

## 642-889 Dumps

# Implementing Cisco Service Provider Next-Generation Edge Network Services (SPEDGE)

<https://www.certleader.com/642-889-dumps.html>



**NEW QUESTION 1**

Which three Layer 3 VPN technologies are based on the overlay model? {Choose three.}

- A. ATM virtual circuits
- B. Frame Relay virtual circuits
- C. GRE/IPsec
- D. L2TPv3
- E. MPLS Layer 3 VPNs
- F. DMVPNs

**Answer:** CDF

**Explanation:** The overlay model, where the service provider provides emulated leased lines to the customer.

The service provider provides the customer with a set of emulated leased lines. These leased lines are called VCs, which can be either constantly available {PVCs} or established on demand {SVCs}. The QoS guarantees in the overlay VPN model usually are expressed in terms of bandwidth guaranteed on a certain VC {Committed Information Rate or CIR} and maximum bandwidth available on a certain VC {Peak Information Rate or PIR}. The committed bandwidth guarantee usually is provided through the statistical nature of the Layer 2 service but depends on the overbooking strategy of the service provider. The peer-to-peer model, where the service provider and the customer exchange Layer 3 routing information and the provider relays the data between the customer sites on the optimum path between the sites and without the customer's involvement.

The peer-to-peer VPN model was introduced a few years ago to alleviate the drawbacks of the overlay VPN model. In the peer-to-peer model, the Provider Edge {PE} device is a router {PE-router} that directly exchanges routing information with the CPE router. The Managed Network service offered by many service providers, where the service provider also manages the CPE devices, is not relevant to this discussion because it's only a repackaging of another service. The Managed Network provider concurrently assumes the role of the VPN service provider providing the VPN infrastructure} and part of the VPN customer role {managing the CPE device}.

The peer-to-peer model provides a number of advantages over the traditional overlay model:

Routing {from the customer's perspective} becomes exceedingly simple, as the customer router exchanges routing information with only one {or a few} PE-router, whereas in the overlay VPN network, the number of neighbor routers can grow to a large number.

Routing between the customer sites is always optimal, as the provider routers know the customer's network topology and can thus establish optimum inter-site routing.

Bandwidth provisioning is simpler because the customer has to specify only the inbound and outbound bandwidths for each site {Committed Access Rate [CAR] and Committed Delivery Rate [CDR]} and not the exact site-to-site traffic profile.

The addition of a new site is simpler because the service provider provisions only an additional site and changes the configuration on the attached PE-router.

Under the overlay VPN model, the service provider must provision a whole set of VCs leading from that site to other sites of the customer VPN.

Prior to an MPLS-based VPN implementation, two implementation options existed for the peer-to-peer VPN model: The shared-router approach, where several VPN customers share the same PE-router.

The dedicated-router approach, where each VPN customer has dedicated PE-routers.

**NEW QUESTION 2**

Which VPN technology uses the Group Domain of Interpretation as the keying protocol and IPsec for encryption that is often deployed over a private MPLS core network?

- A. DMVPN
- B. GET VPN
- C. SSL VPN
- D. L2TPv3

**Answer:** B

**Explanation:** [http://www.cisco.com/en/US/prod/collateral/iosswrel/ps6537/ps6586/ps6635/ps7180/deployment\\_guide\\_c07\\_554\\_713.html](http://www.cisco.com/en/US/prod/collateral/iosswrel/ps6537/ps6586/ps6635/ps7180/deployment_guide_c07_554_713.html)

**NEW QUESTION 3**

Which flavor of MPLS Layer 3 VPN has MPLS enabled on PE-CE links?

- A. basic
- B. CSC
- C. inter-AS
- D. AToM
- E. VPLS

**Answer:** B

**Explanation:** [http://www.cisco.com/en/US/docs/ios/12\\_0st/12\\_0st14/feature/guide/csc.html](http://www.cisco.com/en/US/docs/ios/12_0st/12_0st14/feature/guide/csc.html)

**CE router:** A customer edge router is part of a customer network and interfaces to a provider edge (PE) router. In this document, the CE router sits on the edge of the customer carrier network.

