

FOZ DO IGUAÇU

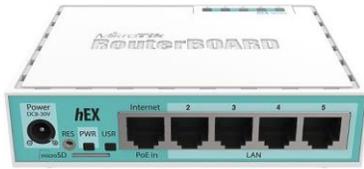
MUM BRASIL 2019

Switches MIKROTIK aumentando a disponibilidade da sua rede.

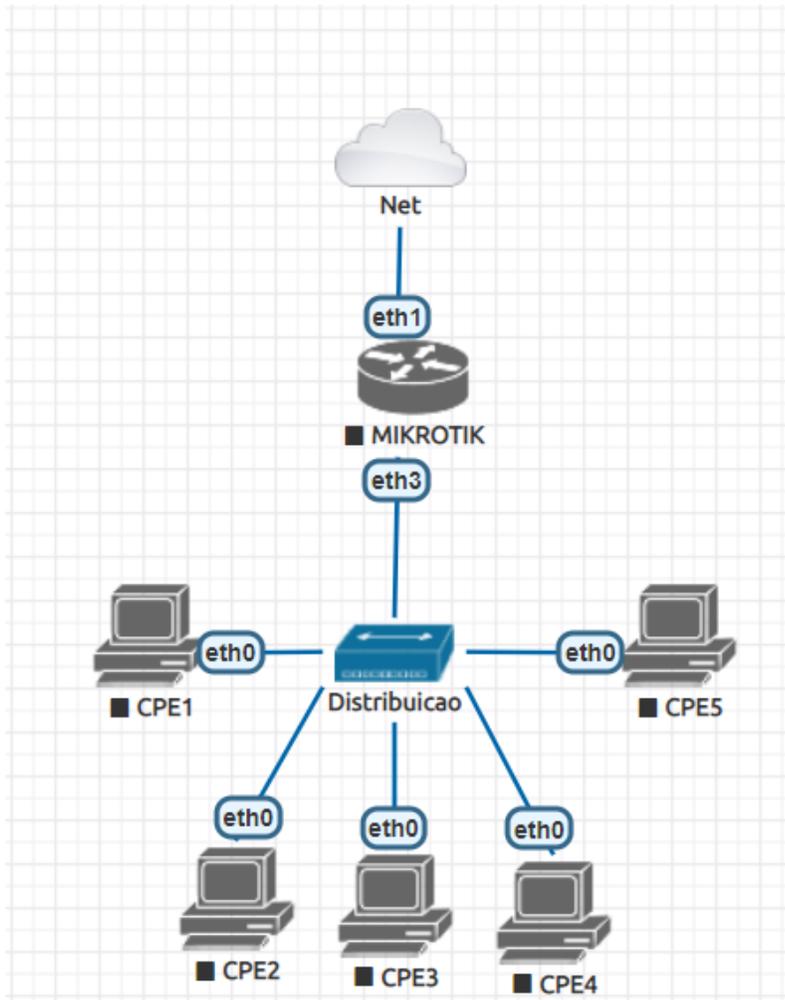


Emilio Moreira Dias (Consultoriae)

- Cientista da computação.
- 2016 Consultor Mikrotik.
- MTCNA, MTCRE, MTCINE, MTCWE, MTCTCE, MTCUME e MTCIPv6E
- Morando atualmente em Curitiba/PR

