Fast Mobile IP Handoffs in Cellular Systems

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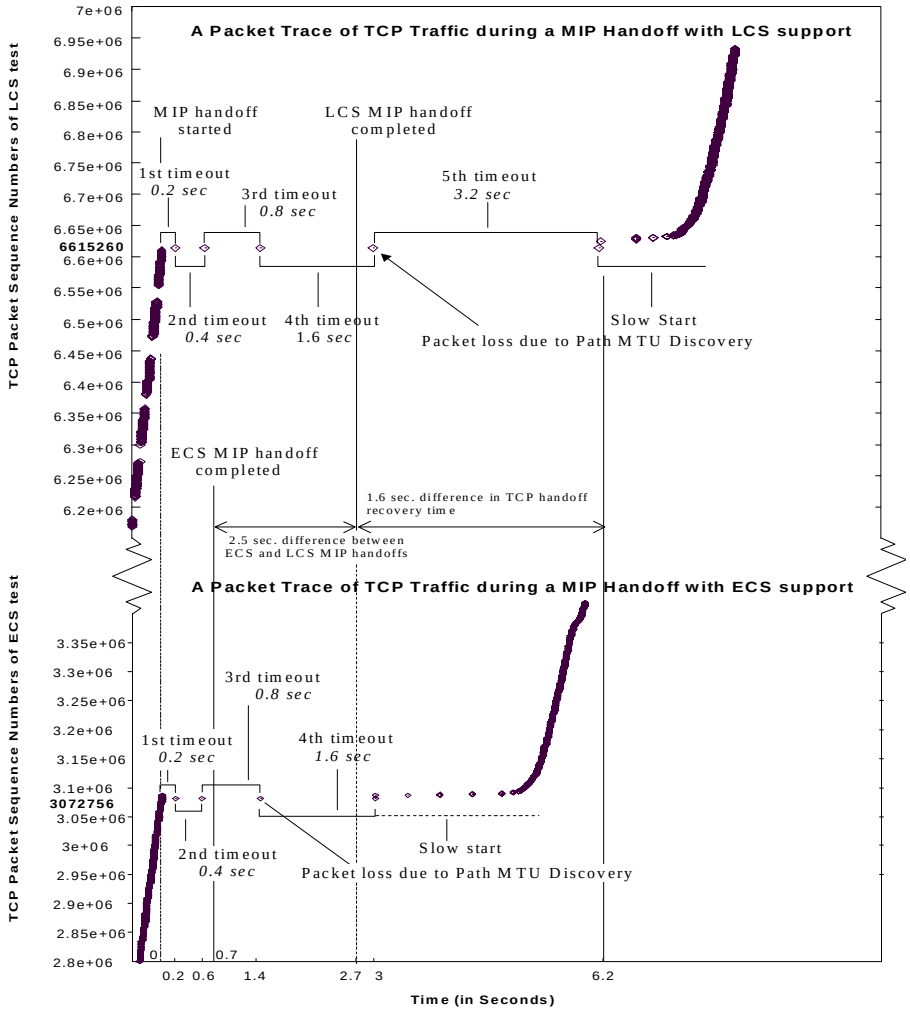
(draft-elmalki-mobileip-fast-handoffs-00.txt by K. El Malki, N. Fikouras and S. Cvetkovic)

- MIP Handoff performance can cause excessive packet loss and service disruption
- Smooth handoffs cannot fully support “inelastic” real-time applications (e.g. IP Telephony)
- Fast Handoff method uses the Hierarchical Agents
  Hierarchies may contain more than one level
- Fast Handoffs require an advertisement extension to support hierarchical advertising

MIP Handoff Performance

TCP Performance over MIP with LCS (Path MTU Discovery)

