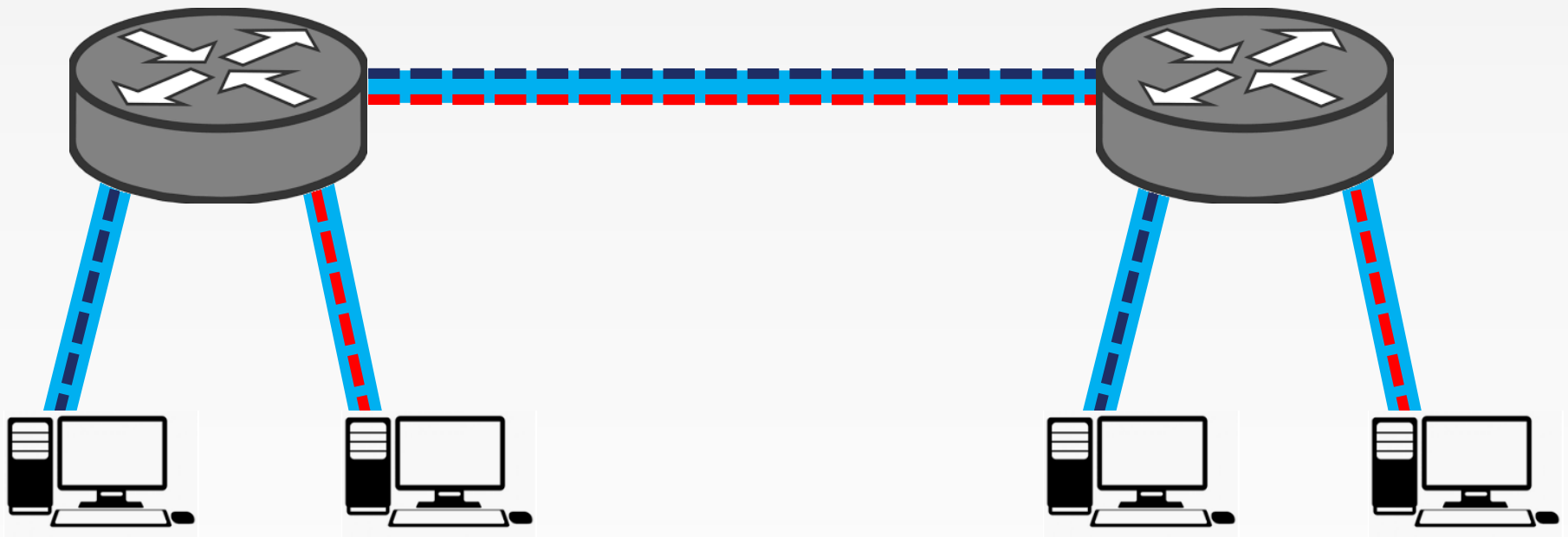


5 Formas diferentes de configurar VLANs em equipamentos da MikroTik



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.

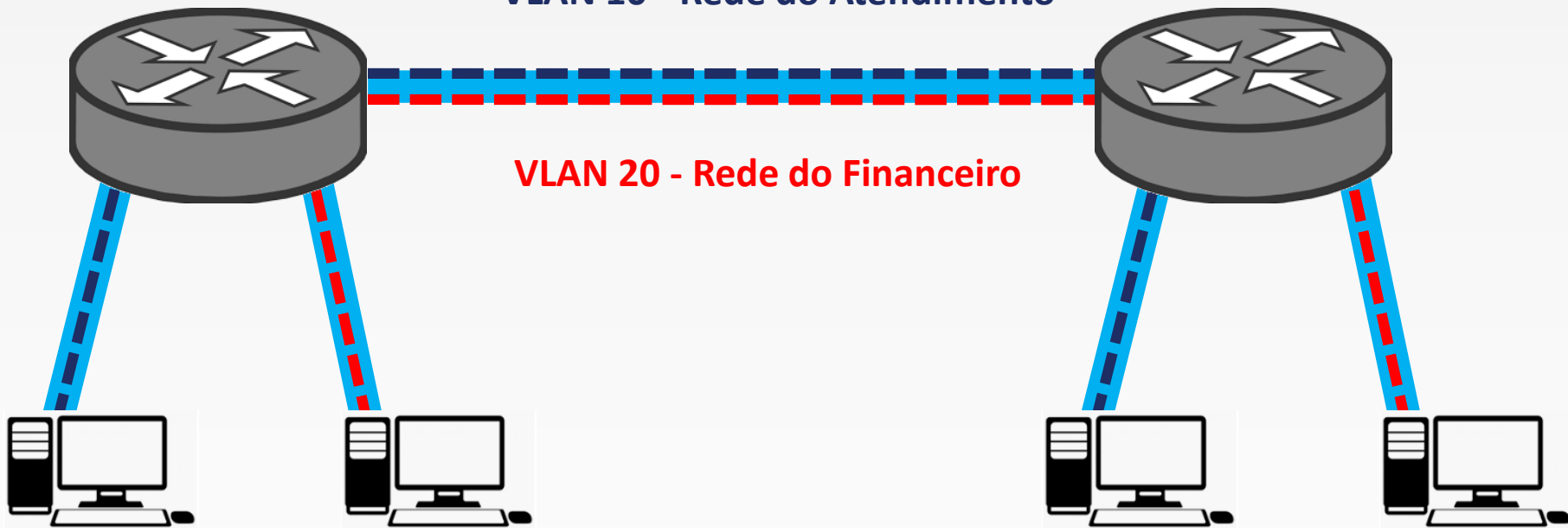
- Noções sobre VLANs;
- CPU? Switch Chip?;
- Bridges e Hardware offloading.

O que é VLAN?

- 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

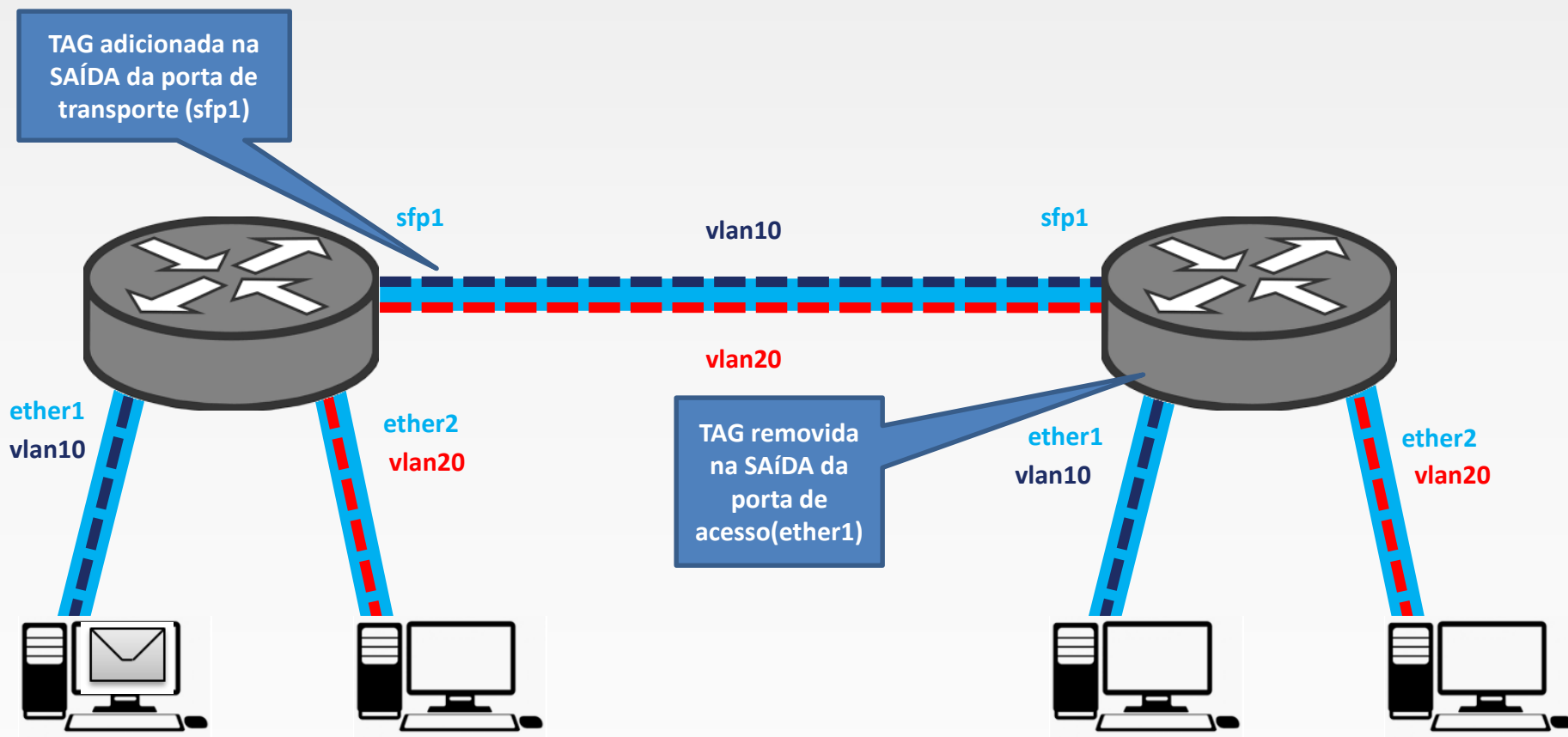
Redes Brasil

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



Como funciona?

