Docker Command

Docker Hub 로그인&로그아웃

#docker login [옵션] [서버명]

옵션	설명
-u	사용자명
-p	패스워드
-e	이메일 주소

#docker logout [서버명]

#docker login

username :

password :

*서버명을 입력하지 않으면 Docker Hub에 액세스

#docker logout

```
root@ubuntu:/# docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't
te one.
Username: soraland
Password:
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
root@ubuntu:/# docker logout
Removing login credentials for https://index.docker.io/v1/
root@ubuntu:/#
```

#docker search centos

* Docker Hub에 공개된 'centos' 관련 docker 이미지 목록 검색

```
root@ubuntu:/# docker search centos
NAME                              DESCRIPTION                                     STARS     OFFICIAL   AUTOMATED
centos                            The official build of CentOS.                   6465      [OK]
ansible/centos7-ansible           Ansible on Centos7                              133                  [OK]
consol/centos-xfce-vnc            Centos container with "headless" VNC session…   127                  [OK]
jdeathe/centos-ssh                OpenSSH / Supervisor / EPEL/IUS/SCL Repos - …   117                  [OK]
centos/systemd                    systemd enabled base container.                 97                   [OK]
centos/mysql-57-centos7           MySQL 5.7 SQL database server                   87
imagine10255/centos6-lnmp-php56   centos6-lnmp-php56                              58                   [OK]
tutum/centos                      Simple CentOS docker image with SSH access      46
kinogmt/centos-ssh                CentOS with SSH                                 29                   [OK]
pivotaldata/centos-gpdb-dev       CentOS image for GPDB development. Tag names…   13
guyton/centos6                    From official centos6 container with full up…   10                   [OK]
centos/tools                      Docker image that has systems administration…   7                    [OK]
drecom/centos-ruby                centos ruby                                     6                    [OK]
pivotaldata/centos                Base centos, freshened up a little with a Do…   5
pivotaldata/centos-gcc-toolchain  CentOS with a toolchain, but unaffiliated wi…   3
pivotaldata/centos-mingw          Using the mingw toolchain to cross-compile t…   3
darksheer/centos                  Base Centos Image -- Updated hourly             3                    [OK]
mamohr/centos-java                Oracle Java 8 Docker image based on Centos 7    3                    [OK]
indigo/centos-maven               Vanilla CentOS 7 with Oracle Java Developmen…   2                    [OK]
amd64/centos                      The official build of CentOS.                   2
mcnaughton/centos-base            centos base image                               1                    [OK]
blacklabelops/centos              CentOS Base Image! Built and Updates Daily!     1                    [OK]
pivotaldata/centos6.8-dev         CentosOS 6.8 image for GPDB development         0
pivotaldata/centos7-dev           CentosOS 7 image for GPDB development           0
smartentry/centos                 centos with smartentry                          0                    [OK]
root@ubuntu:/#
```

#docker search webserver

* Docker Hub에 공개된 'webserver' 관련 docker 이미지 목록 검색

```
root@ubuntu:/# docker search webserver
NAME                              DESCRIPTION                                     STARS     OFFICIAL   AUTOMATED
nazarpc/webserver                 WebServer (MariaDB, PHP-FPM, Nginx) composed…   31                   [OK]
yejune/webserver                  php nginx phalcon webserver                     3                    [OK]
bitbull/webserver                 Webserver image with optimized Apache webser…   2
campanda/webserver-mock           Customizable HTTP/HTTPS webserver to be used…   2                    [OK]
suchitagarwal/webserver           Webserver base image                            1
klambt/webserver                  Apache 2.4.25+, mod_brotli, Google PageSpeed…   1                    [OK]
healthplatforms/webserver         Webservers Apache 2.4 + php 5.6                 1
itisfoundation/webserver                                                          1
pcrespov/webserver                                                                0
versantus/webserver-drupal        drupal webserver                                0                    [OK]
anderegg/webserver                                                                0
eguilhon/webserver-hub                                                            0
gettestedcovid19/webserver        https://get-tested-covid19.org webserver        0
nazarpc/webserver-apps            Carefully crafted images that are intended t…   0                    [OK]
ak413/webserver                                                                   0
opsway/webserver                  Webserver docker images                         0                    [OK]
jack1007533560/webserver                                                          0
physk/webserver                                                                   0
odeimaiz/webserver                                                                0
webserverhu/spamassassin          Mail filter to identify spam using a wide ra…   0                    [OK]
octarinesec/webserver_for_tests                                                   0
brightideainc/webserver-newrelic  Webserver with New Relic with PHP 7.3 with C…   0
stefanscherer/webserver-windows   A minimal webserver written in Go to run in …   0
hubhk/webserver                                                                   0
suhuruli/webserver                                                                0
root@ubuntu:/#
```

```
root@ubuntu:/# docker search webserver
NAME                        DESCRIPTION                                     STARS     OFFICIAL    AUTOMATED
nazarpc/webserver           WebServer (MariaDB, PHP-FPM, Nginx) composed…   31                    [OK]
yejune/webserver            php nginx phalcon webserver                     3                     [OK]
```

