Laboratorio #1

Repaso de Redes de Computacion 1

Redes de Computación 2

Estudiante:

Alexis H. Segales R.

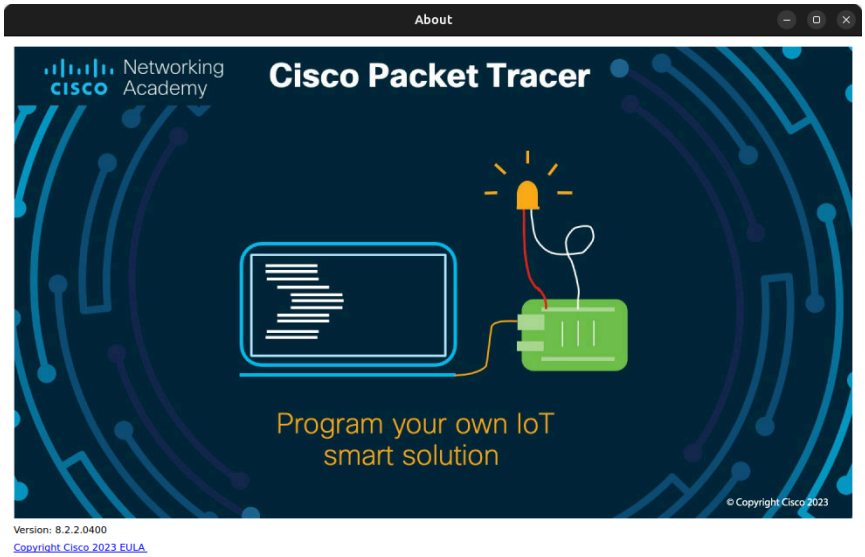
Fecha:

