

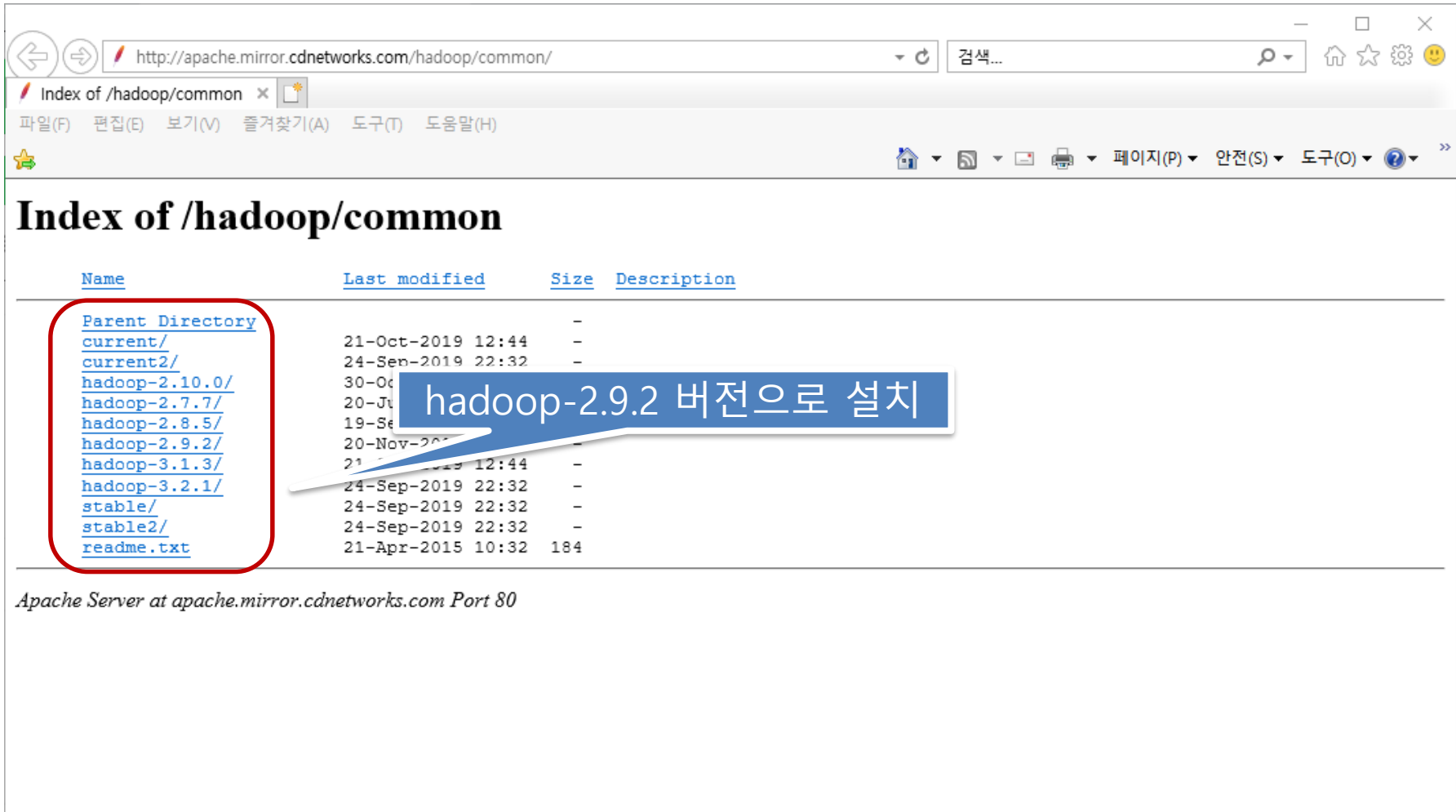
3. Hadoop 설치

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1. Hadoop 설치(다운로드 가능 버전 확인)

<http://apache.mirror.cdnetworks.com/hadoop/common/> 에서 다운로드 가능한 버전 확인



Index of /hadoop/common

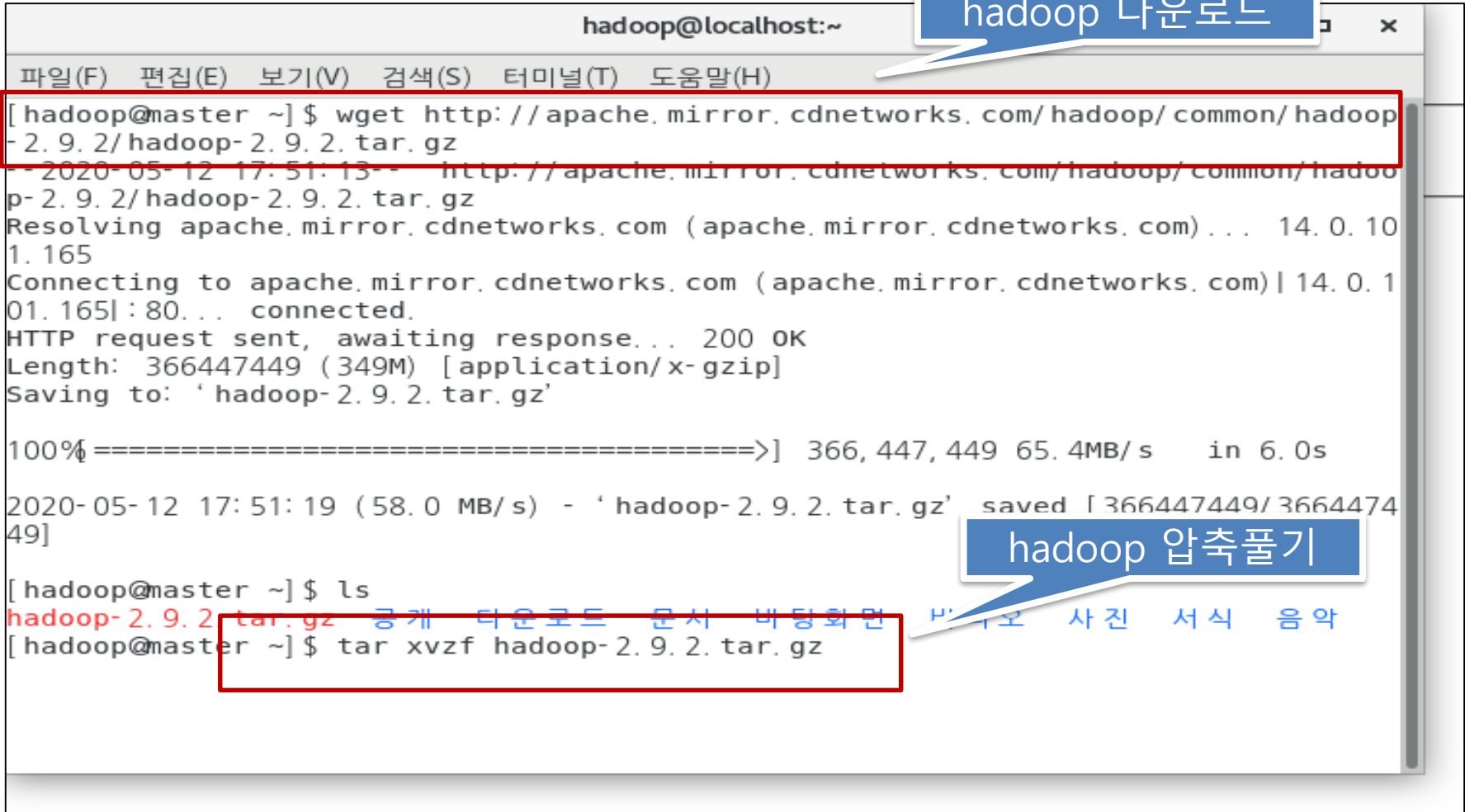
Name	Last modified	Size	Description
Parent Directory		-	
current/	21-Oct-2019 12:44	-	
current2/	24-Sep-2019 22:32	-	
hadoop-2.10.0/	30-Oct-2019 12:44	-	
hadoop-2.7.7/	20-Jul-2019 12:44	-	
hadoop-2.8.5/	19-Sep-2019 12:44	-	
hadoop-2.9.2/	20-Nov-2019 12:44	-	
hadoop-3.1.3/	21-Nov-2019 12:44	-	
hadoop-3.2.1/	24-Sep-2019 22:32	-	
stable/	24-Sep-2019 22:32	-	
stable2/	24-Sep-2019 22:32	-	
readme.txt	21-Apr-2015 10:32	184	

