

# 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 adresse 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
Authenifizierung	MD5
Multicast IP	224.0.0.10
Hello Timmers	5/60
Hold Timers	15/180

# Konfiguration

EIGRP Beispiel  
Image not supported or type unknown

EIGRP Beispiel  
Image not supported or type unknown

# Router 1

```
R1#conf t
R1(config)#interface GigabitEthernet 0/0
R1(config-if)#description WAN Link
R1(config-if)#ip adresse 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 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
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 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]
```