

# Netværks aflevering

## Opgave 49. OSPF routing protocol. Physical in Lab.



.....

University College

Forfatter

Noah Christian Rosenkjær

[ncro58767@edu.ucl.dk](mailto:ncro58767@edu.ucl.dk)

## Table of Contents

1. Introduktion.....	3
2. Publikum.....	3
3. Udstyrsliste.....	3
4. Fremgangsmåde.....	4
1. Draw a HLD with explanation.....	4
2. Put HLD and Configurations on GitHub.....	4
3. Build the setup and list R5 routing table and explain what routes are learned via OSPF and how that is indicated in the table.....	5
4. Draw the route from R1 to 10.10.12.0/28 in on the HLD with explanation.....	6
5. Add a computer to 10.10.11.0/28 in the design and implement the computer physically in the network. Make sure the computer can ping all router interfaces.....	7
6. Use the computer to Wireshark OSPF communication when doing the following items. Note what is observed in terms of OSPF communication when doing the items.....	8
1. Prove that R1 can ping all interfaces on 10.10.12.0/28.....	8
2. Disconnect the interface on R1 with the active route to 10.10.12.0 and show that R1 can still ping all interfaces on 10.10.12.0.....	9
3. List R1 routing table again and explain if OSPF automatically did rerouting when disconnecting the active route interface.....	9
5. Konklusion.....	10

# 1. Introduktion

Denne dokumentation er blevet udarbejdet som en del af første semester af IT-Teknologuddannelsen på UCL Erhvervs- og Professionsskolen i Odense. Den har til formål at besvare opgaverne, der er opstillet i assignment 49. De instruktioner der bliver givet, vil til dels blive angivet i tekstformat og med tilhørende billeder, når der er vigtige instrukser eller ændringer der skal foretages. Hvis det er enkelte instrukser, vil der normalt kun være tekstbaseret instruks. Den fulde instruktion er skrevet på alment dansk uden komplicerede fagtekniske begreber.

# 2. Publikum

Denne dokumentations målgruppe er primært IT-teknolog studerende. Der krav til at brugeren har kendskab til følgende:

- Brug af VMware Workstation
- Brug af ping funktionalitet.
- Netværkskonfiguration

# 3. Udstyrsliste

## **Hardware:**

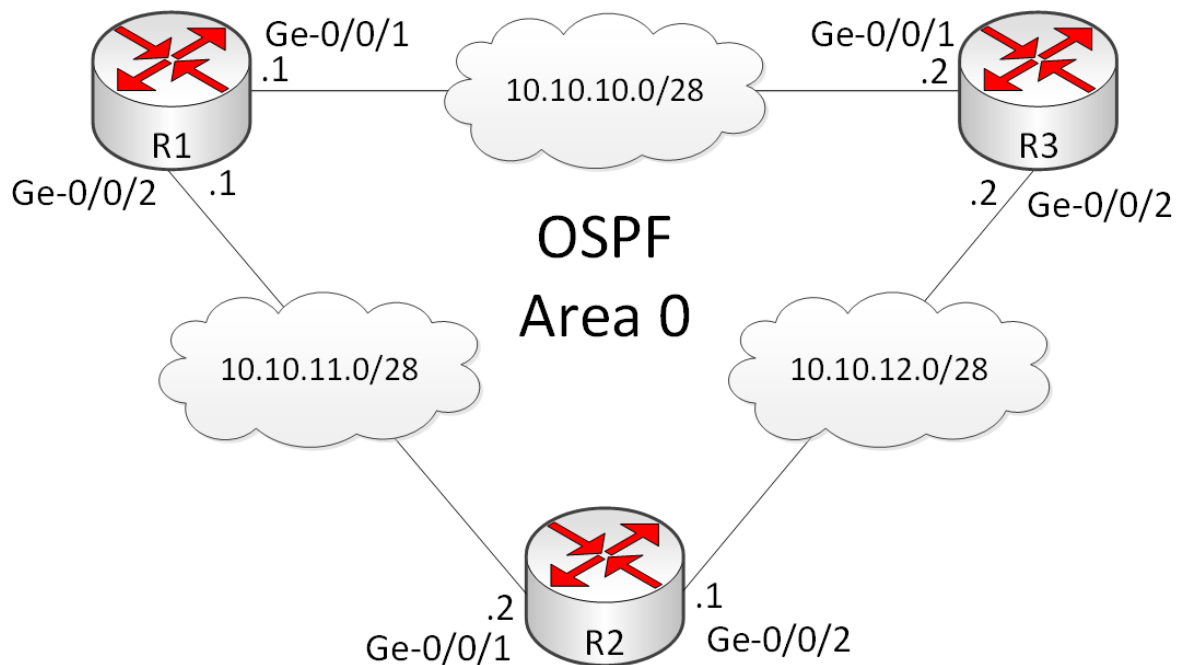
- Computer/Bærbar m. Windows 10/11 og VMware Workstation
- SRX router/firewall

