



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

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Tecnología de la Información

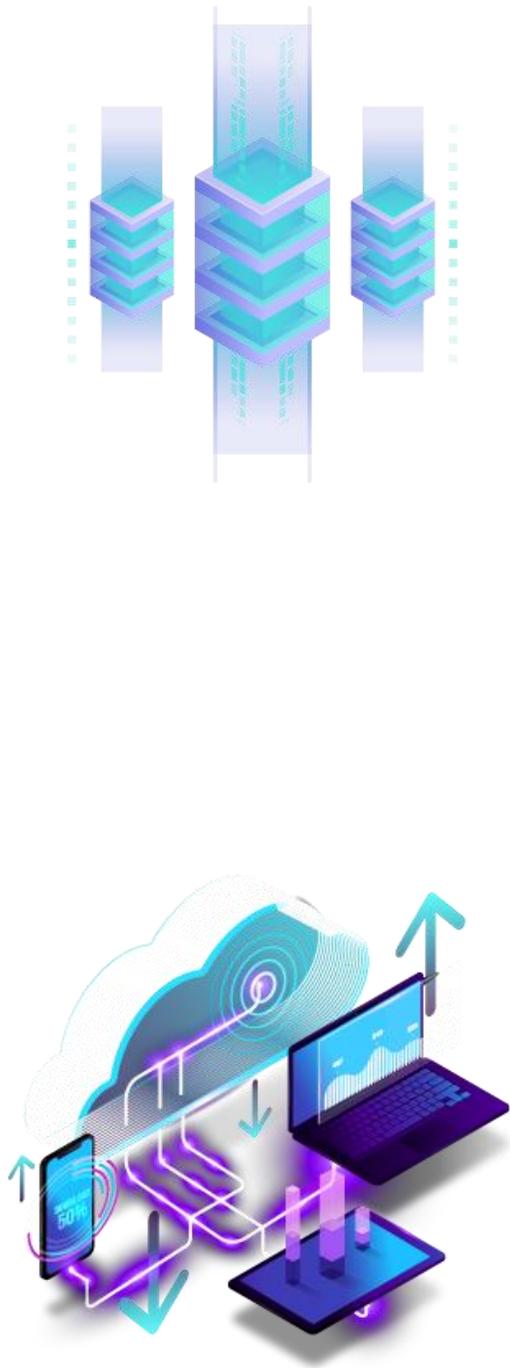
- Sistemas
- Networking
- Infraestructura (Servidores)
- Informática (desarrollo Web, aplicaciones y soluciones)
- Seguridad Informática
- Consultoría TIC

Telecomunicaciones

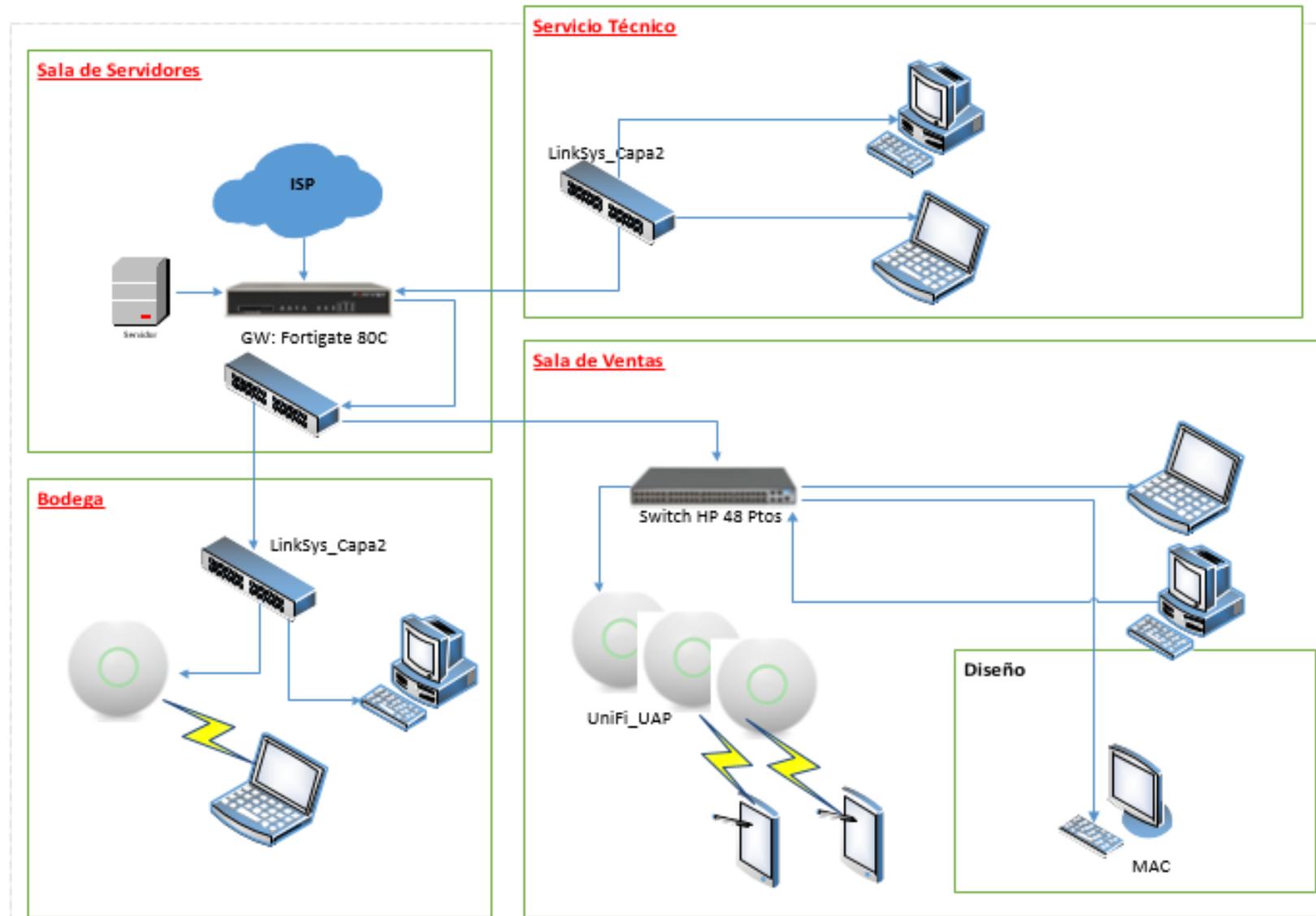
- Telefonía (IP, Digital y Analógica).
- TV (iptv, Satelital)
- ISP (Internet Services Provider)
- Cableado estructurado
- Tendidos de Fibra Óptica
- Redes Inalámbricas
- Proyectos
- Certificaciones

