

# CN-Advanced L41

## Mobility Overview

Dr. Ram P Rustagi

[rprustagi@ksit.edu.in](mailto:rprustagi@ksit.edu.in)

<http://www.rprustagi.com>

<https://www.youtube.com/rprustagi>

# Resources Acknowledgement

## Chapter 6 Wireless and Mobile Networks

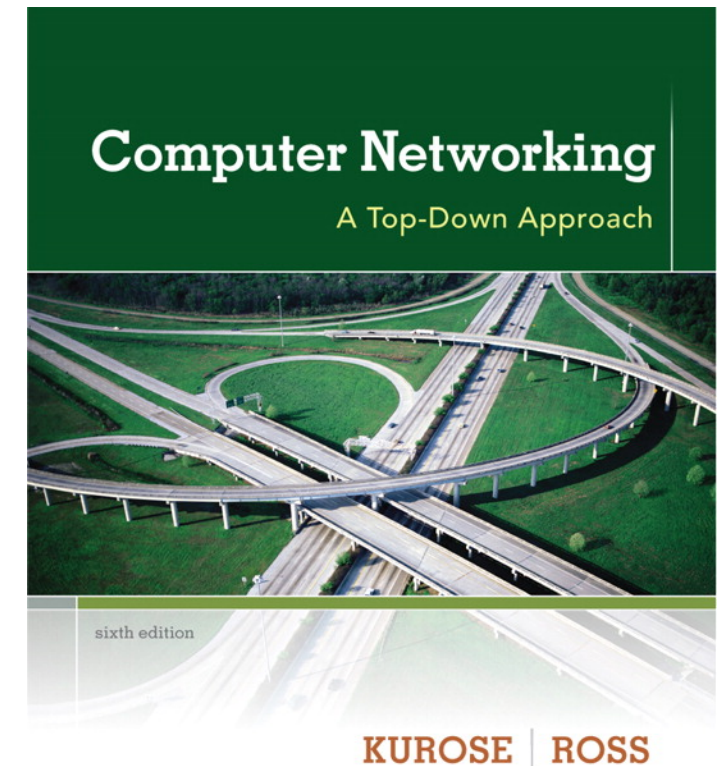
### A note on the use of these ppt slides:

We're making these slides freely available to all (faculty, students, readers). They're in PowerPoint form so you see the animations; and can add, modify, and delete slides (including this one) and slide content to suit your needs. They obviously represent a *lot* of work on our part. In return for use, we only ask the following:

- ❖ If you use these slides (e.g., in a class) that you mention their source (after all, we'd like people to use our book!)
- ❖ If you post any slides on a www site, that you note that they are adapted from (or perhaps identical to) our slides, and note our copyright of this material.

Thanks and enjoy! JFK/KWR

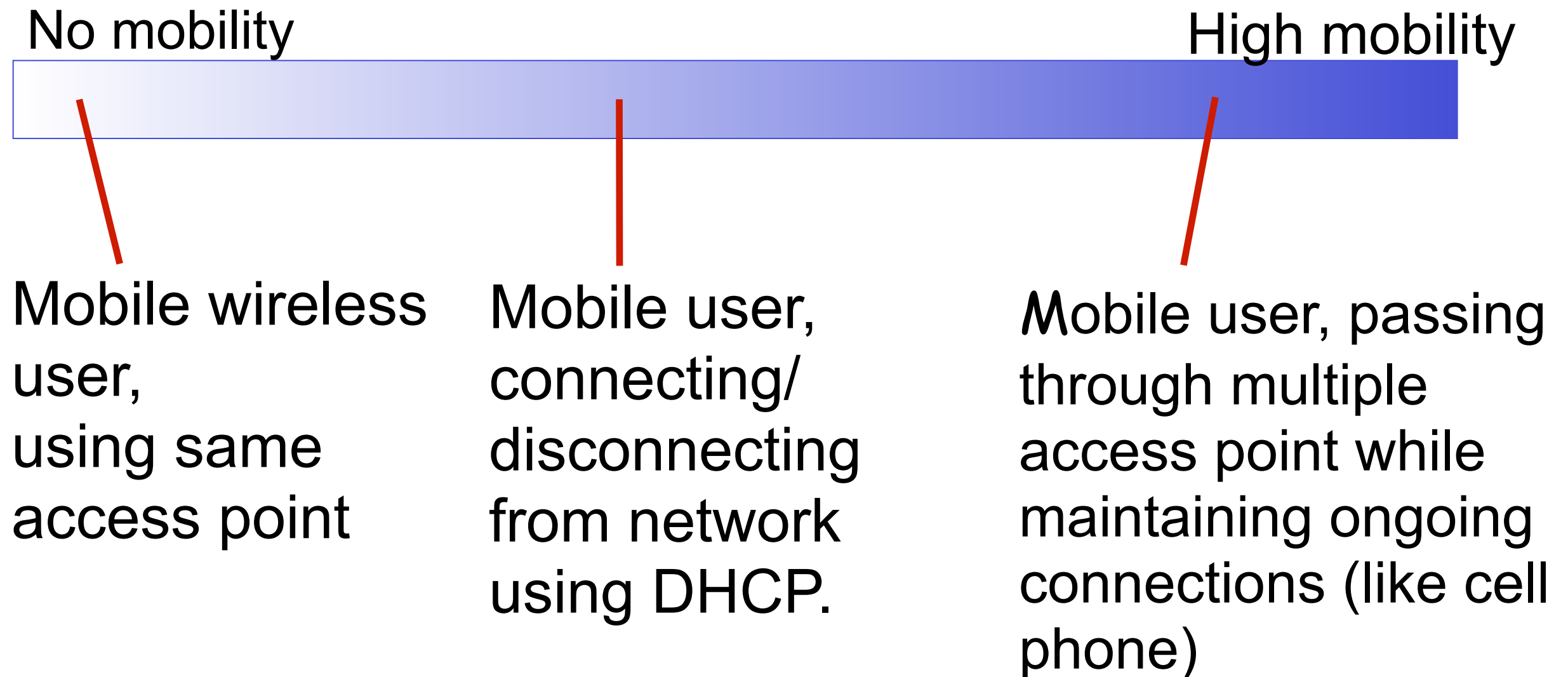
All material copyright 1996-2012  
J.F Kurose and K.W. Ross, All Rights Reserved



