

System Administration

Week 07, Segment 1

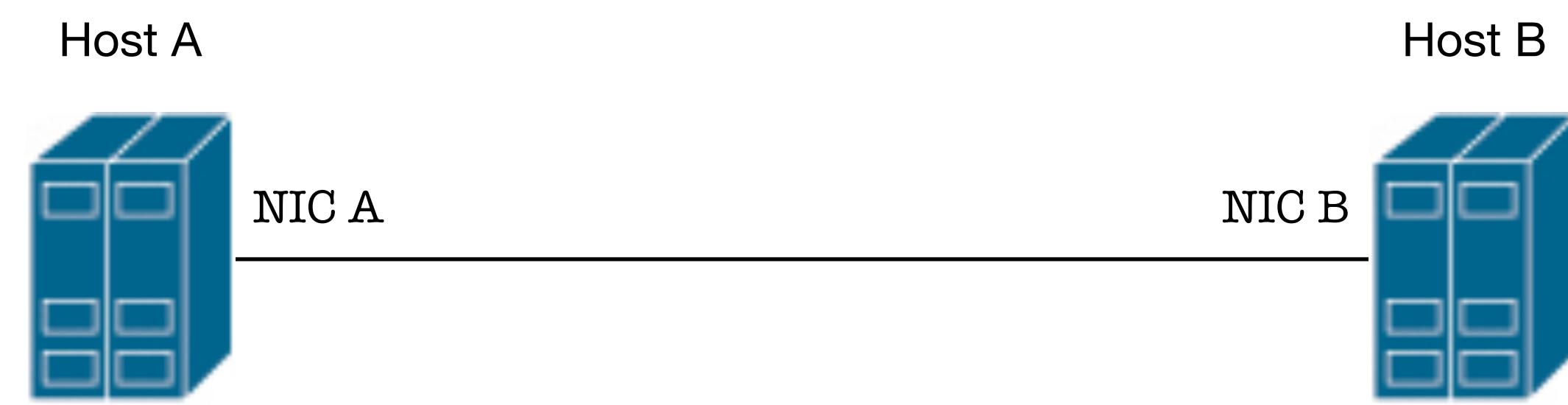
The Domain Name System, Part I

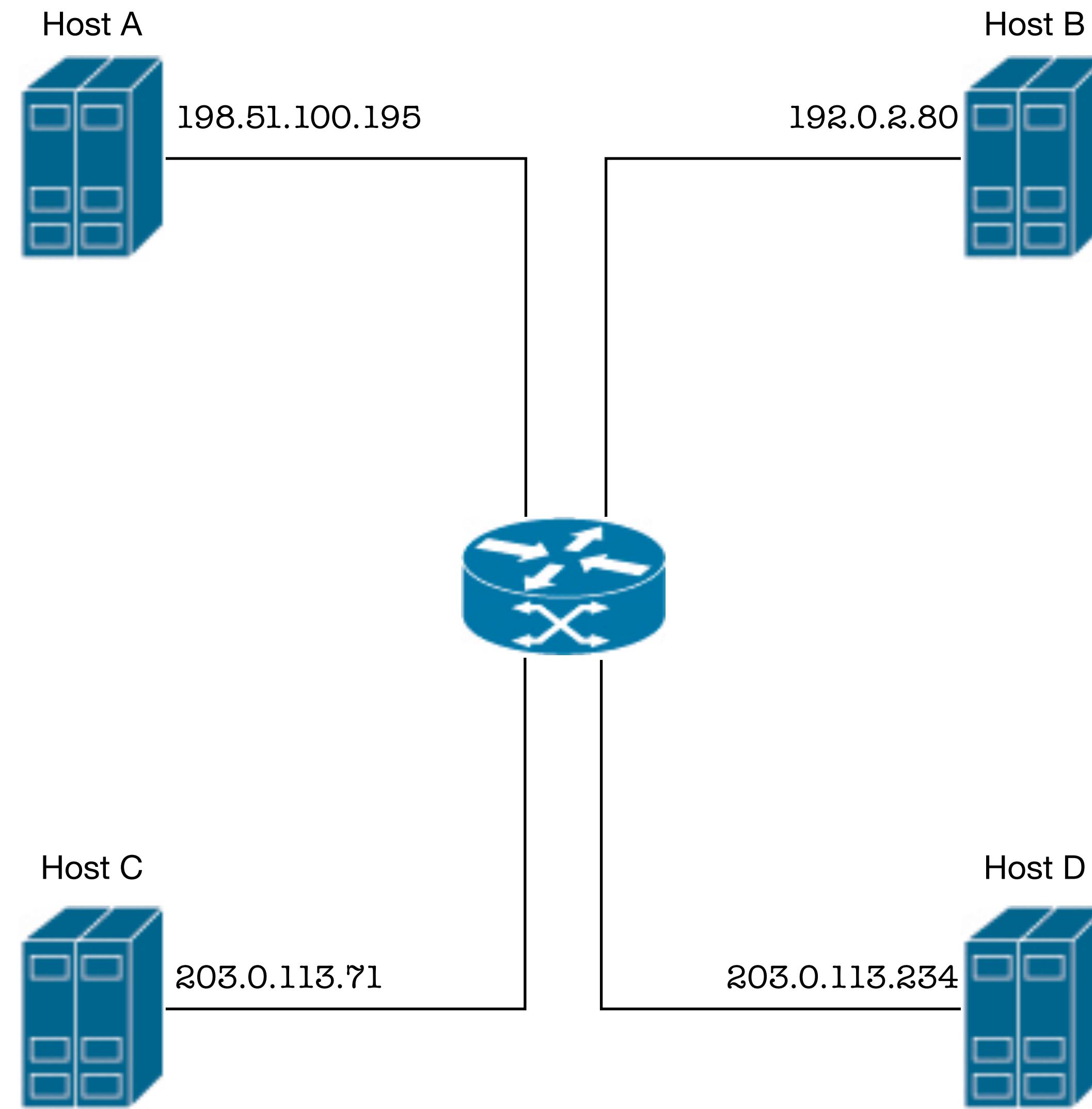
**Department of Computer Science
Stevens Institute of Technology**

