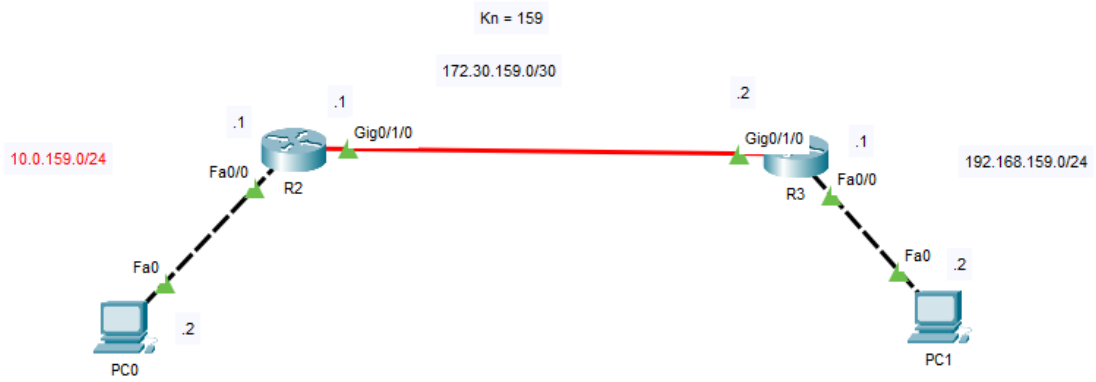
Lab 07



Show interface brief:

```
R1#sh ip int b
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        10.0.159.1      YES manual up                    up
FastEthernet0/1        unassigned      YES NVRAM  administratively down down
GigabitEthernet0/0/0   unassigned      YES NVRAM  administratively down down
GigabitEthernet0/1/0   172.30.159.1    YES manual up                    up
GigabitEthernet0/2/0   unassigned      YES NVRAM  administratively down down
GigabitEthernet0/3/0   unassigned      YES NVRAM  administratively down down
Ethernet1/0            unassigned      YES NVRAM  administratively down down
Ethernet1/1            unassigned      YES NVRAM  administratively down down
Ethernet1/2            unassigned      YES NVRAM  administratively down down
Ethernet1/3            unassigned      YES NVRAM  administratively down down
Vlan1                  unassigned      YES unset  administratively down down

R2#sh ip int b
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        192.168.159.1   YES manual up                    up
FastEthernet0/1        unassigned      YES unset  administratively down down
GigabitEthernet0/0/0   unassigned      YES unset  administratively down down
GigabitEthernet0/1/0   172.30.159.2    YES manual up                    up
GigabitEthernet0/2/0   unassigned      YES unset  administratively down down
GigabitEthernet0/3/0   unassigned      YES unset  administratively down down
Ethernet1/0            unassigned      YES unset  administratively down down
Ethernet1/1            unassigned      YES unset  administratively down down
Ethernet1/2            unassigned      YES unset  administratively down down
Ethernet1/3            unassigned      YES unset  administratively down down
Vlan1                  unassigned      YES unset  administratively down down
```

Show ip route:

```
R1#sh ip rou
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

     10.0.0.0/24 is subnetted, 1 subnets
C       10.0.159.0 is directly connected, FastEthernet0/0
     172.30.0.0/30 is subnetted, 1 subnets
C       172.30.159.0 is directly connected, GigabitEthernet0/1/0
O    192.168.159.0/24 [110/2] via 172.30.159.2, 00:04:04, GigabitEthernet0/1/0

R2#sh ip rou
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

     10.0.0.0/24 is subnetted, 1 subnets
O       10.0.159.0 [110/2] via 172.30.159.1, 00:04:21, GigabitEthernet0/1/0
     172.30.0.0/30 is subnetted, 1 subnets
C       172.30.159.0 is directly connected, GigabitEthernet0/1/0
C    192.168.159.0/24 is directly connected, FastEthernet0/0
```

