Universidade da Beira Interior Departamento de Informática



Laboratório Avaliação Final - Redes de Computadores

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Capítulo

1

Introdução

1.1 Âmbito e Enquadramento

Encontra-se a analisar um pequeno relatório, elaborado no 2.º semestre do 1.º ano da Licenciatura em Engenharia Informática da Universidade da Beira Interior.

Foi confecionado no contexto da unidade curricular Redes de Computadores, com base no Laboratório Avaliação Final. Este documento detém as configurações de todos os Routers e Switches presentes, bem como a suas Tabelas de Endereços relativas a este exercício final.

Por fim, uma breve análise critica e como abordamos o problema.

Capítulo

2

Configurações dos Routers/Switches e Tabelas de Endereços

2.1 Configurações dos Routers e Switches

2.1.1 Router Emp X running-config

```
!
version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption
!
hostname Emp_X_Lx
!
!
```

```
!
no ip cef
no ipv6 cef
interface\ Gigabit Ethernet 0/0
```

```
ip address 172.16.0.2 255.255.255.0
duplex auto
speed auto
interface GigabitEthernet0/0.1
encapsulation dot1Q 1 native
ip address 172.16.1.1 255.255.255.0
ip helper-address 172.16.0.1
interface GigabitEthernet0/0.99
encapsulation dot1Q 99
ip address 173.249.51.1 255.255.255.0
interface GigabitEthernet0/0.100
encapsulation dot1Q 100
ip address 172.16.100.1 255.255.255.0
ip helper-address 172.16.0.1
interface GigabitEthernet0/0.101
encapsulation dot1Q 101
ip address 172.16.101.1 255.255.255.0
ip helper-address 172.16.0.1
interface GigabitEthernet1/0
```

```
ip address 10.0.0.5 255.255.255.252
duplex auto
speed auto
router rip
version 2
network 10.0.0.0
network 172.16.0.0
network 173.249.0.0
no auto-summary
ip classless
ip flow-export version 9
!
!
!
no cdp run
!
!
line con 0
```

```
!
line aux 0
!
line vty 0 4
login
!
!
!
```

2.1.2 Router Emp X Porto running-config

```
!
version 12.2

no service timestamps log datetime msec

no service password-encryption
!
hostname Emp_X_Porto
!
!
!!
!
```

```
!
no ip cef
no ipv6 cef
!
interface GigabitEthernet0/0
 ip\ address\ 10.0.0.10\ 255.255.255.252
 duplex auto
```

```
speed auto
interface GigabitEthernet1/0
ip address 12.0.0.1 255.0.0.0
duplex auto
speed auto
interface GigabitEthernet1/0.1
encapsulation dot1Q 1 native
ip address 172.17.1.1 255.255.255.0
interface GigabitEthernet1/0.100
encapsulation dot1Q 100
ip address 172.17.100.1 255.255.255.0
ip helper-address 172.16.0.1
interface GigabitEthernet1/0.101
encapsulation dot1Q 101
ip address 172.17.101.1 255.255.255.0
ip helper-address 172.16.0.1
interface GigabitEthernet1/0.200
encapsulation dot1Q 200
ip address 172.17.200.1 255.255.255.0
```

```
ip access-group 1 out
router rip
version 2
network 10.0.0.0
network 12.0.0.0
network 172.17.0.0
no auto-summary
ip classless
ip flow-export version 9
!
access-list 1 deny host 172.17.101.2
access-list 1 deny host 172.17.101.3
access-list 1 deny host 172.16.101.2
access-list 1 permit any
!
line con 0
```

```
!
line aux 0
!
line vty 0 4
login
!
!
```

2.1.3 Router ISP A Lx running-config

```
!
version 12.2

no service timestamps log datetime msec

no service password-encryption
!
hostname ISP_A_Lx
!
!
!
```

```
!
no ip cef
no ipv6 cef
!
interface GigabitEthernet0/0
 ip address 10.0.0.6 255.255.255.252
 duplex auto
```

```
speed auto
interface GigabitEthernet1/0
 ip address 10.10.0.1 255.255.255.252
 duplex auto
 speed auto
interface GigabitEthernet2/0
 ip address 10.0.0.1 255.255.255.252
router rip
 version 2
 network 10.0.0.0
 network 172.16.0.0
no auto-summary
ip classless
ip flow-export version 9
no cdp run
!
```

```
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
```