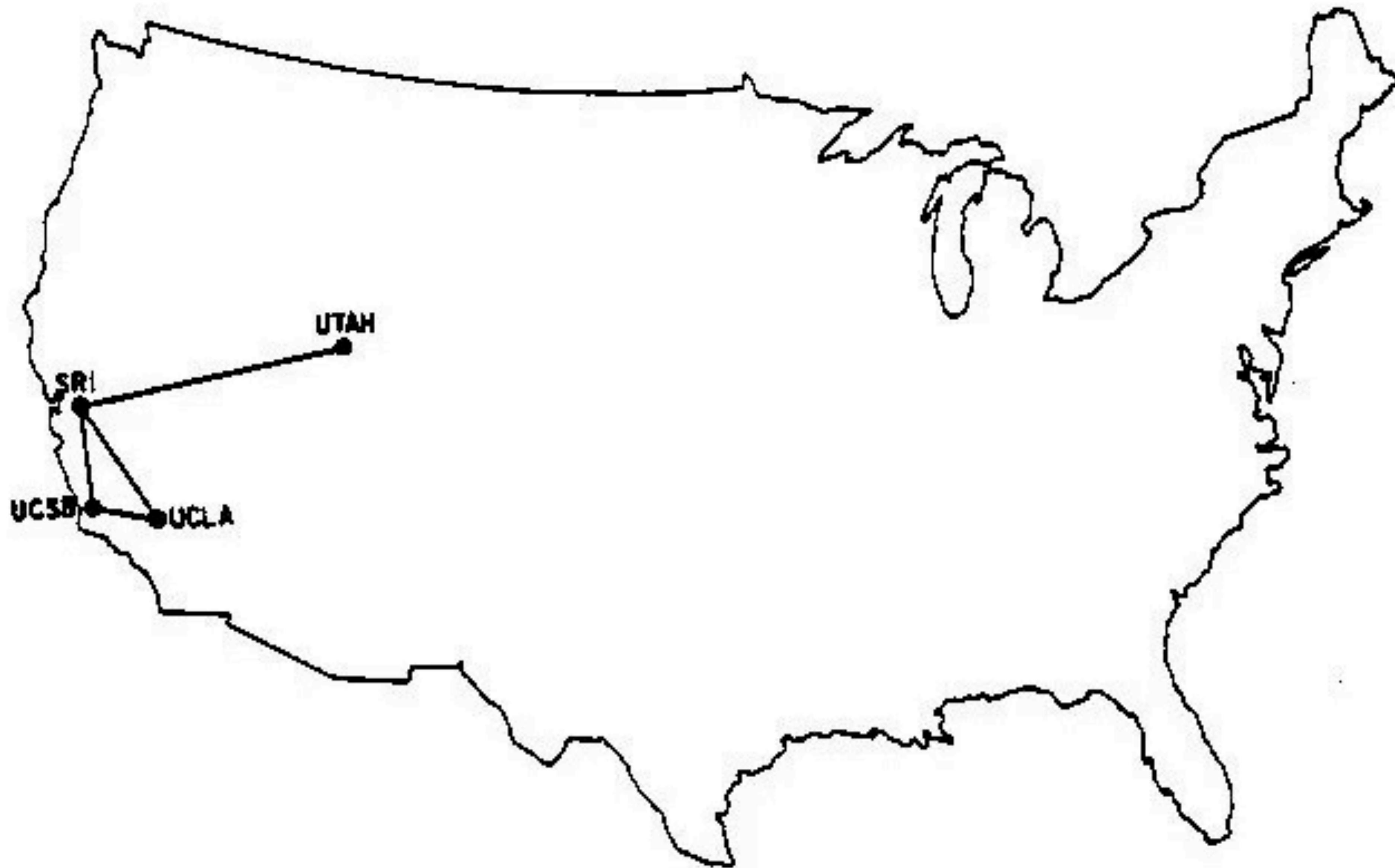
Jan Schaumann

jschauma@stevens.edu

<https://stevens.netmeister.org/615/>







December 1969



When using the name server named(8), or ypserv(8), this file provides a backup when the name server is not running. For the name server, it is suggested that only a few addresses be included in this file. These include address for the local interfaces that ifconfig(8) needs at boot time and a few machines on the local network.

This file may be created from the official host data base maintained at the Network Information Control Center (NIC), though local changes may be required to bring it up to date regarding unofficial aliases and/or unknown hosts. As the data base maintained at NIC is incomplete, use of the name server is recommended for sites on the DARPA Internet.

As network addresses, both IPv4 and IPv6 addresses are allowed. IPv4 addresses are specified in the conventional dot (".") notation using the `inet_nton(3)` routine from the Internet address manipulation library, `inet(3)`. IPv6 addresses are specified in the standard hex-and-colon notation. Host names may contain any printable character other than a field delimiter, newline, or comment character.

FILES

/etc/hosts The `hosts` file resides in `/etc`.



```
TCP/TIME :  
HOST : 8.1.0.14 : BBN-NOC,BBN-NU,NOC : C/70 : UNIX : TCP/TELNET,TCP/FTP,TCP/SMTP  
,TCP/TIME :  
HOST : 8.2.0.14 : DIV6-TAC,D6TAC,DIV6TAC : C/30 : TAC : TCP :  
HOST : 8.4.0.14 : BBN-NOC2,NOC2 : C/70 : UNIX : TCP/TELNET,TCP/FTP,TCP/SMTP,TCP/  
TIME :  
HOST : 8.5.0.14 : CSNET-DEV,CSNET3 : VAX-11/750 : UNIX : TCP/TELNET,TCP/FTP,TCP/  
SMTP,ICMP :  
HOST : 8.6.0.14 : DIV1-TAC,DIV-1-TAC : C/30 : TAC : TCP :  
HOST : 8.7.0.14 : BBNCCM : C/70 : UNIX : TCP/TELNET,TCP/FTP,TCP/SMTP,TCP/TIME,IC  
MP :  
HOST : 8.0.0.15 : BBNCC-DEMO,CCDEMO : C/70 : UNIX : TCP/TELNET,TCP/FTP,TCP/SMTP,  
TCP/TIME,ICMP :  
HOST : 8.2.0.15 : BBN-EDNOC,EDNOC : C/70 : UNIX : TCP/TELNET,TCP/FTP,TCP/SMTP,TC  
P/TIME,ICMP :  
HOST : 8.1.0.16 : BBN-RVAX,RVAX : VAX-11/750 : VMS : TCP/TELNET,TCP/FTP :  
HOST : 8.2.0.16 : BBN-SPCA,SPCA : VAX-11/750 : UNIX : TCP/TELNET,TCP/FTP :  
HOST : 8.3.0.16 : BBN-XVAX,XVAX : VAX-11/750 : VMS : TCP/TELNET,TCP/FTP :  
HOST : 8.0.0.17 : BBNCCC : C/70 : UNIX : TCP/TELNET,TCP/FTP,TCP/SMTP,TCP/TIME :  
HOST : 8.1.0.17 : BBNCCX : C/70 : UNIX : TCP/TELNET,TCP/FTP,TCP/SMTP,TCP/TIME :  
HOST : 8.2.0.17 : BBNCCJ : C/70 : UNIX : TCP/TELNET,TCP/FTP,TCP/SMTP,TCP/TIME :  
[$ grep -c ^HOST hosts.txt  
1325  
$ ]
```

Development of the DNS

- early on, addresses were assigned manually by calling up the Network Information Center (NIC)
- Feinler developed the concept of “domains” (e.g., edu for educational institutions)
- copying around a single host lookup table didn’t scale; Paul Mockapetris proposed a “Domain Name System” in RFC882 and RFC883 in 1983
- first Unix name server implementation, “Berkeley Internet Name Domain” (BIND), written in 1984

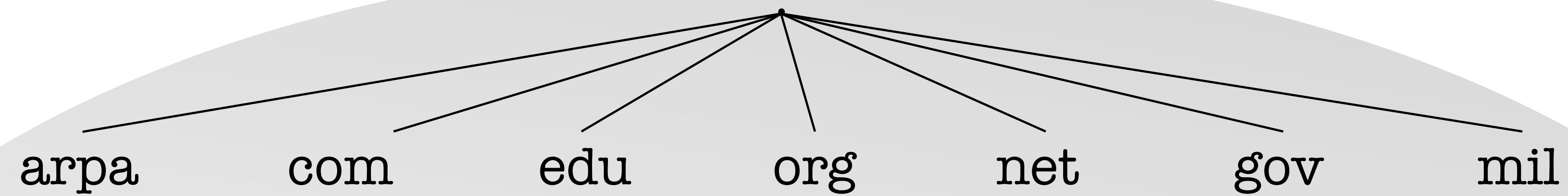


Elizabeth Jocelyn "Jake" Feinler,
Director of the Network Information Systems Center
at the Stanford Research Institute (SRI),
which operated the NIC

The domain name space consists of a tree of
domain names.

