Mobility Management Protocols for Wireless Networks

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Mobility Management

Mobility Management Models

Host-based Mobility Management Protocols

Network-based Mobility Management Protocols

Which is the best?!

Conclusions
Mobility Management

- Fundamental technology used to automatically support MTs enjoying their services while simultaneously roaming with uninterrupted communication
- Most important and challenging problem for seamless access of wireless networks
- Location management and Handover management
Location Mobility

- Database architecture design
- Messaging Procedure design
- Transmission of signalling
- Security
- Dynamic DB updates
- Querying delays
- Terminal Paging
- Paging delays
Handover Management

- Intracell HO / Intercell HO
- Soft HO / Hard HO
- Pkt processing
- Signalling load
- Optimizing connection
- BW reassignment
- Refining QoS
How to choose MM protocol?

- Fast handover
- Seamless Handover (Pkt loss = 0)
- Signalling Overhead (ctr data load, DB access)
- Routing efficiency
- QoS
- Fast Security (key exchange)
- Special changes
Mobility Management Models

1- General Mobility Management Model
Mobility Management Models

2- Hierarchical Mobility Management Model
Host-based Mobility Management Protocols

- General Model/ Macro mobility
- Mobile IP
  - location-independent routing
  - Movement detection and agent discovery
  - Registration
  - Tunneling and routing (triangular routing)
  - Transparency to upper layers
  - High latency handoff
  - High signalling load
MIPv6

- Bigger address space
- Support for address renumbering
- Improve header processing
- Reasonable security
- The problem of reverse tunnelling is solved without affecting the operation of ingress filtering (Optimization route)
Host Identity Protocol

- Separates the end-point identifier and locator roles of IP addresses
- Host Identity name space based on PKI
- Provides secure methods for IP multihoming and mobile computing
- IP addresses are replaced with Cryptographic host Identifier
- Cryptographic keys are self-generated
Network based Mobility Management Protocols

- Micro/ Intra domain mobility
- Fast handoff
- Reduction in pkt loss
- Reduction in mobility-related signalling
- Support for multipath distribution techniques- high transmission reliability
- Support for QoS
Cellular IP – Proxy MIP
Hierarchical MIP
Handoff-aware wireless Access Internet Infrastructure (HAWAII)
## What is the best?!

<table>
<thead>
<tr>
<th>Features</th>
<th>MIPv6</th>
<th>MobiSplit</th>
<th>IP²MN</th>
<th>FMIPv6</th>
<th>PMIPv6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local/Global domain</td>
<td>Global</td>
<td>Both</td>
<td>Global</td>
<td>Global</td>
<td>Local</td>
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<tr>
<td>Pkt loss</td>
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<td>Yes</td>
<td>Yes</td>
<td>No/Yes</td>
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<td>Muli-homing</td>
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<td>No</td>
<td>Yes</td>
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<td>Air interface- Traffic overdead</td>
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<td>Low</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
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<tr>
<td>Terminal Modification</td>
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<td>Yes</td>
<td>No</td>
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<tr>
<td>Tunneling overhead at MN</td>
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<td>Low</td>
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</tbody>
</table>
What is the best ?!

- Number of stations
- Handoff rate
- Number of CNs
- Wired link delay
- Random movement
- Traffic sources (video, voice)
Conclusions

- MIPv6 is the standard global mobility management protocol, however it does not support multi-homing MNs
- FMIPv6 mitigates MIPv6 by proactively perform the handover process
- Local mobility management protocols do not help for high mobility environment (opinion!)
- Solutions? …. Merging
Thank you

Questions??