

Vorlesung Telematik (Computer Networks)
WS2004/05

Network Layer 3: Mobile IP

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What is mobility?

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

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Mobility: Vocabulary

home network: permanent "home" of mobile (e.g., 128.119.40/24)

home agent: entity that will perform mobility functions on behalf of mobile, when mobile is remote

Permanent address: address in home network, can always be used to reach mobile e.g., 128.119.40.186

wide area network

correspondent

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Mobility: more vocabulary

Permanent address: remains constant (e.g., 128.119.40.186)

visited network: network in which mobile currently resides (e.g., 79.129.13/24)

Care-of-address: address in visited network. (e.g., 79.129.13.2)

foreign agent: entity in visited network that performs mobility functions on behalf of mobile.

correspondent: wants to communicate with mobile

wide area network

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How do you contact a mobile friend:

Consider friend frequently changing addresses, how do you find her?

- search all phone books?
- call her parents?
- expect her to let you know where he/she is?



Mobility: approaches

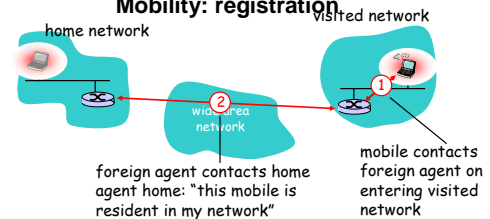
- **Let routing handle it:** routers advertise permanent address of mobile-nodes-in-residence via usual routing table exchange.
 - routing tables indicate where each mobile located
 - no changes to end-systems
- **Let end-systems handle it:**
 - **indirect routing:** communication from correspondent to mobile goes through home agent, then forwarded to remote
 - **direct routing:** correspondent gets foreign address of mobile, sends directly to mobile

Mobility: approaches

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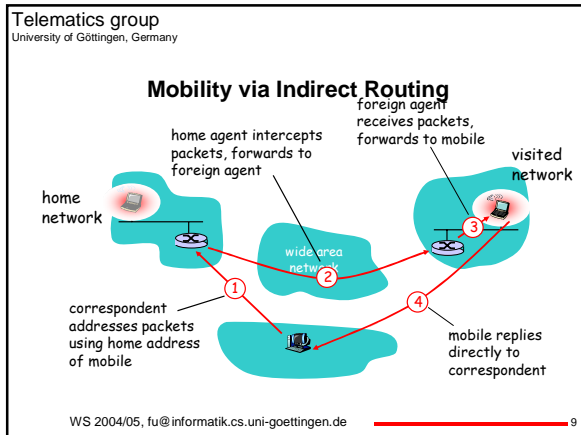
not scalable to millions of mobiles

Mobility: registration

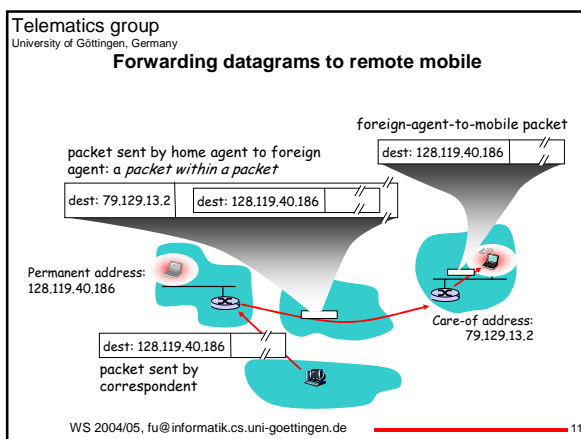


End result:

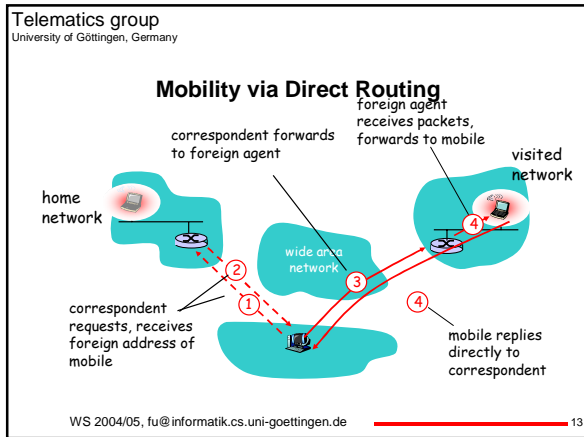
- Foreign agent knows about mobile
- Home agent knows location of mobile



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- ### Indirect Routing: comments
- Mobile uses two addresses:
 - permanent address: used by correspondent (hence mobile location is *transparent* to correspondent)
 - care-of-address: used by home agent to forward datagrams to mobile
 - foreign agent functions may be done by mobile itself
 - triangle routing: correspondent-home-network-mobile
 - inefficient when correspondent, mobile are in same network
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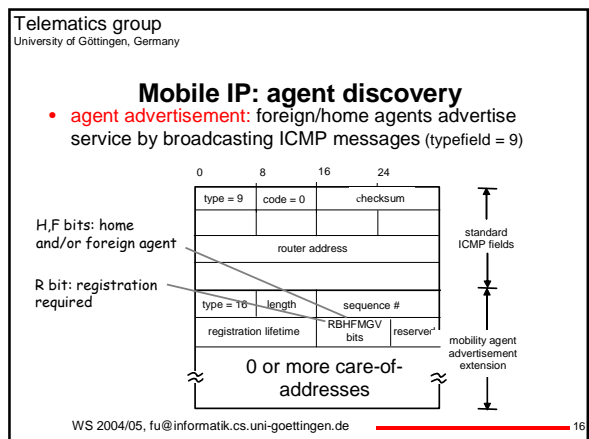


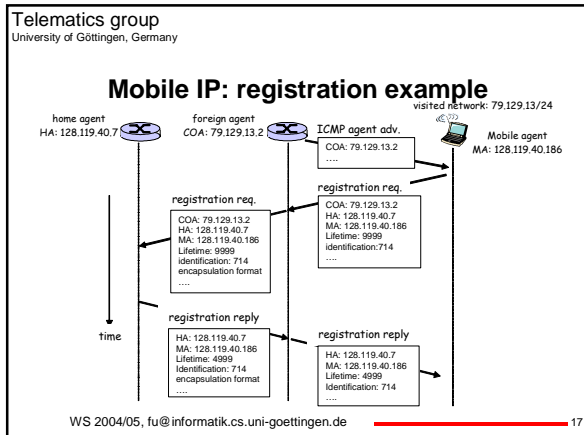
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- ### Indirect Routing: moving between networks
- suppose mobile user moves to another network
 - registers with new foreign agent
 - new foreign agent registers with home agent
 - home agent update care-of-address for mobile
 - packets continue to be forwarded to mobile (but with new care-of-address)
 - Mobility, changing foreign networks transparent: *on going connections can be maintained!*
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- ### Mobility via Direct Routing: comments
- overcome triangle routing problem
 - **non-transparent to correspondent:** correspondent must get care-of-address from home agent
 - What happens if mobile changes networks?
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- ### Mobile IP
- RFC 3220
 - has many features we've seen:
 - home agents, foreign agents, foreign-agent registration, care-of-addresses, encapsulation (packet-within-a-packet)
 - three components to standard:
 - agent discovery
 - registration with home agent
 - indirect routing of datagrams
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Network Layer: summary

What we've covered:

- routing principles: link state and distance vector
- hierarchical routing
- IP
- Internet routing protocols RIP, OSPF, BGP
- what's inside a router?
- IPv6
- mobility

Next stop:
the transport layer!

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