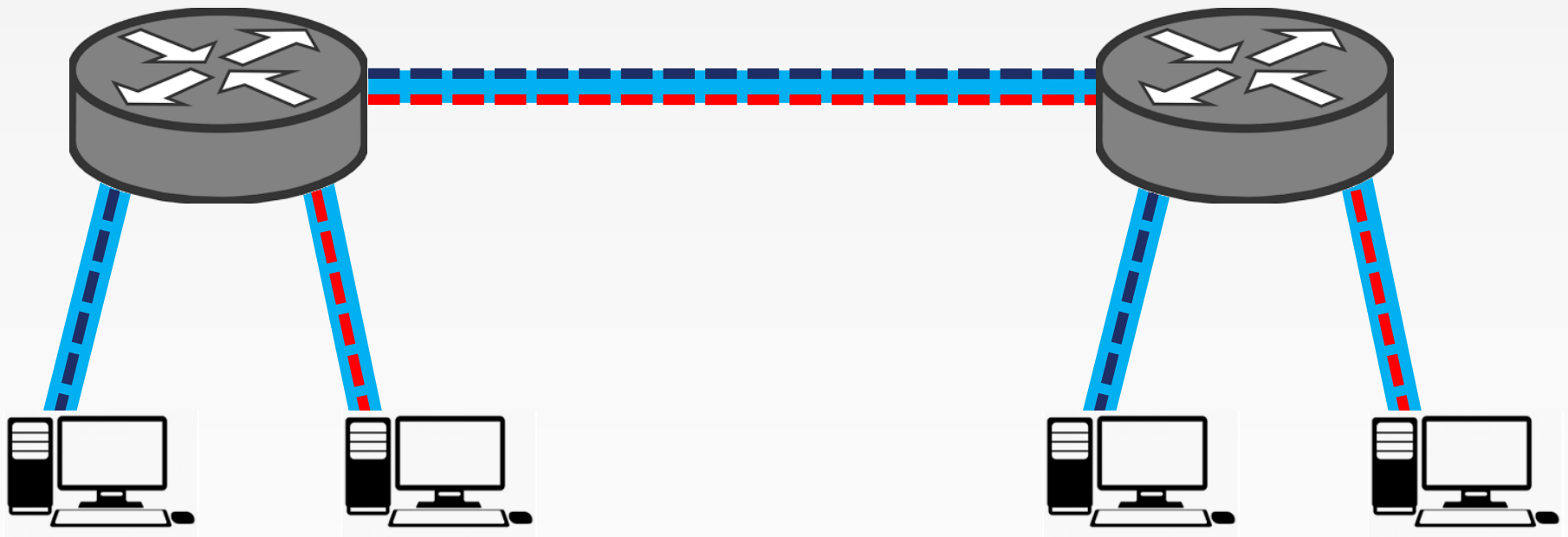


5 Formas diferentes de configurar VLANs em equipamentos da MikroTik



Thales Moisés, 27 anos

- Informática e Redes desde 2006
- Conheci o RouterOS em 2013
- ISP desde 2016
- MTCNA – Agosto/2018
- MTCRE - Fevereiro/2019 -> MikroTik Official Consultant
- MTCIPv6E - Agosto/2019
- MTCINE – Novembro/2019

Atualmente na Redes Brasil Serviços



Redes Brasil

Por que falar sobre VLAN?

- Está presente em diversos cenários, tais como: corporativo e ISP;
- Novos switchs lançados esse ano;
- Provavelmente você vai precisar usar VLAN em algum momento.

- Para todos os usuários, principalmente iniciantes;
- Foco nas particularidades do modo de configurar VLANs nas principais séries de equipamentos MikroTik;
- Algumas particularidades de nomenclatura;
- Como obter o melhor desempenho para cada tipo de equipamento.



O cronograma

- Alguns conceitos essenciais;
- 5 métodos de configurar:
 1. Roteadores **SEM** uso de Switch Chip;
 2. Roteadores **COM** uso de Switch Chip;
 3. Série CRS 1xx e 2xx;
 4. Série CRS 3xx;
 5. SwitchOS e a Série CSS.

- Noções sobre VLANs;
- CPU? Switch Chip?;
- Bridges e Hardware offloading.



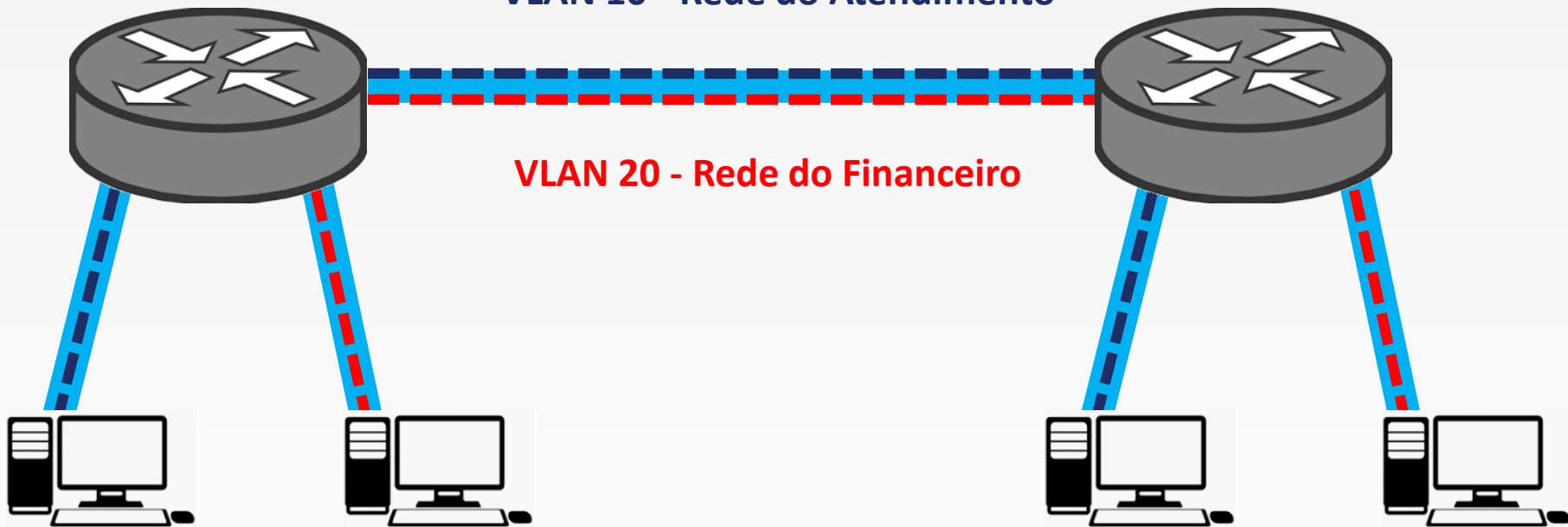
O que é VLAN?

Redes Brasil

- Rede virtual utilizada para separar domínios de broadcast;
- Compartilha o mesmo meio físico porém é logicamente independente.

VLAN 10 - Rede do Atendimento

VLAN 20 - Rede do Financeiro





A nomenclatura

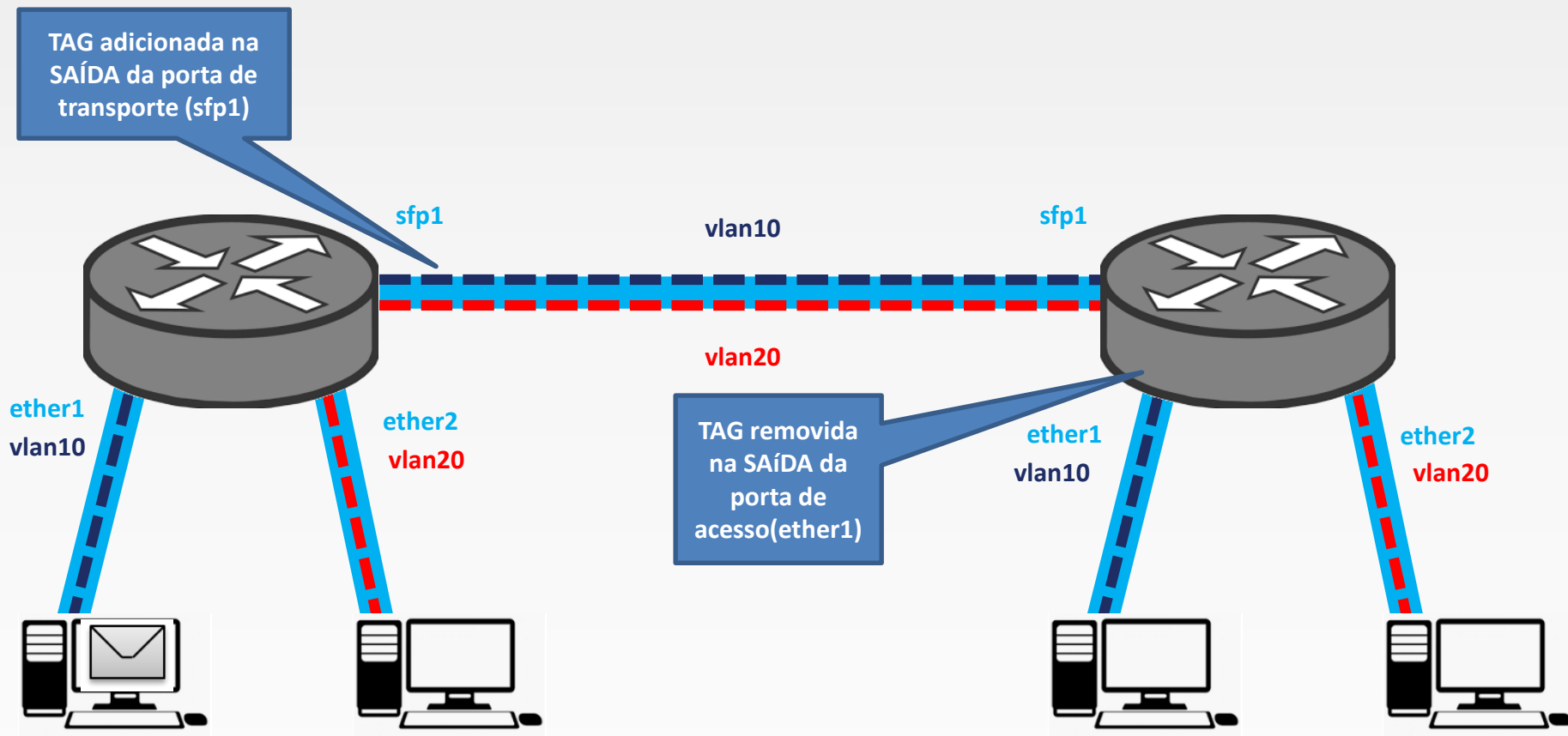
Redes Brasil

PORTA DE ACESSO	PORTA DE TRANSPORTE
UNTAGGED	TAGGED
ALWAYS STRIP	ADD IF MISSING
ACCESS	TRUNK



Como funciona?

