**IP Mobility support for IPv4, revised**

**Abstract**

* Transparent routing of IP datagrams to mobile nodes
* Mobile nodes(MN) 🡪 identified by home address
  + Away from home 🡪 care of address (COA)
* Home Agent (HA)
  + Sends datagrams destined for MN through tunnel to the COA.

1. **Introduction**

A node ‘s IP address 🡪 uniquely identifies its attachment to the internet.

Mobile IP = way to provide node mobility while keeping the node’s IP address

* 1. **Protocol requirements**
* MN must be able to keep communicating while changing its link-layer attachment point to the internet 🡪 no change of MN’s IP address
* No protocol enhancements are needed
* All messages relating updates of the location of a MN must be authenticated (not required for this project)
  1. **Goals**
* Number of administrative messages (sent over a possible wireless link which connects the MN) must be kept to a minimum
* Message size must be as small as possible
  1. **Assumptions**
* Assignment of the MN’s IP address is not constraint by this RFC
* MN will not change their attachment point to the Internet more than once per second
* IP unicast datagrams are routed based on the DEST address in the datagram header (aka not by the SRC address)
  1. **Applicability**
* Mobile IP 🡪 enables nodes to move from one IP subnet to another, Ethernet segment to wireless LAN etc.

🡺 **MN’s IP address must be the same after the movement**

* Mobile IP 🡪 solves macro mobility management
  1. **New architectural entities**
* Mobile node (MN)
  + Host/router that changes it point of attachment from 1 network/subnetwork to another
  + Can change location without changing its IP address
  + Continues communication at different locations using its CONSTANT IP address
* Home agent (HA)
  + Router of the MN’s home network
  + Tunnels datagrams for delivery to the MN (when the MN is not @ home)
  + Maintains current location information of the MN
* Foreign agent (FA)
  + Router of the MN’s visited network
  + Provides routing services when the MN is registered
  + Detunnels and delivers the MN’s datagrams (which were sent through the tunnel coming from the MN’s HA)
  + When MN sends a datagram 🡪 FA functions as default router for the registered MN’s.

MN

🡪 has a long term IP address (given by home network)

🡪 administered same as a permanent IP address provided to a stationary host

🡪 if MN is away from home 🡺 care of address (COA)

🡪 uses its home address as SRC address for **all** sent IP datagrams, except for certain mobility management functions (see section 3.6.1.1)

COA is associated with a MN, reflects MN’s current point of attachment­

* 1. **Terminology**

key words like MUST, SHOULD etc. 🡺 see RFC 2119

* Agent advertisement
  + - Constructed by adding an extension to the Router Advertisement message (see RFC 1256)
* Authentication
  + - The verification of the identity of the originator of the message
    - Not required for this project
* Care-of address (COA)
  + - Tunnel termination point towards the MN, datagrams which were forwarded when MN is away from home
    - 2 types:
      * FA care-of address:
        + Address of the current FA with which the MN is currently registered
      * Co-located care-of address:
        + Externally obtained local address
        + Not required for this project
* Correspondent Node (CN)
  + - Peer with which the MN communicates
    - Mobile / stationary
* Foreign network
  + - Any network which is not the MN’s home network
* ~~Gratuitous ARP~~
  + - ~~ARP packet sent by a node in order to update other nodes their ARP caches 🡪 see section 4.6~~
    - ~~Not required for the project~~
* Home address
  + - IP address which is assigned to the MN for an extended period of time
    - **Remains unchanged regardless the MN’s current location**
* Home network
  + - Network (possibly virtual) with the same network prefix as the MN’s home address
    - Standard IP routing mechanisms will deliver datagrams (with destination the MN) to the MN’s home network
* Link
  + - Facility/medium which enables node communication @ link layer
    - Under the network layer
* Link layer address
  + - Identifies an endpoint of some communication over a physical link
    - Typically an interface’s MAC address
* Mobility agent
  + - Home agent OR foreign agent
* Mobility binding
  + - Association of a home address with the COA
    - Also contains the remaining lifetime of that binding
* Node
  + - Host OR router
* Nonce
  + - Random chosen value
    - Different from previous choices
    - Inserted in a message
* Tunnel
  + - The followed path of an encapsulated datagram
    - Datagram is routed to a decapsulator 🡺 decapsulation + delivered to the correct destination
* Virtual network
  + - No physical instantiation beyond a router
    - Router (HA) advertises reachability to the virtual network using conventional routing protocols
* Visited network
  + - Network different than the home network
    - Currently connected to the MN
* Visitor list
  + - List of the FA’s currently visiting MN’s
  1. **Protocol overview**
  2. **Message format and protocol extensibility**
  3. **Type-length-value extension format for Mobile IP extensions**
  4. **Long extension format**
  5. **Short extension format**