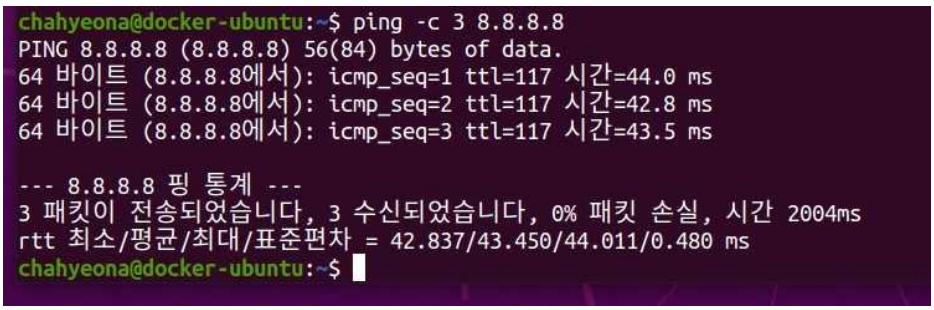
Docker 실습 과제

2020039009 차현아

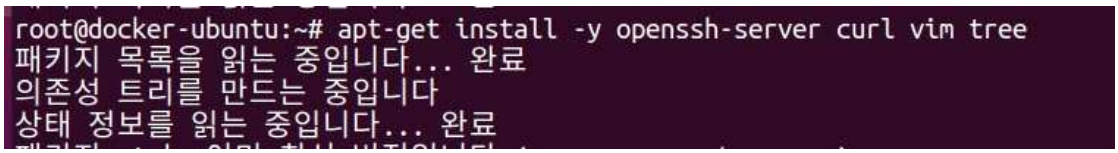
1. 통신을 위해 /etc/hosts/ 파일 수정

2. ping을 통해 가상머신과 외부 네트워크 연결 확인



3. text 로그인 모드로 전환 세팅

4. ssh 데몬 설치



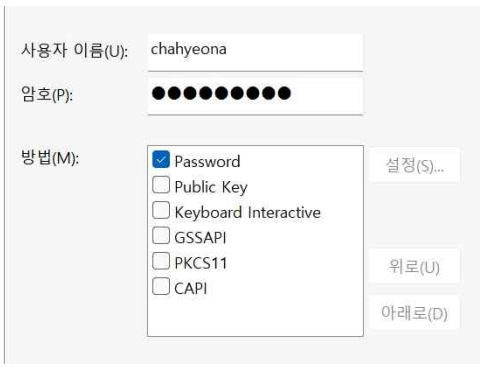
5. ssh 데몬 설치 확인

```
root@docker-ubuntu:~# systemctl status sshd
● ssh.service - OpenBSD Secure Shell server
     Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: e
     Active: active (running) since Sat 2022-06-04 14:05:19 KST; 52s ago
       Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 3931 (sshd)
      Tasks: 1 (limit: 4632)
     Memory: 1.0M
     CGroup: /system.slice/ssh.service
             └─3931 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups

 6월 04 14:05:19 docker-ubuntu systemd[1]: Starting OpenBSD Secure Shell server
 6월 04 14:05:19 docker-ubuntu sshd[3931]: Server listening on 0.0.0.0 port 22.
 6월 04 14:05:19 docker-ubuntu sshd[3931]: Server listening on :: port 22.
 6월 04 14:05:19 docker-ubuntu systemd[1]: Started OpenBSD Secure Shell server.
lines 1-15/15 (END)
```

