

Relatório Aula Prática 6 e 7



Mestrado Integrado em Engenharia Eletrotécnica e
Computadores

Planeamento e Gestão de Redes

Francisco Fernandes Xavier de Barros – 201506338
João Nuno Barbosa Neves – 201405198

10 de Abril de 2019

Introdução

No âmbito da unidade curricular de Planeamento e Gestão de Redes, foi planeado e configurado o endereçamento IP para uma rede empresarial, assim como, o serviço de DNS da mesma, para permitir a resolução de nomes quando for feita a consulta interna ou externa. Também nos foi pedido o serviço de mail e http a partir do exterior e o serviço proxy de http para acessos pela Intranet.

Endereçamento da rede da empresa

	Rede	Broadcast	DNS	Gateway
Servidor	.100.0/23	.101.255	.100.1	.101.254
Loja 1.1	.102.0/27	.102.31	.102.1	.102.30
Loja 1.2	.102.32/27	.102.63	.102.33	.102.62
Loja 2.1	.102.64/27	.102.95	.102.65	.102.94
Loja 2.2	.102.96/27	.102.127	.102.97	.102.126
Loja 3.1	.102.128/27	.102.159	.102.129	.102.158
Loja 3.2	.102.160/27	.102.191	.102.161	.102.190
Armazém	.103.0/27	.103.31	.103.1	.103.30

Notas: - Todos os ip's começam por 192.168, retiramos para mais fácil leitura.
- Cada loja tem duas vlans.

Configuração das VLANs

Configuramos as VLANs com os seguintes comandos (os comandos seguintes foram os utilizados para a configuração da primeira VLAN da loja 1):

No switch:

- configure terminal
- vlan 11
- end
- configure terminal
- interface fastEthernet 0/1
- switchport mode access
- switchport access vlan 11

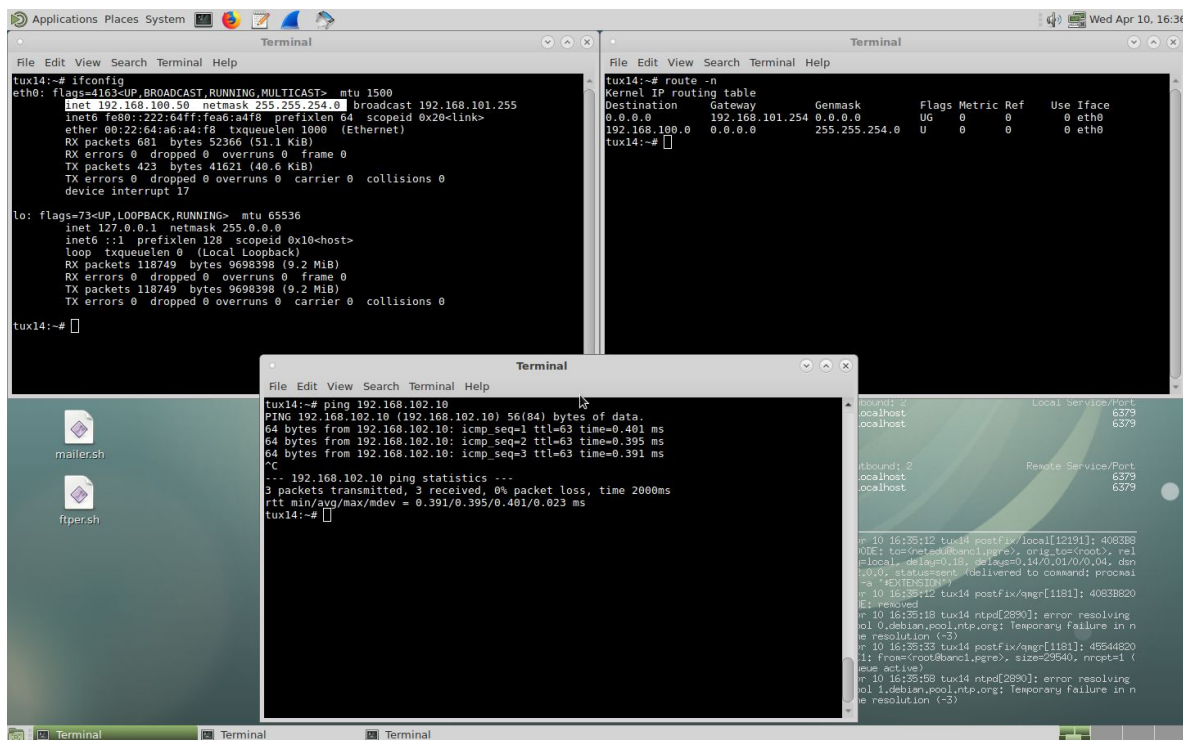
□ end

No router:

- configure terminal
- interface gigabitEthernet 0/0
- no shutdown
- interface gigabitEthernet 0/0.1
- encapsulation dot1Q 11
- ip address 192.168.102.30 255.255.255.224
- no shut

No tux:

- ifconfig eth0 down
- ifconfig eth0 192.168.102.10/27
- route add default gw 192.168.102.30



```
tux14:~# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.100.50 netmask 255.255.254.0 broadcast 192.168.101.255
    inet6 fe80::222:64ff:fea6:a4f8 prefixlen 64 scopeid 0x20<link>
    ether 08:22:64:a6:a4:f8 txqueuelen 1000 (Ethernet)
    RX packets 681 bytes 52366 (51.1 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 423 bytes 41621 (40.6 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
    device interrupt 17

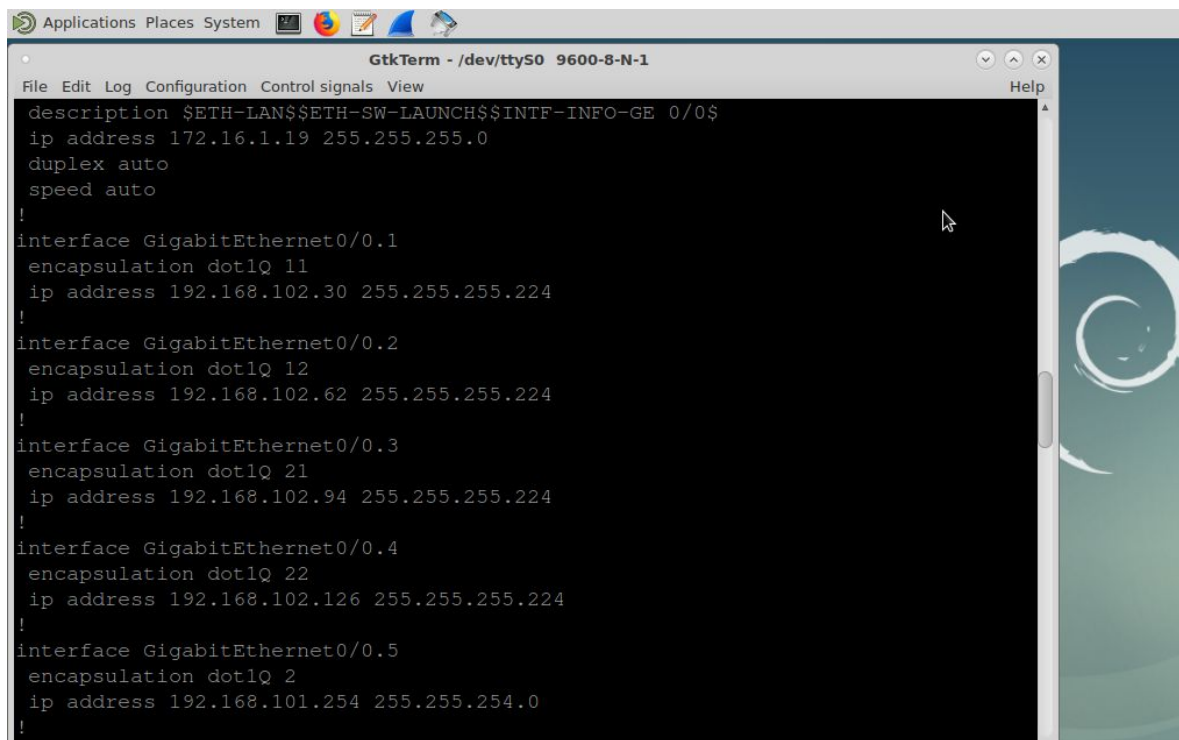
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 0 (Local Loopback)
    RX packets 118749 bytes 9698398 (9.2 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 118749 bytes 9698398 (9.2 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

tux14:~#

tux14:~# route -n
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
0.0.0.0 192.168.101.254 0.0.0.0 UG 0 0 0 eth0
192.168.100.0 0.0.0.0 255.255.254.0 U 0 0 0 eth0
tux14:~#

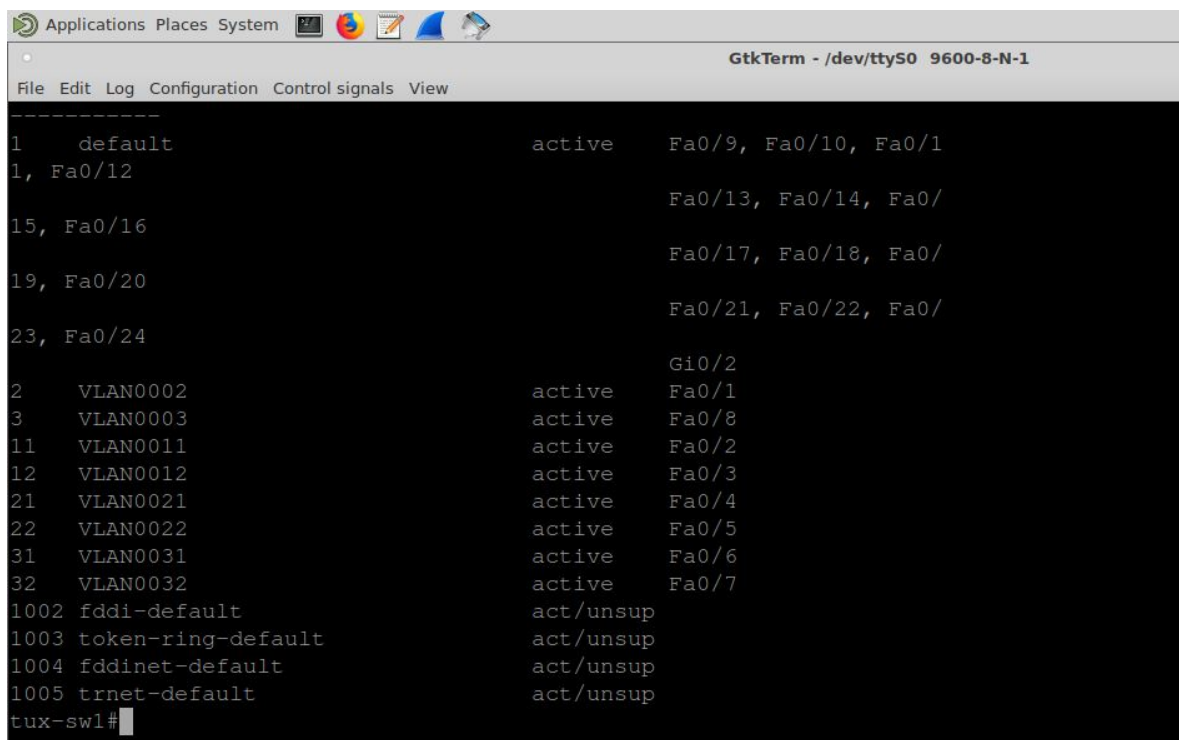
tux14:~# ping 192.168.102.10
PING 192.168.102.10 (192.168.102.10) 56(84) bytes of data:
64 bytes from 192.168.102.10: icmp_seq=1 ttl=63 time=0.401 ms
64 bytes from 192.168.102.10: icmp_seq=2 ttl=63 time=0.395 ms
64 bytes from 192.168.102.10: icmp_seq=3 ttl=63 time=0.391 ms
^C
--- 192.168.102.10 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2000ms
rtt min/avg/max/mdev = 0.391/0.395/0.401/0.023 ms
tux14:~#
```

