

Comunicações por Computadores TP3

4 Março

PL2 Grupo 2

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Respostas:

A.

```
# This file is managed by man:systemd-resolved(8). Do not edit.
#
# This is a dynamic resolv.conf file for connecting local clients to the
# internal DNS stub resolver of systemd-resolved. This file lists all
# configured search domains.
#
# Run "resolvectl status" to see details about the uplink DNS servers
# currently in use.
#
# Third party programs must not access this file directly, but only through the
# symlink at /etc/resolv.conf. To manage man:resolv.conf(5) in a different way,
# replace this symlink by a static file or a different symlink.
#
# See man:systemd-resolved.service(8) for details about the supported modes of
# operation for /etc/resolv.conf.

nameserver 127.0.0.53
options edns0
search home
```

R: Ficheiro de configuração do DNS resolver. Contém informação para regular os parâmetros operacionais e nameservers para que o DNS Resolver possa traduzir domain names para ip addresses.

B.

```
Non-authoritative answer:
Name:    www.sapo.pt
Address: 2001:8a0:2102:c:213:13:146:142

> www.yahoo.com
Server:  router.home
Address: 192.168.1.1

Non-authoritative answer:
Name:    atsv2-fp-shed.wg1.b.yahoo.com
Addresses: 2a00:1288:110:1c::3
           2a00:1288:110:1c::4
Aliases:  www.yahoo.com
```

R: Os servidores “www.sapo.pt” e “www.yahoo.com” têm ambos endereços IPv6 sendo os seus endereços, respectivamente “2001:8a0:2102:c:213:13:146:142” e “2a00:1288:110:1c::3”.

C

```
C:\Users\g1nog>nslookup
Default Server:  router.home
Address:  192.168.1.1

> set type=NS
> uminho.pt
Server:  router.home
Address:  192.168.1.1

Non-authoritative answer:
uminho.pt      nameserver = dns2.uminho.pt
uminho.pt      nameserver = dns.uminho.pt
uminho.pt      nameserver = ns02.fccn.pt
uminho.pt      nameserver = dns3.uminho.pt
> pt.
Server:  router.home
Address:  192.168.1.1

Non-authoritative answer:
pt      nameserver = e.dns.pt
pt      nameserver = a.dns.pt
pt      nameserver = ns2.nic.fr
pt      nameserver = d.dns.pt
pt      nameserver = b.dns.pt
pt      nameserver = h.dns.pt
pt      nameserver = g.dns.pt
pt      nameserver = ns.dns.br
pt      nameserver = f.dns.pt
pt      nameserver = c.dns.pt
> .
Server:  router.home
Address:  192.168.1.1

Non-authoritative answer:
(root)  nameserver = d.root-servers.net
(root)  nameserver = j.root-servers.net
(root)  nameserver = g.root-servers.net
(root)  nameserver = a.root-servers.net
(root)  nameserver = l.root-servers.net
(root)  nameserver = i.root-servers.net
(root)  nameserver = m.root-servers.net
(root)  nameserver = k.root-servers.net
(root)  nameserver = b.root-servers.net
(root)  nameserver = c.root-servers.net
(root)  nameserver = f.root-servers.net
(root)  nameserver = h.root-servers.net
(root)  nameserver = e.root-servers.net
>
```

R: Os servidores de nomes para o domínio “www.uminho.pt” são dns2.uminho.pt, dns.uminho.pt, ns02.fccn.pt e dns3.uminho.pt.

Os servidores de nomes para o domínio “.pt” são a.dns.pt, b.dns.pt, c.dns.pt, d.dns.pt, e.dns.pt, f.dns.pt, g.dns.pt, h.dns.pt e ns.dns.br.

Os servidores de nomes para o domínio “.” são a.root-servers.net, b.root-servers.net, c.root-servers.net, d.root-servers.net, e.root-servers.net, f.root-servers.net, g.root-servers.net, h.root-servers.net, i.root-servers.net, j.root-servers.net, k.root-servers.net, l.root-servers.net e m.root-servers.net.

D.

```
> set type=SOA
> nice.software.
Server:      127.0.0.53
Address:     127.0.0.53#53

Non-authoritative answer:
nice.software
      origin = nsgbr.comlaude.co.uk
      mail addr = hostmaster.comlaude.com
      serial = 2018100204
      refresh = 86400
      retry = 7200
      expire = 2419200
      minimum = 3600
```

R: “nice.software.” é um domínio.