**PE router:** A provider edge router is part of a service provider's network connected to a customer edge (CE) router. In this document, the PE routers sit on the edge of the backbone carrier network.

**ASBR:** In this document, an autonomous system boundary router connects one autonomous system to another.

See the [Glossary](#) for the complete definitions of these terms.

In this example, only the backbone carrier uses MPLS. The customer carrier (ISP) uses only IP. As a result, the backbone carrier must carry all the Internet routes of the customer carrier, which could be as many as 100,000 routes. This poses a scalability problem for the backbone carrier. To solve the scalability problem, the backbone carrier is configured as follows:

- The backbone carrier allows only internal routes of the customer carrier (IGP routes) to be exchanged between the CE routers of the customer carrier and the PE routers of the backbone carrier.
- MPLS is enabled on the interface between the CE router of the customer carrier and the PE router of the backbone carrier.

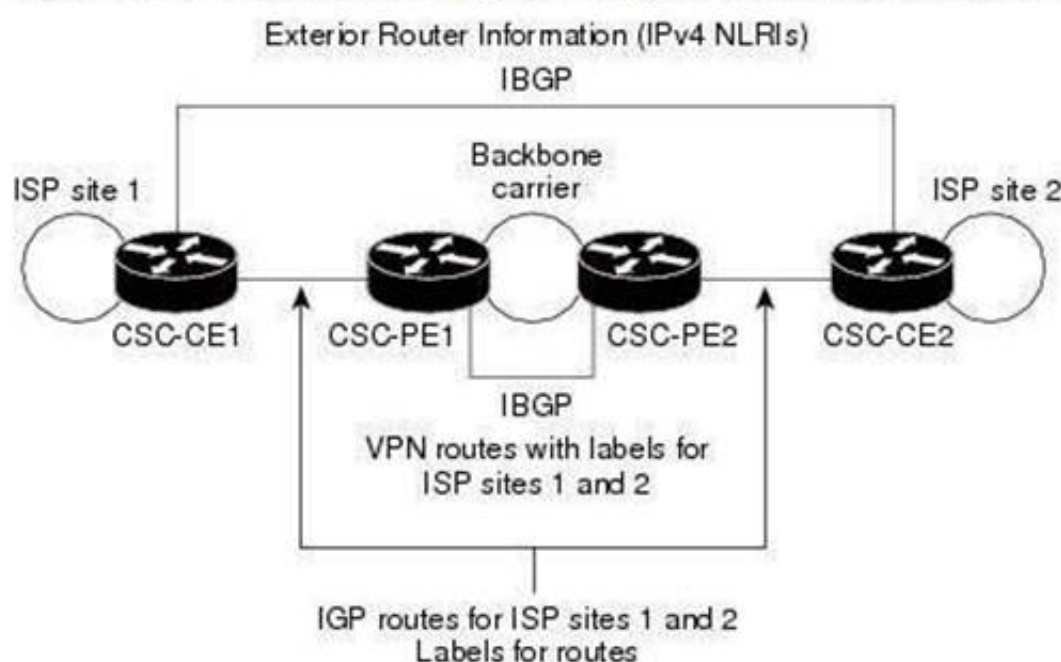
Internal and external routes are differentiated this way:

- Internal routes go to any of the routers within the ISP.
- External routes go to the Internet.

The number of internal routes is much smaller than the number of external routes. Restricting the routes between the CE routers of the customer carrier and the PE routers of the backbone carrier significantly reduces the number of routes that the PE router needs to maintain.

Since the PE routers do not have to carry external routes in the VRF routing table, they can use the incoming label in the packet to forward the customer carrier Internet traffic. Adding MPLS to the routers provides a consistent method of transporting packets from the customer carrier to the backbone carrier. MPLS allows the exchange of an MPLS label between the PE and the CE routers for every internal customer carrier route. The routers in the customer carrier have all the external routes either through IBGP or route redistribution to provide Internet connectivity. [Figure 2](#) shows how information is exchanged when the network is configured in this manner.

