

Domain Name System (DNS)

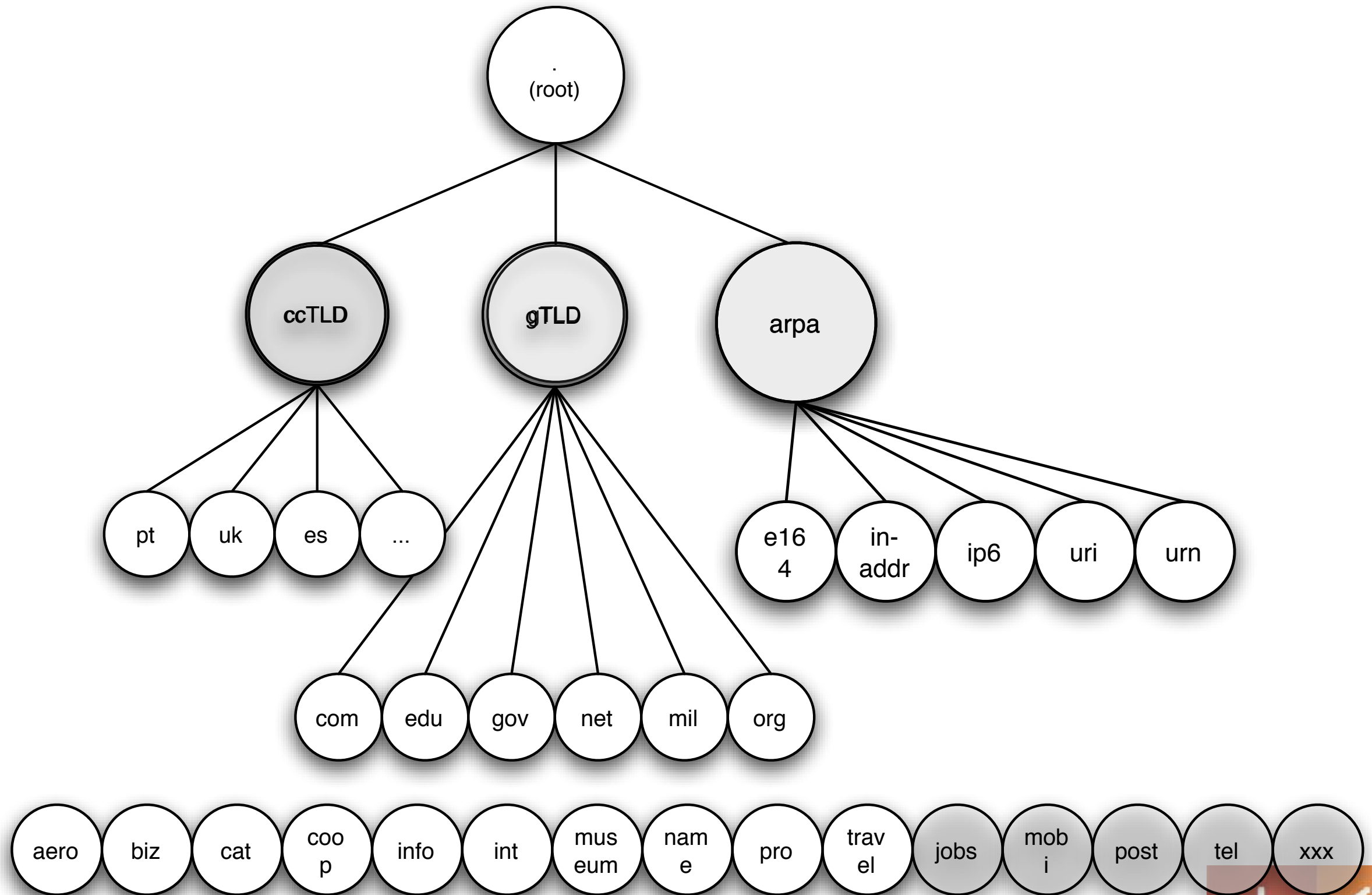


Introdução

- Objectivos
 - Tradução hostname em IP e vice-versa
 - Distribuição da Informação
- Hierárquico
- Delegação de autoridade
- root servers <http://www.root-servers.org/>



Hierarquia



Servidores

- Zonas
 - resolução de nomes num domínio
 - reverse (zona: c.b.a.in-addr.arpa)
- Servidores
 - recursivos
 - não recursivos



Servidores

- Tipo de resposta
 - autoritativa
 - Primários/Secundários
 - stubs
 - distribution name servers
 - não autoritativa
 - cache-only
 - forwarders



Resource Records

- Owner
- type
 - A, CNAME, HINFO, MX, NS, PTR, SOA
- class
 - IN, CH
- TTL
- RDATA
 - depende do tipo de RR



Resource Records

- SOA start of authority
- NS auth. name server
- A hostname-to-ip map
- CNAME host alias
- HINFO
- MX Servidor de mail
- PTR ip-to-hostname map
- SRV service advertise
- AAAA ipv6 host-to-ip map



SOA Record

- MNAME name server responsável
- RNAME email do responsável pela zona
- SERIAL
- REFRESH intervalo max para refresh pelos secundários
- RETRY espera antes do próx. refresh qdo falhou
- EXPIRE intervalo a partir do qual a zona passa a inválida
- MINIMUM TTL mínimo