항목	설명
NAME	Docker Image명 (예) nazarpc/webserver 저장소명(사용자명) / 이미지명
DESCRIPTION	Docker Image 설명
STARS	해당 이미지가 받은 별(star) 수 별 수가 많을 수록 인기 있는 docker 이미지임을 알 수 있음
OFFICIAL	공식 이미지 여부
AUTOMATED	Dockerfile을 기반으로 자동 생성된 이미지 여부

#docker search ubuntu

#docker search centos

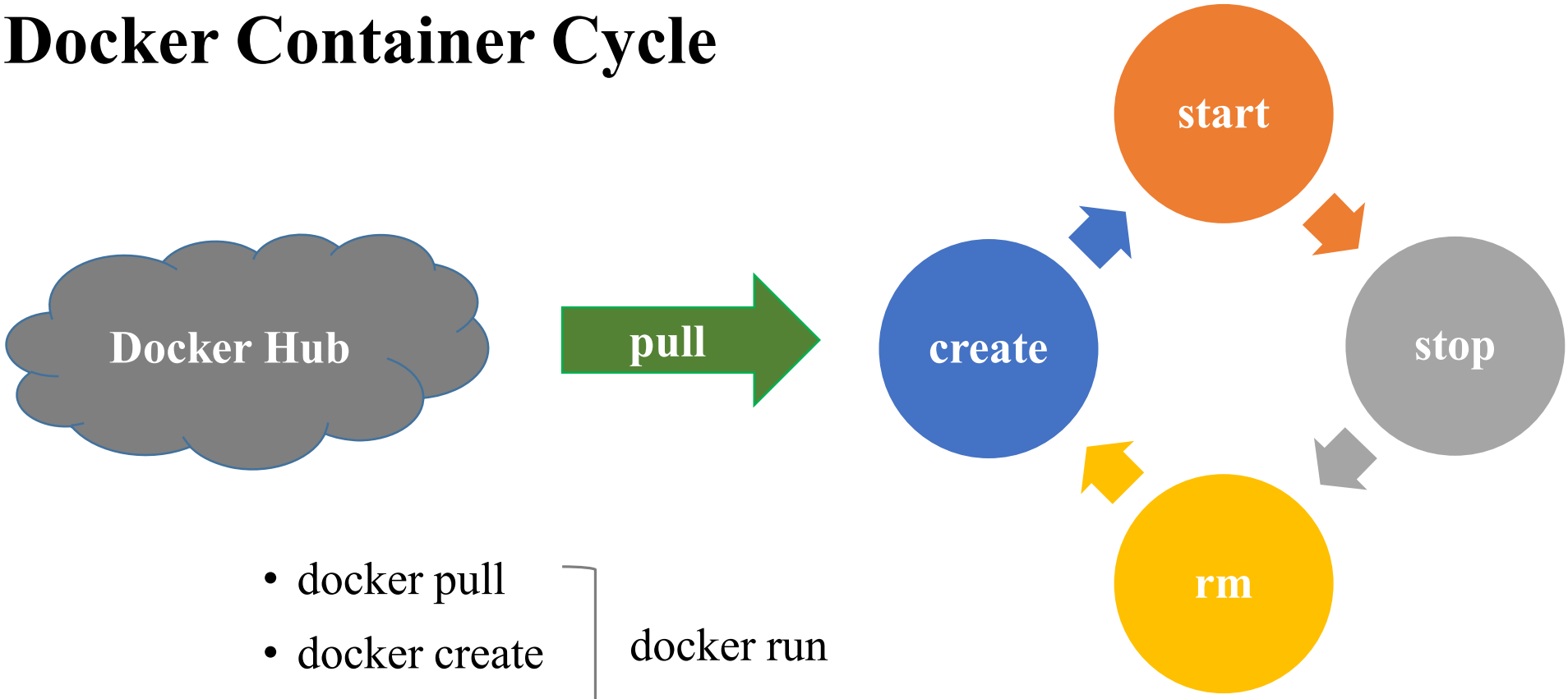
#docker search fedora

#docker search mysql

#docker search wordpress

#docker search java

Docker Container Cycle



- docker pull
- docker create
- docker start

docker run

- docker stop
- docker rm

Docker 기본 명령어

- Container 생성
- Container 구동
- Container 접속
- Container 중지
- Container 삭제
- Container 재시작
- Container 일시정지 및 재시작

