

# Basics of docker<sup>®</sup>

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**AI융합학과**

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## 01 도커 컨테이너 내부에서 네트워크 구성 확인-1

### 터미널 1

```
eevee@myserver01:~$ docker container ls -a ①
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS
eafefe31241c	my-ubuntu:0.1	"bash"	8 minutes ago	Exited (0)
7 minutes ago		optimistic_germain		
209b1ac7a1be	python:3.11.6	"python3"	50 minutes ago	Exited (0)
50 minutes ago		musin_hamilton		

### 터미널 1

```
eevee@myserver01:~$ docker container start eafefe31241c ①
```

eafefe31241c

```
eevee@myserver01:~$ docker container attach eafefe31241c ②
```

## 02 도커 컨테이너 내부에서 네트워크 구성 확인-2

```
root@eafefe31241c:/# ifconfig
```

3

```
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
```

```
inet 172.17.0.2 netmask 255.255.0.0 broadcast 172.17.255.255
```

4

```
ether 02:42:ac:11:00:02 txqueuelen 0 (Ethernet)
```

```
RX packets 10 bytes 876 (876.0 B)
```

```
RX errors 0 dropped 0 overruns 0 frame 0
```

```
TX packets 0 bytes 0 (0.0 B)
```

```
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
```

```
inet 127.0.0.1 netmask 255.0.0.0
```

```
loop txqueuelen 1000 (Local Loopback)
```

```
RX packets 0 bytes 0 (0.0 B)
```

```
RX errors 0 dropped 0 overruns 0 frame 0
```

```
TX packets 0 bytes 0 (0.0 B)
```

```
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

## 03 도커 컨테이너 외부에서 네트워크 구성 확인

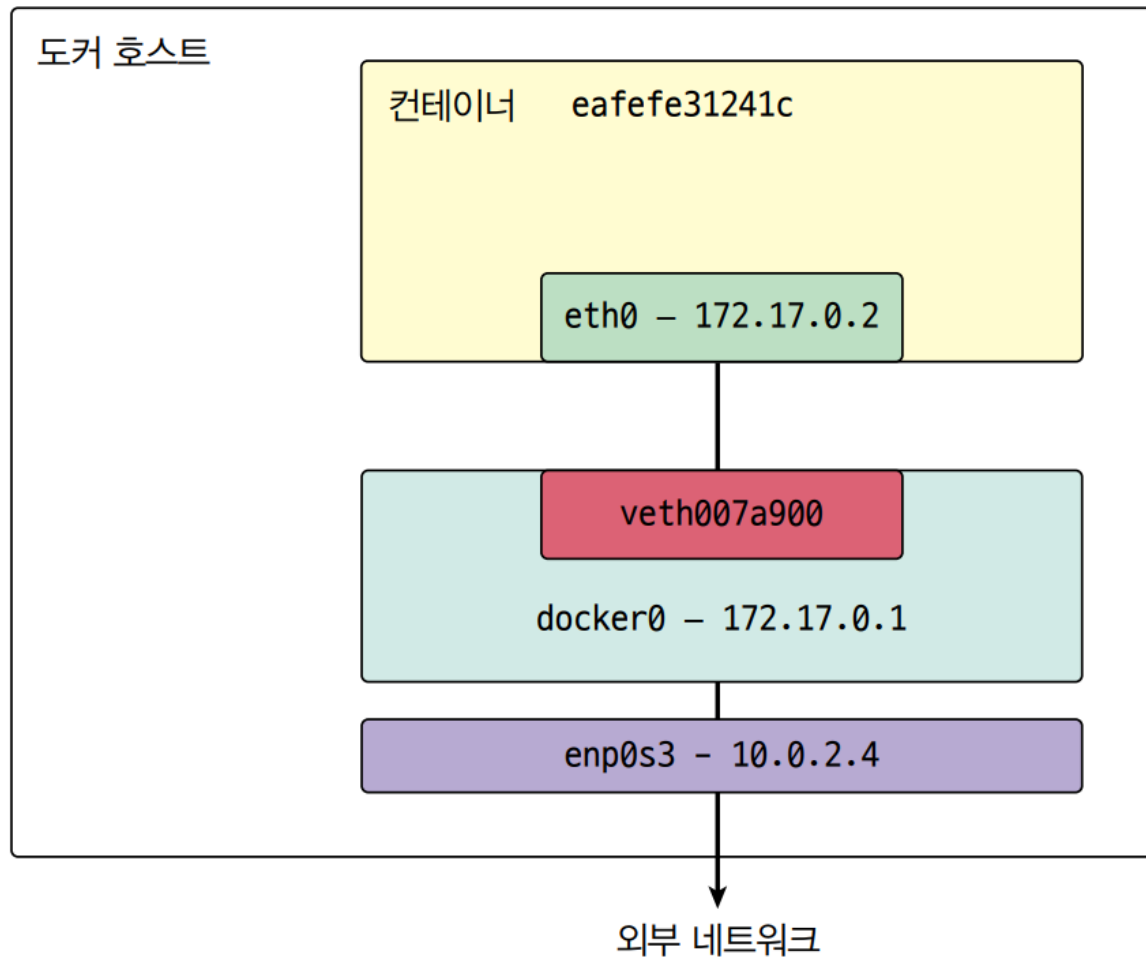
### 터미널 2

```
eevee@myserver01:~$ ifconfig ❶  
docker0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 172.17.0.1 netmask 255.255.0.0 broadcast 172.17.255.255  
    inet6 fe80::42:92ff:fe10:c81e prefixlen 64 scopeid 0x20<link>  
    ether 02:42:92:10:c8:1e txqueuelen 0 (Ethernet)  
    RX packets 3977 bytes 164187 (164.1 KB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 6181 bytes 28784730 (28.7 MB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 10.0.2.4 netmask 255.255.255.0 broadcast 10.0.2.255  
    inet6 fe80::a00:27ff:fec3:3b5d prefixlen 64 scopeid 0x20<link>  
    ether 08:00:27:c3:3b:5d txqueuelen 1000 (Ethernet)  
    RX packets 389523 bytes 583658414 (583.6 MB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 64305 bytes 4379973 (4.3 MB)
```

