**Laboratorio No. 4 - Parte 2**
**Capa de enlace**

## Marco teórico.

*Packet Tracer.*

"Cisco ofrece una herramienta con la que es posible diseñar redes y realizar simulaciones sobre su uso. Esta aplicación gratuita se llama Packet Tracer y puede descargarse desde la web oficial de Cisco.

Con esta herramienta, estudiantes, docentes y profesionales pueden testear el funcionamiento de redes, ciberseguridad y el internet de las cosas (IoT).

Packet Tracer dispone de una interfaz intuitiva que facilita su utilización a la hora de añadir los distintos elementos que componen la red, pudiendo conectarse unos con otros y realizar las configuraciones necesarias de red en apenas unos clics.

Cisco Packet Tracer es una aplicación a través de la cual se puede realizar una gran variedad de funciones relacionadas con las redes, como diseñar y construir una red desde cero, trabajar sobre proyectos preconstruidos (incluye una gran variedad de ejemplos interesantes), probar nuevos diseños y topologías de red, probar cambios en la red antes de aplicarlos a la misma, examinar el flujo de datos a través de una red, hacer simulaciones de Internet of things (internet de las cosas) o preparar exámenes de certificación en redes."

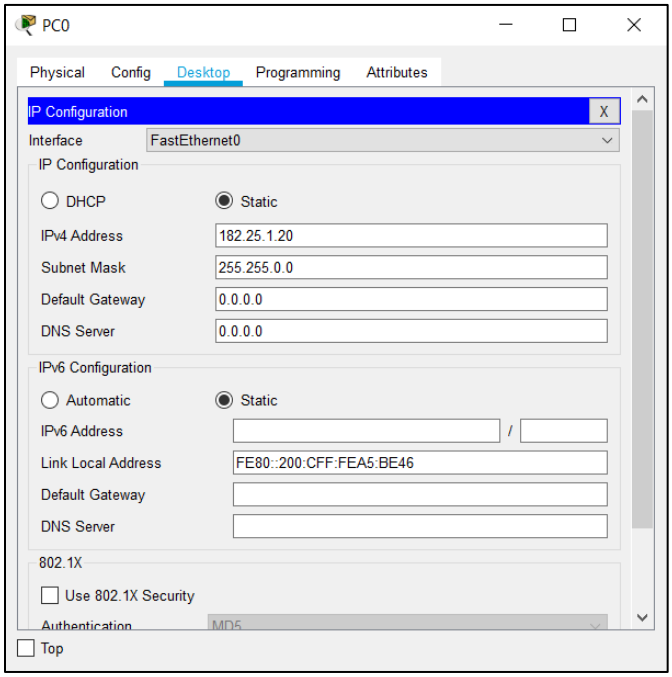
*Switches.*

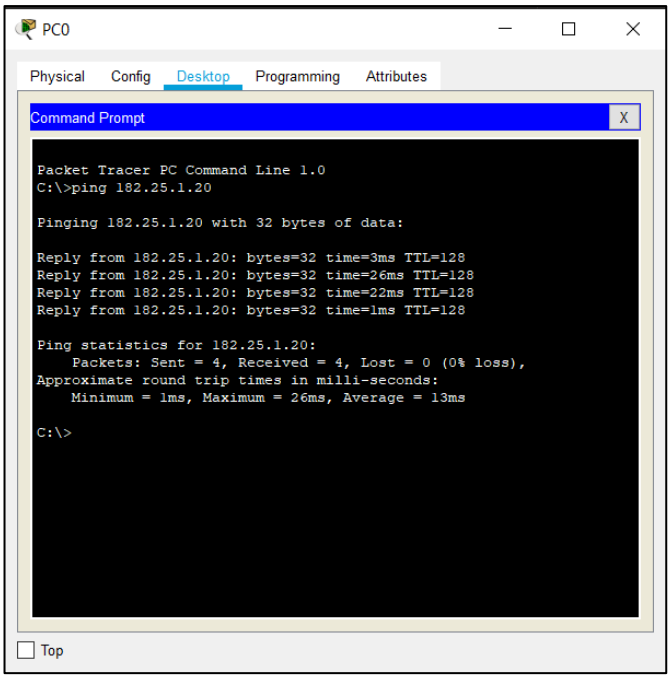
Un switch o conmutador es un dispositivo de interconexión utilizado para conectar equipos en red formando lo que se conoce como una red de área local (LAN) y cuyas especificaciones técnicas siguen el estándar conocido como Ethernet (o técnicamente IEEE 802.3).

El switch es posiblemente uno de los dispositivos con un nivel de escalabilidad más alto. Existen switches de cuatro puertos con funciones básicas para cubrir pequeñas necesidades de interconexión. Pero también podemos encontrar switches con cientos de puertos y con unas prestaciones y características muy avanzadas.

