

Крок 1

PC-B

Physical Config Desktop Programming

Terminal

```
Router>enable
Router#erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue?
[confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Router#
Router#
Router#reload
Proceed with reload? [confirm]
System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2010 by cisco Systems, Inc.
Total memory size = 512 MB - On-board = 512 MB, DIMM0 = 0 MB
CISCO1941/K9 platform with 524288 Kbytes of main memory
Main memory is configured to 64/-1(On-board/DIMM0) bit mode with ECC disabled

Readonly ROMMON initialized

program load complete, entry point: 0x80803000, size: 0x1b340
program load complete, entry point: 0x80803000, size: 0x1b340

IOS Image Load Test

Digitally Signed Release Software
program load complete, entry point: 0x81000000, size: 0x2bb1c58
Self decompressing the image :
#####
[OK]
Smart Init is enabled
smart init is sizing iomem
      TYPE          MEMORY_REQ
Onboard devices &
  buffer pools      0x01E8F000
-----
TOTAL:              0x01E8F000
Rounded IOMEM up to: 32Mb.
Using 6 percent iomem. [32Mb/512Mb]

Restricted Rights Legend
Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.
      cisco Systems, Inc.
      170 West Tasman Drive
      San Jose, California 95134-1706

Cisco IOS Software, C1900 Software (C1900-UNIVERSALK9-M), Version 15.1(4)M4,
RELEASE SOFTWARE (fc2)
```