1) Container 생성과 실행

- Docker image pull, docker container create, docker container start 기능을 하나로 합친 것
- 컨테이너 생성과 실행 명령어 : docker run

#docker run [옵션] <이미지명>[:태그명][값]

옵션 형식	설명
--name 컨테이너명	컨테이너이름 지정
-p 호스트포트번호:컨테이너포트번호	포트번호 지정
-v 호스트디스크:컨테이너디렉터리	볼륨을 마운트함
--net=네트워크이름	컨테이너를 네트워크에 연결
-e 환경변수명=값	환경변수를 설정
-d	백그라운드로 실행
-i	컨테이너에 터미널(키보드)를 연결
-t	특수 키를 사용 가능하도록 함

2) Container 목록 확인

- 컨테이너 목록 확인 명령어 : docker ps

#docker ps [옵션]

옵션	설명
-a	구동, 중지 상태의 모든 컨테이너 표시
-l	마지막에 구동된 컨테이너 표시
-q	컨테이너 ID만 표시
-f	목록에 표시할 컨테이너를 필터링
-s	파일 사이즈 표시

#docker ps
#docker ps –a

```
root@docker:/# docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
root@docker:/# docker ps -a
CONTAINER ID   IMAGE     COMMAND       CREATED              STATUS                          PORTS     NAMES
26ec0da67218   centos    "/bin/bash"   About a minute ago   Exited (0) 24 seconds ago                 TEST01
```

항목	설명
Container ID	컨테이너 ID
Image	컨테이너 기반이 된 IMAGE
COMMAND	컨테이너에서 실행 중인 명령어
CREATED	컨테이너 생성 후 경과 시간
STATUS	컨테이너 상태 (restarting | running | paused | exited)
PORTS	할당된 포트
NAMES	컨테이너 명

#docker ps

#docker ps –a

#docker start 662c

#docker ps

#docker attach 662c

- 컨테이너 이름 대신 ID 사용 가능
- ID가 너무 길 때 앞의 2~3자만 입력해도 됨

```
root@ubuntu:/# docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
root@ubuntu:/# docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS                      PORTS      NAMES
662c059f9350        centos              "/bin/bash"         6 minutes ago       Exited (0) 6 minutes ago                TEST01
1a92731e3701        ubuntu:14.04        "/bin/bash"         18 minutes ago      Exited (127) 8 minutes ago              vigorous_vi
vesvaraya
root@ubuntu:/# docker start 662c
662c
root@ubuntu:/# docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
662c059f9350        centos              "/bin/bash"         11 minutes ago      Up 4 seconds                            TEST01

root@ubuntu:/# docker attach 662c
[root@662c059f9350 /]#
```

