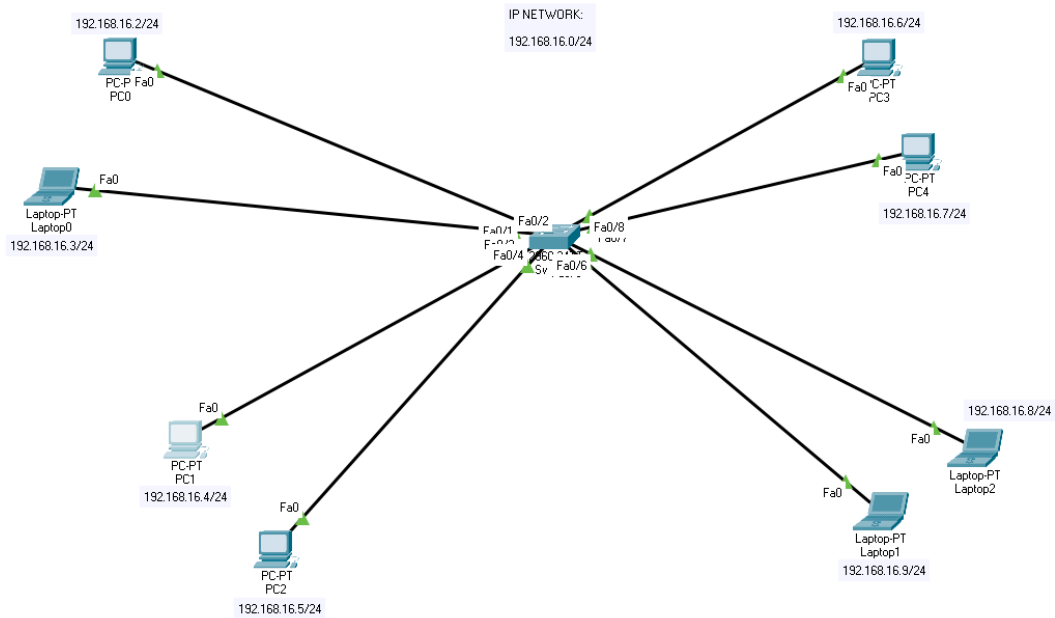
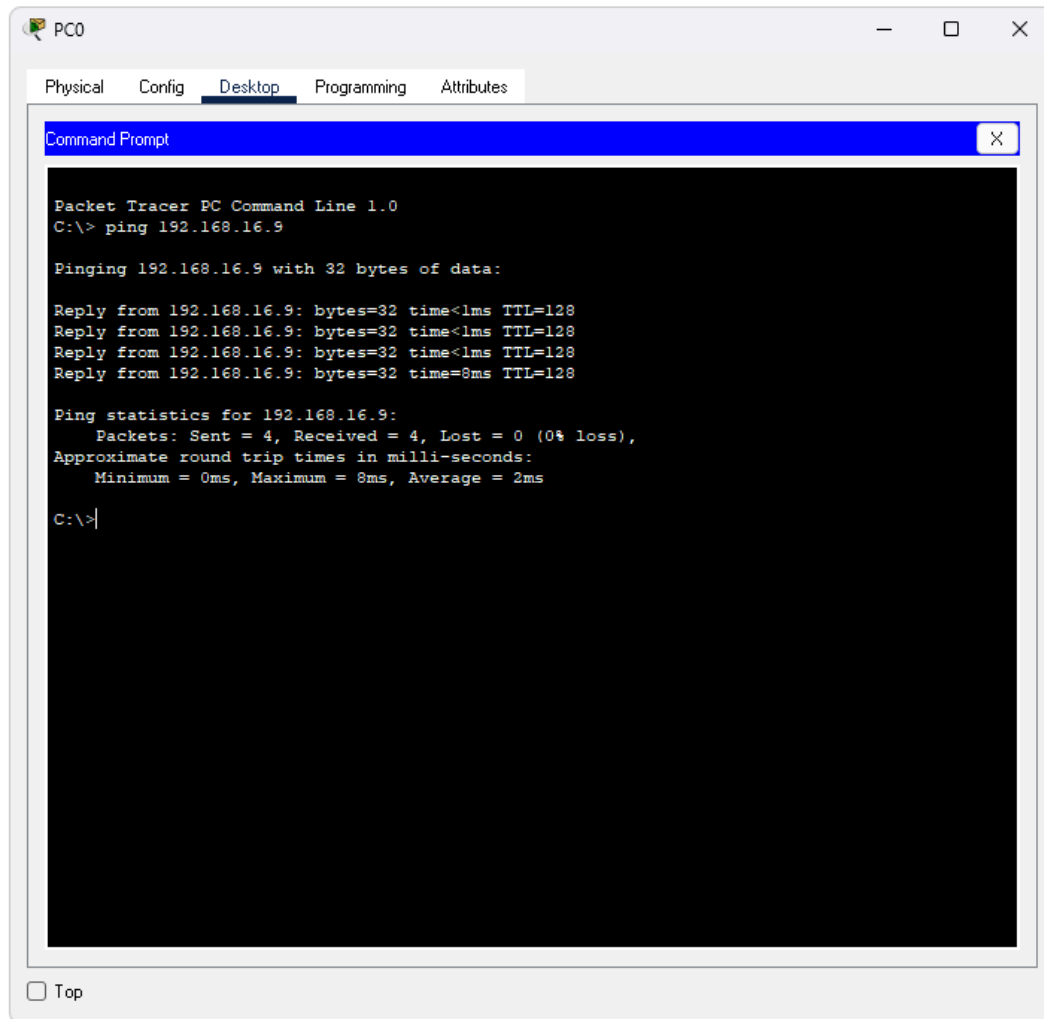


