~]#
```

7. 방화벽 해제

```
[root@Server101 ~]# systemctl stop firewalld
[root@Server101 ~]# systemctl disable firewalld
Removed /etc/systemd/system/multi-user.target.wants/firewalld.service.
Removed /etc/systemd/system/dbus-org.fedoraproject.FirewallD1.service.
```

8. 하둡 설치

```
[root@Server101 ~]# wget https://mirror.navercorp.com/apache/hadoop/common/hadoop-2.10.1/hadoop-2.10.1.tar.gz
```

9.재부팅

```
[root@Server101 ~]# init 6
```

10. 하둡 환경 설정

root@Server101:/home/bigdata

```
12 fi
13 export JAVA_HOME=/usr/lib/jvm/java-1.8.0-openjdk
14 export PATH=$PATH:$JAVA_HOME/bin
15 export HADOOP_HOME=/home/bigdata/hadoop
16 export HADOOP_MAPRED_HOME=$HADOOP_HOME
17 export HADOOP_COMMON_HOME=$HADOOP_HOME
18 export HADOOP_COMMON_LIB_NATIVE_DIR=$HADOOP_HOME/lib/native
19 export HADOOP_OPTS="-Djava.library.path=$HADOOP_HOME/lib/native"
20 export YARN_HOME=$HADOOP_HOME
21 export HADOOP_CONF_DIR=$HADOOP_HOME/etc/hadoop
22 export YARN_CONF_DIR=$HADOOP_HOME/etc/hadoop
23 export PATH=$PATH:$HADOOP_HOME/sbin:$HADOOP_HOME/bin
24 export CLASS_PATH=$JAVA_HOME/lib:$CLASS_PATH
```

11. core-site 설정

```
<configuration>
        <property>
                <name>fs.defaultFS</name>
                <value>hdfs://Server101:9000</value>
        </property>
        <property>
                <name>hadoop.tmp.dir</name>
                <value>/home/bigdata/hadoop/tmp</value>
        </property>
</configuration>
```

12. hdfs 설정

```
<configuration>
        <property>
                <name>dfs.replication</name>
                <value>3</value>
        </property>
        <property>
                <name>dfs.permissions</name>
                <value>false</value>
        </property>
        <property>
                <name>dfs.webhdfs.enabled</name>
                <value>true</value>
```

13.mapred-site 설정

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

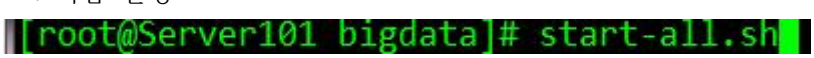
14. yarn 설정