Show isakmp policy

```
R2#sh crypto isakmp policy

Global IKE policy
Protection suite of priority 159
        encryption algorithm:    AES - Advanced Encryption Standard (256 bit keys).
        hash algorithm:          Secure Hash Standard
        authentication method:   Pre-Shared Key
        Diffie-Hellman group:    #5 (1536 bit)
        lifetime:                3600 seconds, no volume limit
Default protection suite
        encryption algorithm:    DES - Data Encryption Standard (56 bit keys).
        hash algorithm:          Secure Hash Standard
        authentication method:   Rivest-Shamir-Adleman Signature
        Diffie-Hellman group:    #1 (768 bit)
        lifetime:                86400 seconds, no volume limit
```

```
R1#sh crypto isakmp policy

Global IKE policy
Protection suite of priority 159
        encryption algorithm:    AES - Advanced Encryption Standard (256 bit keys).
        hash algorithm:          Secure Hash Standard
        authentication method:   Pre-Shared Key
        Diffie-Hellman group:    #5 (1536 bit)
        lifetime:                3600 seconds, no volume limit
Default protection suite
        encryption algorithm:    DES - Data Encryption Standard (56 bit keys).
        hash algorithm:          Secure Hash Standard
        authentication method:   Rivest-Shamir-Adleman Signature
        Diffie-Hellman group:    #1 (768 bit)
        lifetime:                86400 seconds, no volume limit
```

Show crypto map:

```
R2#sh crypto map
Crypto Map R1-R2-POELZL_MAP 159 ipsec-isakmp
        Peer = 172.30.159.1
        Extended IP access list 101
            access-list 101 permit ip 192.168.159.0 0.0.0.255 10.0.159.0 0.0.0.255
        Current peer: 172.30.159.1
        Security association lifetime: 4608000 kilobytes/900 seconds
        PFS (Y/N): Y
        Transform sets={
                R1-R2-POELZL_MAP,
        }
        Interfaces using crypto map R1-R2-POELZL_MAP:
                GigabitEthernet0/1/0
```

```
R1#show crypto map
Crypto Map R1-R2-POELZL_MAP 159 ipsec-isakmp
        Peer = 172.30.159.2
        Extended IP access list 101
            access-list 101 permit ip 10.0.159.0 0.0.0.255 192.168.159.0 0.0.0.255
        Current peer: 172.30.159.2
        Security association lifetime: 4608000 kilobytes/900 seconds
        PFS (Y/N): Y
        Transform sets={
                R1-R2-POELZL_MAP,
        }
        Interfaces using crypto map R1-R2-POELZL_MAP:
                GigabitEthernet0/1/0
```

Show crypto ipsec sa:

```
R2#sh crypto ipsec sa

interface: GigabitEthernet0/1/0
    Crypto map tag: R1-R2-POELZL_MAP, local addr 172.30.159.2

   protected vrf: (none)
   local  ident (addr/mask/prot/port): (192.168.159.0/255.255.255.0/0/0)
   remote  ident (addr/mask/prot/port): (10.0.159.0/255.255.255.0/0/0)
   current_peer 172.30.159.1 port 500
    PERMIT, flags={origin_is_acl,}
   #pkts encaps: 0, #pkts encrypt: 0, #pkts digest: 0
   #pkts decaps: 0, #pkts decrypt: 0, #pkts verify: 0
   #pkts compressed: 0, #pkts decompressed: 0
   #pkts not compressed: 0, #pkts compr. failed: 0
   #pkts not decompressed: 0, #pkts decompress failed: 0
   #send errors 0, #recv errors 0

     local crypto endpt.: 172.30.159.2, remote crypto endpt.:172.30.159.1
     path mtu 1500, ip mtu 1500, ip mtu idb GigabitEthernet0/1/0
     current outbound spi: 0x0(0)

R1#show crypto ipsec sa

interface: GigabitEthernet0/1/0
    Crypto map tag: R1-R2-POELZL_MAP, local addr 172.30.159.1

   protected vrf: (none)
   local  ident (addr/mask/prot/port): (10.0.159.0/255.255.255.0/0/0)
   remote  ident (addr/mask/prot/port): (192.168.159.0/255.255.255.0/0/0)
   current_peer 172.30.159.2 port 500
    PERMIT, flags={origin_is_acl,}
   #pkts encaps: 0, #pkts encrypt: 0, #pkts digest: 0
   #pkts decaps: 0, #pkts decrypt: 0, #pkts verify: 0
   #pkts compressed: 0, #pkts decompressed: 0
   #pkts not compressed: 0, #pkts compr. failed: 0
   #pkts not decompressed: 0, #pkts decompress failed: 0
   #send errors 0, #recv errors 0

     local crypto endpt.: 172.30.159.1, remote crypto endpt.:172.30.159.2
     path mtu 1500, ip mtu 1500, ip mtu idb GigabitEthernet0/1/0
     current outbound spi: 0x0(0)
```

