

Routing

Diverse Routing Protokolle

- [RIP](#)
- [OSPF](#)
- [EIGRP](#)

RIP

Attribut	Wert
Type	Distanzbasiert
Algorithmus	Bellman-Ford
Standard	RFC 2080, 2453
Protokoll	IPv4, IPv6
Port	520,521
Authentifizierung	Klartext, MD5
Multicast IP	224.0.0.9/FF02::9
Update-Time	30 sek.
Invalid-Time	180 sek.
Flush-Time	240 sek.
Hold-down-Time	180 sek.

Konfiguration

RIP Beispiel

RIP Konfiguration

Router 1

```
R1#conf t
R1(config)#interface GigabitEthernet 0/0
R1(config-if)#description WAN Link
R1(config-if)#ip address 192.0.2.41 255.255.255.0
R1(config-if)#interface GigabitEthernet 0/1
R1(config-if)#description Transfernet1
R1(config-if)#ip address 172.16.10.2 255.255.255.252
R1(config-if)#interface GigabitEthernet 0/2.10
R1(config-if)#encapsulation dot1q 10
```

```
R1(config-if)#ip address 10.1.1.1 255.255.254.0
R1(config-if)#interface GigabitEthernet 0/2.20
R1(config-if)#encapsulation dot1q 20
R1(config-if)#ip address 10.1.2.1 255.255.254.0
R1(config-if)#exit
R1(config)#router rip
R1(config-router)#network 10.1.1.0
R1(config-router)#passive-interface GigabitEthernet 0/0
R1(config-router)#default-information originate
R1(config-router)#exit
R1(config)#ip route 0.0.0.0 0.0.0.0 192.0.2.1
R1(config)#do wr
```

Router 2

```
R2#conf t
R2(config)#interface GigabitEthernet 0/0
R2(config-if)#description Transfernet1
R2(config-if)#ip address 172.16.10.3 255.255.255.252
R2(config-if)#interface GigabitEthernet 0/1
R2(config-if)#description Transfernet2
R2(config-if)#ip address 172.16.10.5 255.255.255.252
R2(config-if)#interface GigabitEthernet 0/2.10
R2(config-if)#encapsulation dot1q 10
R2(config-if)#ip address 10.2.1.1 255.255.255.128
R2(config-if)#interface GigabitEthernet 0/2.20
R2(config-if)#encapsulation dot1q 20
R2(config-if)#ip address 10.2.20.1 255.255.254.0
R2(config-if)#interface GigabitEthernet 0/2.30
R2(config-if)#encapsulation dot1q 30
R2(config-if)#ip address 10.2.200.1 255.255.255.0
R2(config-if)#exit
R2(config)#router rip
R2(config-router)#network 10.2.1.0
R2(config-router)#network 10.2.20.0
R2(config-router)#network 10.2.200.0
R2(config-router)#exit
R2(config)#do wr
```

Router 3

```
R3#conf t
R3(config)#interface GigabitEthernet 0/0
R3(config-if)#description Transfernet2
R3(config-if)#ip address 172.16.10.6 255.255.255.252
R3(config-if)#interface GigabitEthernet 0/2.10
R3(config-if)#encapsulation dot1q 10
R3(config-if)#ip address 10.3.1.1 255.255.255.0
R3(config-if)#interface GigabitEthernet 0/2.20
R3(config-if)#encapsulation dot1q 20
R3(config-if)#ip address 10.3.2.1 255.255.255.0
R3(config-if)#exit
R3(config)#router rip
R3(config-router)#network 10.3.1.0
R3(config-router)#exit
R3(config)#do wr
```

Troubelshooting

```
show ip[v6] protocols
show ip[v6] rip database
debug ip rip { database | events }
debug ipv6 rip [interface]
```

OSPF

Attribut	Wert
Type	Link-State
Algorithmus	Dijkstra
Metric	Cost (Bandbreite)
Standard	RFC 3228, 2740
Protokoll	IP
Port	89
Authenifizierung	Klartext, MD5
AllSPF Adresse	224.0.0.5
AllDR Adresse	224.0.0.6
Hello Timers	30
Dead Timers	120

Konfiguration

OSPF Beispiel
Image not found or type unknown

OSPF Beispiel
Image not found or type unknown

Router 1

```
R1#conf t
R1(config)#interface GigabitEthernet 0/0
R1(config-if)#description WAN Link
R1(config-if)#ip address 192.0.2.41 255.255.255.0
R1(config-if)#interface GigabitEthernet 0/1
R1(config-if)#description Transfernet1
R1(config-if)#ip address 172.16.10.2 255.255.255.252
R1(config-if)#interface GigabitEthernet 0/2.10
R1(config-if)#encapsulation dot1q 10
```

```
R1(config-if)#ip address 10.1.1.1 255.255.254.0
R1(config-if)#interface GigabitEthernet 0/2.20
R1(config-if)#encapsulation dot1q 20
R1(config-if)#ip address 10.1.2.1 255.255.254.0
R1(config-if)#exit
R1(config)#router ospf 100
R1(config-router)#network 10.1.1.0 0.0.3.255 area 0
R1(config-router)#router-id 1.1.1.1
R1(config-router)#default-information originate
R1(config-router)#passive-interface GigabitEthernet 0/0
R1(config-router)#exit
R1(config)#ip route 0.0.0.0 0.0.0.0 192.0.2.1
R1(config)#do wr
```

