Exercise 2
IPv6 on hosts

Computer Network Technologies and Services (CNTS)
Tecnologie e Servizi di Rete (TSR)

1 IPv6 network configuration

The IPv6 protocol is installed under Windows XP. A router is connected to the laboratory LAN and IPv6 Router Advertisement is enabled.

The objectives of this exercise is to understand IPv6 host configuration mechanism, capture and analyse IPv6 traffic.

1.1 Useful Notes

- In order to capture the network traffic, you have to run the WireShark network analyzer. Documentation is available at http://www.wireshark.org/docs/.

  ATTENTION! You need to select the physical interface. Other interfaces are not correct.

- Open the Command Line Terminal: Start -> Execute..., type cmd and click OK

  Commands to use in the CLI are netsh, ipv6 and ipconfig

  References:
  netsh:
  ipv6:
  ipconfig:
Lab2: Answer the Questions

1. Identify and write the available interface at your PC. Identify which of these interfaces are related to IPv6 and tunneling (do not consider Virtual Machines interfaces). Briefly describe the functionalities of each interface and the differences among tunneling technologies. Run the the following commands from the CLI:

   - `ipconfig /all`
   - `netsh interface ipv6 show interface`
   - `ipv6 -v if`
2. Identify all the IPv6 addresses (link local, public addresses, ...) of the LAN interface

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<thead>
<tr>
<th>Link local</th>
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<td>Auto-configuration IPv6 address</td>
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<td>IPv6 address due to privacy extension</td>
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3. Briefly describe the differences among the usage of the addresses identified in the previous answer.

4. Identify the validity of addresses (Tip: Use the command `netsh interface ipv6 show address <interface identifier>`). Can you find the same information inside the captured packets?

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5. Capture, analyze and write the most significant fields of ping/traceroute messages to IPv6 hosts

- Ping other addresses in the LADISPE LAN (using link-local and global addresses)
- Ping the IPv6 localhost address (::1) (due to driver limitations, capture works only in Unix OS)

6. Identify the local router address. Run the command “netsh interface ipv6 show address show neighbors”. Can you find the same information inside the captured packets?
7. Run the ... show neighbors command. Describe the difference among Permanent, Stale and Reachable addresses.

8. Analyze the capture and briefly describe the operating principles of the auto-configuration procedure of the IPv6 address (Router Advertisement/Router Solicitation). Which IPv6 address is used when communicating?
9. Analyze the capture and briefly describe the operating principles of the Neighbor Discovery Protocol (specially Neighbor Solicitation/Neighbor Advertisement messages). Which IPv6 address is used when communicating?