hadoop-2.9.2 버전으로 설치

Apache Server at apache.mirror.cdnetworks.com Port 80

1. Hadoop 설치(다운로드 가능 버전 확인)

<http://apache.mirror.cdnetworks.com/hadoop/common/> 에서 다운로드 가능한 버전 확인



The image shows a terminal window titled 'hadoop@localhost:~'. The terminal output shows the execution of the 'wget' command to download 'hadoop-2.9.2.tar.gz' from 'http://apache.mirror.cdnetworks.com/hadoop/common/'. The download is successful, showing a 200 OK response and a file size of 366,447,449 bytes (349M). The file is saved as 'hadoop-2.9.2.tar.gz'. A callout bubble labeled 'hadoop 다운로드' points to the download command. After the download, the user runs 'ls', showing the file 'hadoop-2.9.2.tar.gz' in the directory. A second callout bubble labeled 'hadoop 압축풀기' points to the 'tar xvfz' command. The terminal window has a menu bar with '파일(F)', '편집(E)', '보기(V)', '검색(S)', '터미널(T)', and '도움말(H)'.

```
hadoop@localhost:~  
[hadoop@master ~]$ wget http://apache.mirror.cdnetworks.com/hadoop/common/hadoop-2.9.2/hadoop-2.9.2.tar.gz  
--2020-05-12 17:51:13-- http://apache.mirror.cdnetworks.com/hadoop/common/hadoop-2.9.2/hadoop-2.9.2.tar.gz  
Resolving apache.mirror.cdnetworks.com (apache.mirror.cdnetworks.com)... 14.0.101.165  
Connecting to apache.mirror.cdnetworks.com (apache.mirror.cdnetworks.com)|14.0.101.165|:80... connected.  
HTTP request sent, awaiting response... 200 OK  
Length: 366447449 (349M) [application/x-gzip]  
Saving to: 'hadoop-2.9.2.tar.gz'  
  
100%=====>] 366,447,449 65.4MB/s in 6.0s  
2020-05-12 17:51:19 (58.0 MB/s) - 'hadoop-2.9.2.tar.gz' saved [366447449/366447449]  
  
[hadoop@master ~]$ ls  
hadoop-2.9.2.tar.gz  
[hadoop@master ~]$ tar xvfz hadoop-2.9.2.tar.gz
```

2. Java 홈/ Hadoop 홈 Path 설정

```
hadoop@localhost:~  
파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)  
[hadoop@master ~]$  
[hadoop@master ~]$ ls  
hadoop-2.9.2      공개      문서      비디오     서식  
hadoop-2.9.2.tar.gz 다운로드  바탕화면  사진       음악  
[hadoop@master ~]$  
[hadoop@master ~]$  
[hadoop@master ~]$ ls /usr/l  
lib/      lib64/    libexec/  local/  
[hadoop@master ~]$ ls /usr/lib/j  
java/      java-1.6.0/  java-1.8.0/  jvm/      jvm-exports/  
java-1.5.0/  java-1.7.0/  java-ext/    jvm-common/ jvm-private/  
[hadoop@master ~]$ ls /usr/lib/j  
java/      java-1.6.0/  java-1.8.0/  jvm/      jvm-exports/  
java-1.5.0/  java-1.7.0/  java-ext/    jvm-common/ jvm-private/  
[hadoop@master ~]$ ls /usr/lib/jvm/java-1.8.0*  
/usr/lib/jvm/java-1.8.0:  
bin  include  jre  lib  tapset  
  
/usr/lib/jvm/java-1.8.0-openjdk:  
bin  include  jre  lib  tapset  
  
/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.252.b09-2.el7_8.x86_64:  
bin  include  jre  lib  tapset  
[hadoop@master ~]$
```

Java 패키지 설치 경로 확인

.bash_profile 설정 : Hadoop & Java 홈 디렉터리 지정

hadoop@master:~

파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)

```
/usr/lib/jvm/java-1.8.0-openjdk:  
bin include jre lib tapset
```

```
/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.201.b09-2.el7_6.x86_64:  
bin include jre lib tapset
```

```
[hadoop@master ~]$
```

```
[hadoop@master ~]$
```

```
[hadoop@master ~]$ pwd
```

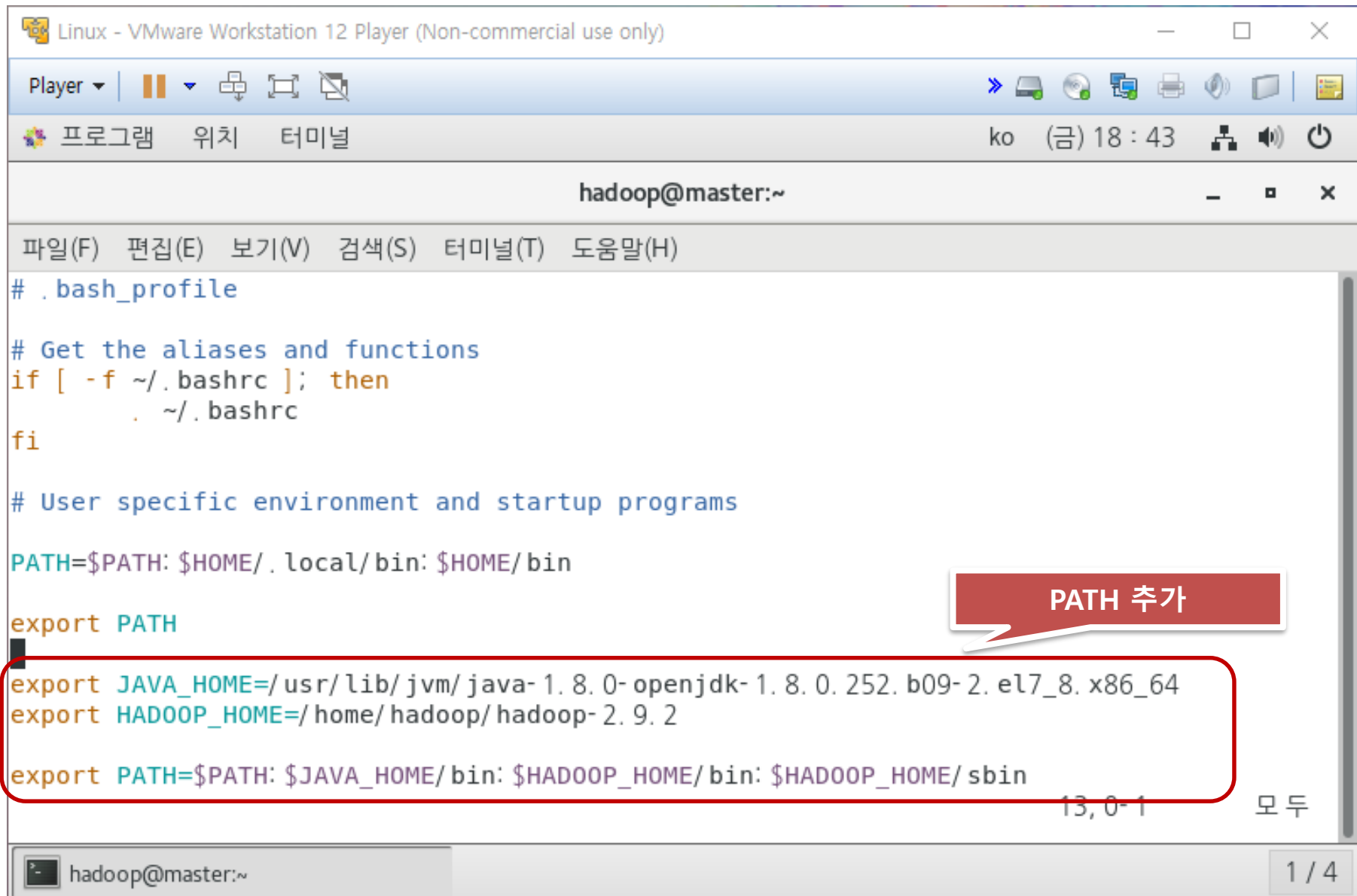
```
/home/hadoop
```

```
[hadoop@master ~]$
```

```
[hadoop@master ~]$ vi .bash_profile
```

