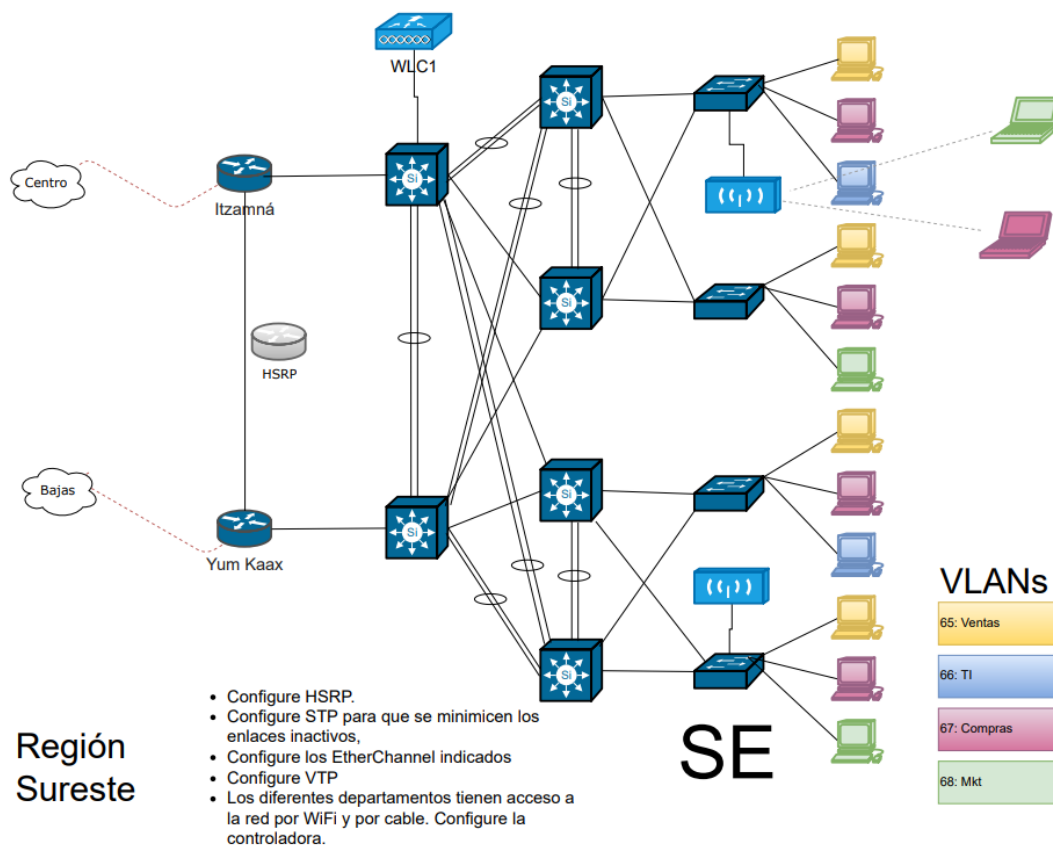Topología 3



Vista general de la topología de red implementada en la Región Sureste. Se observa la estructura jerárquica con una capa de distribución redundante (Switches Multilayer interconectados en malla) y una capa de acceso (Switches 2960). Se destaca la configuración de enlaces EtherChannel (óvalos verdes) para la agregación de ancho de banda y la redundancia de Gateway mediante HSRP entre los routers Itzamná y Yum Kaax. También se visualizan los dispositivos inalámbricos (WLC y APs) integrados a la infraestructura.

# Scripts de Configuración de Red

## Router Principal (Itzamná / Router0)

```
enable
configure terminal
hostname Router_Itzamna

ip domain-name juanmark.com
username admin secret Cisco123
crypto key generate rsa general-keys modulus 1024
line vty 0 4
 transport input ssh
 login local
 exit
service password-encryption


! --- 1. Enrutamiento Dinámico (RIPv2) ---
```

## router rip

```
 version 2
 network 148.60.0.0
 no auto-summary
 ! Evitamos ruido RIP en las VLANs de usuarios
 passive-interface g0/0/0.65
 passive-interface g0/0/0.66
 passive-interface g0/0/0.67
 passive-interface g0/0/0.68
 exit

! --- 2. Pools de DHCP ---
ip dhcp pool VENTAS
 network 148.60.65.0 255.255.255.0
 default-router 148.60.65.1
 dns-server 8.8.8.8

ip dhcp pool TI
 network 148.60.66.0 255.255.255.0
 default-router 148.60.66.1
 dns-server 8.8.8.8

ip dhcp pool COMPRAS
 network 148.60.67.0 255.255.255.0
 default-router 148.60.67.1
 dns-server 8.8.8.8

ip dhcp pool MKT
 network 148.60.68.0 255.255.255.0
 default-router 148.60.68.1
 dns-server 8.8.8.8

! --- 3. Subinterfaces y HSRP (Activo) ---
```

```
interface g0/0/0
 no shutdown
 exit

! VLAN 65 - Ventas
interface g0/0/0.65
 encapsulation dot1Q 65
 ip address 148.60.65.2 255.255.255.0
 standby 65 ip 148.60.65.1
 standby 65 priority 150
 standby 65 preempt
 exit

! VLAN 66 - TI / Gestión
interface g0/0/0.66
 encapsulation dot1Q 66
 ip address 148.60.66.2 255.255.255.0
 standby 66 ip 148.60.66.1
 standby 66 priority 150
 standby 66 preempt
 exit

! VLAN 67 - Compras
interface g0/0/0.67
 encapsulation dot1Q 67
 ip address 148.60.67.2 255.255.255.0
 standby 67 ip 148.60.67.1
 standby 67 priority 150
 standby 67 preempt
 exit

! VLAN 68 - Marketing
interface g0/0/0.68
 encapsulation dot1Q 68
 ip address 148.60.68.2 255.255.255.0
 standby 68 ip 148.60.68.1
 standby 68 priority 150
 standby 68 preempt
 exit
interface Serial0/0/1
 description Enlace_a_YumKaax
 ip address 148.60.0.1 255.255.255.252
 ! Ponemos reloj porque es cable serial
 clock rate 128000
 no shutdown
exit
```

