CN-Advanced
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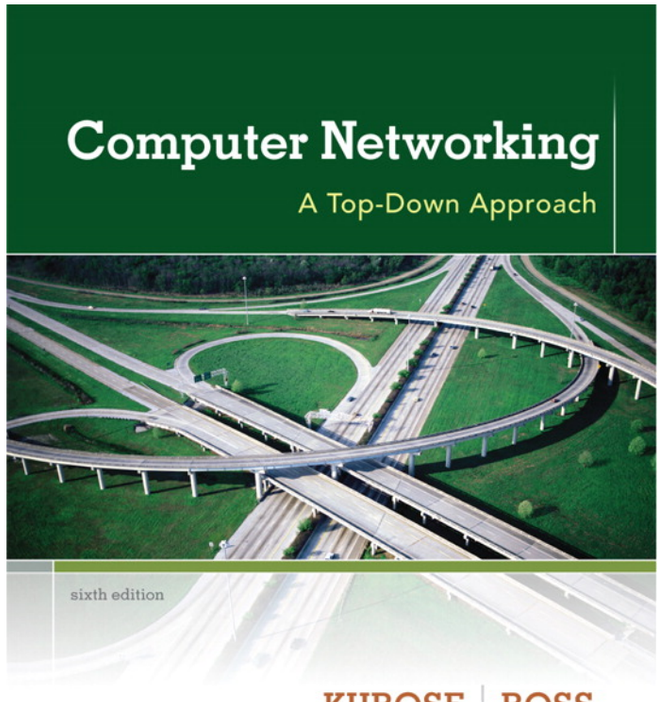
Mobility IP

Dr. Ram P Rustagi
rprustagi@ksit.edu.in
http://www.rprustagi.com
https://www.youtube.com/rprustagi

Resources Acknowledgement

Chapter 6 Wireless and Mobile Networks



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Computer Networking: A Top Down Approach
6th edition
Jim Kurose, Keith Ross
Addison-Wesley
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Mobile IP - RFC 5944

- Mobile IPv4 Requirement
  - Node should be able to change it PoA
    - Maintain (without losing) its ability to communicate
- Possible Mechanisms
  - Node may change its IP Address on PoA change, or
  - host specific route must be propagated
- Practicality
  - Both of these are often unacceptable
  - first doesn't allow transport layer to work
  - second one has scaling problem
  - needs new scalable mechanism

Mobile IP

- Protocol Requirement
  - MN must be able to communicate with others
    - when it changes is link layer PoA
    - but without changing its IP Address
  - the other node need not support mobility features
    - no protocol changes required in other node