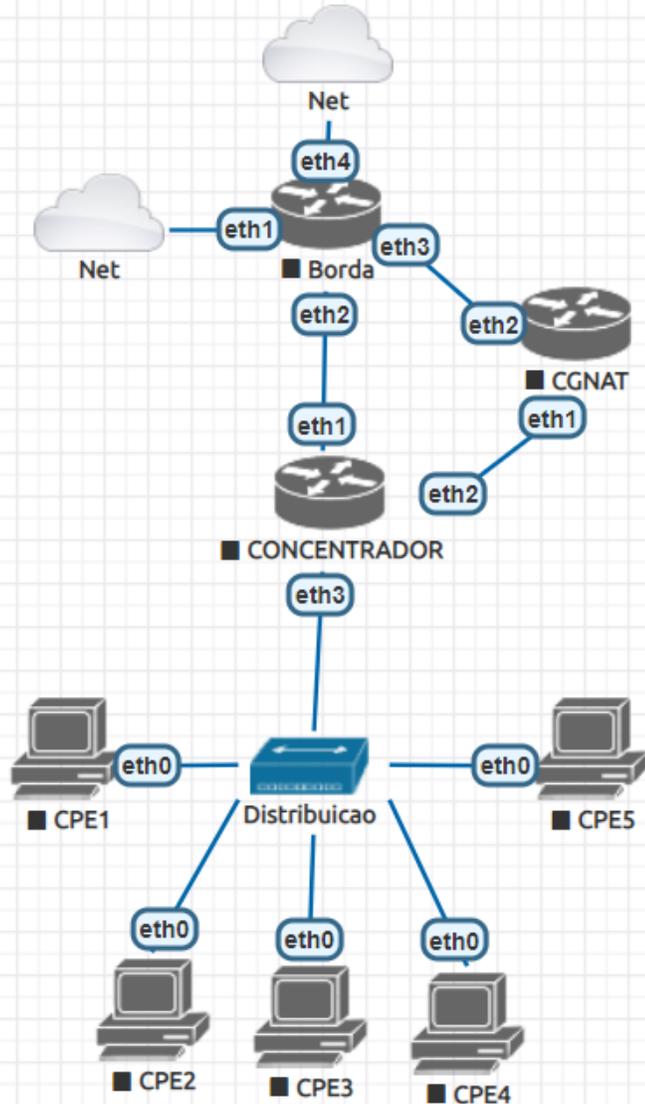


INICIO DO PROVEDOR



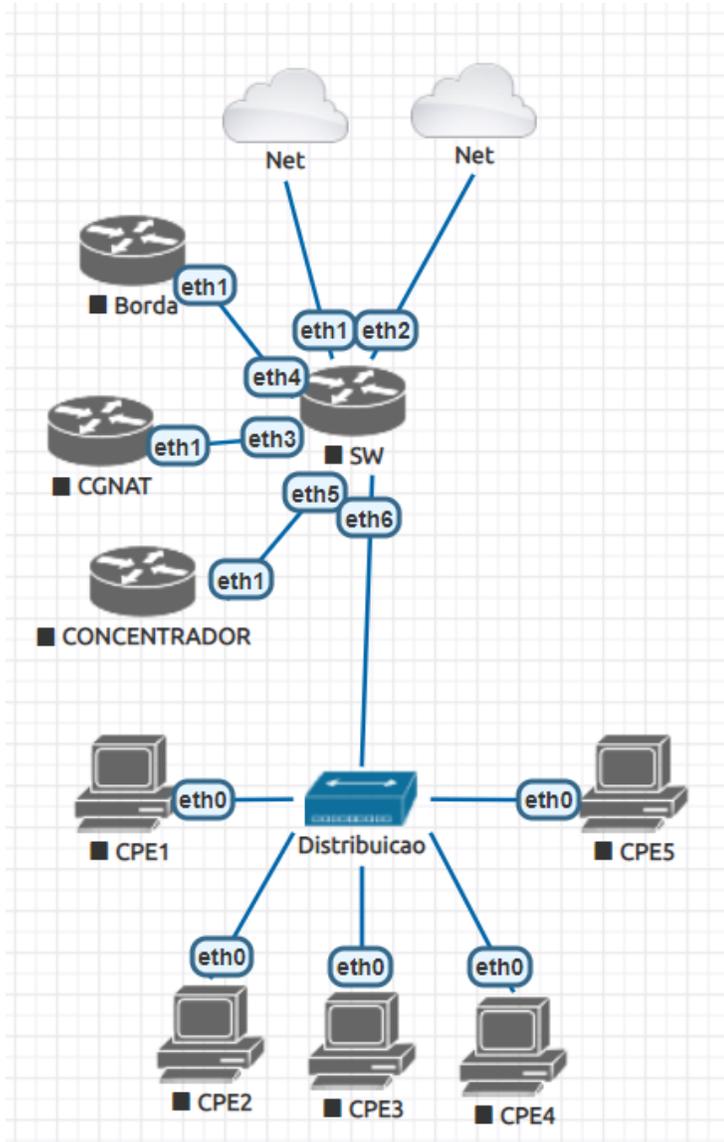
CPU Load: 100 %

REDE TRADICIONAL



- Funciona muito bem até 1gb por interface
- Pops interligados via conversor de mídia ou radio.
- Parada total da rede em caso de falha de um equipamento.

REDE COM SWITCH



- Maior capacidade por interface.
- Agora é possível ligar pops em anel de alta capacidade.
- Agora é possível criar redundância de equipamentos.
- Equipamentos trabalhando juntos podem substituir um maior.

CCR1072-1G-8S+

\$3050.00



CCR1072-1G-8S+		Tile 72 Core (1200Mhz, DDR1600) Max possible throughput					
Mode	Configuration	1518 byte		512 byte		64 byte	
		kpps	Mbps	kpps	Mbps	kpps	Mbps
Bridging	none (fast path)	6,502.0	78,960.3	18,790.0	76,963.8	119,047.6	60,952.4
Bridging	25 bridge filter rules	6,502.0	78,960.3	9,099.2	37,270.3	10,432.3	5,341.3
Routing	none (fast path)	6,502.0	78,960.3	18,790.0	76,963.8	94,668.4	48,470.2
Routing	25 simple queues	6,502.0	78,960.3	13,500.0	55,296.0	13,683.5	7,006.0
Routing	25 ip filter rules	5,247.6	63,726.9	6,125.5	25,090.0	6,104.0	3,125.2

Switching results

CRS309-1G-8S+IN

\$269.00



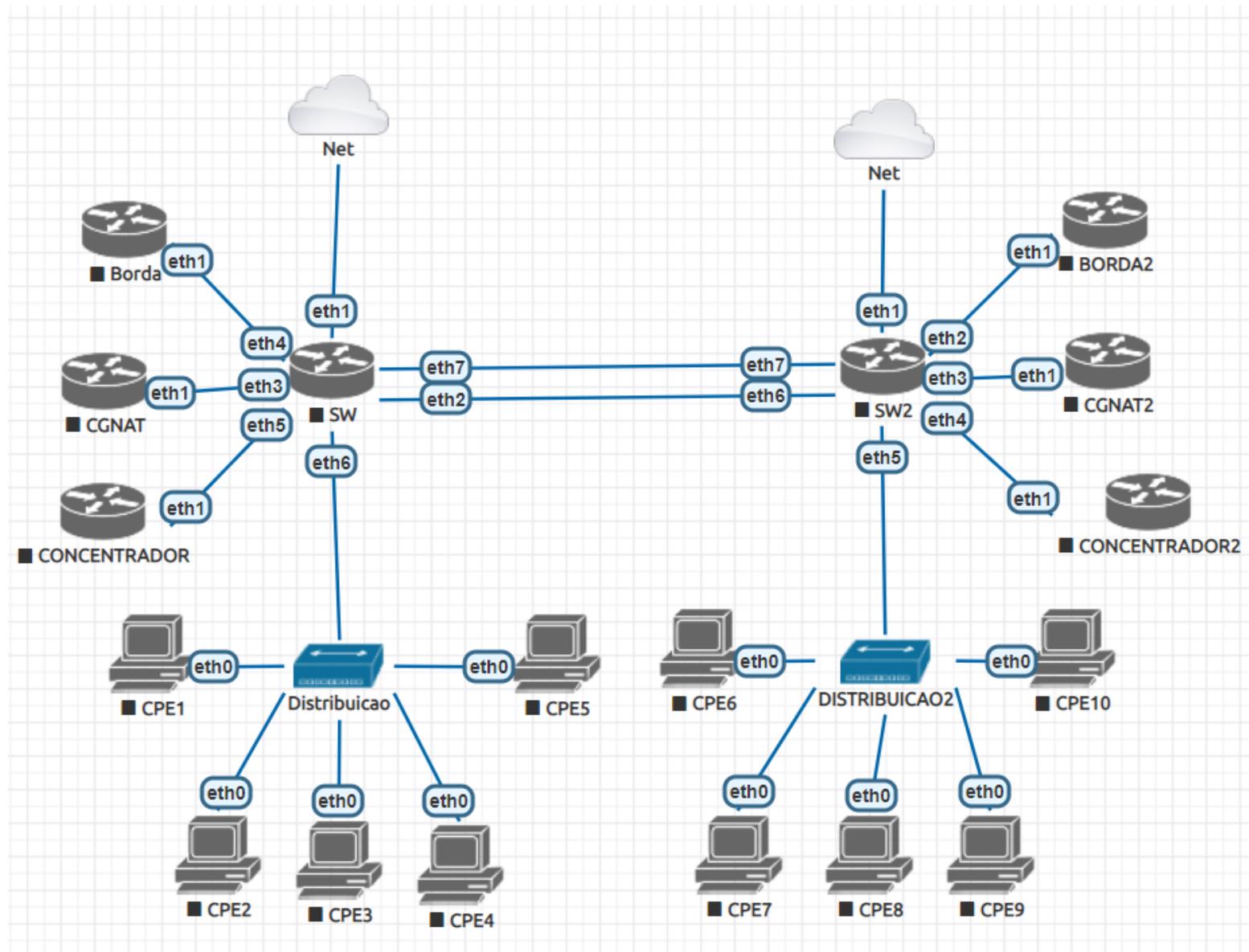
CRS309-1G-8S+IN		Tile 72 Core (1200Mhz, DDR1600) Max possible throughput					
Mode	Configuration	1518 byte		512 byte		64 byte	
		kpps	Mbps	kpps	Mbps	kpps	Mbps
Switching	Non blocking Layer 2 throughput	6,583.2	79,946.7	19,032.0	77,954.9	120,535.7	61,714.3
Switching	Non blocking Layer 2 capacity	6,583.2	159,893.4	19,032.0	155,909.8	120,535.7	123,428.6
Switching	Non blocking Layer 1 throughput	6,583.2	81,000.0	19,032.0	81,000.0	120,535.7	81,000.0
Switching	Non blocking Layer 1 capacity	6,583.2	162,000.0	19,032.0	162,000.0	120,535.7	162,000.0

