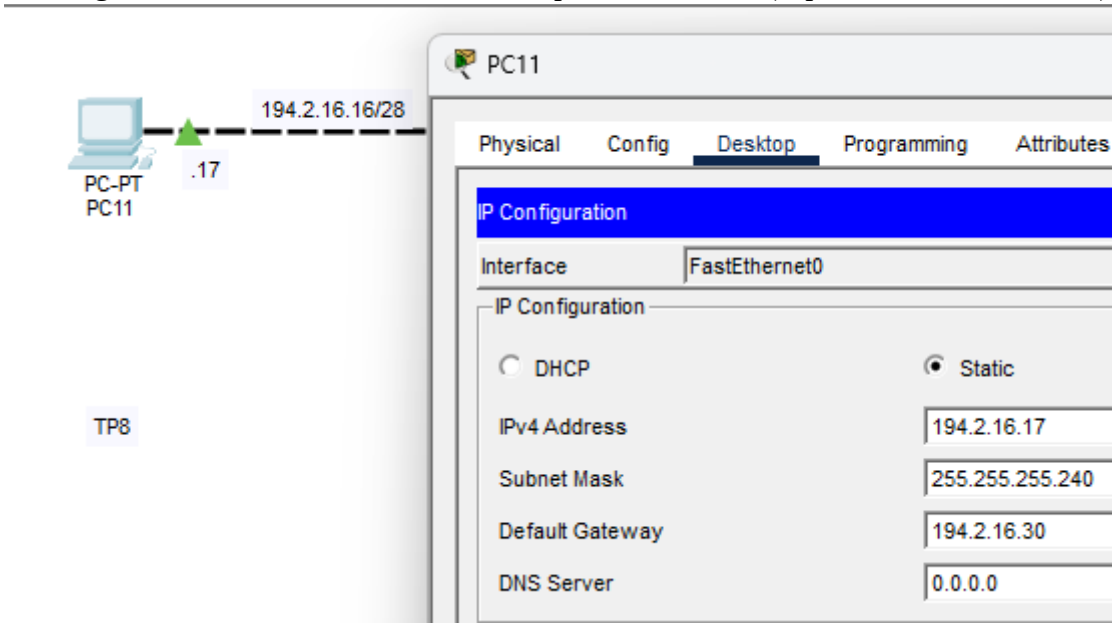
sommaire

1. Visualisation des tables de routage.

▪Vérifiecation la configuration IP des interfaces de PC11 et R11 : - PC11 : Desktop / IP Configuration ; - R11 : commande show ip interface brief (capture d'écran à réaliser).




```
R11>
R11>ena
R11#sh ip interface brief
Interface              IP-Address      OK? Method S
FastEthernet0/0        194.2.16.33     YES manual u
FastEthernet0/1        194.2.16.30     YES manual u
Vlan1                  unassigned      YES unset  a
R11#
```

Vérifiecation de la table de routage de chacun des routeurs (commande show ip route). Faites une capture d'écran des tables de routages de R1 et R11.

R11

```
Gateway of last resort is not set

S    192.168.2.0/24 [1/0] via 194.2.16.35
     194.2.16.0/28 is subnetted, 10 subnets
C       194.2.16.16 is directly connected, FastEthernet0/1
C       194.2.16.32 is directly connected, FastEthernet0/0
D       194.2.16.48 [90/30720] via 194.2.16.34, 00:11:07, FastEthernet0/0
D       194.2.16.96 [90/2172416] via 194.2.16.35, 00:11:07, FastEthernet0/0
D       194.2.16.112 [90/30720] via 194.2.16.35, 00:11:07, FastEthernet0/0
D       194.2.16.128 [90/2172416] via 194.2.16.35, 00:11:07, FastEthernet0/0
D       194.2.16.144 [90/2174976] via 194.2.16.35, 00:11:06, FastEthernet0/0
D       194.2.16.192 [90/35840] via 194.2.16.35, 00:11:06, FastEthernet0/0
D       194.2.16.208 [90/33280] via 194.2.16.35, 00:11:06, FastEthernet0/0
D       194.2.16.224 [90/35840] via 194.2.16.35, 00:11:06, FastEthernet0/0

R11#
```