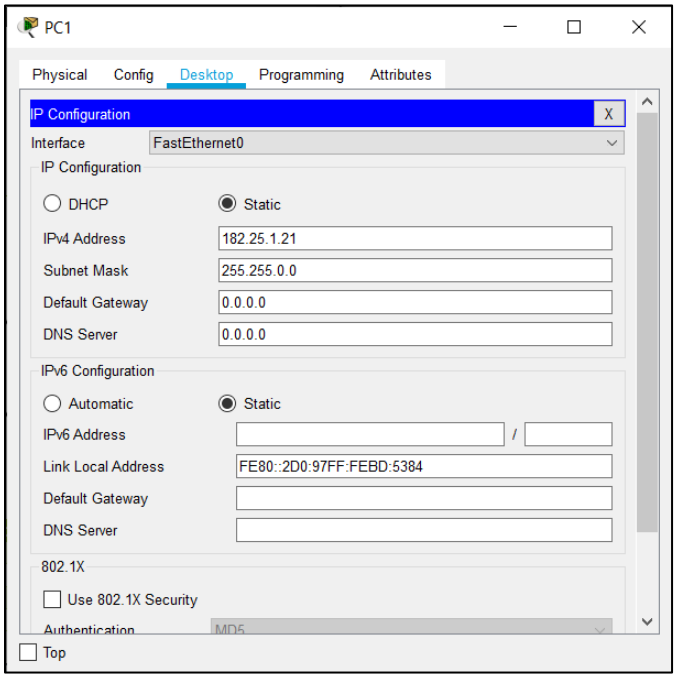
# 1. CONFIGURACIÓN BÁSICA DEL SWITCH

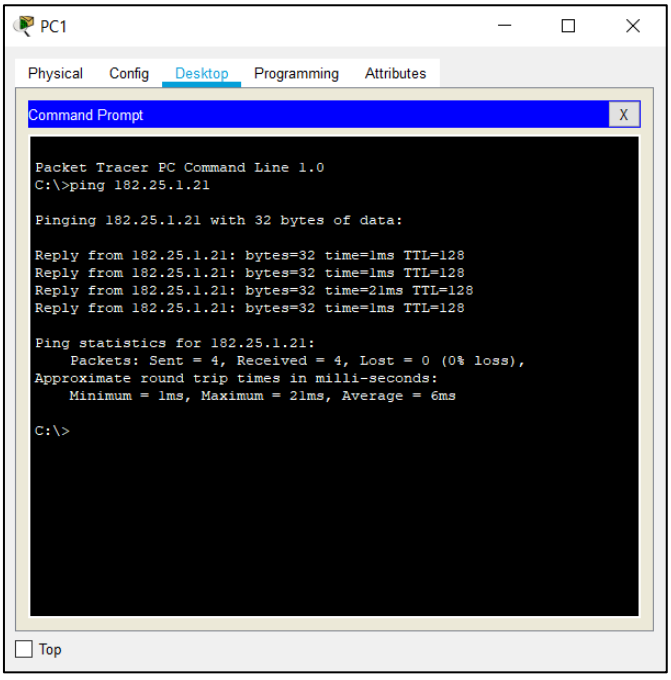
## - PC0



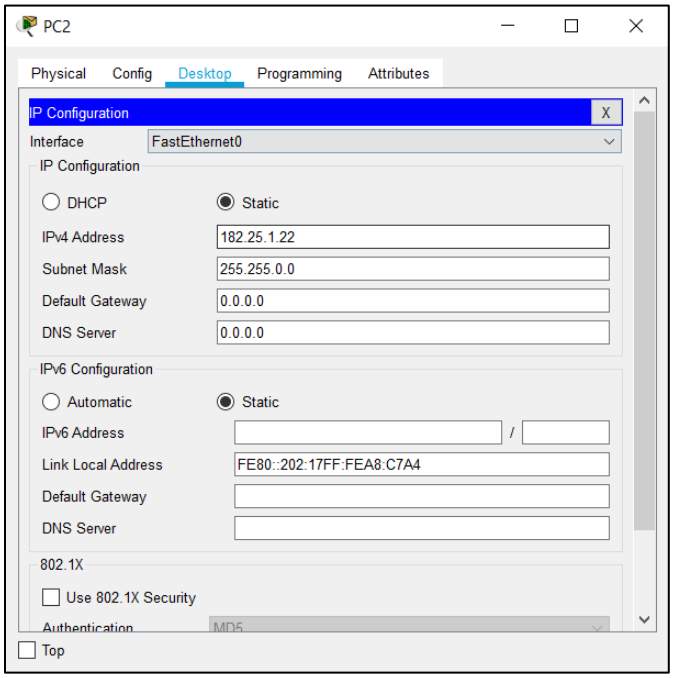



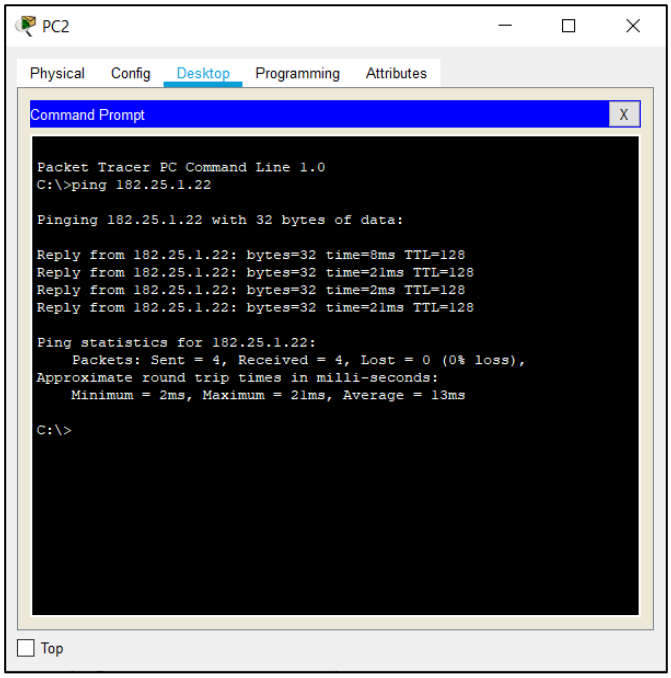

## - PC1



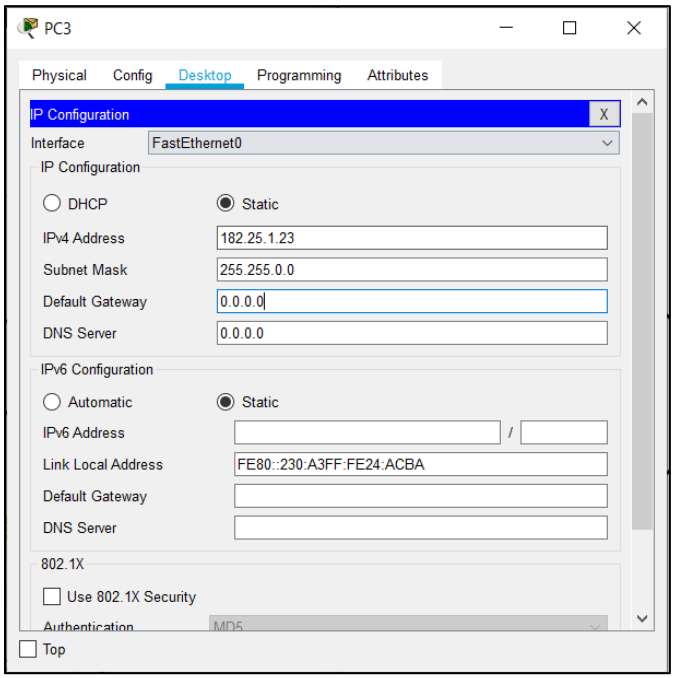



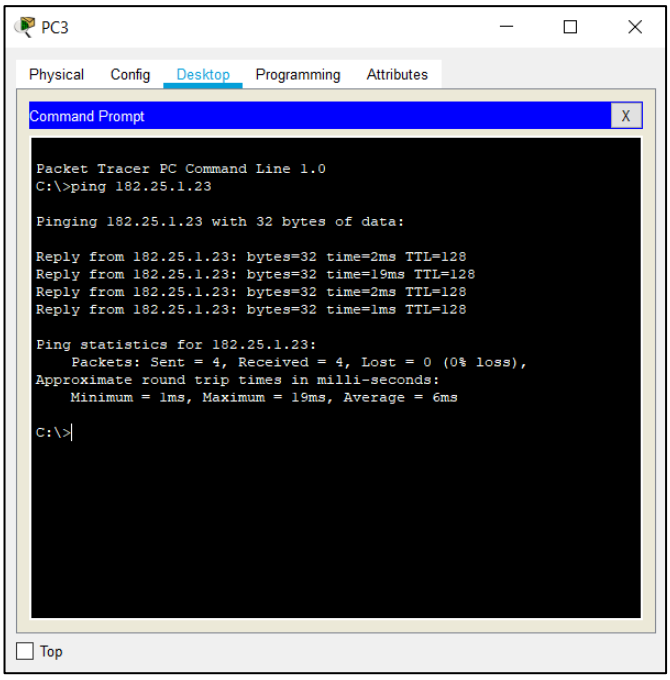
- **PC2**

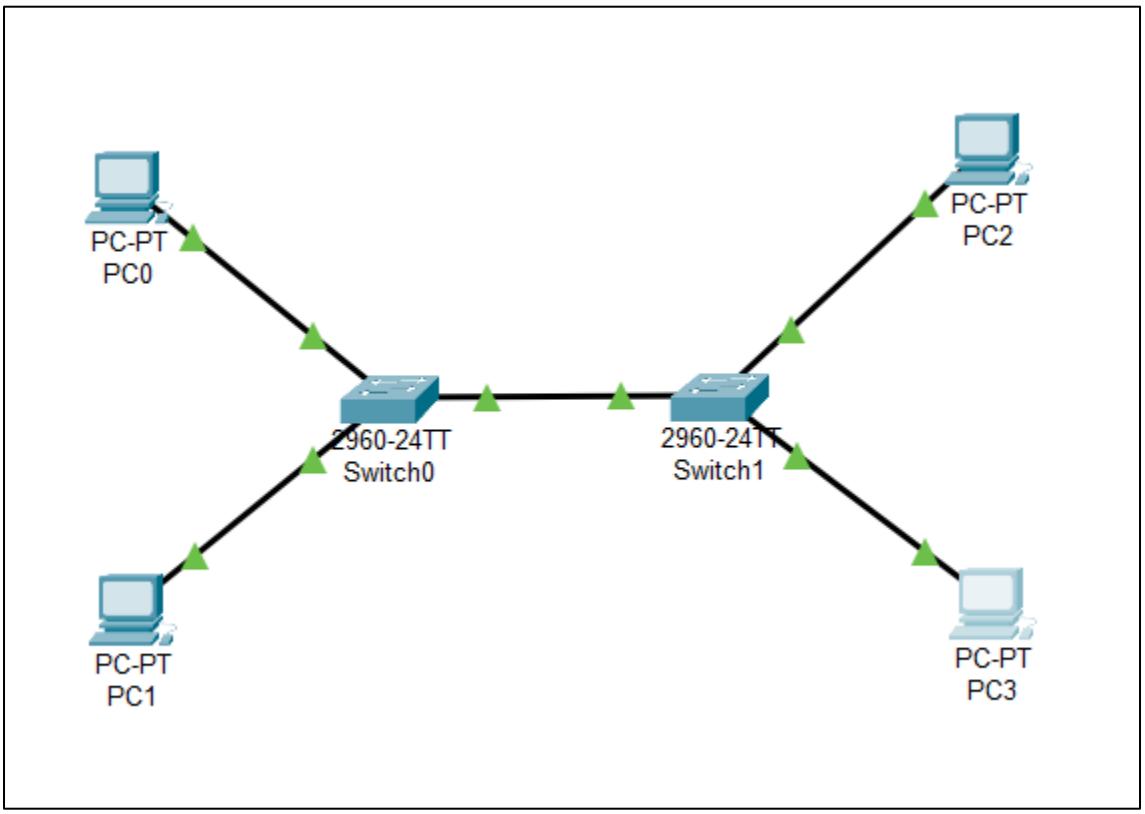

PC2
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
182.25.1.22
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::202:17FF:FEA8:C7A4
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Top


PC2
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 182.25.1.22
Pinging 182.25.1.22 with 32 bytes of data:
Reply from 182.25.1.22: bytes=32 time=8ms TTL=128
Reply from 182.25.1.22: bytes=32 time=21ms TTL=128
Reply from 182.25.1.22: bytes=32 time=2ms TTL=128
Reply from 182.25.1.22: bytes=32 time=21ms TTL=128
Ping statistics for 182.25.1.22:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 21ms, Average = 13ms
C:\>
Top

- **PC3**


PC3
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
182.25.1.23
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::230:A3FF:FE24:ACBA
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Top


PC3
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 182.25.1.23
Pinging 182.25.1.23 with 32 bytes of data:
Reply from 182.25.1.23: bytes=32 time=2ms TTL=128
Reply from 182.25.1.23: bytes=32 time=19ms TTL=128
Reply from 182.25.1.23: bytes=32 time=2ms TTL=128
Reply from 182.25.1.23: bytes=32 time=1ms TTL=128
Ping statistics for 182.25.1.23:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 19ms, Average = 6ms
C:\>
Top




## 2. CONFIGURACIÓN BÁSICA DEL SWITCH

- Pasos de configuración PC0 – Switch Silva

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname <Silva>
<Silva>(config)#banner motd # Este equipo es para uso exclusivo de los estudiantes de RECO del Lab4 #
<Silva>(config)#line console 0
<Silva>(config-line)#loggin synchronous
<Silva>(config-line)#password <RECO_C>
<Silva>(config-line)#login
<Silva>(config-line)#exit
<Silva>(config)#line vty 0 15
<Silva>(config-line)#loggin synchronous
<Silva>(config-line)#password <RECO_T>
<Silva>(config-line)#login
<Silva>(config-line)#exit
<Silva>(config)#
```

```
<Silva>(config-if)#interface FastEthernet0/1
<Silva>(config-if)#description "Conexin a computador PC0"
```

```
<Silva>(config-if)#enable secret <RECO_E>
<Silva>(config)#exit
```

```
<Silva>#show running-config
Building configuration...

Current configuration : 1403 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname <Silva>
!
enable secret 5 $1$mERr$4pl/R1Ed.BXK0wiov6B4j1
!
!
!
no ip domain-lookup
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 description "Conexin a computador PC0"
!
interface FastEthernet0/2
!
interface FastEthernet0/3
!
interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
 --More--
```

```
interface Vlan1
 no ip address
 shutdown
!
banner motd ^C Este equipo es para uso exclusivo de los estudiantes de RECO del
Lab4 ^C
!
!
!
line con 0
 password <RECO_C>
 logging synchronous
 login
!
line vty 0 4
 password <RECO_T>
 logging synchronous
 login
line vty 5 15
 password <RECO_T>
 logging synchronous
 login
!
!
!
!
end
```

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

- Pasos de configuración PC2 – Switch Mina

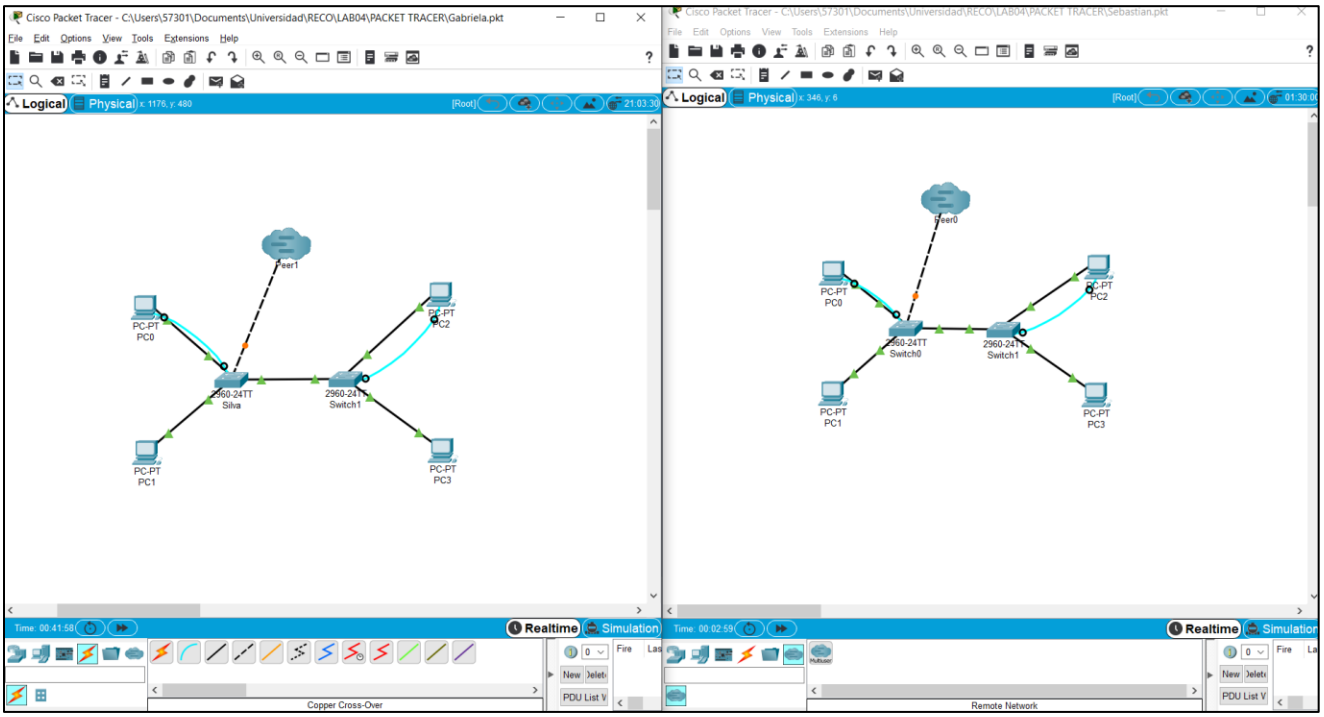
```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname <Echavarria>
<Echavarria>(config)#banner motd #Este equipo es para uso exclusivo de los estudiantes de RECO del lab4#
<Echavarria>(config)#line console 0
<Echavarria>(config-line)#logging synchronous
<Echavarria>(config-line)#password <RECO_C>
<Echavarria>(config-line)#login
<Echavarria>(config-line)#exit
<Echavarria>(config)#line vty 0 15
<Echavarria>(config-line)#logging synchronous
<Echavarria>(config-line)#password <RECO_T>
<Echavarria>(config-line)#login
<Echavarria>(config-line)#exit
<Echavarria>(config)#no ip domain-lookup
<Echavarria>(config)#interface
% Incomplete command.
<Echavarria>(config)#interface FastEthernet0/1
<Echavarria>(config-if)#description "Conexion a computador PC0"
<Echavarria>(config-if)#enable secret <RECO_E>
<Echavarria>(config)#exit
<Echavarria>#
%SYS-5-CONFIG_I: Configured from console by console
```

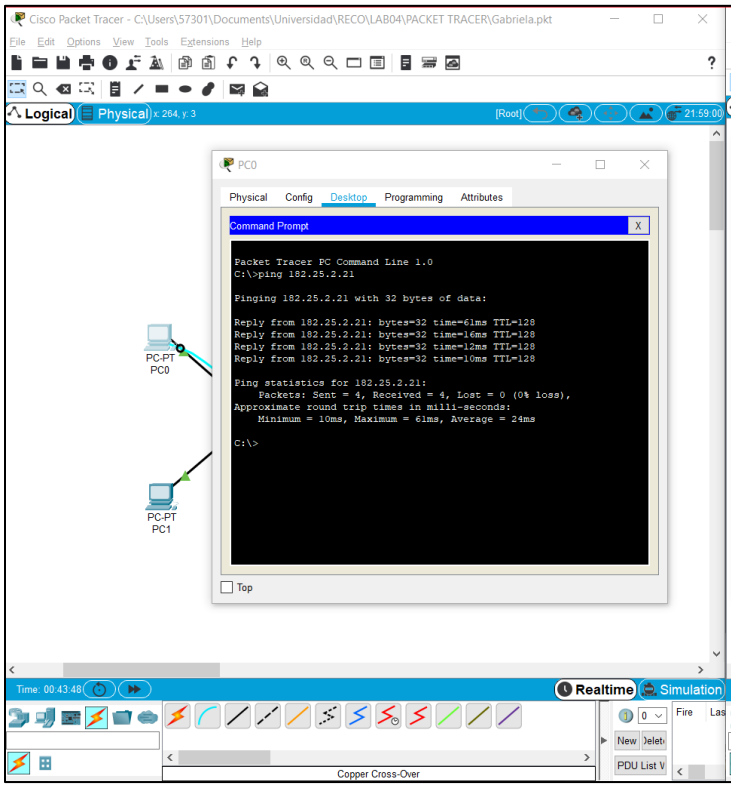
```
<Echavarria>#show running-config
Building configuration...