SWITCHES

- Permite aumentar o numero de portas de um roteador(bridge/Vlan).
- Usado para aumentar a disponibilidade da rede.
- Chip especializado para comunicação dos dados.
- Custo reduzido a comprado a roteadores*.
- Cada vez mais esta no centro da rede do provedor.
- Os mais novos suportam Mpls através de hardware.

* Switches não são capazes de exercer todas as funções de um roteador.

REDE COM REDUNDÂNCIA



CONFIGURANDO O SWITCH

- CRS: Exemplos Básicos para Configurar seu Switch MikroTik by Wissam Melhem Quemel (Telequemel, Brazil) MUM 2018
- WIKI MIKROTIK
 - https://wiki.mikrotik.com/wiki/Manual:CRS3xx_series_switches
 - https://wiki.mikrotik.com/wiki/Manual:CRS1xx/2xx_series_switches_examples
 - https://wiki.mikrotik.com/wiki/Manual:CRS_Router

AUTENTICAÇÃO PARALELA PPPOE

CONFIGURAÇÃO CONCENTRADOR 1 E 2

PPPoE Service <109>

Service Name: 109

Interface: vlan109teste

Max MTU: []

Max MRU: []

MRRU: []

Keepalive Timeout: 10

Default Profile: PPPOE

One Session Per Host

Max Sessions: 64

PADO Delay: [] ms

Authentication: mschap2 mschap1
 chap pap

enabled

OK
Cancel
Apply
Disable
Copy
Remove

PPPoE Service <109-b>

Service Name: 109-b

Interface: vlan109teste

Max MTU: []

Max MRU: []

MRRU: []

Keepalive Timeout: 10

Default Profile: PPPOE

One Session Per Host

Max Sessions: []

PADO Delay: 100 ms

Authentication: mschap2 mschap1
 chap pap

enabled

OK
Cancel
Apply
Disable
Copy
Remove

AUTENTICAÇÃO FAILOVER PPPOE

CONCENTRADOR 1

PPPoE Service <109>

Service Name: 109

Interface: vlan109-teste

Max MTU: []

Max MRU: []

MRRU: []

Keepalive Timeout: 10

Default Profile: PPPOE

One Session Per Host

Max Sessions: []

PADO Delay: [] ms

Authentication: mschap2 mschap1
 chap pap

enabled

OK
Cancel
Apply
Disable
Copy
Remove

CONCENTRADOR 2

PPPoE Service <109-b>

Service Name: 109-b

Interface: vlan109-teste

Max MTU: []

Max MRU: []

MRRU: []

Keepalive Timeout: 10

Default Profile: PPPOE

One Session Per Host

Max Sessions: []

