

**I H C QU C GIA THÀNH PH H CHÍ MINH
TR NG I H C KHOA H C T NHIÊN**

**KHOA CÔNG NGH THÔNG TIN
MÔN:TH C T P M NG MÁY TÍNH**

BÁO CÁO BÀI T P TU N 7

PPP – Ch ng th c PAP CHAP

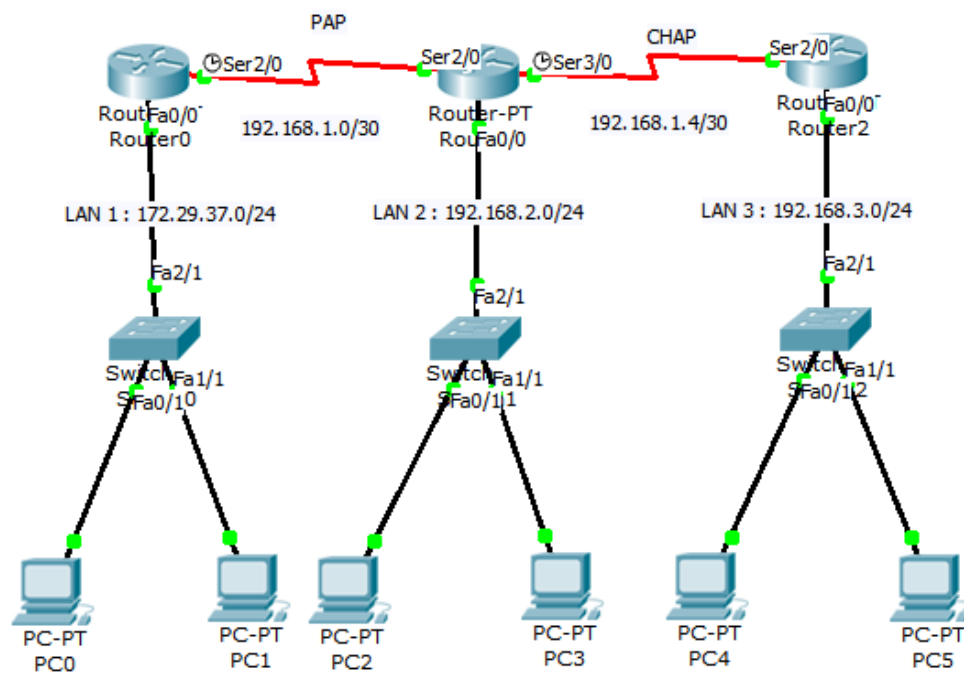
L p: 09HCA

H tên : Võ Hu nh an

MSSV : 0941037

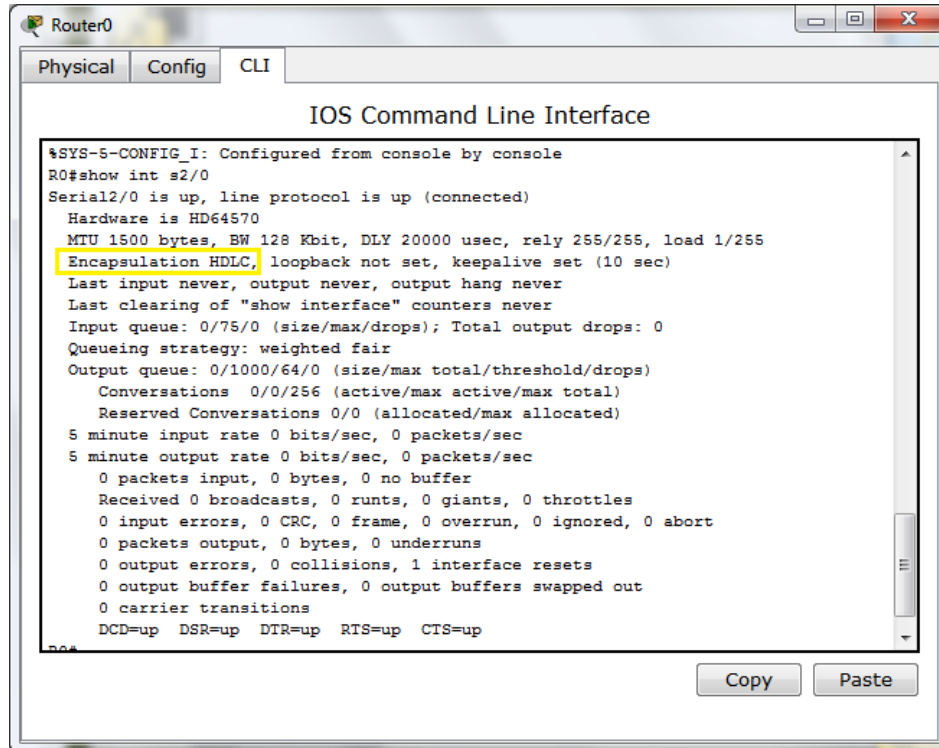
Bài làm:

1. Mô hình thực hiện :



2. . HDLC – PPP

Xem thông tin v c ng Ser2/0

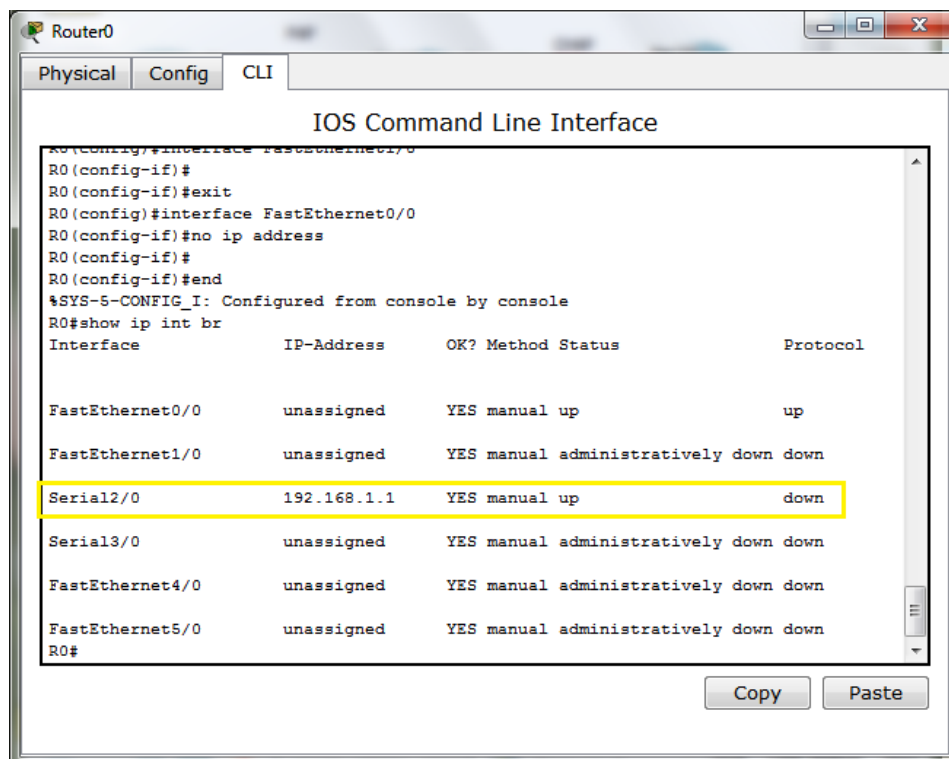


```
Router0
Physical Config CLI
IOS Command Line Interface

%SYS-5-CONFIG_I: Configured from console by console
R0#show int s2/0
Serial2/0 is up, line protocol is up (connected)
Hardware is HD64570
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec, rely 255/255, load 1/255
Encapsulation HDLC, loopback not set, keepalive set (10 sec)
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 1 interface resets
0 output buffer failures, 0 output buffers swapped out
0 carrier transitions
DCD=up DSR=up DTR=up RTS=up CTS=up

R0#
```