3) Container 실행 중지

- 중지되어 있는 컨테이너 구동 명령어 : docker stop

#docker stop <컨테이너명 또는 ID>

4) Container 삭제

- 구동중인 컨테이너에 접속 명령어 : docker rm

#docker rm [옵션] <컨테이너명 또는 ID>

항목	설명
-f	구동중인 컨테이너를 강제 삭제

- 생성된 컨테이너가 많은 경우 한번에 생성되어 있는 모든 컨테이너 삭제

docker container prune

5) 이미지 삭제

- 이미지 삭제 명령어

#docker rmi [옵션] <이미지명>

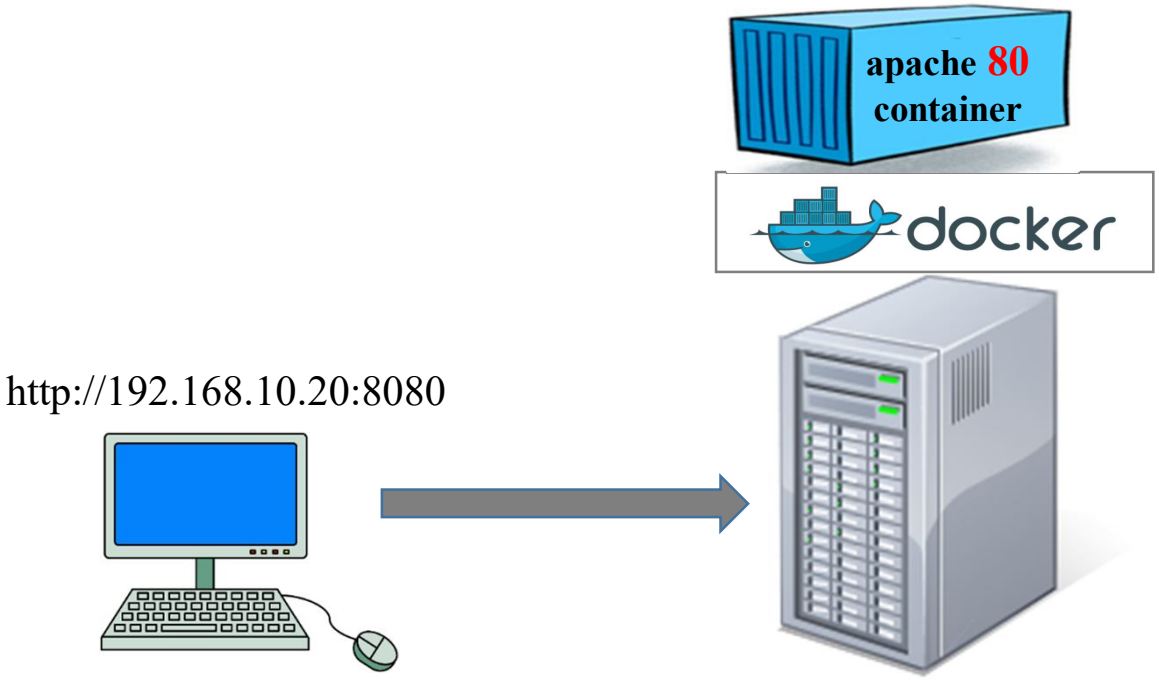
옵션	설명
-f	이미지 강제 삭제

실습 1. Apache container 생성

1. docker run --name webserver -d httpd
2. docker ps
3. docker stop webserver
4. docker ps
5. docker ps –a
6. docker rm webserver

실습 2. 외부에서 Apache container에 접속

1. docker run --name apache –d –p 8080:80 httpd
2. docker ps
3. http://192.168.10.20:8080
4. docker stop apache
5. docker ps -a
6. docker rm apache



6) Container 접속 명령어

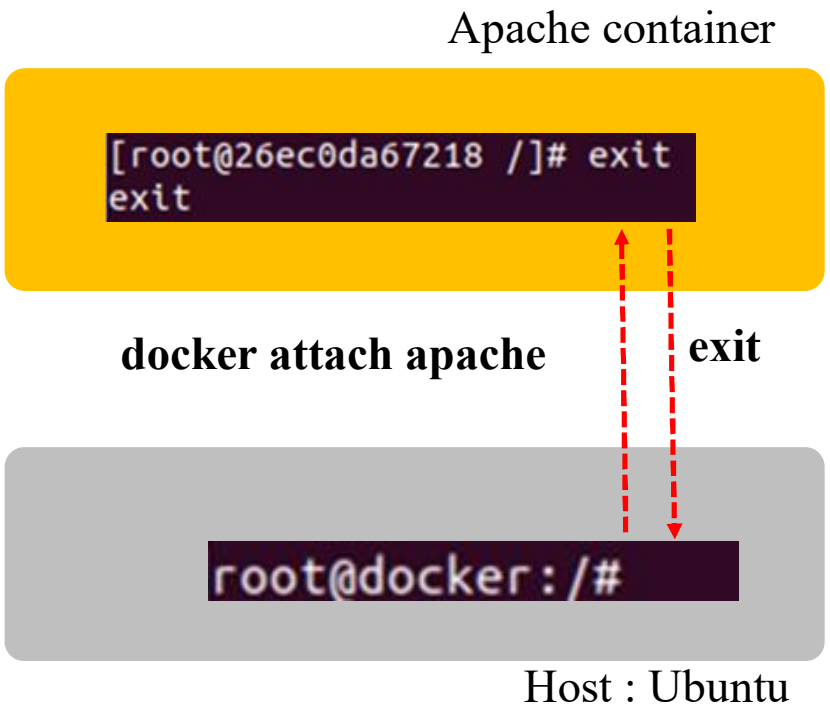
- docker exec 또는 docker attach
  - 컨테이너가 실행되고 있을 때 사용
  - docker ps 를 입력했을 때 실행 중인 컨테이너가 없다면 실행할 수 없음

docker exec <CONTAINER ID> <OPTIONS>	실행 중인 컨테이너에 명령어를 전달 (외부 -> 내부)
docker exec –it <CONTAINER ID> /bin/bash	실행 중인 컨테이너에 직접 들어가 명령어를 실행 (내부 접근)
docker run -it --name <CONTAINER NAME> /bin/bash docker attach <CONTAINER ID>	실행 중인 컨테이너에 직접 들어가 명령어를 실행 (내부 접근) */bin/bash로 컨테이너를 생성해야 attach로 접속 가능

