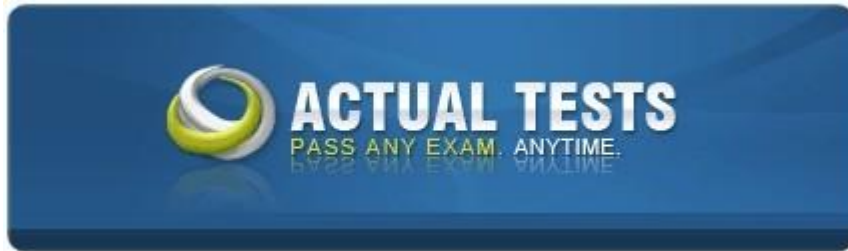


Implementing Cisco Service Provider Next-Generation Core Network Services (SPCORE)

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Number: 642-887
Passing Score: 800
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File Version: 1.0

Cisco 642-887



Implementing Cisco Service Provider Next-Generation

Core Network Services

Version: 5.0
Cisco 642-887 Exam

Sections

1. QOS in a Service Provider IP NGN Environment
2. MPLS/LDP in a Service Provider IP NGN Environment
3. MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)
4. Transport Technologies
5. LAB-1
6. LAB-2

Questions

QUESTION 1

Which three conditions can occur when metering traffic using a dual token bucket traffic policing QoS mechanism on Cisco routers? (Choose three.)

- A. conform
- B. pass
- C. violate
- D. exceed
- E. burst
- F. matched

Correct Answer: ACD

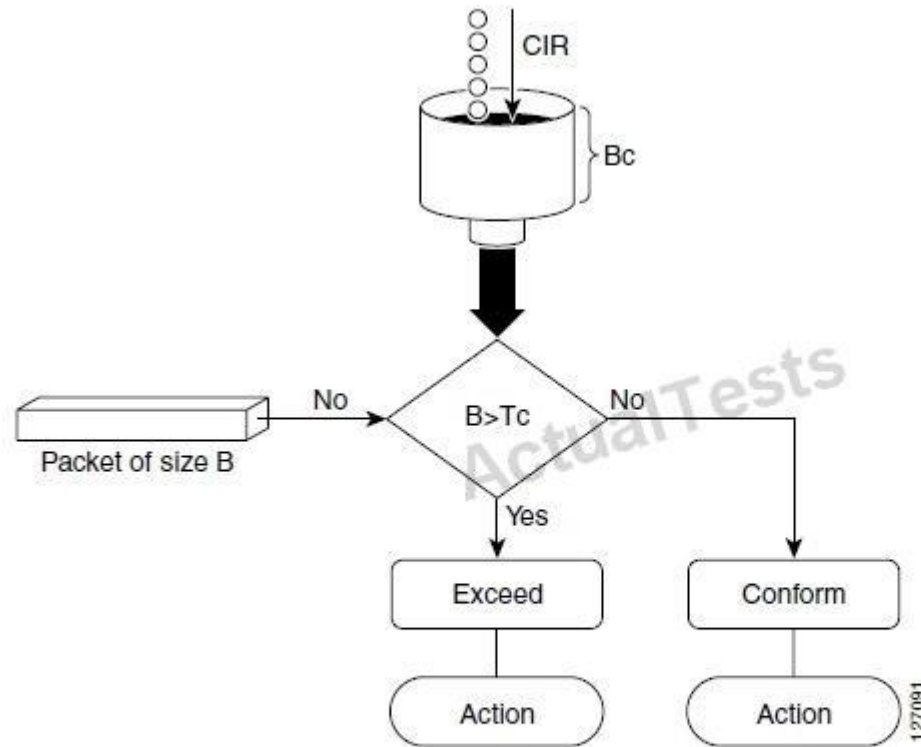
Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

Figure 2 *How a Traffic Policing Mechanism Regulates Traffic*



The time interval between token updates (T_c) to the token bucket is updated at the CIR value each time a packet arrives at the traffic policer. The T_c token bucket can contain up to the B_c value. If a packet of size B is greater than the T_c token bucket, then the packet exceeds the CIR value and a configured action is performed. If a packet of size B is less than the T_c token bucket, then the packet conforms and a different configured action is performed.

QUESTION 2

What is the correct formula for determining the CIR?

- A. $CIR = B_c / T_c$
- B. $CIR = B_c \times T_c$
- C. $CIR = T_c / B_c$
- D. $CIR = B_c + B_e$

- E. $CIR = Tc/(Bc+Be)$
- F. $CIR = (Bc+Be)/Tc$

Correct Answer: A

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

Committed Information Rate (CIR) the rate the device will send at (on average) over a one second period.

The default CIR when traffic-shaping is enabled on the interface is 56K. CIR is also referred to as the "target rate". Since the device is forced to send at the AR, it does not send all of the time (within one second) in order to send an average amount of data that equals the CIR. Minimum CIR (mincir) the rate the service provider guarantees to accept. Theoretically, the provider will set the DE bit for all traffic above this rate. Mincir is designed to be used in conjunction with adaptive shaping. With adaptive shaping, the router will throttle down in the event of congestion. The router will not throttle down below this value. Committed Burst (Bc) the number of committed bits allows to be sent during a given interval. The device sends an average amount of traffic to achieve the CIR. The Bc value defaults to 1/8 of the configured CIR for speeds below 650K. For speeds above that, it is roughly 1/16 of CIR. Excess Burst (Be) the number of non-committed bits the router is allowed to send above Bc during the first interval (Tc). The amount of Be "credits" is derived from unused Bc credits in previous intervals. There is no limit to how long Be can "store" unused Bc credits. It is a common misconception that Be can only store credits from the previous interval or the previous second.

There is no default Be value.

Committed Rate Measurement Interval (Tc) the time interval over which Bc or Bc+Be can be transmitted. The max value is 125 ms and the minimum value is 10 ms.

The Formula

CIR, Tc, and Bc are related mathematically by the following formula:

$CIR = Bc/(Tc/1000)$ Notice the division of Tc by 1000 is used to convert milliseconds into seconds the common measurement of CIR and Bc.

QUESTION 3

DS-TE implementations on Cisco routers support which bandwidth pool(s) and class type(s)? (Choose two.)

- A. global pool only
- B. subpool only
- C. global pool and subpool
- D. class-type 0 only
- E. class-type 1 only
- F. class-type 0 and class-type 1

Correct Answer: CF

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

Differential Service Tunnels

Differential Service Traffic Engineering (TE) is an extension of the regular MPLS Traffic Engineering (MPLSTE) feature. Regular TE does not provide bandwidth guarantees to different traffic classes. A single bandwidth pool (global pool) is used in regular TE that is shared by all traffic. In order to support various class of service (CoS), the ability to provide multiple bandwidth pools is required. These bandwidth pools then can be treated differently based on the requirement for the traffic class using that pool.

In RSVP global and subpools reservable bandwidths are configured on a per interface basis to accommodate TE tunnels on the node. Available bandwidth from all configured bandwidth pools is advertised using Interior Gateway Protocol (IGP). RSVP is used to signal the TE tunnel with appropriate bandwidth pool requirements.

QUESTION 4

Which field in the MPLS shim header is used to support different QoS markings?

- A. IP precedence
- B. DSCP
- C. EXP
- D. ToS
- E. S
- F. Label

Correct Answer: C

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

MPLS EXP Marking

The three MPLS EXP (experimental) bits in the shim header of an input or output MPLS packet header may be set or changed by a user configured value

QUESTION 5

On a Cisco IOS XR router, which mechanism protects the router resources by filtering and policing the packets flows that are destined to the router that is based on defined flow-type rates?

- A. LLQ
- B. LPTS
- C. Committed Access Rate
- D. Control Plane Policing

- E. Management Plane Protection
- F. NetFlow
- G. ACL

Correct Answer: B

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

Local Packet Transport Services (LPTS) maintains tables describing all packet flows destined for the secure domain router (SDR), making sure that packets are delivered to their intended destinations.

The Low Latency Queueing feature brings strict priority queueing to Class-Based Weighted Fair Queueing (CBWFQ).

QUESTION 6

When configuring LLQ (strict priority queue) on a traffic class using the Cisco IOS XR priority command on a Cisco ASR9K router, which additional QoS command is required for this traffic class?

- A. shape
- B. police
- C. random-detect
- D. bandwidth

Correct Answer: B

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

The Low Latency Queueing feature brings strict priority queueing to Class-Based Weighted Fair Queueing (CBWFQ).

QUESTION 7

On the Cisco ASR9K router, when using the bandwidth command to specify the minimum guaranteed bandwidth to be allocated for a specific class of traffic, what will be used as the queuing algorithm?

- A. custom queuing
- B. CBWFQ
- C. WFQ
- D. FIFO
- E. priority queuing

Correct Answer: B

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

Class based weighted fair queuing (CB-WFQ) was initially released without the support of a priority queuing system, thus it could not guarantee the delay and jitter (delay variation) requirements of real-time, interactive voice and video conversations. Since for CBWFQ, the weight for a packet belonging to a specific class is derived from the bandwidth assigned to the class, which in turn determines the order in which packets are sent. All packets are serviced fairly based on weight and no class of packets may be granted strict priority. This scheme poses problems for voice traffic that is largely intolerant of delay, especially variation in delay

QUESTION 8

When implementing MPLS DS-TE on Cisco IOS XR routers, all aggregate Cisco MPLS TE traffic is mapped to which class type by default?

- A. class-type 0 (bandwidth global pool)
- B. class-type 1 (bandwidth subpool)
- C. class-type 2 (bandwidth priority)
- D. class type class-default (bandwidth best-effort)

Correct Answer: A

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

Differentiated Services Traffic Engineering

MPLS Differentiated Services (Diff-Serv) Aware Traffic Engineering (DS-TE) is an extension of the regular

MPLS-TE feature. Regular traffic engineering does not provide bandwidth guarantees to different traffic classes. A single bandwidth constraint is used in regular TE that is shared by all traffic. To support various classes of service (CoS), users can configure multiple bandwidth constraints. These bandwidth constraints can be treated differently based on the requirement for the traffic class using that constraint.

MPLS diff-serv traffic engineering provides the ability to configure multiple bandwidth constraints on an MPLS-enabled interface. Available bandwidths from all configured bandwidth constraints are advertised using IGP.

TE tunnel is configured with bandwidth value and class-type requirements. Path calculation and admission control take the bandwidth and class-type into consideration. RSVP is used to signal the TE tunnel with bandwidth and class-type requirements.

Diff-Serv TE can be deployed with either Russian Doll Model (RDM) or Maximum Allocation Model (MAM) for bandwidth calculations.

TE Class Mapping

Each of the eight available bandwidth values advertised in the IGP corresponds to a TE Class. Because the IGP advertises only eight bandwidth values, there can be a maximum of only eight TE classes supported in an IETF DS-TE network.

TE class mapping must be exactly the same on all routers in a DS-TE domain. It is the responsibility of the operator configure these settings properly as there is no way to automatically check or enforce consistency.

The operator must configure TE tunnel class types and priority levels to form a valid TE class. When the TE class map configuration is changed, tunnels already up are brought down. Tunnels in the down state, can be set up if a valid TE class map is found.

[Table 4](#) list the default TE class and attributes.

Table 4 TE Classes and Priority

TE Class	Class Type	Priority
0	0	7
1	1	7
2	Unused	
3	Unused	
4	0	0
5	1	0
6	Unused	
7	Unused	



ote The default mapping includes four class types.

QUESTION 9

On the Cisco IOS XR, which MQC configuration is different than on the Cisco IOS and IOS XE?

- A. On the Cisco IOS XR, WRED can only be applied in the output direction.
- B. On the Cisco IOS XR, marking can only be applied in the input direction.
- C. On the Cisco IOS XR, LLQ can be applied in the input or output direction.
- D. On the Cisco IOS XR, LLQ can use up to four priority queues: level 1, level 2, level 3, and level 4.

Correct Answer: C

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 10

On Cisco routers, how is hierarchical QoS implemented?

- A. Within the parent policy, reference another child policy using the policy-map command.
- B. Within the child policy, reference another parent policy using the policy-map command.
- C. Use the policy-map command within a service-policy to implement nested policy-maps.
- D. Within the parent policy-map, reference another child policy-map using the service-policy command.

Correct Answer: D

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 11

```

policy-map test
!
class one
priority level 1
!
class two
priority level 2
!
class three
bandwidth percent 60
!
interface GigabitEthernet0/0/0/2
service-policy output test
!
!

```

Refer to the Cisco IOS XR policy-map configuration exhibit.

What is wrong with the policy-map configuration?

- A. missing the priority percent command under class one and class two
- B. missing the police command under class one and class two
- C. missing the police command under class three
- D. missing the priority bandwidth command under class one and class two
- E. missing the bandwidth command under class one and class two

Correct Answer: B

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

Hierarchical policing is also supported. In such a configuration, both parent and child policies have class-maps

containing policing statements, as in the following example:

```

!
policy-map child
class gold
police rate percent 50 conform-action set precedence immediate exceed-action drop
!

```

```
!  
policy-map parent  
class match_all  
police rate 10000 kbps burst 15000 exceed-action drop  
service-policy child
```

QUESTION 12

When configuring class-based WRED on Cisco routers, which WRED parameter is not user configurable on a Cisco IOS XR but is user configurable on a Cisco IOS and IOS XE?

- A. the ingress or egress direction where the class-based WRED policy will be applied
- B. the maximum threshold
- C. the minimum threshold
- D. the mark probability denominator

Correct Answer: D

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

Comparison of Cisco IOS QoS and Cisco IOS-XR QoS

The Cisco IOS-XR software implementation of QoS is basically the same as the QoS implementation on Cisco

IOS software, with the following exceptions:

·On Cisco IOS-XR software, the bandwidth command can be configured only in egress policies. ·The following changes have been made to the class-map command on Cisco IOS-XR software:

Supports 4K per logical router.

Maximum number of match criteria configurable in one class map is eight.

·When a class is marked as high priority using the priority command on Cisco IOS-XR software, we recommend that you configure a policer to limit the priority traffic. Limiting the priority traffic will ensure that the priority traffic does not starve all of the other traffic on the line card. Use the police command to explicitly configure the policer.

·On Cisco IO-XR software, only one conform-action, exceed-action, or violate-action command can be configured at a time. To configure traffic policing, use the police command. ·On Cisco IOS-XR software, policy modifications cannot be made on existing policies. Use the policy-map command to remove the policy from all attached interfaces, delete the policy map, and redefine a new policy.

·When configuring a policy map on Cisco IOS-XR software, the maximum number of classes configurable in one policy map is 16, which includes both Level 1 and Level 2 classes. To configure a policy map, use the policy-map command.

·When WRED is configured on Cisco IOS-XR software, the mark probability in the random-detect command is not configurable--it is always set to 1.

·When the random-detect exp command is used on Cisco IOS-XR software, the exponential weighting constant is not configurable and will be programmed automatically by Cisco IOS-XR software.

·When access control lists (ACLs) are used in QoS class maps, the underlying deny or permit actions associated with access control entries (ACEs) are ignored. ACEs are used as a classification mechanism in order to provide appropriate QoS behavior as specified in class maps.

Use ACLs that include ACEs with permit actions only.

QUESTION 13

Which of the following three statements are correct regarding IPv6 QoS? (Choose three.)

- A. The traffic class field in the IPv6 header can be used to set specific precedence or DSCP values.
- B. A 20-bit flow label field enables per-flow processing.
- C. DS-TE is not supported by IPv6.
- D. Per-hop behavior in IPv6 networks is based on EXP bits.
- E. IPv6 QoS features are configured using the modular QoS CLI on Cisco routers.

Correct Answer: ABE

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

http://www.cisco.com/en/US/technologies/tk648/tk872/technologies_white_paper0900aecd802600_4d.pdf



IPv6 QoS AT-A-GLANCE

RFC 2460/3697

Currently IPv6 provides support for QoS marking via a field in the IPv6 header.

Similar to the type of service (ToS) field in the IPv4 header, the traffic class field (8 bits) is available for use by originating nodes and/or forwarding routers to identify and distinguish between different classes or priorities of IPv6 packets.

Figure 1

The traffic class field may be used to set specific precedence or differentiated services code point (DSCP) values. These values are used in the exact same way as in IPv4.