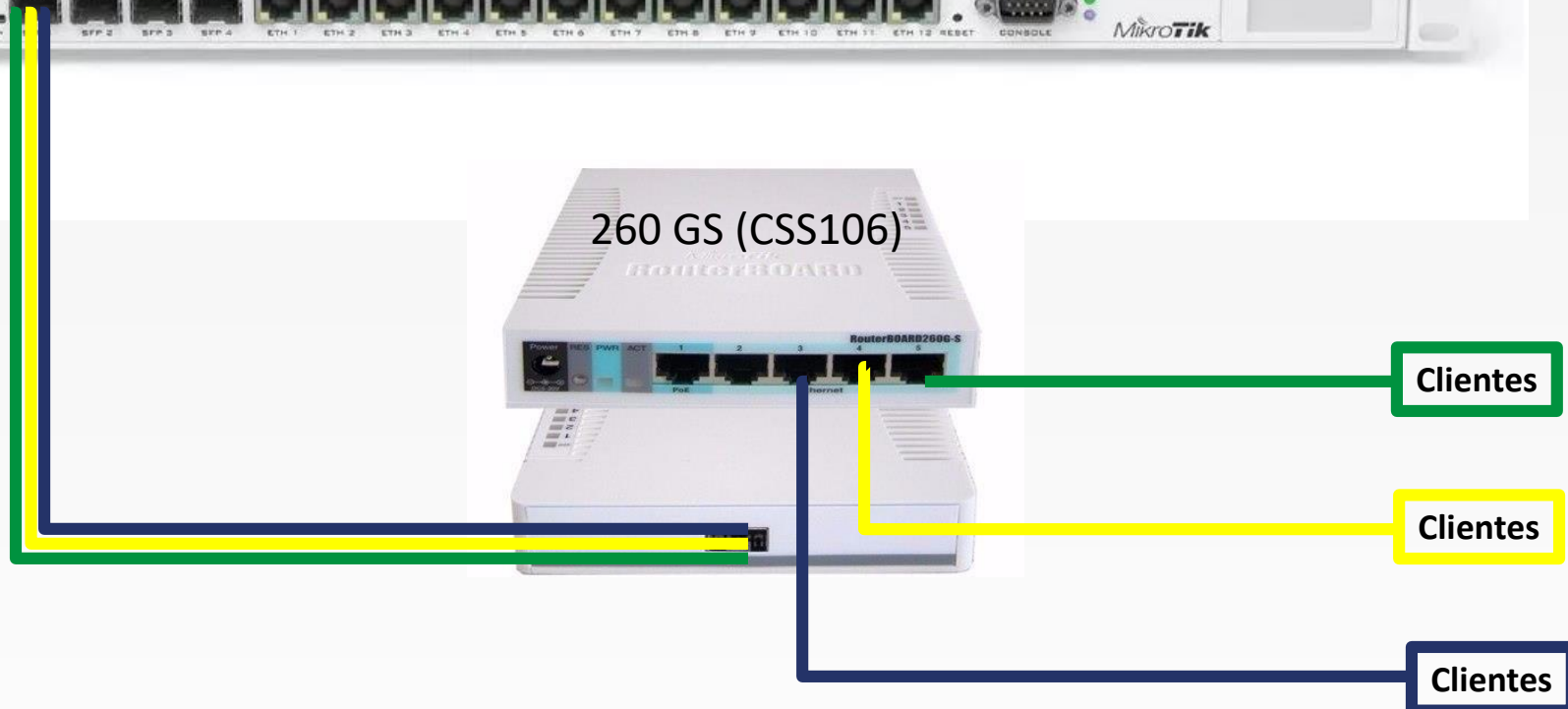
- Porta de transporte / TAGGED = Adiciona a VLAN ao frame;}
- Porta de acesso / UNTAGGED = Remove a VLAN do frame.





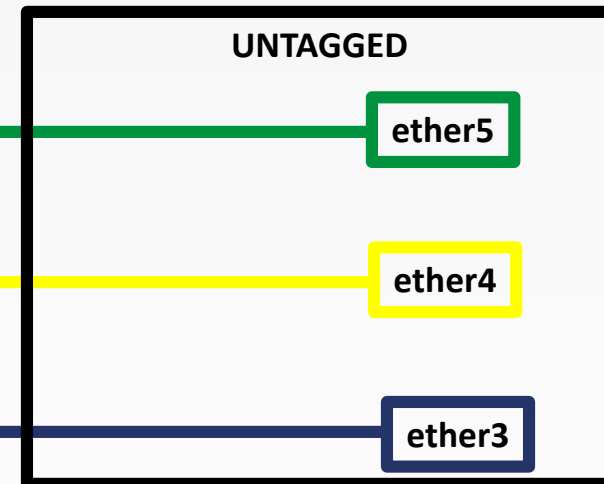
Uma breve história

Redes Brasil

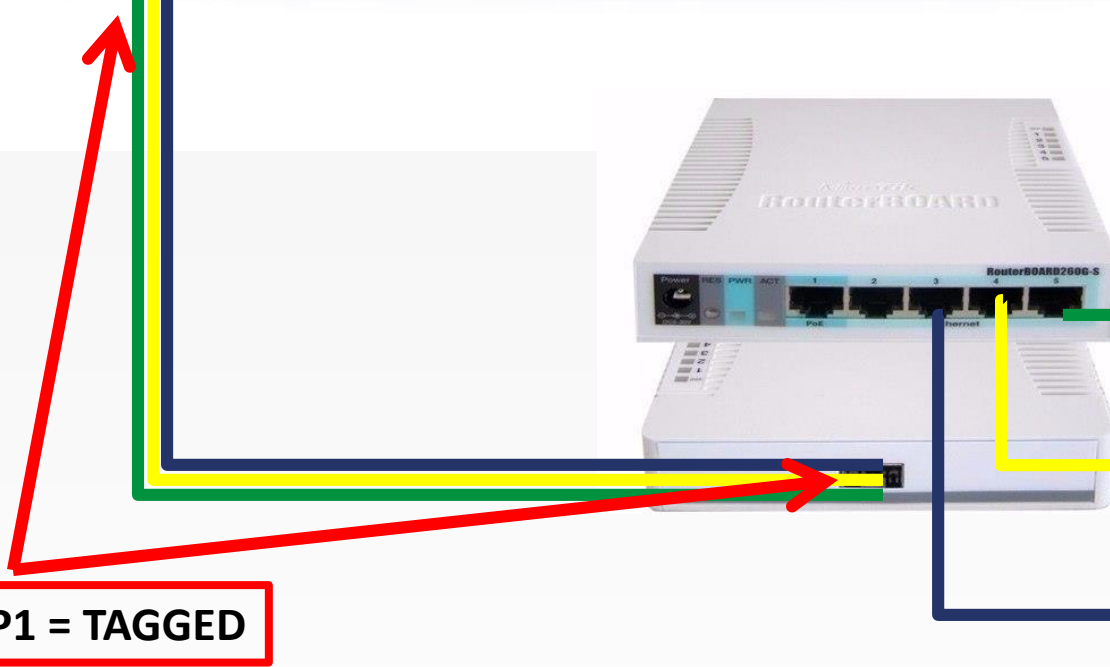




Sobre VLANs



SFP1 = TAGGED



Uma breve história

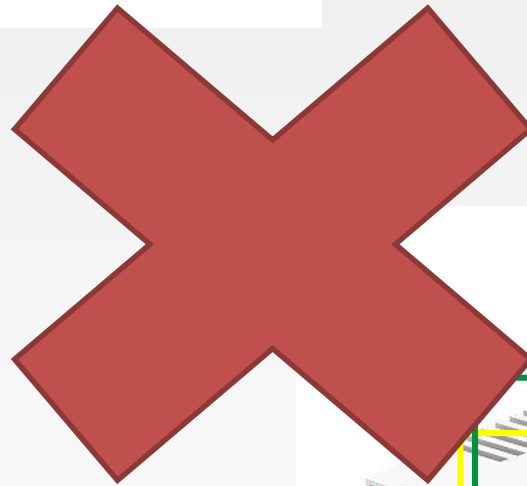
CRS 106



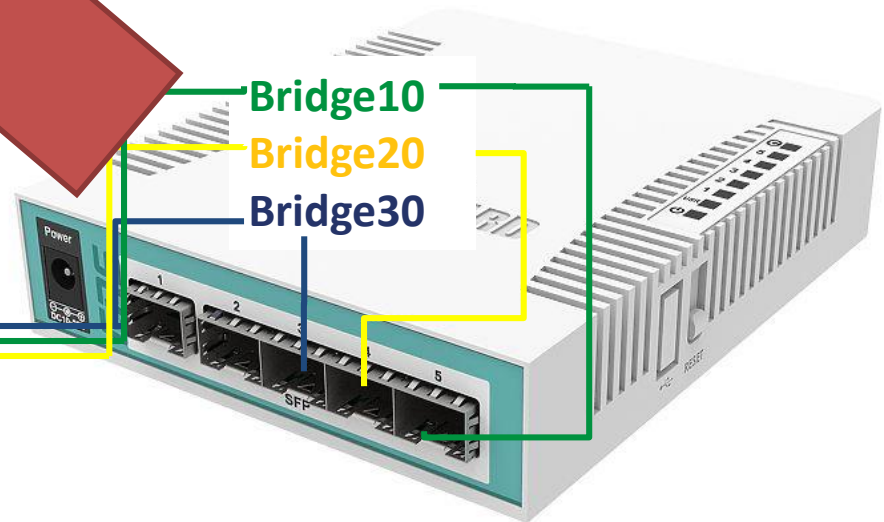


Uma breve história

Redes Brasil



VLAN10
VLAN20
VLAN30



Bridge10

Bridge20

Bridge30



Analizando o equipamento

Redes Brasil

Switching results

CRS106-1C-5S		1518 byte		512 byte		64 byte	
Mode	Configuration	kpps	Mbps	kpps	Mbps	kpps	Mbps
		Switching	Non blocking Layer 2 throughput	487.6	5,922.0	1,409.8	5,774.4
Switching	Non blocking Layer 2 capacity	487.6	11,844.0	1,409.8	11,548.9	8,928.6	9,142.9
Switching	Non blocking Layer 1 throughput	487.6	6,000.0	1,409.8	6,000.0	8,928.6	6,000.0
Switching	Non blocking Layer 1 capacity	487.6	12,000.0	1,409.8	12,000.0	8,928.6	12,000.0

Ethernet test results

CRS106-1C-5S		QCA8511 1G all port test					
Mode	Configuration	1518 byte		512 byte		64 byte	
		kpps	Mbps	kpps	Mbps	kpps	Mbps
Bridging	none	48.0	582.9	73.5	301.1	78.0	39.9
Bridging	25 bridge filter rules	26.1	317.0	28.6	117.1	29.6	15.2
Routing	none	46.5	564.7	65.7	269.1	71.1	36.4
Routing	25 simple queues	14.5	176.1	16.1	65.9	16.8	8.6
Routing	25 ip filter rules	7.8	94.7	8.0	32.8	8.3	4.2



Pesquisando um pouco... Redes Brasil

Manual:Interface/VLAN - MikroTik Wiki

<https://wiki.mikrotik.com/wiki/VLAN> ▾ Traduzir esta página

19 de out. de 2018 - Summary. Sub-menu: /interface **vlan**. Standards: IEEE 802.1Q. Virtual Local Area Network (**VLAN**) is a Layer 2 method that allows multiple ...

[Manual:Basic VLAN switching](#) · [Manual:Layer2 misconfiguration](#)

Manual:CRS3xx VLANs with Bonds - MikroTik Wiki

https://wiki.mikrotik.com/wiki/Manual:CRS3xx_V... ▾ Traduzir esta página

10 de jan. de 2019 - Summary. This page will show how to configure multiple switches to use bonding interfaces and port based **VLANs**, it will also show a working ...

[Manual:CRS1xx/2xx series switches examples - MikroTik Wiki](#)

<https://wiki.mikrotik.com/wiki/Manual:CRS1xx> ▾ Traduzir esta página

Ir para **VLAN Tunneling (Q-in-Q)** - This example covers typical **VLAN** tunneling use case where service provider devices add another **VLAN** tag for ...

Manual:Basic VLAN switching - MikroTik Wiki

https://wiki.mikrotik.com/wiki/Manual:Basic_VLA... ▾ Traduzir esta página

10 de jan. de 2019 - Introduction. Many MikroTik devices come with a built-in switch chips that usually have an option to do **VLAN** switching on a hardware level, this ...

[Introduction](#) · [CRS3xx series switches](#) · [CRS1xx/CRS2xx series](#) ...

