

Universidad de San Carlos de Guatemala

Facultad de Ingeniería

Escuela de Ciencias y Sistemas

Redes de Computadoras 2

Práctica 1

MANUAL TECNICO

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MANUAL TECNICO

Explicación de vtp:

Es un protocolo de mensajes de nivel 2 usado para configurar y administrar VLANs en equipos Cisco. Permite centralizar y simplificar la administración en un dominio de VLANs, pudiendo crear, borrar y renombrar las mismas, reduciendo así la necesidad de configurar la misma VLAN en todos los nodos. El protocolo VTP nace como una herramienta de administración para redes de cierto tamaño, donde la gestión manual se vuelve inabordable.

VTP opera en 3 modos distintos:

Servidor:

Es el modo por defecto. Desde él se pueden crear, eliminar o modificar VLANs. Su cometido es anunciar su configuración al resto de switches del mismo dominio VTP y sincronizar dicha configuración con la de otros servidores, basándose en los mensajes VTP recibidos a través de sus enlaces trunk. Debe haber al menos un servidor. Se recomienda autenticación MD5.

Cliente:

En este modo no se pueden crear, eliminar o modificar VLANs, tan sólo sincronizar esta información basándose en los mensajes VTP recibidos de servidores en el propio dominio. Un cliente VTP sólo guarda la información de la VLAN para el dominio completo mientras el switch está activado. Un reinicio del switch borra la información de la VLAN.

Transparente:

Desde este modo tampoco se pueden crear, eliminar o modificar VLANs que afecten a los demás switches. La información VLAN en los switches que trabajen en este modo sólo se puede modificar localmente. Su nombre se debe a que no procesa las actualizaciones VTP recibidas, tan sólo las reenvía a los switches del mismo dominio.

subredes resultantes

explicación:

La función del Subneteo o Subnetting es dividir una red IP física en subredes lógicas (redes más pequeñas) para que cada una de estas trabaje a nivel envío y recepción de paquetes como una red individual, aunque todas pertenezcan a la misma red física y al mismo dominio.

Subred	Nº de Hosts	IP de red	Máscara	Primer Host	Último Host	Broadcast
Subred 1	62	192.168.88.0 /26	255.255.255.192	192.168.88.1	192.168.88.62	192.168.88.63
Subred 2	62	192.168.88.64 /26	255.255.255.192	192.168.88.65	192.168.88.126	192.168.88.127
Subred 3	62	192.168.88.128 /26	255.255.255.192	192.168.88.129	192.168.88.190	192.168.88.191
Subred 4	62	192.168.88.192 /26	255.255.255.192	192.168.88.193	192.168.88.254	192.168.88.255

Configuración:

	<u>Configuración</u>
1	<i>Switch0</i>
	<ul style="list-style-type: none"><i>Configuracion de vtp server</i> <pre>enable config t vtp domain grupo8 vtp password grupo8 vtp mode server</pre> <ul style="list-style-type: none"><i>VLAN</i> <pre>enable config t vlan 18 name Ventas vlan 28 name Distribucion exit vlan 38 name Administracion exit vlan 48</pre>

```
name Servidores
exit
vlan 99
name Management&Native
exit
vlan 999
name BlackHole
exit
```

- *MODO TRONCAL*

```
enable
config t
interface range fa0/1-2
switchport mode trunk
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
```

- *InterVLAN*

```
config t
int vlan18
ip address 192.168.88.62 255.255.255.192
exit
int vlan28
ip address 192.168.88.126 255.255.255.192
exit
int vlan38
ip address 192.168.88.190 255.255.255.192
exit
int vlan48
ip address 192.168.88.254 255.255.255.192
ip routing
```

- *STP*

```
enable
configure terminal
spanning-tree mode rapid-pvst
end
```

```
configure terminal
spanning-tree mode pvst
end
```

	<p>sh spanning-tree summary</p> <ul style="list-style-type: none"> • BLACKHOLE (SEGURIDAD) <pre>//show interface status configure terminal interface range fa0/3-24 switchport mode access switchport access vlan 999 end configure terminal interface range gig0/1-2 switchport mode access switchport access vlan 999 exit</pre> <ul style="list-style-type: none"> • VLAN NATIVA 99 (SEGURIDAD) <pre>configure terminal interface range fa0/1-2show switchport trunk native vlan 99</pre> <ul style="list-style-type: none"> • DESACTIVAR DTP (SEGURIDAD) <pre>configure terminal interface range fa0/1-2 switchport nonegotiate</pre>
2	<p><i>Switch1</i></p> <ul style="list-style-type: none"> • <i>Configuracion de vtp client</i> <pre>enable config t vtp domain grupo8 vtp password grupo8 vtp mode client</pre> <ul style="list-style-type: none"> • <i>MODO TRONCAL</i>

```
enable
config t
interface fa0/1
switchport mode trunk
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
exit
interface fa0/6
switchport mode trunk
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
exit
```