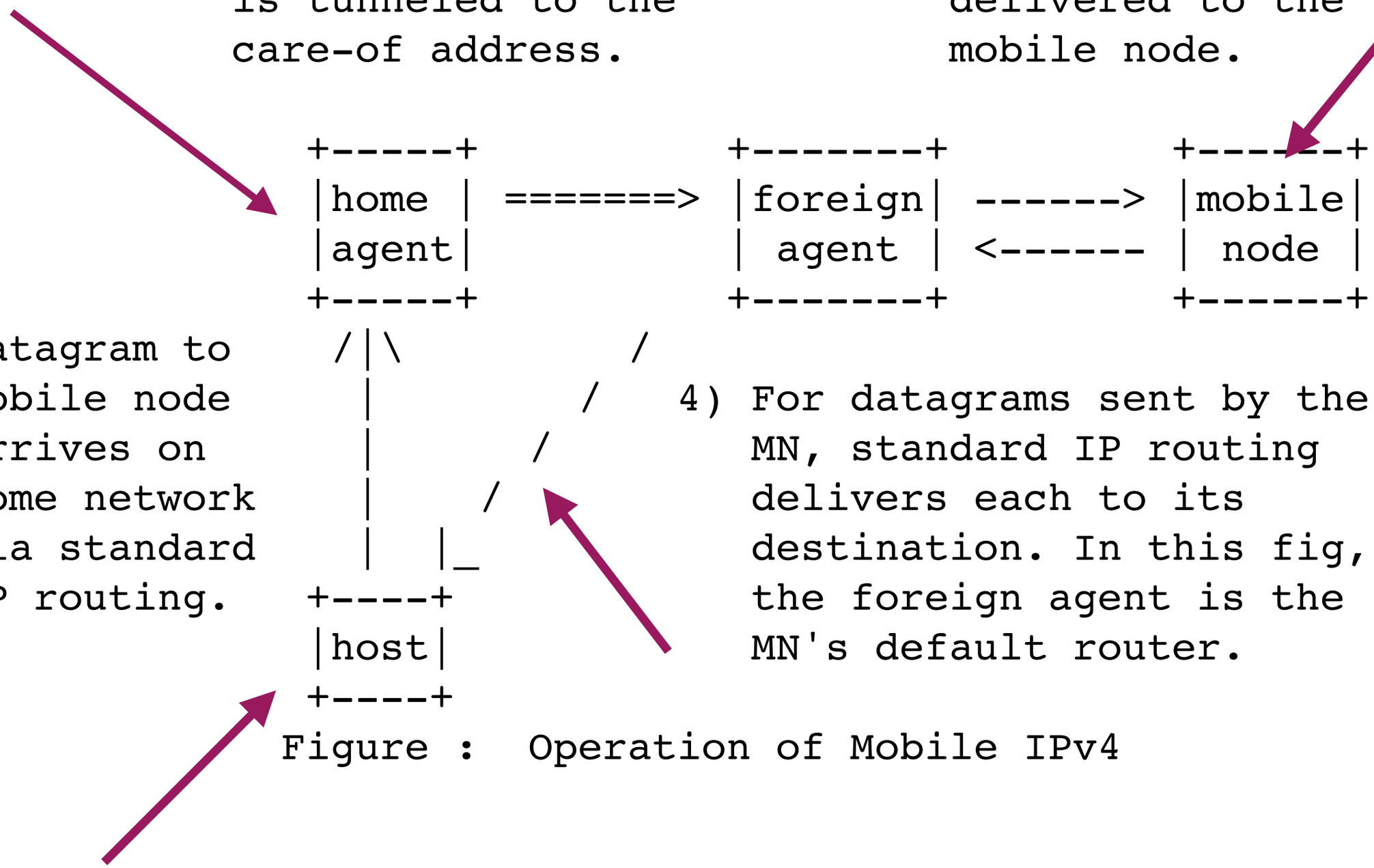
Mobile IP

- RFC 5944: IP Mobility Support (Obsoletes 3944)
- 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:
  - indirect routing of datagrams
  - agent discovery
  - registration with home agent

Mobile IP: Outline of Operation...

2) Datagram is intercepted by home agent and is tunneled to the care-of address.

3) Datagram is detunneled and delivered to the mobile node.



1) Datagram to mobile node arrives on home network via standard IP routing.

4) For datagrams sent by the MN, standard IP routing delivers each to its destination. In this fig, the foreign agent is the MN's default router.