```
        <property>
                <name>yarn.nodemanager.aux-services</name>
                <value>mapreduce_shuffle</value>
        </property>
        <property>
                <name>yarn.nodemanager.aux-services.mapreduce.shuffle.class</name>
                <value>org.apache.hadoop.mapred.ShuffleHandler</value>
        </property>
        <property>
                <name>yarn.resourcemanager.hostname</name>
                <value>Server101</value>
        </property>
</configuration>
```

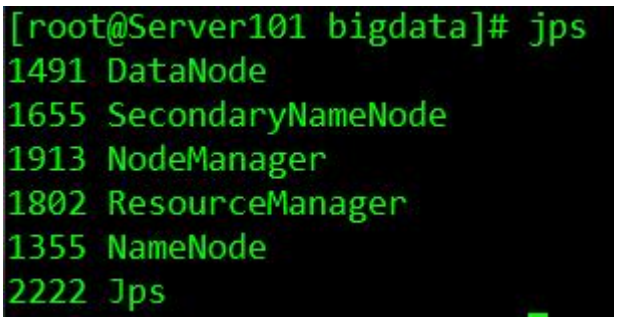
15. 마스터, 슬레이브 설정

16. 하둡 포맷

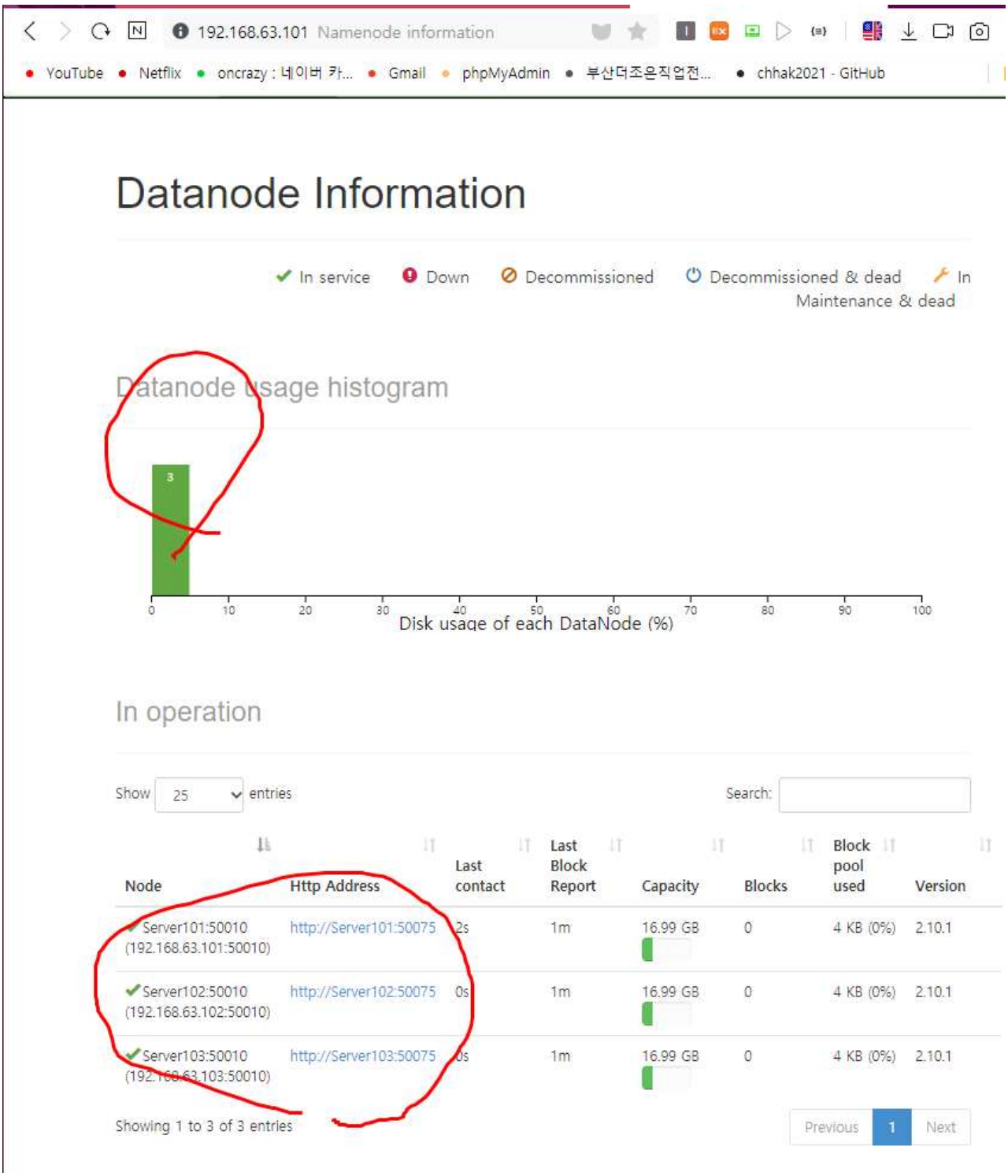
17. 하둡 실행



18. 프로세스 확인



19. 홈페이지 확인


192.168.63.101 Namenode information
YouTube
Netflix
oncrazy : 네이버 카...
Gmail
phpMyAdmin
부산더조은직업전...
chhak2021 - GitHub
Datanode Information
In service
Down
Decommissioned
Decommissioned & dead
In Maintenance & dead
Datanode usage histogram
3
0
10
20
30
40
50
60
70
80
90
100
Disk usage of each DataNode (%)
In operation
Show 25 entries
Search:
Node
Http Address
Last contact
Last Block Report
Capacity
Blocks
Block pool used
Version
Server101:50010 (192.168.63.101:50010)
http://Server101:50075
2s
1m
16.99 GB
0
4 KB (0%)
2.10.1
Server102:50010 (192.168.63.102:50010)
http://Server102:50075
0s
1m
16.99 GB
0
4 KB (0%)
2.10.1
Server103:50010 (192.168.63.103:50010)
http://Server103:50075
0s
1m
16.99 GB
0
4 KB (0%)
2.10.1
Showing 1 to 3 of 3 entries
Previous
1
Next

3. 스쿱 실습

1. 스쿱 설치