PADO Delay: 100 ms

Authentication: mschap2 mschap1
 chap pap

enabled

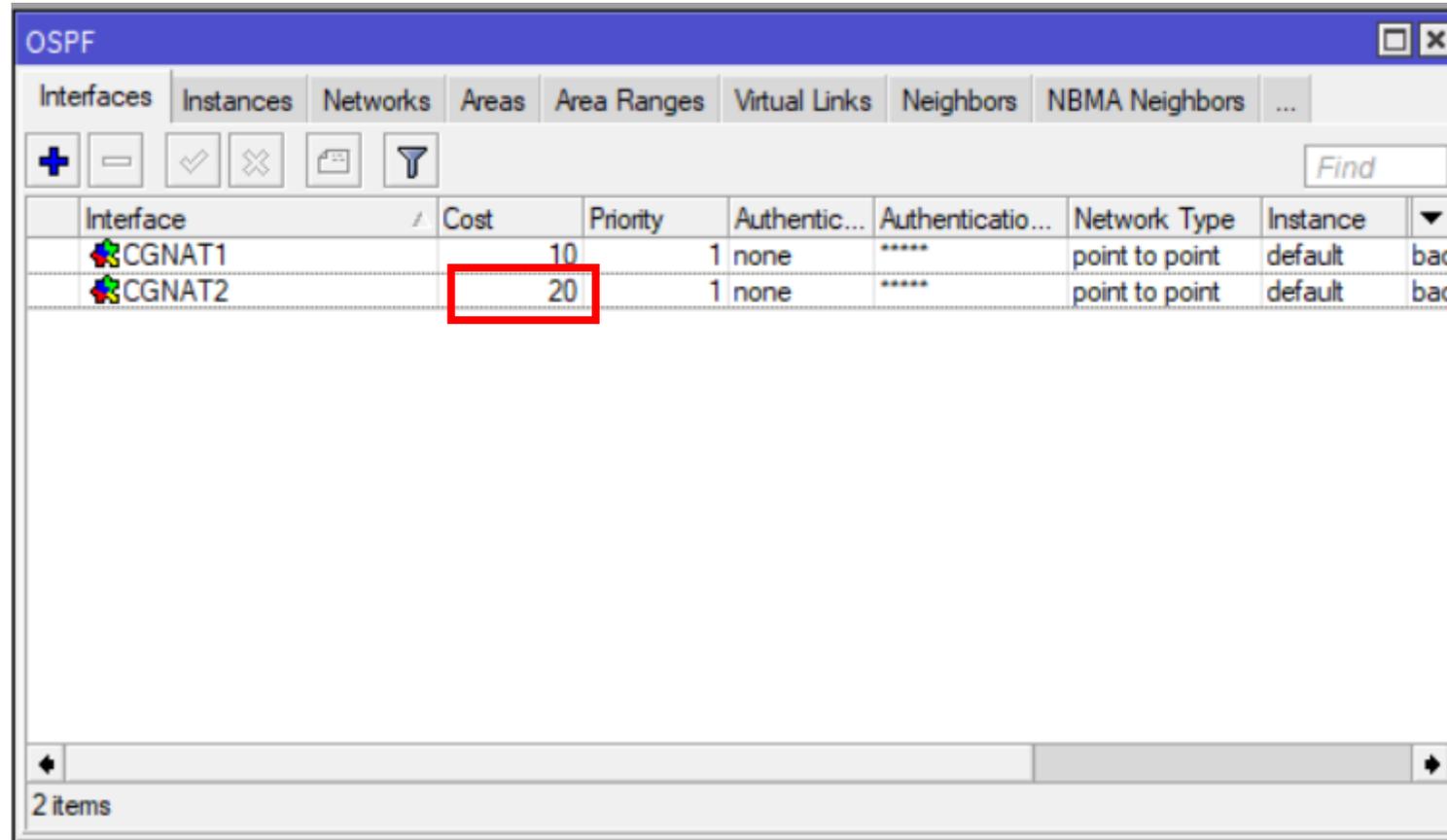
OK
Cancel
Apply
Disable
Copy
Remove

CONFIGURANDO O OSPF

- Routing OSPF by Flávio Guimarães (Matrix Corporation, Brazil) MUM 2018
- WIKI MIKROTIK
 - <https://wiki.mikrotik.com/wiki/Manual:Routing/OSPF>
 - <https://wiki.mikrotik.com/wiki/Manual:OSPF-examples>
 - https://wiki.mikrotik.com/wiki/Manual:OSPF_Case_Studies

MANIPULAÇÃO CUSTO INTERFACE DO CGNAT

CONFIGURAÇÃO CONCENTRADOR 1



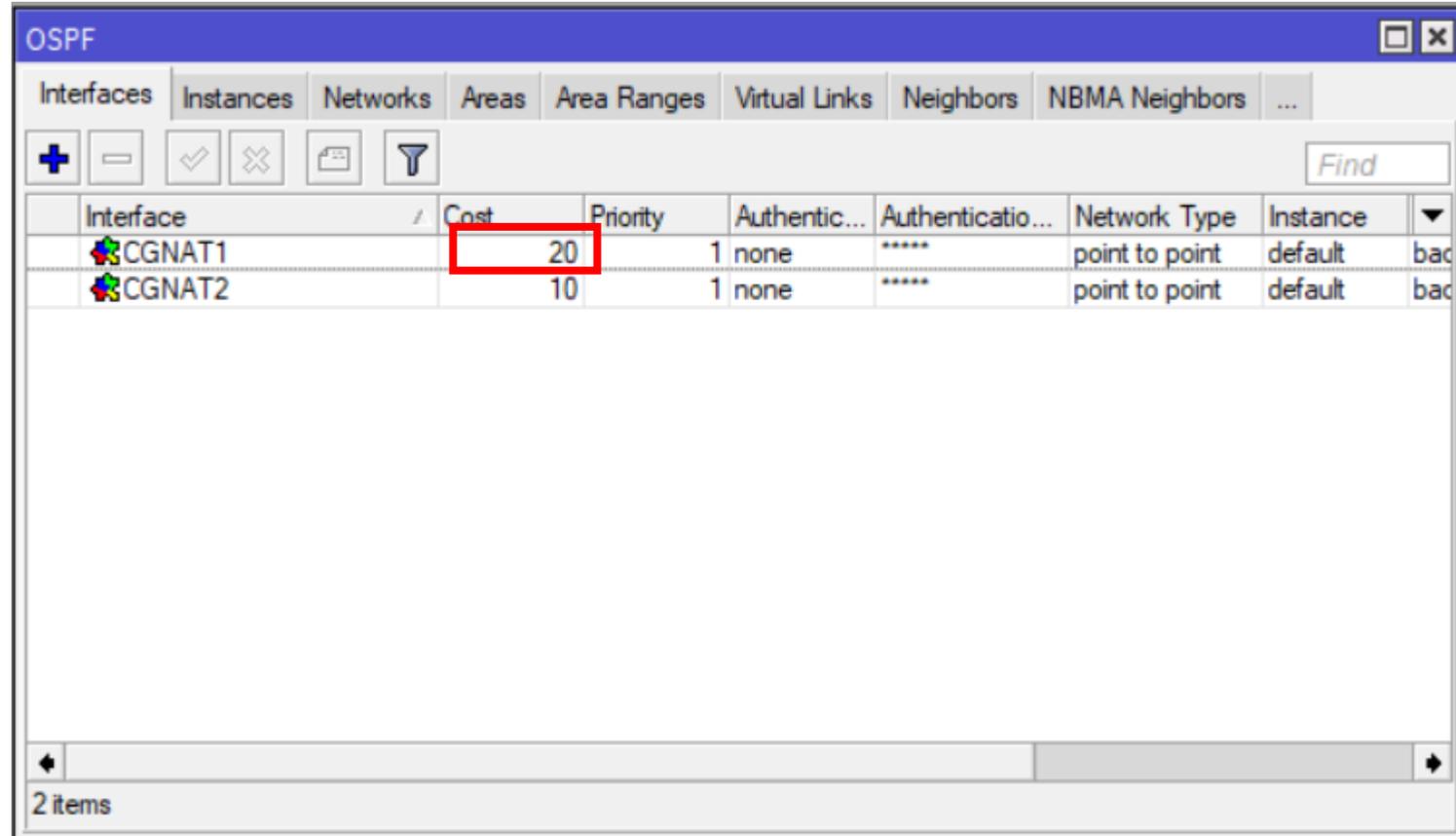
The screenshot shows the OSPF configuration window with the 'Interfaces' tab selected. A table lists the configured interfaces and their parameters. The 'Cost' column for CGNAT2 is highlighted with a red box, indicating its value of 20.

