DNS – the protocol

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DNS as a language

- spoken between pairs of programs
  - a dns client program, e.g., the resolver
  - a 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
A DNS conversation

dns server program

DNS query

DNS reply

A DNS conversation

DNS query

DNS reply

dns client program

Typical configuration...

name server

DNS query

DNS reply

DNS query

DNS reply

client

client

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

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

The DNS reply

The answer to the query is, “homepage.smc.edu’s address is 198.147.67.246.”
Biblio

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