STCH

SOLUCIONES TÉCNICAS CHILE ®

TECNOLOGÍA DE LA INFORMACIÓN
TELECOMUNICACIONES
SEGURIDAD INFORMÁTICA

SOMOS UN EQUIPO INTEGRAL Y MULTIDISCIPLINARIO.

Nuestra empresa está conformada por un equipo de trabajo multidisciplinario que tiene la capacidad de crear soluciones a la medida en cada uno de los servicios que ofrece, otorgando siempre un producto de excelencia que nos ha permitido crear una relación de fidelidad con todos nuestros clientes y asociados comerciales. El team STCH no solo ofrecerá la mejor solución a sus requerimientos sino también el mejor servicio Postventa, con la finalidad de generar satisfacción y agrado en todo momento.

TEAM STCH

- INGENIERO MECATRÓNICO JORGE ROSAS

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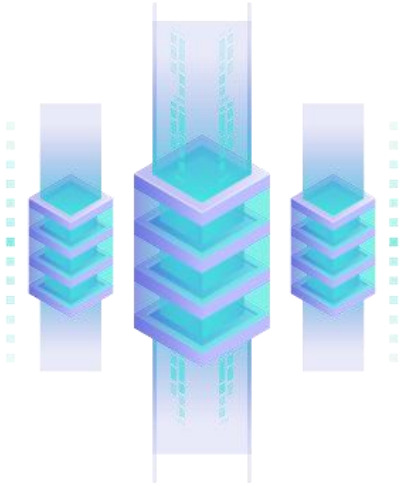
SERVICIOS



Tecnología de la Información

- Sistemas
- Networking
- Infraestructura (Servidores)
- Informática (desarrollo Web, aplicaciones y soluciones)
- Seguridad Informatica
- Consultoría TIC

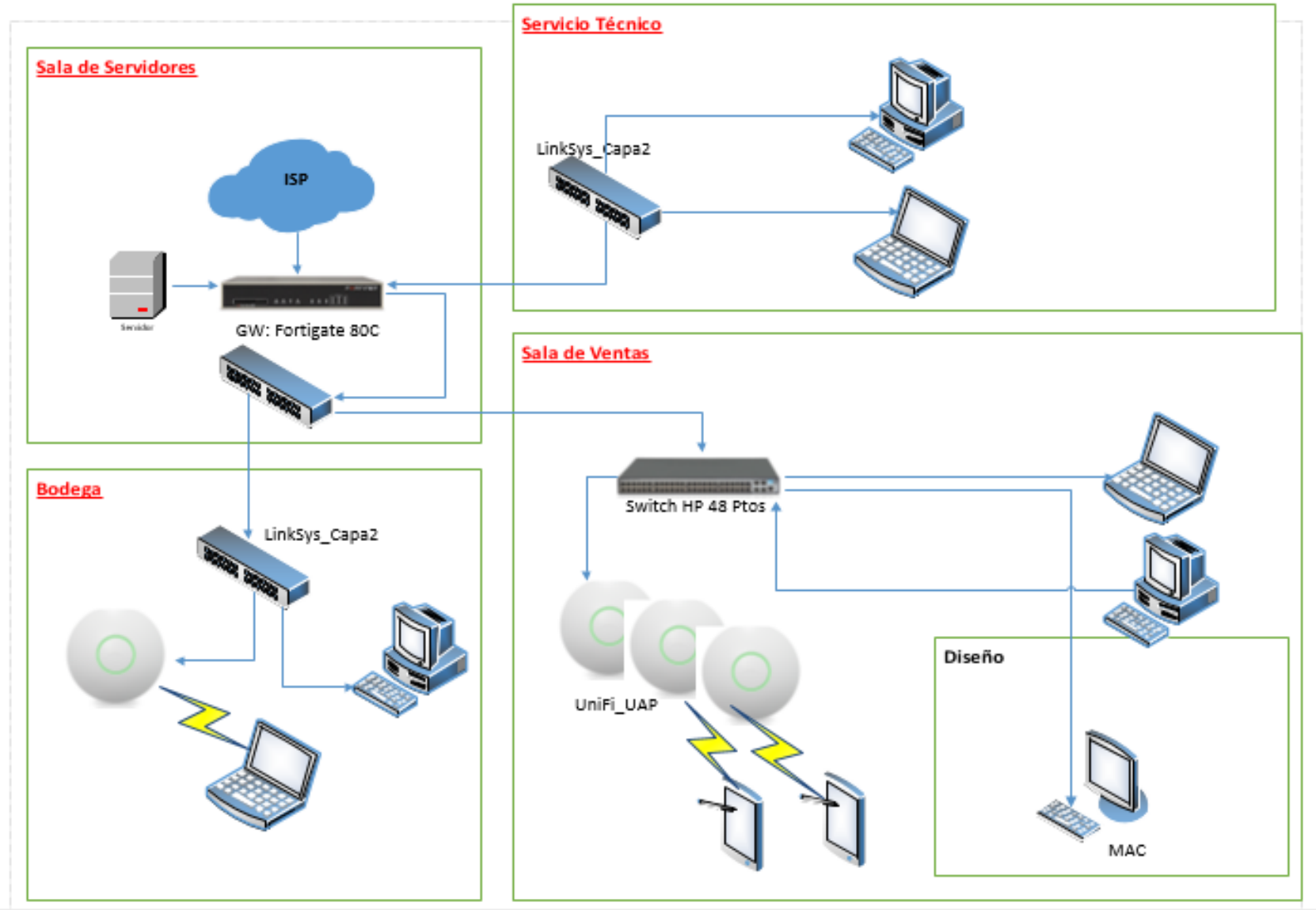
Telecomunicaciones

- Telefonía (IP, Digital y Analógica).
- TV (iptv, Satelital)
- ISP (Internet Services Provider)
- Cableado estructurado
- Tendidos de Fibra Óptica
- Redes Inalámbricas
- Proyectos
- Certificaciones

Seguridad Informática

- CCTV
- Control de Acceso y presencia
- Alarmas
- Citofonía
- Cercos Eléctricos

ESCENARIO PREVIO A LA IMPLEMENTACIÓN



ESCENARIO PREVIO A LA IMPLEMENTACIÓN

Aspectos Lógicos:

- Toda la red se maneja bajo un mismo dominio de Broadcast (ausencia de sub-redes)
- Ausencia de sistema de monitoreo de redes
- Visibilidad entre todos los HOST.
- Ausencia de QoS.

Aspectos Físicos:

- Existencia de Switch capa 2 (no administrables), Bodega y Despacho
- Equipos UniFi (Ubiquiti) de una sola banda (2,4 GHz), capacidad de tráfico limitado
- Ausencia de Router para gestión de tráfico hacia los usuarios, se maneja con Fortigate 80C

PROPUESTA

Reemplazo de equipamiento activo, destacando lo siguiente:

(1) Router Mikrotik CCR-1009-7G-1C-1S+

(5) Switch CRS326-24G-2S-RM

(6) cAP AC Dual-Band

PROPUESTA

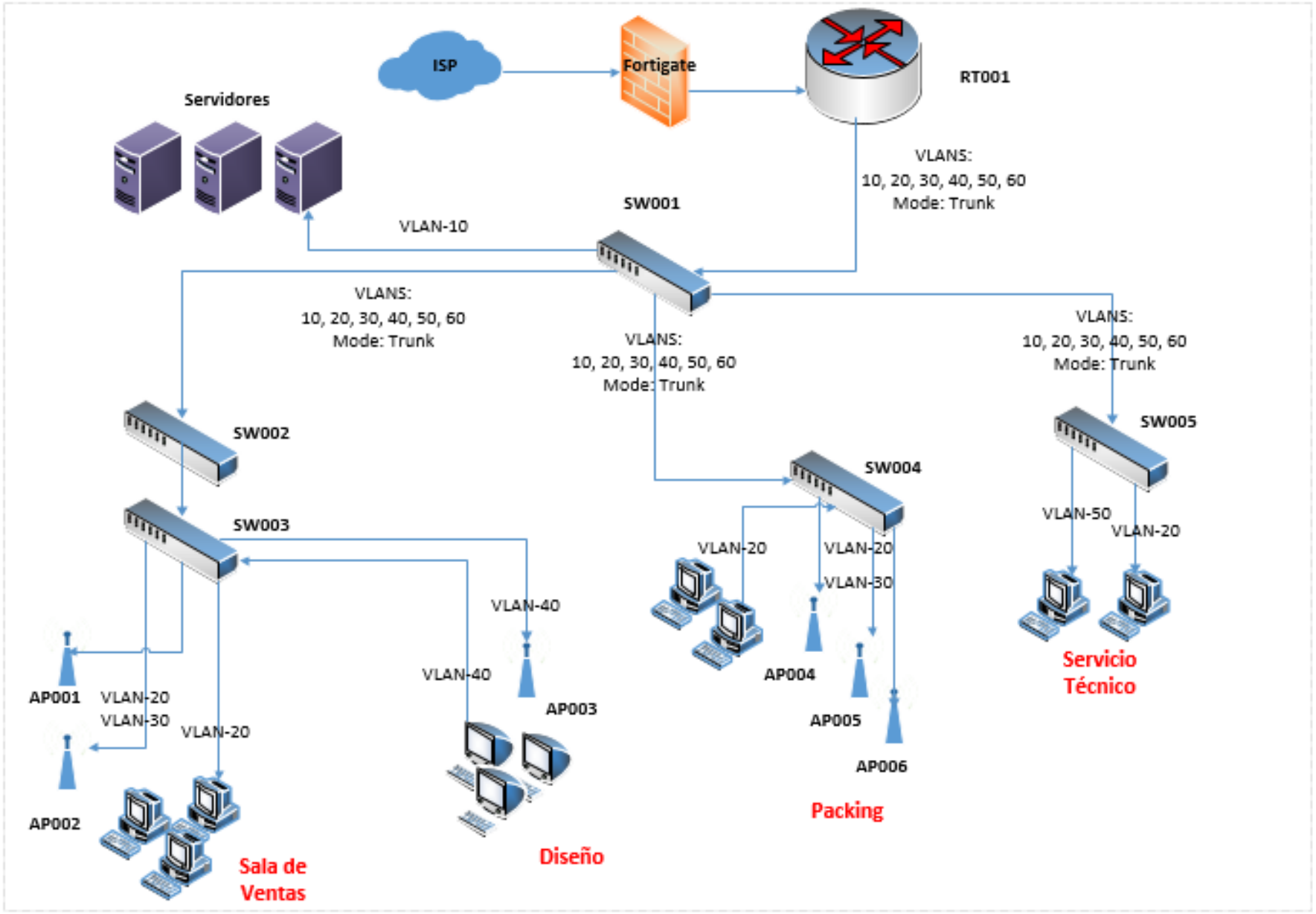
Segmentación por VLAN

VLAN	Nombre
VLAN-10	Usuarios
VLAN-20	Invitados
VLAN-30	Servidores
VLAN-40	Diseño
VLAN-50	Servicio Técnico
VLAN-60	CCTV

OBJETIVO

- Con el reemplazo del equipamiento y la segmentación de las redes, se logra estandarizar la red existente logrando así una mejor gestión del tráfico y fácil detección de fallas, optimizando al máximo el acceso a los diferentes servicios que corren sobre la infraestructura de la empresa.
- Aumentar la seguridad.
- Escalabilidad y robustez.
- Monitorización de los servicios.

PROPUESTA


ISP
Fortigate
RT001
Servidores
VLANS:
10, 20, 30, 40, 50, 60
Mode: Trunk
SW001
VLAN-10
VLANS:
10, 20, 30, 40, 50, 60
Mode: Trunk
VLANS:
10, 20, 30, 40, 50, 60
Mode: Trunk
VLANS:
10, 20, 30, 40, 50, 60
Mode: Trunk
SW002
SW003
SW004
SW005
VLAN-50
VLAN-20
VLAN-20
VLAN-20
VLAN-30
VLAN-40
VLAN-40
AP001
VLAN-20
VLAN-30
VLAN-20
AP002
AP003
AP004
AP005
AP006
Servicio
Técnico
Packing
Diseño
Sala de
Ventas

CONSIDERACIONES PREVIAS

Versión RouterOS

RouterOS version release chains

When upgrading RouterOS, you can choose a release chain from which to install the new packages. For mission critical installations, **bugfixes-only** release chain is suggested, as it does not include freshly added new features and is kept for a long time on the download page, with only critical fixes applied to it.

