

Correctness

- Redundancy
- Bit encoding
- Framing

- Error detection/correction
- Addresses (UIDs)
- Header + data

- IP: semantics
- Addressing:
 - DHCP
 - ARP
 - DNS
 - NAT
 - Stun
- Layering
- Routing

- UDP: semantics
- Port
- Socket abstraction

- TCP: semantics
- ARQ
- Reorder buffer
- Stream- vs. packet orientation

How does RFID fit in here (and everywhere)?

Scalability

- Size => *heterogeneous*
 - Hardware / performance
 - Speed
 - Error rate
 - Administration / policy
 - Standard's committees
 - Distance / latency
- Size => *dynamic*
 - Independent failures
 - Always in transient state...
 - Dampening
 - LAN bridge algorithm
 - IP routing
- Size => *long lived*
 - Version # in header
- End-to-end argument
- Protocol layering
- Routing basics
 - LAN broadcast
 - Collision resolution
 - Carrier sense
 - Collision detect
 - Ethernet
 - 802.11 wireless
 - Forwarding
 - DV/LS routing
- Layered routing
 - LAN bridging
 - DHCP / gateways
 - NAT
 - Subnets
 - Supernets (CIDR)
 - BGP
- Congestion control (TCP)
 - RTT estimation
 - AIMD

Performance

- Buffering
 - Avoid layer crossing
- Timeouts
 - RTT estimation
 - Lost data detection
- TCP
 - Nagel'ing
 - Flow control
 - Sliding window
 - Bandwidth x delay
 - Congestion control
 - AIMD
 - Slow start
 - Fast retransmit

Distributed State: Protocols

- P2P
 - TOMCAST: ordering
 - Lamport clocks
 - 2PC: agreement
 - Independent failures
- Client-server
 - Don't distribute state
 - e.g., Lobby
 - Push state to client
 - e.g., web
 - e.g., IP routing
 - "Stateless server"
 - HTTP
 - NFS
- Connections
 - TCP: 2 node P2P or duplex client-server?