S1 - E5 RETI VLAN



Nell'immagine sopra viene creata la rete 192.168.16.0/24. Tutti gli host sono collegati ad uno switch che gli permette di comunicare tra loro essendo i dispositivi appartenenti alla stessa IP Network. Configuriamo per ogni host il proprio indirizzo IP.

Nell immagine seguente vediamo il comando PING del PC0 a dimostrazione che i dispositivi sulla stessa rete possono comunicare.



The image shows a Packet Tracer PC Command Line window for PC0. The window has tabs for Physical, Config, Desktop, Programming, and Attributes, with Desktop selected. Inside the Desktop tab is a Command Prompt window. The Command Prompt displays the output of a ping command to 192.168.16.9. The output shows four successful replies with 32 bytes of data, a time of 8ms, and a TTL of 128. Ping statistics for 192.168.16.9 show 4 packets sent, 4 received, 0 lost (0% loss), and approximate round trip times in milliseconds: Minimum = 0ms, Maximum = 8ms, Average = 2ms. The Command Prompt prompt is C:\>.

```
Packet Tracer PC Command Line 1.0
C:\> ping 192.168.16.9

Pinging 192.168.16.9 with 32 bytes of data:

Reply from 192.168.16.9: bytes=32 time<1ms TTL=128
Reply from 192.168.16.9: bytes=32 time<1ms TTL=128
Reply from 192.168.16.9: bytes=32 time<1ms TTL=128
Reply from 192.168.16.9: bytes=32 time=8ms TTL=128

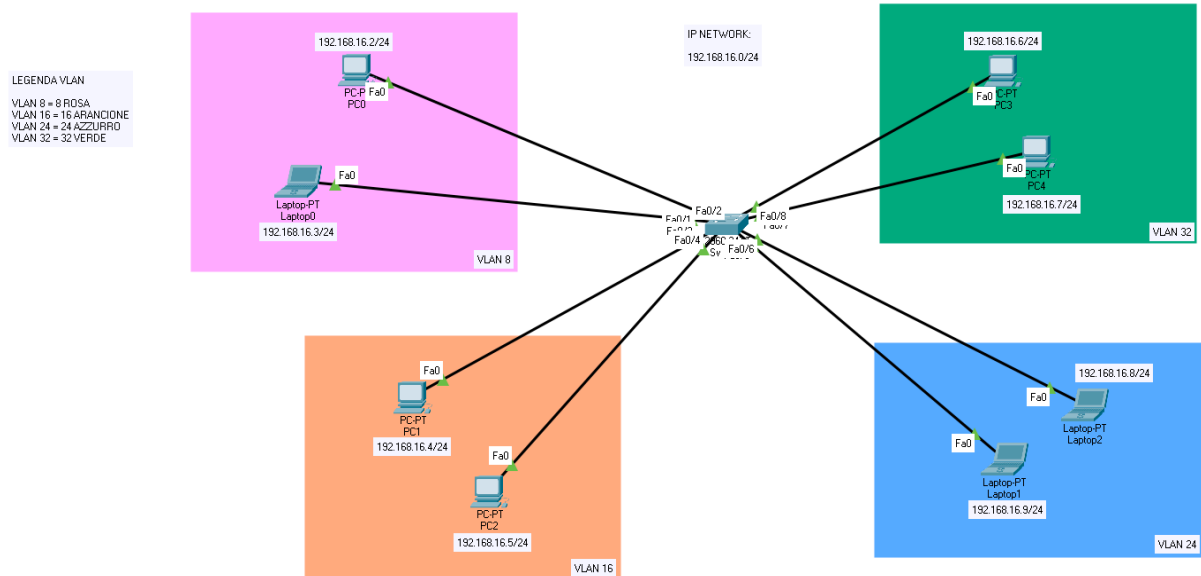
Ping statistics for 192.168.16.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 8ms, Average = 2ms

C:\>|
```

