MOBILE IP

Why MOBILE IP is needed ?

1. Mobile IP is enhancement to IP which allows a computer to roam fully on the internet while still maintaining the same IP address.
2. The applications feel that the mobile computer is connected to its usual IP address even if it is far away from its home network.

The problem with IP ?

1.An IP address is associated with a fixed network location.

2.When we go to office, university or workplace and access the internet from a fixed IP address. This IP address may be for a desktop or laptop computer.

3.In IP, if we take computer to a different place, outside our usual network we have to reconfigure it with a new IP.

Two Addresses in Mobile IP

1. Home address-The host had its original address, called the Home Address.It is associated with the home network.

2. Care of address-The temporary address of the host is called as Care of Address. It is associated with the foreign network.

The mobile node gets a new care-of address every time it connects to a new point of attachment.

Home Agent & Home Network

1.The home network contains a network node called Home Agent. The home address of the mobile node is the IP address of the home agent.

2.The home agent is responsible for receiving all the packets sent to the mobile node when the mobile node is away.

3.It is the responsibility of the home agent to deliver the packets to the mobile node at its current point of attachment

Foreign Agent and Foreign Network

1. When a mobile node moves, it first connects to a foreign agent in a foreign network.

2. Next, the mobile node is assigned a care-of address (an IP address) by the foreign network.

3. The node now registers its care-of address with the home agent.

4.The foreign agent is usually a router attached to the foreign network.

5.The foreign agent recieves and delivers packets sent by the home agent to the mobile hosts.

6.When the mobile host acts as a foreign agent the care -of address is called as co-located care of address

