Mobile IP Extensions

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Mobile IP: Terminology

- **Mobile Node (MN):** A host or router that may change its point of attachment from one network or subnetwork to another through the internet. Has a pre-assigned fixed home address on a home network.

- **Home Agent (HA):** A router that maintains a list of registered mobile nodes in a visitor list. It is used to forward mobile node-addressed packets to the appropriate local network when the mobile nodes are away from home.

- **Foreign Agent (FA):** A router that assists a locally reachable mobile node that is away from its home network. It delivers information between the mobile node and the home agent.

- **Care-of-address (COA)**

- **Tunnel:** The path which is taken by encapsulated packets. It is the path which leads packets from the home agent to the foreign agent.
Mobile IP Overview

Network B
(Net Addr. = 128.6.5.0, Net Mask = 255.255.255.0)

Network A
(Net Addr. = 128.226.3.0, Net Mask = 255.255.255.224)
Mobile IP: How it works

The HA Intercept the Packets Send by the CH Destined to the MH

Direct Tunneling between the CH and the FA

Internet

Router 1

Router 2

Home Network

Foreign Network

The HA Encapsulates and Transmits the New Packets to the FA

Home Agent

Foreign Agent

Correspondent Host

Mobile Host

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Tunneling in Mobile IP

[Diagram showing the process of tunneling in Mobile IP, including Home agent, Foreign agent, and Mobile mode.]
Tunneling Enhancement: Minimal Encapsulation

• IP in IP Encapsulation adds a new IP Header to the encapsulated packet which is at least 20 octets

• Minimal Encapsulation adds a Minimal Forwarding Header which is 8 to 12 octets
Minimal Forwarding Header

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<tr>
<th>Protocol</th>
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<th>reserved</th>
<th>Header Checksum</th>
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<td>Original Destination Address</td>
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<td>(if present) Original Source Address</td>
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Minimum Encapsulation Tunneling: Implementation in Linux

- Implemented as a Loadable Kernel Module
- Uses a virtual interface to create a tunnel between two hosts
- Modifies routing table to send packets to the other end of the tunnel through the virtual interface
- Packets transmitted through the virtual interface undergo minimum encapsulation
- The other end of the tunnel does decapsulation on receiving minimally encapsulated packets
- Can be used to implement the home agent and foreign agent functionality in Mobile IP