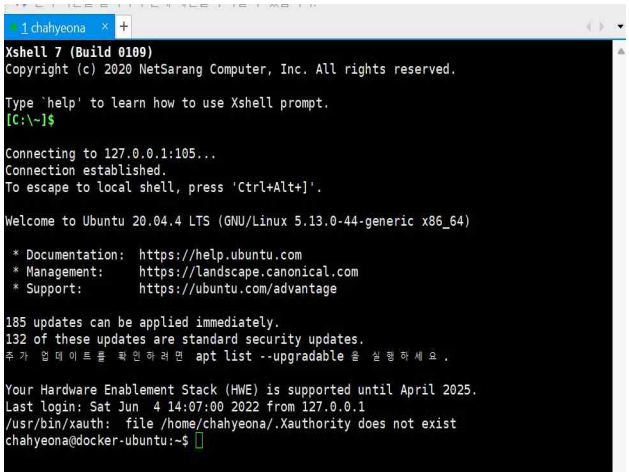
```
chahyeona@docker-ubuntu:~$ exit
로그아웃
Connection to localhost closed.
root@docker-ubuntu:~# exit
로그아웃
```

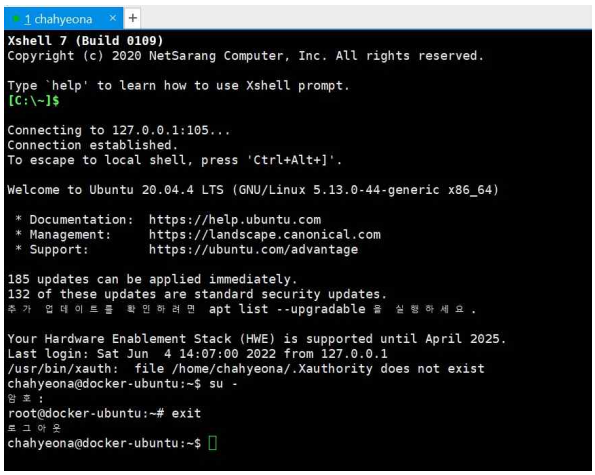
```
root@docker-ubuntu:~# ssh chahyeona@localhost
The authenticity of host 'localhost (127.0.0.1)' can't be established.
ECDSA key fingerprint is SHA256:IfQTcGVFtg5rLxuwHcJeXegt6H2v1rcxIe9kjRaW2tA.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yse
Please type 'yes', 'no' or the fingerprint: yes
Warning: Permanently added 'localhost' (ECDSA) to the list of known hosts.
chahyeona@localhost's password:
```

6. xshell을 사용하여 가상머신과 연결(포트 포워딩 과정 포함)



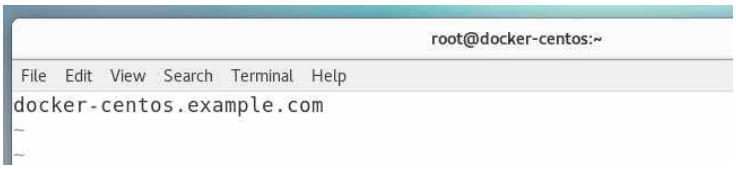
7. xshell을 사용하여 우분투 연결 접속 완료

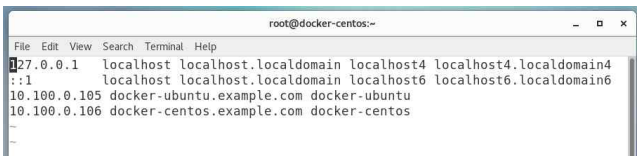




<우분투와 마찬가지로 Centos와 xshell 연결하기>

8. centos도 동일하게 진행(/etc/hostname, /etc/hosts)





9. ping을 통해 가상머신과 외부 네트워크 연결 확인

```
[root@docker-centos ~]# ping 8.8.8.8 -c 3
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=117 time=102 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=117 time=46.9 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=117 time=47.9 ms

--- 8.8.8.8 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2004ms
rtt min/avg/max/mdev = 46.924/65.923/102.884/26.138 ms
[root@docker-centos ~]#
```

10. 텍스트 로그인 모드 전환 세팅

```
[root@docker-centos ~]# systemctl set-default multi-user.target
Removed symlink /etc/systemd/system/default.target.
Created symlink from /etc/systemd/system/default.target to /usr/lib/systemd/syst
em/multi-user.target.
[root@docker-centos ~]#
```