Interface	Cost	Priority	Authentic...	Authenticatio...	Network Type	Instance	
CGNAT1	10	1	none	*****	point to point	default	bac
CGNAT2	20	1	none	*****	point to point	default	bac

2 items

MANIPULAÇÃO CUSTO INTERFACE DO CGNAT

CONFIGURAÇÃO CONCENTRADOR 2



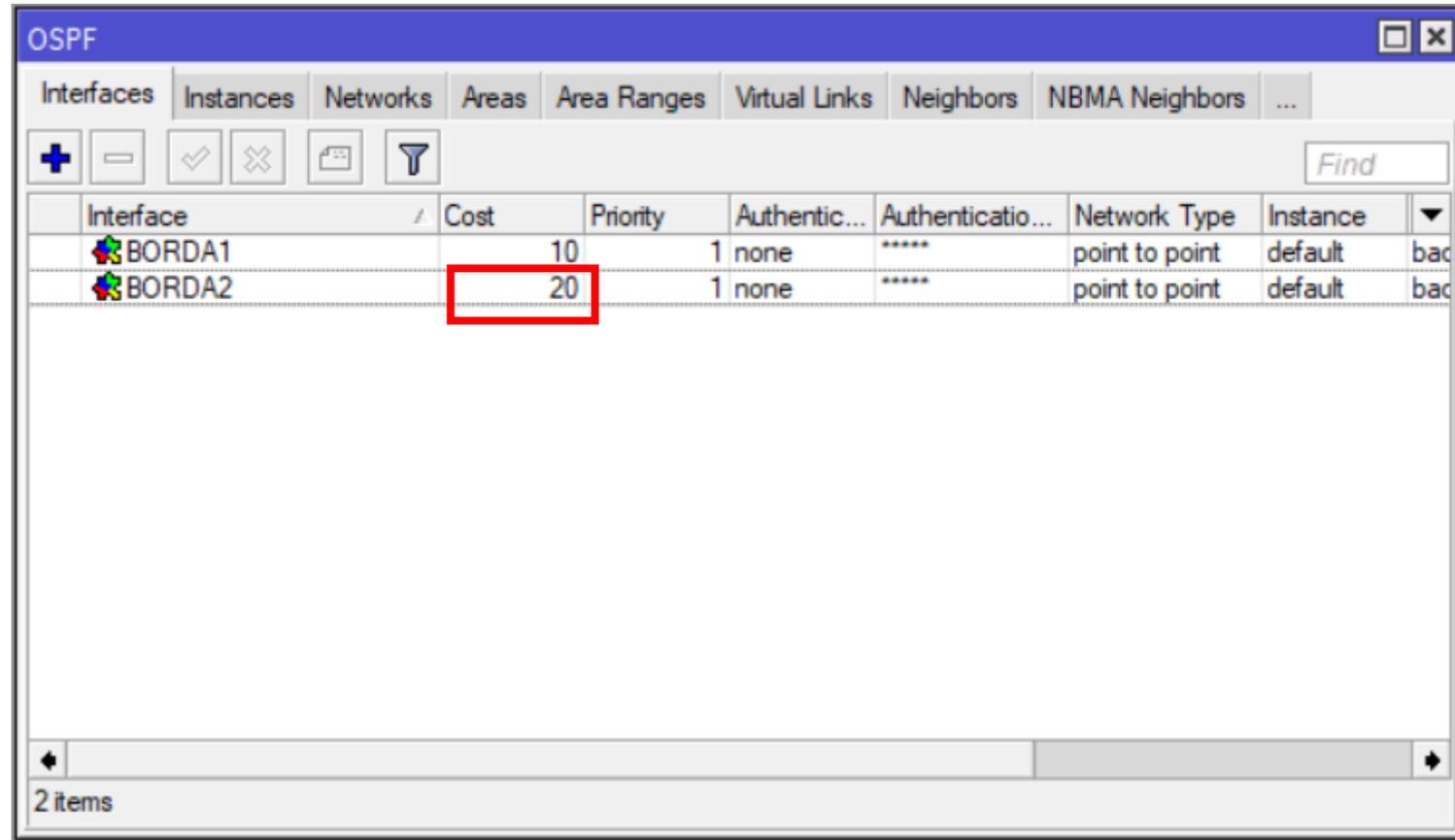
The screenshot shows the OSPF configuration window with a table of interface configurations. The 'Cost' column for the 'CGNAT1' interface is highlighted with a red box, showing a value of 20. The 'CGNAT2' interface has a cost of 10. The table includes columns for Interface, Cost, Priority, Authentication, Network Type, and Instance.

Interface	Cost	Priority	Authentic...	Authenticatio...	Network Type	Instance
CGNAT1	20	1	none	*****	point to point	default
CGNAT2	10	1	none	*****	point to point	default