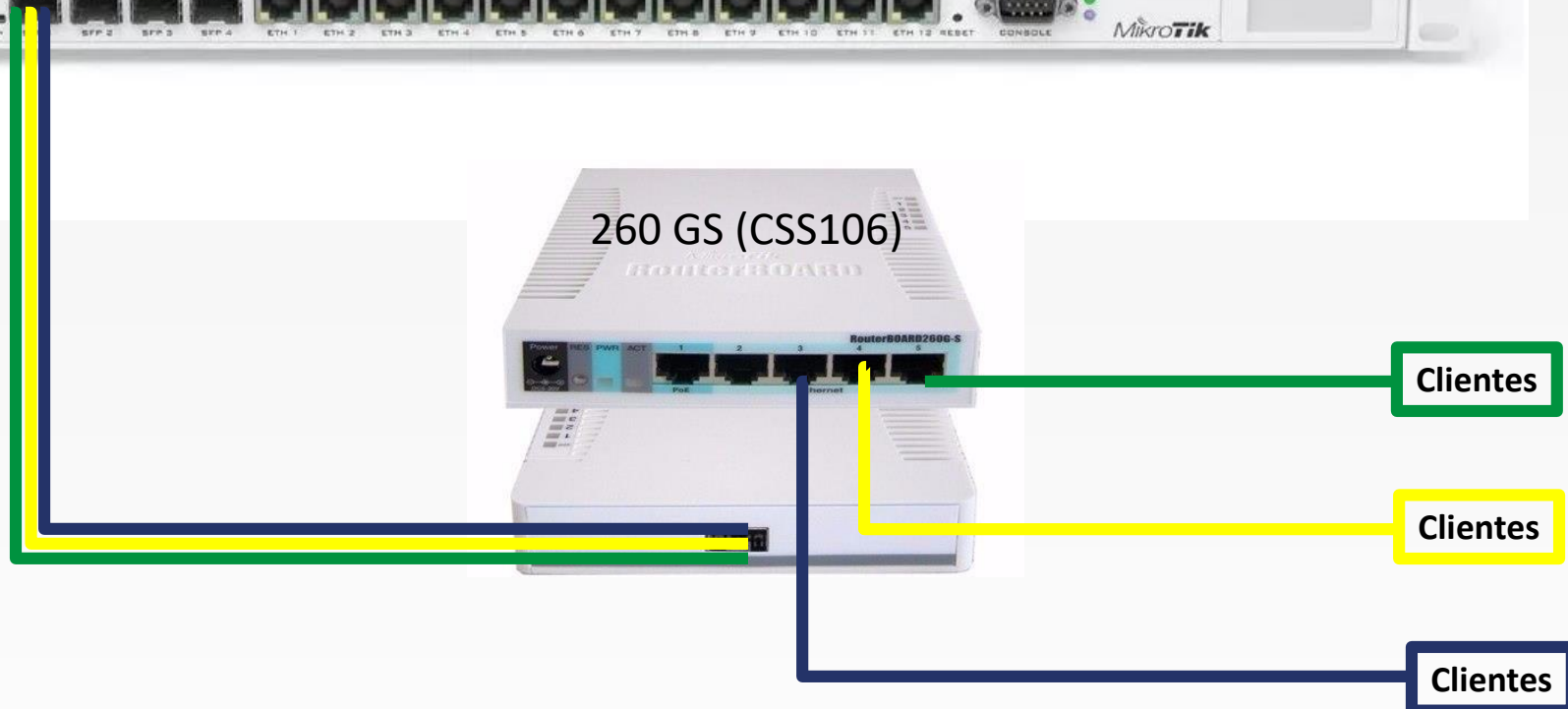
- Porta de transporte / TAGGED = Adiciona a VLAN ao frame;}
- Porta de acesso / UNTAGGED = Remove a VLAN do frame.





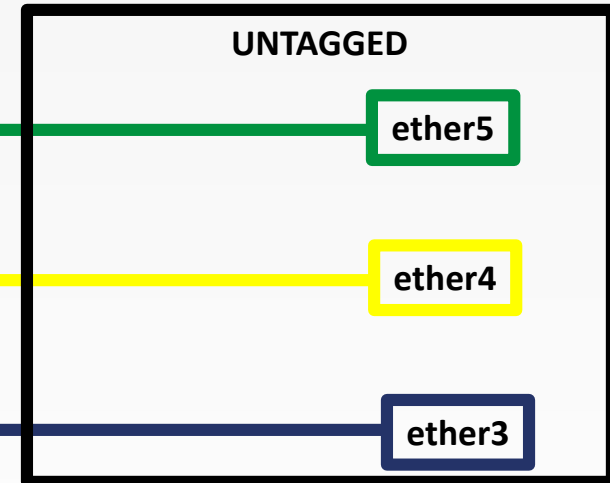
Uma breve história

Redes Brasil





Sobre VLANs



SFP1 = TAGGED



Uma breve história

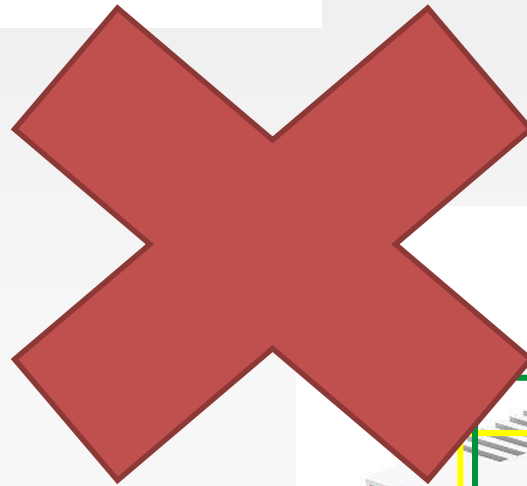
CRS 106



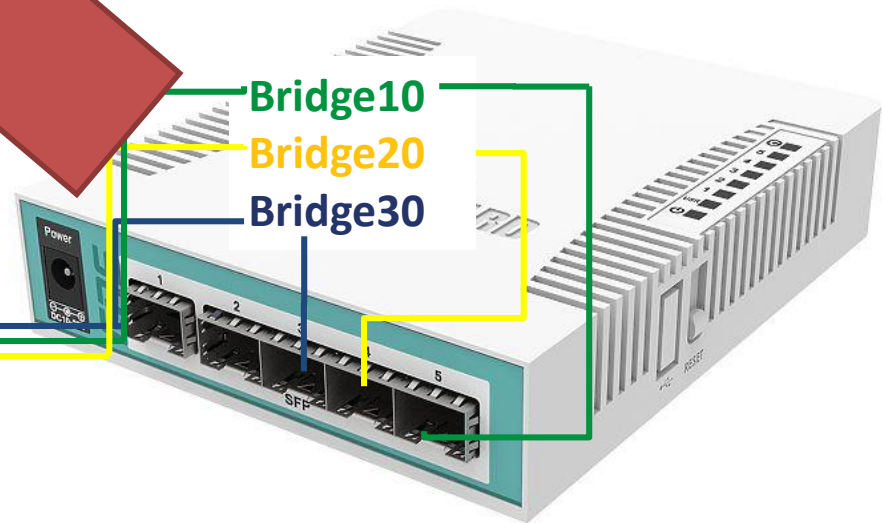


Uma breve história

Redes Brasil



VLAN10
VLAN20
VLAN30





Analizando o equipamento

Redes Brasil

Switching results

CRS106-1C-5S

Mode	Configuration	1518 byte		512 byte		64 byte	
		kpps	Mbps	kpps	Mbps	kpps	Mbps
Switching	Non blocking Layer 2 throughput	487.6	5,922.0	1,409.8	5,774.4	8,928.6	4,571.4
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