Khi m i chuy n R0 sang PPP

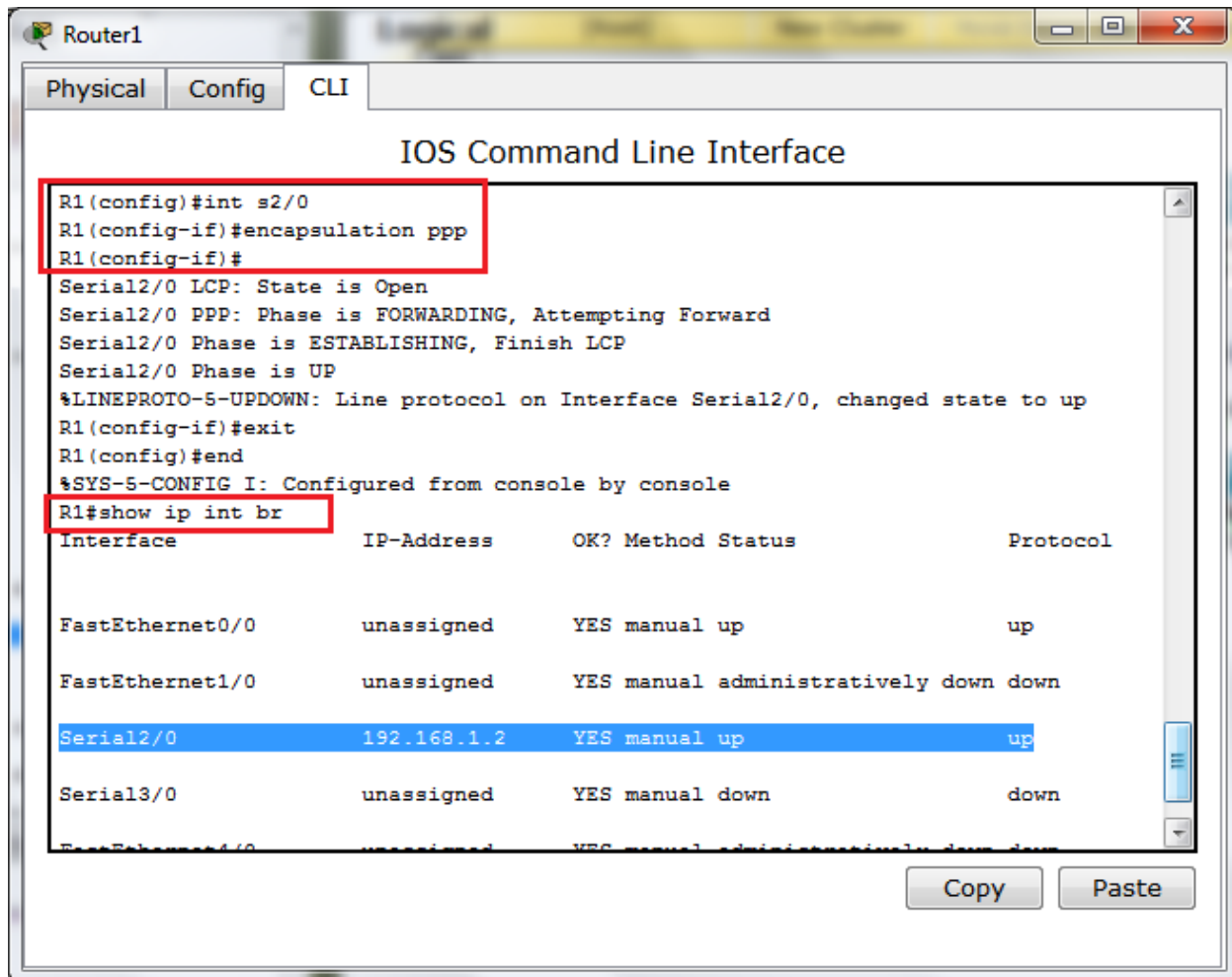


```
Router0
Physical Config CLI
IOS Command Line Interface

R0(config)#interface FastEthernet0/0
R0(config-if)#
R0(config-if)#exit
R0(config)#interface FastEthernet0/0
R0(config-if)#no ip address
R0(config-if)#
R0(config-if)#end
%SYS-5-CONFIG_I: Configured from console by console
R0#show ip int br
Interface IP-Address OK? Method Status Protocol

FastEthernet0/0 unassigned YES manual up up
FastEthernet1/0 unassigned YES manual administratively down down
Serial2/0 192.168.1.1 YES manual up down
Serial3/0 unassigned YES manual administratively down down
FastEthernet4/0 unassigned YES manual administratively down down
FastEthernet5/0 unassigned YES manual administratively down down
R0#
```

Chuyển R1 sang PPP



The screenshot shows the Router1 CLI interface with the following commands and output:

```
R1(config)#int s2/0
R1(config-if)#encapsulation ppp
R1(config-if)#
```

Serial2/0 LCP: State is Open
Serial2/0 PPP: Phase is FORWARDING, Attempting Forward
Serial2/0 Phase is ESTABLISHING, Finish LCP
Serial2/0 Phase is UP
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
R1(config-if)#exit
R1(config)#end
%SYS-5-CONFIG I: Configured from console by console

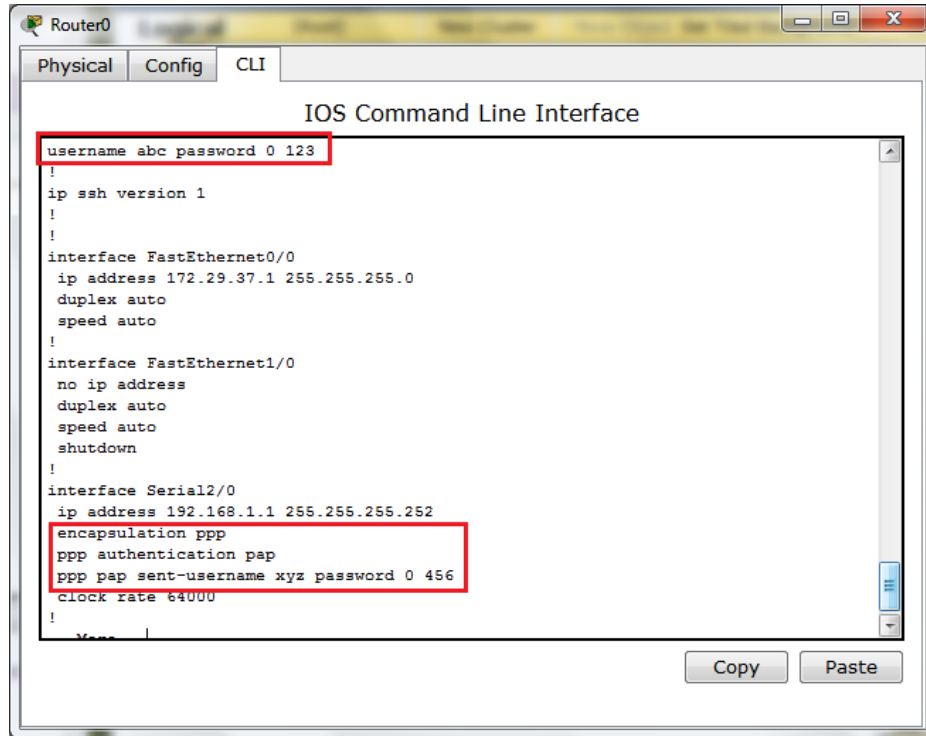
The output of the `R1#show ip int br` command is shown below:

| Interface | IP-Address | OK? | Method | Status | Protocol |
|-----------------|-------------|-----|--------|-----------------------|----------|
| FastEthernet0/0 | unassigned | YES | manual | up | up |
| FastEthernet1/0 | unassigned | YES | manual | administratively down | down |
| Serial2/0 | 192.168.1.2 | YES | manual | up | up |
| Serial3/0 | unassigned | YES | manual | down | down |
| FastEthernet4/0 | unassigned | YES | manual | administratively down | down |

Kh i t o username password cho R0 và R1

Show running-config

R0

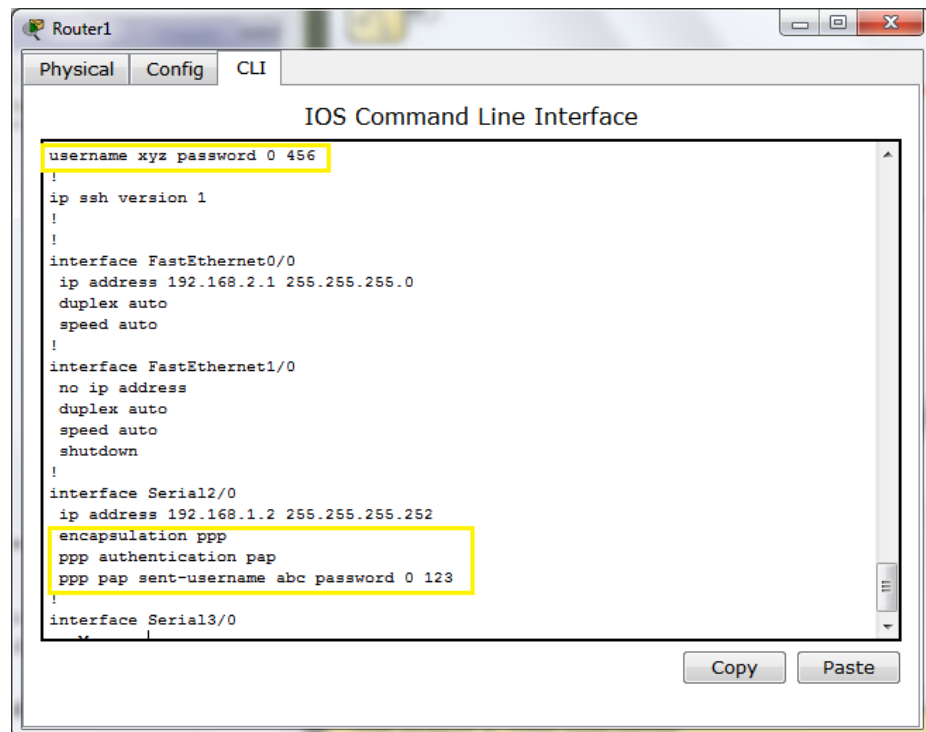


The screenshot shows the configuration window for Router0. The 'CLI' tab is active, displaying the 'IOS Command Line Interface'. The configuration text is as follows:

```
username abc password 0 123
!
ip ssh version 1
!
!
interface FastEthernet0/0
ip address 172.29.37.1 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet1/0
no ip address
duplex auto
speed auto
shutdown
!
interface Serial2/0
ip address 192.168.1.1 255.255.255.252
encapsulation ppp
ppp authentication pap
ppp pap sent-username xyz password 0 456
clock rate 64000
!
```

Red boxes highlight the 'username abc password 0 123' line at the top and the 'encapsulation ppp', 'ppp authentication pap', and 'ppp pap sent-username xyz password 0 456' lines in the Serial2/0 interface section. 'Copy' and 'Paste' buttons are visible at the bottom right.