E.

```
core@XubunCORE:~$ dig ns1.dds.nl

; <<>> DiG 9.8.1-P1 <<>> ns1.dds.nl
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 10640
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;ns1.dds.nl.                IN      A

;; ANSWER SECTION:
ns1.dds.nl.                86400   IN      A      91.142.253.70

;; Query time: 112 msec
;; SERVER: 192.168.1.1#53(192.168.1.1)
;; WHEN: Wed Apr 15 11:50:21 2020
;; MSG SIZE rcvd: 44
```

R: O servidor dns primário é “ns1.dds.nl”. Este servidor aceita queries recursivas como podemos observar na figura acima no campo flags a presença de “ra” (recursion available) que indica essa possibilidade.

Um exemplo de uma query recursiva neste caso seria querer obter o endereço IP de “msf.org.”, primeiramente o cliente iria interrogar o root-server para descobrir servidores DNS para o domínio de topo “org”, de seguida o cliente interroga servidor DNS de org para obter servidor DNS de “msf.org” e por fim o cliente interroga o servidor DNS “msf.org” para obter o endereço IP pretendido.

F.

```
-----
Got answer:
  HEADER:
    opcode = QUERY, id = 2, rcode = NOERROR
    header flags:  response, want recursion, recursion avail.
    questions = 1,  answers = 0,  authority records = 1,  additional = 0

  QUESTIONS:
    ns1.dds.nl, type = MX, class = IN
  AUTHORITY RECORDS:
-> dds.nl
   ttl = 2560 (42 mins 40 secs)
   primary name server = ns1.dds.nl
   responsible mail addr = postmaster.dds.nl
   serial  = 1
   refresh = 16384 (4 hours 33 mins 4 secs)
   retry   = 2048 (34 mins 8 secs)
   expire  = 1048576 (12 days 3 hours 16 mins 16 secs)
   default TTL = 2560 (42 mins 40 secs)

-----
dds.nl
   ttl = 2560 (42 mins 40 secs)
   primary name server = ns1.dds.nl
   responsible mail addr = postmaster.dds.nl
   serial  = 1
   refresh = 16384 (4 hours 33 mins 4 secs)
   retry   = 2048 (34 mins 8 secs)
   expire  = 1048576 (12 days 3 hours 16 mins 16 secs)
   default TTL = 2560 (42 mins 40 secs)
>
```

R: Resposta autoritativa à questão anterior.

G.

```
> set type=SRV
> presidencia.pt.
Server:  router.home
Address: 192.168.1.1

-----
Got answer:
  HEADER:
    opcode = QUERY, id = 4, rcode = NOERROR
    header flags:  response, want recursion, recursion avail.
    questions = 1,  answers = 0,  authority records = 1,  additional = 0

  QUESTIONS:
    presidencia.pt, type = SRV, class = IN
  AUTHORITY RECORDS:
-> presidencia.pt
    ttl = 3600 (1 hour)
    primary name server = ns1.presidencia.pt
    responsible mail addr = hostmaster.presidencia.pt
    serial  = 2020022801
    refresh = 14400 (4 hours)
    retry   = 1800 (30 mins)
    expire  = 1209600 (14 days)
    default TTL = 3600 (1 hour)

-----
presidencia.pt
  ttl = 3600 (1 hour)
  primary name server = ns1.presidencia.pt
  responsible mail addr = hostmaster.presidencia.pt
  serial  = 2020022801
  refresh = 14400 (4 hours)
  retry   = 1800 (30 mins)
  expire  = 1209600 (14 days)
  default TTL = 3600 (1 hour)
>
```



```

> casacivil.gov.br.
Server:  router.home
Address:  192.168.1.1

-----
Got answer:
  HEADER:
    opcode = QUERY, id = 5, rcode = NOERROR
    header flags:  response, want recursion, recursion avail.
    questions = 1,  answers = 0,  authority records = 1,  additional = 0

  QUESTIONS:
    casacivil.gov.br, type = SRV, class = IN
  AUTHORITY RECORDS:
-> casacivil.gov.br
    ttl = 300 (5 mins)
    primary name server = alpha.planalto.gov.br
    responsible mail addr = postmaster.planalto.gov.br
    serial  = 2020031801
    refresh = 300 (5 mins)
    retry   = 300 (5 mins)
    expire  = 604800 (7 days)
    default TTL = 300 (5 mins)

-----
casacivil.gov.br
    ttl = 300 (5 mins)
    primary name server = alpha.planalto.gov.br
    responsible mail addr = postmaster.planalto.gov.br
    serial  = 2020031801
    refresh = 300 (5 mins)
    retry   = 300 (5 mins)
    expire  = 604800 (7 days)
    default TTL = 300 (5 mins)
>

