**Branch :** Computer Science and Engineering

**Subject :** Mobile computing

Unit : Mobile Data Communication

Classical TCP Improvements

Introduction: Indirect TCP (I-TCP): Indirect TCP segments a TCP connection into a fixed part and a wireless part. The following figure shows an example with a mobile host connected via a wireless link and an access point to the 'wired' internet where the correspondent host resides.
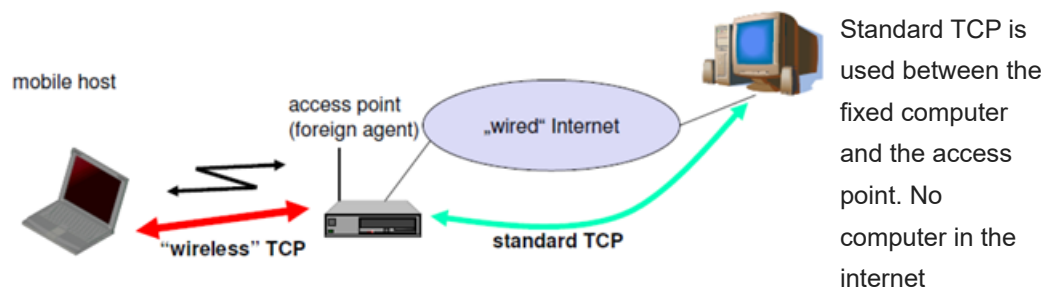
Standard TCP is used between the fixed computer and the access point. No computer in the internet recognizes any changes to TCP. Instead of the mobile host, the access point now terminates the standard TCP connection, acting as a proxy. This means that the access point is now seen as the mobile host for the fixed host and as the fixed host for the mobile host. Between the access point and the mobile host, a special TCP, adapted to wireless links, is used. However, changing TCP for the wireless link is not a requirement. A suitable place for segmenting the connection is at the foreign agent as it not only controls the mobility of the mobile host anyway and can also hand over the connection to the next foreign agent when the mobile host moves on.

The foreign agent acts as a proxy and relays all data in both directions. If CH (correspondent host) sends a packet to the MH, the FA acknowledges it and forwards it to the MH. MH acknowledges on successful reception, but this is only used by the FA. If a packet is lost on the wireless link, CH doesn't observe it and FA tries to retransmit it locally to maintain reliable data transport. If the MH sends a packet, the FA acknowledges it and forwards it to CH. If the packet is lost on the wireless link, the mobile hosts notice this much faster due to the lower round trip time and can directly retransmit the packet. Packet loss in the wired network is now handled by the foreign agent.
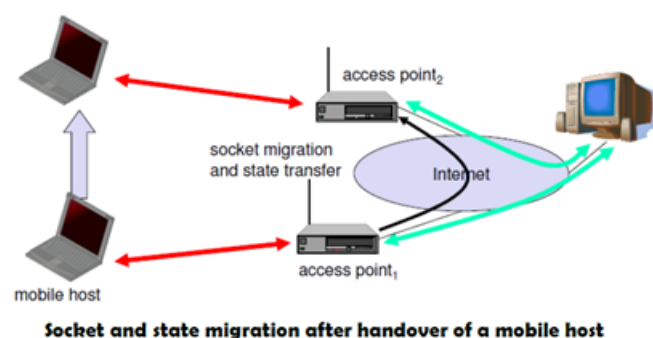
Socket and state migration after handover of a mobile host

During handover, the buffered packets, as well as the system state (packet sequence number, acknowledgements, ports, etc), must migrate to the new agent. No new connection may be established for the mobile host, and the correspondent host must not see any changes in connection state. Packet delivery in I-TCP is shown below:
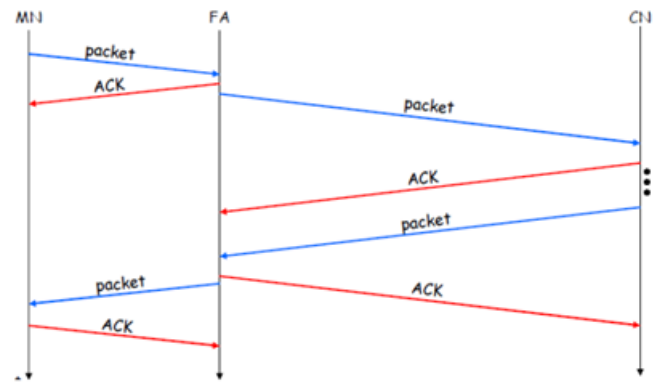
1. No changes in the fixed network necessary, no changes for the hosts (TCP protocol) necessary, all current optimizations to TCP still work
2. Simple to control, mobile TCP is used only for one

   hop between, e.g., a foreign agent and mobile host

- transmission errors on the wireless link do not propagate into the fixed network
- therefore, a very fast retransmission of packets is possible, the short delay on the mobile hop s known
  1. It is always dangerous to introduce new mechanisms in a huge network without knowing exactly how they behave.

- New optimizations can be tested at the last hop, without jeopardizing the stability of the Internet.
  1. It is easy to use different protocols for wired and wireless networks.

Disadvantages of I-TCP

1. Loss of end-to-end semantics:- an acknowledgement to a sender no longer means that a receiver really has received a packet, foreign agents might crash.
2. Higher latency possible:- due to buffering of data within the foreign agent and forwarding to a new foreign agent
3. Security issue:- The foreign agent must be a trusted entity

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Questions of this topic

Describe Classical TCP Improvements and what is I-TCP?   Answer This

Explain Advantages and disadvantages for I-TCP   Answer This

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