Manual:Switch Router - MikroTik Wiki

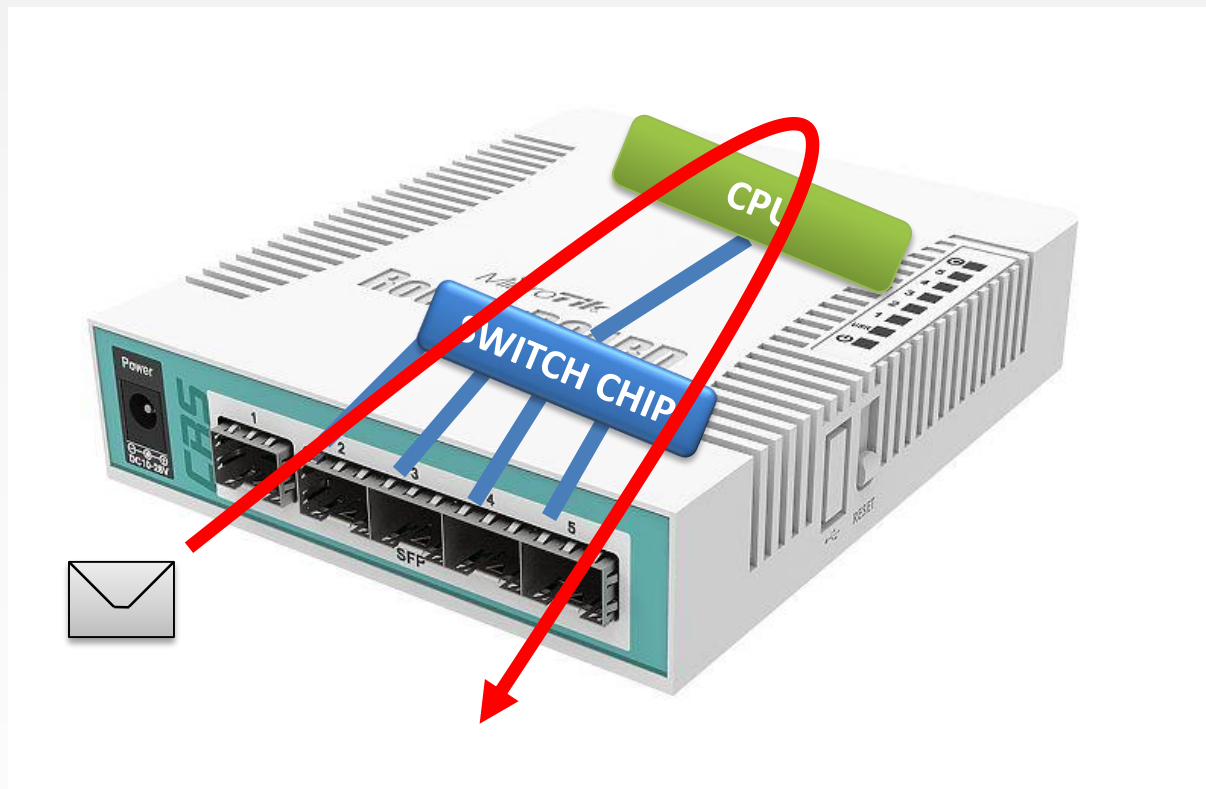
https://wiki.mikrotik.com/wiki/Manual:Switch_Rou... ▾ Traduzir esta página

Ir para **VLAN switching** - /interface ethernet **switch vlan** add independent-learning=yes ports=ether2,switch1-cpu **switch**=switch1 **vlan-id**=10 add ...

- ~~Noções sobre VLANs;~~
- CPU? Switch Chip?;
- Bridges e Hardware offloading.

Switch chip x CPU

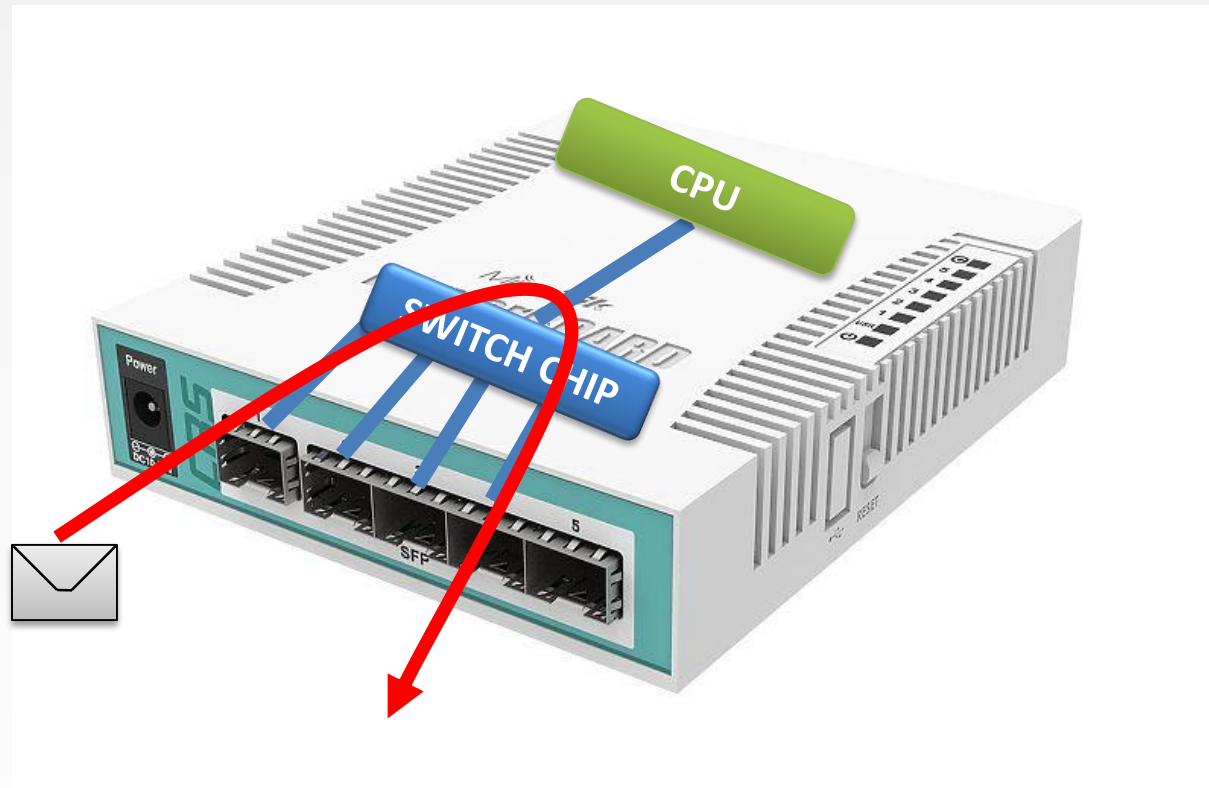
- Como os frames são processados numa Bridge SEM Hardware Offloading?





Switch chip x CPU

- Como os frames são processados numa Bridge COM Hardware Offloading?





O que eu ganho com isso?

Redes Brasil

Usando o CPU

- Firewall
- QoS
- Torch

Usando o Switch Chip

- Maior capacidade de tráfego, “Throughput”



Na prática

Redes Brasil

Switching results

CRS106-1C-5S		1518 byte		512 byte		64 byte	
Mode	Configuration	kpps	Mbps	kpps	Mbps	kpps	Mbps
		Switching	Non blocking Layer 2 throughput	487.6	5,922.0	1,409.8	5,774.4
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Ethernet test results

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Routing	25 simple queues	14.5	176.1	16.1	65.9	16.8	8.6
Routing	25 ip filter rules	7.8	94.7	8.0	32.8	8.3	4.2

Bridge SEM
Hardware
Offloading:
300Mb

Bridge COM
Hardware
Offloading:
5,7 Gb!



Sem Hardware Offloading

Redes Brasil

```
MAC Telnet CE:E7:26:88:01:7F

[admin@CRS106] > system routerboard print
routerboard: yes
  model: CRS106-1C-5S
  serial-number: 6DE008488501
  firmware-type: qca8513L
  factory-firmware: 3.41
  current-firmware: 6.45.6
  upgrade-firmware: 6.45.6
[admin@CRS106] > interface monitor-traffic aggregate
rx-packets-per-second: 117 222
  rx-bits-per-second: 483.8Mbps
fp-rx-packets-per-second: 95 434
fp-rx-bits-per-second: 390.8Mbps
  rx-drops-per-second: 0
  rx-errors-per-second: 0
tx-packets-per-second: 89 785
  tx-bits-per-second: 370.6Mbps
fp-tx-packets-per-second: 95 434
fp-tx-bits-per-second: 390.8Mbps
  tx-drops-per-second: 0
  tx-queue-drops-per-second: 5 597
  tx-errors-per-second: 0
-- [Q quit|D dump|C-z pause]
```

483 Mega

```
MAC Telnet CE:E7:26:88:01:7F

[admin@CRS106] > system routerboard print
routerboard: yes
  model: CRS106-1C-5S
  serial-number: 6DE008488501
  firmware-type: qca8513L
  factory-firmware: 3.41
  current-firmware: 6.45.6
  upgrade-firmware: 6.45.6
[admin@CRS106] > interface bridge port print
Flags: X - disabled, I - inactive, D - dynamic, H - hw-offload
#  INTERFACE  BRIDGE  HW  PVID  PR  PATH-COST  INTERNA...  HORIZON
0 I  sfp1       bridge1 no   1 0x    10         10         none
1 I  sfp2       bridge1 no   1 0x    10         10         none
2 I  sfp3       bridge1 no   1 0x    10         10         none
3 I  sfp4       bridge1 no   1 0x    10         10         none
4  sfp5       bridge1 no   1 0x    10         10         none
5  combol    bridge1 no   1 0x    10         10         none
[admin@CRS106] > system resource monitor
cpu-used: 100%
free-memory: 107848KiB
-- [Q quit|D dump|C-z pause]
```

CPU travada com
100% de
processamento

Com Hardware Offloading

admin@CC:2D:E0:3D:66:6E (CRS106) via 100.100.100.4 - WinBox v6.45.6 on CRS106-1C-5S (mipsbe)

Session Settings Dashboard

Safe Mode Session: CC:2D:E0:3D:66:6E

H significa que o Hardware Offloading está ativo

#	Interface	Bridge	Horizon	Trusted	Priority (h...	Path C...	Role
5 H	combo1	bridge1		no	80	10	designated port
0 IH	sfp1	bridge1		no	80	10	disabled port
1 IH	sfp2	bridge1		no	80	10	disabled port
2 IH	sfp3	bridge1		no	80	10	disabled port
3 IH	sfp4	bridge1		no	80	10	disabled port
4 H	sfp5	bridge1		no	80	10	designated port

6 items (1 selected)

951 Mega

Interface	Name	Type	Actual MTU	L2 MTU	Tx	Rx	Tx
R	bridge1	Bridge	1500	1588	0 bps	1376 bps	
RS	combo1	Ethernet	1500	1588	951.8 Mbps	19.7 kbps	
S	sfp1	Ethernet	1500	1588	0 bps	0 bps	
S	sfp2	Ethernet	1500	1588	0 bps	0 bps	
S	sfp3	Ethernet	1500	1588	0 bps	0 bps	
S	sfp4	Ethernet	1500	1588	0 bps	0 bps	
RS	sfp5	Ethernet	1500	1588	4.9 kbps	951.8 Mbps	

7 items

CPU com 20% de processamento gerado pelo acesso do Winbox

```
[admin@CRS106] > system routerboard print
routerboard: yes
model: CRS106-1C-5S
serial-number: 6DE008488501
firmware-type: qca8513L
factory-firmware: 3.41
current-firmware: 6.45.6
upgrade-firmware: 6.45.6
[admin@CRS106] > system resource monitor
cpu-used: 20%
free-memory: 107684KiB
-- [Q quit|D dump|C-z pause]
```



Resumindo

Redes Brasil

- Resumo dos conceitos:

- Os cabeçalhos de VLANs são inseridos ou removidos na saída do frame pela interface;

- Com os pacotes sendo processados pelo CPU podemos utilizar Firewall, QoS e Torch;

- Com os frames processados pelo Switch Chip o equipamento terá maior capacidade de tráfego.





