Hierarchical Mobile IP

UNIK 4700 Radio and Mobility

UNIK
UNIVERSITY GRADUATE
CENTER
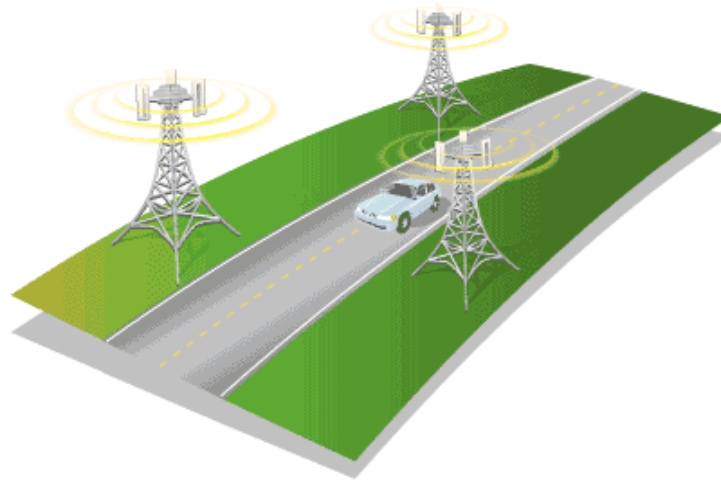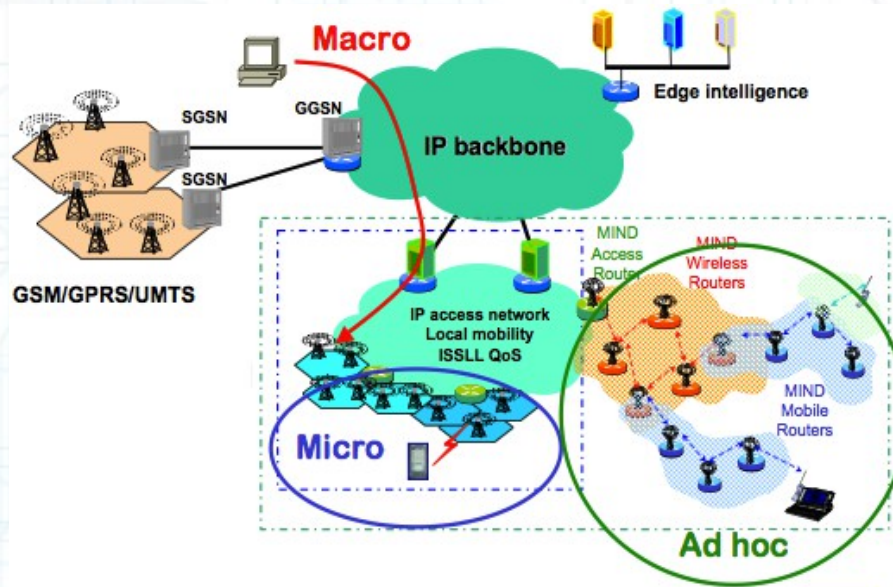
Outline

Benefits of All-IP Networks

Technical:
- Minimize system latency.
- Flexibility in network planning and deployment.
- Develop a flexible core network.

Economic:
- Reduce the number of network elements.
- Cost saving for the Core Netwok.

Mobility Aspects

- <u>Macro-mobility</u> concerns the management of users movements at a large scale: Mobile IP.

- <u>Micro-mobility</u> covers the management of users movements at a local level: Hierarchical Mobile IP, HAWAII, Cellular IP...
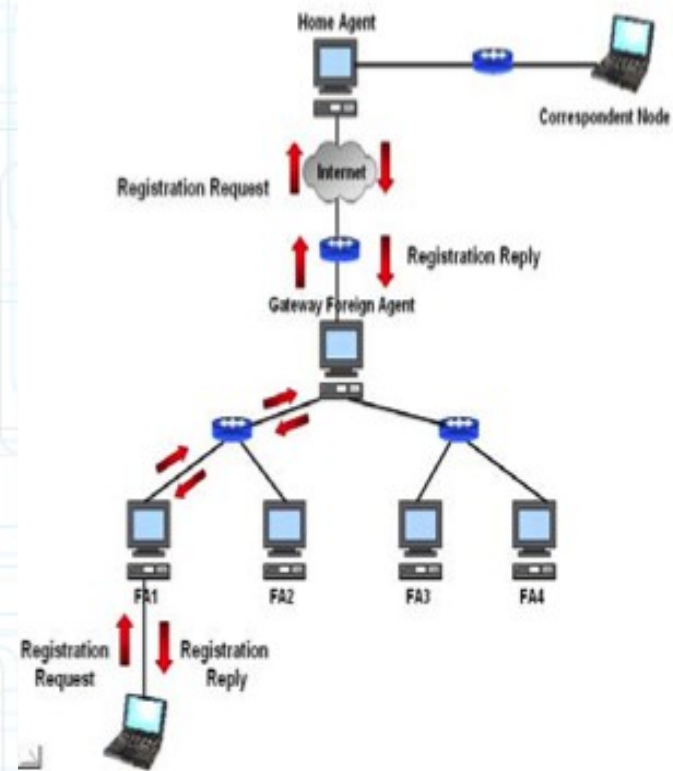
HMIP: How it works