- **Bugfixed-only** version is the most stable release without new features, just most important fixes. Updated rarely, only when a critical issue is found in a **bugfixes-only** release.
- **Current** includes the same fixes plus improvements and new features. Once a current release has been tested for several months, it is promoted to **bugfix-only** and is no longer updated with features.
- **Release candidate** released a few times per week. Includes newest features, released without intensive testing. Not recommended for production.

Note: Since RouterOS v6.44beta6 release channels have been renamed - "bugfix" to "long-term", "current" to "stable" and "release candidate" to "testing".

CONSIDERACIONES PREVIAS

RouterBOOT Version

Checking RouterBOOT version

This command shows the current RouterBOOT version of your device, and available upgrade which is *either included in routerboard.npk package, or if you uploaded a FWF file* corresponding to device model:

```
[admin@MikroTik] > system routerboard print
       routerboard: yes
             model: "750"
     serial-number: "1FC201DD513B"
  current-firmware: "2.18"
  upgrade-firmware: "2.20"
[admin@MikroTik] >
```

In this case you see, that there is **a newer version** of the Bootloader firmware available already inside your current RouterOS version.

CONSIDERACIONES PREVIAS

RouterBOOT Version

Simple Upgrade

RouterBOOT can be upgraded from RouterOS by:

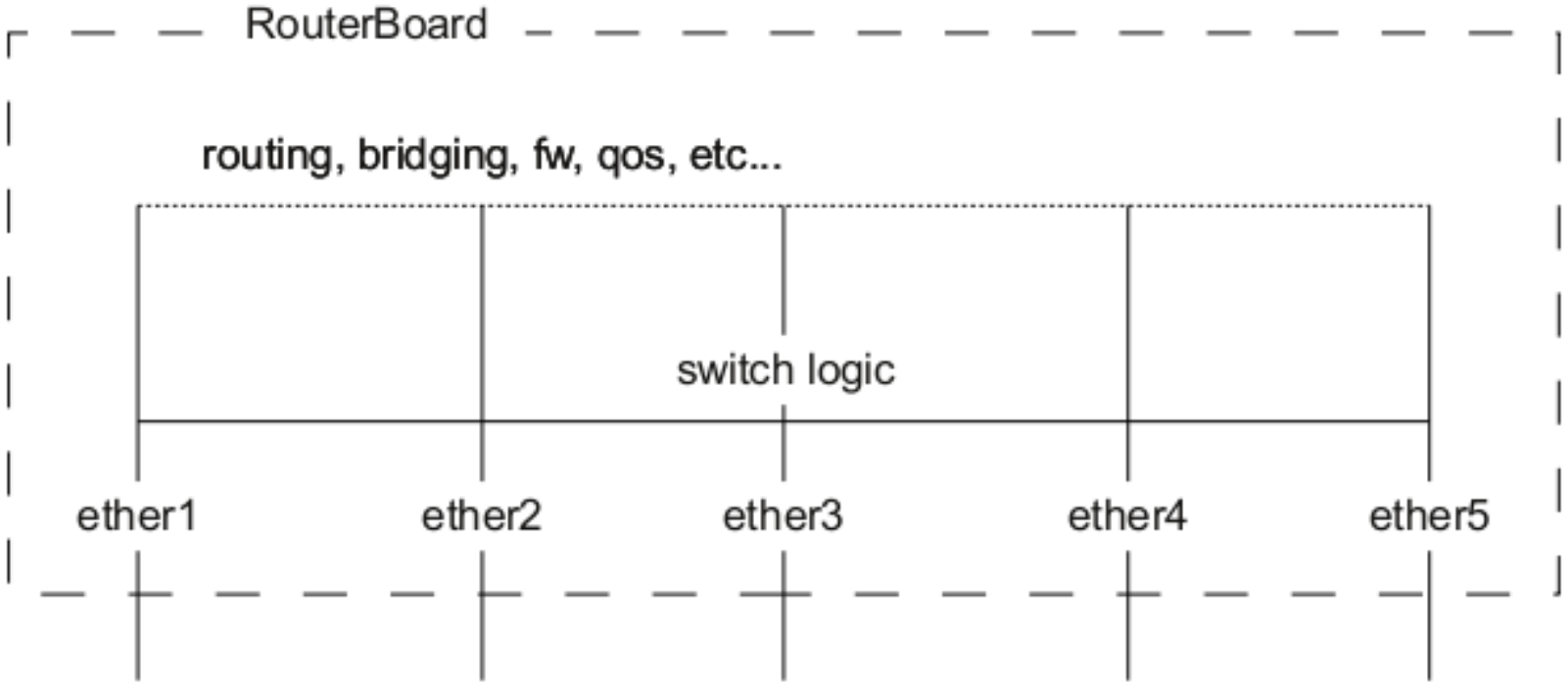
- Run command */system routerboard upgrade*
- Reboot your router to apply the upgrade (*/system reboot*)]

PORT TAGGED Y UNTAGGED

Tagged / Untagged - En el menú ***/interface bridge vlan*** puede especificar una entrada que contenga puertos ***Tagged*** y ***Untagged***. En general, los puertos ***Tagged*** deben ser sus puertos ***Trunk*** y los puertos ***Untagged*** deben ser sus puertos de acceso. Al especificar un puerto ***Tagged, el Bridge siempre establecerá una etiqueta VLAN para los paquetes que se envían a través de este puerto (egreso)***. Al especificar un puerto sin ***Untagged, el bridge siempre eliminará la etiqueta VLAN de los paquetes de egreso.***

BRIDGE HARDWARE OFFLOADING

Desde RouterOS v6.41 es posible conmutar varios puertos juntos si un dispositivo tiene un ***built-in switch chip***. Si bien un ***Bridge es una función de software que consumirá los recursos de la CPU***, la función ***bridge hardware offloading*** le permitirá utilizar el chip incorporado para reenviar paquetes, esto le permite lograr un ***rendimiento más alto***, si está configurado correctamente. El diagrama a continuación ilustra que ***el switching ocurre antes de cualquier acción relacionada con el software***:



LIST OF DEVICES AND FEATURE THAT SUPPORTS HARDWARE OFFLOADING

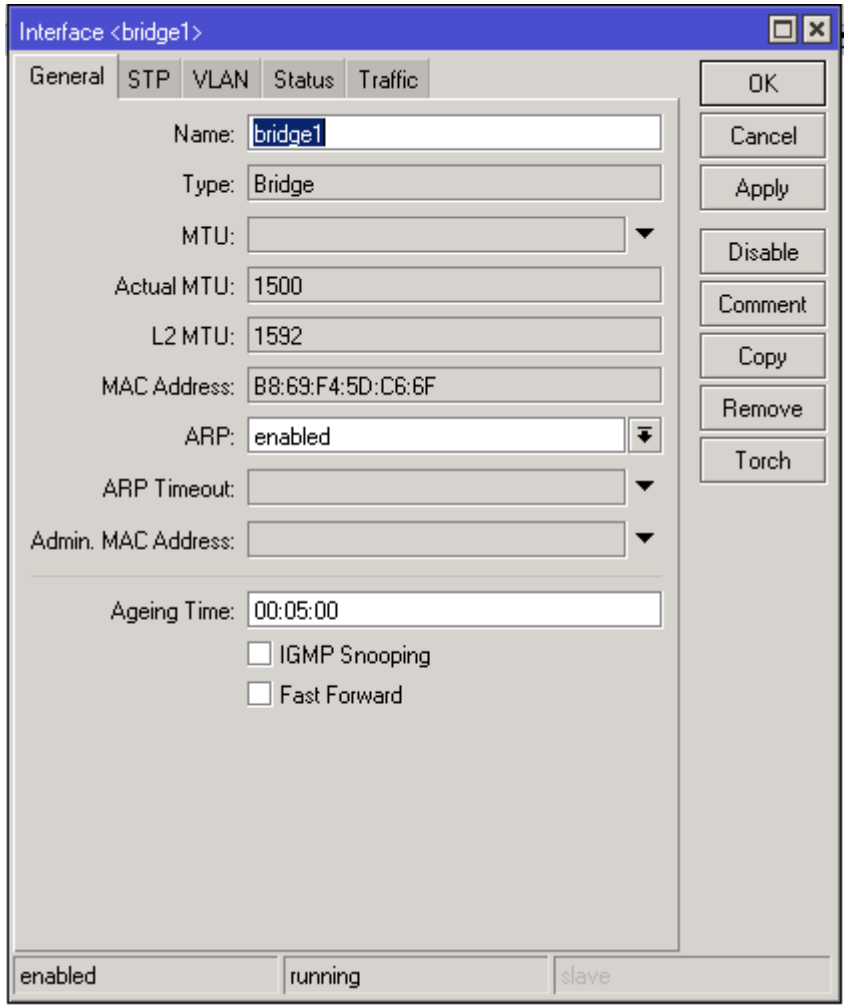
RouterBoard/[Switch Chip] Model	Features in Switch menu	Bridge STP/RSTP	Bridge MSTP	Bridge IGMP Snooping	Bridge DHCP Snooping	Bridge VLAN Filtering	Bonding
CRS3xx series	+	+	+	+	+	+	+
CRS1xx/CRS2xx series	+	+	-	+ [1]	+ [1]	-	-
[QCA8337]	+	+	-	-	+ [2]	-	-
[Atheros8327]	+	+	-	-	+ [2]	-	-
[Atheros8227]	+	+	-	-	-	-	-
[Atheros8316]	+	+	-	-	+ [2]	-	-
[Atheros7240]	+	+	-	-	-	-	-
[MT7621]	+	-	-	-	-	-	-
[RTL8367]	+	-	-	-	-	-	-
[ICPlus175D]	+	-	-	-	-	-	-

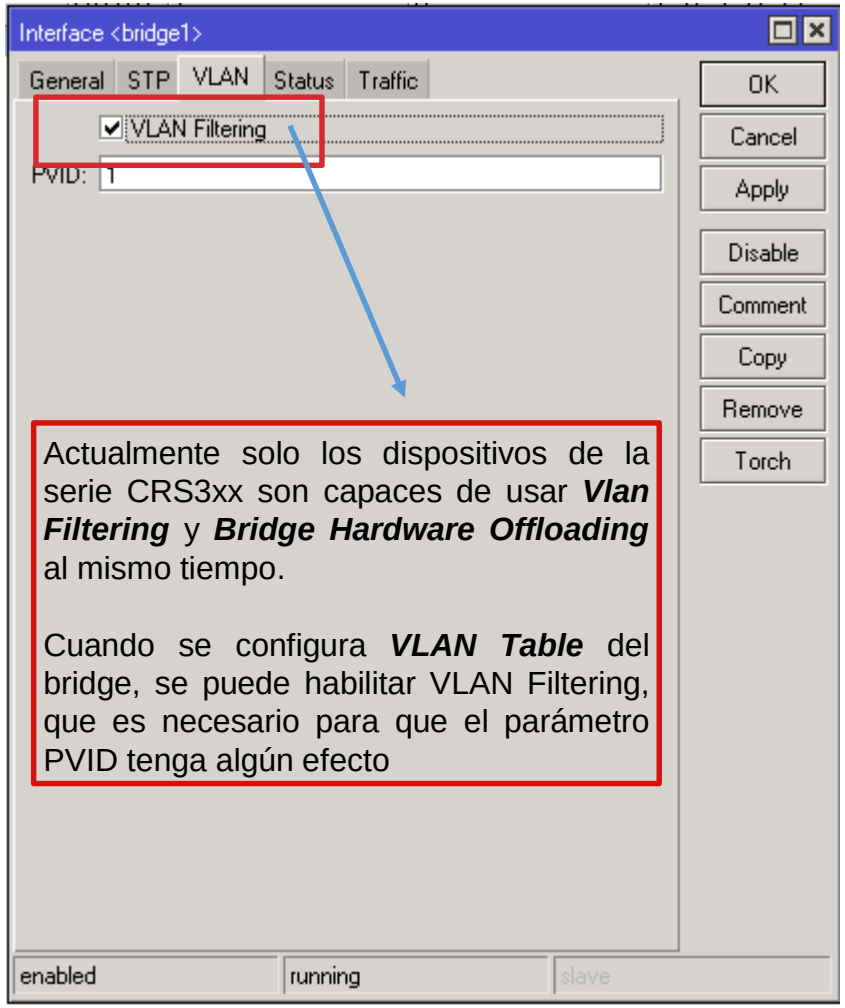
CONFIGURACIONES CRS 326-24G-2S +RM SW001 - SW005
CREACION BRIDGE

