CS 338
Monday
16 May 2022
Ethernet

user machines

A B C D E

interface "en0" on this computer

local network
Shared medium

gateway

other net.
computer interface has
- name (used on the computer itself)
- IP address
- MAC address

"medium access control"
<table>
<thead>
<tr>
<th>Src MAC addr</th>
<th>MAC header</th>
</tr>
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<tbody>
<tr>
<td>Dest MAC addr</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Src addr</th>
<th>IP header</th>
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<tbody>
<tr>
<td>Dest addr</td>
<td>TCP header</td>
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<tr>
<td>TTL etc.</td>
<td></td>
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<table>
<thead>
<tr>
<th>Src port</th>
<th>HTTP</th>
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<tbody>
<tr>
<td>Dest port</td>
<td></td>
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<tr>
<td>etc.</td>
<td></td>
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<table>
<thead>
<tr>
<th>GET /</th>
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<tbody>
<tr>
<td>Host:</td>
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<table>
<thead>
<tr>
<th>CRC Checksum</th>
<th>MAC Footer</th>
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</thead>
</table>
A talks (and listens)
D talks (and listens)
A and D detect bit corruption and stop transmitting
Both wait either 1 time chunk or 0 time chunks and then start talking again ("exponential back up")
- A wants to send a packet to IP addr X.Y.Z.W
- Who gets it? on my local net
A has a "routing table".
Given a destination IP, which local IP should I send my packet to?
A says great. My packet for eff.org (173.239.79.196) needs to go to my local gateway 137.22.1.254 (carl-gw.carleton.edu)
A ok. wanna sent to carl-gw

Option 1: "Hey everybody!
Who has IP 137.22.1.254?
ARP broadcast message

Option 2: I asked this question
before. Did I write the
answer down?
ARP cache
A gets IP -> NAC translation, stores in her ARP cache. Can use it for hours.
Host detection

nmap -sn 137.22.4.0/24

If 137.22.4.* is on the local network, nmap will use ARP resolution to detect local hosts. 256 broadcast messages.
cont'd

for addr = 137.22.4.0 to 137.22.4.255

{Hey! What's the MAC

for addr!}
Otherwise, `nmap` tries to start a TCP connection for all addresses from `137.22.40` to `.255`. Send ping.