Relatório – Trabalho Prático de Redes de computadores

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Índice

1 - Para e elaboração do trabalho prático, seguiram-se os seguintes passos:

1- Começou-se por colocar no ficheiro os diversos equipamentos da topologia disponibilizada.
2- Ligaram-se esses equipamentos a partir da cablagem indicada para o efeito (não esquecendo a fibra ótica entre os dois nós GigaPix e ISP_A do Porto e de Lisboa).
3- Atribuíram-se os *IP's* e *GATEWAY's* aos diversos *PC* e servidores (consoante a tabela de endereços que nos foi dada) e configuram-se as entradas dos routers com os endereços necessários etc.
4- Relativamente à configuração dos circuitos da *Cloud* (exemplificando para o circuito GigaPixPorto – www.cnn.com):
    a. No RouterCNN criaram-se duas subinterfaces (se0/0.400 e se0/0.401) com os endereços 10.10.8.1 e 10.10.5.2. Após isto, no GigaPixPorto criaram-se duas subinterfaces (se0/0.300 e se0/0.301) com os endereços 10.10.8.2 e 10.10.5.1.
    b. Nas entradas *serial* 0 da *Cloud* definimos os DLCI necessários, neste caso o DLCI 300 e 301 (nome->" lig 1" e "lig 2") e na *serial* 3 e o 400 e 401 (nome->" liga1" e "liga2") na serial 3.
    c. Na *Frame Relay* (ainda na *Cloud*), "montámos o circuito" da seguinte forma:

Serial0	t2	Serial2	l1
Serial0	lig1	Serial3	liga2

    d. No RouterCNN adicionaram-se as rotas estáticas para chegar à rede 10.10.7.0/24 e à 10.10.6.0/24 e *RIP V2* para chegar à rede 151.101.0.0/24 (rede do server www.cnn.com).

e. No GigaPixPorto adicionaram-se rotas estáticas para chegar às redes dos servidores (8.0.0.0/8, 151.101.133.0/24, 170.1.2.0/24) e RIP V2 para as redes que o rodeiam (10.0.0.0).

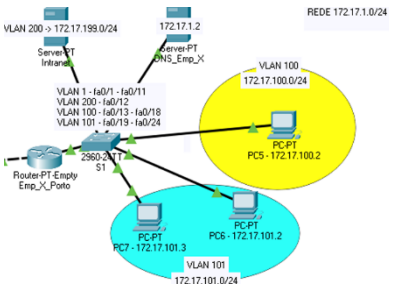
5- Configurou-se *OSPF* (versão 10) entre os dois Routers GigaPix.

6- Configurou-se *RIP V2* nos restantes Routers do circuito, para permitir comunicação entre todos os equipamentos do circuito.

7- Configurou-se a partilha de rotas entre *OSPF* e *RIPV2* (nos dois routers GigaPix) a partir da ligação disponibilizada no enunciado do trabalho prático.

8- Na configuração das *VLAN's* foi usada a linha de comandos do router que permitiu que separássemos a ligação entre o switch e o router em várias subinterfaces, às quais atribuímos *IP's* que remetem para as várias *VLAN's* criadas.
Não concebido: Não foi possível que os equipamentos das várias *VLAN's* recebessem os IP's por *DHCP* (*DHCP Lx*).

Circuito:



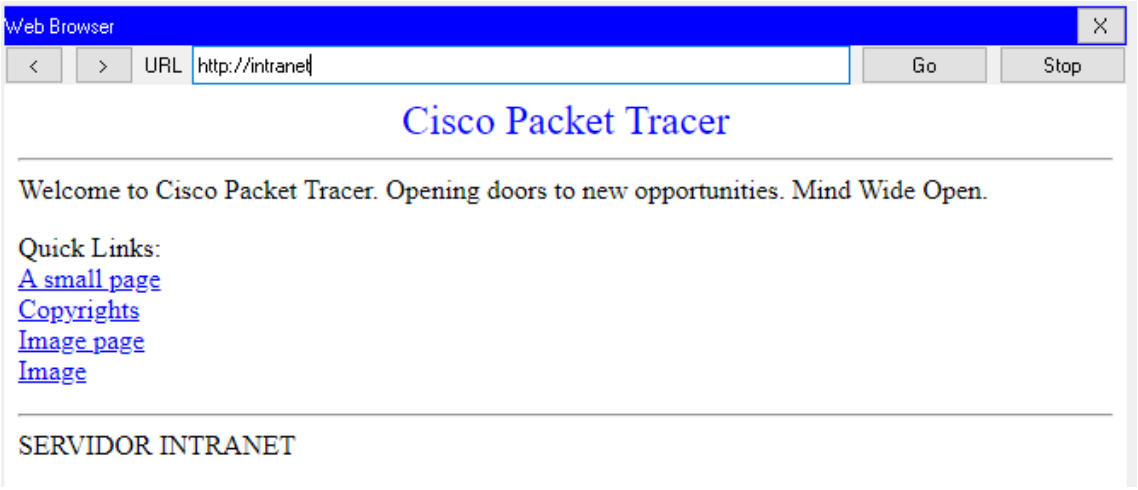
VLAN's da Empresa X:

```
S1>show vlan brief

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                 Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                 Fa0/9, Fa0/10, Fa0/11, Gig0/2
100  vlan100                           active    Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                 Fa0/17, Fa0/18
101  vlan101                           active    Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                                 Fa0/23, Fa0/24
200  vlan200                           active    Fa0/12
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
```

9- Em relação aos servidores de *DNS* todos estão configurados em cadeia e de uma forma hierárquica sendo o *DNS* geral (8.8.8.8) o que tem prioridade quando outro servidor não consegue resolver algum nome/*IP*. Contudo na empresa X o único serviço de *DNS* que consegue aceder ao servidor "*Intranet*" é o local, neste caso o *DNS_Emp_X*.
Servidor de *DNS* geral (8.8.8.8):

No.	Name	Type	Detail
0	Dns_Emp_Porto	A Record	172.17.1.2
1	Dns_Isp_Porto	A Record	10.0.8.8
2	email.com	A Record	170.1.2.3
3	emailisb.pt	A Record	193.1.2.3
4	wikimail.org	A Record	208.80.154.238
5	www.cnn.com	A Record	151.101.133.67
6	www.noticiasdacovilha.pt	A Record	173.249.51.18
7	www.wikipedia.org	A Record	91.198.174.192

10- Nos servidores, definimos uma página *HTML* diferente para cada um tendo cada uma o nome do servidor.

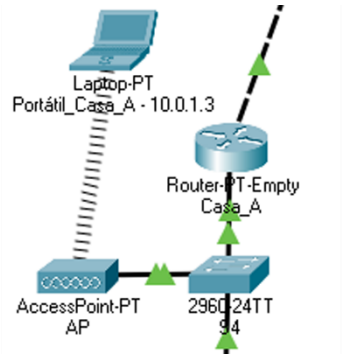


Não concebido: Nesta etapa não foi possivel estabelecer ligação entre os servidores de DNS com o site www.noticiasdacovilha.pt, porém ativou-se o serviço HTTP e HTTPS.

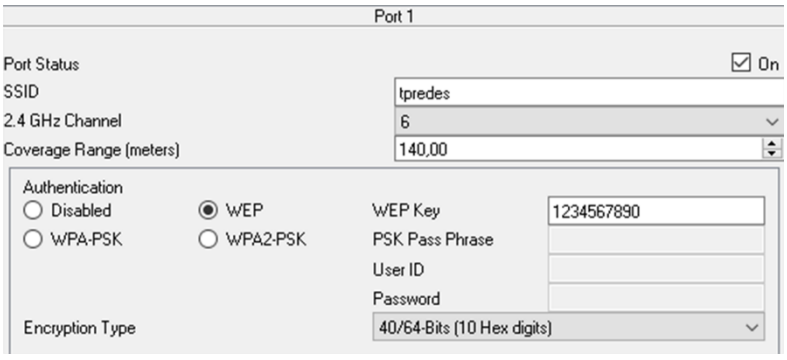
11- Em relação aos servidores de *email*, ativaram-se os serviços *SMTP* e *POP3*. Depois foram criadas contas para diferentes usuários as quais estão configuradas no seu respetivo computador

12- Na Casa_A foi adicionado um *access-point* ligado via *Wi-Fi* a um equipamento portátil, onde foi configurada uma senha *WEP*.