r1

```
     194.2.16.0/28 is subnetted, 10 subnets
D       194.2.16.16 [90/2174976] via 194.2.16.97, 00:12:12, Serial0/0/0
D       194.2.16.32 [90/2172416] via 194.2.16.97, 00:12:35, Serial0/0/0
D       194.2.16.48 [90/2174976] via 194.2.16.97, 00:12:12, Serial0/0/0
C       194.2.16.96 is directly connected, Serial0/0/0
D       194.2.16.112 [90/2172416] via 194.2.16.146, 00:12:36, Serial0/0/1
                     [90/2172416] via 194.2.16.97, 00:12:35, Serial0/0/0
D       194.2.16.128 [90/2681856] via 194.2.16.146, 00:12:36, Serial0/0/1
                     [90/2681856] via 194.2.16.97, 00:12:35, Serial0/0/0
C       194.2.16.144 is directly connected, Serial0/0/1
D       194.2.16.192 [90/2174976] via 194.2.16.146, 00:12:12, Serial0/0/1
D       194.2.16.208 [90/2172416] via 194.2.16.146, 00:12:36, Serial0/0/1
D       194.2.16.224 [90/2174976] via 194.2.16.146, 00:12:12, Serial0/0/1

R1#
```

Vérification la connectivité de chacun des 4 PC avec les 3 autres à l’aide de la commande ping

pc11

```
C:\>ping 194.2.16.193

Pinging 194.2.16.193 with 32 bytes of data:

Reply from 194.2.16.193: bytes=32 time<1ms TTL=124
Reply from 194.2.16.193: bytes=32 time<1ms TTL=124
Reply from 194.2.16.193: bytes=32 time<1ms TTL=124
Reply from 194.2.16.193: bytes=32 time=1ms TTL=124

Ping statistics for 194.2.16.193:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 194.2.16.225

Pinging 194.2.16.225 with 32 bytes of data:

Reply from 194.2.16.225: bytes=32 time=1ms TTL=124
Reply from 194.2.16.225: bytes=32 time<1ms TTL=124
Reply from 194.2.16.225: bytes=32 time<1ms TTL=124
Reply from 194.2.16.225: bytes=32 time<1ms TTL=124

Ping statistics for 194.2.16.225:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 194.2.16.49

Pinging 194.2.16.49 with 32 bytes of data:

Reply from 194.2.16.49: bytes=32 time<1ms TTL=126
Reply from 194.2.16.49: bytes=32 time<1ms TTL=126
Reply from 194.2.16.49: bytes=32 time<1ms TTL=126
Reply from 194.2.16.49: bytes=32 time<1ms TTL=126

Ping statistics for 194.2.16.49:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

pc12

```
Pinging 194.2.16.17 with 32 bytes of data:

Reply from 194.2.16.17: bytes=32 time<1ms TTL=126
Reply from 194.2.16.17: bytes=32 time<1ms TTL=126
Reply from 194.2.16.17: bytes=32 time<1ms TTL=126
Reply from 194.2.16.17: bytes=32 time<1ms TTL=126

Ping statistics for 194.2.16.17:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 194.2.16.193

Pinging 194.2.16.193 with 32 bytes of data:

Reply from 194.2.16.193: bytes=32 time<1ms TTL=124
Reply from 194.2.16.193: bytes=32 time<1ms TTL=124
Reply from 194.2.16.193: bytes=32 time<1ms TTL=124
Reply from 194.2.16.193: bytes=32 time<1ms TTL=124

Ping statistics for 194.2.16.193:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 194.2.16.225

Pinging 194.2.16.225 with 32 bytes of data:

Reply from 194.2.16.225: bytes=32 time<1ms TTL=124
Reply from 194.2.16.225: bytes=32 time<1ms TTL=124
Reply from 194.2.16.225: bytes=32 time=1ms TTL=124
Reply from 194.2.16.225: bytes=32 time<1ms TTL=124