## Router de Respaldo (Yum Kaax / Router1)

```
enable
configure terminal
hostname Router_YumKaax
```

```
ip domain-name juanmark.com
username admin secret Cisco123
crypto key generate rsa general-keys modulus 1024
line vty 0 4
 transport input ssh
 login local
 exit
service password-encryption

! --- 1. Enrutamiento Dinámico ---
```

## router rip

```
 version 2
 network 148.60.0.0
 no auto-summary
 passive-interface g0/0/0.65
 passive-interface g0/0/0.66
 passive-interface g0/0/0.67
 passive-interface g0/0/0.68
 exit

! --- 2. Subinterfaces y HSRP (Standby) ---
interface g0/0/0
 no shutdown
 exit

interface g0/0/0.65
 encapsulation dot1Q 65
 ip address 148.60.65.3 255.255.255.0
 standby 65 ip 148.60.65.1
 standby 65 priority 100
 standby 65 preempt
 exit

interface g0/0/0.66
 encapsulation dot1Q 66
 ip address 148.60.66.3 255.255.255.0
 standby 66 ip 148.60.66.1
 standby 66 priority 100
 standby 66 preempt
 exit

interface g0/0/0.67
 encapsulation dot1Q 67
 ip address 148.60.67.3 255.255.255.0
 standby 67 ip 148.60.67.1
 standby 67 priority 100
 standby 67 preempt
 exit
interface g0/0/0.68
 encapsulation dot1Q 68
```

```
 ip address 148.60.68.3 255.255.255.0
 standby 68 ip 148.60.68.1
 standby 68 priority 100
 standby 68 preempt
 exit

interface Serial0/0/0
 description Enlace_a_Itzamna
 ip address 148.60.0.2 255.255.255.252
no shutdown
```

## configuracion Switch server

```
enable
configure terminal
hostname DSW1
vtp domain JuanMark
vtp version 2
vtp mode server
vtp password cisco

ip domain-name juanmark.com
username admin secret Cisco123
crypto key generate rsa general-keys modulus 1024
line vty 0 4
 transport input ssh
 login local
 exit
service password-encryption

vlan 65
 name Ventas
vlan 66
 name Gestion_TI
vlan 67
 name Compras
vlan 68
 name MKT
exit

interface range g1/0/1-2
 channel-protocol pagp
 channel-group 1 mode desirable
 no shutdown
 exit

interface range g1/0/3-4
 channel-protocol pagp
 channel-group 2 mode desirable
 no shutdown
 exit
```

```
interface range g1/0/5-6
 channel-protocol pagp
 channel-group 3 mode desirable
 no shutdown
 exit

interface Port-channel 1
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
 exit

interface Port-channel 2
 ! Si el switch es Capa 3 (Multilayer), descomenta la siguiente línea:
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
 exit

interface Port-channel 3
 ! Si el switch es Capa 3 (Multilayer), descomenta la siguiente línea:
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
 exit

interface gig1/0/7
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
 exit

interface g1/0/24
  switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
 no shutdown
 exit
spanning-tree vlan 65,66 root primary
spanning-tree vlan 67,68 root secondary
```

## Switch 1

```
enable
configure terminal
hostname ASW1
```

```
ip domain-name juanmark.com
username admin secret Cisco123
crypto key generate rsa general-keys modulus 1024
line vty 0 4
 transport input ssh
 login local
 exit
service password-encryption

vtp domain JuanMark
vtp version 2
vtp mode client
vtp password cisco

interface range g1/0/1-2
 channel-protocol pagp
 channel-group 1 mode desirable
 no shutdown
exit

interface range g1/0/3-4
 channel-protocol pagp
 channel-group 2 mode desirable
 no shutdown
exit

interface range g1/0/5-6
 channel-protocol pagp
 channel-group 3 mode desirable
 no shutdown
exit

interface Port-channel 1
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface Port-channel 2
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface Port-channel 3
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit
```

```
interface g1/0/8
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface g1/0/7
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface f0/10
 switchport mode access
 switchport access vlan 65
 spanning-tree portfast
 no shutdown
exit

interface f0/11
                                  switchport mode access
 switchport access vlan 66
 spanning-tree portfast
 no shutdown
exit

spanning-tree vlan 67,68 root primary
spanning-tree vlan 65,66 root secondary
```

## Switch 2

```
enable
configure terminal
hostname ASW2

ip domain-name juanmark.com
username admin secret Cisco123
crypto key generate rsa general-keys modulus 1024
line vty 0 4
 transport input ssh
 login local
 exit
service password-encryption

vtp domain JuanMark
vtp version 2
vtp mode client
vtp password cisco

interface range g1/0/1-2
```

```
 channel-protocol pagp
 channel-group 1 mode desirable
 no shutdown
exit

interface range g1/0/3-4
 channel-protocol pagp
 channel-group 2 mode desirable
 no shutdown
exit

interface range g1/0/5-6
 channel-protocol pagp
 channel-group 3 mode desirable
 no shutdown
exit

interface Port-channel 1
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface Port-channel 2
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface Port-channel 3
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface g1/0/8
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface g1/0/7
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface f0/10
```

```
 switchport mode access
 switchport access vlan 65
 spanning-tree portfast
 no shutdown
exit

interface f0/11
 switchport mode access
 switchport access vlan 66
 spanning-tree portfast
 no shutdown
exit
```

## Switch 3

```
enable
configure terminal
hostname ASW3

ip domain-name juanmark.com
username admin secret Cisco123
crypto key generate rsa general-keys modulus 1024
line vty 0 4
 transport input ssh
 login local
 exit
service password-encryption

vtp domain JuanMark
vtp version 2
vtp mode client
vtp password cisco

interface range g1/0/1-2
 channel-protocol pagp
 channel-group 1 mode desirable
 no shutdown
exit

interface Port-channel 1
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface g1/0/3
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit
```

```
interface g1/0/4
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface g1/0/5
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface g1/0/6
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit
```

## Switch 4

```
enable
configure terminal
hostname ASW4

vtp domain JuanMark
vtp version 2
vtp mode client
vtp password cisco

interface range g1/0/1-2
 channel-protocol pagp
 channel-group 1 mode desirable
 no shutdown
exit

interface Port-channel 1
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface g1/0/3
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit
```

```
interface g1/0/4
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface g1/0/5
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface g1/0/6
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit
```

