PARTIE RESEAUX

1. Vlans configuration Site A

```
SWA1>enable
SWA1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
SWA1(config)#vtp domain lab
Changing VTP domain name from NULL to lab
SWA1(config)#vtp version 2
SWA1(config)#vtp password rahli
Setting device VLAN database password to rahli
SWA1(config)#vtp mode server
Device mode already VTP SERVER.
```

```
SWA1#show vtp status
VTP Version                     : 2
Configuration Revision          : 25
Maximum VLANs supported locally : 255
Number of existing VLANs        : 8
VTP Operating Mode              : Server
VTP Domain Name                 : lab
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Enabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0x2D 0x42 0x03 0xD2 0x81 0x72 0x07
0xE2
Configuration last modified by 0.0.0.0 at 3-1-93 00:05:41
Local updater ID is 0.0.0.0 (no valid interface found)
```

On fait la même chose pour les switch SWA2 et SWD

SWD :

```
SWD>en
SWD#config t
Enter configuration commands, one per line.  End with CNTL/Z.
SWD(config)#vlan 3
SWD(config-vlan)#exit
SWD(config)#vlan 2
SWD(config-vlan)#exit
SWD(config)#vlan 10
SWD(config-vlan)#exit
SWD(config)#
```

- Interfaces de SWD

```
SWD(config)#interface fa 0/1
SWD(config-if)#swit
SWD(config-if)#switchport tr
SWD(config-if)#switchport trunk encapsulation dot1q
SWD(config-if)#switch
SWD(config-if)#switchport mode trunk

SWD(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

SWD(config-if)#interface fa 0/2
SWD(config-if)#switchport trunk encapsulation dot1q
SWD(config-if)#switchport mode trunk
SWD(config-if)#
SWD(config-if)#exit
SWD(config)#end
SWD#
%SYS-5-CONFIG_I: Configured from console by console

SWD#show int trunk
Port        Mode         Encapsulation  Status        Native vlan
Fa0/1       on           802.1q         trunking      1
Gig0/1      auto         n-802.1q       trunking      1
Gig0/2      auto         n-802.1q       trunking      1

Port        Vlans allowed on trunk
Fa0/1       1-1005
Gig0/1      1-1005
Gig0/2      1-1005

Port        Vlans allowed and active in management domain
Fa0/1       1,2,3,10
Gig0/1      1,2,3,10
Gig0/2      1,2,3,10

Port        Vlans in spanning tree forwarding state and not pruned
Fa0/1       1,2,3,10
```

- Interfaces de SWA1

```
Name: Fa0/1
Switchport: Enabled
Administrative Mode: static access
Operational Mode: static access
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: native
Negotiation of Trunking: Off
Access Mode VLAN: 2 (VLAN0002)
```

```
Name: Fa0/2
Switchport: Enabled
Administrative Mode: trunk
Operational Mode: trunk
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)

Name: Fa0/3
Switchport: Enabled
Administrative Mode: static access
Operational Mode: static access
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: native
Negotiation of Trunking: Off
Access Mode VLAN: 2 (VLAN0002)

Name: Fa0/4
Switchport: Enabled
Administrative Mode: trunk
Operational Mode: trunk
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
```

```
SWA1#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- ---------
-------------------------------
1    default                          active    Fa0/3, Fa0/4, Fa0/5,
Fa0/6
                                               Fa0/7, Fa0/8, Fa0/9,
Fa0/10
                                               Fa0/11, Fa0/12,
Fa0/13, Fa0/14
                                               Fa0/15, Fa0/16,
Fa0/17, Fa0/18
                                               Fa0/19, Fa0/20,
Fa0/21, Fa0/22
                                               Fa0/23, Fa0/24
2    Users_Site_A                     active    Fa0/1, Fa0/2
3    Manage_Production                active
10   Interconnection                  active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
```

- Interfaces de SWA2

```
Name: Fa0/1
Switchport: Enabled
Administrative Mode: trunk
Operational Mode: trunk
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)

Name: Fa0/2
Switchport: Enabled
Administrative Mode: static access
Operational Mode: static access
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: native
Negotiation of Trunking: Off
Access Mode VLAN: 3 (VLAN0003)

Name: Fa0/3
Switchport: Enabled
Administrative Mode: static access
Operational Mode: static access
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: native
Negotiation of Trunking: Off
Access Mode VLAN: 3 (VLAN0003)

Name: Fa0/4
Switchport: Enabled
Administrative Mode: trunk
Operational Mode: trunk
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
```

```
Switch#show vlan brief

VLAN Name                              Status    Ports
---- --------------------------------- ---------
--------------------------------
1    default                           active    Fa0/3, Fa0/4, Fa0/5,
Fa0/6
                                                 Fa0/7, Fa0/8, Fa0/9,
Fa0/10
                                                 Fa0/11, Fa0/12,
Fa0/13, Fa0/14
                                                 Fa0/15, Fa0/16,
Fa0/17, Fa0/18
                                                 Fa0/19, Fa0/20,
Fa0/21, Fa0/22
                                                 Fa0/23, Fa0/24
2    Users_Site_A                      active
3    Manage_Production                 active    Fa0/1, Fa0/2
10   Interconnection                   active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
```

2. Spanning-tree

- **SWA2**

```
Switch#show spanning-tree vlan 3
VLAN0003
  Spanning tree enabled protocol ieee
  Root ID     Priority    32771
              Address     0001.C909.6BE3
              Cost        4
              Port        25(GigabitEthernet0/1)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32771  (priority 32768 sys-id-ext 3)
              Address     0002.4AB9.8C5D
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- --------
--------------------------------
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/2            Desg FWD 19        128.2    P2p
Gi0/1            Root FWD 4         128.25   P2p
Gi0/2            Desg FWD 4         128.26   P2p
```

```
Switch#show spanning-tree vlan 2
VLAN0002
  Spanning tree enabled protocol ieee
  Root ID     Priority    32770
              Address     0001.C909.6BE3
              Cost        4
              Port        25(GigabitEthernet0/1)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32770  (priority 32768 sys-id-ext 2)
              Address     0002.4AB9.8C5D
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- --------
--------------------------------
Gi0/1            Root FWD 4         128.25   P2p
Gi0/2            Desg FWD 4         128.26   P2p

Switch#show spanning-tree vlan 10
VLAN0010
  Spanning tree enabled protocol ieee
  Root ID     Priority    32778
              Address     0001.C909.6BE3
              Cost        4
              Port        25(GigabitEthernet0/1)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32778  (priority 32768 sys-id-ext 10)
              Address     0002.4AB9.8C5D
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- --------
--------------------------------
Gi0/1            Root FWD 4         128.25   P2p
Gi0/2            Desg FWD 4         128.26   P2p
```