### 터미널 1

```
root@eafefe31241c:/# exit  
exit
```

## 04 도커 컨테이너 네트워크 연결 구조



## 05 도커 네트워크 확인

### 터미널 2

```
eevee@myserver01:~$ docker network ls
```

1

NETWORK ID	NAME	DRIVER	SCOPE
be8f8b63505a	bridge	bridge	local
2d1a75c7bcc7	host	host	local
0feadfe2e928	none	null	local

- bridge 드라이버: 컨테이너 생성시 제공되는 기본 드라이버. 각 컨테이너는 각자의 네트워크 인터페이스 보유. 도커 호스트의 docker0와 바인딩됨.
- host 드라이버: 컨테이너 자체적으로 네트워크 인터페이스를 가지지 않고 호스트 컴퓨터의 네트워크 인터페이스를 공유.
- none 드라이버: 컨테이너가 네트워크 인터페이스 갖지 않음. 외부 통신 불가능

## 06 호스트 드라이버를 갖는 컨테이너 생성

### 터미널 1

```
eevee@myserver01:~$ docker container run -it --network=host my-ubuntu:0.1
```

1

```
root@myserver01:/# ifconfig
```

2

```
docker0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
```

```
inet 172.17.0.1 netmask 255.255.0.0 broadcast 172.17.255.255
```

```
inet6 fe80::42:92ff:fe10:c81e prefixlen 64 scopeid 0x20<link>
```

```
ether 02:42:92:10:c8:1e txqueuelen 0 (Ethernet)
```

```
RX packets 3977 bytes 164187 (164.1 KB)
```

```
RX errors 0 dropped 0 overruns 0 frame 0
```

```
TX packets 6181 bytes 28784730 (28.7 MB)
```

```
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
```

```
inet 10.0.2.4 netmask 255.255.255.0 broadcast 10.0.2.255
```

```
inet6 fe80::a00:27ff:fec3:3b5d prefixlen 64 scopeid 0x20<link>
```

```
ether 08:00:27:c3:3b:5d txqueuelen 1000 (Ethernet)
```

```
RX packets 389578 bytes 583664246 (583.6 MB)
```

```
RX errors 0 dropped 0 overruns 0 frame 0
```

```
TX packets 64345 bytes 4387413 (4.3 MB)
```

```
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```



## 07 none 드라이버를 갖는 컨테이너 생성

### 터미널 1

```
eevee@myserver01:~$ docker container run -it --network=none my-ubuntu:0.1
```

①