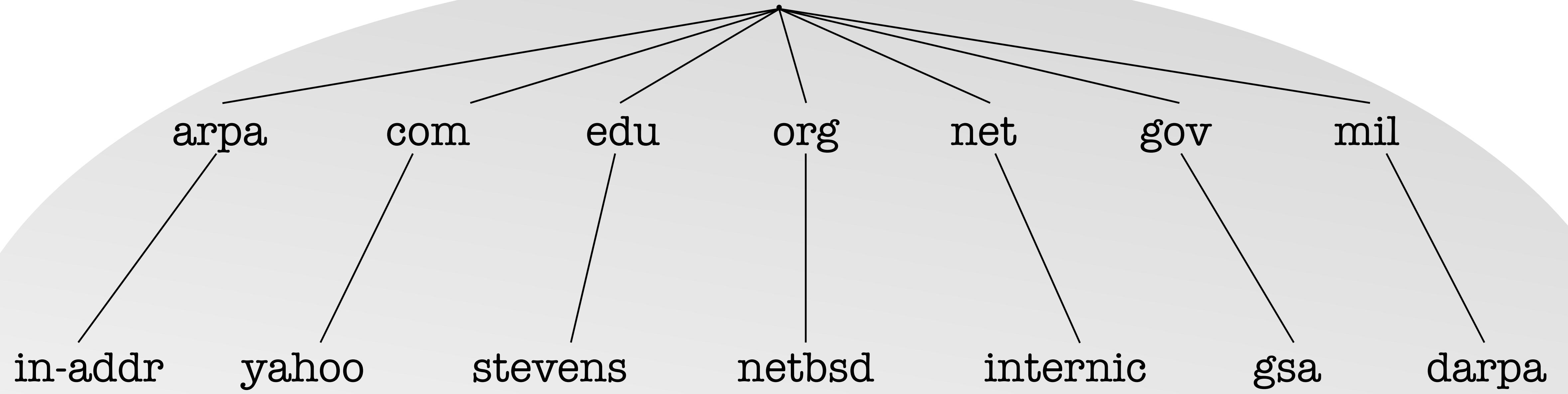


The root of the DNS tree is “.”.

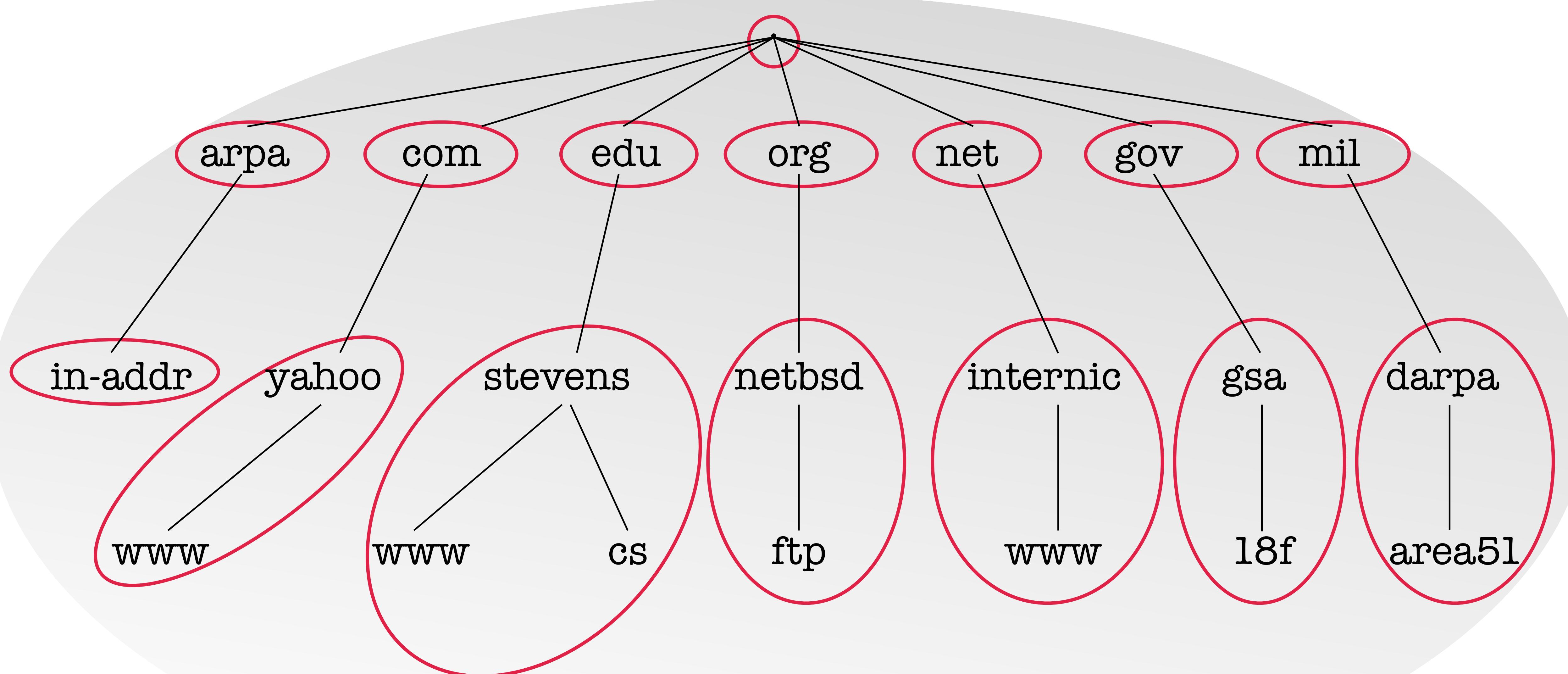


The tree sub-divides into *zones* consisting of
domains and *sub-domains*.

