

100 Chapter 1 First Half Quiz (100/10/12)

Class: _____ ID: _____ Name: _____

1. Explain the following terms

(a) bandwidth (b) IETF RFC (c) List two kinds of wireless access networks

(d) List any three types of Access networks. (e) List three types of wired Physical Media (f) How do loss occur in router buffers? (g) throughput (h) What is defined by the network protocol? (i) network edge (j) network core (4% each answer, 76% total)

2. How long does it take to send a file of 64,000 bits from host A to host B over a circuit-switched network? Assume (a) all links are 2.048 Mbps. (b) each link uses TDM with 24 slots (c) 500 msec to establish end-to-end circuit. (要說明清楚你的算式代表的意義，只寫答案不計分. 14%)

3. Compare the circuit switching and packet switching on resource usage, performance, and call setup. (total 18%)

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1. (a) bandwidth: link transmission rate (4%)
 - (b) IETF RFC: Internet standards (4%)
 - (c) wireless LANs and wider-area wireless access (8%)
 - (d) Dial-up Modem (任三個，12%)
 - Digital Subscriber Line (DSL)
 - cable modems (HFC: hybrid fiber coax)
 - Fiber to the Home
 - Ethernet Internet access
 - (e) Twisted Pair (TP) (12%)
 - Coaxial cable
 - Fiber optic cable
 - (f) arriving packets dropped (loss) if no free buffers (4%)
 - (g) throughput: rate (bits/time unit) at which bits transferred between sender/receiver (4%)
 - (h) protocols define (1) format, (2) order of msgs sent and received among network entities, and (3) actions taken on msg transmission, receipt (4% each, total 12%)
 - (i) network edge:
 - applications and hosts (8%)
 - (j) network core:
 - interconnected routers (4%)
 - network of networks (4%)

2. How long does it take to send a file of 64,000 bits from host A to host B over a circuit-switched network? Assume (a) all links are 2.048 Mbps. (b) each link uses TDM with 24 slots (c) 500 msec to establish end-to-end circuit. (要說明清楚你的算式代表的意義，只寫答案不計分. 14%)

Ans: $500\text{ms} + 64,000 / (2.048 * 10^6 * \frac{1}{24})\text{s} = \underline{1.25\text{ s}}$

500ms: The circuit-switched network has to establish end-to-end circuit (3%)

use 1 of 24 slots (3%)

$64,000 / (2.048 * 10^6 * \frac{1}{24})$: packet length L/ bandwidth R (3%)

1.25 s (5%)

(14%)

3. Compare the circuit switching and packet switching on resource usage, performance, and call setup. (total 18%)

Circuit-switching: (3% each, total 18%)

- i. end-end resources reserved for "call", like link bandwidth, switch capacity. dedicated resources (3%): no sharing (1%)
- ii. circuit-like (guaranteed) performance
- iii. call setup required

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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