Physical Config Desktop Programming

Terminal

```
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 12-Oct-05 22:05 by pt_team

Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed
state to up

Switch>enable
Switch#erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue?
[confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Switch#delete vlan.dat
Delete filename [vlan.dat]?
Delete flash:/vlan.dat? [confirm]
%Error deleting flash:/vlan.dat (No such file or directory)

Switch#reload
Proceed with reload? [confirm]
C2960 Boot Loader (C2960-HBOOT-M) Version 12.2(25r)FX, RELEASE SOFTWARE (fc4)
Cisco WS-C2960-24TT (RC32300) processor (revision C0) with 21039K bytes of
memory.
2960-24TT starting...
Base ethernet MAC Address: 0060.2FB4.EC01
Xmodem file system is available.
Initializing Flash...
flashfs[0]: 1 files, 0 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 64016384
flashfs[0]: Bytes used: 4414921
flashfs[0]: Bytes available: 59601463
flashfs[0]: flashfs fsck took 1 seconds.
...done Initializing Flash.

Boot Sector Filesystem (bs:) installed, fsid: 3
Parameter Block Filesystem (pb:) installed, fsid: 4

Loading "flash:/c2960-lanbase-mz.122-25.FX.bin"...
#####
[OK]

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```

Physical Config **Desktop** Programming

IP Configuration X

Interface FastEthernet0 ▾

IP Configuration

☐ DHCP☒ Static

IPv4 Address

192.168.1.3

Subnet Mask

255.255.255.0

Default Gateway

192.168.1.1

DNS Server

0.0.0.0

IPv6 Configuration

☐ Automatic☒ Static

IPv6 Address

2001:db8:acad:1::3

/ 64

Link Local Address

FE80::2E0:A3FF:FEC3:CCC

Default Gateway

fe80::1

DNS Server

802.1X

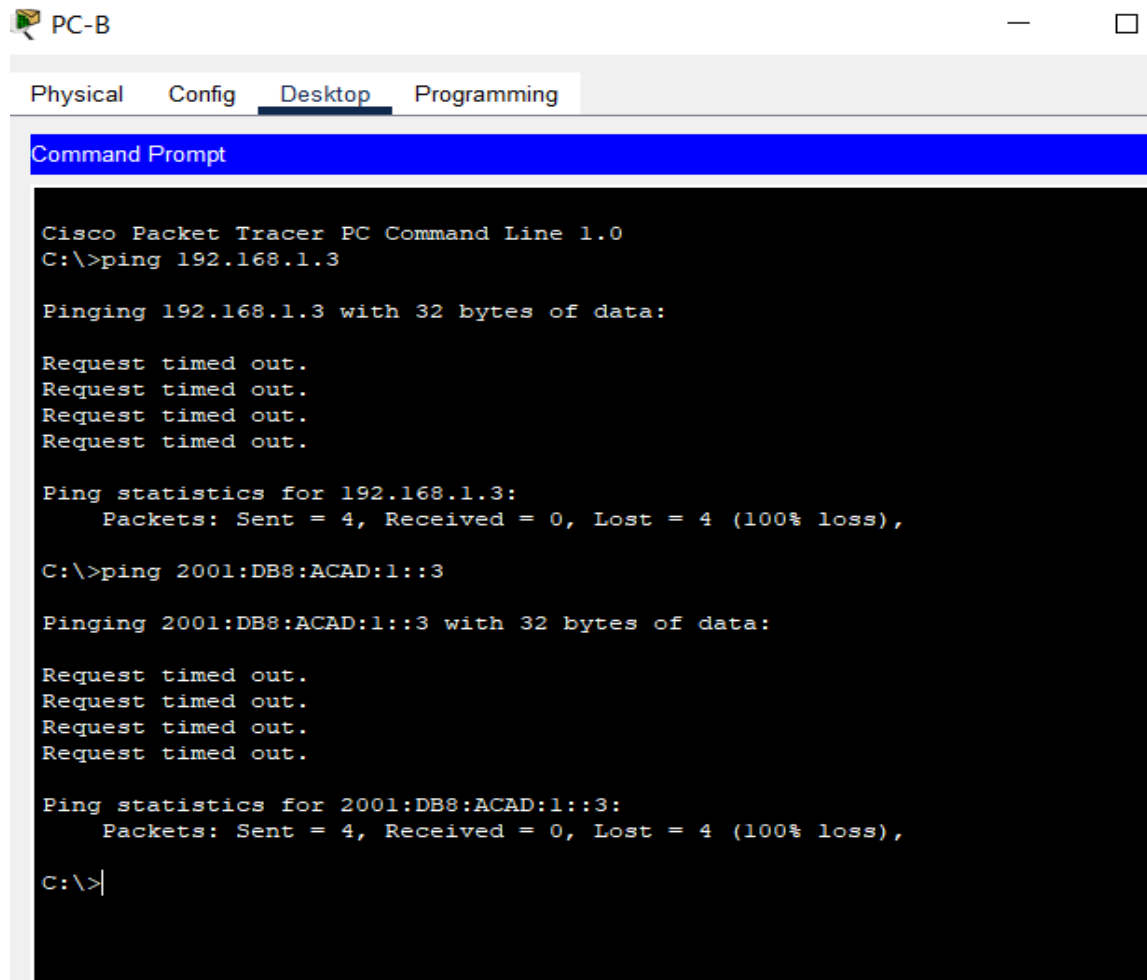
☐ Use 802.1X Security

Authentication

MD5 ▾

Username

Password



Чому запит ping був невдалим? Тому, що ми налаштовували вручну і трафік із-за цього не передається в підмережі на цьому рівні.

Крок 2

Terminal

```
R1(config-line)#login
R1(config-line)#line vty 0 15
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#service password-encryption
R1(config)#banner motd $Unauthorized access is prohibited$
R1(config)#int g0/0/0
%Invalid interface type and number
R1(config)#interfa
R1(config)#interface gig
R1(config)#interface gigabitEthernet 0/0
R1(config-if)#ip address 192.168.0.1 255.255.255.0
R1(config-if)#ipv6 address 2001:db8:acad::1/64
R1(config-if)#
R1(config-if)#ipv6 address fe80::1 link-local
R1(config-if)#no shutdown

R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

R1(config-if)#interface gigabitEthernet 0/1
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#ipv6 address 2001:db8:acad:1::1/64
R1(config-if)#ipv6 address fe80::1 link-local
R1(config-if)#no shutdown