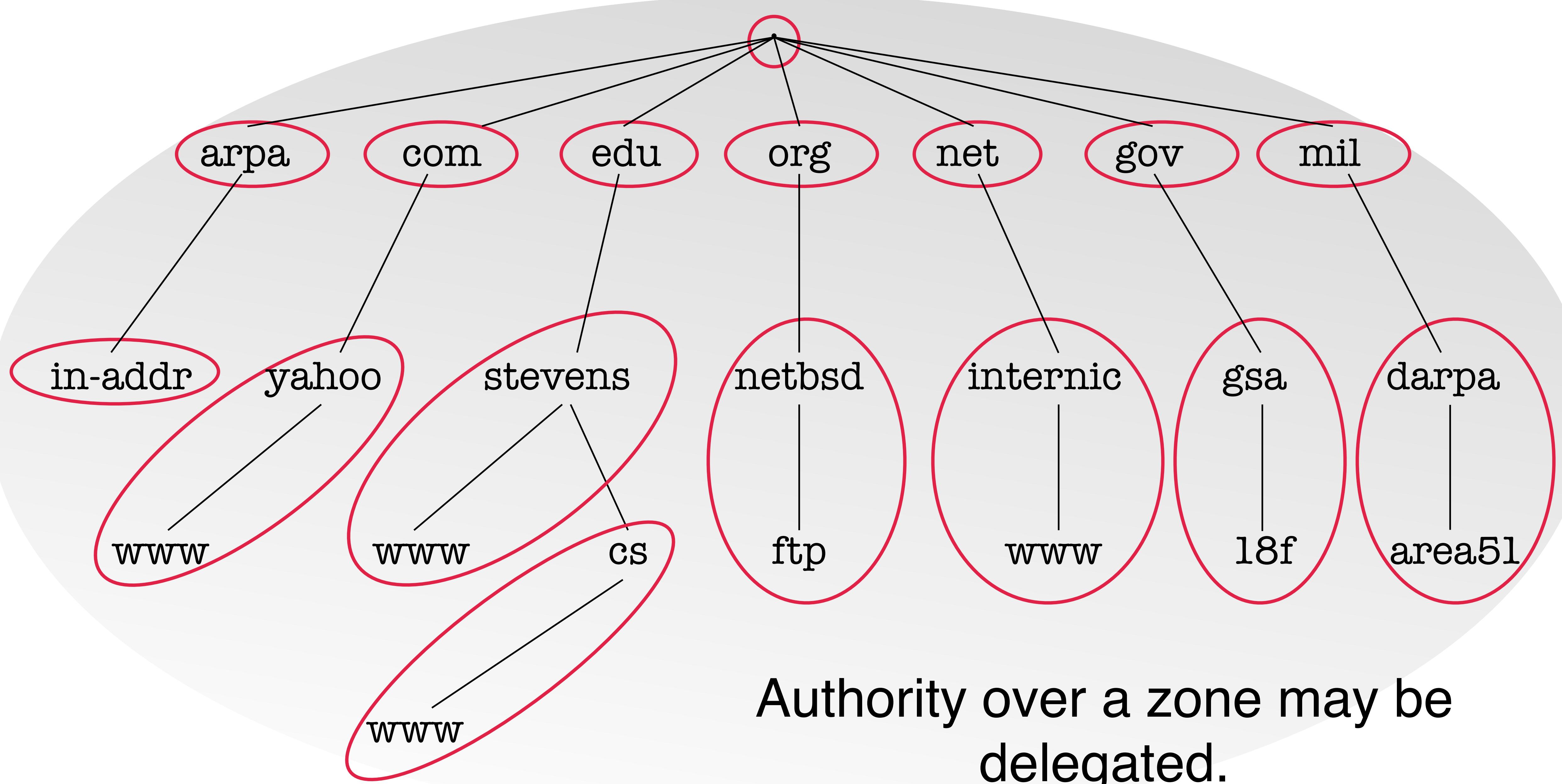
The domains directly under the root are known as
***Top Level Domains* or TLDs**