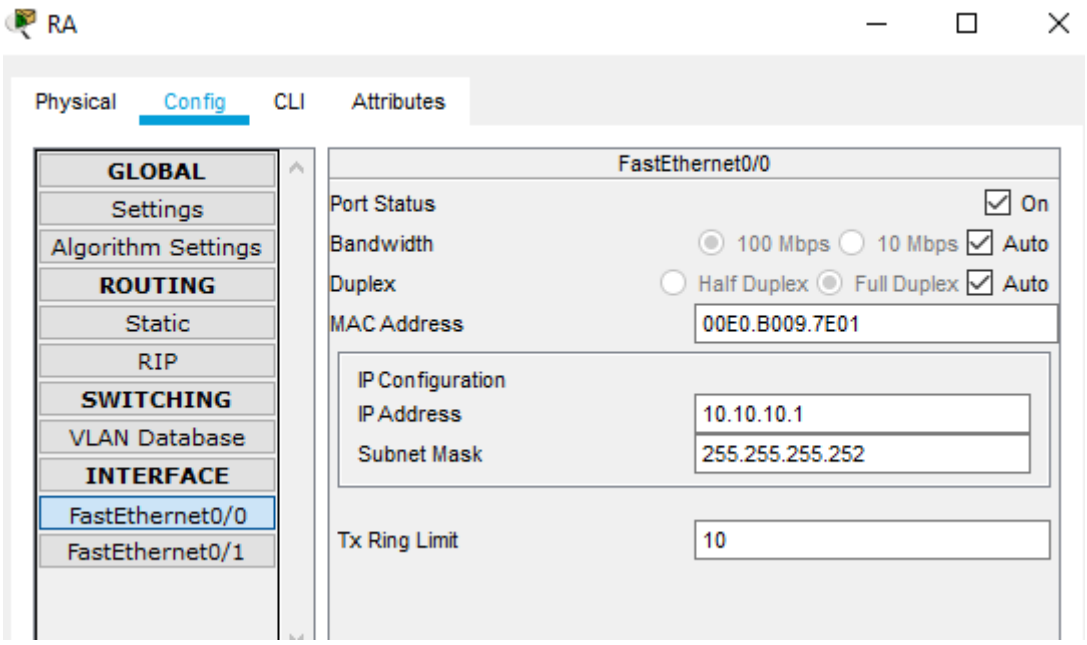
- **SWD**

```
SWD#show spanning-tree vlan 10
VLAN0010
  Spanning tree enabled protocol ieee
  Root ID     Priority    32778
              Address     0001.C909.6BE3
              Cost        4
              Port        25(GigabitEthernet0/1)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32778  (priority 32768 sys-id-ext 10)
              Address     000A.F3E1.740C
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- --------
--------------------------------
Fa0/1            Desg FWD 19        128.1    P2p
Gi0/1            Root FWD 4         128.25   P2p
Gi0/2            Altn BLK 4         128.26   P2p


SWD#show spanning-tree vlan 2
VLAN0002
  Spanning tree enabled protocol ieee
  Root ID     Priority    32770
              Address     0001.C909.6BE3
              Cost        4
              Port        25(GigabitEthernet0/1)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32770  (priority 32768 sys-id-ext 2)
              Address     000A.F3E1.740C
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- --------
--------------------------------
Fa0/1            Desg FWD 19        128.1    P2p
Gi0/1            Root FWD 4         128.25   P2p
Gi0/2            Altn BLK 4         128.26   P2p


SWD#show spanning-tree vlan 3
VLAN0003
  Spanning tree enabled protocol ieee
  Root ID     Priority    32771
              Address     0001.C909.6BE3
              Cost        4
              Port        25(GigabitEthernet0/1)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32771  (priority 32768 sys-id-ext 3)
              Address     000A.F3E1.740C
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- --------
--------------------------------
Fa0/1            Desg FWD 19        128.1    P2p
Gi0/1            Root FWD 4         128.25   P2p
Gi0/2            Altn BLK 4         128.26   P2p
```

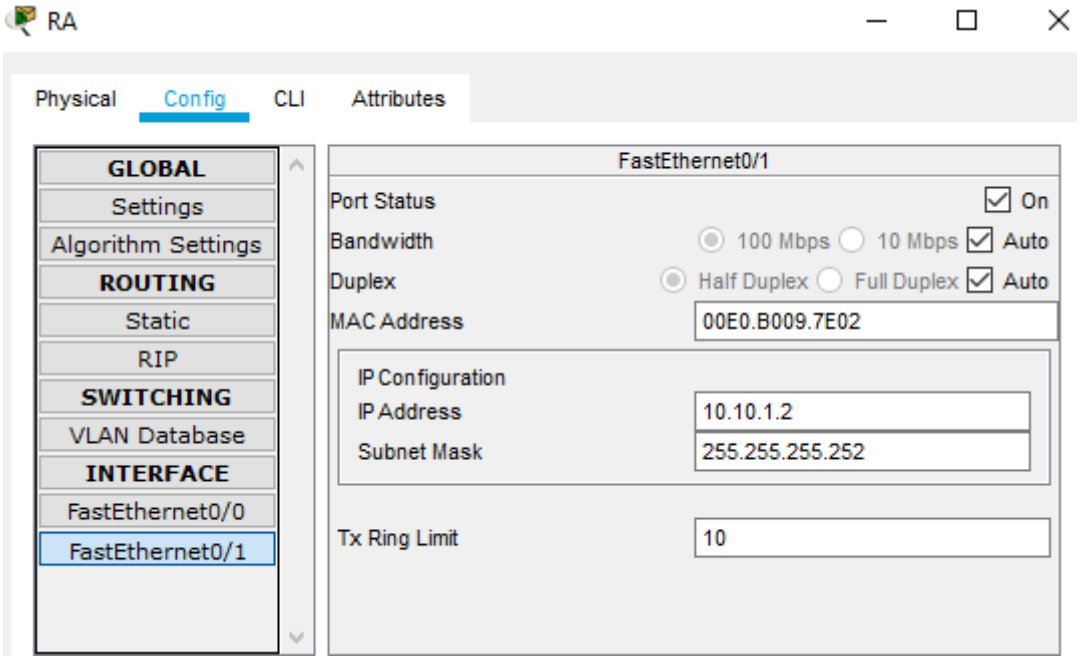
- **SWA1**

```
SWA1#show spanning-tree vlan 2
VLAN0002
  Spanning tree enabled protocol ieee
  Root ID     Priority    32770
              Address     0001.C909.6BE3
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32770  (priority 32768 sys-id-ext 2)
              Address     0001.C909.6BE3
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- --------
--------------------------------
Gi0/2            Desg FWD 4         128.26   P2p
Gi0/1            Desg FWD 4         128.25   P2p
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/2            Desg FWD 19        128.2    P2p
```

