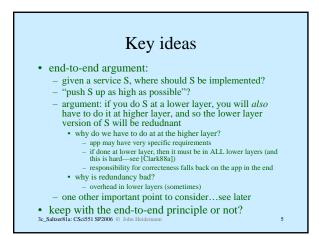
The End-to-End Argument: Saltzer, Reed, Clark [Saltzer81a]

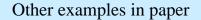
CSci551: Computer Networks SP2006 Thursday Section John Heidemann

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Example: Reliability

- Consider copying a file - want an end-to-end checksum
- steps:
 - A reads from disk to mem; sends to network
 - network moves data from A to B
 - B gets data from network; writes to disk
- possible faults:
- disk IO errors, buffer overruns in NIC, memory errors, network corruption or congestion, computer crashes 3c_Saltzer81a: CSci551 SP2006 © John He 6



- encrypted data transfer
- duplicate message suppression
- guaranteed FIFO message delivery
- transactions in a DB

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Other examples?

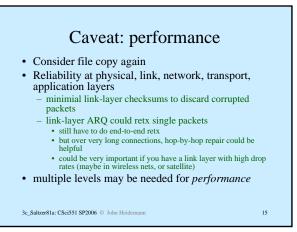
- encryption
 - wireless and WEP
 - not good enough for "full security"
 – ex: end host could be compromised
 – ex: other hops in the network aren't encrypted
- reliability in the net?
 - sending long-distnace messages in the Internet: if they're corrupted, detect and discard them early
 - maybe somethings can *only* be detected in the net
 ex. Denial-of-service attacks

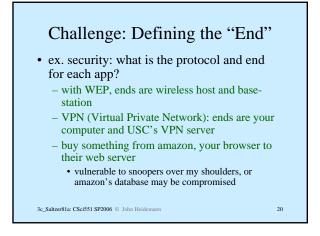
 - be careful: e2e argument doesn't say NEVER do things in the middle, it says if you *must* do it at the end, ask yourself if *also* doing it in the middle is helpful

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Why is End-to-End Important to Network Design?

smart vs. dumb?	telephone	Internet
network	smart	dumb
terminal	dumb	smart
 e2e is about efficiency but smart networks can become very application specific therefore become less able to adapt to new applications 		
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