Example 3 – DHCP Server and Relay

router2

eth1: 10.0.0.2

pc1

dhcprelay

eth0: 10.2.0.1

LAN A
10.0.0.0/16

10.2.0.2

LAN C
10.2.0.0/16

eth0: 10.0.0.1

LAN B
10.1.0.0/16

eth1: 10.1.0.1

pc2

router1
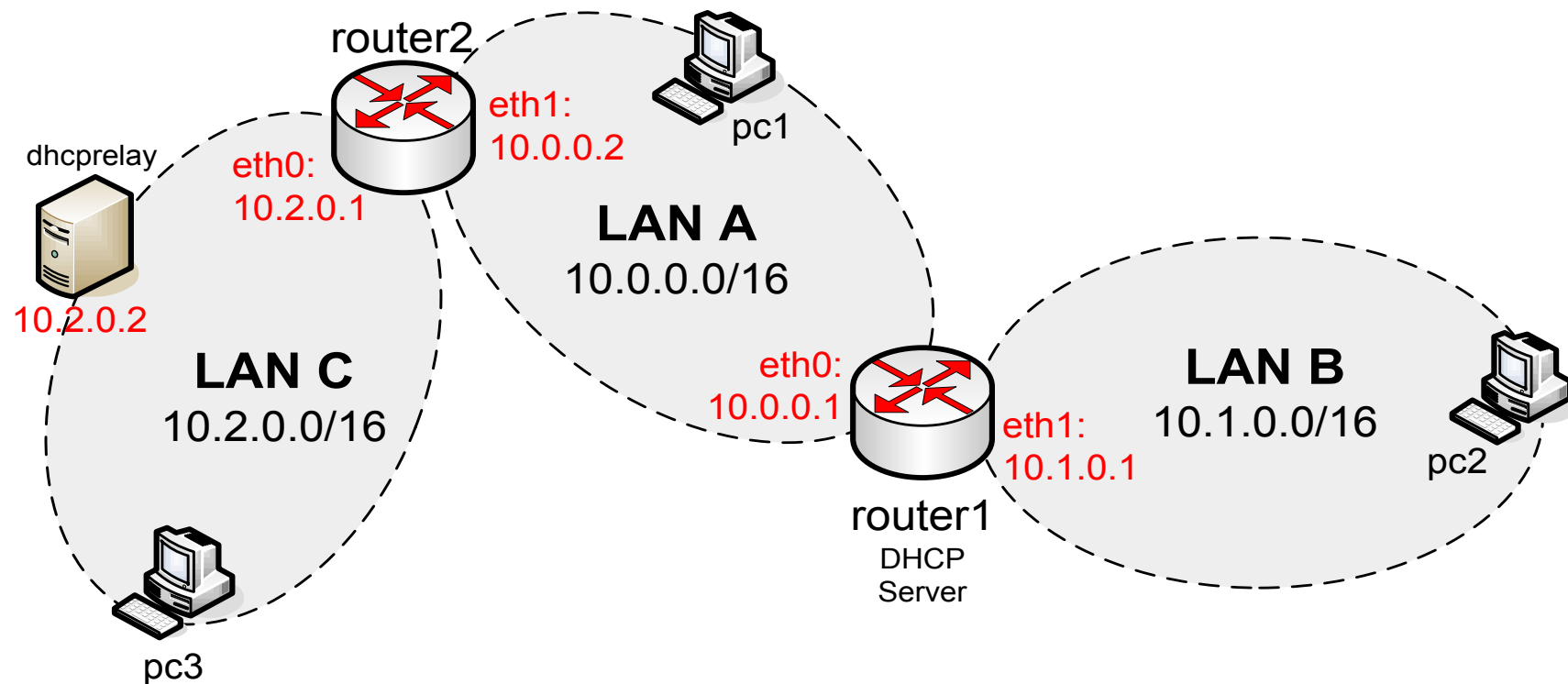DHCP Server

pc3

NOTE – the files for this example are in:
`esercitazione-2010/example3-lab/`
`To start the lab use: ./start_lab`

At first boot the DHCP RELAY won't start...

Example 3 – Lab set-up

lab.conf:
```
router1[0]=A
router1[1]=B
router1[mem]=64

router2[0]=C
router2[1]=A
router2[mem]=64

dhcprelay[0]=C
dhcprelay[mem]=64

pc1[0]=A
pc2[0]=B
pc3[0]=C
```

pc1.startup, pc2.startup, pc3.startup:
```
dhclient eth0
```

Example 3 – Lab set-up

router1.startup:
```
ip link set eth0 up
ip link set eth1 up
ip address add 10.0.0.1/16 dev eth0
ip address add 10.1.0.1/16 dev eth1

ip route add  10.2.0.0/16 via 10.0.0.2

/etc/init.d/dhcp3-server start

echo 1 > /proc/sys/net/ipv4/ip_forward
```

Example 3 – Lab set-up

```
router1/etc/dhcp3/dhcpd.conf:
default-lease-time 3600;

subnet 10.0.0.0 netmask 255.255.0.0 {
      range 10.0.0.100 10.0.0.254;
      option routers 10.0.0.1;
}


subnet 10.1.0.0 netmask 255.255.0.0 {
      range 10.1.0.100 10.1.0.254;
      option routers 10.1.0.1;
}


subnet 10.2.0.0 netmask 255.255.0.0 {
      range 10.2.0.100 10.2.0.254;
      option routers 10.2.0.1;
}
```