1 - Ping do servidor para a loja 1 que demonstra o bom funcionamento das VLANs



```
description $ETH-LAN$$ETH-SW-LAUNCH$$INTF-INFO-GE 0/0$
ip address 172.16.1.19 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/0.1
 encapsulation dot1Q 11
 ip address 192.168.102.30 255.255.255.224
!
interface GigabitEthernet0/0.2
 encapsulation dot1Q 12
 ip address 192.168.102.62 255.255.255.224
!
interface GigabitEthernet0/0.3
 encapsulation dot1Q 21
 ip address 192.168.102.94 255.255.255.224
!
interface GigabitEthernet0/0.4
 encapsulation dot1Q 22
 ip address 192.168.102.126 255.255.255.224
!
interface GigabitEthernet0/0.5
 encapsulation dot1Q 2
 ip address 192.168.101.254 255.255.254.0
!
```

2 - Configuração do router



```
-----
1    default          active    Fa0/9, Fa0/10, Fa0/1
1, Fa0/12
                                Fa0/13, Fa0/14, Fa0/
15, Fa0/16
                                Fa0/17, Fa0/18, Fa0/
19, Fa0/20
                                Fa0/21, Fa0/22, Fa0/
23, Fa0/24
                                Gi0/2
2    VLAN0002         active    Fa0/1
3    VLAN0003         active    Fa0/8
11   VLAN0011         active    Fa0/2
12   VLAN0012         active    Fa0/3
21   VLAN0021         active    Fa0/4
22   VLAN0022         active    Fa0/5
31   VLAN0031         active    Fa0/6
32   VLAN0032         active    Fa0/7
1002 fddi-default     act/unsup
1003 token-ring-default act/unsup
1004 fddinet-default  act/unsup
1005 trnet-default    act/unsup
tux-sw1#
```

3 - Configuração do switch

Configuração do serviço DNS

□ nano /etc/bind/named.conf.local

```
1 zone "qquma.pt" {
2     type master;
3     file "/var/named/db.qquma.pt";
4 };
5
6 zone "51.49.20.in-addr.arpa" {
7     type master;
8     file "/var/named/db.51.49.20.in-addr.arpa";
9 };
```