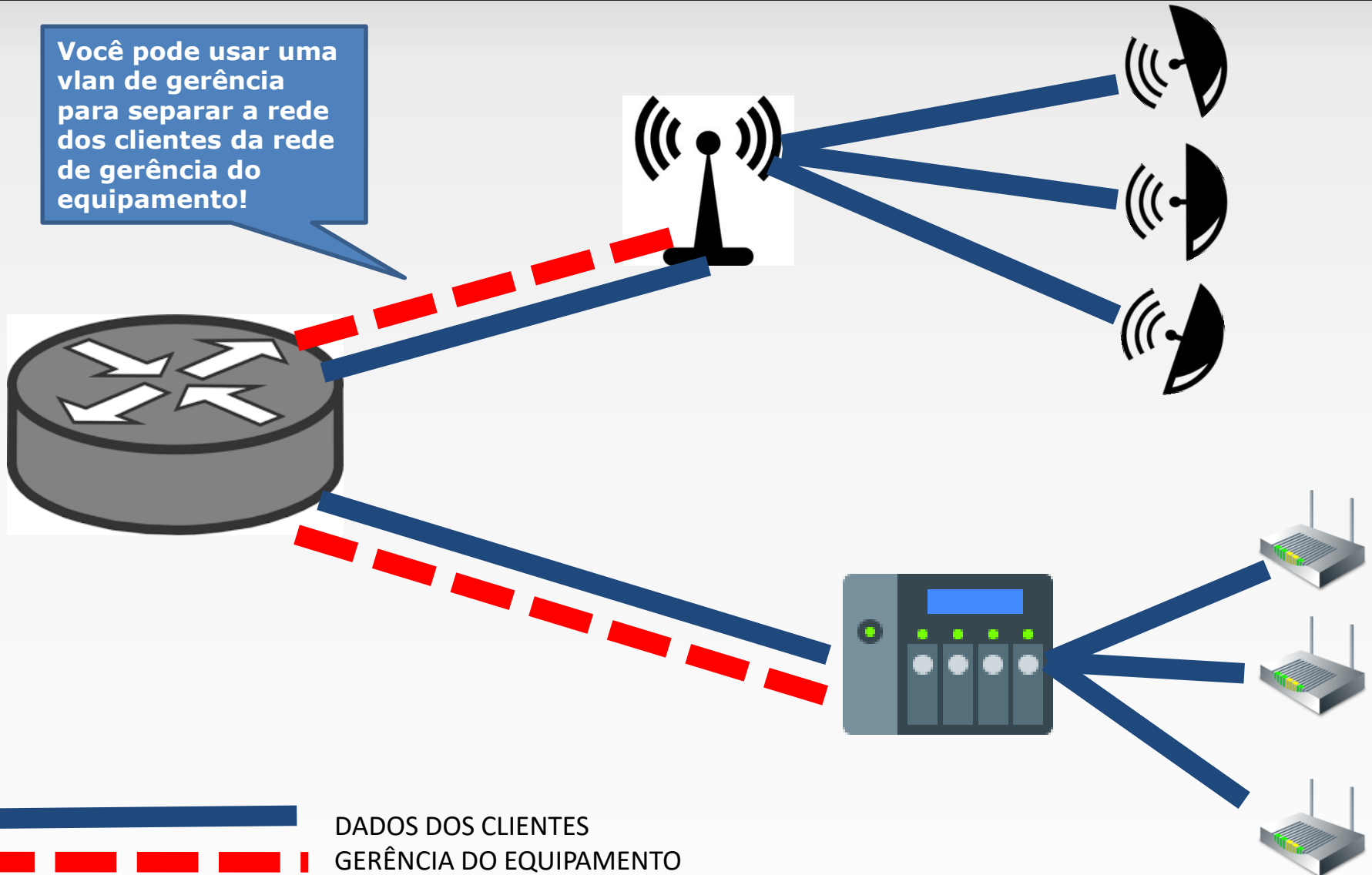
Método 1 de configurar VLANs:

Roteadores **SEM** uso de Switch Chip



Onde utilizar esse método?

Você pode usar uma vlan de gerência para separar a rede dos clientes da rede de gerência do equipamento!





Como configurar?

Redes Brasil

- Crie a VLANs “dentro” da porta de transporte do roteador para o equipamento;
- Atribua o IP de gerência na VLAN;
- Crie a VLAN na interface do equipamento que se comunica com o roteador;
- Atribua o IP de gerência na VLAN.

A configuração no AP

Interface List

Interface	Name	Type	Actual
R	bridge-clientes	Bridge	15
RS	ether1	Ethernet	15
R	ether1_vlan10-gerencia	VLAN	15
	pwr-line1	PWR	15
	wlan1	Wireless (Atheros AR9...	15

A VLAN está na interface que se comunica com o roteador.

Address List

Address	Network	Interface
10.0.0.2/24	10.0.0.0	ether1_vlan10-gerencia

1 item

O IP de gerência está na VLAN!

Bridge

#	Interface	Bridge	Horizon	Trusted	Priority (h...	Path Cost	Role	Root F
0	wlan7	bridge-clientes		no	80	10	disabled port	
1	ether1	bridge-clientes		no	80	10	designated port	

A VLAN não está na bridge dos clientes!



A configuração no Roteador

Redes Brasil

Name	Type	Actual MTU
ether1-clientes	Ethernet	1500
ether1_vlan10-gerencia	VLAN	1500
ether2	Ethernet	1500
ether3	Ethernet	1500
pwr-line1	PWR	1500
wlan1	Wireless (At...	1500

6 items

A VLAN está na interface que se comunica com o AP.

O IP de gerência está na VLAN!

Address	Network	Interface
10.0.0.1/24	10.0.0.0	ether1_vlan10-gerencia

Resumindo

- Resumo do método 1 – Roteadores sem uso de Switch Chip:

- O tráfego irá passar pela CPU;



- Normalmente usado para separar a rede gerência da rede dos clientes/usuários;

- As interfaces físicas não precisam estar em uma bridge;

- Pode ser usado em redes que já estão roteadas.



O cronograma

Redes Brasil

- ~~Alguns conceitos;~~

- ~~1. Roteadores **SEM** uso de Switch Chip;~~

2. Roteadores **COM** uso de Switch Chip;

3. Série CRS 1xx e 2xx;

4. Série CRS 3xx;

5. SwitchOS e a Série CSS.

USANDO
SWITCH CHIP



3 passos infalíveis para não errar com switch chip

Redes Brasil

1

- Criar a VLAN

2

- Definir a porta TAGGED

3

- Definir a porta UNTAGGED *

*

* A configuração da porta UNTAGGED quase sempre precisa de algum detalhe a mais.



Método 2 de configurar VLANs:

Roteadores **COM** uso de Switch Chip

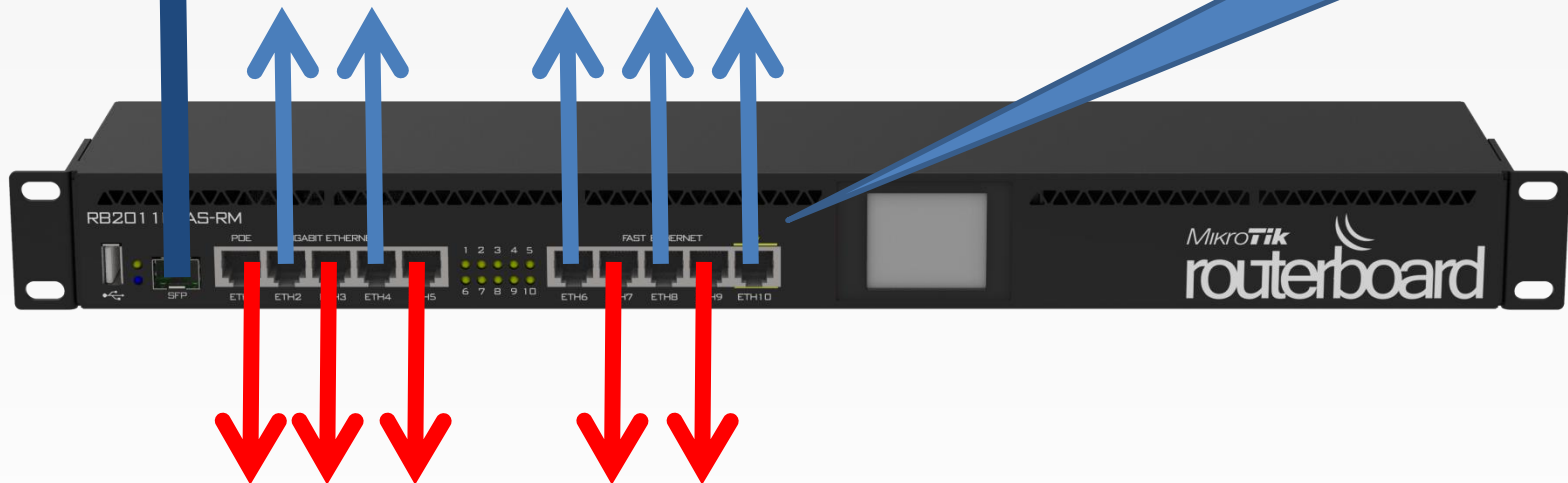


Onde utilizar esse método?



Podemos aumentar o número de portas disponíveis usando um equipamento que é um ROTEADOR como se fosse um SWITCH!

Pode ser atribuída uma VLAN para cada porta de acesso/untagged.



- Alguns roteadores possuem mais de 1 switch chip, fique atento!;
- Safe Mode é essencial para não perder o acesso!;
- Configure uma VLAN de gerência sempre que possível;
- Verifique qual o modelo do seu switch chip e o que ele suporta!.

Tabela de compatibilidade

Feature	QCA8337	Atheros8327	Atheros8316	Atheros8227	Atheros7240	ICPlus175D	MT7621	RTL8367	Other
Port Switching	yes	yes	yes	yes	yes	yes	yes	yes	yes
Port Mirroring	yes	yes	yes	yes	yes	yes	yes	yes	no
TX limit	yes	yes	yes	yes	yes	no	no	no	no
RX limit	yes	yes	no	no	no	no	no	no	no
Host table	2048 entries	2048 entries	2048 entries	1024 entries	2048 entries	no	2048 entries	2048 entries	no
Vlan table	4096 entries	4096 entries	4096 entries	4096 entries	16 entries	no	no	no	no
Rule table	92 rules	92 rules	32 rules	no	no	no	no	no	no

“VLAN table” é a configuração que nos interessa para usar um roteador como switch com segmentação de VLANs

Lista completa:

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



Tabela de compatibilidade

Redes Brasil

Alguns roteadores que possuem compatibilidade com VLAN Table

Switch Chip QCA8337

RB750GR2

RB3011

OMNITIK AC

Não possuem compatibilidade com VLAN Table

Switch Chip MT7621

RB750GR3

RB760IGS

Switch Chip RTL8367

RB1100AHx4

RB4011iGS+

Lista completa:

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

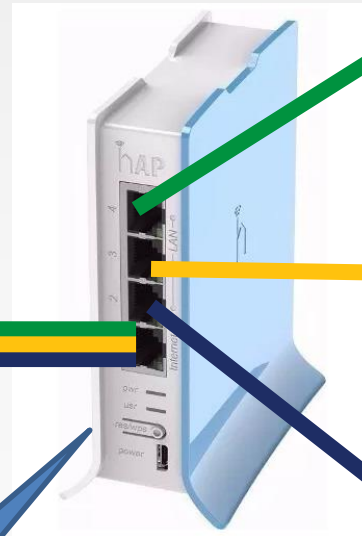


A topologia

Redes Brasil

**RB 750Gr3
MT7621**

**hAP Lite
Atheros8227**



ROTEADOR usado como SWITCH para aumentar o número de portas disponíveis.



