

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 congestion 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 endpoints 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 bandwidths 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.
- (c) Packet loss.
- (d) Sustained link utilization.