Arquitetura de Redes

Laboratory Guide

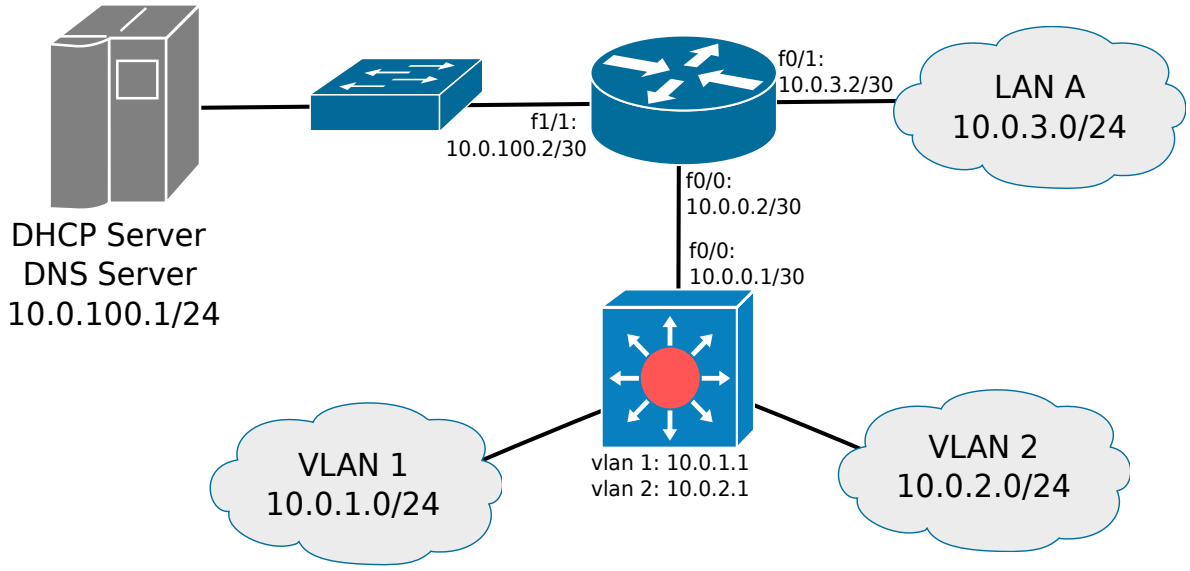
Objectives

- Deployment of a DHCP server
- Deployment of a DNS server

DHCP

1. Construct the network below, using as DHCP server a Debian server. Configure all static IPv4 addresses (Servers, Router and SWL3 interfaces) and deploy a routing mechanism. Test full connectivity between devices before proceeding.

Important: A wrongly (or forgotten) active DHCP server in a network can create severe connection issues to users. After this guide, disable or uninstall the DHCP server.



2. At the DHCP server, install package isc-dhcp-server: `apt-get install isc-dhcp-server`
Edit file /etc/default/isc-dhcp-server to define the interfaces where DHCP messages are received:

```
INTERFACES="eth0"
```

Edit file /etc/dhcp/dhcpd.com to create IPv4 address pools to all (V)LAN:

```
option domain-name-servers 10.0.100.1;
subnet 10.0.1.0 netmask 255.255.255.0 {
  range 10.0.1.10 10.0.1.200;
  option routers 10.0.1.1;}
subnet 10.0.2.0 netmask 255.255.255.0 {
  range 10.0.2.10 10.0.2.200;
  option routers 10.0.2.1;}
subnet 10.0.3.0 netmask 255.255.255.0 {
  range 10.0.3.10 10.0.3.200;
  option routers 10.0.3.2;}
subnet 10.0.100.0 netmask 255.255.255.0 {
  range 10.0.100.10 10.0.100.200;
  option routers 10.0.100.2;}
```

(Re)Start the DHCP server: `sudo service isc-dhcp-server restart`
Check the file /var/log/syslog to inspect and solve possible errors.

3. At all L3 interfaces of Routers/SWL3 configure the DHCP relay agent to send DHCP requests to the central DHCP server:

```
Router(config)# interface vlan 1
Router(config-if)# ip helper-address 10.0.100.1
```

4. Activate DHCP in interfaces of all (V)LAN terminal devices. Check the obtained IPv4 addresses.

5. Repeat steps 1 to 4 for IPv6.

DNS

6. At the DNS server, install package bind9: `apt-get install bind9`
Assuming that you own the domain **ar.com** configure your DNS server to act as a master server (zone) for that domain. Start by creating the definition of the zone with the associated *statements* (zone specific parameters), edit the file /etc/bind/named.conf.local (with root privileges) and add the following definition:

```
zone "ar.com" in{
   type master;                  //statement to define the zone as master
   file "/etc/bind/db.ar.com";          //location of the zone file with the records
};
```

Create the file /etc/bind/db.ar.com (with root privileges) and add the following contents:

```
$TTL   604800
$ORIGIN grupo1ar.com.
@      IN     SOA    ns1.ar.com. adm.ar.com. (
                           2             ; Serial
                      604800             ; Refresh
                       86400             ; Retry
                     2419200             ; Expire
                      604800 )     ; Negative Cache TTL
       IN     NS     ns1.ar.com.
       IN     A      10.0.100.1
v1sw1  IN     A      10.0.1.1
vlsw1  IN     AAAA   2001:0:1::1
       IN     MX     10     server1
ns1    IN     A      10.0.100.1
server1       IN     A      10.0.100.1
server2 IN    CNAME  server1
```

Verify if your zone file it is correctly defined:

```
 named-checkzone ar.com db.ar.com
```

Restart your DNS server:

```
 service bind9 restart
```

Using a Linux terminal, test the configuration of your DNS by performing the following DNS queries:

```
 dig @10.0.100.1 ar.com
 dig @10.0.100.1 v1sw1.ar.com
 dig @10.0.100.1 v1sw1.ar.com AAAA
 dig @10.0.100.1 server1.ar.com
 dig @10.0.100.1 server2.ar.com
 dig @10.0.100.1 ar.com MX
```

Analyze the output of the dig commands.

7. Add a zone to configure the IPv4 reverse DNS mapping of your domain. Add to /etc/bind/named.conf.local the following zone definition:

```
zone "1.0.10.in-addr.arpa" in{
  type master;
  file "/etc/bind/db.10.0.1.rev"; };
```

Create the file /etc/bind/db.10.0.1.rev (with root privileges) and add the following contents:

```
$TTL   604800
$ORIGIN 1.0.10.in-addr.arpa.
@      IN     SOA    ns1.ar.com. adm.ar.com. (
                           2             ; Serial
                      604800             ; Refresh
                       86400             ; Retry
                     2419200             ; Expire
                      604800 )     ; Negative Cache TTL
              IN      NS      ns1.ar.com.
1              IN      PTR     v1sw1.ar.com. ; qualified name
11             IN      PTR     vlan1-11.ar.com.
12             IN      PTR     vlan1-12.ar.com.
```

Restart your DNS server:

```
service bind9 restart
```

Using your PC, test your configuration with the commands:

```
host 10.1.0.1 10.0.100.1
host 10.1.0.2 10.0.100.1
```