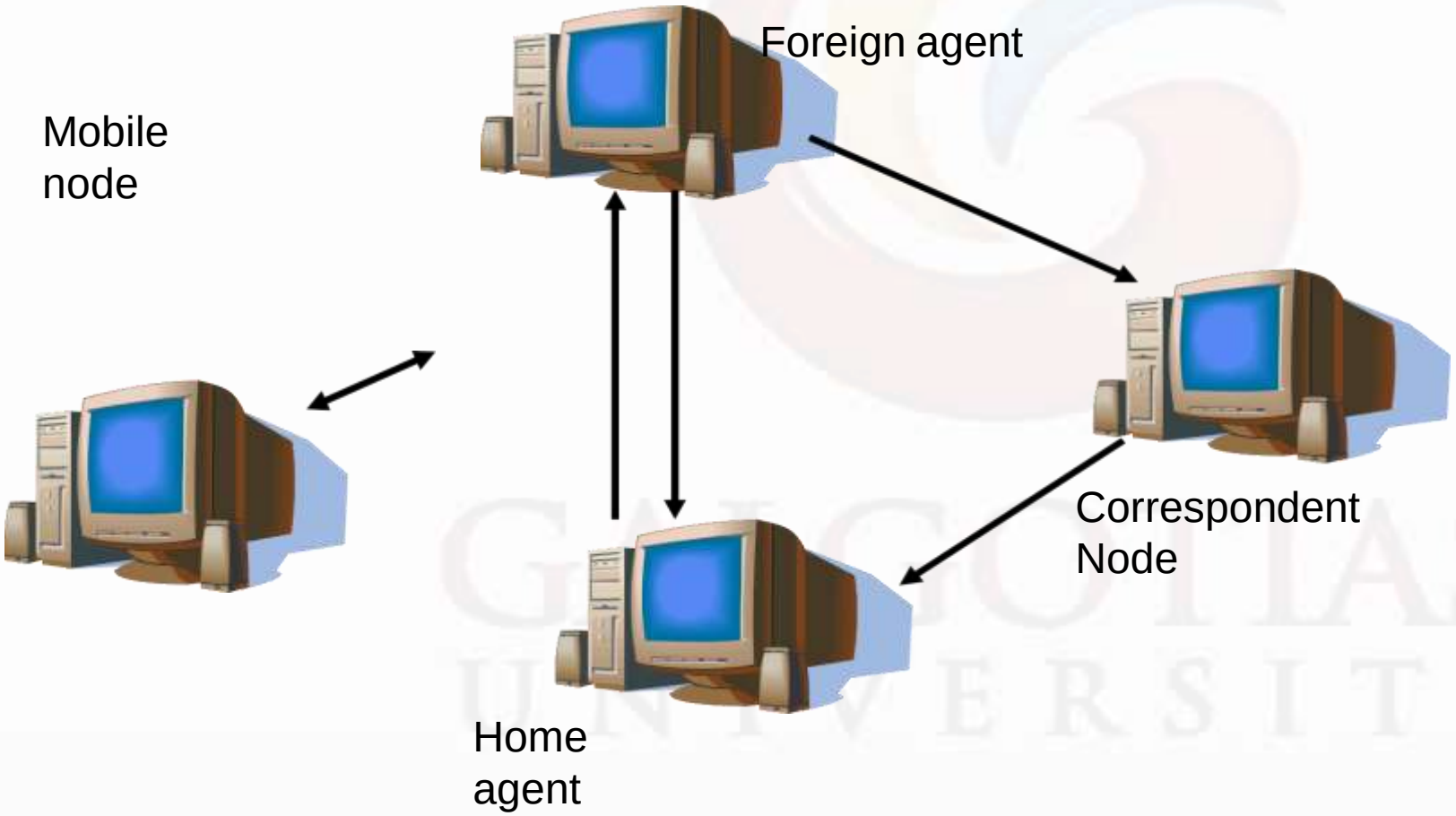
Correspondent Node

1.A correspondent node is a computer that sends packets to the mobile node. A correspondent node is typically connected to its own home network

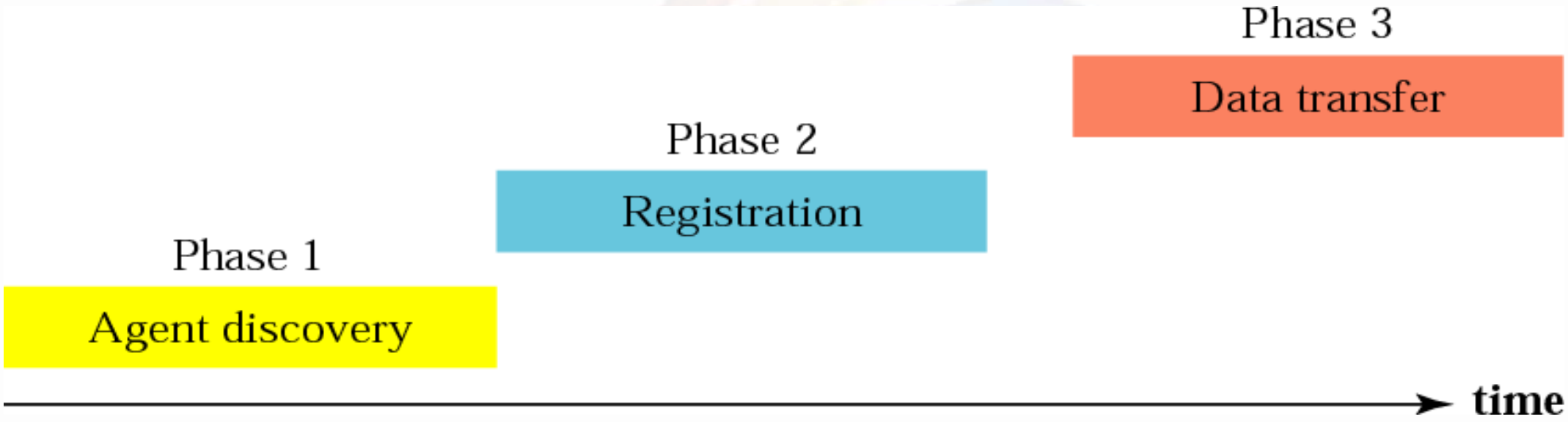
2.A correspondent node is aware of only the IP address of the mobile node in the home network of the mobile node

3.Any packet from the correspondent node is delivered to the home agent

A Schematic Diagram of Mobile IP



The Phases



1st phase: Discovering the care-of Address

1.In mobile IP, both a foreign agent and a home agent periodically broadcast agent advertisement messages

2.A mobile host must discover(learn the address of) a home agent before it leaves the home agent.