1 sept 2024

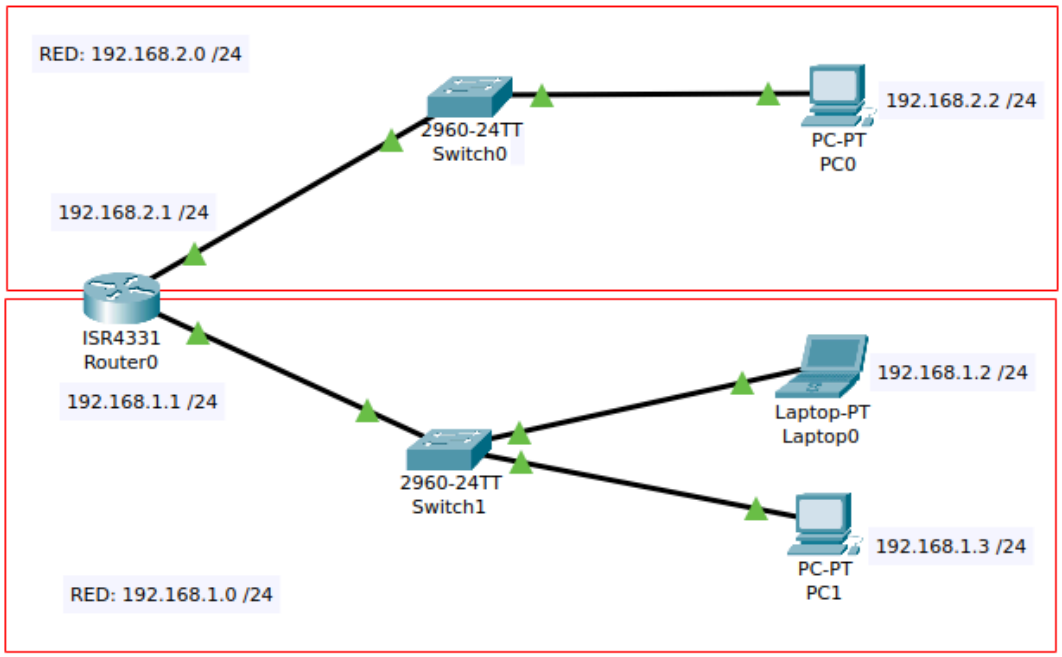
Index

Actividad #1 - Diseño de red LAN básica

Packet Tracer

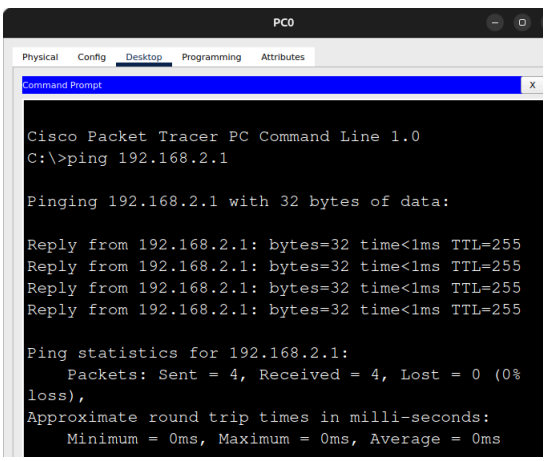


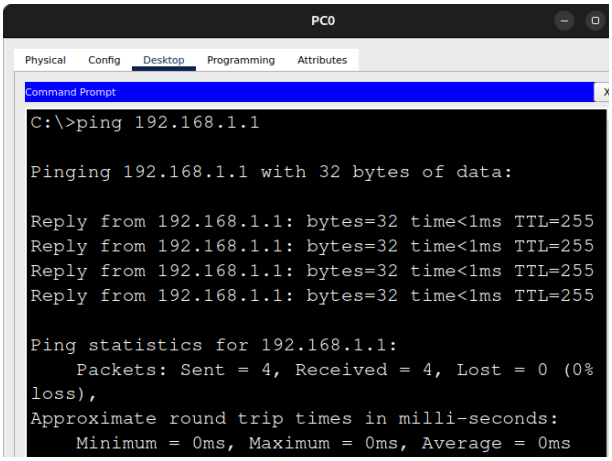
Topología



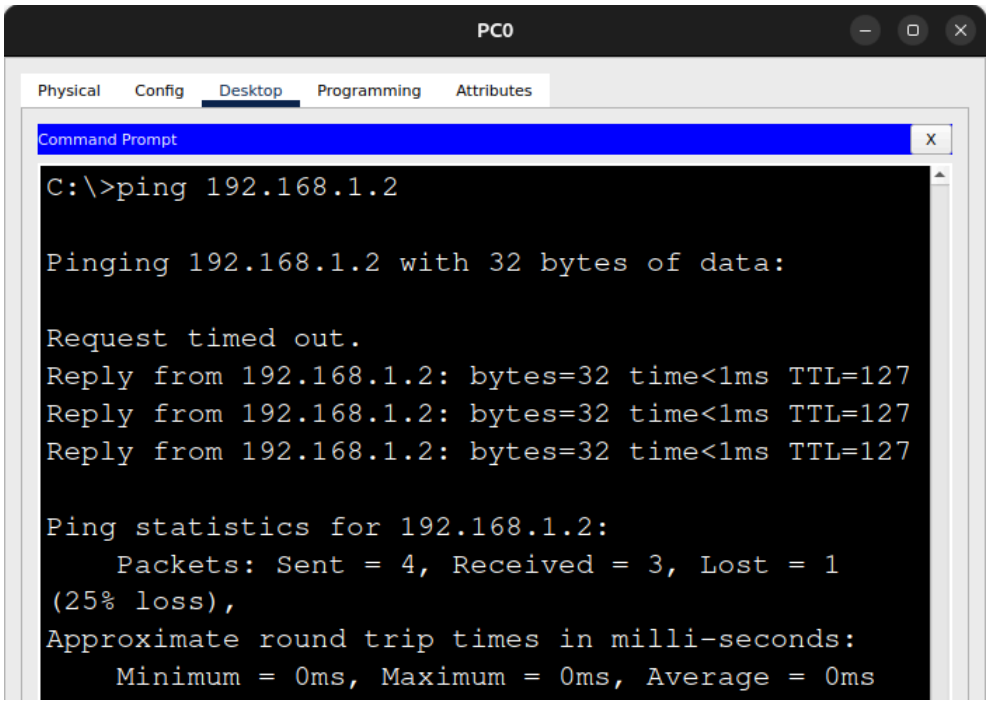
Conectividad

PC0 a Router0

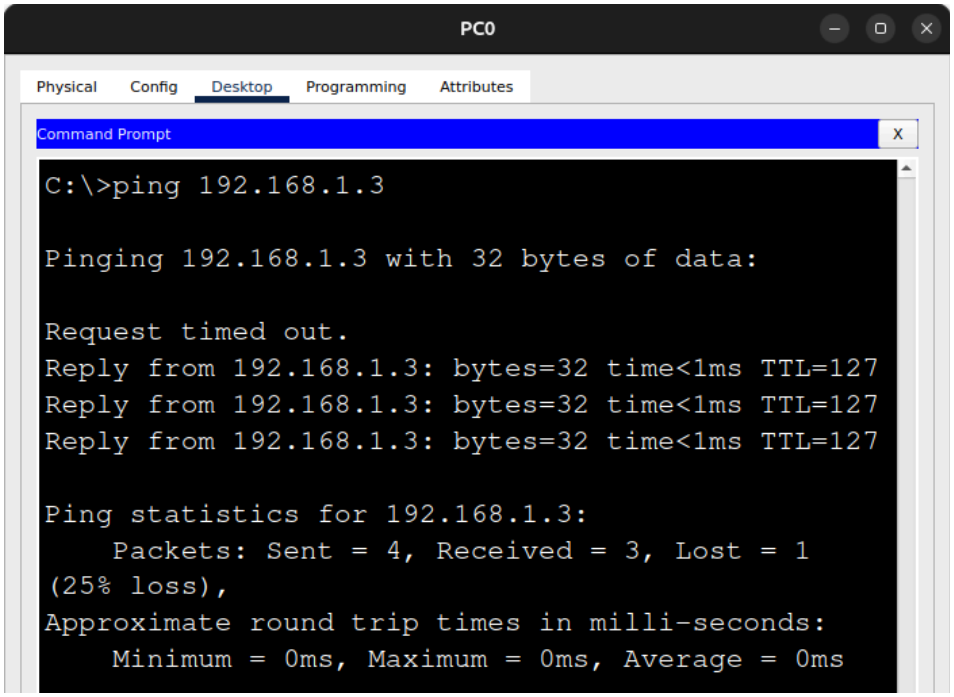




PC0 a Laptop0



PC0 a PC1



Actividad #2 - Diseño de red LAN extendida

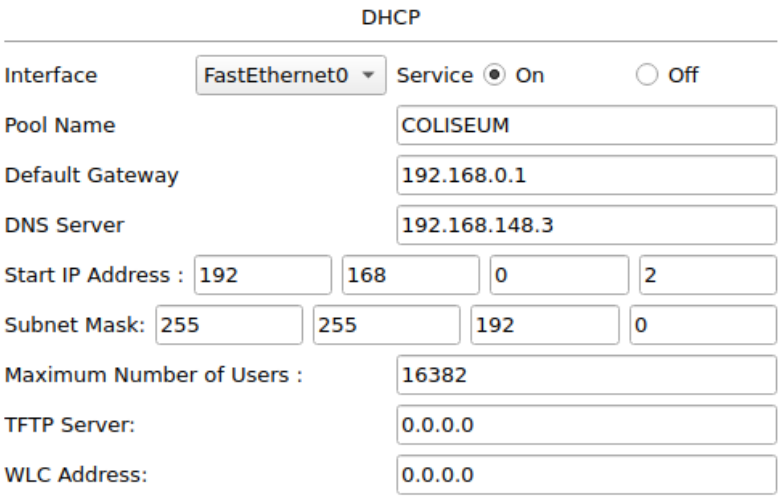
Segmentación

Propósito	Red + Mascara	Ultima Dirección	Direcciones
Coliseum	192.168.0.0/18	192.168.63.255	16384
Lab Ingenieria	192.169.64.0/19	192.169.95.255	8192