3. Configure IP for cisco devices



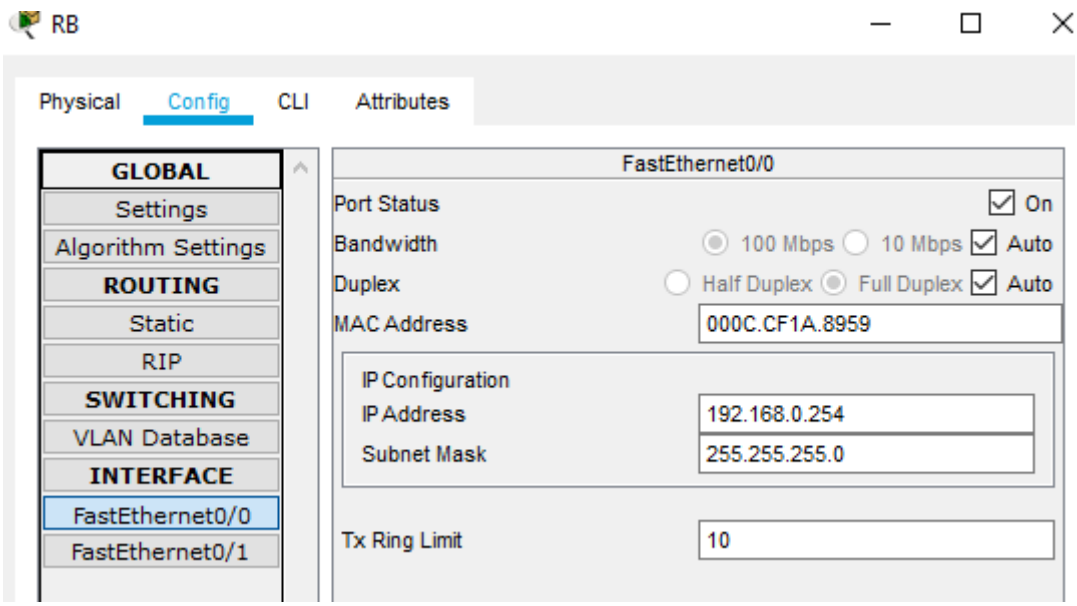

```
RA(config)#interface FastEthernet0/1
RA(config-if)#ip address dhcp
RA(config-if)#
%DHCP-6-ADDRESS_ASSIGN: Interface FastEthernet0/1 assigned DHCP
address 10.10.1.2, mask 255.255.255.252, hostname RA
```

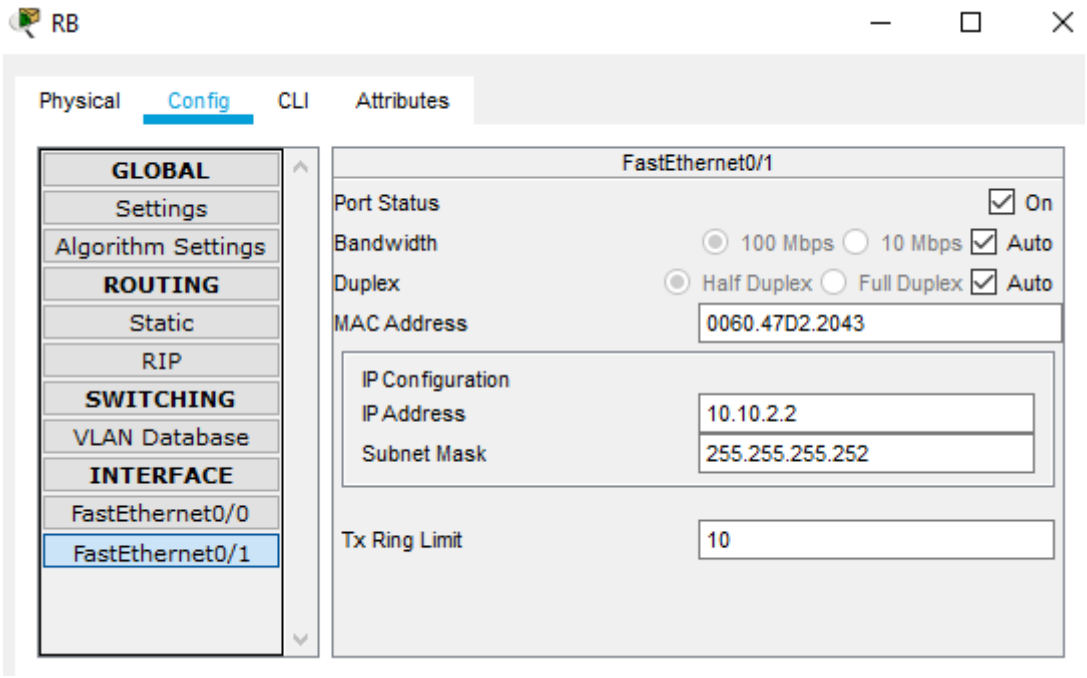



```
RA#show interfaces FastEthernet 0/1
FastEthernet0/1 is up, line protocol is up (connected)
  Hardware is Lance, address is 00e0.b009.7e02 (bia 00e0.b009.7e02)
  Internet address is 10.10.1.2/30
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Full-duplex, 100Mb/s, media type is RJ45
  ARP type: ARPA, ARP Timeout 04:00:00,
  Last input 00:00:08, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 1 bits/sec, 0 packets/sec
  5 minute output rate 4 bits/sec, 0 packets/sec
     2 packets input, 132 bytes, 0 no buffer
     Received 2 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 input packets with dribble condition detected
     2 packets output, 178 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 babbles, 0 late collision, 0 deferred
--More--
```

```
RA#show 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 10.10.1.1 to network 0.0.0.0

     10.0.0.0/30 is subnetted, 2 subnets
C       10.10.1.0 is directly connected, FastEthernet0/1
C       10.10.10.0 is directly connected, FastEthernet0/0
S*   0.0.0.0/0 [254/0] via 10.10.1.1
```

- **RB**






```
RB#show interfaces FastEthernet 0/1
FastEthernet0/1 is up, line protocol is up (connected)
  Hardware is Lance, address is 0060.47d2.2043 (bia 0060.47d2.2043)
  Internet address is 10.10.2.2/30
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Full-duplex, 100Mb/s, media type is RJ45
  ARP type: ARPA, ARP Timeout 04:00:00,
  Last input 00:00:08, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     2 packets input, 132 bytes, 0 no buffer
     Received 2 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 input packets with dribble condition detected
     2 packets output, 178 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 babbles, 0 late collision, 0 deferred
 --More--
```

```
RB#show 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 10.10.2.1 to network 0.0.0.0

     10.0.0.0/30 is subnetted, 1 subnets
C       10.10.2.0 is directly connected, FastEthernet0/1
C    192.168.0.0/24 is directly connected, FastEthernet0/0
S*   0.0.0.0/0 [254/0] via 10.10.2.1
```