2 items

MANIPULAÇÃO CUSTO INTERFACE DO CGNAT

CONFIGURAÇÃO CGNAT 1



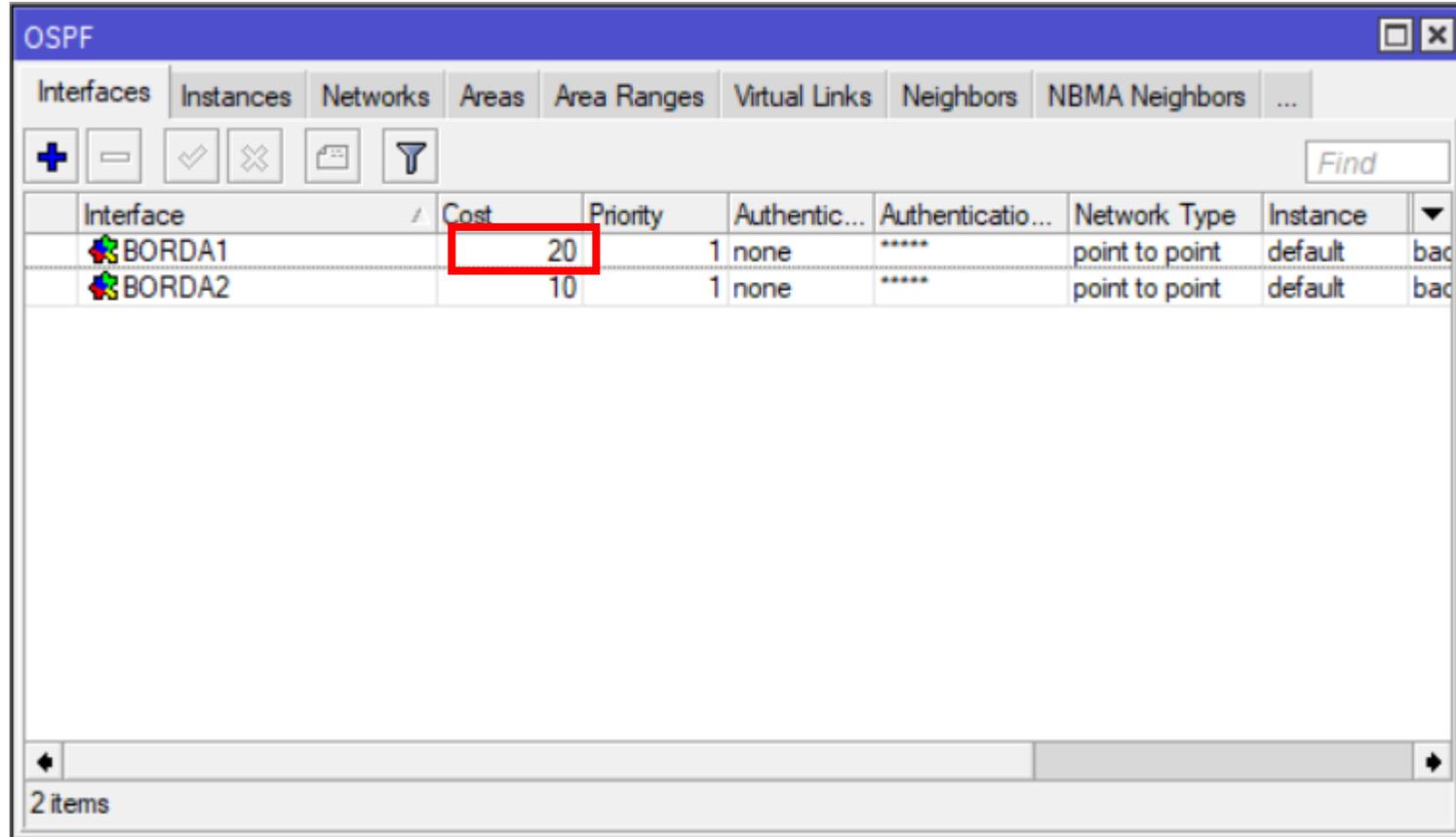
The screenshot shows the OSPF configuration window with the 'Interfaces' tab selected. A table lists the configured interfaces and their associated costs. The cost for BORDA2 is highlighted with a red box.

Interface	Cost	Priority	Authentic...	Authenticatio...	Network Type	Instance	
BORDA1	10	1	none	*****	point to point	default	bac
BORDA2	20	1	none	*****	point to point	default	bac

2 items

MANIPULAÇÃO CUSTO INTERFACE DO CGNAT

CONFIGURAÇÃO CGNAT 2



The screenshot shows the OSPF configuration window with a table of interface configurations. The 'Cost' column for the 'BORDA1' interface is highlighted with a red box, indicating its value of 20.

Interface	Cost	Priority	Authentic...	Authenticatio...	Network Type	Instance	
BORDA1	20	1	none	*****	point to point	default	bac
BORDA2	10	1	none	*****	point to point	default	bac

2 items

CONFIGURANDO O CGNAT

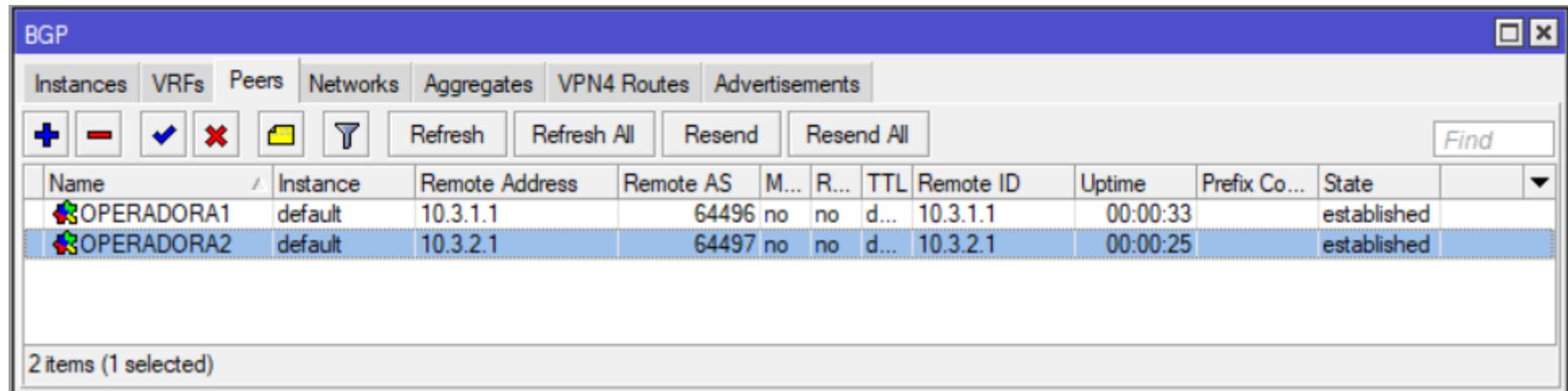
- Explorando o IP Pool, IP (v4) diferente a cada conexão e compartilhamento de IPs com CGNAT com preservação de histórico by Ademir Vida (Wide Soft International, Brazil)MUM 2017
- WIKI MIKROTIK
 - <https://wiki.mikrotik.com/wiki/Manual:IP/Firewall/NAT>