3.A mobile host must also discover a foreign agent after it moved to a foreign network.

Agent Advertisement

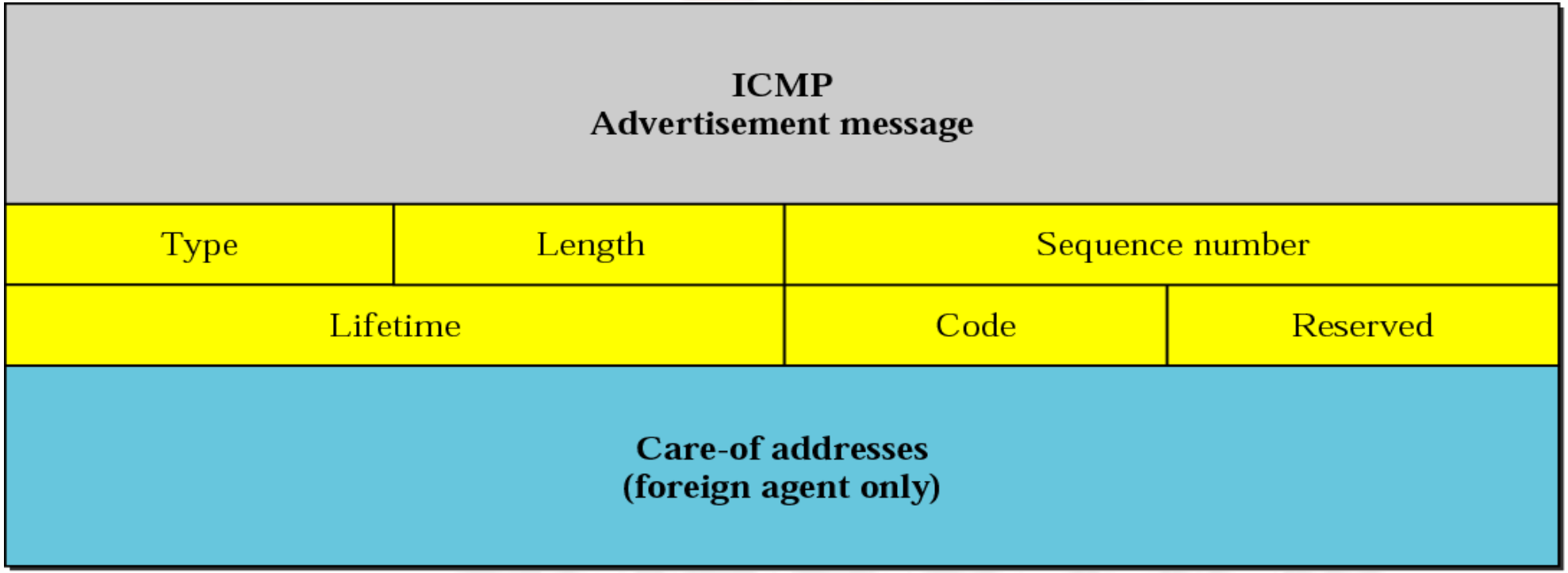
An agent advertisement has the functions

1.It allows mobile nodes to discover foreign agents and get care-of addresses.

2.It allows the mobile node to know the services provided by the foreign agent.

3.It allows the mobile node to determine whether an agent is its home agent or a foreign agent

Agent Advertisement



Solicitation from a Mobile Node

1.When an mobile host has moved to a new network and has not recieved agent advertisements,it can initiate an agent solicitation.