Example 3 – Lab set-up

router2.startup:
```
ip link set eth0 up
ip link set eth1 up
ip address add 10.2.0.1/16 dev eth0
ip address add 10.0.0.1/16 dev eth1
ip route add 10.1.0.0/16 via 10.0.0.1


echo 1 > /proc/sys/net/ipv4/ip_forward
```
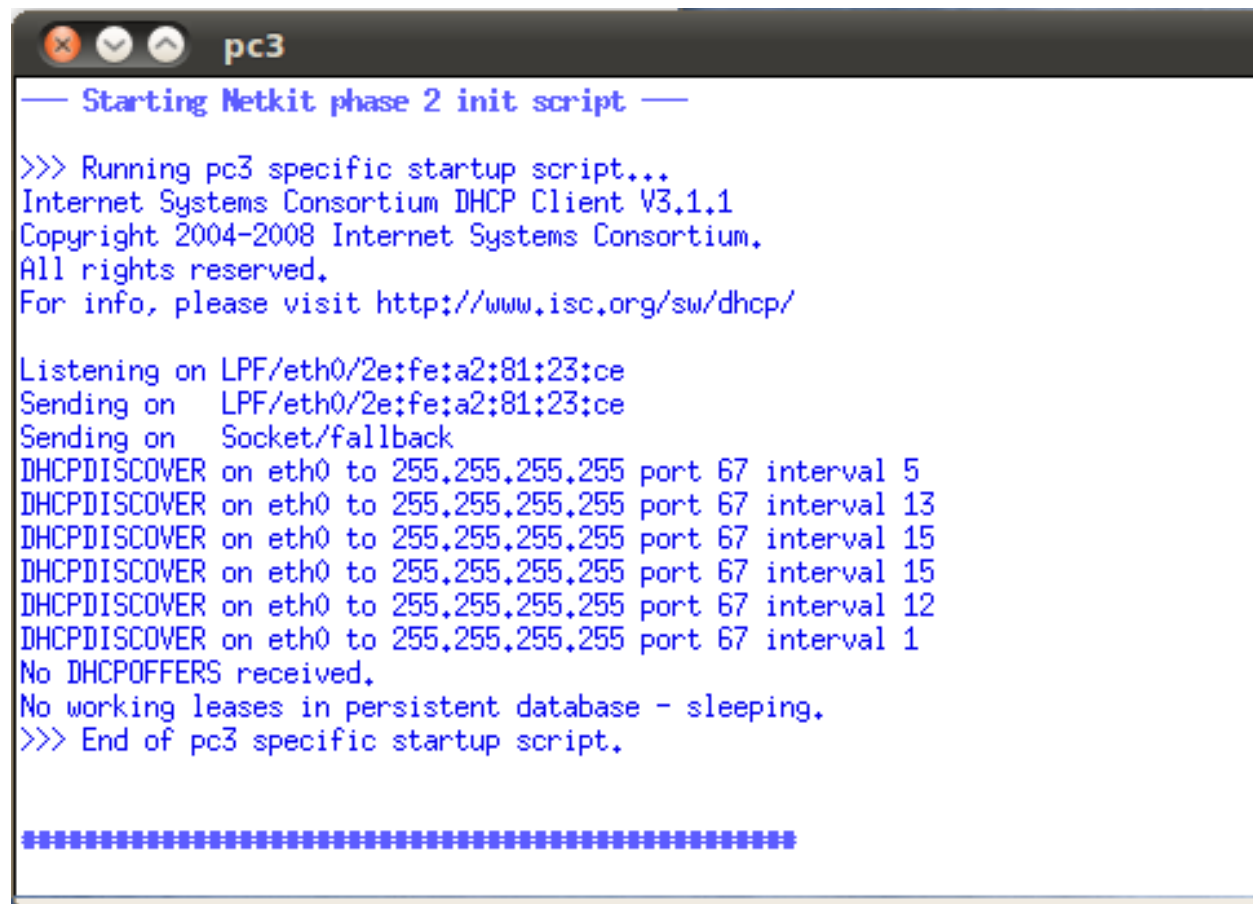
dhcprelay.startup:
```
ip link set eth0 up
ip address add 10.2.0.2/16 dev eth0
ip route add default via 10.2.0.1

#!! No dchp relay configured and run!
```

PC3 couldn't contact DHCP server…

SURE! The DHCP server is not in LAN C and broadcast packets doesn't get through the router….

How to make pc3 get IP configuration from the DHCP server

Install dhcrelay package on dhcprelay VM (the files are in /root).
```
dhcprelay:~# dpkg -i *.deb
(ignore the configuration wizard..)
```

Run dhcrelay manually:
```
dhcprelay:~# dhcrelay -d -i eth0 10.0.0.1
```

```
usage:
dhcrelay [options] DHCP_SERVER_ADDRESS
-i <ifaces>: interface to listen on
-d: don't go in background
```

Run dhcrp client on pc3:
```
pc3:~# dhclient eth0
```
➡ **OK**