R1

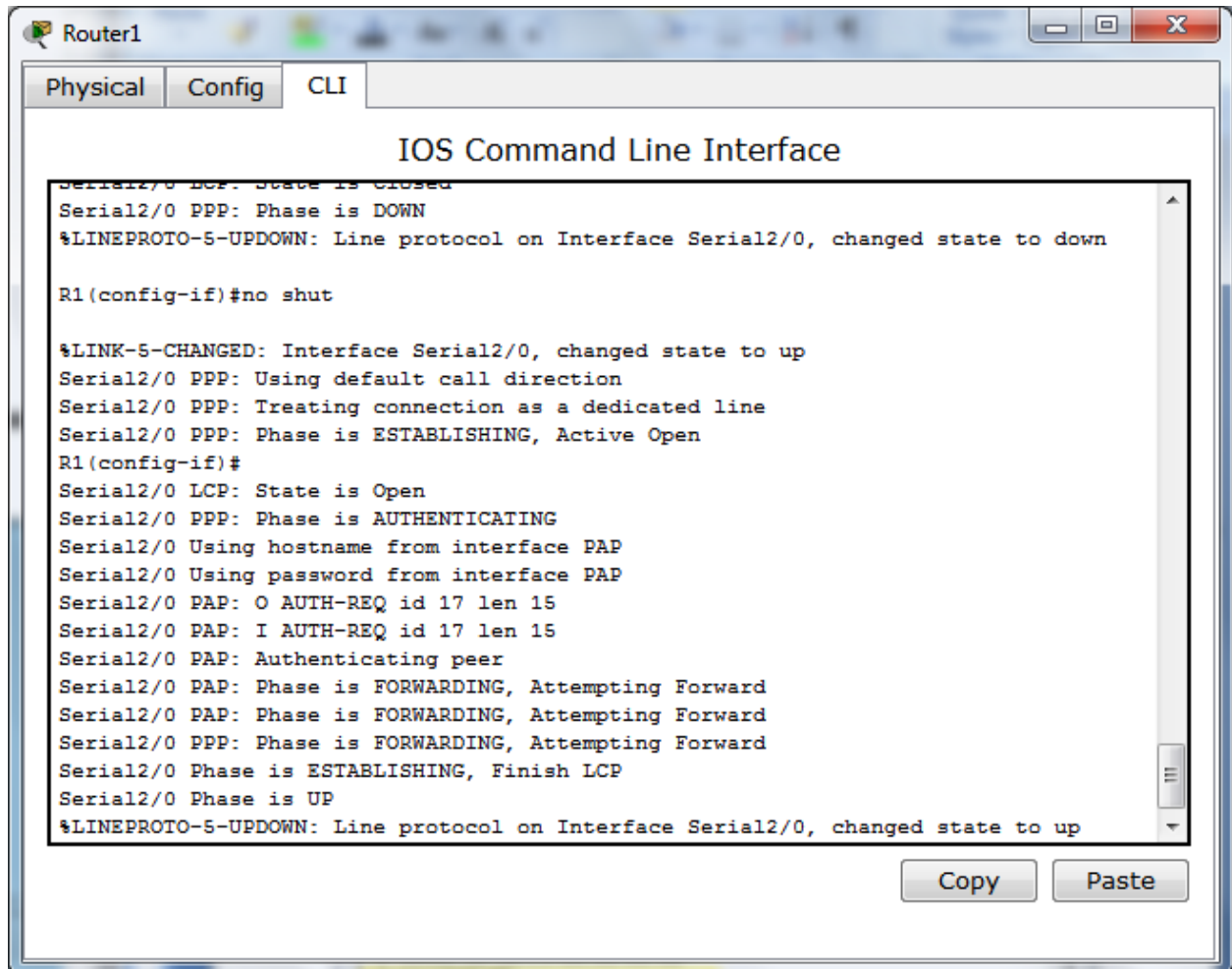


The screenshot shows the configuration window for Router1. The 'CLI' tab is active, displaying the 'IOS Command Line Interface'. The configuration text is as follows:

```
username xyz password 0 456
!
ip ssh version 1
!
!
interface FastEthernet0/0
ip address 192.168.2.1 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet1/0
no ip address
duplex auto
speed auto
shutdown
!
interface Serial2/0
ip address 192.168.1.2 255.255.255.252
encapsulation ppp
ppp authentication pap
ppp pap sent-username abc password 0 123
!
interface Serial3/0
```

Yellow boxes highlight the 'username xyz password 0 456' line at the top and the 'encapsulation ppp', 'ppp authentication pap', and 'ppp pap sent-username abc password 0 123' lines in the Serial2/0 interface section. 'Copy' and 'Paste' buttons are visible at the bottom right.

Thông tin quá trình ch ng th c



The screenshot shows a Cisco Router CLI window titled "Router1" with tabs for "Physical", "Config", and "CLI". The main area is titled "IOS Command Line Interface". The output shows the state of Serial2/0 changing from down to up, and the PPP protocol establishing a connection. The user enters the command "no shut" to bring the interface up.

```
Serial2/0 LCP: State is Closed
Serial2/0 PPP: Phase is DOWN
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down

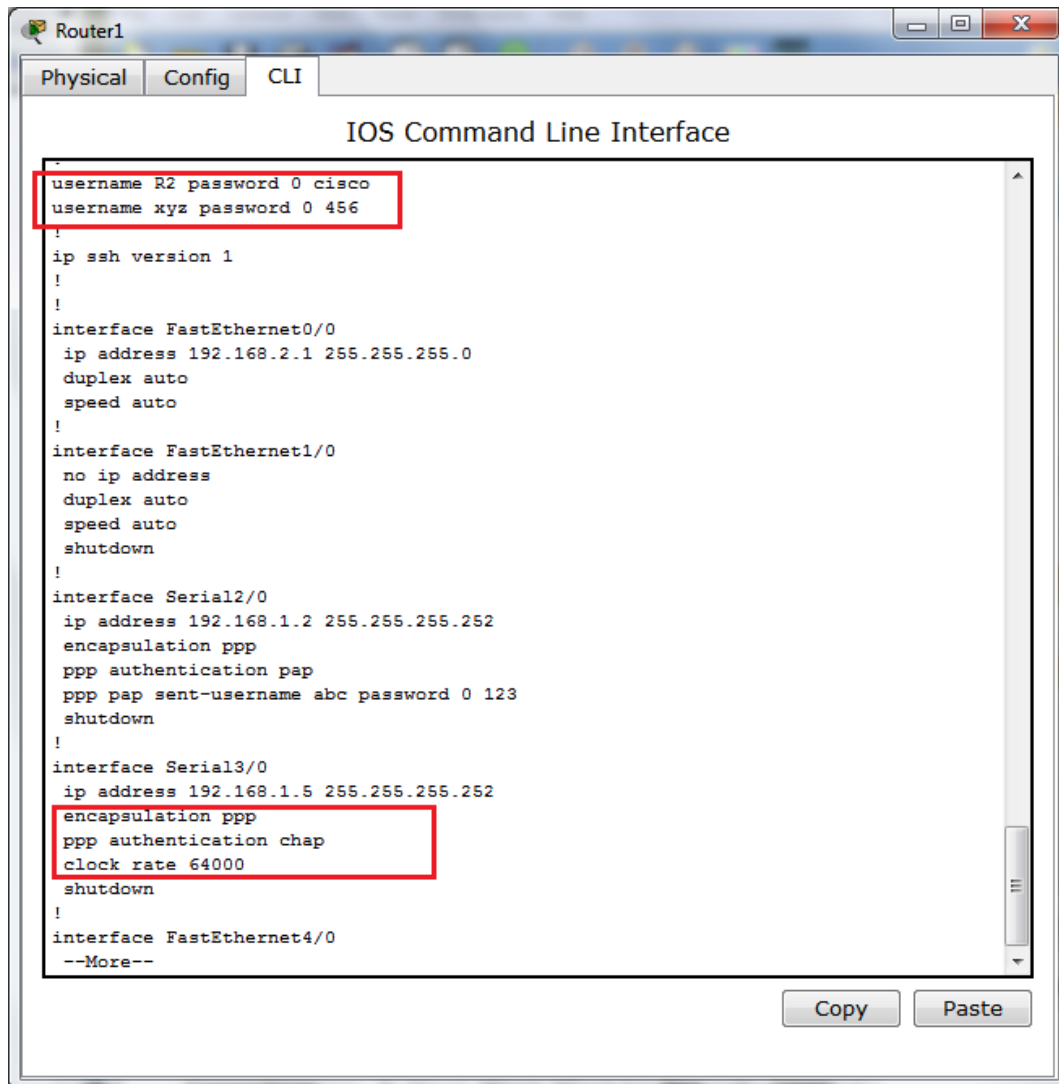
R1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial2/0, changed state to up
Serial2/0 PPP: Using default call direction
Serial2/0 PPP: Treating connection as a dedicated line
Serial2/0 PPP: Phase is ESTABLISHING, Active Open
R1(config-if)#
Serial2/0 LCP: State is Open
Serial2/0 PPP: Phase is AUTHENTICATING
Serial2/0 Using hostname from interface PAP
Serial2/0 Using password from interface PAP
Serial2/0 PAP: O AUTH-REQ id 17 len 15
Serial2/0 PAP: I AUTH-REQ id 17 len 15
Serial2/0 PAP: Authenticating peer
Serial2/0 PAP: Phase is FORWARDING, Attempting Forward
Serial2/0 PAP: Phase is FORWARDING, Attempting Forward
Serial2/0 PPP: Phase is FORWARDING, Attempting Forward
Serial2/0 Phase is ESTABLISHING, Finish LCP
Serial2/0 Phase is UP
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

Copy Paste

Ch ng th c CHAP

Kết quả cấu hình cho R1