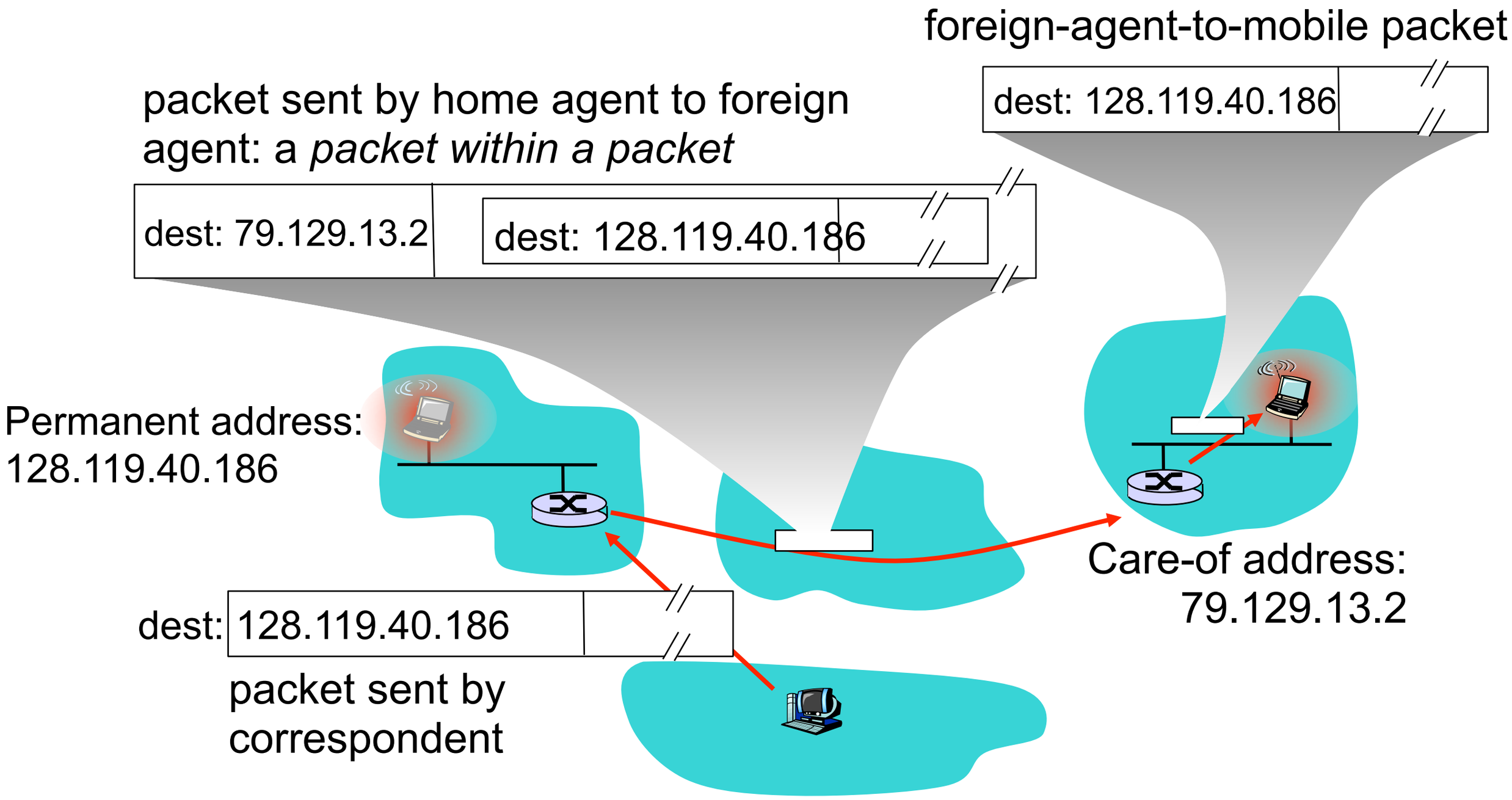
Figure : Operation of Mobile IPv4

src: RFC5944

Mobile IP: Key components

- Agent Discovery
  - defines protocols used by home or foreign agent
    - agents advertise its services to mobile users
    - mobile users can solicit these services
- Registration
  - protocols to register/de-register mobile node with home/foreign agents
- Indirect Routing
  - how to forward datagrams to mobile nodes
    - by Correspondent node to mobile node in Home N/W

Mobile IP: indirect routing



Mobile IP: Outline of Operation

- Mobility Agents advertise their presence
  - both foreign agents and home agents
  - A mobile node may solicit these advertisement msgs
- Mobile nodes decides if it is home or foreign n/w
- When Mobile node is in Home network
  - it operates without mobility services
  - when returning to Home Network
    - deregisters with Home Agent
- When Mobile node moves to foreign networks
  - obtains a CoA (Care of Address)
    - possibly by FA's Advertisement
    - by external means e.g DHCP

Mobile IP: Outline of Operation...

- MN registers its CoA with its HA
  - using registration/reply message
    - possibly via foreign agent
- Datagrams sent to MN in its home network
  - intercepted by HA
  - tunneled by HA to CoA
  - delivered to Mobile Node
- Datagrams sent by MN
  - generally sent directly to its destination
  - using standard IP routing and not via its Home Agent

Mobile IP: Outline of Operation...

- Tunnel setup between HA and CoA
- CoA
  - must be an normal IP address
  - datagrams delivered using conventional IP routing
  - extracts the original Datagram and delivers to MN
- CoA Acquisition
  - provided by FA via agent advertisement
    - it is the IP address of FA
    - FA acts as the tunnel endpoint
    - preferred mechanism
      - does not cause additional IP address requirement

Mobile IP: Outline of Operation...

- CoA Acquisition...
  - Co-Located CoA
    - Acquired by MN itself through external means
      - may be acquired thru DHCP
    - MN associates it with its network interface
    - MN serves as the tunnel end point
  - Advantages of Co-located CoA
    - Does not need Foreign Agent
  - disadvantages
    - foreign network needs additional network addresses
      - to be assigned to visiting mobile nodes

Mobile IP: Outline of Operation...

- Distinction between FA and CoA
  - CoA is end of Tunnel
  - FA is mobility agent that provides services to MN
- Functionality of HA
  - ability to intercept datagrams meant for HA
  - using proxy and gratuitous ARP
  - should have n/w interface on the home addr of MN

Summary

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