R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

R1(config-if)#description Connected to Host PC-B
R1(config-if)#interface gi
R1(config-if)#interface gi
R1(config-if)#interface g
R1(config-if)#interface gigabitEthernet 0/0
R1(config-if)#description Connected to Host PC-B
R1(config-if)#interface gigabitEthernet 0/1
R1(config-if)#description Connected to f0/5 on S1
R1(config-if)#exit
R1(config)#ipv6 unicast-routing
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R1#clock set 00:25:00 16 May 2022
R1#
```

```
Physical  Config  Desktop  Programming

Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.3

Pinging 192.168.0.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.0.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 2001:DB8:ACAD::3

Pinging 2001:DB8:ACAD::3 with 32 bytes of data:

Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127

Ping statistics for 2001:DB8:ACAD::3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

```
Physical  Config  Desktop  Programming

Command Prompt

C:\>
C:\>
C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time<1ms TTL=127
Reply from 192.168.1.3: bytes=32 time<1ms TTL=127
Reply from 192.168.1.3: bytes=32 time<1ms TTL=127
Reply from 192.168.1.3: bytes=32 time=15ms TTL=127

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 15ms, Average = 3ms

C:\>ping 2001:DB8:ACAD:1::3

Pinging 2001:DB8:ACAD:1::3 with 32 bytes of data:

Reply from 2001:DB8:ACAD:1::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD:1::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD:1::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD:1::3: bytes=32 time<1ms TTL=127

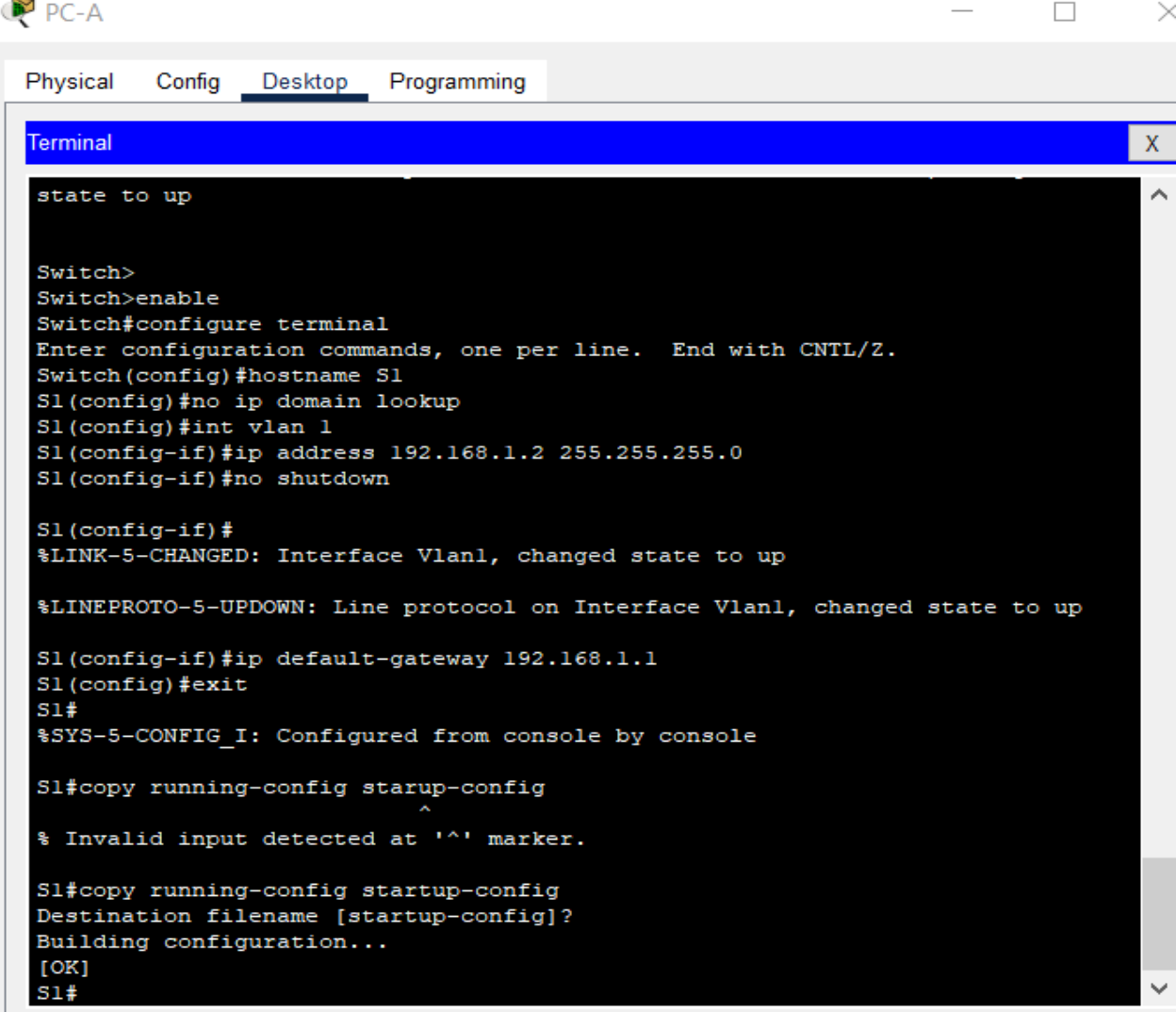
Ping statistics for 2001:DB8:ACAD:1::3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Чи було пінгування вдалим? Поясніть.

Так, бо маршрутизується у двох підмережах за замовчуванням.

Крок 3



The screenshot shows a window titled "PC-A" with four tabs: "Physical", "Config", "Desktop", and "Programming". The "Desktop" tab is active, displaying a terminal window. The terminal shows a sequence of commands and system messages for configuring a switch named S1.