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

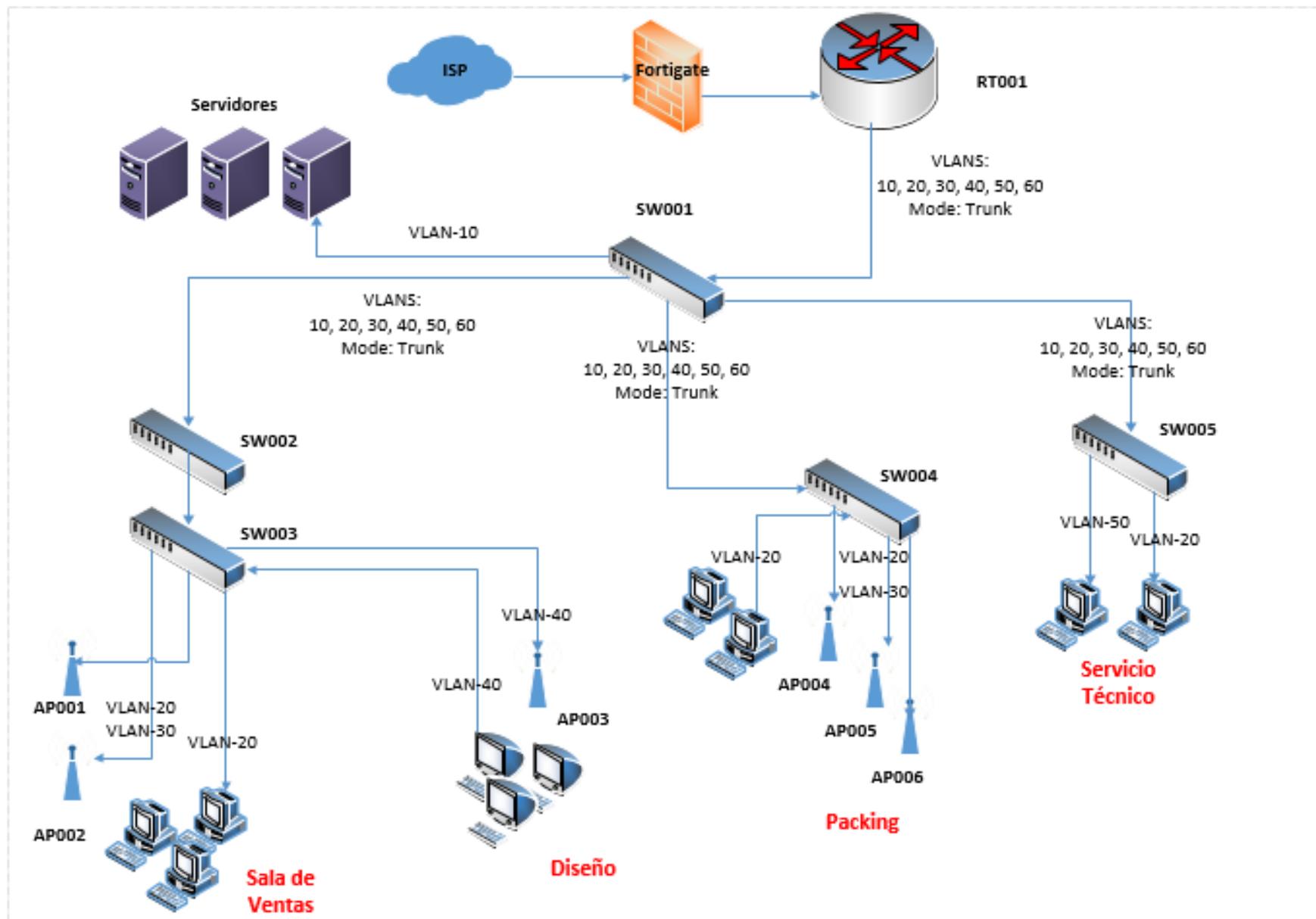
Segmentación por VLAN

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



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:

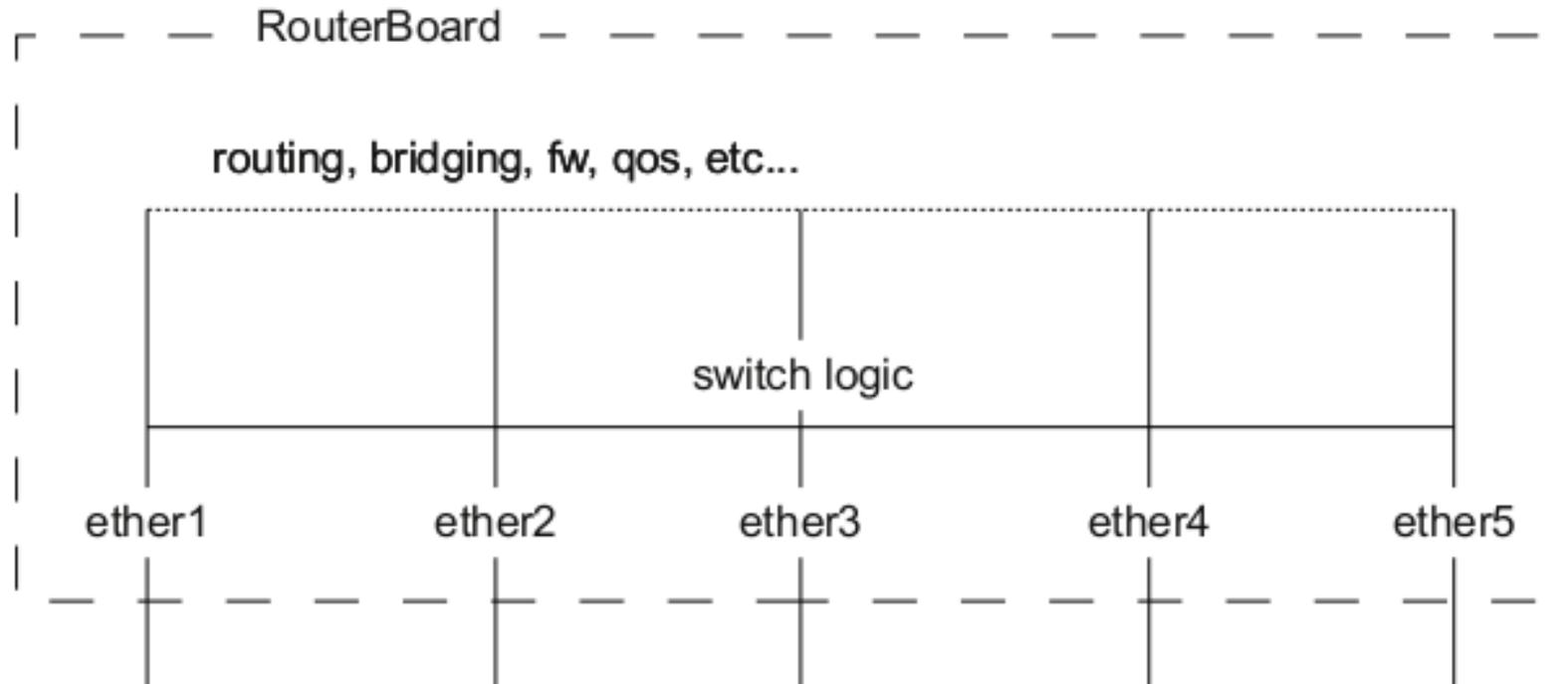
- Run command */system routerboard upgrade*
- Reboot your router to apply the upgrade (*/system reboot*)]

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***:



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

CREACION BRIDGE

PASO 1

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

← USANDO TERMINAL

The screenshot shows the 'Interface <bridge1>' configuration window with the 'General' tab selected. The 'Name' field is set to 'bridge1' and the 'Type' is 'Bridge'. The 'Actual MTU' is 1500 and the 'L2 MTU' is 1592. The 'MAC Address' is B8:69:F4:5D:C6:6F. The 'ARP' is set to 'enabled'. The 'Ageing Time' is 00:05:00. There are checkboxes for 'IGMP Snooping' and 'Fast Forward', both of which are currently unchecked. The status bar at the bottom shows 'enabled', 'running', and 'slave'.