PASO 1

```
> interface bridge add name=bridge1
```

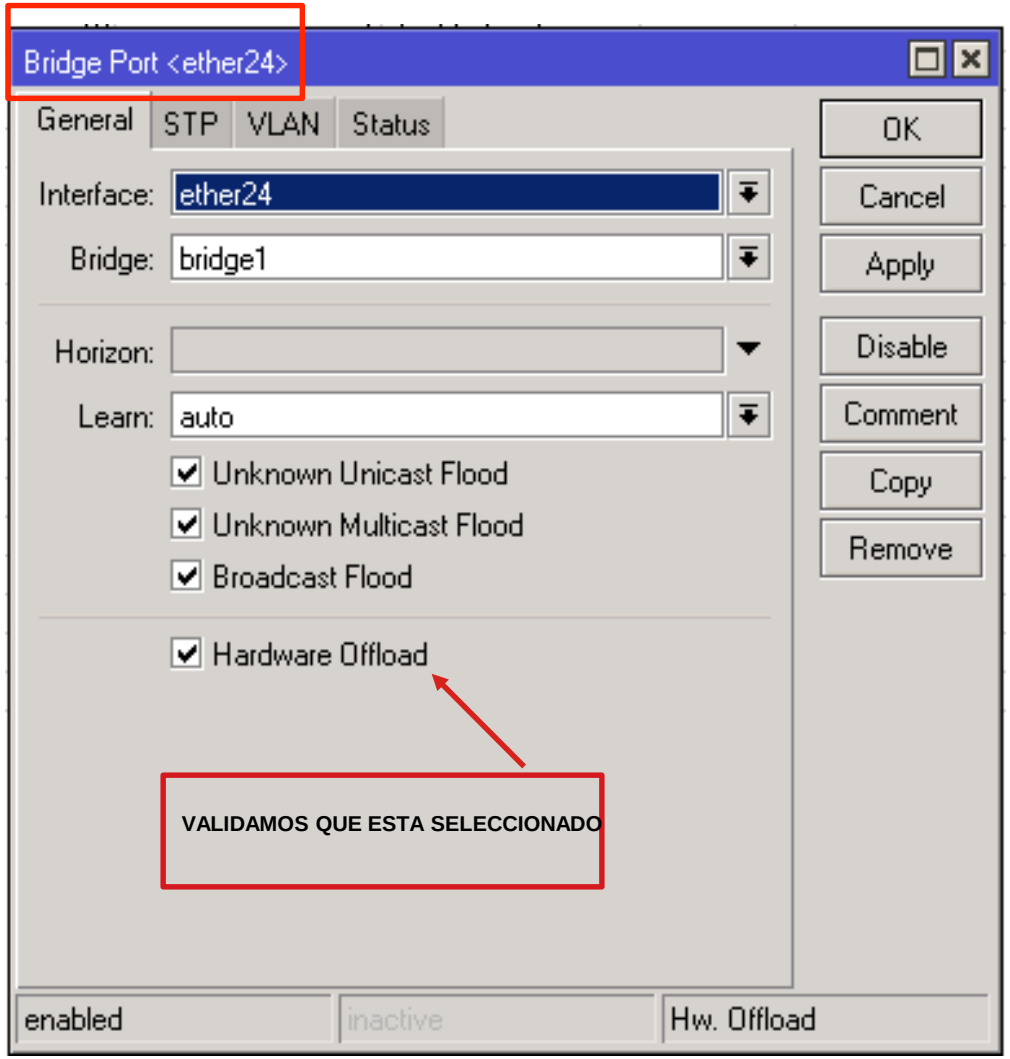
USANDO TERMINAL

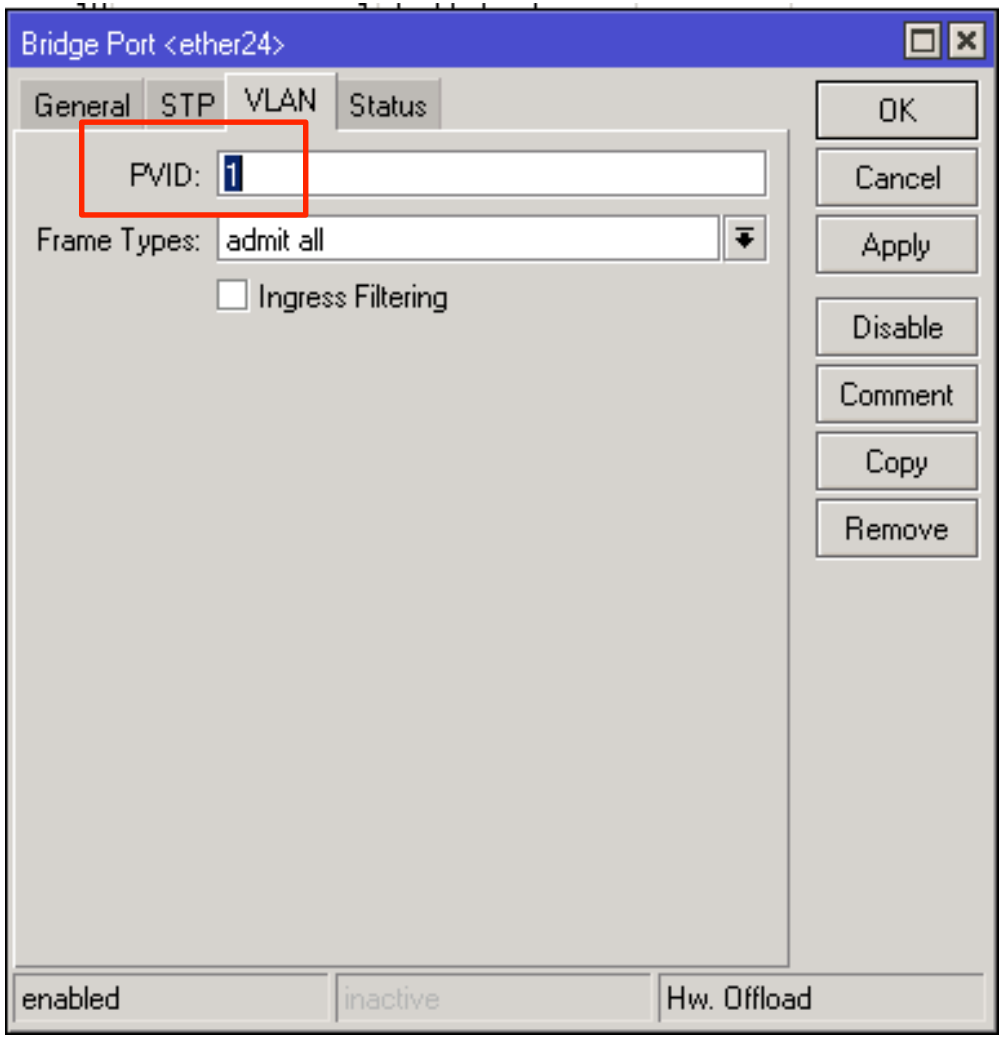




PASO 2

CONFIGURACIONES CRS 326-24G-2S + RM SW001 MAIN, SW002, SW003, SW004, SW005 CASCADAS





Trunk PVID = 1
ether 20-24
SW 001

Trunk PVID = 1
ether 23-24
SW 002

Trunk PVID = 1
ether 23-24
SW 003

Trunk PVID = 1
ether 23-24
SW 004

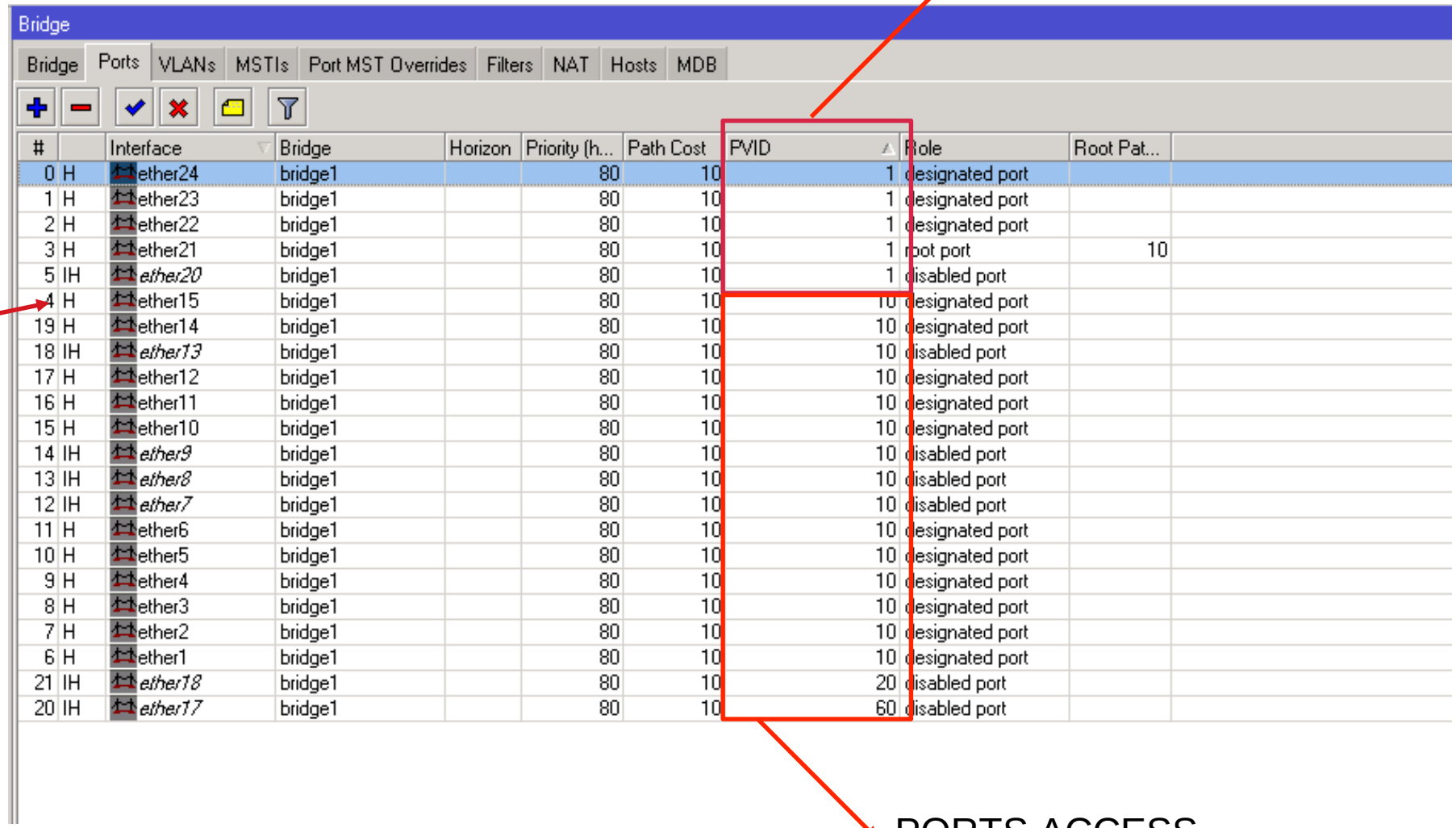
Trunk PVID = 1
ether 23-24
SW 005

PASO 2

CONFIGURACIONES CRS 326-24G-2S + RM SW001

Puertos Trunk PVID = 1
ether 24, ether23, ether22, ether21, ether20

PORTS TRUNK



#		Interface	Bridge	Horizon	Priority (h...	Path Cost	PVID	Role	Root Pat...
0	H	ether24	bridge1		80	10	1	designated port	
1	H	ether23	bridge1		80	10	1	designated port	
2	H	ether22	bridge1		80	10	1	designated port	
3	H	ether21	bridge1		80	10	1	root port	10
5	IH	*ether20*	bridge1		80	10	1	disabled port	
4	H	ether15	bridge1		80	10	10	designated port	
19	H	ether14	bridge1		80	10	10	designated port	
18	IH	*ether13*	bridge1		80	10	10	disabled port	
17	H	ether12	bridge1		80	10	10	designated port	
16	H	ether11	bridge1		80	10	10	designated port	
15	H	ether10	bridge1		80	10	10	designated port	
14	IH	*ether9*	bridge1		80	10	10	disabled port	
13	IH	*ether8*	bridge1		80	10	10	disabled port	
12	IH	*ether7*	bridge1		80	10	10	disabled port	
11	H	ether6	bridge1		80	10	10	designated port	
10	H	ether5	bridge1		80	10	10	designated port	
9	H	ether4	bridge1		80	10	10	designated port	
8	H	ether3	bridge1		80	10	10	designated port	
7	H	ether2	bridge1		80	10	10	designated port	
6	H	ether1	bridge1		80	10	10	designated port	
21	IH	*ether18*	bridge1		80	10	20	disabled port	
20	IH	*ether17*	bridge1		80	10	60	disabled port	

Asegúrese de que todos los puertos del Bridge tengan la bandera "**H**", que indica que el dispositivo está utilizando el ***switch chip*** para reenviar paquetes.