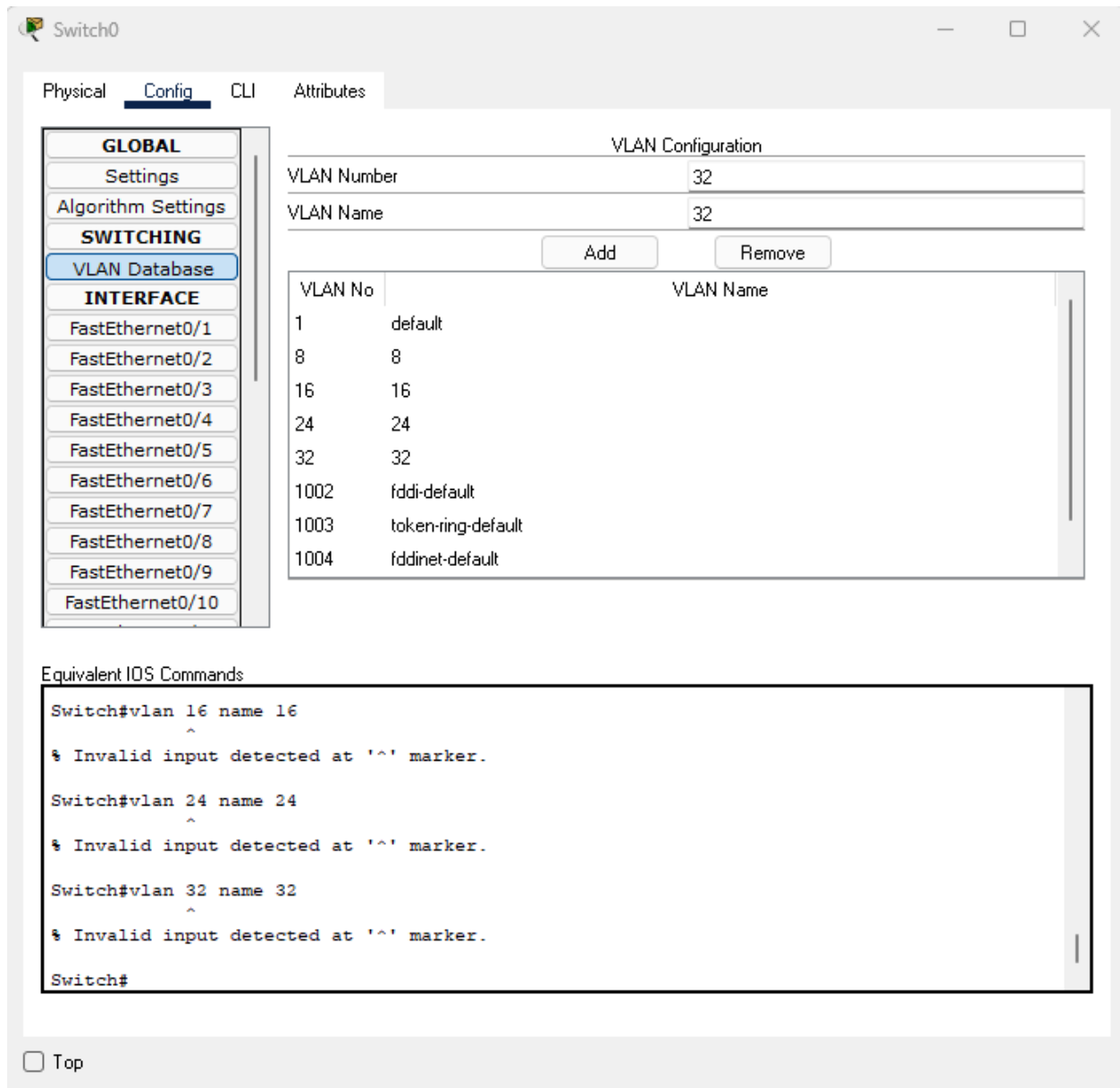
Ora che abbiamo testato la rete possiamo procedere alla segmentazione di quest'ultima tramite VLAN. Vengono create 4 VLAN raggruppando all'interno di ognuna di esse 2 dispositivi. Le VLAN create sono rispettivamente:

VLAN 8 (Rosa), VLAN 16 (Arancione), VLAN 24 (Azzurro), VLAN 32 (Verde)

(Vedi immagine seguente)



Ora che abbiamo creato le VLAN andiamo a configurarle all'interno dello switch in "Config" - "Vlan Database" assegnando come riportato sopra Numero e Nome delle VLAN. Una volta effettuata questa configurazione andiamo ad assegnare ai dispositivi a quale VLAN appartengono. Per farlo andiamo sempre all'interno di "Config" nello "Switch", selezioniamo le porte FastEthernet e assegnamo la VLAN a cui corrispondono. (vedi immagini seguenti)



The screenshot shows the configuration interface for a switch named "Switch0". The "Config" tab is active, and the "VLAN Database" option is selected in the left sidebar. The "VLAN Configuration" section displays the "VLAN Number" and "VLAN Name" both set to "32". Below this, there is a table listing existing VLANs. The table has two columns: "VLAN No" and "VLAN Name". The entries are: 1 (default), 8 (8), 16 (16), 24 (24), 32 (32), 1002 (fddi-default), 1003 (token-ring-default), and 1004 (fddinet-default). At the bottom, there is a section titled "Equivalent IOS Commands" which shows the commands used to create the VLANs: "Switch#vlan 16 name 16", "Switch#vlan 24 name 24", and "Switch#vlan 32 name 32". Each command is followed by an error message: "% Invalid input detected at '^' marker.".

Switch0

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

VLAN Configuration

VLAN Number 32

VLAN Name 32

Add Remove

VLAN No	VLAN Name
1	default
8	8
16	16
24	24
32	32
1002	fddi-default
1003	token-ring-default
1004	fddinet-default

Equivalent IOS Commands

```
Switch#vlan 16 name 16
^
% Invalid input detected at '^' marker.

Switch#vlan 24 name 24
^
% Invalid input detected at '^' marker.

Switch#vlan 32 name 32
^
% Invalid input detected at '^' marker.

Switch#
```

☐ Top

Switch0

PhysicalConfigCLIAttributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/1

Port Status

☒ On

Bandwidth

☒ 100 Mbps☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex☒ Full Duplex

☒ Auto

AccessVLAN

8

Tx Ring Limit

10

Equivalent IOS Commands

Switch>enable

Switch#

Switch#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#interface FastEthernet0/1