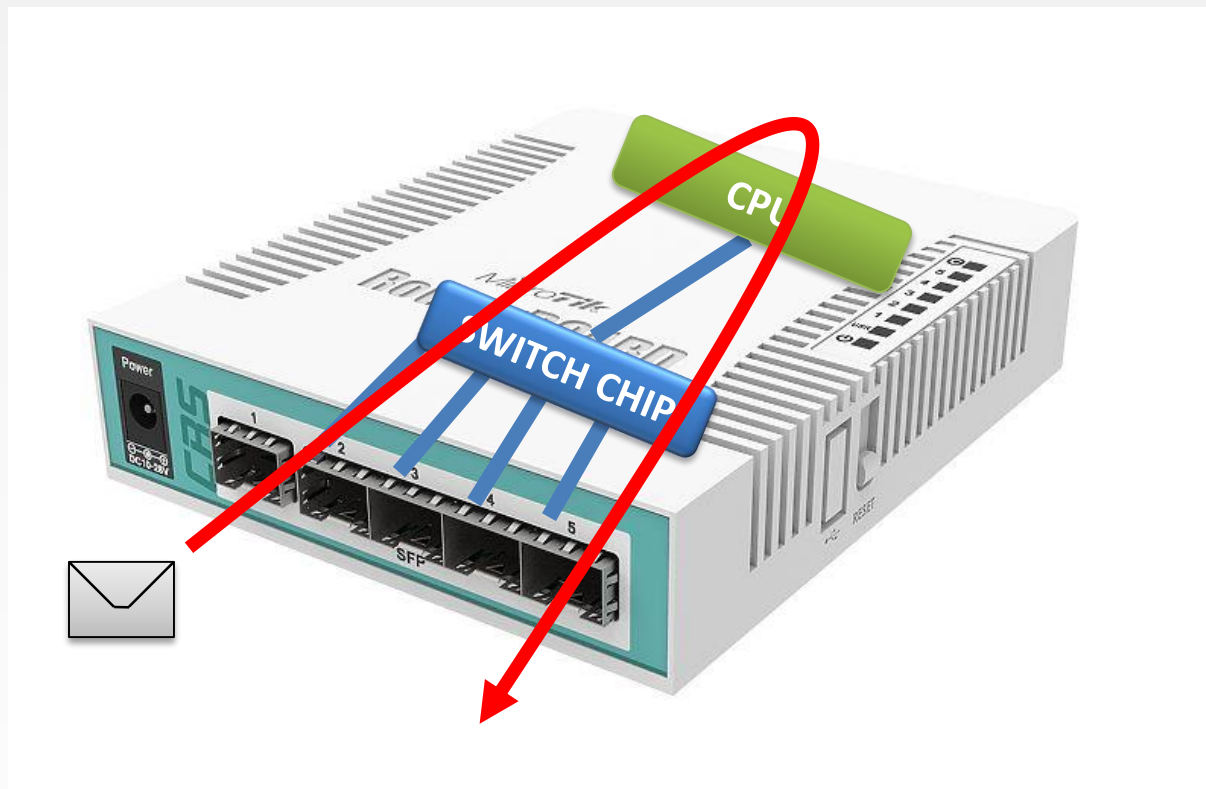
https://wiki.mikrotik.com/wiki/Manual:Switch_Rou... ▼ Traduzir esta página

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.

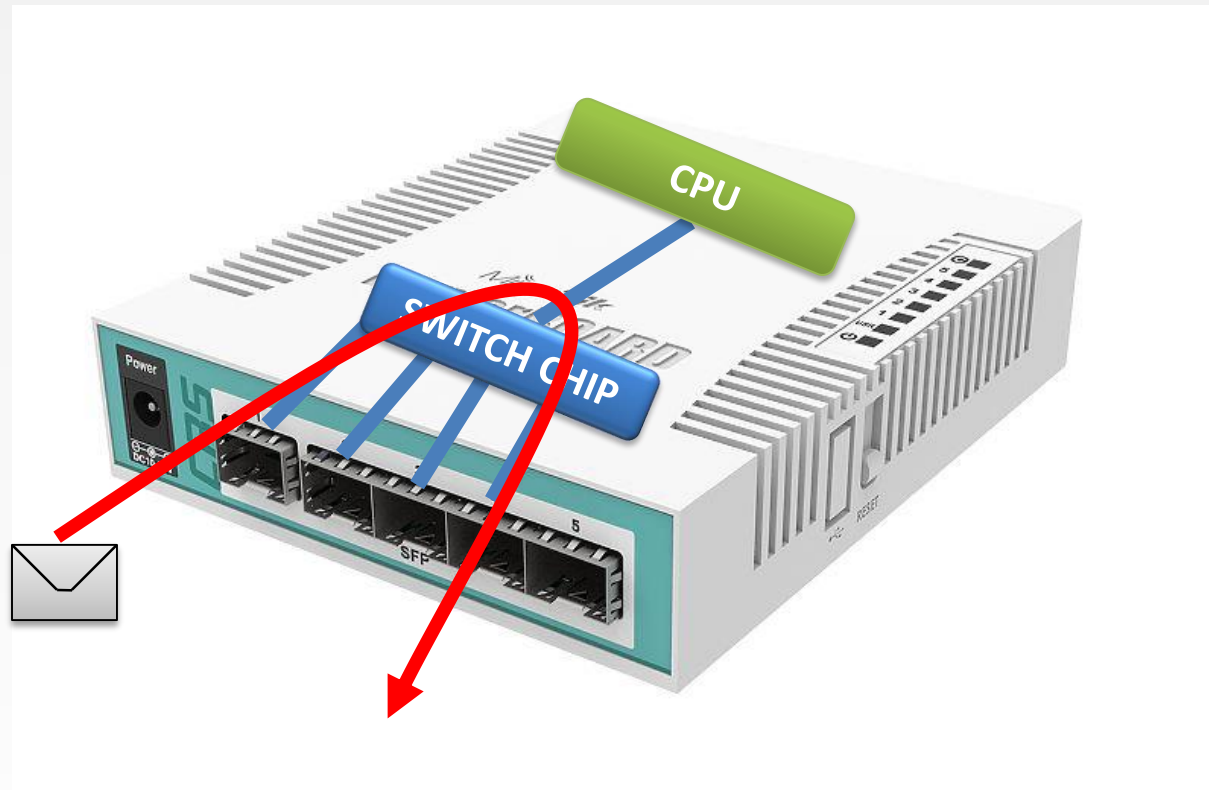
Switch chip x CPU

- 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
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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		1518 byte		512 byte		64 byte	
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Routing	none	46.5	564.7	65.7	269.1	71.1	36.4
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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       bridgel no   1 0x   10         10         none
1 I  sfp2       bridgel no   1 0x   10         10         none
2 I  sfp3       bridgel no   1 0x   10         10         none
3 I  sfp4       bridgel no   1 0x   10         10         none
4  sfp5       bridgel no   1 0x   10         10         none
5  combol    bridgel 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:

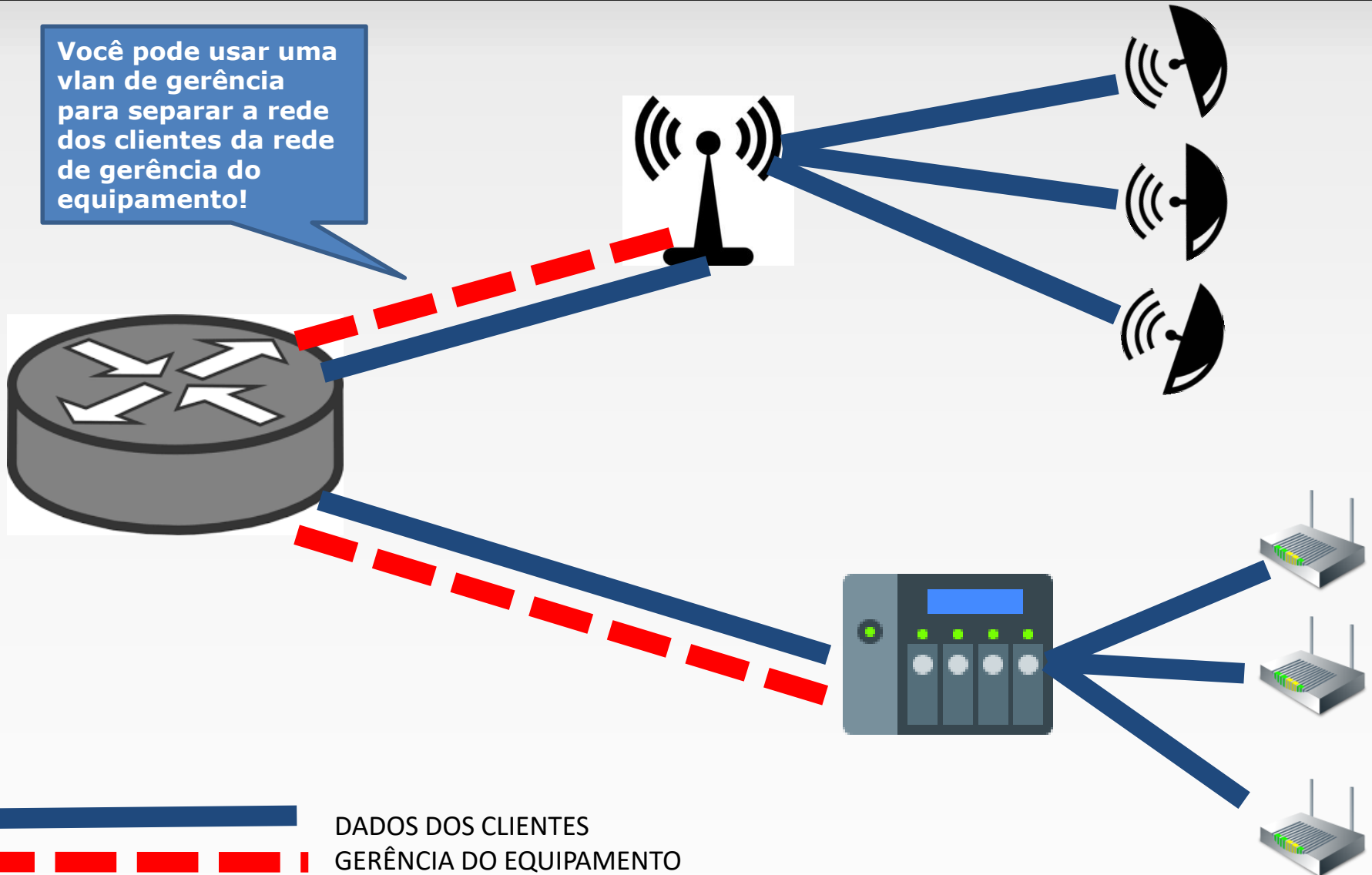
Roteadores **SEM** uso de Switch Chip



Onde utilizar esse método?

Redes Brasil

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

Interface List

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

Address List

Address	Network	Interface
10.0.0.1/24	10.0.0.0	ether1_vlan10-gerencia

6 items

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

O IP de gerência está na VLAN!

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

- ~~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:

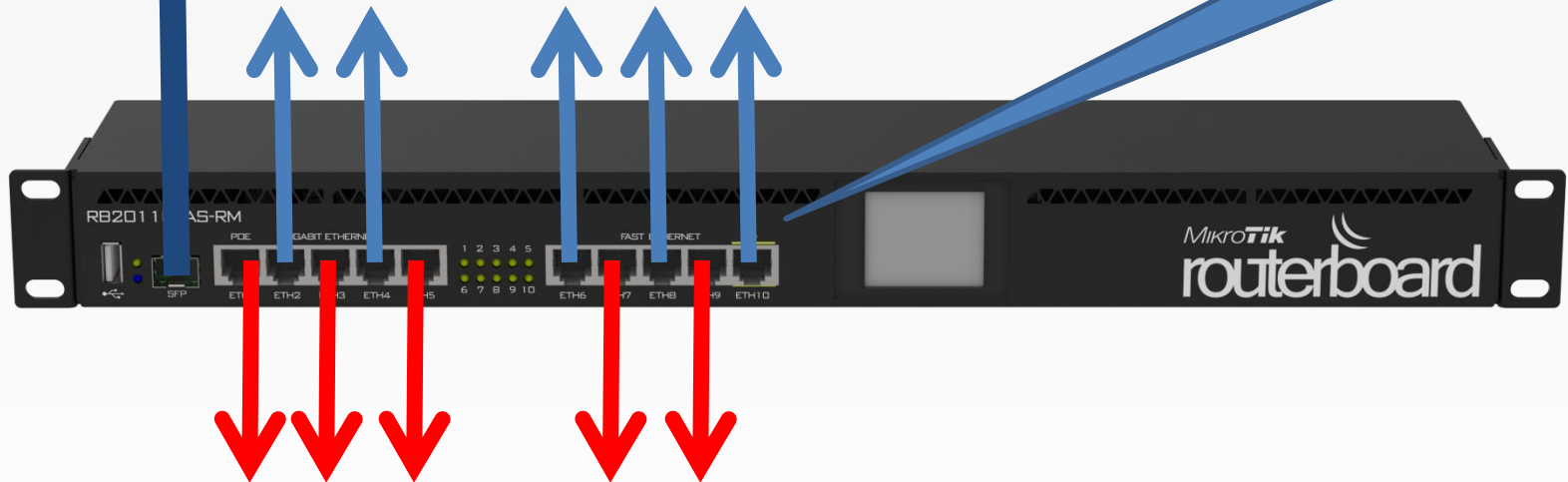
Roteadores **COM** uso de Switch Chip

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.





Roteador COM uso de switch chip

Redes Brasil

- 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

Redes Brasil

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:

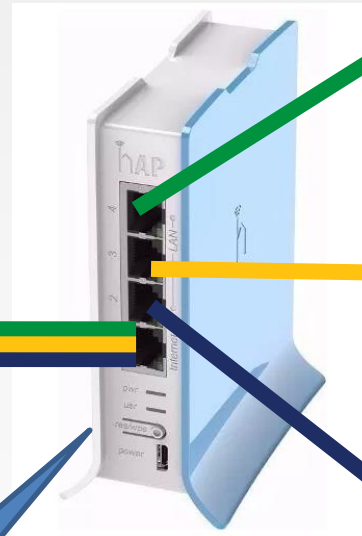
https://wiki.mikrotik.com/wiki/Manual:Switch_Chip_Features



A topologia

**RB 750Gr3
MT7621**

**hAP Lite
Atheros8227**



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



O que vamos fazer?

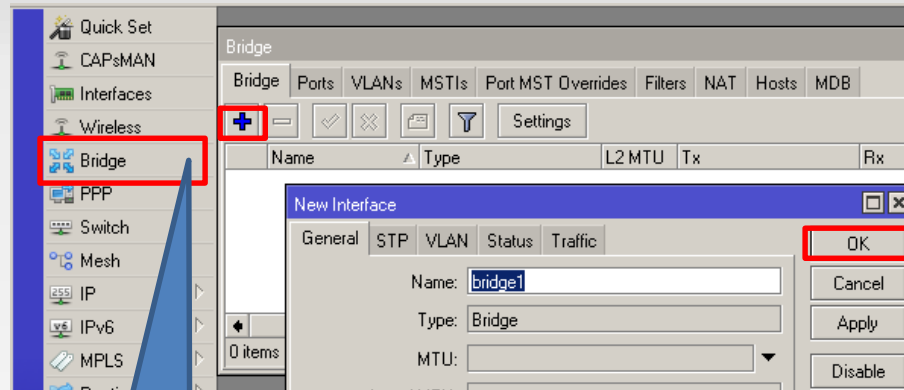
Redes Brasil

- 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.