PORTS ACCESS

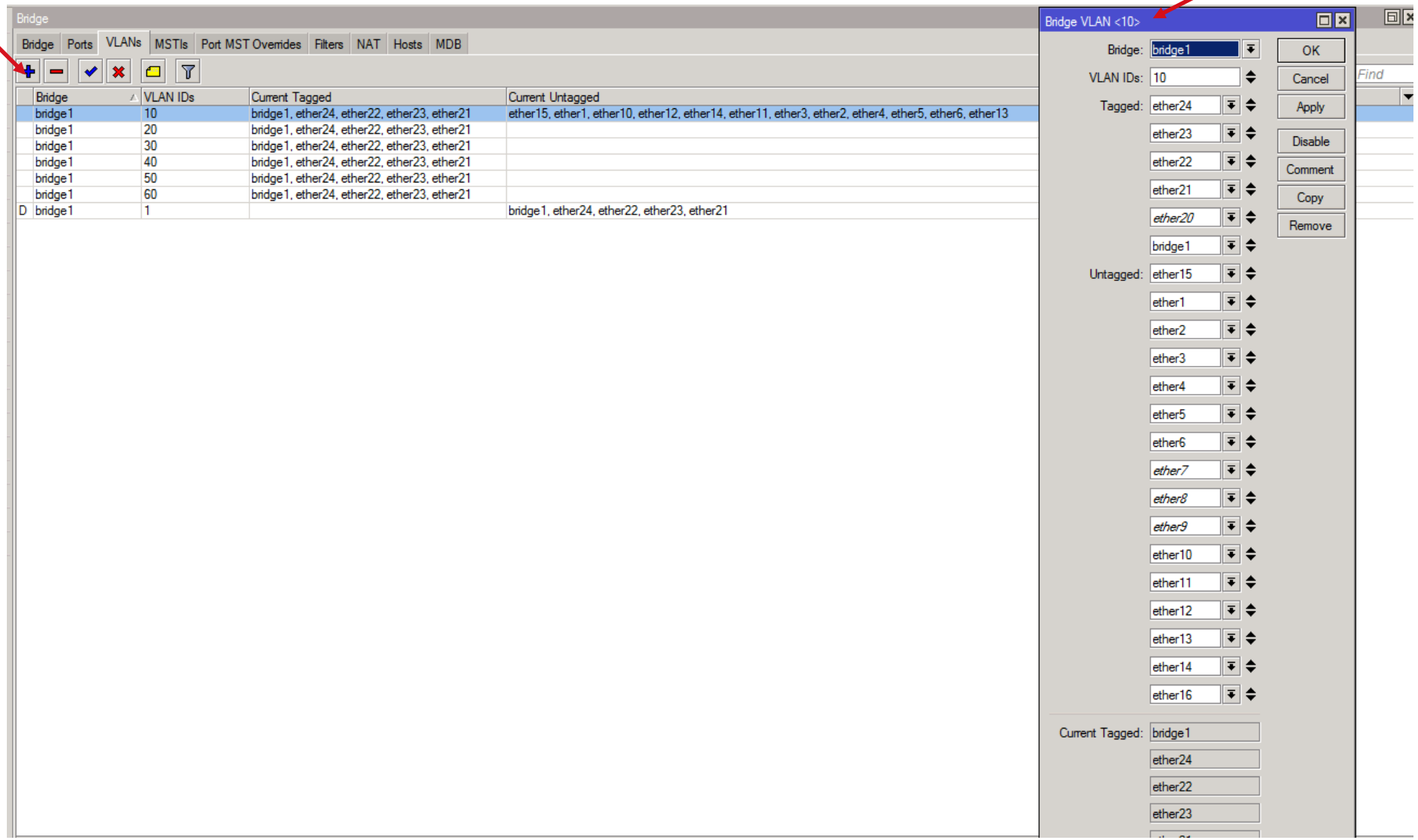
PASO 3

CONFIGURACIONES CRS 326-24G-2S + RM SW001 - SW005

Puertos Trunk PVID = 1
ether 24, ether23, ether22, ether21, ether20

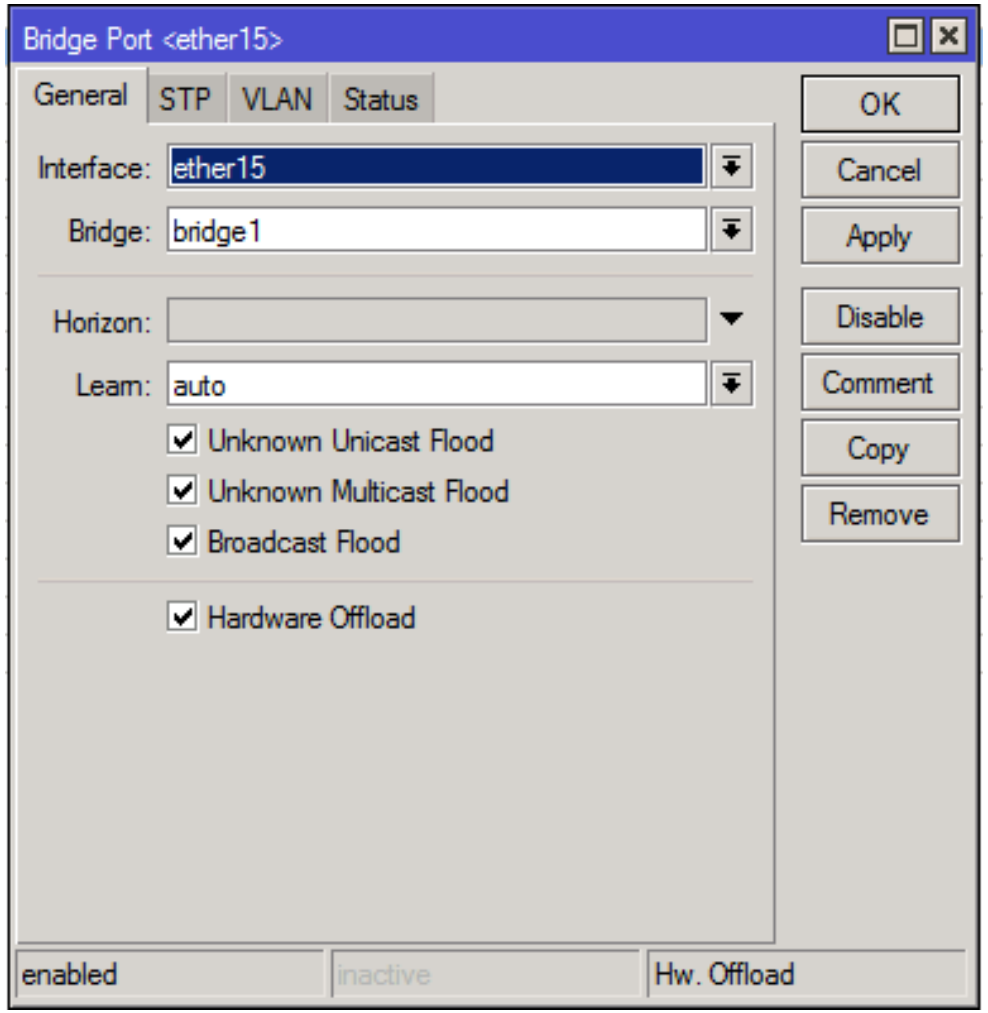
1

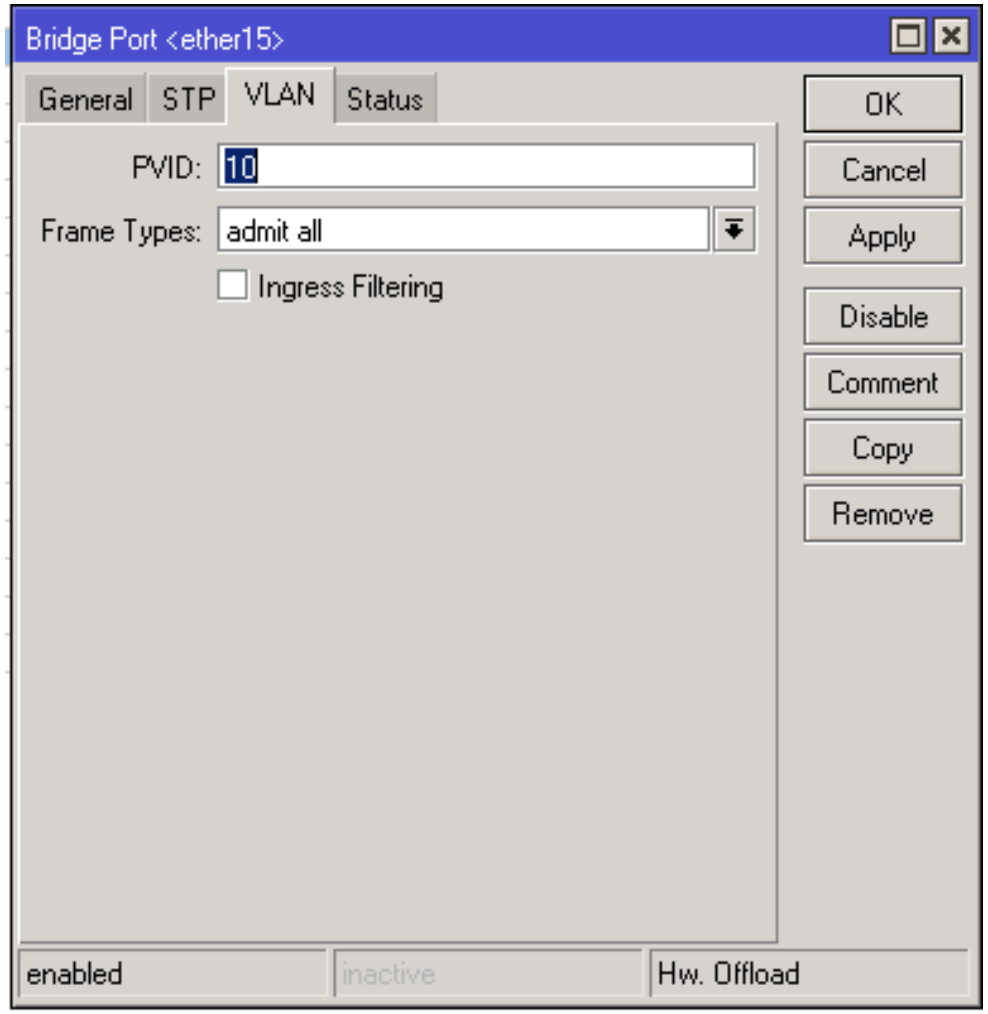
2



CONFIGURACIONES CRS 326-24G-2S +RM SW001

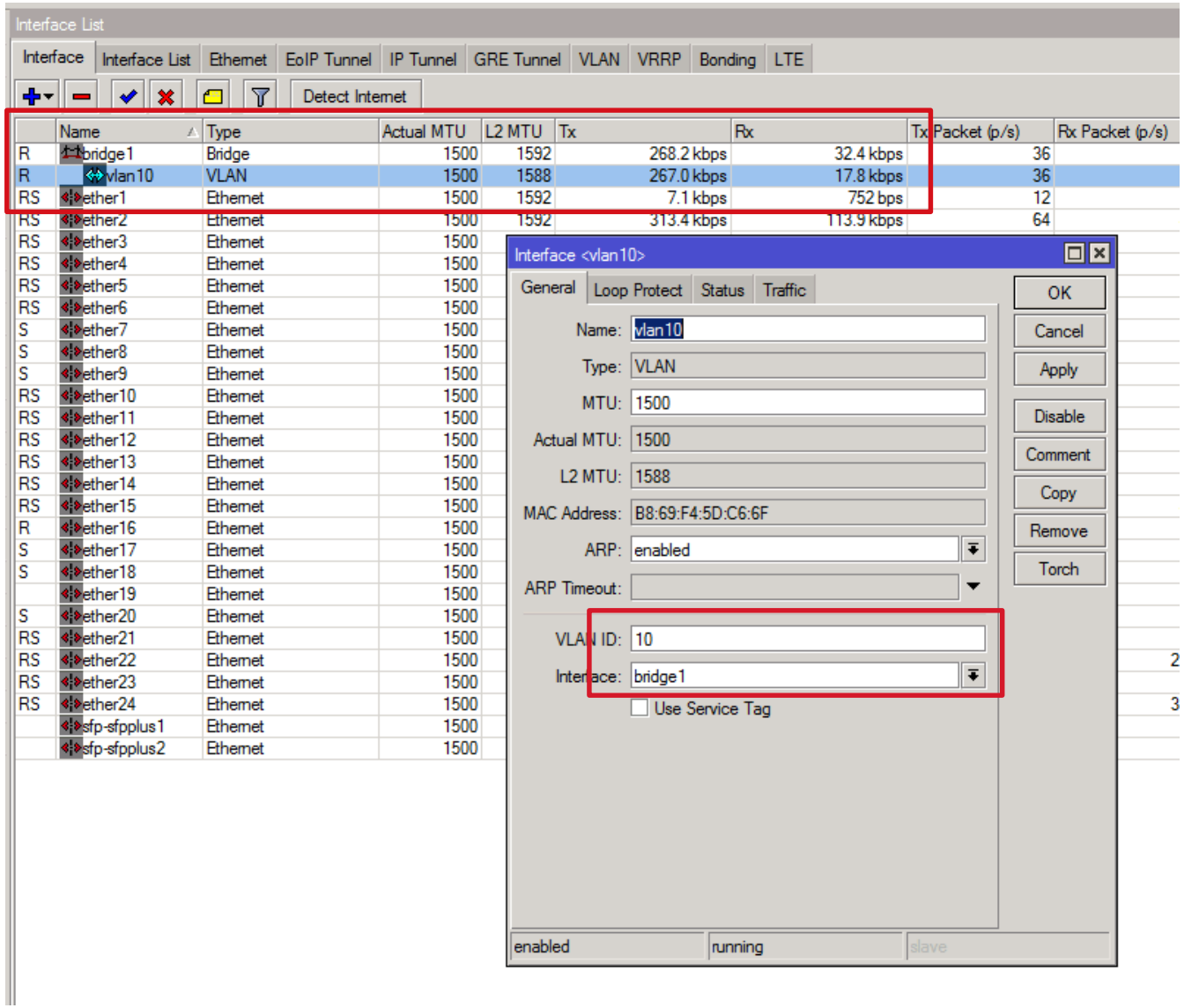
Puertos Access PVID = 10-20-30-40-50-60
ether 15



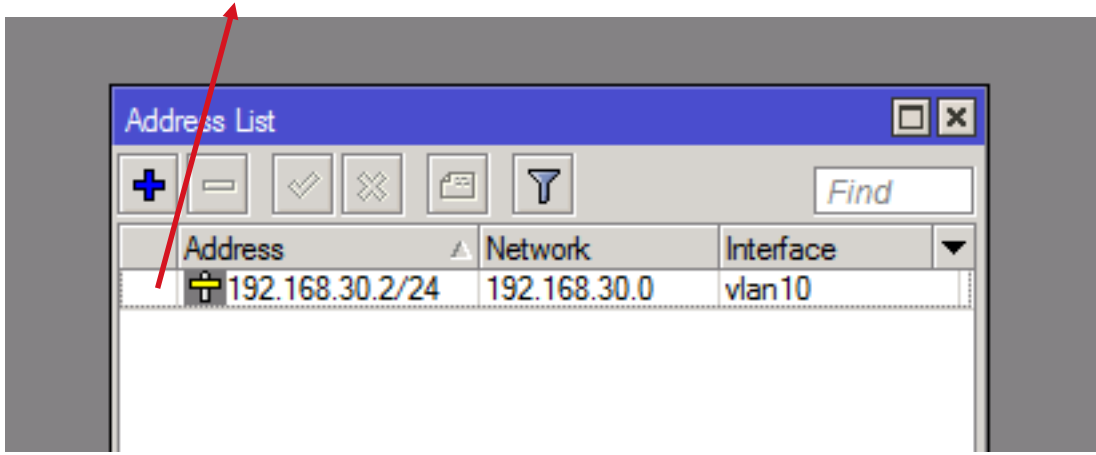


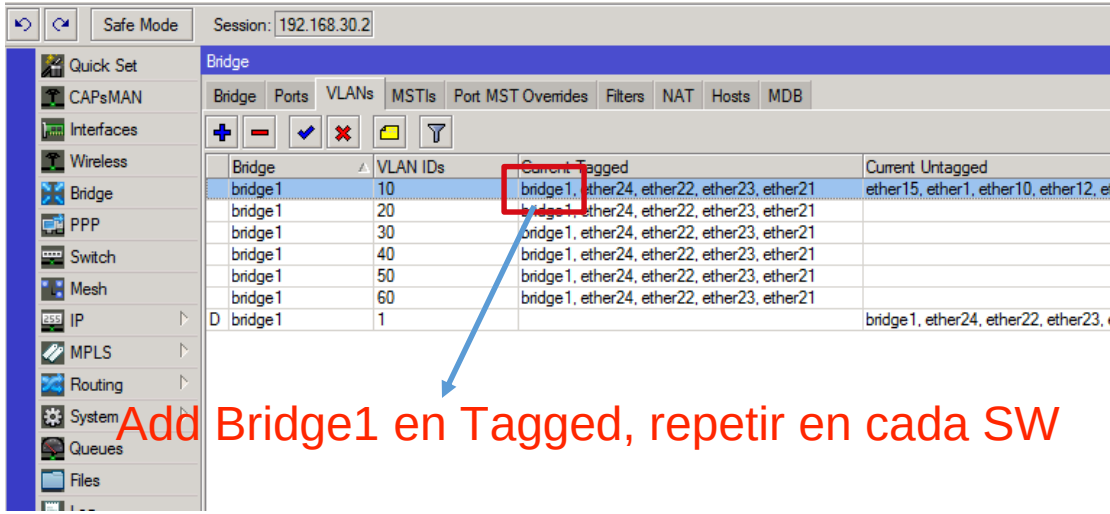
CONFIGURACIONES CRS 326-24G-2S +RM SW001

Management VLAN



IP administrativa

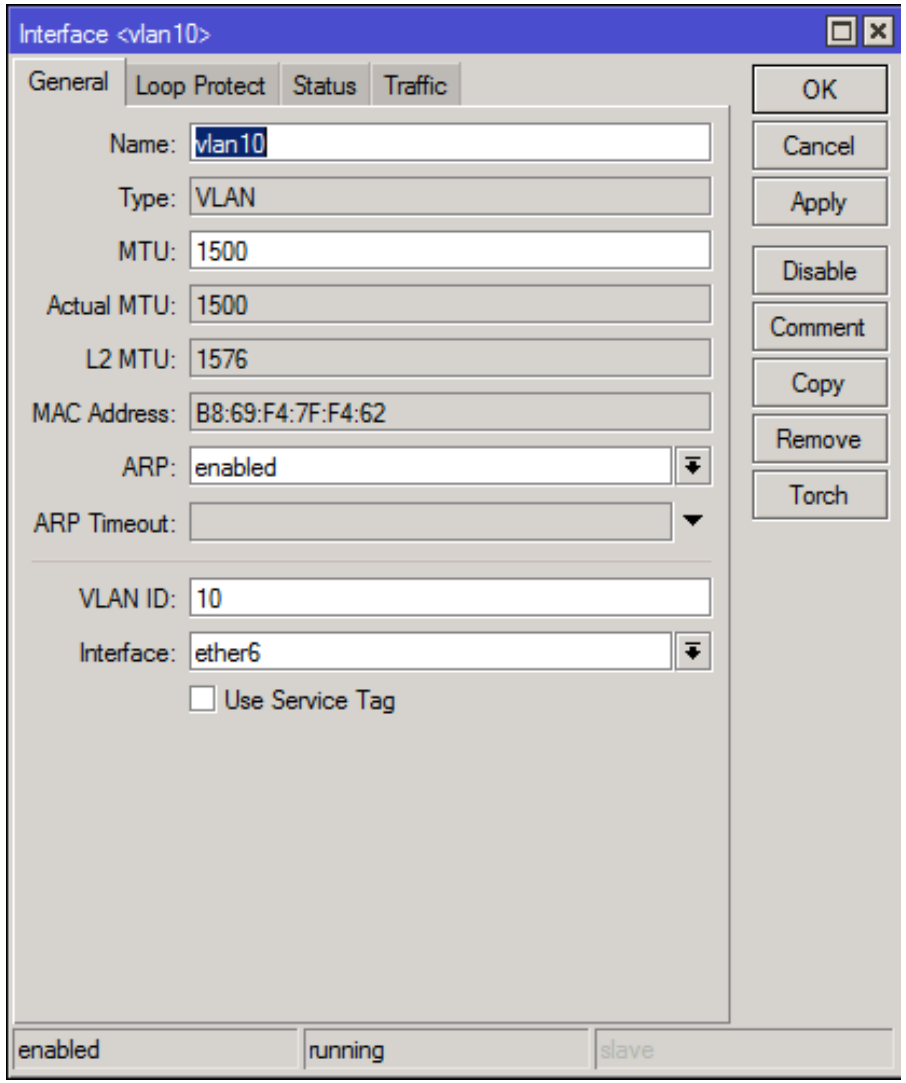




Add Bridge1 en Tagged, repetir en cada SW

CONFIGURACIONES CCR 1009-7G-1C-1S+

Creación de VLAN 10-20-30-40-50-60



CONFIGURACIONES CCR 1009-7G-1C-1S+