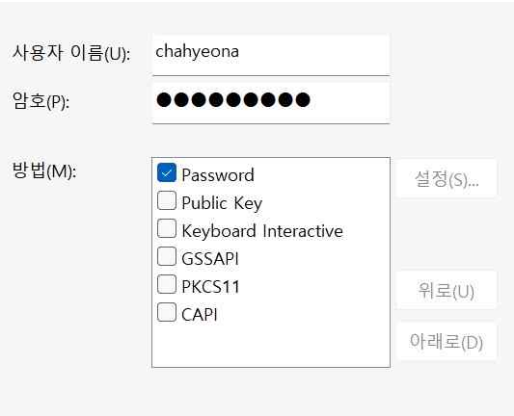
11. sshd 동작 확인

```
[root@docker-centos ~]# systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset:
 enabled)
   Active: active (running) since Sat 2022-06-04 15:05:28 KST; 14min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1198 (sshd)
   CGroup: /system.slice/sshd.service
           └─1198 /usr/sbin/sshd -D

Jun 04 15:05:27 docker-centos.example.com systemd[1]: Starting OpenSSH server...
Jun 04 15:05:28 docker-centos.example.com sshd[1198]: Server listening on 0.0...
Jun 04 15:05:28 docker-centos.example.com sshd[1198]: Server listening on :: ...
Jun 04 15:05:28 docker-centos.example.com systemd[1]: Started OpenSSH server ...
Hint: Some lines were ellipsized, use -l to show in full.
```

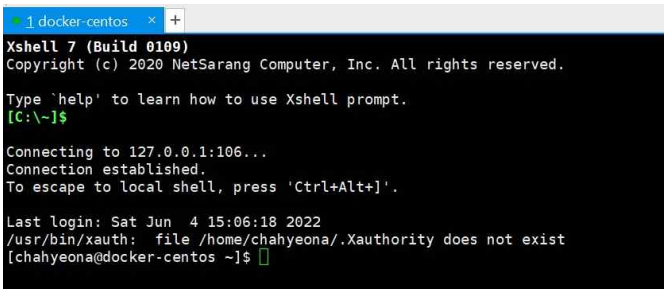
12. tree설치

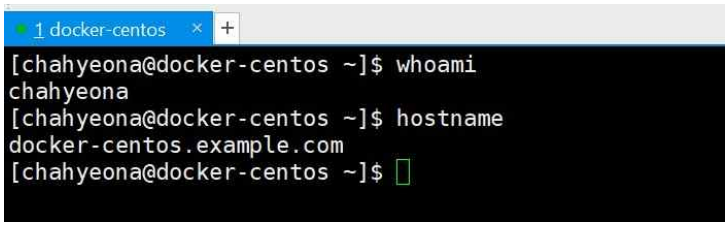
```
Transaction test succeeded
Running transaction
  Installing : tree-1.6.0-10.el7.x86_64                                    1/1
  Verifying  : tree-1.6.0-10.el7.x86_64                                    1/1

Installed:
  tree.x86_64 0:1.6.0-10.el7

Complete!
[root@docker-centos ~]#
```

13. xshell에서 centos에 접속하기 위해 세팅



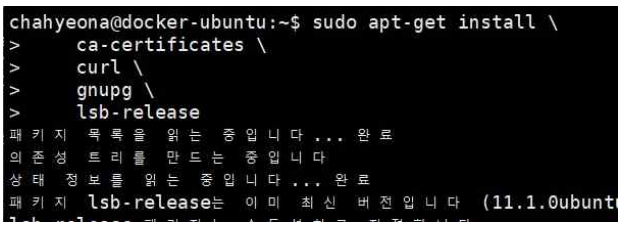
14. 연결 성공 확인





<우분투에서 도커 설치하기>

15. 우분투에서 도커를 설치하기 위해 필요한 요구 프로그램 설치



16. 도커 인증서 저장

17. url 등록

```
chahyeona@docker-ubuntu:~$ echo \
>   "deb [arch=$(dpkg --print-architecture) signed-by=/etc/apt/keyrings/do
cker.gpg] https://download.docker.com/linux/ubuntu \
>   $(lsb_release -cs) stable" | sudo tee /etc/apt/sources.list.d/docker.l
ist > /dev/null
```