```

R: Como se pode observar nas figuras acima, o campo que fornece a resposta á questão é o “responsible mail addr”, tendo isso em conta, as mensagens de correio eletrónico dirigidas a “marcelo@presidencia.pt” são entregues a “hostmaster.presidencia.pt” e da mesma forma, as dirigidas a “bolsonaro@casacivil.gov.br” são entregues a “postmaster.planalto.gov.br”.

H.


```
> set type=ANY
> whitehouse.gov
Server:      127.0.0.53
Address:     127.0.0.53#53

Non-authoritative answer:
whitehouse.gov rdata_46 = TXT 7 2 3600 20200327153345 20200324143345 45692 whitehouse.gov. b3MAiEZDdC5zN9izxXYBFEBPZ26sndAckmvsACoX9W
EyBhSsfP0oEdm DZ0QTNi03h9+ox1DAKLPvi5q5STpzNq2kT+R+ptUL2+Mg/NELGs4YPLA YUMMIHHHeFG+tpZ1p6b1v5Lv3ZKHEx+qr3nWSzXe4591xr6T3FofK0w+ mdw=
whitehouse.gov text = "google-site-verification=-JwbHEICaAjxSBvyk24PmeRbAMxlwkMNBbMgezzZFzc"
whitehouse.gov text = "v=spf1 +mx include:spf.mandrillapp.com ip4:214.3.140.16/32 ip4:214.3.140.255/32 ip4:214.3.115.12/32 ip4:214.3.1
15.10/32 ip4:214.3.115.225/32 ip4:214.3.115.14/32 ip4:214.3.140.22/32 ~all"
whitehouse.gov rdata_46 = NS 7 2 300 20200327153345 20200324143345 45692 whitehouse.gov. Y8bZ5e3TJVEMcRypMqZhs5MEqKKCE/IMqKMMt0iqKoVEW
1ucHLz03mZi kiITZy1Trp7doAm6E1rNczRrpn0hiU/w3sTgGCIbhbKLaFIHKxooslx 1eqLkdi4/GAY3+tz/jqjcNpZIBFA1cFbhVxnyAqHr7xJiQn4dy316gZ 04g=
whitehouse.gov rdata_46 = AAAA 7 2 20 20200327153345 20200324143345 45692 whitehouse.gov. dg4XetXcZafUDIMHm4z0fYLX8cbpi//bhK0d0/kYE1t7
g0cXmf83qq22 b8PhE60SJt7BBBx65cIImy+KB5ph47PInNZ34RvHgehpuUN7PgdbaNBC RQKM7jClN8VlWRHtHJsIcmmpPAQUVTqXnixxb0bqRje3aqKe/AcWpRbU Ybw=
Name:      whitehouse.gov
Address:   2a02:26f0:e0:28c::2add
Name:      whitehouse.gov
Address:   2a02:26f0:e0:29c::2add
whitehouse.gov rdata_46 = A 7 2 20 20200327153345 20200324143345 45692 whitehouse.gov. NZ09cDqvvpZ/vuLVZg0/8/tfBhsdZYpDfwBb1FqLGrtrtH
jg8jB0F7e UUUjUtwTcDUYsoyAkyoKJMivn7pzWDnqVsaUNzNarc0FwVgxVsuuBhfn NptGYRT75nuP6t2qo2i/M5opJOZ3FljJG0PL50fB858mEPM3bv1qL+9 K7Q=
