DNS and DHCP

DNS Handling in Linux

Start Wireshark and Firefox, capture the DNS request and result for google.com.

Try the following commands and compare with the result DNS message:

`host google.com`   translates name to IP address
`host 142.251.36.110`   translates IP address to name

`nslookup google.com`   translates name to IP address
`nslookup 142.251.36.110`   translates IP address to name

`dig google.com`   translates name to IP address
`dig –x 142.251.36.110`   translates IP address to name

`dig google.com +short`   short output, similar to the `host` command
`dig google.com ANY`   all types of DNS records
`dig google.com AAAA`   only the selected type (A, AAAA, NS, MX, SOA,…)
`dig google.com NS +short`   only the selected type, the short variant

`dig mail.google.com +trace`   list the path of the request and answer

Example Network

Open the dns.pkt file from http://vavreckova.zam.slu.cz/english.html.

IPv4, IPv6, DHCP

Configure IPv4 and IPv6 on R2:

- interface g0/0: the IPv4 address 10.10.0.2, mask 255.255.0.0, activate the interface
- interface g0/0: the IPv6 global address 2001:0:0:10::2/64 and the link-local address fe80::2
- interface g0/1: the IPv4 address 10.30.0.1, mask 255.255.0.0, activate the interface
- interface g0/1: the IPv6 global address 2001:0:0:30::1/64 and the link-local address fe80::2
- set the IPv6 unicast routing
- set the IPv4 static route 0.0.0.0 0.0.0.0 leading to the g0/0 interface
- set the IPv6 static route ::/0 leading to the g0/0 interface

Configure DHCPv4 on R2 for 10.30.0.0/16:

```
ip dhcp excluded-address 10.30.0.1 10.30.0.9
ip dhcp pool LAN-POOL
      network 10.30.0.0 255.255.0.0
      default-router 10.30.0.1
      dns-server 10.20.0.9
      end
show running-config
```

PC0 gets its IP address by DHCP. Check the obtained IP address.

Check this information on R2:

```
show ip dhcp binding
```

Configure SLAAC on R2 for 2001:0:0:30::/64:

```
ipv6 dhcp pool IPV6-SLAAC
      dns-server 2001:0:0:20::9
      exit
int g0/1
```

```
        ipv6 dhcp server IPV6-SLAAC
        ipv6 nd other-config-flag
        end
sh run
sh ipv6 dhcp binding
```

Check if PC0 gets its IPv6 address using the autoconfiguration.

Add new device (e.g. laptop) to the example network, connect it to the f0/2 port of S2. What IPv4 and IPv6 address did this device get?

DNS

There is one DNS server in our network. Check its configuration (the "Services" tab, the DNS service). What names are listed here? What server names are missing? Add them into the DNS database.

Does PC0 get the DNS server address by DHCP?

Ping the names of various servers from PC0.

Simple Resolver in Router

Router R1: provide the following commands:

```
ip host mycloud 10.20.0.10
ipv6 host r2 2001:0:0:10::2
```

Ping the given names.