Lab Medicina	192.168.96.0/19	192.168.127.255	8192
Librería	192.168.128.0/20	192.168.143.255	4096
P. Ejecutiva	192.168.144.0/23	192.168.145.255	512
Ad. Ingenieria	192.168.146.0/24	192.168.146.255	256
Ad. Medicina	192.168.147.0/24	192.168.147.255	256
Servidores	192.168.148.0/28	192.168.148.15	16
R. Admin - Servers	10.10.1.0/30	10.10.1.3	4

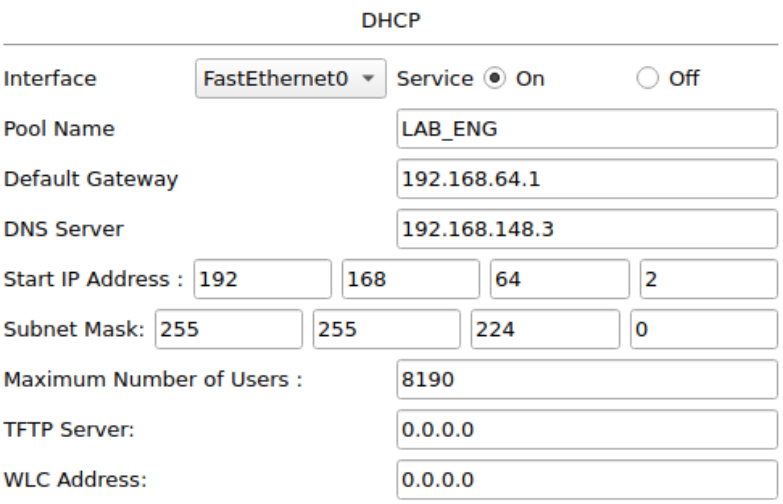
R. Servers - Labs	10.10.1.4/30	10.10.1.7	4
R. Labs - Campus	10.10.1.8/30	10.10.1.11	4
R. Campus - Admin	10.10.1.12/30	10.10.1.15	4
R. Campus - Servers	10.10.1.16/30	10.10.1.19	4

