Índice.

Introducción

En la actualidad, la interconexión de redes es esencial para el funcionamiento eficiente de las empresas. Una marca de autos que cuenta con dos plantas de armado y dos agencias de ventas ubicadas en diferentes municipios del Estado de México ha solicitado el diseño e implementación de redes que permitan una comunicación fluida y segura entre todas sus sucursales. Este proyecto tiene como objetivo proporcionar una infraestructura de red que soporte los servicios necesarios para las operaciones diarias, garantizando la eficiencia y seguridad en la transmisión de datos. A continuación, se describen brevemente los principales protocolos de comunicación que serán implementados en el diseño de estas redes.

Ethernet.

Ethernet es el estándar más utilizado para redes de área local (LAN). Este protocolo define las características de la capa física y la capa de enlace de datos en el modelo OSI, permitiendo la transmisión de datos a través de cables de par trenzado o fibra óptica. Ethernet utiliza un método de acceso al medio llamado CSMA/CD (Carrier Sense Multiple Access with Collision Detection) para gestionar el acceso a la red y evitar colisiones de datos. Es conocido por su alta velocidad y fiabilidad, siendo capaz de soportar velocidades desde 10 Mbps hasta 100 Gbps.

DHCP.

El Protocolo de Configuración Dinámica de Host (DHCP) es un protocolo de red que permite a los dispositivos obtener una dirección IP y otros parámetros de configuración automáticamente. DHCP simplifica la gestión de redes al asignar dinámicamente direcciones IP a los dispositivos conectados, evitando conflictos de direcciones y reduciendo la necesidad de configuración manual. Funciona en la capa de aplicación del modelo OSI y utiliza el modelo cliente-servidor para asignar y gestionar las direcciones IP.

ICMP

El Protocolo de Mensajes de Control de Internet (ICMP) es utilizado principalmente para enviar mensajes de error y de control en las redes IP. ICMP es esencial para el diagnóstico y la resolución de problemas de red, ya que permite a los dispositivos de red reportar errores y obtener información sobre el estado de la red. Un uso común de ICMP es el comando "ping", que verifica la conectividad entre dos dispositivos de red. ICMP opera en la capa de red del modelo OSI.

OSPF.

El Protocolo de Enrutamiento de Estado de Enlace Abierto (OSPF) es un protocolo de enrutamiento dinámico utilizado en redes de gran tamaño. OSPF utiliza un algoritmo de estado de enlace para calcular la ruta más eficiente para el tráfico de datos, adaptándose rápidamente a los cambios en la topología de la red. Este protocolo es muy eficiente y escalable, siendo capaz de soportar redes complejas y de gran tamaño. OSPF opera en la capa de red del modelo OSI.

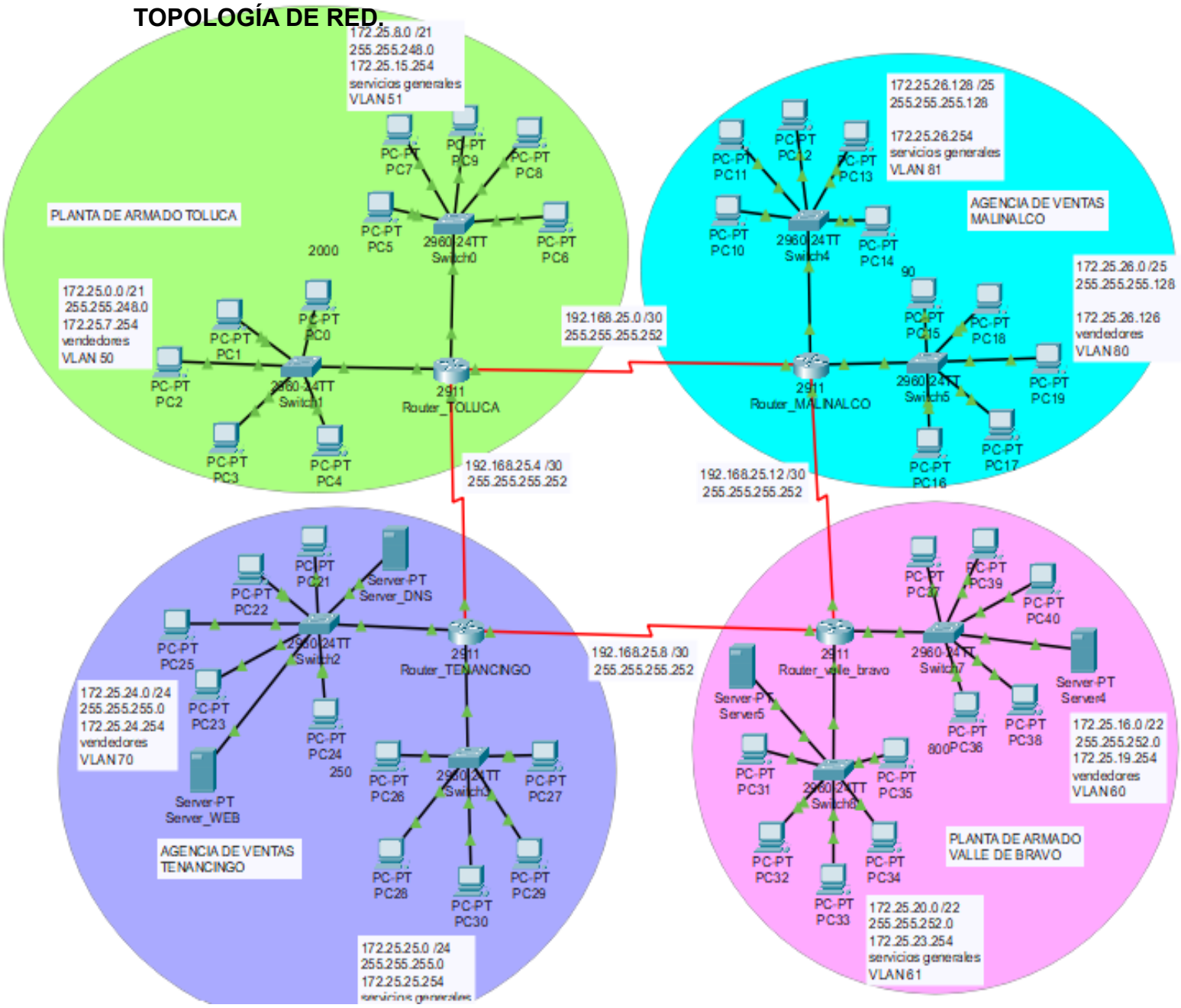
TELNET.

TELNET es un protocolo que permite a los usuarios conectarse a dispositivos remotos y gestionarlos como si estuvieran físicamente presentes. Funciona en la capa de aplicación del modelo OSI y proporciona una interfaz de línea de comandos para interactuar con el dispositivo remoto. Aunque TELNET es útil para la administración remota, no es seguro, ya que transmite los datos en texto claro. Por esta razón, suele ser reemplazado por protocolos más seguros como SSH.

