Chapter1

**circuit switching**:dedicated circuit per call, End-end resources reserved for “call”,link bandwidth, switch capacity,dedicated resources: no sharing,circuit-like (guaranteed) performance,call setup required, network resources (e.g.bandwidth) divided into “pieces”,pieces allocated to calls, resource piece idle if not used by owning call (no sharing), dividing link bandwidth into “pieces”frequency division/time division.

**packet-switching**: data sent thru net in discrete“chunks”,each end-end data stream divided into packets, user A, B packets share network resources each packet uses full link bandwidth,resources used as needed. resource contention:aggregate resource demand can exceed amount available; Packets queue up; store and forward: packets move one hop at a time, Node receives complete packet before forwarding.

Great for bursty data,resource sharing,simpler, no call setup

Excessive congestion: packet delay and loss, protocols needed for reliability, congestion control

Loss delay throughput分别是什么:

**delay**:dnodal = dproc + dqueue + dtrans + dprop

**Loss**:queue (aka buffer) preceding link in buffer has finite capacity,packet arriving to full queue dropped (aka lost),lost packet may be retransmitted by previous node, by source end system, or not at all

**Throughput**:rate (bits/time unit) at which bits transferred between sender/receiver min(Rc,Rs,R/10)

Chapter2

client-server, P2P, hybrid : Client与server功能，p2p与c-s区别

**server**:always-on host,permanent IP address,server farms for scaling

**clients**:communicate with server,may be intermittently connected,may have dynamic IP addresses,do not communicate directly with each other

**P2p**:no always-on server,arbitrary end systems directly communicate,peers are intermittently connected and change IP addresses

http计算(non)persistent/pipeline

non: 2RTT+ <file transmit time>

Dns 相关 不同层级 hierarchical:root--com,org,edu--...

Chapter3

TCP:reliable data transfer

flow control

congestion control

Udp checksum 16bit字加和取反

tahoe:1,ssthresh=cwnd/2

reno:cwnd/2+3

Chapter4

Data plane control plane功能

forwarding和路由区别

Ipv4怎么定义，怎么看

Nat

Ipv6 tunneling, 和ipv4区别

Chapter5

Ospf

Intra/inter

Internet Control Message Protocol

Chapter6

Aloha，CSMA，CSMA/CD,CSMA/CA

Ether-cd,wifi-ca

Aloha slot/pure

link layer addressing-mac

具体协议,ether,switch/router,switch-learn

Chapter7

无线链路特点

Wifi

Mobility