Ping statistics for 194.2.16.225:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

pc21

```
C:\>ping 194.2.16.17

Pinging 194.2.16.17 with 32 bytes of data:

Reply from 194.2.16.17: bytes=32 time<1ms TTL=124
Reply from 194.2.16.17: bytes=32 time<1ms TTL=124
Reply from 194.2.16.17: bytes=32 time<1ms TTL=124
Reply from 194.2.16.17: bytes=32 time<1ms TTL=124

Ping statistics for 194.2.16.17:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss)
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 194.2.16.225

Pinging 194.2.16.225 with 32 bytes of data:

Reply from 194.2.16.225: bytes=32 time<1ms TTL=126
Reply from 194.2.16.225: bytes=32 time<1ms TTL=126
Reply from 194.2.16.225: bytes=32 time<1ms TTL=126
Reply from 194.2.16.225: bytes=32 time<1ms TTL=126

Ping statistics for 194.2.16.225:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss)
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 194.2.16.49

Pinging 194.2.16.49 with 32 bytes of data:

Reply from 194.2.16.49: bytes=32 time=1ms TTL=124
Reply from 194.2.16.49: bytes=32 time<1ms TTL=124
Reply from 194.2.16.49: bytes=32 time<1ms TTL=124
Reply from 194.2.16.49: bytes=32 time<1ms TTL=124

Ping statistics for 194.2.16.49:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss)
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

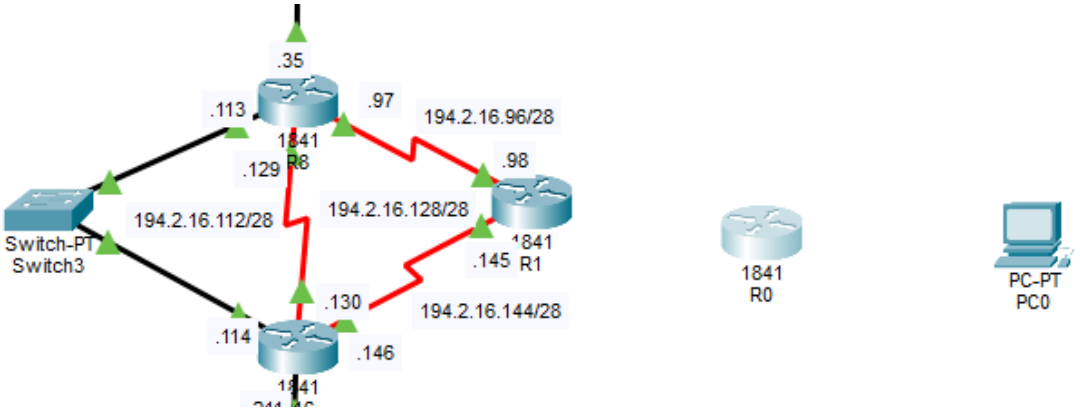
pc22

```
C:\>ping 194.2.16.17

Pinging 194.2.16.17 with 32 bytes of data:

Reply from 194.2.16.17: bytes=32 time<1ms TTL=124
Reply from 194.2.16.17: bytes=32 time=1ms TTL=124
Reply from 194.2.16.17: bytes=32 time=4ms TTL=124
Reply from 194.2.16.17: bytes=32 time<1ms TTL=124

Ping statistics for 194.2.16.17:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 1ms

C:\>ping 194.2.16.193

Pinging 194.2.16.193 with 32 bytes of data:

Reply from 194.2.16.193: bytes=32 time<1ms TTL=126
Reply from 194.2.16.193: bytes=32 time<1ms TTL=126
Reply from 194.2.16.193: bytes=32 time<1ms TTL=126
Reply from 194.2.16.193: bytes=32 time<1ms TTL=126

Ping statistics for 194.2.16.193:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 194.2.16.49

Pinging 194.2.16.49 with 32 bytes of data:

Reply from 194.2.16.49: bytes=32 time<1ms TTL=124
Reply from 194.2.16.49: bytes=32 time=4ms TTL=124
Reply from 194.2.16.49: bytes=32 time=1ms TTL=124
Reply from 194.2.16.49: bytes=32 time=1ms TTL=124

Ping statistics for 194.2.16.49:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 1ms
```

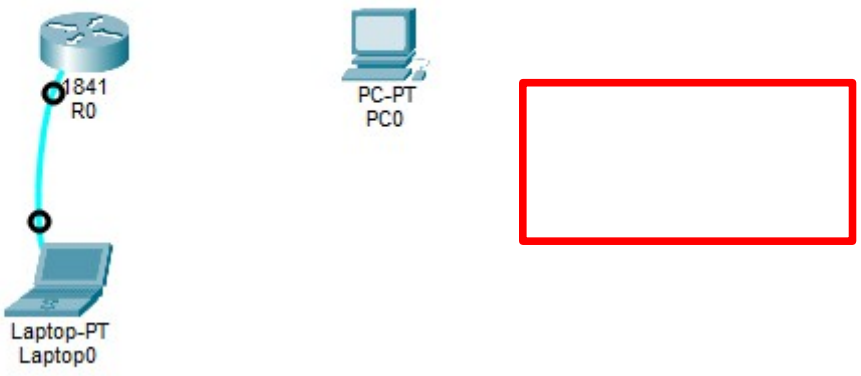
2. Ajout du routeur R0 et de l’ordinateur PC0.

2.1. Placement des périphériques dans la topologie

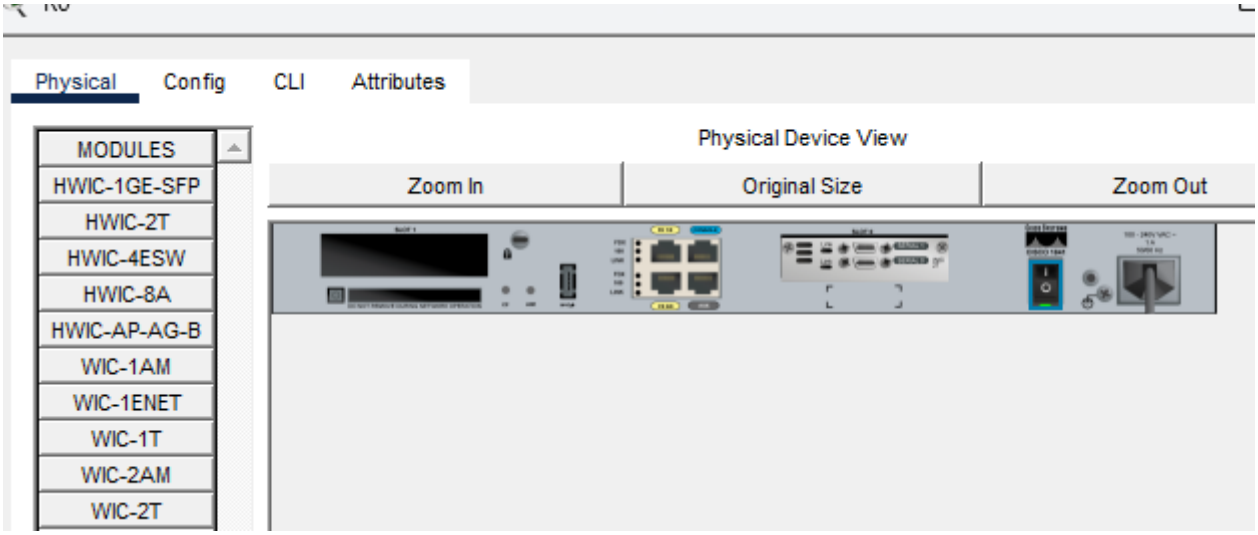
un routeur 1841 est mis en place depuis l’emplacement des périphériques vers la droite du routeur R1. Et ont refais la meme Procédure pour ajouter un portable sous le routeur ainsi qu’un PC àdroite du routeur. droite du routeur.



Et ont relie le portable au routeur avec un câble console :



2.2. Ajout du module WIC-2T au routeur



2.3. Configuration de base du routeur : utilisation du mode « setup »

Ont procède a l'installation du routeur r0

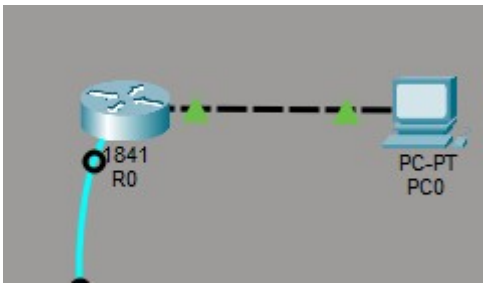
```
Would you like to enter basic management setup? [yes/no]: yes
Configuring global parameters:

