Communication Networks 2

SS 2017

Assignment X

Group Y

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1 Network Hierarchy Recovery

```
traceroute to landline.cn2lab.cn.tuwien.ac.at (10.1.6.110), 30 hops max, 60 byte packets
 1  border.cn2lab.cn.tuwien.ac.at (192.168.88.2)  6.382 ms  6.279 ms  6.259 ms
 2  10.0.20.1 (10.0.20.1)  322.040 ms  326.126 ms  326.109 ms
 3  landline.cn2lab.cn.tuwien.ac.at (10.1.6.110)  326.091 ms  326.073 ms  326.055 ms


traceroute to satellite.cn2lab.cn.tuwien.ac.at (10.1.7.123), 30 hops max, 60 byte packets
 1  border.cn2lab.cn.tuwien.ac.at (192.168.88.2)  3.160 ms  3.286 ms  3.250 ms
 2  10.0.20.1 (10.0.20.1)  155.870 ms  160.159 ms  161.802 ms
 3  10.0.84.2 (10.0.84.2)  2685.357 ms  2692.193 ms  2692.169 ms
 4  satellite.cn2lab.cn.tuwien.ac.at (10.1.7.123)  2692.266 ms  2692.375 ms  2692.533 ms


CN_08@pc05:~$ ip -6 neigh
fe80::1ec1:deff:fe80:3261 dev eno1 lladdr 1c:c1:de:80:32:61 router REACHABLE
2001:629:2600:a018::2 dev eno1 lladdr 72:8f:5d:f9:92:6f router STALE
fe80::708f:5dff:fef9:926f dev eno1 lladdr 72:8f:5d:f9:92:6f router STALE
2001:629:2600:a018::1 dev eno1 lladdr 1c:c1:de:80:32:61 router STALE
CN_08@pc05:~$ ip -4 neigh
192.168.88.2 dev eno1 lladdr 72:8f:5d:f9:92:6f REACHABLE
192.168.88.1 dev eno1 lladdr 1c:c1:de:80:32:61 REACHABLE


traceroute to 10.0.84.2 (10.0.84.2), 30 hops max, 60 byte packets
 1  * * *
 2  10.0.20.1 (10.0.20.1)  165.113 ms  165.100 ms  165.091 ms
 3  10.0.84.2 (10.0.84.2)  955.090 ms  955.082 ms  971.120 ms


Nmap scan report for 10.0.20.2
Nmap scan report for 10.0.84.1
Nmap scan report for 10.0.212.1
Nmap scan report for 10.0.212.52


CN_08@pc17:~/Downloads/Assignments/3_Assignment$ traceroute 10.0.212.52
traceroute to 10.0.212.52 (10.0.212.52), 30 hops max, 60 byte packets
 1  border.cn2lab.cn.tuwien.ac.at (192.168.88.2)  3.046 ms  3.075 ms  3.323 ms
 2  10.0.212.52 (10.0.212.52)  3.291 ms  3.242 ms  3.207 ms
CN_08@pc17:~/Downloads/Assignments/3_Assignment$ traceroute 10.0.212.1
traceroute to 10.0.212.1 (10.0.212.1), 30 hops max, 60 byte packets
 1  10.0.212.1 (10.0.212.1)  2.846 ms  2.910 ms  3.269 ms
```

```
CN_08@pc17:~/Downloads/Assignments/3_Assignment$ traceroute 10.0.84.1
traceroute to 10.0.84.1 (10.0.84.1), 30 hops max, 60 byte packets
 1  10.0.84.1 (10.0.84.1)  3.296 ms  3.208 ms  3.172 ms
CN_08@pc17:~/Downloads/Assignments/3_Assignment$ traceroute 10.0.20.2
traceroute to 10.0.20.2 (10.0.20.2), 30 hops max, 60 byte packets
 1  10.0.20.2 (10.0.20.2)  3.098 ms  3.132 ms  3.117 ms
```