```
Router1
Physical Config CLI
IOS Command Line Interface
username R2 password 0 cisco
username xyz password 0 456
!
ip ssh version 1
!
!
interface FastEthernet0/0
ip address 192.168.2.1 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet1/0
no ip address
duplex auto
speed auto
shutdown
!
interface Serial2/0
ip address 192.168.1.2 255.255.255.252
encapsulation ppp
ppp authentication pap
ppp pap sent-username abc password 0 123
shutdown
!
interface Serial3/0
ip address 192.168.1.5 255.255.255.252
encapsulation ppp
ppp authentication chap
clock rate 64000
shutdown
!
interface FastEthernet4/0
--More--
Copy Paste
```

Kết quả cấu hình cho R2

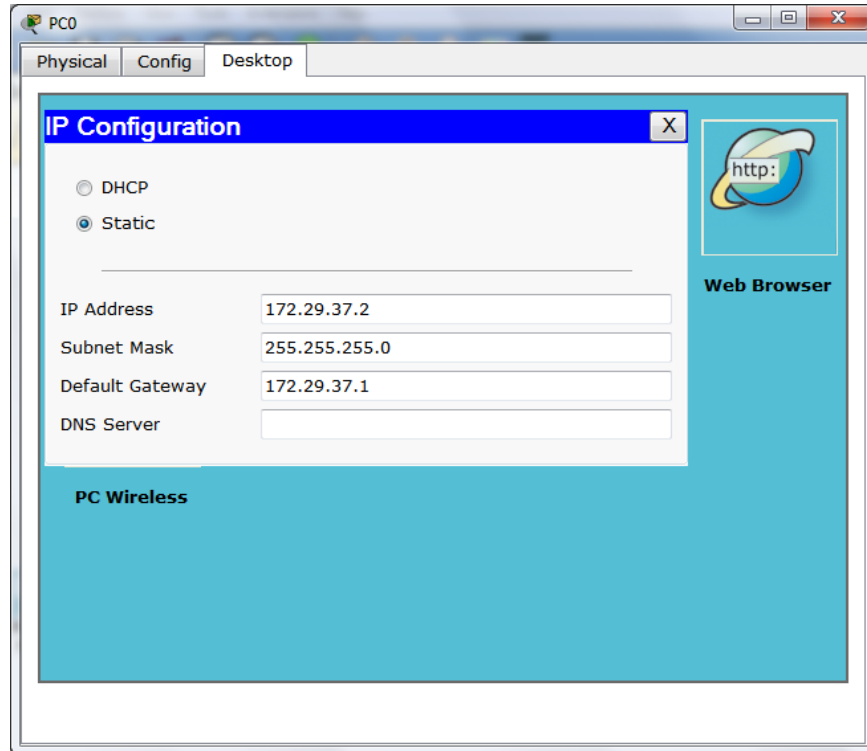
```
Router2
Physical Config CLI
IOS Command Line Interface

