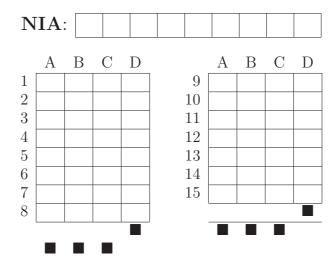# Quality of Service
Lecture 2

Date: Spring
Duration: 15 min.

- There is only one correct answer for each multiple choice question.

- Each correct answer adds 1 point.

- Each incorrect answer has a penalty of $\frac{1}{3}$ points.

- No score is awarded for unanswered questions, neither positive nor negative.

- Mark out your answers with an "X". Make sure that the "X" reaches the corners of the rectangle. ⊠

- No score is awarded if you mark more than one answer.

Write your personal data clearly.

Last name:	
First name:	
Group:	

Permutation: A

NIA:

	A	B	C	D
1				
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	A	B	C	D
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1.- Which measure of bandwidth in common for billing in contracts between ISPs?

(a) 95 % percentile bandwith of averages of 5 minutes.

(b) Minimum bandwidth.

(c) Average bandwidth.

(d) Maximum bandwidth.

2.- Which techniques can we use to deal with errors?

(a) Cell integrity metric (CIM), error dealing technique (EDT), weighted round robin (WRR).

(b) Hierarchical replication code (HRC), strong data protection (SDR), error prevention mechanism (EPM).

(c) Forward error correction (FEC), automatic repeat request (ARQ), packet loss concealment (PLC).

(d) Binary robust redundancy (BRR), spatial data duplexing (SDD), repeat-until-received (RUR).

3.- Which of the following statements is true?

(a) P2P file exchange is not an elastic application.

(b) Voice packets should be prioritized over video.

(c) Voice require more bandwidth than video.

(d) Web traffic has stricter delay contraints than VoIP.

4.- Why it is necessary to offer different tiers of service?

(a) To reduce the delay of all packets of the network.

(b) Because heterogeneous applications coexist in the same network.

(c) Because the applications that use larger volumes of traffic need to be prioritized.

(d) To prevent that VoIP packets are transmitted over the same link as Web packets.

5.- Which of the following is not a QoS metric considered in the course?

(a) Availability.

(b) Packet order preservation.

(c) Confidentiality.

(d) Bandwidth.

6.- Which of the following media is more reliable in terms of bit error rate?

(a) Optical fibre.

(b) Satellite link.

(c) WiFi link.

(d) ADSL over twisted pair.

7.- For TCP connections, our main concern is ...

    (a) the jitter.

    (b) the delay.

    (c) the average hop duration.

    (d) the round-trip-time (RTT).

8.- Given L the packet length and R the line rate, what is $\frac{L}{R}$?

    (a) The queueing time.

    (b) The transmission time.

    (c) The processing time.

    (d) The propagation time.

9.- A router is performing load balancing using two parallel links ...

    (a) It should take a hash of the protocol (UDP or TCP), source and destination address and source and destination port to decide the route of the packets.

    (b) It should use the ECN bit to route the packet.

    (c) It should take a hash of the QoS field to route the packet.

    (d) It should use the flow sequence number to route the packet.

10.- Why is defining SLA's is tricky? Take the example of bandwidth.

    (a) The bandwidth changes with different operative systems and browsers.

    (b) It is difficult to measure packets that are travelling very fast (the speed of light).

    (c) Bandwidth may have different meanings (line speed, with or without L2 headers, average or maximum, etc.).

    (d) Bandwidth can be meaured in bits per second or bytes per second.

11.- What is common packetizatin interval for VoIP?

    (a) 100 μs.

    (b) 1 ms .

    (c) 20 ms .

    (d) 200 ms.

12.- What of the following is a good practice (a requirement, actually) in router design?

    (a) Keep a separate queue for each flow.

    (b) Keep the packets of the same flow in the same queue.

    (c) Keep packets of different flows in different queues.

    (d) Keep packets of the same flow in different queues.

13.- Which of the following is not a positive aspect of a network?

(a) High $\frac{MTTR}{MTBF+MTTR}$ ratio.

(b) Short MTTR..

(c) Short MTBF.

(d) High availability.

14.- What is the re-ordering ratio of this sequence (1, 2, 3, 4, 7, 5, 6, 8, 9, 10)?

(a) 10/10.

(b) 3/10.

(c) 5/10.

(d) 0/10.

15.- What is the name of the contract that details QoS guarantees?

(a) QoS contract (QSC).

(b) High Quality Contract (HQS).

(c) Guarantee Provision Society (GPS).

(d) Service Level Agreement (SLA).