- *MODO ACCESO*

```
enable
config t
interface fa0/7
switchport mode access
switchport access vlan 18
exit
interface fa0/8
switchport mode access
switchport access vlan 28
```

- *PORT CHANEL*
*/*LACP*/*

```
enable
config t
interface range fa0/2-3
channel-protocol lacp
channel-group 1 mode active
exit
interface range fa0/4-5
channel-protocol lacp
channel-group 3 mode active
exit
interface port-channel 1
switchport mode trunk
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
exit
interface port-channel 3
switchport mode trunk
```

```
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
```

```
/*DESACTIVAR LAGP O PAGP*/
```

```
enable
conf t
interface range fa0/2-3
no channel-protocol
no channel-group
exit
no interface port-channel 1
interface range fa0/4-5
no channel-protocol
no channel-group
exit
no interface port-channel 3
end
```

```
/*PAGP*/
```

```
enable
config t
interface range fa0/2-3
channel-protocol pagp
channel-group 1 mode desirable
exit
interface range fa0/4-5
channel-protocol pagp
channel-group 3 mode desirable
```

- *STP*

```
enable
configure terminal
spanning-tree mode rapid-pvst
end
```

```
sh spanning-tree summary
```

- *BLACKHOLE (SEGURIDAD)*

```
configure terminal
interface range fa0/9-24
switchport mode access
switchport access vlan 999
end
configure terminal
interface range gig0/1-2
switchport mode access
switchport access vlan 999
exit
```

- *VLAN NATIVA 99 (SEGURIDAD)*

```
--show interface trunk
configure terminal
interface fa0/1
switchport trunk native vlan 99
exit
interface fa0/6
switchport trunk native vlan 99
exit
interface port-channel 1
switchport trunk native vlan 99
exit
interface port-channel 3
switchport trunk native vlan 99
exit
```

- *DESACTIVAR DTP (SEGURIDAD)*

```
configure terminal
interface fa0/1-6
switchport nonegotiate
exit
```


	<ul style="list-style-type: none"> • PORT SECURITY (SEGURIDAD) <pre> configure terminal interface range fa0/7 switchport port-security switchport port-security maximum 5 switchport port-security violation shutdown switchport port-security mac-address sticky exit interface range fa0/8 switchport port-security switchport port-security maximum 1 switchport port-security violation shutdown switchport port-security mac-address sticky exit </pre>
3	<p><i>Switch2</i></p> <ul style="list-style-type: none"> • <i>Configuracion de vtp client</i> <pre> enable config t vtp domain grupo8 vtp password grupo8 vtp mode client </pre> <ul style="list-style-type: none"> • <i>MODULO TRONCAL</i> <pre> enable config t interface fa0/3 switchport mode trunk switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005 exit interface fa0/8 switchport mode trunk switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005 exit </pre> <ul style="list-style-type: none"> • <i>PORT CHANEL</i> <i>/*LACP*/</i> <pre> enable config t </pre>

```
interface range fa0/1-2
channel-protocol lacp
channel-group 1 mode active
exit
interface range fa0/6-7
channel-protocol lacp
channel-group 2 mode active
exit
interface range fa0/4-5
channel-protocol lacp
channel-group 5 mode active
exit
interface port-channel 1
switchport mode trunk
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
exit
interface port-channel 2
switchport mode trunk
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
exit
interface port-channel 5
switchport mode trunk
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
```

*/*DESACTIVAR LAGP O PAGP*/*

```
enable
conf t
interface range fa0/1-2
no channel-protocol
no channel-group
exit
no interface port-channel 1
interface range fa0/6-7
no channel-protocol
no channel-group
exit
no interface port-channel 2
interface range fa0/4-5
no channel-protocol
no channel-group
```

```
exit
no interface port-channel 5
end
```