  Enter host name [Router]: R0

  The enable secret is a password used to protect access to
  privileged EXEC and configuration modes. This password, after
  entered, becomes encrypted in the configuration.
  Enter enable secret: mdp1

  The enable password is used when you do not specify an
  enable secret password, with some older software versions, and
  some boot images.
  Enter enable password: mdp2

  The virtual terminal password is used to protect
  access to the router over a network interface.
  Enter virtual terminal password: mdp3
Configure SNMP Network Management? [no]:no
```

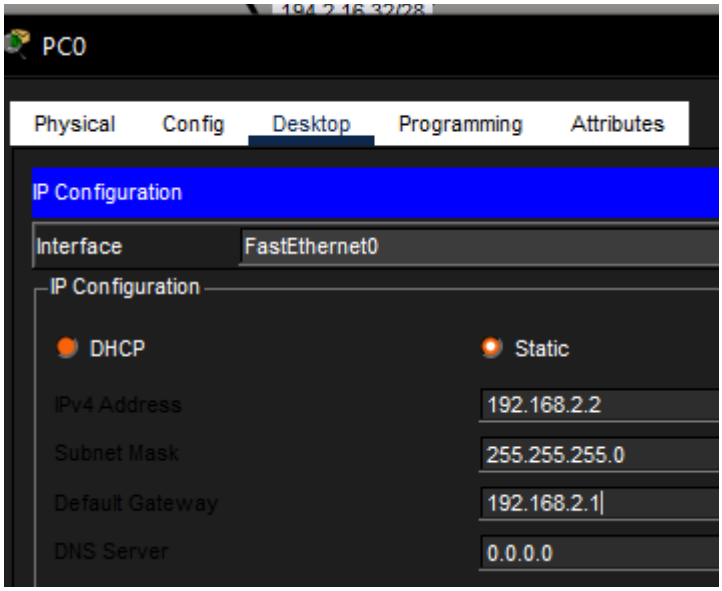
```
Configure SNMP Network Management? [no]:no

Current interface summary

Interface              IP-Address      OK? Method Status                Protocol

FastEthernet0/0        unassigned      YES manual administratively down down

FastEthernet0/1        unassigned      YES manual administratively down down

Serial0/0/0            unassigned      YES manual administratively down down

Serial0/0/1            unassigned      YES manual administratively down down

Vlan1                  unassigned      YES manual administratively down down

Enter interface name used to connect to the
management network from the above interface summary: fastEthernet0/0

Configuring interface FastEthernet0/0:
  Configure IP on this interface? [yes]: yes
    IP address for this interface: 192.168.2.1
    Subnet mask for this interface [255.255.255.0] :
```

```
 ip address 192.168.2.1 255.255.255.0
!
interface FastEthernet0/1
 shutdown
 no ip address
!
interface Serial0/0/0
 shutdown
 no ip address
!
interface Serial0/0/1
 shutdown
 no ip address
!
end

[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.

Enter your selection [2]: 2
Building configuration...
[OK]
Use the enabled mode 'configure' command to modify this configuration.


Press RETURN to get started!