Pings:

PC0 → PC1

```
C:\>ping 192.168.159.2

Pinging 192.168.159.2 with 32 bytes of data:

Reply from 192.168.159.2: bytes=32 time<1ms TTL=126
Reply from 192.168.159.2: bytes=32 time<1ms TTL=126
Reply from 192.168.159.2: bytes=32 time<1ms TTL=126
Reply from 192.168.159.2: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.159.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PC1 → PC0

```
C:\>ping 10.0.159.2

Pinging 10.0.159.2 with 32 bytes of data:

Reply from 10.0.159.2: bytes=32 time<1ms TTL=126
Reply from 10.0.159.2: bytes=32 time<1ms TTL=126
Reply from 10.0.159.2: bytes=32 time<1ms TTL=126
Reply from 10.0.159.2: bytes=32 time<1ms TTL=126

Ping statistics for 10.0.159.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

R1:

```
crypto isakmp policy 159
encr aes 256
authentication pre-share
group 5
lifetime 3600
!
crypto isakmp key POELZL12345 address 172.30.159.2
!
!
!
crypto ipsec transform-set R1-R2-POELZL_MAP esp-aes esp-sha-hmac
!
crypto map R1-R2-POELZL_MAP 159 ipsec-isakmp
set peer 172.30.159.2
set pfs group5
set security-association lifetime seconds 900
set transform-set R1-R2-POELZL_MAP
match address 101
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface FastEthernet0/0
ip address 10.0.159.1 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface GigabitEthernet0/0/0
no ip address
shutdown
!
interface GigabitEthernet0/1/0
ip address 172.30.159.1 255.255.255.252
crypto map R1-R2-POELZL_MAP
!
```

```
interface GigabitEthernet0/2/0
no ip address
shutdown
!
interface GigabitEthernet0/3/0
no ip address
shutdown
!
interface Ethernet1/0
no ip address
duplex auto
speed auto
shutdown
!
interface Ethernet1/1
no ip address
duplex auto
speed auto
shutdown
!
interface Ethernet1/2
no ip address
duplex auto
speed auto
shutdown
!
interface Ethernet1/3
no ip address
duplex auto
speed auto
shutdown
!
interface Vlan1
no ip address
shutdown
!
router ospf 10
log-adjacency-changes
network 10.0.159.0 0.0.0.255 area 10
network 172.30.159.0 0.0.0.3 area 10
!
ip classless
!
ip flow-export version 9
!
!
access-list 101 permit ip 10.0.159.0 0.0.0.255 192.168.159.0 0.0.0.255
```

R2:

```
crypto isakmp policy 159
encr aes 256
authentication pre-share
group 5
lifetime 3600
!
crypto isakmp key POELZL12345 address 172.30.159.1
!
!
!
crypto ipsec transform-set R1-R2-POELZL_MAP esp-aes esp-sha-hmac
!
crypto map R1-R2-POELZL_MAP 159 ipsec-isakmp
set peer 172.30.159.1
set pfs group5
set security-association lifetime seconds 900
set transform-set R1-R2-POELZL_MAP
match address 101
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface FastEthernet0/0
ip address 192.168.159.1 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface GigabitEthernet0/0/0
no ip address
shutdown
!
interface GigabitEthernet0/1/0
ip address 172.30.159.2 255.255.255.252
crypto map R1-R2-POELZL_MAP
!
```

```
interface GigabitEthernet0/2/0
no ip address
shutdown
!
interface GigabitEthernet0/3/0
no ip address
shutdown
!
interface Ethernet1/0
no ip address
duplex auto
speed auto
shutdown
!
interface Ethernet1/1
no ip address
duplex auto
speed auto
shutdown
!
interface Ethernet1/2
no ip address
duplex auto
speed auto
shutdown
!
interface Ethernet1/3
no ip address
duplex auto
speed auto
shutdown
!
interface Vlan1
no ip address
shutdown
!
router ospf 10
log-adjacency-changes
network 192.168.159.0 0.0.0.255 area 10
network 172.30.159.0 0.0.0.3 area 10
!
ip classless
!
ip flow-export version 9
!
!
access-list 101 permit ip 192.168.159.0 0.0.0.255 10.0.159.0 0.0.0.255
```