Current configuration : 1407 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname <Echavarria>
!
enable secret 5 $1$mERr$4pl/RlEd.BXK0wiov6B4j1
!
!
!
no ip domain-lookup
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 description "Conexion a computador PC0"
!
interface FastEthernet0/2
!
interface FastEthernet0/3
!
interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
 --More--
```

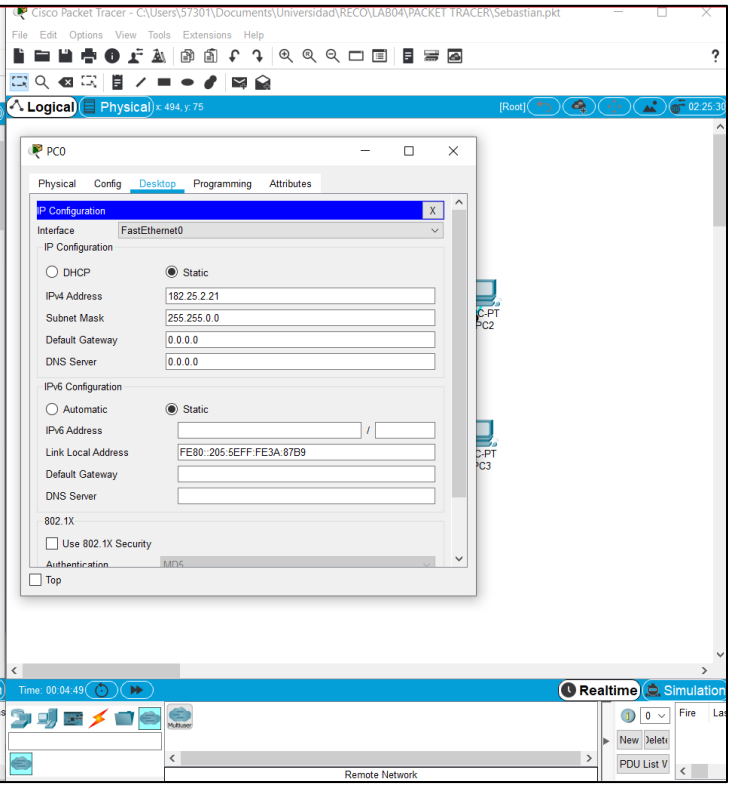
```
interface Vlan1
 no ip address
 shutdown
!
banner motd ^CEste equipo es para uso exclusivo de los estudiantes de RECO del lab4^C
!
!
!
line con 0
 password <RECO_C>
 logging synchronous
 login
!
line vty 0 4
 password <RECO_T>
 logging synchronous
 login
line vty 5 15
 password <RECO_T>
 logging synchronous
 login
!
!
!
!
end
```

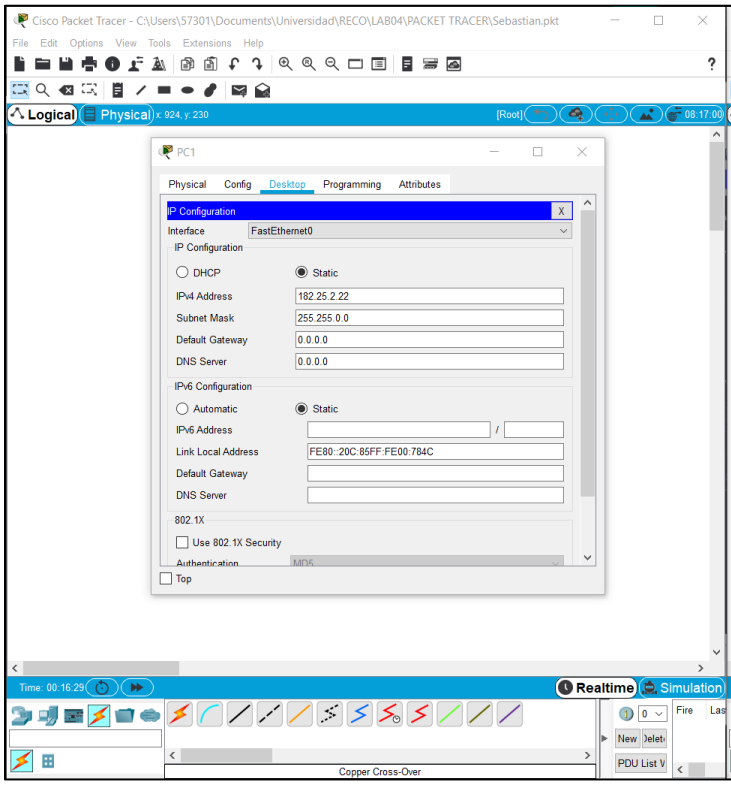
```
<Echavarria>#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

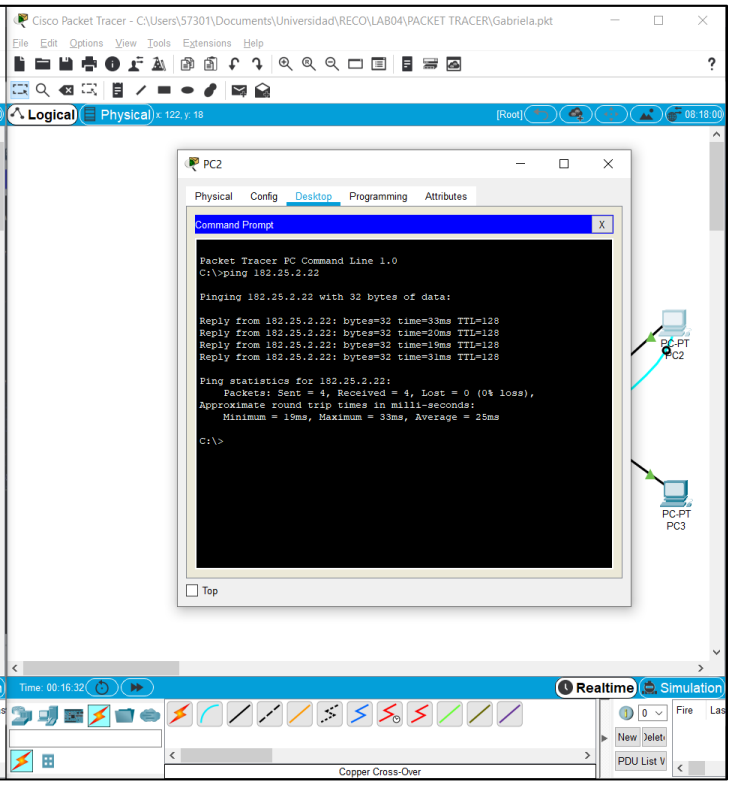
- Multiuser




Cisco Packet Tracer - C:\Users\57301\Documents\Universidad\RECO\LAB04\PACKET TRACER\Gabriela.pkt
PC0
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 182.25.2.21
Pinging 182.25.2.21 with 32 bytes of data:
Reply from 182.25.2.21: bytes=32 time=61ms TTL=128
Reply from 182.25.2.21: bytes=32 time=16ms TTL=128
Reply from 182.25.2.21: bytes=32 time=12ms TTL=128
Reply from 182.25.2.21: bytes=32 time=10ms TTL=128
Ping statistics for 182.25.2.21:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 10ms, Maximum = 61ms, Average = 24ms
C:\>
PC-PT PC0
PC-PT PC1
Copper Cross-Over

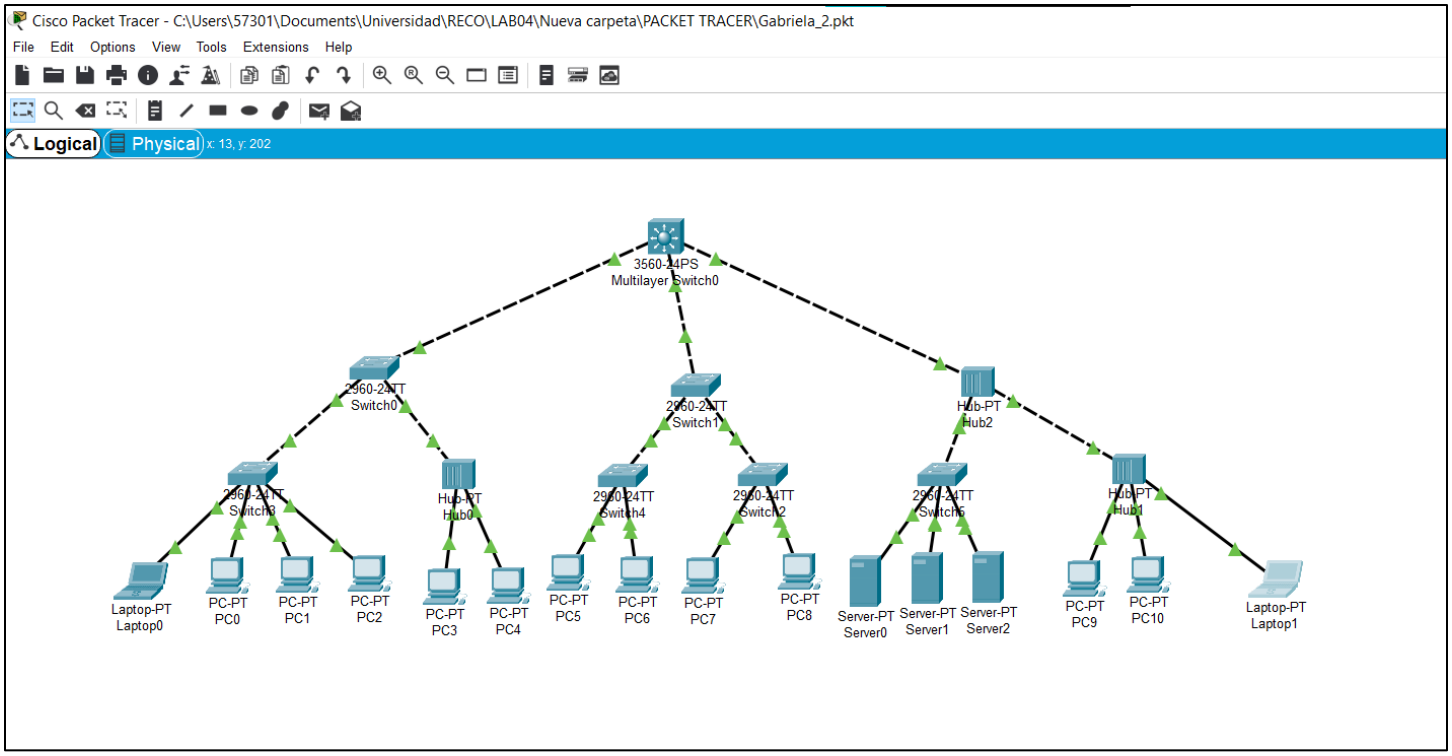

Cisco Packet Tracer - C:\Users\57301\Documents\Universidad\RECO\LAB04\PACKET TRACER\Sebastian.pkt
PC0
IP Configuration
Interface FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address 182.25.2.21
Subnet Mask 255.255.0.0
Default Gateway 0.0.0.0
DNS Server 0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address FE80::205:5EFF:FE3A:87B9
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Remote Network


Cisco Packet Tracer - C:\Users\57301\Documents\Universidad\RECO\LAB04\PACKET TRACER\Sebastian.pkt
PC1
IP Configuration
Interface FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address 182.25.2.22
Subnet Mask 255.255.0.0
Default Gateway 0.0.0.0
DNS Server 0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address FE80::20C:85FF:FE00:784C
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Copper Cross-Over

