UIC UNIVERSITY OF ILLINOIS AT CHICAGO Department of Computer Science COLLEGE OF ENGINEERING

CS450 – Introduction to Networking

Lecture 25 – Midterm example review & Assignment 4

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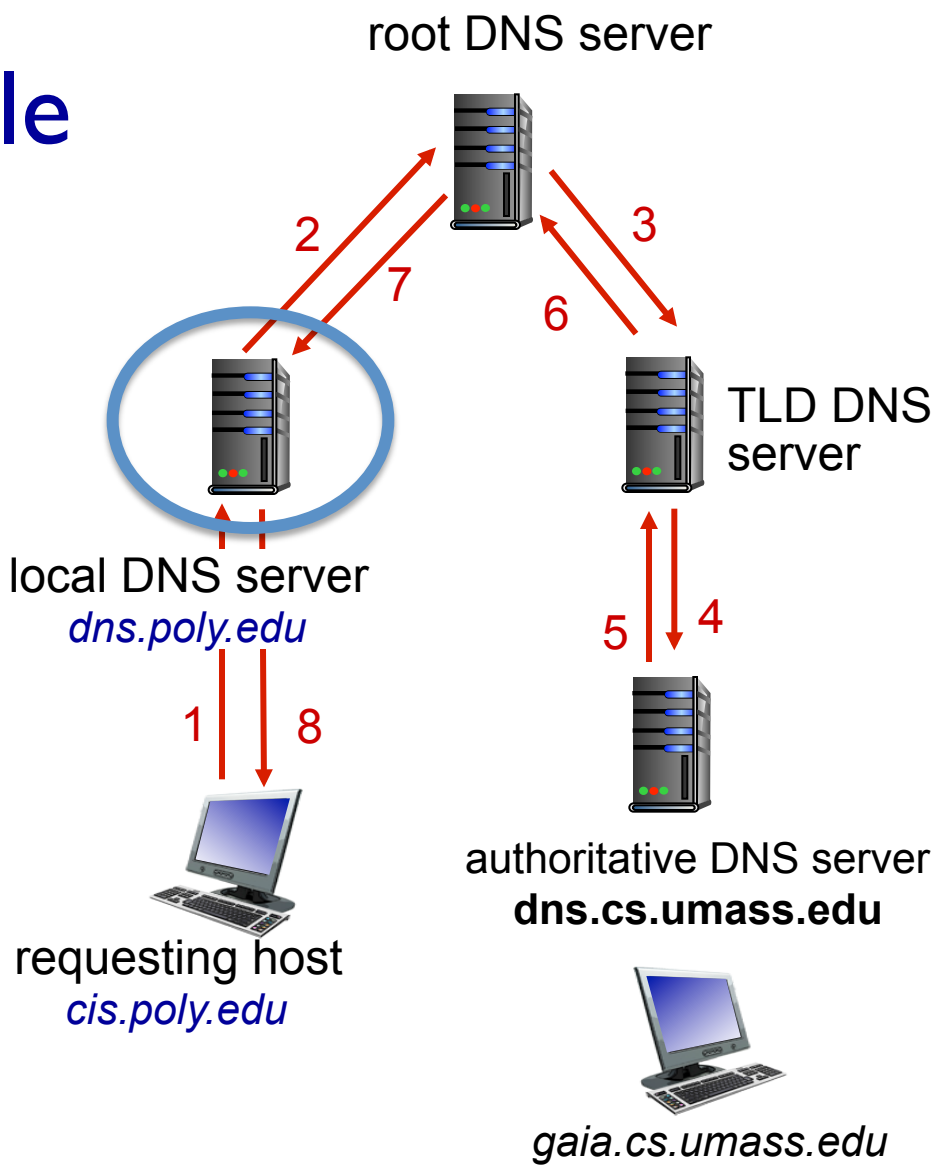
Assignment 4

- Recursive DNS resolver

DNS name resolution example

recursive query:

- puts burden of name resolution on contacted name server
- heavy load at upper levels of hierarchy?