2.1.4 Router ISP A Porto running-config

```
!
version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption
!
hostname ISP_A_Porto
!
```

```
!
!
no ip cef
no ipv6 cef
!
!
!
!
!
!
!
!
!
!
```

```
!
interface GigabitEthernet0/0
ip address 10.0.0.2 255.255.255.252
interface GigabitEthernet1/0
ip address 10.0.0.9 255.255.255.252
duplex auto
speed auto
interface GigabitEthernet2/0
ip address 10.10.0.13 255.255.255.252
duplex auto
speed auto
router rip
version 2
network 10.0.0.0
no auto-summary
ip classless
ip flow-export version 9
```

```
no cdp run
!
line con 0
!
line aux 0
line vty 0 4
login
end
```

2.1.5 Router GigaPixLx running-config

```
! version 12.2 no service timestamps log datetime msec
```

```
no service timestamps debug datetime msec
no service password-encryption
!
hostname GigaPixLx
no ip cef
no ipv6 cef
!
!
```

```
!
interface GigabitEthernet0/0
ip address 10.10.0.2 255.255.255.252
duplex auto
speed auto
interface GigabitEthernet1/0
ip address 10.10.0.5 255.255.255.252
 duplex auto
speed auto
interface GigabitEthernet2/0
ip address 10.10.0.9 255.255.255.252
 duplex auto
speed auto
interface GigabitEthernet3/0
ip address 10.10.0.33 255.255.255.252
```

```
router ospf 10
router-id 1.1.1.1
log-adjacency-changes
redistribute rip subnets
network 10.10.0.0 0.0.0.3 area 0
router rip
version 2
redistribute ospf 10 metric 12
network 10.0.0.0
no auto-summary
ip classless
ip flow-export version 9
!
no cdp run
banner motd #Bem Vindo ao Router GigaPix de Lisboa#
!
!
!
```

```
!
!!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
```

2.1.6 Router GigaPixPorto running-config

```
!
version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption
!
hostname GigaPixPorto
!
```

```
!
no ip cef
no ipv6 cef
!
interface GigabitEthernet0/0
```

```
ip address 10.10.0.14 255.255.255.252
duplex auto
speed auto
interface GigabitEthernet1/0
ip address 10.10.0.34 255.255.255.252
interface Serial2/0
no ip address
encapsulation frame-relay
interface Serial2/0.100 point-to-point
ip address 10.10.0.21 255.255.255.252
frame-relay interface-dlci 100
interface Serial2/0.200 point-to-point
ip address 10.10.0.25 255.255.255.252
frame-relay interface-dlci 200
interface Serial2/0.300 point-to-point
ip address 10.10.0.29 255.255.255.252
frame-relay interface-dlci 300
interface GigabitEthernet3/0
```

```
ip address 10.10.0.17 255.255.255.252
 duplex auto
speed auto
router ospf 10
router-id 2.2.2.2
log-adjacency-changes
redistribute rip subnets
network 10.10.0.0 0.0.0.3 area 0
router rip
version 2
redistribute ospf 10 metric 12
network 10.0.0.0
no auto-summary
!
ip classless
ip flow-export version 9
!
no cdp run
banner motd #Bem Vindo ao Router GigaPix do Porto#
```

```
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
```

2.1.7 Router Emp Y running-config

```
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Emp_Y
```

```
!
no ip cef
no ipv6 cef
```

```
interface GigabitEthernet0/0
ip address 10.10.0.10 255.255.255.252
duplex auto
speed auto
interface FastEthernet1/0
ip address 91.198.174.1 255.255.255.0
duplex auto
speed auto
interface FastEthernet2/0
ip address 208.80.154.1 255.255.255.0
duplex auto
speed auto
interface FastEthernet3/0
ip address 20.0.0.1 255.255.255.252
duplex auto
speed auto
router rip
```

```
version 2
network 10.0.0.0
network 20.0.0.0
network 91.0.0.0
network 208.80.154.0
no auto-summary
ip classless
ip flow-export version 9
!
no cdp run
!
line con 0
line aux 0
line vty 0 4
```

```
login
!
!
!
end
```

2.1.8 RouterEmail running-config

```
!
interface Serial0/0
no ip address
encapsulation frame-relay
clock rate 2000000
interface Serial0/0.101 point-to-point
ip\ address\ 10.10.0.22\ 255.255.255.252
frame-relay interface-dlci 101
```

```
interface FastEthernet1/0
 ip address 170.1.2.1 255.255.255.0
 duplex auto
 speed auto
router rip
 version 2
 network 10.0.0.0
 network 170.1.0.0
no auto-summary
ip classless
ip flow-export version 9
no cdp run
!
!
```

```
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
```

