

Lecture 7: The Domain Name System and UDP

Homework 2 is due Monday Sept 13

Reading 2.5 (DNS), 2.1.4 (Transport Types)

Domain Name System

- distributed application

forward lookup:

translates domain names into IP addresses

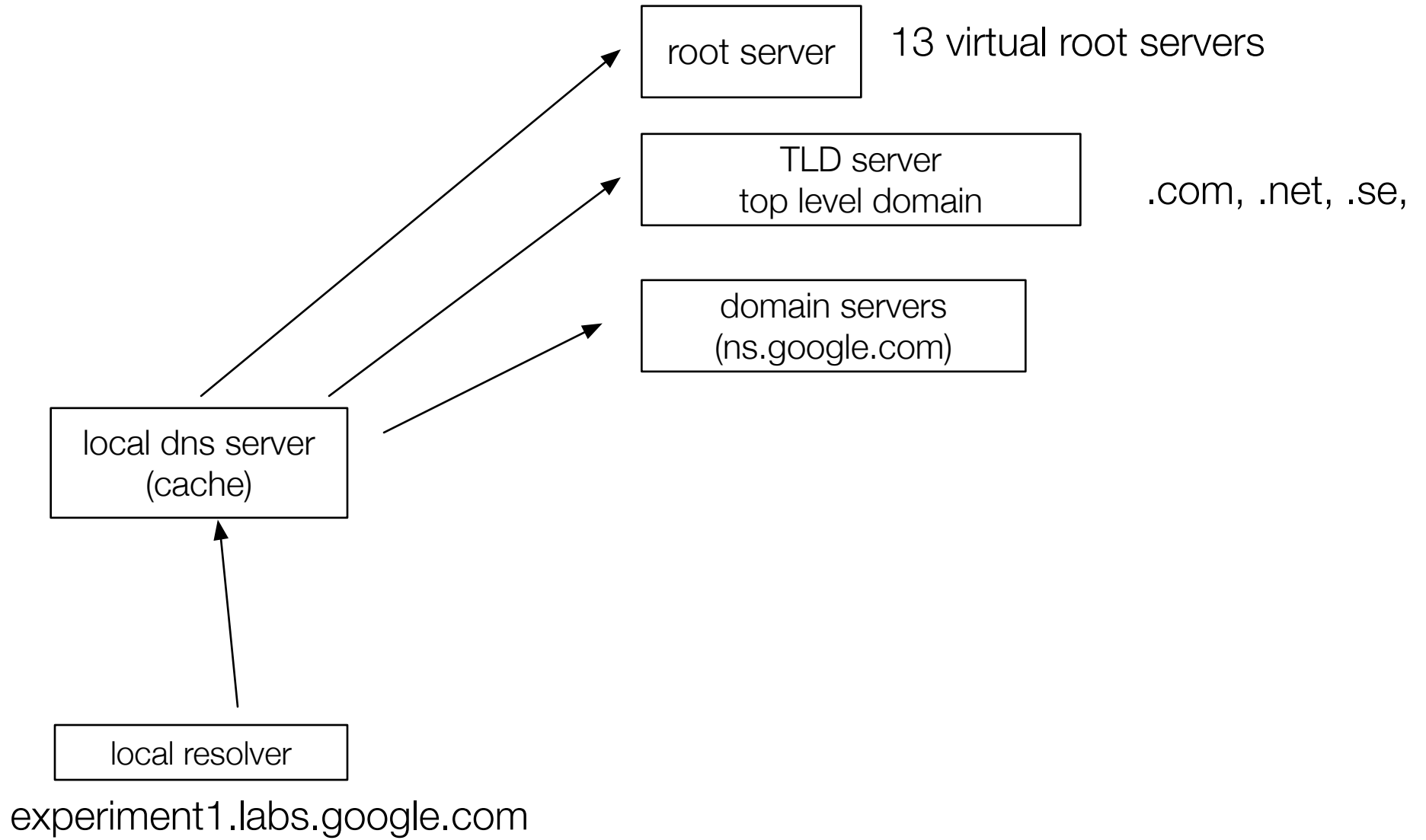
www.google.com -> 134.87.9.98

mail exchange resolution:

uic.edu (MX) -> mailin-grp1.uic.edu

reverse lookup:

134.87.9.98 -> frontend102948484.google.com



DNS response types (resource records)