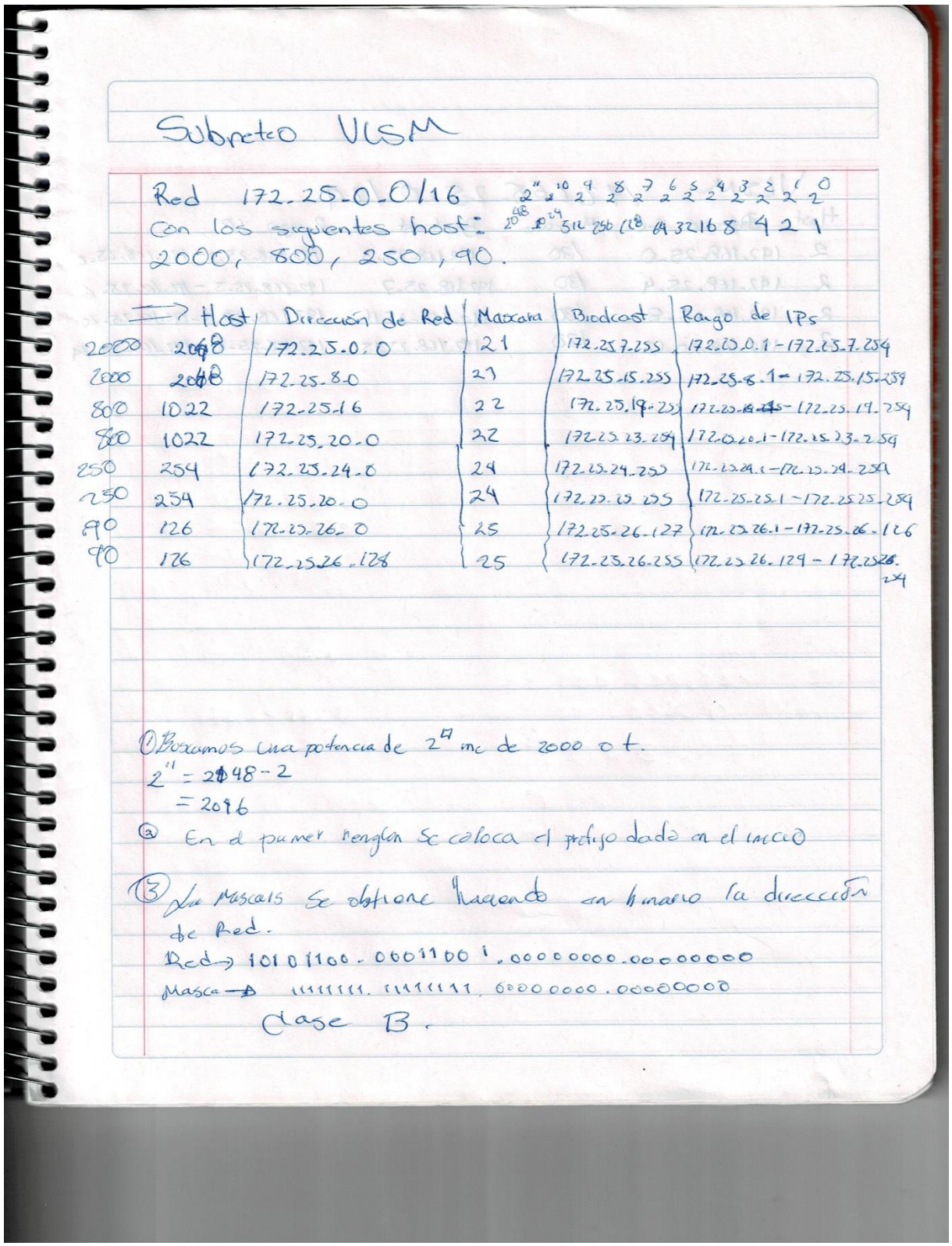
HTTPS.

HTTPS (Hypertext Transfer Protocol Secure) es una versión segura del protocolo HTTP, utilizado para la transferencia de datos en la web. HTTPS utiliza el protocolo SSL/TLS para cifrar los datos transmitidos entre el navegador del usuario y el servidor web, garantizando la privacidad e integridad de la información. Es esencial para proteger las transacciones en línea, como las compras y la banca en línea, y se ha convertido en un estándar para asegurar la comunicación web. HTTPS opera en la capa de aplicación del modelo OSI.

TOPOLOGÍA DE RED.



SUBNETEO VLSM



Subneteo VLSM

Red 172.25.0.0/16 2^{11} 2^{10} 2^{9} 2^{8} 2^{7} 2^{6} 2^{5} 2^{4} 2^{3} 2^{2} 2^{1} 2^{0}

Con los siguientes host: 2^{11} 2^{10} 2^{9} 512 256 128 64 32 16 8 4 2 1

2000, 800, 250, 90.

⟹ Host	Dirección de Red	Mascara	Brodcast	Rango de IPs
2000 2048	172.25.0.0	21	172.25.7.255	172.25.0.1 - 172.25.7.254
2000 2048	172.25.8.0	21	172.25.15.255	172.25.8.1 - 172.25.15.254
800 1022	172.25.16	22	172.25.19.255	172.25.16.1 - 172.25.19.254
800 1022	172.25.20.0	22	172.25.23.254	172.25.20.1 - 172.25.23.254
250 254	172.25.24.0	24	172.25.24.255	172.25.24.1 - 172.25.24.254
250 254	172.25.20.0	24	172.25.25.255	172.25.25.1 - 172.25.25.254
90 126	172.25.26.0	25	172.25.26.127	172.25.26.1 - 172.25.26.126
90 126	172.25.26.128	25	172.25.26.255	172.25.26.129 - 172.25.26.254

① Buscamos una potencia de 2^{11} mc de 2000 o +.

$2^{11} = 2048 - 2$

$= 2046$

② En el primer renglon se coloca el prefijo dado en el inicio

③ La Mascara se obtiene haciendo en binario la dirección de Red.

Red → 10101100.00011001.00000000.00000000

Masca → 11111111.11111111.00000000.00000000

Clase B.

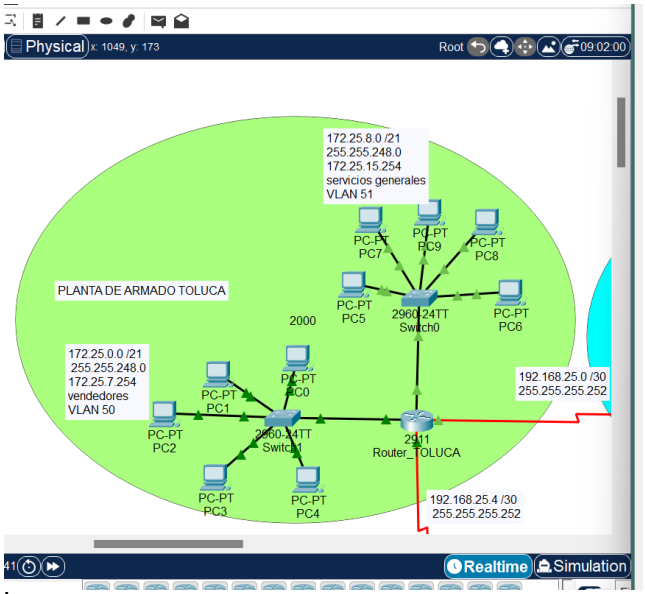
VLSM 192.168.25.0/29

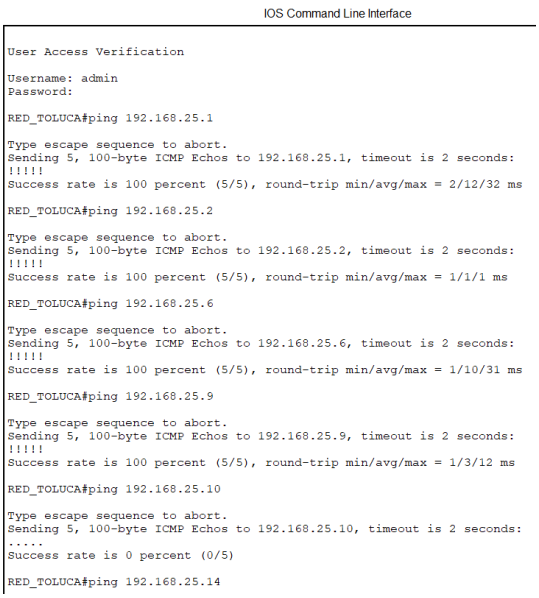
Host	Dirección Red	Mascara	Broadcast	Rango IP
2	192.168.25.0	/30	192.168.25.3	192.168.25.1 - 192.168.25.2
2	192.168.25.4	/30	192.168.25.7	192.168.25.5 - 192.168.25.6
2	192.168.25.8	/30	192.168.25.11	192.168.25.9 - 192.168.25.10
2	192.168.25.12	/30	192.168.25.15	192.168.25.13 - 192.168.25.14

ICMP.