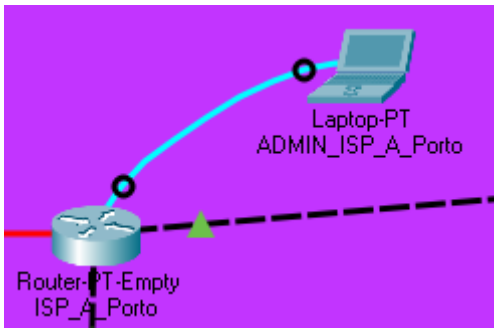
Circuito:



Configuração no Access Point:



13- O computador (Admin_ISP_A_Porto) ligado ao router ISP_A_Porto através de cabo de consola permite gerir o mesmo através do seu terminal.



14- As *passwords* foram configuradas de modo a ser pedida para o *login* (*config terminal*) e para acessar o modo *enable* (*enable*) sendo a pass no *switch* (S3) de "*rocks*" e no router (Casa_A) de "ubi", ambos contêm um banner ("*Welcome Tarefa 16*").

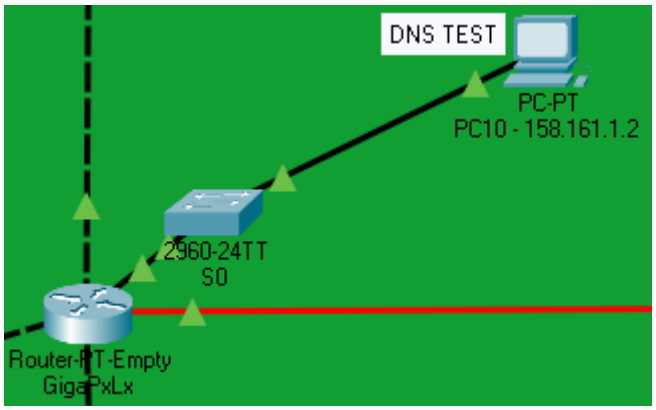
Switch:

```
Welcome Tarefa 16

User Access Verification

Password:

S3>en
Password:
S3#
```

Router:

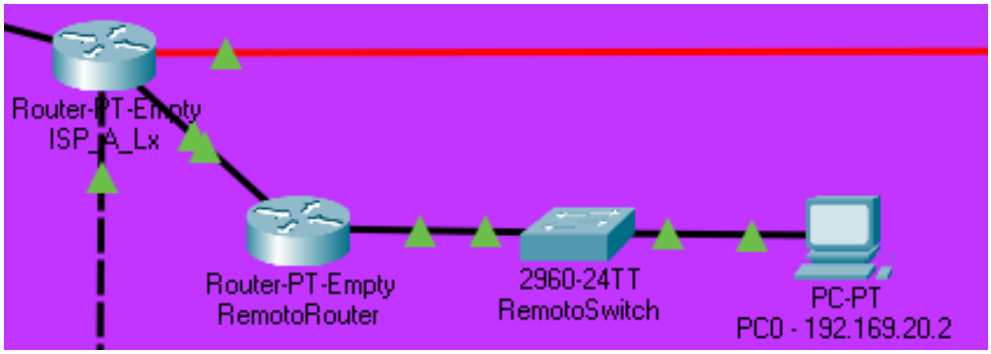
```
Welcome Tarefa 16

User Access Verification

Password:

Casa_A>en
Password:
Casa A#
```

15- Na rede desenvolvida foram adicionados vários computadores com o fim de obter o correto servidor de dns associado.



PONTO BONUS

1- O ponto bónus realizado foi o 22, no qual configurámos um *switch* e um *router* com endereços *IP* de modo a permitir acesso remoto a todo o circuito através de um computador (*PC0* - 192.169.20.2).



2- Tabelas de endereços.