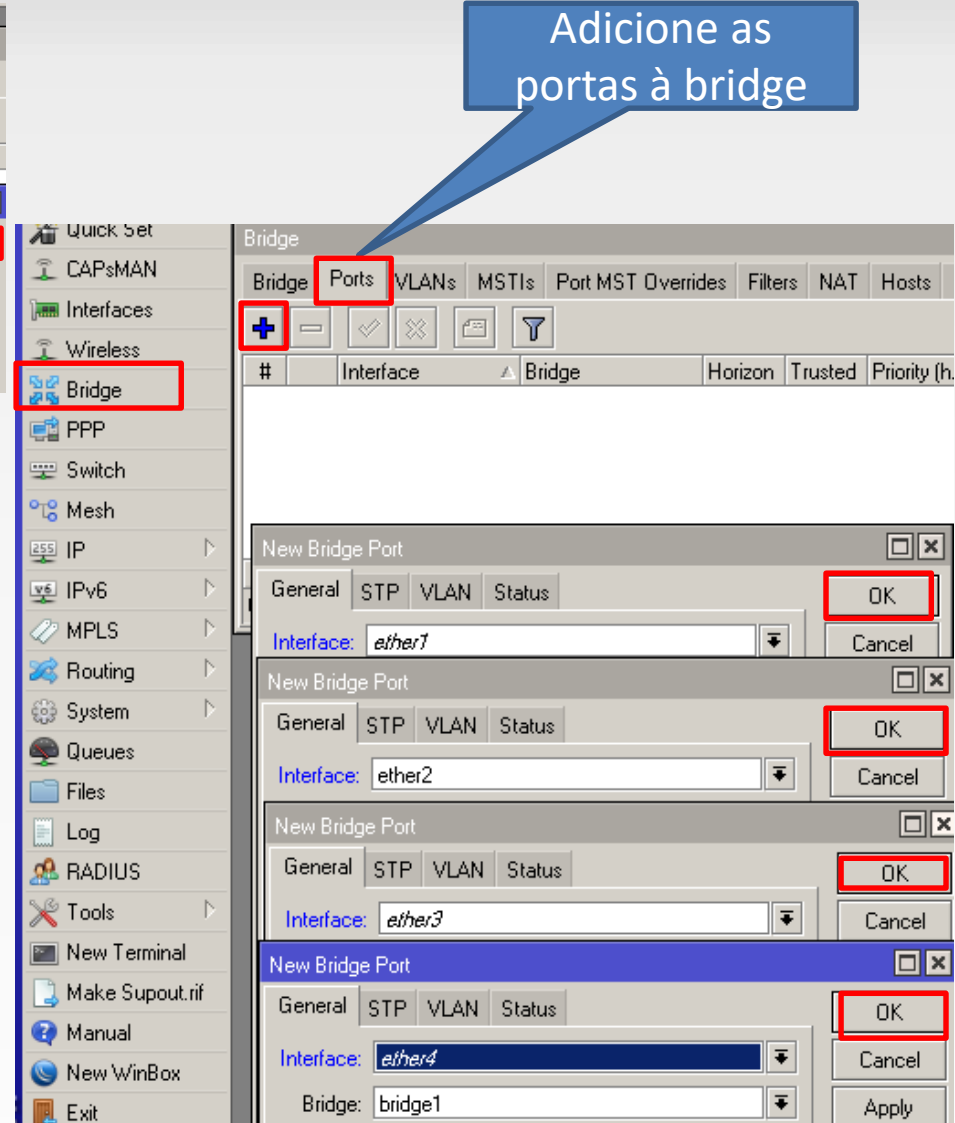


Criando a bridge

Redes Brasil



Crie uma bridge





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

Redes Brasil

- 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.





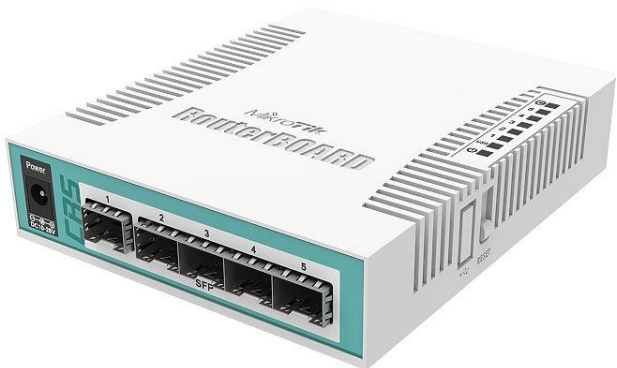
Método 3 de configurar VLANs

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 ?

Redes Brasil

- 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.



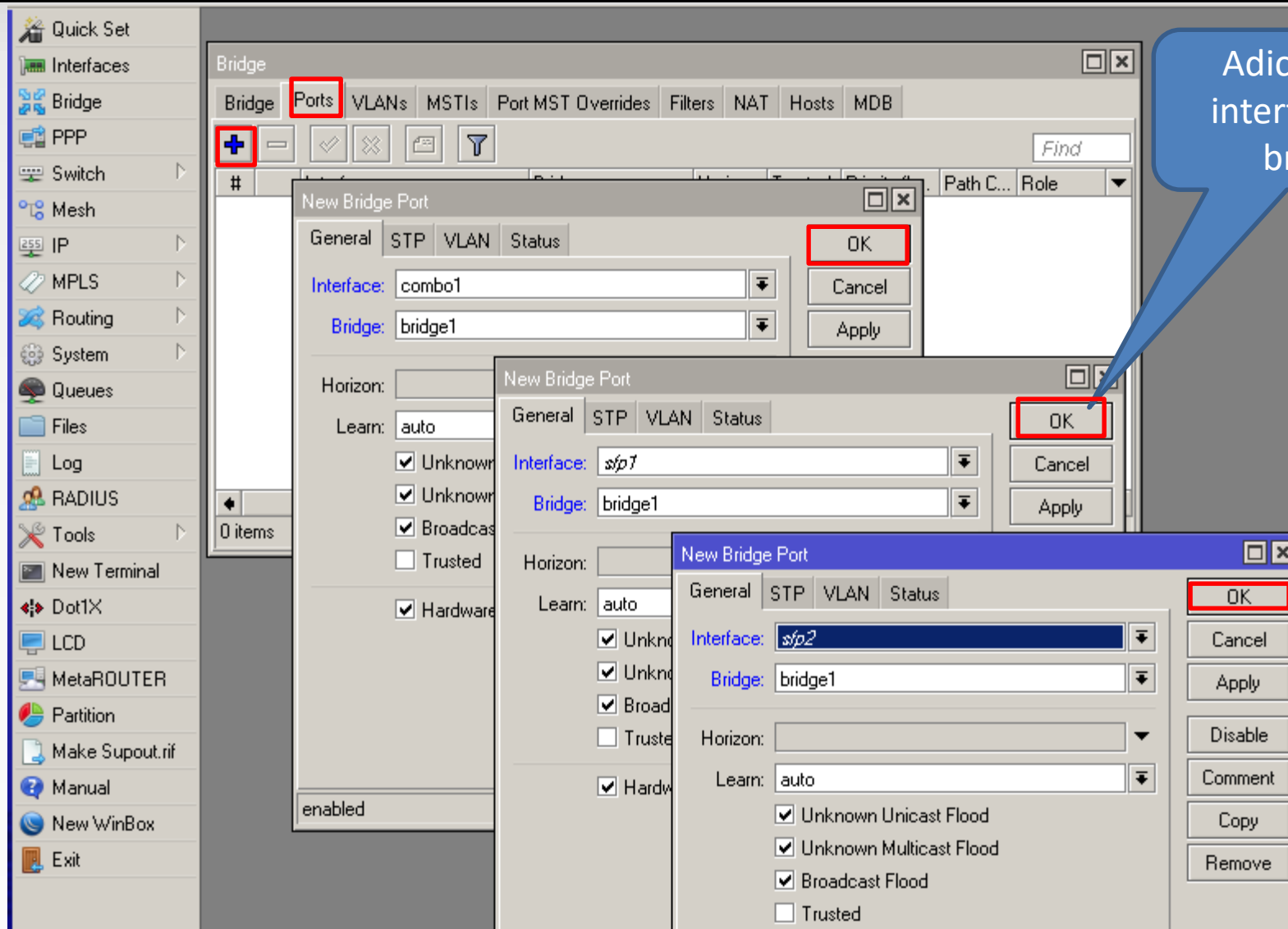
Configuração desta série

Redes Brasil

The screenshot shows the Mikrotik WinBox interface for configuring a bridge. On the left sidebar, the 'Bridge' option is highlighted with a red box. The main window displays the 'Bridge' configuration page, with the 'New Interface' dialog box open. In the dialog, the 'Name' field contains 'bridge1' and the 'Type' is set to 'Bridge'. 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'.