```
root@07247fe4c3c1:/# ifconfig
```

②

```
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
```

```
    inet 127.0.0.1 netmask 255.0.0.0
```

```
    loop txqueuelen 1000 (Local Loopback)
```

```
    RX packets 0 bytes 0 (0.0 B)
```

```
    RX errors 0 dropped 0 overruns 0 frame 0
```

```
    TX packets 0 bytes 0 (0.0 B)
```

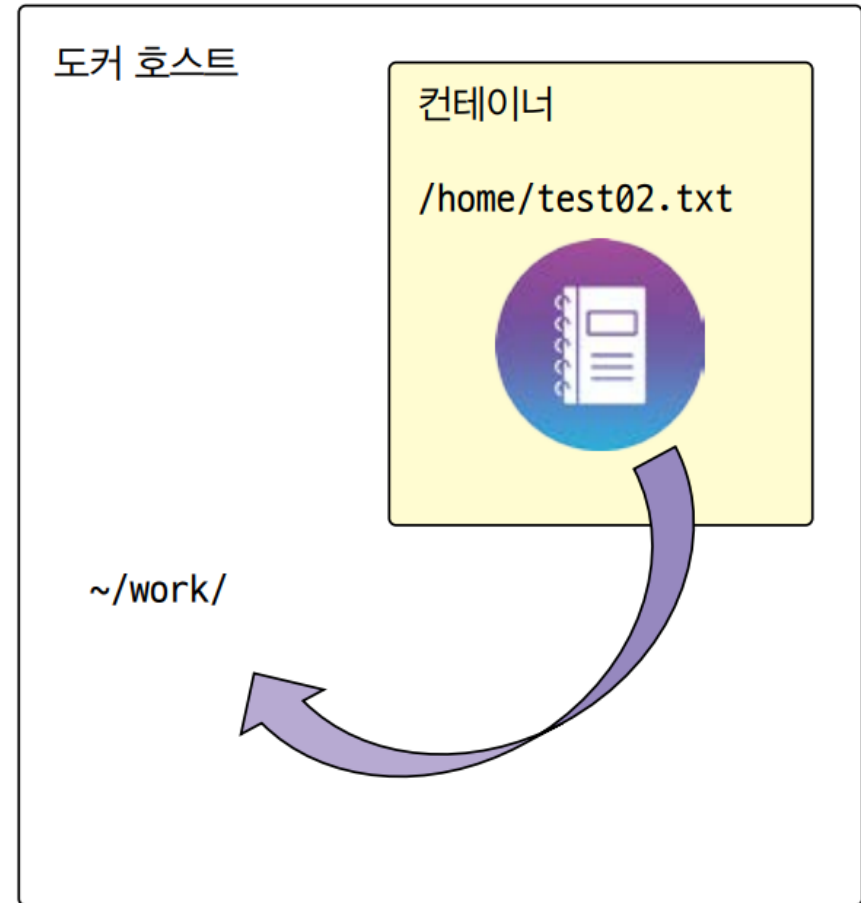
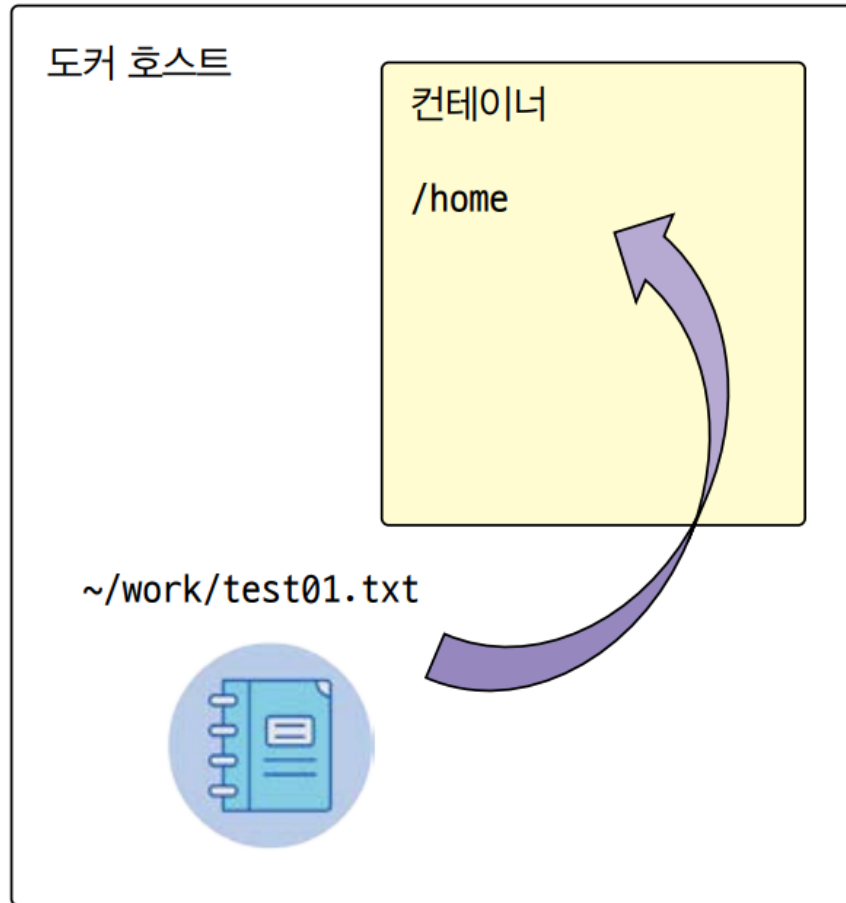
```
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
root@07247fe4c3c1:/# exit
```

③