실습 3. docker attach로 Container 내부에 접근하여 명령어 실행

1. docker run -it --name apache -d httpd /bin/bash
2. docker attach apache
3. ls
4. pwd
5. exit
6. docker start apache
7. docker stop apache
8. docker rm apache
9. docker rmi apahce

***/bin/bash로 컨테이너를 생성해야 attach로 접속 가능**



실습 4. docker exec를 이용한 Container에 명령어 전달

❶ docker run --name apache -d httpd

❷ docker exec apache ls

❸ docker exec apache pwd

❹ docker exec apache cat /usr/local/apache2/htdocs/index.html

실습 5. docker exec로 Container 내부에 접근하여 명령어 실행

❶ docker exec -it apache /bin/bash

❷ ls

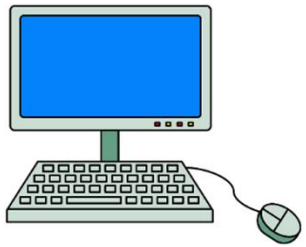
❸ pwd

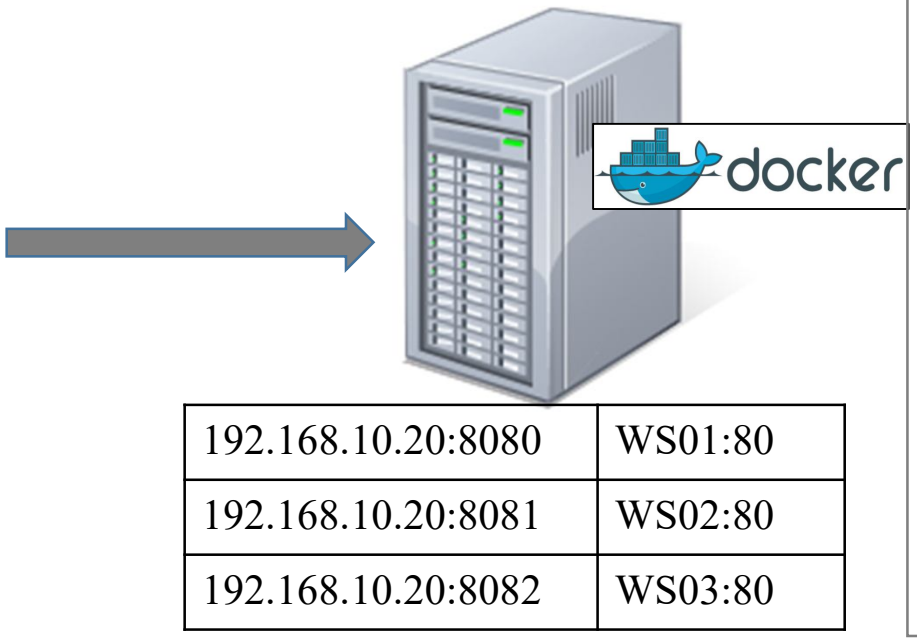
❹ cat /usr/local/apache2/htdocs/index.html