Verificar con el protocolo ICMP que haya comunicación entre todos los hosts de las LAN.

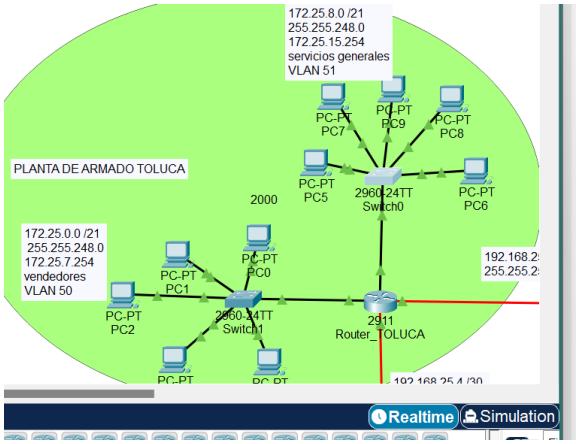
I. RED TOLUCA



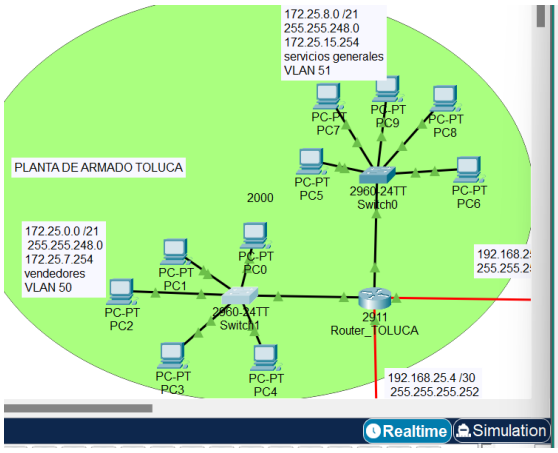



```
RED_TOLUCA#ping 192.168.25.14

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.14, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/35/62 ms

RED_TOLUCA#ping 192.168.25.13

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.13, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/12/22 ms

RED_TOLUCA#
```

Vlan:




```
RED_SERV_GEN>en
RED_SERV_GEN#sh int st
Port      Name               Status       Vlan       Duplex  Speed Type
Fa0/1                        connected    51         auto    auto  10/100BaseTX
Fa0/2                        connected    51         auto    auto  10/100BaseTX
Fa0/3                        connected    51         auto    auto  10/100BaseTX
Fa0/4                        connected    51         auto    auto  10/100BaseTX
Fa0/5                        connected    51         auto    auto  10/100BaseTX
Fa0/6                        notconnect   51         auto    auto  10/100BaseTX
Fa0/7                        notconnect   51         auto    auto  10/100BaseTX
Fa0/8                        notconnect   51         auto    auto  10/100BaseTX
Fa0/9                        notconnect   51         auto    auto  10/100BaseTX
Fa0/10                       notconnect   51         auto    auto  10/100BaseTX
Fa0/11                       notconnect   51         auto    auto  10/100BaseTX
Fa0/12                       notconnect   51         auto    auto  10/100BaseTX
Fa0/13                       notconnect   51         auto    auto  10/100BaseTX
Fa0/14                       notconnect   51         auto    auto  10/100BaseTX
Fa0/15                       notconnect   51         auto    auto  10/100BaseTX
Fa0/16                       notconnect   51         auto    auto  10/100BaseTX
Fa0/17                       notconnect   51         auto    auto  10/100BaseTX
Fa0/18                       notconnect   51         auto    auto  10/100BaseTX
Fa0/19                       notconnect   51         auto    auto  10/100BaseTX
Fa0/20                       notconnect   51         auto    auto  10/100BaseTX
Fa0/21                       notconnect   51         auto    auto  10/100BaseTX
Fa0/22                       notconnect   51         auto    auto  10/100BaseTX
Fa0/23                       notconnect   51         auto    auto  10/100BaseTX
Fa0/24                       notconnect   51         auto    auto  10/100BaseTX
Gig0/1    ENLACE_ROUTER      connected    trunk      auto    auto  10/100BaseTX
Gig0/2                       notconnect   1          auto    auto  10/100BaseTX

RED_SERV_GEN#
```




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


RED_VENDEDORES>en
RED_VENDEDORES#sh int st
Port      Name               Status       Vlan       Duplex  Speed Type
Fa0/1                        connected    50         auto    auto  10/100BaseTX
Fa0/2                        connected    50         auto    auto  10/100BaseTX
Fa0/3                        connected    50         auto    auto  10/100BaseTX
Fa0/4                        connected    50         auto    auto  10/100BaseTX
Fa0/5                        connected    50         auto    auto  10/100BaseTX
Fa0/6                        notconnect   50         auto    auto  10/100BaseTX
Fa0/7                        notconnect   50         auto    auto  10/100BaseTX
Fa0/8                        notconnect   50         auto    auto  10/100BaseTX
Fa0/9                        notconnect   50         auto    auto  10/100BaseTX
Fa0/10                       notconnect   50         auto    auto  10/100BaseTX
Fa0/11                       notconnect   50         auto    auto  10/100BaseTX
Fa0/12                       notconnect   50         auto    auto  10/100BaseTX
Fa0/13                       notconnect   50         auto    auto  10/100BaseTX
Fa0/14                       notconnect   50         auto    auto  10/100BaseTX
Fa0/15                       notconnect   50         auto    auto  10/100BaseTX
Fa0/16                       notconnect   50         auto    auto  10/100BaseTX
Fa0/17                       notconnect   50         auto    auto  10/100BaseTX
Fa0/18                       notconnect   50         auto    auto  10/100BaseTX
Fa0/19                       notconnect   50         auto    auto  10/100BaseTX
Fa0/20                       notconnect   50         auto    auto  10/100BaseTX
Fa0/21                       notconnect   50         auto    auto  10/100BaseTX
Fa0/22                       notconnect   50         auto    auto  10/100BaseTX
Fa0/23                       notconnect   50         auto    auto  10/100BaseTX
Fa0/24                       notconnect   50         auto    auto  10/100BaseTX
Gig0/1    ENLACE_ROUTER      connected    trunk      auto    auto  10/100BaseTX
Gig0/2                       notconnect   1          auto    auto  10/100BaseTX
```

DHCP:

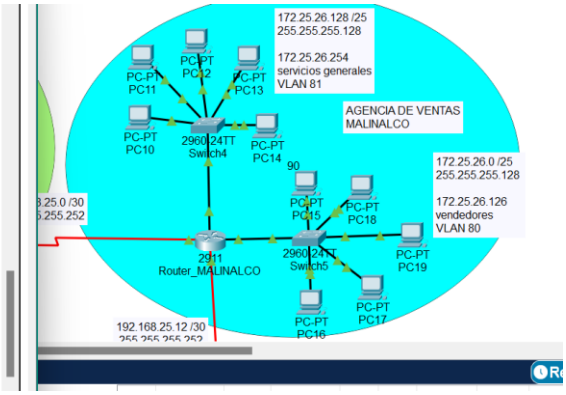
```
hostname RED_TOLUCA
!
!
!
!
!
ip dhcp pool VLAN_TOLUCA_VENDEDORES
 network 172.25.0.0 255.255.248.0
 default-router 172.25.7.254
 dns-server 172.25.24.250
ip dhcp pool VLAN_TOLUCA_SERVGEN
 network 172.25.8.0 255.255.248.0
 default-router 172.25.15.254
 dns-server 172.25.24.250
!
```