```
state to up

Switch>
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#no ip domain lookup
S1(config)#int vlan 1
S1(config-if)#ip address 192.168.1.2 255.255.255.0
S1(config-if)#no shutdown

S1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

S1(config-if)#ip default-gateway 192.168.1.1
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#copy running-config startup-config
^
% Invalid input detected at '^' marker.

S1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
S1#
```

Крок 4

PC-A

Physical Config Desktop Programming

Command Prompt

```
Approximate round trip times in milli-seconds:
  Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.0.3

Pinging 192.168.0.3 with 32 bytes of data:

Reply from 192.168.0.3: bytes=32 time<1ms TTL=127
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 2001:db8:acad::3

Pinging 2001:db8:acad::3 with 32 bytes of data:

Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127

Ping statistics for 2001:DB8:ACAD::3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

```
[OK]
S1#ping 192.168.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.3, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms

S1#
```

Частина 3

Крок 1

Скільки записів про маршрути в таблиці маршрутизації мають код C? 2

Які типи інтерфейсів пов'язані з маршрутами, що мають код C?

```
R1>show ip route
Codes: L - local, C - connected, S - static, 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

    192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.0.0/24 is directly connected, GigabitEthernet0/0
L       192.168.0.1/32 is directly connected, GigabitEthernet0/0
    192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.0/24 is directly connected, GigabitEthernet0/1
L       192.168.1.1/32 is directly connected, GigabitEthernet0/1
```



```

R1>show ipv6 route
IPv6 Routing Table - 5 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
        U - Per-user Static route, M - MIPv6
        I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
        ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect
        O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
        ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
        D - EIGRP, EX - EIGRP external
C   2001:DB8:ACAD::/64 [0/0]
    via GigabitEthernet0/0, directly connected
L   2001:DB8:ACAD::1/128 [0/0]
    via GigabitEthernet0/0, receive
C   2001:DB8:ACAD:1::/64 [0/0]
    via GigabitEthernet0/1, directly connected
L   2001:DB8:ACAD:1::1/128 [0/0]
    via GigabitEthernet0/1, receive
L   FF00::/8 [0/0]
    via Null0, receive

