Quality of Service
Lecture 5

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:

	A	B	C	D		A	B	C	D
1					9				
2					10				
3					11				
4					12				
5					13				
6					14				
7					15				
8					16				

1.- What is the purpose of a packet queue?

(a) To absorb transient data bursts.
(b) To increase the delay.
(c) To discard packets.
(d) To change the order of packets.

2.- What is the reaction of TCP when a timeout expires?

(a) It doubles the congestion window.
(b) It halves the congestion window.
(c) It moves back to the slow start phase.
(d) It moves back to the congstion avoidance phase.

3.- What is the benefit of ECN?

(a) The TCP receiver does not need to send acknowledgement packets.
(b) Only the lesser important UDP packets are dropped.
(c) The size of the queues can be increased.
(d) The enpoints of a TCP flow can be notified about congestion without packet drop.

4.- What is the name of the queue that drops only those packets that arrive to an full queue?

(a) High-five.
(b) Tailend.
(c) Dropbox.
(d) Taildrop.

5.- Why is bufferbloat a problem?

(a) Because it assumes a fluid model and data packets behave differently.
(b) Because the routers overheat and start dropping packets.
(c) Because it makes it difficult to separate traffic in different queues.
(d) Because it unnecessarily increases the delay.

6.- How does RED compute the dropping probability?

(a) As a function of the average queue occupancy, which is computed using a EWMA.
(b) Using the packet size and the packet delay.
(c) The dropping probability in RED is always one.
(d) As a function of a hash of the protocol field, two IP addresses and the two ports of the IP packet.

7.- What is window scaling?

(a) A technique used to fill long fat pipes.

(b) A technique to prevent that the queues fill up.

(c) A technique to detect packet loss.

(d) A technique to separate linux traffic from windows traffic.

8.- What should we do to prevent packet re-ordering?

(a) Distribute the packets of a class of service among the different queues.

(b) Have a different queue for each class of service.

(c) Map all the packets of the same class of service to the same queue.

(d) Use a policer to control the amount of traffic that is directed to each of the queues.

9.- In a weighted taildrop queue we have ...

(a) different schedulers for large packets and small packets.

(b) different queue sizes for in-contract and out-of-contract traffic.

(c) different schedulers for in-contract and out-of-contract traffic.

(d) different queue sizes for large packets and small packets.

10.- What is the difference between RED and WRED?

(a) In WRED the dropper marks the dropped packets with a flag.

(b) WRED is used in core routers and RED in the edge routers.

(c) In WRED different dropping profiles are applied to packets with different dropping precedence.

(d) WRED supports larger bandwiths because it is more efficient than RED.

11.- To be used, ECN needs to be supported by ...

(a) ... the core routers of the network.

(b) ... the routers and the network administrator.

(c) ... the routers and the endpoints'TCP stack.

(d) ... the endpoints'TCP and UDP stacks.

12.- What are long fat networks?

(a) Networks that are slow and it takes a very long time for a packet to reach the other end.

(b) Networks that can contain a lot of data. TCP has to push a lot of data to fill the pipe.

(c) Networks that use more than 100 Km of coaxial cable..

(d) Networks with strict QoS constraints. A policer is needed to keep the traffic under control.

13.- What is a bad queue?

(a) A queue that is always empty.

(b) A queue that drop packets.

(c) A queue that is always full.

(d) A queue that is never full.

14.- What is a characteristic of Random Early Detection?

(a) It is unnecessary and should never be used.

(b) It drops (or marks with ECN flag) packets before the queue is full.

(c) It uses Weighted Deficit Round Robin.

(d) It detects congestion but it does not take any action.

15.- What is the reaction of TCP when a single packet is lost (detected thanks to the reception of duplicate acks)?

(a) Enabling quality of service.

(b) Activating the ECN flag.

(c) Halving the congestion window.

(d) Doubling the contention window.

16.- What kind of problems can appear in the absence of active queue management?

(a) TCP flow control.

(b) TCP global synchronization and bufferbloat.

(c) Overbloat and packet loss.

(d) Sustained link utilization.