## Switch 5

```
enable
configure terminal
hostname ASW5

ip domain-name juanmark.com
username admin secret Cisco123
crypto key generate rsa general-keys modulus 1024
line vty 0 4
 transport input ssh
 login local
 exit
service password-encryption

vtp domain JuanMark
vtp version 2
vtp mode client
vtp password cisco

interface range g1/0/1-2
 channel-protocol pagp
 channel-group 1 mode desirable
 no shutdown
exit

interface range g1/0/3-4
 channel-protocol pagp
 channel-group 2 mode desirable
 no shutdown
```

```
exit

interface range g1/0/5-6
 channel-protocol pagp
 channel-group 3 mode desirable
 no shutdown
exit

interface Port-channel 1
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface Port-channel 2
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface Port-channel 3
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface g1/0/8
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit

interface g1/0/7
 switchport trunk encapsulation dot1q
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
exit
```

## Switch 1 capa 2

```
enable
configure terminal
hostname ASW0_ConAP

ip domain-name juanmark.com
username admin secret Cisco123
crypto key generate rsa general-keys modulus 1024
```

```
line vty 0 4
 transport input ssh
 login local
 exit
service password-encryption

vtp domain JuanMark
vtp version 2
vtp mode client
vtp password cisco
no ip domain-lookup

interface range g0/1-2
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
 no shutdown
exit

interface f0/3
 description Link_to_AP
 switchport mode trunk
 switchport nonegotiate
 switchport trunk native vlan 66
 switchport trunk allowed vlan 1,65-68
 no shutdown
exit

interface range f0/1-2, f0/4-5
 switchport mode access
 switchport access vlan 65
 spanning-tree portfast
 switchport port-security
exit

interface range f0/6-10
 switchport mode access
 switchport access vlan 66
 spanning-tree portfast
 switchport port-security
exit

interface range f0/11-15
 switchport mode access
 switchport access vlan 67
 spanning-tree portfast
 switchport port-security
exit

interface range f0/16-20
 switchport mode access
 switchport access vlan 68
 spanning-tree portfast
```

```
 switchport port-security
exit
```

## Switch 2 capa 2

```
enable
configure terminal
hostname ASW1_ConAP

ip domain-name juanmark.com
username admin secret Cisco123
crypto key generate rsa general-keys modulus 1024
line vty 0 4
 transport input ssh
 login local
 exit
service password-encryption

vtp domain JuanMark
vtp version 2
vtp mode client
vtp password cisco
no ip domain-lookup

interface range g0/1-2
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
 no shutdown
exit

interface f0/3
 description Link_to_AP
 switchport mode trunk
 switchport nonegotiate
 switchport trunk native vlan 66
 switchport trunk allowed vlan 1,65-68
 no shutdown
exit

interface range f0/1-2, f0/4-5
 switchport mode access
 switchport access vlan 65
 spanning-tree portfast
 switchport port-security
exit

interface range f0/6-10
 switchport mode access
 switchport access vlan 66
 spanning-tree portfast
 switchport port-security
```

```
exit

interface range f0/11-15
 switchport mode access
 switchport access vlan 67
 spanning-tree portfast
 switchport port-security
exit

interface range f0/16-20
 switchport mode access
 switchport access vlan 68
 spanning-tree portfast
 switchport port-security
exit
```

## Switch 3 capa 2

```
enable
configure terminal
hostname ASW2_PCs

ip domain-name juanmark.com
username admin secret Cisco123
crypto key generate rsa general-keys modulus 1024
line vty 0 4
 transport input ssh
 login local
 exit
service password-encryption

vtp domain JuanMark
vtp version 2
vtp mode client
vtp password cisco
no ip domain-lookup

interface range g0/1-2
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
 no shutdown
exit

interface range f0/1-5
 switchport mode access
 switchport access vlan 65
 spanning-tree portfast
 switchport port-security
exit

interface range f0/6-10
```
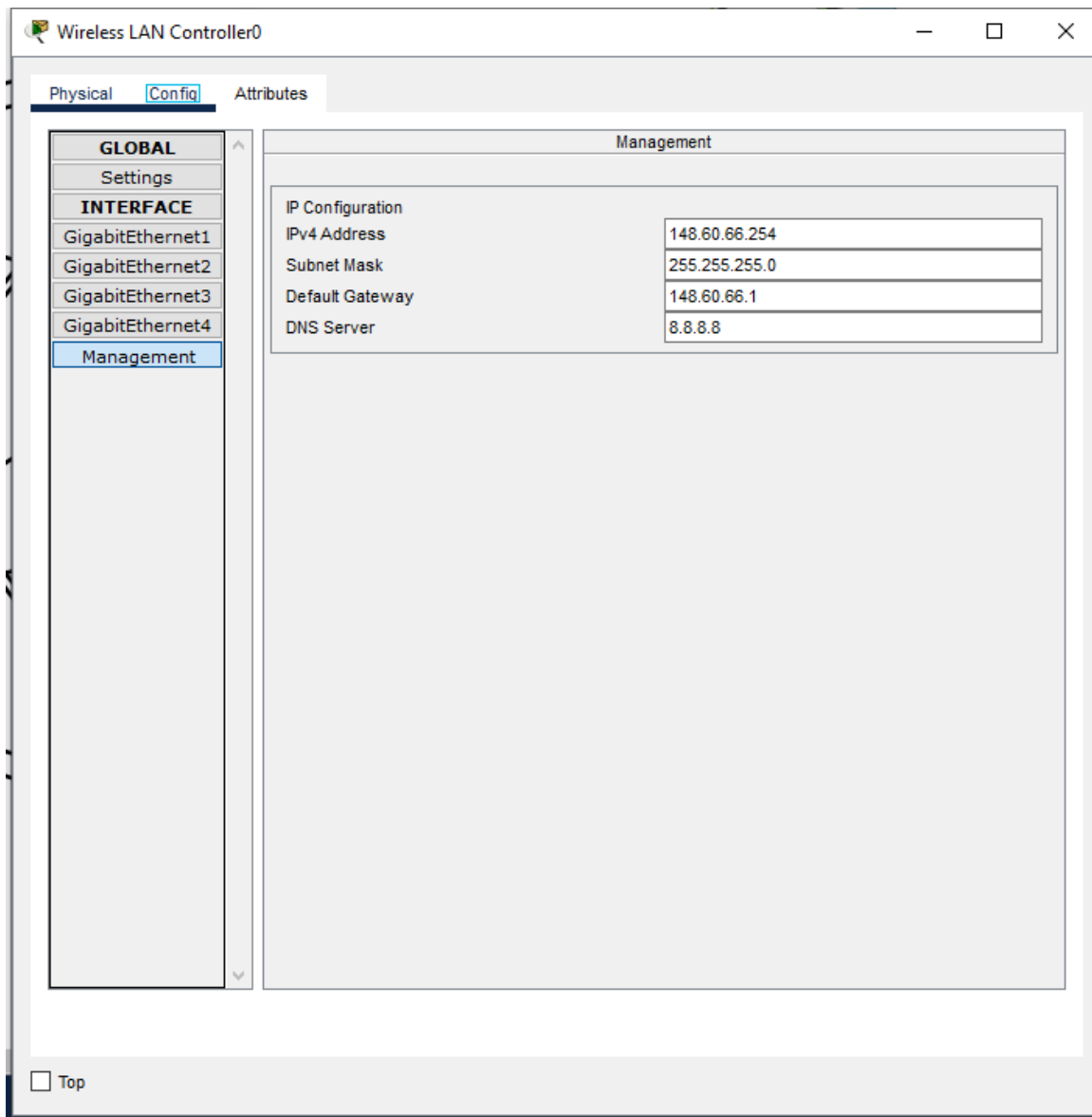
```
 switchport mode access
 switchport access vlan 66
 spanning-tree portfast
 switchport port-security
exit

interface range f0/11-15
 switchport mode access
 switchport access vlan 67
 spanning-tree portfast
 switchport port-security
exit

interface range f0/16-20
 switchport mode access
 switchport access vlan 68
 spanning-tree portfast
 switchport port-security
exit
```