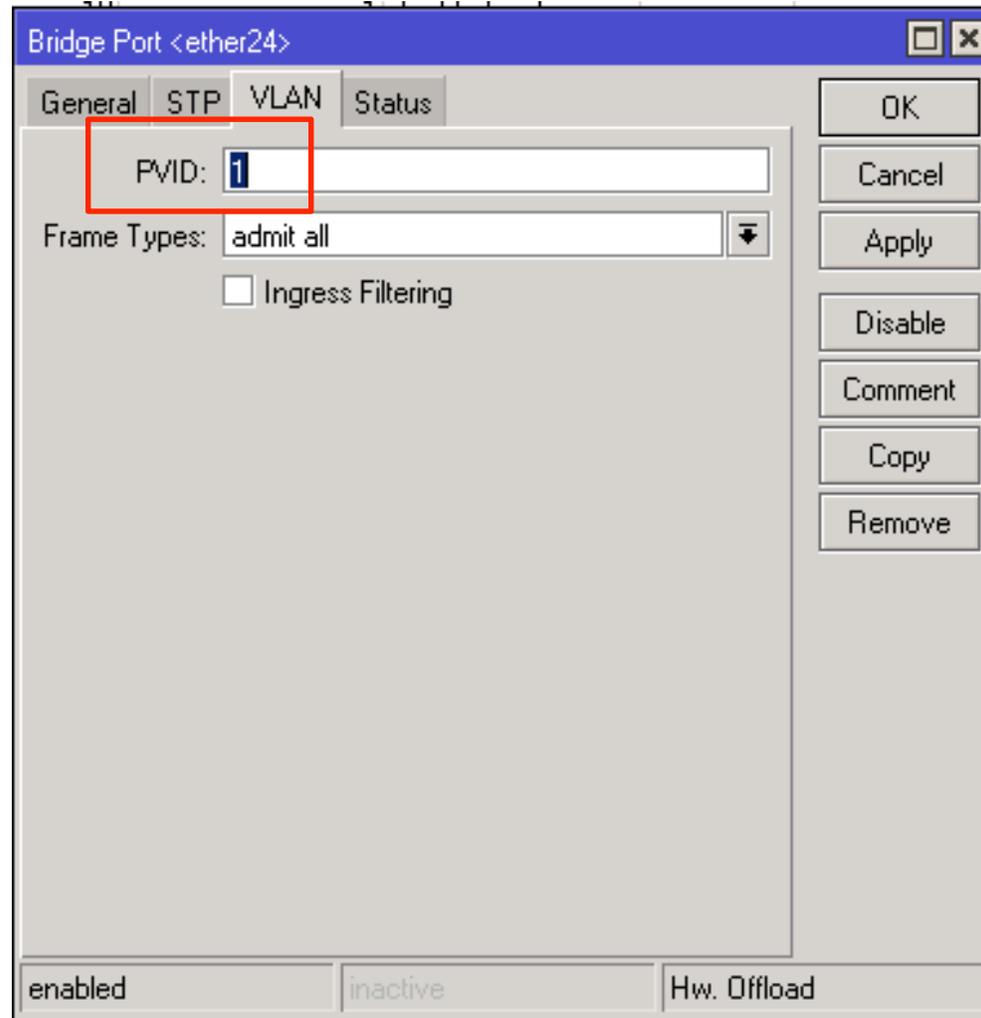
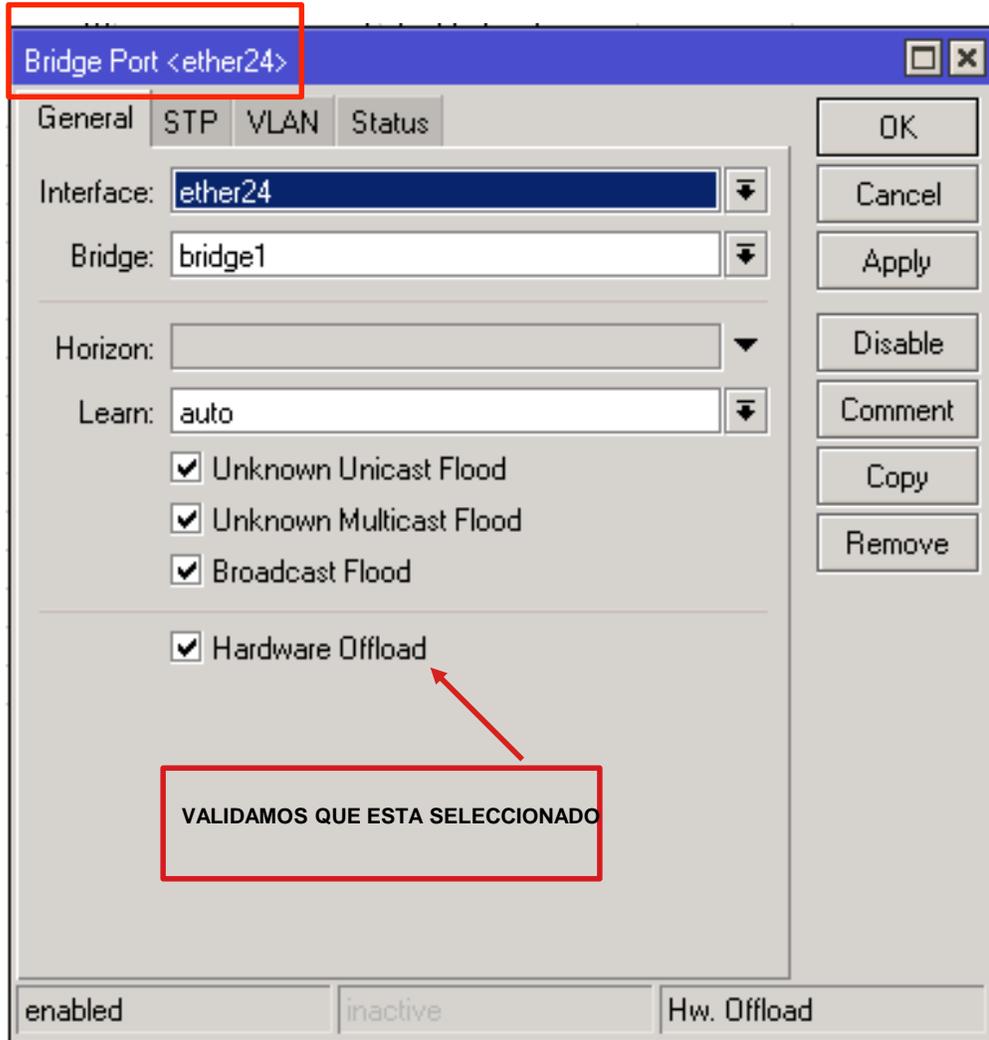
The screenshot shows the 'Interface <bridge1>' configuration window with the 'VLAN' tab selected. The 'VLAN Filtering' checkbox is checked and highlighted with a red box. A blue arrow points from this checkbox to a text box below. The 'PVID' is set to 1. The status bar at the bottom shows 'enabled', 'running', and 'slave'.