Entre os routers	Bloco de endereços (254 hosts / 1 subnet)	Endereço do primeiro host	Endereço do último host	Endereço de broadcast
GigapixLX - GigaPixPorto	10.10.2.0/24	10.10.2.1	10.10.2.254	10.10.2.255
GigapixLX - ISP_A_Lx	10.10.1.0/24	10.10.1.1	10.10.1.254	10.10.1.254
GigapixLX - ISP_B_Lx	10.10.3.0/24	10.10.3.1	10.10.3.254	10.10.3.254
GigapixLX - Emp_Y	10.10.4.0/24	10.10.4.1	10.10.4.254	10.10.4.254
GigaPixPorto - ISP_A_Porto	10.10.7.0/24	10.10.7.1	10.10.7.254	10.10.7.254
GigaPixPorto - ISP_B_Porto	10.10.6.0/24	10.10.6.1	10.10.6.254	10.10.6.254
GigaPixPorto - RouterDNS	10.10.10.0/24 10.10.9.0/24	10.10.10.1 10.10.9.1	10.10.10.254 10.10.9.254	10.10.10.254 10.10.9.254
GigaPixPorto - RouterCNN	10.10.8.0/24 10.10.5.0/24	10.10.8.1 10.10.5.1	10.10.8.254 10.10.5.254	10.10.8.254 10.10.5.254
GigaPixPorto - RouterEmail	10.10.11.0/24 10.10.12.0/24	10.10.11.1 10.10.12.1	10.10.11.254 10.10.12.254	10.10.11.254 10.10.12.254
ISP_A_Lx - ISP_A_Porto	10.0.4.0/24	10.0.4.1	10.0.4.254	10.0.4.254
ISP_A_Lx - Emp_X_Lx	10.0.5.0/24	10.0.5.1	10.0.5.254	10.0.5.254
ISP_A_Porto - Emp_X_Porto	10.0.3.0/24	10.0.3.1	10.0.3.254	10.0.3.254
ISP_A_Lx - RemotoRouter	10.0.6.0/24	10.0.6.1	10.0.6.254	10.0.6.255
ISP_B_Porto - RouterDNS	192.168.1.0/24 192.168.3.0/24	192.168.1.1 192.168.3.1	192.168.1.254 192.168.3.254	192.168.1.254 192.168.3.254
ISP_B_Lx - Casa_A	10.1.1.0/24	10.1.1.1	10.1.1.254	10.1.1.254
ISP_B_Lx - Casa_B	10.1.2.0/24	10.1.2.1	10.1.2.254	10.1.2.254
ISP_B_Porto - DHCP	10.0.99.0/24	10.0.99.1	10.0.99.254	10.0.99.255
ISP_B_Porto - DNS	10.0.8.0/24	10.0.8.1	10.0.8.254	10.0.8.255
ISP_B_Porto – emailisb.pt	193.1.2.0/24	193.1.2.1	193.1.2.254	193.1.2.255
Emp_Y - www.wikipedia.org	91.198.174.0/24	91.198.174.1	91.198.174.254	91.198.174.255
Emp_Y - wikimail.org	208.80.154.0/24	208.80.154.1	208.80.154.254	208.80.154.255
RouterCNN - www.cnn.com	151.101.133.0/24	151.101.133.1	151.101.133.254	151.101.133.255
RouterMail - email.com	170.1.2.0/24	170.1.2.1	170.1.2.254	170.1.2.255

RouterDNS – dns.org | 8.0.0.0/8 (**16777214 host e 1 subnet**) | 8.0.0.1 | 8.255.255.254 | 8.255.255.255