편집기로 설정파일 열기

.bash_profile 설정 : Hadoop & Java 홈 디렉터리 지정



```
Linux - VMware Workstation 12 Player (Non-commercial use only)
Player ▾ | [Icons]
프로그램 위치 터미널 ko (금) 18 : 43 [Icons]
hadoop@master:~
파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)
# .bash_profile

# Get the aliases and functions
if [ -f ~/.bashrc ]; then
    . ~/.bashrc
fi

# User specific environment and startup programs

PATH=$PATH: $HOME/.local/bin: $HOME/bin

export PATH

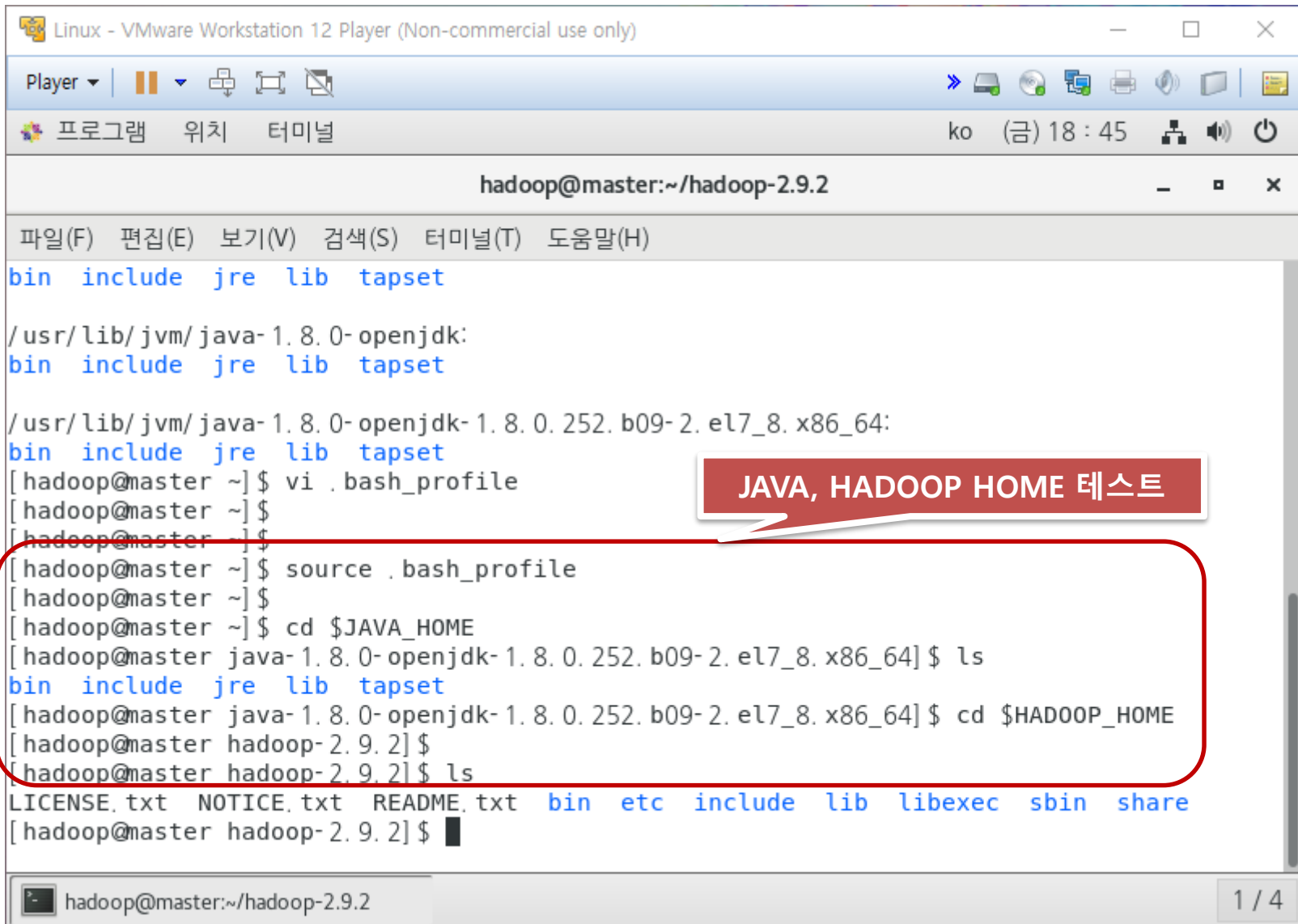
export JAVA_HOME=/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.252.b09-2.el7_8.x86_64
export HADOOP_HOME=/home/hadoop/hadoop-2.9.2

export PATH=$PATH: $JAVA_HOME/bin: $HADOOP_HOME/bin: $HADOOP_HOME/sbin
```

PATH 추가

hadoop@master:~ 1 / 4

.bash_profile 적용/환경변수 확인



```
Linux - VMware Workstation 12 Player (Non-commercial use only)
Player | [Icons]
프로그램 위치 터미널 ko (금) 18 : 45
hadoop@master:~/hadoop-2.9.2
파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)
bin include jre lib tapset
/usr/lib/jvm/java-1.8.0-openjdk:
bin include jre lib tapset
/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.252.b09-2.el7_8.x86_64:
bin include jre lib tapset
[hadoop@master ~]$ vi .bash_profile
[hadoop@master ~]$
[hadoop@master ~]$
[hadoop@master ~]$ source .bash_profile
[hadoop@master ~]$
[hadoop@master ~]$ cd $JAVA_HOME
[hadoop@master java-1.8.0-openjdk-1.8.0.252.b09-2.el7_8.x86_64]$ ls
bin include jre lib tapset
[hadoop@master java-1.8.0-openjdk-1.8.0.252.b09-2.el7_8.x86_64]$ cd $HADOOP_HOME
[hadoop@master hadoop-2.9.2]$
[hadoop@master hadoop-2.9.2]$ ls
LICENSE.txt NOTICE.txt README.txt bin etc include lib libexec sbin share
[hadoop@master hadoop-2.9.2]$
```

JAVA, HADOOP HOME 테스트

hadoop@master:~/hadoop-2.9.2 1 / 4

3. Hadoop 환경 설정 관련 파일

파일명	설정 내용
hadoop-env.sh	Hadoop을 실행하는 설정파일[JDK경로, Class 패스, 데몬 실행 옵션 등]
yarn-env.sh	YARN(Mapreduce ver2)을 실행하는 설정파일[JDK경로 등]
masters	보조 Name node를 실행 할 서버 설정
slaves	Data node를 실행할 서버 설정
core-site.xml	분산파일시스템[HDFS]를 지정하고, HDFS와 YARN에서 이용될 임시 디렉터리 지정
hdfs-site.xml	Name node와 Data node의 디렉터리 지정
mapred-site.xml	Mapreduce에서 사용할 환경설정 파일
yarn-site.xml	YARN[Hadoop 클러스터 관리 시스템] 설정파일, Resource Manager, Node Manager 지정

Hadoop 환경 설정

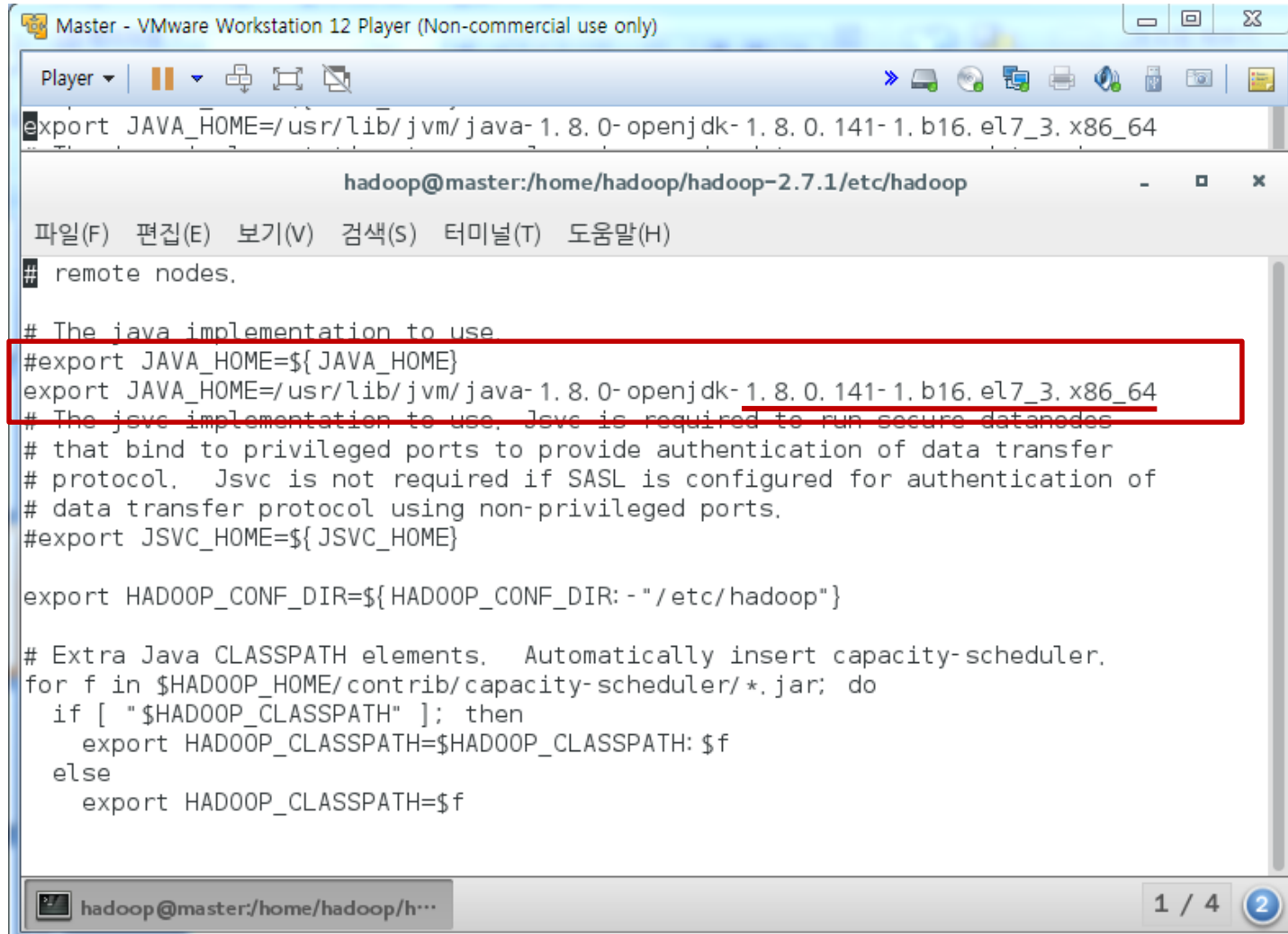
```
hadoop@master:~/hadoop-2.7.6/etc/hadoop
```