Actualmente solo los dispositivos de la serie CRS3xx son capaces de usar **Vlan Filtering** y **Bridge Hardware Offloading** al mismo tiempo.

Cuando se configura **VLAN Table** del bridge, se puede habilitar VLAN Filtering, que es necesario para que el parámetro PVID tenga algún efecto

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

2

1

The screenshot displays a network configuration interface. On the left, a table lists bridge configurations. On the right, a dialog box for 'Bridge VLAN <10>' is open, showing configuration options for bridge 'bridge1'.

Bridge	VLAN IDs	Current Tagged	Current Untagged
bridge1	10	bridge1, ether24, ether22, ether23, ether21	ether15, ether1, ether10, ether12, ether14, ether11, ether3, ether2, ether4, ether5, ether6, ether13
bridge1	20	bridge1, ether24, ether22, ether23, ether21	
bridge1	30	bridge1, ether24, ether22, ether23, ether21	
bridge1	40	bridge1, ether24, ether22, ether23, ether21	
bridge1	50	bridge1, ether24, ether22, ether23, ether21	
bridge1	60	bridge1, ether24, ether22, ether23, ether21	
D bridge1	1		bridge1, ether24, ether22, ether23, ether21

The 'Bridge VLAN <10>' dialog box shows the following configuration:

- Bridge: bridge1
- VLAN IDs: 10
- Tagged: ether24, ether23, ether22, ether21, ether20, bridge1
- Untagged: ether15, ether1, ether2, ether3, ether4, ether5, ether6, ether7, ether8, ether9, ether10, ether11, ether12, ether13, ether14, ether16
- Current Tagged: bridge1, ether24, ether22, ether23

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

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

Bridge Port <ether15>

General | STP | VLAN | Status

Interface: ether15

Bridge: bridge1

Horizon: []

Learn: auto

- Unknown Unicast Flood
- Unknown Multicast Flood
- Broadcast Flood
- Hardware Offload

Buttons: OK, Cancel, Apply, Disable, Comment, Copy, Remove

enabled | inactive | Hw. Offload

Bridge Port <ether15>

General | STP | VLAN | Status

PVID: 10

Frame Types: admit all

Ingress Filtering

Buttons: OK, Cancel, Apply, Disable, Comment, Copy, Remove

enabled | inactive | Hw. Offload

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

Management VLAN

The screenshot shows the 'Interface List' window with a table of interfaces. A red box highlights the 'vlan10' entry. Below it, the 'Interface <vlan10>' configuration window is open, with a red box around the 'VLAN ID: 10' and 'Interface: bridge1' fields.