```
interface GigabitEthernet0/0
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/0.50
 encapsulation dot1Q 50
 ip address 172.25.7.254 255.255.248.0
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/1.51
 encapsulation dot1Q 51
 ip address 172.25.15.254 255.255.248.0
!
interface GigabitEthernet0/2
 no ip address
 duplex auto
 speed auto
!
interface Serial0/0/0
 ip address 192.168.25.1 255.255.255.252
!
interface Serial0/0/1
 ip address 192.168.25.6 255.255.255.252
!
interface Vlan1
 no ip address
!
router ospf 1
 log-adjacency-changes
 network 172.25.0.0 0.0.7.255 area 0
 network 172.25.8.0 0.0.7.255 area 0
 network 192.168.25.0 0.0.0.3 area 0
 network 192.168.25.4 0.0.0.3 area 0
!
ip classless
!
```

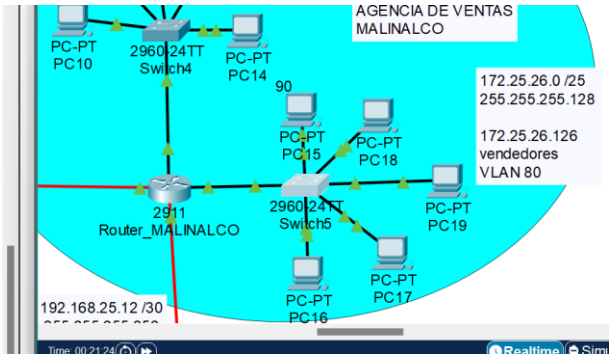
II. RED MALINALCO

```
interface GigabitEthernet0/0
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/0.80
 encapsulation dot1Q 80
 ip address 172.25.26.126 255.255.255.128
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/1.81
 encapsulation dot1Q 81
 ip address 172.25.26.254 255.255.255.128
!
interface GigabitEthernet0/2
 no ip address
 duplex auto
 speed auto
!
interface Serial0/0/0
 ip address 192.168.25.2 255.255.255.252
 clock rate 2000000
!
interface Serial0/0/1
 ip address 192.168.25.13 255.255.255.252
 clock rate 2000000
!
interface Vlan1
 no ip address
!
router ospf 1
 log-adjacency-changes
 network 172.25.26.0 0.0.0.127 area 0
 network 172.25.26.128 0.0.0.127 area 0
 network 192.168.25.0 0.0.0.3 area 0
 network 192.168.25.12 0.0.0.3 area 0
!
```

```
RED_MALINALCO_SERV_GEN#sh int st
Port      Name               Status       Vlan       Duplex  Speed Type
Fa0/1                        connected    81         auto    auto  10/100BaseTX
Fa0/2                        connected    81         auto    auto  10/100BaseTX
Fa0/3                        connected    81         auto    auto  10/100BaseTX
Fa0/4                        connected    81         auto    auto  10/100BaseTX
Fa0/5                        connected    81         auto    auto  10/100BaseTX
Fa0/6                        notconnect   81         auto    auto  10/100BaseTX
Fa0/7                        notconnect   81         auto    auto  10/100BaseTX
Fa0/8                        notconnect   81         auto    auto  10/100BaseTX
Fa0/9                        notconnect   81         auto    auto  10/100BaseTX
Fa0/10                       notconnect   81         auto    auto  10/100BaseTX
Fa0/11                       notconnect   81         auto    auto  10/100BaseTX
Fa0/12                       notconnect   81         auto    auto  10/100BaseTX
Fa0/13                       notconnect   81         auto    auto  10/100BaseTX
Fa0/14                       notconnect   81         auto    auto  10/100BaseTX
Fa0/15                       notconnect   81         auto    auto  10/100BaseTX
Fa0/16                       notconnect   81         auto    auto  10/100BaseTX
Fa0/17                       notconnect   81         auto    auto  10/100BaseTX
Fa0/18                       notconnect   81         auto    auto  10/100BaseTX
Fa0/19                       notconnect   81         auto    auto  10/100BaseTX
Fa0/20                       notconnect   81         auto    auto  10/100BaseTX
Fa0/21                       notconnect   81         auto    auto  10/100BaseTX
Fa0/22                       notconnect   81         auto    auto  10/100BaseTX
Fa0/23                       notconnect   81         auto    auto  10/100BaseTX
Fa0/24                       notconnect   81         auto    auto  10/100BaseTX
Gig0/1    ENLACE_ROUTER      connected    trunk      auto    auto  10/100BaseTX
Gig0/2                       notconnect   1          auto    auto  10/100BaseTX

