

Advanced Computer Networking (ACN)

Exercise 2 – Wireshark, Spanning Tree and Traceroute

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Tutorial 2

Deadlines

Problem 1: Wireshark

Problem 2: Spanning Tree Protocol

Problem 3: Traceroute

Deadlines

Start	November 9, 16:00
First submission	November 16, 14:00
Exercise lecture	November 16, 14:00
Second submission	November 23, 14:00

Availability

- Available **after** the lecture in the template Git (branch: tutorial)
 - `tutorial/tutorial2/tutorial2.ipynb`

Tutorial 2

Problem 1: Wireshark

- Highly relevant for the exam
- **Goal:** understand how network traffic is parsed
- You will write functions to parse Ethernet frames containing IPv4 and IPv6 packets

Frame with IPv4 packet:

```
FC E9 98 97 EC EA 44 D9 E7 00 40 01 08 00 45 00
00 38 00 00 00 00 F1 01 8C 2B 3E 9A 59 2E AC 13
F9 BD 0B 00 BF 50 00 00 00 00 45 00 00 3C 15 B2
00 00 01 11 EA 81 AC 13 F9 BD 81 BB 91 F1 D4 0F
82 BE 00 28 DE B8
```

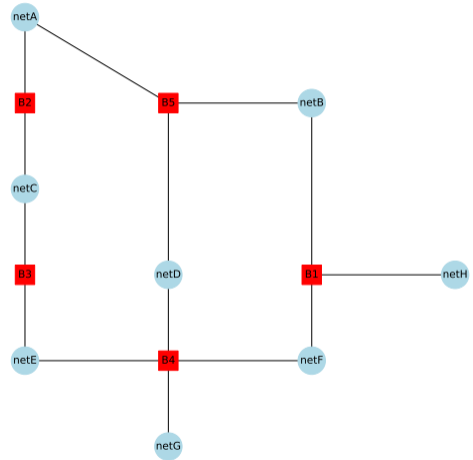
Frame with IPv6 packet:

```
33 33 FF D7 6D A0 00 25 90 54 73 9A 86 DD 60 00
00 00 00 20 3A FF FE 80 00 00 00 00 00 00 02 25
90 FF FE 54 73 9A FF 02 00 00 00 00 00 00 00 00
00 01 FF D7 6D A0 87 00 19 C9 00 00 00 00 20 01
4C A0 20 01 00 11 02 25 90 FF FE D7 6D A0 01 01
00 25 90 54 73 9A
```

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Problem 2: Spanning Tree Protocol

- Understand the difference between Minimum Spanning Tree (MST) and Shortest Path Tree (SPT)
- Run the Spanning-Tree-Protocol (STP) on a simple topology
- Learn how the STP reacts on node failure



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Problem 3: Traceroute

- Explain how the network analysis tool traceroute works
- Analyze the output of a traceroute
- Visualize the data using matplotlib

```
traceroute to ufrj.br (146.164.84.216), 64 hops max, 52 byte packets
 0 131.159.20.11 0.182 ms 0.154 ms 0.155 ms
 1 131.159.252.148 0.324 ms 0.384 ms 0.372 ms
 2 131.159.252.6 0.792 ms 1.023 ms 1.283 ms
 3 188.1.37.89 1.071 ms 1.096 ms 1.182 ms
 4 188.1.145.229 9.473 ms 9.492 ms 9.549 ms
 5 62.40.124.217 9.411 ms 9.326 ms 9.302 ms
 6 62.40.98.181 17.755 ms 17.725 ms 17.675 ms
 7 62.40.98.66 37.304 ms 37.376 ms 37.211 ms
 8 62.40.98.96 46.609 ms 46.620 ms 46.772 ms
 9 62.40.127.151 108.948 ms 108.921 ms 108.893 ms
10 . . .
11 146.164.84.216 161.794 ms 161.708 ms 161.552 ms
```