

WEB3Tier + DHCP + DNS + Redis - 실습가이드

최초 작성일 : 2024/02/01

최종 제출일 : 2024/02/02

김민경

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I. 실습

1. 실습과정

1) DB 서버에 Redis 설치하기

- 업데이트 하기

```
sudo apt-get update
```

```
sudo apt-get upgrade
```

- redis-server 설치하기

```
sudo apt-get install redis-server
```

- redis-server 활성화 여부 확인하기

```
sudo systemctl status redis-server
```

[illegible]

- 각 서버가 dhcp로부터 ip 할당받기

- WEB 서버에서 dhcp 활성화 상태 확인하기

```

kim@kim-VirtualBox:~$ sudo systemctl status isc-dhcp-server
●isc-dhcp-server.service - ISC DHCP IPv4 server
   Loaded: loaded (/lib/systemd/system/isc-dhcp-server.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-02-01 13:26:33 KST; 3min 13s ago
     Docs: man:dhcpcd(8)
    Main PID: 856 (dhcpd)
      Tasks: 4 (limit: 2260)
     Memory: 3.7M
        CPU: 40ms

```

- WAS 서버 ip 할당받기

```
kim@kim-VirtualBox:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:35:9f:74 brd ff:ff:ff:ff:ff:ff
    inet 192.168.76.101/24 brd 192.168.76.255 scope global dynamic noprefixroute enp0s3
        valid_lft forever preferred_lft forever
```

- DB 서버 ip 할당받기

```
ubuntu@ubuntu:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s9: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:e5:2d:c7 brd ff:ff:ff:ff:ff:ff
    inet 192.168.96.101/24 metric 100 brd 192.168.96.255 scope global dynamic enp0s9
        valid_lft 42796sec preferred_lft 42796sec
    inet6 fe80::a00:27ff:fee5:2dc7/64 scope link
        valid_lft forever preferred_lft forever
ubuntu@ubuntu:~$ _
```

2) WAS 2 서버를 구축하기

- WAS 서버 복제하기
 - MAC 주소는 다르게 설정해서 기존 WAS 서버 복제하기
 - WAS 서버의 정보
 - 어댑터 2 (WAS1과 같은 어댑터)
- WAS2 서버 ip를 dhcp에서 할당받기
 - DHCP 서버의 /etc/dhcp/dhpd.conf 파일에서 WAS2 정보 추가

```
(WEB)Ubuntu-DeskTop (24/01/23) [실행 중] - Oracle VM VirtualBox
파일  머신  보기  입력  장치  도움말

# option definitions common to all supported networks...

subnet 192.168.76.0 netmask 255.255.255.0 {
    option routers 192.168.76.254;

    host WAS {
        hardware ethernet 08:00:27:35:9f:74;
        fixed-address 192.168.76.101;
    }

    host WAS2 {
        hardware ethernet 08:00:27:2a:f1:5a;
        fixed-address 192.168.76.102;
    }
}

subnet 192.168.96.0 netmask 255.255.255.0 {
    option routers 192.168.96.254;
    host DB {
        hardware ethernet 08:00:27:e5:2d:c7;
        fixed-address 192.168.96.101;
    }
}
```

- dhcp 재시작 후 확인

```
kim@kim-VirtualBox:~$ sudo systemctl restart isc-dhcp-server
kim@kim-VirtualBox:~$ sudo systemctl status isc-dhcp-server
●isc-dhcp-server.service - ISC DHCP IPv4 server
   Loaded: loaded (/lib/systemd/system/isc-dhcp-server.service; enabled; vendor
   Active: active (running) since Thu 2024-02-01 14:29:45 KST; 1s ago
     Docs: man:dhcpcd(8)
    Main PID: 2691 (dhcpcd)
```

- dhcp로부터 ip 할당받기 ⇒ 성공

```
(WAS2) U-Desk3 [실행 중] - Oracle VM VirtualBox
파일  머신  보기  입력  장치  도움말

현재 활동  터미널  2월 1일 14:32

kim@kim-VirtualBox: ~
[sudo] kim 암호:
kim@kim-VirtualBox:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:2a:f1:5a brd ff:ff:ff:ff:ff:ff
    inet 192.168.76.102/24 brd 192.168.76.255 scope global dynamic noprefixroute
```

- Route 설정하기

- WAS2 & WEB 서버

```
sudo ip route add 192.168.56.0/24 via 192.168.76.254 //WAS2 에서 설정
```