DHCP Server' Pools

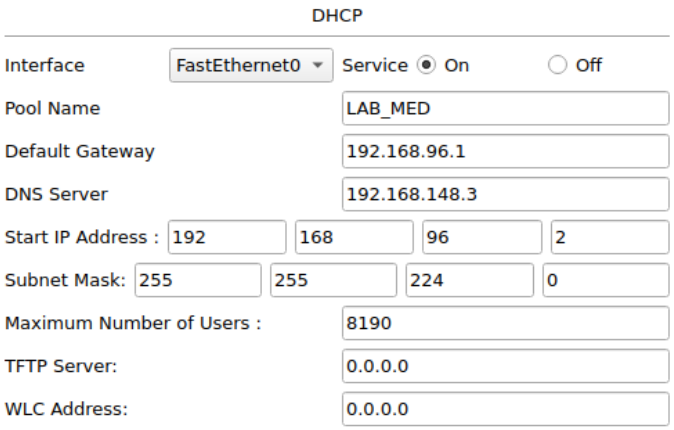
Coliseum



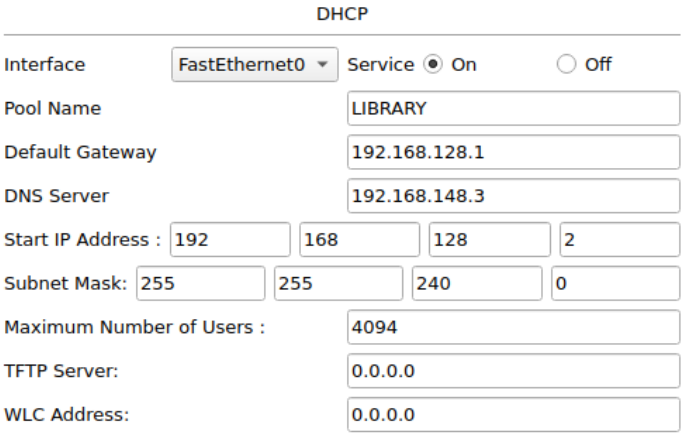
Laboratory of Engineering



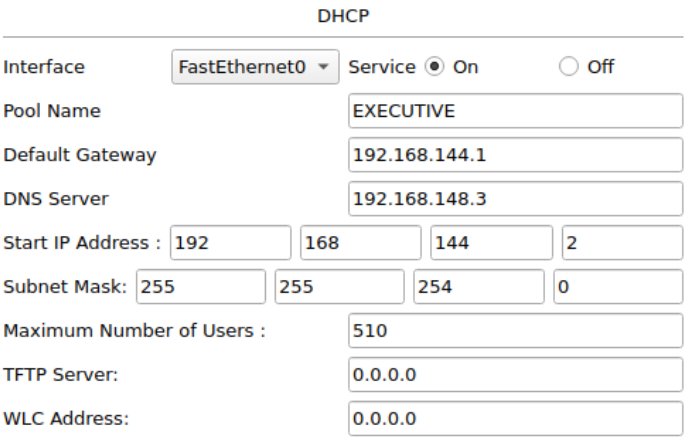
Laboratory of Medicine



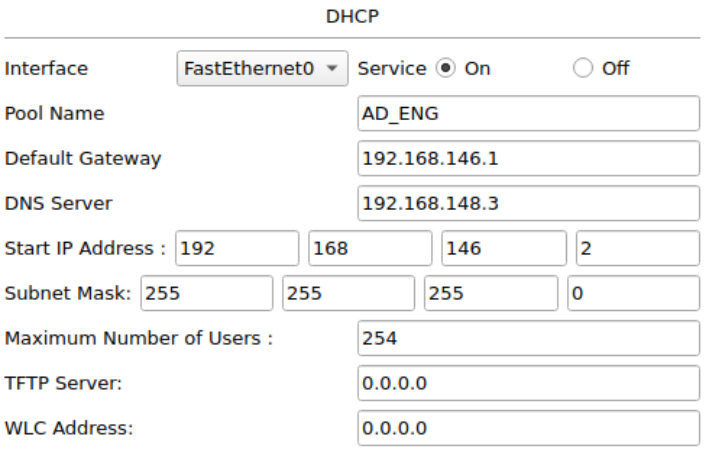
Library



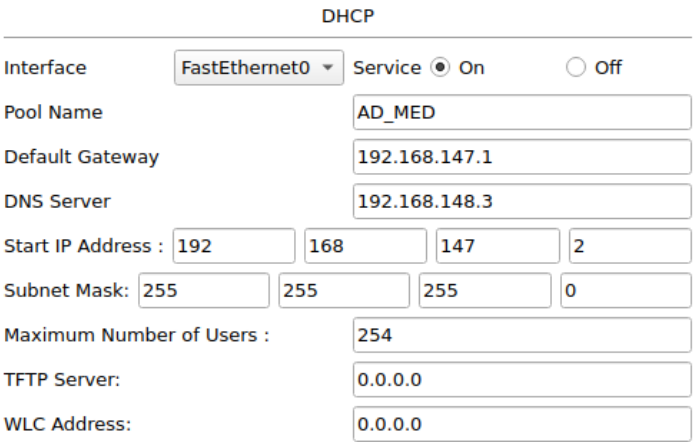
Executive



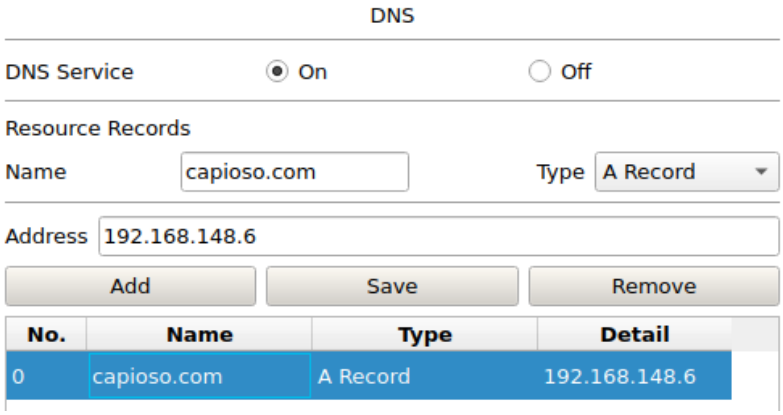
Administration of Engineering



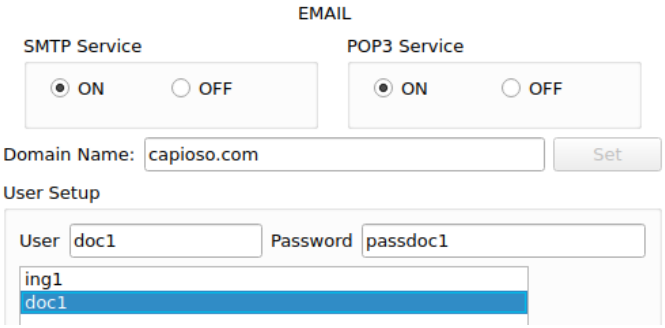
Administration of Medicine



DNS Server



Email Server



Router SERVERS

```
SERVERS#show running-config
Building configuration...
!
hostname SERVERS
!
interface GigabitEthernet0/0/0
 ip address 192.168.148.1 255.255.255.240
 duplex auto
 speed auto
!
interface Serial0/1/0
 ip address 10.10.1.6 255.255.255.252
 clock rate 2000000
!
interface Serial0/1/1
 ip address 10.10.1.2 255.255.255.252
!
interface Serial0/2/0
 ip address 10.10.1.18 255.255.255.252
!
router rip
 version 2
 network 10.0.0.0
 network 192.168.148.0
!
end
```

Router LABS

```
LABS#show running-config
!
hostname LABS
!
interface GigabitEthernet0/0/0
 ip address 192.168.64.1 255.255.224.0
 ip helper-address 192.168.148.2
 duplex auto
 speed auto
!
interface GigabitEthernet0/0/1
 ip address 192.168.96.1 255.255.224.0
 ip helper-address 192.168.148.2
 duplex auto
 speed auto
!
interface Serial0/1/0
 ip address 10.10.1.10 255.255.255.252
!
interface Serial0/1/1
 ip address 10.10.1.5 255.255.255.252
!
router rip
 version 2
 network 10.0.0.0
 network 192.168.64.0
 network 192.168.96.0
!
end
```

Router CAMPUS

```
CAMPUS#show running-config
!
hostname CAMPUS
!
interface GigabitEthernet0/0/0
 ip address 192.168.128.1 255.255.240.0
 ip helper-address 192.168.148.2
 duplex auto
 speed auto
```