Name:      whitehouse.gov
Address:   184.27.2.2
whitehouse.gov rdata_46 = NSEC3PARAM 7 2 300 20200327153345 20200324143345 45692 whitehouse.gov. kDzeDwcVz9ava94cmxwQwdyLgHmLapE9U5jH9
KBCU7pCY+P7mqZEPYwQ qUifkVPBzRzWlR0dpyI3y3gbxeA9wJssDsgmf7MbtH0DvdIctQ7hRAWAL QXyH98zUxBn2jklpLxwbkH6VIMhinh-nrjmziUw0hujkPUDmgXTozzQ r
ho=
whitehouse.gov rdata_51 = 1 0 1 FF2070BEC07177B4
whitehouse.gov rdata_46 = SOA 7 2 300 20200327153345 20200324143345 45692 whitehouse.gov. wEsJh2nBPL6gSLwRHFQkFtS6q4i+ESfj8dKyaQJBAMKQ
IAmVdtRCyF3 CEPnTagP4x2iAxqEMijcSzSqp0InQ5XeICRmmM6d+WWuf/Jsk/g20P+ ZYMV6UuLYwsMVnCIphm+uH63HDvitAddw1BQ282U7zVP50vRPdL6cos/ fA8=
whitehouse.gov
```

```
origin = 399e-adcs001.ede.pitc.gov
mail addr = postmaster.whitehouse.gov
serial = 2017022363
refresh = 300
retry = 300
expire = 604800
minimum = 300
whitehouse.gov rdata_46 = DNSKEY 7 2 7200 20200327153345 20200324143345 24048 whitehouse.gov. sMj0d67CIL3Yb057dyZWqqj3twYAoeT3Cv+Tnsr6
yF1WLg-yUdd028uaI Dfe5lLhui4xfv/0GfWgkaviFnId6TeMMZ36v7keVbHxxzZB8UxPp01lC J8ENq04rbYG524Vz0.vYoQBc9ry2wu2v9jMCADdHTHW1eb3ZH795VD/P LoNk
KE1Y5U1xy5NjP2JQR5QVR4CWEpSr361fBc6ixBpmnUFUnrJfjfhU xetsC3b8nhJ2LE0DQipj3yIjKgwL2X2bG13lJPOGGOXrdZcCf+UsoxZ ipPxbSulbvjqropG9XiSn6cz2
ckoSVs6htXILm00ig0QzPm/n0VC8wPe DEKPRQ==
whitehouse.gov rdata_46 = DNSKEY 7 2 7200 20200327153345 20200324143345 3093 whitehouse.gov. cDqe4qbI7jA5EA6g0XT+GbLVdXgiB9cW5Q6SxSL6
/7Lyq+qzbZNUdpq eqhZxeTWdudEaHkzdYd3e0Gua817sNob9q7VT6WcbC7cLFFXCuorq4F8 usYVD6HJ6kWT9vgchIw41MTy8JG4GhLV972IwJAI18f/ZS3zj4fxKvwm Wdna3
xcEyKz1lgeRpgUcVEMl0g5Z72kBNhDBX0xnAgf/ulp+7rlwdwMZ qJfV2uJl9FhCUCeX5D3AnN0D6asX5DXaWPftpyyWthxP5i5kr2gmuKiz 4UiDW5MbgvLMcE3ZxcGQNFaUB
rIigQE4+lgY2WGilkXgG62HppjIQXQ B+ScTg==
whitehouse.gov rdata_48 = 257 3 7 AWEAAAD8LMK0MQD8uvF8sUAp0xWzC6H4PtZUshyFjkM5Xxraamt7t/d2 z+G9HhNb/LrG58G4r+3Es0J7mVEkSti4A907ErP5H0u
WWKqMSWzYug7w TRJQ3zTQEsc0KU6FDHieY+rQk269mxhQdoyfP6juckZQnnXyE9/ZIwGz 8LMbLVxZj0JqIzaH0TWhQ4JZ0aeSVQfIdaa+SN9328t/98dbwwJph131 dLNaLav