*Computer  
Networking: A Top  
Down Approach*  
6<sup>th</sup> edition  
Jim Kurose, Keith Ross  
Addison-Wesley  
March 2012

# What is mobility?

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

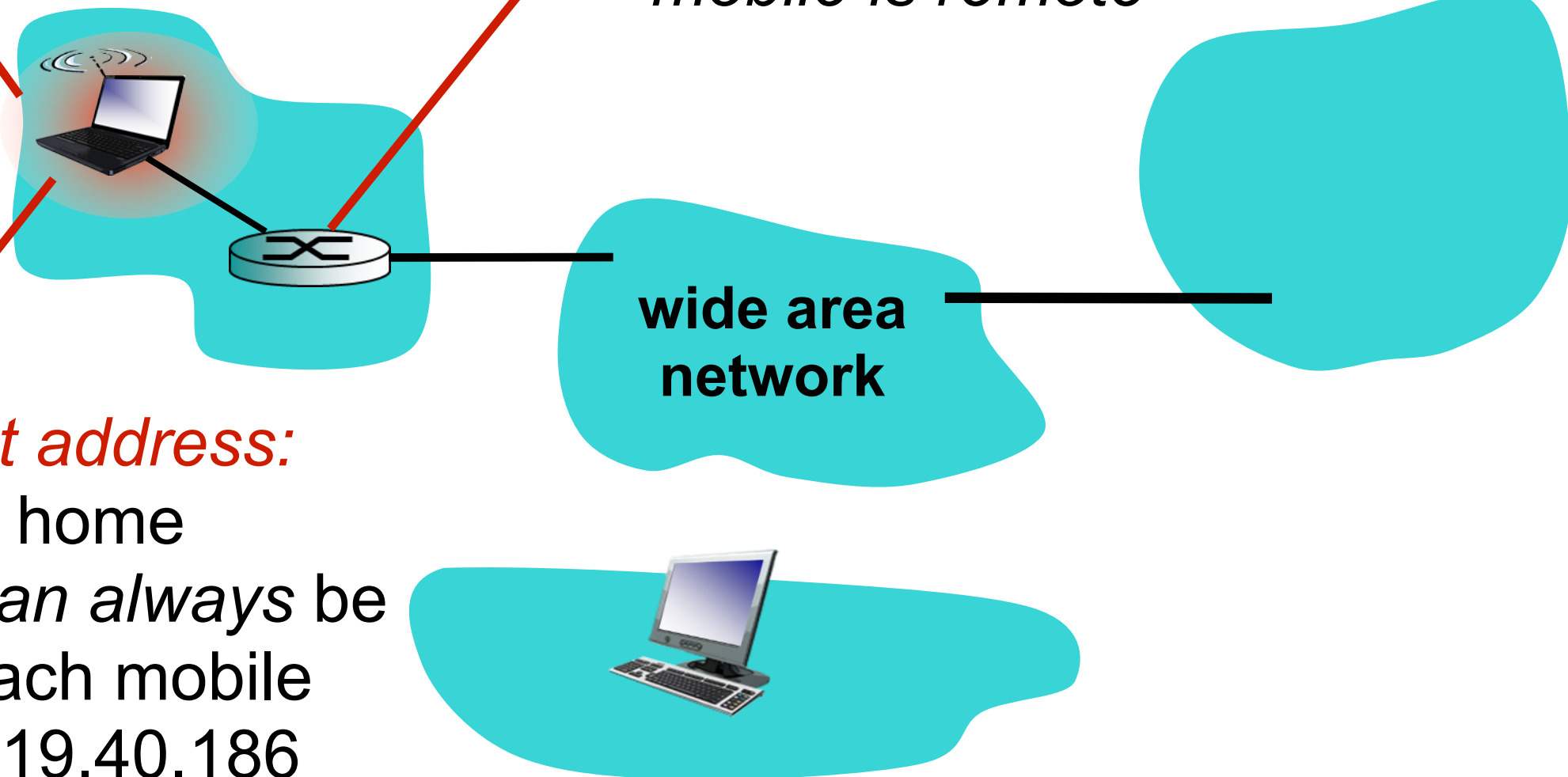