Switch(config-if)#

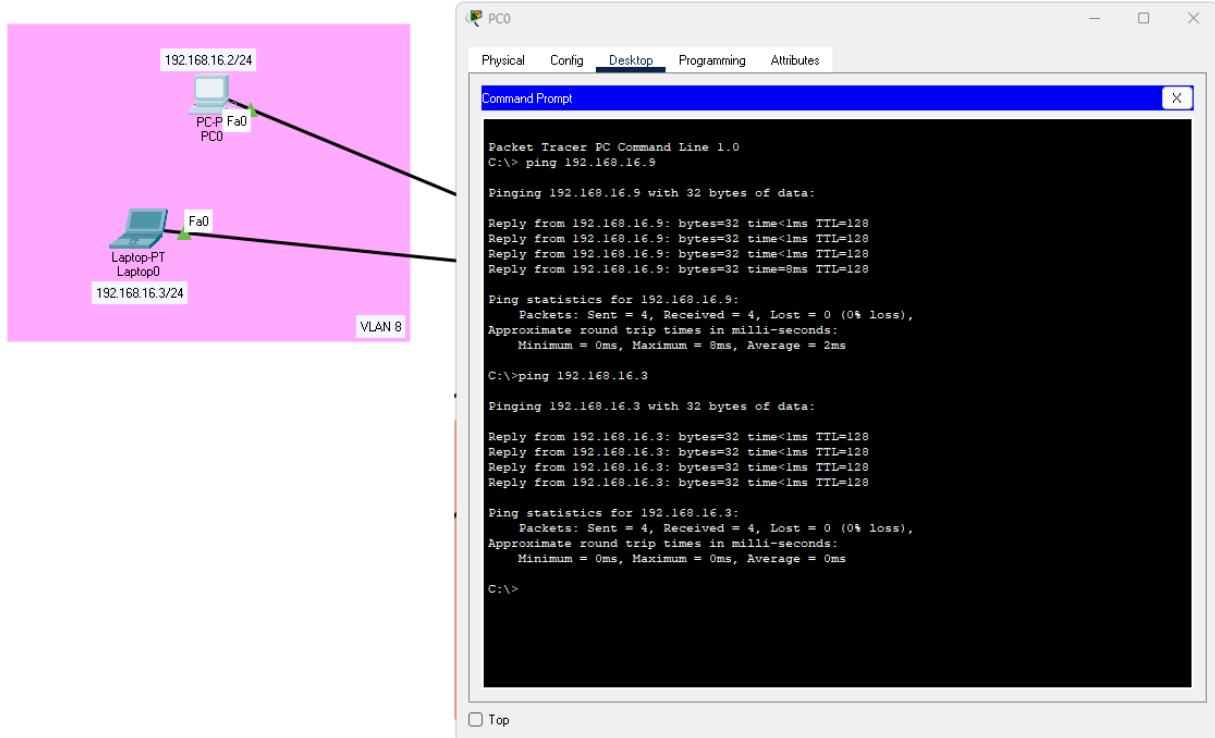
Switch(config-if)#exit

Switch(config)#interface FastEthernet0/1

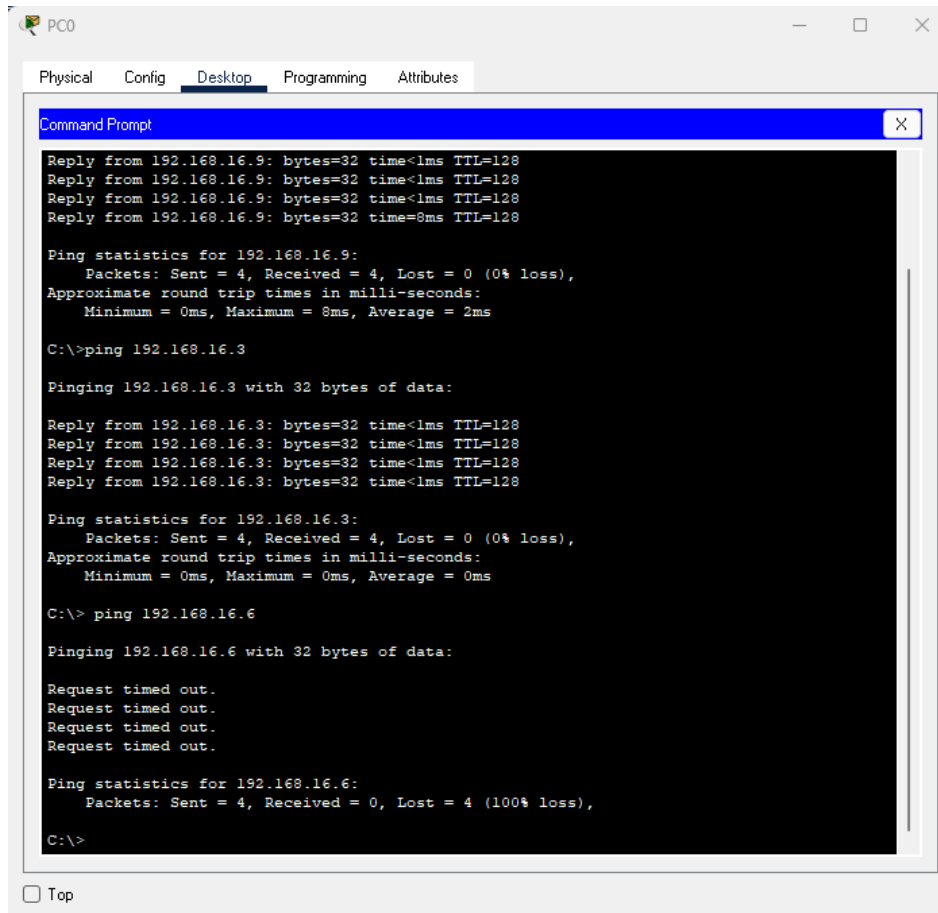
Switch(config-if)#

☐ Top

Ora che abbiamo configurato correttamente tutte e 4 le VLAN procediamo a testare se le comunicazioni tra host appartenenti alla stessa VLAN funzionano nell'immagine successiva vediamo la VLAN 8.