Crie a bridge

Configuração desta série



The screenshot displays the Mikrotik WinBox interface for configuring a bridge. 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, indicating the action to add a new port. Three "New Bridge Port" dialog boxes are shown, each with the "OK" button highlighted in red. The first dialog box shows "Interface: combo1" and "Bridge: bridge1". The second dialog box shows "Interface: sfp1" and "Bridge: bridge1". The third dialog box shows "Interface: sfp2" and "Bridge: bridge1". A blue callout bubble points to the "OK" button of the third dialog box with the text "Adicione as interfaces na bridge".

Adicione as interfaces na bridge



Configuração desta série

Redes Brasil

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

Switch 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

Switch VLAN <10>

VLAN ID: 10

Ports: sfp1, combo1

SVL: SA Learning: Flood: Ingress Mirror: QoS Group: none

OK

Switch VLAN <20>

VLAN ID: 20

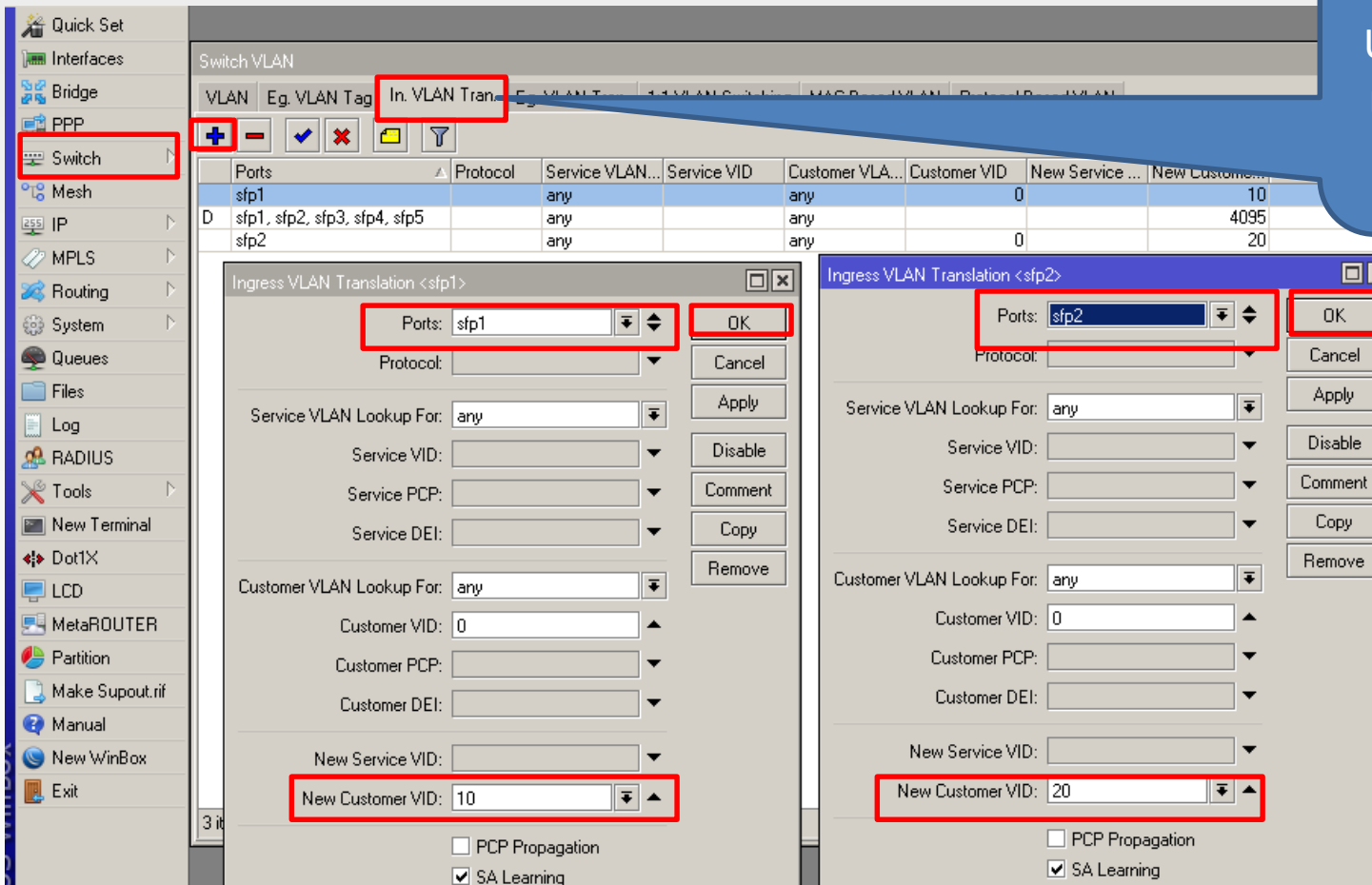
Ports: combo1, sfp2

SVL: SA Learning: Flood: Ingress Mirror: QoS Group: none

OK

Configuração desta série

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



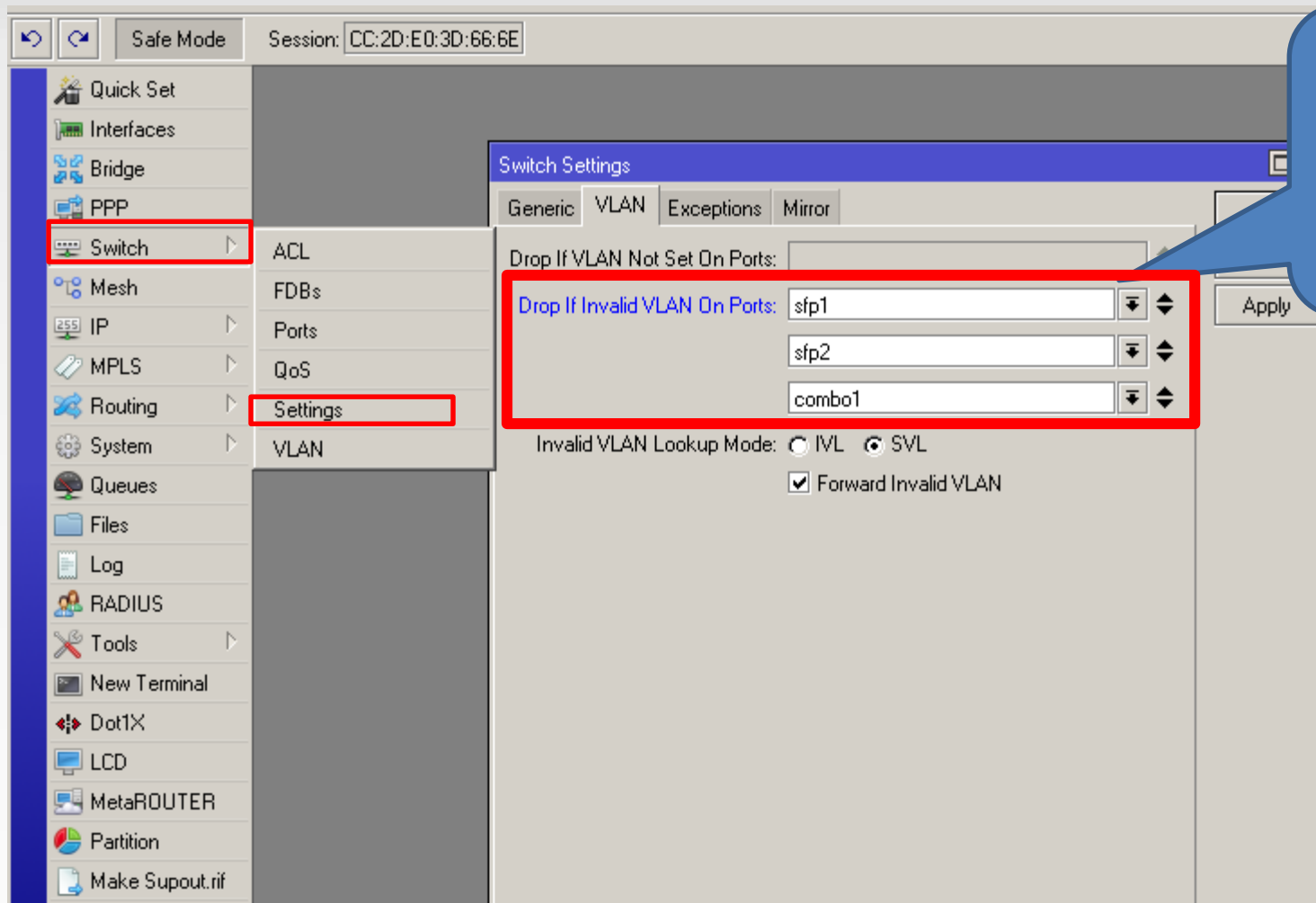
The screenshot displays the 'Switch VLAN' configuration window. On the left, the 'Switch' menu item is highlighted. The main window shows a table with columns: Ports, Protocol, Service VLAN..., Service VID, Customer VLA..., Customer VID, New Service..., and New Custom... The table contains three rows of data.