The key advantage with the flow label is that the transit routers do not have to open the inner packet to identify the flow, which aids with identification of the flow when using encryption and other scenarios.

Version	Traffic Class	Flow Label	
Payload Length		Next Header	Hop Limit
Source Address			
Destination Address			

Current Cisco IOS® Software support for IPv6 QoS includes:

- Packet classification
- Queuing (includes LLQ; excludes legacy PQ/CQ)
- Traffic shaping
- WRED

IPv6 also has a 20-bit field known as the flow label field (RFC 3697). The flow label enables per-flow processing for differentiation at the IP layer.

It can be used for special sender requests and is set by the source node.

The flow label must not be modified by an intermediate node.

Planned Cisco IOS Software support for IPv6 QoS includes:

- Compressed Real-Time Protocol (cRTP)
- Network-based application recognition (NBAR)
- Committed access rate (CAR)

QUESTION 14

With unmanaged CE routers, at which point in the service provider network is the QoS trust boundary, and what is required at the trust boundary?

- A. between the CE and PE router and mapping of the customer traffic classes into the service provider traffic classes at the PE router ingress
- B. between the CE and PE router and trusting the QoS markings from the CE router and applying the required QoS mechanisms based on the customer QoS markings
- C. between the PE and the P router and mapping of the customer traffic classes into the service provider traffic classes at the P router ingress
- D. between the PE and P router and trusting the QoS markings from the CE router and applying the required QoS mechanisms based on the customer QoS markings
- E. between the customer network and the CE router ingress and applying the required egress QoS policy on the CE router

Correct Answer: A

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 15

On the Cisco IOS XR, when using the match protocol command within a class-map to classify traffic, you noticed that the match protocol option on the Cisco IOS XR shows much fewer protocol options than on the Cisco IOS or IOS XE, like there is no option such as the match protocol yahoo-messenger command on the Cisco IOS XR. Why is this?

- A. because the Cisco IOS XR router does not have the correct software packages installed
- B. because when defining the class-map, the class-map type should be set to type inspect: class-map type inspect class-map-name command
- C. because NBAR is not supported on the Cisco IOS XR
- D. because flexible packet matching has not been enabled on the Cisco IOS XR router

Correct Answer: C

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 16

Within the service provider core network, which two QoS mechanisms are typically deployed on the P routers? (Choose two.)

- A. LLQ

- B. traffic policing and remarking
- C. WRED
- D. traffic shaping
- E. traffic classification and markings
- F. link fragmentation and interleaving

Correct Answer: AC

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

QUESTION 17

Which three steps are required to configure QPPB on Cisco IOS XR routers? (Choose three.)

- A. Apply a QPPB route policy to the BGP process using the table-policy command
- B. Apply a QPPB route policy to the BGP neighbor using the route-policy command
- C. Define a QPPB route policy to match the customer routes, then set the IP precedence or qos- group
- D. Define a QPPB route policy to match the customer IP precedence or qos-group markings, then set the BGP community
- E. Enable QPPB on an interface using the ipv4 bgp policy propagation input ip-precedence|qos- group destination|source command
- F. Enable QPPB on an interface using the ipv4 bgp policy propagation output ip-precedence|qos- group destination|source command

Correct Answer: ACE

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QoS Policy Propagation via BGP (QPPB), is a mechanism that allows propagation of quality of service (QoS) policy and classification by the sending party based on access lists, community lists and autonomous system paths in the Border Gateway Protocol (BGP), thus helping to classify based on destination instead of source address.

QUESTION 18

The Cisco IOS and IOS XE qos pre-classify command allows which kind of packet classification on IP packets that are encapsulated with GRE and IPsec?

- A. allows for packets to be classified based on the ToS byte values before packet encryption
- B. allows for packets to be classified based on the ToS byte values after packet encryption
- C. allows for packets to be classified based on the packet payload before packet encryption

- D. allows for packets to be classified based on the packet payload after packet encryption
- E. allows for packets to be classified based on the packet header parameters other than the ToS byte values after packet encryption

Correct Answer: A

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

http://www.cisco.com/en/US/tech/tk543/tk545/technologies_tech_note09186a008017405e.shtml The qos pre-classify command

When packets are encapsulated by tunnel or encryption headers, QoS features are unable to examine the original packet headers and correctly classify the packets. Packets traveling across the same tunnel have the same tunnel headers, so the packets are treated identically if the physical interface is congested. With the introduction of the Quality of Service for Virtual Private Networks (VPNs) feature, packets can now be classified before tunneling and encryption occur. In this example, tunnel0 is the tunnel name. The qos pre-classify command enables the QoS for VPNs feature on tunnel0:

```
Router(config)# interface tunnel0
Router(config-if)# qos pre-classify
```

QUESTION 19

Which are typical class-based marking policies that are implemented on service provider IP NGN PE routers?

- A. On the PE ingress, classify the customer traffic and then mark with qos-group. On the PE egress, classify based on the qos-group and then mark with mpls exp.
- B. On the PE ingress, classify the customer traffic and then mark with mpls exp. On the PE egress, classify based on the mpls exp and then mark with qos-group.
- C. On the PE ingress, trust the customer QoS markings. On the PE egress, classify based on the customer QoS markings and then mark with qos-group.
- D. On the PE ingress, trust the customer QoS markings. On the PE egress, classify based on the customer QoS markings and then mark with mpls exp.

Correct Answer: A

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 20

Which item is not available to be used for QoS classification in Cisco IOS XR?

- A. MAC SA

- B. protocol
- C. inner EXP
- D. discard-class
- E. QoS-group
- F. VLAN

Correct Answer: C

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

QUESTION 21

Which statement is correct regarding the default MPLS TTL behavior?

- A. When an ingress edge LSR receives an IP packet, it will decrement the IP TTL field by 1; then it will set the MPLS Label TTL field to 255.
- B. When an ingress edge LSR receives an IP packet, it will decrement the IP TTL field by 1; then it will copy the decremented IP TTL field into the MPLS Label TTL field.
- C. When an ingress edge LSR receives an IP packet, it will just copy the IP TTL field into the MPLS Label TTL field.
- D. When an ingress edge LSR receives an IP packet, it will copy the IP TTL field into the MPLS Label TTL field first; then it will only decrement the MPLS Label TTL field by 1.
- E. When an ingress edge LSR receives an IP packet, it will copy the IP TTL field into the MPLS Label TTL field first; then it will only decrement the IP TTL field by 1.

Correct Answer: B

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 22

Which three statements are correct regarding ping mpls command operations? (Choose three.)

- A. MPLS OAM has to be enabled on the router using the mpls oam command.
- B. They use a 127/8 address as the destination address in the MPLS echo request packet.
- C. They use ICMP echo request and ICMP echo reply packets.
- D. They are used to test for a broken LSP.

- E. If there is a broken LSP, instead of using label switching, the packet can still be forwarded based on the destination IP address in the mpls ping echo request packet.

Correct Answer: ABD

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

How MPLS Ping works?

MPLS Ping doesn't rely on ICMP echo messages. Instead it uses UDP protocol with both source and destination port as 3503 and relies on MPLS Echo request and MPLS Echo reply. When MPLS ping is triggered from any MPLS router, it will generate UDP segment with source/destination port as 3503. The source address will be selected as usual while the destination address will be 127.0.0.1. The IP TTL will be set to 1.

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Below is a sample IP format when MPLS Ping is originated from R5 to 150.1.6.6/32,

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
|Version|  IHL  |Type of Service|                Total Length        |
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
|                Identification                |Flags|  Fragment Offset  |
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
|  TTL=1    |  Protocol=UDP  |                Header Checksum        |
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
|                150.1.5.5                |
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
|                127.0.0.1                |
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
|                Options                |  Padding  |
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
```

Now the originating LSR will look into the LFIB and populate the label header with respective labels to reach the FEC, in our case 150.1.6.6/32.

R4 on receiving the MPLS packet will be able to send to the actual destination only if the LSP is end to end. If the LSP is broken between R4 and R6, R4 will look into the destination IP address which will be 127.0.0.1 and won't be able to perform IP forwarding. As per RFC 1812, a router should not forward any packet that has destination address of 127.0.0.0/8

QUESTION 23

What are the four fields inside the MPLS shim header? (Choose four.)

- A. EXP
- B. TTL
- C. Version
- D. S
- E. Length
- F. Label
- G. Type
- H. FCS

Correct Answer: ABDF

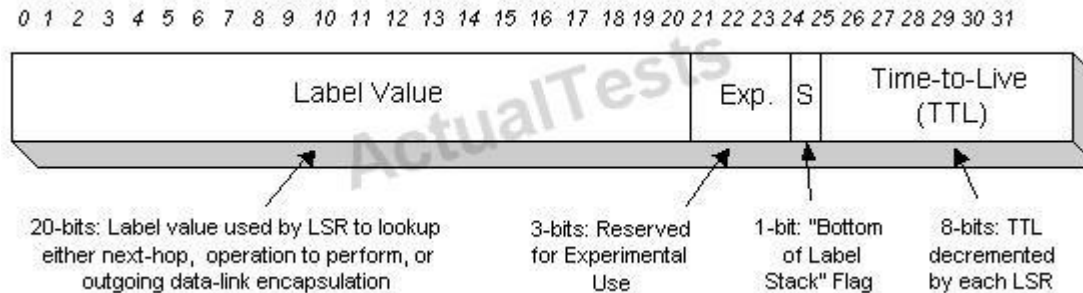
Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

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QUESTION 24

Which two of the following statements are correct regarding LSPs? (Choose two.)

- A. An LSP is created for every routing protocol entry.
- B. Each LSP is bidirectional, that is, packets traveling in the opposite direction use the same LSP.
- C. An IGP is used to populate routing tables in all routers in an MPLS domain.
- D. LDP is used to propagate labels and build LSPs.
- E. The FIB is used to forward MPLS-labeled packets down an LSP.

Correct Answer: CD

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 25

Which four pieces of information are stored for each prefix in the LFIB? (Choose four.)

- A. local label
- B. outgoing label
- C. next-hop IP address
- D. outgoing interface
- E. incoming interface
- F. Layer 2 header rewrite information

Correct Answer: ABCD

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

Forwarding Labeled Packets

LSR forwards the packet based on:

Top Label value of the received packet

Corresponding entry in LFIB (LABEL <=> INTERFACE)

#show mpls forwarding-table - will show:

local label

outgoing label

prefix (network)

outgoing interface

next-hop

```
Pomerol#show mpls forwarding-table
```

Local tag	Outgoing tag or VC	Prefix or Tunnel Id	Bytes tag switched	Outgoing interface	Next Hop
16	Pop tag	10.1.1.12/30	636	Se3/0	point2point
17	Pop tag	10.10.10.1/32	0	Se3/0	point2point
18	21	10.10.10.4/32	0	Se3/0	point2point
19	Pop tag	10.1.1.0/30	0	Se4/0	point2point
	Pop tag	10.1.1.0/30	0	Se3/0	point2point
20	Pop tag	10.10.10.6/32	612	Se2/0	point2point
21	Pop tag	10.1.1.16/30	0	Se3/0	point2point
22	16	10.10.10.5/32	0	Se3/0	point2point
23	Pop tag	10.10.10.2/32	0	Se4/0	point2point

LSR expects packet to come with "top" label being "Local" (from show mpls forwarding-table). If Outgoing label is "Aggregate", then that means that this is a summary route and more specific lookup is performed.

If LSR cannot find label/interface mapping in LFIB, then it drops the packet. There are several "RESERVED" labels numbered from 0 to 15:

0 - explicit NULL - is used to preserve QoS info through EXP bits. It copies 'ip prec' or DiffServ. 1 - Router alert label - forces LSR to software switch the packet. 3 - Implicit NULL - this label is used for "connected" or "summary" routes. This way LSR signals its neighbors to execute "POP label" operation on "connected" routes. It is called PHP, Penultimate Hop Popping, and is used to make sure that LSR does not perform 2 lookups (label + ip). 14 - OEM alert label - is used for monitoring purpose. In Cisco IOS, the default range is 16 through 100,000, but can be expanded by using "mpls label range" command.

QUESTION 26

Which three network services can be implemented using MPLS within the service provider IP NGN core? (Choose three.)

- A. Layer 2 VPNs
- B. Layer 3 VPNs
- C. traffic engineering
- D. IntServ traffic engineering tunnels
- E. encrypted LSPs

Correct Answer: ABC

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 27

LDP session protection uses which one to maintain the LDP session between LDP neighbors?

- A. LDP NSF
- B. LDP NSR
- C. backup-targeted LDP hellos
- D. BFD
- E. LDP-IGP synchronization

Correct Answer: C

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 28

You are tasked to enable LDP on many of the interfaces on the Cisco CRS-3 router, and because there are many interfaces that need to have LDP enabled, you mistakenly did not enable LDP on all the required interfaces. To prevent this issue from happening again in the future, what could you do the next time you need to enable LDP on many interfaces?

- A. use the mpls ldp auto-config command under the IGP routing process
- B. use the mpls ldp sync command under the IGP routing process
- C. use the interface all command under the MPLS LDP process
- D. use the discovery command under the MPLS LDP process

Correct Answer: A

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 29

Which two statements are correct in describing ISP environments that are running IP/MPLS in the core network? (Choose two.)

- A. On the PE routers, each BGP route must use a unique label to reach the BGP next hop.
- B. The BGP next hops point to the PE routers, and only the PE routers are required to run BGP.
- C. A full mesh of IBGP sessions are required between all of the PE and P routers to ensure proper packets forwarding.

D. The PE and P routers run LDP to learn the labels for reaching the BGP next-hop addresses.

Correct Answer: BD

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 30

When troubleshooting LDP operations on the Cisco IOS and IOS XE routers, what is one of the first things that should be verified?

- A. if running OSPF as the IGP, ensure that OSPFv3 has been enabled
- B. check if the ip cef command has been enabled
- C. verify in the running configurations that all of the required LDP interfaces are defined under the mpls ldp command configuration mode
- D. verify if there are any access lists that are denying TCP and UDP port 464 packets

Correct Answer: B

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 31

```
mpls ldp
label
advertise
disable
for test1 to test2
!
ipv4 access-list test2
10 permit ipv4 any any
ipv4 access-list test1
10 permit ipv4 host 10.1.1.1 any
```

Referring to the Cisco IOS XR configuration exhibit, which labels will be advertised by the router with this configuration?

- A. Only the label for 10.1.1.1/32 will be advertised to all the LDP peers.

- B. Labels for all prefixes will be advertised to the 10.1.1.1 LDP peer.
- C. Labels for all prefixes will be advertised to all the LDP peers.
- D. No labels will be advertised to any LDP peers.

Correct Answer: A

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 32

What is the term that is used for the label that an LSR assigns and distributes to other LSRs in MPLS?

- A. Local
- B. Remote
- C. Explicit
- D. Explicit Null
- E. Aggregate

Correct Answer: A

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 33

Which Cisco IOS XR high-availability feature is used to prevent routes from being used before LDP converges?

- A. LDP session protection
- B. LDP-IGP synchronization
- C. BFD
- D. IGP session protection

Correct Answer: B

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 34

Which Cisco IOS XR command should be used in order to enable LDP-IGP synchronization for the ISIS IGP protocol?

- A. RP/0/RSP0/CPU0:R1(config-isis-if-af)#mpls ldp sync
- B. RP/0/RSP0/CPU0:R1(config-isis)#mpls ldp sync
- C. RP/0/RSP0/CPU0:R1(config-ldp)#isis ldp sync
- D. LDP-IGP synchronization is not supported for the ISIS IGP protocol on Cisco IOS XR platforms

Correct Answer: A

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 35