SWD : VLAN interfaces

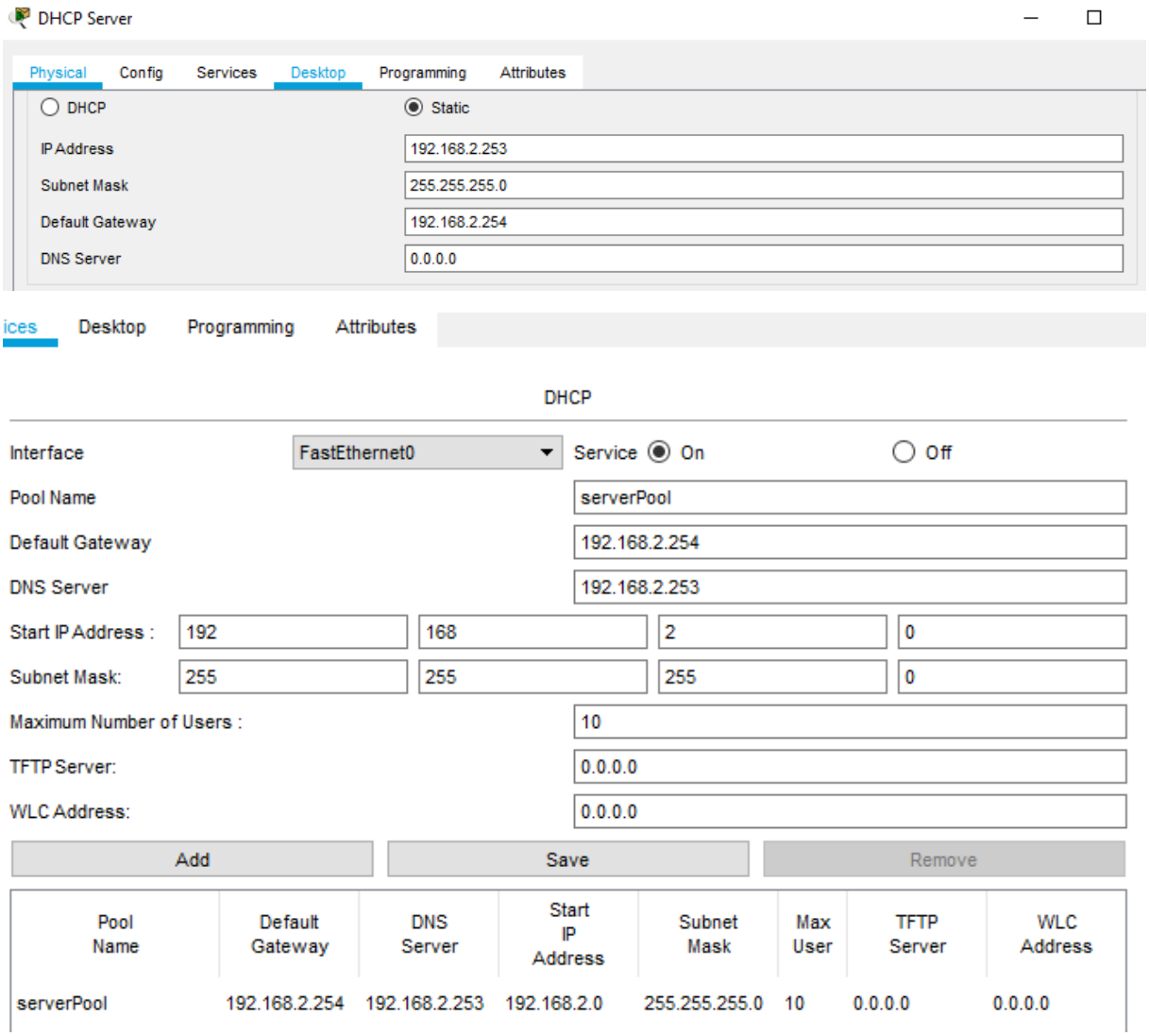
VLAN 2 : 192.168.2.254/24

VLAN 3: 192.168.3.254/24

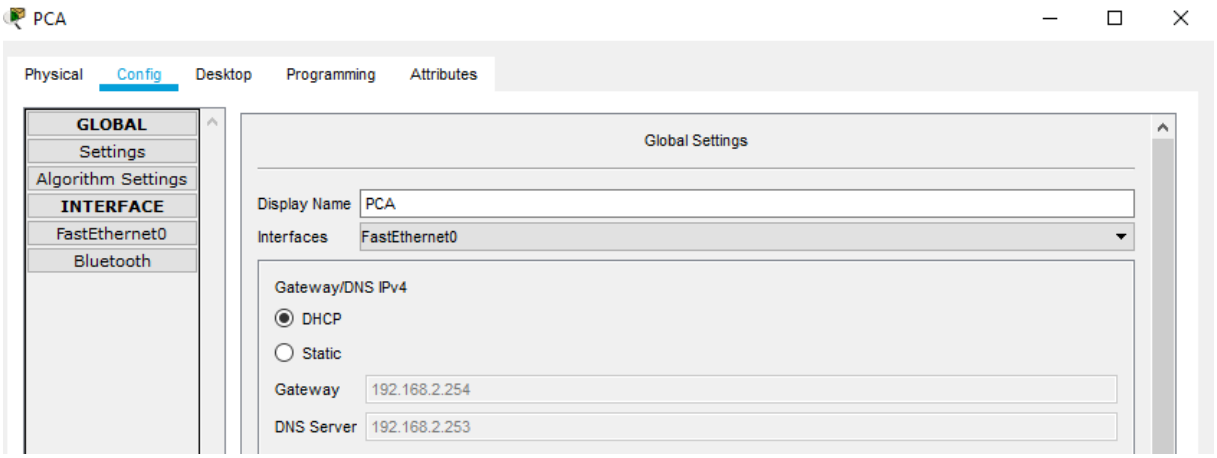
VLAN 10 : 10.10.10.2/30

```
SWD#config t
Enter configuration commands, one per line.  End with CNTL/Z.
SWD(config)#int vlan 2
SWD(config-if)#ip address 192.168.2.254 255.255.255.0
SWD(config-if)#exit
SWD(config)#int vlan 3
SWD(config-if)#ip address 192.168.3.254 255.255.255.0
SWD(config-if)#exit
SWD(config)#int vlan 10
SWD(config-if)#ip address 10.10.10.2 255.255.255.252
SWD(config-if)#
```

