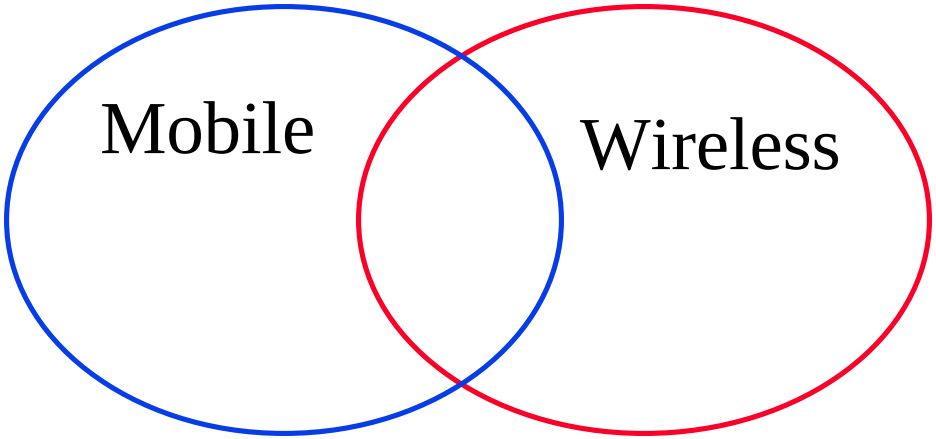
Mobile IP

Raj Jain

Raj Jain is now at
Washington University in Saint Louis
Jain@cse.wustl.edu
http://www.cse.wustl.edu/~jain/

- Wireless: Introduction
- Problem: IP Addresses and location
- Solution: Mobile IP

Mobile vs Wireless



- Mobile vs Stationary
- Wireless vs Wired
- Wireless ⇒ media sharing issues
- Mobile ⇒ routing, location, addressing issues

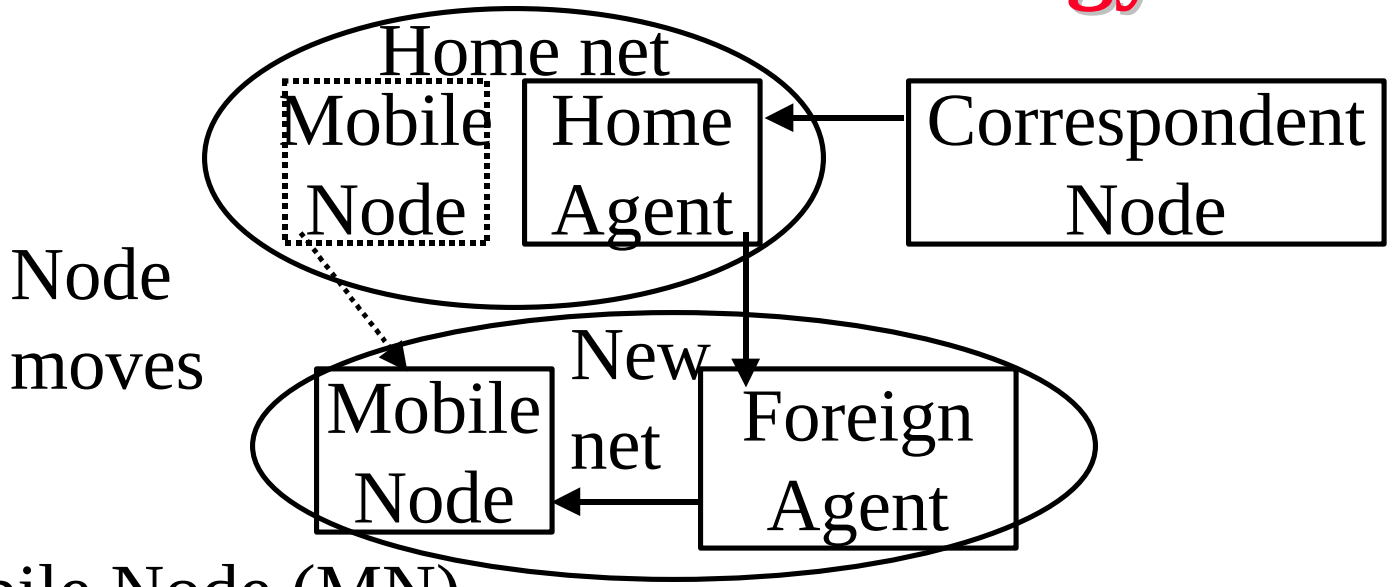
Mobile IP: Features

- You can take you notebook to any location
- Finds nearby IP routers and connects *automatically*
  You don't even have to find a phone jack
- Only "Mobility Aware" routers and mobile units need new s/w
- Other routers and hosts can use current IP
- No new IP addresses or address formats
- Secure: Allows authentication
- Also supports mobile networks
  (whole airplane/car load of mobile units)

