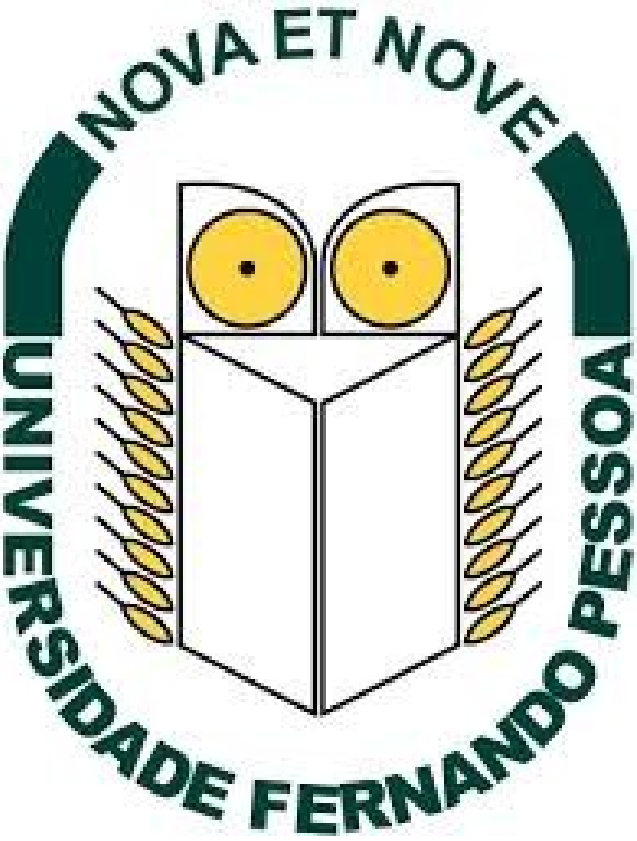
Universidade Fernando Pessoa

Curso de engenharia informática



Relatório de projeto

Disciplina: Redes de Computadores II

Realizado por: Luís Aguiar (36452)

Tráfego a comprovar a correta tradução do NAT configurado

Topologia 1

```
CE1#sh run | sec nat
 ip nat inside
 ip nat inside
 ip nat inside
 ip nat outside
ip nat inside source list NAT interface GigabitEthernet0/3 overload
```

Frames do ping de PC2 para PE1 (capturados na ligação entre CE1 e PE1)

```
115 293.9166… 22.22.22.2    22.22.22.1    ICMP   98 Echo (ping) request  id=0x004c, seq=2/512, ttl=62 (reply in 116)
116 293.9178… 22.22.22.1    22.22.22.2    ICMP   98 Echo (ping) reply    id=0x004c, seq=2/512, ttl=255 (request in 115)
```

Demonstração da filtragem de tráfego pelas ACL’s instaladas

Topologia 1

Pc1 não consegue comunicar com o exterior (tentativa de ping à lo de PE1)

```
root@PC1-SSH:/# ping 2.2.2.2
PING 2.2.2.2 (2.2.2.2) 56(84) bytes of data.
From 22.22.22.1 icmp_seq=1 Destination Host Unreachable
From 22.22.22.1 icmp_seq=2 Destination Host Unreachable
From 22.22.22.1 icmp_seq=3 Destination Host Unreachable
```

Telnet de pc2 para pc3 bloqueado pela ACL

```
root@PC2:~# telnet 192.168.1.192
Trying 192.168.1.192...
^C
```

Pc2 não consegue acedar ao servidor de PC3

```
PING 192.168.1.194 (192.168.1.194) 56(84) bytes of data.
From 192.168.1.253 icmp_seq=2 Packet filtered
From 192.168.1.253 icmp_seq=3 Packet filtered
From 192.168.1.253 icmp_seq=4 Packet filtered
From 192.168.1.253 icmp_seq=5 Packet filtered
From 192.168.1.253 icmp_seq=6 Packet filtered
```

Os leases realizados pelo DHCP

Topologia 1

Negociação DHCP de PC1

```
 7 10.092100 0.0.0.0         255.255.255.2… DHCP   342 DHCP Discover - Transaction ID 0xe014f84f
 8 10.549852 192.168.1.1     192.168.1.12   DHCP   342 DHCP Offer    - Transaction ID 0xe014f84f
 9 10.550241 0.0.0.0         255.255.255.2… DHCP   342 DHCP Request  - Transaction ID 0xe014f84f
10 10.554279 192.168.1.245   192.168.1.12   ICMP    70 Echo (ping) request  id=0x0003, seq=0/0, tt
11 10.577373 192.168.1.1     192.168.1.12   DHCP   342 DHCP ACK      - Transaction ID 0xe014f84f
```