파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)

```
[hadoop@master ~]$  
[hadoop@master ~]$  
[hadoop@master ~]$ source .bash_profile  
[hadoop@master ~]$  
[hadoop@master ~]$ cd hadoop-2.7.6/etc/hadoop/  
[hadoop@master hadoop]$  
[hadoop@master hadoop]$ pwd  
/home/hadoop/hadoop-2.7.6/etc/hadoop  
[hadoop@master hadoop]$  
[hadoop@master hadoop]$ vi hadoop-env.sh
```

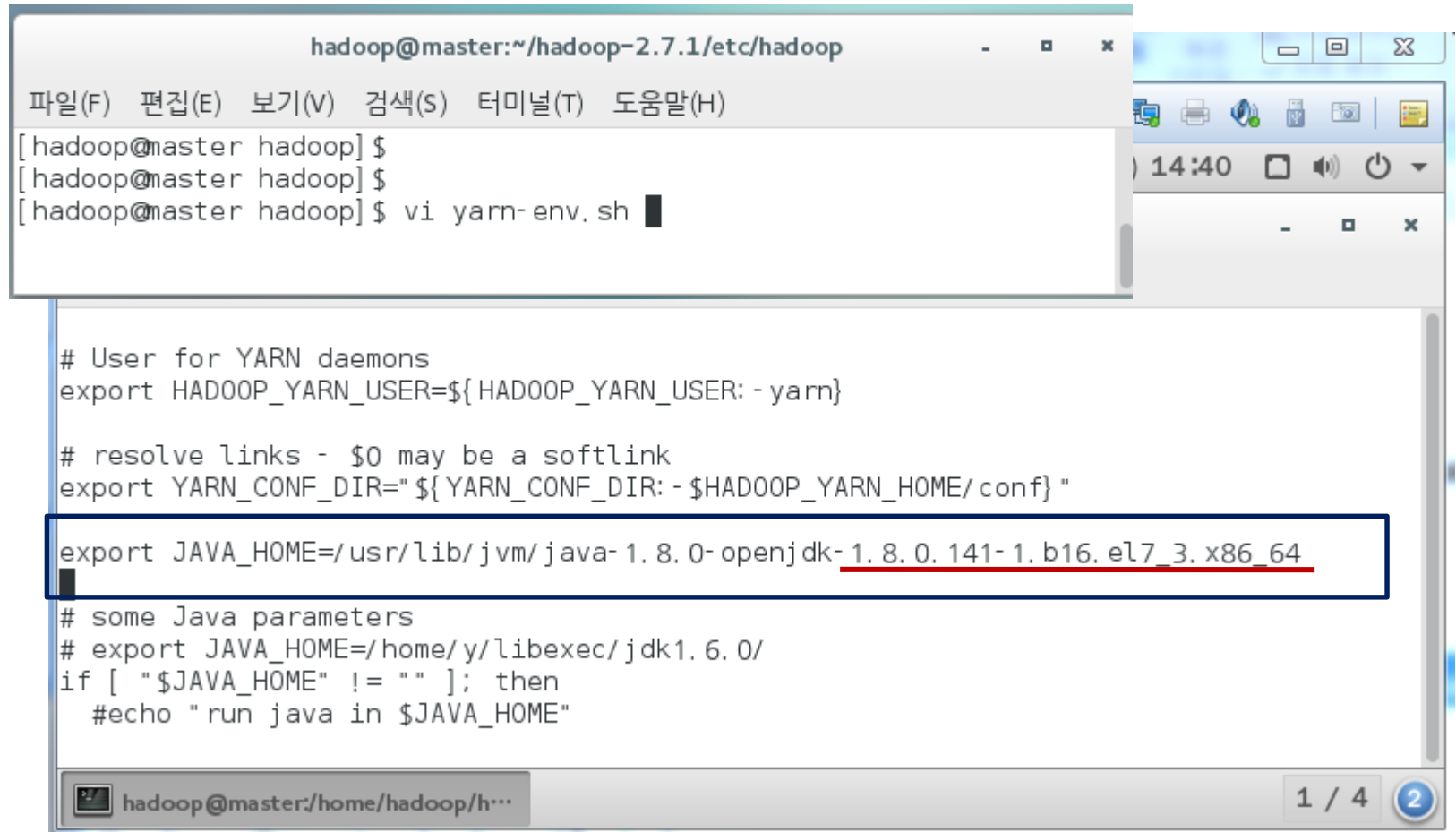
패키지 경로 확인

Hadoop-env.sh 설정(jdk 추가)



```
Master - VMware Workstation 12 Player (Non-commercial use only)
Player
export JAVA_HOME=/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.141-1.b16.el7_3.x86_64
hadoop@master:/home/hadoop/hadoop-2.7.1/etc/hadoop
파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)
# remote nodes.
# The java implementation to use
#export JAVA_HOME=${JAVA_HOME}
export JAVA_HOME=/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.141-1.b16.el7_3.x86_64
# The jsvc implementation to use. Jsvc is required to run secure datanodes
# that bind to privileged ports to provide authentication of data transfer
# protocol. Jsvc is not required if SASL is configured for authentication of
# data transfer protocol using non-privileged ports.
#export JSVC_HOME=${JSVC_HOME}
export HADOOP_CONF_DIR=${HADOOP_CONF_DIR:-"/etc/hadoop"}
# Extra Java CLASSPATH elements. Automatically insert capacity-scheduler.
for f in $HADOOP_HOME/contrib/capacity-scheduler/*.jar; do
  if [ "$HADOOP_CLASSPATH" ]; then
    export HADOOP_CLASSPATH=$HADOOP_CLASSPATH:$f
  else
    export HADOOP_CLASSPATH=$f
  fi
done
```

Yarn 환경 설정(jdk 추가)



```
hadoop@master:~/hadoop-2.7.1/etc/hadoop
파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)
[hadoop@master hadoop]$
[hadoop@master hadoop]$
[hadoop@master hadoop]$ vi yarn-env.sh

# User for YARN daemons
export HADOOP_YARN_USER=${HADOOP_YARN_USER:- yarn}

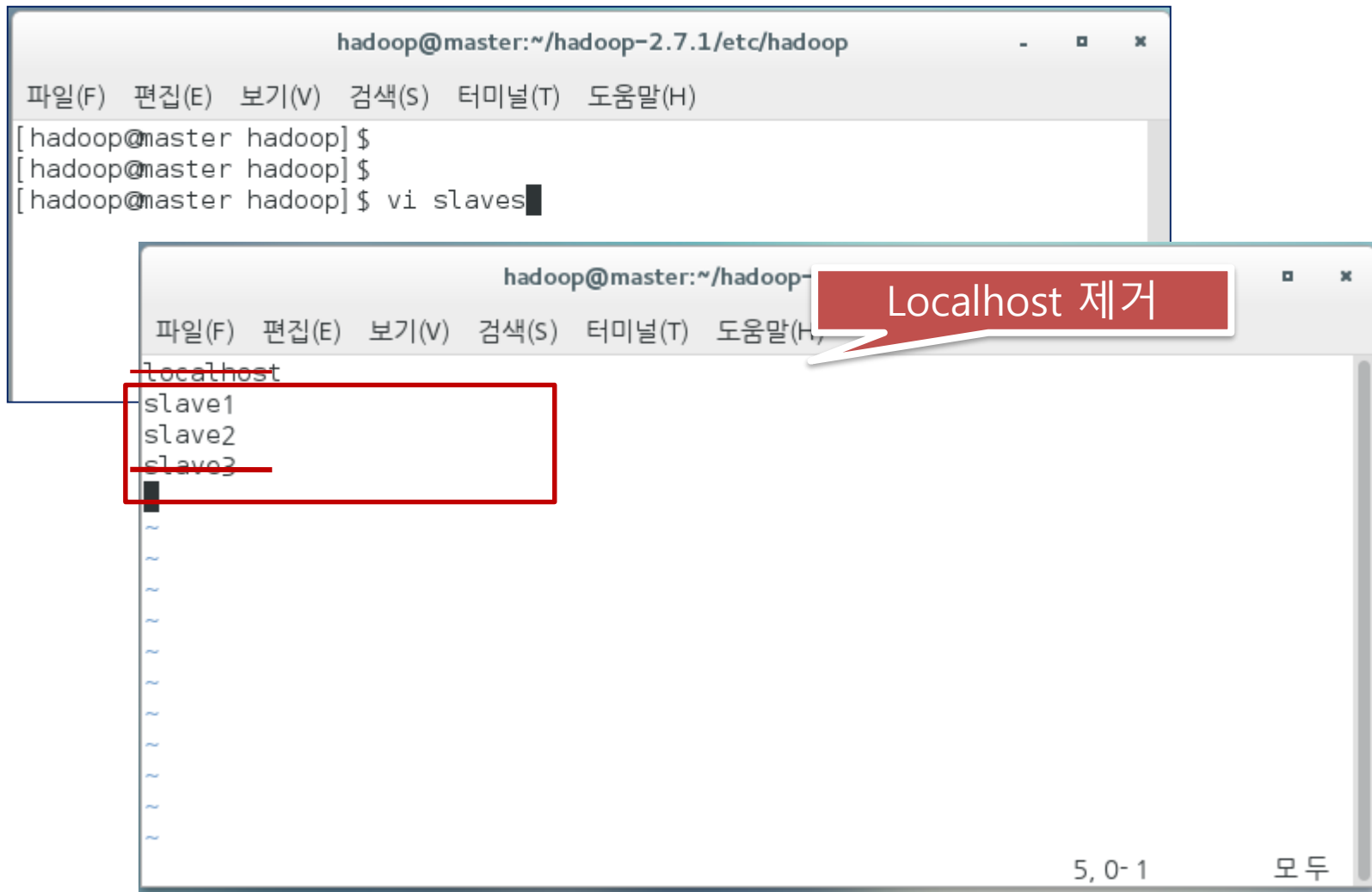
# resolve links - $0 may be a softlink
export YARN_CONF_DIR="${YARN_CONF_DIR:- $HADOOP_YARN_HOME/conf}"

export JAVA_HOME=/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.141-1.b16.el7_3.x86_64

# some Java parameters
# export JAVA_HOME=/home/y/libexec/jdk1.6.0/
if [ "$JAVA_HOME" != "" ]; then
    #echo "run java in $JAVA_HOME"

hadoop@master:/home/hadoop/h... 1 / 4 2
```

