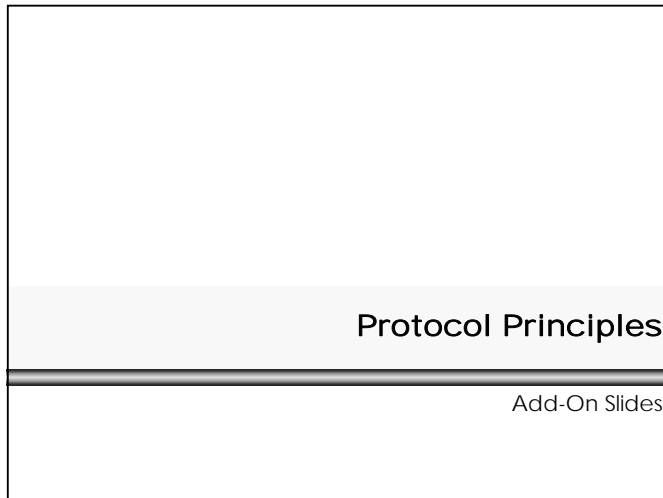


L02 - Protocol Principles Add-On Slides

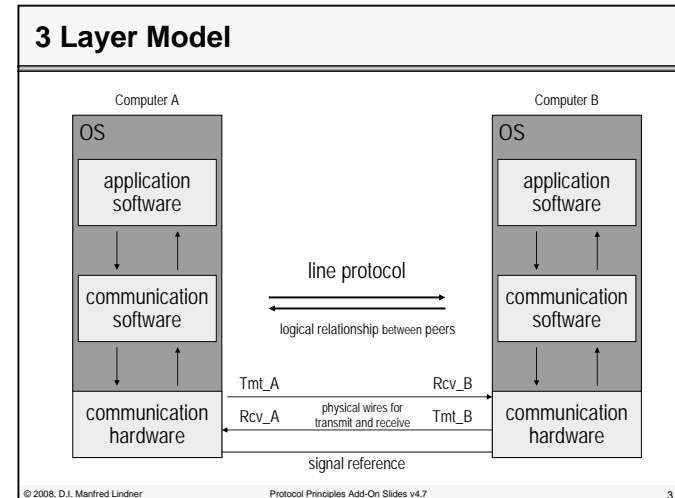


Summary Protocol Principles Day 1

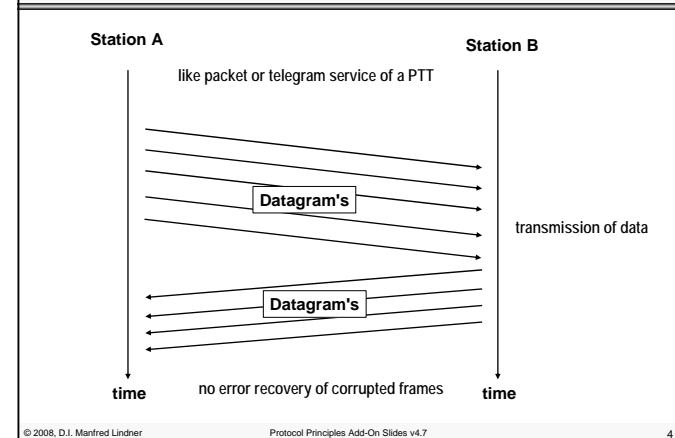
• **Two important principles of data communication**

- Layering
 - Structuring the complex task of data communication into smaller pieces by usage of "layers"
 - A layer is built by the resources of the corresponding protocol peer entities and by the protocol procedures performed between them
 - protocol standards define fields of the control field of a frame (bits seen on the wire) and the communication behavior of the peers receiving and sending frames
 - A layer is using the services of the lower layers to provide an enhanced service to the upper layer
 - The application layer can access the lower layer (the protocol stack) via API (application programming interface)
 - The communication layer can access the lower layer via network-card driver
- Connectionless versus connection-oriented service

L02 - Protocol Principles Add-On Slides

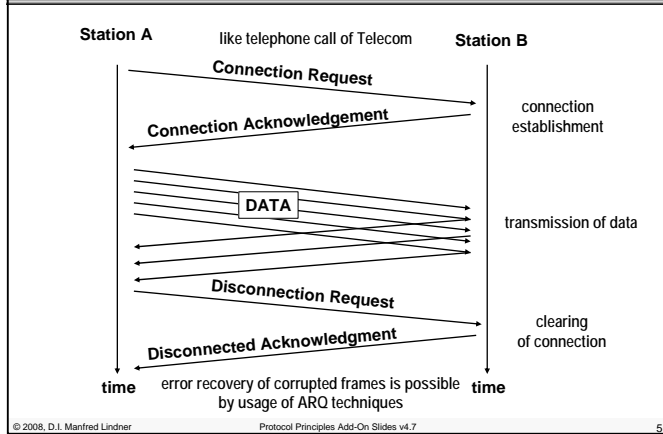


Connectionless Service (Com-SW)



