

## SEE 6DISS – Section C – Applications Hands-on

Athanasios Liakopoulos

[aliako@grnet.gr](mailto:aliako@grnet.gr)

## 1. Lab information

**Network Topology**

The network topology is shown in Figure 1. PCs belong to different VLANs, each of them having a different IPv6 address prefix. For example, the first three routers in the 2<sup>nd</sup> row belong in the VLAN 3 and use the 2001:648:E000:3::/64 address space.

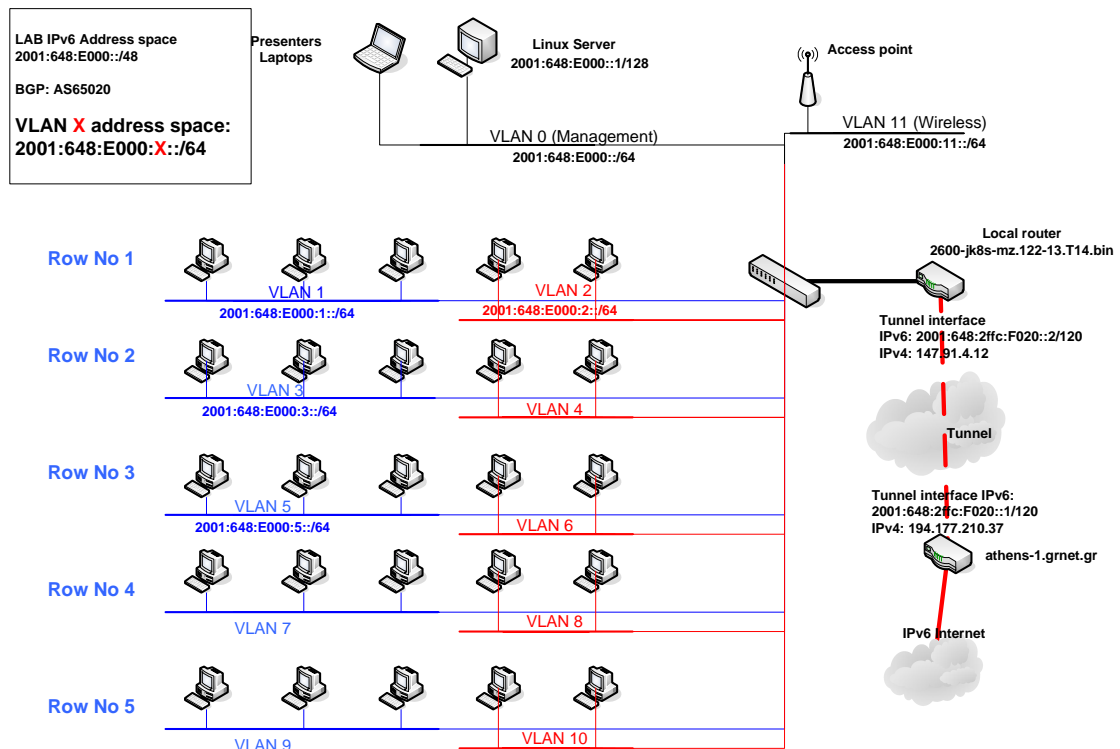


Figure 1: Lab topology

**Linux Server**

A PC having Scientific Linux 4.2 (<https://www.scientificlinux.org/>) is running BIND 9.2.4 (<http://www.isc.org/sw/bind/>). Access to the linux server is allowed via SSH (port 22) at the address 2001:648:E000::1/64<sup>1</sup> using the **login/password: see6diss/see6diss**.

<sup>1</sup> IPv6 address/network

## Exercise A: IPv6 DNS

### Objectives

There are IPv4 DNS (A, PTR) entries in the `/var/named/` directory for all lab PCs. Students are asked to create the relevant IPv6 DNS (AAAA, PTR) entries. (Students should have basic knowledge of BIND/DNS!)