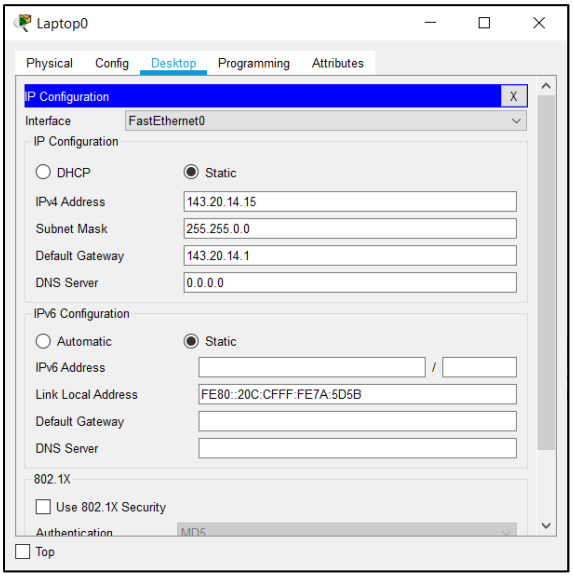

Cisco Packet Tracer - C:\Users\57301\Documents\Universidad\RECO\LAB04\PACKET TRACER\Gabriela.pkt
PC2
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 182.25.2.22
Pinging 182.25.2.22 with 32 bytes of data:
Reply from 182.25.2.22: bytes=32 time=33ms TTL=128
Reply from 182.25.2.22: bytes=32 time=20ms TTL=128
Reply from 182.25.2.22: bytes=32 time=19ms TTL=128
Reply from 182.25.2.22: bytes=32 time=31ms TTL=128
Ping statistics for 182.25.2.22:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 19ms, Maximum = 33ms, Average = 25ms
C:\>
PC-PT PC2
PC-PT PC3
Copper Cross-Over

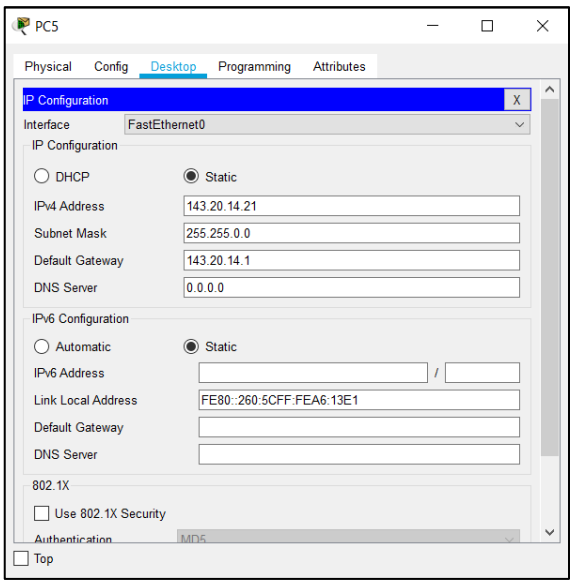
## 3. REDES DE SWITCHES MÁS GRANDES

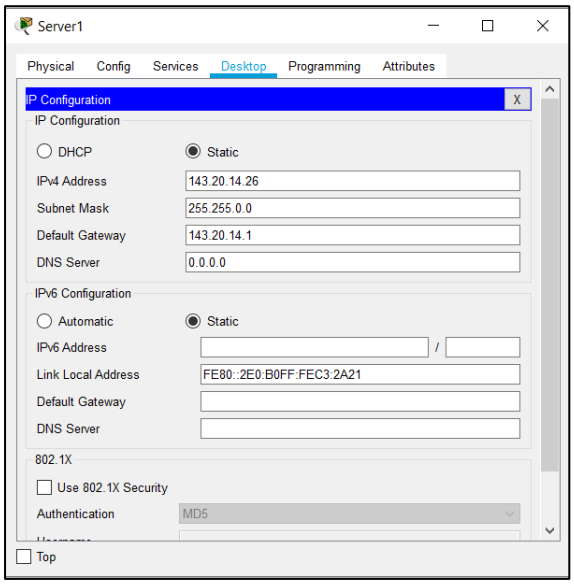
Archivo Ana Gabriela



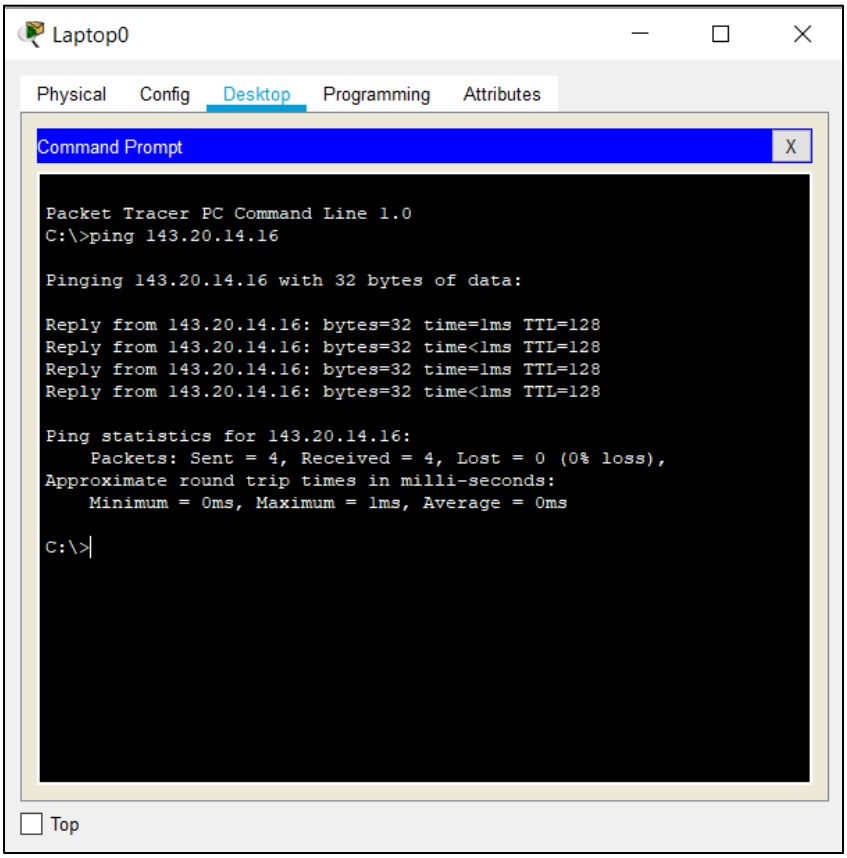

Algunas configuraciones.