```
[root@Server101 ~]# wget https://mirror.navercorp.com/apache/sqoop/1.4.7/sqoop-1.4.7.bin__had
oop-2.6.0.tar.gz
```

2. 압축 해제 및 링크생성

```
[root@Server101 ~]# mv sqoop-1.4.7.bin__hadoop-2.6.0 /home/bigdata/
[root@Server101 ~]# cd /home/bigdata/
[root@Server101 bigdata]# ln -s sqoop-1.4.7.bin__hadoop-2.6.0/ sqoop
```

3. 환경변수 설정

```
export SQOOP_HOME=/home/bigdata/sqoop
export SQOOP_CONF_DIR=/home/bigdata/sqoop/conf
export PATH=$PATH:$SQOOP_HOME/bin
```

4. rdbms 드라이버 설치

```
[root@Server101 ~]# wget https://downloads.mysql.com/archives/get/p/3/file/mysql-connector-ja
va-5.1.49.tar.gz
```

5. 라이브러리 복사

```
[root@Server101 ~]# cp mysql-connector-java-5.1.49/mysql-connector-java-5.1.49-bin.jar $SQOOP
_HOME/lib
```

6. 마리아 db 설치

```
[root@Server101 ~]# dnf install mariadb mariadb-server -y
```

7. 스쿱 계정 생성

```
MariaDB [(none)]> CREATE USER 'sqoop'@'localhost' identified by '1234';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> CREATE USER 'sqoop'@'%' identified by '1234';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> CREATE DATABASE sqoop;
Query OK, 1 row affected (0.000 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON sqoop.* TO 'sqoop'@'localhost';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON sqoop.* TO 'sqoop'@'*';
ERROR 1133 (28000): Can't find any matching row in the user table
MariaDB [(none)]> GRANT ALL PRIVILEGES ON *.* TO 'sqoop'@'localhost';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.000 sec)
```

8. 테이블 생성

```
MariaDB [sqoop]> INSERT INTO User1 VALUES('A101','KimYuShin','010-1234-1111',23);
Query OK, 1 row affected (0.001 sec)

MariaDB [sqoop]> INSERT INTO User1 VALUES('A102','KimChunChu','010-1234-2222',21);
Query OK, 1 row affected (0.001 sec)

MariaDB [sqoop]> INSERT INTO User1 VALUES('A103','LeeSunShin','010-1234-3333',35);
Query OK, 1 row affected (0.001 sec)

MariaDB [sqoop]> CREATE TABLE User2 LIKE User1;
Query OK, 0 rows affected (0.004 sec)
```

9. import

```
[root@Server101 ~]# sqoop import --connect jdbc:mysql://192.168.63.101:3306/sqoop --table User
1 --username sqoop --password 1234 -m 1 --target-dir hdfs://192.168.63.101:9000/sqoop/User1
```

10. export

```
[root@Server101 ~]# sqoop export --connect jdbc:mysql://192.168.63.101:3306/sqoop --table User
2 --export-dir /sqoop/User1 --username sqoop --password 1234 -m 1
```

import, export 실습은 다음과 같은 에러가 발생해 완료하지 못함.

```
21/06/17 23:05:20 ERROR tool.ImportTool: Import failed: java.io.IOException: No columns to gen
erate for ClassWriter
        at org.apache.sqoop.orm.ClassWriter.generate(ClassWriter.java:1677)
        at org.apache.sqoop.tool.CodeGenTool.generateORM(CodeGenTool.java:106)
        at org.apache.sqoop.tool.ImportTool.importTable(ImportTool.java:501)
        at org.apache.sqoop.tool.ImportTool.run(ImportTool.java:628)
        at org.apache.sqoop.Sqoop.run(Sqoop.java:147)
        at org.apache.hadoop.util.ToolRunner.run(ToolRunner.java:76)
        at org.apache.sqoop.Sqoop.runSqoop(Sqoop.java:183)
        at org.apache.sqoop.Sqoop.runTool(Sqoop.java:234)
        at org.apache.sqoop.Sqoop.runTool(Sqoop.java:243)
        at org.apache.sqoop.Sqoop.main(Sqoop.java:252)
```