%LINK-3-UPDOWN: Interface Vlan1, changed state to down

%LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to down

%LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to down

%LINK-5-CHANGED: Interface Vlan1, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administrati

%SYS-5-CONFIG_I: Configured from console by console


R0>
```

2.4. Configuration de l'ordinateur et connexion au routeur

Ont conecte le pc au routeur avec un cable croisé sur linterface fast etherrnet





2.5. Observez le fonctionnement ARP et vérifiez la connectivité entre PC0 et R0

Laptop

```
R0>ena
Password:
R0#sh arp
Protocol  Address          Age (min)  Hardware Addr   Type   Interface
Internet  192.168.2.1            -   00D0.FF8E.7E01  ARPA   FastEthernet0/0
R0#
```

pc0

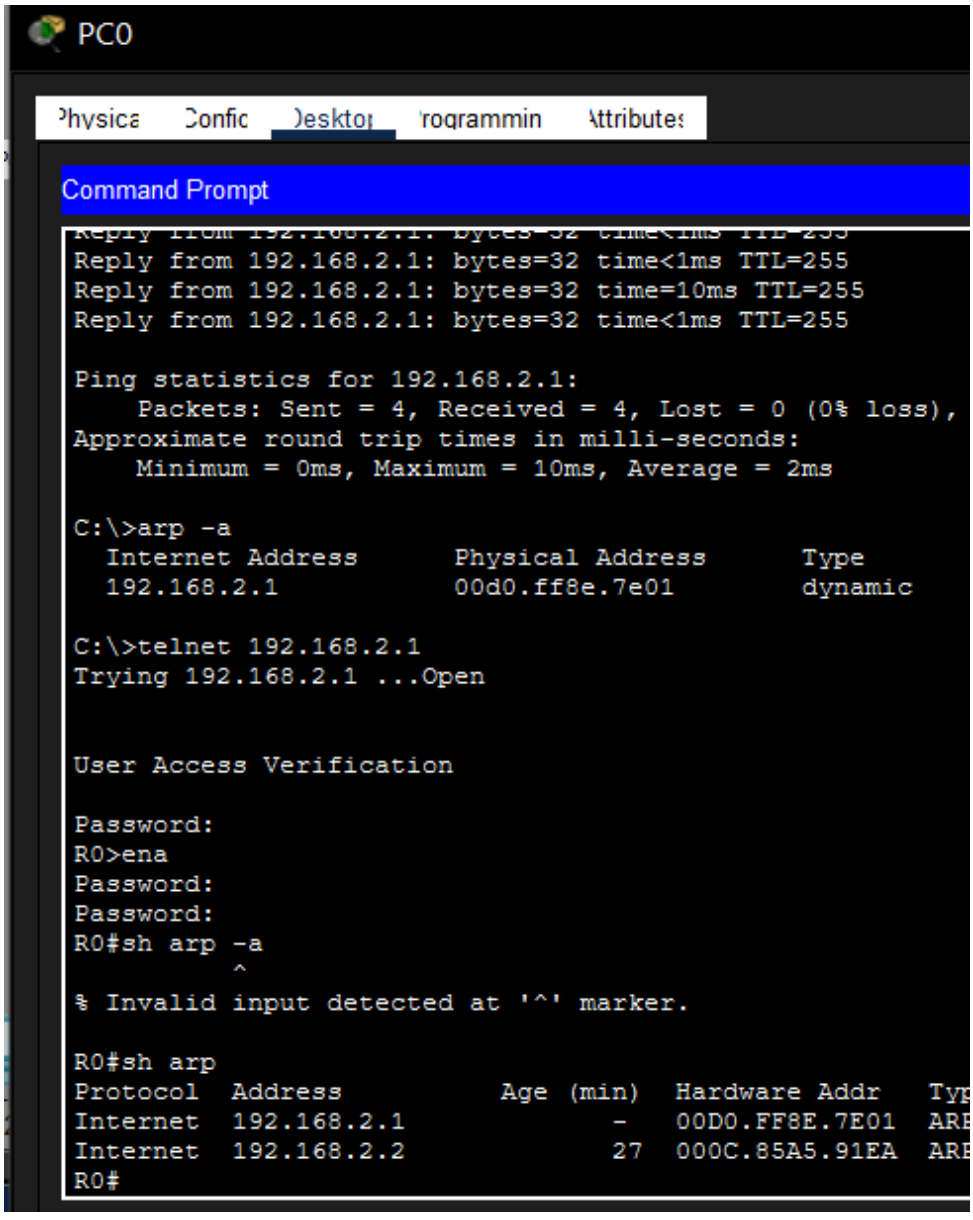
```
C:\>arp -a
No ARP Entries Found
C:\>
```

Entre ensuite la commande **arp –a**.

