1. 기본 설정

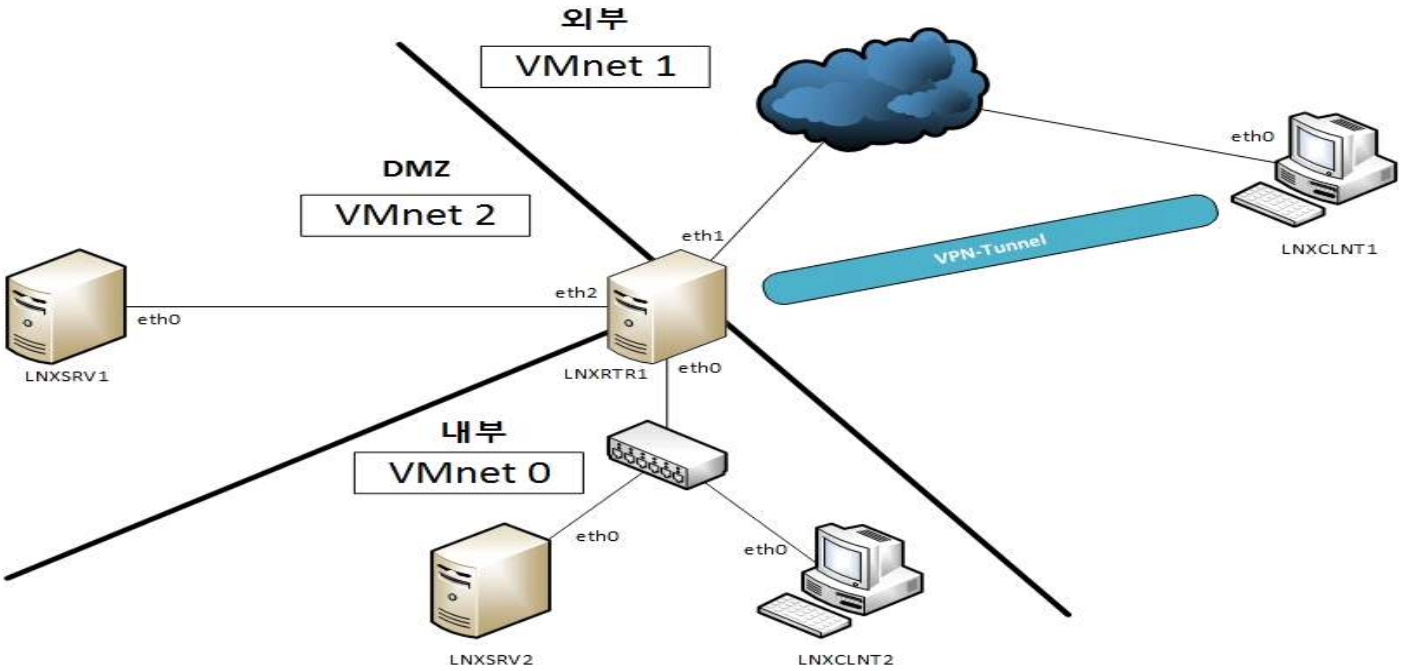
2016

2015 국제대회 문제 풀이

A 과제 풀이 – ITNSA 풀이본을 중심으로 재구성되었습니다.

Connect to Virtual Network

아래 사진을 참고하여 가상 네트워크를 연결합니다.



각 운영체제를 Debian 7.7.0으로 설치합니다.

이때, LNXCLNT1, LNXCLNT2를 위한 클론 머신은 아래를 주의하여 설치합니다.

LNXRTR1, LNXSRV1, LNXSRV2

LNXCLNT1, LNXCLNT2

설치가 완료되면 아래의 결과에 맞는 기본 설정을 진행합니다.

Check on LNXRTR1

root@lnxrtr1:~# **cat /etc/hostname**

```
root@lnxrtr1:~# cat /etc/hostname
lnxrtr1
```

root@lnxrtr1:~# **cat /etc/hosts | grep 127**

```
root@lnxrtr1:~# cat /etc/hosts | grep 127
127.0.0.1       localhost
127.0.1.1       lnxrtr1.apps4you.com    lnxrtr1
```

root@lnxrtr1:~# sysctl –p

```
root@lnxrtr1:~# sysctl -p
kernel.hostname = lnxrtr1
kernel.domainname = apps4you.com
net.ipv4.ip_forward = 1
```

root@lnxrtr1:~# ifconfig | egrep “encap|inet addr”

```
root@lnxrtr1:~# ifconfig | egrep "encap|inet addr"
eth0      Link encap:Ethernet  HWaddr 00:0c:29:5f:6a:62
          inet addr:172.17.20.1  Bcast:172.17.20.255  Mask:255.255.255.0
eth1      Link encap:Ethernet  HWaddr 00:0c:29:5f:6a:6c
          inet addr:32.54.87.115  Bcast:32.54.87.119  Mask:255.255.255.248
eth1:1    Link encap:Ethernet  HWaddr 00:0c:29:5f:6a:6c
          inet addr:32.54.87.114  Bcast:32.54.87.119  Mask:255.255.255.248
eth2      Link encap:Ethernet  HWaddr 00:0c:29:5f:6a:76
          inet addr:192.168.10.129  Bcast:192.168.10.255  Mask:255.255.255.128
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
```

