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# TP7

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## 1. Examen des routes statiques

Etape 1 : Consultation de la configuration

**R1** :

Configuration actuelle du routage statique

```
interface FastEthernet0/0
 ip address 172.16.3.1 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/0/0
 ip address 172.16.2.1 255.255.255.0
 clock rate 64000
!
interface Serial0/0/1
 no ip address
 clock rate 2000000
!
interface Vlan1
 no ip address
 shutdown
!
ip classless
ip route 192.168.2.0 255.255.255.0 172.16.2.2
ip route 192.168.1.0 255.255.255.0 172.16.2.2
ip route 172.16.1.0 255.255.255.0 172.16.2.2
!
ip flow-export version 9
!
!
!
!
!
 --More--
```

Table de routage

```
R1#sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     172.16.0.0/24 is subnetted, 3 subnets
S       172.16.1.0 [1/0] via 172.16.2.2
C       172.16.2.0 is directly connected, Serial0/0/0
C       172.16.3.0 is directly connected, FastEthernet0/0
S    192.168.1.0/24 [1/0] via 172.16.2.2
S    192.168.2.0/24 [1/0] via 172.16.2.2
```

**R2** :

Configuration actuelle du routage statique

```
interface FastEthernet0/0
 mac-address 0007.eca7.1511
 ip address 172.16.1.1 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 mac-address 0001.42dd.a220
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/0/0
 ip address 172.16.2.2 255.255.255.0
!
interface Serial0/0/1
 ip address 192.168.1.2 255.255.255.0
 clock rate 64000
!
interface Vlan1
 no ip address
 shutdown
!
ip classless
ip route 172.16.3.0 255.255.255.0 Serial0/0/0
ip route 192.168.2.0 255.255.255.0 Serial0/0/1
!
ip flow-export version 9
!
!
!
```

Table de routage

```
R2#sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     172.16.0.0/24 is subnetted, 3 subnets
C       172.16.1.0 is directly connected, FastEthernet0/0
C       172.16.2.0 is directly connected, Serial0/0/0
S       172.16.3.0 is directly connected, Serial0/0/0
C    192.168.1.0/24 is directly connected, Serial0/0/1
S    192.168.2.0/24 is directly connected, Serial0/0/1
```

**R3** :

Configuration actuelle du routage statique

```
interface FastEthernet0/0
 mac-address 0003.e472.7a36
 ip address 192.168.2.1 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 mac-address 0006.2a91.d285
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/0/0
 no ip address
 clock rate 2000000
!
interface Serial0/0/1
 ip address 192.168.1.1 255.255.255.0
!
interface Vlan1
 no ip address
 shutdown
!
ip classless
ip route 172.16.3.0 255.255.255.0 192.168.1.2
ip route 172.16.2.0 255.255.255.0 192.168.1.2
ip route 172.16.1.0 255.255.255.0 192.168.1.2
!
ip flow-export version 9
!
!
!
!
```

Table de routage

```
R3#sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     172.16.0.0/24 is subnetted, 3 subnets
S       172.16.1.0 [1/0] via 192.168.1.2
S       172.16.2.0 [1/0] via 192.168.1.2
S       172.16.3.0 [1/0] via 192.168.1.2
C    192.168.1.0/24 is directly connected, Serial0/0/1
C    192.168.2.0/24 is directly connected, FastEthernet0/0
```

Etape 2 : vérification de la connectivité

**PC1** :

PC>ping 172.16.1.1 (PC2)

```
C:\>ping 172.16.1.1

Pinging 172.16.1.1 with 32 bytes of data:

Reply from 172.16.1.1: bytes=32 time=7ms TTL=254
Reply from 172.16.1.1: bytes=32 time=6ms TTL=254
Reply from 172.16.1.1: bytes=32 time=5ms TTL=254
Reply from 172.16.1.1: bytes=32 time=6ms TTL=254

Ping statistics for 172.16.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 5ms, Maximum = 7ms, Average = 6ms
```