```

Крок 2

Який поточний стан інтерфейсу G0/0/1? connected

Яке значення адреси керування доступом до середовища (MAC) інтерфейсу G0/1? 0030.a37b.6502

Який вигляд має в цій команді Інтернет-адреса? 192.168.1.1/24

```

R1>show ipv6 interface g0/1
GigabitEthernet0/1 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80::1
  No Virtual link-local address(es):
  Global unicast address(es):
    2001:DB8:ACAD:1::1, subnet is 2001:DB8:ACAD:1::/64
  Joined group address(es):
    FF02::1
    FF02::2
    FF02::1:FF00:1
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ICMP unreachables are sent
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
  ND advertised reachable time is 0 (unspecified)
  ND advertised retransmit interval is 0 (unspecified)
  ND router advertisements are sent every 200 seconds
  ND router advertisements live for 1800 seconds
  ND advertised default router preference is Medium
  Hosts use stateless autoconfig for addresses.
R1>

```

Крок 3

```

R1>show ip interface brief
Interface                IP-Address      OK? Method Status      Protocol
GigabitEthernet0/0       192.168.0.1     YES manual up          up
GigabitEthernet0/1       192.168.1.1     YES manual up          up
Vlan1                    unassigned      YES NVRAM  administratively down down
R1>show ipv6 interface brief
GigabitEthernet0/0       [up/up]
    FE80::1
    2001:DB8:ACAD::1
GigabitEthernet0/1       [up/up]
    FE80::1
    2001:DB8:ACAD:1::1
Vlan1                    [administratively down/down]
    unassigned

```

PC-A

Physical Config Desktop Programming

Terminal

```
S1>enable
S1#show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/1	unassigned	YES	manual	down	down
FastEthernet0/2	unassigned	YES	manual	down	down
FastEthernet0/3	unassigned	YES	manual	down	down
FastEthernet0/4	unassigned	YES	manual	down	down
FastEthernet0/5	unassigned	YES	manual	up	up
FastEthernet0/6	unassigned	YES	manual	up	up
FastEthernet0/7	unassigned	YES	manual	down	down
FastEthernet0/8	unassigned	YES	manual	down	down
FastEthernet0/9	unassigned	YES	manual	down	down
FastEthernet0/10	unassigned	YES	manual	down	down
FastEthernet0/11	unassigned	YES	manual	down	down
FastEthernet0/12	unassigned	YES	manual	down	down
FastEthernet0/13	unassigned	YES	manual	down	down
FastEthernet0/14	unassigned	YES	manual	down	down
FastEthernet0/15	unassigned	YES	manual	down	down
FastEthernet0/16	unassigned	YES	manual	down	down
FastEthernet0/17	unassigned	YES	manual	down	down
FastEthernet0/18	unassigned	YES	manual	down	down
FastEthernet0/19	unassigned	YES	manual	down	down
FastEthernet0/20	unassigned	YES	manual	down	down
FastEthernet0/21	unassigned	YES	manual	down	down
FastEthernet0/22	unassigned	YES	manual	down	down
FastEthernet0/23	unassigned	YES	manual	down	down
FastEthernet0/24	unassigned	YES	manual	down	down
GigabitEthernet0/1	unassigned	YES	manual	down	down
GigabitEthernet0/2	unassigned	YES	manual	down	down
Vlan1	192.168.1.2	YES	manual	up	up

```
S1#
```

Питання для самоперевірки

- 1. Якщо інформація про інтерфейс G0/0/1 показує, що він був адміністративно вимкнений (administratively down), яку команду налаштування інтерфейсу ви б використали для його активації? No shutdown
- 2. Що станеться, якщо на маршрутизаторі неправильно налаштувати на інтерфейсі G0/0/1 IP-адресу 192.168.1.2? Не зміг би пінгувати