- WAS2 & DB 서버

```
sudo ip route add 192.168.96.0/24 via 192.168.76.254 //WAS2 에서 설정
```

3) WAS 서버 2개를 로드밸런싱 해주기

- Apache의 mod_proxy 및 mod_proxy_balancer 모듈을 사용해야 함

- window서버에서 요청을 받으면 WEB서버가 WAS1 or WAS2에 로드밸런싱을 통해

- 보내는 것이기 때문에 위의 모듈은 WEB 서버에 설정해줘야 함

```
sudo a2enmod proxy_balancer
```

```
sudo a2enmod lbmethod_byrequests
```

```
kim@kim-VirtualBox:~$ sudo a2enmod proxy_balancer
[sudo] kim 암호:
Considering dependency proxy for proxy_balancer:
Module proxy already enabled
Considering dependency alias for proxy_balancer:
Module alias already enabled
Considering dependency slotmem_shm for proxy_balancer:
Enabling module slotmem_shm.
Enabling module proxy_balancer.
To activate the new configuration, you need to run:
    systemctl restart apache2
```

```
kim@kim-VirtualBox:~$ sudo a2enmod lbmethod_byrequests
Considering dependency proxy_balancer for lbmethod_byrequests:
Considering dependency proxy for proxy_balancer:
Module proxy already enabled
Considering dependency alias for proxy_balancer:
Module alias already enabled
Considering dependency slotmem_shm for proxy_balancer:
Module slotmem_shm already enabled
Module proxy_balancer already enabled
Enabling module lbmethod_byrequests.
To activate the new configuration, you need to run:
    systemctl restart apache2
```

- apache2 재시작 해주기

```
kim@kim-VirtualBox:~$ sudo systemctl restart apache2
kim@kim-VirtualBox:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-02-01 15:19:14 KST; 5s ago
     Docs: https://httpd.apache.org/docs/2.4/
   Process: 2881 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
   Main PID: 2886 (apache2)
     Tasks: 55 (limit: 2260)
```