Avendo segmentato la rete in 4 VLAN e non avendo configurato un Router Gateway ovviamente gli host appartenenti a VLAN diverse non possono comunicare tra loro (vedi immagine seguente)



The screenshot shows a window titled "PC0" with tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is active, displaying a "Command Prompt" window. The Command Prompt shows the results of several ping commands. First, four successful pings to 192.168.16.9 are shown, each with a time of less than 1ms and TTL=128. Then, a ping statistics summary for 192.168.16.9 is displayed, showing 4 packets sent, 4 received, 0% loss, and an average round trip time of 2ms. Next, four successful pings to 192.168.16.3 are shown, each with a time of less than 1ms and TTL=128. Then, a ping statistics summary for 192.168.16.3 is displayed, showing 4 packets sent, 4 received, 0% loss, and an average round trip time of 0ms. Finally, four failed pings to 192.168.16.6 are shown, each with a "Request timed out." message. A ping statistics summary for 192.168.16.6 is displayed, showing 4 packets sent, 0 received, 100% loss, and an average round trip time of 0ms. The Command Prompt prompt is "C:\>".

```
PC0
Physical Config Desktop Programming Attributes
Command Prompt
Reply from 192.168.16.9: bytes=32 time<1ms TTL=128
Reply from 192.168.16.9: bytes=32 time<1ms TTL=128
Reply from 192.168.16.9: bytes=32 time<1ms TTL=128
Reply from 192.168.16.9: bytes=32 time=8ms TTL=128

Ping statistics for 192.168.16.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 8ms, Average = 2ms

C:\>ping 192.168.16.3

Pinging 192.168.16.3 with 32 bytes of data:

Reply from 192.168.16.3: bytes=32 time<1ms TTL=128
Reply from 192.168.16.3: bytes=32 time<1ms TTL=128
Reply from 192.168.16.3: bytes=32 time<1ms TTL=128
Reply from 192.168.16.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.16.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

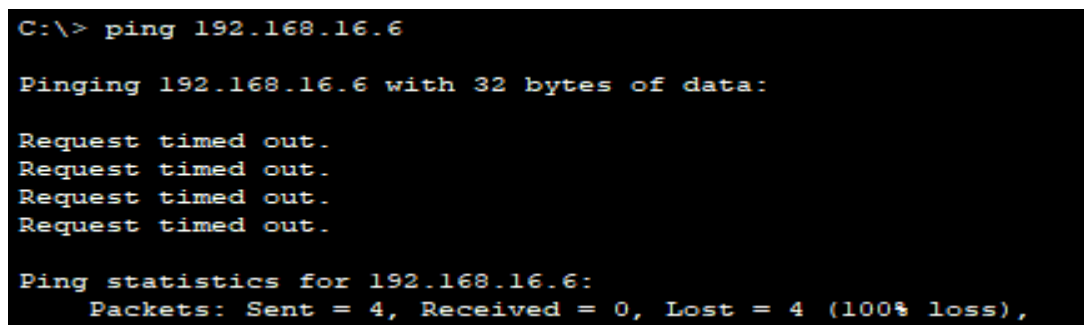
C:\> ping 192.168.16.6

Pinging 192.168.16.6 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.16.6:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```



This is a close-up screenshot of the Command Prompt output for the failed ping command. It shows the "Request timed out." message four times, followed by the ping statistics summary for 192.168.16.6, which indicates 100% loss.

```
C:\> ping 192.168.16.6

Pinging 192.168.16.6 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.16.6:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

CONCLUSIONE

Abbiamo deciso di segmentare la rete utilizzando le VLAN così che la rete possa essere più sicura. Questo accade perchè più una rete è segmentata più è difficile per l'attaccante poter accedere a tutta la rete e perchè host di VLAN diverse non possono comunicare tra loro. A differenza del SUBNETTING la VLAN nasce per segmentare il dominio di broadcast.

Oltre ad un discorso di sicurezza la VLAN viene scelta perchè è più performante in quanto riduce il traffico di pacchetti inutili all'interno della rete.