DNS – the protocol

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DNS as a language

- spoken between pairs of programs
  - a dns client program, e.g., the resolver
  - an dns server program, e.g., BIND
  - they’re written specially to speak it
- discussing server giving info it has, or gets, to client
- simple query-response behavior

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An DNS conversation

DNS query
DNS reply

DNS server program

DNS client program

Typical configuration...

DNS query
DNS reply

DNS server

DNS client
DNS client
DNS client

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DNS particles of speech

- DNS messages
- 2 kinds
  - query messages
  - reply messages
- both have same format

DNS message format

<table>
<thead>
<tr>
<th>Identification</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of questions</td>
<td>Number of answer RRs</td>
</tr>
<tr>
<td>Number of authority RRs</td>
<td>Number of additional RRs</td>
</tr>
<tr>
<td>Questions (variable number)</td>
<td></td>
</tr>
<tr>
<td>Answers (variable number of resource records)</td>
<td></td>
</tr>
<tr>
<td>Authority (variable number of resource records)</td>
<td></td>
</tr>
<tr>
<td>Additional info (variable number of resource records)</td>
<td></td>
</tr>
</tbody>
</table>
A DNS query

this is a query message (number F45E)

...containing the single question,
"What is the address...
for ‘homepage.smc.edu’"

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The DNS reply

this is a reply message (matches query number F45E)

the original query

The answer to the query is,
"homepage.smc.edu’s address is 198.147.67.246."

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Biblio

- RFC 1034 “Domain names - concepts and facilities”
- RFC 1035 “Domain names - implementation and specification”