4) 가상 호스트 구성하기

- apache 설정 파일에 가상 호스트 구성하기

ProxyPass 및 ProxyPassReverse 지시문을 사용하여 각 WAS 서버를 지정하기

sudo nano /etc/apache2/sites-available/000-default.conf

```
GNU nano 6.2 /etc/apache2/sites-available/000-default.conf *
<VirtualHost *:80>
    # The ServerName directive sets the request scheme, hostname and port that
    # the server uses to identify itself. This is used when creating
    # redirection URLs. In the context of virtual hosts, the ServerName
    # specifies what hostname must appear in the request's Host: header to
    # match this virtual host. For the default virtual host (this file) this
    # value is not decisive as it is used as a last resort host regardless.
    # However, you must set it for any further virtual host explicitly.
    #ServerName www.example.com

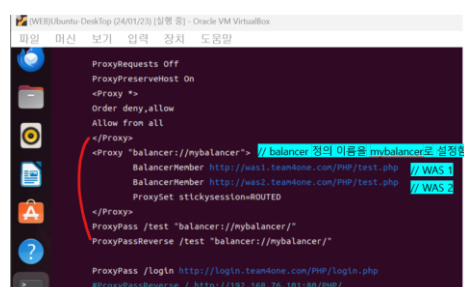
    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/html

    ProxyRequests Off
    ProxyPreserveHost On
    <Proxy *>
        Order deny,allow
        Allow from all
    </Proxy>
    <Proxy "balancer://mybalancer">
        BalancerMember http://was1.team4one.com
        BalancerMember http://was2.team4one.com
        ProxySet stickysession=ROUTED
    </Proxy>
    ProxyPass /test.php "balancer://mysticky/test.php"
    ProxyPass /create_session.php "balancer://mysticky/create_session.php"
    ProxyPass /delete_session.php "balancer://mysticky/delete_session.php"
    ProxyPassReverse /test "balancer://mybalancer/"

    ProxyPass /login http://login.team4one.com/PHP/login.php
    ProxyPassReverse / http://192.168.76.101:80/PHP/

    # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
    # error, crit, alert, emerg.
    # It is also possible to configure the loglevel for particular
    # modules, e.g.
    #LogLevel info ssl:warn

    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined
```



```
ProxyRequests Off
ProxyPreserveHost On
<Proxy *>
    Order deny,allow
    Allow from all
</Proxy>
<Proxy "balancer://mybalancer">
    BalancerMember http://was1.team4one.com/PHP/test.php //WAS1
    BalancerMember http://was2.team4one.com/PHP/test.php //WAS2
    ProxySet stickysession=ROUTED
</Proxy>
ProxyPass /test "balancer://mybalancer/"
ProxyPassReverse /test "balancer://mybalancer/"

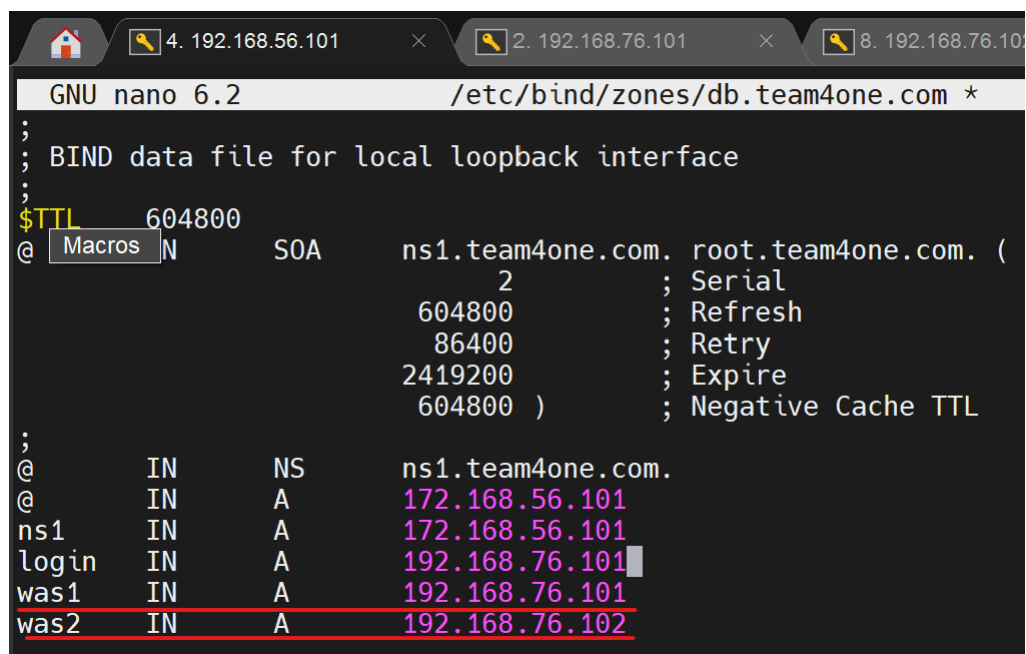
ProxyPass /login http://login.team4one.com/PHP/login.php
ProxyPassReverse / http://192.168.76.101:80/PHP/
```

- apache2 재시작 해주기

```
kim@kim-VirtualBox:~$ sudo systemctl restart apache2
kim@kim-VirtualBox:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-02-01 15:44:24 KST; 7s ago
     Docs: https://httpd.apache.org/docs/2.4/
   Process: 3024 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
    Main PID: 3029 (apache2)
      Tasks: 55 (limit: 2260)
```