Creación de VLAN 10-20-30-40-50-60

	ether4	Ethernet	1500	1580	0 bps	0 bps	0	
	ether5	Ethernet	1500	1580	0 bps	0 bps	0	
;;; Trunk								
R	ether6	Ethernet	1500	1580	37.9 Mbps	37.8 Mbps	4 549	
;;; Servidores y Despositivos de Red								
R	vlan10	VLAN	1500	1576	1210.7 kbps	36.5 Mbps	1 112	
;;; Usuarios y Dispositivos de Impresion								
R	vlan20	VLAN	1500	1576	34.5 Mbps	1059.6 kbps	3 249	
;;; Red Wifi Visitantes								
R	vlan30	VLAN	1500	1576	0 bps	0 bps	0	
;;; Red Diseño								
R	vlan40	VLAN	1500	1576	24.8 kbps	10.7 kbps	10	
;;; Servicio Tecnico Post Venta								
R	vlan50	VLAN	1500	1576	2.0 Mbps	45.9 kbps	178	
;;; CCTV								
R	vlan60	VLAN	1500	1576	0 bps	0 bps	0	
	ether7	Ethernet	1500	1580	0 bps	0 bps	0	
	sfp-sfpplus1	Ethernet	1500	1580	0 bps	0 bps	0	