!
!
username R1 password 0 cisco
!
ip ssh version 1
!
!
interface FastEthernet0/0
ip address 192.168.3.1 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet1/0
no ip address
duplex auto
speed auto
shutdown
!
interface Serial2/0
ip address 192.168.1.6 255.255.255.252
encapsulation ppp
ppp authentication chap
!
interface Serial3/0
no ip address
shutdown
--More--
```

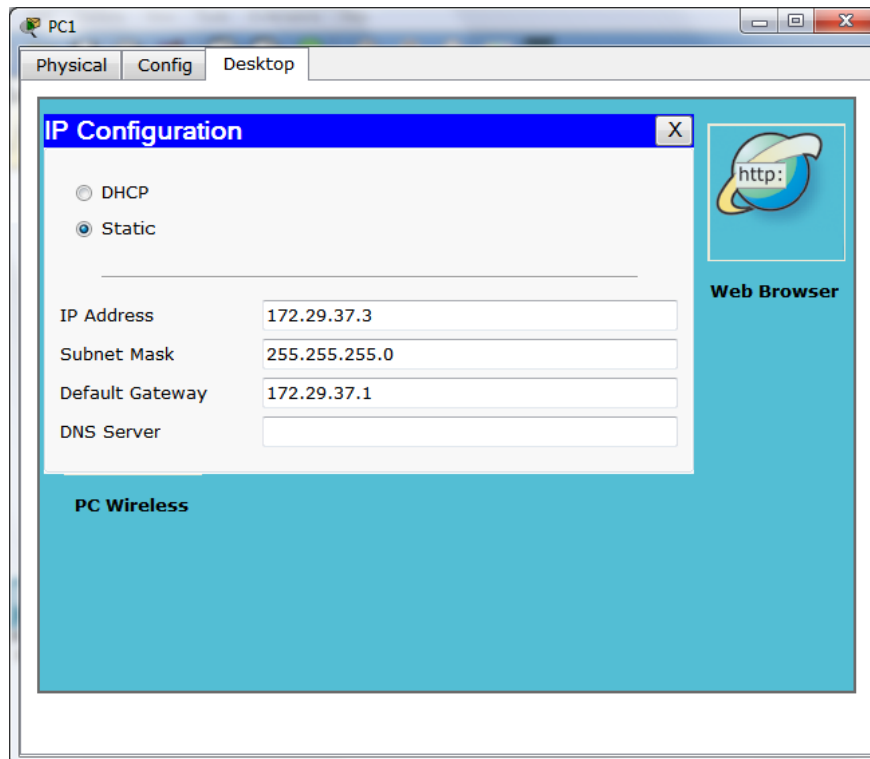
Copy Paste

Cấu hình IP cho các PC và Route như sau :

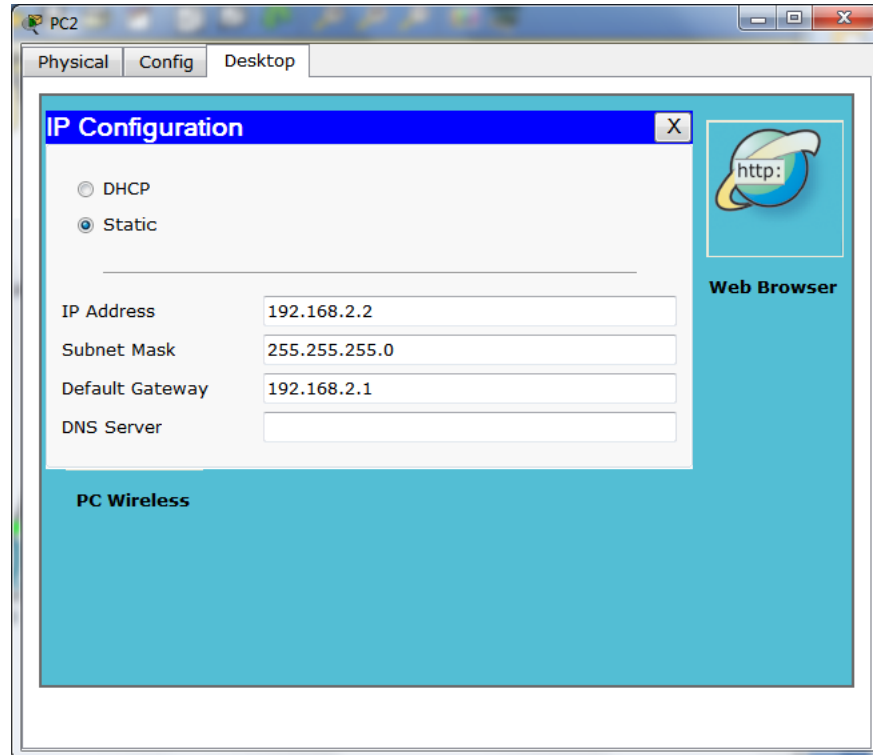
PC0



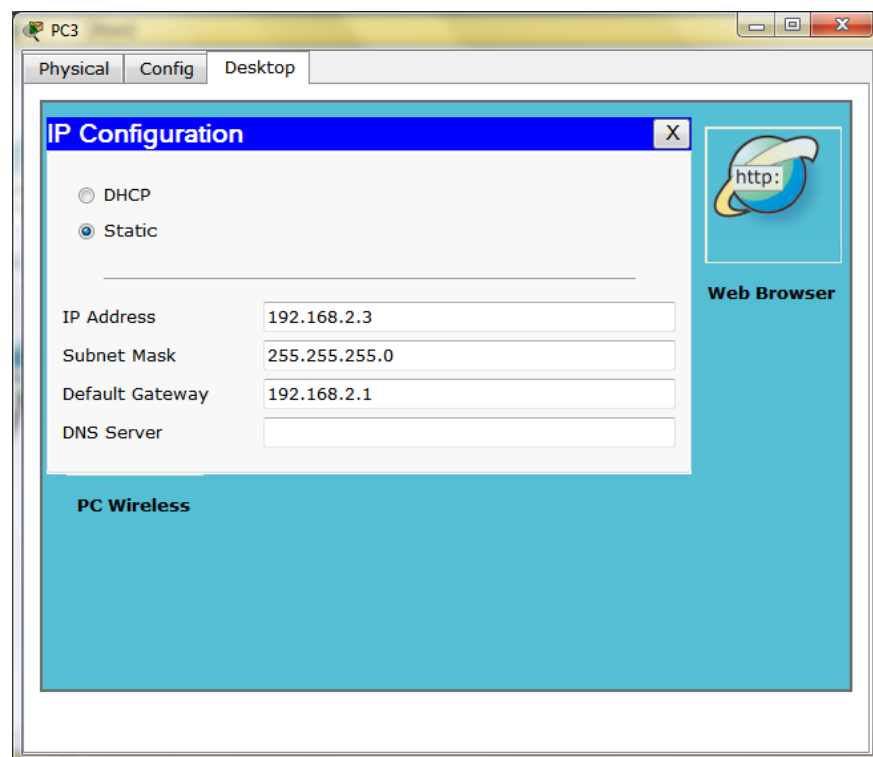
PC1



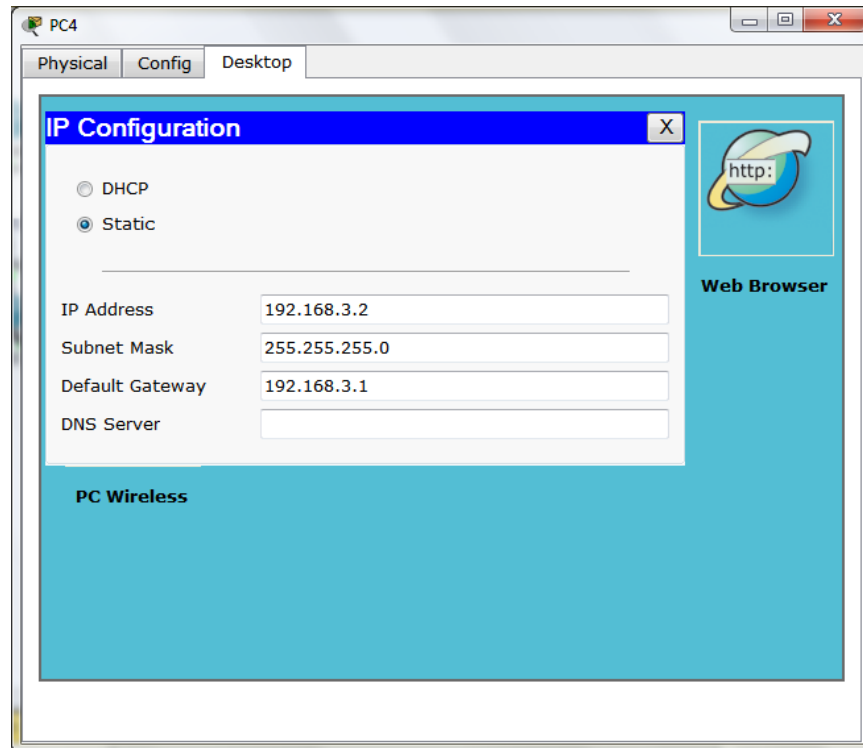
PC2



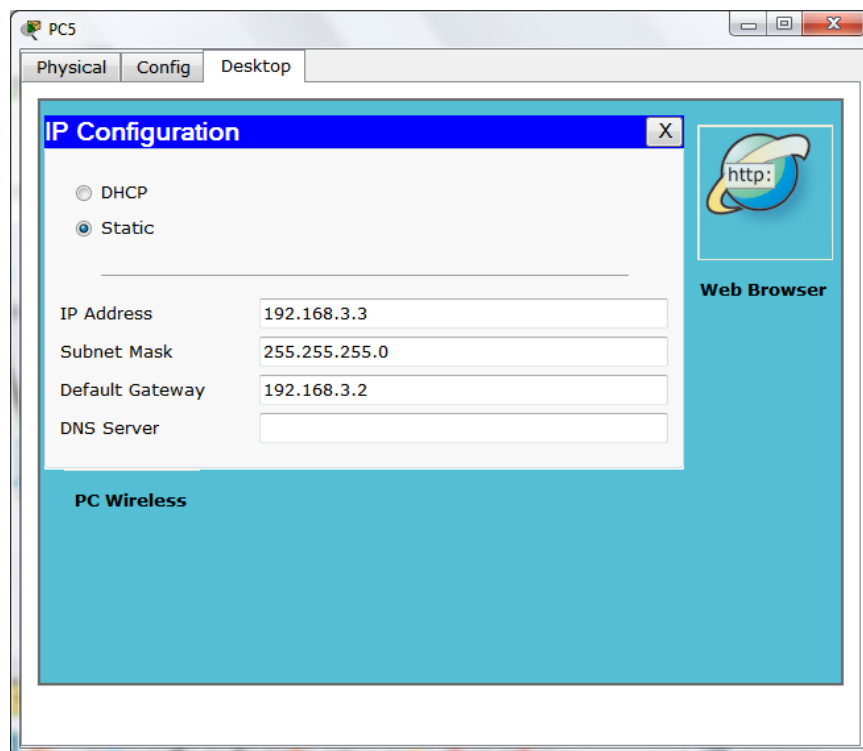
PC3



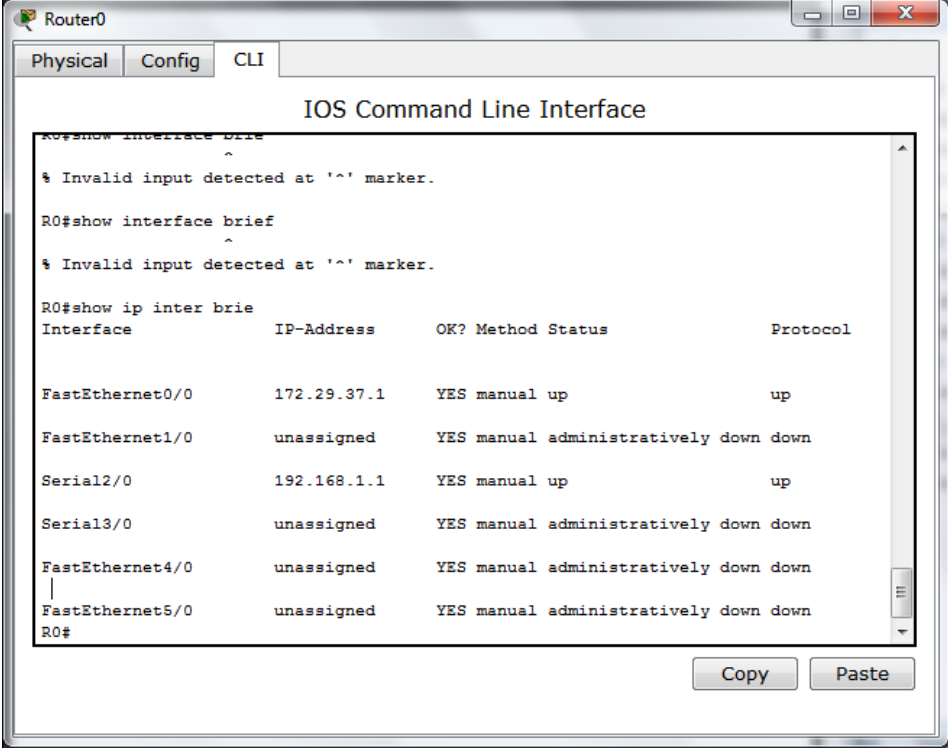
PC4



PC5



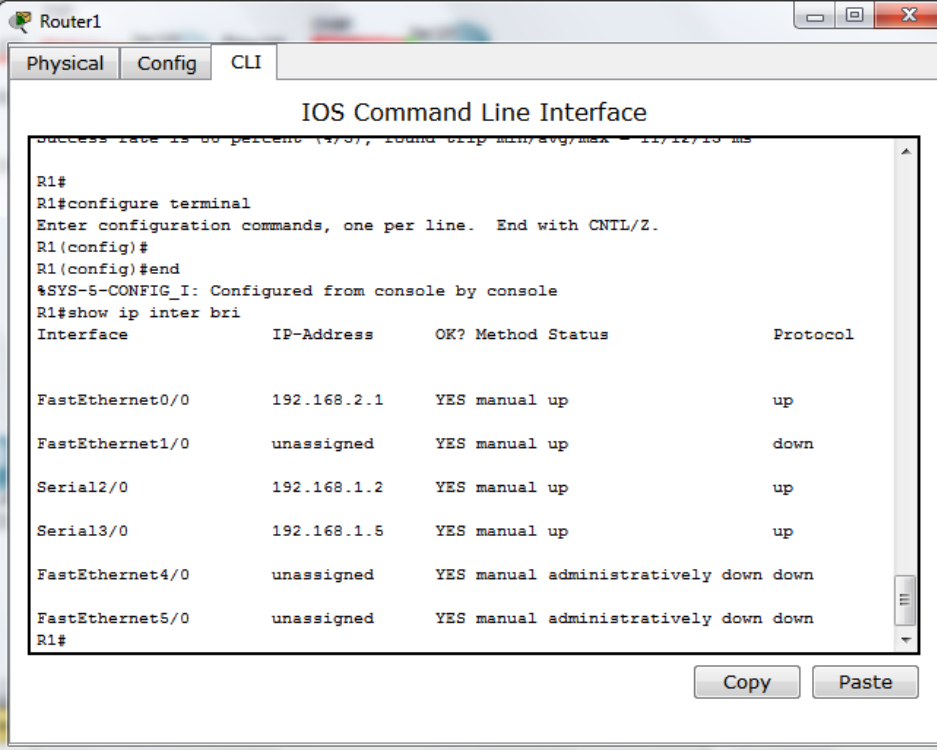
R0



The screenshot shows the CLI of Router0. The user has entered the command `show ip inter bri`, which was corrected to `show ip interface brief`. The output displays the status of several interfaces:

| Interface | IP-Address | OK? | Method | Status | Protocol |
|-----------------|-------------|-----|--------|-----------------------|----------|
| FastEthernet0/0 | 172.29.37.1 | YES | manual | up | up |
| FastEthernet1/0 | unassigned | YES | manual | administratively down | down |
| Serial2/0 | 192.168.1.1 | YES | manual | up | up |
| Serial3/0 | unassigned | YES | manual | administratively down | down |
| FastEthernet4/0 | unassigned | YES | manual | administratively down | down |
| FastEthernet5/0 | unassigned | YES | manual | administratively down | down |

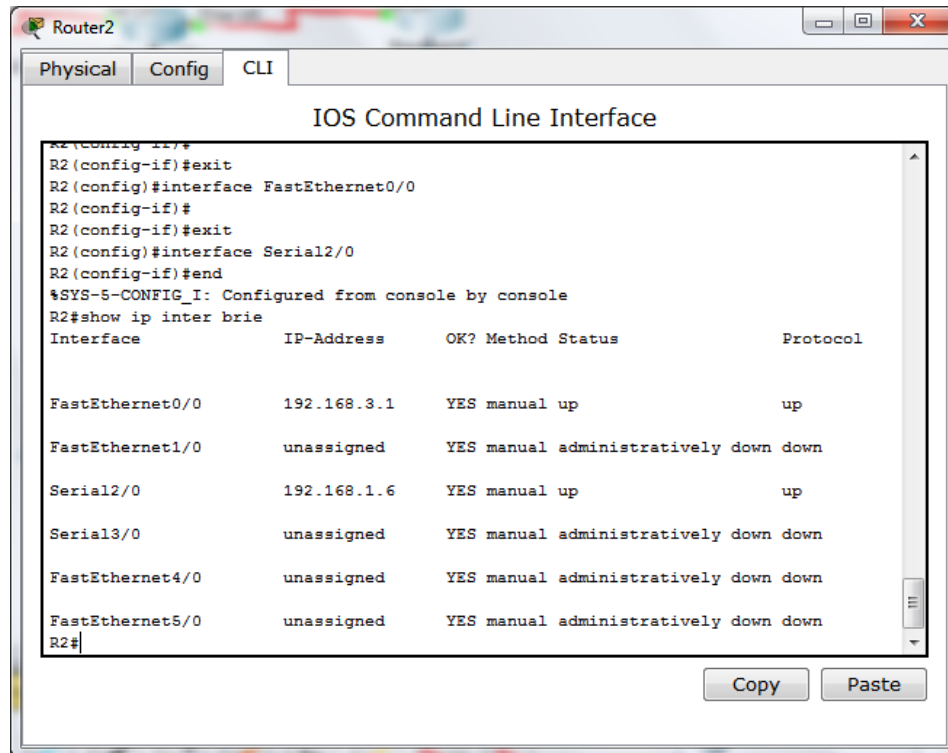
R1



The screenshot shows the CLI of Router1. The user has entered the command `show ip inter bri`, which was corrected to `show ip interface brief`. The output displays the status of several interfaces:

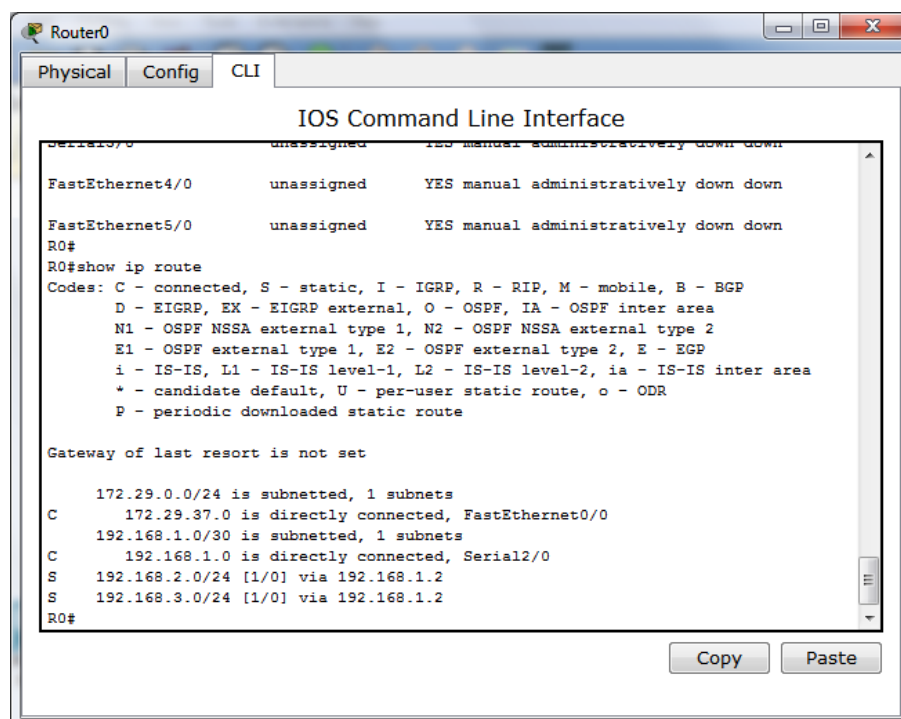
| Interface | IP-Address | OK? | Method | Status | Protocol |
|-----------------|-------------|-----|--------|-----------------------|----------|
| FastEthernet0/0 | 192.168.2.1 | YES | manual | up | up |
| FastEthernet1/0 | unassigned | YES | manual | up | down |
| Serial2/0 | 192.168.1.2 | YES | manual | up | up |
| Serial3/0 | 192.168.1.5 | YES | manual | up | up |
| FastEthernet4/0 | unassigned | YES | manual | administratively down | down |
| FastEthernet5/0 | unassigned | YES | manual | administratively down | down |

R2

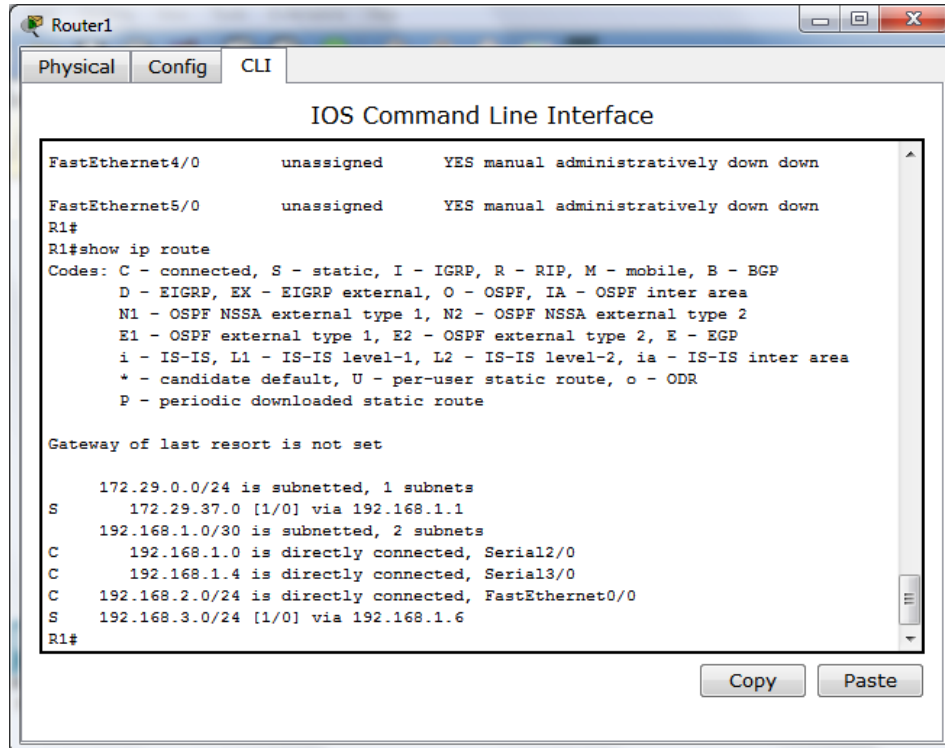


C u hình Static route cho các Router

R0



R1



The screenshot shows the CLI of Router1. At the top, there are tabs for 'Physical', 'Config', and 'CLI'. The title bar says 'Router1'. The main window title is 'IOS Command Line Interface'. The output of the 'show ip route' command is displayed. It shows two unassigned interfaces, FastEthernet4/0 and FastEthernet5/0, both administratively down. The route table lists several static routes: 172.29.0.0/24 (subnetted, 1 subnet), 172.29.37.0 [1/0] via 192.168.1.1, 192.168.1.0/30 (subnetted, 2 subnets), 192.168.1.0 (directly connected, Serial2/0), 192.168.1.4 (directly connected, Serial3/0), 192.168.2.0/24 (directly connected, FastEthernet0/0), and 192.168.3.0/24 [1/0] via 192.168.1.6. A legend explains the codes for route types, and a note states the gateway of last resort is not set. 'Copy' and 'Paste' buttons are at the bottom right.

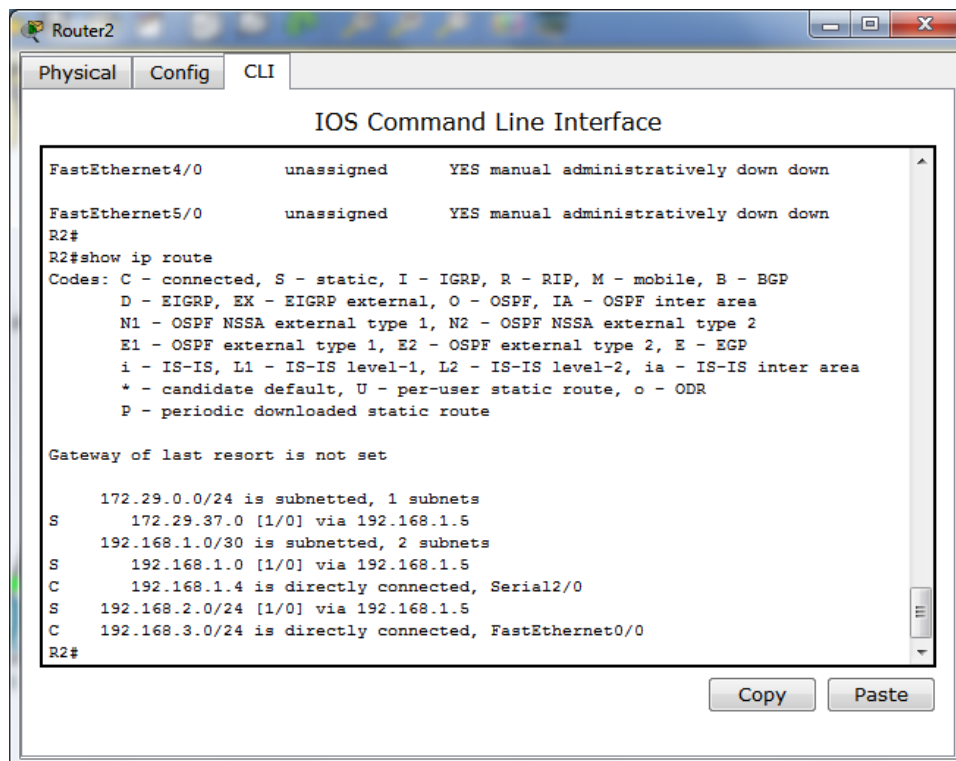
```
Router1
Physical Config CLI
IOS Command Line Interface