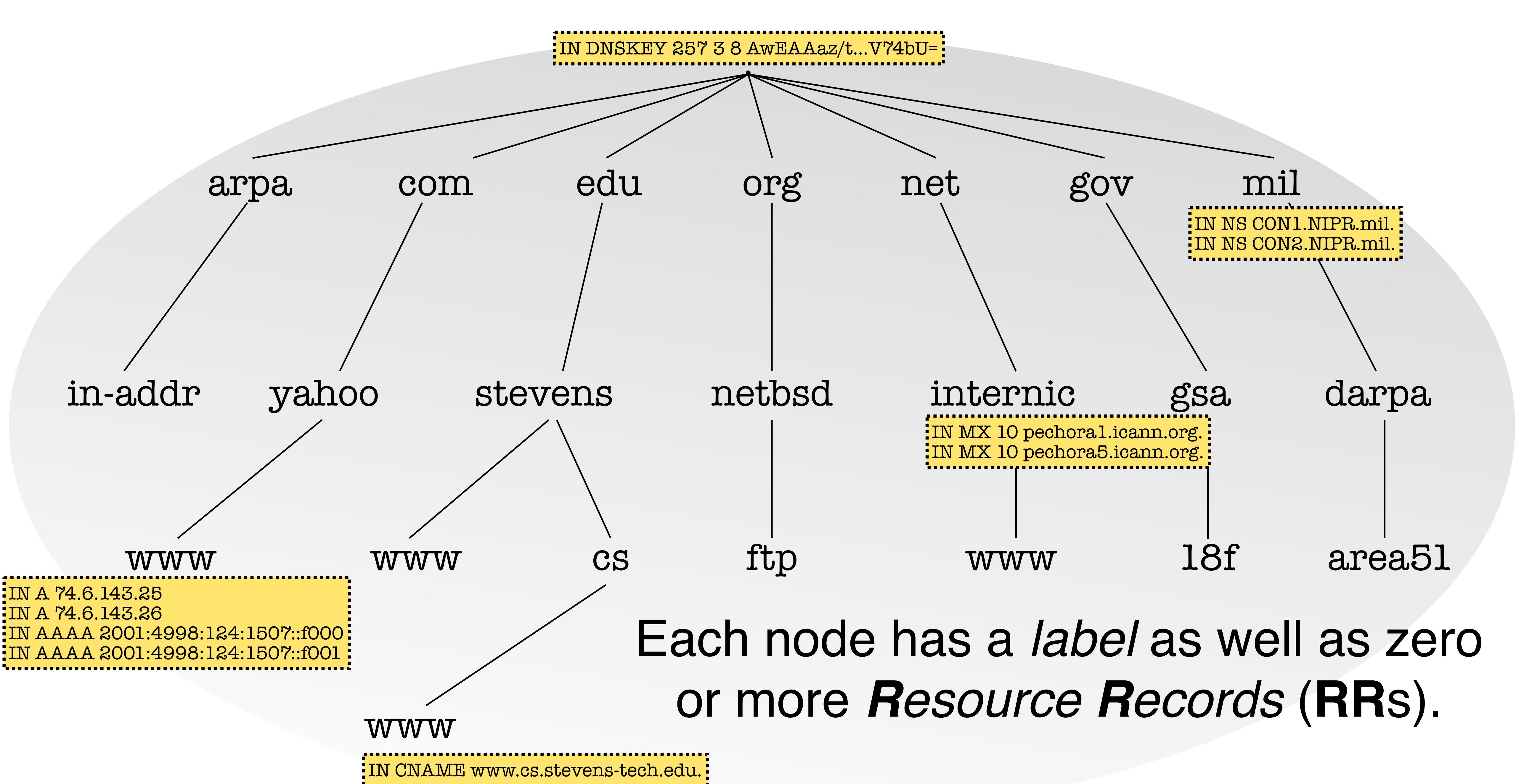


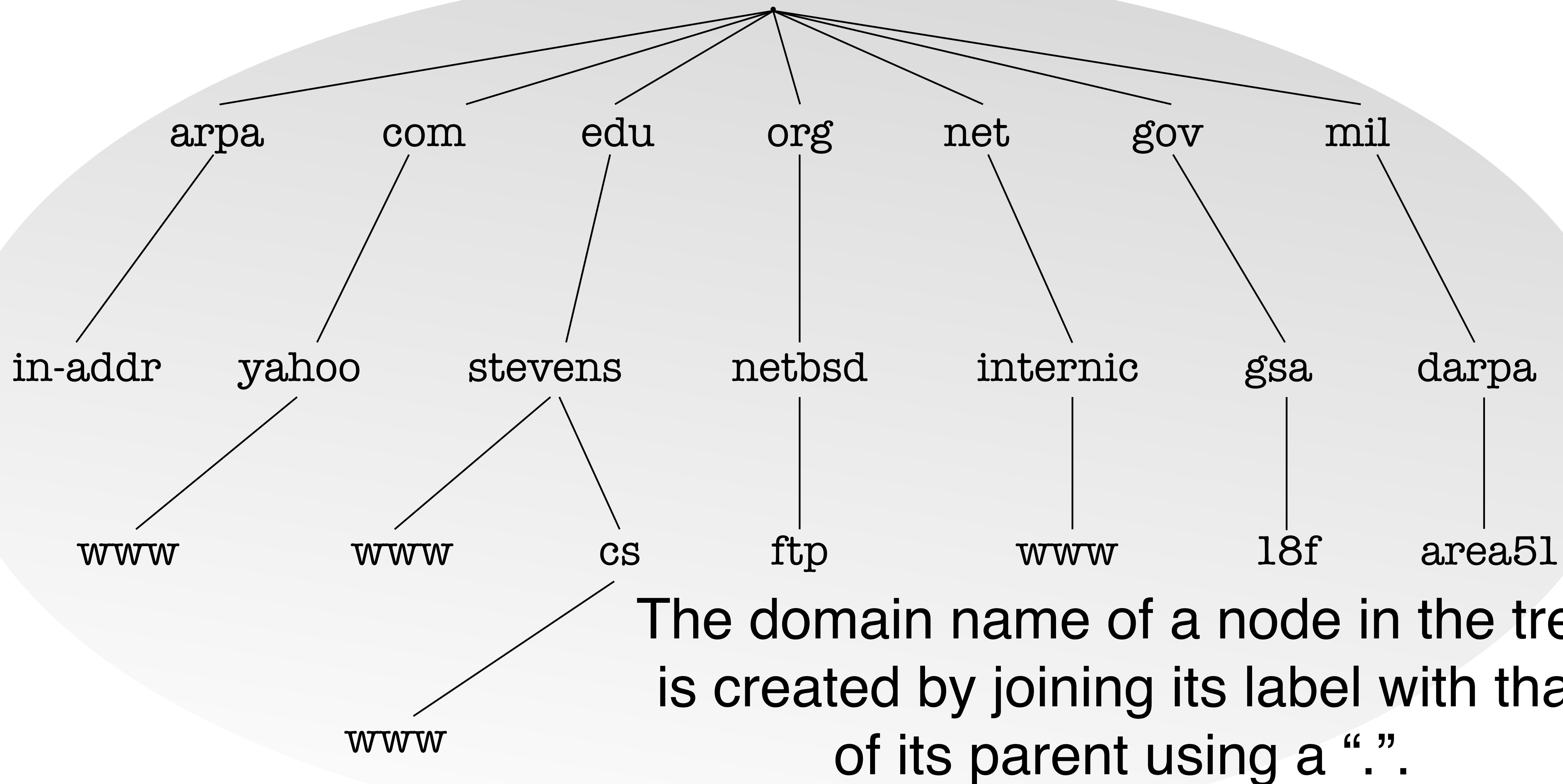
Each zone can be sub-divided.

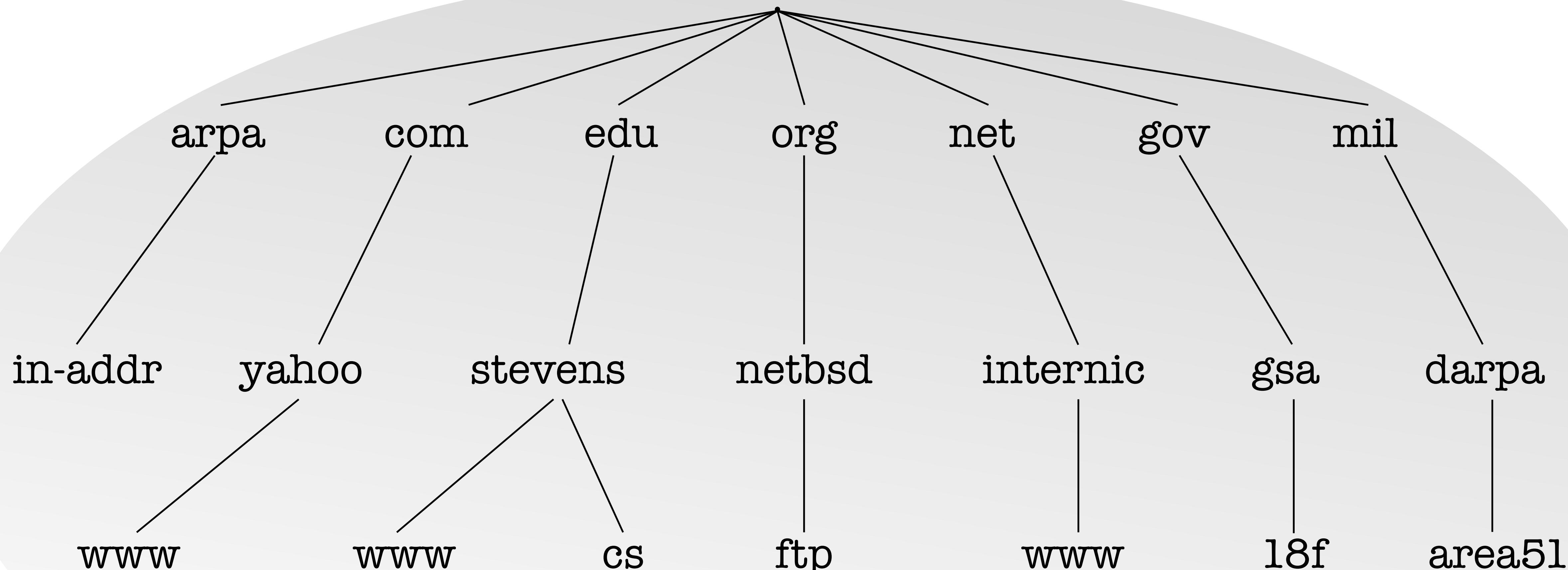


Authority over a zone may be delegated.