- Hierarchy of FAs to locally handle Mobile IP registration.
- All FAs are connected to the gateway (GFA).
- Direct tunnels connect the GFA to FAs that are located at access points.
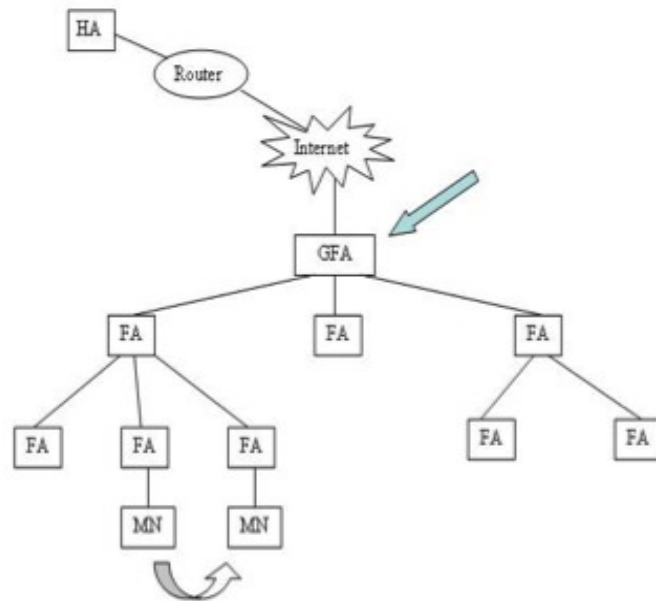
HMIP: How it works

When the MN moves to a foreign network for the first time:

- It will have to send a registration request to the HA.

- Then it will have to wait for a registration reply from the HA.

- Here, the CoA of the MN will be the same as its GFA.
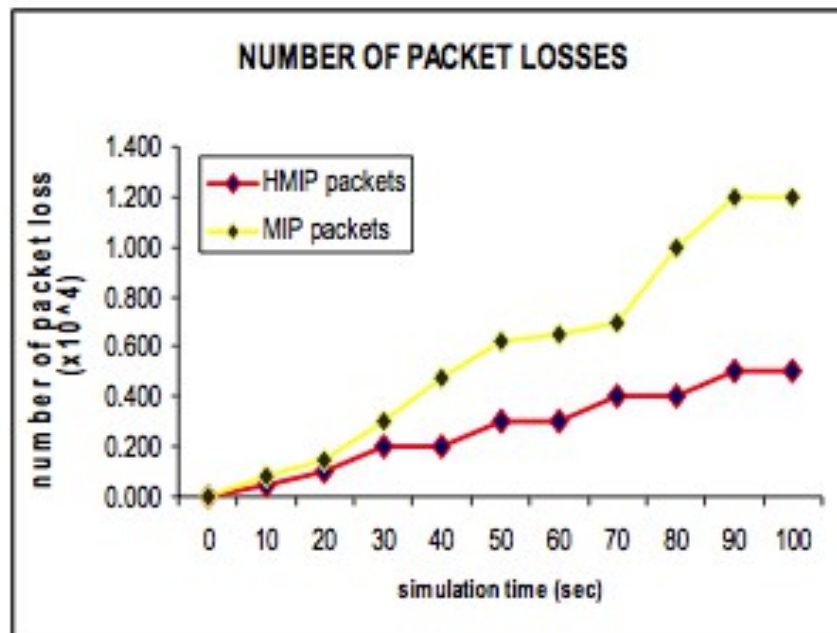
HMIP: How it works

If the MN moves within the GF network:

- It will only have to inform and send Binding Updates to its GFA.