Name	Type	Actual MTU	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)
bridge1	Bridge	1500	1592	268.2 kbps	32.4 kbps	36	
vlan10	VLAN	1500	1588	267.0 kbps	17.8 kbps	36	
ether1	Ethernet	1500	1592	7.1 kbps	752 bps	12	
ether2	Ethernet	1500	1592	313.4 kbps	113.9 kbps	64	
ether3	Ethernet	1500					
ether4	Ethernet	1500					
ether5	Ethernet	1500					
ether6	Ethernet	1500					
ether7	Ethernet	1500					
ether8	Ethernet	1500					
ether9	Ethernet	1500					
ether10	Ethernet	1500					
ether11	Ethernet	1500					
ether12	Ethernet	1500					
ether13	Ethernet	1500					
ether14	Ethernet	1500					
ether15	Ethernet	1500					
ether16	Ethernet	1500					
ether17	Ethernet	1500					
ether18	Ethernet	1500					
ether19	Ethernet	1500					
ether20	Ethernet	1500					
ether21	Ethernet	1500					
ether22	Ethernet	1500					
ether23	Ethernet	1500					
ether24	Ethernet	1500					
sfpp1	Ethernet	1500					
sfpp2	Ethernet	1500					

Interface <vlan10> configuration:
Name: vlan10
Type: VLAN
MTU: 1500
Actual MTU: 1500
L2 MTU: 1588
MAC Address: B8:69:F4:5D:C6:6F
ARP: enabled
VLAN ID: 10
Interface: bridge1
Use Service Tag:

IP administrativa

The 'Address List' window shows a table with the following entry:

Address	Network	Interface
192.168.30.2/24	192.168.30.0	vlan10

The 'Bridge' configuration window shows a table of bridge configurations. A red box highlights the 'bridge1' entry with VLAN ID 10. A blue arrow points from the 'IP administrativa' text to this entry.

Bridge	VLAN IDs	Comment	Tagged	Current Untagged
bridge1	10	bridge1, ether24, ether22, ether23, ether21	bridge1, ether24, ether22, ether23, ether21	ether15, ether1, ether10, ether12, ether13, ether14, ether16, ether17, ether18, ether19, ether20, ether21, ether22, ether23, ether24

Add Bridge1 en Tagged, repetir en cada SW

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

Creación de VLAN 10-20-30-40-50-60

Interface <vlan10>

General | Loop Protect | Status | Traffic

Name:

Type:

MTU:

Actual MTU:

L2 MTU:

MAC Address:

ARP:

ARP Timeout:

VLAN ID:

Interface:

Use Service Tag

OK
Cancel
Apply
Disable
Comment
Copy
Remove
Torch

enabled | running | slave

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

DHCP Server							
DHCP							
Networks							
Leases							
Options							
Option Sets							
Alerts							
+							
-							
✓							
✗							
Filter							
DHCP Config							
DHCP Setup							
Name	Interface	Relay	Lease Time	Address Pool	Add AR...		
server2	vlan20		5d 00:00:00	VLAN20	no		
server3	vlan30		00:10:00	VLAN30	no		
server4	vlan40		00:10:00	VLAN40	no		
server5	vlan50		00:10:00	VLAN50	no		
server6	vlan60		00:10:00	VLAN60	no		

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   ::: Disco 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="Disco\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=Disco\F1o

5   ::: Disco 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="Disco\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=Disco\F1o