## **Software:**

- Xubuntu Linux

## 4. Fremgangsmåde

### 1. Draw a HLD with explanation



Her et High level diagram af 3 SRX routers, som er sat op med OSPF.

### 2. Put HLD and Configurations on GitHub.

[Link til GitHub](#)

### 3. Build the setup and list R5 routing table and explain what routes are learned via OSPF and how that is indicated in the table.

Run: show route terse

```
root@R1> show route terse

inet.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf    Metric 1    Metric 2    Next hop      AS path
* 10.10.10.0/28     D   0                >ge-0/0/1.0
* 10.10.10.1/32     L   0                Local
* 10.10.11.0/28     D   0                >ge-0/0/2.0
* 10.10.11.1/32     L   0                Local
* 10.10.12.0/28     O  10             2          >10.10.10.2
                                   10.10.11.2
* 224.0.0.5/32      O  10             1          MultiRecv
```

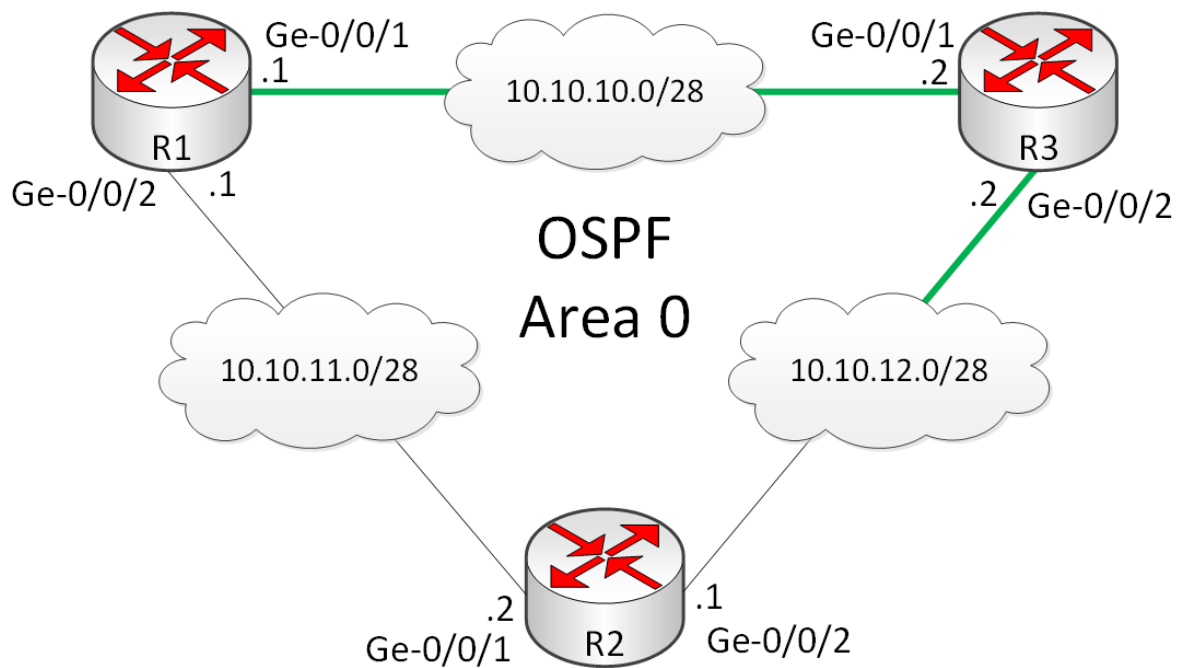
Run: show route protocol ospf

```
root@R1> show route protocol ospf

inet.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.10.12.0/28      *[OSPF/10] 00:16:58, metric 2
                   > to 10.10.10.2 via ge-0/0/1.0
                   to 10.10.11.2 via ge-0/0/2.0
224.0.0.5/32       *[OSPF/10] 00:19:50, metric 1
                   MultiRecv
```