RED_MALINALCO_SERV_GEN#
```



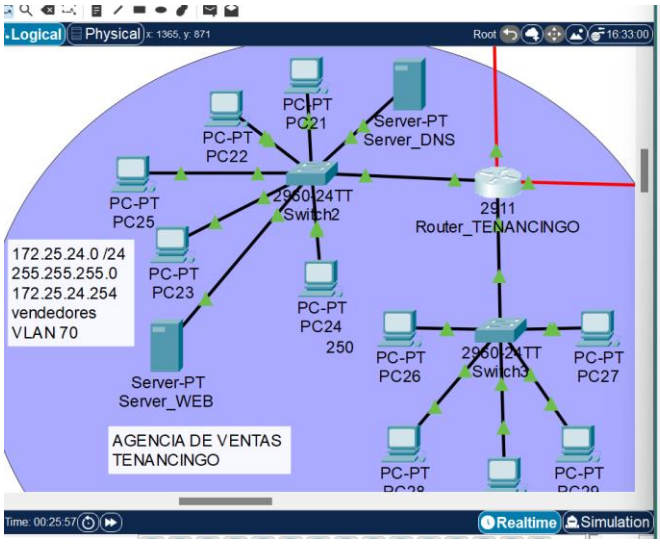

```
RED_VENDEDORES_MALINALCO>en
RED_VENDEDORES_MALINALCO#sh int st
Port      Name               Status       Vlan       Duplex  Speed Type
Fa0/1                        connected    80         auto    auto  10/100BaseTX
Fa0/2                        connected    80         auto    auto  10/100BaseTX
Fa0/3                        connected    80         auto    auto  10/100BaseTX
Fa0/4                        connected    80         auto    auto  10/100BaseTX
Fa0/5                        connected    80         auto    auto  10/100BaseTX
Fa0/6                        notconnect   80         auto    auto  10/100BaseTX
Fa0/7                        notconnect   80         auto    auto  10/100BaseTX
Fa0/8                        notconnect   80         auto    auto  10/100BaseTX
Fa0/9                        notconnect   80         auto    auto  10/100BaseTX
Fa0/10                       notconnect   80         auto    auto  10/100BaseTX
Fa0/11                       notconnect   80         auto    auto  10/100BaseTX
Fa0/12                       notconnect   80         auto    auto  10/100BaseTX
Fa0/13                       notconnect   80         auto    auto  10/100BaseTX
Fa0/14                       notconnect   80         auto    auto  10/100BaseTX
Fa0/15                       notconnect   80         auto    auto  10/100BaseTX
Fa0/16                       notconnect   80         auto    auto  10/100BaseTX
Fa0/17                       notconnect   80         auto    auto  10/100BaseTX
Fa0/18                       notconnect   80         auto    auto  10/100BaseTX
Fa0/19                       notconnect   80         auto    auto  10/100BaseTX
Fa0/20                       notconnect   80         auto    auto  10/100BaseTX
Fa0/21                       notconnect   80         auto    auto  10/100BaseTX
Fa0/22                       notconnect   80         auto    auto  10/100BaseTX
Fa0/23                       notconnect   80         auto    auto  10/100BaseTX
Fa0/24                       notconnect   80         auto    auto  10/100BaseTX
Gig0/1    ENLACE_ROUTER      connected    trunk      auto    auto  10/100BaseTX
Gig0/2                       notconnect   1          auto    auto  10/100BaseTX
```



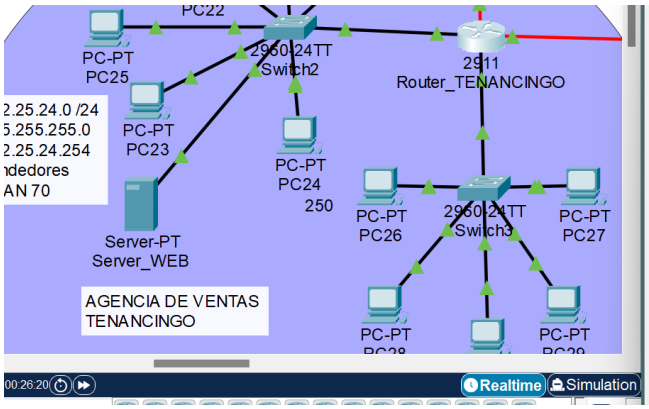
```
RED_MALINALCO#
RED_MALINALCO#ping 192.168.25.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/5/23 ms

RED_MALINALCO#ping 192.168.25.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/17/66 ms

RED_MALINALCO#ping 192.168.25.4

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.4, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/13/63 ms

RED_MALINALCO#ping 192.168.25.5

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.5, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

RED_MALINALCO#
RED_MALINALCO#ping 192.168.25.6

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.6, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/7/34 ms
```

```
RED_MALINALCO#ping 192.168.25.9

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.9, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/16/75 ms

RED_MALINALCO#ping 192.168.25.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/26/130 ms

RED_MALINALCO#ping 192.168.25.13

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.13, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/14/60 ms

RED_MALINALCO#ping 192.168.25.14

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.14, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/7/35 ms

RED_MALINALCO#
```

III. **RED TENANCINGO.**

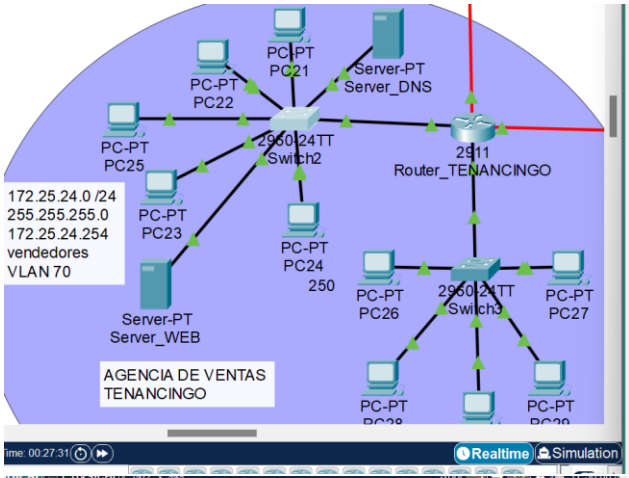



```
RED_TENANCINGO#ping 192.168.25.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/5/24 ms

RED_TENANCINGO#ping 192.168.25.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

RED_TENANCINGO#ping 192.168.25.4

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.4, timeout is 2 seconds:

Reply to request 0 from 192.168.25.6, 4 ms
Reply to request 1 from 192.168.25.6, 1 ms
Reply to request 2 from 192.168.25.6, 1 ms
Reply to request 3 from 192.168.25.6, 1 ms
Reply to request 4 from 192.168.25.6, 1 ms

RED_TENANCINGO#ping 192.168.25.6

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.6, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/6/30 ms

RED_TENANCINGO#ping 192.168.25.9

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.9, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/6/16 ms

RED_TENANCINGO#ping 192.168.25.10

Type escape sequence to abort.
```

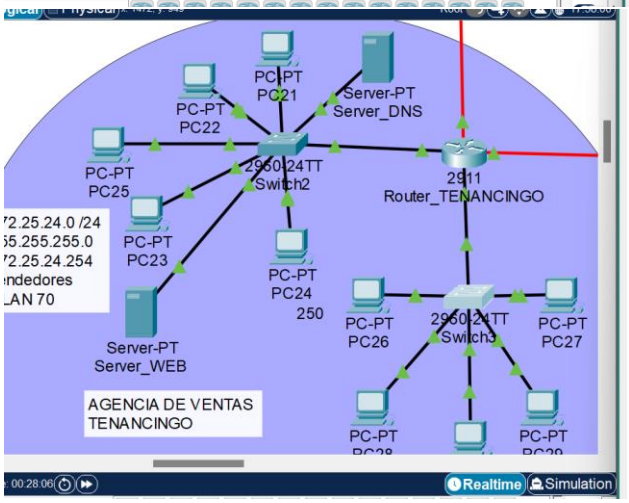



```
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/6/30 ms

RED_TENANCINGO#ping 192.168.25.9

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.9, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/6/16 ms

RED_TENANCINGO#ping 192.168.25.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/6/27 ms

RED_TENANCINGO#ping 192.168.25.13

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.13, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/16/48 ms

RED_TENANCINGO#ping 192.168.25.14

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.14, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/3 ms

RED_TENANCINGO#
```

```
interface GigabitEthernet0/0
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/0.70
 encapsulation dot1Q 70
 ip address 172.25.24.254 255.255.255.0
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/1.71
 encapsulation dot1Q 71
 ip address 172.25.25.254 255.255.255.0
!
interface GigabitEthernet0/2
 no ip address
 duplex auto
 speed auto
!
interface Serial0/0/0
 ip address 192.168.25.9 255.255.255.252
 clock rate 2000000
!
interface Serial0/0/1
 ip address 192.168.25.6 255.255.255.252
 clock rate 2000000
!
interface Vlan1
 no ip address
!
router ospf 1
 log-adjacency-changes
 network 172.25.24.0 0.0.0.255 area 0
 network 172.25.25.0 0.0.0.255 area 0
 network 192.168.25.4 0.0.0.3 area 0
 network 192.168.25.8 0.0.0.3 area 0
```

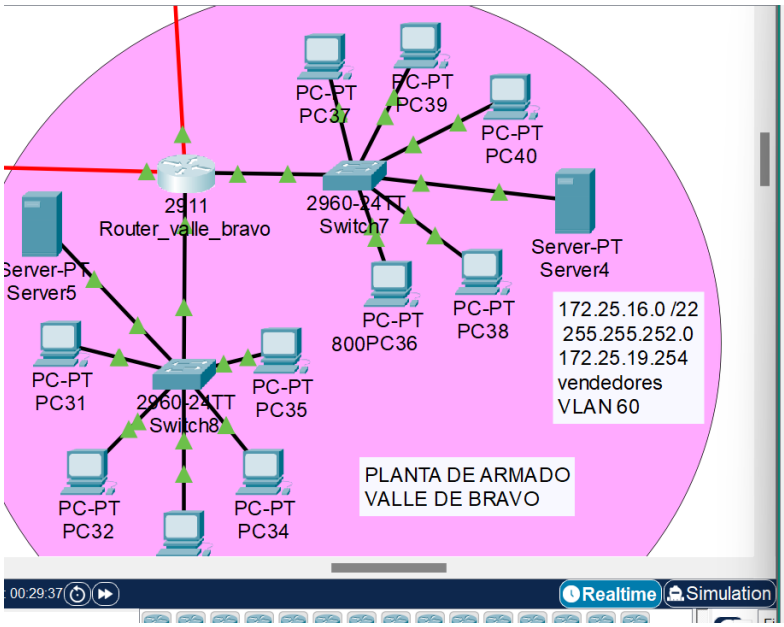