*/*PAGP*/*

```
enable
config t
interface range fa0/1-2
channel-protocol pagp
channel-group 1 mode desirable
exit
interface range fa0/6-7
channel-protocol pagp
channel-group 2 mode desirable
exit
interface range fa0/4-5
channel-protocol pagp
channel-group 5 mode desirable
```

- *STP*

```
enable
configure terminal
spanning-tree mode rapid-pvst
end
```

```
sh spanning-tree summary
```

- *BLACKHOLE (SEGURIDAD)*

```
//show interface status
configure terminal
interface range fa0/9-24
switchport mode access
switchport access vlan 999
end
configure terminal
interface range gig0/1-2
switchport mode access
switchport access vlan 999
```

	<pre>exit</pre> <ul style="list-style-type: none"> • <i>VLAN NATIVA 99 (SEGURIDAD)</i> <pre>--show interface trunk configure terminal interface fa0/3 switchport trunk native vlan 99 exit interface fa0/8 switchport trunk native vlan 99 exit interface port-channel 1 switchport trunk native vlan 99 exit interface port-channel 2 switchport trunk native vlan 99 exit interface port-channel 5 switchport trunk native vlan 99 exit</pre> <ul style="list-style-type: none"> • <i>DESACTIVAR DTP (SEGURIDAD)</i> <pre>configure terminal interface range fa0/1-8 switchport nonegotiate exit</pre>
--	--

4	<i>Switch3</i>
	<ul style="list-style-type: none"> • <i>Configuracion de vtp client</i> <pre>enable config t vtp domain grupo8 vtp password grupo8 vtp mode client</pre>

- *MODO TRONCAL*

```
enable
config t
interface range fa0/1-2
switchport mode trunk
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
exit
```

- *MODO ACCESO*

```
enable
config t
interface fa0/8
switchport mode access
switchport access vlan 28
exit
interface fa0/7
switchport mode access
switchport access vlan 38
```

- *PORT CHANEL*
*/*LACP*/*

```
enable
config t
interface range fa0/3-4
channel-protocol lacp
channel-group 2 mode active
exit
interface range fa0/5-6
channel-protocol lacp
channel-group 4 mode active
exit
interface port-channel 2
switchport mode trunk
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
exit
interface port-channel 4
switchport mode trunk
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
exit
```

*/*DESACTIVAR LAGP O PAGP*/*

```
enable
conf t
interface range fa0/3-4
no channel-protocol
no channel-group
exit
no interface port-channel 2
interface range fa0/5-6
no channel-protocol
no channel-group
exit
no interface port-channel 4
end
```

*/*PAGP*/*

```
enable
config t
interface range fa0/3-4
channel-protocol pagp
channel-group 2 mode desirable
exit
interface range fa0/5-6
channel-protocol pagp
channel-group 4 mode desirable
```

- *STP*

```
enable
configure terminal
spanning-tree mode rapid-pvst
end
```

sh spanning-tree summary

- *BLACKHOLE (SEGURIDAD)*

```
//show interface status
configure terminal
interface range fa0/9-24
switchport mode access
switchport access vlan 999
end
configure terminal
interface range gig0/1-2
switchport mode access
switchport access vlan 999
exit
```

- *VLAN NATIVA 99 (SEGURIDAD)*

```
configure terminal
interface range fa0/1-2
switchport trunk native vlan 99
interface port-channel 2
switchport trunk native vlan 99
exit
interface port-channel 4
switchport trunk native vlan 99
exit
```

- *DESACTIVAR DTP (SEGURIDAD)*

```
configure terminal
interface range fa0/1-6
switchport nonegotiate
exit
```

- *PORT SUCURITY (SEGURIDAD)*

```
configure terminal
interface range fa0/7
switchport port-security
switchport port-security maximum 1
```

	<pre> switchport port-security violation shutdown switchport port-security mac-address 0009.7C28.DDC8 exit interface range fa0/8 switchport port-security switchport port-security maximum 1 switchport port-security violation shutdown switchport port-security mac-address sticky exit switchport port-security </pre>
--	--

5	Switch4
	<ul style="list-style-type: none"> • <i>Configuracion de vtp client</i> <pre> enable config t vtp domain grupo8 vtp password grupo8 vtp mode client </pre> <ul style="list-style-type: none"> • <i>MODULO TRONCAL</i> <pre> enable config t interface range fa0/1-3 switchport mode trunk switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005 </pre> <ul style="list-style-type: none"> • <i>MODULO ACCESO</i> <pre> enable config t interface fa0/4 switchport mode access switchport access vlan 48 exit interface fa0/5 switchport mode access switchport access vlan 18 </pre>