❺ exit

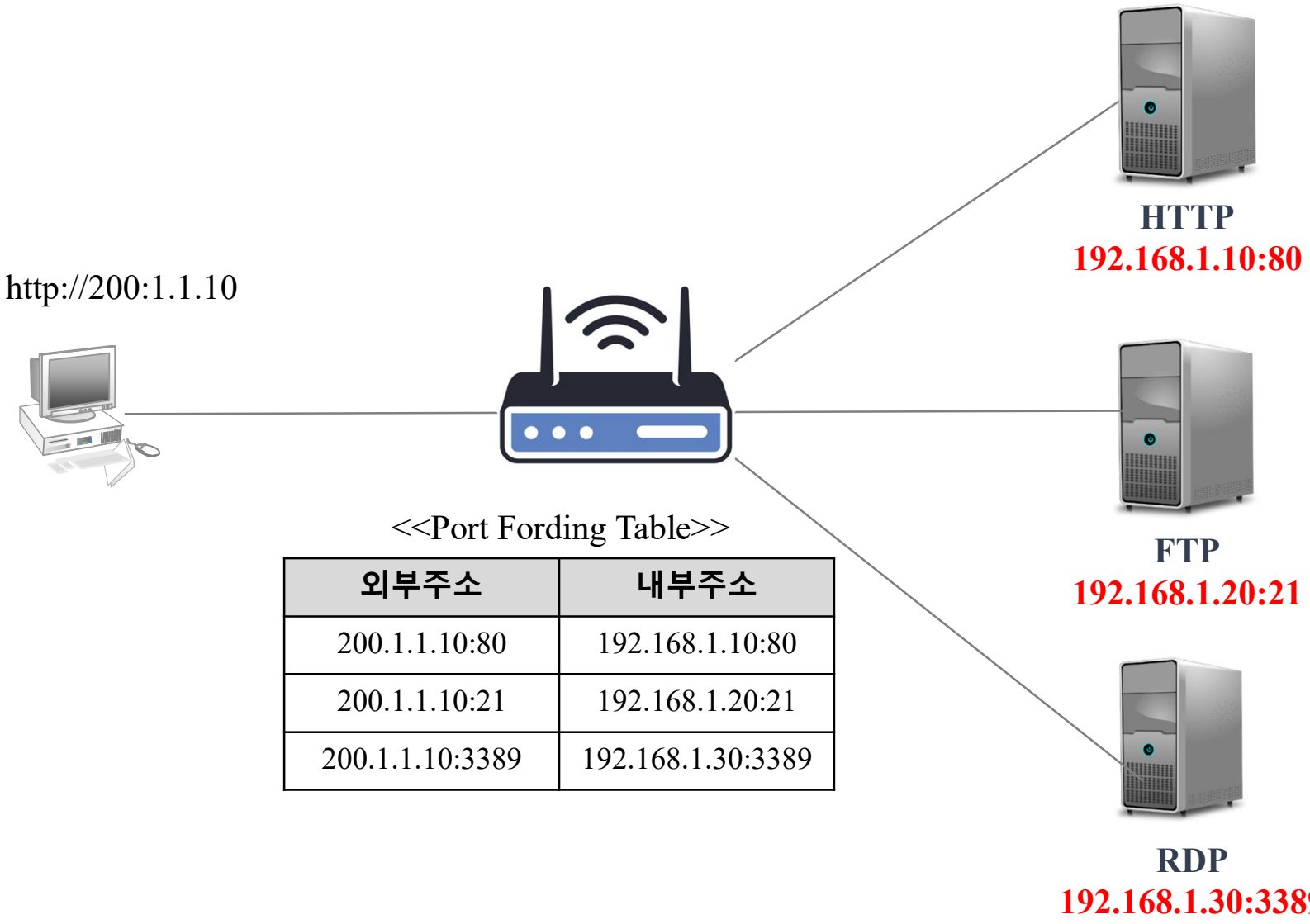
실습 6. Port Forwarding을 이용하여 외부에서 Apache 접속