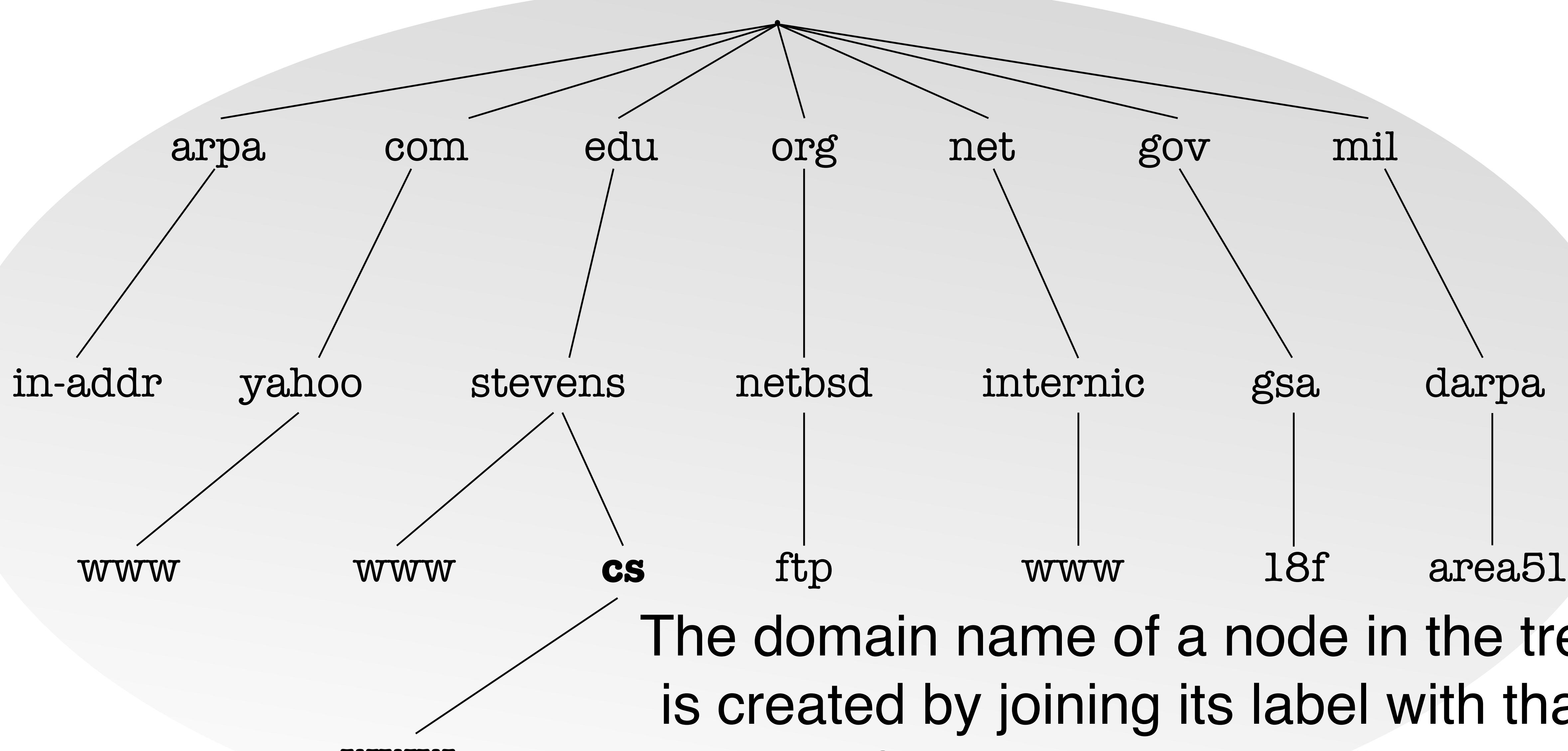




The domain name of a node in the tree
is created by joining its label with that
of its parent using a ".":

