Introduction

CS5984
Mobile Computing

Dr. Ayman Abdel-Hamid
Computer Science Department
Virginia Tech
Introduction

Outline

- Introduction
- Network Models for Mobility
- Host Mobility Problem
- Host Mobility Problem Solutions

Internet Layers

<table>
<thead>
<tr>
<th>Layer</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Supporting network applications (HTTP, SMTP, FTP, DNS, ...)</td>
</tr>
<tr>
<td>Transport</td>
<td>Transporting application-layer messages between client and server sides</td>
</tr>
<tr>
<td></td>
<td>of an application (TCP and UDP)</td>
</tr>
<tr>
<td>Network</td>
<td>Routing datagrams from one host to another (IP protocol: IPv4 and IPv6)</td>
</tr>
<tr>
<td>Data Link</td>
<td>Move entire frames from one network element to an adjacent network element</td>
</tr>
<tr>
<td>Physical</td>
<td>Move individual bits within the frame from one network element to an</td>
</tr>
<tr>
<td></td>
<td>adjacent network element (coaxial cable, fiber optic, ...)</td>
</tr>
</tbody>
</table>

TCP/IP Data Packet Transmission and Addressing
Network Models for Mobility

• *Nomadic* users with *wired* connectivity at access points

• A *cellular-like* network with a wired infrastructure and wireless connection between a mobile host and the network infrastructure (wireless LAN)

• A *mobile Ad Hoc Network* (MANET) with no wired infrastructure (all nodes are mobile and communication is over wireless links, each node should be capable of data forwarding)

Host Mobility Problem Solutions

• **Network layer solutions**
  - IETF Mobile IP (MIPv4 and MIPv6)
    - uses “Mobility agents”
    - hides a change of IP address, when a mobile host is moving between IP networks.

• **Application layer solutions**
  - Mobility support using “Session Initiation Protocol”
    - used for real-time mobile communications
    - problem with TCP connections, suggests using mobile IP for TCP connections

• **End-to-End Host Mobility support**
  - Relies on DNS secure dynamic updates
  - TCP option for connection migration (suspend TCP connection and reactivate it from another IP address)