```
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=255
Reply from 192.168.2.1: bytes=32 time<1ms TTL=255
Reply from 192.168.2.1: bytes=32 time=10ms TTL=255
Reply from 192.168.2.1: bytes=32 time<1ms TTL=255

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 = 10ms, Average = 2ms

C:\>arp -a
  Internet Address      Physical Address      Type
  192.168.2.1           00d0.ff8e.7e01        dynamic

C:\>
```

```
R0#sh arp
Protocol  Address          Age (min)  Hardware Addr   Type   Interface
Internet  192.168.2.1              -   00D0.FF8E.7E01  ARPA   FastEthernet0/0
Internet  192.168.2.2             10   000C.85A5.91EA  ARPA   FastEthernet0/0
R0#
```

2.6. Test de la connexion Telnet au routeur (avec un ping)



Le cable console ainsi que le laptop0 ont etait supprimé

2.7. Connexion du routeur R0 au routeur R1

```
Device Name: R1
Device Model: 1841
Hostname: R1

Port              Link   VLAN   IP Address         IPv6 Address                            MAC Address
FastEthernet0/0   Down   --     <not set>          <not set>                               0090.21BA.8C01
FastEthernet0/1   Down   --     <not set>          <not set>                               0090.21BA.8C02
Serial0/0/0       Up     --     194.2.16.98/28     <not set>                               <not set>
Serial0/0/1       Up     --     194.2.16.145/28    <not set>                               <not set>
Serial0/1/0       Down   --     192.168.1.1/24     <not set>                               <not set>
Serial0/1/1       Down   --     <not set>          <not set>                               <not set>
Vlan1             Down   1      <not set>          <not set>                               0060.4710.2550

Physical Location: Intercity > Home City > Corporate Office > Main Wiring Closet > Rack > R1
```

2.8. Configuration de l'interface série du routeur R0

Configuration IP de l'interface Serial0/0/0

```
R0>ena
Password:
R0#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R0(config)#
R0(config)#interfac
R0(config)#interface s0/0/0
R0(config-if)#ip address 192.168.1.2 255.255.255.0
R0(config-if)#
```

- Configuration de la synchronisation :

```
R0(config-if)#ip address 192.168.1.2 255.255.255.0
R0(config-if)#clock rate 64000
R0(config-if)#no shutdown

R0(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
```

show ip interface brief

```
% Invalid input detected at '^' marker.

R0#sh ip interface brief
Interface              IP-Address      OK? Method Status
Protocol
FastEthernet0/0        192.168.2.1     YES manual up                    up
FastEthernet0/1        unassigned      YES unset  administratively down down
Serial0/0/0            192.168.1.2     YES manual up                    up
Serial0/0/1            unassigned      YES unset  administratively down down
Vlan1                  unassigned      YES unset  administratively down down
R0#
```

```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=22ms TTL=254
Reply from 192.168.1.1: bytes=32 time=16ms TTL=254
Reply from 192.168.1.1: bytes=32 time=3ms TTL=254
Reply from 192.168.1.1: bytes=32 time=2ms TTL=254

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 22ms, Average = 10ms
```

3 Ajout de routes.

la table de routage

```
R0#sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobi
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF in
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA externa
       E1 - OSPF external type 1, E2 - OSPF external type 2,
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia
area
       * - candidate default, U - per-user static route, o -
       P - periodic downloaded static route

Gateway of last resort is not set

C    192.168.1.0/24 is directly connected, Serial0/0/0
C    192.168.2.0/24 is directly connected, FastEthernet0/0

