Mobile IP

- Mobility = IP address change
  - Network prefix changes; All hosts on the same LAN have the same prefix

- What can we do?
  - Correspondent hosts (those that communicate with me) should be unaware of mobile’s movement

Needed Component(s)

<table>
<thead>
<tr>
<th>Home Network</th>
<th>Foreign Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA</td>
<td>Mobile node</td>
</tr>
</tbody>
</table>
Packet forwarding to Mobile

- Packet reaches home network
- HA captures packet [promiscuous mode or using gratuitous ARP]
- HA tunnels packet to mobile at new address [?] 

New address for mobile

1. Foreign Agent Care of Address
   - IP address of MH = address of FA
   - FA receives packet; decapsulates it
   - Delivers packet to mobile
   - FA is tunnel end point

2. Co-located care of address
   - Mobile gets local address
   - HA tunnels packets directly to new address
   - MH is tunnel end point
Other components

- Registration request
  - Mobile to HA
- Registration reply
  - HA to mobile
- Both are UDP messages; port 434
- Agent discovery
- Deregister: on return to Home Network

Agent Discovery

- Extend ICMP Router Discovery
- Agent advertisement or Agent solicitation
- MH must implement agent solicitation
Move detection

- MH records lifetime of agent advertisement; expired; no further advertisement or advertisement from another agent; register with new agent
- Use network prefixes [only if advertisement includes prefix length extension]

Registration

- Request forwarding of packets when in foreign network
- Inform HA of new address
- Renew registration
- Deregister on returning
- Message exchanges between MH, HA and optionally FA
Registration via FA

- MH sends Registration request to FA
- FA processes request, relays to HA
- HA sends Registration Reply to FA [grant or deny]
- FA processes reply, relays to MH

MH registering with HA directly

- MH to HA: Registration Request
- HA to MH: Registration Reply

<table>
<thead>
<tr>
<th>Type (1 B)</th>
<th>SBDMGrTX</th>
<th>LifeTime (2 Bytes)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Home Address</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Home Agent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Care-of Address</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Identification (64 bits)</td>
</tr>
</tbody>
</table>
8 bits

- S: Simultaneous binding [Maintain prior binding]; allow duplicate datagram; tunnel separate datagram for each binding
- B: Broadcast datagrams requested
- D: MH will decapsulate; co-located care of address
- M: Minimal encapsulation
- G: Use GRE: Generic Routing Encapsulation
- R: sent as zero, ignore
- T: Reverse tunneling requested
- X: sent as 0; ignore

Reply

- Type=0; code=0 [accepted] or 1 [no simultaneous binding; others? Rejected]
- Lifetime: # of seconds the registration is valid for
- Id: 64 bit id; must match that of the request