

LINK:

PHY: bit transmission

bit transmission - modulation, error correcting codes

MAC: nbr-to-nbr frame transmission

frame transmission - framing, MAC addressing 48-bits

multiple access- random access, taking-turns,
frequency division, code-division

broadcast

ethernet: hubs, switches, bridges, and routers

spanning tree

NETWORK: endhost - to - endhost packet delivery

hierarchical addressing - common addressing across heterogeneous network technologies

IPv4 - Inter-net Protocol

best-effort service (ordering, latency, speed, reliability)

routing - prefix routing, default route

proactive protocols:

ospf - link state routing protocol

rip - distance vector routing

reactive protocols:

ad hoc networks

hierarchical routing:

BGP - border gateway protocol

policy routing

mobile IP - (relatively efficient)

VPN - tunneling (practical but inefficient)

NAT - network address translation

- end-to-end reachability broken

- some security benefit

IPv4 32-bit addresses, total 4 billion

IPv6 128-bit addresses

- IPv6 - IPv6 tunneling over IPv4

- IPv4/v6 bridging

Transport layer: process-to-process delivery

TCP

ordering

reliability

flow-control

congestion control

UDP

Application layer: user-to-user delivery

WWW

DNS

email

peer-to-peer applications (bittorrent)

Call numbers: 10677 / 20271