2.A mobile node can generate agent solicitation messages when it is looking for a foreign agent.

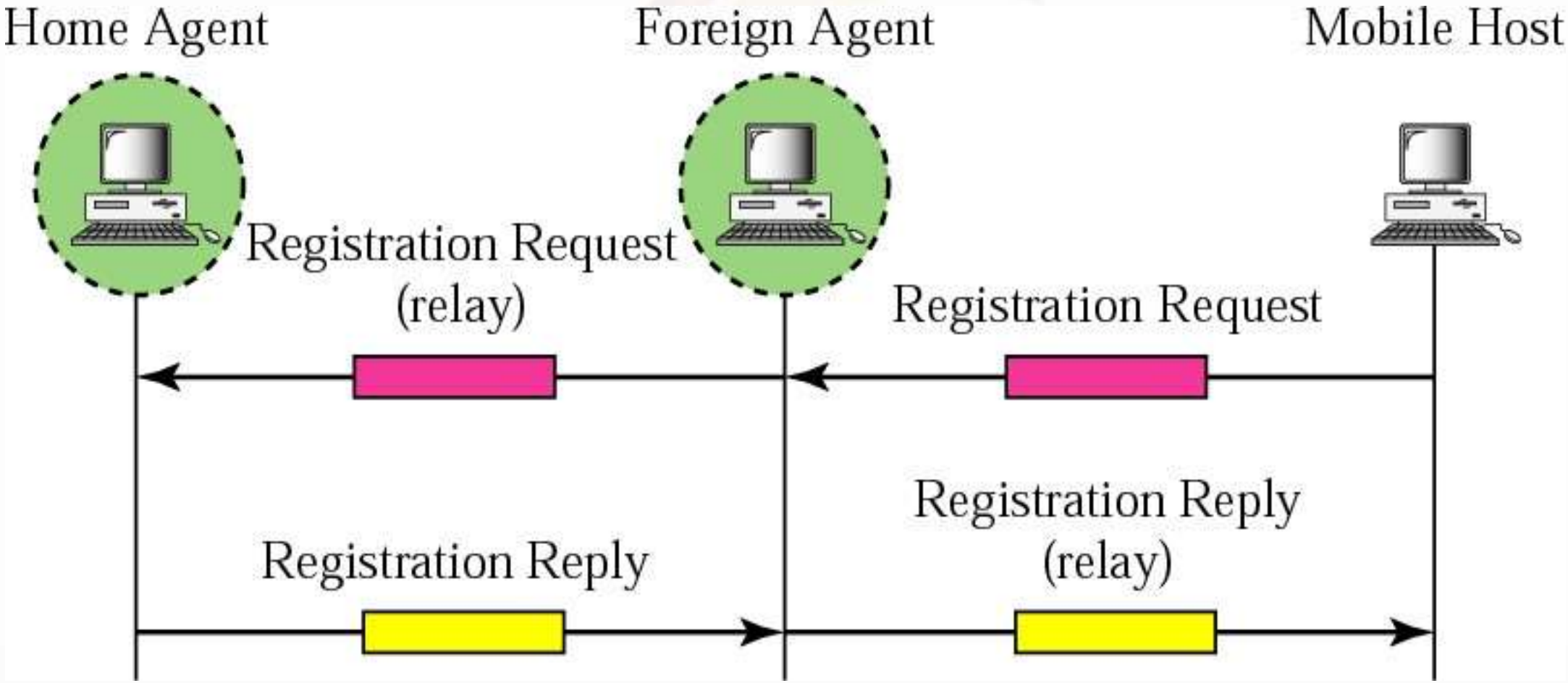
2nd phase: Registration

1.When a mobile node receives a care-of address from a foreign agent, its home agent needs to be informed.