4. Configure the DHCP Server to attribute the IP configuration to PCA.

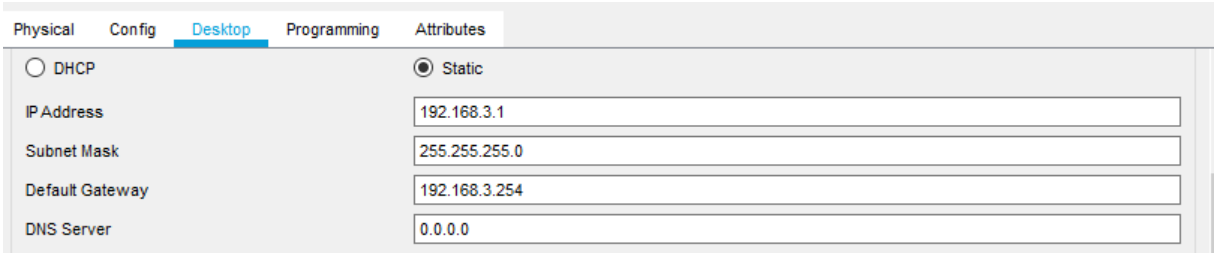


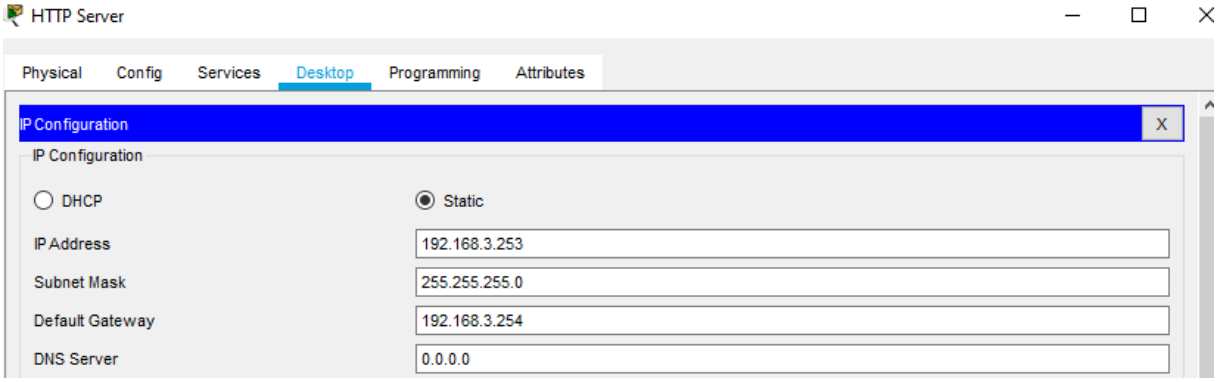
5. Configure the PCA on DHCP

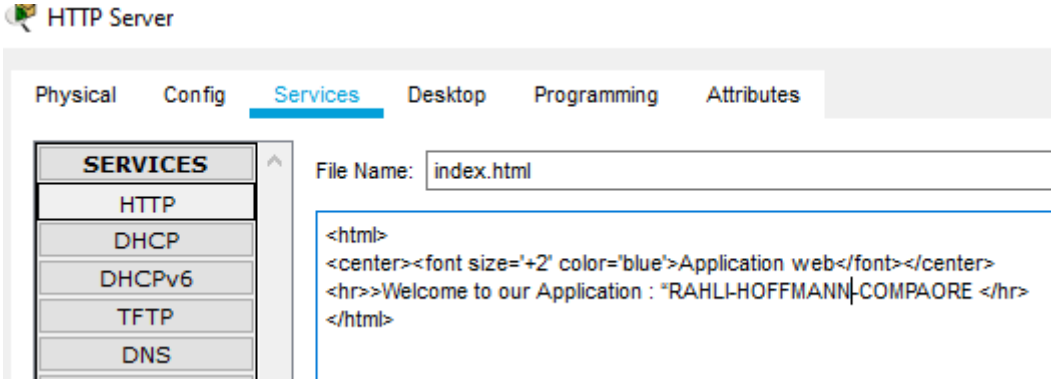


```
Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Link-local IPv6 Address.....: FE80::2E0:8FFF:FEC6:9744
   IP Address.....: 192.168.2.1
   Subnet Mask.....: 255.255.255.0
   Default Gateway.....: 192.168.2.254
```

6. Configure PCT et HTTP server







7. Ping et verification

FROM PCT TO PCA AND DHCP SERVER

```
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=1ms TTL=127
Reply from 192.168.2.1: bytes=32 time=1ms TTL=127
Reply from 192.168.2.1: bytes=32 time=1ms TTL=127
Reply from 192.168.2.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

```
C:\>ping 192.168.2.253

Pinging 192.168.2.253 with 32 bytes of data:

Reply from 192.168.2.253: bytes=32 time=1ms TTL=127
Reply from 192.168.2.253: bytes=32 time<1ms TTL=127
Reply from 192.168.2.253: bytes=32 time<1ms TTL=127
Reply from 192.168.2.253: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.2.253:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

```
C:\>tracert 192.168.2.1

Tracing route to 192.168.2.1 over a maximum of 30 hops:

  1    0 ms      0 ms      0 ms      192.168.3.254
  2    1 ms      1 ms      0 ms      192.168.2.1

Trace complete.
```

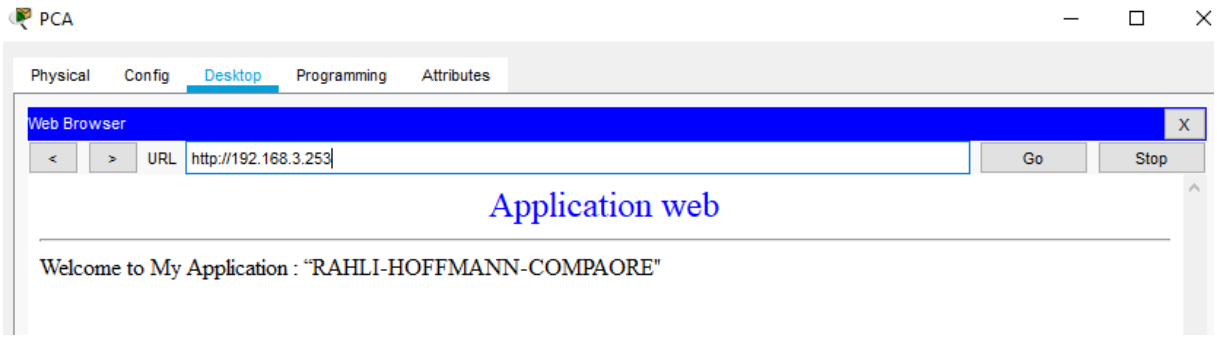
```
C:\>tracert 192.168.2.253

Tracing route to 192.168.2.253 over a maximum of 30 hops:

  1    1 ms      1 ms     14 ms      192.168.3.254
  2    0 ms      0 ms      0 ms      192.168.2.253

Trace complete.
```