```
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up

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

%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to


LAN_VENDEDORES_TENANCINGO>en
LAN_VENDEDORES_TENANCINGO#sh int st
Port      Name               Status       Vlan       Duplex  Speed Type
Fa0/1                        connected    70         auto    auto  10/100BaseTX
Fa0/2                        connected    70         auto    auto  10/100BaseTX
Fa0/3                        connected    70         auto    auto  10/100BaseTX
Fa0/4                        connected    70         auto    auto  10/100BaseTX
Fa0/5                        connected    70         auto    auto  10/100BaseTX
Fa0/6                        connected    70         auto    auto  10/100BaseTX
Fa0/7                        connected    70         auto    auto  10/100BaseTX
Fa0/8                        notconnect   70         auto    auto  10/100BaseTX
Fa0/9                        notconnect   70         auto    auto  10/100BaseTX
Fa0/10                       notconnect   70         auto    auto  10/100BaseTX
Fa0/11                       notconnect   70         auto    auto  10/100BaseTX
Fa0/12                       notconnect   70         auto    auto  10/100BaseTX
Fa0/13                       notconnect   70         auto    auto  10/100BaseTX
Fa0/14                       notconnect   70         auto    auto  10/100BaseTX
Fa0/15                       notconnect   70         auto    auto  10/100BaseTX
Fa0/16                       notconnect   70         auto    auto  10/100BaseTX
Fa0/17                       notconnect   70         auto    auto  10/100BaseTX
Fa0/18                       notconnect   70         auto    auto  10/100BaseTX
Fa0/19                       notconnect   70         auto    auto  10/100BaseTX
Fa0/20                       notconnect   70         auto    auto  10/100BaseTX
Fa0/21                       notconnect   70         auto    auto  10/100BaseTX
Fa0/22                       notconnect   70         auto    auto  10/100BaseTX
Fa0/23                       notconnect   70         auto    auto  10/100BaseTX
Fa0/24                       notconnect   70         auto    auto  10/100BaseTX
Gig0/1    ENLACE_ROUTER      connected    trunk      auto    auto  10/100BaseTX
Gig0/2                       notconnect   1          auto    auto  10/100BaseTX

LAN_VENDEDORES_TENANCINGO#
```

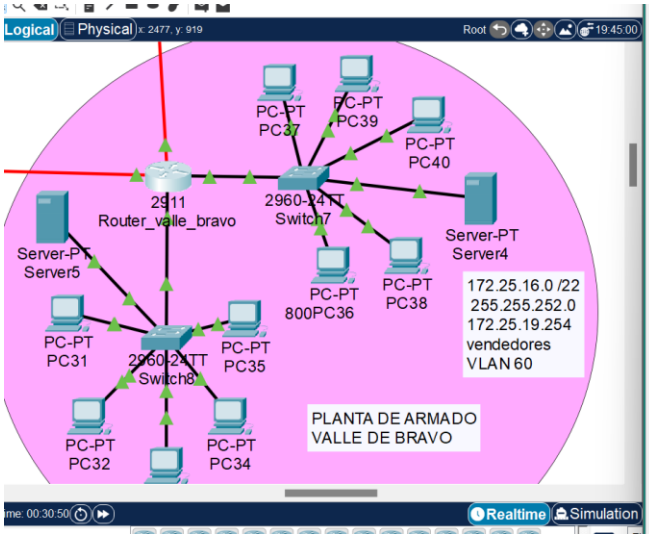



```
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state


RED_SERV_GEN_TENANCINGO>en
RED_SERV_GEN_TENANCINGO#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
RED_SERV_GEN_TENANCINGO(config)#^Z
RED_SERV_GEN_TENANCINGO#
%SYS-5-CONFIG_I: Configured from console by console

RED_SERV_GEN_TENANCINGO#sh int st
Port      Name               Status       Vlan       Duplex  Speed Type
Fa0/1                        connected    71         auto    auto  10/100BaseTX
Fa0/2                        connected    71         auto    auto  10/100BaseTX
Fa0/3                        connected    71         auto    auto  10/100BaseTX
Fa0/4                        connected    71         auto    auto  10/100BaseTX
Fa0/5                        connected    71         auto    auto  10/100BaseTX
Fa0/6                        notconnect   71         auto    auto  10/100BaseTX
Fa0/7                        notconnect   71         auto    auto  10/100BaseTX
Fa0/8                        notconnect   71         auto    auto  10/100BaseTX
Fa0/9                        notconnect   71         auto    auto  10/100BaseTX
Fa0/10                       notconnect   71         auto    auto  10/100BaseTX
Fa0/11                       notconnect   71         auto    auto  10/100BaseTX
Fa0/12                       notconnect   71         auto    auto  10/100BaseTX
Fa0/13                       notconnect   71         auto    auto  10/100BaseTX
Fa0/14                       notconnect   71         auto    auto  10/100BaseTX
Fa0/15                       notconnect   71         auto    auto  10/100BaseTX
Fa0/16                       notconnect   71         auto    auto  10/100BaseTX
Fa0/17                       notconnect   71         auto    auto  10/100BaseTX
Fa0/18                       notconnect   71         auto    auto  10/100BaseTX
Fa0/19                       notconnect   71         auto    auto  10/100BaseTX
Fa0/20                       notconnect   71         auto    auto  10/100BaseTX
Fa0/21                       notconnect   71         auto    auto  10/100BaseTX
Fa0/22                       notconnect   71         auto    auto  10/100BaseTX
Fa0/23                       notconnect   71         auto    auto  10/100BaseTX
Fa0/24                       notconnect   71         auto    auto  10/100BaseTX
Gig0/1    ENLACE_ROUTER      connected    trunk      auto    auto  10/100BaseTX
Gig0/2                       notconnect   1          auto    auto  10/100BaseTX
```

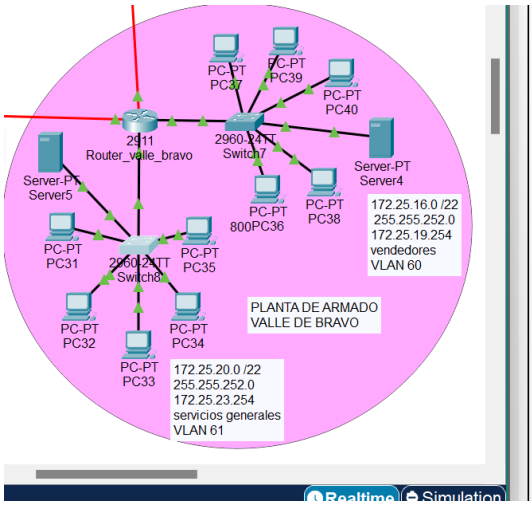
IV. RED VALLE DE BRAVO.