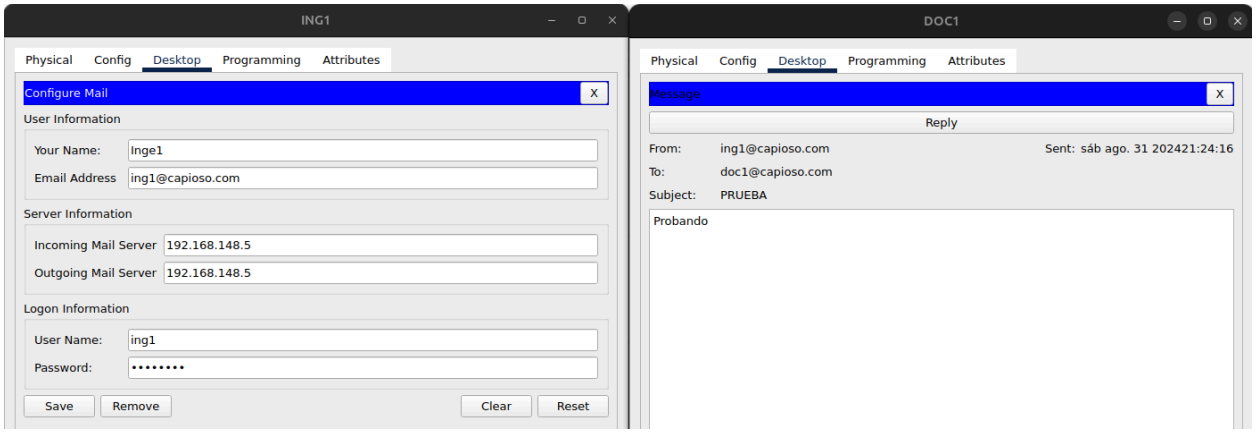
```
!
interface GigabitEthernet0/0/1
 ip address 192.168.0.1 255.255.192.0
 ip helper-address 192.168.148.2
 duplex auto
 speed auto
!
interface Serial0/1/0
 ip address 10.10.1.13 255.255.255.252
!
interface Serial0/1/1
 ip address 10.10.1.9 255.255.255.252
 clock rate 2000000
!
interface Serial0/2/0
 ip address 10.10.1.17 255.255.255.252
 clock rate 2000000
!
router rip
 version 2
 network 10.0.0.0
 network 192.168.0.0
 network 192.168.128.0
!
end
```

Router ADMIN

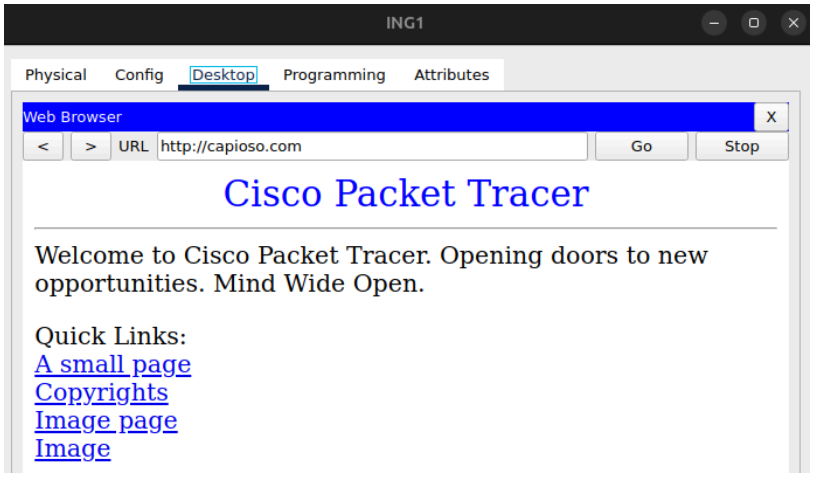
```
ADMIN#show running-config
!
hostname ADMIN
!
interface GigabitEthernet0/0
 ip address 192.168.144.1 255.255.254.0
 ip helper-address 192.168.148.2
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 ip address 192.168.146.1 255.255.255.0
 ip helper-address 192.168.148.2
 duplex auto
 speed auto
!
```

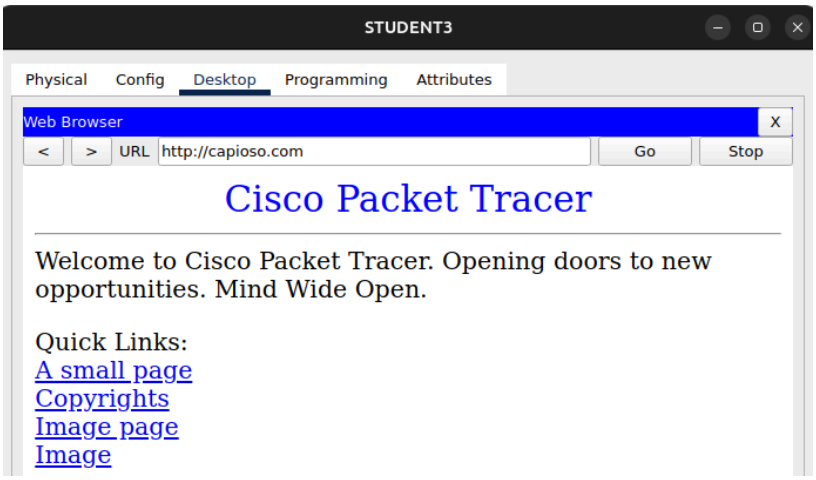
```
interface GigabitEthernet0/2
 ip address 192.168.147.1 255.255.255.0
 ip helper-address 192.168.148.2
 duplex auto
 speed auto
!
interface Serial0/3/0
 ip address 10.10.1.1 255.255.255.252
 clock rate 2000000
!
interface Serial0/3/1
 ip address 10.10.1.14 255.255.255.252
 clock rate 2000000
!
router rip
 version 2
 network 10.0.0.0
 network 192.168.144.0
 network 192.168.146.0
 network 192.168.147.0
!
end
```