2.1.9 RouterCNN running-config

```
!
version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption
!
hostname RouterCNN
!
!
```

```
!
no ip cef
no ipv6 cef
!
!
!
interface Serial0/0
```

```
no ip address
encapsulation frame-relay
clock rate 2000000
!
interface Serial0/0.201 point-to-point
ip address 10.10.0.26 255.255.255.252
frame-relay interface-dlci 201
interface FastEthernet1/0
ip address 151.101.133.1 255.255.255.0
duplex auto
speed auto
router rip
version 2
network 10.0.0.0
network 151.101.0.0
no auto-summary
!
ip classless
ip flow-export version 9
!
```

```
no cdp run
!
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
```

2.1.10 RouterDNS running-config

```
!
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
```

```
!
hostname RouterDNS
no ip cef
no ipv6 cef
```

```
interface Serial0/0
no ip address
encapsulation frame-relay
clock rate 2000000
interface Serial0/0.301 point-to-point
ip address 10.10.0.30 255.255.255.252
frame-relay interface-dlci 301
interface Serial0/0.401 point-to-point
ip address 192.168.1.2 255.255.255.252
frame-relay interface-dlci 401
interface FastEthernet1/0
ip address 8.0.0.1 255.0.0.0
 duplex auto
speed auto
router rip
```

```
version 2
network 8.0.0.0
network 10.0.0.0
no auto-summary
ip classless
ip flow-export version 9
no cdp run
!
line con 0
line aux 0
line vty 0 4
login
```

```
!
!
end
```

2.1.11 Router Casa A running-config

```
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname Casa_A
no ip cef
no ipv6 cef
!
!
```

```
!
!
interface GigabitEthernet0/0
ip address 10.1.0.2 255.255.255.252
duplex auto
speed auto
interface GigabitEthernet1/0
ip address 10.0.1.1 255.255.255.0
duplex auto
speed auto
```

```
router rip
 version 2
 network 10.0.0.0
no auto-summary
ip classless
ip flow-export version 9
!
!
no cdp run
!
!
line con 0
line aux 0
line vty 0 4
 login
```

```
!
!
!
end
```

2.1.12 Router Casa B running-config

```
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname Casa_B
no ip cef
no ipv6 cef
!
```

```
!
username hackerman privilege 15 password 0 123
!
!
!
!
interface\ Gigabit Ethernet 0/0
 ip address 10.1.0.6 255.255.255.252
 duplex auto
 speed auto
interface FastEthernet1/0
```

```
ip address 10.0.2.1 255.255.255.0
 duplex auto
speed auto
router rip
 version 2
 network 10.0.0.0
no auto-summary
ip classless
ip flow-export version 9
no cdp run
!
line con 0
line aux 0
```

```
!
line vty 0 4
login local
!
!
```

2.1.13 Switch0 running-config

```
!
version 12.1

no service timestamps log datetime msec

no service password-encryption
!
hostname Switch0
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
```

```
!
interface FastEthernet0/1
switchport access vlan 100
switchport mode access
interface FastEthernet1/1
switchport access vlan 100
switchport mode access
interface FastEthernet2/1
switchport access vlan 101
switchport mode access
interface FastEthernet3/1
switchport access vlan 99
switchport mode access
!
interface FastEthernet4/1
switchport trunk allowed vlan 1,99-101
switchport mode trunk
interface GigabitEthernet5/1
switchport trunk allowed vlan 1,99-101
switchport mode trunk
```

```
interface Vlan1

ip address 172.16.1.1 255.255.255.0

!
!!
!!
!!
line con 0
!
line vty 0 4
login
line vty 5 15
login
!
!!
!
```

2.1.14 Switch1 running-config

```
!
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
```

```
!
hostname Switch1
!
!
spanning-tree mode pvst
spanning-tree extend system-id
interface GigabitEthernet0/1
switchport trunk allowed vlan 1,99-101,200
switchport mode trunk
interface FastEthernet1/1
switchport access vlan 101
switchport mode access
!
interface FastEthernet2/1
switchport access vlan 101
switchport mode access
interface FastEthernet3/1
 switchport access vlan 100
```

```
switchport mode access
interface FastEthernet4/1
interface FastEthernet5/1
switchport access vlan 200
switchport mode access
interface Vlan1
ip address 172.17.1.1 255.255.255.0
line con 0
password rocks
login
line vty 0 4
login
line vty 5 15
login
!
```

```
!
!
end
```