```
exit
```

## 08 호스트에서 컨테이너로 파일 전송



## 09 호스트 컴퓨터에 파일 준비

### 터미널 1

```
eevee@myserver01:~$ cd work/ ①
eevee@myserver01:~/work$ mkdir ch04 ②
eevee@myserver01:~/work$ ls ③
ch04
eevee@myserver01:~/work$ cd ch04/ ④
eevee@myserver01:~/work/ch04$ mkdir ex01 ⑤
eevee@myserver01:~/work/ch04$ ls ⑥
ex01
eevee@myserver01:~/work/ch04$ cd ex01/ ⑦
eevee@myserver01:~/work/ch04/ex01$ vim test01.txt ⑧
Hello, I am Cheolwon.
eevee@myserver01:~/work/ch04/ex01$ cat test01.txt ⑨
Hello, I am Cheolwon.
eevee@myserver01:~/work/ch04/ex01$ pwd ⑩
/home/eevee/work/ch04/ex01
```

## 10 컨테이너에서 디렉토리 확인

### 터미널 2

```
eevee@myserver01:~$ docker container run -it ubuntu
```

1

```
root@fdf411cb471e:/# ls
```

2

```
bin  dev  home  lib32  libx32  mnt  proc  run  srv  tmp  var
```

```
boot  etc  lib  lib64  media  opt  root  sbin  sys  usr
```

```
root@fdf411cb471e:/# cd home/
```

3

```
root@fdf411cb471e:/home# ls
```

4

```
root@fdf411cb471e:/home#
```

## 11 호스트에서 컨테이너로 파일 복사

### 터미널 1

```
eevee@myserver01:~/work/ch04/ex01$ docker container ls ❶  
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS          PORTS          NAMES  
fdf411cb471e   ubuntu   "/bin/bash"             About a minute ago Up About a minute  
musing_brattain  
  
eevee@myserver01:~/work/ch04/ex01$ docker container cp ./test01.txt fdf411cb471e:/  
home ❷  
Successfully copied 2.05kB to fdf411cb471e:/home  
  
eevee@myserver01:~/work/ch04/ex01$
```

### 터미널 2

```
root@fdf411cb471e:/home# ls ❶  
test01.txt  
root@fdf411cb471e:/home# cat test01.txt ❷  
Hello, I am Cheolwon.
```

## 12 컨테이너에서 호스트로 파일 복사

### 터미널 1

```
eevee@myserver01:~/work/ch04/ex01$ pwd  
/home/eevee/work/ch04/ex01
```

①

```
eevee@myserver01:~/work/ch04/ex01$ ls  
test01.txt
```

②

```
eevee@myserver01:~/work/ch04/ex01$ docker cp fdf411cb471e:/home/test02.txt /home/  
eevee/work/ch04/ex01
```

③