Exemplo SOA record

```
lab-so.di.uminho.pt. IN SOA
gw.lab-so.di.uminho.pt. ; server name
als.di.uminho.pt.      ; responsible
(
    2009102701 ; serial number
    86400      ; refresh ( 24 hours)
    7200       ; retry ( 2 hours)
    3600000    ; expire (1000 hours)
    172800     ;minimum ( 2 days)
)
```



Software

- BIND
 - <http://www.isc.org/products/BIND/>
- Tinydns
 - <http://cr.yp.to/djbdns.html> <http://tinydns.org>
- Microsoft DNS server
 - <http://www.microsoft.com/windowsserver2003/default.mspx>
- Root Servers
 - <ftp://ftp.rs.internic.net./domain/named.root>



Exemplo (BIND)

```
options {
    directory "/var/named";
    forward only;
    forwarders{ 193.136.20.5; 193.136.20.132; };
};
zone "." {
    type hint;
    file "named.root";
};
zone "0.0.127.in-addr.arpa."{
    type master;
    file "named.local";
};
zone "lab-so.di.uminho.pt."{
    type master;
    file "labso.db";
    notify no;
};
zone "1.168.192.in-addr.arpa"{
    type master;
    file "labso.rev";
    notify no;
};
```



Exemplo (root servers)

```
. 3600000 IN NS A.ROOT-SERVERS.NET.
A.ROOT-SERVERS.NET. 3600000 A 198.41.0.4 ; formerly NS.INTERNIC.NET
. 3600000 NS B.ROOT-SERVERS.NET.
B.ROOT-SERVERS.NET. 3600000 A 192.228.79.201 ; formerly NS1.ISI.EDU
. 3600000 NS C.ROOT-SERVERS.NET.
C.ROOT-SERVERS.NET. 3600000 A 192.33.4.12 ; formerly C.PSI.NET
. 3600000 NS D.ROOT-SERVERS.NET.
D.ROOT-SERVERS.NET. 3600000 A 128.8.10.90 ; formerly TERP.UMD.EDU
. 3600000 NS E.ROOT-SERVERS.NET.
E.ROOT-SERVERS.NET. 3600000 A 192.203.230.10 ; formerly NS.NASA.GOV
. 3600000 NS F.ROOT-SERVERS.NET.
F.ROOT-SERVERS.NET. 3600000 A 192.5.5.241 ; formerly NS.ISC.ORG
. 3600000 NS G.ROOT-SERVERS.NET.
G.ROOT-SERVERS.NET. 3600000 A 192.112.36.4 ; formerly NS.NIC.DDN.MIL
. 3600000 NS H.ROOT-SERVERS.NET.
H.ROOT-SERVERS.NET. 3600000 A 128.63.2.53 ; formerly AOS.ARL.ARMY.MIL
. 3600000 NS I.ROOT-SERVERS.NET.
I.ROOT-SERVERS.NET. 3600000 A 192.36.148.17 ; formerly NIC.NORDU.NET
. 3600000 NS J.ROOT-SERVERS.NET. ; operated by VeriSign, Inc.
J.ROOT-SERVERS.NET. 3600000 A 192.58.128.30
. 3600000 NS K.ROOT-SERVERS.NET.
K.ROOT-SERVERS.NET. 3600000 A 193.0.14.129 ; operated by RIPE NCC
. 3600000 NS L.ROOT-SERVERS.NET.
L.ROOT-SERVERS.NET. 3600000 A 198.32.64.12 ; operated by ICANN
. 3600000 NS M.ROOT-SERVERS.NET.
M.ROOT-SERVERS.NET. 3600000 A 202.12.27.33 ; operated by WIDE
```



Exemplo (BD de uma Zona)

```
lab-so.di.uminho.pt. IN SOA
gw.lab-so.di.uminho.pt. als.di.uminho.pt.
( 2009102701 ; serial
  86400 ; refresh ( 24 hours)
  7200 ; retry ( 2 hours)
  3600000 ; expire (1000 hours)
  172800 ; minimum ( 2 days)
)
IN NS gw.lab-so.di.uminho.pt.
IN NS 193.136.20.5.
IN NS 193.136.20.132.
gw IN A 193.136.19.102
localhost IN A 127.0.0.1
maggie IN A 192.168.1.250
brom01 IN A 192.168.1.1
brom02 IN A 192.168.1.2
brom03 IN A 192.168.1.3
brom04 IN A 192.168.1.4
```



Exemplo (BD de uma Zona reverse)

```
1.168.192.in-addr.arpa. IN SOA
gw.lab-so.di.uminho.pt. als.di.uminho.pt.
( 2009102701 ; serial
  8H ; refresh
  2H ; retry
  1W ; expire
  1D ; default _ttl
)
IN NS gw.lab-so.di.uminho.pt.
254 IN PTR gw.lab-so.di.uminho.pt.
250 IN PTR maggie.lab-so.di.uminho.pt.
1 IN PTR brom01.lab-so.di.uminho.pt.
2 IN PTR brom02.lab-so.di.uminho.pt.
3 IN PTR brom03.lab-so.di.uminho.pt.
4 IN PTR brom04.lab-so.di.uminho.pt.
```