```
RP/0/RSP1/CPU0:ASR9006#sh mpls ldp igp sync
Bundle-Ether9000:
  Sync status: Ready
  Peers:
    192.168.1.25:0 (GR)
GigabitEthernet0/1/0/10:
  Sync status: Not ready
```

Referring to the Cisco IOS XR show command output exhibit, what are three possible reasons that the GigabitEthernet0/1/0/10 LDP IGP sync status is not ready? (Choose three.)

- A. GigabitEthernet0/1/0/10 is not configured to run LDP.
- B. Graceful restart is not configured on the peer.
- C. The LDP neighbor on GigabitEthernet0/1/0/10 is not up.
- D. The OSPF neighbor on GigabitEthernet0/1/0/10 is not up.
- E. LDP is up on GigabitEthernet0/1/0/10, but no label bindings have been received from the peer.
- F. GigabitEthernet0/1/0/10 is a member link of Bundle-Ether9000.

Correct Answer: CDE

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 36

In which two Cisco IOS XR configuration modes can mpls ldp igp sync be configured? (Choose two.)

- A. config-ldp
- B. config-if
- C. config-ospf-ar
- D. config-ospf
- E. config-isis

Correct Answer: CD

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 37

On Cisco routers, which three methods can be used to map traffic into the MPLS traffic engineering tunnel? (Choose three.)

- A. on-demand routing
- B. static routing
- C. optimized edge routing
- D. policy-based routing
- E. autoroute

Correct Answer: BDE

Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

Explanation

Explanation/Reference:

Explanation:

QUESTION 38

Which three statements are correct regarding a Cisco MPLS TE? (Choose three.)

- A. A Cisco MPLS TE tunnel maps onto an LSP path.

- B. Tunnels are bidirectional by default.
- C. Packets that are mapped into a Cisco MPLS TE tunnel will have two labels, with the top label indicating what the tail-end router should do with the packet.
- D. A tunnel that is created with a priority of 0 can pre-empt an existing tunnel with a priority of 7.
- E. CBR takes into account link resource and traffic tunnel attributes.
- F. RSVP is used between customer routers.

Correct Answer: ADE

Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

Explanation

Explanation/Reference:

QUESTION 39

On a Cisco router, when will the router actually reserve the bandwidth for the MPLS traffic engineering tunnel?

- A. during the autoroute process
- B. during constraint-based routing calculations
- C. on the receipt of the RSVP Path message
- D. on the receipt of the RSVP Resv message

Correct Answer: D

Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

Explanation

Explanation/Reference:

Explanation:

QUESTION 40

Cisco MPLS TE path setup can be affected by which three tunnel attributes? (Choose three.)

- A. bandwidth
- B. delay
- C. MTU
- D. priority
- E. affinity

Correct Answer: ADE

Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

Explanation

Explanation/Reference:

Explanation:

QUESTION 41

When using the tunnel mpls traffic-eng path-option 1 explicit name test command in Cisco MPLS TE tunnel configurations, the test explicit-path configuration will consist of a list of which values?

- A. tunnel endpoint
- B. resource class affinity
- C. MPLS label
- D. IP address

Correct Answer: D

Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

Explanation

Explanation/Reference:

Explanation:

tunnel mpls traffic-eng path-option

To configure a path option for a Multiprotocol Label Switching (MPLS) traffic engineering tunnel, use the tunnel mpls traffic-eng path-option command in interface configuration mode. To disable the specified path option, use the no form of this command.

tunnel mpls traffic-eng path-option number {dynamic | explicit {name path-name | path-number}} [lockdown]

no tunnel mpls traffic-eng path-option number {dynamic | explicit {name path-name | path-number}} [lockdown]

Syntax Description

number = When multiple path options are configured, lower numbered options are preferred.

dynamic = Path of the LSP is dynamically calculated.

explicit = Path of the LSP is an IP explicit path.

name path-name = Path name of the IP explicit path that the tunnel uses with this option. path-number = Path number of the IP explicit path that the tunnel uses with this option.

lockdown = (Optional) The LSP cannot be reoptimized.

Usage Guidelines

You can configure multiple path options for a single tunnel. For example, there can be several explicit path options and a dynamic option for one tunnel. Path setup preference is for lower (not higher) numbers, so option 1 is preferred.

Examples

The following example shows how to configure the tunnel to use a named IP explicit path:

Router(config-if)# tunnel mpls traffic-eng path-option 1 explicit name test

QUESTION 42

Cisco MPLS TE resource attributes that are configured locally for each link are distributed to the headend router of the traffic engineering tunnel using which protocol?

- A. BGP
- B. MP-BGP
- C. LDP
- D. RSVP
- E. OSPF or IS-IS with TE extension

Correct Answer: E

Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

Explanation

Explanation/Reference:

Explanation:

QUESTION 43

When implementing Cisco MPLS TE, the constrained-based path calculations will use which value as the TE cost of each link within the MPLS domain?

- A. By default, it will use the IGP metric, or each link can be assigned a specific value using the admin-weight command.
- B. It can only use the IGP metric as the TE cost.
- C. It will use the interface bandwidth as the TE cost.
- D. Each link must be assigned a TE cost using the metric command.

Correct Answer: A

Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

Explanation

Explanation/Reference:

Explanation:

QUESTION 44

Which affinity and mask value will match the link affinity that has 0x0F in the first 8 bits and 0x01 in the last 8 bits, and the middle 16 bits can be any value?

- A. affinity 0x0F000001 mask 0x0F000001
- B. affinity 0x0F000001 mask 0x00000000

- C. affinity 0x0F000001 mask 0x11111111
- D. affinity 0x0F000001 mask 0x11000011
- E. affinity 0x0F000001 mask 0xFF0000FF
- F. affinity 0x0F000001 mask 0x00FFFF00

Correct Answer: E

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 45

Which two features are used to provide Cisco MPLS TE node and link protection? (Choose two.)

- A. autoroute
- B. fast reroute
- C. backup tunnels
- D. BFD

Correct Answer: BC

Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

Explanation

Explanation/Reference:

Explanation:

QUESTION 46

In Cisco MPLS TE implementations, what can cause the tunnel bandwidth to adjust automatically based on the traffic load in the tunnel?

- A. fast reroute
- B. admin weight
- C. autobandwidth
- D. bandwidth subpool

Correct Answer: C

Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

Explanation

Explanation/Reference:

Explanation:

QUESTION 47

Which affinity value will be matched by the affinity bit mask of the affinity 0xFF00000A mask 0xFFFF000F command?

- A. 0xFFFF000A
- B. 0xFF00EEEE
- C. 0xFF000000
- D. 0x00000000
- E. 0x11110001

Correct Answer: B

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

0xFF00000A 11111111000000000000000000001010
0xFFFF000F 11111111111111110000000000001111
0xFF00EEEE 11111111000000001110111011101010

QUESTION 48

Refer to the Cisco IOS XR configuration exhibit.

```
interface Tunnel-te 10
ipv4 unnumbered Loopback0
destination 10.5.5.5
signalled-bandwidth 1000
priority 7 7
path-option 1 explicit name testpath
!
explicit-path name testpath
index 1 next-address ipv4 unicast 10.3.3.3
index 2 next-address ipv4 unicast 10.4.4.4
!
mpls traffic-eng
interface GigabitEthernet 0/0/0/10
backup-path tunnel-te 10
```

Which statement is correct?

- A. The backup tunnel-te 10 tunnel is using the highest setup and hold priority settings of 7.
- B. The backup tunnel path is learned dynamically.
- C. The fast-reroute command is missing under the (config-mpls-te-if)# configuration mode.
- D. Interface gi0/0/0/10 is the protected link.

Correct Answer: D

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 49

When defining an explicit MPLS TE tunnel path, which two command options are available under the explicit-path configuration mode? (Choose two.)

- A. exclude-address
- B. include-address
- C. next-address
- D. dynamic-address

Correct Answer: AC

Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

Explanation

Explanation/Reference:

Explanation:

QUESTION 50

Which three mechanisms are used to implement MPLS TE? (Choose three.)

- A. tunnel interface
- B. CSPF
- C. RSVP
- D. LDP
- E. MP-BGP

Correct Answer: ABC

Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

Explanation

Explanation/Reference:

Explanation:

Constrained-Based Shortest Path First (CSPF).

Resource Reservation Protocol - Traffic Engineering is an extension of the resource reservation protocol (RSVP) for traffic engineering.

QUESTION 51

Implementing IPoDWDM interfaces on Cisco CRS routers eliminates the need for which network component?

- A. ROADM
- B. external transponders
- C. electrical-optical-electrical converters
- D. electrical cross-connect

Correct Answer: B

Section: Transport Technologies

Explanation

Explanation/Reference:

Explanation:

IP over DWDM (IPoDWDM) is a technology used in telecommunications networks to integrate IP Routers and Switches in the OTN (Optical Transport Network).

QUESTION 52

Layer 2 VPN services that are offered by traditional service providers using a SONET/SDH backbone can be implemented by service providers using an IP/MPLS backbone with which MPLS feature?

- A. LSP stitching
- B. AToM
- C. virtual private WAN services
- D. cell-mode MPLS

Correct Answer: B

Section: Transport Technologies

Explanation

Explanation/Reference:

Explanation:

QUESTION 53

On Cisco routers, which QoS marker is only locally significant?

- A. DSCP
- B. MPLS EXP
- C. IP precedence
- D. QoS group
- E. discard eligible (DE)

Correct Answer: D

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 54

Which QoS mechanism is used for congestion avoidance?

- A. LLQ
- B. CBWFQ
- C. WRED
- D. LFI
- E. traffic policing

Correct Answer: C

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 55

```
policy-map policy_A
class test
bandwidth 1000000
random-detect dscp AF11 10000 20000
random-detect dscp AF41 12000 24000
```

Only based on the Cisco IOS XR policy-map configuration exhibit, which statement is correct?

- A. All DSCP AF41 marked packets will be dropped when the average queue length reaches 12,000 packets.
- B. DSCP AF11 marked packets will be randomly dropped when the average queue length reaches 10,000 packets.
- C. DSCP AF11 and AF41 marked packets are guaranteed a minimum bandwidth of 1 Mb/s.
- D. DSCP AF11 and AF41 marked packets are guaranteed a maximum bandwidth of 1 Mb/s.

Correct Answer: B

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 56

```
RP/0/RSP0/CPU0:P1# show mpls ldp bindings

10.7.1.1/32, rev 61
Local binding: label: 16008
Remote bindings: (2 peers)
Peer          Label
-----
10.0.2.1:0    16013
10.7.1.1:0    IMP-NULL

10.7.10.1/32, rev 85
Local binding: label: 16009
Remote bindings: (1 peer)
Peer          Label
-----
10.0.2.1:0    16022
```

Referring to the show output exhibit, which statement is correct?

- A. The P1 router is receiving label information for the 10.0.2.1/32 prefix from two LDP peers.
- B. The P1 router is receiving label information for the 10.7.1.1/32 prefix from two LDP peers.
- C. The P1 router is using the IMP-NULL local label for the 10.7.1.1/32 prefix because 10.7.1.1/32 is the loopback interface IP address on the P1 router.
- D. The P1 router will perform PHP for the 10.7.1.1/32 and 10.7.10.1/32 prefixes.

Correct Answer: B

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 57

```
pe1#traceroute 14.14.14.14
Type escape sequence to abort.
Tracing the route to 14.14.14.14
 0  37.37.37.1 [MPLS: Label 66 Exp 0] 40 msec 24 msec 28 msec
 1  78.78.78.2 [MPLS: Label 99 Exp 0] 28 msec 32 msec 28 msec
 2 181.181.181.1 [MPLS: Label 99 Exp 0] 36 msec 24 msec 24 msec
 3 110.110.110.1 28 msec 28 msec 28 msec
 4 103.103.103.2 [MPLS: Label 66 Exp 0] 28 msec 28 msec 24 msec
 5 135.135.135.2 28 msec 28 msec *
```

Referring to the traceroute output exhibit that is shown, which statement is correct?

- A. There is no problem with the end-to-end LSP as indicated by the successful trace.
- B. Normal PHP operation is performed by the hop 4 router.
- C. The end-to-end LSP is broken at hop 4.
- D. At each hop, each LSR is able to perform label swapping.

Correct Answer: C

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 58

What is an important requirement with MPLS applications like Layer 3 MPLS VPNs?

- A. All the PE routers loopback addresses should be summarized to reduce the number of routing table entries in the core routers.
- B. Targeted hellos are required between all the PE routers.
- C. An end-to-end LSP is required between the PE routers.
- D. The LSPs that are built between the PE routers must be symmetrical (bidirectional).

Correct Answer: C

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 59

When implementing MPLS TE tunnels on Cisco IOS XR routers, what is the tunnel setup and hold priority value range, and which value has the highest priority?

- A. 0-63, where 0 is the highest priority
- B. 0-63, where 63 is the highest priority
- C. 0-7, where 0 is the highest priority
- D. 0-7, where 7 is the highest priority

Correct Answer: C

Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

Explanation

Explanation/Reference:

Explanation:

QUESTION 60

Which Cisco IOS XR command should be used in order to enable LDP on all interfaces for which the IGP protocol is enabled?

- A. RP/0/0/CPU0:R1(config-ospf)#mpls ldp auto-config
- B. RP/0/0/CPU0:R1(config-ospf)#mpls ldp interface all enable
- C. RP/0/0/CPU0:R1(config-ospf)#enable all
- D. RP/0/0/CPU0:R1(config-ldp)#enable all

Correct Answer: A

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 61

```
RP/0/RP0/CPU0:Router1#show running-config mpls ldp
```

```
mpls ldp
router-id 33.33.33.33
log
 adjacency
!
interface GigabitEthernet0/2/0/6
!
```

```
RP/0/RP1/CPU0:Router2#show running-config mpls ldp
```

```
mpls ldp
router-id 10.12.0.3
log
 neighbor
!
interface GigabitEthernet0/0/2/2
!
```

```
RP/0/RP0/CPU0:Router1#show running-config router ospf
```

```
router ospf test
area 0
 interface Loopback7
  passive enable
!
```

```
RP/0/RP1/CPU0:Router2#show running-config router ospf
```

```
router ospf test
area 0
 interface Loopback0
  passive enable
!
 interface GigabitEthernet0/0/2/2
!
```

Refer to the partial Cisco IOS XR configurations exhibit for Router 1 and Router 2.

There are two routers that are connected back to back over the Gigabit Ethernet link. If the "show mpls ldp neighbor" command output on Router 1 does not show LDP peering with Router 2, what could be the possible root cause of the LDP peering problem?

- A. missing interface under OSPF IGP configuration
- B. hello timers mismatch on Router 1 and Router 2
- C. password for LDP session mismatch on Router 1 and Router 2
- D. MPLS LDP session protection is not configured

Correct Answer: A

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 62

Which Cisco IOS XR command should be used to identify if MPLS TE FRR is enabled?

- A. show mpls traffic-eng tunnel <tunnel#>
- B. show mpls frr
- C. show mpls traffic-eng protection
- D. show mpls protection
- E. show mpls fast-reroute

Correct Answer: A

Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

Explanation

Explanation/Reference:

Explanation:

The MPLS Traffic Engineering (TE)--Fast Reroute (FRR) Link and Node Protection feature provides link protection (backup tunnels that bypass only a single link of the label-switched path (LSP)), node protection (backup tunnels that bypass next-hop nodes along LSPs), and the following FRR features:

- Backup tunnel support
- Backup bandwidth protection
- Resource Reservation Protocol (RSVP) Hellos

Prerequisites for MPLS Traffic Engineering (TE)--Fast Reroute (FRR) Link and Node Protection

Your network must support the following Cisco IOS features:

- IP Cisco Express Forwarding

·Multiprotocol Label Switching (MPLS)

Your network must support at least one of the following protocols:

·Intermediate System-to-Intermediate System (IS-IS)

·Open Shortest Path First (OSPF)

Before configuring FRR link and node protection, it is assumed that you have done the following tasks but you do not have to already have configured MPLS TE tunnels:

·Enabled MPLS TE on all relevant routers and interfaces ·Configured MPLS TE tunnels

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QUESTION 63

When a link flaps, an mpls ldp session will also flap. Which feature minimizes traffic loss and provides faster convergence after the link is re-established?

- A. BFD
- B. MPLS LDP IGP SYNC
- C. graceful restart
- D. LDP session protection
- E. LDP nonstop routing

Correct Answer: D

Section: MPLS/LDP in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 64

A DSCP value of 41 in decimal corresponds to which IP precedence value?

- A. 3 Flash
- B. 4 Flash Override
- C. 5 Critical
- D. 6 Internet Control
- E. 7 Network Control

Correct Answer: C

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

= INT(41/8)

The AF behavior group defines four separate AF classes with Class 4 having the highest priority. Within each class, packets are given a drop precedence (high, medium or low). The combination of classes and drop precedence yields twelve separate DSCP encodings from AF11 through AF43 (see table)

Assured Forwarding (AF) Behavior Group				
	Class 1 (lowest)	Class 2	Class 3	Class 4 (highest)
Low Drop	AF11 (DSCP 10)	AF21 (DSCP 18)	AF31 (DSCP 26)	AF41 (DSCP 34)
Med Drop	AF12 (DSCP 12)	AF22 (DSCP 20)	AF32 (DSCP 28)	AF42 (DSCP 36)
High Drop	AF13 (DSCP 14)	AF23 (DSCP 22)	AF33 (DSCP 30)	AF43 (DSCP 38)

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QUESTION 65

According to the Intserv model, which two options are traffic-specific parameters? (Choose two.)

- A. token bucket
- B. calculated average queue size
- C. minimum policed unit
- D. traffic marking
- E. rate policing

Correct Answer: AC

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 66

Which three options can an engineer select for a traffic policer in case the traffic rate is less than the conform burst? (Choose three.)

- A. Drop the packet.
- B. Transmit the packet.
- C. Set the CoS value and drop the packet.
- D. Set the DSCP value and drop the packet.
- E. Keep the packet in the buffer.
- F. Set the QoS group and drop the packet.

Correct Answer: ABF

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 67

A network operations center analyzes a Wireshark capture and tries to verify which QoS policy is effective over a customer router. How many bits define the DSCP values?

- A. 3
- B. 6
- C. 8
- D. 16

Correct Answer: B

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 68

Which option is a Cisco-recommended congestion management or queuing method for real-time traffic for voice and video?

- A. CBWFQ
- B. PQ
- C. WFQ

D. LLQ

Correct Answer: D

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 69

An engineer wants to extend the trust boundary to a Cisco IP Phone. Which protocol should be used?

- A. CDP
- B. CoS
- C. ToS
- D. 802.1Q

Correct Answer: A

Section: Transport Technologies

Explanation

Explanation/Reference:

Explanation:

QUESTION 70

Which three options are class maps able to match? (Choose three.)

- A. match access-group
- B. match protocol http url "*cisco"
- C. match destination-port
- D. match DSCP
- E. match all
- F. match mac-address

Correct Answer: ABD

Section: QOS in a Service Provider IP NGN Environment

Explanation

Explanation/Reference:

Explanation:

QUESTION 71

Which option is the appropriate way to configure a color-aware, dual-rate policer together with a color-blind, single-rate policer for the rest of the traffic?

- A.