```
Successfully copied 2.05kB to /home/eevee/work/ch04/ex01
```

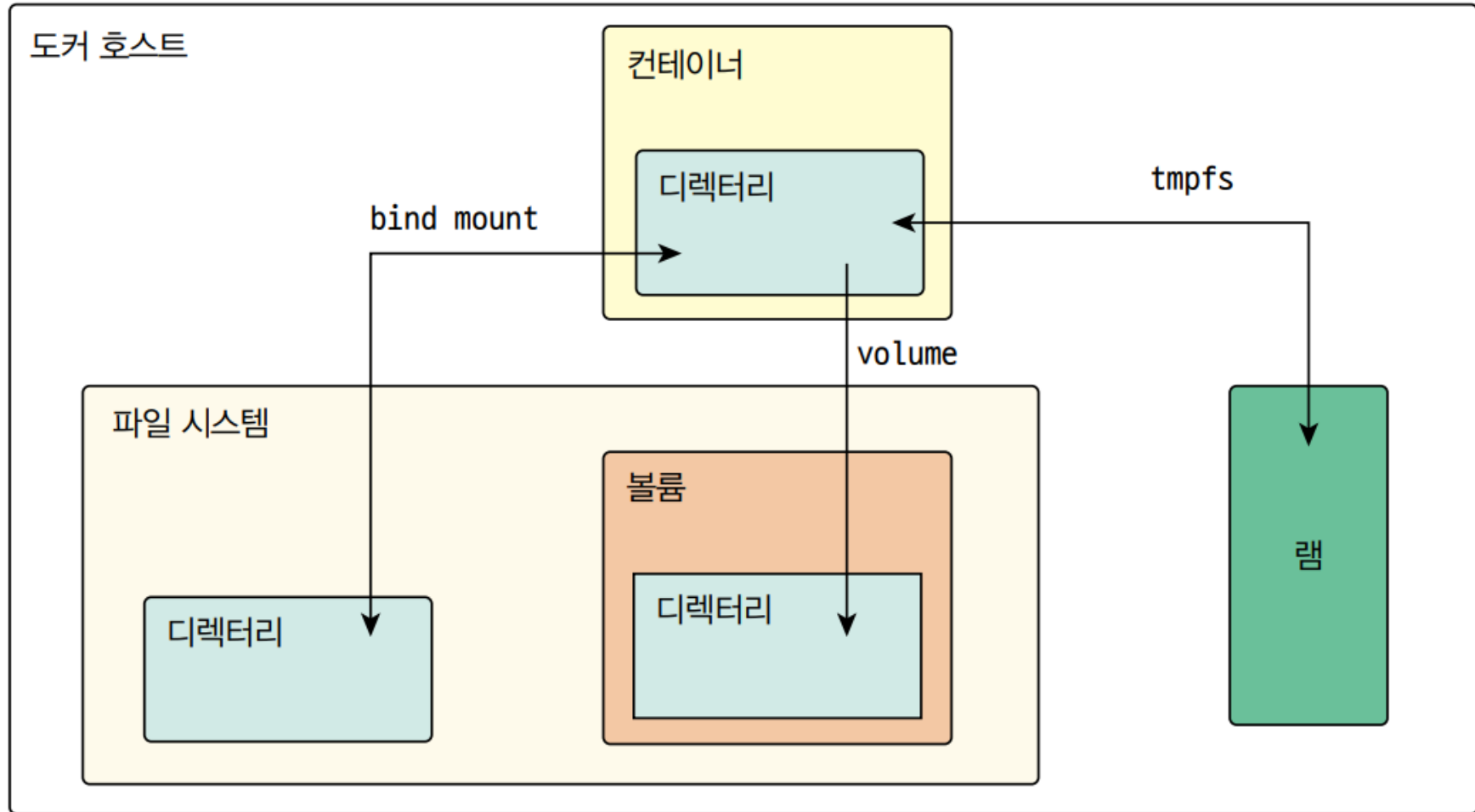
```
eevee@myserver01:~/work/ch04/ex01$ ls  
test01.txt  test02.txt
```

④

```
eevee@myserver01:~/work/ch04/ex01$ cat test02.txt  
Hello, I am Cheolwon.
```

⑤

## 13 도커 스토리지



## 14 도커 스토리지 - volume



2. sbbaik@bare: ~



3. sbbaik@bare: ~

```
sbbaik@bare:~$ docker volume ls
```

```
DRIVER      VOLUME NAME
```

```
sbbaik@bare:~$
```

```
sbbaik@bare:~$
```

```
sbbaik@bare:~$
```

```
sbbaik@bare:~$ docker volume create myvolume01
```

```
myvolume01
```

```
sbbaik@bare:~$
```

```
sbbaik@bare:~$
```

```
sbbaik@bare:~$
```

```
sbbaik@bare:~$ docker volume ls
```

```
DRIVER      VOLUME NAME
```

```
local       myvolume01
```

```
sbbaik@bare:~$ █
```

```
sbbaik@bare:~/work/ex02$ docker container run --mount
```

```
type=volume,source=myvolume01,target=/work/ex02 -it ubuntu
```

> docker container run --mount **type=volume,source=myvolume**  
**,target=/work/ex02 -it ubuntu**

(\*) 빨간색 부분 공백 없이 붙여 쓸 것



## 15 도커 스토리지 - volume

[터미널1]

```
root@03d8eaf084e0:/work/ex02# cat > test11.txt
This is a tesing file for docker volume.
root@03d8eaf084e0:/work/ex02# more test11.txt
This is a tesing file for docker volume.
root@03d8eaf084e0:/work/ex02# ll
total 12
drwxr-xr-x 2 root root 4096 Nov 20 01:49 ./
drwxr-xr-x 3 root root 4096 Nov 20 01:44 ../
-rw-r--r-- 1 root root  41 Nov 20 01:50 test11.txt
```

[터미널2]

```
sbbaik@bare:/var/lib$ cd docker
-bash: cd: docker: Permission denied
sbbaik@bare:/var/lib$ sudo su -
[sudo] password for sbbaik:
root@bare:~# cd /var/lib/docker/volumes/myvolume01/
root@bare:/var/lib/docker/volumes/myvolume01# ll
total 12
drwx-----x 3 root root 4096 Nov 20 01:35 ./
drwx-----x 3 root root 4096 Nov 20 01:35 ../
drwxr-xr-x 2 root root 4096 Nov 20 01:55 _data/
root@bare:/var/lib/docker/volumes/myvolume01# cd _data
root@bare:/var/lib/docker/volumes/myvolume01/_data#
```

<---(\*) sudo -i 명령도 가능

## 16 디렉토리 공유 확인

[터미널2]