## Switch 4 capa 2

```
enable
configure terminal
hostname ASW3_PCs

ip domain-name juanmark.com
username admin secret Cisco123
crypto key generate rsa general-keys modulus 1024
line vty 0 4
 transport input ssh
 login local
 exit
service password-encryption

vtp domain JuanMark
vtp version 2
vtp mode client
vtp password cisco
no ip domain-lookup

interface range g0/1-2
 switchport mode trunk
 switchport nonegotiate
 switchport trunk allowed vlan 1,65-68
 no shutdown
exit

interface range f0/1-5
 switchport mode access
 switchport access vlan 65
 spanning-tree portfast
```

```
 switchport port-security
exit

interface range f0/6-10
 switchport mode access
 switchport access vlan 66
 spanning-tree portfast
 switchport port-security
exit

interface range f0/11-15
 switchport mode access
 switchport access vlan 67
 spanning-tree portfast
 switchport port-security
exit

interface range f0/16-20
 switchport mode access
 switchport access vlan 68
 spanning-tree portfast
 switchport port-security
exit
```

Panel de control principal (Dashboard) del Wireless LAN Controller (WLC). La sección 'Access Point Summary' confirma el estado operativo de la red inalámbrica, mostrando **2 Access Points en estado 'Up'** (verde), lo que indica que ambos APs se han unido exitosamente al controlador a través de la red de gestión (VLAN 66). También se verifica la versión de software y el tiempo de actividad del sistema.