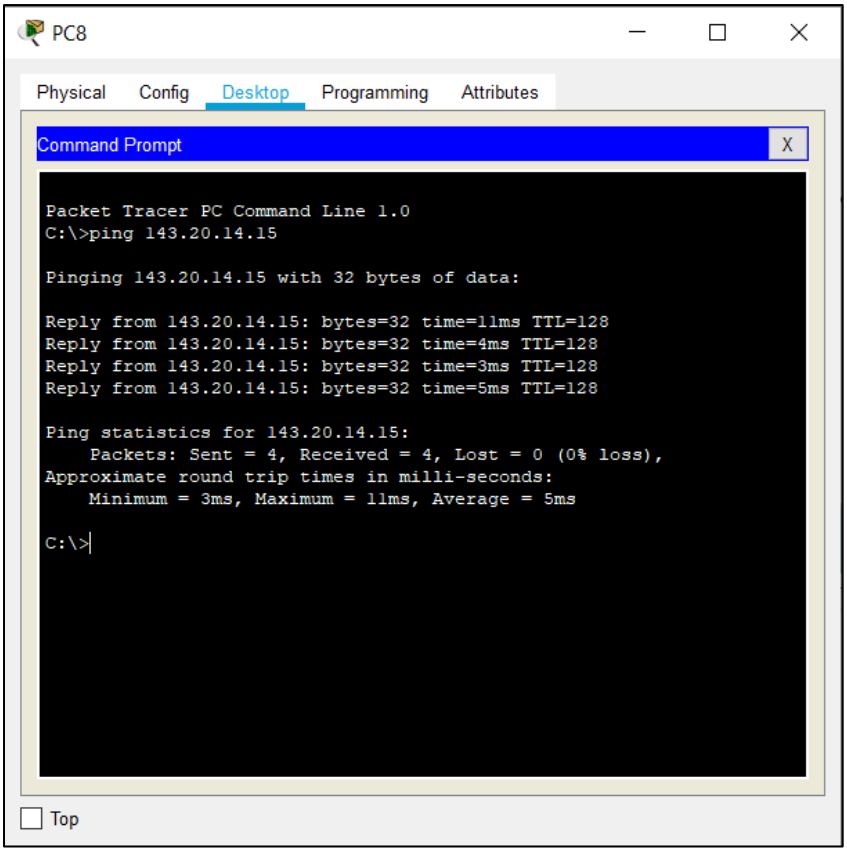




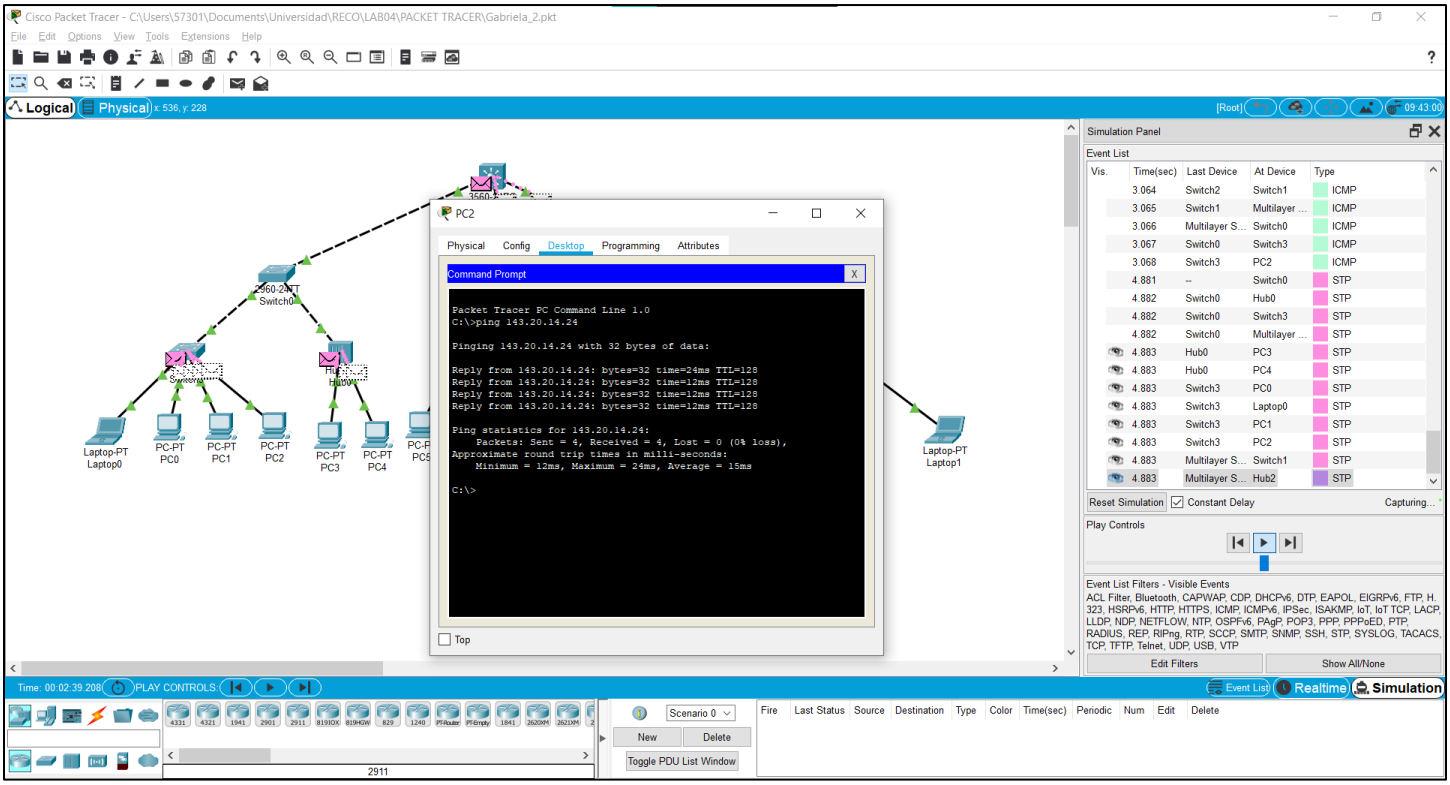

## Conectividad entre equipos



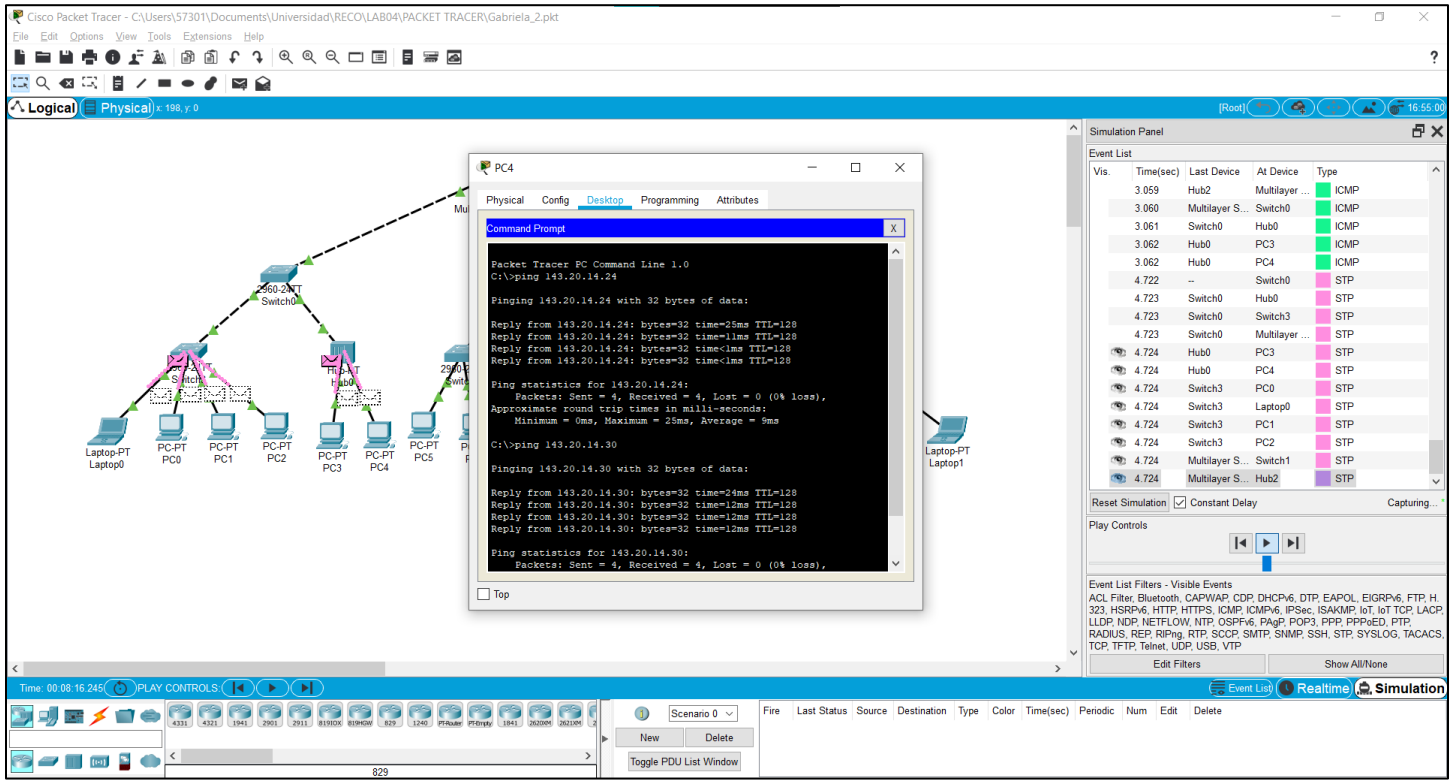



## Comportamiento de la red

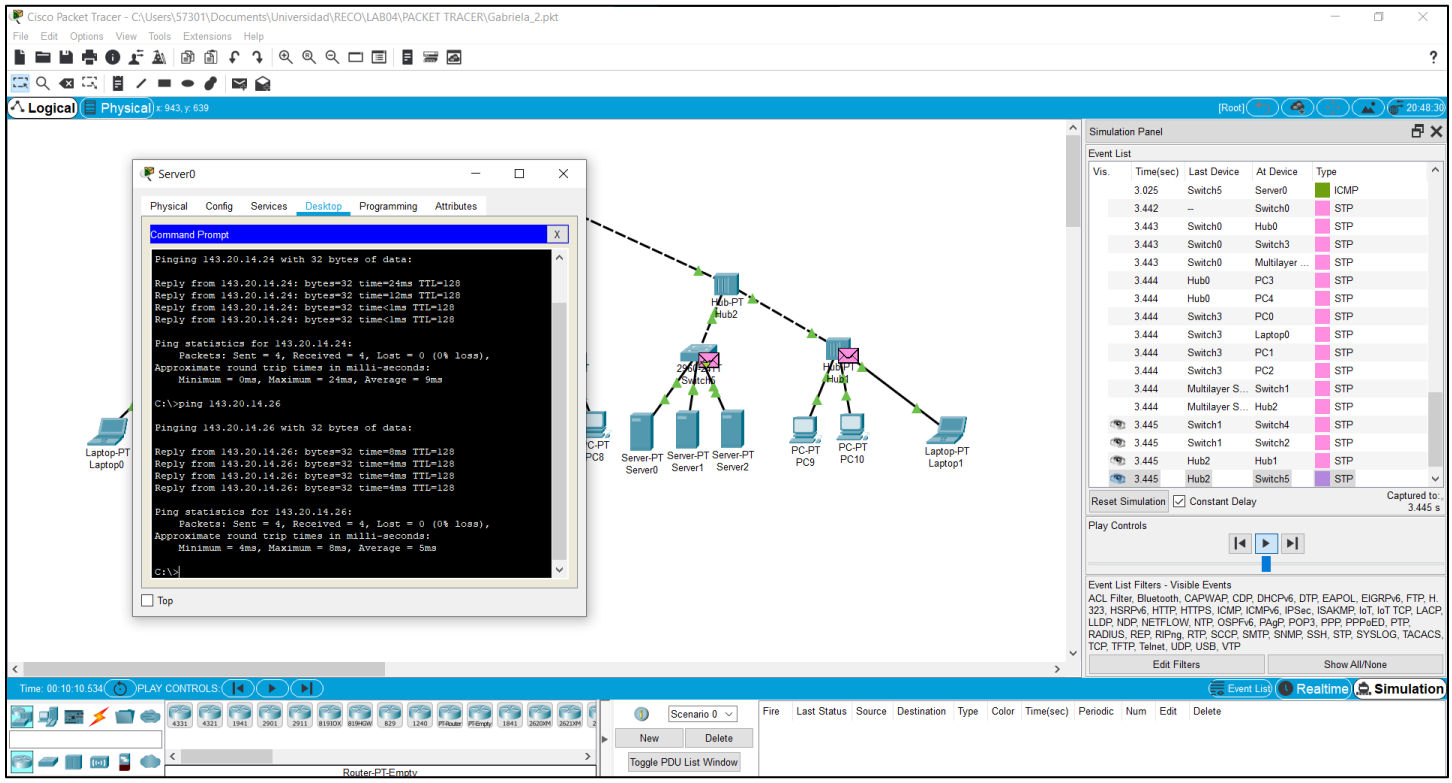
- De PC2 a PC8



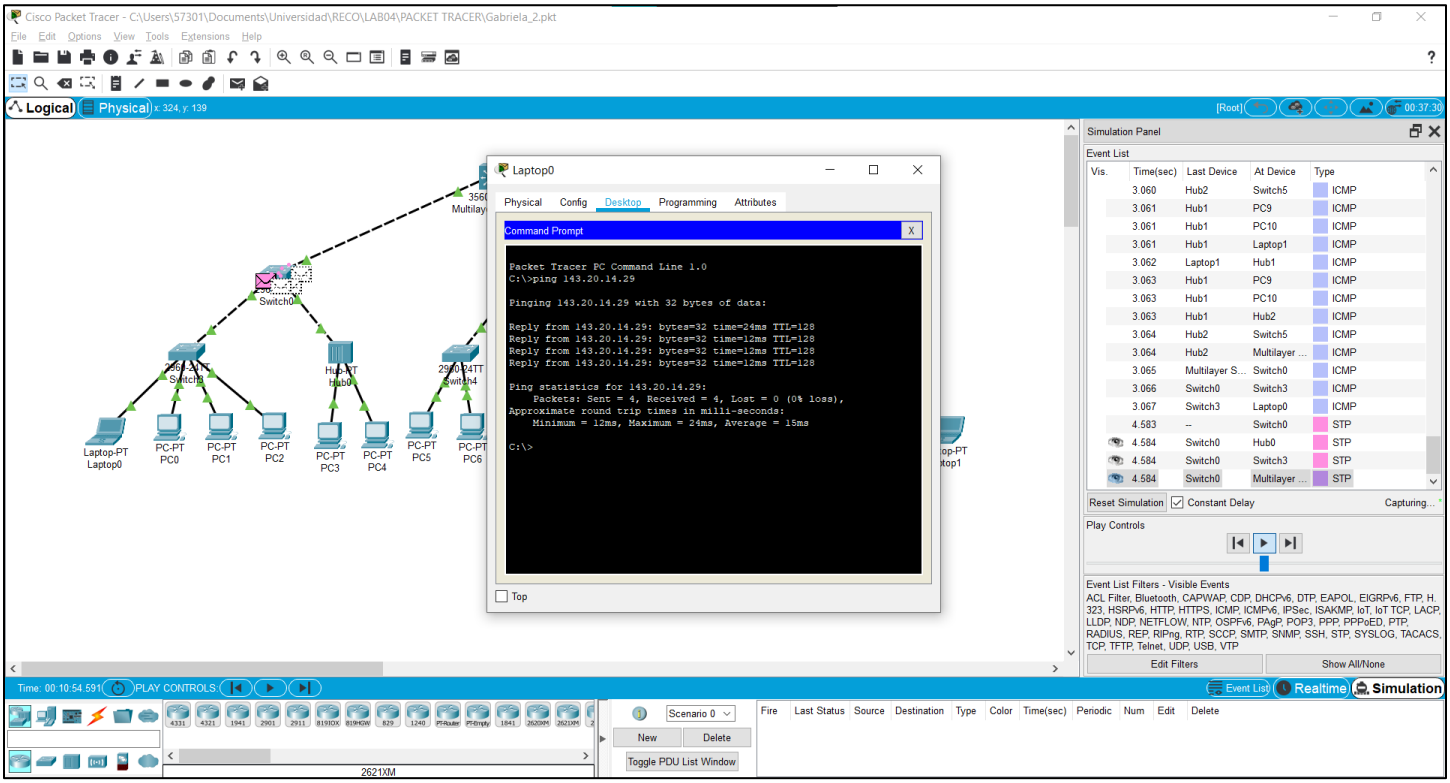
- De PC4 a PC10