```
root@bare:/var/lib/docker/volumes/myvolume01/_data# cp test11.txt test12.txt
root@bare:/var/lib/docker/volumes/myvolume01/_data# ll
total 16
drwxr-xr-x 2 root root 4096 Nov 20 01:55 ./
drwx-----x 3 root root 4096 Nov 20 01:35 ../
-rw-r--r-- 1 root root  41 Nov 20 01:50 test11.txt
-rw-r--r-- 1 root root  41 Nov 20 01:55 test12.txt
root@bare:/var/lib/docker/volumes/myvolume01/_data#
```

[터미널1]

```
root@03d8eaf084e0:/work/ex02# ll
total 16
drwxr-xr-x 2 root root 4096 Nov 20 01:55 ./
drwxr-xr-x 3 root root 4096 Nov 20 01:44 ../
-rw-r--r-- 1 root root  41 Nov 20 01:50 test11.txt
-rw-r--r-- 1 root root  41 Nov 20 01:55 test12.txt
root@03d8eaf084e0:/work/ex02#
```

## 17 도커 삭제 후 Volume 상태 확인

[터미널1]

```
root@03d8eaf084e0:/work/ex02# ll
total 16
drwxr-xr-x 2 root root 4096 Nov 20 01:55 ./
drwxr-xr-x 3 root root 4096 Nov 20 01:44 ../
-rw-r--r-- 1 root root  41 Nov 20 01:50 test11.txt
-rw-r--r-- 1 root root  41 Nov 20 01:55 test12.txt
root@03d8eaf084e0:/work/ex02# exit
exit
sbbaik@bare:~/work/ex02$ docker container ls
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
sbbaik@bare:~/work/ex02$
sbbaik@bare:~/work/ex02$ docker container rm 03d8eaf084e0
```

[터미널2]

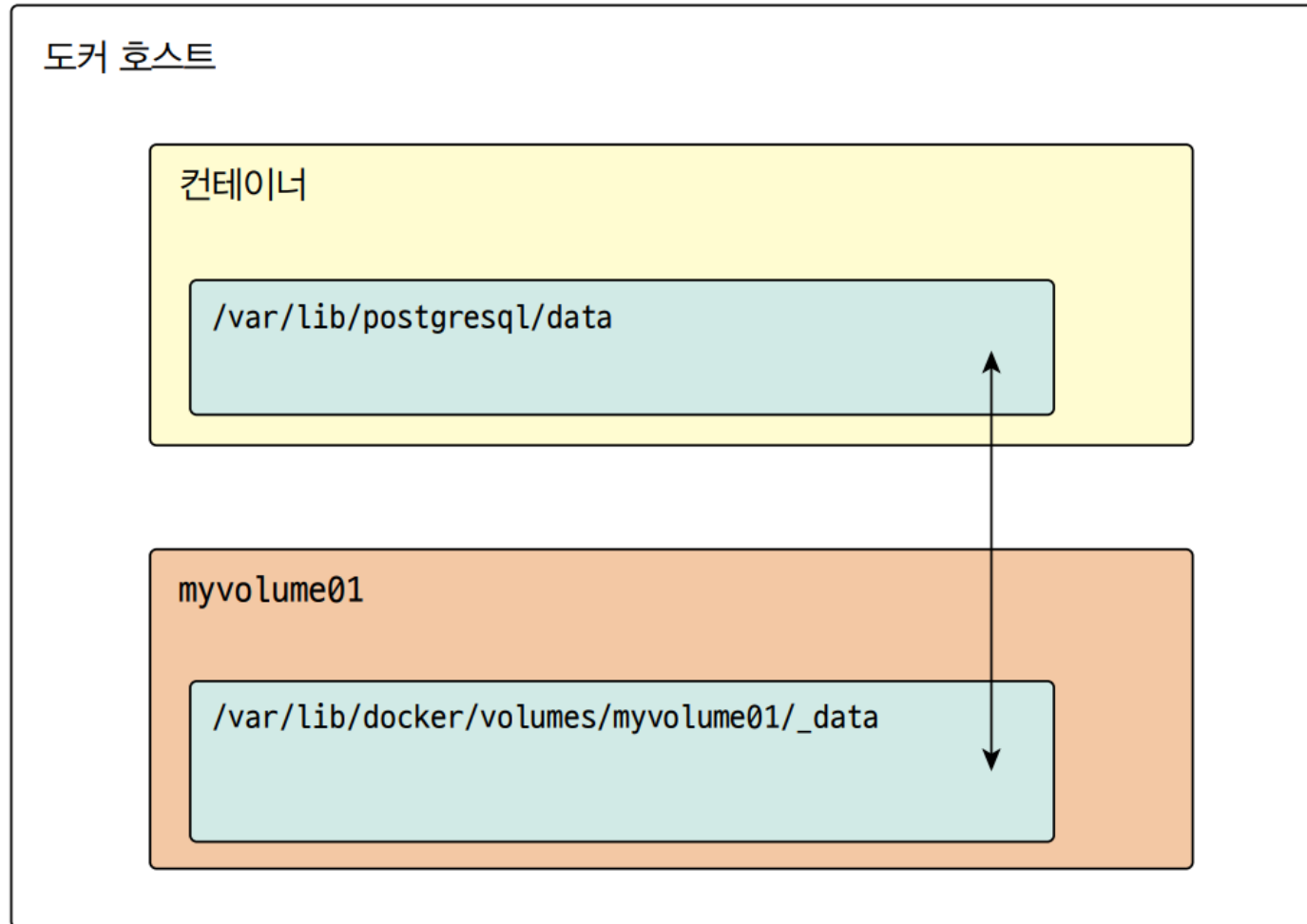
```
2. sbbaik@bare: ~/work/ex02
3. root@bare: /var/lib/docker
root@bare:/var/lib/docker/volumes/myvolume01/_data#
root@bare:/var/lib/docker/volumes/myvolume01/_data# ll
total 16
drwxr-xr-x 2 root root 4096 Nov 20 01:55 ./
drwx-----x 3 root root 4096 Nov 20 01:35 ../
-rw-r--r-- 1 root root  41 Nov 20 01:50 test11.txt
-rw-r--r-- 1 root root  41 Nov 20 01:55 test12.txt
root@bare:/var/lib/docker/volumes/myvolume01/_data#
```

## 17 Volume 정보 확인