PC>ping 192.168.2.1 (PC3)

```
C:\>ping 192.168.2.1

Pinging 192.168.2.1 with 32 bytes of data:

Reply from 192.168.2.1: bytes=32 time=21ms TTL=253
Reply from 192.168.2.1: bytes=32 time=13ms TTL=253
Reply from 192.168.2.1: bytes=32 time=11ms TTL=253
Reply from 192.168.2.1: bytes=32 time=8ms TTL=253

Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 8ms, Maximum = 21ms, Average = 13ms
```

**PC2** :

PC>ping 172.16.3.1 (PC1)

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 172.16.3.1

Pinging 172.16.3.1 with 32 bytes of data:

Reply from 172.16.3.1: bytes=32 time=8ms TTL=254
Reply from 172.16.3.1: bytes=32 time=8ms TTL=254
Reply from 172.16.3.1: bytes=32 time=7ms TTL=254
Reply from 172.16.3.1: bytes=32 time=7ms TTL=254

Ping statistics for 172.16.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 7ms, Maximum = 8ms, Average = 7ms
```

PC>ping 192.168.2.1 (PC3)

```
C:\>ping 192.168.2.1

Pinging 192.168.2.1 with 32 bytes of data:

Reply from 192.168.2.1: bytes=32 time=7ms TTL=254
Reply from 192.168.2.1: bytes=32 time=5ms TTL=254
Reply from 192.168.2.1: bytes=32 time=5ms TTL=254
Reply from 192.168.2.1: bytes=32 time=5ms TTL=254

Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 5ms, Maximum = 7ms, Average = 5ms
```

**PC3** :

PC>ping 172.16.3.1 (PC1)

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 172.16.3.1

Pinging 172.16.3.1 with 32 bytes of data:

Reply from 172.16.3.1: bytes=32 time=9ms TTL=253
Reply from 172.16.3.1: bytes=32 time=9ms TTL=253
Reply from 172.16.3.1: bytes=32 time=12ms TTL=253
Reply from 172.16.3.1: bytes=32 time=7ms TTL=253

Ping statistics for 172.16.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 7ms, Maximum = 12ms, Average = 9ms
```

PC>ping 172.16.1.1 (PC2)

```
C:\>ping 172.16.1.1

Pinging 172.16.1.1 with 32 bytes of data:

Reply from 172.16.1.1: bytes=32 time=8ms TTL=254
Reply from 172.16.1.1: bytes=32 time=5ms TTL=254
Reply from 172.16.1.1: bytes=32 time=7ms TTL=254
Reply from 172.16.1.1: bytes=32 time=5ms TTL=254

Ping statistics for 172.16.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 5ms, Maximum = 8ms, Average = 6ms
```

# 2. Résumé des routes statiques (routeur R3)

Etape 1 : remplacement des routes statiques existantes par une route résumée (agrégée)

R3(config)#no ip route 172.16.1.0 255.255.255.0 192.168.1.2 (PC2)

R3(config)#no ip route 172.16.2.0 255.255.255.0 192.168.1.2 (R1)

R3(config)#no ip route 172.16.3.0 255.255.255.0 192.168.1.2 (PC1)

R3(config)#ip route 172.16.0.0 255.255.252.0 192.168.1.2

Etape 2 : enregistrement des configurations mises à jour

Etape 3 : consultation de la configuration

R3#sh run (configuration du routage statique)

```
interface FastEthernet0/0
 mac-address 0003.e472.7a36
 ip address 192.168.2.1 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 mac-address 0006.2a91.d285
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/0/0
 no ip address
 clock rate 2000000
!
interface Serial0/0/1
 ip address 192.168.1.1 255.255.255.0
!
interface Vlan1
 no ip address
 shutdown
!
ip classless
ip route 172.16.0.0 255.255.252.0 192.168.1.2
!
ip flow-export version 9
!
!
!
!
!
```