Negociação DHCP de PC2

```
15 39.358186 192.168.1.129   192.168.1.140  DHCP   342 DHCP Offer    - Transaction ID 0x7463ac17
16 39.358349 0.0.0.0         255.255.255.2… DHCP   342 DHCP Request  - Transaction ID 0x7463ac17
17 39.361273                                        70 <Ignored>
18 39.366573 192.168.1.129   192.168.1.140  DHCP   342 DHCP ACK      - Transaction ID 0x7463ac17
```

A propagação das rotas via RIPv2

Topologia 1

Comunicação das rotas RIPv2 entre CE1 e SEDE2, depois de reiniciar SEDE2

```
32 151.9872… 192.168.1.253  224.0.0.9      RIP…  126 Response
41 180.2824… 192.168.1.254  224.0.0.9      RIP…   66 Request
42 180.2839… 192.168.1.253  192.168.1.254  RIP…  126 Response
47 181.0523… 192.168.1.253  224.0.0.9      RIP…  126 Response
```

Comunicação das rotas RIPv2 entre CE1 e SEDE1, depois de reiniciar CE1

```
 8 50.670400 192.168.1.246  224.0.0.9      RIP…  106 Response
16 75.789391 192.168.1.245  224.0.0.9      RIP…   66 Request
17 75.790480 192.168.1.246  192.168.1.245  RIP…  106 Response
23 78.028565 192.168.1.245  224.0.0.9      RIP…  126 Response
24 78.167270 192.168.1.246  224.0.0.9      RIP…  106 Response
```

A propagação das rotas via OSPF

Topologia 2

Divulgação das rotas via OSPF entre R1 e R3

```
49 124.2723… 13.13.13.1     224.0.0.5      OSPF    94 Hello Packet
50 128.3385… 13.13.13.1     13.13.13.2     OSPF    78 DB Description
51 129.1013… 13.13.13.2     224.0.0.5      OSPF    94 Hello Packet
52 134.8193… 13.13.13.2     13.13.13.1     OSPF    78 DB Description
53 135.0726… 13.13.13.1     13.13.13.2     OSPF   138 DB Description
54 135.4555… 13.13.13.2     13.13.13.1     OSPF   118 DB Description
55 135.6365… 13.13.13.1     13.13.13.2     OSPF    82 LS Request
56 135.6424… 13.13.13.1     13.13.13.2     OSPF    78 DB Description
57 136.1003… 13.13.13.2     13.13.13.1     OSPF   146 LS Update
58 136.1124… 13.13.13.2     13.13.13.1     OSPF    94 LS Request
59 136.1259… 13.13.13.1     13.13.13.2     OSPF   202 LS Update
60 138.4139… 13.13.13.2     224.0.0.5      OSPF   142 LS Update
62 143.1336… 13.13.13.1     224.0.0.6      OSPF   138 LS Acknowledge
63 144.0802… 13.13.13.2     224.0.0.5      OSPF   118 LS Acknowledge
65 147.6215… 13.13.13.1     224.0.0.6      OSPF   122 LS Update
66 148.4611… 13.13.13.2     224.0.0.5      OSPF   122 LS Update
67 149.3538… 13.13.13.1     224.0.0.5      OSPF    94 Hello Packet
68 154.8742… 13.13.13.2     224.0.0.5      OSPF    78 LS Acknowledge
69 154.8748… 13.13.13.2     224.0.0.5      OSPF    94 Hello Packet
```

A propagação das rotas via BGP

Topologia 2

Propagação das rotas via BGP entre R3 e R5

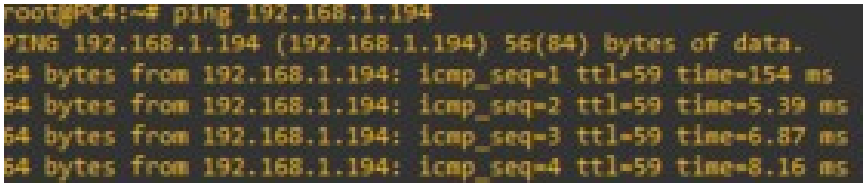
```
34 49.018648 35.35.35.1     35.35.35.2     BGP    111 OPEN Message
36 49.558277 35.35.35.2     35.35.35.1     BGP    111 OPEN Message
37 49.560453 35.35.35.2     35.35.35.1     BGP     73 KEEPALIVE Message
39 49.677276 35.35.35.1     35.35.35.2     BGP     73 KEEPALIVE Message
53 198.9016… 35.35.35.2     35.35.35.1     BGP     73 KEEPALIVE Message
56 200.1781… 35.35.35.1     35.35.35.2     BGP     73 KEEPALIVE Message
57 200.1906… 35.35.35.1     35.35.35.2     BGP    252 UPDATE Message, UPDATE Message, UPDATE Message, UPDATE Message
59 201.8598… 35.35.35.2     35.35.35.1     BGP    204 UPDATE Message, UPDATE Message, UPDATE Message
69 285.8740… 35.35.35.2     35.35.35.1     BGP    178 UPDATE Message, UPDATE Message
78 315.6895… 35.35.35.1     35.35.35.2     BGP     73 KEEPALIVE Message
82 325.4247… 35.35.35.2     35.35.35.1     BGP    110 UPDATE Message
92 369.9871… 35.35.35.1     35.35.35.2     BGP     73 KEEPALIVE Message
97 377.8665… 35.35.35.2     35.35.35.1     BGP     73 KEEPALIVE Message
```