CONFIGURANDO O BGP

- Manipulando Tráfego Utilizando Atributos BGP by Wissam Melhem Quemel (Telequemel, Brazil) MUM 2017
- WIKI MIKROTIK
 - <https://wiki.mikrotik.com/wiki/Manual:Routing/BGP>
 - https://wiki.mikrotik.com/wiki/Manual:BGP_Case_Studies
 - https://wiki.mikrotik.com/wiki/Manual:BGP_HowTo_%26_FAQ

ABERTURA DE SESÃO COM AS DUAS OPERADORAS

CONFIGURAÇÃO PEER BGP BORDA 1 E 2



The screenshot shows a network management interface for BGP. The window title is 'BGP'. The interface includes several tabs: 'Instances', 'VRFs', 'Peers', 'Networks', 'Aggregates', 'VPN4 Routes', and 'Advertisements'. Below the tabs is a toolbar with icons for adding (+), removing (-), checking (✓), deleting (✗), saving (floppy), and filtering (funnel), along with buttons for 'Refresh', 'Refresh All', 'Resend', and 'Resend All'. A search box labeled 'Find' is also present. The main area contains a table with the following columns: Name, Instance, Remote Address, Remote AS, M..., R..., TTL, Remote ID, Uptime, Prefix Co..., and State. Two rows are visible, both with a state of 'established'.

Name	Instance	Remote Address	Remote AS	M...	R...	TTL	Remote ID	Uptime	Prefix Co...	State
OPERADORA1	default	10.3.1.1	64496	no	no	d...	10.3.1.1	00:00:33		established
OPERADORA2	default	10.3.2.1	64497	no	no	d...	10.3.2.1	00:00:25		established

2 items (1 selected)

FILTROS BGP

BORDA1

#	Chain	Prefix	Prefix Length	Action
:-----FILTRO SAÍDA OPERADORA 1-----				
0	OPERADORA1-OUT	10.255.0.0/22	22	accept
1	OPERADORA1-OUT	10.255.0.0/23	23	accept
2	OPERADORA1-OUT			discard
:-----FILTRO SAÍDA OPERADORA 2-----				
3	OPERADORA2-OUT	10.255.0.0/22	22	accept
4	OPERADORA2-OUT	10.255.2.0/23	23	accept
5	OPERADORA2-OUT			discard
:-----FILTRO ENTRADA OPERADORA 1-----				
6	OPERADORA1-IN	0.0.0.0/0	0	accept
7	OPERADORA1-IN	10.255.0.0/22	22-24	discard
8	OPERADORA1-IN	0.0.0.0/0	1-24	accept
9	OPERADORA1-IN			discard
:-----FILTRO ENTRADA OPERADORA 2-----				
10	OPERADORA2-IN	0.0.0.0/0	0	accept
11	OPERADORA2-IN	10.255.0.0/22	22-24	discard
12	OPERADORA2-IN	0.0.0.0/0	1-24	accept
13	OPERADORA2-IN			discard

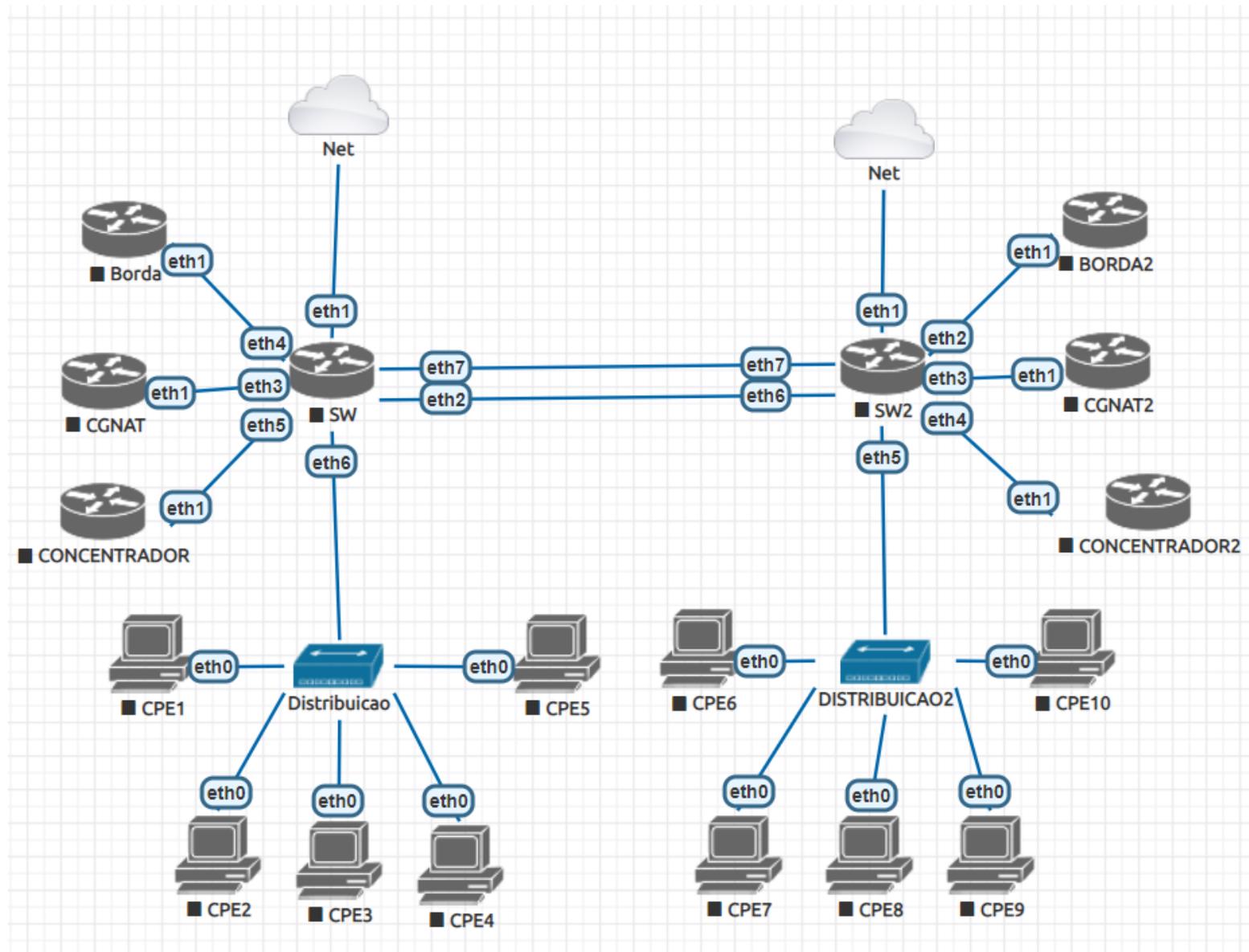
14 items (1 selected)