Data node(Slave 서버) 지정

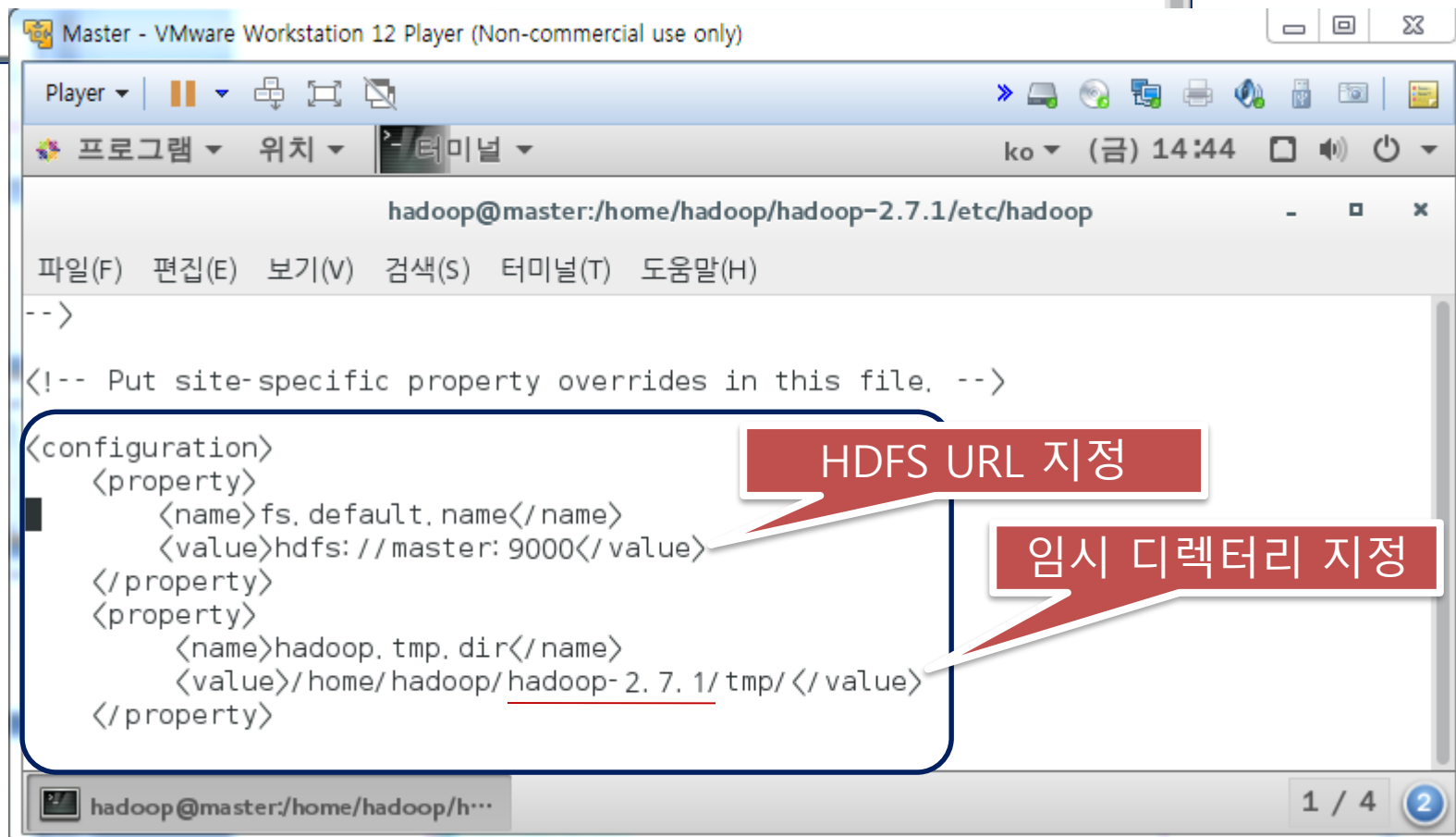


```
hadoop@master:~/hadoop-2.7.1/etc/hadoop
파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)
[hadoop@master hadoop]$
[hadoop@master hadoop]$
[hadoop@master hadoop]$ vi slaves
localhost
slave1
slave2
slave3
~
~
~
~
~
~
~
~
~
5, 0-1 모두
```

Localhost 제거

HDFS의 Name node 지정, HDFS 임시 디렉터리 지정

```
[hadoop@master hadoop]$ vi core-site.xml  
[hadoop@master hadoop]$
```



HDFS에 tmp 임시 데이터용 디렉터리 생성 (core-site.xml 에서 지정한 디렉터리)

```
hadoop@master:~/hadoop-2.7.1/etc/hadoop
파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)
hadoop@master hadoop]$ mkdir /home/hadoop/hadoop-2.7.1/tmp
hadoop@master hadoop]$
```

HDFS 관련 서버 설정

```
hadoop@master:~/hadoop-2.7.6/etc/hadoop
파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)
[hadoop@master hadoop]$
[hadoop@master hadoop]$
[hadoop@master hadoop]$
[hadoop@master hadoop]$ vi hdfs-site.xml
```

```
<!-- Put site-specific property overrides in this file. -->
<configuration>
  <property>
    <name>dfs.replication</name>
    <value>3</value>
  </property>
  <property>
    <name>dfs.permissions</name>
    <value>>false</value>
  </property>
  <property>
    <name>dfs.namenode.secondary.http-address</name>
    <value>slave1: 50090</value>
  </property>
  <property>
    <name>dfs.namenode.secondary.https-address</name>
    <value>slave1: 50091</value>
  </property>
</configuration>
```

보조 네임노드를 실행 할 서버 설정

```
-- 끼워 넣기 --
```

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바닥

MapReduce 애플리케이션 정보 설정

```
hadoop@master:~/hadoop-2.7.1/etc/hadoop
파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)
[hadoop@master hadoop]$
[hadoop@master hadoop]$ cp mapred-site.xml.template mapred-site.xml
[hadoop@master hadoop]$
[hadoop@master hadoop]$
[hadoop@master hadoop]$ vi mapred-site.xml
http://www.apache.org/licenses/LICENSE-2.0
Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License. See accompanying LICENSE file.
-->
<!-- Put site-specific property overrides in this file. -->
<configuration>
  <property>
    <name>mapreduce.framework.name</name>
    <value>yarn</value>
  </property>
</configuration>
~
```

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Hadoop 관리 시스템 설정 (Resource Manager, Node Manager)

```
hadoop@master:~/hadoop-2.7.1/etc/hadoop

파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)

[hadoop@master hadoop]$
[hadoop@master hadoop]$
[hadoop@master hadoop]$ vi yarn-site.xml
[hadoop@master hadoop]$
```

YARN이 수행될 서버 설정

```
See the License for the specific language governing permissions and
limitations under the License. See accompanying LICENSE file.
-->
<configuration>
<!-- Site specific YARN configuration properties -->
  <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.resource-tracker.address</name>
    <value>master:8020</value>
  </property>
  <property>
    <name>yarn.resourcemanager.scheduler.address</name>
    <value>master:8030</value>
  </property>
  <property>
    <name>yarn.resourcemanager.address</name>
    <value>master:8040</value>
  </property>
</configuration>
```

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4. Hadoop 시스템 배포

1) Hadoop 디렉터리 배포

```
[hadoop@master hadoop]$ cd
```

```
[hadoop@master ~]$ scp -r /home/hadoop/hadoop-2.7.1 hadoop@slave1:~
```

```
[hadoop@master ~]$ scp -r /home/hadoop/hadoop-2.7.1 hadoop@slave2:~
```