R0#
```

```
C    192.168.1.0/24 is directly connected, Serial0/1/0
S    192.168.2.0/24 [1/0] via 192.168.1.2
     194.2.16.0/28 is subnetted, 10 subnets
D       194.2.16.16 [90/2174976] via 194.2.16.97, 03:52:40, Serial0/0/0
D       194.2.16.32 [90/2172416] via 194.2.16.97, 03:53:04, Serial0/0/0
D       194.2.16.48 [90/2174976] via 194.2.16.97, 03:52:40, Serial0/0/0
C       194.2.16.96 is directly connected, Serial0/0/0
D       194.2.16.112 [90/2172416] via 194.2.16.146, 03:53:05, Serial0/0/1
                     [90/2172416] via 194.2.16.97, 03:53:04, Serial0/0/0
D       194.2.16.128 [90/2681856] via 194.2.16.146, 03:53:05, Serial0/0/1
                     [90/2681856] via 194.2.16.97, 03:53:04, Serial0/0/0
C       194.2.16.144 is directly connected, Serial0/0/1
D       194.2.16.192 [90/2174976] via 194.2.16.146, 03:52:40, Serial0/0/1
D       194.2.16.208 [90/2172416] via 194.2.16.146, 03:53:05, Serial0/0/1
D       194.2.16.224 [90/2174976] via 194.2.16.146, 03:52:40, Serial0/0/1

R1#
R1#
```

ont a 3 posssiblilité pour crée des routes convenable :

soit ont indique a R0 tout les groupe de reseaux route static.

soit ont utilise la route par defaut 0.0.0.0 .

soit une route agregée.

Pour cette exercice ont vas utilisé la route par defaut en passent par le routeur 1

```
C    192.168.1.0/24 is directly connected, Serial0/0/0
C    192.168.2.0/24 is directly connected, FastEthernet0/0
S*   0.0.0.0/0 [1/0] via 192.168.1.1

R0#
```

et pour finir ont Teste la connectivité

PC11

```
C:\>ping 194.2.16.17

Pinging 194.2.16.17 with 32 bytes of data:

Reply from 194.2.16.17: bytes=32 time=16ms TTL=124
Reply from 194.2.16.17: bytes=32 time=24ms TTL=124
Reply from 194.2.16.17: bytes=32 time=13ms TTL=124
Reply from 194.2.16.17: bytes=32 time=11ms TTL=124

Ping statistics for 194.2.16.17:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 11ms, Maximum = 24ms, Average = 16ms
```

PC12

```
C:\>ping 194.2.16.49

Pinging 194.2.16.49 with 32 bytes of data:

Reply from 194.2.16.49: bytes=32 time=22ms TTL=124
Reply from 194.2.16.49: bytes=32 time=10ms TTL=124
Reply from 194.2.16.49: bytes=32 time=2ms TTL=124
Reply from 194.2.16.49: bytes=32 time=14ms TTL=124

Ping statistics for 194.2.16.49:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 22ms, Average = 12ms
```

pc21

```
C:\>ping 194.2.16.193

Pinging 194.2.16.193 with 32 bytes of data:

Reply from 194.2.16.193: bytes=32 time=21ms TTL=124
Reply from 194.2.16.193: bytes=32 time=11ms TTL=124
Reply from 194.2.16.193: bytes=32 time=8ms TTL=124
Reply from 194.2.16.193: bytes=32 time=11ms TTL=124

Ping statistics for 194.2.16.193:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 8ms, Maximum = 21ms, Average = 12ms
```

PC22

```
C:\>ping 194.2.16.225

Pinging 194.2.16.225 with 32 bytes of data:

Reply from 194.2.16.225: bytes=32 time=17ms TTL=124
Reply from 194.2.16.225: bytes=32 time=8ms TTL=124
Reply from 194.2.16.225: bytes=32 time=12ms TTL=124
Reply from 194.2.16.225: bytes=32 time=20ms TTL=124

Ping statistics for 194.2.16.225:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 8ms, Maximum = 20ms, Average = 14ms
```