Rede		Bloco de endereços (254 hosts / 1 subnet)	Endereço do primeiro host	Endereço do último host	Endereço de broadcast
Rede Casa_A		10.0.1.0/24	10.0.1.1	10.0.1.254	10.0.1.255
Rede Casa_B		10.0.2.0/24	10.0.2.1	10.0.2.254	10.0.2.255
RedeRemoto	(Ligado ao PC0)	192.169.20.0/24	192.169.20.1	192.169.20.254	192.169.20.255
VLAN 1	(Ligação ao router de Lisboa)	172.16.1.0/24	172.16.1.1	172.16.1.254	172.16.1.255
VLAN 99	(Ligação ao router de Lisboa)	173.249.51.0/24	173.249.51.1	173.249.51.254	173.249.51.255
VLAN 100	(Ligação ao router de Lisboa)	172.16.100.0/24	172.16.100.1	172.16.100.254	172.16.100.255
VLAN 101	(Ligação ao router de Lisboa)	172.16.101.0/24	172.16.101.1	172.16.101.254	172.16.101.255
VLAN 1	(Ligação ao router de Porto)	172.17.1.0/24	172.17.1.1	172.17.1.254	172.17.1.255
VLAN 100	(Ligação ao router de Porto)	172.17.100.0/24	172.17.100.1	172.17.100.254	172.17.100.255
VLAN 101	(Ligação ao router de Porto)	172.17.101.0/24	172.17.101.1	172.17.101.254	172.17.101.255
VLAN 200	(Ligação ao router de Porto)	172.17.200.0/24	172.17.200.1	172.17.200.254	172.17.200.255
RemotoRouter	(Ligação com o PC0)	192.169.20.0/24	192.169.20.1	192.169.20.254	192.169.20.255

3- Programação de *routers* e *switches*.

Os *switches* S0, S2, S3, S4 e RemotoSwitch possuem a configuração default logo não serão apresentados na seguinte lista.

S5

```
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
!
interface FastEthernet0/2
!
interface FastEthernet0/3
 switchport access vlan 99
 switchport mode access
!
interface FastEthernet0/4
 switchport access vlan 99
 switchport mode access
!
interface FastEthernet0/5
 switchport access vlan 99
 switchport mode access
!
interface FastEthernet0/6
 switchport access vlan 99
 switchport mode access
!
interface FastEthernet0/7
 switchport access vlan 99
 switchport mode access
!
interface FastEthernet0/8
 switchport access vlan 100
 switchport mode access
!
interface FastEthernet0/9
 switchport access vlan 100
 switchport mode access
!
interface FastEthernet0/10
 switchport access vlan 100
 switchport mode access
!
interface FastEthernet0/11
 switchport access vlan 100
 switchport mode access
!
interface FastEthernet0/12
 switchport access vlan 100
 switchport mode access
!
interface FastEthernet0/13
 switchport access vlan 100
 switchport mode access
!
interface FastEthernet0/14
 switchport access vlan 100
 switchport mode access
!
interface FastEthernet0/15
 switchport access vlan 100
 switchport mode access
!
interface FastEthernet0/16
 switchport access vlan 101
```

S1

```
interface FastEthernet0/1
!
interface FastEthernet0/2
!
interface FastEthernet0/3
!
interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
 switchport access vlan 200
!
interface FastEthernet0/13
 switchport access vlan 100
!
interface FastEthernet0/14
 switchport access vlan 100
!
interface FastEthernet0/15
 switchport access vlan 100
!
interface FastEthernet0/16
 switchport access vlan 100
!
interface FastEthernet0/17
 switchport access vlan 100
!
interface FastEthernet0/18
 switchport access vlan 100
!
interface FastEthernet0/19
 switchport access vlan 101
!
interface FastEthernet0/20
 switchport access vlan 101
!
interface FastEthernet0/21
 switchport access vlan 101
!
interface FastEthernet0/22
 switchport access vlan 101
!
interface FastEthernet0/23
 switchport access vlan 101
!
interface FastEthernet0/24
 switchport access vlan 101
!
interface GigabitEthernet0/1
 switchport mode trunk
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan99
 no ip address
!
interface Vlan100
 no ip address
 ip helper-address 172.16.0.1
!
interface Vlan101
 no ip address
 ip helper-address 172.16.0.1
!
interface Vlan200
 no ip address
```

Router remoto

```
interface Serial0/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
!
interface GigabitEthernet3/0
 ip address 10.0.6.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet4/0
 ip address 192.169.20.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet5/0
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet6/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet7/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet8/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet9/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
router rip
 version 2
 network 10.0.0.0
 network 192.169.20.0
!
ip classless
```