```
interface GigabitEthernet0/0
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/0.60
 encapsulation dot1Q 60
 ip address 172.25.19.254 255.255.252.0
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/1.61
 encapsulation dot1Q 61
 ip address 172.25.23.254 255.255.252.0
!
interface GigabitEthernet0/2
 no ip address
 duplex auto
 speed auto
!
interface Serial0/0/0
 ip address 192.168.25.10 255.255.255.252
!
interface Serial0/0/1
 ip address 192.168.25.14 255.255.255.252
!
interface Vlan1
 no ip address
!
router ospf 1
 log-adjacency-changes
 network 172.25.16.0 0.0.3.255 area 0
 network 172.25.20.0 0.0.3.255 area 0
 network 192.168.25.8 0.0.0.3 area 0
 network 192.168.25.12 0.0.0.3 area 0
!
ip classless
```



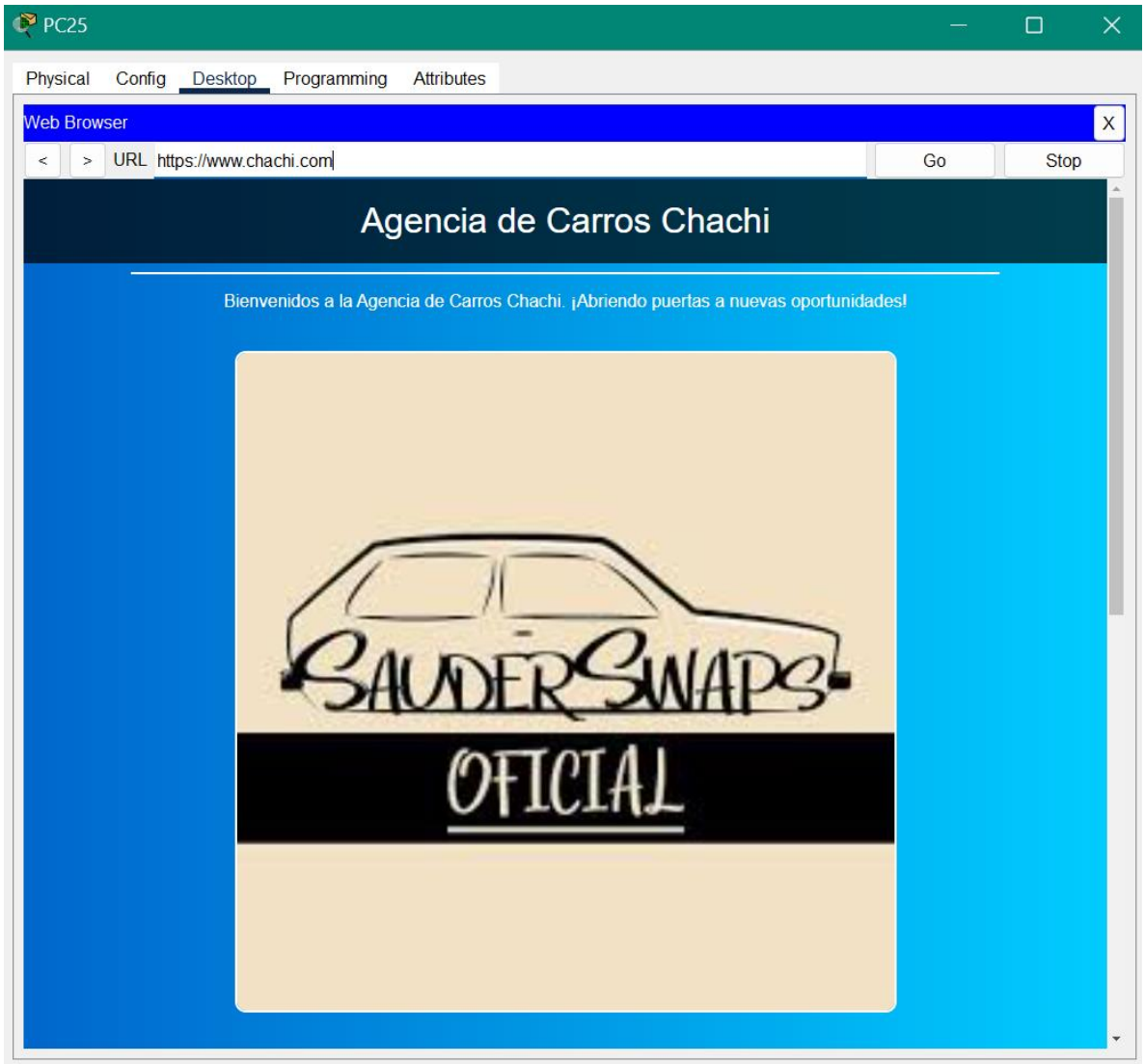

```
RED_VALLE_DE_BRAVO# ping 192.168.25.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/11 ms

RED_VALLE_DE_BRAVO# ping 192.168.25.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/6/25 ms

RED_VALLE_DE_BRAVO# ping 192.168.25.4

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.4, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/14/67 ms

RED_VALLE_DE_BRAVO# ping 192.168.25.6

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.6, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/13/27 ms

RED_VALLE_DE_BRAVO# ping 192.168.25.9

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.9, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/10/46 ms

RED_VALLE_DE_BRAVO# ping 192.168.25.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.25.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/12/52 ms
```



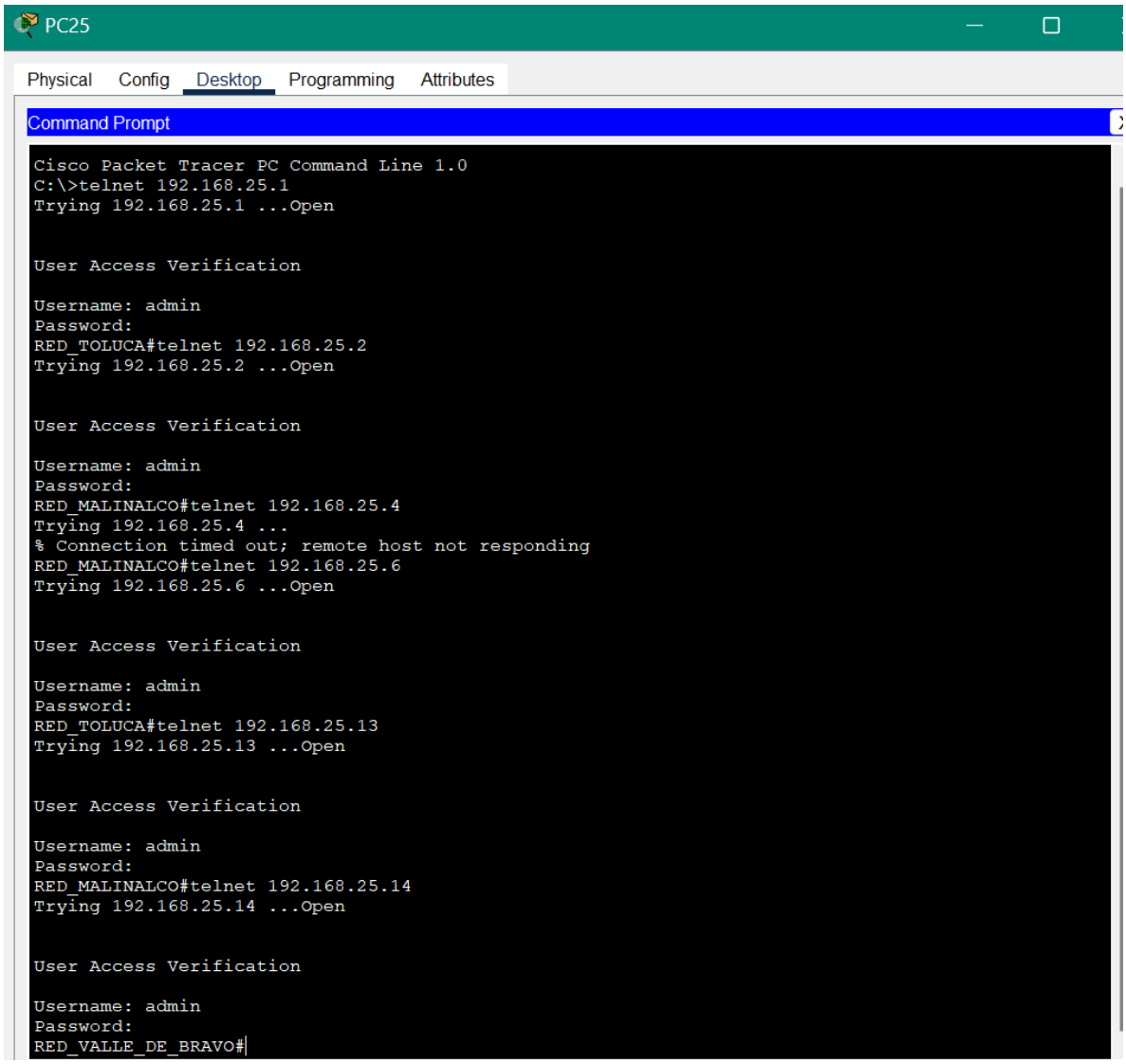