- /etc/bind/zones/db.yang1.com 파일 설정하기

sudo vim /etc/bind/zones/db.team4one.com



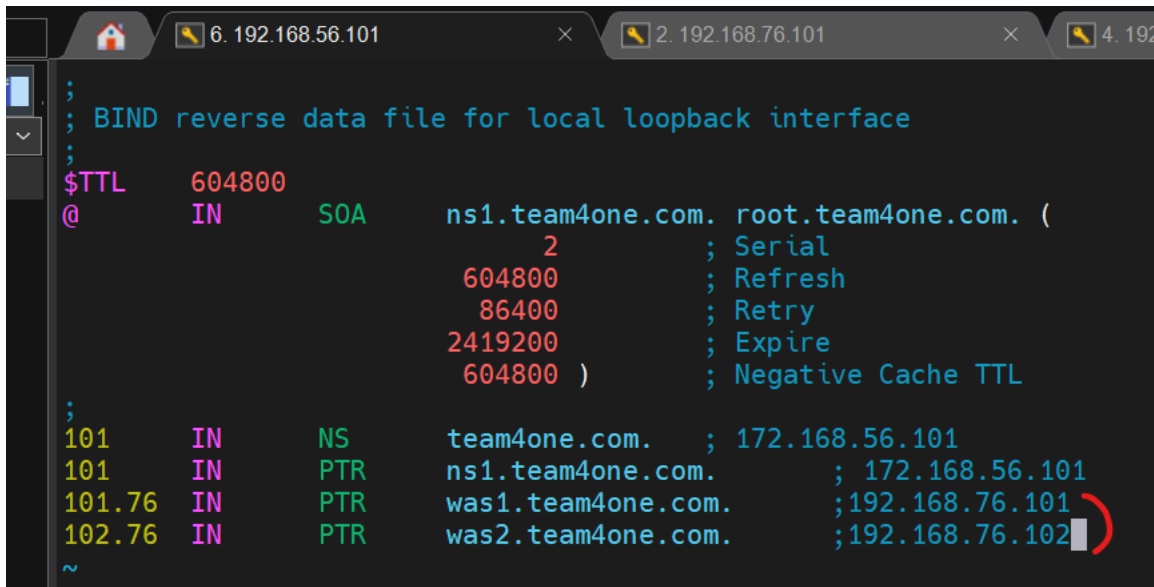
```
GNU nano 6.2 /etc/bind/zones/db.team4one.com *
;
; BIND data file for local loopback interface
;
$TTL 604800
@ IN SOA ns1.team4one.com. root.team4one.com. (
    2      ; Serial
    604800 ; Refresh
    86400  ; Retry
    2419200 ; Expire
    604800 ) ; Negative Cache TTL
;
@ IN NS ns1.team4one.com.
@ IN A 172.168.56.101
ns1 IN A 172.168.56.101
login IN A 192.168.76.101
was1 IN A 192.168.76.101
was2 IN A 192.168.76.102
```

참고) /etc/bind/zones/db.team4one.com 파일

- BIND DNS 서버에서 사용되는 특정 도메인인 team4one.com의 DNS 존 파일인 db.team4one.com 파일을 편집
- DNS 존 파일: 도메인에 대한 DNS 정보를 정의하는데 사용됨
- 이 파일을 수정하면 해당 도메인과 관련된 DNS 정보를 변경하거나 추가할 수 있음
- 다양한 종류의 레코드가 포함됨
 - 레코드(호스트 IPv4 주소), CNAME 레코드(호스트의 별칭), MX 레코드(메일서버 정보) 등

- /etc/bind/zones/db.56.168.172 역방향 파일 설정하기

`sudo vim /etc/bind/zones/db.56.168.172`

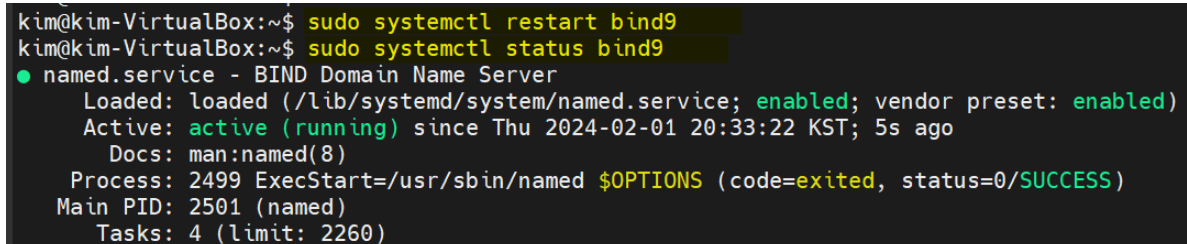


```

;
; BIND reverse data file for local loopback interface
;
$TTL      604800
@         IN      SOA      ns1.team4one.com. root.team4one.com. (
                                2          ; Serial
                                604800     ; Refresh
                                86400      ; Retry
                                2419200    ; Expire
                                604800 )   ; Negative Cache TTL
;
101       IN      NS       team4one.com. ; 172.168.56.101
101       IN      PTR      ns1.team4one.com. ; 172.168.56.101
101.76    IN      PTR      was1.team4one.com. ; 192.168.76.101
102.76    IN      PTR      was2.team4one.com. ; 192.168.76.102
~

