

# Network software

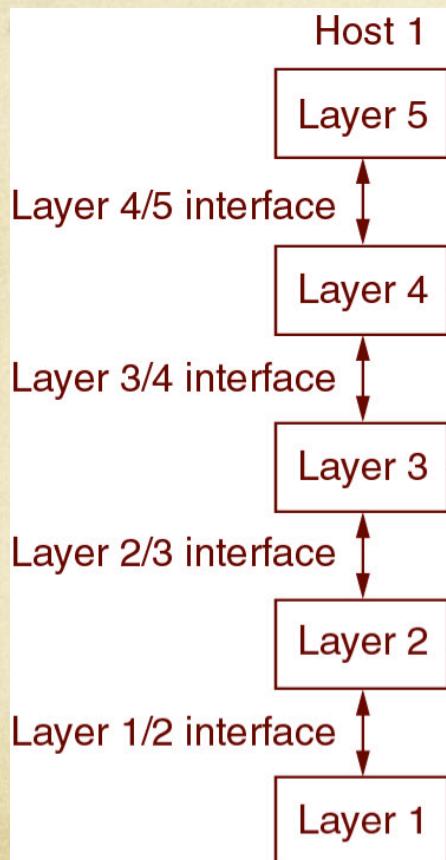
- ◆ Special software needed on computer to enable *networking*
  - ◆ I.e., to enable sending/receiving of data to/from computer
- ◆ Computer initiating data transfer → *sender/source* computer
- ◆ Eventual recipient of data → *receiver/destination* computer

# Design goals

- ◆ *Reliability* → should operate correctly
- ◆ *Security* → should provide data protection
- ◆ *Resource sharing* → should efficiently share available network resources
- ◆ *Scalability* → should be able to support increase in size

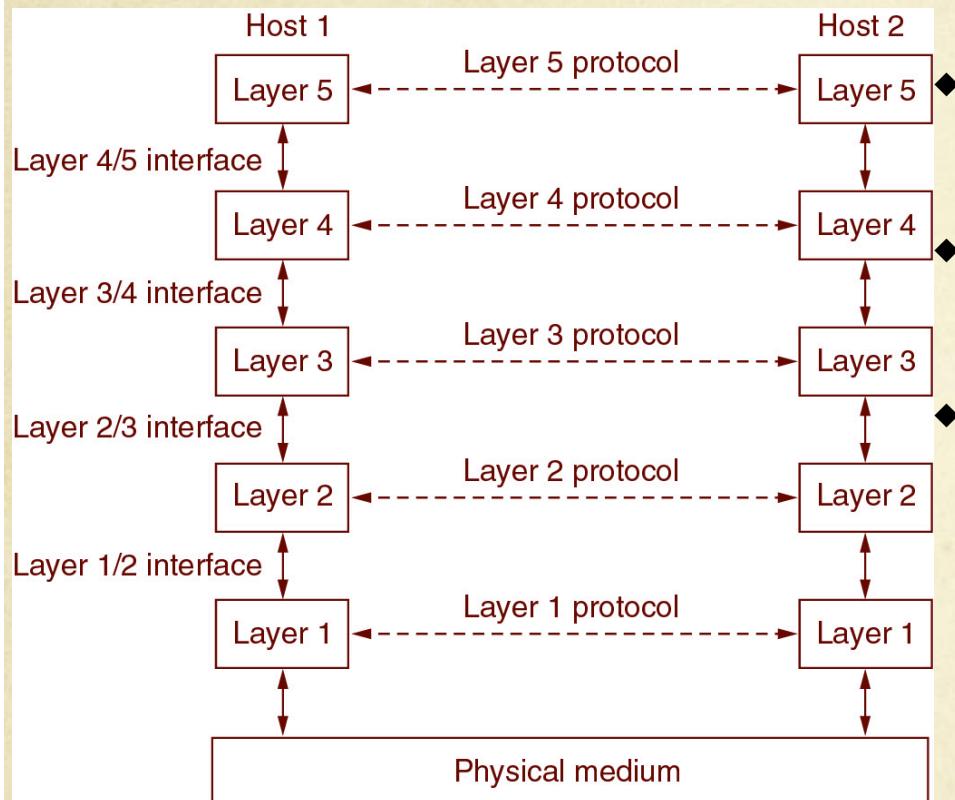
# Network software design

- ◆ *Layered* design used to manage complexity of software
  - ◆ Divide responsibilities among different layers



- ◆ Each layer
  - ◆ *Abstraction* set of services (i.e., hides underlying details)...
  - ◆ ... & provides well-defined *interface* to layer above it
  - ◆ *Directly* interacts only with layer immediately below & above it

# Layered approach



- ◆ Data travels from top to bottom layer on *sender* side
- ◆ Data travels from bottom to top layer on *receiver* side
- ◆ Each layer uses *protocol* for interaction with same layer in other computers
  - ◆ Although there is no direct interaction...
  - ◆ ...layer *n* of one computer *understands* information communicated by layer *n* on other computer

# Layering & protocol analogy...