```
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up

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


RED_SERVICIOS_VALLE>en
RED_SERVICIOS_VALLE#sh int st
Port      Name               Status       Vlan       Duplex  Speed Type
Fa0/1                        connected    61         auto    auto  10/100BaseTX
Fa0/2                        connected    61         auto    auto  10/100BaseTX
Fa0/3                        connected    61         auto    auto  10/100BaseTX
Fa0/4                        connected    61         auto    auto  10/100BaseTX
Fa0/5                        connected    61         auto    auto  10/100BaseTX
Fa0/6                        connected    61         auto    auto  10/100BaseTX
Fa0/7                        notconnect   61         auto    auto  10/100BaseTX
Fa0/8                        notconnect   61         auto    auto  10/100BaseTX
Fa0/9                        notconnect   61         auto    auto  10/100BaseTX
Fa0/10                       notconnect   61         auto    auto  10/100BaseTX
Fa0/11                       notconnect   61         auto    auto  10/100BaseTX
Fa0/12                       notconnect   61         auto    auto  10/100BaseTX
Fa0/13                       notconnect   61         auto    auto  10/100BaseTX
Fa0/14                       notconnect   61         auto    auto  10/100BaseTX
Fa0/15                       notconnect   61         auto    auto  10/100BaseTX
Fa0/16                       notconnect   61         auto    auto  10/100BaseTX
Fa0/17                       notconnect   61         auto    auto  10/100BaseTX
Fa0/18                       notconnect   61         auto    auto  10/100BaseTX
Fa0/19                       notconnect   61         auto    auto  10/100BaseTX
Fa0/20                       notconnect   61         auto    auto  10/100BaseTX
Fa0/21                       notconnect   61         auto    auto  10/100BaseTX
Fa0/22                       notconnect   61         auto    auto  10/100BaseTX
Fa0/23                       notconnect   61         auto    auto  10/100BaseTX
Fa0/24                       notconnect   61         auto    auto  10/100BaseTX
Gig0/1    Enlace_router      connected    trunk      auto    auto  10/100BaseTX
Gig0/2                       notconnect   1          auto    auto  10/100BaseTX
```

```
RED_VENDEDORES_VALLEdeBRAVO>en
RED_VENDEDORES_VALLEdeBRAVO#sh int st
Port      Name               Status       Vlan       Duplex  Speed Type
Fa0/1                        connected    60         auto    auto  10/100BaseTX
Fa0/2                        connected    60         auto    auto  10/100BaseTX
Fa0/3                        connected    60         auto    auto  10/100BaseTX
Fa0/4                        connected    60         auto    auto  10/100BaseTX
Fa0/5                        connected    60         auto    auto  10/100BaseTX
Fa0/6                        connected    60         auto    auto  10/100BaseTX
Fa0/7                        notconnect   60         auto    auto  10/100BaseTX
Fa0/8                        notconnect   60         auto    auto  10/100BaseTX
Fa0/9                        notconnect   60         auto    auto  10/100BaseTX
Fa0/10                       notconnect   60         auto    auto  10/100BaseTX
Fa0/11                       notconnect   60         auto    auto  10/100BaseTX
Fa0/12                       notconnect   60         auto    auto  10/100BaseTX
Fa0/13                       notconnect   60         auto    auto  10/100BaseTX
Fa0/14                       notconnect   60         auto    auto  10/100BaseTX
Fa0/15                       notconnect   60         auto    auto  10/100BaseTX
Fa0/16                       notconnect   60         auto    auto  10/100BaseTX
Fa0/17                       notconnect   60         auto    auto  10/100BaseTX
Fa0/18                       notconnect   60         auto    auto  10/100BaseTX
Fa0/19                       notconnect   60         auto    auto  10/100BaseTX
Fa0/20                       notconnect   60         auto    auto  10/100BaseTX
Fa0/21                       notconnect   60         auto    auto  10/100BaseTX
Fa0/22                       notconnect   60         auto    auto  10/100BaseTX
Fa0/23                       notconnect   60         auto    auto  10/100BaseTX
Fa0/24                       notconnect   60         auto    auto  10/100BaseTX
Gig0/1    Enlace             connected    trunk      auto    auto  10/100BaseTX
Gig0/2                       notconnect   1          auto    auto  10/100BaseTX

RED_VENDEDORES_VALLEdeBRAVO#
```

PAGINA:



TELNET:


PC25
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>telnet 192.168.25.1
Trying 192.168.25.1 ...Open
User Access Verification
Username: admin
Password:
RED_TOLUCA#telnet 192.168.25.2
Trying 192.168.25.2 ...Open
User Access Verification
Username: admin
Password:
RED_MALINALCO#telnet 192.168.25.4
Trying 192.168.25.4 ...
% Connection timed out; remote host not responding
RED_MALINALCO#telnet 192.168.25.6
Trying 192.168.25.6 ...Open
User Access Verification
Username: admin
Password:
RED_TOLUCA#telnet 192.168.25.13
Trying 192.168.25.13 ...Open
User Access Verification
Username: admin
Password:
RED_MALINALCO#telnet 192.168.25.14
Trying 192.168.25.14 ...Open
User Access Verification
Username: admin
Password:
RED_VALLE_DE_BRAVO#

Conclusiones.

La implementación de una red eficiente es esencial para el funcionamiento de las plantas de armado y agencias de ventas de una marca de autos en diferentes municipios del Estado de México. La elección de protocolos de comunicación adecuados es crucial para garantizar una infraestructura de red robusta y fiable. Ethernet proporciona una base sólida para la conectividad local con su alta velocidad y fiabilidad. DHCP simplifica la administración de la red al automatizar la asignación de direcciones IP, reduciendo errores y mejorando la eficiencia operativa.

ICMP es fundamental para el diagnóstico y la resolución de problemas de red, permitiendo una gestión proactiva de la infraestructura. OSPF garantiza un enrutamiento eficiente y adaptable, esencial para mantener una conectividad estable en redes complejas. TELNET, aunque útil para la administración remota, debe ser reemplazado por protocolos más seguros debido a sus vulnerabilidades. Por último, HTTPS asegura la transferencia de datos en la web, protegiendo la información sensible y garantizando la privacidad y seguridad en las transacciones en línea. En conjunto, estos protocolos forman una base sólida para una red que soportará de manera eficaz las operaciones de la empresa.