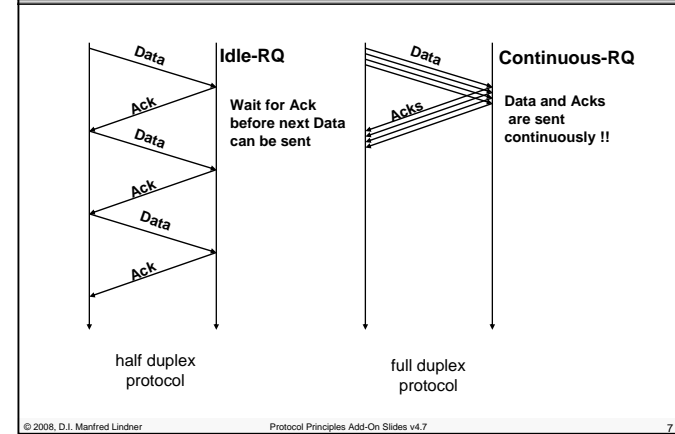
L02 - Protocol Principles Add-On Slides

Connection-Oriented Service (Com-SW)



L02 - Protocol Principles Add-On Slides

Idle-RQ versus Continuous-RQ

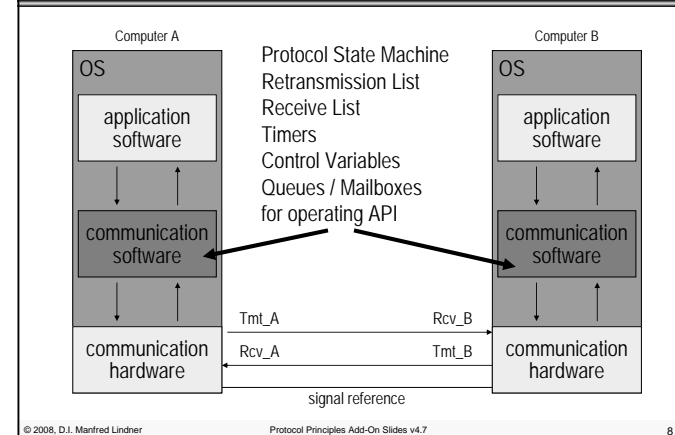


Summary Protocol Principles Day 2

• Connection-oriented service

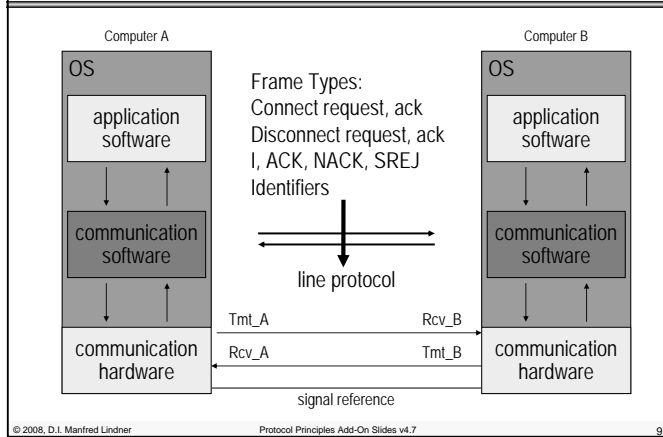
- allows error recovery by feedback error control
- ARQ techniques
 - Receiver acknowledges correct receipt of data frame
 - Idle-RQ
 - Easy to implement (few resources necessary) but inefficient concerning usage of bandwidth in case of full-duplex line
 - Continuous-RQ
 - Several methods
 - › Selective ACK (e.g. TCP optional SACK procedure)
 - › GoBackN (e.g. HDLC basic REJ procedure)
 - › Positive Acknowledgement (e.g. TCP basic procedure)
 - › Selective Reject (HDLC optional SREJ procedure)
 - More complex to implement (much more resources necessary), more efficient concerning usage of bandwidth in case of full-duplex line

Necessary Resources for Com-SW Layer 1



L02 - Protocol Principles Add-On Slides

Necessary Resources for Com-SW Layer 2



Generic Frame Format