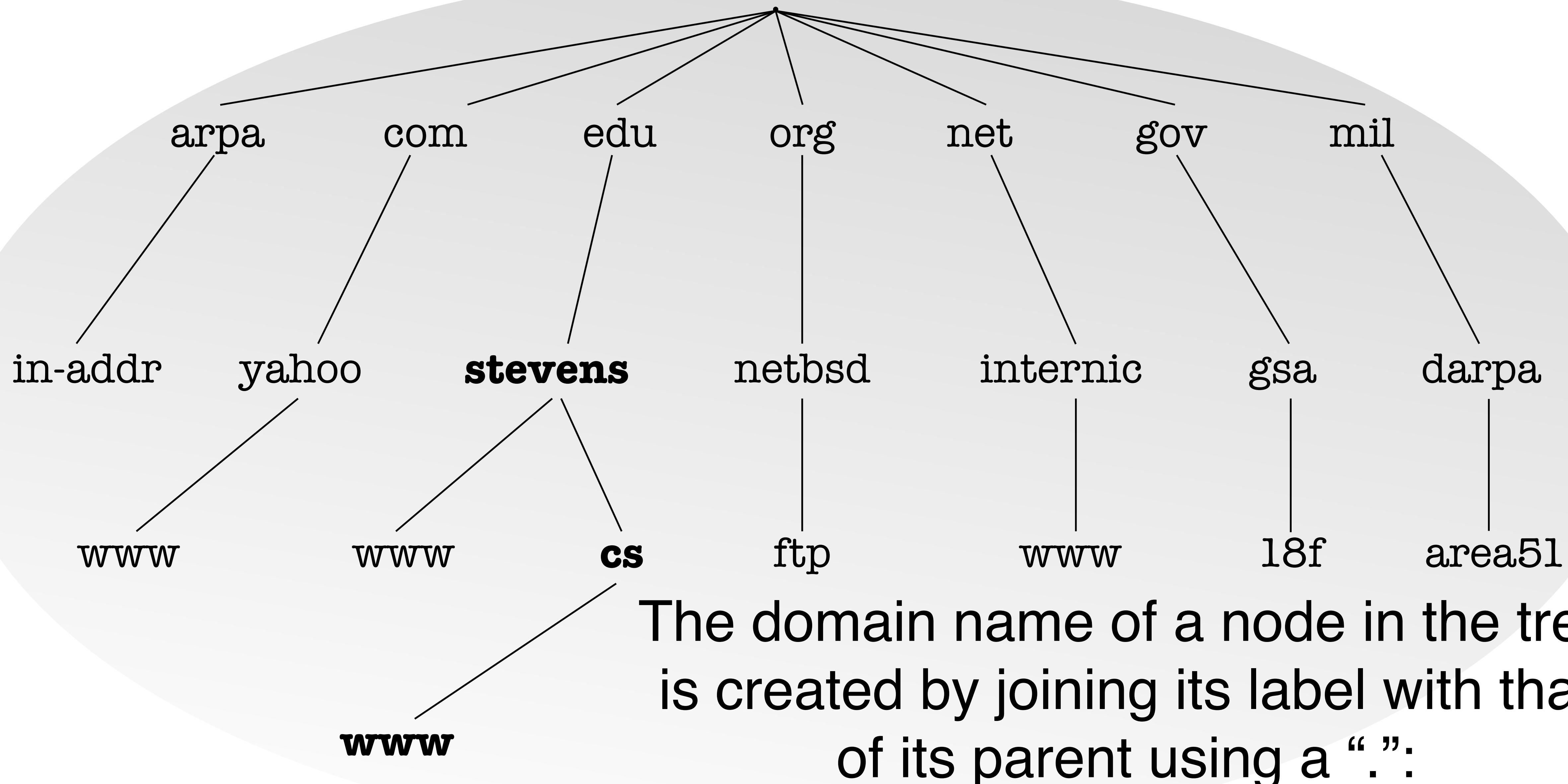
www

www

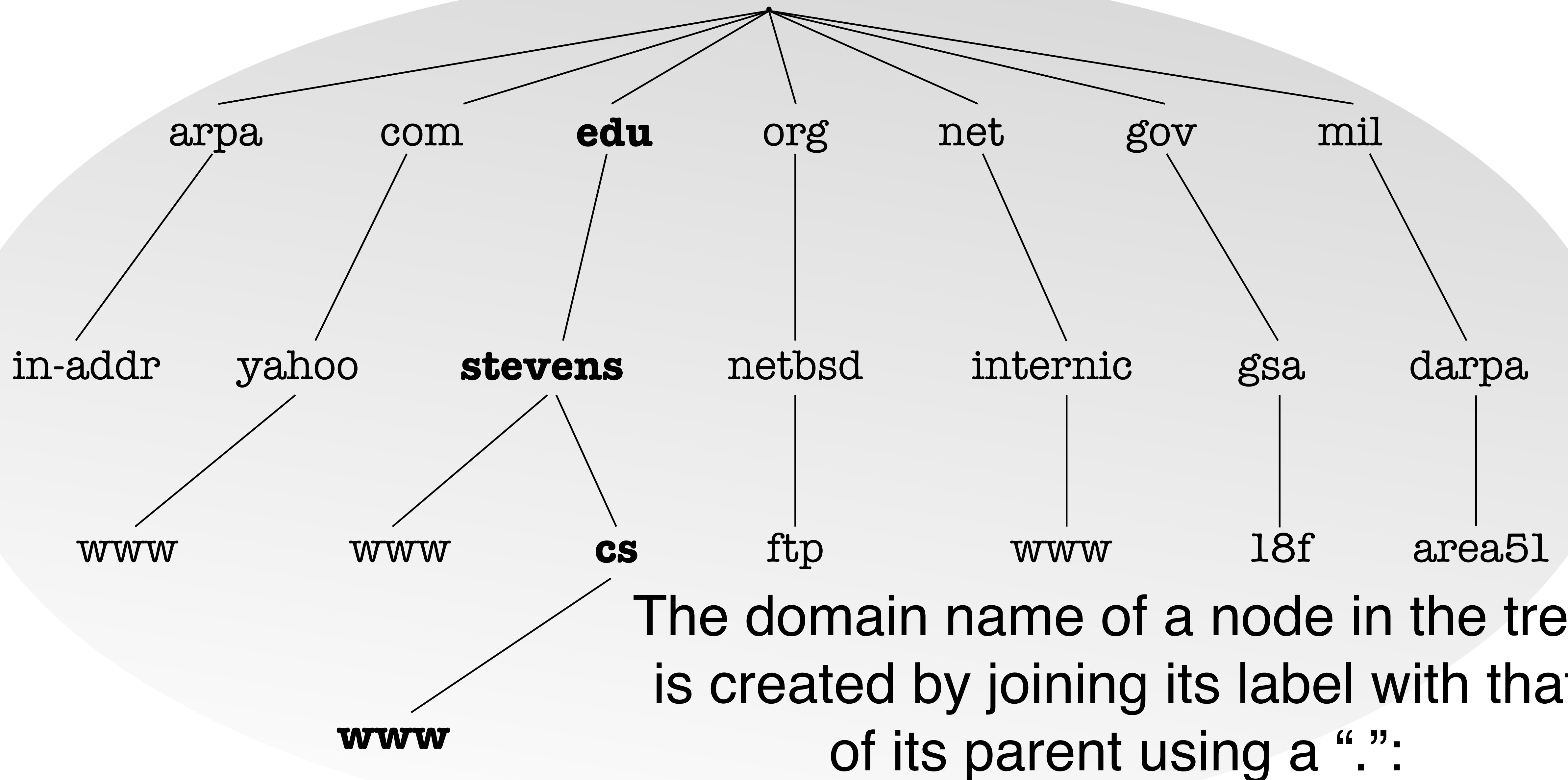


The domain name of a node in the tree is created by joining its label with that of its parent using a “.”:

WWW.CS



`www.cs.stevens`



`www.cs.stevens.edu`



Azeria
@Fox0x01

I'm not telling you how to get past annoying paywalls.

I'm just showing you a dot. 😎

Russian Campaign Promotes Homegrown Vaccine and Undercuts Rivals

Thanks for reading The Times.
Create your free account or log in to continue reading.

Email Address

Continue

or

https://www.nytimes.com./2021/02/05/... Cancel

On This Page (no matches)

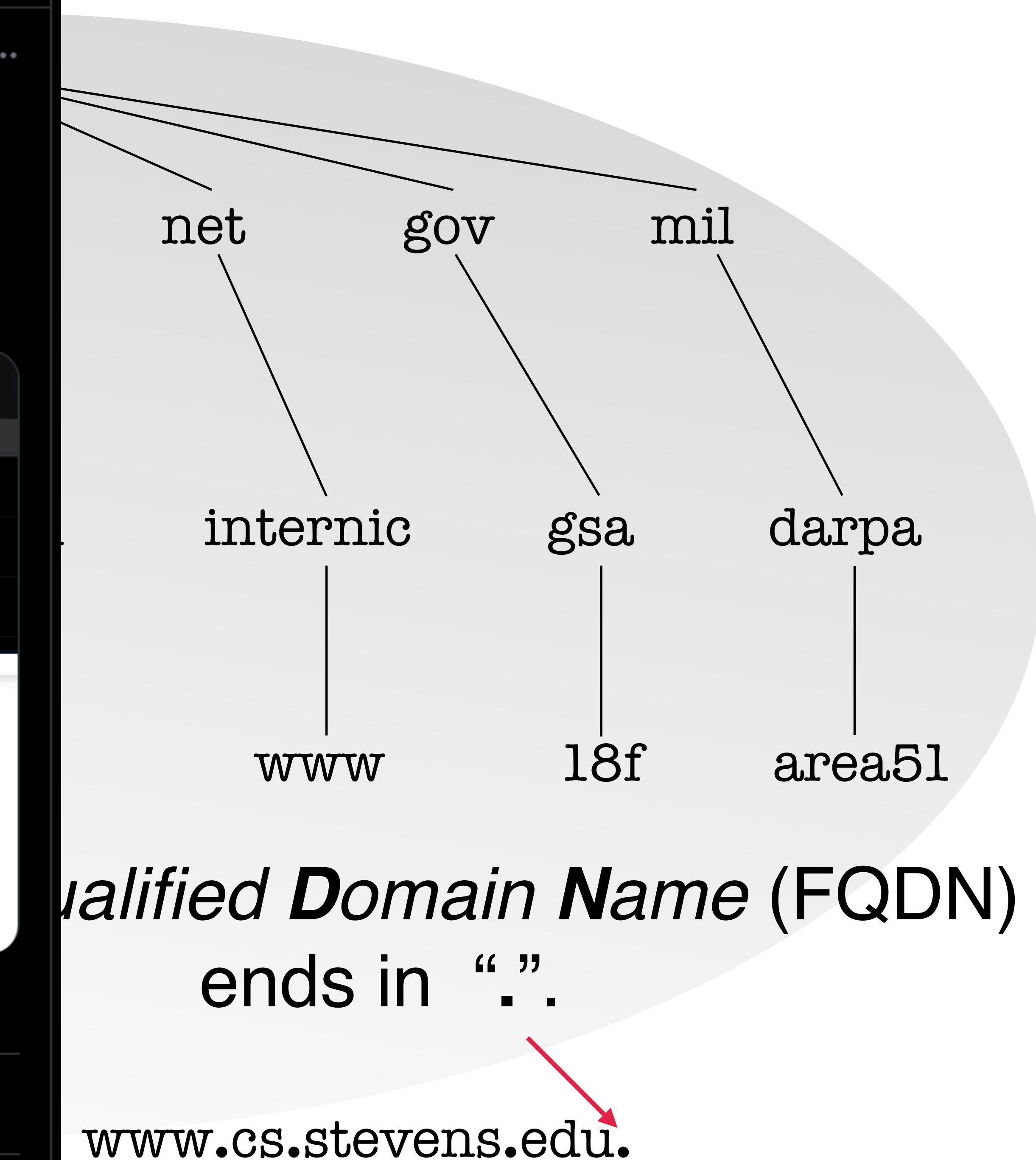
Find "https://www.nytimes.com./2021/02/05/t..."