From PCA to HTTP Server

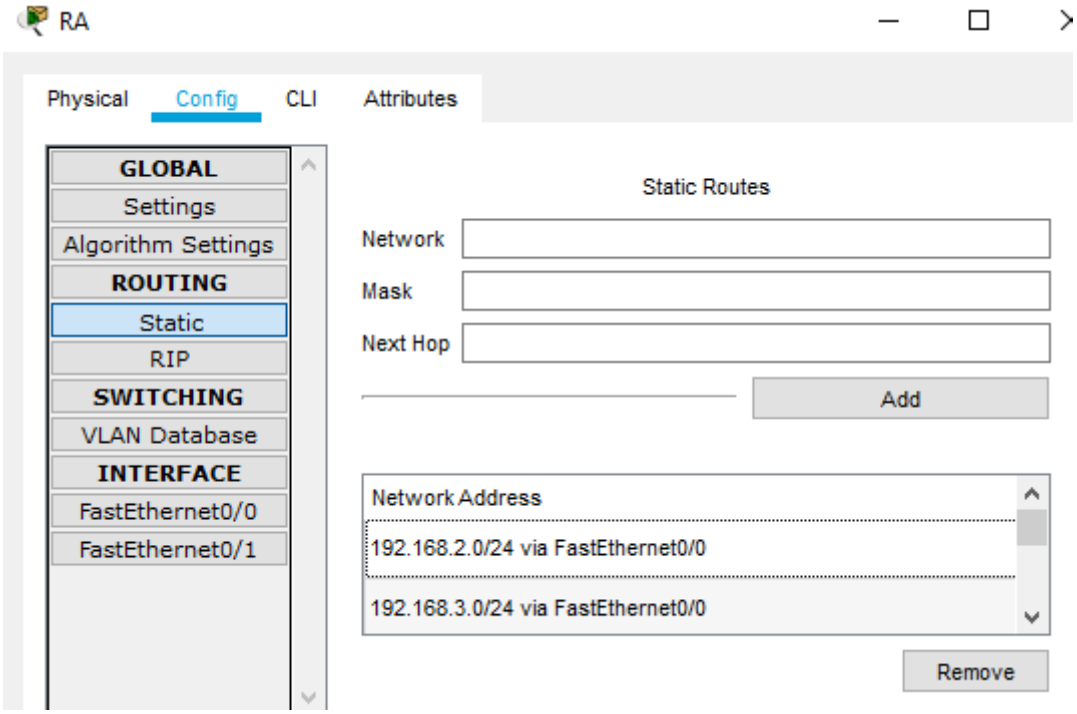
```
C:\>ping 192.168.3.253

Pinging 192.168.3.253 with 32 bytes of data:

Reply from 192.168.3.253: bytes=32 time<1ms TTL=127
Reply from 192.168.3.253: bytes=32 time<1ms TTL=127
Reply from 192.168.3.253: bytes=32 time<1ms TTL=127
Reply from 192.168.3.253: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.3.253:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

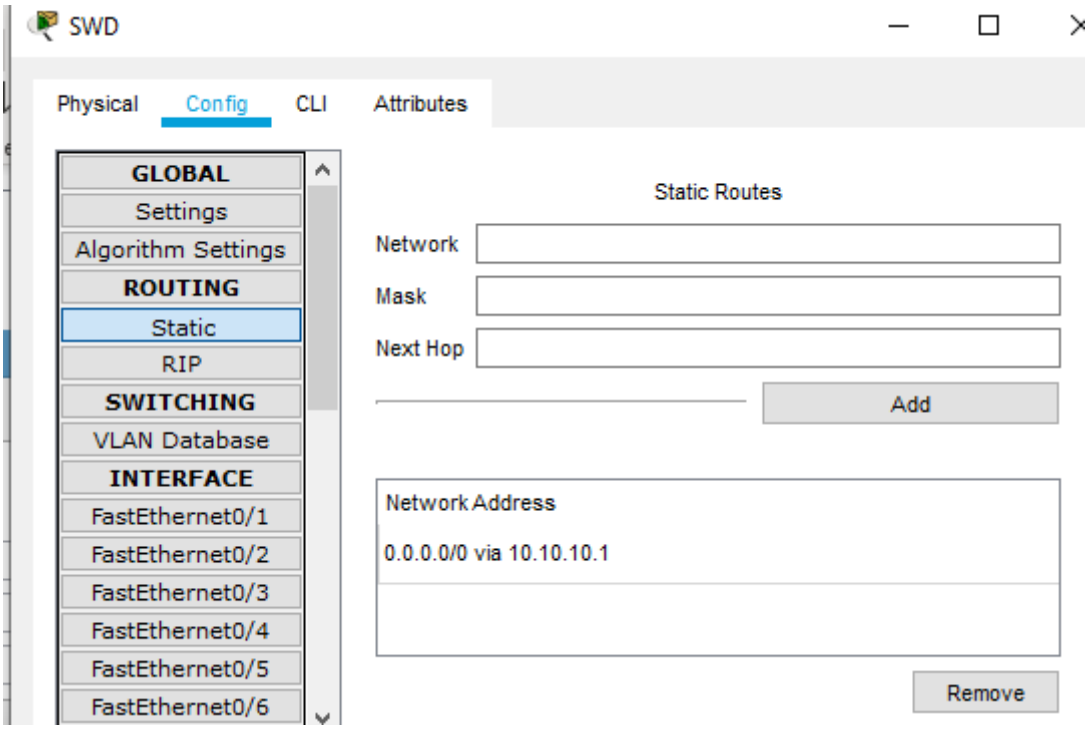
```
C:\>tracert 192.168.3.253

Tracing route to 192.168.3.253 over a maximum of 30 hops:

  1    0 ms      0 ms      0 ms      192.168.2.254
  2    0 ms      1 ms      1 ms      192.168.3.253