Own address: 192.168.88.117

```
CN_08@pc17:~/Downloads/Assignments/3_Assignment$ ip route get 10.0.212.52
10.0.212.52 via 192.168.88.2 dev eno1 src 192.168.88.117 uid 5007
    cache
CN_08@pc17:~/Downloads/Assignments/3_Assignment$ ip route get 10.0.212.1
10.0.212.1 via 192.168.88.2 dev eno1 src 192.168.88.117 uid 5007
    cache
CN_08@pc17:~/Downloads/Assignments/3_Assignment$ ip route get 10.0.84.1
10.0.84.1 via 192.168.88.2 dev eno1 src 192.168.88.117 uid 5007
    cache
CN_08@pc17:~/Downloads/Assignments/3_Assignment$ ip route get 10.0.20.1
10.0.20.1 via 192.168.88.2 dev eno1 src 192.168.88.117 uid 5007
    cache
```

```
ping -4 landline.cn2lab.cn.tuwien.ac.at
PING landline.cn2lab.cn.tuwien.ac.at (10.1.6.110) 56(84) bytes of data.
64 bytes from landline.cn2lab.cn.tuwien.ac.at (10.1.6.110): icmp_seq=1 ttl=62 time=158 ms
```

```
ping -4 satellite.cn2lab.cn.tuwien.ac.at
PING satellite.cn2lab.cn.tuwien.ac.at (10.1.7.123) 56(84) bytes of data.
64 bytes from satellite.cn2lab.cn.tuwien.ac.at (10.1.7.123): icmp_seq=1 ttl=62 time=949 m
```

```
ip route get 10.1.6.110
10.1.6.110 via 192.168.88.2 dev eno1 src 192.168.88.117 uid 5007
    cache
```

```
ip route get 10.1.7.123
10.1.7.123 via 192.168.88.2 dev eno1 src 192.168.88.117 uid 5007
    cache
```

```
traceroute 10.1.6.110
traceroute to 10.1.6.110 (10.1.6.110), 30 hops max, 60 byte packets
 1  border.cn2lab.cn.tuwien.ac.at (192.168.88.2)  3.027 ms  3.193 ms  3.150 ms
 2  10.0.20.1 (10.0.20.1)  157.531 ms  160.582 ms  160.824 ms
 3  landline.cn2lab.cn.tuwien.ac.at (10.1.6.110)  163.504 ms  163.498 ms  163.624 ms
```

```
traceroute 10.1.7.123
traceroute to 10.1.7.123 (10.1.7.123), 30 hops max, 60 byte packets
 1  border.cn2lab.cn.tuwien.ac.at (192.168.88.2)  3.291 ms  3.208 ms  3.175 ms
 2  10.0.20.1 (10.0.20.1)  158.759 ms  164.016 ms  163.994 ms
 3  10.0.84.2 (10.0.84.2)  977.978 ms  977.956 ms  979.547 ms
 4  satellite.cn2lab.cn.tuwien.ac.at (10.1.7.123)  981.655 ms  981.633 ms  981.663 ms
```

```
ip route list
default via 192.168.88.1 dev eno1
10.0.0.0/8 via 192.168.88.2 dev eno1 onlink
192.168.88.0/24 dev eno1 proto kernel scope link src 192.168.88.117
```

2 Deliverables

2.1 Description of the solution

We used `nmap` to scan the network for hosts that would reply to pings. The other /16 IP addresses are ruled out by looking at the output of traceroute, i.e. which IPs act as routers and which act as hosts. We are operating on the Ethernet Layer in the local network, so packets are routed based on the MAC address (that is why the MAC Address doesn't change when a packet is routed to a different network).

If no hops occour between our host and a remote, we can make the assumption that they may be the same node. Only one hop and the same network therefore mean that this is the same node.

2.2 IP of the discovered host

```
Nmap scan report for 10.0.212.52
```

2.3 Network diagram

At home

2.4 Routing tables of the routers

See routing table / create from it

2.5 Measured network parameters

2.6 Graphical representation of the measured data (e.g. Histogram, CDF, ...)

2.7 Discussion of the results, comparing with the results from assignment 2

2.8 TITLE SUBSECTION

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

3 TITLE 2

With vspace, you can add vertical empty space for formatting purposes (which should only be used as a last resort):

The following text is now shifted vertically for one centimeter

- Please use the *itemize* environment for better and clear representation of

Listing 1: Code for adding a picture

```
\begin{figure}[ht]
 \centering
 \includegraphics[height=6cm]{images/loremipsum.png}
 \caption{Descriptive text.}
 \label{fig:lorem}
\end{figure}
```

- your results

1. Also you can use the *enumerate* environment for
2. representing the sub-examples

As can be seen in **??**, tables can also be useful.

4 TITLE 3

You can add graphics with the code example in **??**. The result can be seen in **??**.

Hint: if you add references to items, then LaTeXneeds to be executed two times. The first run is for writing down every reference and the second run for actually outputting the correct reference instead of `\cref{XX}`. If your document contains ?? instead of a reference, you forgot the second compile run.

Table 1: Routing table for network A

router	**destination**	**via**
r1	10.1.2.0/24	10.3.2.1
r1	10.2.1.0/24	10.3.2.1
r1	10.5.3.0/24	10.0.2.1
r2	10.0.3.0/24	10.5.2.1
r3	10.3.0.0/24	10.3.4.1

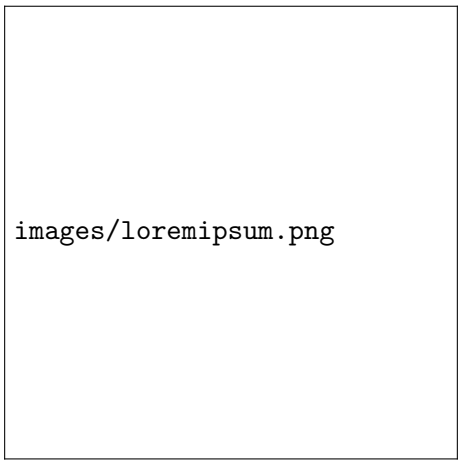

Figure 1: Don't forget to find a fitting caption for your graphics.