```
class-map match-all CLASS1
  match dscp af31
class-map match all CLASS2
  match dscp af32
class-map match-all CLASS3
  match dscp ef
policy-map POLICY1
  class CLASS1
    police rate 100000 peak-rate 200000
    conform-color CLASS2 exceed-color CLASS3
    conform-action set-dscp-transmit af11
    exceed-action set-dscp-transmit af21
    violate-action set-dscp-transmit af23
```
- B.

```
class-map match-all CLASS 1
  match dscp af31
class-map match-all CLASS2
  match dscp af32
class-map match-all CLASS3
  match dscp af33
policy-map POLICY1
  class CLASS1
    police rate 100000 burst 31250
    conform-color CLASS2 exceed-color CLASS3
    conform-action set-dscp-transmit af11
    exceed-action set-dscp-transmit af21
    violate-action set-dscp-transmit af23
```
- C.

```
class-map match-all CLASS 1
  match dscp af31 af32 af33
class-map match-all CLASS2
  match dscp af32
class-map match-all CLASS3
  match dscp af33
policy-map POLICY1
  class CLASS1
    police rate 100000 burst 31250
    conform-color CLASS2 exceed-color CLASS3
    conform-action set-dscp-transmit af31
    exceed-action set-dscp-transmit af32
    violate-action set-dscp-transmit af33
```

- ```

class class-default
 police rate percent 10 peak-rate percent 30
D. class-map match-all CLASS 1
 match dscp af31 af32 af33
class-map match-all CLASS2
 match dscp af32
class-map match-all CLASS3
 match dscp af33
policy-map POLICY1
 class CLASS1
 police rate 100000 peak-rate 200000
 conform-color CLASS2 exceed-color CLASS3
 conform-action set-dscp-transmit af31
 exceed-action set-dscp-transmit af32
 violate-action set-dscp-transmit af33
 class class-default
 police rate percent 10 peak-rate percent 30
E. class-map match-all CLASS 1
 match dscp af31 af32 af33
class-map match-all CLASS2
 match dscp af32
class-map match-all CLASS3
 match dscp af33
policy-map POLICY1
 class CLASS1
 police rate 100000 peak-rate 200000
 conform-color CLASS2 exceed-color CLASS3
 conform-action set-dscp-transmit af31
 exceed-action set-dscp-transmit af32
 violate-action set-dscp-transmit af33
 class class-default
 police rate 10000

```

**Correct Answer:** E

**Section:** QOS in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

## QUESTION 72

Which two traffic types are recognized by NBAR default configuration settings? (Choose two.)

- A. HTTP URL
- B. Sun RPC
- C. TCP
- D. UDP
- E. HTTPS URL

**Correct Answer:** AB

**Section:** QOS in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

#### **QUESTION 73**

Which statement describes the QoS behavior between P and PE routers of an MPLS provider network for an L3VPN service?

- A. The PE function honors DSCP markings set by the CE.
- B. The customer and provider must agree on DSCP classification and traffic priorities.
- C. Classification of customer traffic is handled by the P router.
- D. The PE function cannot map DSCP markings to MPLS EXP bits.

**Correct Answer:** B

**Section:** QOS in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

#### **QUESTION 74**

Which method is used to mark traffic matched by class-map MY\_CLASS as Expedited Forwarding?

- A. set ip dscp cs7
- B. set dscp cs7
- C. set dscp 46
- D. set dscp 45

**Correct Answer:** C

**Section:** QOS in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 75**

Which method maps MPLS EXP bit 5 to COS 5 on Cisco IOS XE?

- A. configure terminal  
class-map match exp  
match mpls experimental topmost 5  
exit  
policy-map EXP2Cos  
class exp  
set cos 5  
exit  
class class-default  
random-detect  
interface fastethernet 0/0  
service-policy output EXP2Cos
- B. configure terminal  
class-map match exp  
match mpls experimental topmost 5  
exit  
policy-map EXP2Cos  
class exp  
set cos 5  
exit  
class class-default  
random-detect  
interface fastethernet 0/0  
service-policy input EXP2Cos
- C. configure terminal  
class-map match exp  
match mpls cos 5  
exit  
policy-map EXP2Cos  
class exp  
set mpls experimental topmost 5  
exit  
class class-default  
random-detect  
interface fastethernet 0/0  
service-policy output EXP2Cos
- D. configure terminal

```
class-map match exp
match mpls cos 5
exit
policy-map EXP2Cos
class exp
set mpls experimental topmost 5
exit
class class-default
random-detect
interface fastethernet 0/0
service-policy output EXP2Cos
exit
commit
```

- E. configure terminal  
ip access-list 101 permit ip any any mpls experimental 5 class-map match exp  
match access-group 101  
exit  
policy-map EXP2Cos  
class exp  
set cos 5  
exit  
class class-default  
random-detect  
interface fastethernet 0/0  
service-policy output EXP2Cos  
exit

**Correct Answer:** A

**Section:** QOS in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

#### **QUESTION 76**

The Cisco IOS and IOS XE qos pre-classify command allows which kind of packet classification on IP packets that are encapsulated with GRE and IPsec?

- A. allows for packets to be classified based on the ToS byte values before packet encryption
- B. allows for packets to be classified based on the ToS byte values after packet encryption
- C. allows for packets to be classified based on the packet payload before packet encryption
- D. allows for packets to be classified based on the packet payload after packet encryption



E. allows for packets to be classified based on the packet header parameters other than the ToS byte values after packet encryption

**Correct Answer:** E

**Section:** QOS in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 77**

An engineer has been tasked to configure a guaranteed 2 Mbps of bandwidth for outgoing FTP traffic on interface FastEthernet 1/1/1 on Cisco IOS XR. Which method accomplishes this configuration?

- A. 

```
configure terminal
class-map FTP_CLASS
match protocol ftp
exit
policy-map POLICY_1
class FTP_CLASS
bandwidth 2000
exit
exit
interface FastEthernet 1/1/1
service-policy output POLICY_1
end
commit
```
- B. 

```
configure terminal
class-map FTP_CLASS
match protocol ftp
exit
policy-map POLICY_1
class FTP_CLASS
bandwidth 2000000
exit
exit
interface FastEthernet 1/1/1
service-policy input POLICY_1
end
commit
```
- C. 

```
configure terminal
access-list 100 permit ip any any eq 21
policy-map POLICY_1
match ip access-list 100
```

```
bandwidth 2000
exit
exit
interface FastEthernet 1/1/1
service-policy output POLICY_1
end
commit
```

- D. configure terminal  
policy-map POLICY\_1  
class FTP\_CLASS  
match protocol ftp  
bandwidth 2000000  
exit  
exit  
interface FastEthernet 1/1/1  
service-policy input POLICY\_1  
end  
commit

**Correct Answer:** A

**Section:** QOS in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

## QUESTION 78

An engineer has been tasked to configure a guaranteed 10 Mbps priority queue for traffic matched by class-map VOICE\_CLASS on Cisco IOS XR. Which policy must be applied for outgoing traffic on interface FastEthernet 0/0/1?

- A. configure  
policy-map VOICE\_POLICY  
class VOICE\_CLASS  
police rate 10000  
exceed-action drop  
exit  
priority level 1  
exit  
exit  
interface FastEthernet 0/0/1  
service-policy output VOICE\_POLICY  
commit
- B. configure

```
policy-map VOICE_POLICY
class VOICE_CLASS
priority percent 10
exit
exit
interface FastEthernet 0/0/1
service-policy output VOICE_POLICY
commit
```

- C. configure
- ```
policy-map VOICE_POLICY
class VOICE_CLASS
police rate 1000
exceed-action drop
exit
priority level 1
exit
exit
interface FastEthernet 0/0/1
service-policy output VOICE_POLICY
commit
```
- D. configure
- ```
policy-map VOICE_POLICY
class VOICE_CLASS
police rate 10 Mbps
exceed-action shape
exit
priority level 1
exit
exit
interface FastEthernet 0/0/1
service-policy output VOICE_POLICY
commit
```

**Correct Answer:** A

**Section:** QOS in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

#### **QUESTION 79**

When implementing CBWFQ, where should Weighted Random Early Detection configuration be applied?

- A. route-map
- B. policy-map
- C. class-map
- D. service-policy

**Correct Answer: B**

**Section: QOS in a Service Provider IP NGN Environment**

**Explanation**

**Explanation/Reference:**

Explanation:

#### QUESTION 80

Which QoS technique can be used to protect customer traffic from being dropped by traffic rate limiting performed by the service provider?

- A. LLQ
- B. policing
- C. fair-queue
- D. shaping

**Correct Answer: D**

**Section: QOS in a Service Provider IP NGN Environment**

**Explanation**

**Explanation/Reference:**

Explanation:

#### QUESTION 81

```

0000 0011 1110 1000 0001
. 000
. 1
. 1111 1111

```

Refer to the exhibit. Based on the raw format of an MPLS header captured by a traffic analyzer, what is the value of the MPLS EXP field?

- A. 1
- B. 255
- C. 5
- D. 29

**Correct Answer:** C

**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 82**

Which two characteristics describe the difference between MPLS QoS pipe and short-pipe models? (Choose two)

- A. Short-pipe mode does not need MPLS usage, but pipe mode does.
- B. In short-pipe mode, the egress LSR uses the tunneled PHB marking, but in pipe mode, the egress LSR uses the LSP PHB marking.
- C. Pipe mode does guarantee that the tunneled packet marking remains unchanged, but short- pipe does not.
- D. In short-pipe mode, the egress LSR uses the LSP PHB marking, but in pipe mode, the egress LSR uses the tunneled PHB marking.
- E. Short-pipe mode can be implemented on MPLS networks regardless of the MPLS PHP mechanism usage.

**Correct Answer:** BE

**Section:** QOS in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 83**

An engineer must automatically copy the IP Prec/DiffServ PHB marking to the EXP bits of the imposed MPLS label on the ingress PE, as well as the MPLS EXP bits to the IP Prec/DiffServ of the egress PE. Which MPLS QoS model is suitable for this requirement?

- A. pipe model
- B. short-pipe model
- C. uniform model
- D. uniform pipe model

**Correct Answer:** C

**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 84**

A service provider recently defined new SLA services that provide QoS transparency over MPLS DiffServ-TE services. Which two tunneling modes provide QoS transparency? (Choose two.)

- A. short pipe mode
- B. uniform mode
- C. pipe mode with an explicit NULL LSP
- D. pipe mode without a explicit NULL LSP
- E. best effort mode

**Correct Answer:** AC

**Section:** MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 85**

```
policy-map WAN
class class_A
shape average 512000 32000
!
interface serial 4/0
service-policy input WAN
```

Refer to the exhibit. Which configuration error prevents this traffic-shaping policy from working?

- A. The WAN interface is starting to drop packets because no queuing mechanism is implemented.
- B. Traffic-shaping policies are applied only in the outbound direction.
- C. The class\_A configuration shape peak is used to maximize the serial interface performances.
- D. The service-policy command is applied only on logical or channeled interfaces.

**Correct Answer:** B

**Section:** QOS in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

#### QUESTION 86

```
PE2#show mpls forwarding-table 5.5.5.5
```

| Local Label | Outgoing Label | Prefix or Tunnel Id | Bytes Switched | Label | Outgoing interface | Next Hop   |
|-------------|----------------|---------------------|----------------|-------|--------------------|------------|
| 20          | 20             | 5.5.5.5/32          | 0              |       | Et0/1              | 10.10.23.3 |
|             | 21             | 5.5.5.5/32          | 0              |       | Et0/2              | 10.10.24.4 |
|             | 19             | 5.5.5.5/32          | 0              |       | Et0/3              | 10.10.26.6 |

Refer to the exhibit. From which table was the information obtained?

- A. FIB
- B. CEF
- C. LIB
- D. LFIB

**Correct Answer:** D

**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

#### QUESTION 87

How many labels does an MPLS packet have, with a bottom-of-stack label set to zero?

- A. The packet has no label.
- B. The packet has one label.
- C. The packet may have one or more labels.
- D. The packet has at least two labels.

**Correct Answer:** D

**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 88**

Which four options are methods by which labels can be assigned in the label stack to an IP prefix? (Choose four.)

- A. LDP
- B. CEF
- C. BGP
- D. RSVP
- E. static
- F. IGP
- G. route recursion
- H. manual tagging

**Correct Answer:** ACDG

**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 89**

An LDP session is established between two neighbors. Over which protocol and port number do they maintain their adjacency?

- A. TCP 711
- B. UDP 646
- C. UDP 711
- D. TCP 646

**Correct Answer:** D

**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:



**QUESTION 90**

Which option describes what happens when a labelled packet with a TTL of 1 is received by an LSR?

- A. The packet is forwarded on to the next router where its TTL expires and from where an ICMP "time exceeded" message is generated and routed back to the source.
- B. The packet is dropped and an ICMP "time exceeded" message is IP routed back to the sender.
- C. The packet is dropped and an ICMP "time exceeded" message is label-switched from the expiring router back on a new path toward the source.
- D. The packet is dropped and an ICMP "time exceeded" message is label-switched from the expiring router on the same label switched path toward the destination and then back to the originating source.
- E. The packet is forwarded on to the next router where its TTL expires and from where an ICMP "time exceeded" message is generated and label switched back to the source.

**Correct Answer:** D

**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 91**

Which protocol is used to send MPLS OAM traffic over an MPLS network?

- A. ICMP
- B. IP protocol number 137
- C. TCP
- D. UDP

**Correct Answer:** D

**Section:** Transport Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 92**

Which four options describe the functions of the control world in an AToM environment? (Choose four.)

- A. It carries generic and Layer 2 payload-specific information.
- B. It prevents fragmentation and reassembly.

- C. It preserves the sequence of the transported frames.
- D. It is responsible for padding all packets.
- E. It is responsible for padding the small packets.
- F. It enables proper load balancing without packet desequencing independent of L2VPN packet content.
- G. It enables an optimal path for the L2VPN packet content to follow through the MPLS backbone.
- H. It carries Layer 2 payload-specific information.

**Correct Answer:** ACEF

**Section:** Transport Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

#### QUESTION 93