18. 도커엔진 설치

```
chahyeona@docker-ubuntu:~$ sudo apt-get install docker-ce docker-ce-cli containerd.io d
ocker-compose-plugin
ssh://chahyeona@127.0.0.  SSH2  xterm  87x27  27,21  2 세션  CAP  NUM
```

19. 도커 실행 확인

```
chahyeona@docker-ubuntu:~$ sudo docker version
Client: Docker Engine - Community
 Version:           20.10.16
 API version:       1.41
 Go version:        go1.17.10
 Git commit:        aa7e414
 Built:             Thu May 12 09:17:23 2022
 OS/Arch:           linux/amd64
 Context:           default
 Experimental:      true

Server: Docker Engine - Community
 Engine:
  Version:          20.10.16
  API version:      1.41 (minimum version 1.12)
  Go version:       go1.17.10
  Git commit:       f756502
  Built:            Thu May 12 09:15:28 2022
  OS/Arch:          linux/amd64
  Experimental:     false
 containerd:
  Version:          1.6.4
  GitCommit:        212e8b6fa2f44b9c21b2798135fc6fb7c53efc16
```

<centos에서 도커 설치하기>

20. centos에서 도커를 설치하기 위해 필요한 요구 프로그램 설치

```
[root@docker-centos ~]# yum-config-manager \
>     --add-repo \
>     https://download.docker.com/linux/centos/docker-ce.repo
```

21. 도커엔진 설치

```
repo saved to /etc/yum.repos.d/docker-ce.repo
[root@docker-centos ~]# yum install docker-ce docker-ce-cli containerd.io docker-compose-plugin -y
```

22. 도커 동작 확인

```
[root@docker-centos ~]# systemctl start docker
[root@docker-centos ~]# docker version
Client: Docker Engine - Community
 Version:           20.10.16
 API version:       1.41
 Go version:        go1.17.10
 Git commit:        aa7e414
 Built:             Thu May 12 09:19:45 2022
 OS/Arch:           linux/amd64
```

23. 우분투에서 내 계정에 도커 관리 권한 부여(centos와 명령어 동일)

```
Last login: Sat Jun  4 15:32:40 2022 from 10.100.0.2
chahyeona@docker-ubuntu:~$ docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
chahyeona@docker-ubuntu:~$
```

24. centos에서 내 계정에 도커 관리 권한 부여

```
[root@docker-centos ~]# usermod -a -G docker chahyeona
[root@docker-centos ~]# su - chahyeona
Last login: Sat Jun  4 15:33:32 KST 2022 from 10.100.0.2 on pts/0
[chahyeona@docker-centos ~]$ docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
[chahyeona@docker-centos ~]$
```

-- 여기까지 3.2 실습 동영상을 수행하기 위한 세팅 완료 --

<3.2 도커 컨테이너 살펴보기 :실습편>

1. 도커데몬이 동작중인지 확인(루트계정과 유저 계정에서 둘다 확인), 세션을 복제해서 둘다 열어놓은 상태

```
chahyeona@docker-ubuntu:~$ docker version
Client: Docker Engine - Community
 Version:           20.10.16
 API version:       1.41
 Go version:        go1.17.10
 Git commit:        aa7e414
 Built:             Thu May 12 09:17:23 2022
 OS/Arch:           linux/amd64
 Context:           default
 Experimental:      true

Server: Docker Engine - Community
 Engine:
```

```
root@docker-ubuntu:~# systemctl status docker
● docker.service - Docker Application Container Engine
     Loaded: loaded (/lib/systemd/system/docker.service; enabled; v>
     Active: active (running) since Sat 2022-06-04 22:18:14 KST; 3m>
TriggeredBy: ● docker.socket
       Docs: https://docs.docker.com
   Main PID: 721 (dockerd)
      Tasks: 8
     Memory: 106.4M
     CGroup: /system.slice/docker.service
             └─721 /usr/bin/dockerd -H fd:// --containerd=/run/cont>

 6월  04 22:18:13 docker-ubuntu.example.com dockerd[721]: time="2022>
```