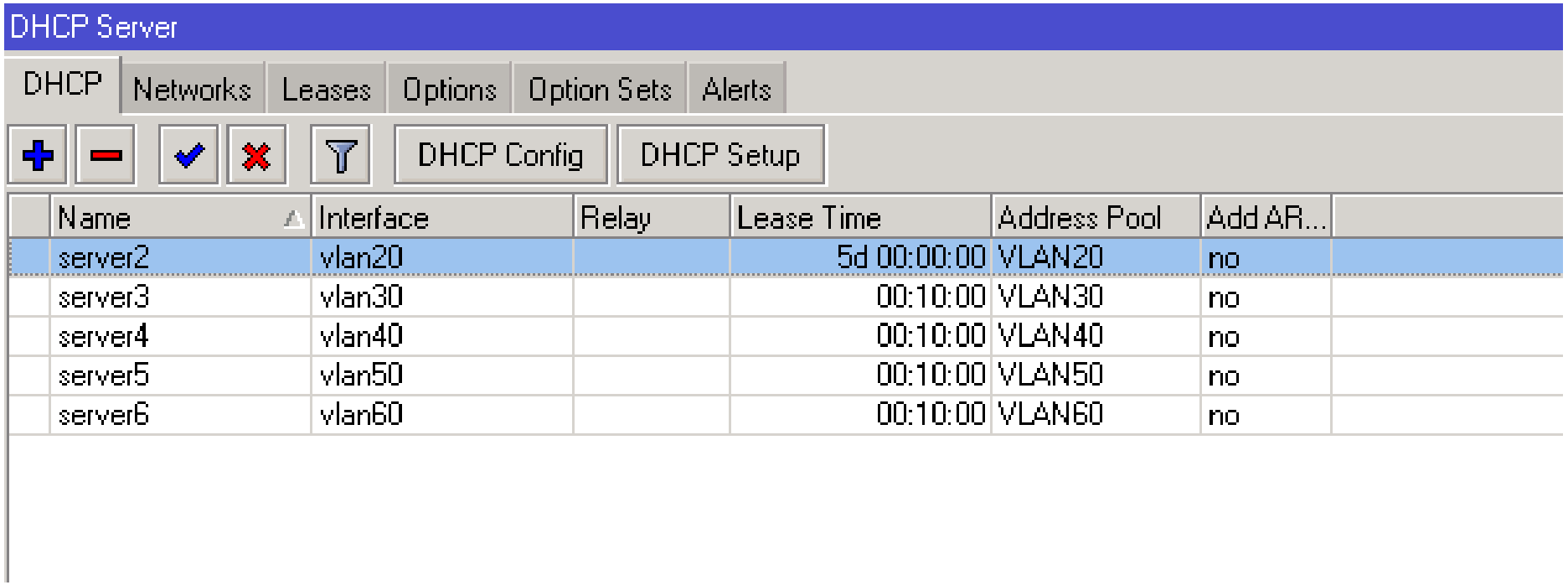
CONFIGURACIONES CCR 1009-7G-1C-1S+

Asignación de redes VLAN 10-20-30-40-50-60

Address	Network	Interface
;;; Servidores y Despositivos de Red		
192.168.30.254/24	192.168.30.0	vlan10
;;; Usuarios y Dispositivos de Impresion		
10.12.2.1/24	10.12.2.0	vlan20
;;; Red Wifi Visitantes		
10.12.3.1/24	10.12.3.0	vlan30
;;; Red Diseño		
10.12.4.1/24	10.12.4.0	vlan40
;;; Servicio Tecnico Post Venta		
10.12.5.1/24	10.12.5.0	vlan50
;;; CCTV		
10.12.6.1/24	10.12.6.0	vlan60

CONFIGURACIONES CCR 1009-7G-1C-1S+

DHCP Server



EL DHCP SERVER PARA LA VLAN10 ESTA CORRIENDO EN OTRO SERVIDOR

CONFIGURACION DE cAP AC Dual-Band

Virtual AP

- Es posible crear puntos de acceso virtual usando el comando agregar en el menú inalámbrico. Debe especificar la interfaz maestra a la que pertenecerá la interfaz virtual. El VirtualAP heredará el modo del maestro, pero puede tener su propio SSID y perfil de seguridad.

- La interfaz AP virtual solo funcionará si la interfaz maestra está en modo ap-bridge, bridge, station o wds-slave. Funciona solo con el protocolo 802.11, no se admite Nv2.

- Puede crear hasta 127 interfaces virtuales por interfaz física. No se recomienda crear más de 30, ya que el rendimiento comenzará a degradarse.

CONFIGURACION DE cAP AC Dual-Band

La misma configuración aplica al resto de los APs

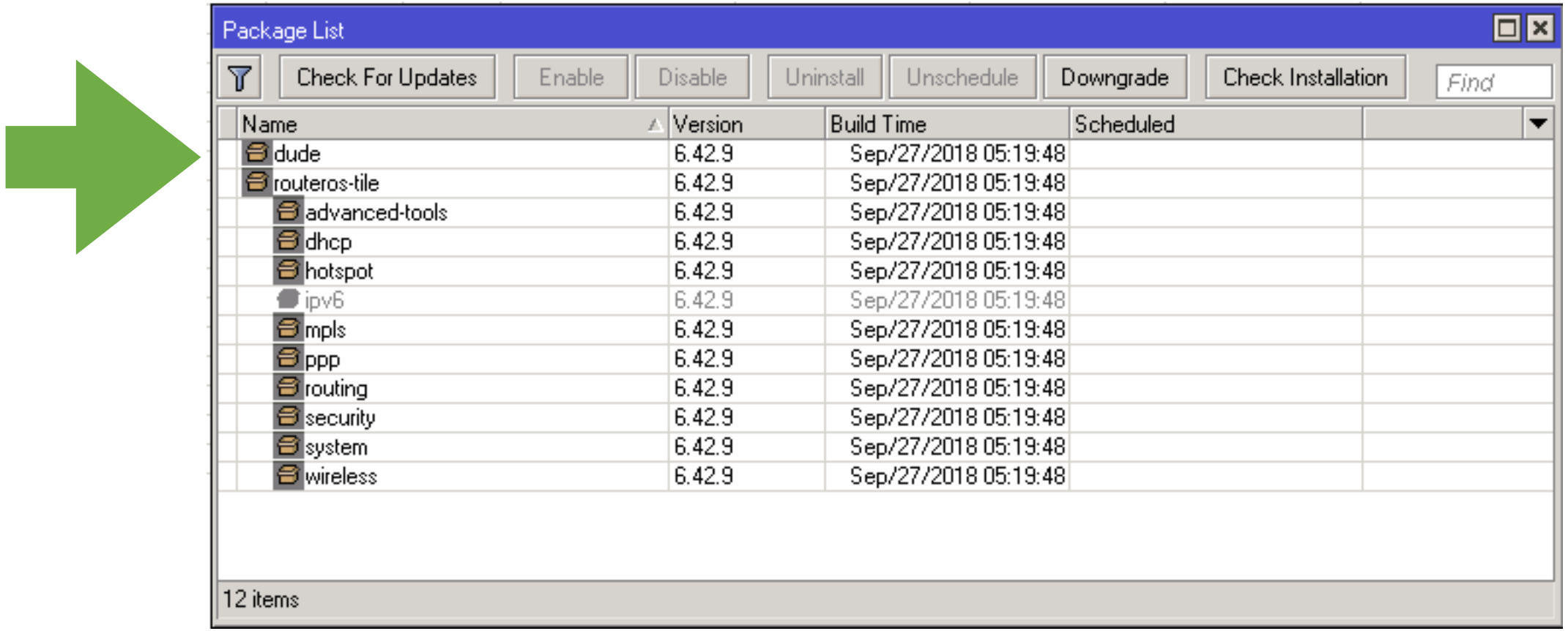
```
[admin@MikroTik] > interface wireless print detail
Flags: X - disabled, R - running
 0    ;;; Usuarios 2G
      name="wlan1" mtu=1500 l2mtu=1600 mac-address=CC:2D:E0:1B:7D:D2 arp=enabled interface-type=IPQ4019 mode=ap-bridge ssid="Usuarios" frequency=auto
      band=2ghz-b/g/n channel-width=20/40mhz-Ce secondary-channel="" scan-list=default wireless-protocol=802.11 vlan-mode=use-tag vlan-id=10
      wds-mode=disabled wds-default-bridge=none wds-ignore-ssid=no bridge-mode=enabled default-authentication=yes default-forwarding=yes
      default-ap-tx-limit=0 default-client-tx-limit=0 hide-ssid=no security-profile=Usuarios compression=no

 1    ;;; Usuarios 5G
      name="wlan2" mtu=1500 l2mtu=1600 mac-address=CC:2D:E0:1B:7D:D3 arp=enabled interface-type=IPQ4019 mode=ap-bridge ssid="Usuarios" frequency=auto
      band=5ghz-a/n/ac channel-width=20/40/80mhz-eeCe secondary-channel="" scan-list=default wireless-protocol=802.11 vlan-mode=use-tag vlan-id=10
      wds-mode=disabled wds-default-bridge=none wds-ignore-ssid=no bridge-mode=enabled default-authentication=yes default-forwarding=yes
      default-ap-tx-limit=0 default-client-tx-limit=0 hide-ssid=no security-profile=Usuarios compression=no

 2    ;;; Invitados 5G
      name="wlan3" mtu=1500 l2mtu=1600 mac-address=CE:2D:E0:1B:7D:D2 arp=enabled interface-type=virtual master-interface=wlan1 mode=ap-bridge
      ssid="Invitados " vlan-mode=use-tag vlan-id=20 wds-mode=disabled wds-default-bridge=none wds-ignore-ssid=no bridge-mode=enabled
      default-authentication=yes default-forwarding=yes default-ap-tx-limit=0 default-client-tx-limit=0 hide-ssid=no security-profile=Invitados

 3    ;;; Invitados 5G
      name="wlan4" mtu=1500 l2mtu=1600 mac-address=CE:2D:E0:1B:7D:D3 arp=enabled interface-type=virtual master-interface=wlan2 mode=ap-bridge
      ssid="Invitados " vlan-mode=use-tag vlan-id=20 wds-mode=disabled wds-default-bridge=none wds-ignore-ssid=no bridge-mode=enabled
      default-authentication=yes default-forwarding=yes default-ap-tx-limit=0 default-client-tx-limit=0 hide-ssid=no security-profile=Invitados

 4    ;;; Dise o 5G
      name="wlan5" mtu=1500 l2mtu=1600 mac-address=CE:2D:E0:1B:7D:D4 arp=enabled interface-type=virtual master-interface=wlan1 mode=ap-bridge ssid="Dise\F1o"
      vlan-mode=use-tag vlan-id=40 wds-mode=disabled wds-default-bridge=none wds-ignore-ssid=no bridge-mode=enabled default-authentication=yes
      default-forwarding=yes default-ap-tx-limit=0 default-client-tx-limit=0 hide-ssid=no security-profile=Dise\F1o

 5    ;;; Dise o 5G
      name="wlan6" mtu=1500 l2mtu=1600 mac-address=CE:2D:E0:1B:7D:D5 arp=enabled interface-type=virtual master-interface=wlan2 mode=ap-bridge ssid="Dise\F1o"
      vlan-mode=use-tag vlan-id=40 wds-mode=disabled wds-default-bridge=none wds-ignore-ssid=no bridge-mode=enabled default-authentication=yes
      default-forwarding=yes default-ap-tx-limit=0 default-client-tx-limit=0 hide-ssid=no security-profile=Dise\F1o
[admin@MikroTik] >
```