Impact

- Your Email is continuously delivered
- You can start a telnet or x-window session as if local
- Continuous access to your home resources
- Access to local resources: Printers
- Airports, Hotels, Hospitals will provide "Mobile IP connectivity"
- Better connectivity
  $\Rightarrow$ More productive meetings and conferences
- Cities will feature "Mobile IP Accessways"
- You can compute while driving

Mobile IP: Terminology



- Mobile Node (MN)
- Home Agent (HA), Foreign Agent (FA)
- Care-of-address (COA): Address of the end-of-tunnel towards the mobile node
- Correspondent Node (CN)
- Home Address: Mobile's permanent IP address

Mobile IP: Processes

- Agent Discovery: To find agents
  - Home agents and foreign agents advertise periodically on network layer and optionally on datalink
  - They also respond to solicitation from mobile node
  - Mobile selects an agent and gets/uses care-of-address
- Registration
  - Mobile registers its care-of-address with home agent. Either directly or through foreign agent
  - Home agent sends a reply to the mobile node via FA

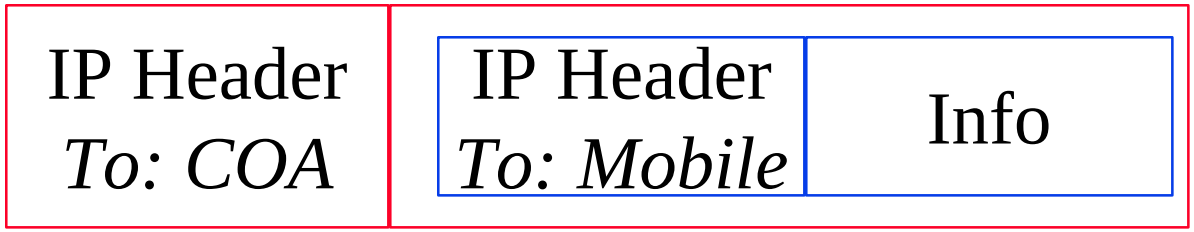
Processes (Cont)

- Each "Mobility binding" has a negotiated lifetime limit
- To continue, reregister within lifetime

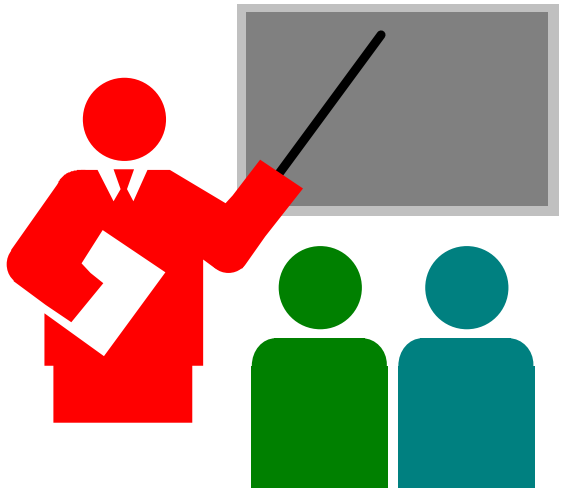
- Return to Home:
  - Mobile node deregisters with home agent sets care-of-address to its permanent IP address
  - Lifetime = 0 $\Rightarrow$ Deregistration
- Deregistration with foreign agents is not required. Expires automatically
- Simultaneous registrations with more than one COA allowed (for handoff)

Encaptulation/Tunneling

- Home agent intercepts mobile node's datagrams and forwards them to care-of-address
- Home agent tells local nodes and routers to send mobile node's datagrams to it
- Decaptulation: Datagram is extracted and sent to mobile node



Summary



- Wireless vs mobile
- IP: Transparent mobility via home/foreign agents

Mobile IP: References

- C. Huitema, "Routing in the Internet," Prentice-Hall, 1995, Chapter 12.
- [RFC2002] C. Perkins, "IP Mobility Support," 10/29/96, 79 pages.
- Mobile-IP working group homepage, http://www.ietf.cnri.reston.va.us/html.charters/mobileip-charter.html