2. 써치 명령으로 내가 원하는 컨테이너가 도커 허브에 존재하는지 찾기

```
chahyeona@docker-ubuntu:~$ docker search ngnix
NAME                                DESCRIPTION                                     STARS     OFFICIAL   AUTOMATED
userxy2015/ngnix                    ngnix                                           15
merpso/ngnix-plus-k8s-ingress       NGNIX+ kubernetes-ingess                        2
jhuiting/ngnix                                                                      1
ludwringliccien/ngnix-php7.1        ngnix-php7.1                                    1                  [OK]
snehagupta83/ngnix                  Test setup                                      0
alamalhoda/ngnix                                                                    0
hamropatrorepo/ngnix-reverse-proxy                                                  0
bharath2012/ngnix                                                                   0
motork/ngnix-static-app             Nginx with config for a static js app           0
afzal/ngnix_rate_limit              ngnix rate limit examples                       0
silvade/ngnix-static                ngnix docker image  with ubuntu                 0
sushanth53/ngnix_server             ngnix server                                    0
ssvreddy/ngnix                                                                      0
agualbbus/ngnix-php-proxy                                                           0
caubequay00/ngnix-heroku            Already set listen port of nginx to $PORT  o…   0
bguruprasad/ngnix-print-hostname    ngnix-print-hostname                            0
sitek/ngnix-vsftpd                  ngnix-vsftpd                                    0                  [OK]
sanghaiakshay/ngnix_https_webserver                                                 0
jenorish/ngnix                                                                      0
venkateshs2006/ngnix-php-fpm-laravel                                                0
covenant/ngnix                                                                      0
theburi/ngnix                       ngnix                                           0
starlkj/ngnix                       tde test                                        0                  [OK]
sunlitweb/ngnix                                                                     0
motork/ngnix-unprivileged-static-app   Image for static app without root user       0
chahyeona@docker-ubuntu:~$
```

3. 컨테이너 이미지 다운로드

```
chahyeona@docker-ubuntu:~$ docker pull nginx
Using default tag: latest
latest: Pulling from library/nginx
42c077c10790: Pull complete
62c70f376f6a: Pull complete
915cc9bd79c2: Pull complete
75a963e94de0: Pull complete
7b1fab684d70: Pull complete
db24d06d5af4: Pull complete
Digest: sha256:2bcabc23b45489fb0885d69a06ba1d648aeda973fae7bb981ba
bb884165e514
Status: Downloaded newer image for nginx:latest
docker.io/library/nginx:latest
chahyeona@docker-ubuntu:~$
```

4. 루트계정으로 overlay2 폴더에서 이미지 레이어가 잘 들어온걸 확인 가능
-nginx는 6개의 레이어로 구성된것을 알 수 있음 + 사용자에서 확인도 가능

```
root@docker-ubuntu:/var/lib/docker/overlay2# ls -l
합계 28
drwx--x--- 3 root root 4096  6월   4 22:29 079ffcc73622d58d31fa9dec8d8d12b899082c07f15fad58a706a469c065fe16
drwx--x--- 4 root root 4096  6월   4 22:29 568e0c2893cd246b18474eb6870e59396e38efd2aae34613007b03adeacaf0c1
drwx--x--- 4 root root 4096  6월   4 22:29 af425693c56f9796ae21fd09e0b2beb8c3762729895e1cd9acbd0c04165cc223
drwx--x--- 4 root root 4096  6월   4 22:29 afbcfcb01043bbe5b2952c0df0228971a35e00cdb7e518a6c09b7f7915b20591
drwx--x--- 4 root root 4096  6월   4 22:29 d6c3c8c2caf35d0513298288562c5a3cec07708e66c2ab68c3b29dcfe7945f55
drwx--x--- 4 root root 4096  6월   4 22:29 f633f3590767b7f4b33d3eb23fdbea346789d543a75bd97cb1f31ae652cecea6
drwx------ 2 root root 4096  6월   4 22:29 l
root@docker-ubuntu:/var/lib/docker/overlay2#
```

```
chahyeona@docker-ubuntu:~$ docker image ls
REPOSITORY   TAG       IMAGE ID       CREATED      SIZE
nginx        latest    0e901e68141f   7 days ago   142MB
chahyeona@docker-ubuntu:~$
```