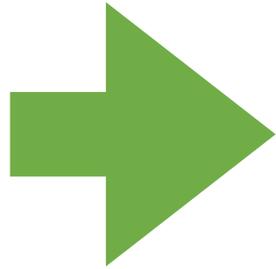
[admin@MikroTik] >
```

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



Package List

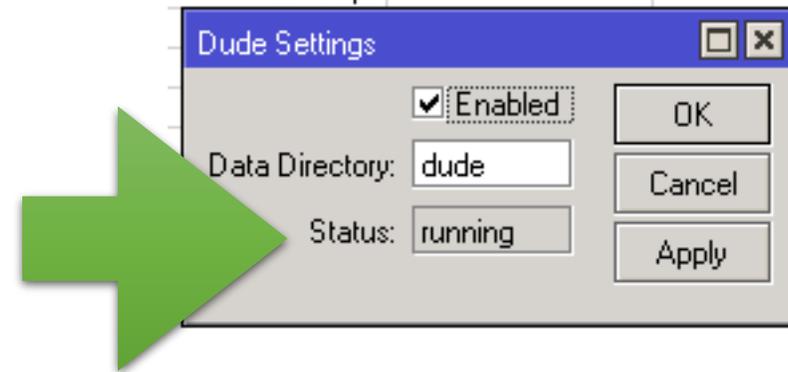
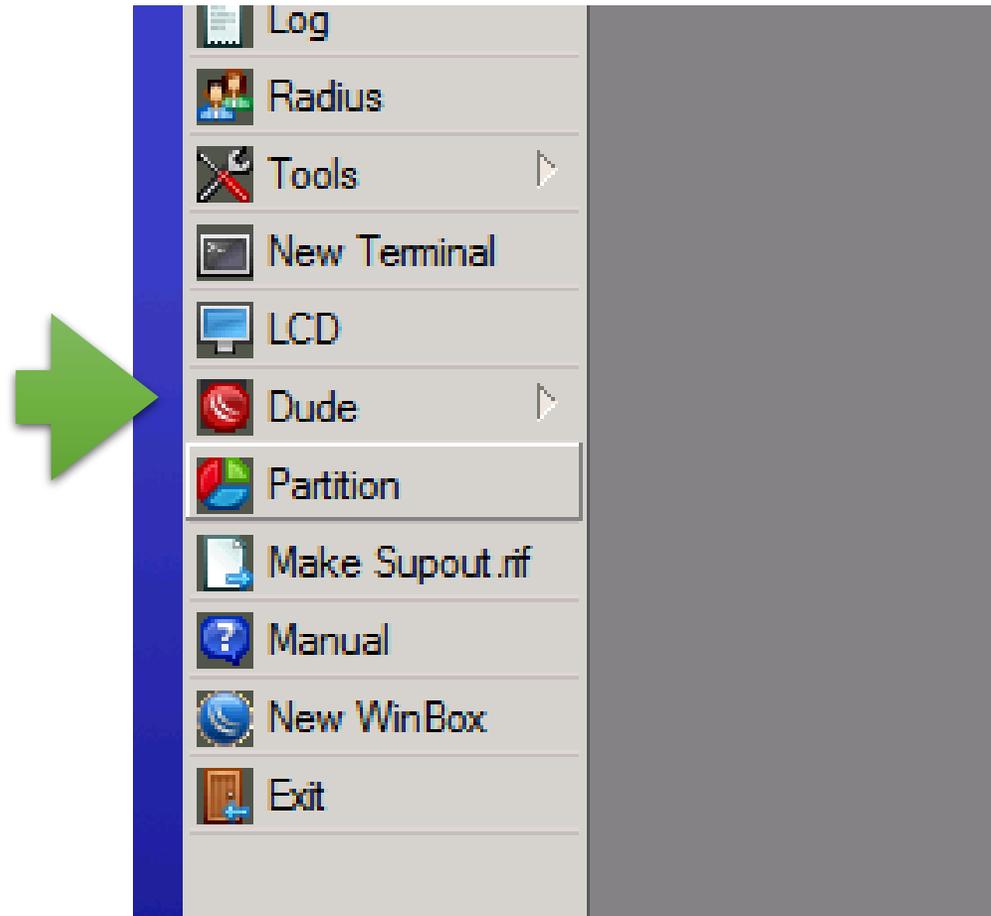
Check For Updates Enable Disable Uninstall Unschedule Downgrade Check Installation Find

Name	Version	Build Time	Scheduled
dude	6.42.9	Sep/27/2018 05:19:48	
routeros-tile	6.42.9	Sep/27/2018 05:19:48	
advanced-tools	6.42.9	Sep/27/2018 05:19:48	
dhcp	6.42.9	Sep/27/2018 05:19:48	
hotspot	6.42.9	Sep/27/2018 05:19:48	
ipv6	6.42.9	Sep/27/2018 05:19:48	
mpls	6.42.9	Sep/27/2018 05:19:48	
ppp	6.42.9	Sep/27/2018 05:19:48	
routing	6.42.9	Sep/27/2018 05:19:48	
security	6.42.9	Sep/27/2018 05:19:48	
system	6.42.9	Sep/27/2018 05:19:48	
wireless	6.42.9	Sep/27/2018 05:19:48	

12 items

INSTALAR DUDE SERVER CORRESPONDIENTE A LA ARQUITECTURA TILE

DUDE SERVER



VALIDAMOS QUE EL SERVICIO ESTE RUNNING

DUDE CLIENT

not connected - The Dude 6.42.9

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

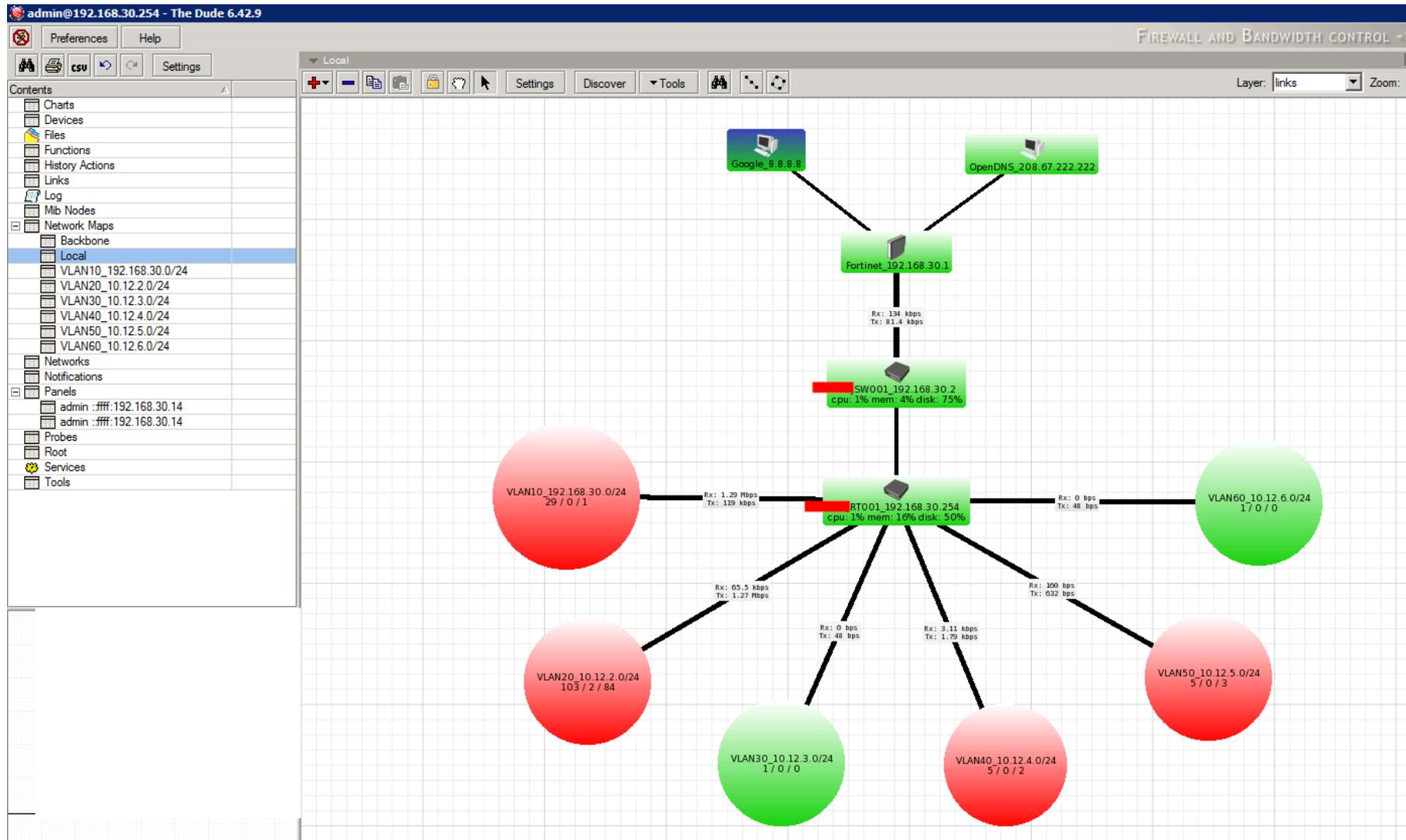
disconnected

Ip Dude Server

Usuario

Password

DUDE SERVER



DUDE SERVER

The screenshot shows the 'The Dude' network management interface. The title bar reads 'admin@192.168.30.254 - The Dude 6.42.9'. The sidebar on the left contains a 'Contents' tree with categories like Charts, Devices, Files, Functions, History Actions, Links, Log, Mib Nodes, Network