# Mobility: vocabulary

*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



# Mobility: more vocabulary

*permanent address:* remains constant (e.g., 128.119.40.186)

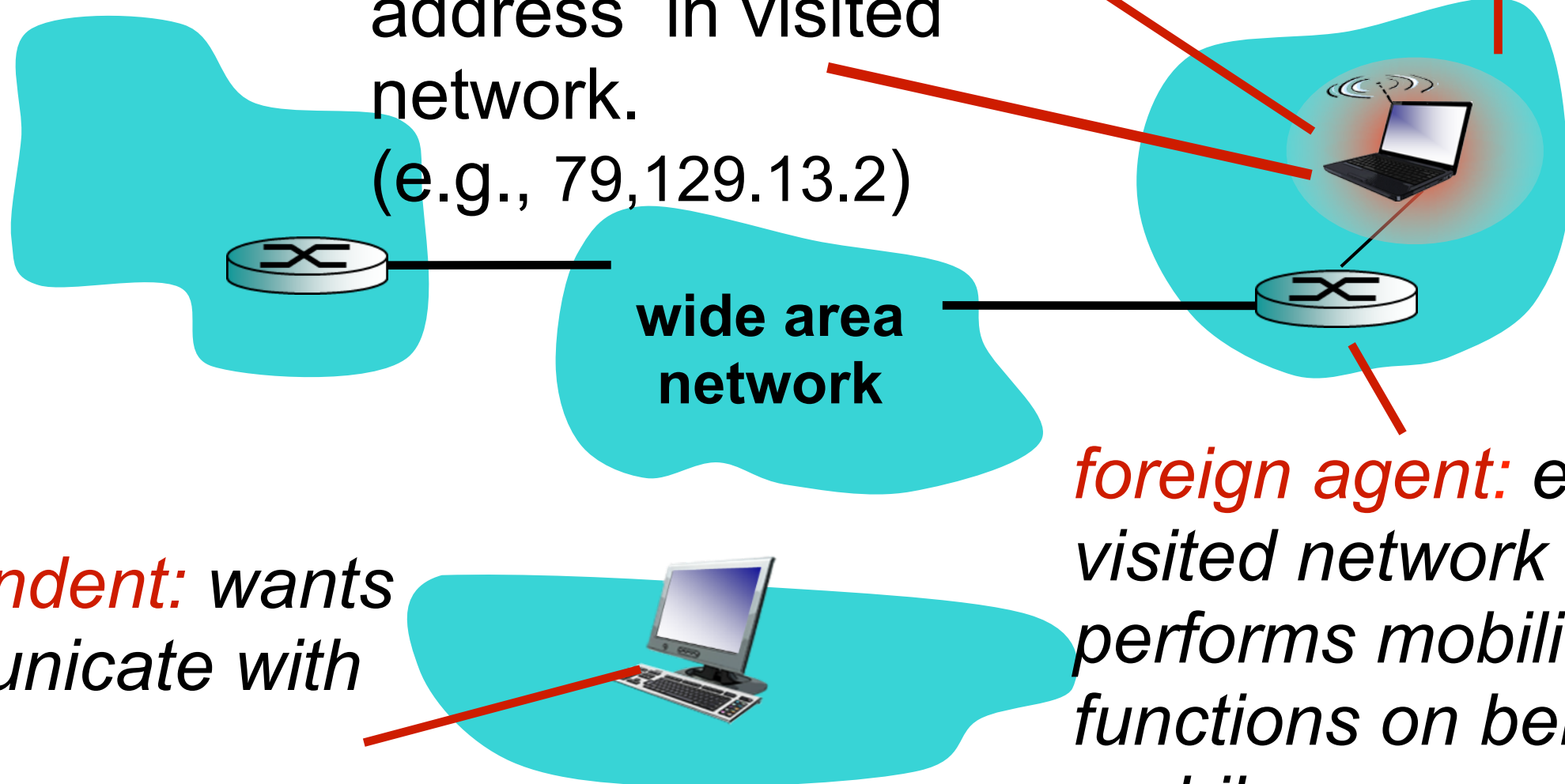
*visited network:* network in which mobile currently resides (e.g., 79.129.13/24)