5. 컨테이너 실행하고 확인해보기
- nginx 컨테이너가 실행, 고유한 컨테이너 아이디를 알 수 있음

```
chahyeona@docker-ubuntu:~$ docker run --name web -d -p 80:80 nginx
28bb764802b6b4fc4e251a255cfa0c1bac3131a8e6970401c23d0e7fe8977e70
chahyeona@docker-ubuntu:~$
```

6. 현재 동작중인 도커 컨테이너 출력

```
chahyeona@docker-ubuntu:~$ docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED
    STATUS              PORTS                                   NAMES
28bb764802b6   nginx     "/docker-entrypoint.…"   About a minute ag
o   Up About a minute   0.0.0.0:80->80/tcp, :::80->80/tcp   web
chahyeona@docker-ubuntu:~$
```

7. 웹 페이지 출력을 확인
- 다른 컴퓨터와 완전히 분리된 환경에서 컨테이너 모양을 가지고 어플리케이션 동작을 하게 해줌

```
chahyeona@docker-ubuntu:~$ curl localhost:80
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<style>
html { color-scheme: light dark; }
body { width: 35em; margin: 0 auto;
font-family
</style>
</head>
<body>
<h1>Welcome to
<p>If you see t
working. Further configuration is required.</p>

<p>For online documentation and support please refer to
<a href="http://nginx.org/">nginx.org</a>.<br/>
Commercial support is available at
<a href="http://nginx.com/">nginx.com</a>.</p>

<p><em>Thank you for using nginx.</em></p>
```

```
chahyeona@docker-ubuntu:~$ docker image ls
REPOSITORY   TAG       IMAGE ID       CREATED      SIZE
nginx        latest    0e901e68141f   7 days ago   142MB
chahyeona@docker-ubuntu:~$
```

8. web 컨테이너 사용 중지

```
chahyeona@docker-ubuntu:~$ docker stop web
web
chahyeona@docker-ubuntu:~$ curl localhost:80
curl: (7) Failed to connect to localhost port 80: 연결이 거부됨
chahyeona@docker-ubuntu:~$
```

9. 컨테이너 삭제

```
chahyeona@docker-ubuntu:~$ docker rm web
web
chahyeona@docker-ubuntu:~$
```

10. 컨테이너 이미지 삭제

```
chahyeona@docker-ubuntu:~$ docker rmi nginx
Untagged: nginx:latest
Untagged: nginx@sha256:2bcabc23b45489fb0885d69a06ba1d648aeda973fae7bb981bafbb884165e514
Deleted: sha256:0e901e68141fd02f237cf63eb842529f8a9500636a9419e3cf4fb986b8fe3d5d
Deleted: sha256:1e877fb1acf761377390ab38bbad050a1d5296f1b4f51878c2695d4ecdb98c62
Deleted: sha256:834e54d50f731515065370d1c15f0ed47d2f7b6a7b0452646db80f14ace9b8de
Deleted: sha256:d28ca7ee17ff94497071d5c075b4099a4f2c950a3471fc49bdf9876227970b24
Deleted: sha256:096f97ba95539883af393732efac02acdd0e2ae587a5479d97065b64b4eded8c
Deleted: sha256:de7e3b2a7430261fde88313fbf784a63c2229ce369b9116053786845c39058d5
Deleted: sha256:ad6562704f3759fb50f0d3de5f80a38f65a85e709b77fd24491253990f30b6be
chahyeona@docker-ubuntu:~$
```

11. 루트 계정에서 컨테이너 이미지 삭제 확인

```
root@docker-ubuntu:/var/lib/docker/overlay2# ls -l
합계 4
drwx------ 2 root root 4096  6월   4 22:43 l
root@docker-ubuntu:/var/lib/docker/overlay2#
```