FastEthernet4/0      unassigned      YES manual administratively down down
FastEthernet5/0      unassigned      YES manual administratively down down
R1#
R1#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 not set

      172.29.0.0/24 is subnetted, 1 subnets
S       172.29.37.0 [1/0] via 192.168.1.1
      192.168.1.0/30 is subnetted, 2 subnets
C       192.168.1.0 is directly connected, Serial2/0
C       192.168.1.4 is directly connected, Serial3/0
C       192.168.2.0/24 is directly connected, FastEthernet0/0
S       192.168.3.0/24 [1/0] via 192.168.1.6
R1#
```

R2



The screenshot shows the CLI of Router2. At the top, there are tabs for 'Physical', 'Config', and 'CLI'. The title bar says 'Router2'. The main window title is 'IOS Command Line Interface'. The output of the 'show ip route' command is displayed. It shows two unassigned interfaces, FastEthernet4/0 and FastEthernet5/0, both administratively down. The route table lists several static routes: 172.29.0.0/24 (subnetted, 1 subnet), 172.29.37.0 [1/0] via 192.168.1.5, 192.168.1.0/30 (subnetted, 2 subnets), 192.168.1.0 [1/0] via 192.168.1.5, 192.168.1.4 (directly connected, Serial2/0), 192.168.2.0/24 [1/0] via 192.168.1.5, and 192.168.3.0/24 (directly connected, FastEthernet0/0). A legend explains the codes for route types, and a note states the gateway of last resort is not set. 'Copy' and 'Paste' buttons are at the bottom right.

```
Router2
Physical Config CLI
IOS Command Line Interface

FastEthernet4/0      unassigned      YES manual administratively down down
FastEthernet5/0      unassigned      YES manual administratively down down
R2#
R2#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