BORDA2

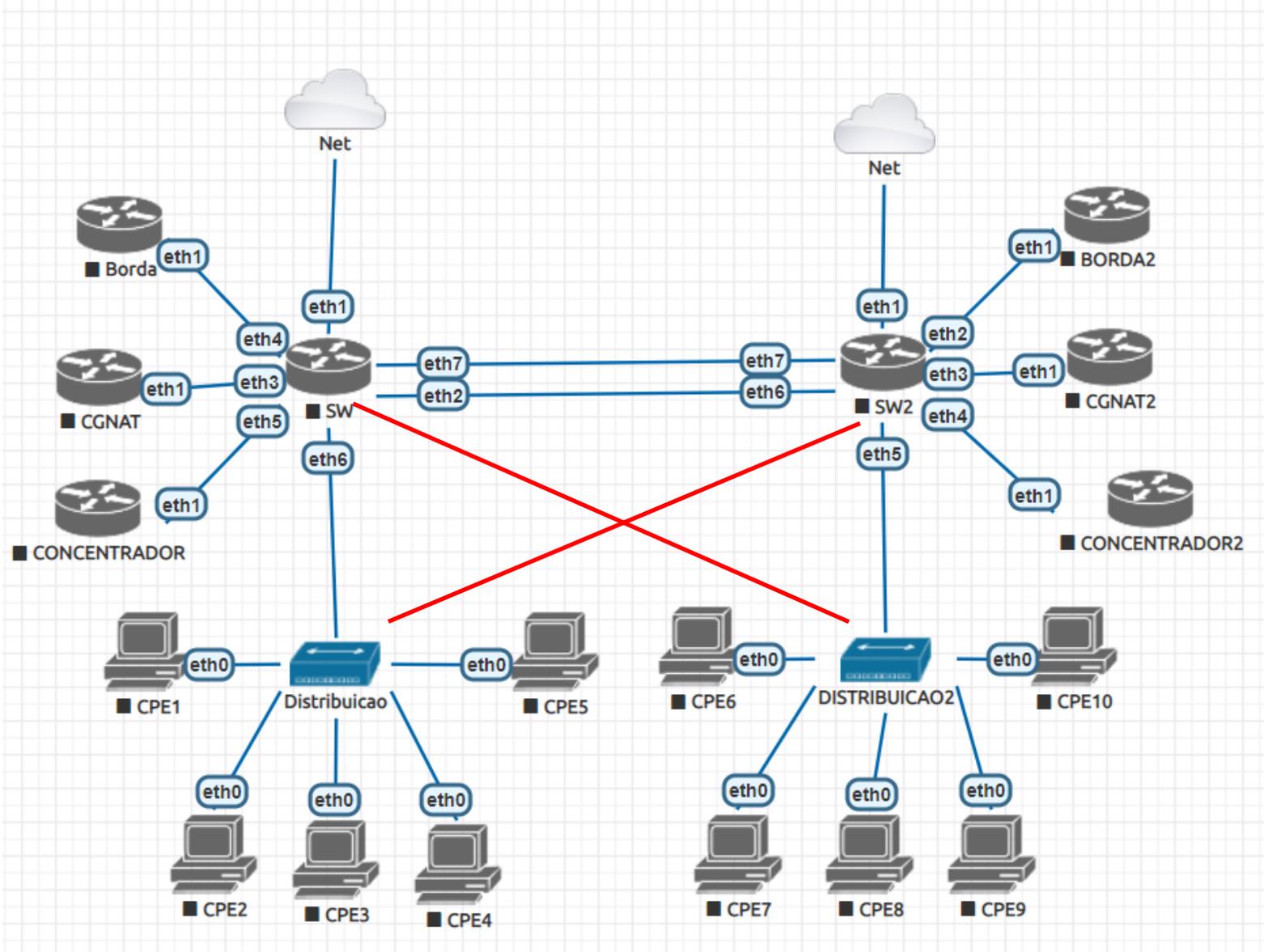
#	Chain	Prefix	Prefix Length	Action
:-----FILTRO SAÍDA OPERADORA 1-----				
0	OPERADORA1-OUT	10.255.0.0/22	22	accept
1	OPERADORA1-OUT	10.255.0.0/23	23	accept
2	OPERADORA1-OUT			discard
:-----FILTRO SAÍDA OPERADORA 2-----				
3	OPERADORA2-OUT	10.255.0.0/22	22	accept
4	OPERADORA2-OUT	10.255.2.0/23	23	accept
5	OPERADORA2-OUT			discard
:-----FILTRO ENTRADA OPERADORA 1-----				
6	OPERADORA1-IN	0.0.0.0/0	0	accept
7	OPERADORA1-IN	10.255.0.0/22	22-24	discard
8	OPERADORA1-IN	0.0.0.0/0	1-24	accept
9	OPERADORA1-IN			discard
:-----FILTRO ENTRADA OPERADORA 2-----				
10	OPERADORA2-IN	0.0.0.0/0	0	accept
11	OPERADORA2-IN	10.255.0.0/22	22-24	discard
12	OPERADORA2-IN	0.0.0.0/0	1-24	accept
13	OPERADORA2-IN			discard

14 items (1 selected)

REDE COM REDUNDÂNCIA



REDE COM REDUNDÂNCIA



CONFIGURANDO O MSTP

- Let's take a look at the Multiple Spanning Tree Protocol (MSTP) by Sebastian Inacker MUM FR 2019
- WIKI MIKROTIK
 - https://wiki.mikrotik.com/wiki/Manual:Spanning_Tree_Protocol

Meu sw não é da linha 3xx.

Meu sw não é da linha 3xx.

Desligue a porta MANUALMENTE no crs/css.

DÚVIDAS