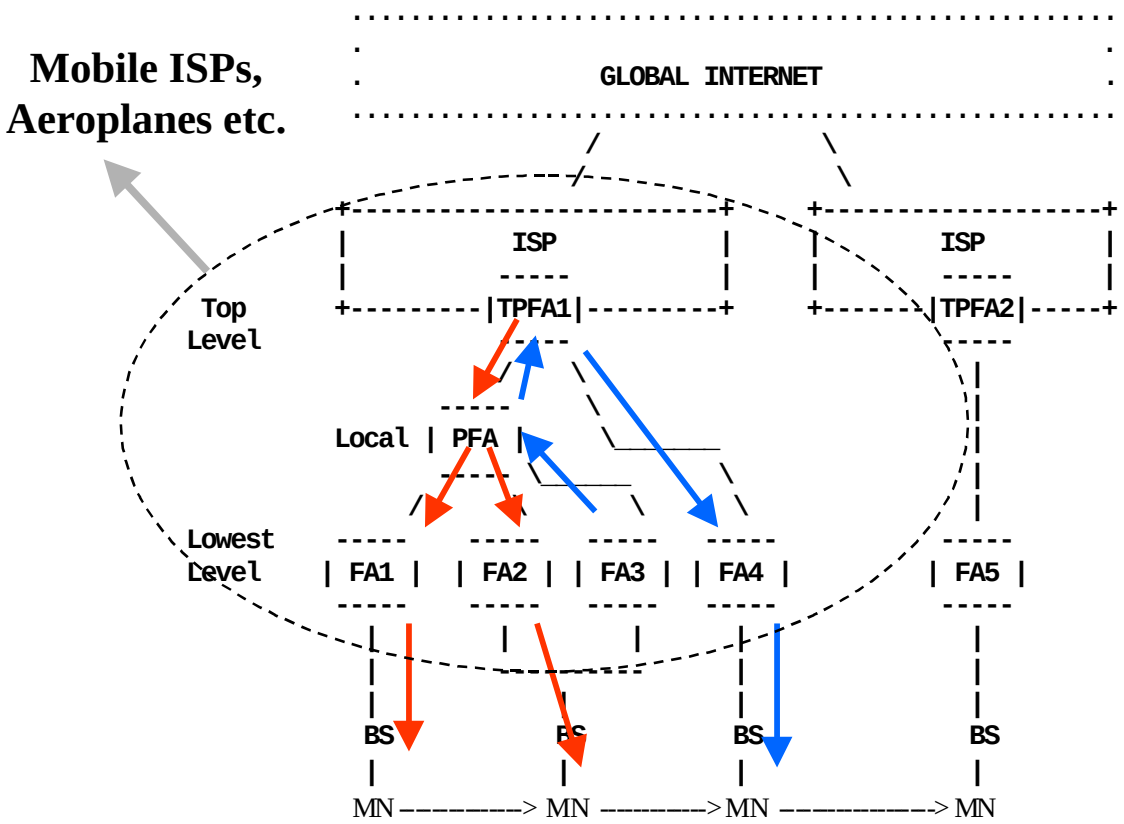


Service Disruption = 6.3s

TCP Performance over MIP with ECS (Path MTU Discovery)

Service Disruption = 2.7s

Hierarchical Mobility Agents



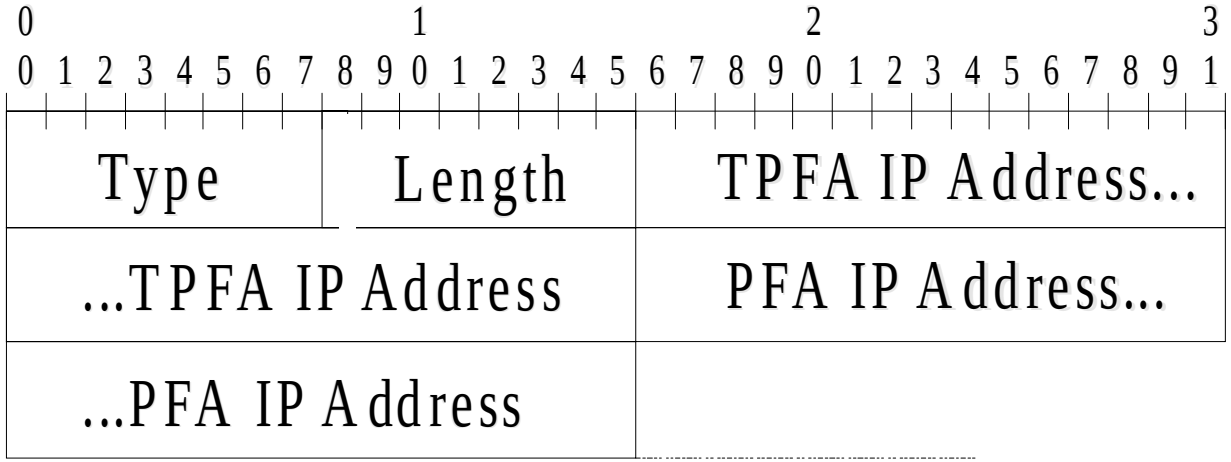
- **Smooth** and **Fast Handoffs**

Fast Mobile IP Handoffs

If Received advertisement *then*
If PM comparison indicates discovery of new subnet *then*
Movement has been detected (cached PFA address extension)
Find common PFA
If there is a common PFA *then*
Send a registration request using the common PFA as COA
Set the S bit for a simultaneous binding
Use a short registration lifetime (3*advertisement rate)
else
Send a registration request using the TPFA as COA
Set the S bit for a simultaneous binding
Use a short registration lifetime (3*advertisement rate)

MD methods: ***Eager*** *to add a binding,* ***Lazy*** *to abandon an existing binding*

The Fast Handoffs Advertisement Extension



Type

To be defined

Length

2+(4*N), where N is the sum of a TPFA and the number of PFA addresses advertised

TPFA IP Address

The TPFA IP Address field contains the Top Proxy Foreign Agent's address.

PFA IP Address

The PFA IP Address fields contains the Proxy Foreign Agent addresses.

Fast Mobile IP Handoffs in Cellular Systems

- Support for “loss-less” “inelastic” real-time traffic (IP Telephony)
- Easy migration to CDMA 3rd/4th Generation Cellular Systems (simple coordination of operations between layers 2 & 3)
- Hierarchical Networks are easily scaleable (i.e. multi-level)
- Mobile Networks (Mobile VPNs)
  - Aeroplanes etc.
- Cellular QoS based on IntServ and DiffServ