ISP_A_PORTO

```
interface Serial0/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
!
interface GigabitEthernet3/0
 ip address 10.10.7.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet4/0
 ip address 10.0.3.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet5/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet6/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet7/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet8/0
 no ip address
 shutdown
!
interface GigabitEthernet9/0
 ip address 10.0.4.2 255.255.255.0
!
router rip
 version 2
 network 10.0.0.0
 no auto-summary
!
ip classless
!
ip flow-export version 9
```

ISP_A_LX

```
interface Serial0/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
!
interface GigabitEthernet3/0
 ip address 10.0.5.2 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet4/0
 ip address 10.10.1.1 255.255.255.(
 duplex auto
 speed auto
!
interface GigabitEthernet5/0
 ip address 10.0.6.2 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet6/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet7/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet8/0
 no ip address
 shutdown
!
interface GigabitEthernet9/0
 ip address 10.0.4.1 255.255.255.0
!
router rip
 version 2
 network 10.0.0.0
```

EMP_X_PORTO

```
interface Serial0/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
!
interface GigabitEthernet3/0
 ip address 10.0.3.2 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet4/0
 ip address 172.17.1.1 255.255.255.0
 ip helper-address 172.16.1.1
 duplex auto
 speed auto
!
interface GigabitEthernet4/0.100
 encapsulation dot1Q 100
 ip address 172.17.100.1 255.255.255.0
!
interface GigabitEthernet4/0.101
 encapsulation dot1Q 101
 ip address 172.17.101.1 255.255.255.0
!
interface GigabitEthernet4/0.200
 encapsulation dot1Q 200
 ip address 172.17.199.2 255.255.255.0
!
interface GigabitEthernet5/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet6/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet7/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet8/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet9/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
router rip
 version 2
 network 10.0.0.0
 network 172.17.0.0
!
ip classless
!
ip flow-export version 9
```

EMP_X_LX

```
interface Serial0/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
!
interface GigabitEthernet3/0
 ip address 172.16.1.2 255.255.255.0
 ip helper-address 172.16.1.1
 duplex auto
 speed auto
!
interface GigabitEthernet3/0.99
 encapsulation dot1Q 99
 ip address 172.16.99.1 255.255.255.0
!
interface GigabitEthernet3/0.100
 encapsulation dot1Q 100
 ip address 172.16.100.1 255.255.255.0
!
interface GigabitEthernet3/0.101
 encapsulation dot1Q 101
 ip address 172.16.101.1 255.255.255.0
!
interface GigabitEthernet4/0
 ip address 10.0.5.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet5/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet6/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet7/0
 no ip address
 duplex auto
 speed auto
 shutdown
```

```
interface GigabitEthernet8/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet9/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
router rip
 version 2
 network 10.0.0.0
 network 172.16.0.0
!
ip classless
```

ROUTER MAIL

```
interface Serial0/0
 no ip address
 encapsulation frame-relay
 clock rate 125000
!
interface Serial0/0.500 point-to-point
 ip address 10.10.11.2 255.255.255.0
 frame-relay interface-dlci 500
!
interface Serial0/0.501 point-to-point
 ip address 10.10.12.1 255.255.255.0
 frame-relay interface-dlci 501
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
!
interface GigabitEthernet3/0
 ip address 170.1.2.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet4/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet5/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet6/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet7/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet8/0
 no ip address
 duplex auto
 speed auto
 shutdown
interface GigabitEthernet9/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
router rip
 version 2
 network 10.0.0.0
 network 170.1.0.0
 no auto-summary
!
ip classless
ip route 10.10.6.0 255.255.255.0 10.10.11.1
ip route 10.10.7.0 255.255.255.0 10.10.11.1
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
 login
!
!
!
end
```

