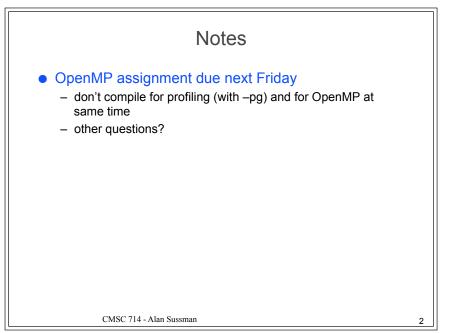
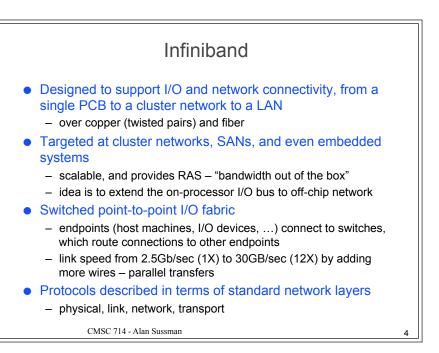
CMSC 714 Lecture 9 Ethernet and Infiniband Alan Sussman



Ethernet

- One of the first, and definitely the most successful, local area network (LAN) protocol and implementation
- Notice that also targeted at multiprocessing, not just distributed computing
- CSMA/CD wire protocol carrier sense multiple access, with collision detection
 - a shared physical medium, even with repeaters
 - randomized exponential backoff after a collision
 - error detection using checksums on medium, still need endto-end error detection since whole packets can be lost
- Modern Ethernet protocols are different for a switched physical medium to scale better
 - original at 3Mb/s (shared), 1Gb/sec (switched) common now, with 10Gb/sec and 100Gb/sec in HPC environments CMSC 714 - Alan Sussman



Infiniband Layers

• Physical

 defines electrical and mechanical charcteristics – cables, connectors, pins, etc.

• Link

- packet layout management and data
- switching uses local IDs in Local Route Header of a packet
- QoS through Virtual Lanes
- credit based flow control
- data integrity error correction both for each link (VCRC) and end-to-end (ICRC)
- Network
 - route packets across subnets uses IPv6 addresses (128 bits) in Global Route Header of a packet

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Infiniband Layers (cont.)

• Transport

- in-order packet delivery sequence numbers
- segmenting data into packets
- channel multiplexing
- transport services reliable/unreliable connection/datagram

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- all implemented in hardware

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