PbrH96WJGBx08Y1JHh8wd056MuMk/ChQUpYkAE/FSRh5UEBrZ ucRh9XmGAwII8W9BT/xN4y6UzoKK8kdJNC9EvM1AlFhNC5L7X52Abafa 4Ct0VSiYyxs=
whitehouse.gov rdata_48 = 257 3 7 AWEAAa2J1x0ADHoGoZpxTosLGEV7FOM09Np7IsrVU+wTmIxiqIdo01Iao 3r6pg3QB0N5j7L2nuw+3IFh6K0ssivJ9J9Pyrd488go
I3BicEKYB1E4B 7gLFHfjxzJd+Ww/tjgva8qneQW0t4nmpvunv9w89aG6u1x6DzCjj7toF c5mo02q59pSMna5Xpns/jih0jKeJu8ECF/774jMQd9NfZRQg8x9mKuD cCBU5SK
oJzc3kP1CD0EAa0BME1BhXQS2QOS/b2/GOMFFj5h2aepiHhgB isfihErxxYXKZoILt4KUVeP6y/StiyuNIYKWP07SVZ4sBkULwk4w5Iyq dMR0YiaBi0E=
whitehouse.gov rdata_48 = 256 3 7 AWEAAcdVgGz9EsfiPjZTX03dLEfv+UvmkacuPh+ImyqzFHc5sLspzrc x3DOQEX92imly9uFu9zSuRQQLyZhXtgeFyVwE7M8ZFe
agu3Q5SuoKbga MMLG7xyTbhtmrctR3M0bjVfPcFPWyoq5ipiXueo3huKsY/rQU5W+c1xc ONSX4sct
whitehouse.gov rdata_48 = 256 3 7 AWEAAc/oD8X/nmhtg4WF72nkwMkOSnPQRHQ5zq9UuaeizyqFcY+BdtEc 91JYDpdXkE3ik0bLgCym/fQXmsqE6L2+1cwVJ3nCyHg
3CjiuWptIUYiX l6rdKsZ9AFxzT2wt4Nk5ldfMGpnhbXqaGSzv5s2u1EE1QG0mtTkcmul +LeY92IX
whitehouse.gov rdata_46 = DS 8 2 3600 20200401101007 20200325101007 36558 gov. yoL5xduf0bUdkVXNWydKi5wY6gBZGNjII9woLCi48h24TBoeljG9hVR
Q GDG0KeXMaBBJugj0z5N7uLNMxrkj8J3fyx3+16pJF351f12ky6j6s6qt ZUJ141xlmW7qe99S5E+NkE5W/mvBg2fZVpcdlkpAsGvwdZqckJFdoacj 8+DQL023sJ6ynbGLSJA
VaemGRh8Dcn8hlW1wsjdd/wRQWg==
```

```
whitehouse.gov rdata_43 = 24048 7 2 947BD113209A51E8CE97AF23D2AFD5F319383664D09A985DE7E85769 532F7EA5
whitehouse.gov nameserver = a5-64.akam.net.
whitehouse.gov nameserver = zc.akam.net.
whitehouse.gov nameserver = a12-64.akam.net.
whitehouse.gov nameserver = ns1-145.akam.net.
whitehouse.gov nameserver = asia9.akam.net.
whitehouse.gov nameserver = usw6.akam.net.
whitehouse.gov nameserver = ns1-176.akam.net.
whitehouse.gov nameserver = a1-61.akam.net.
whitehouse.gov nameserver = a22-66.akam.net.
whitehouse.gov nameserver = a3-67.akam.net.
whitehouse.gov nameserver = usw1.akam.net.
whitehouse.gov nameserver = use6.akam.net.
whitehouse.gov nameserver = usw5.akam.net.
whitehouse.gov nameserver = a20-65.akam.net.
```