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

wide area network

*correspondent:* wants to communicate with mobile

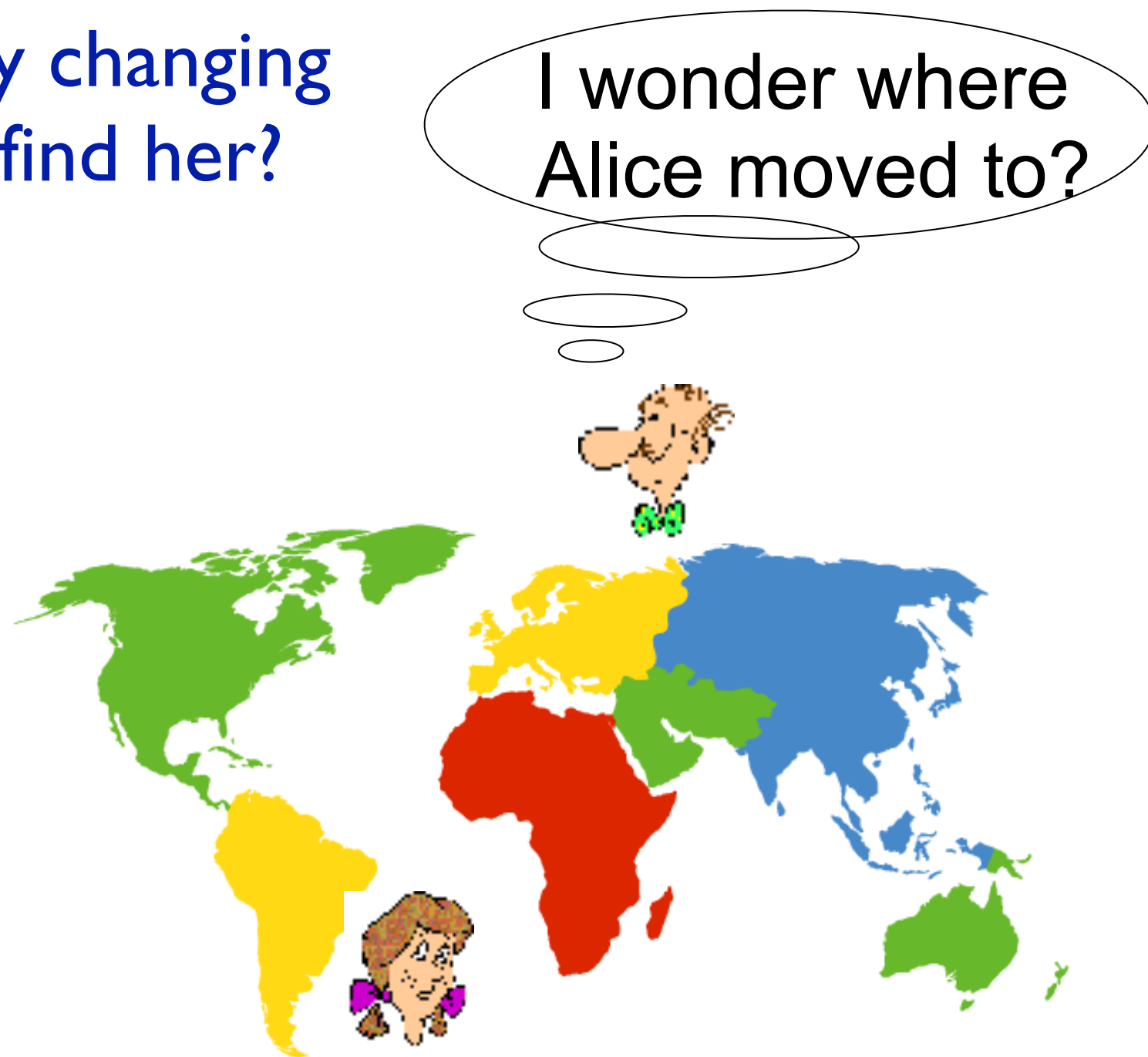
*foreign agent:* entity in visited network that performs mobility functions on behalf of mobile.