- This will reduce the signaling overhead at the Internet.
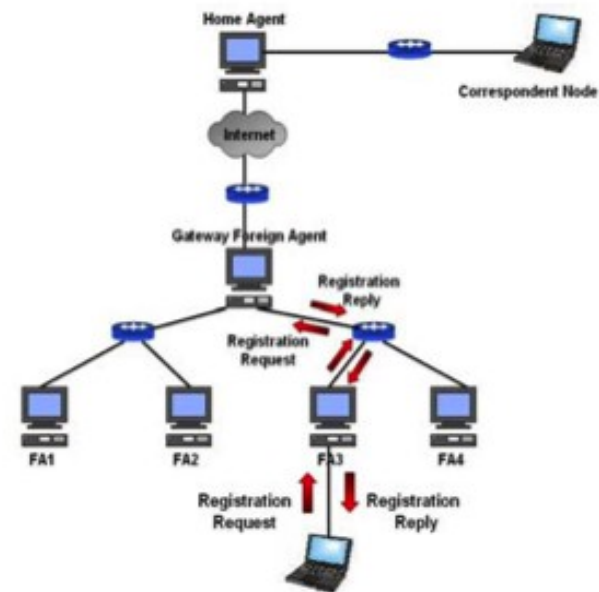
HMIP vs MIP

- <u>MIP packet loss:</u> signaling overhead at the Internet, registration process between the MN-HA; registration due to timeout when the MN is in the foreign network.
- <u>HMIP packet loss</u>: registration request and reply between MN-GFA-HA; regional tunneling in the GF Network.

NUMBER OF PACKET LOSSES

- HMIP packets
- MIP packets

HMIP v6: How it works

- There are no FAs, but there is still need to provide a central point to assist with MIP handoffs.

- It uses anchor points to deploy two levels of hierarchies (MS or Mobility Anchor Point-MAP).

- IPv6 functionalities: a large address space and neighbor discovery.
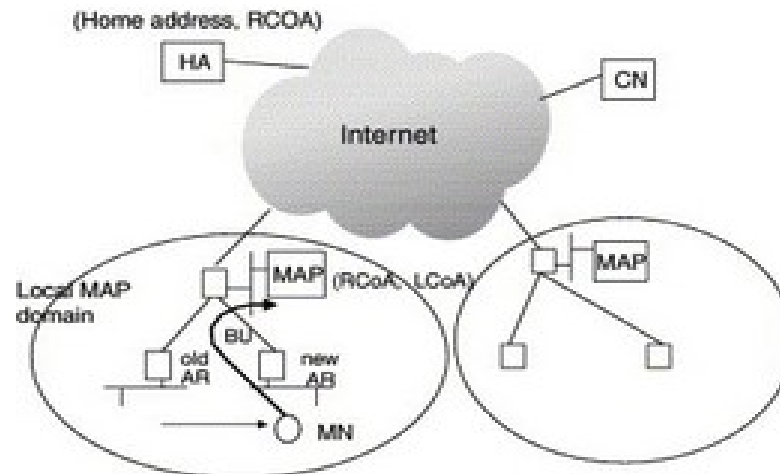
HMIP v6: How it works

If MH moves into new domain, It gets two CoA: global CoA(GCoA) and local CoA (LcoA).

- GcoA: in the Mobility Network (stays constant as long as MH is roaming within the site).