- *STP*

```
enable
configure terminal
spanning-tree mode rapid-pvst
end
```

```
sh spanning-tree summary
```

- *MANDAR AL HOYO NEGRO (SEGURIDAD)*

```
//show interface status
configure terminal
interface range fa0/6-24
switchport mode access
switchport access vlan 999
end
configure terminal
interface range gig0/1-2
switchport mode access
switchport access vlan 999
exit
```

- *DESACTIVAR DTP (SEGURIDAD)*

```
configure terminal
interface range fa0/1-3
switchport nonegotiate
exit
```

- *VLAN NATIVA 99 (SEGURIDAD)*

```
configure terminal
interface range fa0/1-3
switchport trunk native vlan 99
```

	<ul style="list-style-type: none"> • <i>PORT SUCURITY (SEGURIDAD)</i> <pre> conf t interface range fa0/5 switchport port-security switchport port-security maximum 5 switchport port-security violation shutdown switchport port-security mac-address sticky exit </pre>
--	---

6	<p><i>Switch5</i></p> <ul style="list-style-type: none"> • <i>Configuracion de vtp client</i> <pre> enable config t vtp domain grupo8 vtp password grupo8 vtp mode client </pre> <ul style="list-style-type: none"> • <i>MODULO TRONCAL</i> <pre> enable config t interface fa0/3 switchport mode trunk switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005 exit interface fa0/6 switchport mode trunk switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005 exit </pre> <ul style="list-style-type: none"> • <i>MODULO ACCESO</i> <pre> enable config t interface fa0/9 </pre>
---	--

```
switchport mode access
switchport access vlan 28
exit
interface fa0/10
switchport mode access
switchport access vlan 38
```

- *PORT CHANEL*
*/*LACP*/*

```
enable
config t
interface range fa0/4-5
channel-protocol lacp
channel-group 5 mode active
exit
interface range fa0/1-2
channel-protocol lacp
channel-group 3 mode active
exit
interface range fa0/7-8
channel-protocol lacp
channel-group 4 mode active
exit
interface port-channel 3
switchport mode trunk
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
exit
interface port-channel 4
switchport mode trunk
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
exit
interface port-channel 5
switchport mode trunk
switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005
end
```

*/*DESACTIVAR LAGP O PAGP*/*

```
enable
conf t
interface range fa0/4-5
```

```
no channel-protocol
no channel-group
exit
no interface port-channel 5
interface range fa0/1-2
no channel-protocol
no channel-group
exit
no interface port-channel 3
interface range fa0/7-8
no channel-protocol
no channel-group
exit
no interface port-channel 4
end
```

*/*PAGP*/*

```
enable
config t
interface range fa0/4-5
channel-protocol pagp
channel-group 5 mode desirable
exit
interface range fa0/1-2
channel-protocol pagp
channel-group 3 mode desirable
exit
interface range fa0/7-8
channel-protocol pagp
channel-group 4 mode desirable
end
```

- *STP*

```
enable
configure terminal
spanning-tree mode rapid-pvst
end
sh spanning-tree summary
```

- *BLACKHOLE (SEGURIDAD)*

```
//show interface status
configure terminal
```

```
interface range fa0/11-24
switchport mode access
switchport access vlan 999
end
configure terminal
interface range gig0/1-2
switchport mode access
switchport access vlan 999
exit
```

- *DESACTIVAR DTP (SEGURIDAD)*

```
configure terminal
interface range fa0/1-8
switchport nonegotiate
exit
```

- *VLAN NATIVA 99 (SEGURIDAD)*

```
configure terminal
interface fa0/3
switchport trunk native vlan 99
exit
interface fa0/6
switchport trunk native vlan 99
exit
interface port-channel 3
switchport trunk native vlan 99
exit
interface port-channel 4
switchport trunk native vlan 99
exit
interface port-channel 5
switchport trunk native vlan 99
exit
```

- *PORT SECURITY (SEGURIDAD)*

```
conf t
interface range fa0/9
switchport port-security
```

	switchport port-security maximum 1 switchport port-security violation shutdown switchport port-security mac-address sticky exit interface range fa0/10 switchport port-security switchport port-security maximum 1 switchport port-security violation shutdown switchport port-security mac-address 000A.4189.A6A3 exit
--	--