2) Hadoop 환경 변수(계정 profile 배포)

```
[hadoop@master ~]$ scp /home/hadoop/.bash_profile hadoop@slave1:~
```

```
[hadoop@master ~]$ scp /home/hadoop/.bash_profile hadoop@slave2:~
```

파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)

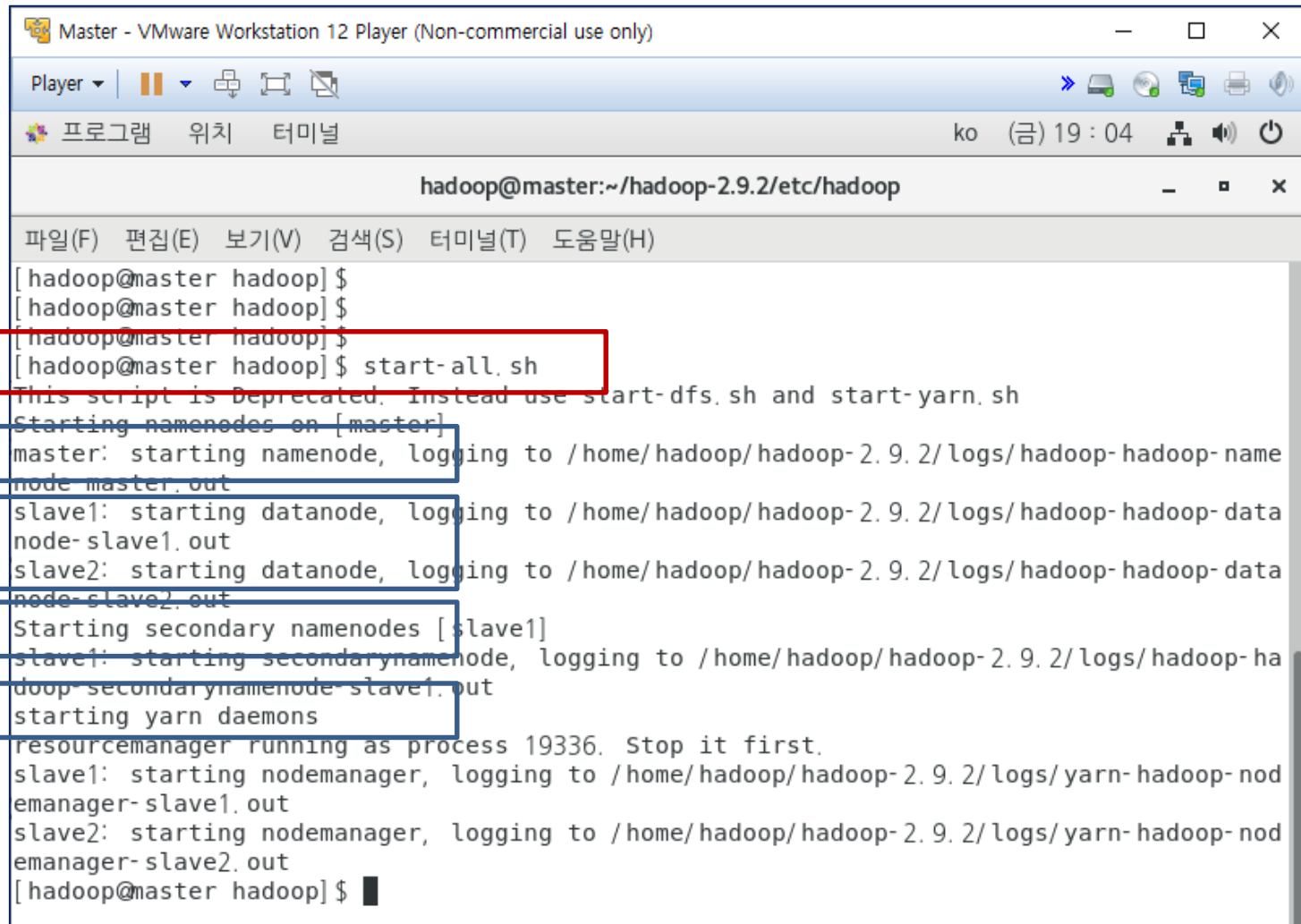
hadoop-2.7.1	100% 1640	1.6KB/s	00:00
hadoop-2.7.1	100% 2223	2.2KB/s	00:00
hadoop-2.7.1	100% 2134	2.1KB/s	00:00
hadoop-2.7.1	100% 5431	5.3KB/s	00:00
hadoop-2.7.1	100% 1366	1.3KB/s	00:00
hadoop@master ~]\$ scp /home/hadoop/.bash_profile hadoop@slave1:~			
bash_profile	100% 355	0.4KB/s	00:00
hadoop@master ~]\$ scp /home/hadoop/.bash_profile hadoop@slave2:~			
bash_profile	100% 355	0.4KB/s	00:00

HDFS 포맷(최초 사용시)

```
hadoop@master:~  
파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)  
[hadoop@master ~]$  
[hadoop@master ~]$  
[hadoop@master ~]$ hdfs namenode -format  
17/03/10 15:37:57 INFO namenode.NameNode: STARTUP_MSG:  
/ *****  
STARTUP_MSG: Starting NameNode  
STARTUP_MSG: host = master/192.168.136.5  
STARTUP_MSG: args = [-format]  
STARTUP  
STARTUP  
/common/ 파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:03 INFO metrics.TopMetrics: NNTop conf: dfs.namenode.top.num.users = 10  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:03 INFO metrics.TopMetrics: NNTop conf: dfs.namenode.top.windows.minutes = 1,5,25  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:03 INFO namenode.FSNamesystem: Retry cache on namenode is enabled  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:03 INFO namenode.FSNamesystem: Retry cache will use 0.03 of total heap and retry cache  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:03 INFO namenode.FSNamesystem: Retry cache entry expiry time is 600000 millis  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:03 INFO util.GSet: Computing capacity for map NameNodeRetryCache  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:03 INFO util.GSet: VM type = 64-bit  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:03 INFO util.GSet: 0.029999999329447746% max memory 966.7 MB = 297.0 KB  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:03 INFO util.GSet: capacity = 2^15 = 32768 entries  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:03 INFO namenode.FSImage: Allocated new BlockPoolId: BP-1897259230-192.168.136.5-1489127883531  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:03 INFO common.Storage: Storage directory /home/hadoop/hadoop-2.7.1/tmp/dfs/name has been successfully formatted.  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:04 INFO namenode.NNStorageRetentionManager: Going to retain 1 images with txid >= 0  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:04 INFO util.ExitUtil: Exiting with status 0  
hadoop/hadoop-2.7.1/ 17/03/10 15:38:04 INFO namenode.NameNode: SHUTDOWN_MSG:  
/ *****  
SHUTDOWN_MSG: Shutting down NameNode at master/192.168.136.5  
*****/  
[hadoop@master ~]$
```

5. Hadoop/Yarn/Historyserver 시작

1) Hadoop/Yarn 시작



The screenshot shows a terminal window titled "Master - VMware Workstation 12 Player (Non-commercial use only)". The terminal prompt is "hadoop@master:~/hadoop-2.9.2/etc/hadoop". The user enters the command "start-all.sh", which is highlighted with a red box. The output shows the script is deprecated and suggests using "start-dfs.sh" and "start-yarn.sh". Subsequent lines show the starting of namenodes on the master and slave1, slave2, and the starting of secondary namenodes on slave1. The output also shows the starting of yarn daemons, including the resource manager running as process 19336. The terminal window has a menu bar with "파일(F)", "편집(E)", "보기(V)", "검색(S)", "터미널(T)", and "도움말(H)". The status bar shows "ko (금) 19 : 04".

```
hadoop@master:~/hadoop-2.9.2/etc/hadoop
[hadop@master hadoop]$
[hadop@master hadoop]$
[hadop@master hadoop]$
[hadop@master hadoop]$ start-all.sh
This script is Deprecated. Instead use start-dfs.sh and start-yarn.sh
Starting namenodes on [master]
master: starting namenode, logging to /home/hadoop/hadoop-2.9.2/logs/hadoop-hadoop-name
node-master.out
slave1: starting datanode, logging to /home/hadoop/hadoop-2.9.2/logs/hadoop-hadoop-data
node-slave1.out
slave2: starting datanode, logging to /home/hadoop/hadoop-2.9.2/logs/hadoop-hadoop-data
node-slave2.out
Starting secondary namenodes [slave1]
slave1: starting secondarynamenode, logging to /home/hadoop/hadoop-2.9.2/logs/hadoop-ha
doo-secondarynamenode-slave1.out
starting yarn daemons
resource manager running as process 19336. Stop it first.
slave1: starting nodemanager, logging to /home/hadoop/hadoop-2.9.2/logs/yarn-hadoop-nod
emanager-slave1.out
slave2: starting nodemanager, logging to /home/hadoop/hadoop-2.9.2/logs/yarn-hadoop-nod
emanager-slave2.out
[hadop@master hadoop]$
```

3) Historyserver 데몬 실행

hadoop

Map reduce 데몬(잡 히스토리 서버) 실행

파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)