Servicio de Email

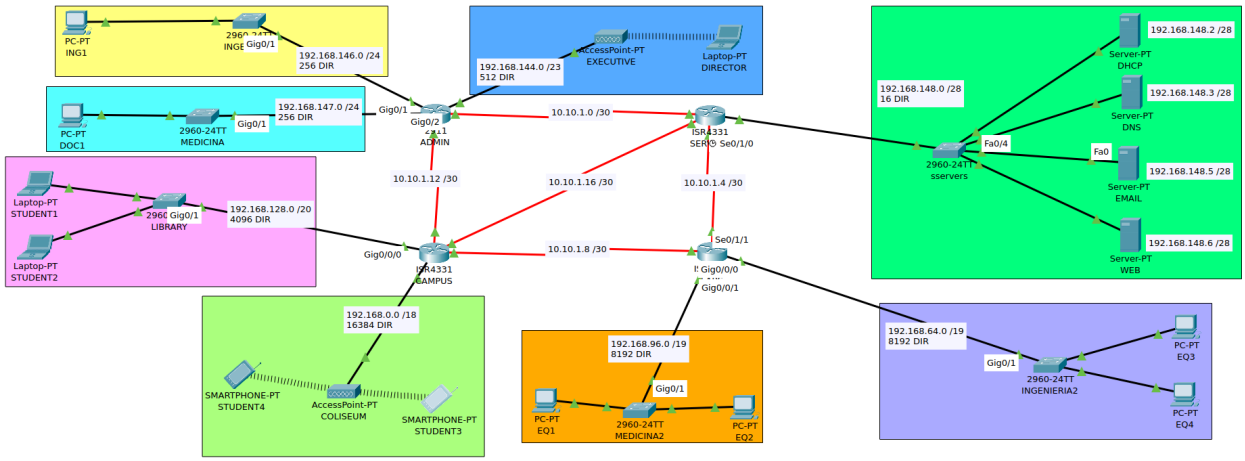


Prueba de servicio Web


ING1
Physical
Config
Desktop
Programming
Attributes
Web Browser
X
<
>
URL
http://capioso.com
Go
Stop
Cisco Packet Tracer
Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind Wide Open.
Quick Links:
A small page
Copyrights
Image page
Image


STUDENT3
Physical
Config
Desktop
Programming
Attributes
Web Browser
X
<
>
URL
http://capioso.com
Go
Stop
Cisco Packet Tracer
Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind Wide Open.
Quick Links:
A small page
Copyrights
Image page
Image

Topología


192.168.146.0 /24
256 DIR
192.168.144.0 /23
512 DIR
192.168.148.0 /28
16 DIR
192.168.148.2 /28
192.168.148.3 /28
192.168.148.5 /28
192.168.148.6 /28
192.168.147.0 /24
256 DIR
192.168.128.0 /20
4096 DIR
192.168.0.0 /18
16384 DIR
192.168.96.0 /19
8192 DIR
192.168.64.0 /19
8192 DIR
10.10.1.0 /30
10.10.1.12 /30
10.10.1.16 /30
10.10.1.4 /30
10.10.1.8 /30
Server-PT DHCP
Server-PT DNS
Server-PT EMAIL
Server-PT WEB
2960-24TT sservers
2960-24TT MEDICINA
2960-24TT MEDICINA2
2960-24TT INGENIERIA2
ISR4331 CAMPUS
ISR4331 SERVICIOS
AccessPoint-PT EXECUTIVE
AccessPoint-PT COLISEUM
Laptop-PT DIRECTOR
Laptop-PT STUDENT1
Laptop-PT STUDENT2
SMARTPHONE-PT STUDENT4
SMARTPHONE-PT STUDENT3
PC-PT ING1
PC-PT DOC1
PC-PT EQ1
PC-PT EQ2
PC-PT EQ3
PC-PT EQ4