La imagen muestra el **Panel de Control Principal (Dashboard)** del Wireless LAN Controller (WLC). Esta vista es la primera que se accede después de iniciar sesión en el interfaz web seguro (https://148.60.66.254) y ofrece un resumen del estado de la red inalámbrica.
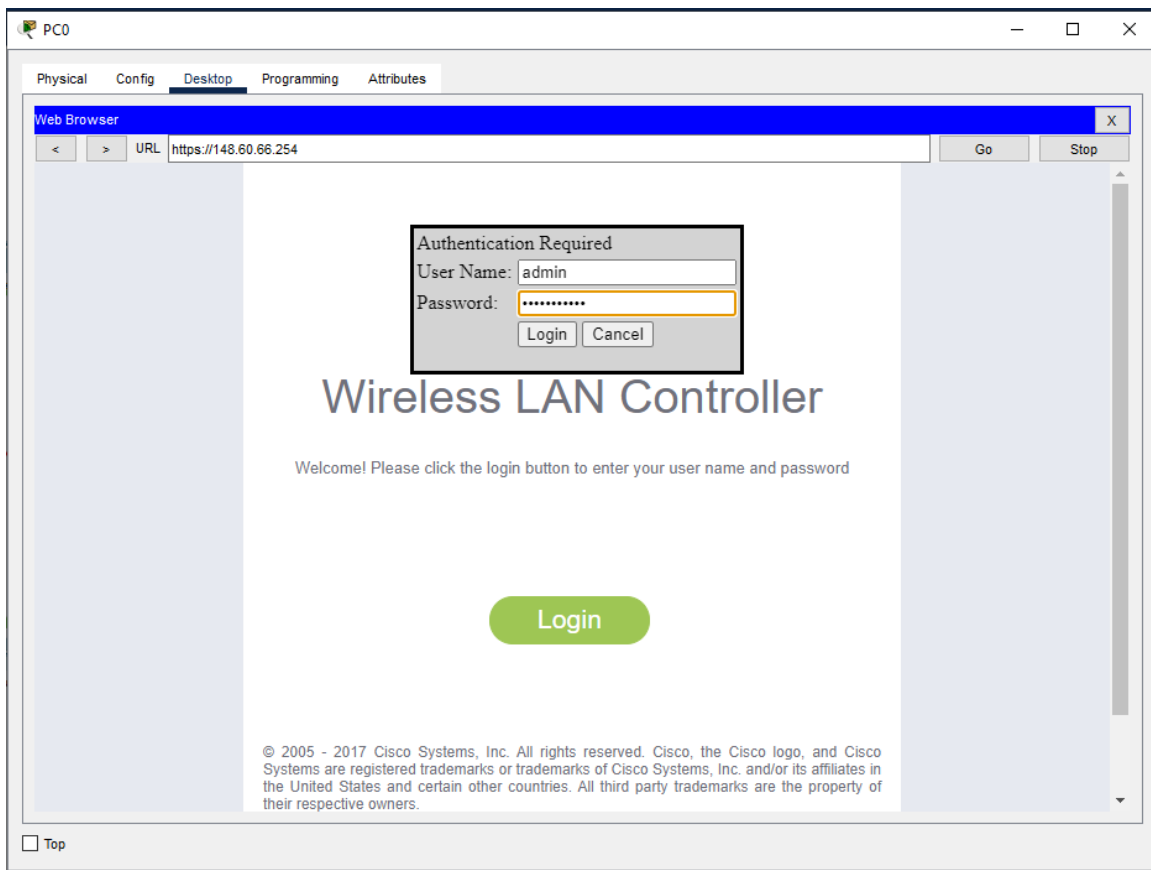
La imagen muestra la utilidad de configuración de la tarjeta de red **Wireless-N Notebook Adapter** de la Laptop. Esta interfaz confirma el estado de la conexión del cliente final a la red inalámbrica.
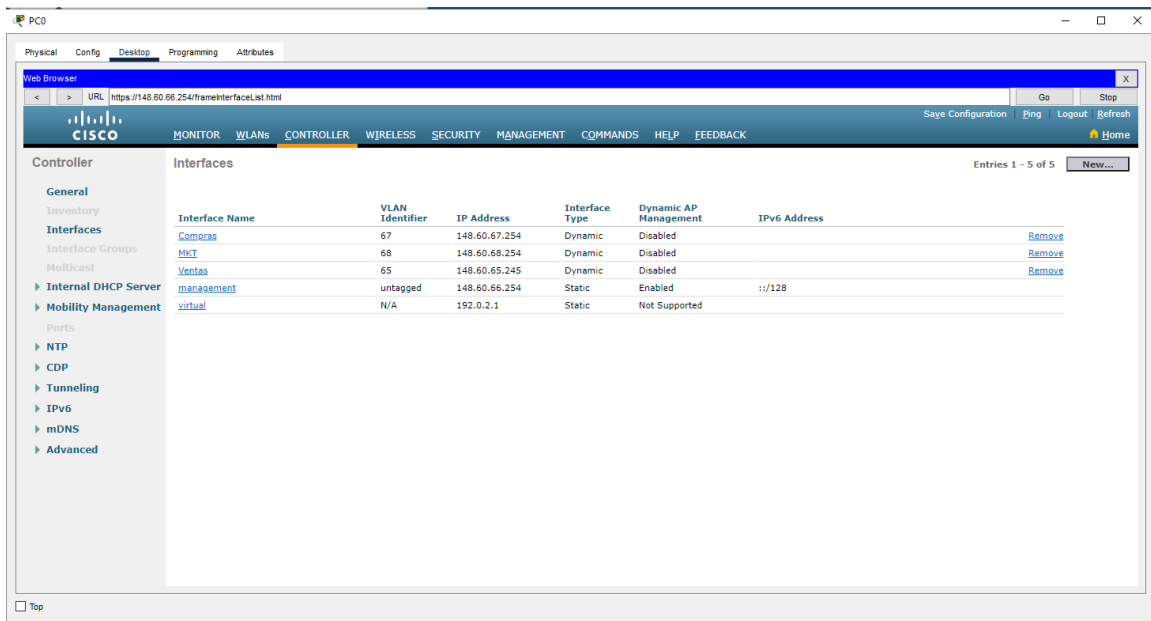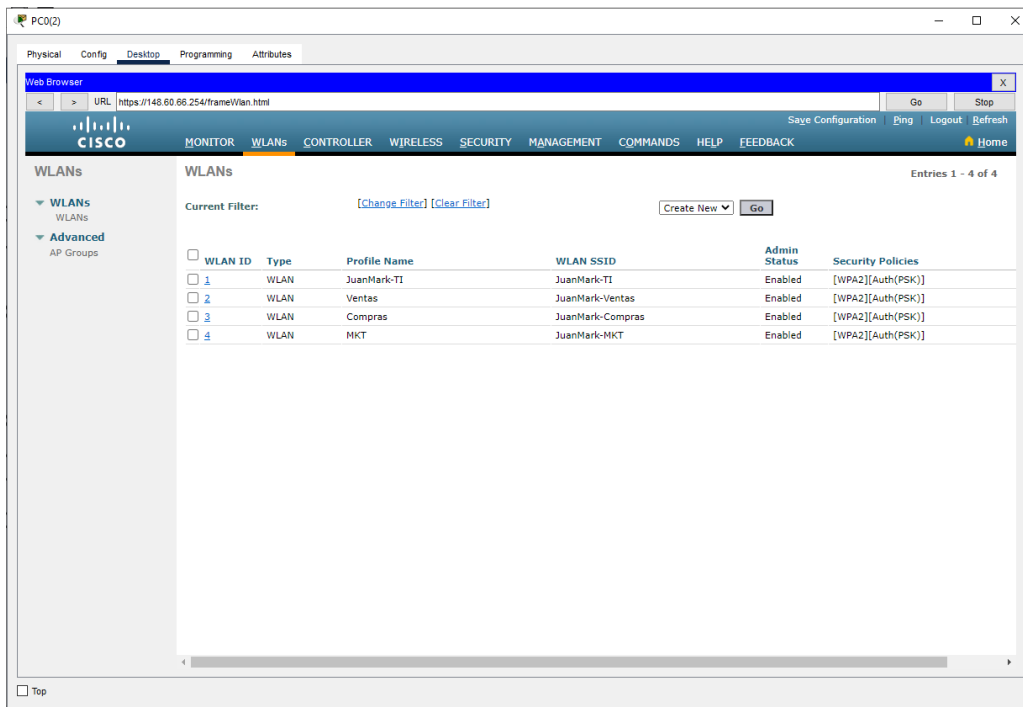