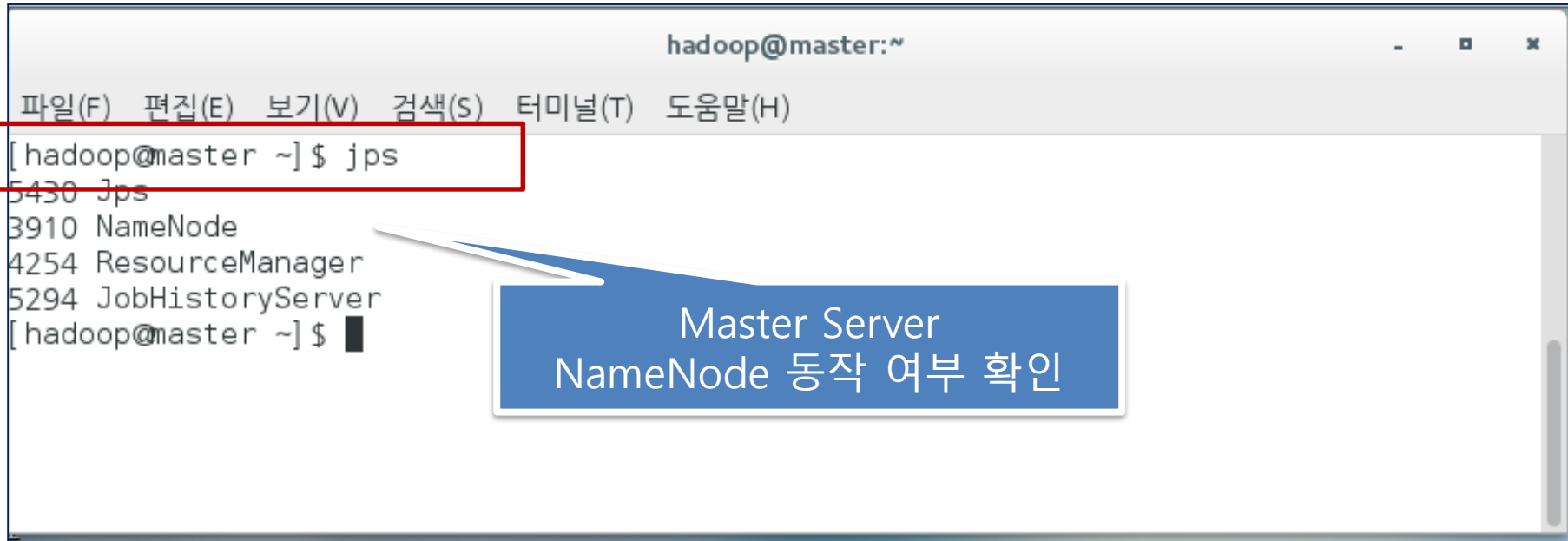
[hadoop@master ~]\$

[hadoop@master ~]\$ mr-jobhistory-daemon.sh start historyserver

starting historyserver, logging to /home/hadoop/hadoop-2.7.1/logs/mapred-hadoop-historyserver-master.out

6. Hadoop system 상태 확인

❖ Name node용 서버에서 jps 실행하면 NameNode, JobTracker 출력

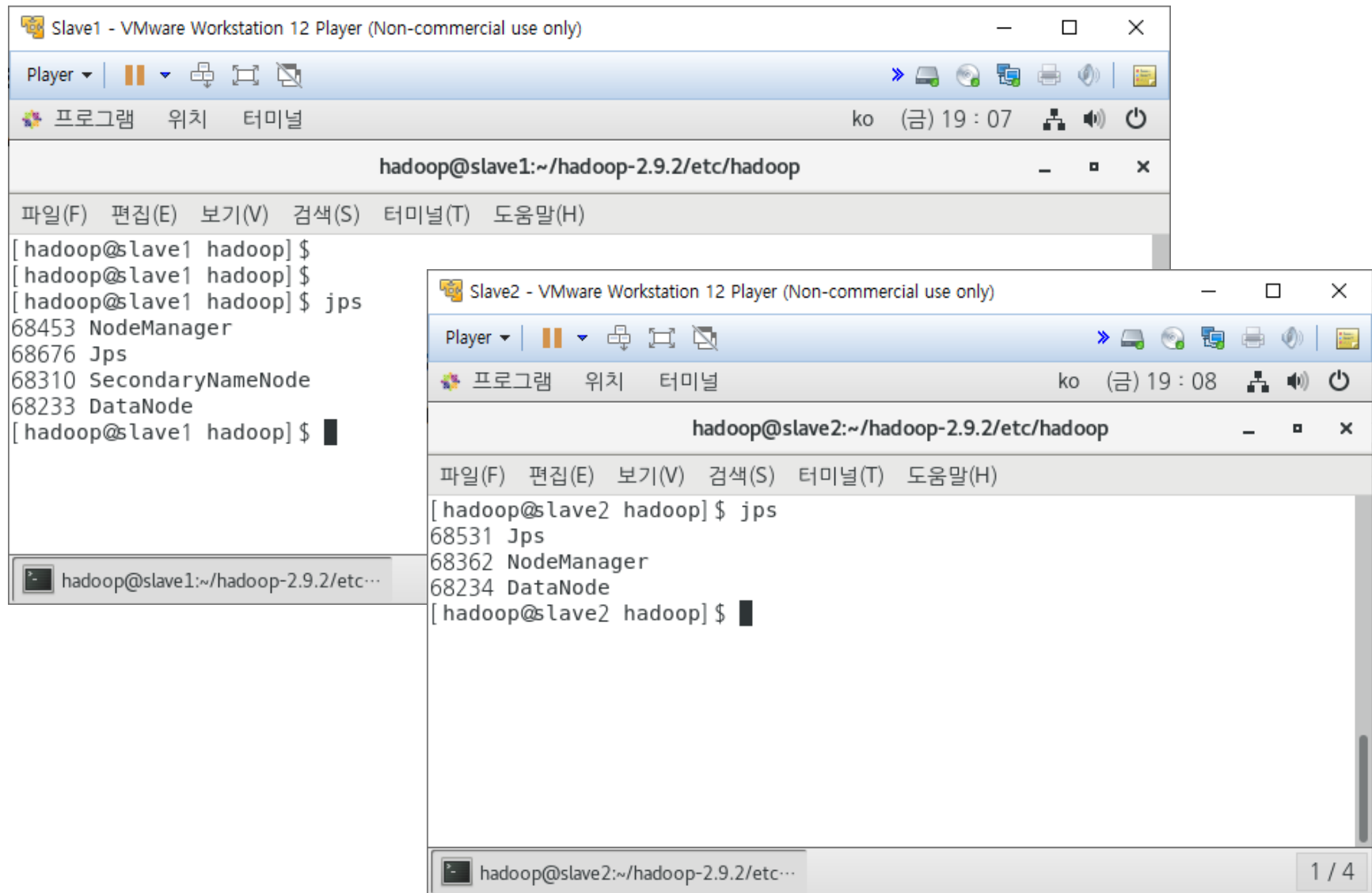


The image shows a terminal window titled 'hadoop@master:~'. The menu bar includes '파일(F)', '편집(E)', '보기(V)', '검색(S)', '터미널(T)', and '도움말(H)'. A red rectangle highlights the command '[hadoop@master ~]\$ jps'. The output of the command is as follows:

```
5430 jps
3910 NameNode
4254 ResourceManager
5294 JobHistoryServer
[hadoop@master ~]$
```

A blue callout box with a white arrow pointing to the output contains the text: 'Master Server NameNode 동작 여부 확인'.

❖ Data Node용 서버에서 jsp 실행하면 DataNode, SecondaryNameNode 출력



The image displays two terminal windows from VMware Workstation 12 Player, showing the execution of Hadoop commands on two different slave nodes.

Slave1 - VMware Workstation 12 Player (Non-commercial use only)

Terminal window showing the execution of `jsp` command on `slave1`:

```
hadoop@slave1:~/hadoop-2.9.2/etc/hadoop

[ hadoop@slave1 hadoop] $
[ hadoop@slave1 hadoop] $
[ hadoop@slave1 hadoop] $ jsp
68453 NodeManager
68676 Jps
68310 SecondaryNameNode
68233 DataNode
[ hadoop@slave1 hadoop] $
```

Slave2 - VMware Workstation 12 Player (Non-commercial use only)

Terminal window showing the execution of `jsp` command on `slave2`:

```
hadoop@slave2:~/hadoop-2.9.2/etc/hadoop

[ hadoop@slave2 hadoop] $ jsp
68531 Jps
68362 NodeManager
68234 DataNode
[ hadoop@slave2 hadoop] $
```

Both windows show the output of the `jsp` command, listing the processes running on the respective slave nodes. The output for `slave1` includes `NodeManager`, `Jps`, `SecondaryNameNode`, and `DataNode`. The output for `slave2` includes `Jps`, `NodeManager`, and `DataNode`.

hadoop@master:~

HDFS 파일 시스템 상태 확인

파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)

4699 lps

[hadoop@master ~]\$ hdfs dfsadmin -report

Safe mode is ON

Configured Capacity: 36655562752 (34.14 GB)

Present Capacity: 24357769216 (22.68 GB)

DFS Remaining: 24356474880 (22.68 GB)