# 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



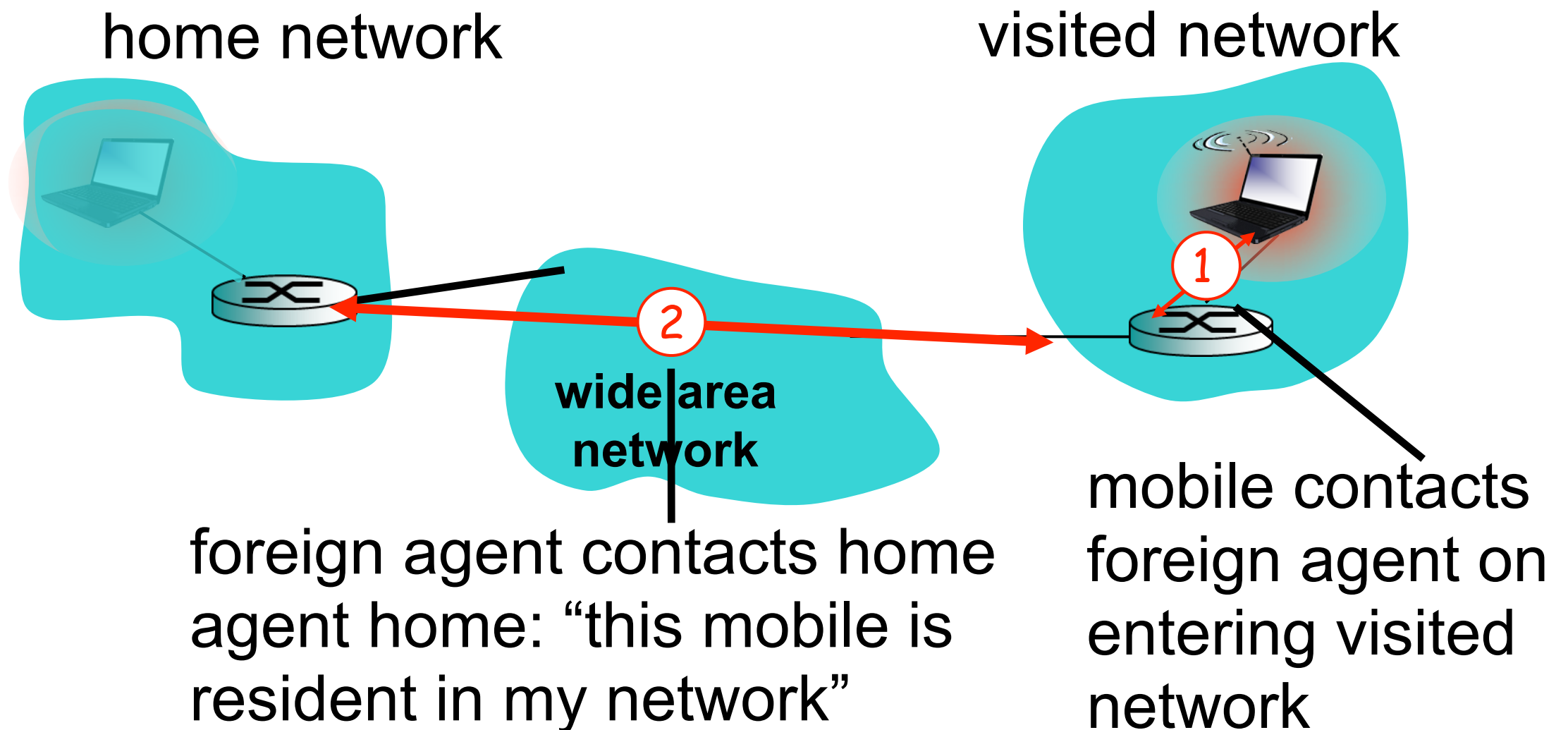
# Mobility: approaches

- *let routing handle it:* routers advertise permanent address of mobile-nodes-in-residence via usual routing table exchange.
  - routing tables indicate where mobile is 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