R: Usando os types ” DNSKEY , RRSIG, SOA, NS, TXT, A, AAAA e NSEC3PARAM” conseguimos obter informações acerca de “whitehouse.gov” relativamente a DNS KEY RECORD, a assinatura DNSSEC, a informação autoritativa da zona DNS, os servidores de nomes, o address record, o IPv6 address record e os parâmetros NSEC3.

I.

```
> set type=PTR
> 2001:690:a00:1036:1113::247
Server:  router.home
Address: 192.168.1.1

-----
Got answer:
  HEADER:
    opcode = QUERY, id = 7, rcode = NOERROR
    header flags:  response, want recursion, recursion avail.
    questions = 1,  answers = 1,  authority records = 0,  additional = 0

    QUESTIONS:
      7.4.2.0.0.0.0.0.0.0.0.0.3.1.1.1.6.3.0.1.0.0.a.0.0.9.6.0.1.0.0.2.ip6.arpa, type = PTR, class = IN
    ANSWERS:
      -> 7.4.2.0.0.0.0.0.0.0.0.0.3.1.1.1.6.3.0.1.0.0.a.0.0.9.6.0.1.0.0.2.ip6.arpa
          name = www.fccn.pt
          ttl = 86400 (1 day)

-----
Non-authoritative answer:
7.4.2.0.0.0.0.0.0.0.0.0.3.1.1.1.6.3.0.1.0.0.a.0.0.9.6.0.1.0.0.2.ip6.arpa
    name = www.fccn.pt
    ttl = 86400 (1 day)
```

```

> set type=RP
> www.fccn.pt.
Server:  router.home
Address:  192.168.1.1

-----
Got answer:
  HEADER:
    opcode = QUERY, id = 9, rcode = NOERROR
    header flags:  response, want recursion, recursion avail.
    questions = 1,  answers = 0,  authority records = 1,  additional = 0

  QUESTIONS:
    www.fccn.pt, type = RP, class = IN
  AUTHORITY RECORDS:
-> fccn.pt
   ttl = 14400 (4 hours)
   primary name server = ns01.fccn.pt
   responsible mail addr = hostmaster.fccn.pt
   serial  = 2020032305
   refresh = 21600 (6 hours)
   retry   = 7200 (2 hours)
   expire  = 1209600 (14 days)
   default TTL = 14400 (4 hours)

-----
fccn.pt
   ttl = 14400 (4 hours)
   primary name server = ns01.fccn.pt
   responsible mail addr = hostmaster.fccn.pt
   serial  = 2020032305
   refresh = 21600 (6 hours)
   retry   = 7200 (2 hours)
   expire  = 1209600 (14 days)
   default TTL = 14400 (4 hours)
>

```

R: Usando o type PTR conseguimos obter o nome do domínio, sendo neste caso “www.fccn.pt”.

No caso de algum problema, definindo o type como RP (Responsible person) consegue-se obter um contato responsável por este endereço IPv6, sendo neste caso “hostmaster.fccn.pt”.

J.

```
Default Server:  router.home
Address:  192.168.1.1

> set type=SOA
> di.uminho.pt
Server:  router.home
Address:  192.168.1.1

Non-authoritative answer:
di.uminho.pt
      primary name server = dns.di.uminho.pt
      responsible mail addr = dnsadmin.di.uminho.pt
      serial    = 2020041401
      refresh  = 28800 (8 hours)
      retry    = 7200 (2 hours)
      expire   = 28800 (8 hours)
      default TTL = 43200 (12 hours)
>
```

R:

Transferência de zona DNS é uma query DNS do tipo IXFR ou AXFR. Esta query é usada para replicar uma porção contígua (zona) ou a totalidade da base de dados DNS do servidor que a recebe. A transferência é feita, através de uma ligação TCP, começando pela verificação do preâmbulo que contém um número de série (neste caso seria 2020041401). Esta verificação determina se a transferência tem de facto de ocorrer pois, se o número de série for igual ou inferior ao do servidor que envia o pedido 7 de transferência de zona, a transferência não ocorre dado que este contém uma versão da base de dados igual ou mais recente.

Parte 2

Primario

```
$TTL      604800
@      IN      SOA      dns.cc.pt.  admin.cc.pt. (
                        3      ; serial
                        604800 ; Refresh
                        86400  ; Retry
                        2419200 ; Expire
                        604800 ) ; Negative Cache TTL

;List Nameservers
@      IN      NS       dns.cc.pt.
@      IN      NS       dns2.cc.pt.

; PTR Records
1      IN      PTR      Serv1.cc.pt. ; 10.3.3.1
2      IN      PTR      Serv2.cc.pt.
3      IN      PTR      Serv3.cc.pt.
```

db.3-3-10

```
$TTL      604800
@      IN      SOA      dns2.cc.pt. admin.cc.pt. (
                        3      ; serial
                        604800 ; Refresh
                        86400  ; Retry
                        2419200 ; Expire
                        604800 ) ; Negative Cache TTL

;List Nameservers
@      IN      NS       dns.cc.pt.
@      IN      NS       dns2.cc.pt.

; PTR Records
1      IN      PTR      Hermes.cc.pt.
2      IN      PTR      Zeus.cc.pt.
3      IN      PTR      Atena.cc.pt.
```

