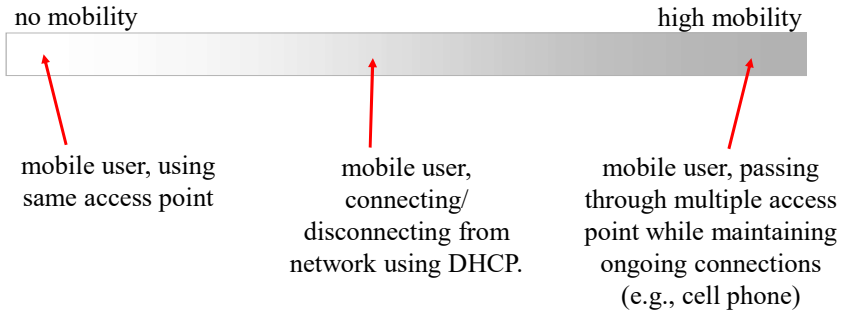
What is network mobility?

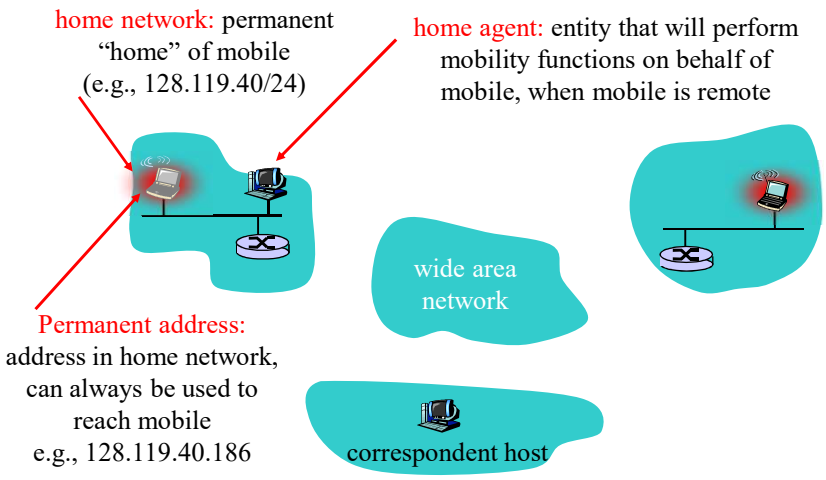
- Spectrum of mobility, from the *network* perspective:



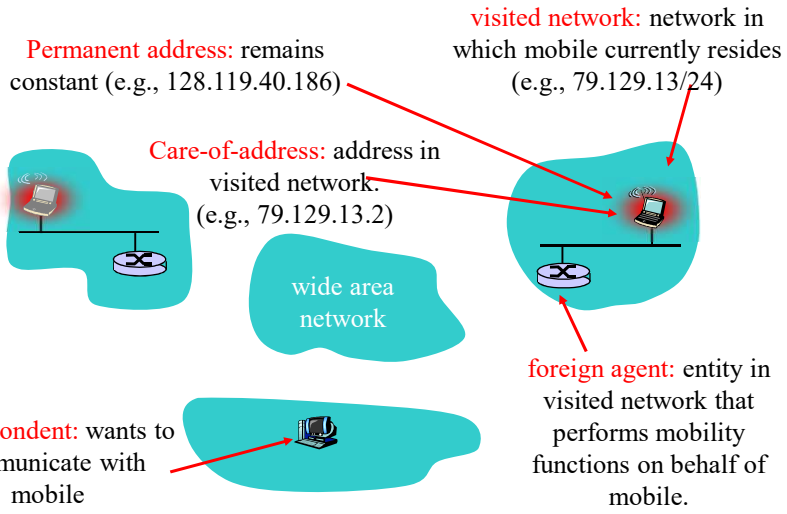
Mobility and IP Routing

- IP assumes end hosts are in fixed physical locations
  - ❖ What happens if we move a host between networks?
- IP addresses enable IP routing algorithms to get packets to the correct network
  - ❖ Each IP address has network part and host part
    - ▪ This keeps host specific information out of routers
  - ❖ Layer 2 is used to get packets to hosts in networks
    - ▪ This still assumes a fixed end host
- What if a user wants to roam between networks?
  - ❖ Mobile users don't want to know that they are moving between networks
  - ❖ Why can't mobile users change IP when running an application?
- The standard that governs support for Internet mobility is RFC 2002.