ROUTER DNS

```
interface Serial0/0
 no ip address
 encapsulation frame-relay
 clock rate 125000
!
interface Serial0/0.100 point-to-point
 ip address 192.168.1.2 255.255.255.0
 frame-relay interface-dlci 100
!
interface Serial0/0.101 point-to-point
 ip address 192.168.3.1 255.255.255.0
 frame-relay interface-dlci 101
!
interface Serial0/0.600 point-to-point
 ip address 10.10.10.4 255.255.255.0
 frame-relay interface-dlci 600
!
interface Serial0/0.601 point-to-point
 ip address 10.10.9.5 255.255.255.0
 frame-relay interface-dlci 601
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 encapsulation frame-relay
 clock rate 2000000
 shutdown
!
interface Serial2/0.100 point-to-point
 no ip address
!
interface GigabitEthernet3/0
 ip address 8.0.0.1 255.0.0.0
 duplex auto
 speed auto
!
interface GigabitEthernet4/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet5/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet6/0
 no ip address
 duplex auto
 speed auto
 shutdown
interface GigabitEthernet7/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet8/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet9/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
router rip
 version 2
 network 8.0.0.0
 network 10.0.0.0
 network 192.168.1.0
 network 192.168.3.0
 no auto-summary
!
ip classless
ip route 10.10.6.0 255.255.255.0 10.10.10.5
ip route 10.10.7.0 255.255.255.0 10.10.10.5
ip route 10.10.6.0 255.255.255.0 192.168.1.1
ip route 192.14.2.0 255.255.255.0 192.168.1.1
ip route 10.0.99.0 255.255.255.0 192.168.1.1
ip route 10.0.8.0 255.255.255.0 192.168.1.1
ip route 193.1.2.0 255.255.255.0 192.168.1.1
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
 login
!
!
!
end
```

ROUTER CNN

```
interface Serial0/0
 no ip address
 encapsulation frame-relay
 clock rate 125000
!
interface Serial0/0.400 point-to-point
 ip address 10.10.8.1 255.255.255.0
 frame-relay interface-dlci 400
!
interface Serial0/0.401 point-to-point
 ip address 10.10.5.2 255.255.255.0
 frame-relay interface-dlci 401
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
!
interface GigabitEthernet3/0
 ip address 151.101.133.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet4/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet5/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet6/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet7/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet8/0
 no ip address
 duplex auto
 speed auto
 shutdown
```

```
interface GigabitEthernet9/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
router rip
 version 2
 network 10.0.0.0
 network 151.101.0.0
 no auto-summary
!
ip classless
ip route 10.10.6.0 255.255.255.0 10.10.8.2
ip route 10.10.7.0 255.255.255.0 10.10.8.2
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
 login
!
!
!
end
```

ISP_B_PORTO

```
interface Serial0/0
 no ip address
 encapsulation frame-relay
!
interface Serial0/0.200 point-to-point
 ip address 192.168.3.2 255.255.255.0
 frame-relay interface-dlci 200
!
interface Serial0/0.201 point-to-point
 ip address 192.168.1.1 255.255.255.0
 frame-relay interface-dlci 201
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
!
interface GigabitEthernet3/0
 ip address 10.10.6.2 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet4/0
 ip address 10.0.99.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet5/0
 ip address 10.0.8.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet6/0
 ip address 193.1.2.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet7/0
 ip address 192.14.2.1 255.255.255.0
 ip helper-address 10.0.99.99
 duplex auto
 speed auto
!
interface GigabitEthernet8/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet9/0
 no ip address
 duplex auto
 speed auto
 shutdown
interface GigabitEthernet9/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
router rip
 version 2
 network 10.0.0.0
 network 170.1.0.0
 network 192.14.2.0
 network 192.168.1.0
 network 192.168.3.0
 network 193.1.2.0
 no auto-summary
!
ip classless
ip route 8.0.0.0 255.0.0.0 192.168.3.1
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
 login
!
!
!
end
```