CONFIGURACION DE cAP AC Dual-Band

Agregamos todas las interfaces al Bridge1

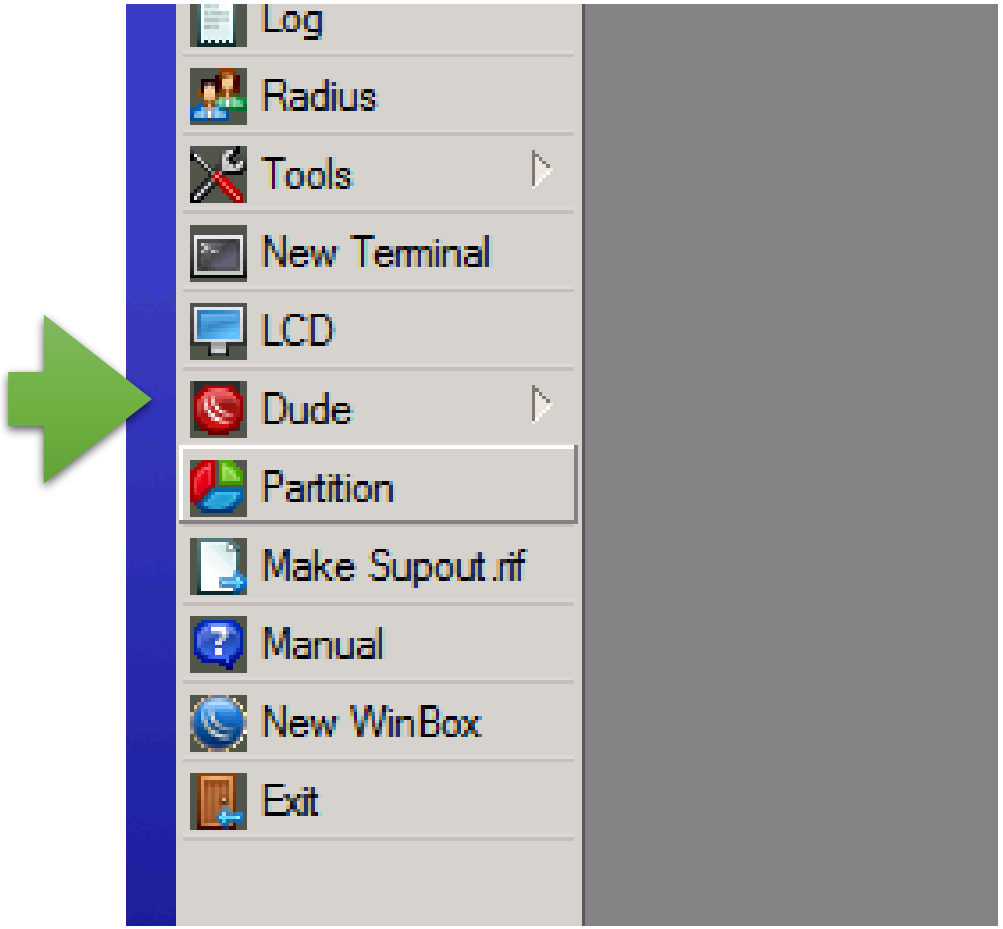
```
[admin@MikroTik] > interface bridge port print detail
Flags: X - disabled, I - inactive, D - dynamic, H - hw-offload
 0 I   interface=wlan1 bridge=bridge1 priority=0x80 path-cost=10 internal-path-cost=10 edge=auto point-to-point=auto learn=auto horizon=none auto-isolate=no
       restricted-role=no restricted-tcn=no pvid=1 frame-types=admit-all ingress-filtering=no unknown-unicast-flood=yes unknown-multicast-flood=yes
       broadcast-flood=yes

 1 I   interface=wlan2 bridge=bridge1 priority=0x80 path-cost=10 internal-path-cost=10 edge=auto point-to-point=auto learn=auto horizon=none auto-isolate=no
       restricted-role=no restricted-tcn=no pvid=1 frame-types=admit-all ingress-filtering=no unknown-unicast-flood=yes unknown-multicast-flood=yes
       broadcast-flood=yes

 2 I   interface=ether2 bridge=bridge1 priority=0x80 path-cost=10 internal-path-cost=10 edge=auto point-to-point=auto learn=auto horizon=none hw=no
       auto-isolate=no restricted-role=no restricted-tcn=no pvid=1 frame-types=admit-all ingress-filtering=no unknown-unicast-flood=yes
       unknown-multicast-flood=yes broadcast-flood=yes

 3     interface=ether1 bridge=bridge1 priority=0x80 path-cost=10 internal-path-cost=10 edge=auto point-to-point=auto learn=auto horizon=none hw=no
       auto-isolate=no restricted-role=no restricted-tcn=no pvid=1 frame-types=admit-all ingress-filtering=no unknown-unicast-flood=yes
       unknown-multicast-flood=yes broadcast-flood=yes

 4 I   interface=wlan3 bridge=bridge1 priority=0x80 path-cost=10 internal-path-cost=10 edge=auto point-to-point=auto learn=auto horizon=none auto-isolate=no
       restricted-role=no restricted-tcn=no pvid=1 frame-types=admit-all ingress-filtering=no unknown-unicast-flood=yes unknown-multicast-flood=yes
       broadcast-flood=yes

 5 I   interface=wlan4 bridge=bridge1 priority=0x80 path-cost=10 internal-path-cost=10 edge=auto point-to-point=auto learn=auto horizon=none auto-isolate=no
       restricted-role=no restricted-tcn=no pvid=1 frame-types=admit-all ingress-filtering=no unknown-unicast-flood=yes unknown-multicast-flood=yes
       broadcast-flood=yes

 6 I   interface=wlan5 bridge=bridge1 priority=0x80 path-cost=10 internal-path-cost=10 edge=auto point-to-point=auto learn=auto horizon=none auto-isolate=no
       restricted-role=no restricted-tcn=no pvid=1 frame-types=admit-all ingress-filtering=no unknown-unicast-flood=yes unknown-multicast-flood=yes
       broadcast-flood=yes

 7 I   interface=wlan6 bridge=bridge1 priority=0x80 path-cost=10 internal-path-cost=10 edge=auto point-to-point=auto learn=auto horizon=none auto-isolate=no
       restricted-role=no restricted-tcn=no pvid=1 frame-types=admit-all ingress-filtering=no unknown-unicast-flood=yes unknown-multicast-flood=yes
       broadcast-flood=yes
[admin@MikroTik] >
```

