


Quality of Service

Lecture 3

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.
- Pad your NIA with 0s on the left to complete the NIA field.

Write your personal data clearly.

Last name:	
First name:	
Group:	

Permutation: A

NIA:

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Figure 1 shows two 7x4 grids representing the 28 letters of the alphabet. The left grid is labeled A, B, C, D and 1-7. The right grid is labeled A, B, C, D and 8-13. Below the grids are 28 black squares arranged in two rows of 14, representing the 28 letters of the alphabet.

- 1.- Which tool smoothes bursty traffic without dropping packets?
 - (a) A classifier.
 - (b) A meter.
 - (c) A shaper.
 - (d) A marker.

- 2.- Which of the following classification methods has the lower computational cost?
 - (a) Deep packet inspection.
 - (b) QoS markings.
 - (c) IP and port source and destination pairs.
 - (d) Stateful inspection.

- 3.- Where can we find a TX-ring
 - (a) Between the marker and the meter.
 - (b) Between the classifier and the queues.
 - (c) Between the scheduler and the transmission line.
 - (d) Between the policer and the shaper.

- 4.- Why is QoS more important in case of equipment failure or scheduled downtime?
 - (a) Because QoS simplifies the configuration and reduces the length of the downtime.
 - (b) Because there might be not enough resources to satisfy all traffic, and it is important to prioritize.
 - (c) Because the scheduled downtime is usually at night or during the weekend.
 - (d) Because QoS increases the available bandwidth, making sure that there is plenty of resources even during failure conditions.

- 5.- Where is computationally expensive classification and marking done?
 - (a) At the edge of the network where traffic is less aggregated.
 - (b) At the outgoing interface of core routers.
 - (c) In the network core, where the routers are more powerful.
 - (d) At the incoming interface of core routers.

- 6.- What is the name defined by the IETF to refer to the treatment that a router offers to a class of traffic?
 - (a) Synchronous Optical Networking (SONET).
 - (b) Per Hop Behaviour (PHB).
 - (c) Hierarchical replication code (HRC).
 - (d) Binary Exponential Backoff (BEB).

7.- When is it appropriate to police the traffic?

- (a) When it is desired to prevent packet loss.
- (b) When the traffic is in contract and we want to increase the delay.
- (c) When we want to absorb a burst and temporarily store the additional traffic.
- (d) When it is exceeding the agreed profile and we want to avoid delay and jitter.

8.- Which of the following is not a typical element in a queue system?

- (a) An IP address.
- (b) A buffer.
- (c) A scheduler.
- (d) A dropper.

9.- What is the preferred OSI layer to implement end-to-end QoS?

- (a) Layer 1.
- (b) Layer 3.
- (c) Layer 4.
- (d) Layer 7.

10.- Where is a chain of QoS tools applied?

- (a) In the routing tables.
- (b) In the router switching fabric. A tool (e.g. a policer) that is configured in a router, will apply to all interfaces and directions.
- (c) In the router interfaces, taking into account the direction of traffic (incoming/outgoing).
- (d) In the router ports.

11.- Which techniques would you use to identify and classify P2P traffic?

- (a) Incoming interface and source IP address.
- (b) Deep packet inspection and stateful inspection.
- (c) Source port classification and layer 4 protocol.
- (d) Metering.

12.- Why is it not possible to offer per IP flow granularity in data networks?

- (a) Because a router only pays attention to layer 4 information.
- (b) A core router may handle millions of IP flows and it is not scalable to keep state about them and treat them differently.
- (c) Because it is not possible for a router to identify an IP flow.
- (d) Because it would increase the queueing time.

13.- What is not a downside of bandwidth overprovisioning?

- (a) The need to pay for the extra bandwidth.
- (b) Lack of protection from the extra bandwidth consumption by virus/worms and other security attacks.
- (c) Network usage may increase in pair with extra network provisioning.
- (d) Higher complexity.