Db.4-4-10

```
zone "cc.pt" {
    type master;
    file "/home/core/primario/db.cc.pt";
    allow-transfer { 10.4.4.1; };
};

zone "3.3.10.in-addr.arpa." {
    type master;
    file "/home/core/primario/db.3-3-10.rev";
    allow-transfer { 10.4.4.1; };
};

zone "4.4.10.in-addr.arpa." {
    type master;
    file "/home/core/primario/db.4-4-10.rev";
    allow-transfer { 10.4.4.1; };
};
```

named.conf.local


```

$TTL      604800
@ IN SOA  dns.cc.pt. grupo02@cc.pt. (
    3      ; serial
    604800 ; Refresh
    86400  ; Retry
    2419200 ; Expire
    604800 ) ; Negative Cache TTL

;List Nameservers
@ IN NS  dns
@ IN NS  dns2

; LAN 3

Serv1 IN A 10.3.3.1
dns IN A 10.3.3.1

;Mail,www

Serv3 IN A 10.3.3.3
www IN CNAME Serv3
mail IN A 10.3.3.3
@ IN MX 10 mail.cc.pt.

;imap,pop,mail2

Serv2 IN A 10.3.3.2
pop IN CNAME Serv2
imap IN CNAME Serv2
@ in MX 20 mail.cc.pt.

; LAN 4

Hermes IN A 10.4.4.1
dns2 IN A 10.4.4.1

Zeus IN A 10.4.4.2
Atena IN A 10.4.4.3

; LAN 2

Alfa IN A 10.2.2.1
Delta IN A 10.2.2.2
Omega IN A 10.2.2.3

; LAN 1

Portatil1 IN A 10.1.1.1
Grupo02 IN CNAME Portatil1

Portatil2 IN A 10.1.1.2
Portatil3 IN A 10.1.1.3

```

Secundario

```
zone "cc.pt" {
    type slave;
    file "var/cache/bind/db.cc.pt";
    masters { 10.3.3.1; };
};

zone "3.3.10.in-addr.arpa" {
    type slave;
    file "var/cache/bind/db.3-3-10.rev";
    masters { 10.3.3.1; };
};

zone "4.4.10.in-addr.arpa" {
    type slave;
    file "var/cache/bind/db.4-4-10.rev";
    masters { 10.3.3.1; };
};
```

Named.conf.local

Querys

```
root@Portatil1:/tmp/pycore.54038/Portatil1.conf# nslookup
> set q=SOA
> cc.pt
Server:      10.3.3.1
Address:     10.3.3.1#53

cc.pt
    origin = dns.cc.pt
    mail addr = grupo02\@cc.pt
    serial = 3
    refresh = 604800
    retry = 86400
    expire = 2419200
    minimum = 604800
```

-SOA

```
> set q=NS
> cc.pt.
Server:      10.3.3.1
Address:     10.3.3.1#53

cc.pt.  nameserver = dns2.cc.pt.
cc.pt.  nameserver = dns.cc.pt.
```

-NS

```
> set q=MX
> cc.pt.
Server:      10.3.3.1
Address:     10.3.3.1#53

cc.pt  mail exchanger = 10 mail.cc.pt.
cc.pt  mail exchanger = 20 mail.cc.pt.
```

-MX

```
root@Portatill1:/tmp/pycore.57831/Portatill1.conf# nslookup
> set q=PTR
> 1.3.3.10.in-addr.arpa.
Server:      10.3.3.1
Address:     10.3.3.1#53

1.3.3.10.in-addr.arpa  name = Serv1.cc.pt.
> 1.4.4.10.in-addr.arpa.
Server:      10.3.3.1
Address:     10.3.3.1#53

1.4.4.10.in-addr.arpa  name = Hermes.cc.pt.
```

-PTR

```
> set q=any
> cc.pt.
Server:      10.3.3.1
Address:     10.3.3.1#53

cc.pt  mail exchanger = 20 mail.cc.pt.
cc.pt  mail exchanger = 10 mail.cc.pt.
cc.pt

      origin = dns.cc.pt
      mail addr = grupo02\@cc.pt
      serial = 3
      refresh = 604800
      retry = 86400
      expire = 2419200
      minimum = 604800
cc.pt  nameserver = dns.cc.pt.
cc.pt  nameserver = dns2.cc.pt.
```