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

Two 'Ingress VLAN Translation' dialog boxes are shown. The first dialog is for 'sfp1' and the second is for 'sfp2'. Both dialog boxes have the following fields:

- Ports: sfp1 (for sfp1) / sfp2 (for sfp2)
- Protocol: (dropdown)
- Service VLAN Lookup For: any (dropdown)
- Service VID: (dropdown)
- Service PCP: (dropdown)
- Service DEI: (dropdown)
- Customer VLAN Lookup For: any (dropdown)
- Customer VID: 0 (input)
- Customer PCP: (dropdown)
- Customer DEI: (dropdown)
- New Service VID: (dropdown)
- New Customer VID: 10 (for sfp1) / 20 (for sfp2)
- PCP Propagation:
- SA Learning:

Configuração desta série



The screenshot shows the configuration interface of a network device. 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 tabs for 'Generic', 'VLAN', 'Exceptions', and 'Mirror'. The 'VLAN' tab is active. Under the heading 'Drop If Invalid VLAN On Ports:', there are three dropdown menus with 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

- 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:

Type:

MTU:

Actual MTU:

L2 MTU:

MAC Address:

ARP:

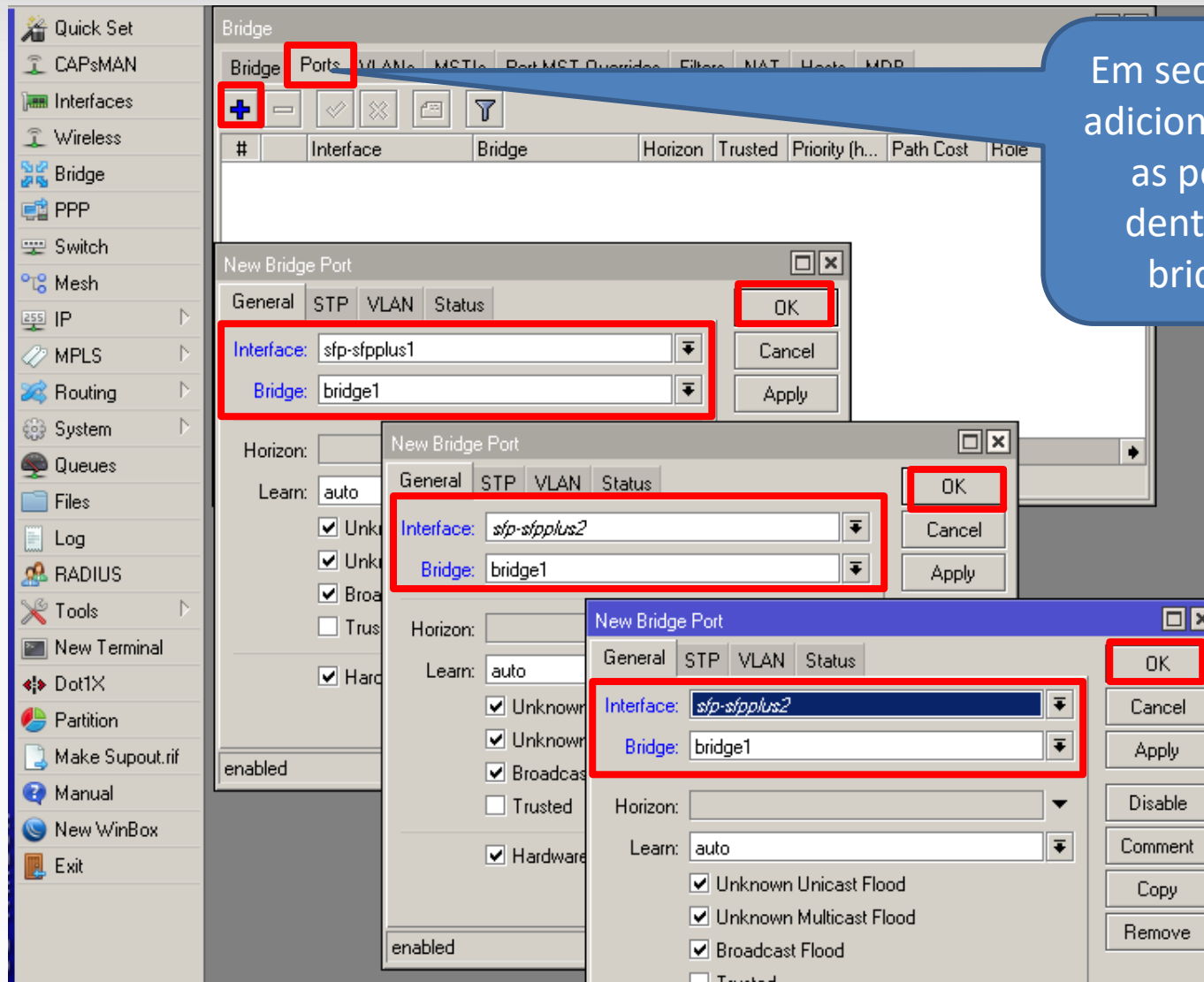
ARP Timeout:

Admin. MAC Address:

OK Cancel Apply Disable Comment Copy Remove Torch

Primeiro passo: crie uma bridge!