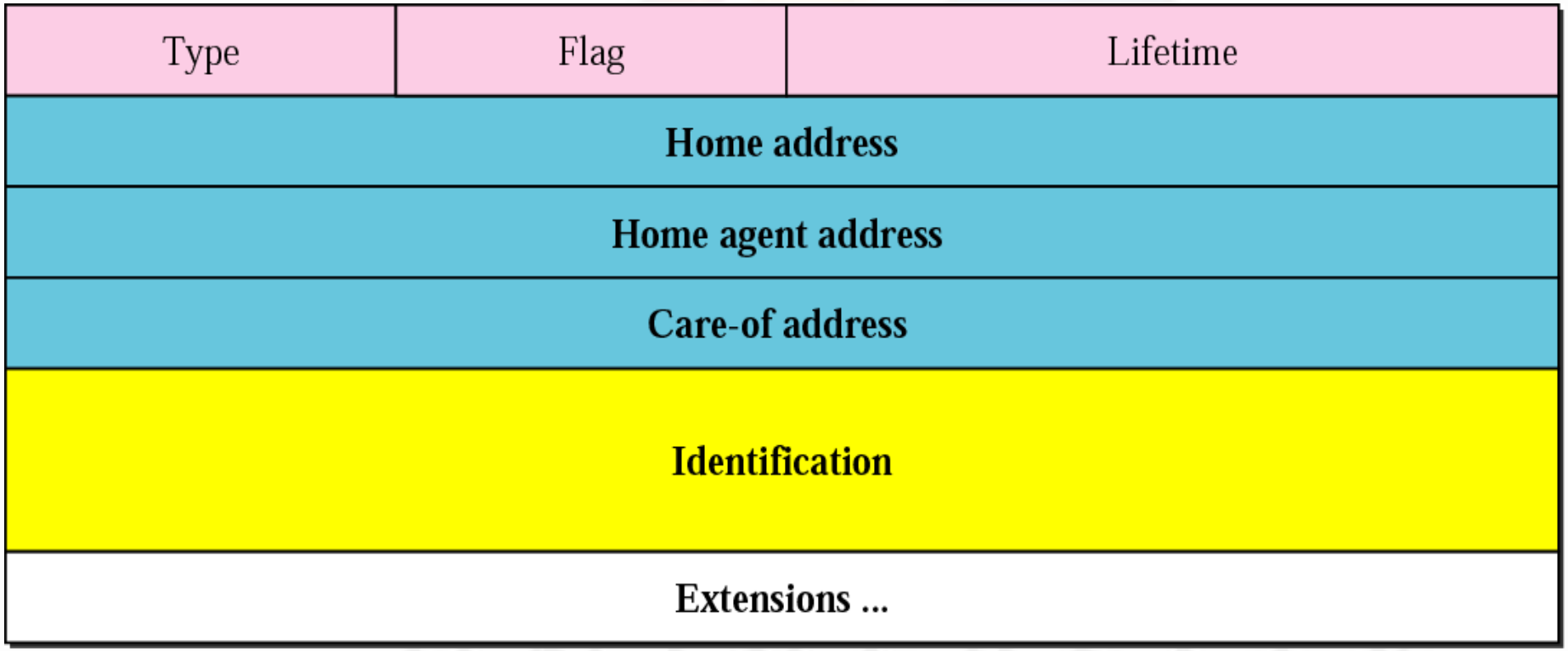
2.The mobile node sends a registration request to its home agent through the foreign agent who has provided the new care-of address.

3.When the home agent receives the request, it updates its routing table and sends a registration reply back to the foreign agent.

