Mobile IP:

Goals: Mobile IP aims to enable seamless communication for mobile devices as they move between different networks while maintaining their IP address and ongoing connections.
Assumptions and Requirements: Mobile IP assumes that mobile devices change their point of attachment to the network frequently and require continuous connectivity. Requirements include transparent mobility, minimal disruption to ongoing communications, and efficient use of network resources.
Entities and Terminology:
Mobile Node (MN): A mobile device that moves between different networks.
Home Agent (HA): A router in the home network of the mobile node that maintains its permanent IP address.
Foreign Agent (FA): A router in a foreign network visited by the mobile node, which assists in forwarding packets to and from the mobile node.
Care-of Address (CoA): The temporary IP address assigned to the mobile node in the foreign network.
IP Packet Delivery: Mobile IP ensures that IP packets destined for the mobile node are correctly routed to its

current location, either through direct routing or tunneling.

Agent Discovery: The mobile node discovers the presence of foreign agents in the visited network using various mechanisms such as ICMP Router Discovery or DHCP options.

Registration: When the mobile node moves to a foreign network, it registers its current location (care-of address) with its home agent using the Mobile IP registration protocol.

Tunneling and Encapsulation: To ensure packet delivery to the mobile node's current location, packets destined for the mobile node are encapsulated and tunneled from the home agent to the care-of address.

Optimizations: Various optimizations such as triangular routing and direct routing can reduce the latency and overhead associated with Mobile IP handovers.

Reverse Tunneling: Allows the mobile node to initiate communication with a correspondent node by tunneling packets through its home agent, even if the correspondent node does not support Mobile IP.

IPv6: Mobile IPv6 is an extension of Mobile IP that supports IPv6 addresses and offers improvements over Mobile IPv4, including simplified mobility management and

enhanced security.

Dynamic Host Configuration Protocol (DHCP): DHCP is used to assign IP addresses and network configuration parameters to mobile nodes when they attach to a network. DHCP extensions such as DHCPv6 are used in Mobile IPv6 deployments to facilitate address assignment and configuration.