Mobility: Vocabulary



Mobility: more vocabulary



Mobility: approaches

- Let routing handle it: routers advertise permanent address of mobile-nodes-in-residence via usual routing table exchange.
  - ❖ routing tables indicate where each mobile located
  - ❖ no changes to end-systems

Mobility: approaches

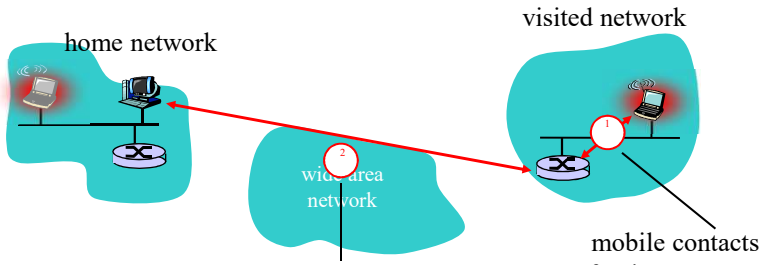
- Let routing handle it: ro… …rmanent address of mobile-nodes-in-residence via … exchange.
  - routing tables indic… …bile located
  - no changes to end-sys…

not scalable to millions of mobiles

- Let end-systems handle it:
  - indirect routing: communication from correspondent to mobile goes through home agent, then forwarded to remote
  - direct routing: correspondent gets foreign address of mobile, sends directly to mobile

Mobile IP - Registration

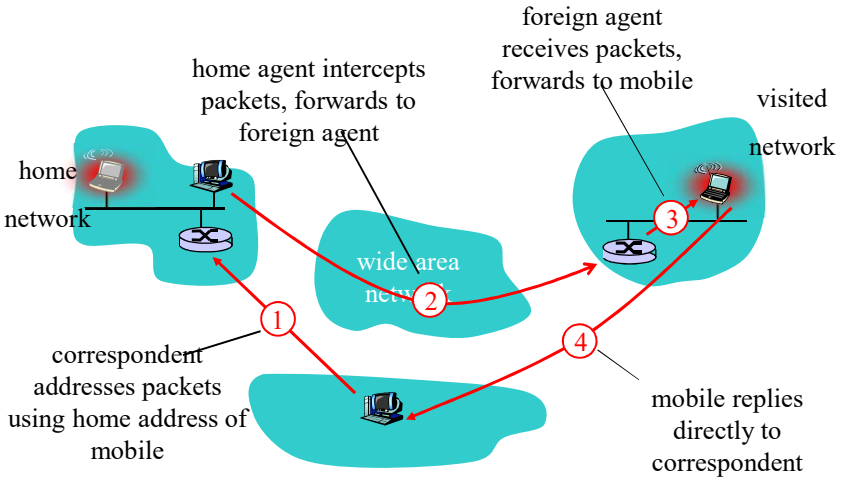
Mobile IP: IETF's proposal for supporting IP mobility in the Internet



End result:

- Foreign agent knows about mobile
- Home agent knows location of mobile

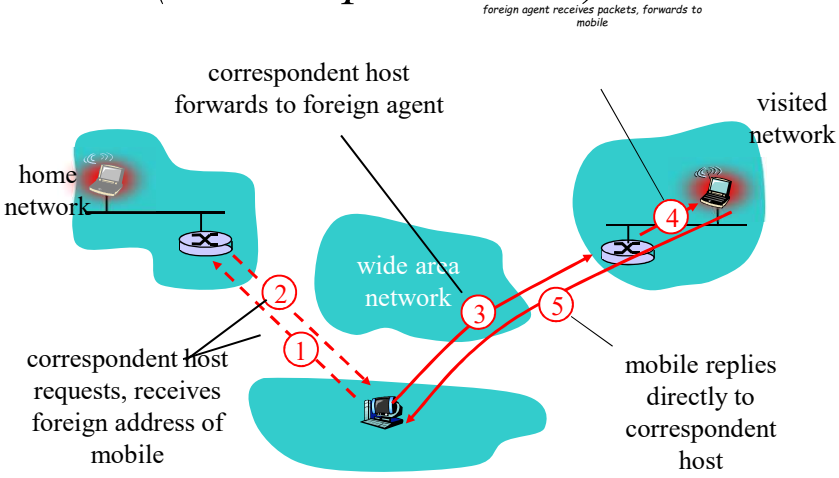
Mobility via Indirect Routing



Indirect Routing: comments

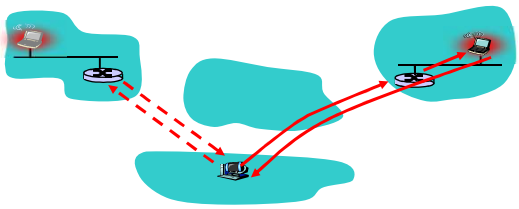
- Mobile uses two addresses:
  - ❖ permanent address: used by correspondent host (hence mobile location is *transparent* to the correspondent host)
  - ❖ care-of-address: used by home agent to forward datagrams to mobile
- foreign agent functions may be done by mobile itself
- triangle routing: correspondent-host – home-network – mobile-host
  - ❖ inefficient when correspondent, mobile are in same network
- How does the home agent receives packets destined to mobile node?
  - ❖ Uses Proxy ARP mechanism to impersonate the mobile to the access router

Mobility via Direct Routing (Route Optimization)



Mobility via Direct Routing: comments

- Direct Routing overcomes the triangle-routing problem
- But it's non-transparent to the correspondent host: the correspondent host must get care-of-address from home agent
  - ❖ What happens if mobile changes networks?



Mobile IP vs IP Multicast

- Interaction between Mobile IP and IP multicast?
- Can we use ASM based multicast ideas to support IP mobility?
- Can we use SSM based multicast ideas to support IP mobility?