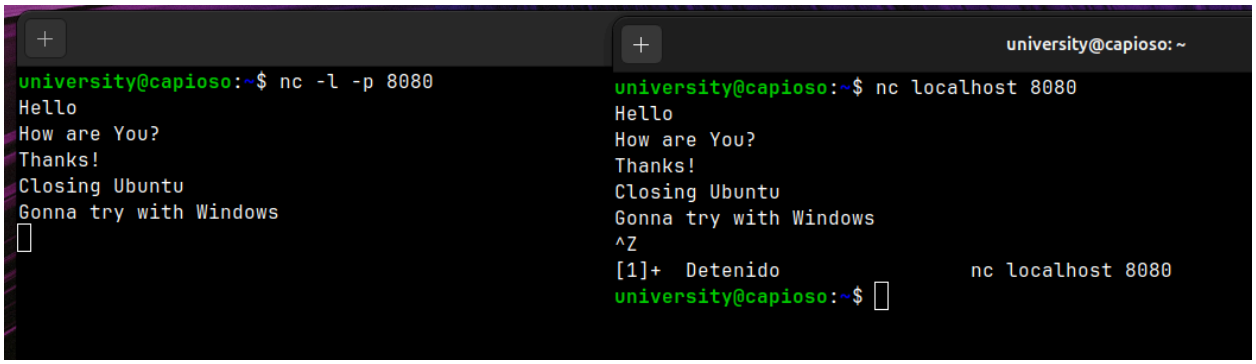
Actividad #3 - Herramienta de monitoreo

Host (Ubuntu)

```
university@capioso:~$ nc -h
OpenBSD netcat (Debian patchlevel 1.226-1ubuntu2)
usage: nc [-46CDdFhklNnrStUuvZz] [-I length] [-i interval] [-M ttl]
          [-m minttl] [-O length] [-P proxy_username] [-p source_port]
          [-q seconds] [-s sourceaddr] [-T keyword] [-V rtable] [-W recvlimit]
          [-w timeout] [-X proxy_protocol] [-x proxy_address[:port]]
          [destination] [port]
        Command Summary:
                -4              Use IPv4
                -6              Use IPv6
                -b              Allow broadcast
                -C              Send CRLF as line-ending
                -D              Enable the debug socket option
                -d              Detach from stdin
                -F              Pass socket fd
                -h              This help text
                -I length       TCP receive buffer length
                -i interval     Delay interval for lines sent, ports scanned
                -k              Keep inbound sockets open for multiple connects
                -l              Listen mode, for inbound connects
                -M ttl          Outgoing TTL / Hop Limit
                -m minttl       Minimum incoming TTL / Hop Limit
                -N              Shutdown the network socket after EOF on stdin
                -n              Suppress name/port resolutions
                -O length       TCP send buffer length
                -P proxyuser    Username for proxy authentication
                -p port         Specify local port for remote connects
                -q secs         quit after EOF on stdin and delay of secs
                -r              Randomize remote ports
                -S              Enable the TCP MD5 signature option
                -s sourceaddr   Local source address
                -T keyword      TOS value
                -t              Answer TELNET negotiation
                -U              Use UNIX domain socket
                -u              UDP mode
                -V rtable       Specify alternate routing table
                -v              Verbose
                -W recvlimit    Terminate after receiving a number of packets
                -w timeout      Timeout for connects and final net reads
                -X proto        Proxy protocol: "4", "5" (SOCKS) or "connect"
                -x addr[:port]  Specify proxy address and port
                -Z              DCCP mode
                -z              Zero-I/O mode [used for scanning]
        Port numbers can be individual or ranges: lo-hi [inclusive]
```

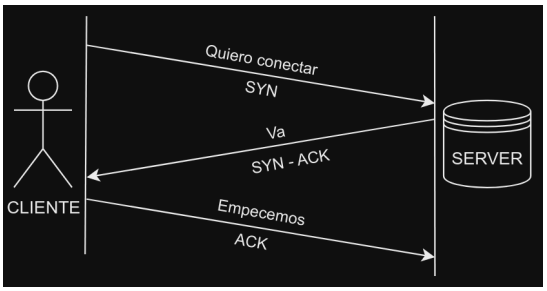
Resultados

```
university@capioso:~$ sudo lsof -i :8080
COMMAND PID     USER    FD TYPE DEVICE SIZE/OFF NODE NAME
  nc    8841 university 3u IPv4 50999  0t0 TCP  *:http-alt (LISTEN)
  nc    8841 university 4u IPv4 51000  0t0 TCP  localhost:http-alt->localhost:40394 (ESTABLISHED)
  nc    9059 university 3u IPv4 48867  0t0 TCP  localhost:40394->localhost:http-alt (ESTABLISHED)
```



Como se expresa, se intento conectar con una VM windows con interfaz de red tipo bridge y con ambos firewall apagado con tal de probar rápidamente. Sin embargo, no fue exitoso.

Conexion Three way handshake



Cliente a Servidor: SYN

El cliente envía un segmento con la bandera SYN para iniciar la conexión.

Servidor a Cliente: SYN-ACK

El servidor responde con un segmento que tiene tanto las banderas SYN como ACK, indicando que ha recibido el SYN y está listo para sincronizar.

Cliente a Servidor: ACK

El cliente responde con un segmento ACK, confirmando la recepción del SYN-ACK y completando el establecimiento de la conexión.