Propagação das rotas via BGP entre R2 e R5

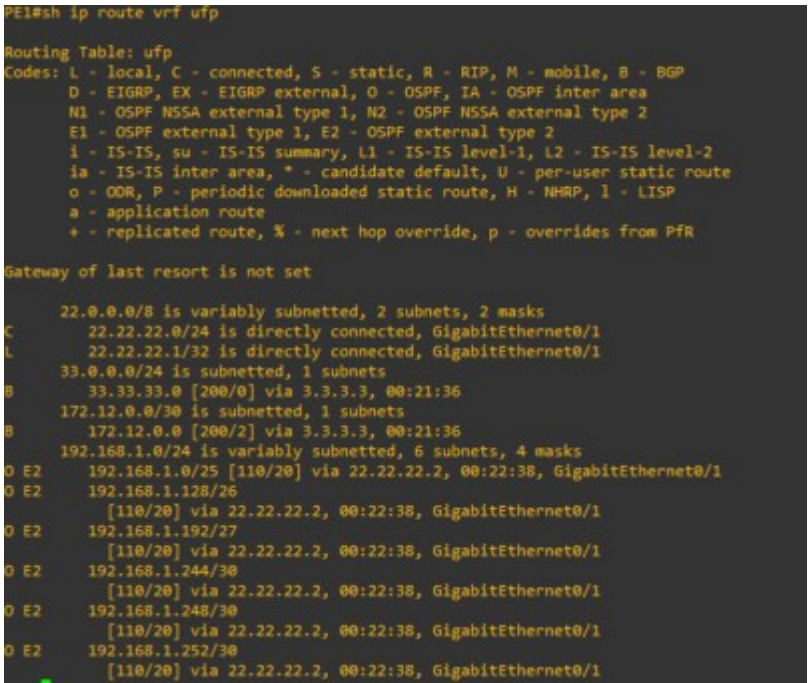
```
29 42.906476 25.25.25.1     25.25.25.2     BGP    111 OPEN Message
32 43.284557 25.25.25.2     25.25.25.1     BGP    111 OPEN Message
33 43.287678 25.25.25.2     25.25.25.1     BGP     73 KEEPALIVE Message
36 43.586424 25.25.25.1     25.25.25.2     BGP     73 KEEPALIVE Message
55 202.4003… 25.25.25.1     25.25.25.2     BGP     73 KEEPALIVE Message
57 204.6272… 25.25.25.2     25.25.25.1     BGP     73 KEEPALIVE Message
58 204.8218… 25.25.25.2     25.25.25.1     BGP    204 UPDATE Message, UPDATE Message, UPDATE Message
60 205.2670… 25.25.25.1     25.25.25.2     BGP    252 UPDATE Message, UPDATE Message, UPDATE Message, UPDATE Message
69 288.8359… 25.25.25.2     25.25.25.1     BGP    178 UPDATE Message, UPDATE Message
75 314.4653… 25.25.25.1     25.25.25.2     BGP     73 KEEPALIVE Message
81 326.1891… 25.25.25.1     25.25.25.2     BGP    117 UPDATE Message
84 328.3818… 25.25.25.2     25.25.25.1     BGP    110 UPDATE Message
91 357.8357… 25.25.25.1     25.25.25.2     BGP     82 UPDATE Message
01 387.1043… 25.25.25.2     25.25.25.1     BGP     73 KEEPALIVE Message
09 420.7546… 25.25.25.1     25.25.25.2     BGP     73 KEEPALIVE Message
```

Comunicação entre dispositivos em UFP-SEDE e UFP-HE via MPLS

Ping de Pc 4 para PC 3



Routes para a vrf UFP em PE1



Frames deste ping capturadas entre PE2 e CE3

```
5 7.488850  172.12.0.2     192.168.1.194  ICMP   98 Echo (ping) request  id=0x0041, seq=1/256, ttl=63 (reply in 6)
6 7.495196  192.168.1.194  172.12.0.2     ICMP   98 Echo (ping) reply    id=0x0041, seq=1/256, ttl=60 (request in 5)
7 8.490493  172.12.0.2     192.168.1.194  ICMP   98 Echo (ping) request  id=0x0041, seq=2/512, ttl=63 (reply in 8)
8 8.495491  192.168.1.194  172.12.0.2     ICMP   98 Echo (ping) reply    id=0x0041, seq=2/512, ttl=60 (request in 7)
9 9.493124  172.12.0.2     192.168.1.194  ICMP   98 Echo (ping) request  id=0x0041, seq=3/768, ttl=63 (reply in 10)
```