SRM: Floyd, Jacobson, Liu, McCanne, Zhang [Floyd97c]

CSci551: Computer Networks SP2006 Thursday Section John Heidemann

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Key ideas

- provide framework for reliability
 - SRM: Scalable Reliable Multicast
 - receiver-based, NACK
 - recovery
 - multicast repair request
 - any with data multicasts repair
- leave details to the application
 - ALF: Application Layer Framing
- application: shared whiteboard (wb)
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SRM Design Issues

- how to do cope with loss
- how to cope with out-of-order data and updates from many people
- how to accommodate *late joiners*
- what to do if the network partitions
- how to self-configure (adjust timing) for different topologies
- how to adapt to heterogeneous bandwidths and congestion

(*we'll come back to these at the end*) 13f_Floyd97c: CSci551 SP2006 © John Heidemann

Application-Level Framing

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- ALF from Clark and Tennenhouse '90 paper
 - best app performance requires that the app's semantics be reflected in the protocol
 - ex. streaming media might use special dropping rules, HTTP might allow data to arrive out-of-order, etc. (Q: what are other examples?)

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ALF in SRM

- how does ALF influence SRM?
 - all data uses application data units (ADU)
 - \bullet page X, change sequence number Y, by sender Z
 - no guarantee of ordering
 - let the application sort out ordering after the fact

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Deterministic Suppression

• Observation:

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- with a simple line topology
- by weighting response times by d_{SR}
- you can *guarantee* that there is *exactly* one request and one repair
- For complicated topologies, the guarantee doesn't generalize, but it's a good heuristic.

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SRM (summary) NACK/Retransmission suppression delay before sending delay based on RTT estimation deterministic and stochastic components Periodic session messages discover lost final packets used to estimate OTT from sender to recievers Adaptive algorithm to adjust constants

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