Trace complete.
```

- **Use the Web Browser of PCA to connect to the HTTP Server**



8. Configure the routing on SWD and RA :





- **Make a show ip route on RA and SWD (copy screenshot hereafter)**

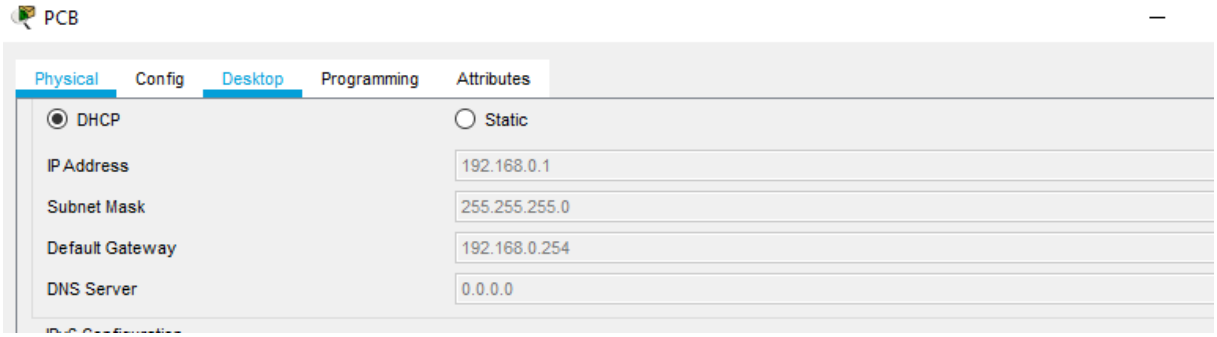
```
SWD#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B -
BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       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 10.10.10.1 to network 0.0.0.0

     10.0.0.0/30 is subnetted, 1 subnets
C       10.10.10.0 is directly connected, Vlan10
C    192.168.2.0/24 is directly connected, Vlan2
C    192.168.3.0/24 is directly connected, Vlan3
S*   0.0.0.0/0 [1/0] via 10.10.10.1
```

```
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 10.10.1.1 to network 0.0.0.0

     10.0.0.0/30 is subnetted, 2 subnets
C       10.10.1.0 is directly connected, FastEthernet0/1
C       10.10.10.0 is directly connected, FastEthernet0/0
S    192.168.2.0/24 [1/0] via 10.10.10.2
S    192.168.3.0/24 [1/0] via 10.10.10.2
S*   0.0.0.0/0 [254/0] via 10.10.1.1
```

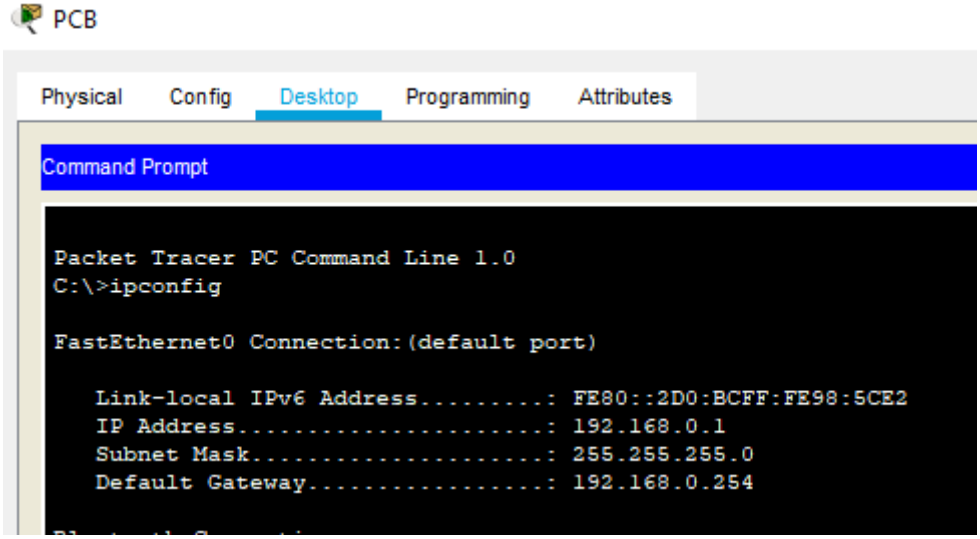
9. Configure dhcp server on the router RB

```
RB>en
RB#config t
Enter configuration commands, one per line.  End with CNTL/Z.
RB(config)#ip dhcp pool dhcpB
RB(dhcp-config)#network 192.168.0.0 255.255.255.0
RB(dhcp-config)#default-router 192.168.0.254
RB(dhcp-config)#exit
RB(config)#exit
RB#
%SYS-5-CONFIG_I: Configured from console by console

RB#config t
Enter configuration commands, one per line.  End with CNTL/Z.
RB(config)#ip dhcp excluded-address 192.168.0.11 192.168.0.253
```

10. Configure the PCB on DHCP




```
RB#
RB#show ip dhcp binding
IP address       Client-ID/              Lease expiration        Type
                 Hardware address
192.168.0.1      00D0.BC98.5CE2           --
Automatic
```



PARTIE SECURITE

11. You will configure a tunnel IPSec between RA and RB to provide a secure communication between Site A and Site B.

- **Configure a ISAKMP policy**

- **RA**

```
RA#config t
Enter configuration commands, one per line.  End with CNTL/Z.
RA(config)#crypto isakmp enable
RA(config)#crypto isakmp policy 10
RA(config-isakmp)#authentification pre-share
                             ^
% Invalid input detected at '^' marker.

RA(config-isakmp)#authentication pre-share
RA(config-isakmp)#encryption des
RA(config-isakmp)#hash md5
RA(config-isakmp)#exit
```

- **RB**

```
RB(config)#crypto isakmp enable
RB(config)#crypto isakmp policy 10
RB(config-isakmp)#authentication pre-share
RB(config-isakmp)#encryption des
RB(config-isakmp)#hash md5
```

- **Configure a pre-shard key (the same key must be configured on the two routers) with the peer WAN IP address (RA is the peer of RB)**

```
RA(config)#crypto isakmp key rhc address 10.10.2.2

RB(config)#crypto isakmp key rhc address 10.10.1.2
```

- **Configure transform-set labset , you will use esp protocol**
  - **Encryption algorithm 3DES**
  - **Hash algorithm sha**

```
RA(config)#crypto ipsec transform-set labset esp-3des esp-sha-hmac

RB(config)#crypto ipsec transform-set labset esp-3des esp-sha-hmac
```

- **Configure an access-list 100 to define interesting VPN traffic (the LANs subnet => encryption domains).**

```
RA(config)#access-list 100 permit ip 10.10.10.1 0.0.0.3 192.168.0.254
0.0.0.255

RB(config)#access-list 100 permit ip 192.168.0.254 0.0.0.255
10.10.10.1 0.0.0.3
```

- **Configure the crypto map labmap**

- **Set the peer address**
- **Use the transform labset.**
- **Match the access-list 100**

```
RA(config)#crypto map labmap 10 ipsec-isakmp
% NOTE: This new crypto map will remain disabled until a peer
        and a valid access list have been configured.
RA(config-crypto-map)#set peer 10.10.2.2
RA(config-crypto-map)#set transform-set labset
RA(config-crypto-map)#match address 100
RA(config-crypto-map)#exit
RA(config)#int fast
RA(config)#int fastEthernet 0/1
RA(config-if)#crypto map labmap
*Jan  3 07:16:26.785: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is ON
RA(config-if)#

RB#config t
Enter configuration commands, one per line.  End with CNTL/Z.
RB(config)#crypto map labmap 10 ipsec-isakmp
% NOTE: This new crypto map will remain disabled until a peer
        and a valid access list have been configured.
RB(config-crypto-map)#set peer 10.10.1.2
RB(config-crypto-map)#set transform-set labset
RB(config-crypto-map)#match address 100
RB(config-crypto-map)#exit
RB(config)#int Fas
RB(config)#int FastEthernet 0/1
RB(config-if)#crypto map labmap
*Jan  3 07:16:26.785: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is ON
```

12. Ping Server HTTP from PCB (copy screenshot hereafter).