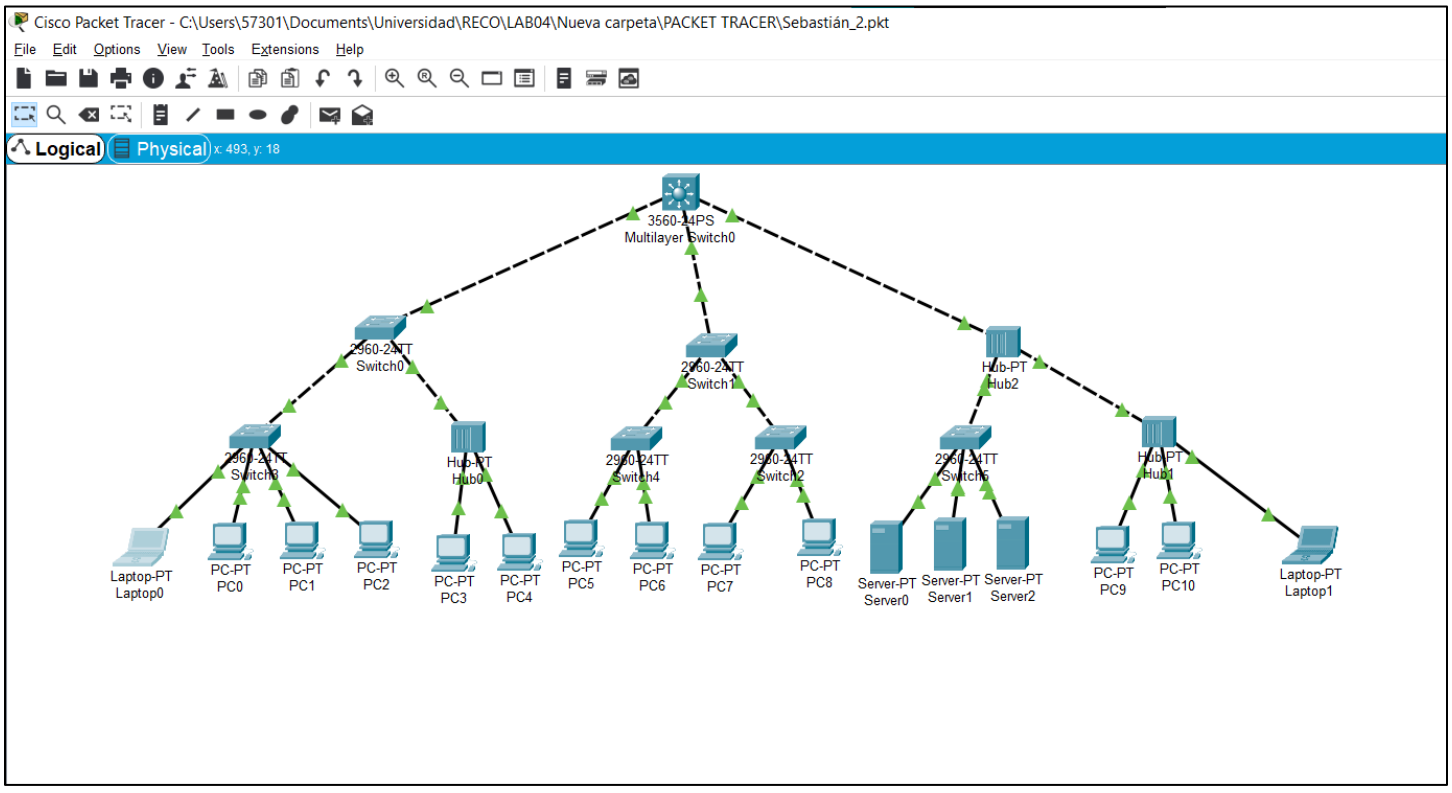

- De Server0 a Server1



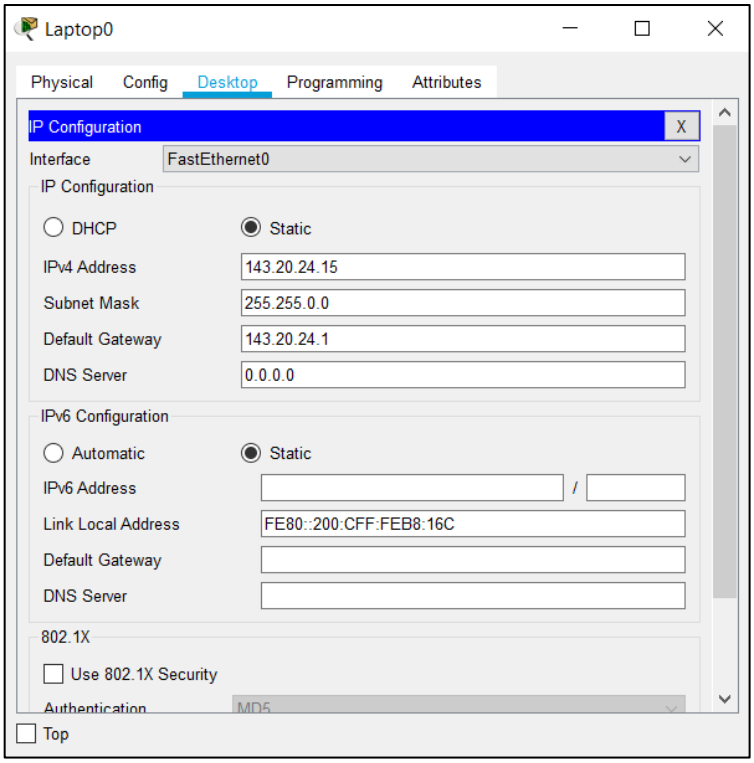
- Laptop0 a Laptop1

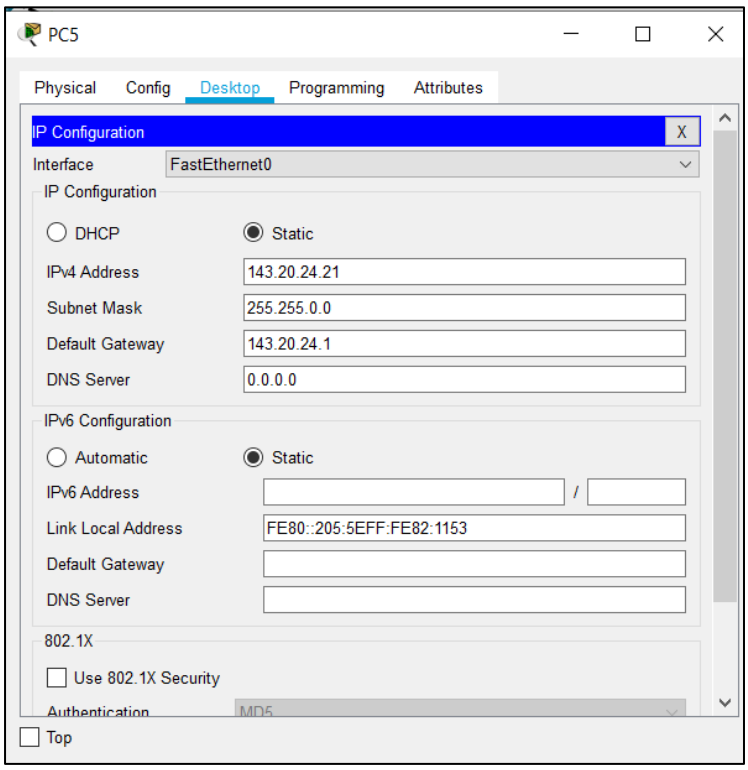



## Archivo Juan Sebastián

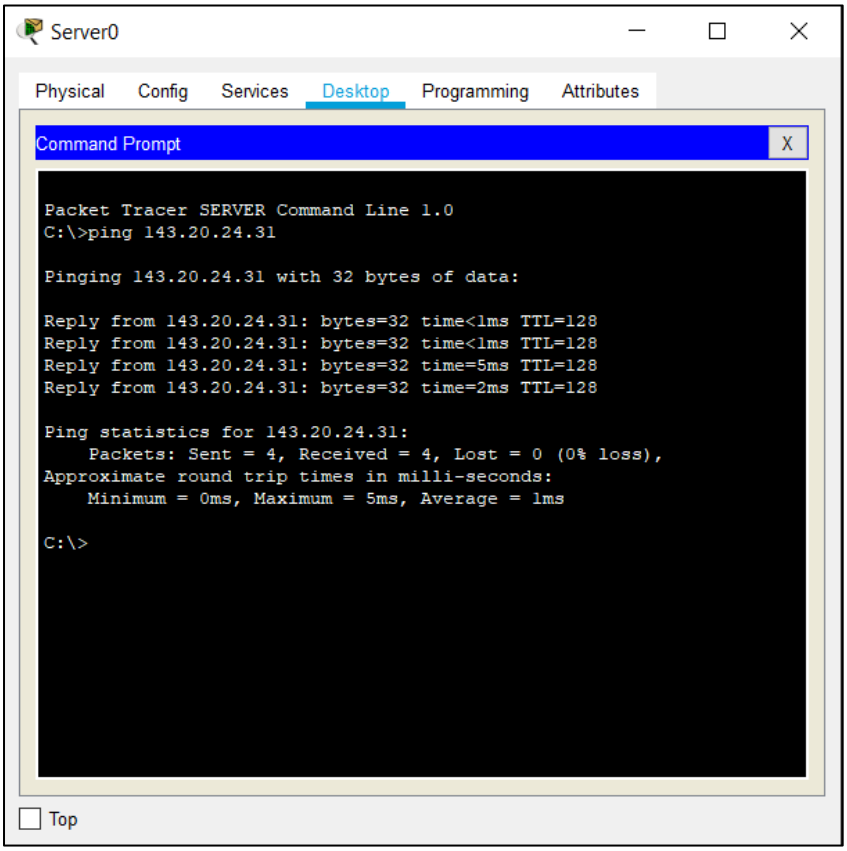


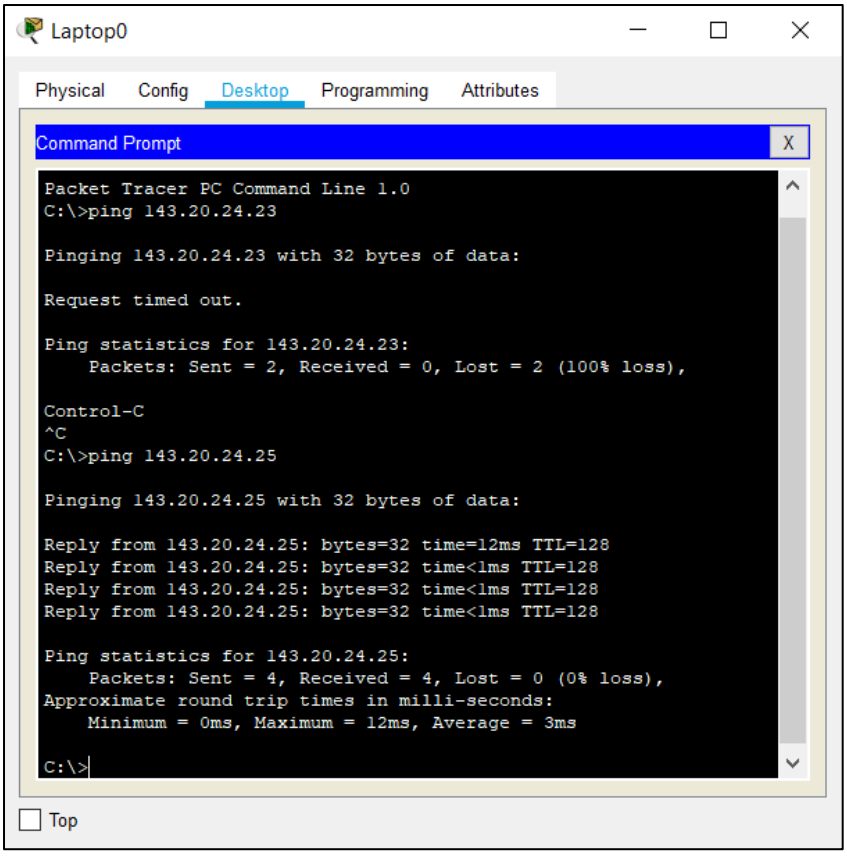
Algunas configuraciones.