```

- bind9 재시작 해주기



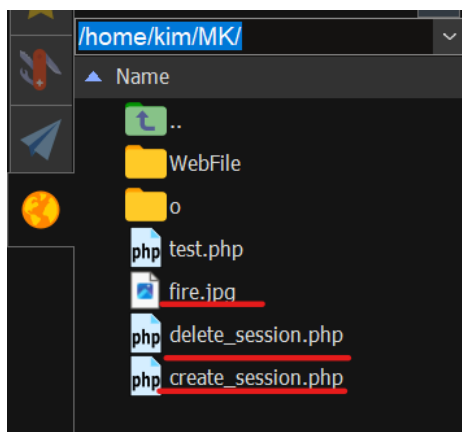
```

kim@kim-VirtualBox:~$ sudo systemctl restart bind9
kim@kim-VirtualBox:~$ sudo systemctl status bind9
● named.service - BIND Domain Name Server
   Loaded: loaded (/lib/systemd/system/named.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-02-01 20:33:22 KST; 5s ago
     Docs: man:named(8)
  Process: 2499 ExecStart=/usr/sbin/named $OPTIONS (code=exited, status=0/SUCCESS)
    Main PID: 2501 (named)
      Tasks: 4 (limit: 2260)

```

- 강사님이 제공해주시는 파일 3가지 옮기고, 권한 부여하고, 수정하기

- 파일 3가지를 mobaxterm을 통해 WAS1, WAS2 서버에 옮기기



- 파일에 권한 주기 (WAS1, WAS2 둘 다)

```

kim@kim-VirtualBox:~$ cd /home/kim/MK
kim@kim-VirtualBox:~/MK$ ll
합계 148
drwxrwxr-x 4 kim kim 4096 2월 1 19:08 ./
drwxr-x--- 17 kim kim 4096 2월 1 19:03 ../
drwxrwxr-x 3 kim kim 4096 1월 27 16:22 WebFile/
-rw-rw-r-- 1 kim kim 163 2월 1 19:08 create_session.php
-rw-rw-r-- 1 kim kim 86 2월 1 19:08 delete_session.php
-rw-rw-r-- 1 kim kim 120424 1월 25 20:15 fire.jpg
drwxrwxr-x 3 kim kim 4096 1월 30 00:22 o/
-rw-rw-r-- 1 kim kim 524 2월 1 19:08 test.php
kim@kim-VirtualBox:~/MK$ sudo chmod 777 -R ./create_session.php
[sudo] kim 암호:
kim@kim-VirtualBox:~/MK$ sudo chmod 777 -R ./delete_session.php
kim@kim-VirtualBox:~/MK$ sudo chmod 777 -R ./test.php

```

```

kim@kim-VirtualBox:~$ cd /home/kim/MK
kim@kim-VirtualBox:~/MK$ sudo chmod 777 -R ./create_session.php
[sudo] kim 암호:
kim@kim-VirtualBox:~/MK$ sudo chmod 777 -R ./test.php
kim@kim-VirtualBox:~/MK$ sudo chmod 777 -R ./delete_session.php
kim@kim-VirtualBox:~/MK$

```

- /var/www/html 밑으로 옮기기(WAS1, WAS2 둘 다)

```

kim@kim-VirtualBox:~$ cd /home/kim/MK
kim@kim-VirtualBox:~/MK$ sudo mv test.php /var/www/html/test.php
[sudo] kim 암호:
죄송합니다만, 다시 시도하십시오.
[sudo] kim 암호:
kim@kim-VirtualBox:~/MK$ sudo mv test.php /var/www/html/create_session.php
mv: 'test.php' 상태 정보 확인 불가: 그런 파일이나 디렉터리가 없습니다
kim@kim-VirtualBox:~/MK$ sudo mv create_session.php /var/www/html/create_session.php
kim@kim-VirtualBox:~/MK$ sudo mv delete_session.php /var/www/html/delete_session.php
kim@kim-VirtualBox:~/MK$
kim@kim-VirtualBox:~/MK$ sudo mv test.php /var/www/html/test.php
kim@kim-VirtualBox:~/MK$ sudo mv test.php /var/www/html/create_session.php
mv: 'test.php' 상태 정보 확인 불가: 그런 파일이나 디렉터리가 없습니다
kim@kim-VirtualBox:~/MK$ sudo mv create_session.php /var/www/html/create_session.php
kim@kim-VirtualBox:~/MK$ sudo mv delete_session.php /var/www/html/delete_session.php