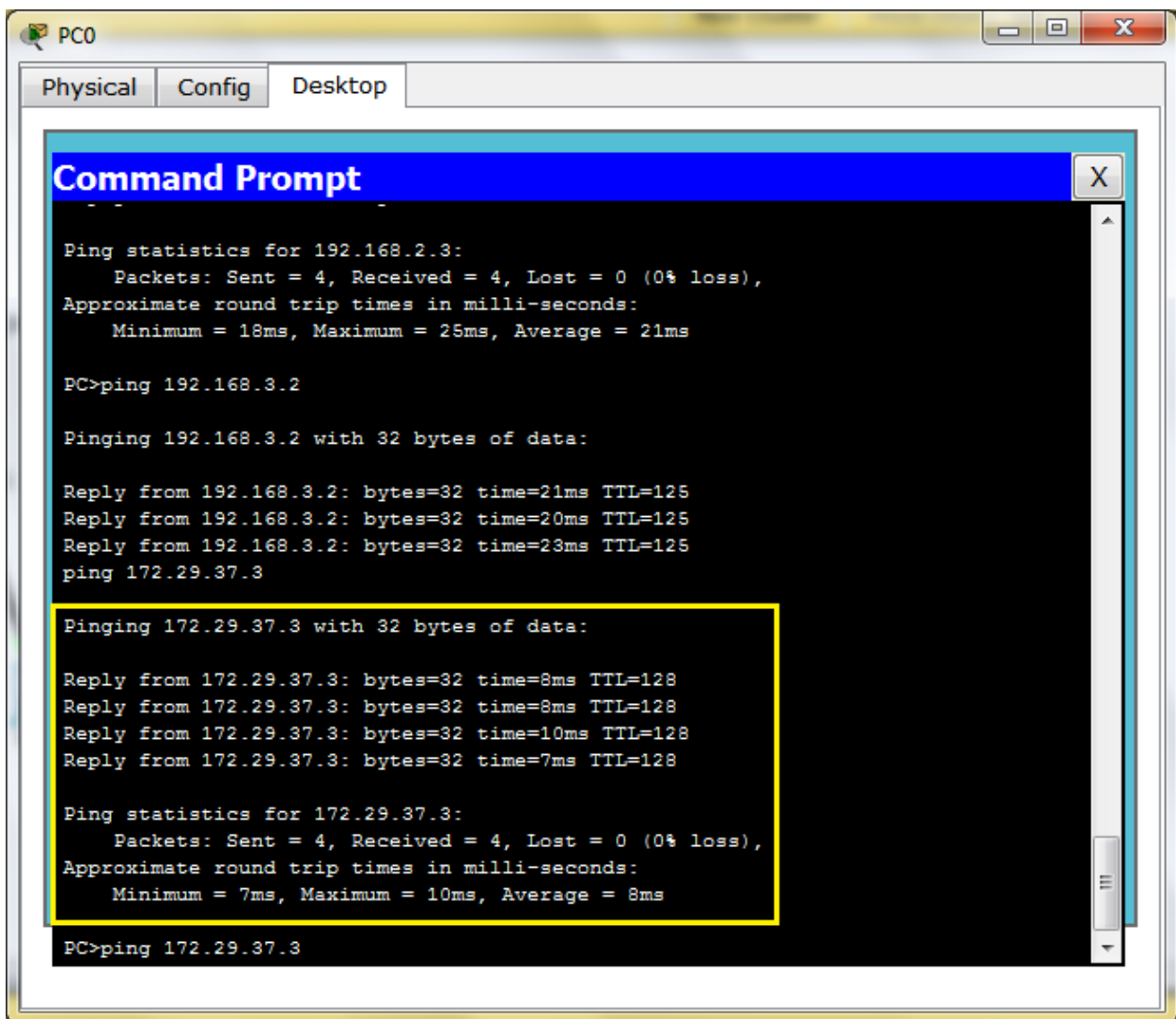
Gateway of last resort is not set

      172.29.0.0/24 is subnetted, 1 subnets
S       172.29.37.0 [1/0] via 192.168.1.5
      192.168.1.0/30 is subnetted, 2 subnets
S       192.168.1.0 [1/0] via 192.168.1.5
C       192.168.1.4 is directly connected, Serial2/0
S       192.168.2.0/24 [1/0] via 192.168.1.5
C       192.168.3.0/24 is directly connected, FastEthernet0/0
R2#
```

Sau khi c u hình thì các PC có th ping c cho nhau

PC0 ping t i các PC khác thành công

T i PC1



The screenshot shows a Windows-style window titled "PC0" with tabs for "Physical", "Config", and "Desktop". The "Desktop" tab is active, displaying a "Command Prompt" window. The Command Prompt has a blue title bar and a black background with white text. It shows the results of a ping command to 192.168.2.3, followed by a new ping command to 192.168.3.2. The results for 192.168.3.2 show four successful replies with times ranging from 20ms to 23ms. Then, a new ping command is entered: "ping 172.29.37.3". The results for this command are highlighted with a yellow rectangular box. These results show four successful replies with times ranging from 7ms to 10ms. Finally, the Command Prompt shows the command "PC>ping 172.29.37.3" entered at the prompt.

```
Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 18ms, Maximum = 25ms, Average = 21ms

PC>ping 192.168.3.2

Pinging 192.168.3.2 with 32 bytes of data:

Reply from 192.168.3.2: bytes=32 time=21ms TTL=125
Reply from 192.168.3.2: bytes=32 time=20ms TTL=125
Reply from 192.168.3.2: bytes=32 time=23ms TTL=125
ping 172.29.37.3

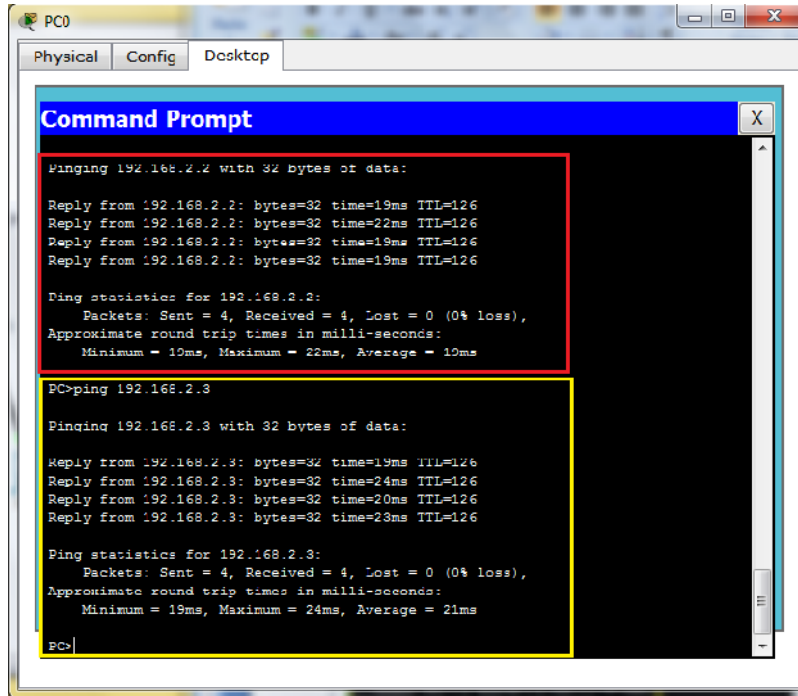
Pinging 172.29.37.3 with 32 bytes of data:

Reply from 172.29.37.3: bytes=32 time=8ms TTL=128
Reply from 172.29.37.3: bytes=32 time=8ms TTL=128
Reply from 172.29.37.3: bytes=32 time=10ms TTL=128
Reply from 172.29.37.3: bytes=32 time=7ms TTL=128

Ping statistics for 172.29.37.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 7ms, Maximum = 10ms, Average = 8ms

PC>ping 172.29.37.3
```

T i PC2 và PC3



The screenshot shows a Windows Command Prompt window titled "PC0" with tabs for "Physical", "Config", and "Desktop". The window contains two sections of ping results, each enclosed in a colored box. The first section, outlined in red, shows the results of pinging 192.168.2.2. The second section, outlined in yellow, shows the results of pinging 192.168.2.3. Both sections show four successful replies with 0% loss and provide statistics on round trip times.

```
PC0
Physical Config Desktop

Command Prompt

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=19ms TTL=126
Reply from 192.168.2.2: bytes=32 time=22ms TTL=126
Reply from 192.168.2.2: bytes=32 time=19ms TTL=126
Reply from 192.168.2.2: bytes=32 time=19ms TTL=126

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 19ms, Maximum = 22ms, Average = 19ms

PC>ping 192.168.2.3

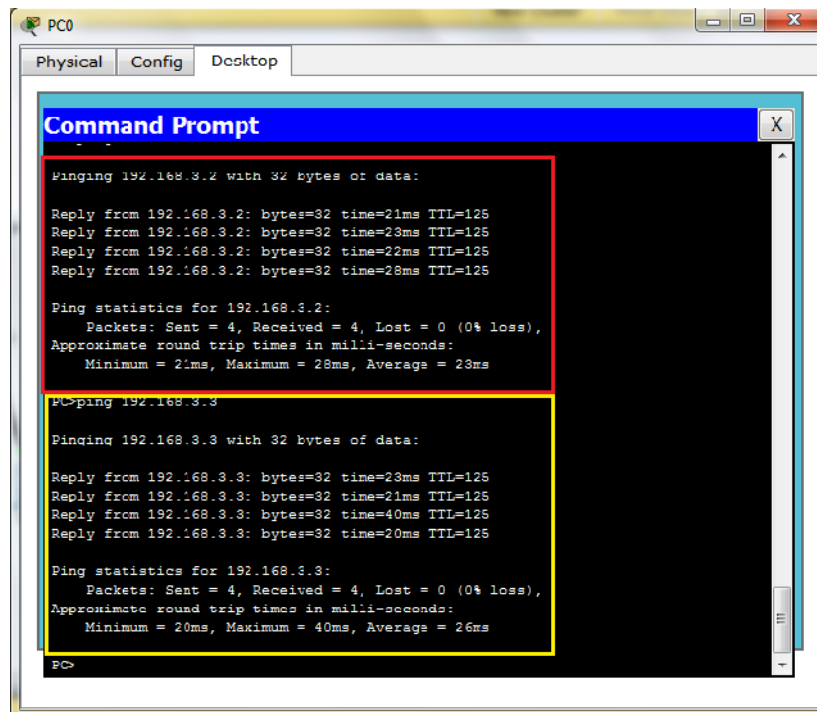
Pinging 192.168.2.3 with 32 bytes of data:

Reply from 192.168.2.3: bytes=32 time=19ms TTL=126
Reply from 192.168.2.3: bytes=32 time=24ms TTL=126
Reply from 192.168.2.3: bytes=32 time=20ms TTL=126
Reply from 192.168.2.3: bytes=32 time=23ms TTL=126

Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 19ms, Maximum = 24ms, Average = 21ms

PC>
```

T i PC4 và PC5



The screenshot shows a Windows Command Prompt window titled "PC0" with tabs for "Physical", "Config", and "Desktop". The window contains two sections of ping results, each enclosed in a colored box. The first section, outlined in red, shows the results of pinging 192.168.3.2. The second section, outlined in yellow, shows the results of pinging 192.168.3.3. Both sections show four successful replies with 0% loss and provide statistics on round trip times.

```
PC0
Physical Config Desktop

Command Prompt

Pinging 192.168.3.2 with 32 bytes of data:

Reply from 192.168.3.2: bytes=32 time=21ms TTL=125
Reply from 192.168.3.2: bytes=32 time=23ms TTL=125
Reply from 192.168.3.2: bytes=32 time=22ms TTL=125
Reply from 192.168.3.2: bytes=32 time=28ms TTL=125

Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 21ms, Maximum = 28ms, Average = 23ms

PC>ping 192.168.3.3

Pinging 192.168.3.3 with 32 bytes of data:

Reply from 192.168.3.3: bytes=32 time=23ms TTL=125
Reply from 192.168.3.3: bytes=32 time=21ms TTL=125
Reply from 192.168.3.3: bytes=32 time=40ms TTL=125
Reply from 192.168.3.3: bytes=32 time=20ms TTL=125

Ping statistics for 192.168.3.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 20ms, Maximum = 40ms, Average = 26ms

PC>
```

--- H T ---