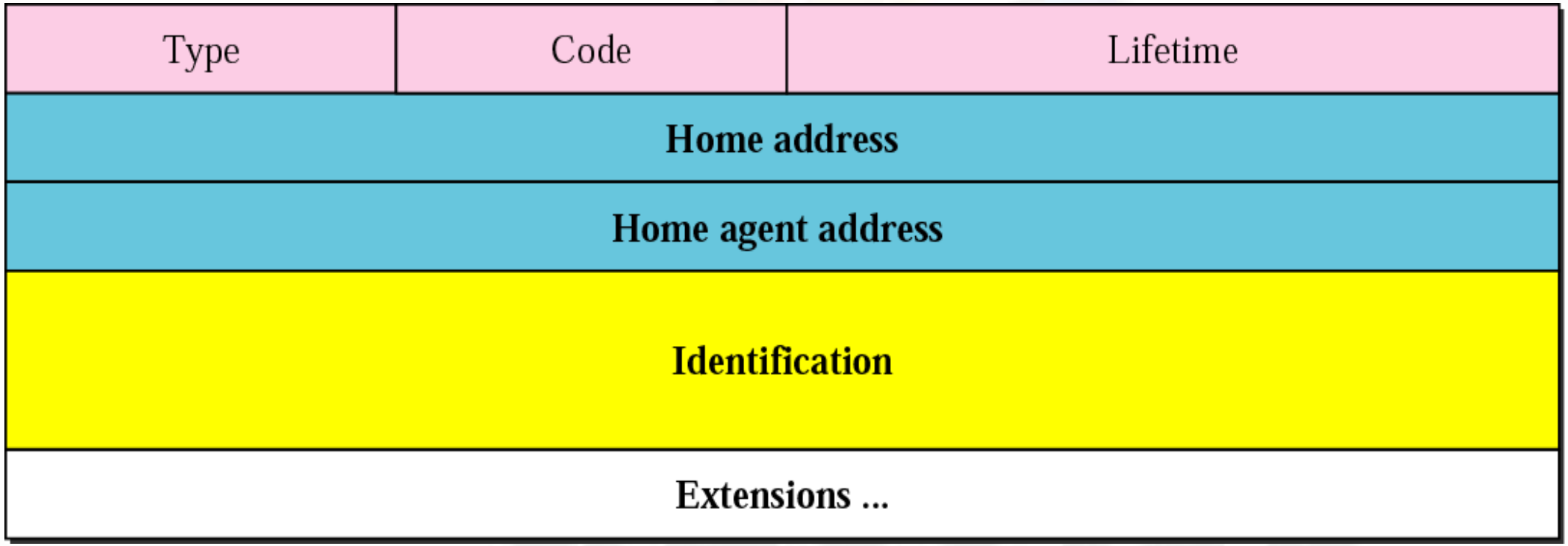
Registration Request and Reply



Registration request format



Registration reply format



3rd phase: Data Transfer

1. When a remote host wants to send a packet to the mobile host, it uses its address as the source address and the home address of the mobile host as the destination address .

2. After receiving the packet , the home agent sends the packet to the foreign agent . The home agent encapsulates the whole IP packet inside another IP packet using its address as the source and the foreign agent's as the destination address.

4.When the foreign agent recieves the packet ,it removes the original packet. Since the destination address is the home address of the mobile host ,the foreign agent consults a registry table to find the care of address.

5.When a mobile host wants to send a packet to a remote host, it sends as it done normally. The mobile host prepares a packet with its home address as the source and the address of the remote host as the destination.

Tunneling and IP within IP

1. The transfer of the packet from the home agent to the care-of address is called tunneling.

2. The home agent is the source of the tunnel. The home agent inserts a new tunnel header in front of the IP header of a packet addressed to the mobile agent and received by the home agent

3. The tunnel header is the care-of IP address of the mobile node. The old header is preserved as it was in the original packet.

4. The foreign agent is the receiver of the tunnel

5 .When the foreign agent receives the tunneled packet, it has to delete the tunnel header to recover the original packet.

6.The foreign agent delivers the packet to the mobile node after removing the tunnel header

REFERENCES

1. TCP/IP PROTOCOL SUITE by Behrouz A. Fourouzan
2. Mobile Communication by Jochen Schiller

Thank You