La imagen corresponde a la pestaña **Interfaces** bajo el menú **CONTROLLER** en la interfaz de gestión web del Wireless LAN Controller (WLC). Esta vista es crucial para el **enrutamiento de datos** y la segmentación de la red inalámbrica.
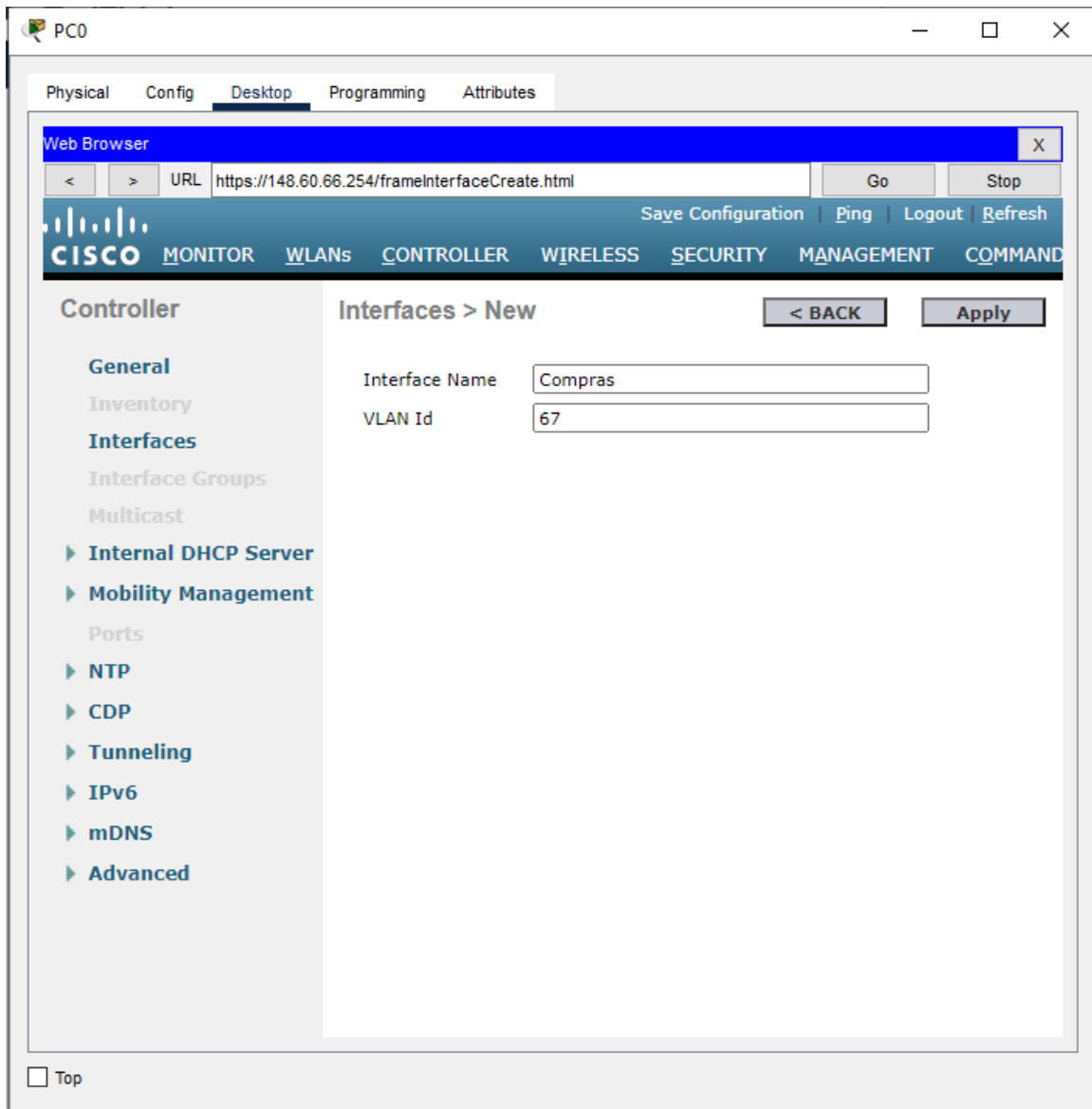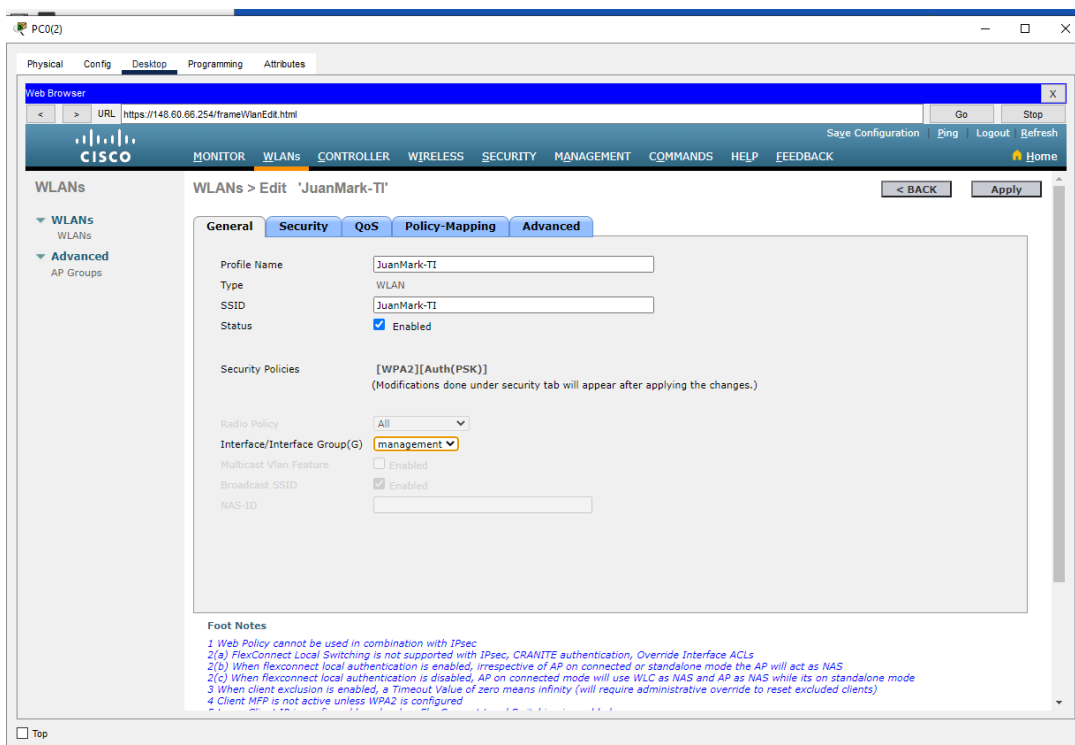
La imagen corresponde a la ventana Interfaces > New en el menú CONTROLLER de la interfaz