

Overview of Mobile IP:

Mobile IP (MIP) is a protocol that enables mobile devices, such as smartphones and tablets, to maintain a consistent IP address as they move between different networks. It is a protocol that allows for transparent routing of IP datagrams to mobile nodes in spite of changes to their location. Mobile IP provides a way for a mobile device to stay connected to the internet while moving from one network to another.

Mobile IP works by assigning a unique IP address to each mobile device and linking that IP address to the device's home network. When a mobile device moves to a new network, its IP address remains the same, but the device's "care-of" address changes to reflect its current location. The mobile device then registers its current care-of address with a Home Agent, which is a network device that tracks the mobile device's location and forwards its packets to its current care-of address.

Mobile IP operates at the network layer of the OSI model and is compatible with both IPv4 and IPv6. It is used primarily in wireless networks, where mobile devices frequently move between different access points or cellular towers.

Mobile IP can be used to support a wide range of applications, including VoIP, video conferencing, and mobile messaging. By enabling mobile devices to maintain a consistent IP address, Mobile IP allows for seamless communication between devices and applications, regardless of the device's physical location.

Features of Mobile IP:

1. Transparent mobility: MIP enables mobile devices to maintain network connectivity while moving between different networks, without the need to reestablish network connections or

change IP addresses.

2. Location independence: MIP enables mobile devices to be assigned a unique IP address that is independent of their physical location, allowing them to communicate with other devices over the internet regardless of their current network.
3. Home network registration: Mobile devices register with their home network, which is responsible for tracking the device's current location and forwarding packets to its current care-of address.
4. Care-of address: A care-of address is a temporary address that is assigned to a mobile device when it moves to a new network. The care-of address is used to route packets to the device's current location.
5. Home Agent: A Home Agent is a network device that is responsible for forwarding packets to a mobile device's current care-of address, based on information received from the device's home network.
6. Foreign Agent: A Foreign Agent is a network device that is responsible for assigning a care-of address to a mobile device that is visiting its network.
7. Compatibility with IPv4 and IPv6: MIP is compatible with both IPv4 and IPv6, allowing it to support a wide range of mobile devices and applications.

Key Mechanism in Mobile IP:

1. Home network registration: When a mobile device connects to a network for the first time, it registers with its home network, which assigns it a unique IP address. The home network

maintains a record of the device's IP address and tracks its current location.

2. Care-of address: When a mobile device moves to a new network, it is assigned a temporary address known as a care-of address. The care-of address is used to route packets to the mobile device's current location.

3. Agent discovery: To enable communication between the mobile device and its home network, the mobile device must discover the Home Agent that is responsible for forwarding packets to its current care-of address. The mobile device discovers the Home Agent through a process of agent discovery, which involves sending discovery packets to the network and receiving responses from available agents.

4. Tunneling: To enable communication between the mobile device and its home network, the Home Agent tunnels packets to the mobile device's current care-of address. This involves encapsulating the packets in a new packet that contains the mobile device's care-of address, and forwarding it to the current network.

5. Reverse tunneling: When a mobile device initiates a connection with a remote device, the Home Agent establishes a reverse tunnel to the mobile device's current care-of address. This enables packets from the remote device to be forwarded to the mobile device, even if it has moved to a new network.

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