O que vamos fazer?

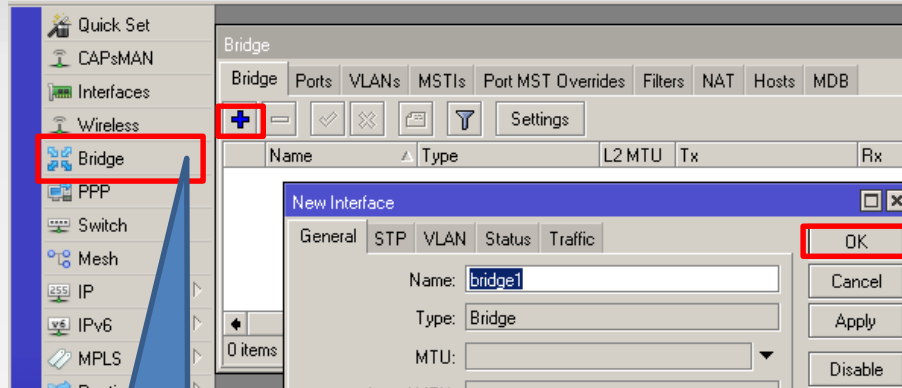
Redes Brasil

- Adicionar as portas em uma Bridge;
- Criar as VLANs;
- Escolher a porta TAGGED e UNTAGGED para cada VLAN no menu Switch > VLAN;
- Configurar o tipo de porta e o “VLAN id” no menu Switch > Port.

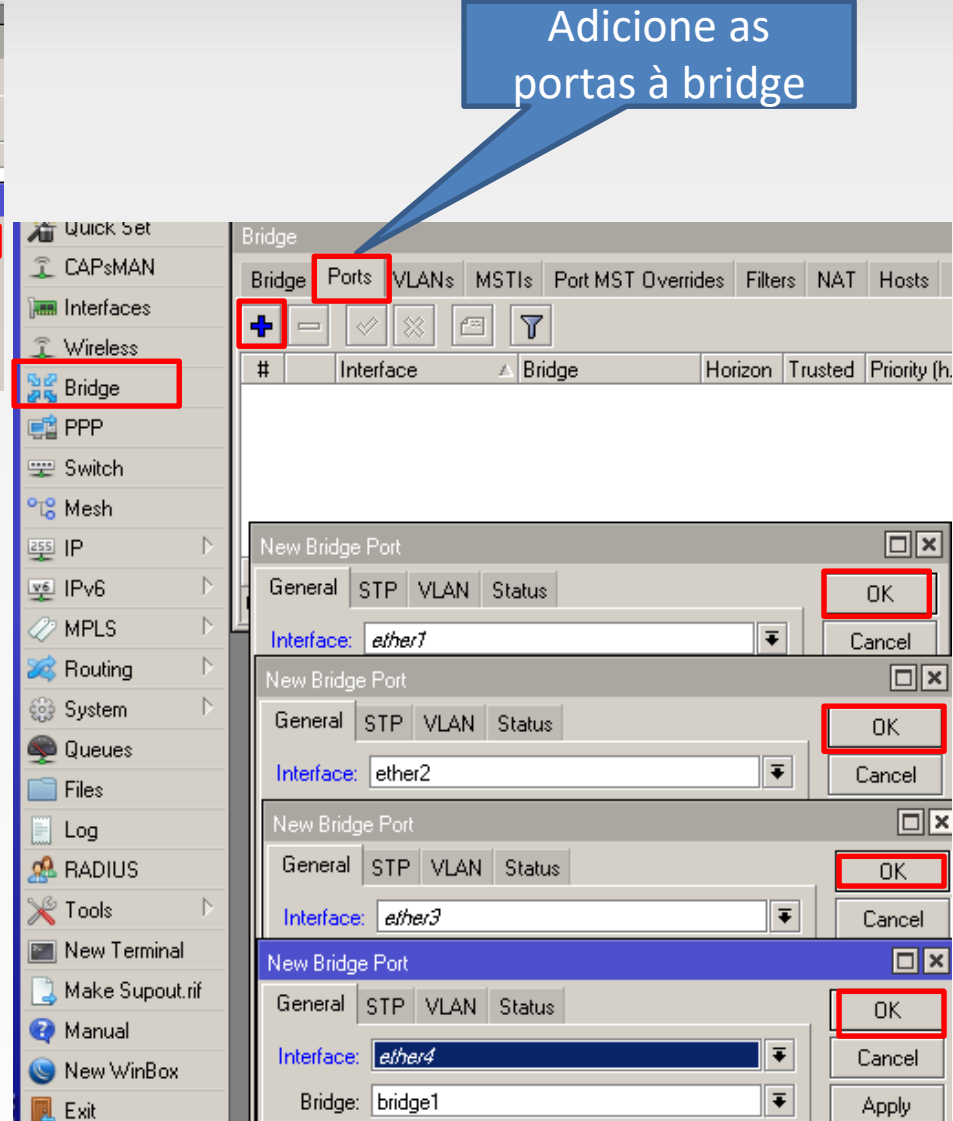


Criando a bridge

Redes Brasil



Crie uma bridge



Adicione as portas à bridge



Configurando as VLANs

Redes Brasil

Switch

Switch Port Port Isolation Host **VLAN**

+ - ✓ ✗ ⏏

Switch	VLAN ID	Ports
switch1	30	ether1, ether3
switch1	40	ether1, ether4
switch1	20	ether2, ether1

Criando as vlans

Setando porta TAGGED com "add if missing"

Switch

Switch Port Port Isolation Host VLAN Rule

Find

Name	Switch	VLAN Mode	VLAN Header	Default VLAN ID	Ingress Rate	Egress Rate
ether1	switch1	secure	add if missing	0		
ether2	switch1	secure	always strip	20		
ether3	switch1	secure	always strip	30		
ether4	switch1	secure	always strip	40		
switch1 cpu	switch1	disabled	leave as is	0		

5 items

Setando porta UNTAGGED com "always strip"

Esse método serve para RB4xx, RB9xx, RB2011, RB3011, hAP, hEX, cAP e alguns outros dispositivos

Resumindo

- Resumo do método 2 – Roteadores com uso de Switch Chip:
 - O tráfego não irá passar pelo CPU;
 - Maior tráfego suportado utilizando o SWITCH ao invés de ROTEADOR;
 - As interfaces precisam estar numa bridge;
 - O Hardware Offloading vai ficar ativado.





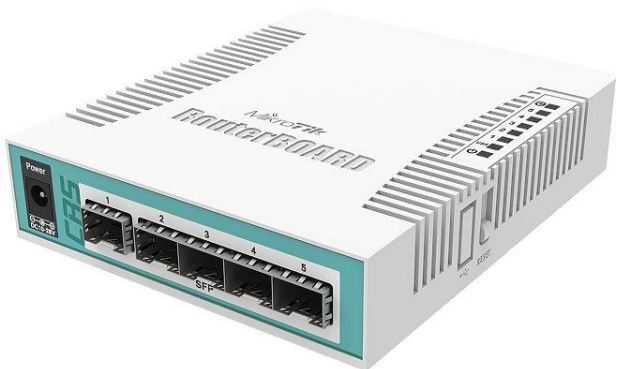
Método 3 de configurar VLANs

Série CRS 1xx e CRS 2xx

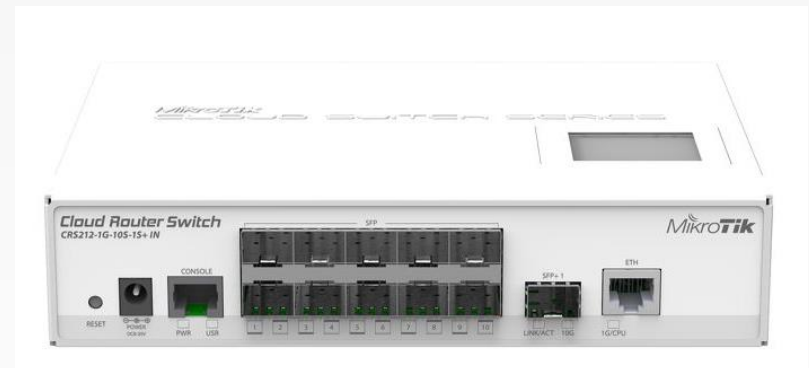
A serie 1xx e 2xx

- Particularidades
- Como usar o Switch chip?
- Alguns modelos:

CRS 106



CRS 212





Antes de começar

Redes Brasil

- Atenção! Grandes possibilidades de perder o acesso;
- Ative o SAFE MODE ou tenha um cabo console de backup;
- Se possível faça laboratórios antes de configurar em produção.





O que vamos fazer ?

- Adicione as interfaces em uma bridge;
- Crie a VLAN e adicione as portas de transporte e acesso no menu Switch > VLAN;
- Configure as portas de acesso no menu Switch > VLAN > Ingress VLAN Translation;
- Configure a porta de transporte no menu switch > VLAN > Egress VLAN Tag;
- Ative o filtro de VLANs.