```
RP/0/RSP1/CPU0:ASR9006#sh mpls ldp igp sync
Bundle-Ether9000:
 Sync status: Ready
 Peers:
 192.168.1.25:0 (GR)
GigabitEthernet0/1/0/10:
 Sync status: Not ready
```

Referring to the Cisco IOS XR show command output exhibit, what are three possible reasons that the GigabitEthernet0/1/0/10 LDP IGP sync status is not ready? (Choose three.)

- A. GigabitEthernet0/1/0/10 is not configured to run LDP.
- B. Graceful restart is not configured on the peer.
- C. The LDP neighbor on GigabitEthernet0/1/0/10 is not up.
- D. The OSPF neighbor on GigabitEthernet0/1/0/10 is not up.
- E. LDP is up on GigabitEthernet0/1/0/10, but no label bindings have been received from the peer.
- F. GigabitEthernet0/1/0/10 is a member link of Bundle-Ether9000.

**Correct Answer:** CDE

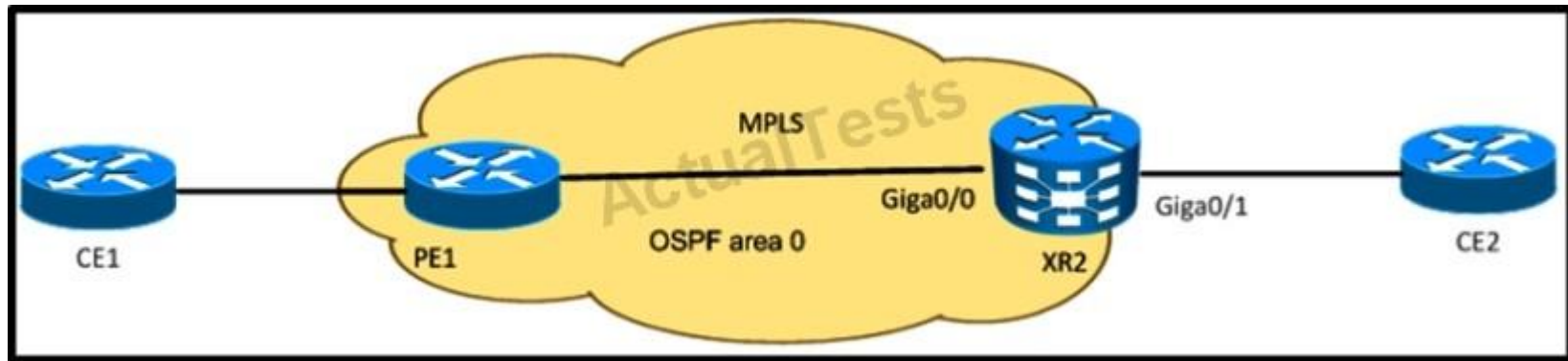
**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

#### QUESTION 94



Refer to the exhibit. XR2 needs to have LDP configured with PE1. Which configuration achieves this goal?

- A. interface giga 0/0  
mpls ip  
exit  
commit
- B. router ospf 1  
mpls ldp auto config area 0  
exit  
commit
- C. router ospf 1  
area 0 mpls ldp auto config  
exit  
commit
- D. interface giga 0/1  
mpls ldp  
exit  
commit

**Correct Answer: C**

**Section: MPLS/LDP in a Service Provider IP NGN Environment**

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 95**

Which three fields must be the same in an IPv6 header to consider different packets on the same flow? (Choose three.)

- A. source port
- B. destination address
- C. destination port
- D. source address
- E. flow label
- F. transport protocol type

**Correct Answer:** BDE

**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 96**

An engineer is working in a service provider environment to troubleshoot a MPLS VPN. The engineer determines that LDP neighborship is flapping between two routers and causing disruption to the traffic. Which LDP feature can help to solve the issue?

- A. LDP Discovery
- B. LDP auto-configuration
- C. LDP graceful-restart
- D. LDP NSF

**Correct Answer:** C

**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 97**

Which configuration can a network engineer use to establish high availability for LDP in an MPLS setup?

- A. mpls ldp  
graceful-restart  
graceful-restart  
graceful-restart forwarding state-holdtime 180

```
graceful-restart reconnect-timeout 15
interface HundredGigE0/4/0/0
```

- B. mpls ldp  
graceful-restart  
graceful-restart forwarding state-holdtime 180  
graceful-restart reconnect-timeout 15
- C. mpls ldp  
session protection for peer\_acl duration 60  
ipv4 access-list peer\_acl  
10 permit ip host 192.168.10.1 any
- D. router ospf 1  
mpls ldp sync  
mpls ldp  
igp sync delay 30
- E. mpls ldp  
router-id loopback0  
discovery hello holdtime 15  
discovery hello interval 5

**Correct Answer:** A

**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

#### **QUESTION 98**

Which configuration fulfills the requirement of configuring LDP with Cisco Nonstop Forwarding on a router with 5 minutes time to hold the forwarding table information and 1 minute retry timer value for an LDP connection?

- A. mpls ldp  
graceful-restart  
graceful-restart forwarding state-holdtime 5  
graceful-restart reconnect-timeout 1  
interface GigabitEthernet0/0/0/0  
!
- B. mpls ldp  
graceful-restart  
graceful-restart forwarding state-holdtime 300  
graceful-restart reconnect-timeout 60  
interface GigabitEthernet0/0/0/0  
!

- C. mpls ldp  
nsr  
graceful-restart  
graceful-restart forwarding state-holdtime 300  
graceful-restart reconnect-timeout 60  
interface GigabitEthernet0/0/0/0  
!
- D. mpls ldp  
nsr  
graceful-restart  
graceful-restart forwarding state-holdtime 5  
graceful-restart reconnect-timeout 1  
interface GigabitEthernet0/0/0/0  
!

**Correct Answer:** B

**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 99**

Which three commands are used to troubleshoot why IP packets are not forwarded on the LSP? (Choose three.)

- A. show cef prefix/length to check the prefix information
- B. debug mpls ldp transport events to display events related to the LDP peer discovery mechanism
- C. show mpls forwarding labels <label-id> hardware egress location <node-id> to check the hardware label FIB
- D. show arp <prefix> location <node-id> for the next hop prefix
- E. show mpls ldp discovery for the corresponding label information
- F. debug mpls ea platform all to display MPLS setup events and errors

**Correct Answer:** ACD

**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 100**

A network engineer must design a core network routing domain that supports Cisco MPLS TE. Which two interior gateway protocols represent viable

solutions? (Choose two.)

- A. Routing Information Protocol version 2
- B. Open Shortest Path First
- C. Enhanced Interior Gateway Routing Protocol
- D. Intermediate-System to Intermediate-System
- E. Border Gateway Protocol

**Correct Answer:** BD

**Section:** MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

**Explanation**

**Explanation/Reference:**

Explanation:

## QUESTION 101

The network architecture team is proposing to enable Cisco MPLS TE over the entire service provider core network. Which two options are benefits of Cisco MPLS TE that affect their decision? (Choose two.)

- A. Cisco MPLS TE optimizes network resources.
- B. Cisco MPLS TE data flows independent from the underlying IGP.
- C. Cisco MPLS TE increases the data forwarding rate.
- D. Cisco MPLS TE tunneling does not require maintenance.
- E. Cisco MPLS TE offers network resource reservation, which removes any need for QoS MQC policies.

**Correct Answer:** AB

**Section:** MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

**Explanation**

**Explanation/Reference:**

Explanation:

## QUESTION 102

Which two fields are in the traffic engineering topology database? (Choose two.)

- A. TE-metric
- B. IGP metric
- C. link delay
- D. LSP setup priority

E. LDP authentication

**Correct Answer:** AD

**Section:** MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 103**

A network engineer must analyze RSVP-TE signaling on a syslog server. Which three RSVP messages are valid? (Choose three.)

- A. RSVP PATH
- B. RSVP RESERVATION
- C. RSVP ESTABLISHED
- D. RSVP PATH TEAR
- E. RSVP KILL
- F. RSVP INIT

**Correct Answer:** ABD

**Section:** MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 104**

An engineer is tasked to deploy Fast Reroute for Cisco MPLS TE. Which LSR is in charge to request the Fast Reroute capability along the LSP?

- A. point of local repair
- B. tail end router
- C. ingress and egress PE routers
- D. head-end router
- E. BGP routers acting as route reflectors

**Correct Answer:** D

**Section:** MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

**Explanation**

**Explanation/Reference:**



Explanation:

#### **QUESTION 105**

The regional operation center deploys a Cisco MPLS TE tunnel over the company's core network. The Cisco MPLS TE tunnel is up and no error is detected, but no traffic is traversing the tunnel.

Which two issues are possible causes? (Choose two.)

- A. The provider edge router is not performing the correct redistribution.
- B. The interior gateway protocol has no knowledge of the Cisco MPLS TE tunnel.
- C. No static route has been defined to route data traffic over the Cisco MPLS TE tunnel.
- D. The customer edge router is injecting rogue IPv4 prefixes in the provider edge routing table.
- E. The end-to-end label switched path has not been established.

**Correct Answer:** BC

**Section:** MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

**Explanation**

**Explanation/Reference:**

Explanation:

#### **QUESTION 106**

Cisco MPLS TE tunnels recently have been deployed to minimize the utilization of a congested link in the core network. The tunnels are up and the administrative weight is correctly configured, but no improvement has occurred since they went into production. Which IOS command can be used to modify Cisco MPLS TE path selection on an interface?

- A. mpls traffic-eng administrative-weight 100
- B. ls-ls metric 100
- C. ip rsvp bandwidth percent 90
- D. tunnel mpls traffic-eng path-selection metric te

**Correct Answer:** A

**Section:** MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

**Explanation**

**Explanation/Reference:**

Explanation:

#### **QUESTION 107**

Given this configuration of an interface for MPLS traffic engineering on a Cisco IOS XE router:

```
interface POS1/1/0
mpls traffic-eng tunnels
ip rsvp bandwidth 5000
```

Which option lists the equivalent configurations required on a Cisco IOS XR router?

- A. interface POS1/1/0  
mpls traffic-eng tunnels  
ip rsvp bandwidth 5000
- B. mpls traffic-eng  
interface POS1/1/0
- C. mpls traffic-eng  
interface POS1/1/1  
bandwidth 5mb
- D. mpls traffic-eng  
interface POS1/1/0  
rsvp  
interface POS1/1/0
- E. mpls traffic-eng  
interface POS1/1/0  
rsvp  
interface POS1/1/0  
bandwidth 5000

**Correct Answer:** E

**Section:** MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

**Explanation**

**Explanation/Reference:**

Explanation:

#### **QUESTION 108**

A company asks an engineer to provide an explanation for implementing MPLS DiffServ-TE services. Which option is a DiffServ-TE fundamental concept that should be highlighted?

- A. expedited forwarding
- B. assured forwarding
- C. class of service
- D. class types
- E. fast reroute

**Correct Answer:** D

**Section:** MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

**Explanation**

**Explanation/Reference:**

Explanation:

## QUESTION 109

A network engineer must make a reservable maximum bandwidth of 75 Mbps on a Cisco ASR 9000 series router. Which configuration satisfies this requirement in Cisco IOS XR?

- A. 2802\_FY14Q4\_CORE\_Q33\_o1
- B. 2813\_FY14Q4\_CORE\_Q33\_o2
- C. 2824\_FY14Q4\_CORE\_Q33\_o3
- D. 2835\_FY14Q4\_CORE\_Q33\_o4

**Correct Answer:** C

**Section:** QOS in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

## QUESTION 110

A network operations center requests support to configure a Cisco MPLS TE tunnel on a Cisco IOS XR router. Which command sets a specific bandwidth required to the corresponding Cisco MPLS TE tunnel?

- A. rsvp  
  interface interface-path-id  
  bandwidth bandwidth
- B. interface tunnel-te tunnel\_id  
  !  
  bandwidth bandwidth
- C. interface tunnel-te tunnel\_id  
  !  
  signaled-bandwidth bandwidth
- D. mpls traffic-eng  
  auto-bw collect frequency value  
  !

**Correct Answer:** C

**Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)**

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 111**

An engineer is allocating a determined amount of bandwidth to a customer Cisco MPLS TE tunnel to guarantee its availability on a 24/7 SLA type. Which option must be configured to make sure the customer is able to use the bandwidth agreed on the SLA?

- A. RSVP that guarantees bandwidth availability end-to-end
- B. Cisco MPLS TE tunnel to signal the bandwidth required
- C. a QoS policy to reinforce the RSVP bandwidth reservation
- D. overprovisioning to guarantee bandwidth

**Correct Answer: C**

**Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)**

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 112**

Which two considerations are important when implementing a Cisco MPLS TE NHOP or NNHOP protection? (Choose two.)

- A. The head-end router requires configuring high priority for the Cisco MPLS TE tunnel.
- B. The head-end router requires configuration for the NHOP or NNHOP protection request to occur.
- C. The reconvergence time must be no longer than 10 seconds.
- D. The Cisco MPLS TE tunnel on the Point of Local Repair implementing protection requires configuration as backup interface.
- E. The tail-end router must be aware of the request for NHOP or NNHOP protection.

**Correct Answer: BD**

**Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)**

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 113**

An engineer is setting up a routing instance to route the traffic across the back-up tunnel on a deployed Cisco MPLS TE next-hop protection. Which option describes the result?

- A. a static route that points to the link
- B. BGP routes that points to the link
- C. an OSPF or IS-IS instance that explicitly advertises the back-up tunnel
- D. rerouted traffic by the back-up tunnel in the event of link failure

**Correct Answer:** D

**Section:** MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 114**

Which two network devices are trusted endpoints in a network? (Choose two.)

- A. video endpoint
- B. PC
- C. wireless clients
- D. IP phone

**Correct Answer:** AD

**Section:** Transport Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 115**

In an IPv6 header, what does a flow label of zero indicate?

- A. The packet is not part of any flow.
- B. The size of the flow label is zero bytes.
- C. The label flow cannot have a value of zero.
- D. The packet belongs to the flow labeled zero.

**Correct Answer:** A

**Section:** MPLS/LDP in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

**QUESTION 116**

Which option is the appropriate method for CBWFQ WRED implementation in Cisco IOS XR?

- A. configure  
policy-map POLICY\_1  
class CLASS1  
random-detect default  
commit
- B. configure  
policy-map POLICY\_1  
class CLASS1  
wred default  
commit
- C. configure  
interface pos 0/0/0/0  
random-detect default  
commit
- D. configure  
policy-map POLICY\_1  
class CLASS1  
weighted random-detect default  
commit

**Correct Answer:** A

**Section:** QOS in a Service Provider IP NGN Environment

**Explanation**

**Explanation/Reference:**

Explanation:

## DragDrop

### QUESTION 1

#### Select and Place:

Referring to Cisco MPLS TE path setup operations using RSVP, drag the RSVP characteristic on the left to match the correct RSVP message type on the right.

|                                                    |                   |
|----------------------------------------------------|-------------------|
| sent from the tunnel headend to the tunnel tailend | RSVP PATH Message |
| sent from the tunnel tailend to the tunnel headend | Target            |
| carries the MPLS label requests                    | Target            |
| carries the MPLS labels                            | RSVP RESV Message |
|                                                    | Target            |
|                                                    | Target            |

#### Correct Answer:

Referring to Cisco MPLS TE path setup operations using RSVP, drag the RSVP characteristic on the left to match the correct RSVP message type on the right.

**RSVP PATH Message**

sent from the tunnel headend to the tunnel tailend

carries the MPLS label requests

**RSVP RESV Message**

sent from the tunnel tailend to the tunnel headend

carries the MPLS labels

**Section: MPLS/LDP in a Service Provider IP NGN Environment - Traffic Engineering (TE)**

**Explanation**

**Explanation/Reference:**

## QUESTION 2

**Select and Place:**



Drag each of the QoS mechanisms on the left to match the correct description on the right. (Not all options on the left are used.)

LLQ

Can drop excess traffic beyond the committed rate and remark nonconforming traffic before transmitting it.

LFI

Use to avoid the TCP global synchronization problems that occur when tail drop is used as the congestion avoidance mechanism.

traffic shaping

Provide a strict priority queue to allow delay-sensitive data such as voice to be dequeued and sent first.

WRED

Excess traffic beyond the committed rate will be queued and scheduled for later transmission. Only applied in the output direction.

CBWFQ

traffic policing

WFQ

**Correct Answer:**

Drag each of the QoS mechanisms on the left to match the correct description on the right. (Not all options on the left are used.)

|       |                  |
|-------|------------------|
|       | traffic policing |
| LFI   | WRED             |
|       | LLQ              |
|       | traffic shaping  |
| CBWFQ |                  |
|       |                  |
| WFQ   |                  |

**Section: QOS in a Service Provider IP NGN Environment**

**Explanation**

**Explanation/Reference:**

**QUESTION 3**

**Select and Place:**

Drag the Cisco MQC configuration task on the left to match the correct description on the right. (Not all options on the left are required.)

|                |                                                                                |
|----------------|--------------------------------------------------------------------------------|
| class-map      | applies the QoS policy to an interface                                         |
| tcp-map        | defines the PHB QoS action(s) for each of the different traffic classes        |
| route-map      | defines the matching parameter(s) for classifying packets into service classes |
| policy-map     |                                                                                |
| service-policy |                                                                                |
| route-policy   |                                                                                |
| qos-group      |                                                                                |

ActualTest

**Correct Answer:**

Drag the Cisco MQC configuration task on the left to match the correct description on the right. (Not all options on the left are required.)

|              |                |
|--------------|----------------|
|              | service-policy |
| tcp-map      | policy-map     |
| route-map    | class-map      |
|              |                |
|              |                |
| route-policy |                |
| qos-group    |                |

**Section: QOS in a Service Provider IP NGN Environment**  
**Explanation**

**Explanation/Reference:**

#### QUESTION 4

**Select and Place:**

Put the MPLS LDP steps on the left into the correct order from top to bottom on the right.

|                  |        |
|------------------|--------|
| Build RIB        | Target |
| Build LFIB       | Target |
| Assign Labels    | Target |
| Advertise Labels | Target |

**Correct Answer:**

Put the MPLS LDP steps on the left into the correct order from top to bottom on the right.

|  |                  |
|--|------------------|
|  | Build RIB        |
|  | Assign Labels    |
|  | Advertise Labels |
|  | Build LFIB       |

**Section: MPLS/LDP in a Service Provider IP NGN Environment**

**Explanation**

**Explanation/Reference:**

**QUESTION 5**

**Select and Place:**

Drag the QoS model on the left to match its correct description on the right.

|             |                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------|
| DiffServ    | All network packets are treated exactly the same.                                               |
| IntServ     | It divides traffic into classes and applies a different level of service for each class.        |
| Best Effort | Traffic-handling characteristics are based on signaling events from network-based applications. |

**Correct Answer:**

Drag the QoS model on the left to match its correct description on the right.

|  |             |
|--|-------------|
|  | Best Effort |
|  | DiffServ    |
|  | IntServ     |

**Section: QOS in a Service Provider IP NGN Environment**

**Explanation**

**Explanation/Reference:**

**QUESTION 6**

**Select and Place:**

Drag the MPLS Diff-Serv tunneling mode on the left to match the correct description on the right.

Pipe Mode

If a QoS marking (MPLS EXP) is changed in the MPLS network, it is also changed in the egress IP packet.

Short-Pipe Mode

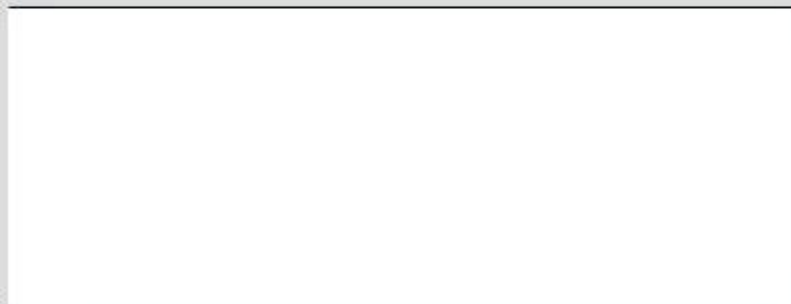
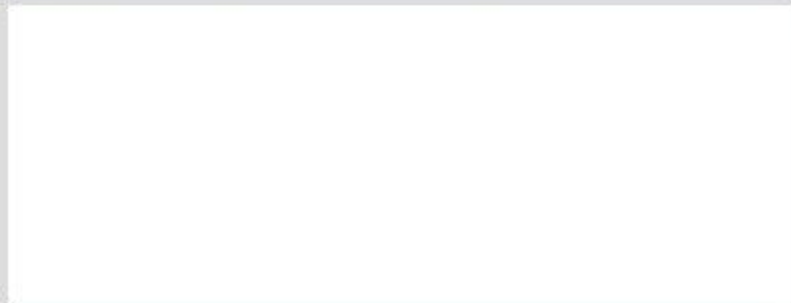
This provides QoS transparency where the customer QoS marking (for example, DSCP) in the IP packet is preserved. The egress PE uses the original customer QoS marking instead of the service provider QoS marking.

Uniform Mode

QoS is done on the output interface of the PE router that is based on the received MPLS EXP field. The customer QoS marking (for example, DSCP) is not altered when the customer packet travels from the ingress to the egress of the MPLS domain.

**Correct Answer:**

Drag the MPLS Diff-Serv tunneling mode on the left to match the correct description on the right.



Uniform Mode

Short-Pipe Mode

Pipe Mode

**Section: QOS in a Service Provider IP NGN Environment**  
**Explanation**

**Explanation/Reference:**



## Lab-1

### QUESTION 1

Scenario:

Instructions

Enter the proper CLI commands and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

No console or enable passwords are required.

There are **four** multiple-choice questions with this task. Be sure to answer all **four** questions before selecting the Next button.

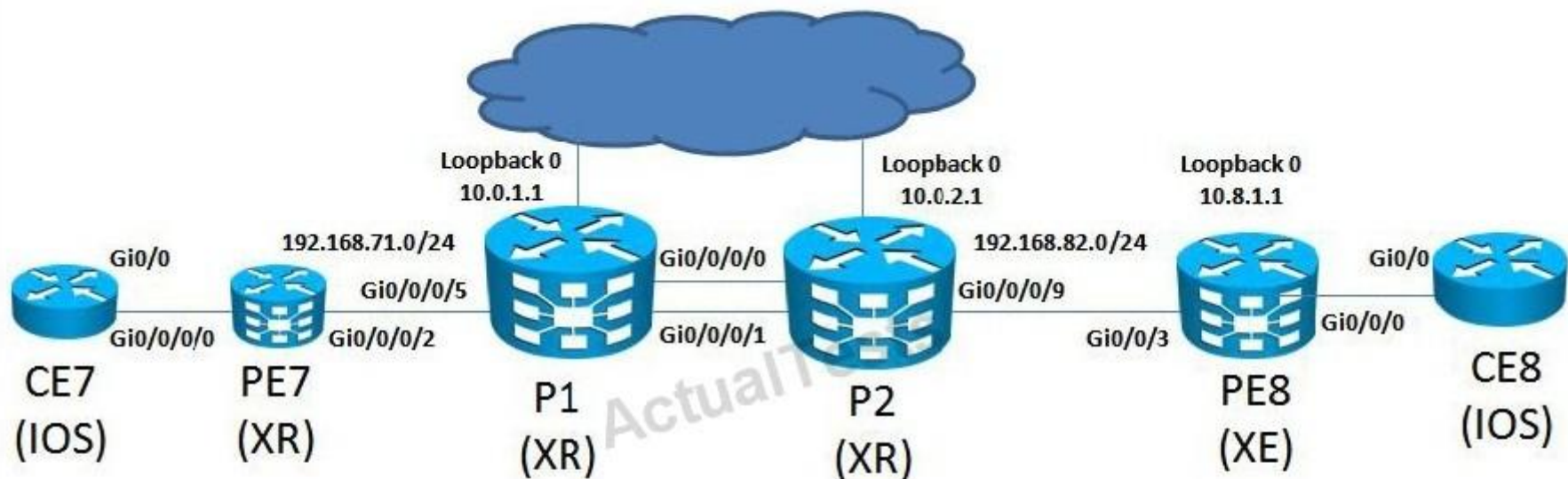
Not all the CLI commands or commands options are supported or required for this simulation.

For example, the show running-config command is **NOT** supported in this simulation.

All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.

Scenario

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the PE8 and P2 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.



In this simulation, you will only have access to the PE8 and P2 consoles  
Click on the PE8 and P2 router icon to access the respective console  
PE8 is an ASR1K and P2 is an ASR9K





On the PE8-router what is the label value used to reach the 10.7.1.1/32 network prefix?

- A. 10.0.2.1:0
- B. imp-null
- C. 16024
- D. 128

**Correct Answer: C**

**Section: LAB-1**

**Explanation**

**Explanation/Reference:**

Explanation: Issue on PE8: show mpls forwarding-table

Look for the "Outgoing Label" not the "Local Label" for the prefix 10.7.1.1/32. You will notice that the Label value is 16024.

## QUESTION 2

Scenario:

Instructions

Enter the proper CLI commands and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

No console or enable passwords are required.

There are **four** multiple-choice questions with this task. Be sure to answer all **four** questions before selecting the Next button.

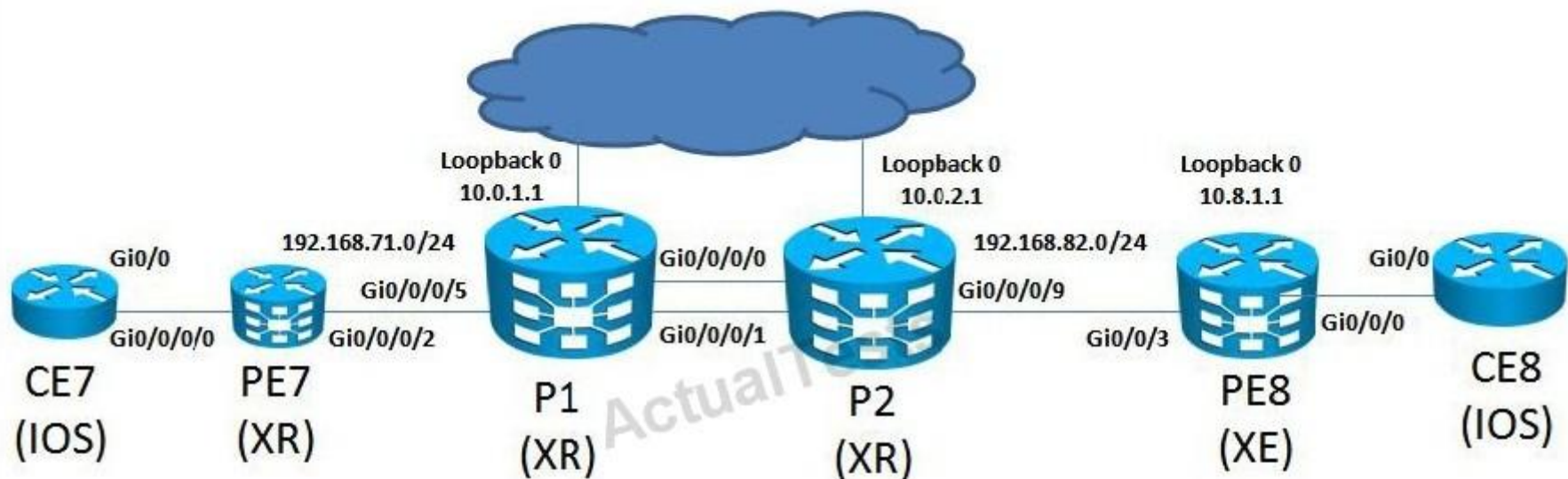
Not all the CLI commands or commands options are supported or required for this simulation.

For example, the show running-config command is **NOT** supported in this simulation.

All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.

Scenario

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the PE8 and P2 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.



In this simulation, you will only have access to the PE8 and P2 consoles  
Click on the PE8 and P2 router icon to access the respective console  
PE8 is an ASR1K and P2 is an ASR9K





On P2IOS-XR router what is targeted LDP hellos hold time on LDP session with 10.0.1.1:0 LDP ID?

- A. 90 sec
- B. 10 sec
- C. 3 sec
- D. 8.6 sec

**Correct Answer:** A

**Section:** LAB-1

**Explanation**

**Explanation/Reference:**

Explanation: Issue on P2: show mpls ldp discovery (details).

Ps: The command show mpls ldp parameter is not Implemented. Look at the end, you will see the hello and the holdtime values for the target neighbour.



Be careful he is asking for "targeted LDP hellos hold time". No other command will work!!! At the end of the show result you will see something looks like the following:

LDP discovery sources:

Targeted Hello 10.0.2.1 -> 10.0.1.1 active, passive;  
Hello: 30 sec  
holdtime: 90 sec

### QUESTION 3

Scenario:

Instructions

Enter the proper CLI commands and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

No console or enable passwords are required.

There are **four** multiple-choice questions with this task. Be sure to answer all **four** questions before selecting the Next button.

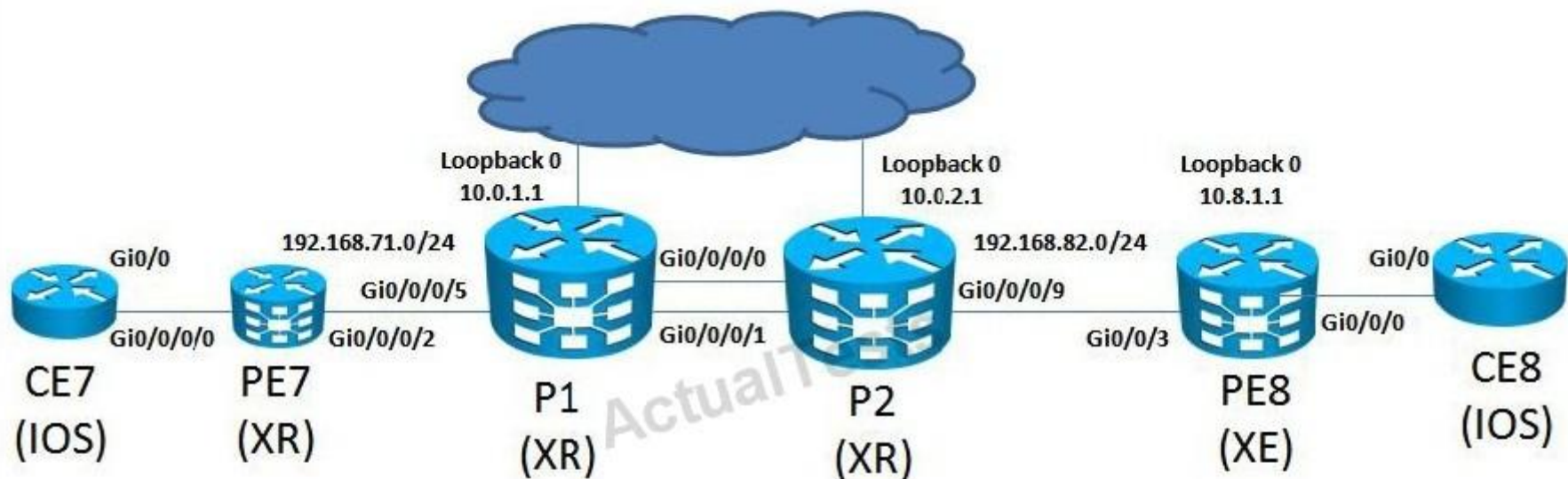
Not all the CLI commands or commands options are supported or required for this simulation.

For example, the show running-config command is **NOT** supported in this simulation.

All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.

Scenario

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the PE8 and P2 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.



In this simulation, you will only have access to the PE8 and P2 consoles  
Click on the PE8 and P2 router icon to access the respective console  
PE8 is an ASR1K and P2 is an ASR9K





From PE8 router, what is the label action used to reach the P2 loopback 0 interface 10.0.2.1/32?

- A. Swap label 35 with label 16004
- B. Push label 16004
- C. Pop label 35
- D. Pop label 16009
- E. Push Label 16009
- F. Swap label 35 with label 16009

**Correct Answer:** C

**Section:** LAB-1

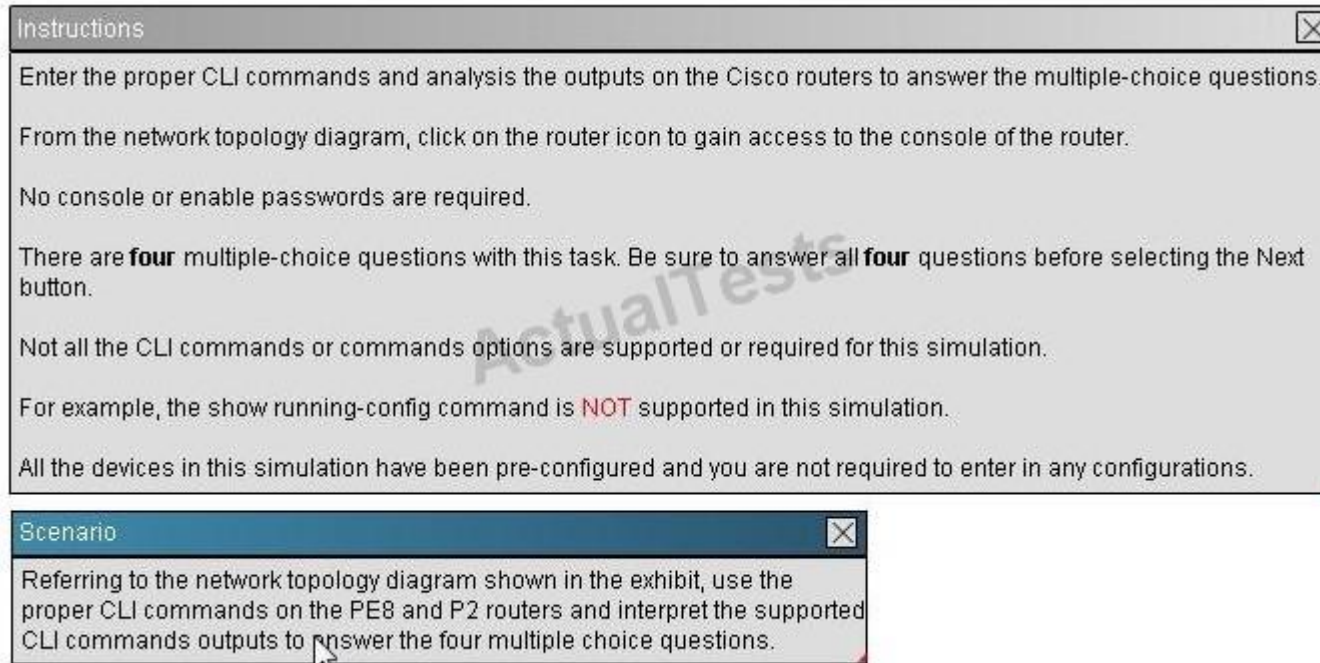
**Explanation**

**Explanation/Reference:**

Explanation: show mpls forwarding-table , find prefix 10.0.2.1 and you will see there under outgoing Label "Pop Label" (This is actually logic because the prefix is directly connected and therefore the packet will forward without label). If the router should forward any packet to that prefix, the packet should be received with Local label on PE8 (Local Label = 35), the router will remove it and forward it without Label.

**QUESTION 4**

Scenario:



The screenshot displays two overlapping windows from a simulation interface. The top window, titled 'Instructions', contains the following text: 'Enter the proper CLI commands and analysis the outputs on the Cisco routers to answer the multiple-choice questions.', 'From the network topology diagram, click on the router icon to gain access to the console of the router.', 'No console or enable passwords are required.', 'There are **four** multiple-choice questions with this task. Be sure to answer all **four** questions before selecting the Next button.', 'Not all the CLI commands or commands options are supported or required for this simulation.', 'For example, the show running-config command is **NOT** supported in this simulation.', and 'All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.' The bottom window, titled 'Scenario', contains the text: 'Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the PE8 and P2 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.'

Instructions

Enter the proper CLI commands and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

No console or enable passwords are required.

There are **four** multiple-choice questions with this task. Be sure to answer all **four** questions before selecting the Next button.

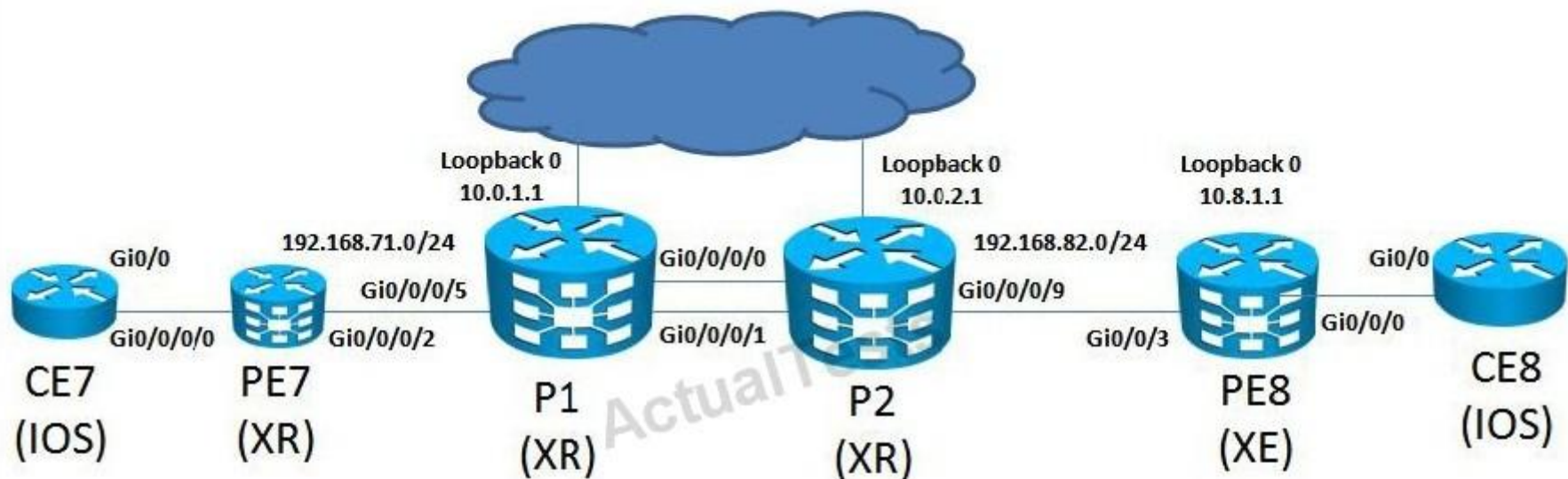
Not all the CLI commands or commands options are supported or required for this simulation.

For example, the show running-config command is **NOT** supported in this simulation.

All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.

Scenario

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the PE8 and P2 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.



In this simulation, you will only have access to the PE8 and P2 consoles  
Click on the PE8 and P2 router icon to access the respective console  
PE8 is an ASR1K and P2 is an ASR9K





From the PE8 router, how many total prefixes for have an incoming local label assigned (including the imp-null)?

- A. 45
- B. 21
- C. 66
- D. 22

**Correct Answer:** B

**Section:** LAB-1

**Explanation**

**Explanation/Reference:**

Explanation: On PE8 issue: show mpls ip binding summary and look at "assigned in labels". That value is the correct answer NOT "learned out label".