2.1.15 Switch2 running-config

```
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname Switch2
username hackerman2 privilege 15 password 0 123
spanning-tree mode pvst
spanning-tree extend system-id
interface GigabitEthernet0/1
!
```

```
interface GigabitEthernet1/1
interface FastEthernet2/1
interface Vlan1
ip address 10.0.1.4 255.255.255.0
ip default-gateway 10.0.1.1
line con 0
line vty 0 4
login local
line vty 5 15
login
!
end
```

2.2 Tabelas de Endereços

Equipamento	Interface	Endereço	Máscara de Rede	Default Gateway
Laptop0	Wireless0	10.0.1.3	255.255.255.0	10.0.1.1
www.noticiasdacovilha.pt	fa0	173.249.51.18	255.255.255.0	173.249.51.1
www.intranet.com	fa0	172.17.200.2	255.255.255.0	172.17.200.1
www.cnn.com	fa0	151.101.133.67	255.255.255.0	151.101.133.1
www.wikimail.org	fa0	208.80.154.238	255.255.255.0	208.80.154.1
www.wikipedia.org	fa0	91.198.174.192	255.255.255.0	91.198.174.1
DNS Emp X	fa0	12.0.8.8	255.0.0.0	12.0.0.1
DNS	fa0	10.0.8.8	255.255.255.224	10.0.8.1
DNS 8.8.8.8	fa0	8.8.8.8	255.0.0.0	8.0.0.1
emailispb.pt	fa0	193.1.2.3	255.255.255.0	193.1.2.1
email.com	fa0	170.1.2.3	255.255.255.0	170.1.2.1
DHCP Lx	fa0	172.16.0.1	255.255.255.0	172.16.0.2
DHCP	fa0	10.0.99.99	255.255.255.0	10.0.99.1
FTP	fa0	20.0.0.2	255.255.255.252	20.0.0.1
	gi0/0	172.16.0.2	255.255.255.0	N/A
	gi0/0.1	172.16.1.1	255.255.255.0	N/A
Emp X Lx	gi0/0.99	173.249.51.1	255.255.255.0	N/A
	gi0/0.100	172.16.100.1	255.255.255.0	N/A
	gi0/0.101	172.16.101.1	255.255.255.0	N/A
	gi1/0	10.0.0.5	255.255.255.252	N/A
	gi0/0	10.0.0.10	255.255.255.252	N/A
	gi1/0	12.0.0.1	255.0.0.0	N/A
Emp X Porto	gi1/0.1	172.17.1.1	255.255.255.0	N/A
	gi1/0.100	172.17.100.1	255.255.255.0	N/A
	gi1/0.101	172.17.101.1	255.255.255.0	N/A
	gi1/0.200	172.17.200.1	255.255.255.0	N/A
ISP A Lx	gi0	10.0.0.6	255.255.255.252	N/A
	gi1	10.10.0.1	255.255.255.252	N/A
	gi2	10.0.0.1	255.255.255.252	N/A
	gi0	10.0.0.2	255.255.255.252	N/A
ISP A Porto	gi1	10.0.0.9	255.255.255.252	N/A
	gi2	10.10.0.13	255.255.255.252	N/A

Tabela 2.1: Tabela de Endereços.