```
2. root@03d8eaf084e0: /work/ex02
3. sbbaik@bare: ~/work/ex02

sbbaik@bare:~/work/ex02$ docker volume inspect myvolume01
[
  {
    "CreatedAt": "2024-11-20T01:35:27Z",
    "Driver": "local",
    "Labels": null,
    "Mountpoint": "/var/lib/docker/volumes/myvolume01/_data",
    "Name": "myvolume01",
    "Options": null,
    "Scope": "local"
  }
]
sbbaik@bare:~/work/ex02$
```

## 17 Volume 스토리지 개념



## 14 도커 스토리지 - bind mount

### 터미널 1

```
eevee@myserver01:~$ ls
```

1

work

```
eevee@myserver01:~$ cd work/ch04/ex01/
```

2

```
eevee@myserver01:~/work/ch04/ex01$ ls
```

3

```
test01.txt test02.txt
```

```
eevee@myserver01:~/work/ch04/ex01$ pwd
```

4

```
/home/eevee/work/ch04/ex01
```

## 15 도커 스토리지 - bind mount

[터미널1]

```
2. root@68dd13944e00: /work
3. sbbaik@bare: ~

sbbaik@bare:~/work/ex01$
sbbaik@bare:~/work/ex01$ ll
total 12
drwxrwxr-x 2 sbbaik sbbaik 4096 Nov 13 02:02 ./
drwxrwxr-x 4 sbbaik sbbaik 4096 Nov 13 02:02 ../
-rw-rw-r-- 1 sbbaik sbbaik  47 Nov 13 02:02 test01.txt
sbbaik@bare:~/work/ex01$ pwd
/home/sbbaik/work/ex01
sbbaik@bare:~/work/ex01$ docker container run --mount type=bind,source=/home/sbbaik/work/ex01,target=/work -it ubuntu
Unable to find image 'ubuntu:latest' locally
latest: Pulling from library/ubuntu
ff65ddf9395b: Pull complete
Digest: sha256:99c35190e22d294cdace2783ac55effc69d32896daaa265f0bbedbcde4fbe3e5
Status: Downloaded newer image for ubuntu:latest
root@68dd13944e00:/# cd work
root@68dd13944e00:/work# ll