not  
scalable  
to millions of  
mobiles



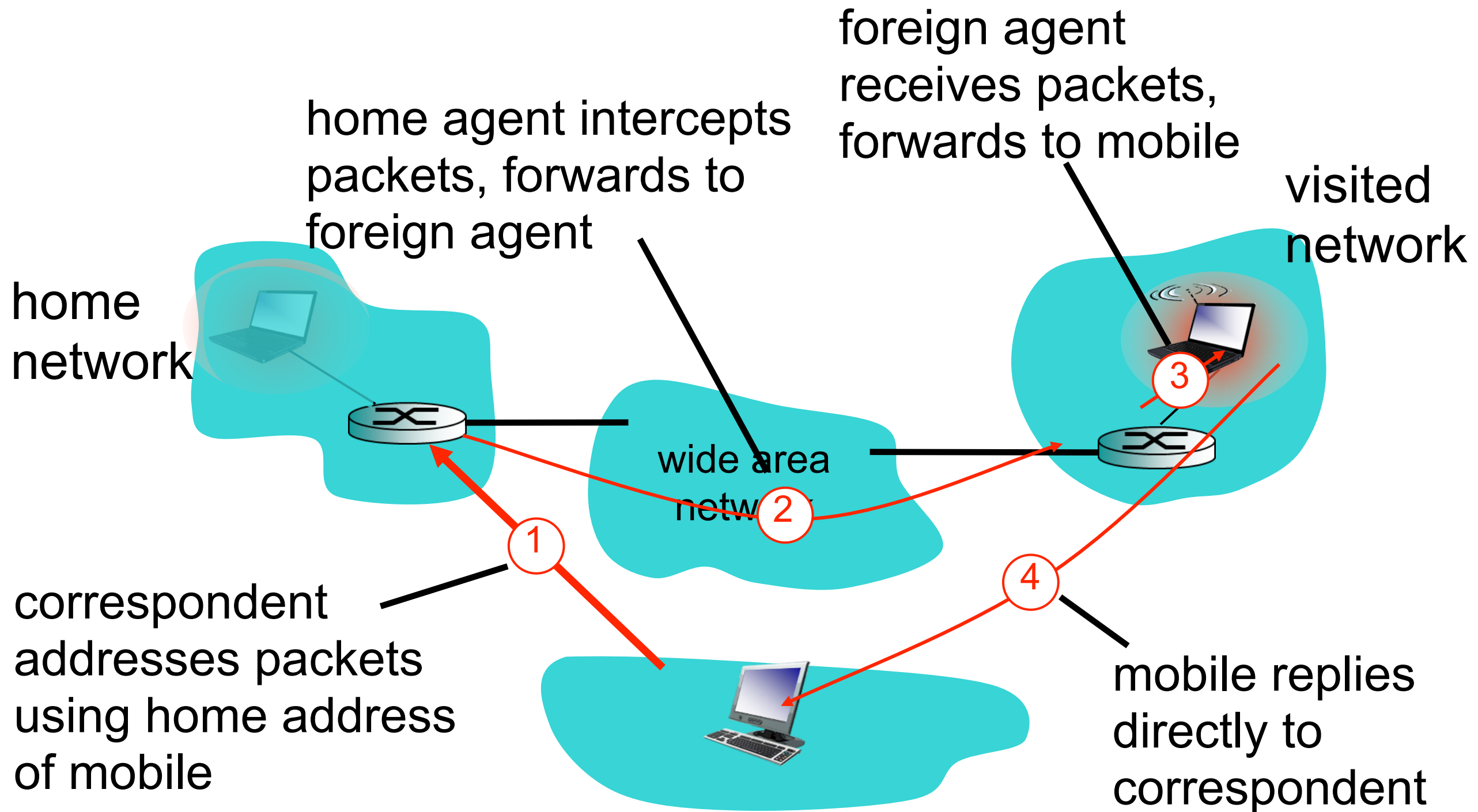
# Mobility: registration



end result:

- foreign agent knows about mobile
- home agent knows location of mobile

# Mobility via indirect routing



# Indirect Routing: comments

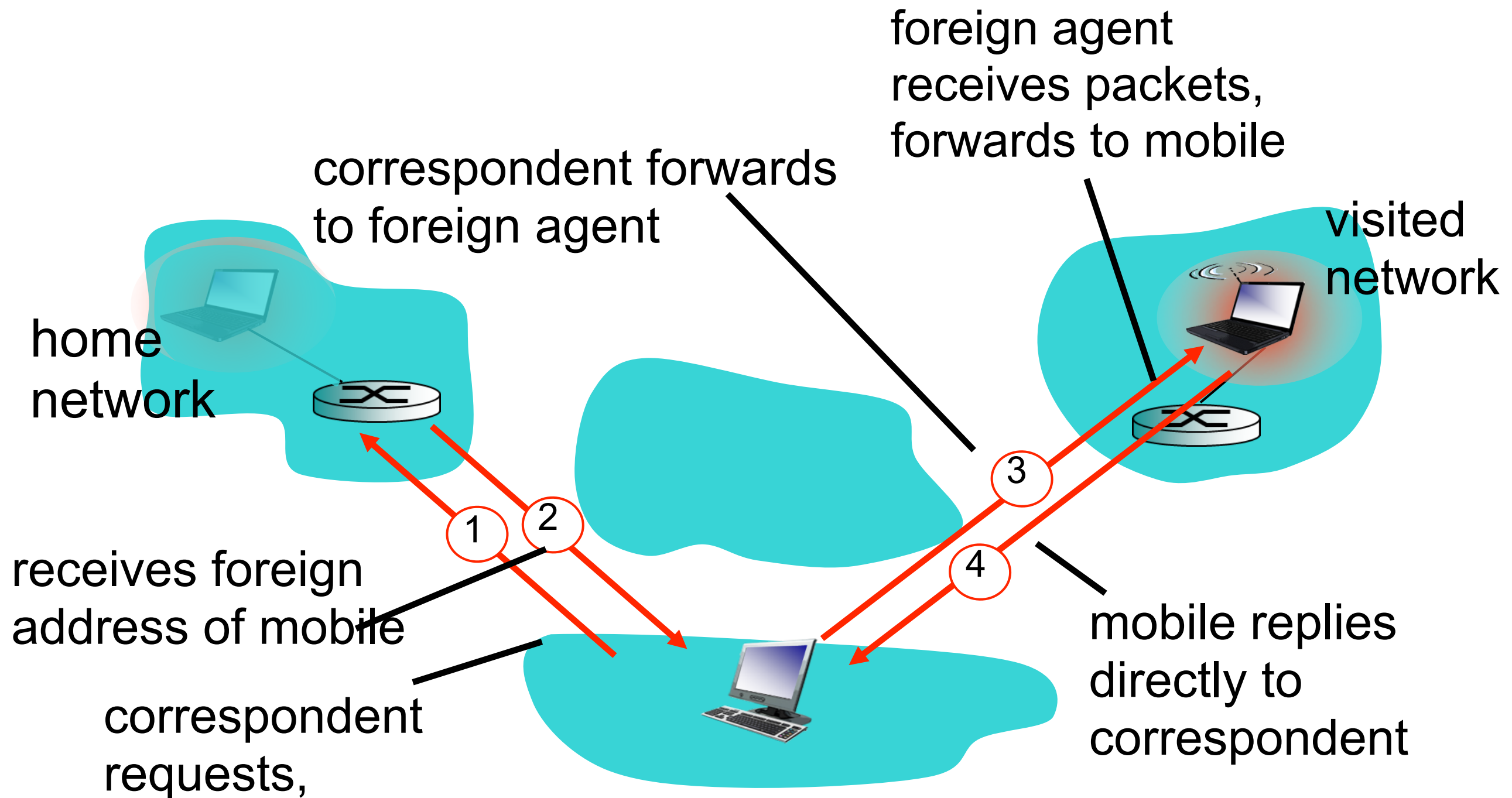
- mobile uses two addresses:
  - **permanent address**: used by correspondent (hence mobile location is *transparent* to correspondent)
  - **care-of-address**: used by home agent to forward datagrams to mobile
- foreign agent functions may be done by mobile itself
- **triangle routing**: correspondent-home-network-mobile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



# Indirect routing: moving between networks

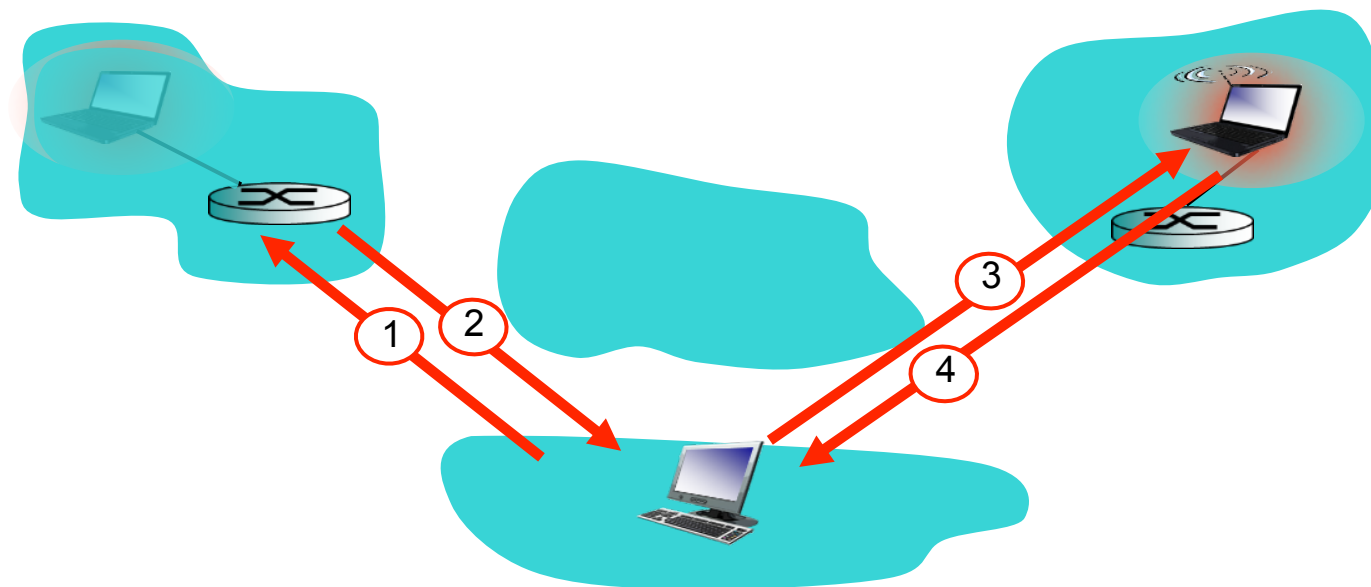
- suppose mobile user moves to another network
  - registers with new foreign agent
  - new foreign agent registers with home agent
  - home agent update care-of-address for mobile
  - packets continue to be forwarded to mobile (but with new care-of-address)
- mobility, changing foreign networks transparent: *on going connections can be maintained!*