### DNS configuration basics

The DNS server is configured via the `/etc/named.conf` file. The “forward- or reverse-zone” files that contain the DNS entries are defined in the `/etc/named.conf` via the following syntax:

```
zone "testbed.6diss.org" in {
    type master;
    file "db.6diss";
};
zone "10.10.10.in-addr.arpa" in {
    type master;
    file "db.10.10.10";
};
```

In order to add IPv6 DNS entries for PCs belong in VLAN **X**, the zone file `db.6diss2` and the reverse-zone `db.X.E000.648.2001` have to be created. (The file `/etc/named.conf` already contains the appropriate entries.)

```
zone "testbed.6dissX.org" in {
    type master;
    file "db.6dissX";
};
zone "X.0.0.0.0.0.0.E.8.4.6.0.1.0.0.2.ip6.arpa" in {
    type master;
    file "db.X.E000.648.2001";
};
```

### Exercises steps

1. Create and populate the files `"testbed.6dissX.org"` and `"X.0.0.0.0.0.0.E.8.4.6.0.1.0.0.2.ip6.arpa"`
  - (Tip: See configuration examples at the end of the document)
2. Validate the configuration files using the command “`named-checkzone`”
  - (Tip (example): `# named-checkzone testbed.6diss1.org db.6diss1`)
3. Restart DNS server

<sup>2</sup> The IPv4 and IPv6 forward zone files could be the same. However, in the 6DISS training the forward-zone files for IPv4 and IPv6 are separated in order to allow different groups to create their own configuration.

- (Tip: `kill -HUP `cat /var/run/named/named.pid``. Note that in order to restart the DNS server, root privileges are required. Therefore, DNS named will be restarted on demand by the tutors!)
4. Check DNS server logs
    - (Tip: `grep named /var/log/messages`)
  5. Validate DNS queries using your lab PC. Do the same using the local linux server. What is the transport protocol for the DNS queries?
    - (Tip: Use the `nslookup` and change the DNS server to 213.240.38.90 )
  6. Use IPv6 as DNS queries transport protocol. What is the problem in the DNS queries at the lab PC? Is there the same problem in DNS queries in the Linux machine?
    - (Tip: Use the `nslookup` and change the DNS server to 2001:648:E000::1 )

## **Exercise B: Examples of IPv6 applications**

### ***Objectives***

Lab participants are asked to use simple IPv6 applications and verify their proper operation.

### ***Exercises steps***

1. Access a IPv6 web site and capture traffic using `ethereal` tool
2. Access an AS Path web site. Find the number of IPv6 AS numbers and the number of routing entries in the IPv6 routing table. Identify the IPv6 upstream provider for SEEREN network. What is worth noticing?
  - (Tip: `http://www.join.uni-muenster.de/bgp/bgp.html`)
3. Use a Looking Glass web site. Identify the same information as in previous step.
  - (Tip (example): `http://http://netmon.grnet.gr/lg.shtml`)





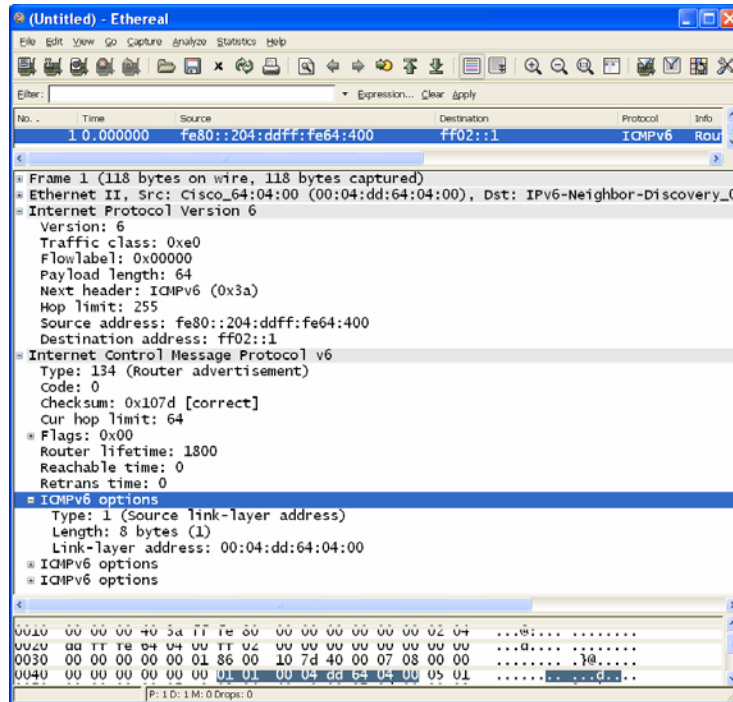


Figure 3: Ethereal interface

(Tip: Use the filter “ip6” to show only IPv6 packets, “icmpv6.code==0” to show ICMP packets of specific code or “http” to show HTTP traffic.)

### **Lab specifications**

PCs are running WinXP (SP2) while Ethereal Version 0.10.13 is installed. Router is an Cisco 2610 using 2600-jk8s-mz.122-13.T14.bin IOS.