total 12
drwxrwxr-x 2 ubuntu ubuntu 4096 Nov 13 02:02 ./
drwxr-xr-x 1 root    root   4096 Nov 13 02:06 ../
-rw-rw-r-- 1 ubuntu ubuntu  47 Nov 13 02:02 test01.txt
root@68dd13944e00:/work#
```

docker container run --mount  
type=bind,source=/home/sbbaik/work/ex01,target=/work -it ubuntu

공백 없이 붙여 쓸 것

## 16 디렉토리 공유 확인

[터미널1]

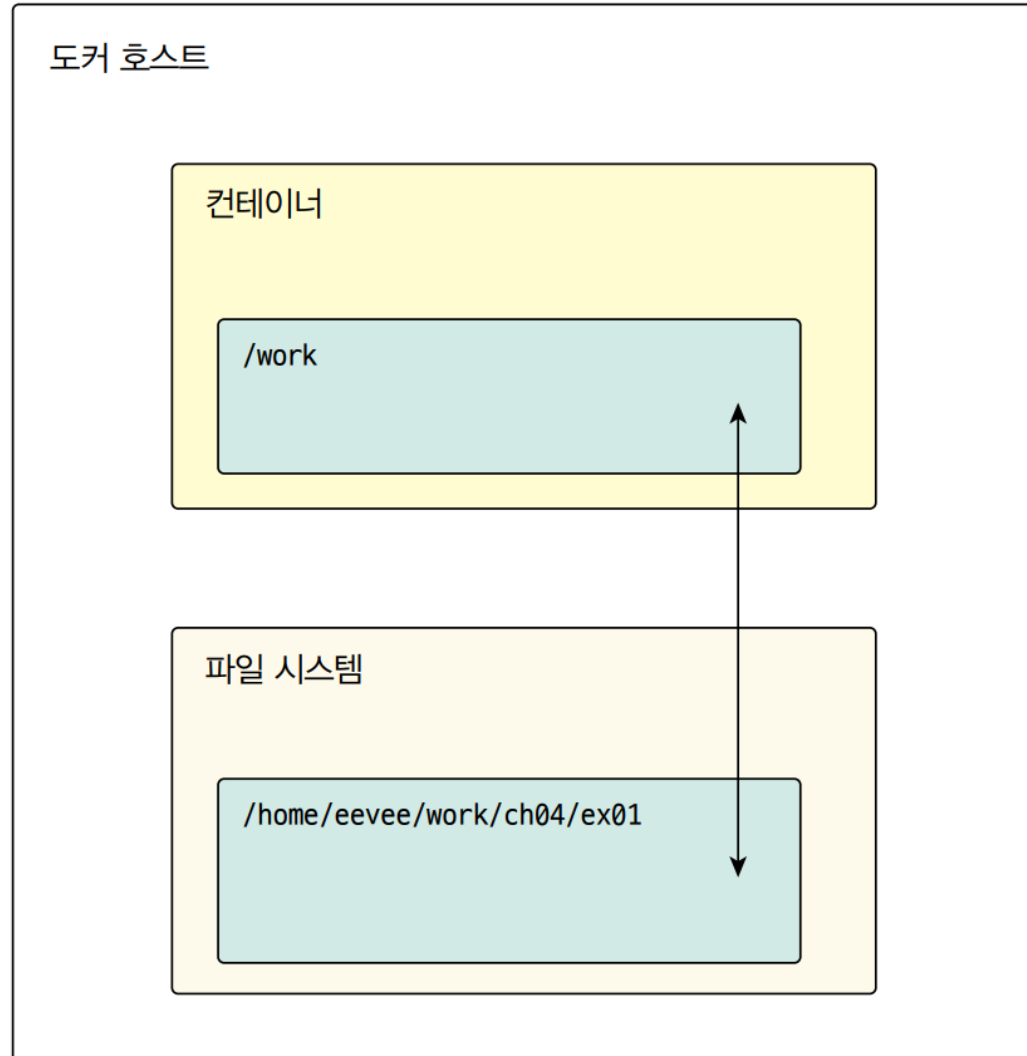
```
2. root@68dd13944e00: /work
3. sbbaik@bare: ~
root@68dd13944e00:/work# vi test02.txt
bash: vi: command not found
root@68dd13944e00:/work# cat > test02.txt
This is a testing file for volume binding between the host and the docker.
root@68dd13944e00:/work#
root@68dd13944e00:/work# more !$
more test02.txt
This is a testing file for volume binding between the host and the docker.
root@68dd13944e00:/work# ll
total 16
drwxrwxr-x 2 ubuntu ubuntu 4096 Nov 13 02:11 ./
drwxr-xr-x 1 root root 4096 Nov 13 02:06 ../
-rw-rw-r-- 1 ubuntu ubuntu 47 Nov 13 02:02 test01.txt
-rw-r--r-- 1 root root 75 Nov 13 02:12 test02.txt
root@68dd13944e00:/work#
```

[터미널2]

```
2. root@68dd13944e00: /work
3. sbbaik@bare: ~/work/ex01
sbbaik@bare:~/work/ex01$ pwd
/home/sbbaik/work/ex01
sbbaik@bare:~/work/ex01$ ll
total 16
drwxrwxr-x 2 sbbaik sbbaik 4096 Nov 13 02:11 ./
drwxrwxr-x 4 sbbaik sbbaik 4096 Nov 13 02:02 ../
-rw-rw-r-- 1 sbbaik sbbaik 47 Nov 13 02:02 test01.txt
-rw-r--r-- 1 root root 75 Nov 13 02:12 test02.txt
sbbaik@bare:~/work/ex01$
```



## 17 bind mount 개념



서로에게, 자신에게 친절합니다 - 허준이