□ cp /etc/bind/db.local /var/named/db.qquma.pt

□ nano /var/named/db.qquma.pt

```
1 ;
2 ; BIND data file for local loopback interface
3 ;
4 $TTL      604800
5 @         IN      SOA      ns.qquma.pt. root.qquma.pt. (
6             201506338      ; Serial
7             604800         ; Refresh
8             86400          ; Retry
9             2419200        ; Expire
10            604800 )       ; Negative Cache TTL
11 ;
12 @         IN      NS       ns.qquma.pt.
13 ns        IN      A        20.49.51.161
14 mail      IN      A        20.49.51.162
15 www       IN      CNAME    qquma.pt.
```

□ cp /etc/bind/db.127 /var/named/db51.49.20.in-addr.arpa

□ nano /var/named/db.51.49.20.in-addr.arpa

```
1 ;
2 ; BIND reverse data file for local loopback interface
3 ;
4 $TTL      604800
5 @         IN      SOA      ns.qquma.pt. root.qquma.pt. (
6             201506338      ; Serial
7             604800         ; Refresh
8             86400          ; Retry
9             2419200        ; Expire
10            604800 )       ; Negative Cache TTL
11 ;
12 @         IN      NS       ns.qquma.pt.
13 161       IN      PTR      ns.qquma.pt.
14 162       IN      PTR      mail.qquma.pt.
15 163       IN      PTR      www.qquma.pt
```

Resultados Obtidos

```
Terminal
File Edit View Search Terminal Help
tux11:~# nslookup www.qquma.pt
Server:      20.49.51.161
Address:     20.49.51.161#53

www.qquma.pt    canonical name = qquma.pt.

tux11:~#
```

nslookup google.pt

```
Terminal
File Edit View Search Terminal Help
tux11:~# nslookup google.pt
Server:      20.49.51.161
Address:     20.49.51.161#53

Non-authoritative answer:
Name:   google.pt
Address: 216.58.210.163

tux11:~#
```

nslookup qquma.pt

```
tux11:~# traceroute google.pt
traceroute to google.pt (216.58.211.35), 30 hops max, 60 byte packets
 1  20.49.51.174 (20.49.51.174)  1.877 ms  1.929 ms  1.986 ms
 2  172.16.1.254 (172.16.1.254)  1.277 ms  1.319 ms  1.413 ms
 3  192.168.110.253 (192.168.110.253)  2.061 ms  2.102 ms  2.147 ms
 4  gw.fe.up.pt (193.136.33.254)  2.434 ms  2.217 ms  2.349 ms
 5  193.136.25.81 (193.136.25.81)  3.875 ms  3.099 ms  3.903 ms
 6  Router20.Porto.fccn.pt (193.136.4.37)  2.820 ms  1.731 ms  1.817 ms
 7  Router23.Porto.fccn.pt (193.137.4.4)  2.648 ms  2.067 ms  1.841 ms
 8  Router13.20GE.DWDM.Backbone1.Lisboa.fccn.pt (193.136.1.1)  6.429 ms  6.637 ms  6.765 ms
 9  ROUTER6.10GE.CR2.Lisboa.fccn.pt (193.137.0.22)  6.799 ms  8.273 ms  8.309 ms
10  Google.AS15169.gigapix.pt (193.136.250.20)  8.068 ms  8.109 ms  8.150 ms
11  216.239.49.242 (216.239.49.242)  18.449 ms  18.493 ms  17.226 ms
12  108.170.253.241 (108.170.253.241)  20.852 ms  17.677 ms  108.170.253.225 (108.170.253.225)  16.731 ms
13  108.170.234.221 (108.170.234.221)  22.205 ms  16.085 ms  108.170.234.231 (108.170.234.231)  17.120 ms
14  muc03s14-in-f3.1e100.net (216.58.211.35)  13.692 ms  13.463 ms  13.393 ms
tux11:~#
```

traceroute google.pt

Conclusão

O grupo conseguiu atingir os objetivos propostos na primeira parte do trabalho à exceção dos servidores de http e mail que por falta de tempo não foram criados. Na segunda parte tivemos mais dificuldades para configurar o serviço bind9 e o NAT no router mas no fim obtivemos bons resultados.

Foi um trabalho que nos ocupou bastante tempo mas no fim pudemos ser capazes de melhor entender como funciona o planeamento de uma rede empresarial, tanto da Intranet como da parte que liga à Internet.

Fontes

<https://www.itzgeek.com/how-tos/linux/debian/configure-dns-server-on-debian-9-ubuntu-16-04.html>

https://www.howtoforge.com/two_in_one_dns_bind9_views