```
Router# show mpls forwarding-table
```

| Local Label | Outgoing Label or VC | Prefix or Tunnel Id | Bytes switched | label Outgoing interface | Next Hop    |
|-------------|----------------------|---------------------|----------------|--------------------------|-------------|
| 26          | No Label             | 10.253.0.0/16       | 0              | Et4/0/0                  | 10.27.32.4  |
| 28          | 1/33                 | 10.15.0.0/16        | 0              | AT0/0.1                  | point2point |
| 29          | Pop Label            | 10.91.0.0/16        | 0              | Hs5/0                    | point2point |
|             | 1/36                 | 10.91.0.0/16        | 0              | AT0/0.1                  | point2point |
| 30          | 32                   | 10.250.0.97/32      | 0              | Et4/0/2                  | 10.92.0.7   |
|             | 32                   | 10.250.0.97/32      | 0              | Hs5/0                    | point2point |
| 34          | 26                   | 10.77.0.0/24        | 0              | Et4/0/2                  | 10.92.0.7   |
|             | 26                   | 10.77.0.0/24        | 0              | Hs5/0                    | point2point |
| 35          | No Label[T]          | 10.100.100.101/32   | 0              | Tu301                    | point2point |
| 36          | Pop Label            | 10.1.0.0/16         | 0              | Hs5/0                    | point2point |
|             | 1/37                 | 10.1.0.0/16         | 0              | AT0/0.1                  | point2point |

```

Router# show mpls ldp bindings
```

```
10.0.0.0/8, rev 9
 local binding: label: imp-null
 remote binding: lsr: 10.10.0.55:0, label: 17
 remote binding: lsr: 10.66.0.66:0, label: 18
 remote binding: lsr: 10.0.0.44:0, label: imp-null
172.16.0.0/8, rev 17
 local binding: label: 19
 remote binding: lsr: 10.0.0.55:0, label: imp-null
 remote binding: lsr: 10.66.0.66:0, label: 16
 remote binding: lsr: 10.0.0.44:0, label: imp-null
192.168.0.66/32, rev 19
 local binding: label: 20
 remote binding: lsr: 10.0.0.55:0, label: 19
 remote binding: lsr: 10.66.0.66:0, label: imp-null
 remote binding: lsr: 10.0.0.44:0, label: 18
```