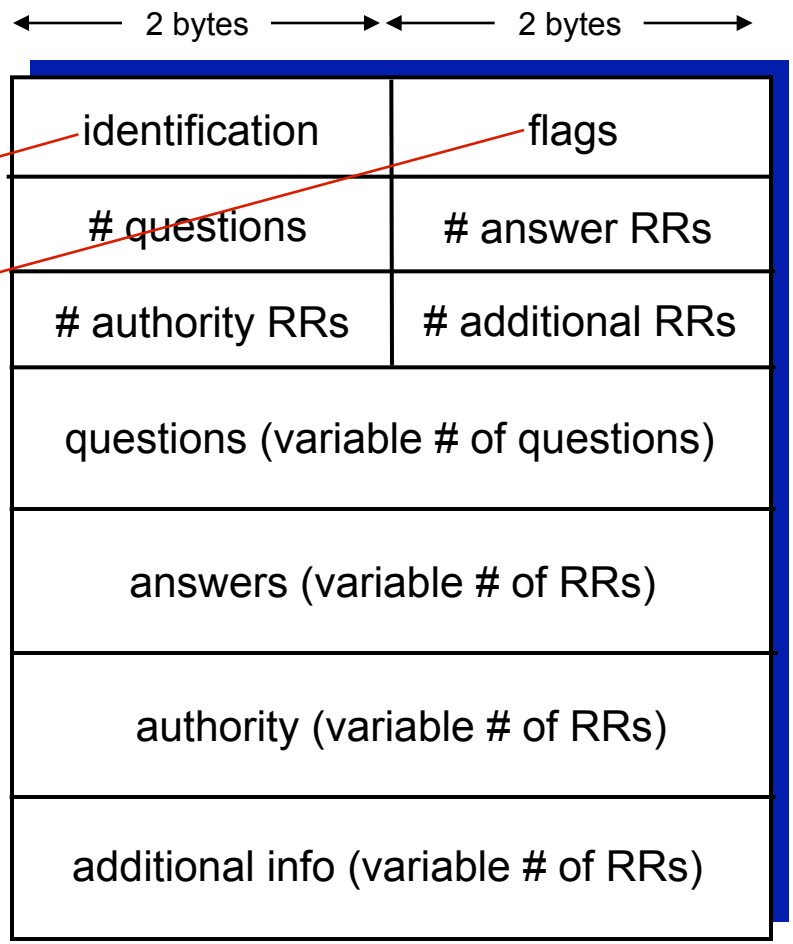


DNS protocol, messages

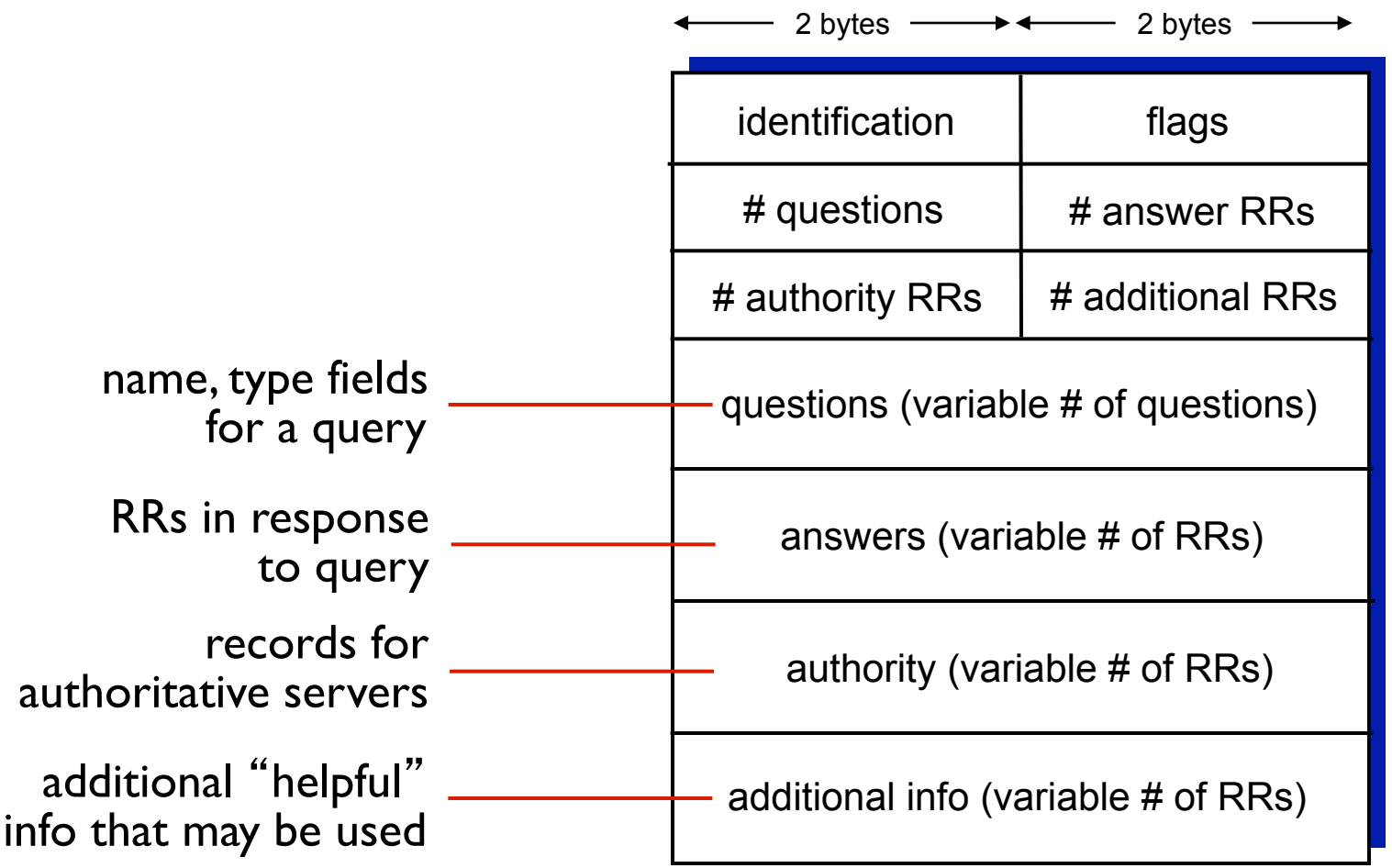
- *query* and *reply* messages, both with same *message format*

msg header

- identification: 16 bit # for query, reply to query uses same #
- flags:
  - query or reply
  - recursion desired
  - recursion available
  - reply is authoritative



DNS protocol, messages



DNS query sample

```
Domain Name System (query)
    [Response In: 20]
    Transaction ID: 0x0003
▽   Flags: 0x0100 Standard query
      0... .... .... .... = Response: Message is a query
      .000 0... .... .... = Opcode: Standard query (0)
      .... ..0. .... .... = Truncated: Message is not truncated
      .... ...1 .... .... = Recursion desired: Do query recursively
      .... .... .0.. .... = Z: reserved (0)
      .... .... ...0 .... = Non-authenticated data: Unacceptable
    Questions: 1
    Answer RRs: 0
    Authority RRs: 0
    Additional RRs: 0
▽   Queries
    ▷ www.mit.edu: type A, class IN
```

DNS response sample

```
Domain Name System (response)
    [Request In: 19]
    [Time: 0.016757000 seconds]
    Transaction ID: 0x0003
▷   Flags: 0x8580 Standard query response, No error
    Questions: 1
    Answer RRs: 1
    Authority RRs: 3
    Additional RRs: 3
▽   Queries
    ▷ www.mit.edu: type A, class IN
▽   Answers
    ▷ www.mit.edu: type A, class IN, addr 18.7.22.83
▽   Authoritative nameservers
    ▷ mit.edu: type NS, class IN, ns BITSY.mit.edu
    ▷ mit.edu: type NS, class IN, ns STRAWB.mit.edu
    ▷ mit.edu: type NS, class IN, ns W20NS.mit.edu
▽   Additional records
    ▷ BITSY.mit.edu: type A, class IN, addr 18.72.0.3
    ▷ STRAWB.mit.edu: type A, class IN, addr 18.71.0.151
    ▷ W20NS.mit.edu: type A, class IN, addr 18.70.0.160
```

Demo

Assignment 4 progress

A. Almost done/submitted

B. >=75%

C. >=50%

D. >=25%

E. Something else