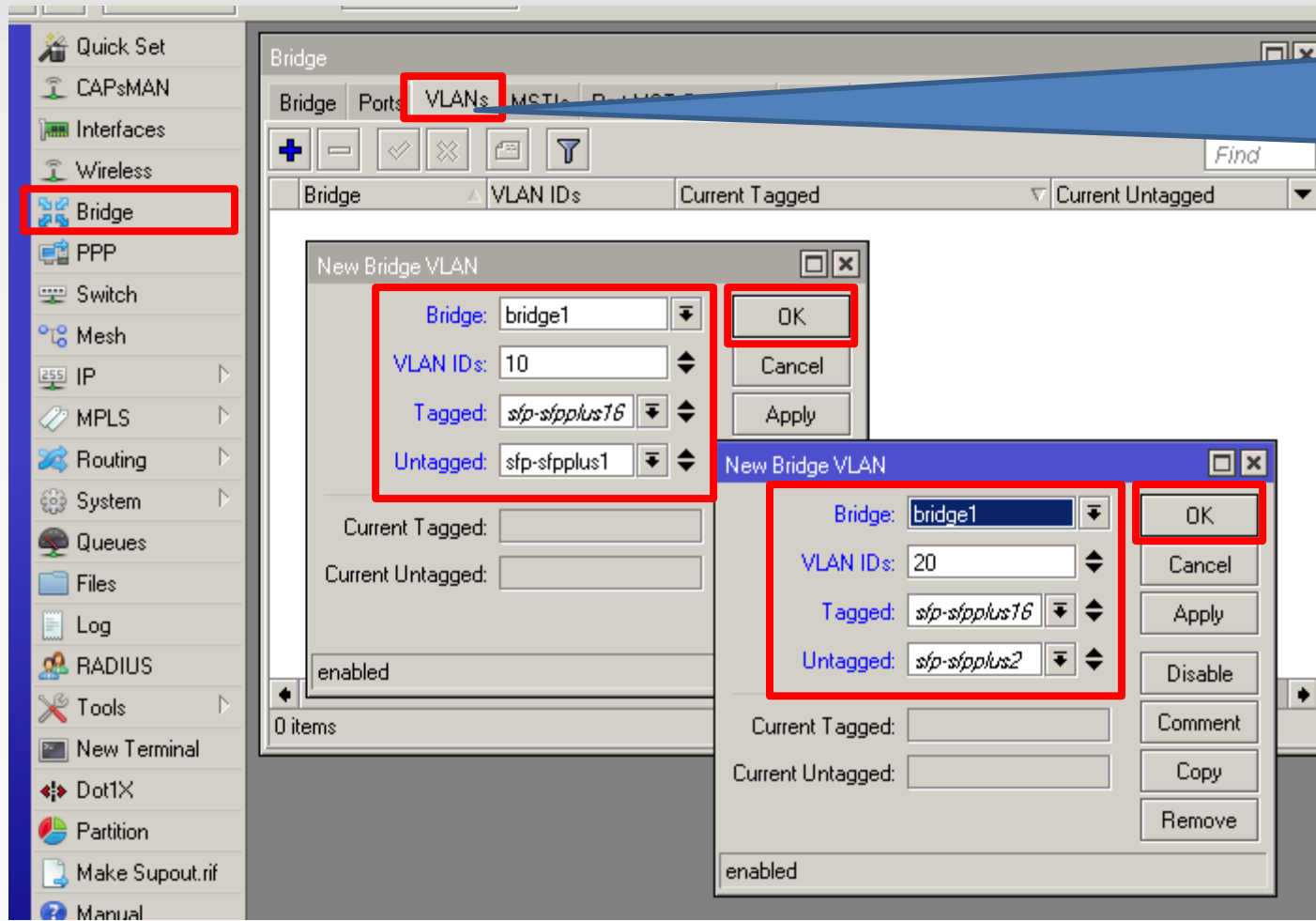
A configuração no RouterOS



The screenshot displays the RouterOS configuration interface for a bridge. The 'Bridge' tab is selected, and the 'Ports' sub-tab is active. A red box highlights the '+' icon in the toolbar, indicating the action to add a new port. 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. A blue callout bubble on the right contains the text: 'Em sequência adicione todas as portas dentro da bridge!'.

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: bridge1', 'VLAN IDs: 10', 'Tagged: sfp-sfpplus16', and 'Untagged: sfp-sfpplus1'. The second dialog shows 'Bridge: bridge1', 'VLAN IDs: 20', 'Tagged: sfp-sfpplus16', and 'Untagged: sfp-sfpplus2'. Red boxes highlight the 'Bridge', 'VLAN IDs', 'Tagged', and 'Untagged' fields in both dialog boxes, and the 'OK' button in each.

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
1 IH	sfp-sfpplus3	bridge1		no	80	10	disabled port
2 IH	sfp-sfpplus4	bridge1		no	80	10	disabled port
3 IH	sfp-sfpplus5	bridge1		no	80	10	disabled port
4 IH	sfp-sfpplus6	bridge1		no	80	10	disabled port
5 IH	sfp-sfpplus7	bridge1		no	80	10	disabled port
6 IH	sfp-sfpplus8	bridge1		no	80	10	disabled port
7 IH	sfp-sfpplus9	bridge1		no	80	10	disabled port
8 IH	sfp-sfpplus10	bridge1		no	80	10	disabled port
9 IH	sfp-sfpplus11	bridge1		no	80	10	disabled port
10 IH	sfp-sfpplus12	bridge1		no	80	10	disabled port
11 IH	sfp-sfpplus13	bridge1		no	80	10	disabled port
12 IH	sfp-sfpplus14	bridge1		no	80	10	disabled port
13 IH	sfp-sfpplus15	bridge1		no	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

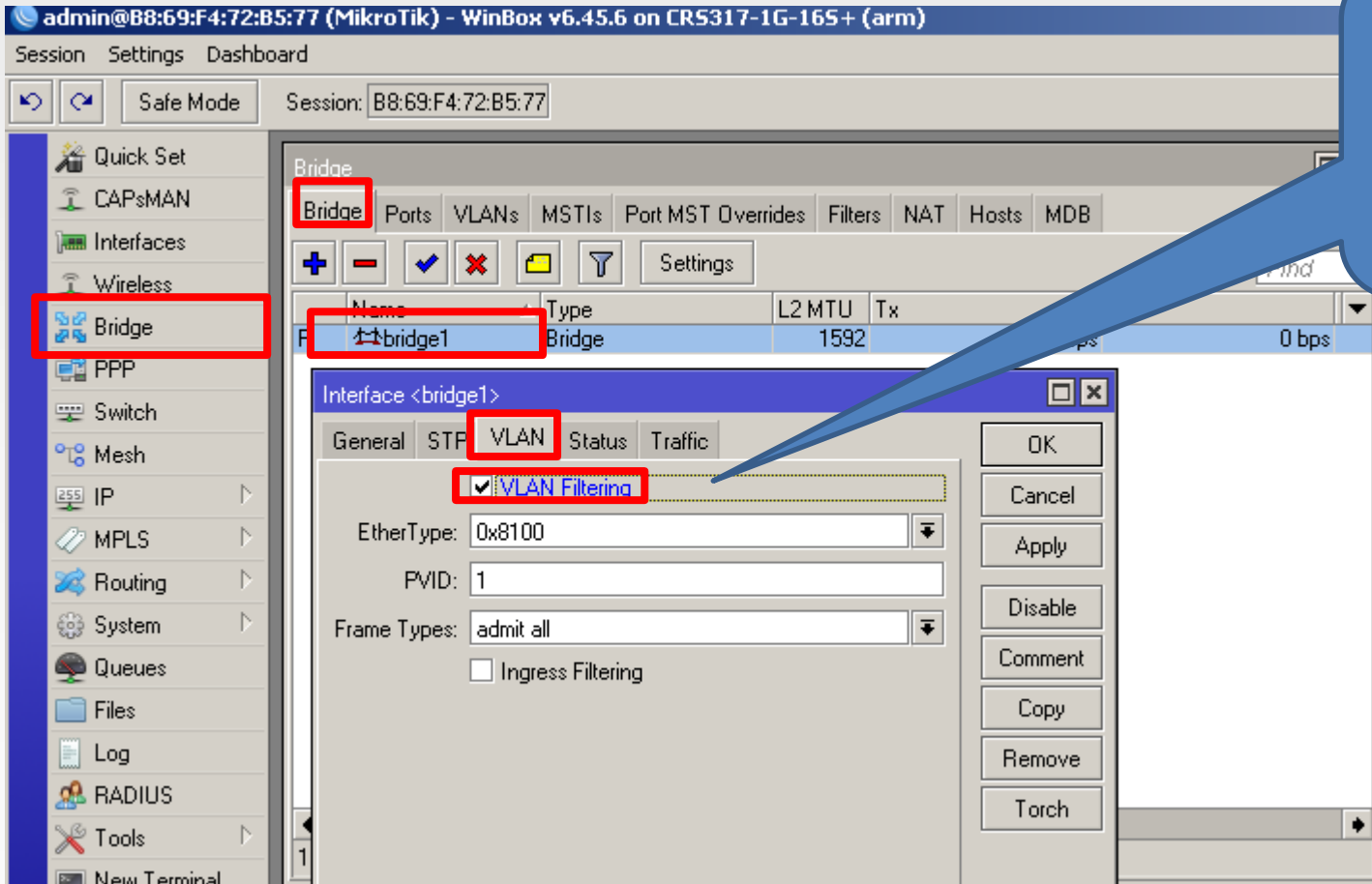
Frame Types: admit all

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 'Bridge' tab selected. The 'VLAN' sub-tab is also selected, and the 'VLAN Filtering' checkbox is checked and highlighted with a red box. The 'Interface <bridge1>' window is open, showing the 'VLAN' tab with the 'VLAN Filtering' checkbox checked. The 'EtherType' is set to '0x8100', 'PVID' is '1', and 'Frame Types' is 'admit all'. The 'Ingress Filtering' checkbox is unchecked. The 'OK' button is visible on the right side of the 'Interface <bridge1>' window.

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

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	<input type="checkbox"/>
SFP7	optional ▼	any ▼	1	<input type="checkbox"/>
SFP8	optional ▼	any ▼	1	<input type="checkbox"/>
SFP9	optional ▼	any ▼	1	<input type="checkbox"/>
SFP10	optional ▼	any ▼	1	<input type="checkbox"/>
SFP11	optional ▼	any ▼	1	<input type="checkbox"/>
SFP12	optional ▼	any ▼	1	<input type="checkbox"/>
SFP13	optional ▼	any ▼	1	<input type="checkbox"/>
SFP14	optional ▼	any ▼	1	<input type="checkbox"/>
SFP15	optional ▼	any ▼	1	<input type="checkbox"/>
SFP16	optional ▼	only tagged ▼	1	<input type="checkbox"/>
MGMT	optional ▼	any ▼	1	<input type="checkbox"/>

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

