

Computer Network chap 1 Quiz

1. Describe four sources of packet delays (3% each delay name, 2% reason of each delay, 20% total)
2. (a) Compare the circuit switching and packet switching on resource usage, performance, and call setup. (12%) (b) List two circuit switching techniques (6%) (c) Draw two figures to explain their operations. (8%) (26% total)
3. (a) Explain Internet protocol stack (2% each layer's name, 1% each layer's functions, 15% total)
(b) Besides, you have to write the name of data unit of upper four layer. (寫出最上面四層資料單位的專有名稱，如 xx 層：yy) (8%)
(c) For the encapsulation/decapsulation processes of the Internet protocol stack, what are the first layers, the second layers, the third layers to perform? (12% , 分 encapsulation process 與 decapsulation process 兩部分) (35% total)
4. Explain the following terms (a) bandwidth (b) IETF RFC (c) List two kinds of wireless access networks (d) How do loss occur in router buffers? (e) Network Throughput (f) Why do we use the layered Internet protocol stack? (2%) (g) Network protocol (6%) (20% total)

Computer Network chap 1 Quiz

1. Describe four sources of packet delays (3% each delay name, 2% reason of each delay, 20% total)

Ans:

- (a) node processing delay: check bit errors, determine output link
- (b) queuing delay: time waiting at output link for transmission, depends on congestion level of router
- (c) transmission delay: R =link bandwidth (bps) L =packet length (bits), time to send bits into link = L/R
- (d) propagation delay: d = length of physical link, s = propagation speed in medium, propagation delay = d/s (3% each delay name, 2% reason of each delay, 20% total)

2. (a) Compare the circuit switching and packet switching on resource usage, performance, and call setup. (12%) (b) List two circuit switching techniques (6%) (c) Draw two figures to explain their operations. (8%) (26% total)

Ans:

(a) Circuit-switching: (2% each, total 12%)

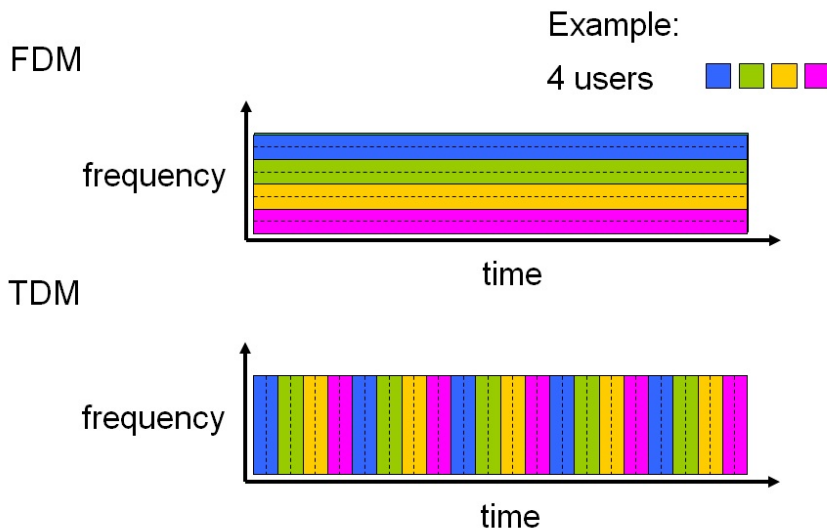
- i. end-end resources reserved for "call", like link bandwidth, switch capacity. dedicated resources: no sharing
- ii. circuit-like (guaranteed) performance
- iii. call setup required

Packet-switching:

- i. each end-end data stream divided into *packets*. User A, B packets *share* network resources *as needed*
- ii. resource contention may degrade performance.
- iii. no call setup required

(b) FDM and TDM (3% each)

(c) (4% each: time, frequency)



3. (a) Explain Internet protocol stack (2% each layer's name, 1% each layer's functions, 15% total)
 (b) Besides, you have to write the name of data unit of upper four layer. (寫出最上面四層資料單位的專有名詞，如 xx 層 : yy) (8%)
 (c) For the encapsulation/decapsulation processes of the Internet protocol stack, what are the first layers, the second layers, the third layers to perform? (12% , 分 encapsulation process 與 decapsulation process 兩部分) (35% total)

Computer Network chap 1 Quiz

Ans:

(a)

application: supporting network applications

transport: host-host data transfer

network: routing of datagrams from source to destination

link: data transfer between neighboring network elements

physical: bits “on the wire” (2% each layer’s name, 1% each layer’s functions, 15% total)

application
transport
network
link
physical

(b)

application layer: message

transport layer: segment

network layer: datagram

link layer: frame

各 2% ， 共 8%

(c)

Source encapsulation process: application layer -> transport layer -> network layer

Destination decapsulation process: physical layer -> link layer -> network layer 各 2% ， 共 12%

4. Explain the following terms (a) bandwidth (b) IETF RFC (c) List two kinds of wireless access networks (d) How do loss occur in router buffers? (e) Network Throughput (f) Why do we use the layered Internet protocol stack? (2%) (g) Network protocol (6%) (20% total)

Ans: (a) bandwidth: link transmission rate (2%)

(b) IETF RFC: Internet standards (2%)

(c) wireless LANs and wider-area wireless access (4%)

(d) (e) arriving packets dropped (loss) if no free buffers (2%)

(e) Network Throughput: rate (bits/time unit) at which bits transferred between sender/receiver (2%)

(f) modularization eases maintenance, updating of system (2%)

(g) Protocol: protocols define format, order of msgs sent and received among network entities, and actions taken on msg transmission, receipt (6%)