	Interface	Endereço	Máscara de Rede	Default Gateway
Equipamento GigaPixLx	gi0	10.10.0.2	255.255.255.252	N/A
	gi1	10.10.0.5	255.255.255.252	N/A
	gi2	10.10.0.9	255.255.255.252	N/A
	gi3	10.10.0.33	255.255.255.252	N/A
	gi0	10.10.0.14	255.255.255.252	N/A
	gi1	10.10.0.34	255.255.255.252	N/A
GigaPixPorto	se2/0.100	10.10.0.21	255.255.255.252	N/A
_	se2/0.200	10.10.0.25	255.255.255.252	N/A
	se2/0.300	10.10.0.29	255.255.255.252	N/A
	gi3	10.10.0.17	255.255.255.252	N/A
	gi0	10.0.0.6	255.255.255.252	N/A
ISP B Lx	gi1	10.1.0.1	255.255.255.252	N/A
	gi2	10.1.0.5	255.255.255.252	N/A
	gi0	10.10.0.18	255.255.255.252	N/A
	se1/0.400	102.168.1.1	255.255.255.252	N/A
ISP B Porto	fa2	193.1.2.1	255.255.255.0	N/A
	fa3	10.0.8.1	255.255.255.224	N/A
	fa4	10.0.99.1	255.255.255.0	N/A
	gi0	10.10.0.10	255.255.255.252	N/A
Emp Y	fa1	91.198.174.1	255.255.255.0	N/A
_	fa2	208.80.154.1	255.255.255.0	N/A
	fa3	20.0.0.1	255.255.255.252	N/A
RouterEmail	se0/0.101	10.10.0.22	255.255.255.252	N/A
	fa1	171.1.2.1	255.255.255.0	N/A
RouterCNN	se0/0.201	10.10.0.26	255.255.255.252	N/A
	fa1	151.101.133.1	255.255.255.0	N/A
RouterDNS	se0/0.301	10.10.0.30	255.255.255.252	N/A
	se0/0.401	192.168.1.2	255.255.255.252	N/A
	fa1	8.0.0.1	255.0.0.0	N/A
Casa A	gi0	10.1.0.2	255.255.255.252	N/A
	gi1	10.0.1.1	255.255.255.0	N/A
Casa B	gi0	10.1.0.6	255.255.255.252	N/A
	fa1	10.0.2.1	255.255.255.0	N/A
Switch0	Vlan1	172.16.1.1	255.255.255.0	N/A
Switch1	Vlan1	172.17.1.1	255.255.255.0	N/A
Switch2	Vlan1	10.0.1.4	255.255.255.0	N/A
PC0	fa0	10.0.1.2	255.255.255.0	10.0.1.1
PC1	fa0	10.0.2.2	255.255.255.0	10.0.2.1
PC2	fa0	DHCP		
PC3	fa0	DHCP		
PC4	fa0	DHCP		
PC5	fa0	DHCP		
PC6	fa0	DHCP		
PC7	fa0	DHCP		
RouterEmail RouterCNN RouterDNS Casa A Casa B Switch0 Switch1 Switch2 PC0 PC1 PC2 PC3 PC4 PC5 PC6	fa2 fa3 se0/0.101 fa1 se0/0.201 fa1 se0/0.301 se0/0.401 fa1 gi0 gi1 gi0 fa1 Vlan1 Vlan1 Vlan1 fa0 fa0 fa0 fa0 fa0 fa0 fa0 fa0	208.80.154.1 20.0.0.1 10.10.0.22 171.1.2.1 10.10.0.26 151.101.133.1 10.10.0.30 192.168.1.2 8.0.0.1 10.1.0.2 10.0.1.1 10.1.0.6 10.0.2.1 172.16.1.1 172.17.1.1 10.0.1.4 10.0.1.2 DHCP DHCP DHCP DHCP DHCP	255.255.255.0 255.255.255.252 255.255.255.252 255.255.255.252 255.255.255.252 255.255.255.252 255.255.255.252 255.255.255.252 255.255.255.252 255.255.255.252 255.255.255.252 255.255.255.252 255.255.255.250 255.255.255.0 255.255.255.0 255.255.255.0 255.255.255.0	N/A

Tabela 2.2: Tabela de Endereços.

Capítulo

3

Análise Crítica

Contávamos com um grande desafio e foi assim que o abordámos desde o início.

Após lermos o respetivo enunciado, começamos por configurar toda a rede da Empresa X, à partida mostrou-se um enorme desafio, mas gradualmente conseguimos corrigir os erros que surgiam. Com toda a parte superior da rede funcional, passámos para a configuração dos ISPs, Routers e Servidores, bem como DNS Hierárquico, contas Email e depois sim, a Cloud. Por fim, fizemos os extras e concluímos o relatório.

No geral, a experiência laboratorial adquirida nas aulas foi suficiente para concluir este desafio, havendo apenas a necessidade de uma pesquisa mais pessoal nos extras, através de alguns vídeos. O maior desafio foi mesmo a rede da Empresa X, no começo contámos com a presença de erros de APIPA e tivemos de recordar conceitos dados anteriormente.

É importante realçar a presença dos professores, que se mostraram sempre disponíveis para salvaguardar o bem-estar, esclarecer dúvidas e transmitir o sentimento de segurança necessário, mesmo à distância.

É de lamentar as condições que devemos à atual situação pandémica, mas conseguimos nos adaptar na medida do possível.