http://192.168.10.20:8080
http://192.168.10.20:8081
http://192.168.10.20:8082



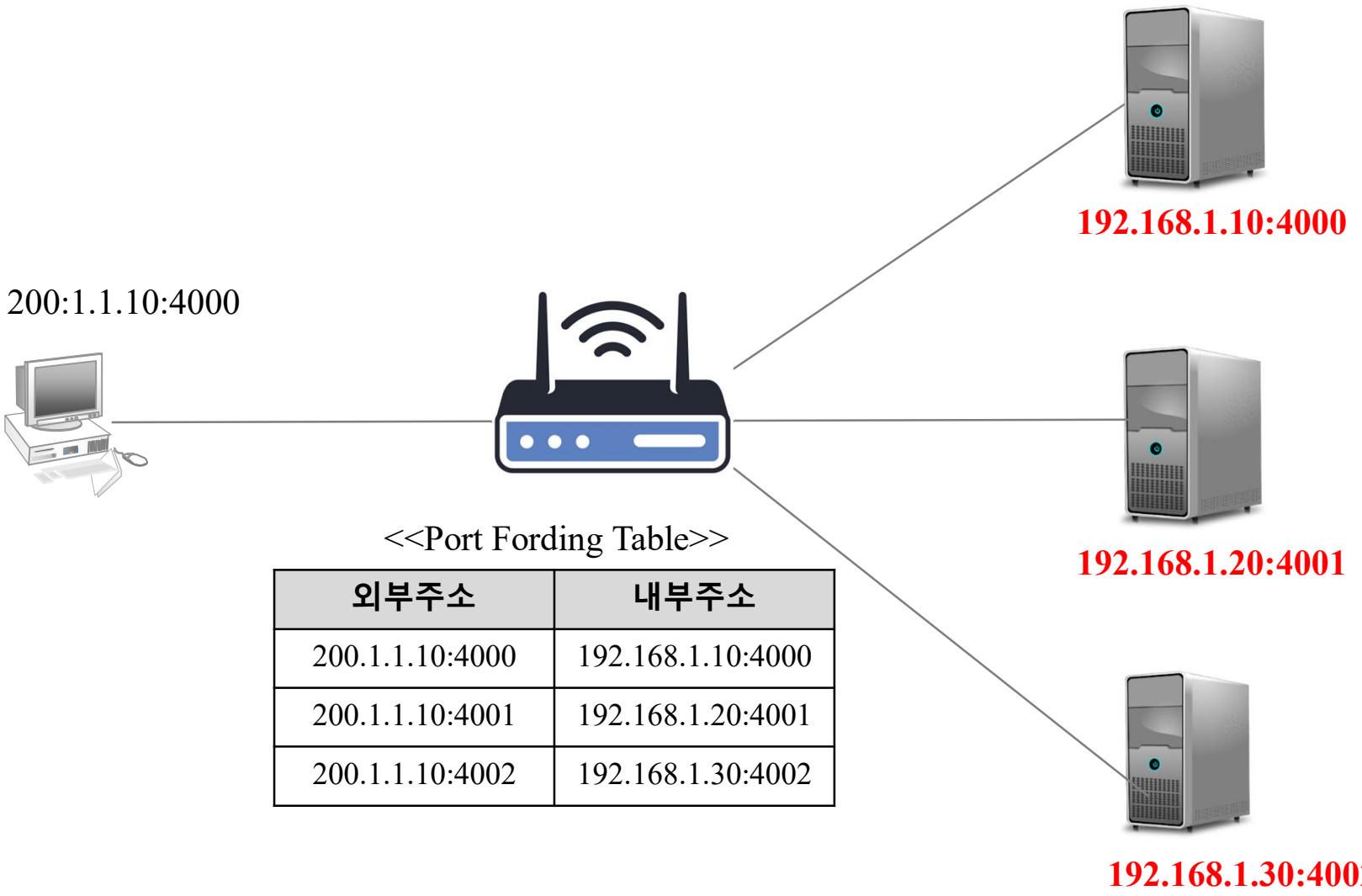


192.168.10.20:8080	WS01:80
192.168.10.20:8081	WS02:80
192.168.10.20:8082	WS03:80



<<Port Fording Table>>

외부주소	내부주소
200.1.1.10:80	192.168.1.10:80
200.1.1.10:21	192.168.1.20:21
200.1.1.10:3389	192.168.1.30:3389



<<Port Fording Table>>

외부주소	내부주소
200.1.1.10:4000	192.168.1.10:4000
200.1.1.10:4001	192.168.1.20:4001
200.1.1.10:4002	192.168.1.30:4002

❶ docker run --name WS01 –d –p 8081:80 httpd

docker run --name WS02 –d –p 8082:80 httpd

docker run --name WS03 –d –p 8083:80 httpd

❷ docker ps

❸ docker exec –it **WS01** /bin/bash

cd /usr/local/apache2/htdocs

cat index.html

echo "<h1>Apache Server **NO.1**</h1>” > usr/local/apache2/htdocs/index.html

❹ http://192.168.10.20:8080

❺ docker stop WS01

docker stop WS02

docker stop WS03

❻ docker ps

❼ docker ps –a

❽ docker rm WS01

docker rm WS02

docker rm WS03

7) Container 일시 정지와 재시작

- 구동중인 컨테이너에서 실행중인 프로세스를 모두 일시 정지 명령어 : docker pause

#docker pause <컨테이너명 또는 ID>

- 일시 정지된 프로세스 재시작 명령어 : docker unpause

#docker unpause <컨테이너명 또는 ID>

8) Container 정지와 재시작

- 컨테이너 정지 명령어 : docker stop

  #docker stop <컨테이너명 또는 ID>

- 컨테이너 재시작 명령어 : docker restart

  #docker restart [옵션] <컨테이너명 또는 ID>

항목	설명
-t	컨테이너 재시작 시간을 지정(default는 10초)