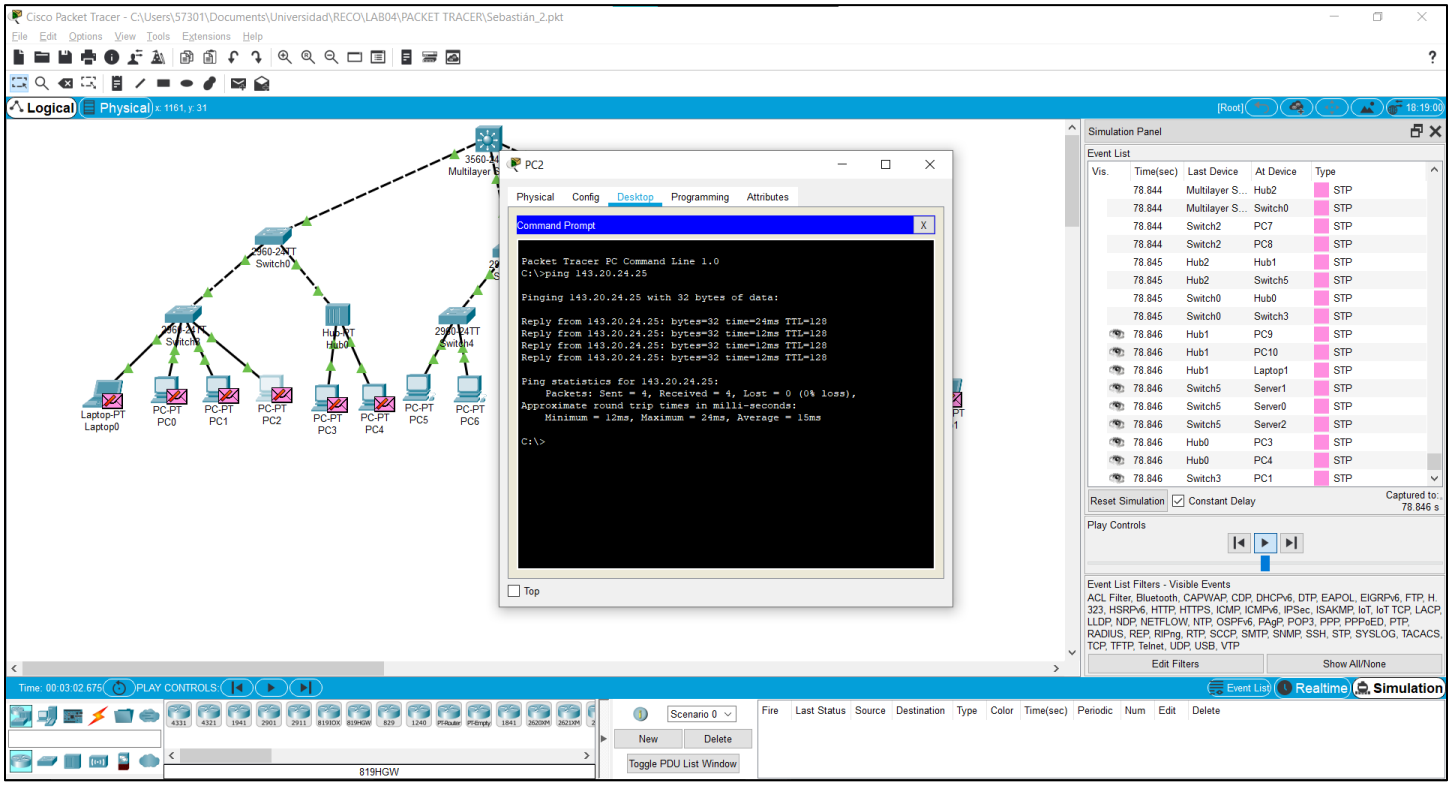

Conectividad entre equipos



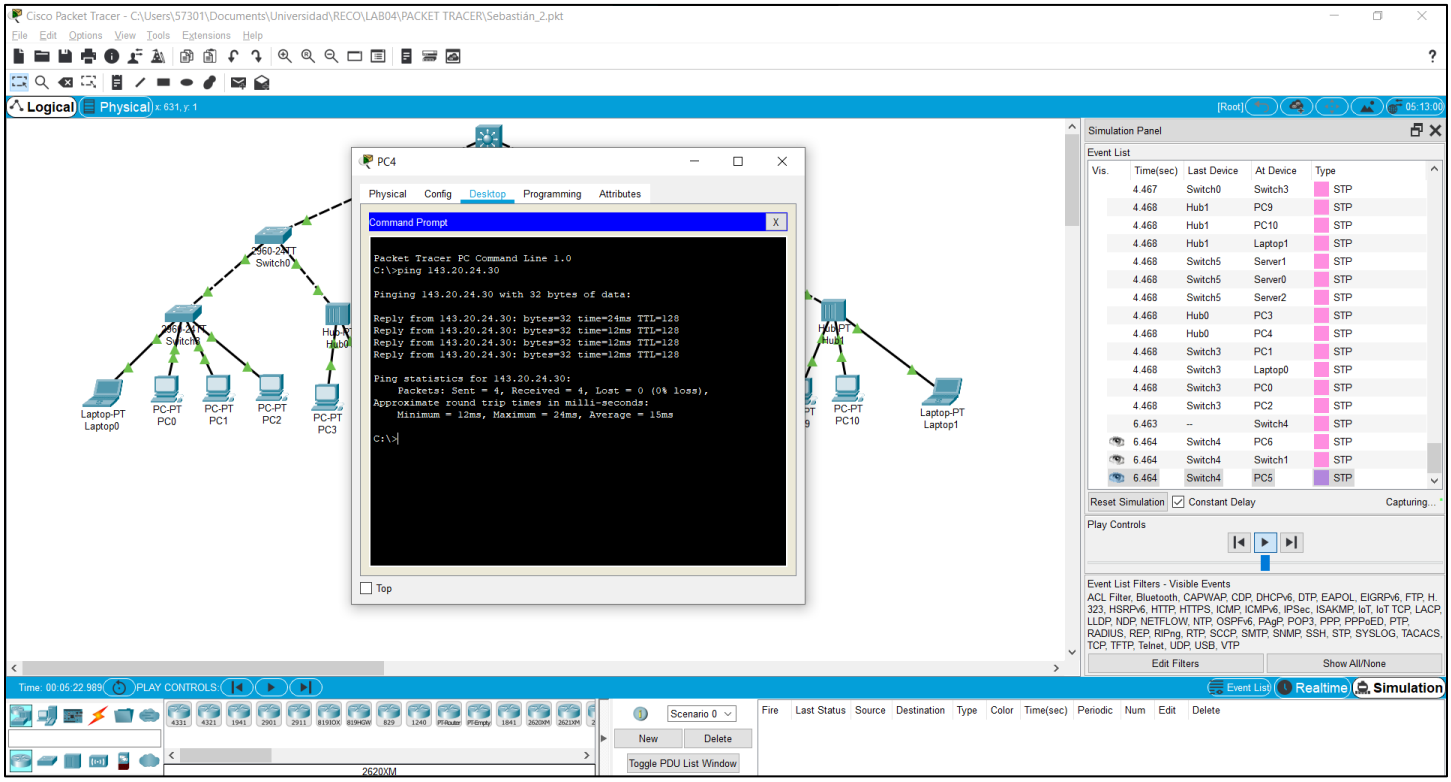



## Comportamiento de la red

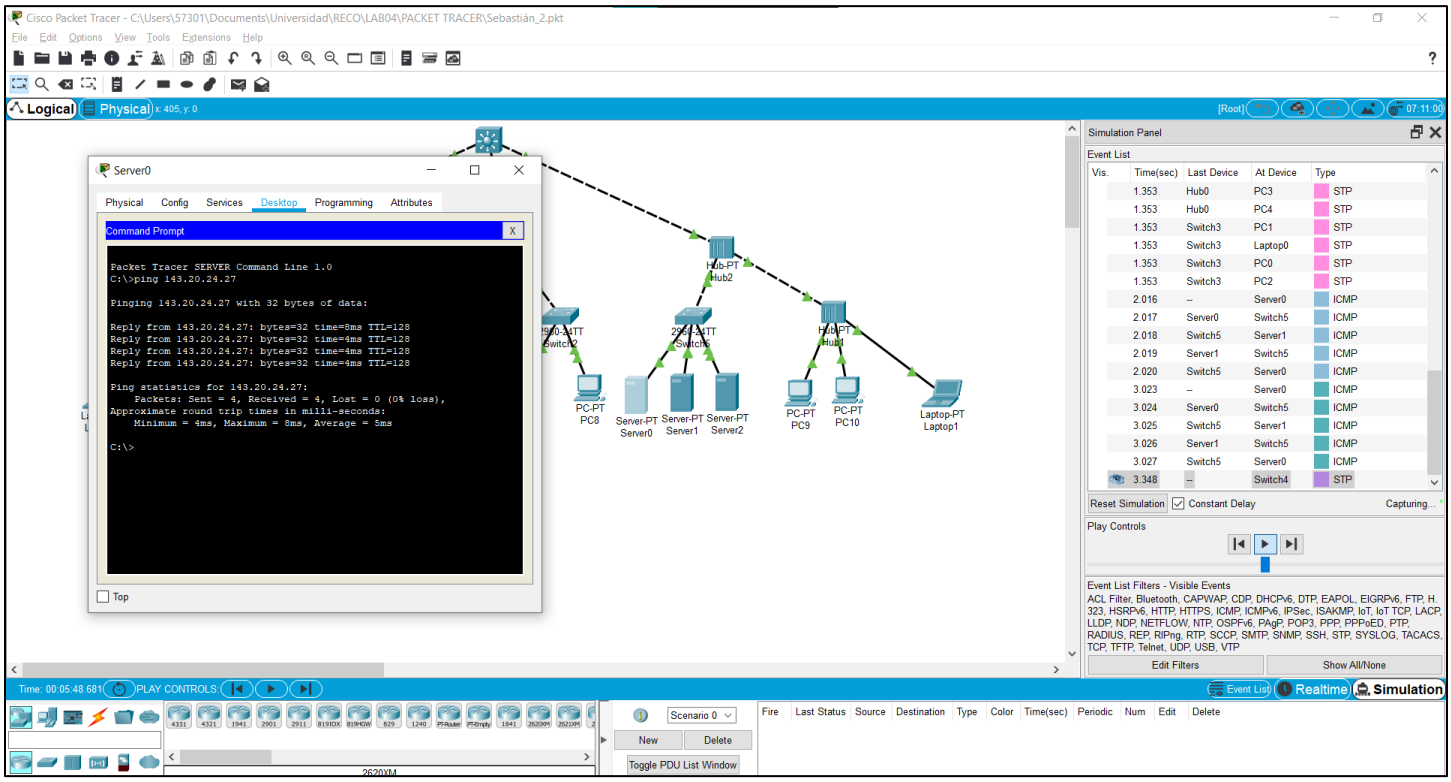
- De PC2 a PC8



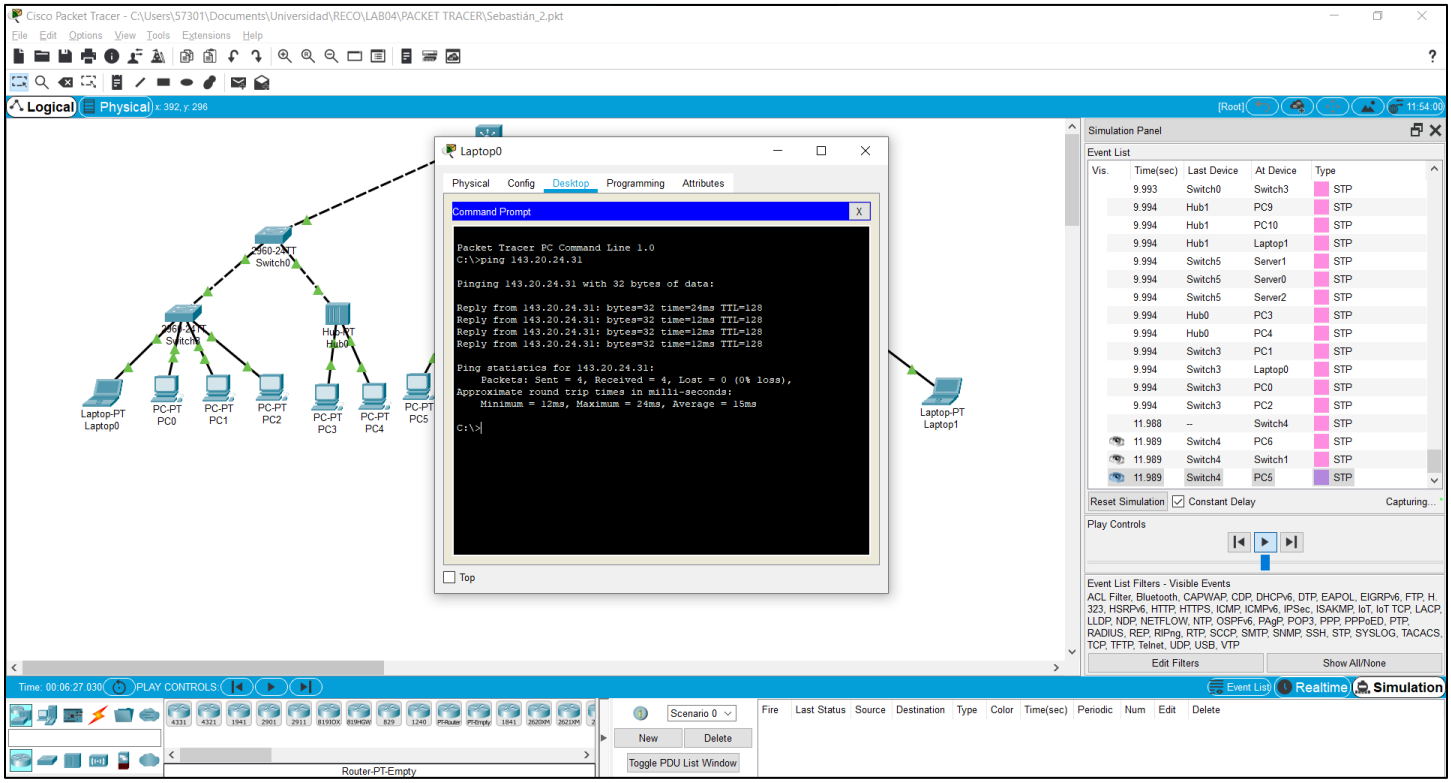
- De PC4 a PC10



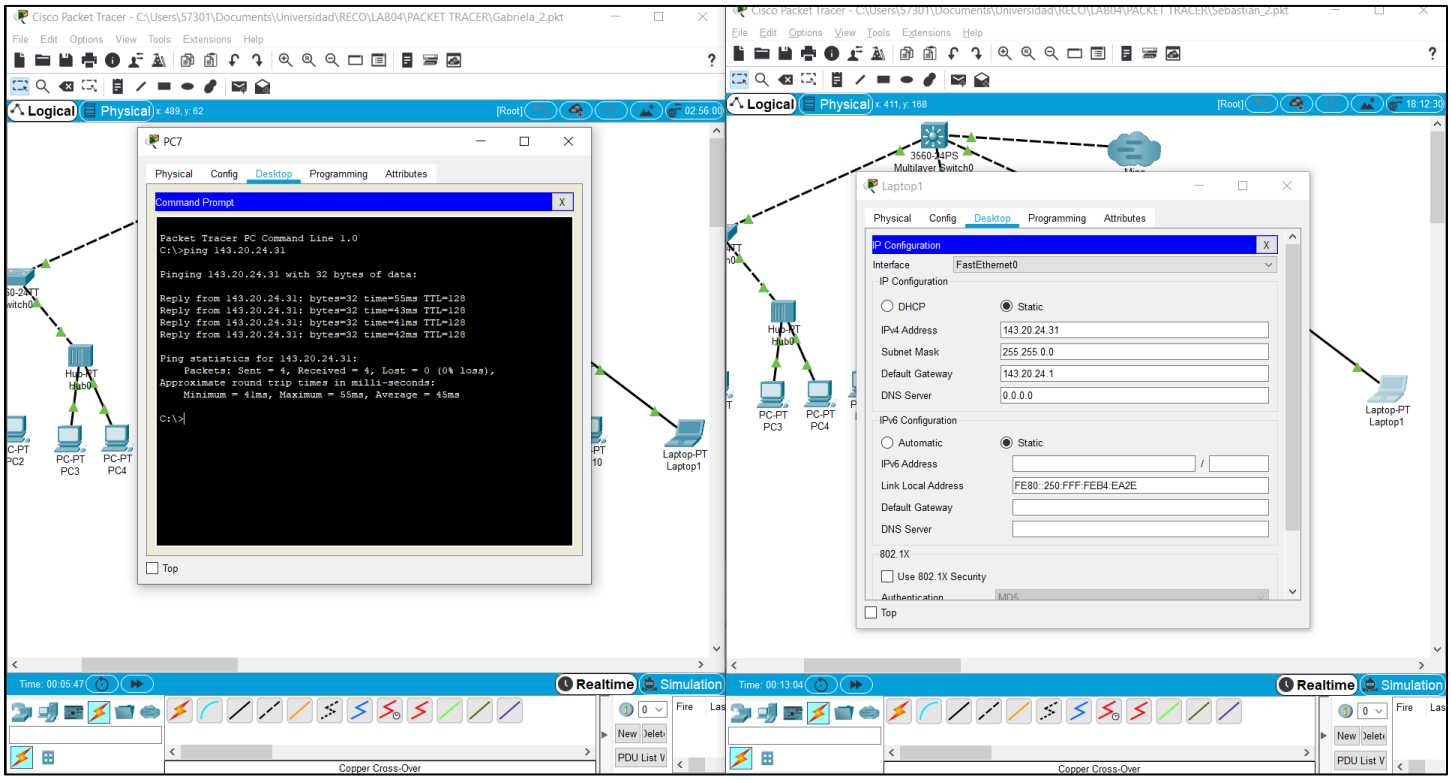

- De Server0 a Server1

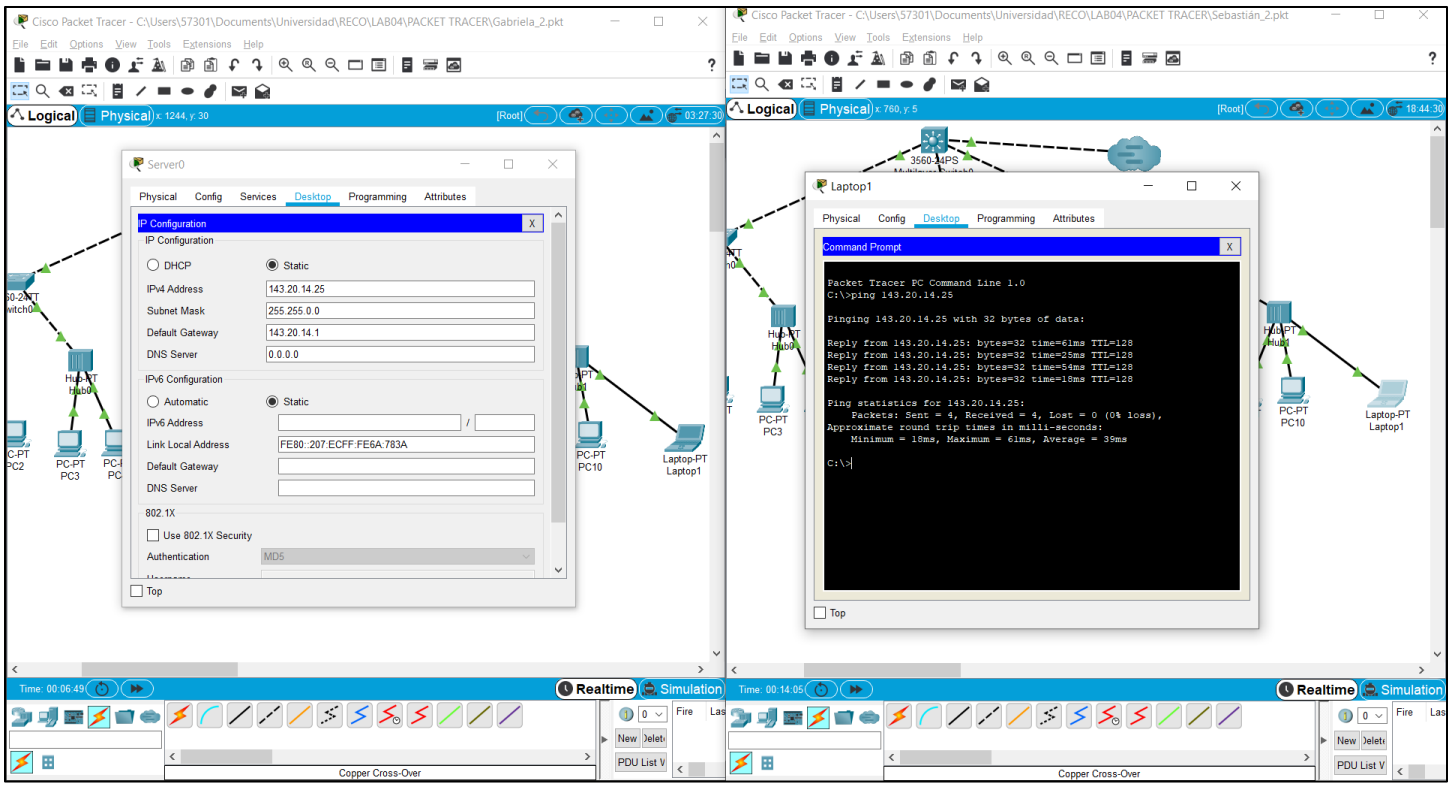


- Laptop0 a Laptop1

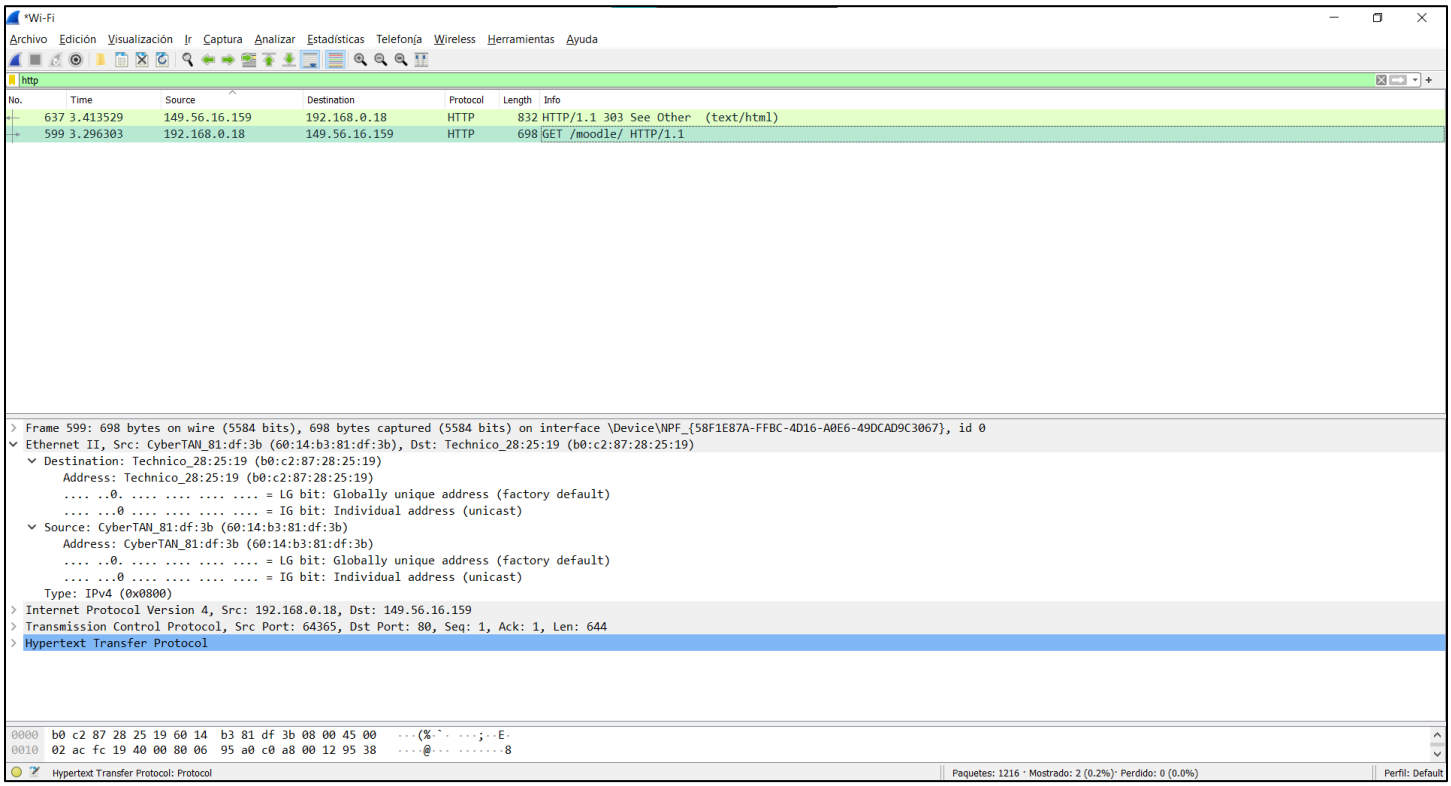


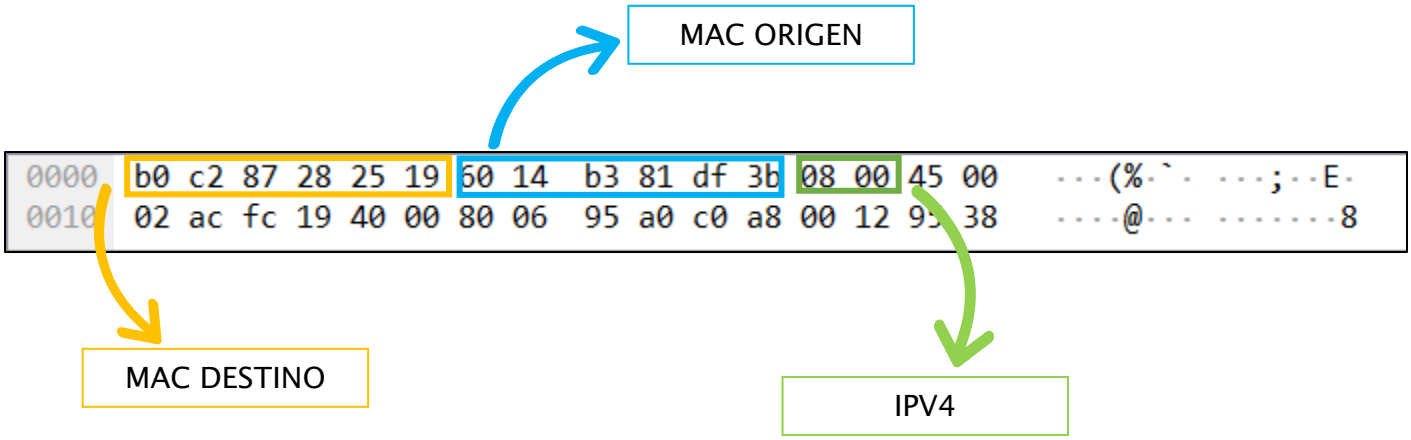

## Multiuser






## 4. REVISIÓN DE FRAMES DE ETHERNET






## CONCLUSIONES

- La aplicación Packet Tracer nos permite aprender a configurar switches desde consola y de igual forma la interconexión de archivo “Cisco Packet Tracer”.
- La aplicación Wireshark nos permite conocer más a fondo el significado de los bits al momento de hacer una captura.

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- 10.4.1.2 Packet Tracer Multiuser - Tutorial Instructions.pdf (itesa.edu.mx)
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