Recitation 2: DNS
Plan

- What is DNS for?
- How DNS works
- Hands-on with Dig
- Security issues
What is DNS for?

Mapping hostnames → IP addresses
logical addr → physical addr

Why would we want this?
- Clean UI
- Clean separation of concerns
- Fault tolerance
- Load balancing...

Remember phone numbers? Phone books?

Why is it cool?
- Decentralized
- Scalable ("Internet scale")
- Fault tolerant
- Extensible
How DNS works? (Credit to Amir for diagram!)

What is IP of Google.com?

<table>
<thead>
<tr>
<th>a. gld-server.net</th>
<th>192.5.6.30</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>oddy</td>
</tr>
<tr>
<td>type</td>
<td></td>
</tr>
<tr>
<td>google.com</td>
<td>216.239.32.10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b. root-servers.net</th>
<th>199.9.14.20</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>oddy</td>
</tr>
<tr>
<td>type</td>
<td></td>
</tr>
<tr>
<td>ed.</td>
<td></td>
</tr>
<tr>
<td>com.</td>
<td>192.5.6.30</td>
</tr>
<tr>
<td>net.</td>
<td></td>
</tr>
<tr>
<td>tv.</td>
<td></td>
</tr>
</tbody>
</table>

Student.mit.edu

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Root server: 199.9.14.201
Record types

A  - IPv4 address
AAAA - IPv6 address
CNAME - Alias "Common name"
MX - mail
NS - Name server

... many others, LOC

What does name file look like?

Show zone file for .com

If you actually look up google.com, you get an NS record pointing to HOSTNAME!

How do users create bindings?

Example: WebDNS.csail.mit.edu
Dig exercise goes here...
Security issues

Do not try this at home!

* No privacy

* No authentication (cache poisoning)

* Censorship (see UK)

* Anyone can register any name: finance.mit.edu
google.com
mit.co.uk
mit.edu
...

If time, mention DoH...