- LcoA: in the visited LAN (changes at each movement of MH)
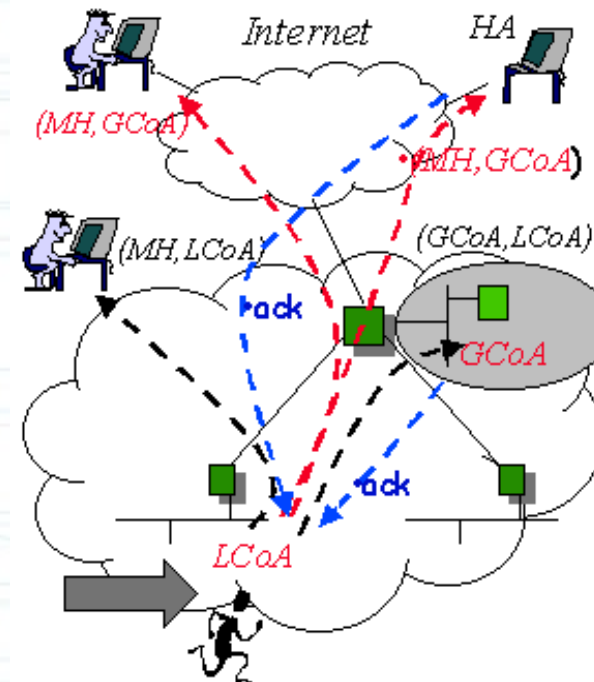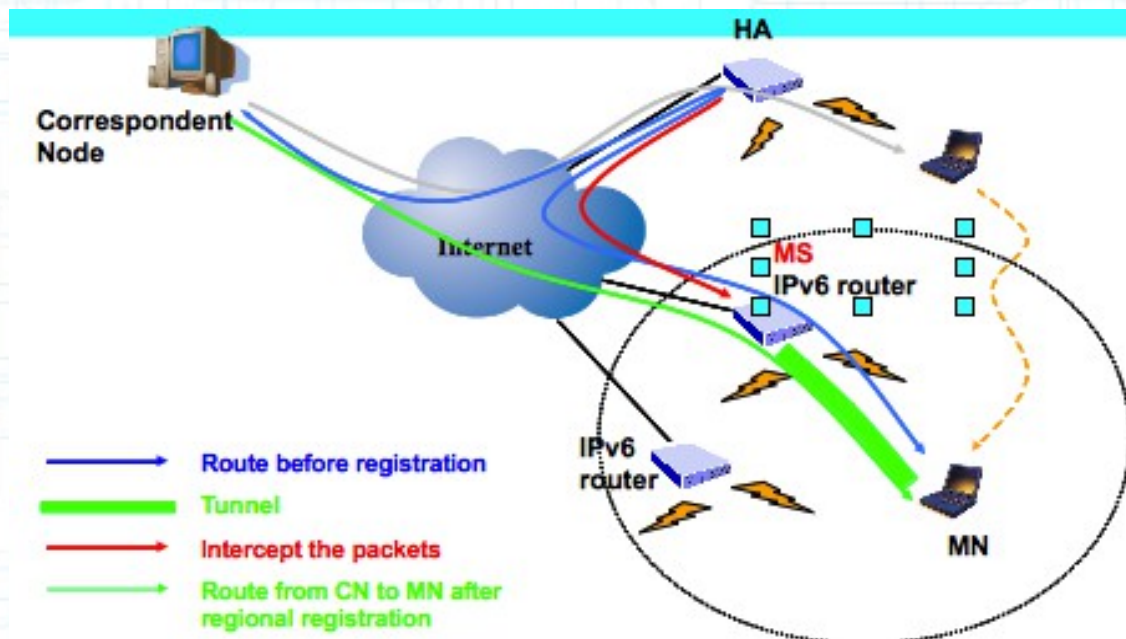
HMIP v6: How it works

If it moves within a domain:

- It only needs to change its LCoA

- The GCoA remains the same

- MH register its GCoA with its HA and correspondent hosts.

- The Mobility Server can be changed dynamically without having to change the GCoAs of the MHs currently roaming in the domain.
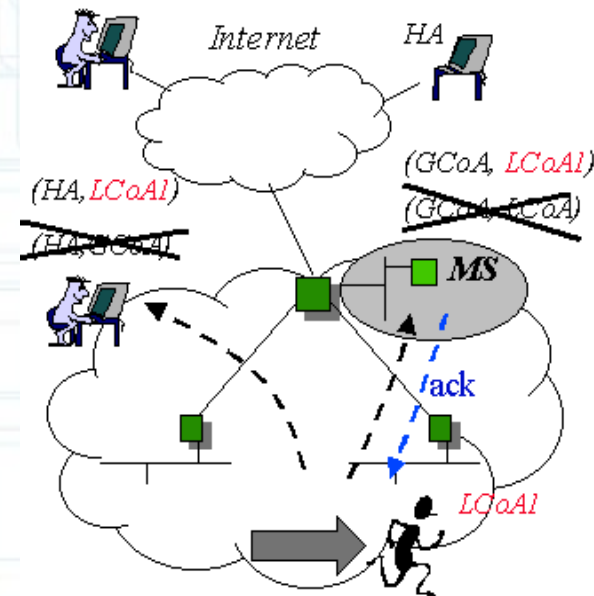
HMIP v6: How it works

- Packets addressed to the MH's GCoA are routed to the domain intercepted by the MS & encapsulated to the MH's current LCoA.

END

Questions?