A - name = IPv4 address

AAAA - name = IPv6 address

NS - name : next nameserver (name) to ask

MX - domain/name : responsible smtp server

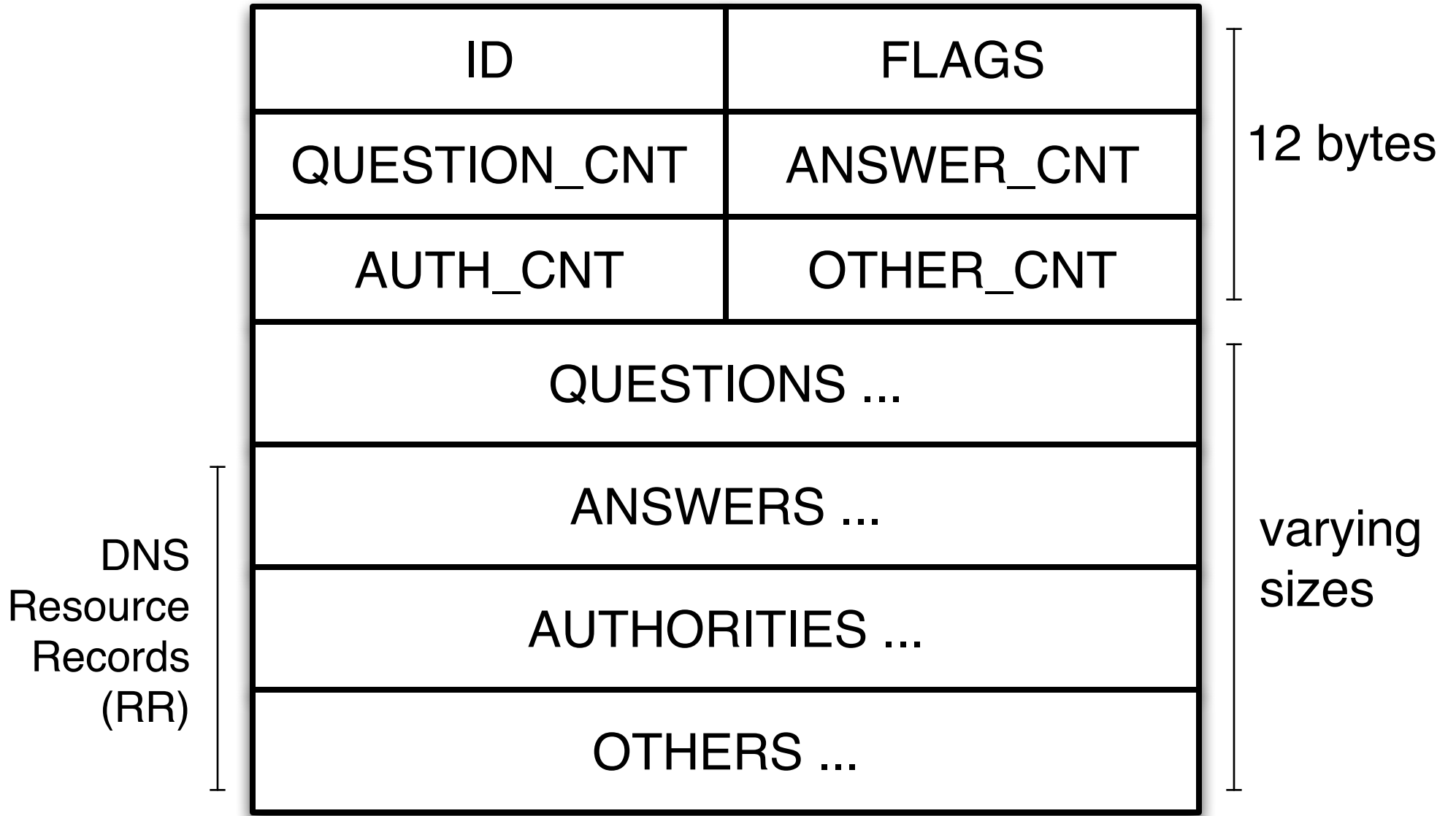
SOA - start of authority

TXT - text

PTR - reverse DNS pointer : in-addr.arpa address -> name

CNAME - alias: www.google.com -> google.com

The DNS Message Format



DNS Question section format

NAME	TYPE	CLASS
variable	2 bytes	2 bytes

DNS Resource Record format

NAME	TYPE	CLASS
TIME TO LIVE		DATALEN
4 bytes		2 bytes

DATA ...

DNS Name Compression

Because host names are frequently repeated or very similar in DNS responses, a compression mechanism is used. First names are transcribed:

www.cs.uic.edu
↓
3www2cs3uic3edu

If one of the 'length numbers' is on the (binary) form (11*****) (0xc0) the 6 LSB and the next byte are used as an (offset) pointer into the packet.

Let the name 3www2cs3uic3edu start at offset 0x20.
The name 4mail(0xc024) is then read out as mail.cs.uic.edu:
4mail + 2cs3uic3edu

dns.h - has the supporting code for this