Check on LNXSRV1

root@lnxsrv1:~# cat /etc/hostname

```
root@lnxsrv1:~# cat /etc/hostname
lnxsrv1
```

root@lnxsrv1:~# cat /etc/hosts | grep 127

```
root@lnxsrv1:~# cat /etc/hosts | grep 127
127.0.0.1       localhost
127.0.1.1       lnxsrv1.apps4you.com    lnxsrv1
```

root@lnxsrv1:~# sysctl –p

```
root@lnxsrv1:~# sysctl -p
kernel.hostname = lnxsrv1
kernel.domainname = apps4you.com
```

root@lnxsrv1:~# ifconfig | egrep “encap|inet addr”

```
root@lnxsrv1:~# ifconfig | egrep "encap|inet addr"
eth0      Link encap:Ethernet  HWaddr 00:0c:29:cc:d9:b1
          inet addr:192.168.10.150  Bcast:192.168.10.255  Mask:255.255.255.128
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
```

root@lnxsrv1:~# cat /etc/network/interfaces | egrep “auto|gateway”

```
root@lnxsrv1:~# cat /etc/network/interfaces | egrep "auto|gateway"
auto lo
auto eth0
        gateway 192.168.10.129
```

Check on LNXSRV2

LNXSRV2의 가상 머신에 좌측과 같이 가상 디스크 3개가 더 있는지 확인합니다.

(없는 경우 같은 크기의 가상 디스크를 3개 추가합니다.)

좌측과 같이 추가합니다. ----------à

root@lnxsrv2:~# cat /etc/hostname

```
root@lnxsrv2:~# cat /etc/hostname
lnxsrv2
```

root@lnxsrv2:~# cat /etc/hosts | grep 127

```
root@lnxsrv2:~# cat /etc/hosts | grep 127
127.0.0.1       localhost
127.0.1.1       lnxsrv2.apps4you.com    lnxsrv2
```

root@lnxsrv2:~# sysctl –p

```
root@lnxsrv2:~# sysctl -p
kernel.hostname = lnxsrv2
kernel.domainname = apps4you.com
```

root@lnxsrv2:~# ifconfig | egrep "encap|inet addr"

```
root@lnxsrv2:~# ifconfig | egrep "encap|inet addr"
eth0      Link encap:Ethernet  HWaddr 00:0c:29:e1:ca:6f
          inet addr:172.17.20.50  Bcast:172.17.20.255  Mask:255.255.255.0
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
```

root@lnxsrv2:~# cat /etc/network/interfaces | egrep "auto|gateway"

```
root@lnxsrv2:~# cat /etc/network/interfaces | egrep "auto|gateway"
auto lo
auto eth0
        gateway 172.17.20.1
```

가상 디스크가 있는지도 확인합니다.

root@lnxsrv2:~# ls –l /dev/sd*

```
root@lnxsrv2:~# ls -l /dev/sd*
brw-rw---T 1 root disk 8,  0 May 12 08:17 /dev/sda
brw-rw---T 1 root disk 8,  1 May 12 08:17 /dev/sda1
brw-rw---T 1 root disk 8,  2 May 12 08:17 /dev/sda2
brw-rw---T 1 root disk 8, 16 May 12 08:17 /dev/sdb
brw-rw---T 1 root disk 8, 32 May 12 08:17 /dev/sdc
brw-rw---T 1 root disk 8, 48 May 12 08:17 /dev/sdd
```

Check on LNXCLNT1

root@lnxclnt1:~# cat /etc/hostname

```
root@lnxclnt1:~# cat /etc/hostname
lnxclnt1
```

root@lnxclnt1:~# cat /etc/hosts | grep 127

```
root@lnxclnt1:~# cat /etc/hosts | grep 127
127.0.0.1       localhost
127.0.1.1       lnxclnt1.apps4you.com   lnxclnt1
```

root@lnxclnt1:~# sysctl –p

```
root@lnxclnt1:~# sysctl -p
kernel.hostname = lnxclnt1
kernel.domainname = apps4you.com
```

root@lnxclnt1:~# ifconfig | egrep "encap|inet addr"

```
root@lnxclnt1:~# ifconfig | egrep "encap|inet addr"
eth0      Link encap:Ethernet  HWaddr 00:0c:29:2e:69:d9
          inet addr:32.54.87.116  Bcast:32.54.87.119  Mask:255.255.255.248
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
```