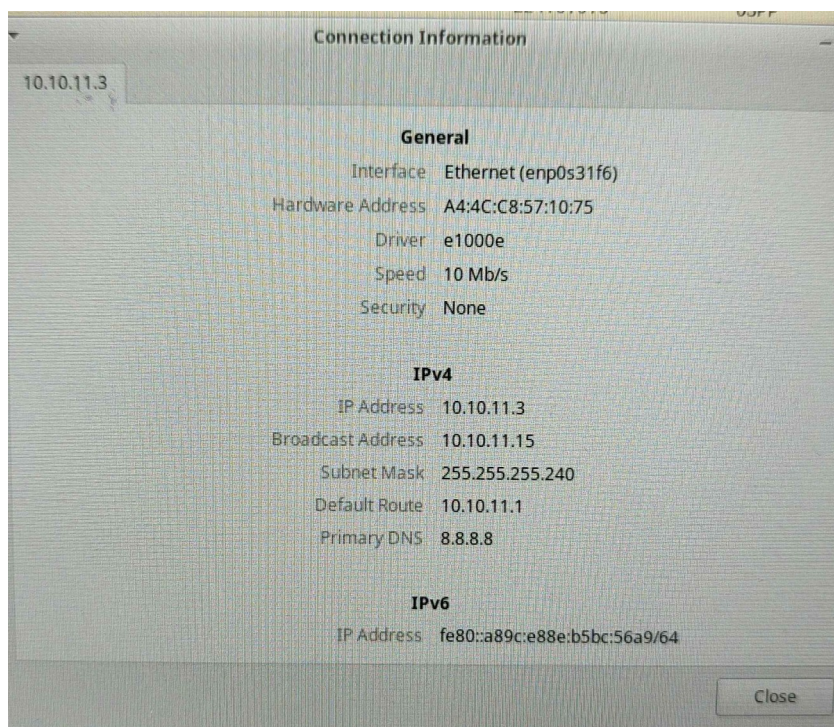
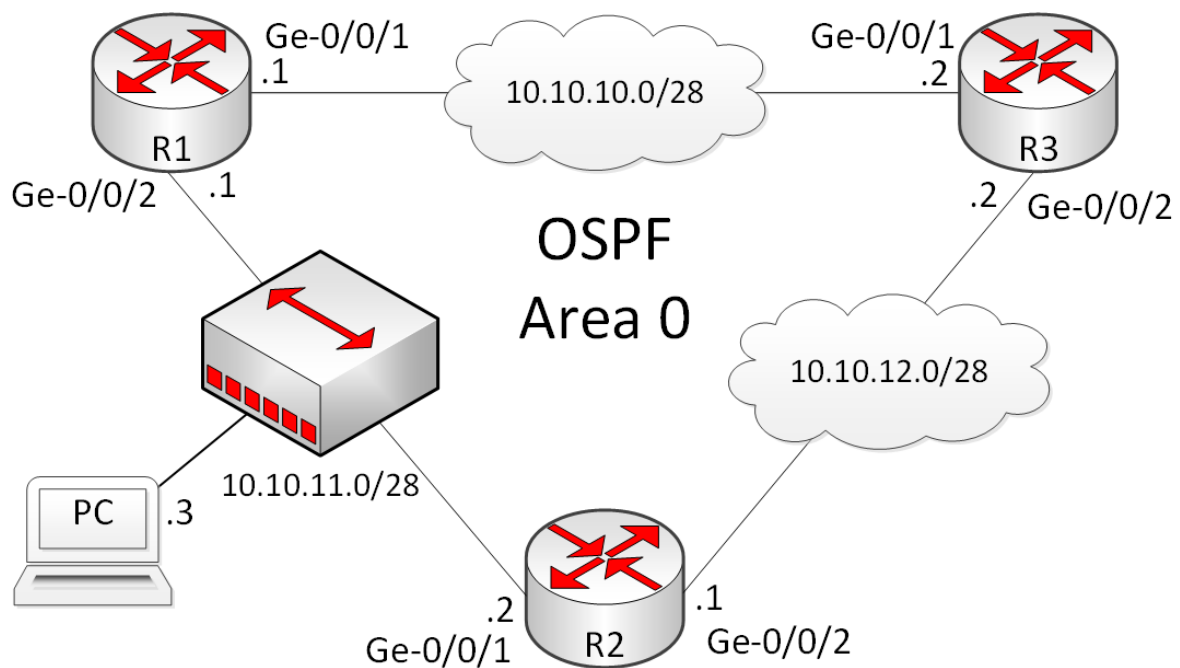
4. Draw the route from R1 to 10.10.12.0/28 in on the HLD with explanation.