R3#sh ip route

```
R3#sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     172.16.0.0/22 is subnetted, 1 subnets
S       172.16.0.0 [1/0] via 192.168.1.2
C    192.168.1.0/24 is directly connected, Serial0/0/1
C    192.168.2.0/24 is directly connected, FastEthernet0/0
```

Etape 4 : vérification de la connectivité

PC(3)>ping 172.16.3.1 (PC1)

```
C:\>ping 172.16.3.1

Pinging 172.16.3.1 with 32 bytes of data:

Reply from 172.16.3.1: bytes=32 time=13ms TTL=253
Reply from 172.16.3.1: bytes=32 time=6ms TTL=253
Reply from 172.16.3.1: bytes=32 time=9ms TTL=253
Reply from 172.16.3.1: bytes=32 time=8ms TTL=253

Ping statistics for 172.16.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 6ms, Maximum = 13ms, Average = 9ms
```

PC(3)>ping 172.16.1.1 (PC2)

```
C:\>ping 172.16.1.1

Pinging 172.16.1.1 with 32 bytes of data:

Reply from 172.16.1.1: bytes=32 time=7ms TTL=254
Reply from 172.16.1.1: bytes=32 time=6ms TTL=254
Reply from 172.16.1.1: bytes=32 time=7ms TTL=254
Reply from 172.16.1.1: bytes=32 time=5ms TTL=254

Ping statistics for 172.16.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 5ms, Maximum = 7ms, Average = 6ms
```

## 3. Configuration d’un réseau d’extrémité (routeur R1)

Etape 1 : remplacement des routes statiques existantes par une route par défaut

R1(config)#no ip route 172.16.1.0 255.255.255.0 172.16.2.2

R1(config)#no ip route 192.168.1.0 255.255.255.0 172.16.2.2

R1(config)#no ip route 192.168.2.0 255.255.255.0 172.16.2.2

R1(config)#ip route 0.0.0.0 0.0.0.0 172.16.2.2

Etape 2 : enregistrement des configurations mises à jour

Etape 3 : consultation de la configuration

R1#sh run

```
interface FastEthernet0/0
 ip address 172.16.3.1 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/0/0
 ip address 172.16.2.1 255.255.255.0
 clock rate 64000
!
interface Serial0/0/1
 no ip address
 clock rate 2000000
!
interface Vlan1
 no ip address
 shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.2.2
!
ip flow-export version 9
!
!
!
!
!
```

R1#sh ip route

```
R1#sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 172.16.2.2 to network 0.0.0.0

     172.16.0.0/24 is subnetted, 2 subnets
C       172.16.2.0 is directly connected, Serial0/0/0
C       172.16.3.0 is directly connected, FastEthernet0/0
S*   0.0.0.0/0 [1/0] via 172.16.2.2
```

Etape 4 : vérification de la connectivité

PC(1)>192.168.2.1 (PC3)

```
C:\>ping 192.168.2.1

Pinging 192.168.2.1 with 32 bytes of data:

Reply from 192.168.2.1: bytes=32 time=10ms TTL=253
Reply from 192.168.2.1: bytes=32 time=9ms TTL=253
Reply from 192.168.2.1: bytes=32 time=9ms TTL=253
Reply from 192.168.2.1: bytes=32 time=9ms TTL=253

Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 9ms, Maximum = 10ms, Average = 9ms
```

PC(1)>ping 172.16.1.1 (PC2)

```
C:\>ping 172.16.1.1

Pinging 172.16.1.1 with 32 bytes of data:

Reply from 172.16.1.1: bytes=32 time=2ms TTL=254
Reply from 172.16.1.1: bytes=32 time=5ms TTL=254
Reply from 172.16.1.1: bytes=32 time=5ms TTL=254
Reply from 172.16.1.1: bytes=32 time=5ms TTL=254

Ping statistics for 172.16.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 5ms, Average = 4ms
```