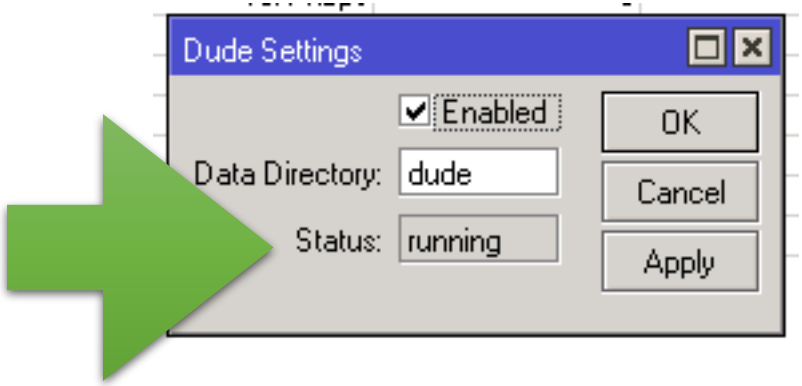
DUDE SERVER



INSTALAR DUDE SERVER CORRESPONDIENTE A LA ARQUITECTURA TILE

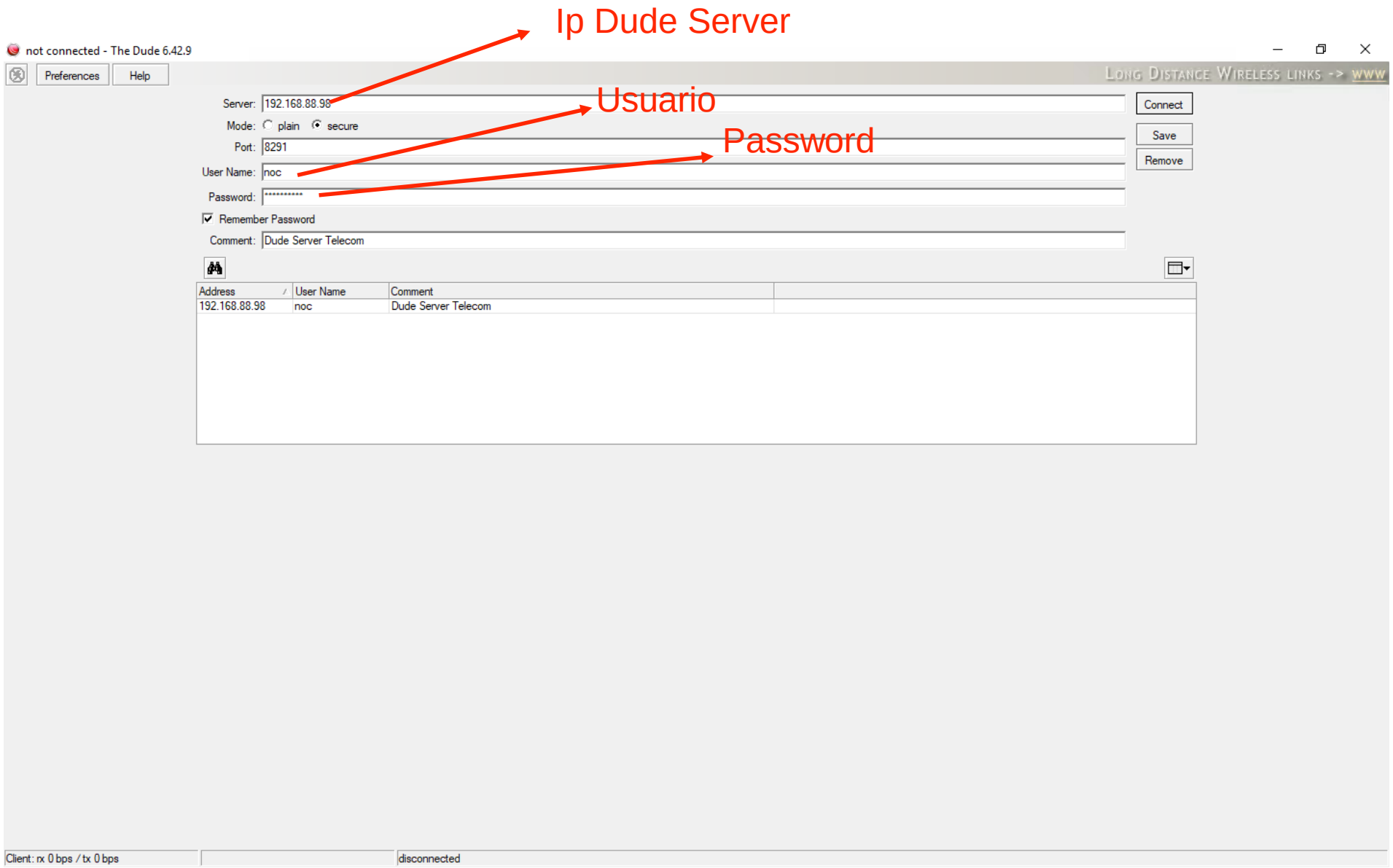
DUDE SERVER



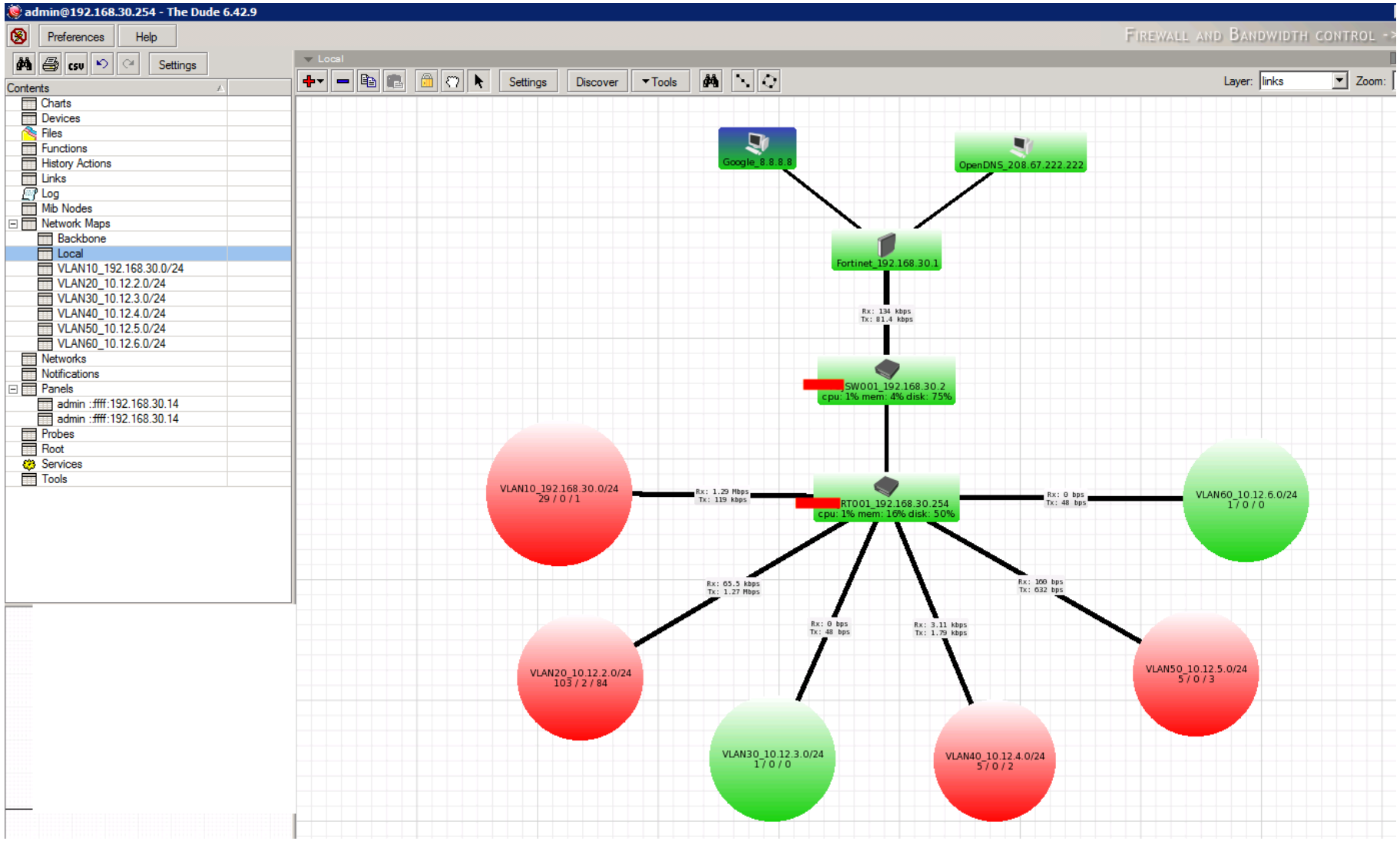


VALIDAMOS QUE EL SERVICIO ESTE RUNNING

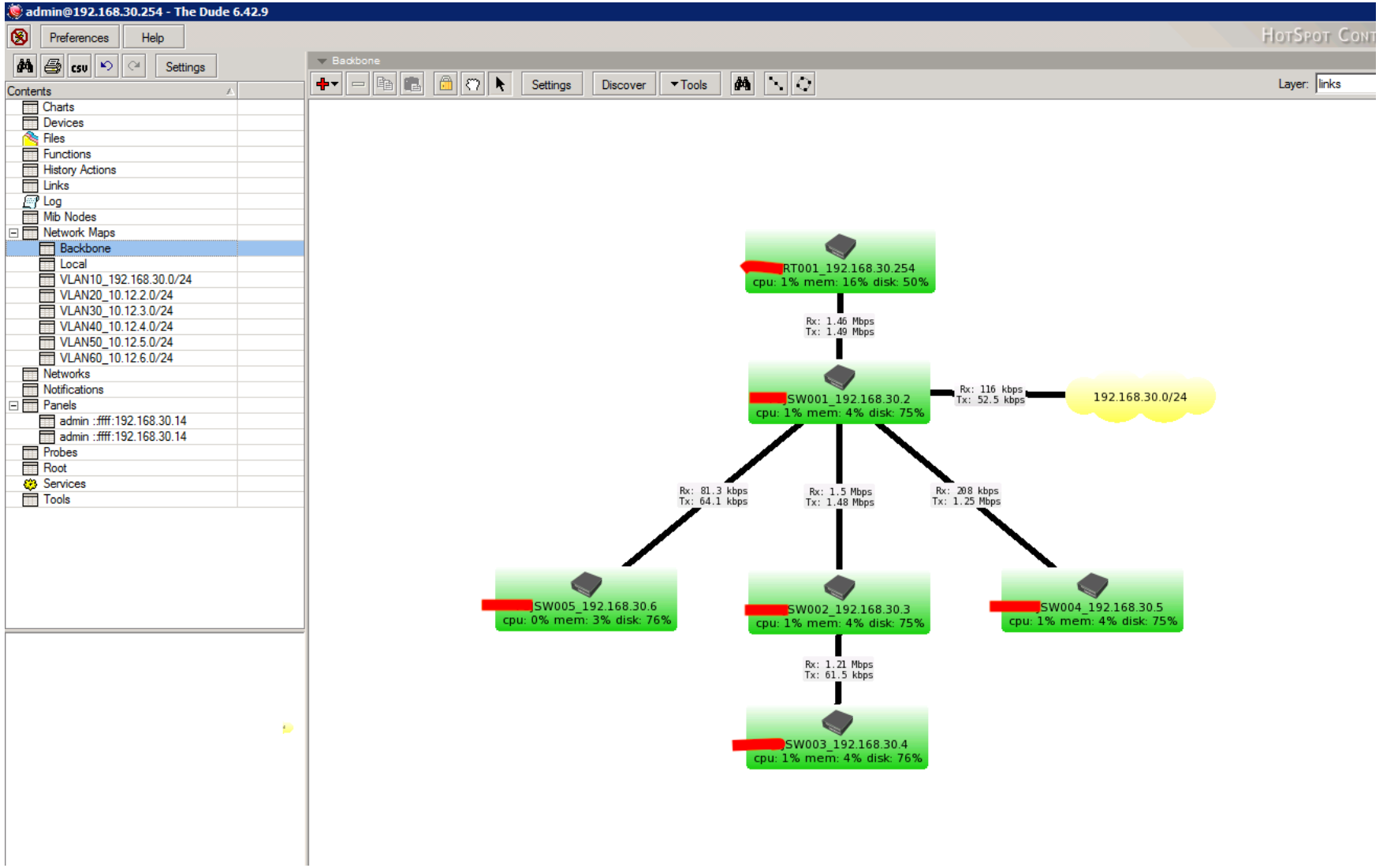
DUDE CLIENT


Ip Dude Server
Usuario
Password
not connected - The Dude 6.42.9
Preferences
Help
Long Distance Wireless Links -> www
Server: 192.168.88.98
Mode: plain secure
Port: 8291
User Name: noc
Password:
Remember Password
Comment: Dude Server Telecom
Connect
Save
Remove
Address
User Name
Comment
192.168.88.98
noc
Dude Server Telecom
Client: rx 0 bps / tx 0 bps
disconnected

DUDE SERVER


admin@192.168.30.254 - The Dude 6.42.9
Preferences
Help
Settings
Contents
Charts
Devices
Files
Functions
History Actions
Links
Log
Mib Nodes
Network Maps
Backbone
Local
VLAN10_192.168.30.0/24
VLAN20_10.12.2.0/24
VLAN30_10.12.3.0/24
VLAN40_10.12.4.0/24
VLAN50_10.12.5.0/24
VLAN60_10.12.6.0/24
Networks
Notifications
Panels
admin :ffff:192.168.30.14
admin :ffff:192.168.30.14
Probes
Root
Services
Tools
Local
Settings
Discover
Tools
Layer:
links
Zoom:
Google_8.8.8.8
OpenDNS_208.67.222.222
Fortinet_192.168.30.1
Rx: 134 kbps
Tx: 81.4 kbps
SW001_192.168.30.2
cpu: 1% mem: 4% disk: 75%
VLAN10_192.168.30.0/24
29 / 0 / 1
Rx: 1.29 Mbps
Tx: 119 kbps
RT001_192.168.30.254
cpu: 1% mem: 16% disk: 50%
Rx: 0 bps
Tx: 48 bps
VLAN60_10.12.6.0/24
1 / 0 / 0
Rx: 65.5 kbps
Tx: 1.27 Mbps
Rx: 0 bps
Tx: 48 bps
Rx: 3.11 kbps
Tx: 1.79 kbps
Rx: 160 bps
Tx: 632 bps
VLAN20_10.12.2.0/24
103 / 2 / 84
VLAN30_10.12.3.0/24
1 / 0 / 0
VLAN40_10.12.4.0/24
5 / 0 / 2
VLAN50_10.12.5.0/24
5 / 0 / 3

DUDE SERVER


admin@192.168.30.254 - The Dude 6.42.9
Preferences
Help
Settings
Contents
Charts
Devices
Files
Functions
History Actions
Links
Log
Mib Nodes
Network Maps
Backbone
Local
VLAN10_192.168.30.0/24
VLAN20_10.12.2.0/24
VLAN30_10.12.3.0/24
VLAN40_10.12.4.0/24
VLAN50_10.12.5.0/24
VLAN60_10.12.6.0/24
Networks
Notifications
Panels
admin ::ffff:192.168.30.14
admin ::ffff:192.168.30.14
Probes
Root
Services
Tools
Backbone
Settings
Discover
Tools
Layer:
links
RT001_192.168.30.254
cpu: 1% mem: 16% disk: 50%
Rx: 1.46 Mbps
Tx: 1.49 Mbps
SW001_192.168.30.2
cpu: 1% mem: 4% disk: 75%
Rx: 116 kbps
Tx: 52.5 kbps
192.168.30.0/24
Rx: 81.3 kbps
Tx: 64.1 kbps
Rx: 1.5 Mbps
Tx: 1.48 Mbps
Rx: 208 kbps
Tx: 1.25 Mbps
SW005_192.168.30.6
cpu: 0% mem: 3% disk: 76%
SW002_192.168.30.3
cpu: 1% mem: 4% disk: 75%
SW004_192.168.30.5
cpu: 1% mem: 4% disk: 75%
Rx: 1.21 Mbps
Tx: 61.5 kbps
SW003_192.168.30.4
cpu: 1% mem: 4% disk: 76%

MATERIAL DE CONSULTA

https://wiki.mikrotik.com/wiki/Manual:CRS3xx_series_switches

https://wiki.mikrotik.com/wiki/Manual:VLANs_on_Wireless

https://wiki.mikrotik.com/wiki/Manual:Interface/Bridge#Management_port

https://wiki.mikrotik.com/wiki/Manual:Upgrading_RouterOS#RouterOS_version_release_chains

https://wiki.mikrotik.com/wiki/Manual:Bridge_VLAN_Table

https://wiki.mikrotik.com/wiki/Manual:Interface/Wireless#VirtualAP

CONTACTO

Más información acerca de nuestros servicios envíenos sus preguntas o comentarios llenando el formulario en nuestro sitio web y un miembro del **TEAM STCH** se pondrá en contacto con usted.

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