Router 2

```
R2#conf t
R2(config)#interface GigabitEthernet 0/0
R2(config-if)#description Transfernet1
R2(config-if)#ip address 172.16.10.3 255.255.255.252
R2(config-if)#interface GigabitEthernet 0/1
R2(config-if)#description Transfernet2
R2(config-if)#ip address 172.16.10.5 255.255.255.252
R2(config-if)#interface GigabitEthernet 0/2.10
R2(config-if)#encapsulation dot1q 10
R2(config-if)#ip address 10.2.1.1 255.255.255.128
R2(config-if)#interface GigabitEthernet 0/2.20
R2(config-if)#encapsulation dot1q 20
R2(config-if)#ip address 10.2.20.1 255.255.254.0
R2(config-if)#interface GigabitEthernet 0/2.30
R2(config-if)#encapsulation dot1q 30
R2(config-if)#ip address 10.2.200.1 255.255.255.0
R2(config-if)#exit
R2(config)#router ospf 100
R2(config-router)#network 10.2.1.0 0.0.0.127 area 0
R2(config-router)#network 10.2.20.0 0.0.1.255 area 0
R2(config-router)#network 10.2.200.0 0.0.0.255 area 0
R2(config-router)#router-id 1.1.1.2
```

```
R2(config-router)#exit
R2(config)#do wr
```

Router 3

```
R3#conf t
R3(config)#interface GigabitEthernet 0/0
R3(config-if)#description Transfernet2
R3(config-if)#ip address 172.16.10.6 255.255.255.252
R3(config-if)#interface GigabitEthernet 0/2.10
R3(config-if)#encapsulation dot1q 10
R3(config-if)#ip address 10.3.1.1 255.255.255.0
R3(config-if)#interface GigabitEthernet 0/2.20
R3(config-if)#encapsulation dot1q 20
R3(config-if)#ip address 10.3.2.1 255.255.255.0
R3(config-if)#exit
R3(config)#router ospf 100
R3(config-router)#network 10.3.1.0 0.0.1.255 area 0
R3(config-router)#router-id 1.1.1.3
R3(config-router)#exit
R3(config)#do wr
```

Troubelshooting

```
clear ip[v6] ospf process
show ip[v6] ospf [process] interface
show ip[v6] ospf [process] neighbor
show ip[v6] ospf border-routers
show ip[v6] ospf database [LSA-type]
show ip[v6] ospf virtual-links
debug ip[v6] ospf [...]
```

EIGRP

Attribut	Wert
Type	Distanzbasiert
Algorithmus	DUAL
Standard	Cisco, Proprietär
Protokoll	IP, IPX, Appletalk
Port	88
Authentifizierung	MD5
Multicast IP	224.0.0.10
Hello Timmers	5/60
Hold Timers	15/180

Konfiguration

EIGRP Beispiel
Image not supported or type unknown

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R1(config-if)#description Transfernet1
R1(config-if)#ip address 172.16.10.2 255.255.255.252
R1(config-if)#interface GigabitEthernet 0/2.10
R1(config-if)#encapsulation dot1q 10
R1(config-if)#ip address 10.1.1.1 255.255.254.0
R1(config-if)#interface GigabitEthernet 0/2.20
R1(config-if)#encapsulation dot1q 20
```



```
R1(config-if)#ip address 10.1.2.1 255.255.254.0
R1(config-if)#exit
R1(config)#router eigrp 100
R1(config-router)#network 10.1.1.0
R1(config-router)#passive-interface GigabitEthernet 0/0
R1(config-router)#exit
R1(config)#ip route 0.0.0.0 0.0.0.0 192.0.2.1
R1(config)#do wr
```

Router 2

```
R2#conf t
R2(config)#interface GigabitEthernet 0/0
R2(config-if)#description Transfernet1
R2(config-if)#ip address 172.16.10.3 255.255.255.252
R2(config-if)#interface GigabitEthernet 0/1
R2(config-if)#description Transfernet2
R2(config-if)#ip address 172.16.10.5 255.255.255.252
R2(config-if)#interface GigabitEthernet 0/2.10
R2(config-if)#encapsulation dot1q 10
R2(config-if)#ip address 10.2.1.1 255.255.255.128
R2(config-if)#interface GigabitEthernet 0/2.20
R2(config-if)#encapsulation dot1q 20
R2(config-if)#ip address 10.2.20.1 255.255.254.0
R2(config-if)#interface GigabitEthernet 0/2.30
R2(config-if)#encapsulation dot1q 30
R2(config-if)#ip address 10.2.200.1 255.255.255.0
R2(config-if)#exit
R2(config)#router eigrp 100
R2(config-router)#network 10.2.1.0
R2(config-router)#network 10.2.20.0
R2(config-router)#network 10.2.200.0
R2(config-router)#exit
R2(config)#do wr
```

Router 3

```
R3#conf t
R3(config)#interface GigabitEthernet 0/0
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R3(config-if)#ip address 172.16.10.6 255.255.255.252
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R3(config-if)#ip address 10.3.1.1 255.255.255.0
R3(config-if)#interface GigabitEthernet 0/2.20
R3(config-if)#encapsulation dot1q 20
R3(config-if)#ip address 10.3.2.1 255.255.255.0
R3(config-if)#exit
R3(config)#router eigrp 100
R3(config-router)#network 10.3.1.0
R3(config-router)#exit
R3(config)#do wr
```

Troubelshooting

```
show ip eigrp interfaces
show ip eigrp neighbors
show ip eigrp topology
show ip eigrp traffic
clear ip eigrp neighbors
debug ip eigrp [packet | neighbors]
```