# Mobility via direct routing



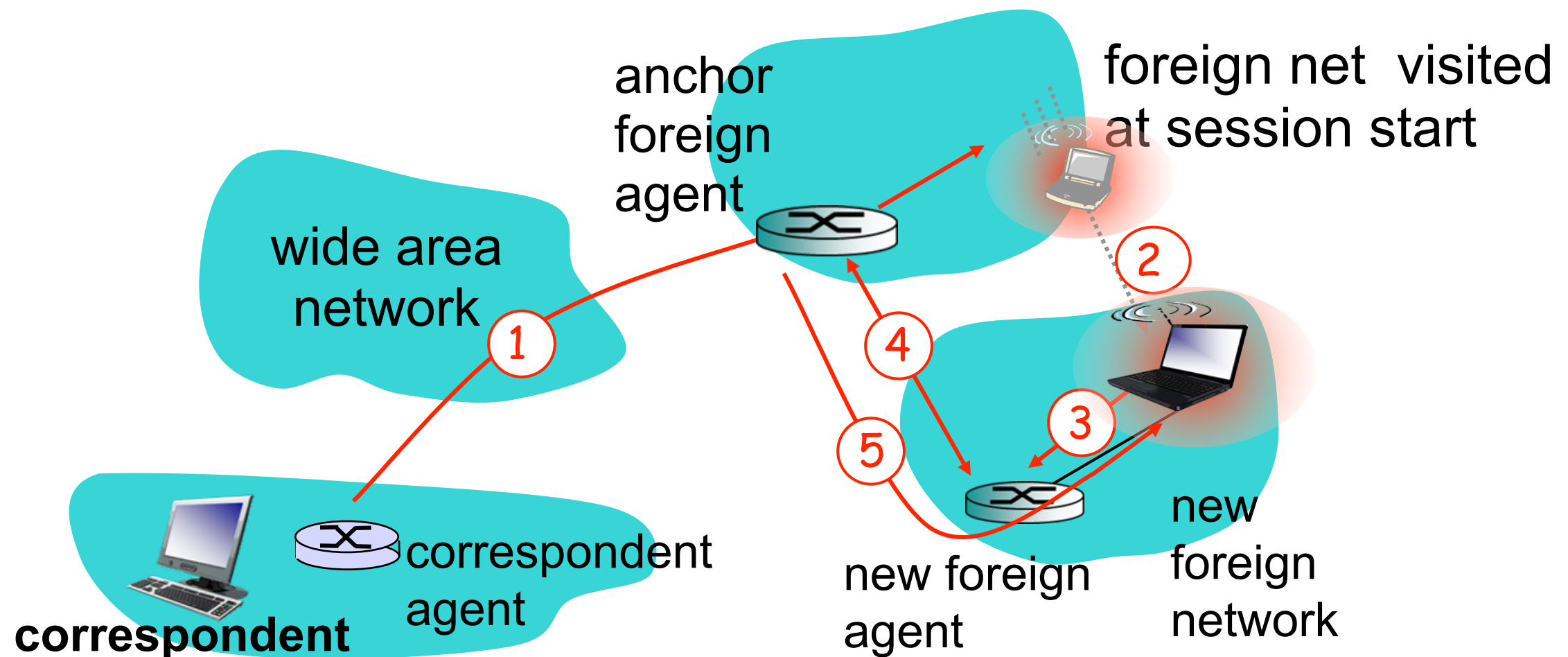
# Mobility via direct routing: comments

- overcome triangle routing problem
- *non-transparent to correspondent*: correspondent must get care-of-address from home agent
  - what if mobile changes visited network?



# Accommodating mobility with direct routing

- anchor foreign agent: FA in first visited network
- data always routed first to anchor FA
- when mobile moves: new FA arranges to have data forwarded from old FA (chaining)





# Summary

- Mobility
- Vocabulary:
  - Home network, Visited network, permanent address,
  - Home agent, Foreign agent, Care of Address, Correspondent
- Routing: Indirect and Direct