7	Switch6
	<ul style="list-style-type: none"> • <i>Configuracion de vtp client</i> enable config t vtp domain grupo8 vtp password grupo8 vtp mode client end <ul style="list-style-type: none"> • <i>MODO TRONCAL</i> enable config t interface range fa0/1-3 switchport mode trunk switchport trunk allowed vlan 1,18,28,38,48,99,999,1002-1005 exit <ul style="list-style-type: none"> • <i>MODO ACCESO</i> enable config t interface fa0/4 switchport mode access switchport access vlan 18 exit interface fa0/5 switchport mode access switchport access vlan 48 end <ul style="list-style-type: none"> • <i>STP RAPID PVST</i> enable

```
configure terminal
spanning-tree mode rapid-pvst
end
```

- *STP PVST*

```
enable
configure terminal
spanning-tree mode pvst
end
```

```
sh spanning-tree summary
```

- *BLACKHOLE (SEGURIDAD)*

```
//show interface status
configure terminal
interface range fa0/6-24
switchport mode access
switchport access vlan 999
end
configure terminal
interface range gig0/1-2
switchport mode access
switchport access vlan 999
exit
```

- *DESACTIVAR DTP (SEGURIDAD)*

```
configure terminal
interface range fa0/1-3
switchport nonegotiate
exit
```

- *VLAN NATIVA 99 (SEGURIDAD)*

```
configure terminal
interface range fa0/1-3
switchport trunk native vlan 99
```

- *PORT SUCURITY (SEGURIDAD)*

```
conf t
interface range fa0/4
```

	<pre> switchport port-security switchport port-security maximum 5 switchport port-security violation shutdown switchport port-security mac-address sticky exit </pre> <ul style="list-style-type: none"> • Para limpiar la tabla de mac <pre> clear port-security all </pre>
--	---

8	CONFIGURACION DE IP's
	<ul style="list-style-type: none"> • <i>VENTAS - 192.168.88.0</i> <i>PC0</i> --- ipconfig 192.168.88.1 255.255.255.192 192.168.88.62 <i>PC2</i> --- ipconfig 192.168.88.2 255.255.255.192 192.168.88.62 <i>PC5</i> --- ipconfig 192.168.88.3 255.255.255.192 192.168.88.62 • <i>DISTRIBUCION - 192.168.88.64</i> <i>PC1</i> --- ipconfig 192.168.88.65 255.255.255.192 192.168.88.126 <i>PC3</i> --- ipconfig 192.168.88.66 255.255.255.192 192.168.88.126 <i>PC7</i> --- ipconfig 192.168.88.67 255.255.255.192 192.168.88.126 • <i>ADMINISTRACION - 192.168.88.128</i> <i>PC4</i> --- ipconfig 192.168.88.129 255.255.255.192 192.168.88.190 <i>PC6</i> --- ipconfig 192.168.88.130 255.255.255.192 192.168.88.190

	<ul style="list-style-type: none"> • <i>SERVIDOR - 192.168.88.192</i> <p><i>SERVER1</i></p> <pre>--- ipconfig 192.168.88.193 255.255.255.192 192.168.88.254</pre> <p><i>SERVER2</i></p> <pre>--- ipconfig 192.168.88.194 255.255.255.192 192.168.88.254</pre>
--	--

Escenario de Mejor Convergencia

Escenario	Tipo Ethernet Channel Y Protocolo Spanning-Tree	TIEMPO:
1	PAGP con Rapid PVST	17.29s
2	PAGP con PVST	1m:10.08s
3	LACP con PVST	1m:1.20s
4	LACP con Rapid PVST	16.22s

ANEXO:

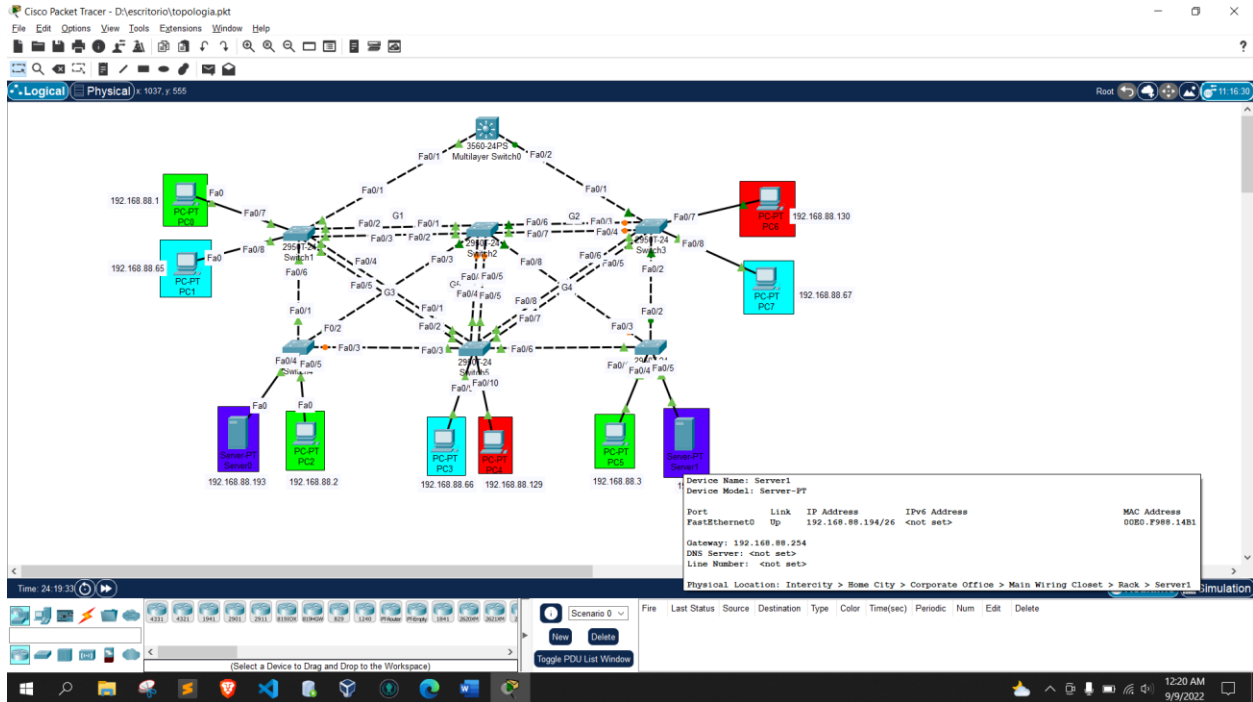
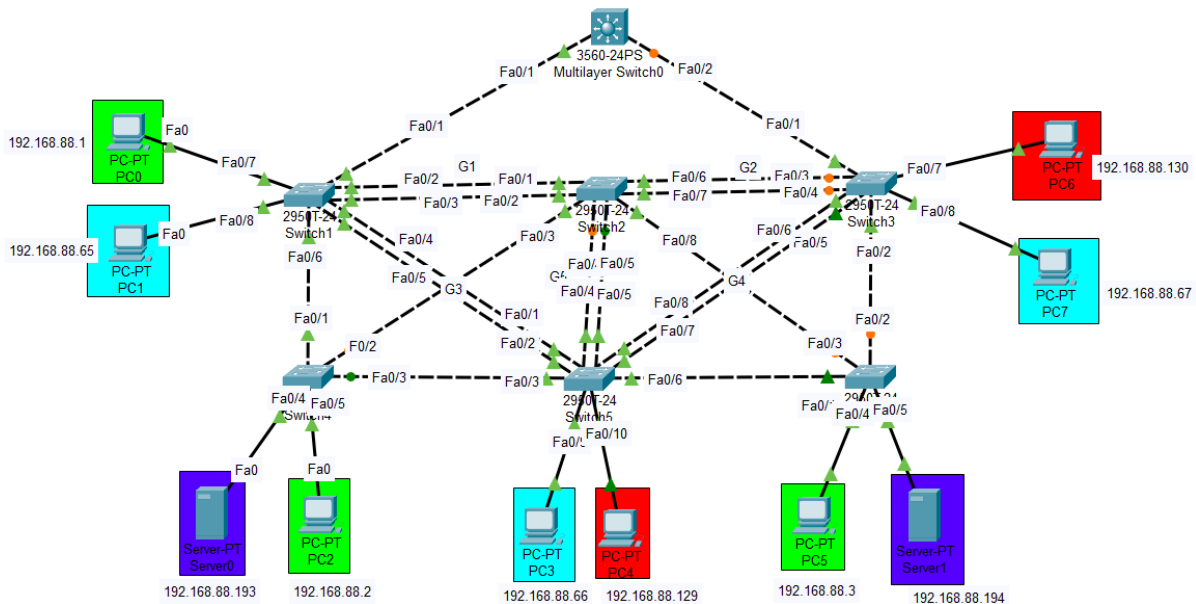
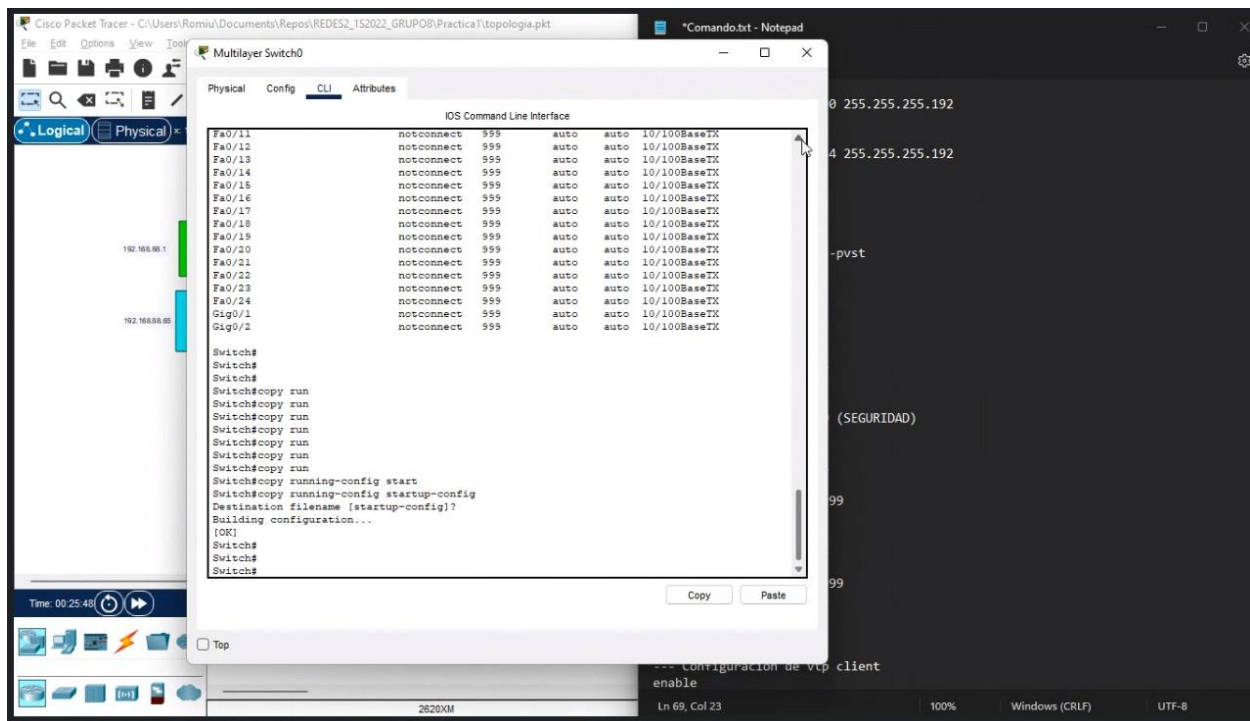



DIAGRAMA DE TOPOLOGIA:





IP's



Device Name: PC5

Device Model: PC-PT

Port	Link	IP Address	IPv6 Address	MAC Address
FastEthernet0	Up	192.168.88.3/26	<not set>	000B.BEB8.D000
Bluetooth	Down	<not set>	<not set>	000C.CF9C.5C5D

Gateway: 192.168.88.62

DNS Server: <not set>

Line Number: <not set>

Physical Location: Intercity > Home City > Corporate Office > PC5

Vlan's

Vlan1	Down	1	<not set>	<not set>	0002.17E1.8AD5
Vlan18	Up	18	192.168.88.62/26	<not set>	0002.17E1.8A01
Vlan28	Up	28	192.168.88.126/26	<not set>	0002.17E1.8A02
Vlan38	Up	38	192.168.88.190/26	<not set>	0002.17E1.8A03
Vlan48	Up	48	192.168.88.254/26	<not set>	0002.17E1.8A04

Physical Location: Intercity > Home City > Corporate Office > Main Wiring Closet > Rack > Multilayer Switch0

Blackhole