-ANY

Transfer

```
15-Apr-2020 13:56:30.178 running
15-Apr-2020 13:56:30.178 zone cc.pt/IN: sending notifies (serial 3)
15-Apr-2020 13:56:30.178 zone 3.3.10.in-addr.arpa/IN: sending notifies (serial 3)
15-Apr-2020 13:56:30.179 zone 4.4.10.in-addr.arpa/IN: sending notifies (serial 3)
15-Apr-2020 13:56:49.390 client 10.4.4.1#41739: transfer of '3.3.10.in-addr.arpa/IN': AXFR started
15-Apr-2020 13:56:49.390 client 10.4.4.1#41739: transfer of '3.3.10.in-addr.arpa/IN': AXFR ended
15-Apr-2020 13:56:49.889 client 10.4.4.1#49156: transfer of 'cc.pt/IN': AXFR started
15-Apr-2020 13:56:49.889 client 10.4.4.1#41804: transfer of '4.4.10.in-addr.arpa/IN': AXFR started
15-Apr-2020 13:56:49.889 client 10.4.4.1#49156: transfer of 'cc.pt/IN': AXFR ended
15-Apr-2020 13:56:49.889 client 10.4.4.1#41804: transfer of '4.4.10.in-addr.arpa/IN': AXFR ended
15-Apr-2020 13:56:49.890 client 10.4.4.1#45677: received notify for zone '4.4.10.in-addr.arpa'
```

-Serv1

```
15-Apr-2020 13:56:49.387 zone 3.3.10.in-addr.arpa/IN: Transfer started.
15-Apr-2020 13:56:49.388 transfer of '3.3.10.in-addr.arpa/IN' from 10.3.3.1#53: connected using 10.4.4.1#41739
15-Apr-2020 13:56:49.391 zone 3.3.10.in-addr.arpa/IN: transferred serial 3
15-Apr-2020 13:56:49.391 transfer of '3.3.10.in-addr.arpa/IN' from 10.3.3.1#53: Transfer completed: 1 messages, 7 records, 229 bytes, 0.002 secs (114500 bytes/sec)
15-Apr-2020 13:56:49.391 zone 3.3.10.in-addr.arpa/IN: sending notifies (serial 3)
15-Apr-2020 13:56:49.393 dumping master file: var/cache/bind/tmp-KDUcgVfQo8: open: file not found
15-Apr-2020 13:56:49.887 zone cc.pt/IN: Transfer started.
15-Apr-2020 13:56:49.887 zone 4.4.10.in-addr.arpa/IN: Transfer started.
15-Apr-2020 13:56:49.887 transfer of '4.4.10.in-addr.arpa/IN' from 10.3.3.1#53: connected using 10.4.4.1#41804
15-Apr-2020 13:56:49.888 transfer of 'cc.pt/IN' from 10.3.3.1#53: connected using 10.4.4.1#49156
15-Apr-2020 13:56:49.889 zone cc.pt/IN: transferred serial 3
15-Apr-2020 13:56:49.889 zone 4.4.10.in-addr.arpa/IN: transferred serial 3
15-Apr-2020 13:56:49.889 transfer of '4.4.10.in-addr.arpa/IN' from 10.3.3.1#53: Transfer completed: 1 messages, 7 records, 229 bytes, 0.001 secs (229000 bytes/sec)
15-Apr-2020 13:56:49.889 transfer of 'cc.pt/IN' from 10.3.3.1#53: Transfer completed: 1 messages, 25 records, 580 bytes, 0.001 secs (580000 bytes/sec)
15-Apr-2020 13:56:49.889 zone cc.pt/IN: sending notifies (serial 3)
15-Apr-2020 13:56:49.889 zone 4.4.10.in-addr.arpa/IN: sending notifies (serial 3)
```

-Hermes

Conclusões:

Com a realização deste trabalho prático, todo o grupo conseguiu fortalecer e consolidar a matéria leccionada nas aulas teóricas.

No final deste trabalho, conseguimos afirmar que o nosso conhecimento sobre o sistema de gestão de nomes hierárquico e distribuído, designado de DNS ou Serviço de Resolução de Nomes, ficou bastante mais amplo e aprofundado.

Numa primeira fase, com a utilização do comando “nslookup” conseguimos interrogar de forma específica o DNS sobre vários aspetos. Estas questões diferenciadas são possíveis devido à utilização do sub-comando “set type” que nos permitiu definir os parâmetros sobre os quais queremos interrogar o DNS. Exemplos destes parâmetros utilizados são o AAAA para obter um endereço IPv6, NS para os name servers do domínio, RP para o contacto do responsável de um endereço e SOA que contém informação administrativa de uma zona.

Numa segunda fase do trabalho, procedemos à instalação, configuração e teste de um domínio “cc.pt”. Foi necessário parar o servidor DNS previamente instalado e configurar o BIND. Por fim, tivemos de configurar o servidor primário e o servidor secundário de forma a responder a várias queries corretamente.