Wireless Multimedia Systems Fall, 2008 (Topic 8)

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1. **Today's topic (II):**
   Summary of coming issues
   Finishing Wireless TCP

## *Topic I: Wireless TCP*

Suggested Reading:
◆Required Reading:

- ◆ [Balakrishnan95], Harri Balakrishnan, Srinivasan Seshan, Elan Amir and Randy H. Katz, "Improving TCP/IP Performance over Wireless Networks", ACM Mobicom95
- ◆ [Balarkrishnan97], Harri Balarkrishna, Venkat N, Padmanabhan, Srinivasan Seshan and Randy Katz, "A Comparison of Mechanisms for Improving TCP Performance over Wireless Links", IEEE JSAC 97.
- ◆ Reference: [Mario2001], Mario Gerla, "West TCP", Mobicom2001
- ◆

a) *Fundamental of TCP*

   (1) flow control (congestion control) and error control (retransmission)

   (2) slow start, congestion avoidance, time out (window size, threshold)
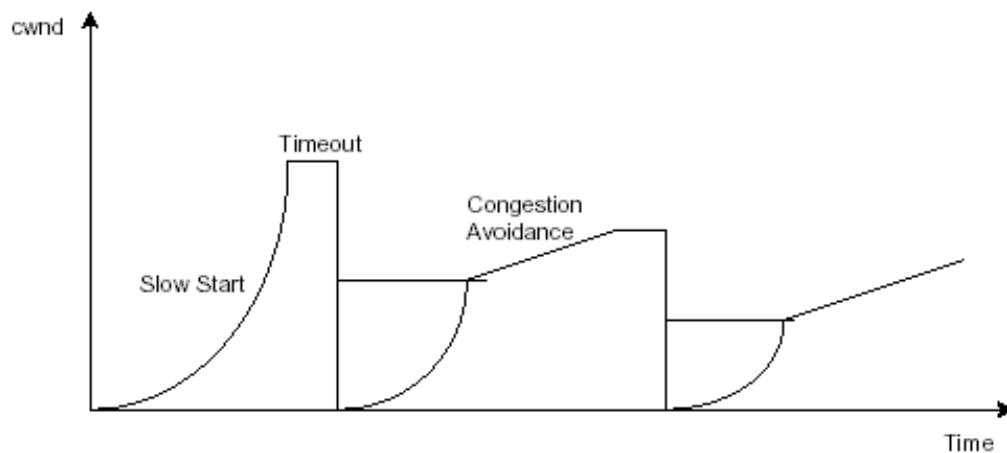
   (3) fast retransmission

b) **Challenge of Wireless TCP**

   (1) Heterogeneous network (Wired and wireless)

   (2) The mobility problem

   (3) The wireless characteristics

c) **Solutions of Wireless TCP**

Non-End-to-End Schemes

(1) Split Connection Approach
Indirect TCP (I-TCP):
An end-to-end connection between a fixed host a mobile host is split into two separate connections.
Motivation:
Mobile IP proposals attempt to hide mobility, disconnection from higher layer
Therefore host mobility causes temporary disruption
Error prone wireless links
Advantage: a more optimized wireless link-specific protocol tuned for better performance
Disadvantage:
  a. Not end-to-end semantic:
  b. Application relinking
  c. Software overhead

(2) Link Layer Approach
FEC (Forward Error Correction)
ARQ (Automatic repeat request)

(3) Snoop Approach
The snoop agent monitors every packet that passes through the TCP connection in both directions and maintains a cache of TCP segments sent across the link that have not yet been acknowledged by the receiver.

End-to-End Schemes

(4) ELN Approach
Explicit Loss Notifications
(5) Westwood TCP