de gestión web del Wireless LAN Controller (WLC). Esta ventana se utiliza para iniciar la creación de una Interfaz Dinámica.
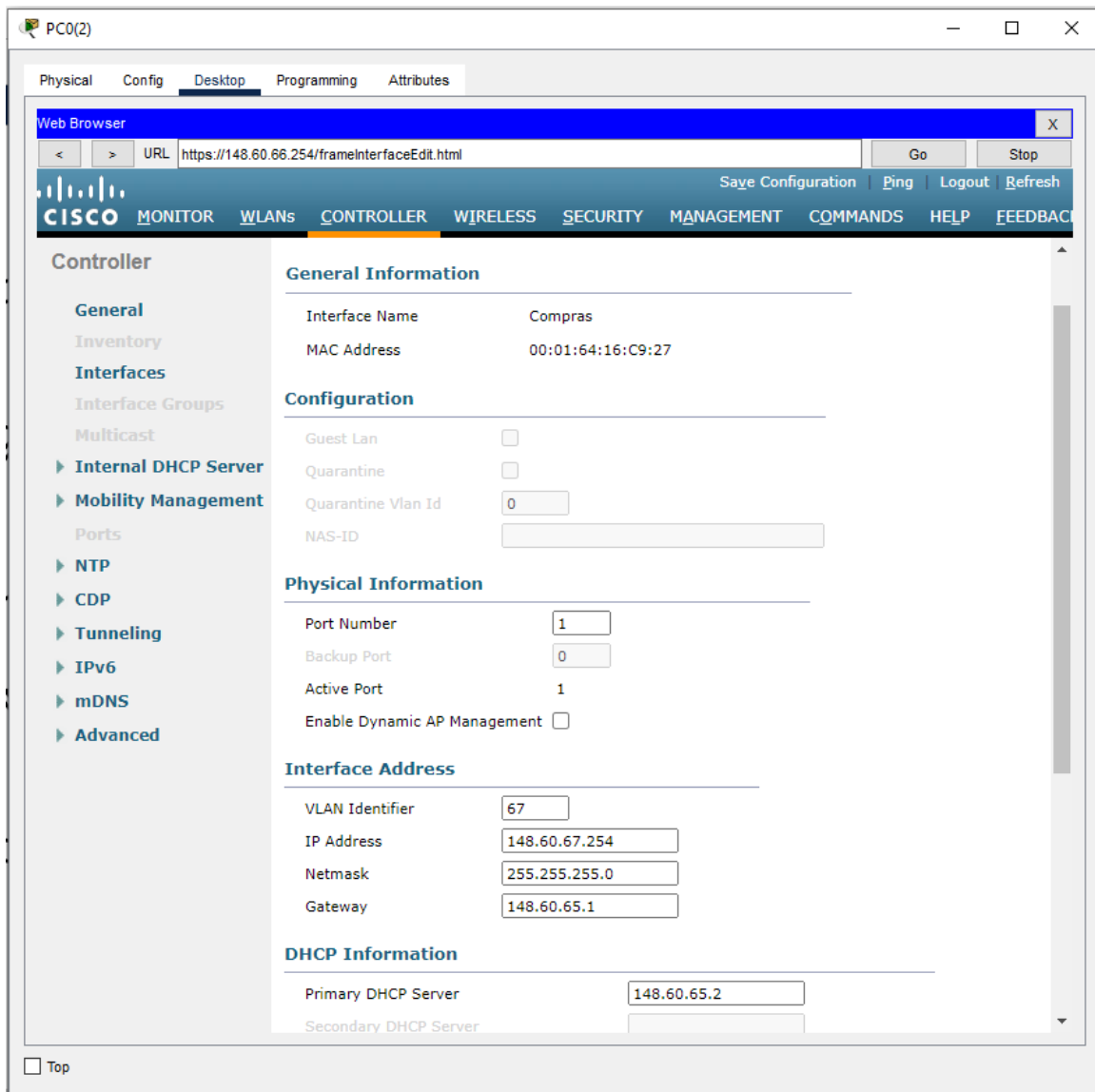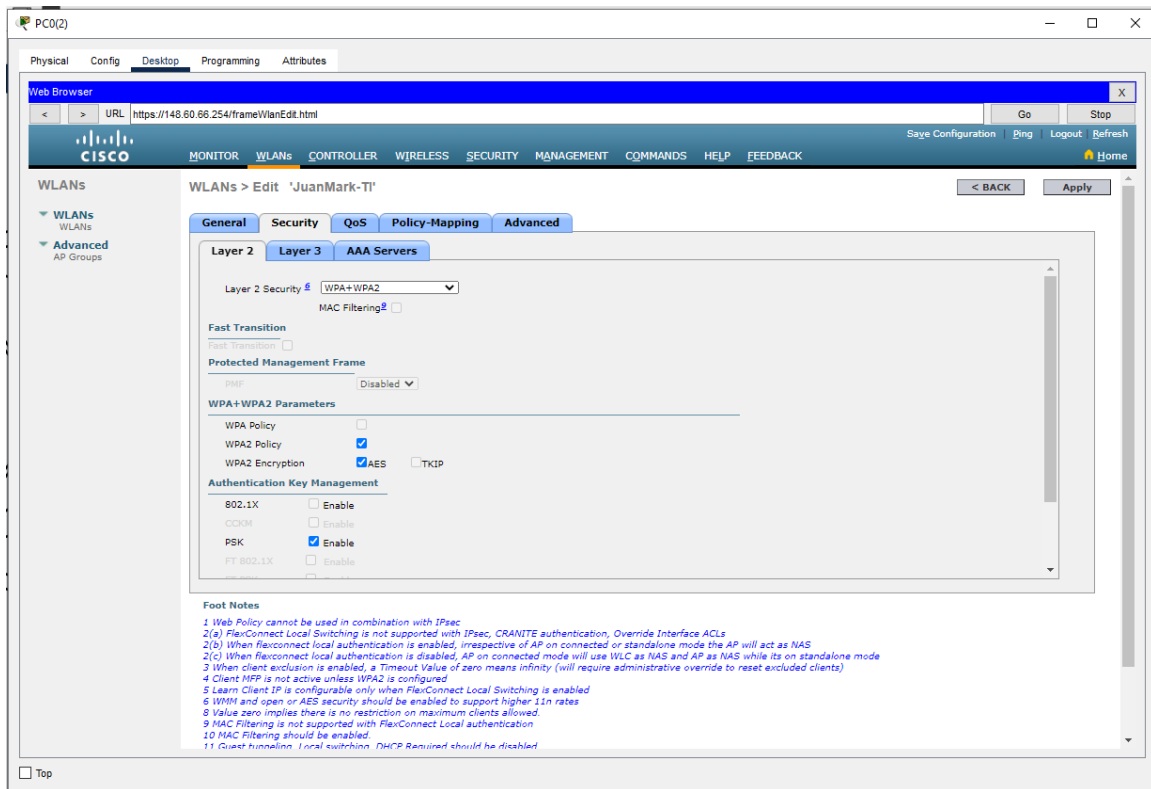
La imagen corresponde a la ventana de **edición** de la interfaz dinámica **"Compras"** en el Wireless LAN Controller (WLC). Esta vista muestra todos los parámetros de Capa 3 asociados a la **VLAN 67**.