GIGAPIX PORTO

```
interface Serial0/0
 no ip address
 encapsulation frame-relay
!
interface Serial0/0.300 point-to-point
 ip address 10.10.5.1 255.255.255.0
 frame-relay interface-dlci 300
!
interface Serial0/0.301 point-to-point
 ip address 10.10.8.2 255.255.255.0
 frame-relay interface-dlci 301
!
interface Serial0/0.700 point-to-point
 ip address 10.10.9.5 255.255.255.0
 frame-relay interface-dlci 700
!
interface Serial0/0.701 point-to-point
 ip address 10.10.10.5 255.255.255.0
 frame-relay interface-dlci 701
!
interface Serial0/0.800 point-to-point
 ip address 10.10.12.2 255.255.255.0
 frame-relay interface-dlci 800
!
interface Serial0/0.801 point-to-point
 ip address 10.10.11.1 255.255.255.0
 frame-relay interface-dlci 801
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
!
interface GigabitEthernet3/0
 ip address 10.10.7.2 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet4/0
 ip address 10.10.6.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet5/0
 ip address 194.161.1.1 255.255.255.0
 ip helper-address 10.0.99.99
 duplex auto
 speed auto
!
interface GigabitEthernet6/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet7/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet8/0
 no ip address
 shutdown
!
interface GigabitEthernet9/0
 ip address 10.10.2.2 255.255.255.0
!
router ospf 10
 router-id 2.2.2.2
 log-adjacency-changes
 network 10.10.2.0 0.0.0.255 area 0
!
router ospf 1
 log-adjacency-changes
 redistribute rip subnets
!
router rip
 version 2
 redistribute ospf 1 metric 12
 network 10.0.0.0
 network 194.161.1.0
 no auto-summary
!
ip classless
ip route 8.0.0.0 255.0.0.0 10.10.10.4
ip route 151.101.133.0 255.255.255.0 10.10.5.2
ip route 170.1.2.0 255.255.255.0 10.10.12.1
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
 login
!
!
!
end
```

GIGAPIX LISBOA

```
interface Serial0/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
!
interface GigabitEthernet3/0
 ip address 10.10.1.2 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet4/0
 ip address 10.10.3.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet5/0
 ip address 10.10.4.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet6/0
 ip address 159.161.1.1 255.255.255.0
 ip helper-address 10.0.99.99
 duplex auto
 speed auto
!
interface GigabitEthernet7/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet8/0
 no ip address
 shutdown
!
interface GigabitEthernet9/0
 ip address 10.10.2.1 255.255.255.0
!
router ospf 10
 router-id 1.1.1.1
 log-adjacency-changes
 network 10.10.2.0 0.0.0.255 area 0
!
router ospf 1
 log-adjacency-changes
 redistribute rip subnets
router rip
 version 2
 redistribute ospf 1 metric 12
 network 10.0.0.0
 network 159.161.0.0
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
 login
!
!
!
end
```

EMP Y

```
interface Serial0/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
!
interface GigabitEthernet3/0
 ip address 10.10.4.2 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet4/0
 ip address 91.198.174.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet5/0
 ip address 208.80.154.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet6/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet7/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet8/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet9/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
router rip
 version 2
 network 10.0.0.0
 network 91.0.0.0
 network 208.80.154.0
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
 login
!
!
!
end
```

CASA B

```
interface Serial0/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
!
interface GigabitEthernet3/0
 ip address 10.1.2.2 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet4/0
 ip address 10.0.2.1 255.255.255.0
 ip helper-address 10.0.99.99
 duplex auto
 speed auto
!
interface GigabitEthernet5/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet6/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet7/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet8/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet9/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
router rip
 version 2
 network 10.0.0.0
ip classless
!
ip flow-export version 9
!
!
!
no cdp run
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
 login
!
!
!
end
```

CASA A

```
interface Serial0/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial1/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
!
interface GigabitEthernet3/0
 ip address 10.1.1.2 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet4/0
 ip address 10.0.1.1 255.255.255.0
 ip helper-address 10.0.99.99
 duplex auto
 speed auto
!
interface GigabitEthernet5/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet6/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet7/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet8/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet9/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
router rip
 version 2
 network 10.0.0.0
ip classless
!
ip flow-export version 9
!
!
!
no cdp run
!
banner motd ^CWelcome Tarefa 16^C
!
!
!
!
!
line con 0
 password ubi
 login
!
line aux 0
!
line vty 0 4
 login
!
!
!
end
```