Configuração desta série

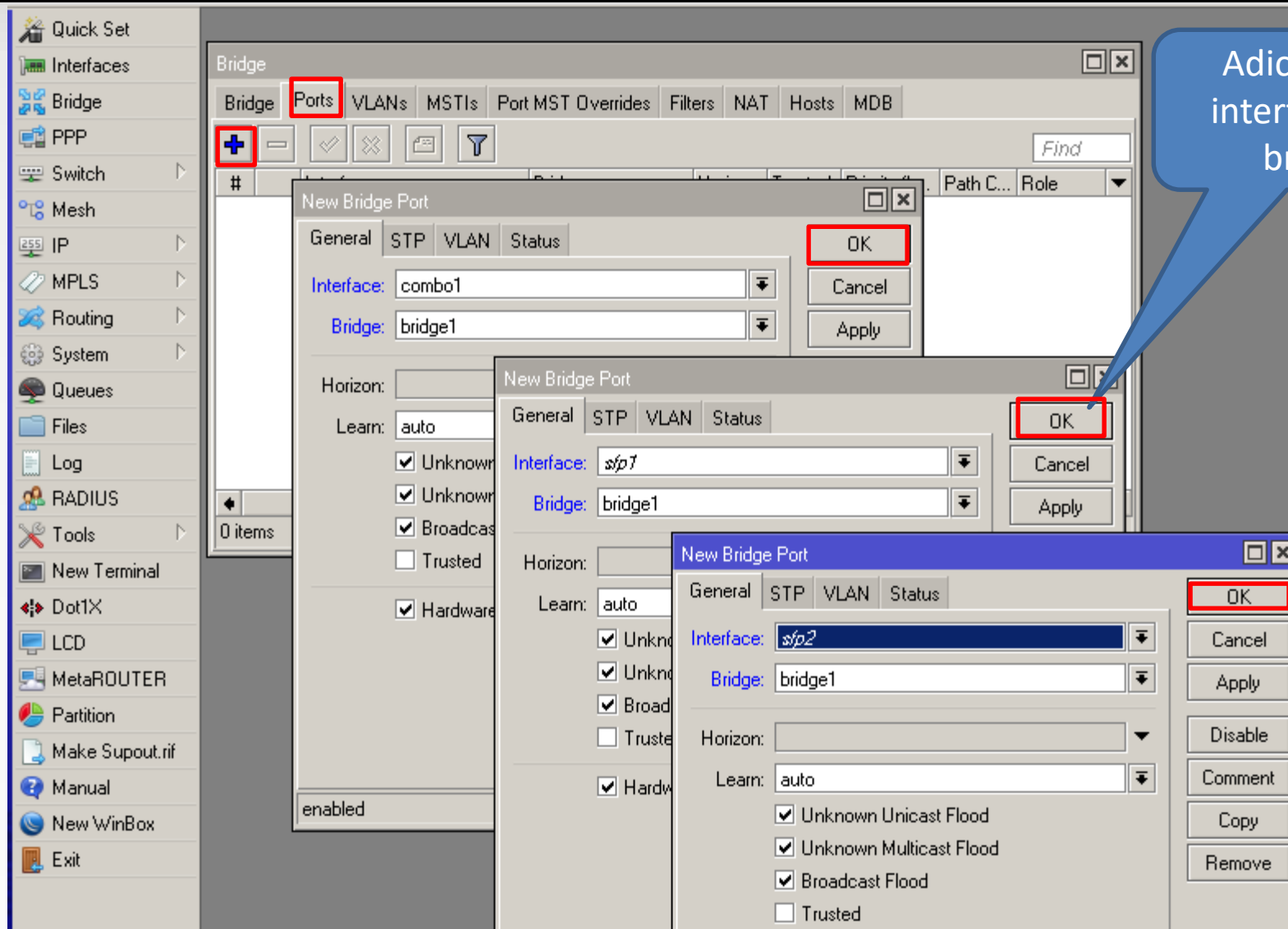
Redes Brasil

The screenshot shows the Mikrotik WinBox interface. On the left sidebar, the 'Bridge' option is highlighted with a red box. The main window displays the 'Bridge' configuration page. A 'New Interface' dialog box is open, showing the following fields:

- Name: bridge1
- Type: Bridge
- MTU: (empty)
- Actual MTU: (empty)
- L2 MTU: (empty)
- MAC Address: (empty)
- ARP: enabled
- ARP Timeout: (empty)
- Admin. MAC Address: (empty)
- Ageing Time: 00:05:00
- IGMP Snooping:
- DHCP Snooping:
- Fast Forward:

The 'OK' button in the dialog is highlighted with a red box. A blue speech bubble points to the 'OK' button with the text 'Crie a bridge'.

Configuração desta série



The screenshot displays the Mikrotik WinBox interface for configuring a bridge. The left sidebar shows a tree view with categories like Quick Set, Interfaces, Bridge, PPP, Switch, Mesh, IP, MPLS, Routing, System, Queues, Files, Log, RADIUS, Tools, New Terminal, Dot1X, LCD, MetaROUTER, Partition, Make Supout.rif, Manual, New WinBox, and Exit. The main window is titled 'Bridge' and has tabs for Bridge, Ports, VLANs, MSTIs, Port MST Overrides, Filters, NAT, Hosts, and MDB. The 'Ports' tab is active, and a red box highlights the '+' icon in the toolbar. Three 'New Bridge Port' dialog boxes are open, each with a red box around its 'OK' button. The first dialog shows 'Interface: combo1' and 'Bridge: bridge1'. The second dialog shows 'Interface: sfp1' and 'Bridge: bridge1'. The third dialog shows 'Interface: sfp2' and 'Bridge: bridge1'. A blue callout bubble points to the 'OK' button of the third dialog with the text 'Adicione as interfaces na bridge'.

Adicione as interfaces na bridge

Configuração desta série

Switch VLAN

VLAN

+ - ✓ ✗

VLAN ID	Ports	SVL	SA Learni...	Flood
10	sfp1, combo1	no	yes	no
20	combo1, sfp2	no	yes	no
4095	switch1-cpu, sfp1, sfp2, sfp3, sfp4, sfp5	no	no	no

Quick Set
Interfaces
Bridge
PPP
Switch
Mesh
IP
MPLS
Routing
System
Queues
Files
Log
RADIUS
Tools
New Terminal
Dot1X
LCD
MetaROUTER
Partition

Switch VLAN <10>

VLAN ID: 10

Ports: sfp1
combo1

SVL
 SA Learning
 Flood
 Ingress Mirror

QoS Group: none

enabled

Switch VLAN <20>

VLAN ID: 20

Ports: combo1
sfp2

SVL
 SA Learning
 Flood
 Ingress Mirror

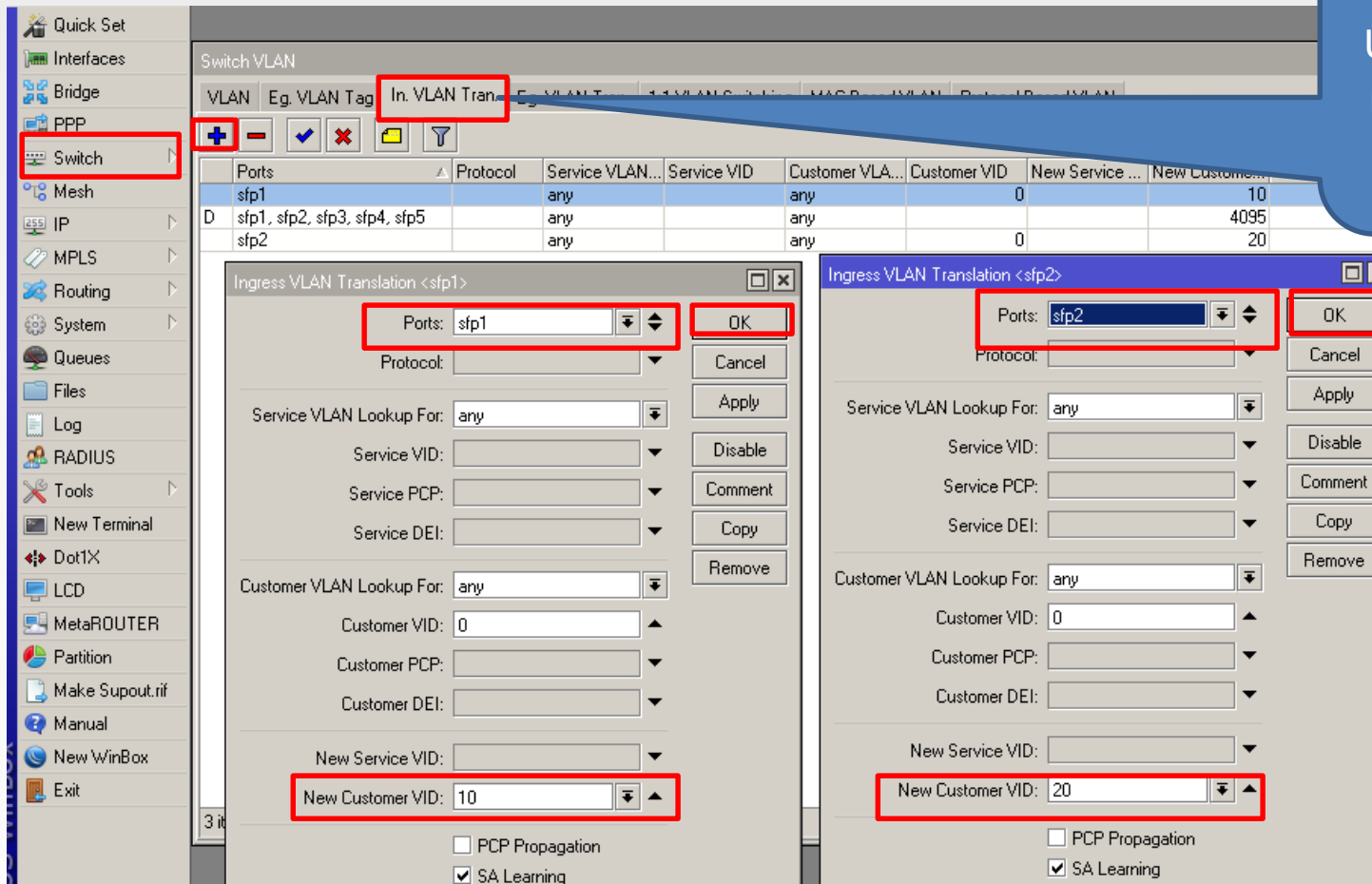
QoS Group: none

enabled

Crie as VLANs nas interfaces utilizando o menu "Switch > VLAN"

Configuração desta série

Configure as Portas UNTAGGED no menu "Switch > VLAN > In. VLAN Tran."



Switch VLAN

VLAN	Eg. VLAN Tag	In. VLAN Tran.		
			Ports	Protocol	Service VLAN...	Service VID	Customer VLA...	Customer VID	New Service ...	New Custom...
D			sfp1		any		any		0	10
			sfp1, sfp2, sfp3, sfp4, sfp5		any		any			4095
			sfp2		any		any		0	20

Ingress VLAN Translation <sfp1>

Ports: sfp1

Protocol: any

Service VLAN Lookup For: any

Service VID: 0

Service PCP: 0

Service DEI: 0

Customer VLAN Lookup For: any

Customer VID: 0

Customer PCP: 0

Customer DEI: 0

New Service VID: 0

New Customer VID: 10

PCP Propagation:

SA Learning:

Ingress VLAN Translation <sfp2>

Ports: sfp2

Protocol: any

Service VLAN Lookup For: any

Service VID: 0

Service PCP: 0

Service DEI: 0

Customer VLAN Lookup For: any

Customer VID: 0

Customer PCP: 0

Customer DEI: 0

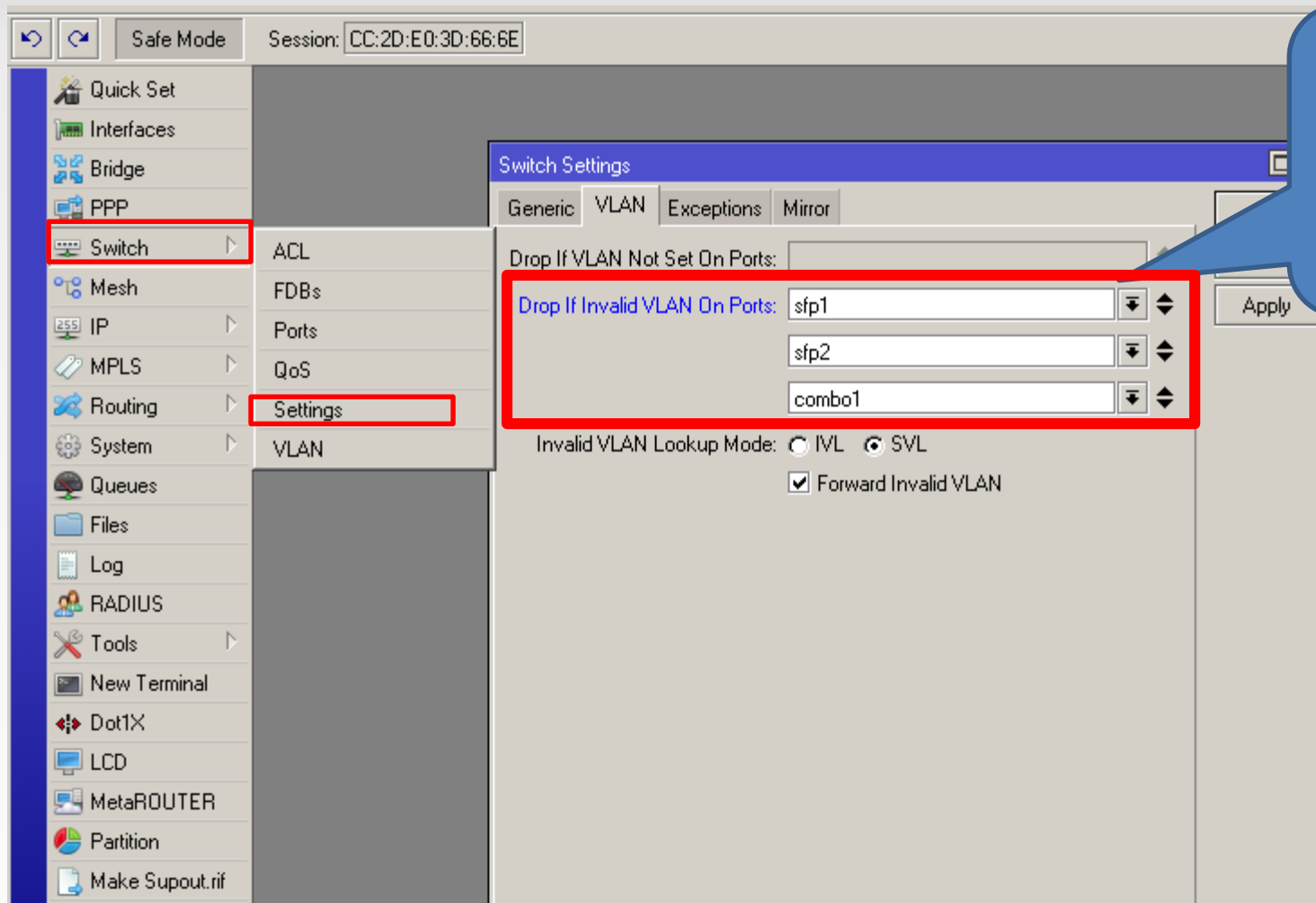
New Service VID: 0

New Customer VID: 20

PCP Propagation:

SA Learning:

Configuração desta série



The screenshot shows a network device configuration interface. The left sidebar contains a menu with the following items: Quick Set, Interfaces, Bridge, PPP, Switch, Mesh, IP, MPLS, Routing, System, Queues, Files, Log, RADIUS, Tools, New Terminal, Dot1X, LCD, MetaROUTER, Partition, and Make Supout.tif. The 'Switch' menu item is highlighted with a red box, and its sub-menu is open, showing 'Settings' and 'VLAN' also highlighted with red boxes. The main area displays the 'Switch Settings' configuration page, with the 'VLAN' tab selected. The 'Drop If Invalid VLAN On Ports' section is highlighted with a red box and contains three dropdown menus with the values 'sfp1', 'sfp2', and 'combo1'. Below this, the 'Invalid VLAN Lookup Mode' is set to 'SVL' (Selected) and 'Forward Invalid VLAN' is checked. An 'Apply' button is visible on the right.

Ative o filtro de VLANs no menu “Switch > Settings > VLAN”

Resumindo

- Resumo do método 3 – Série CRS 1xx e 2xx



- As configurações são feitas no menu de SWITCH;
- O tráfego não irá passar pela CPU, conseguindo assim um alto desempenho;
- As interfaces precisam estar em uma bridge.



Método 4 de configurar VLANs

Série CRS 3xx



A nova geração: CRS 3xx

Redes Brasil

- Dual boot: RouterOS e SwitchOS
- Melhor desempenho e custo x benefício
- Alguns modelos:
- CRS305-1G-4S+IN
- CRS317-1G-16S+RM
- CRS326-24S+2Q+RM **NOVO**
- CRS312-4C+8XG-RM **NOVO**

- Todas as portas em bridge com hardware offloading ativado;
- Configure as portas de acesso em: Bridge > Ports > VLAN;
- Por último ative o Bridge VLAN filtering dentro da interface bridge.

A configuração no RouterOS

admin@B8:69:F4:72:B5:77 (MikroTik) - WinBox v6.45.6 on CR5317-1G-165+ (arm)

Session Settings Dashboard

Safe Mode Session: B8:69:F4:72:B5:77

- Quick Set
- CAPsMAN
- Interfaces
- Wireless
- Bridge
- PPP
- Switch
- Mesh
- IP
- MPLS
- Routing
- System
- Queues
- Files
- Log
- RADIUS
- Tools
- New Terminal

Bridge

Bridge Ports VLANs MSTIs Port MST Overrides Filters NAT Hosts MDB



Settings

Find

Name	Type	L2 MTU	Tx	Rx
------	------	--------	----	----

0 items out of 17

New Interface

General STP VLAN Status Traffic

Name: bridge1

Type: Bridge

MTU:

Actual MTU:

L2 MTU:

MAC Address:

ARP: enabled

ARP Timeout:

Admin. MAC Address:

OK

Cancel

Apply

Disable

Comment

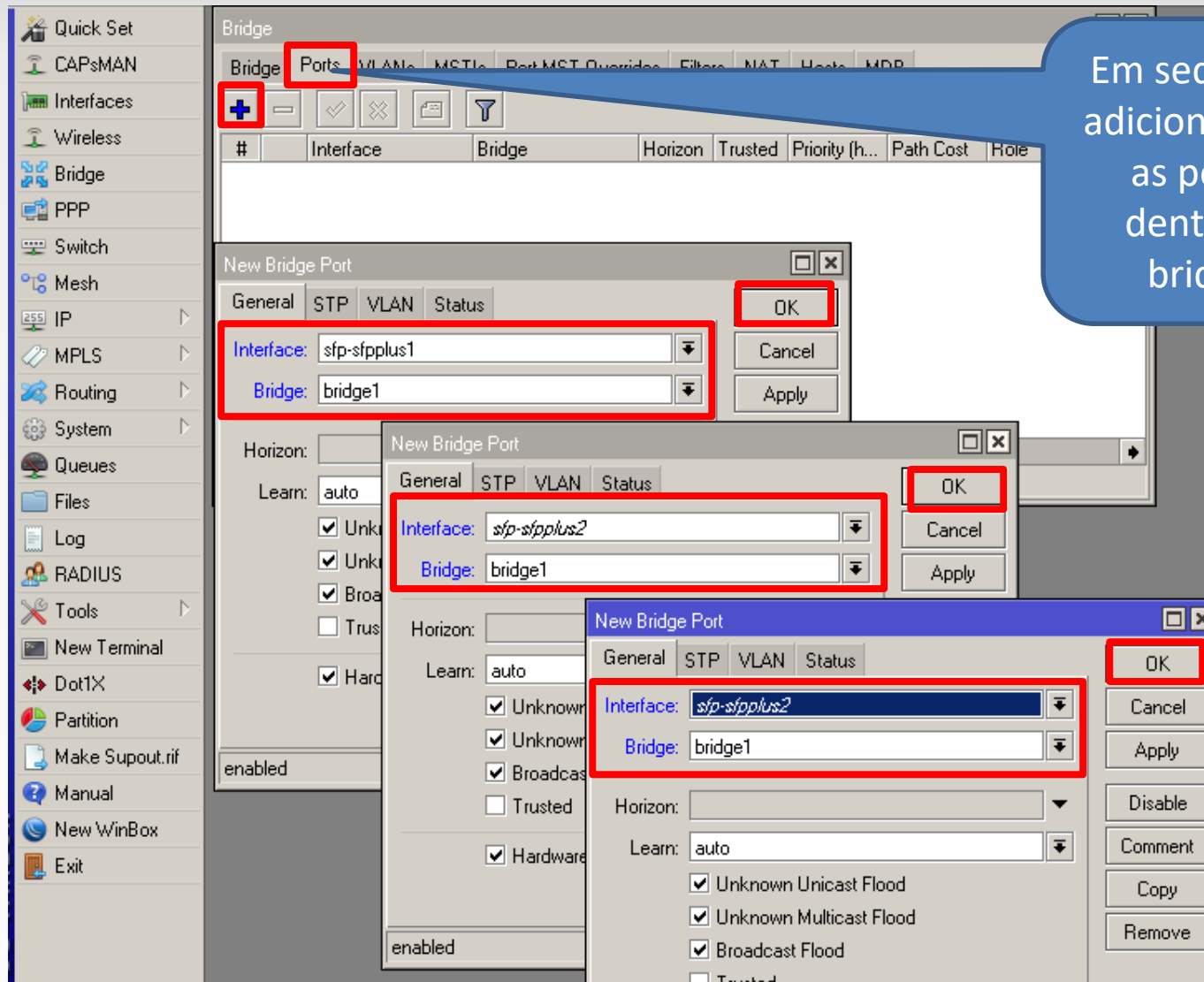
Copy

Remove

Torch

Primeiro passo: crie uma bridge!

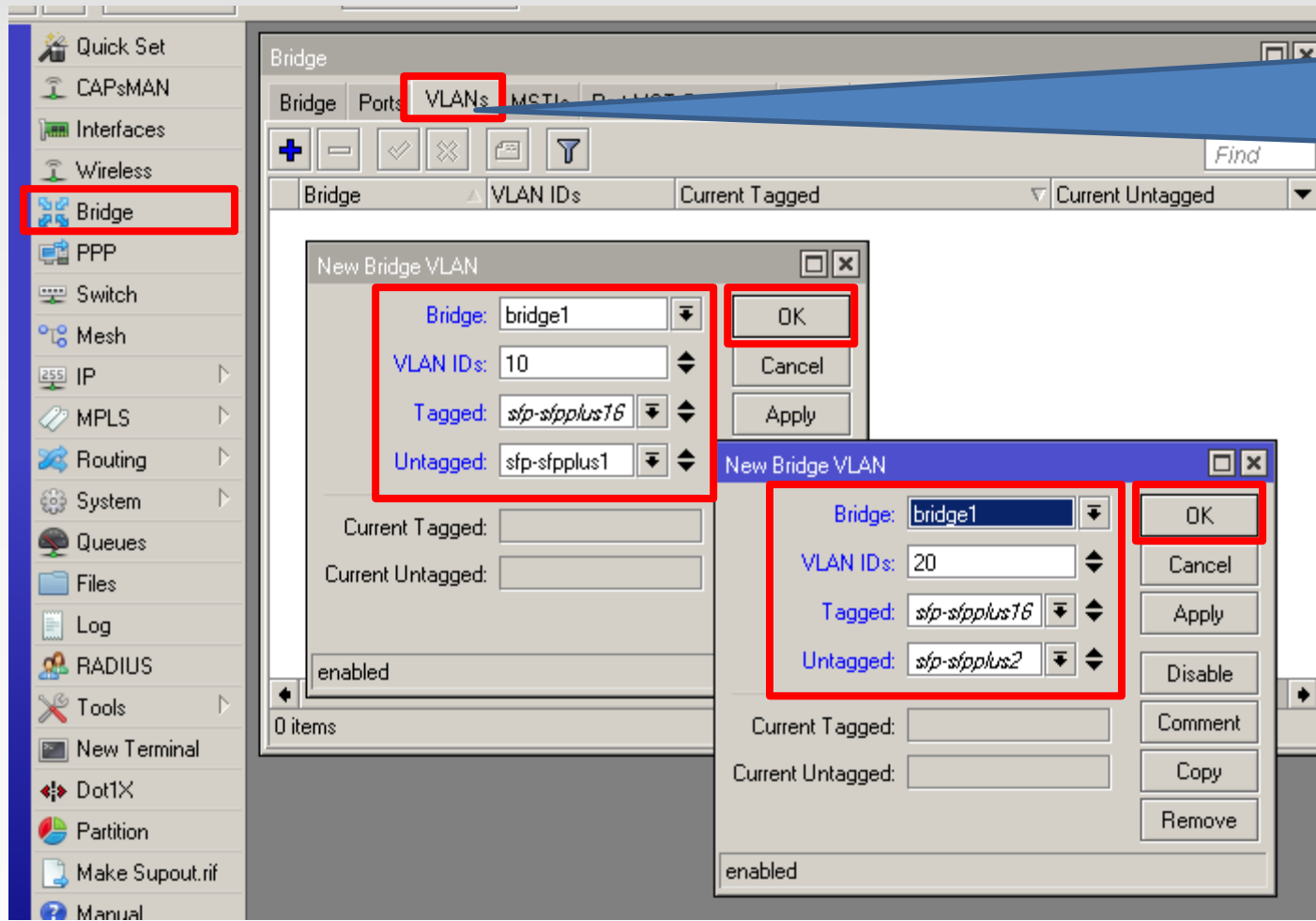
A configuração no RouterOS



The screenshot shows the Mikrotik WinBox interface with the Bridge configuration window open. The 'Ports' tab is selected, and a '+' icon is highlighted with a red box. Three 'New Bridge Port' dialog boxes are shown in a sequence, each with a red box around the 'Interface' and 'Bridge' fields. The first dialog shows 'Interface: sfp-sfpplus1' and 'Bridge: bridge1'. The second dialog shows 'Interface: sfp-sfpplus2' and 'Bridge: bridge1'. The third dialog shows 'Interface: sfp-sfpplus2' and 'Bridge: bridge1'. The 'OK' button in each dialog is also highlighted with a red box.