```

- create_session.php 파일 수정하기

- WAS1 서버

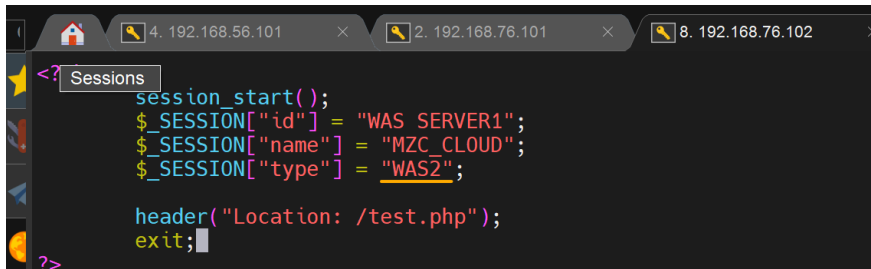
```

<?php
session_start();
$_SESSION["id"] = "WAS_SERVER1";
$_SESSION["name"] = "MZC_CLOUD";
$_SESSION["type"] = "WAS1";

#header("Location: /test.php");
exit;

```

- WAS2 서버



```
<? Sessions
session_start();
$_SESSION["id"] = "WAS SERVER1";
$_SESSION["name"] = "MZC CLOUD";
$_SESSION["type"] = "WAS2";

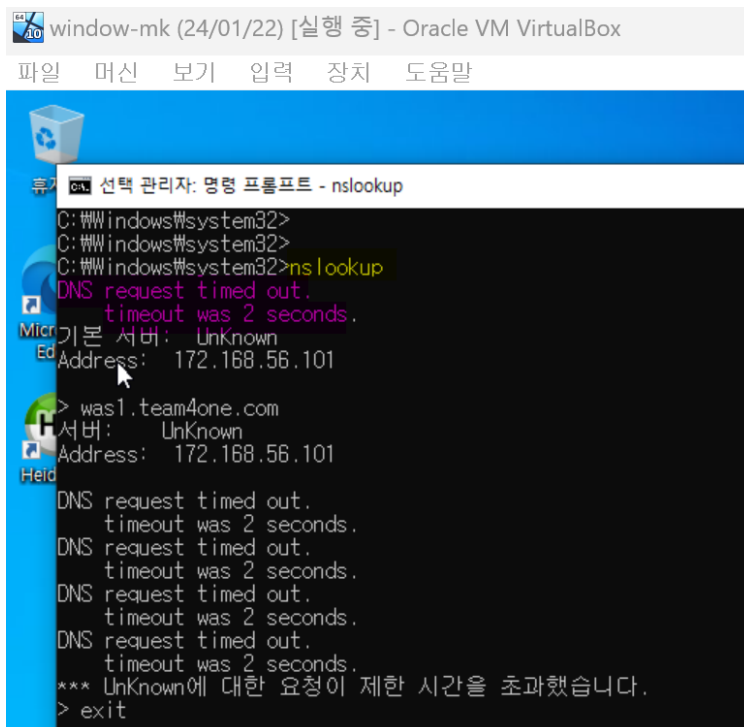
header("Location: /test.php");
exit;
```

• nslookup 명령어로 확인하기

nslookup이란?

nslookup 명령어는 네트워크 디버깅을 위해 자주 사용되는 리눅스 명령어로, DNS 서버에 직접 DNS 쿼리를 하고 그 결과를 출력해줍니다. 이를 통해서 DNS 설정이 정상적인지, 혹은 DNS 서버가 정상적으로 동작하고 있는지, 네트워크가 의도한대로 설정되어있는지 등을 확인할 수 있습니다. 또한 nslookup은 리눅스 명령어지만, 맥OS나 윈도우에도 같은 이름을 가진 명령어가 있습니다. 현재는 nslookup보다는 비슷한 기능을 하는 dig나 host 명령어 사용을 권장하는 편입니다. 이 글에서는 nslookup의 사용법과 옵션에 대해서 소개합니다.

- 오류 뜸



⇒ 원인은 Window & WEB 서버가 통신이 안됨(ping 이 안감)

```
kim@kim-VirtualBox:~$ ping 10.1.2.3
PING 10.1.2.3 (10.1.2.3) 56(84) bytes of data.
From 192.168.56.254 icmp_seq=1 Destination Net Unreachable
From 192.168.56.254 icmp_seq=2 Destination Net Unreachable
^C
--- 10.1.2.3 ping statistics ---
2 packets transmitted, 0 received, +2 errors, 100% packet loss, time 1150ms
```

so ip route 설정을 해 ping 가능하게 만들

```
kim@kim-VirtualBox:~$ sudo ip route add 10.1.2.0/24 via 172.168.56.254
```

5) 파일이 내부 web 브라우저로 접속가능한지 확인하기

- 리다이렉션 문제로 Create_session.php에서 header를 주석 처리 후 다시 접속하기