La imagen corresponde a la pestaña **WLANs** en la interfaz de gestión web del Wireless LAN Controller (WLC). Esta vista muestra las **cuatro redes inalámbricas** que han sido creadas para la segmentación departamental en la red.



La imagen corresponde a la pestaña **General** dentro de la ventana de edición de la WLAN **"JuanMark-TI"** en la interfaz web del Wireless LAN Controller (WLC).

La imagen corresponde a la pestaña **Security** > **Layer 2** dentro de la ventana de edición de la WLAN **"JuanMark-TI"**. Esta vista confirma la implementación del estándar de seguridad para la autenticación de los clientes.
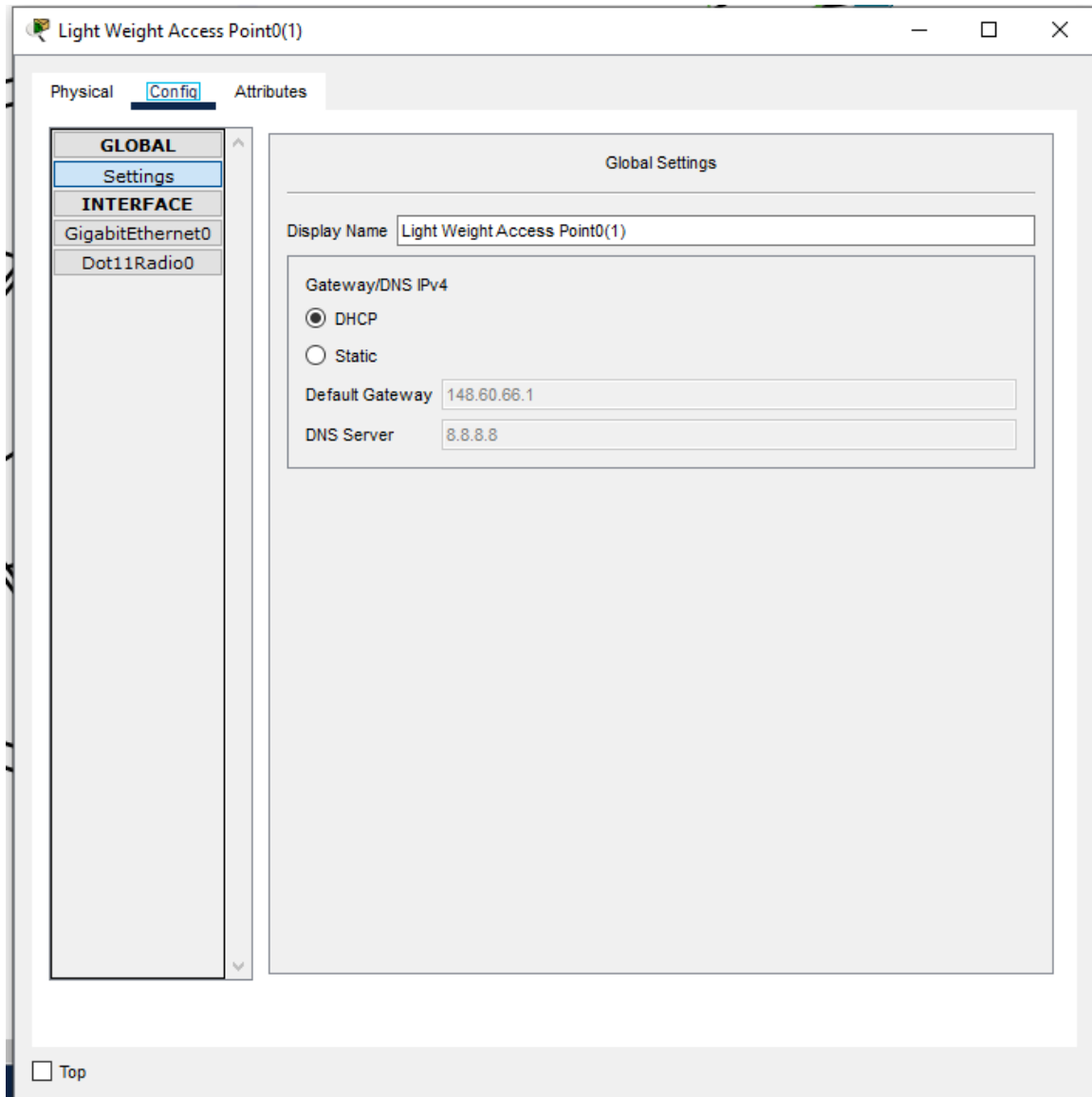
La imagen corresponde a la ventana de inicio de sesión o **Autenticación Requerida** del Wireless LAN Controller (WLC).