DFS Used: 1294336 (1.23 MB)

DFS Used% 0.01%

Under replicated blocks: 0

Blocks with corrupt replicas: 0

Missing blocks: 0

Missing blocks (with replication factor 1): 0

Live datanodes (2):

Name: 192.168.220.10:50010 (slave1)

Hostname: slave1

Decommission Status : Normal

Configured Capacity: 18327781376 (17.07 GB)

DFS Used: 647168 (632 KB)

Non DFS Used: 5194002432 (4.84 GB)

DFS Remaining: 12178509824 (11.34 GB)

DFS Used% 0.00%

DFS Remaining% 66.45%

Configured Cache Capacity: 0 (0 B)

Cache Used: 0 (0 B)

Cache Remaining: 0 (0 B)

Cache Used% 100.00%

Cache Remaining% 0.00%

Xceivers: 1

Last contact: Mon Jul 09 16:38:08 KST 2018

Hadoop 상태 확인

The screenshot shows a VMware Workstation 12 Player window titled "Master - VMware Workstation 12 Player (Non-commercial use only)". Inside the player, a Mozilla Firefox browser window is open with the title "Namenode information - Mozilla Firefox". The browser's address bar is highlighted with a red box and contains the URL "localhost:50070/dfshealth.html#tab-overview". A blue callout box points to the address bar with the text "http://localhost:50070". The browser displays the Hadoop "Overview" page for the NameNode. The page has a green header with the "Hadoop" logo and a navigation menu with "Overview", "Datanodes", "Datanode Volume Failures", "Snapshot", "Startup Progress", and "Utilities". The main content area shows the "Overview" for the NameNode 'master:9000' (active). Below this is a table with the following information:

Started:	Tue Aug 08 14:43:33 KST 2017
Version:	2.7.1, r15ecc87ccf4a0228f35af08fc56de536e6ce657a
Compiled:	2015-06-29T06:04Z by jenkins from (detached from 15ecc87)
Cluster ID:	CID-43b2b5fb-e370-4fd4-a873-2a3436ad6eef
Block Pool ID:	BP-1249208457-192.168.13.5-1502170976206

The bottom of the browser window shows the taskbar with the terminal icon and the text "hadoop@master:~", and the browser tab titled "Namenode information - Mozilla ...". The bottom right corner of the browser window shows "1 / 4" and a circular icon with the number "1".

Master - VMware Workstation 12 Player (Non-commercial use only)

Player ▾ | [Icons] | [Icons]

프로그램 ▾ 위치 ▾ Firefox 웹 브라우저 ▾ ko ▾ (화) 14:55 [Icons]

Namenode information - Mozilla Firefox

Namenode information x +

localhost:50070/dfshealth.html#tab-overview 🔍 검색 [Icons]

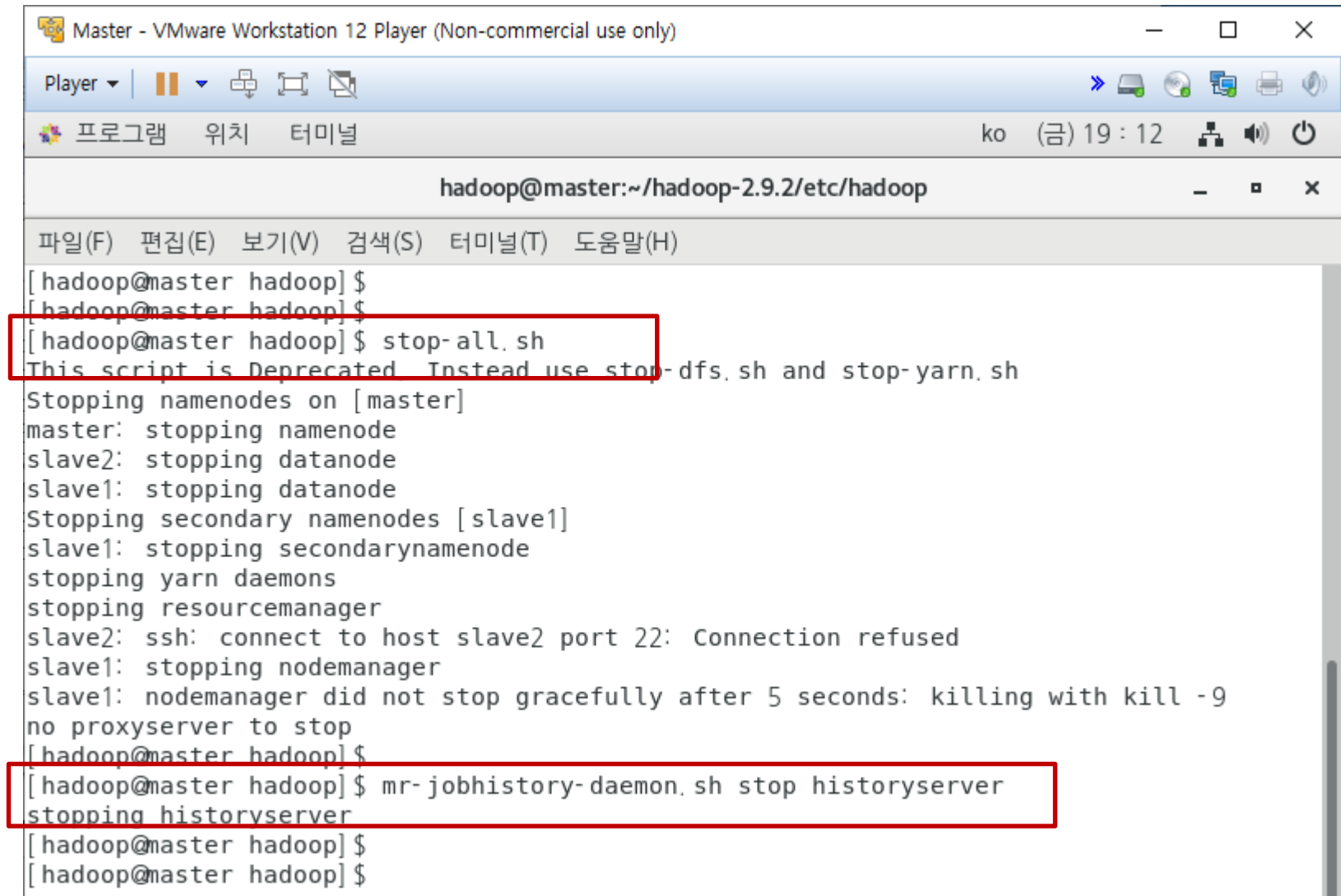
Heap memory used 68.14 MB of 141 MB Heap memory. Max heap memory is 689 MB.
Non Heap Memory used 42.81 MB of 43.69 MB Committed Non Heap Memory. Max Non Heap Memory is -1 B.

Configured Capacity:	33.21 GB
DFS Used:	52 KB (0%)
Non DFS Used:	12 GB
DFS Remaining:	
Block Pool Used:	52 KB (0%)
DataNodes usage (min/Median/Max/stdDev):	0.00% / 0.00% / 0.00% / 0.00%
Live Nodes	2 (Decommissioned: 0)
Dead Nodes	0 (Decommissioned: 0)
Decommissioning Nodes	0
Total Datanode Volume Failures	0 (0 B)

hadoop@master:~
Namenode information - Mozilla ... 1 / 4 1

연결된 Data Node 수

7. Hadoop system 종료



The screenshot shows a terminal window titled "Master - VMware Workstation 12 Player (Non-commercial use only)". The terminal prompt is "hadoop@master:~/hadoop-2.9.2/etc/hadoop". The terminal output shows the execution of "stop-all.sh", which is deprecated and replaced by "stop-dfs.sh" and "stop-yarn.sh". The script proceeds to stop namenodes on the master, datanodes on slave2 and slave1, secondary namenodes on slave1, yarn daemons, and the resourcemanager. It also shows an SSH connection attempt to slave2 on port 22, which is refused. The nodemanager on slave1 is stopped, and a message indicates it did not stop gracefully after 5 seconds, so it was killed with "kill -9". Finally, the proxyserver is stopped. The terminal then shows the execution of "mr-jobhistory-daemon.sh stop historyserver", which successfully stops the historyserver.

```
hadoop@master:~/hadoop-2.9.2/etc/hadoop
[hadop@master hadoop]$
[hadop@master hadoop]$
[hadop@master hadoop]$ stop-all.sh
This script is Deprecated. Instead use stop-dfs.sh and stop-yarn.sh
Stopping namenodes on [master]
master: stopping namenode
slave2: stopping datanode
slave1: stopping datanode
Stopping secondary namenodes [slave1]
slave1: stopping secondarynamenode
stopping yarn daemons
stopping resourcemanager
slave2: ssh: connect to host slave2 port 22: Connection refused
slave1: stopping nodemanager
slave1: nodemanager did not stop gracefully after 5 seconds: killing with kill -9
no proxyserver to stop
[hadop@master hadoop]$
[hadop@master hadoop]$ mr-jobhistory-daemon.sh stop historyserver
stopping historyserver
[hadop@master hadoop]$
[hadop@master hadoop]$
```