Det kan ses af de overstående screenshots at OSPF har valgt den aktive vej til at være ud ad ge-0/0/1 og gennem 10.10.10.0/28 subnettet.

5. Add a computer to 10.10.11.0/28 in the design and implement the computer physically in the network. Make sure the computer can ping all router interfaces.

The PC was connected using a hub like so:



6. Use the computer to Wireshark OSPF communication when doing the following items. Note what is observed in terms of OSPF communication when doing the items.

1. Prove that R1 can ping all interfaces on 10.10.12.0/28.

Ping R2 on 10.10.12.1

```
root@R1> ping 10.10.12.1
PING 10.10.12.1 (10.10.12.1): 56 data bytes
64 bytes from 10.10.12.1: icmp_seq=0 ttl=63 time=2.177 ms
64 bytes from 10.10.12.1: icmp_seq=1 ttl=63 time=2.099 ms
^C
--- 10.10.12.1 ping statistics ---
2 packets transmitted, 2 packets received, 0% packet loss
round-trip min/avg/max/stddev = 2.099/2.138/2.177/0.039 ms
```

ping R3 on 10.10.12.2

```
root@R1> ping 10.10.12.2
PING 10.10.12.2 (10.10.12.2): 56 data bytes
64 bytes from 10.10.12.2: icmp_seq=0 ttl=64 time=2.820 ms
64 bytes from 10.10.12.2: icmp_seq=1 ttl=64 time=2.563 ms
^C
--- 10.10.12.2 ping statistics ---
2 packets transmitted, 2 packets received, 0% packet loss
round-trip min/avg/max/stddev = 2.563/2.692/2.820/0.128 ms
```



2. Disconnect the interface on R1 with the active route to 10.10.12.0 and show that R1 can still ping all interfaces on 10.10.12.0.

```
root@R1> ping 10.10.12.1
PING 10.10.12.1 (10.10.12.1): 56 data bytes
64 bytes from 10.10.12.1: icmp_seq=0 ttl=63 time=2.170 ms
64 bytes from 10.10.12.1: icmp_seq=1 ttl=63 time=2.113 ms
^C
--- 10.10.12.1 ping statistics ---
2 packets transmitted, 2 packets received, 0% packet loss
round-trip min/avg/max/stddev = 2.113/2.141/2.170/0.029 ms

root@R1> ping 10.10.12.2
PING 10.10.12.2 (10.10.12.2): 56 data bytes
64 bytes from 10.10.12.2: icmp_seq=0 ttl=64 time=2.056 ms
^C
--- 10.10.12.2 ping statistics ---
1 packets transmitted, 1 packets received, 0% packet loss
round-trip min/avg/max/stddev = 2.056/2.056/2.056/0.000 ms
```

3. List R1 routing table again and explain if OSPF automatically did rerouting when disconnecting the active route interface.

```
root@R1> show route protocol ospf

inet.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.10.11.0/28      *[OSPF/10] 00:02:28, metric 3
                   > to 10.10.10.2 via ge-0/0/1.0
10.10.12.0/28      *[OSPF/10] 00:02:28, metric 2
                   > to 10.10.10.2 via ge-0/0/1.0
224.0.0.5/32      *[OSPF/10] 01:15:28, metric 1
                   MultiRecv
```

Her kan det ses at det er valgt en ny route gennem ge-0/0/1 i stedet for ge-0/0/2, for at nå computere og/eller routers på 10.10.11.0/28, og 10.10.12.0/28.

## 5. Konklusion

Generelt gennem hele udførelsen benyttes tekst instruktioner med tilhørende billede eksempler for at understrege når der er reelle ændringer som brugeren skal tage højde for under opsætning og installationsfasen. Der bliver dog, i vise tilfælde, kun brugt tekst instruktioner når det næste trin er, f.eks. et enkelt tryk på en museknap. Sprogbruget i dokumentation er blevet holdt meget lavpraktisk med forståelsen om at brugeren har alment kendskab til IT-systemer.