Em sequência adicione todas as portas dentro da bridge!

A configuração no RouterOS



The screenshot displays the Mikrotik WinBox interface. On the left sidebar, the 'Bridge' menu item is highlighted with a red box. The main window shows the 'Bridge' configuration page with the 'VLANs' tab selected. Two 'New Bridge VLAN' dialog boxes are open. The first dialog shows 'Bridge' set to 'bridge1', 'VLAN IDs' set to 10, 'Tagged' set to 'sfp-sfpplus16', and 'Untagged' set to 'sfp-sfpplus1'. The second dialog shows 'Bridge' set to 'bridge1', 'VLAN IDs' set to 20, 'Tagged' set to 'sfp-sfpplus16', and 'Untagged' set to 'sfp-sfpplus2'. Red boxes highlight the 'Bridge' dropdown, 'VLAN IDs' field, 'Tagged' dropdown, 'Untagged' dropdown, and 'OK' button in both dialog boxes.

Crie as VLANs e defina quais portas são TAGGED e UNTAGGED;

A configuração no RouterOS

admin@B8:69:F4:72:B5:77 (MikroTik) - WinBox v6.45.6 on CR5317-1G-165+ (arm)

Session Settings Dashboard

Safe Mode Session: B8:69:F4:72:B5:77

Bridge

Bridge Ports VLANs MSTIs Port MST Overrides Filters NAT Hosts MDB

#	Interface	Bridge	Horizon	Trusted	Priority (h...	Path Cost	Role
2 H	sfp-sfpplus1	bridge1		no	80	10	designated port
0 IH	sfp-sfpplus2	bridge1		no	80	10	disabled port
					80	10	disabled port
					80	10	disabled port
					80	10	disabled port
					80	10	disabled port
					80	10	disabled port
					80	10	disabled port
					80	10	disabled port

Bridge Port <sfp-sfpplus1>

General STP VLAN Status

PVID: 10

OK

Cancel

Bridge Port <sfp-sfpplus2>

General STP VLAN Status

PVID: 20

OK

Cancel

Apply

Disable

Comment

Copy

Remove

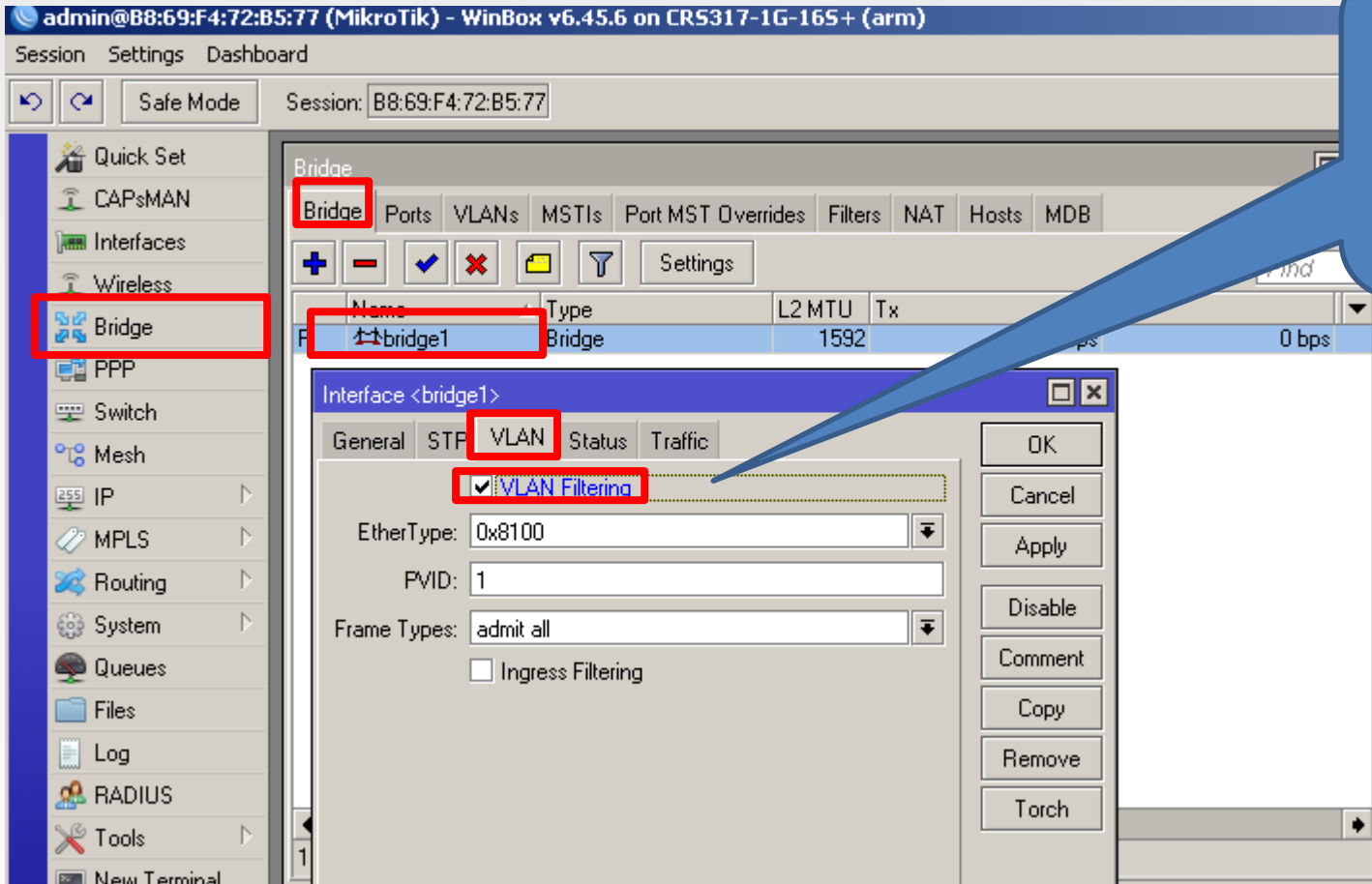
Frame Types: admit all

Ingress Filtering

Tag Stacking

Configure o PVID nas interfaces UNTAGGED;

A configuração no RouterOS



The screenshot shows the Mikrotik WinBox interface for configuring a bridge. The left sidebar has the 'Bridge' menu item highlighted with a red box. The main window shows the 'Bridge' configuration for 'bridge1', with the 'VLAN' tab selected. The 'VLAN Filtering' checkbox is checked and highlighted with a red box. Other fields include EtherType: 0x8100, PVID: 1, and Frame Types: admit all. The 'Ingress Filtering' checkbox is unchecked.

Name	Type	L2 MTU	Tx
bridge1	Bridge	1592	0 bps

Interface <bridge1>

General | STP | **VLAN** | Status | Traffic

VLAN Filtering

EtherType: 0x8100

PVID: 1

Frame Types: admit all

Ingress Filtering

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

Ative o bridge
“VLAN
filtering” por
último



Um exemplo em produção: CRS 317

Redes Brasil

```
Terminal
[REDACTED-SW_CORE] > system routerboard print
routerboard: yes
  model: CRS317-1G-16S+
  serial-number: 955E09294141
  firmware-type: dx3230L
  factory-firmware: 6.41
  current-firmware: 6.43.14
  upgrade-firmware: 6.43.14
[REDACTED-SW_CORE] > interface monitor-traffic aggregate
rx-packets-per-second: 312 398
rx-bits-per-second: 2.5Gbps
fp-rx-packets-per-second: 73
fp-rx-bits-per-second: 78.8kbps
rx-drops-per-second: 0
rx-errors-per-second: 0
tx-packets-per-second: 312 628
tx-bits-per-second: 2.5Gbps
fp-tx-packets-per-second: 73
fp-tx-bits-per-second: 78.8kbps
tx-drops-per-second: 0
tx-queue-drops-per-second: 0
tx-errors-per-second: 0
-- [Q quit|D dump|C-z pause]

Terminal
[REDACTED-SW_CORE] > system routerboard print
routerboard: yes
  model: CRS317-1G-16S+
  serial-number: 955E09294141
  firmware-type: dx3230L
  factory-firmware: 6.41
  current-firmware: 6.43.14
  upgrade-firmware: 6.43.14
[REDACTED-SW_CORE] > system resource monitor
cpu-used: 2%
cpu-used-per-cpu: 3%,1%
free-memory: 1012752KiB
-- [Q quit|D dump|C-z pause]
```

Resumindo

- Resumo do método 4 – CRS 3xx

- A configuração é feita no menu Bridge;
- Configuração mais simples se comparado com a série CRS 1xx e CRS 2xx;
- Switchs de altíssimo desempenho.





Método 5 de configurar VLANs:

SwitchOS

- S.O. MikroTik desenvolvido para Switchs;
- S.O. da série CSS – Cloud Smart Switch;
- Reboot extremamente ágil;
- O tráfego sempre passa pelo Switch Chip.



TAGGED e UNTAGGED

Redes Brasil

MikroTik SwOS

Link SFP Port Isolation LAG Forwarding RSTP Stats Errors Hist **VLAN** ...

	VLAN Mode	VLAN Receive	Default VLAN ID
SFP1	optional ▼	only untagged ▼	10
SFP2	optional ▼	only untagged ▼	20
SFP3	optional ▼	any ▼	1
SFP4	optional ▼	any ▼	1
SFP5	optional ▼	any ▼	1
SFP6	optional ▼	any ▼	1
SFP7	optional ▼	any ▼	1
SFP8	optional ▼	any ▼	1
SFP9	optional ▼	any ▼	1
SFP10	optional ▼	any ▼	1
SFP11	optional ▼	any ▼	1
SFP12	optional ▼	any ▼	1
SFP13	optional ▼	any ▼	1
SFP14	optional ▼	any ▼	1
SFP15	optional ▼	any ▼	1
SFP16	optional ▼	only tagged ▼	1
MGMT	optional ▼	any ▼	1

Pending changes Discard Changes Apply All

O menu VLAN é utilizado para definir quais portas TAGGED e UNTAGGED.

Resumindo

- Resumo do método 5 – SwitchOS

- Configuração via navegador/web;

- O tráfego sempre vai utilizar o Switch Chip, ou seja, o Hardware Offloading vai estar habilitado.





3 passos infalíveis para não errar com switch chip

Redes Brasil

1

- Criar a VLAN

2

- Definir a porta TAGGED

3

- Definir a porta UNTAGGED *

*

* A configuração da porta UNTAGGED quase sempre precisa de algum detalhe a mais.

- Primeiro entenda o seu cenário, depois configure adequadamente.
- Verificar o modelo de equipamento escolhido e a configuração ideal para a série.
- RouterOS ou SwitchOS ?
- Sempre tentar habilitar o hardware offloading!

Agradecimentos

- A MikroTik;
- Aos palestrantes;
- Aos participantes.

Dúvidas e comentários