```
:
:
```

## Lab-2

### QUESTION 1

Scenario:

Instructions

Enter the proper CLI commands and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

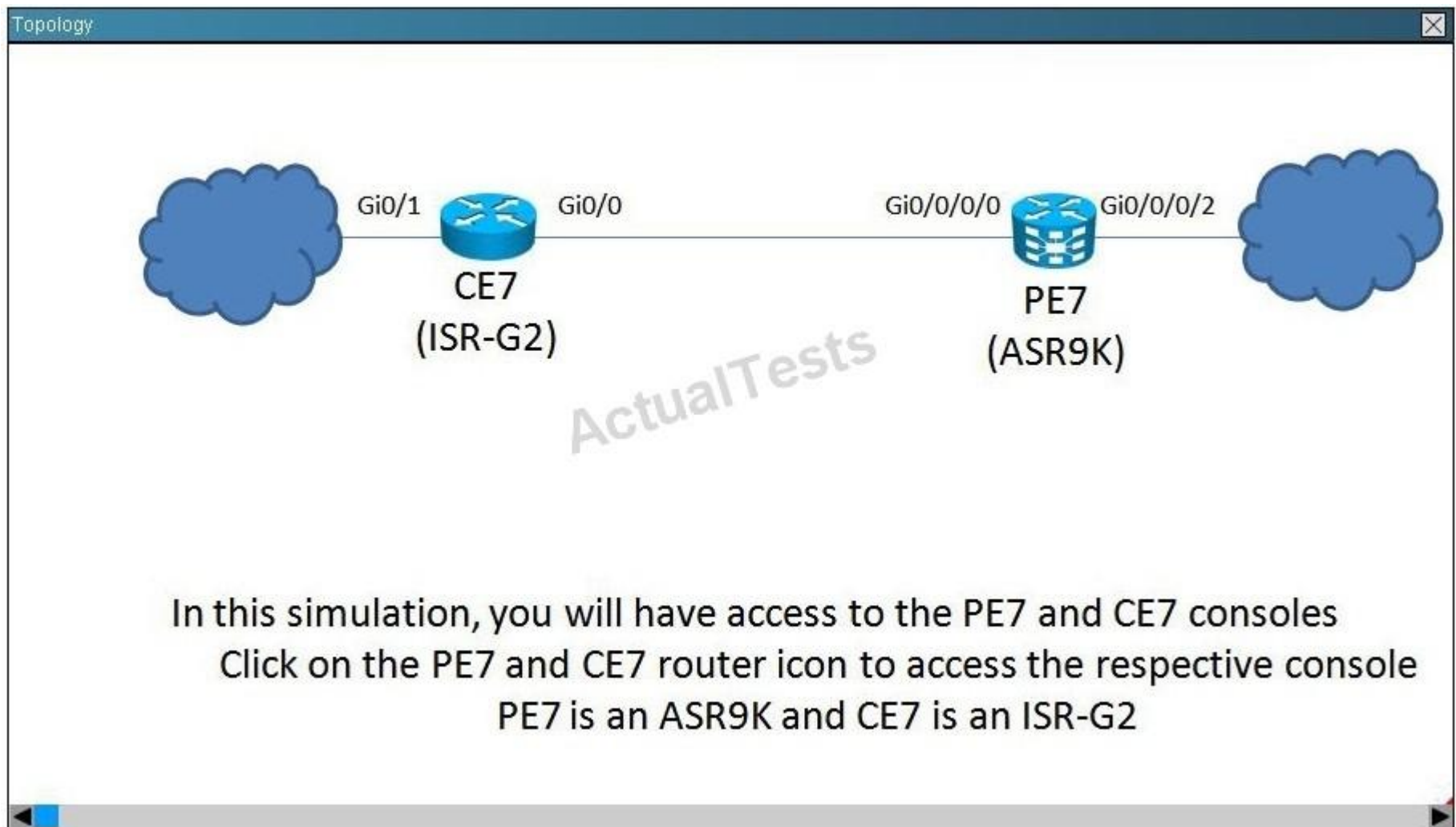
No console or enable passwords are required.

There are four multiple-choice questions with this task. Be sure to answer all four questions before selecting the Next button.

Not all the CLI commands or commands options are supported or required for this simulation. All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.

Scenario

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the CE7 and PE7 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.







On CE 7 router, which statement is correct regarding the "QOS-POLICY policy map configurations?

- A. Traffic matched by the "QOS-HTTP-1" class-map is shaped to an average rate of 2560000 128000bps
- B. Traffic matched by the "QOS1-HTTP-2" class-map will be queued in the low-latency-queue which has a maximum bandwidth guarantee of 64000
- C. Traffic matched by the "QOS-FTP-1" class-map can't use more than 256 Kbps under any condition
- D. The "QOS-POLICY" is applied to the gi0/0 interface in the input direction

**Correct Answer: C**

**Section: LAB-2**

**Explanation**

**Explanation/Reference:**

Explanation:

# show policy-map

# show policy-map interface x/y  
# show running-config policy-map

## QUESTION 2

Scenario:

### Instructions

Enter the proper CLI commands and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

No console or enable passwords are required.

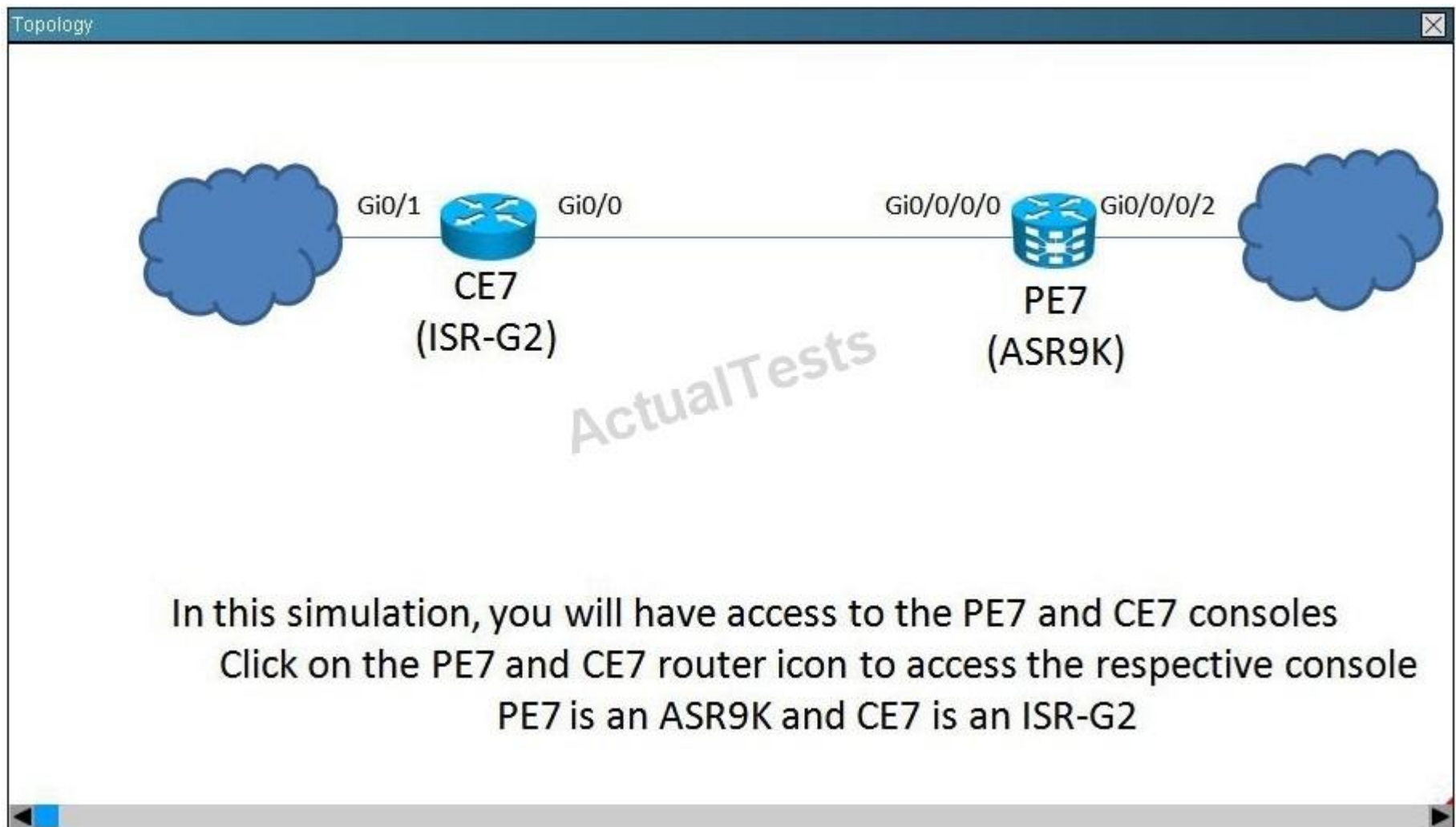
There are four multiple-choice questions with this task. Be sure to answer all four questions before selecting the Next button.

Not all the CLI commands or commands options are supported or required for this simulation. All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.

### Scenario

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the CE7 and PE7 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.











After reviewing present router configuration CE7 .which two statements are correct regarding behavior of the "llq" policy-map? (Choose 2)

- A. Traffic matched by the "cisco1" class-map will be assigned to the priority queue.
- B. The "llq" QoS policy is applied to the gi0/0 interface in the output direction
- C. Traffic matched by the "cisco2" class-map has a maximum bandwidth of 30%
- D. Traffic matched by the "cisco3" class-map has no priority and has a minimum bandwidth guarantee of 20%
- E. There are no packets being matched by the "class-default" traffic class in the "llq" policy

**Correct Answer:** AD

**Section:** LAB-2

**Explanation**

**Explanation/Reference:**

Explanation: You will notice that "cisco1" class map is assigned to the priority queue (the command is configured under policy-map llq class cisco1 priority xxx) "cisco2" class map: is indeed configured using bandwidth 30%, however that defines the minimum bandwidth but not the maximum. "cisco3" class map: is indeed configured using "bandwidth 20%", No priority configured and that will define the minimum guaranteed bandwidth. The last choice is wrong! check under "show policy-map interface" There are 4 or more packets being matched by the "class-default" traffic class in the "llq" policy.  
Class-map: class-default (match-any)  
4 packets, 968 bytes

### QUESTION 3

Scenario:

#### Instructions

Enter the proper CLI commands and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

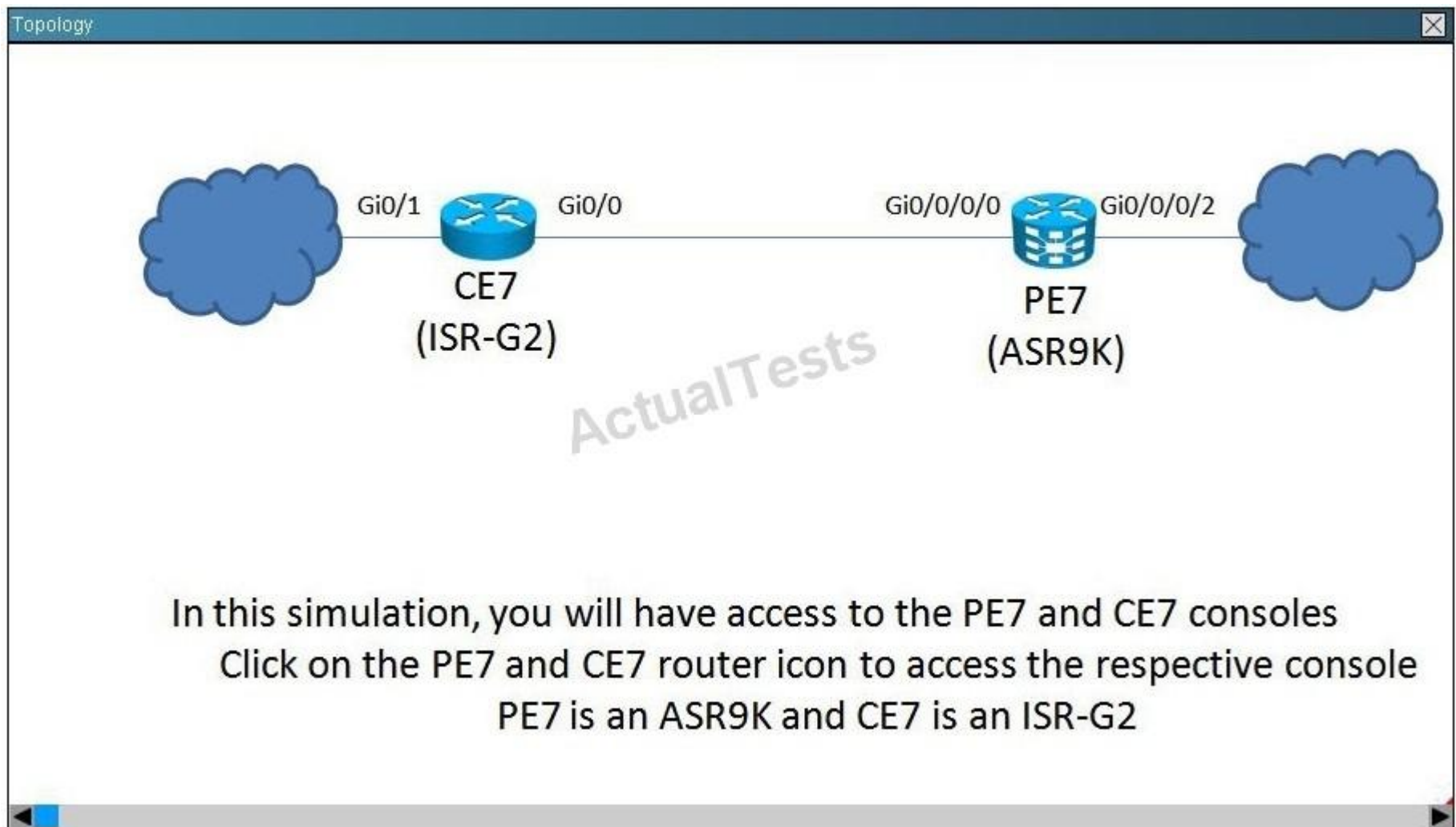
No console or enable passwords are required.

There are four multiple-choice questions with this task. Be sure to answer all four questions before selecting the Next button.

Not all the CLI commands or commands options are supported or required for this simulation.  
All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.

#### Scenario

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the CE7 and PE7 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.







On CE7 which statement is correct regarding Traffic the QoS policy applied to the gi0/0 interface in the input direction?

- A. Traffic matching the "MARKING2" class-map will be marked with qos-group 5
- B. Traffic matching the "MARKING1" class-map will be marked with MPLS EXP 5
- C. All incoming packets not matched by the "MARKING1" class-map will be dropped
- D. All incoming packets with the DSCP EF marking will be marked with MPLS EXP 0

**Correct Answer:** B

**Section:** LAB-2

**Explanation**

**Explanation/Reference:**

Explanation: Issue: show policy-map interface gi0/0

First find out which policy-map is applied (it called something like QOSPOLICY1) A is wrong. Class MARKING2 is indeed defined but not applied to that

policy-map. There are two class-maps applied MARKING1 and class-default. Both will mark the traffic with MPLS EXP values.  
default:

set mpls experimental imposition 0

MARKING1

set mpls experimental imposition 5

#### QUESTION 4

Scenario:

Instructions

Enter the proper CLI commands and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

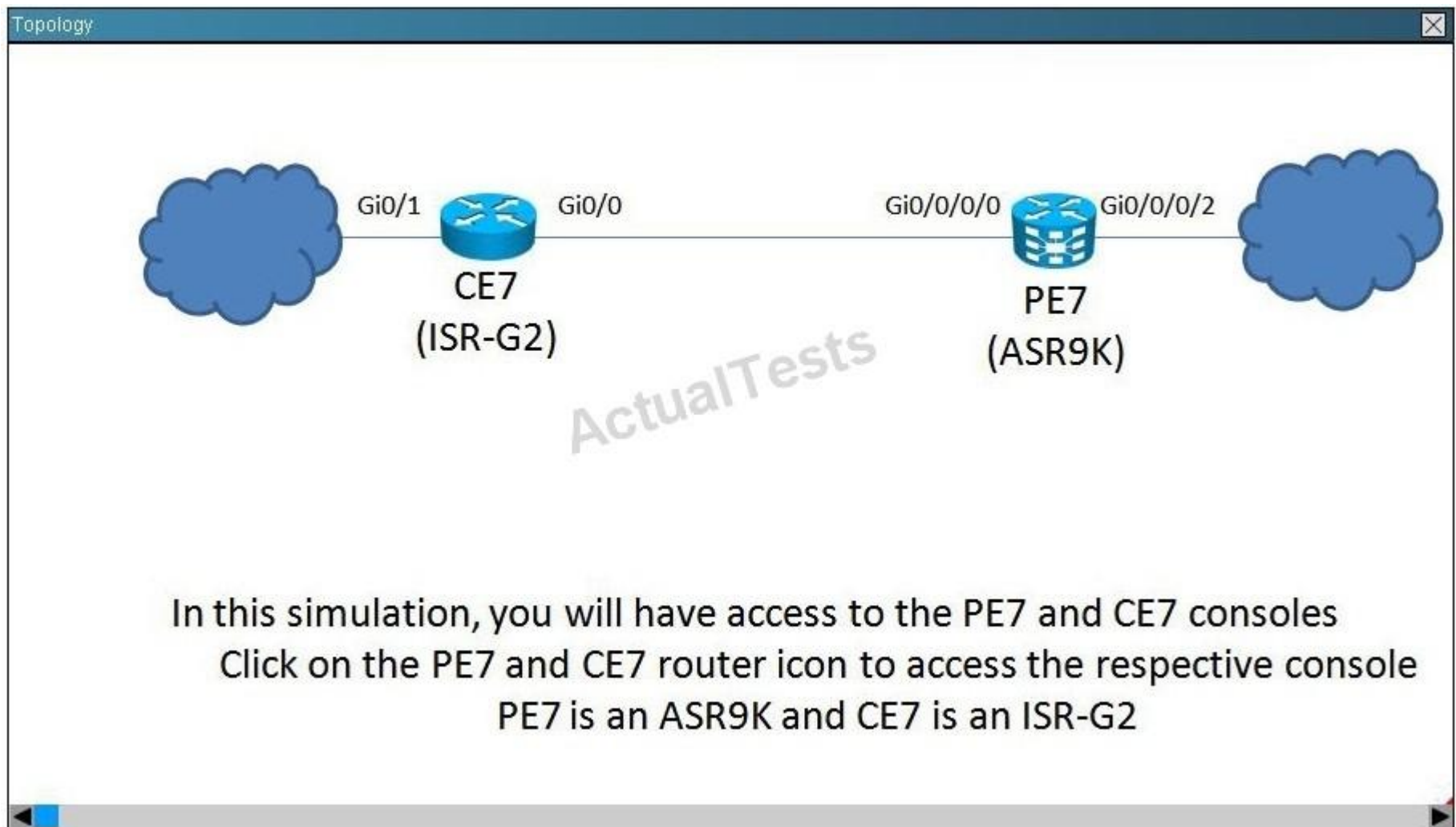
No console or enable passwords are required.

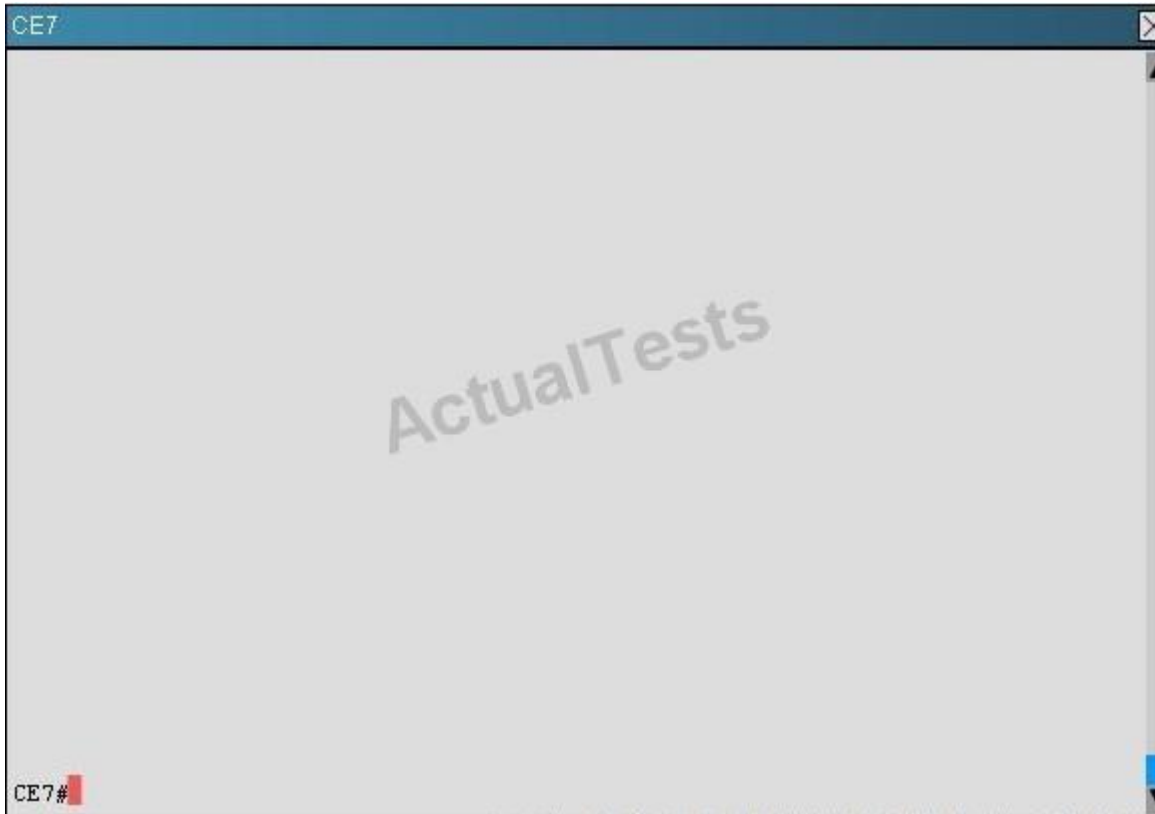
There are four multiple-choice questions with this task. Be sure to answer all four questions before selecting the Next button.

Not all the CLI commands or commands options are supported or required for this simulation.  
All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.

Scenario

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the CE7 and PE7 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.









On PE7 which statement is correct regarding the "traffic-policing" policy-map?

- A. The "traffic-policing" QoS policy is applied to the Gi0/0/0/0 interface in the outbound direction.
- B. The "traffic-policing" QoS policy will police the traffic matched by the "test12" ACL to 3 mbps and will drop all exceeding traffic.
- C. All incoming traffic not matched by the "test12" ACL to the Gi0/0/0/0 interface will be dropped.
- D. The "traffic-policing" QoS policy is using dual rate class-based traffic policing.

**Correct Answer:** B

**Section:** LAB-2

**Explanation**

**Explanation/Reference:**

Explanation:

#show running-config policy-map

#show policy-map