9) Container 이름 변경

- 컨테이너 이름 변경 명령어 : docker rename

  #docker rename 이전컨테이너명 변경컨테이너명

```
root@ubuntu:/# docker ps
CONTAINER ID        IMAGE          COMMAND       CREATED             STATUS          PORTS     NAMES
e05c598255d6        300e315adb2f   "/bin/bash"   4 minutes ago       Up 31 seconds             compassionate_albattani

root@ubuntu:/# docker rename compassionate_albattani TEST02
root@ubuntu:/# docker ps
CONTAINER ID        IMAGE          COMMAND       CREATED             STATUS          PORTS     NAMES
e05c598255d6        300e315adb2f   "/bin/bash"   4 minutes ago       Up 56 seconds             TEST02
root@ubuntu:/#
```

#docker images

#docker ps -a

#docker rmi centos

#docker images

```
root@ubuntu:/# docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
centos              latest              300e315adb2f        3 months ago        209MB
ubuntu              14.04               df043b4f0cf1        6 months ago        197MB
root@ubuntu:/# docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS                      PORTS
1a92731e3701        ubuntu:14.04        "/bin/bash"         2 hours ago         Exited (127) 2 hours ago
root@ubuntu:/# docker rmi centos
Untagged: centos:latest
Untagged: centos@sha256:5528e8b1b1719d34604c87e11dcd1c0a20bedf46e83b5632cdeac91b8c04efc1
Deleted: sha256:300e315adb2f96afe5f0b2780b87f28ae95231fe3bdd1e16b9ba606307728f55
Deleted: sha256:2653d992f4ef2bfd27f94db643815aa567240c37732cae1405ad1c1309ee9859
root@ubuntu:/# docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
ubuntu              14.04               df043b4f0cf1        6 months ago        197MB
root@ubuntu:/#
```

10) Docker 버전확인

- Docker 버전
- Go 언어버전

  * 도커는 Go 언어Go로 개발

- OS 확인
- 서버와 클라이언트정보확인

#docker version

```
root@ubuntu:/# docker version
Client:
 Version:           19.03.8
 API version:       1.40
 Go version:        go1.13.8
 Git commit:        afacb8b7f0
 Built:             Wed Mar 11 23:42:35 2020
 OS/Arch:           linux/amd64
 Experimental:      false

Server:
 Engine:
  Version:          19.03.8
  API version:      1.40 (minimum version 1.12)
  Go version:       go1.13.8
  Git commit:       afacb8b7f0
  Built:            Wed Mar 11 22:48:33 2020
  OS/Arch:          linux/amd64
  Experimental:     false
 containerd:
  Version:          1.3.3-0ubuntu2
  GitCommit:
 runc:
  Version:          spec: 1.0.1-dev
  GitCommit:
 docker-init:
  Version:          0.18.0
  GitCommit:
root@ubuntu:/#
```

11) Docker 실행환경 확인

#docker info

```
root@ubuntu:/# docker info
Client:
 Debug Mode: false

Server:
 Containers: 1
  Running: 1
  Paused: 0
  Stopped: 0
 Images: 3
 Server Version: 19.03.8
 Storage Driver: overlay2
  Backing Filesystem: <unknown>
  Supports d_type: true
  Native Overlay Diff: true
 Logging Driver: json-file
 Cgroup Driver: cgroupfs
 Plugins:
  Volume: local
  Network: bridge host ipvlan macvlan null overlay
  Log: awslogs fluentd gcplogs gelf journald json-
 Swarm: inactive
 Runtimes: runc
 Default Runtime: runc
 Init Binary: docker-init
 containerd version:
 runc version:
 init version:
 Security Options:
  apparmor
  seccomp
   Profile: default
 Kernel Version: 5.4.0-26-generic
 Operating System: Ubuntu 20.04 LTS
 OSType: linux
 Architecture: x86_64
 CPUs: 1
 Total Memory: 1.914GiB
 Name: ubuntu
 ID: BI5Q:T5JV:CNV5:JKCE:3LM3:2T7B:4R6V:
 Docker Root Dir: /var/lib/docker
 Debug Mode: false
 Registry: https://index.docker.io/v1/
 Labels:
 Experimental: false
 Insecure Registries:
  127.0.0.0/8
 Live Restore Enabled: false

WARNING: No swap limit support
```

컨테이너 수

Docker호스트명

Docker저장소명

12) 컨테이너 프로세스 확인

- 구동중인 컨테이너에서 실행 중인 프로세스 확인 확인 명령어 :

#docker top [옵션]

```
root@ubuntu:/# docker top e05c598255d6
UID                 PID                 PPID                C                   STIME               TTY                 TIME
```