Maps, Local, VLANs, Networks, Notifications, Panels, Probes, Root, Services, and Tools. The main workspace displays a network topology diagram for the 'Backbone' network. The diagram features a central router (RT001_192.168.30.254) at the top, connected to a switch (SW001_192.168.30.2) below it. SW001 is connected to three other switches: SW005_192.168.30.6 on the left, SW002_192.168.30.3 in the middle, and SW004_192.168.30.5 on the right. SW002 is further connected to SW003_192.168.30.4 below it. A yellow cloud icon represents the 192.168.30.0/24 network connected to SW001. Each node in the diagram shows its CPU, memory, and disk usage, along with its IP address. Traffic statistics (Rx and Tx) are also displayed on the links between nodes.

```
graph TD; RT001[RT001_192.168.30.254] --- SW001[SW001_192.168.30.2]; SW001 --- SW005[SW005_192.168.30.6]; SW001 --- SW002[SW002_192.168.30.3]; SW001 --- SW004[SW004_192.168.30.5]; SW002 --- SW003[SW003_192.168.30.4]; Cloud((192.168.30.0/24)) --- SW001;
```

Device	IP	CPU	Mem	Disk	Rx	Tx
RT001	192.168.30.254	1%	16%	50%	1.46 Mbps	1.49 Mbps
SW001	192.168.30.2	1%	4%	75%	116 kbps	52.5 kbps
SW005	192.168.30.6	0%	3%	76%	81.3 kbps	64.1 kbps
SW002	192.168.30.3	1%	4%	75%	1.5 Mbps	1.48 Mbps
SW004	192.168.30.5	1%	4%	75%	208 kbps	1.25 Mbps
SW003	192.168.30.4	1%	4%	76%	1.21 Mbps	61.5 kbps

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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