```
C:\>ping 192.168.3.253

Pinging 192.168.3.253 with 32 bytes of data:

Reply from 192.168.3.253: bytes=32 time<1ms TTL=127
Reply from 192.168.3.253: bytes=32 time<1ms TTL=127
Reply from 192.168.3.253: bytes=32 time<1ms TTL=127
Reply from 192.168.3.253: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.3.253:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

```
C:\>tracert 192.168.3.253

Tracing route to 192.168.3.253 over a maximum of 30 hops:

  1    1 ms      0 ms      0 ms      192.168.0.254
  2    *         21 ms     *         Request timed out.
  3    15 ms     41 ms     40 ms     10.10.1.2
  4    71 ms     *         *         Request timed out.
  5    51 ms     87 ms     46 ms     192.168.3.253

Trace complete.
```

15. Execute the commands on the RA and RB (copy screenshot hereafter).

- **show crypto map**

```
RA#show crypto map
Crypto Map labmap 10 ipsec-isakmp
        Peer = 10.10.2.2
        Extended IP access list 100
            access-list 100 permit ip 10.10.10.0 0.0.0.3 192.168.0.0
0.0.0.255
        Current peer: 10.10.2.2
        Security association lifetime: 4608000 kilobytes/3600 seconds
        PFS (Y/N): N
        Transform sets={
                labset,
        }
        Interfaces using crypto map labmap:
                FastEthernet0/1
```

```
RB#show crypto map
Crypto Map labmap 10 ipsec-isakmp
        Peer = 10.10.1.2
        Extended IP access list 100
            access-list 100 permit ip 192.168.0.0 0.0.0.255 10.10.10.0 0.0.0.3
        Current peer: 10.10.1.2
        Security association lifetime: 4608000 kilobytes/3600 seconds
        PFS (Y/N): N
        Transform sets={
                labset,
        }
        Interfaces using crypto map labmap:
                FastEthernet0/1
```

- **show crypto isakmp sa**

```
RA#show crypto isakmp sa
IPv4 Crypto ISAKMP SA
dst             src             state          conn-id slot
status
10.10.2.2       10.10.1.2       QM_IDLE           1031    0
ACTIVE


IPv6 Crypto ISAKMP SA
```

```
RB#show crypto isakmp sa
IPv4 Crypto ISAKMP SA
dst             src             state          conn-id slot
status
10.10.1.2       10.10.2.2       QM_IDLE           1000    0
ACTIVE


IPv6 Crypto ISAKMP SA
```

- **show crypto ipsec sa**

RA :

```
RA#show crypto ipsec sa

interface: FastEthernet0/1
    Crypto map tag: labmap, local addr 10.10.1.2

   protected vrf: (none)
   local  ident (addr/mask/prot/port): (10.10.10.0/255.255.255.252/0/0)
   remote  ident (addr/mask/prot/port): (192.168.0.0/255.255.255.0/0/0)
   current_peer 10.10.2.2 port 500
    PERMIT, flags={origin_is_acl,}
   #pkts encaps: 1, #pkts encrypt: 1, #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 1, #recv errors 0

     local crypto endpt.: 10.10.1.2, remote crypto endpt.:10.10.2.2
     path mtu 1500, ip mtu 1500, ip mtu idb FastEthernet0/1
     current outbound spi: 0x287C5C78(679238776)

     inbound esp sas:
      spi: 0x020E2742(34481986)
        transform: esp-3des esp-sha-hmac ,
        in use settings ={Tunnel, }
        conn id: 2006, flow_id: FPGA:1, crypto map: labmap
        sa timing: remaining key lifetime (k/sec): (4525504/3157)
        IV size: 16 bytes
        replay detection support: N
        Status: ACTIVE

     inbound ah sas:

     inbound pcp sas:

     outbound esp sas:
```

```
  spi: 0x287C5C78(679238776)
    transform: esp-3des esp-sha-hmac ,
    in use settings ={Tunnel, }
    conn id: 2007, flow_id: FPGA:1, crypto map: labmap
    sa timing: remaining key lifetime (k/sec): (4525504/3157)
    IV size: 16 bytes
    replay detection support: N
    Status: ACTIVE

 outbound ah sas:

 outbound pcp sas:
```

RB:

```
RB>en
RB#show crypto isakmp sa
IPv4 Crypto ISAKMP SA
dst             src             state          conn-id slot status
10.10.1.2       10.10.2.2       QM_IDLE           1000    0 ACTIVE


IPv6 Crypto ISAKMP SA


RB#show crypto ipsec sa

interface: FastEthernet0/1
    Crypto map tag: labmap, local addr 10.10.2.2

   protected vrf: (none)
   local  ident (addr/mask/prot/port): (192.168.0.0/255.255.255.0/0/0)
   remote  ident (addr/mask/prot/port): (10.10.10.0/255.255.255.252/0/0)
   current_peer 10.10.1.2 port 500
    PERMIT, flags={origin_is_acl,}
   #pkts encaps: 0, #pkts encrypt: 0, #pkts digest: 0
   #pkts decaps: 1, #pkts decrypt: 1, #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.: 10.10.2.2, remote crypto endpt.:10.10.1.2
     path mtu 1500, ip mtu 1500, ip mtu idb FastEthernet0/1
     current outbound spi: 0x020E2742(34481986)

     inbound esp sas:
      spi: 0x287C5C78(679238776)
```

```
    transform: esp-3des esp-sha-hmac ,
    in use settings ={Tunnel, }
    conn id: 2006, flow_id: FPGA:1, crypto map: labmap
    sa timing: remaining key lifetime (k/sec): (4525504/2983)
    IV size: 16 bytes
    replay detection support: N
    Status: ACTIVE

inbound ah sas:

inbound pcp sas:

outbound esp sas:
 spi: 0x020E2742(34481986)
    transform: esp-3des esp-sha-hmac ,
    in use settings ={Tunnel, }
    conn id: 2007, flow_id: FPGA:1, crypto map: labmap
    sa timing: remaining key lifetime (k/sec): (4525504/2983)
    IV size: 16 bytes
    replay detection support: N
    Status: ACTIVE

outbound ah sas:

outbound pcp sas:
```