Russian Campaign Promotes Homegrown Vaccine and Undercuts Rivals

Russian news outlets with connections to the Kremlin ran disingenuous Spanish-

7:07 PM · Feb 5, 2021 · Twitter for iPhone

676 Retweets 78 Quote Tweets 4,535 Likes



Top-Level Domains

- RFC920 defined a set of "general purpose domains":
 - com: commercial use
 - edu: education
 - gov: government use
 - mil: military related
 - org: any other organization
 - arpa: “temporary” use by ARPA

Top-Level Domains

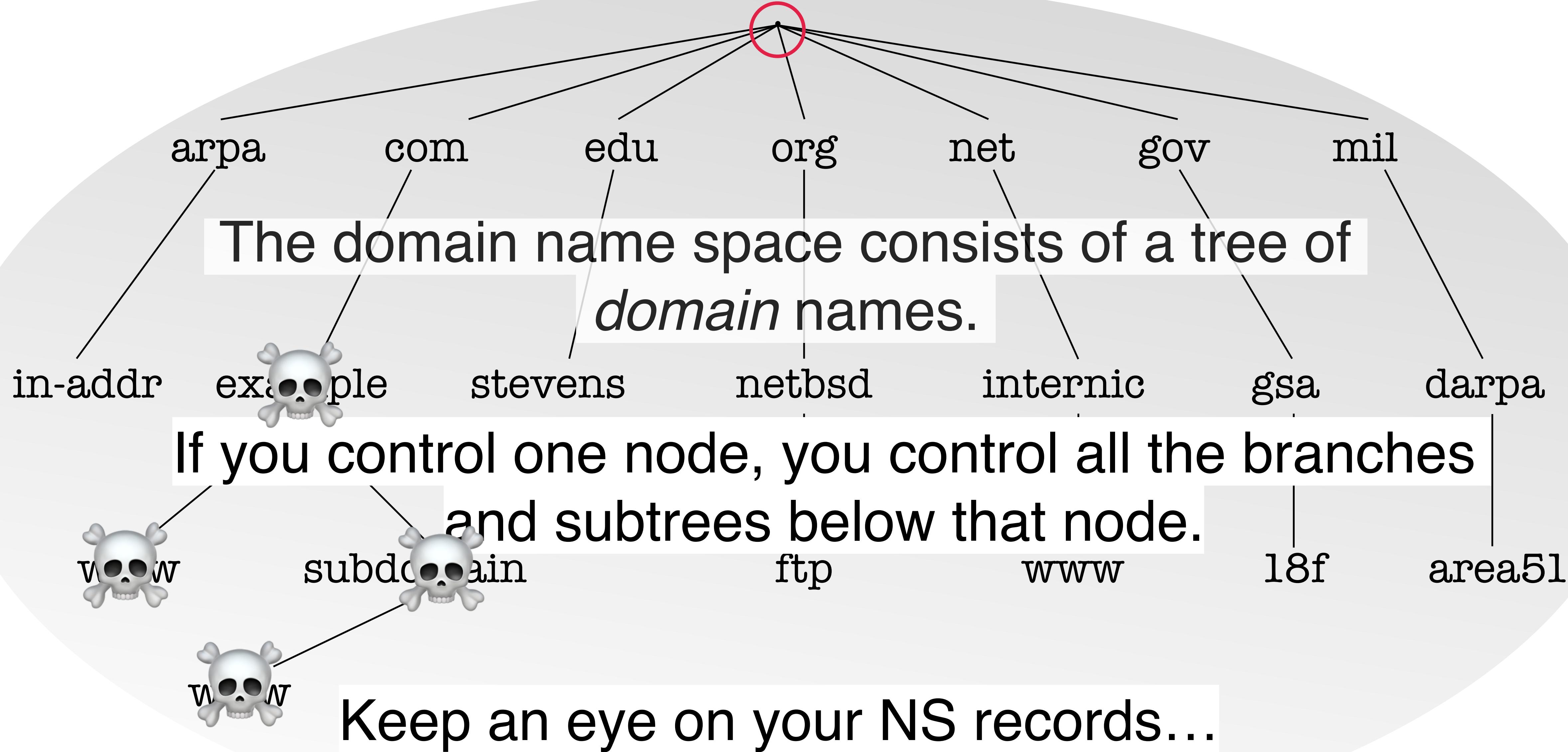
- Since then, a few other TLDs have been added:
 - country-code top-level domains (ccTLD), using ISO 3166 code
 - e.g., de, fr, ar, but also .السعودية, .香港, .ею
 - internationalized generic TLDs (IDN gTLD)
 - e.g., .شبكة, .网络, .сайт
 - sponsored top-level domains (sTLD)
 - e.g., cat, jobs, xxx
 - various iterations of “new” generic TLDs
 - e.g., auto, blue, mom, top, video



om.				
zip.	172800	IN	NS	ns-tld4.charlestonroadregistry.c
om.				
zip.	172800	IN	NS	ns-tld5.charlestonroadregistry.c
om.				
zm.	172800	IN	NS	pch.nic.zm.
zm.	172800	IN	NS	cocca.nic.zm.
zm.	172800	IN	NS	gransy.nic.zm.
zone.	172800	IN	NS	demand.beta.aridns.net.au.
zone.	172800	IN	NS	demand.alpha.aridns.net.au.
zone.	172800	IN	NS	demand.delta.aridns.net.au.
zone.	172800	IN	NS	demand.gamma.aridns.net.au.
zuerich.	172800	IN	NS	a.nic.zuerich.
zuerich.	172800	IN	NS	b.nic.zuerich.
zuerich.	172800	IN	NS	c.nic.zuerich.
zuerich.	172800	IN	NS	d.nic.zuerich.
zw.	172800	IN	NS	ns1.liquidtelecom.net.
zw.	172800	IN	NS	ns2.liquidtelecom.net.
zw.	172800	IN	NS	zw-ns.anycast.pch.net.
zw.	172800	IN	NS	ns1zim.telone.co.zw.
zw.	172800	IN	NS	ns2zim.telone.co.zw.
\$ grep "IN NS" /tmp/root awk '{print \$1}' sort -u wc -l	1504			

Layer 9

- IANA manages the root zone (.), arpa., int.; delegates other authorities to *domain name registries*
- gTLD registries handle gTLDs, ccTLD registries handle ccTLDs
- domain name *registrars* handle the registration of domain names; registrars must be accredited by a gTLD/ccTLD registry
- registries may function as a Domain Name Registrar or may delegate Domain Name registration
- registries control policies of allocations
- registries can (and do) censor, revoke, change, ... entries (see e.g. vb.ly)



Links

- Historical hosts.txt files: <https://github.com/ttkzw/hosts.txt/>
- ISC BIND: <https://www.isc.org/bind/>
- IANA Root Zone Database: <https://www.iana.org/domains/root/db>
- List of Top-Level Domains: https://en.wikipedia.org/wiki/List_of_Internet_top-level_domains