Check on LNXCLNT2

root@lnxclnt2:~# cat /etc/hostname

```
root@lnxclnt2:~# cat /etc/hostname
lnxclnt2
```

root@lnxclnt2:~# cat /etc/hosts | grep 127

```
root@lnxclnt2:~# cat /etc/hosts | grep 127
127.0.0.1       localhost
127.0.1.1       lnxclnt2.apps4you.com   lnxclnt2
```

root@lnxclnt2:~# sysctl -p

```
root@lnxclnt2:~# sysctl -p
kernel.hostname = lnxclnt2
kernel.domainname = apps4you.com
```

이제 정적 NAT를 진행합니다.

Configure on LNXRTR1

root@lnxrtr1:~# vi /etc/rc.local

```
iptables -t nat -F
iptables -t nat -A POSTROUTING -s 192.168.10.150/32 ! -d 172.17.20.0/24 -j SNAT
--to 32.54.87.114
iptables -t nat -A POSTROUTING -s 192.168.10.128/25 ! -d 172.17.20.0/24 -j SNAT
--to 32.54.87.115
iptables -t nat -A POSTROUTING -s 172.17.20.0/24 ! -d 192.168.10.128/25 -j SNAT
--to 32.54.87.115
iptables -t nat -A PREROUTING -d 32.54.87.114 -j DNAT --to 192.168.10.150
```

Check on LNXRTR1

root@lnxrtr1:~# /etc/rc.local

root@lnxrtr1:~# iptables -t nat -L -n

```
root@lnxrtr1:~# iptables -t nat -L -n
Chain PREROUTING (policy ACCEPT)
target     prot opt source               destination
DNAT       all  --  0.0.0.0/0            32.54.87.114        to:192.168.10.150

Chain INPUT (policy ACCEPT)
target     prot opt source               destination

Chain OUTPUT (policy ACCEPT)
target     prot opt source               destination

Chain POSTROUTING (policy ACCEPT)
target     prot opt source               destination
SNAT       all  --  192.168.10.150      !172.17.20.0/24       to:32.54.87.114
SNAT       all  --  192.168.10.128/25   !172.17.20.0/24       to:32.54.87.115
SNAT       all  --  172.17.20.0/24      !192.168.10.128/25    to:32.54.87.115
```

이제 NAT를 확인합니다.

Test on LNXRTR1, LNXSRV1, LNXSRV2

먼저 LNXSRV1에서 LNXCLNT1에게 통신을 보냅니다.

root@lnxsrv1:~# **ping 32.54.87.116**

```
root@lnxsrv1:~# ping 32.54.87.116
PING 32.54.87.116 (32.54.87.116) 56(84) bytes of data.
64 bytes from 32.54.87.116: icmp_req=1 ttl=63 time=0.439 ms
64 bytes from 32.54.87.116: icmp_req=2 ttl=63 time=0.625 ms
64 bytes from 32.54.87.116: icmp_req=3 ttl=63 time=0.841 ms
```

LNXRTR1에서 NAT를 확인합니다.

root@lnxrtr1:~# **while true; do clear; tail -10 /proc/net/nf_conntrack | grep icmp; sleep 1; done;**

```
ipv4     2 icmp     1 29 src=192.168.10.150 dst=32.54.87.116 type=8 code=0 id=25
21 src=32.54.87.116 dst=32.54.87.114 type=0 code=0 id=2521 mark=0 zone=0 use=2
```

LNXSRV2 에서도 확인합니다.

root@lnxsrv2:~# **ping 32.54.87.116**

```
root@lnxsrv2:~# ping 32.54.87.116
PING 32.54.87.116 (32.54.87.116) 56(84) bytes of data.
64 bytes from 32.54.87.116: icmp_req=1 ttl=63 time=0.741 ms
64 bytes from 32.54.87.116: icmp_req=2 ttl=63 time=0.775 ms
64 bytes from 32.54.87.116: icmp_req=3 ttl=63 time=0.514 ms
```

root@lnxrtr1:~# **while true; do clear; tail -10 /proc/net/nf_conntrack | grep icmp; sleep 1; done;**

```
ipv4     2 icmp     1 29 src=172.17.20.50 dst=32.54.87.116 type=8 code=0 id=2612
 src=32.54.87.116 dst=32.54.87.115 type=0 code=0 id=2612 mark=0 zone=0 use=2
```

icmp 의 출발지 및 도착지가 위와 같아야 합니다.