Quality of Service
MPLS-TE and RSVP

Date: Spring
Duration: 15 min.

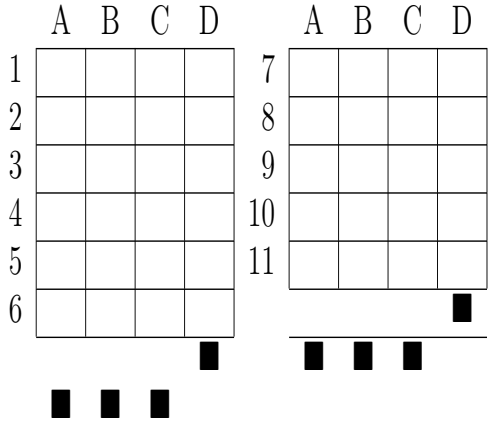
- There is only one correct answer for each multiple choice question.
- Each correct answer adds 1 point.
- Each incorrect answer has a penalty of $\frac{1}{3}$ points.
- No score is awarded for unanswered questions, neither positive nor negative.
- Mark out your answers with an "X". Make sure that the "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:



1.- In MPLS Fast Re-Route ...

(a) the end-to-end LSP is computed before a local detour is activated.
(b) provides restoration times below 50 ns.
(c) the routing protocol is temporarily disabled until the failure has been repaired.
(d) a local restoration path is activated until a new LSP is established.

2.- What is the purpose of the RSVP protocol in a MPLS-TE environment?

(a) Resource reservation.
(b) Routing.
(c) Traffic conditioning.
(d) Policing and shaping.

3.- Which packet performs the actual resource reservation in RSVP?

(a) The SNMP packet.
(b) The PATH packet.
(c) The ECHO packet.
(d) The RSVP packet.

4.- In MPLS-DiffServ-TE ...

(a) the delay of RSVP packets is minimized.
(b) the high priority flows are not policed.
(c) the MPLS packets use a different label than the HTTP packets.
(d) bandwidth reservation is done on a per-class basis.

5.- Is it possible for a MPLS packet to carry more than one label?

(a) Yes. There is flag indicating the bottom of the stack.
(b) Yes. If two or more labels are added to a packet, they cannot be removed.
(c) No, a MPLS packet carries a single label that never changes.
(d) No, a MPLS packet carries one single label that is changed in each hop.

6.- What is not a reason for using MPLS?

(a) To have a tighter control on the path followed by each traffic stream.
(b) To use Fast Re-Route for a recovery time below 50ms.
(c) To use BGP to decide which routers are traversed by the LSP.
(d) To use traffic engineering to distribute the traffic accross the network.

7.- The path of a LSP ...

(a) changes for each packet.

(b) can be computed by CSPF, that takes into account the constraints that apply to the LSP (e.g. bandwidth requirements).

(c) must be computed by the network administrator.

(d) can be inferred by the LSD protocol.

8.- When are VPNs used?

(a) When wireless communication is needed.

(b) To connect different networks of the same institution.

(c) When the number of real networks is not enough.

(d) To classify packets according to their priority.

9.- Which information is used by a core MPLS router to forward a packet?

(a) The MAC of the packet and a marking table.

(b) The IP of the packet and a routing table.

(c) The label of the packet and a lookup table.

(d) The port of the packet and a porting table.

10.- The resource reservation in RSVP is ...

(a) a hard-edge reservation. It lasts until it is explicitly teared down by a TEAR message.

(b) a full duplex reservation.

(c) a soft state reservation. It needs to be periodically refreshed.

(d) a bouncing egg reservation. It lasts for 10 minutes.

11.- Why is MPLS “multi-protocol”?

(a) Because it directly encapsulates packets of other protocols such as ethernet or IP.

(b) Because it directly encapsulates packets of other protocols such as FTP and HTTP.

(c) Because it directly encapsulates packets of other protocols such as TFTP and bittorrent.

(d) Because it directly encapsulates packets of other protocols such as SNMP and SMTP.