**Figure 2 Backbone Carrier Exchanging Routing Information with a Customer Carrier Who Is an ISP**



#### NEW QUESTION 4

Which MP-BGP address family must be configured to use VPLS autodiscovery in a Cisco IOS XR router?

- A. address-family l2vpn vpls-vpws
- B. address-family vpnv4 unicast
- C. address-family ipv4 mdt
- D. address-family ipv4 tunnel
- E. address-family vpls vfi

**Answer:** A

**Explanation:** [http://www.cisco.com/en/US/docs/ios/12\\_2sr/12\\_2srb/feature/guide/srbgpl2v.html](http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbgpl2v.html)

#### NEW QUESTION 5

In MPLS Layer 3 VPN implementations, what is used on the PE router to isolate potential overlapping routing information between different customers?

- A. route targets
- B. VRFs
- C. VC IDs
- D. pseudowire IDs
- E. pseudowire classes

**Answer:** B

#### NEW QUESTION 6



When implementing MPLS Layer 3 VPNs with customers running OSPF as the CE-PE routing protocol, the service provider MPLS backbone looks like what to the CE routers?

- A. the backbone {Area 0}
- B. an external routing domain
- C. a superbackbone that is transparent to the CE OSPF routers
- D. a transit area {similar to a transit area for supporting virtual links}

**Answer:** C

#### NEW QUESTION 7

When implementing MPLS Layer 3 VPNs with customers running OSPF as the CE-PE routing protocol, which situation will require a sham link to be implemented in the MPLS backbone?

- A. to connect customer sites in different OSPF areas
- B. to connect customer sites in the same OSPF area
- C. to prevent OSPF routing loops when a customer site has redundant CE-PE connections
- D. if there is a backdoor link between the CE routers, to ensure that the backdoor link is used only to back up the primary connection through the MPLS VPN

**Answer:** D

**Explanation:** [http://www.cisco.com/en/US/docs/ios/12\\_2t/12\\_2t8/feature/guide/ospfshmk.html](http://www.cisco.com/en/US/docs/ios/12_2t/12_2t8/feature/guide/ospfshmk.html)

#### NEW QUESTION 8

Refer to the partial Cisco IOS XR PE router VRF configuration exhibit.

```
vrf customer1
address-family ipv4 unicast
import route-target
1:1
2:1
export route-target
1:1
2:2
!
vrf customer2
address-family ipv4 unicast
import route-target
1:2
2:1
export route-target
1:2
2:2
!
```

To implement a central-service VPN supporting both customer1 and customer2, what will be the required corresponding VRF configuration on the central-service-server PE router?

- A. vrf central-service-server address-family ipv4 unicast import route-target 3:12:2 export route-target 3:12:1!
- B. vrf central-service-server address-family ipv4 unicast import route-target 3:12:1 export route-target 3:12:2!
- C. vrf central-service-server address-family ipv4 unicast import route-target 3:11:11:2 export route-target 3:11:11:2!
- D. vrf central-service-server address-family ipv4 unicast import route-target 3:11:11:22:12:2 export route-target 3:11:11:22:12:2!

**Answer:** A

#### NEW QUESTION 9

When implementing Layer 3 MPLS VPNs on Cisco IOS/IOS XE PE routers, which PE-to-CE routing protocol requires a separate routing process to be created for each VRF?

- A. EIGRP
- B. RIPv2
- C. OSPF
- D. BGP

**Answer:** C

#### NEW QUESTION 10

In Layer 3 MPLS VPN implementations, if a customer is using the same AS number at both customer sites and the PE-to-CE routing protocol is BGP, what must be enabled on the PE router?

- A. BGP AS override
- B. BGP allowas-in
- C. BGP SOO extended community
- D. BGP AS path prepending

**Answer:** A

**Explanation:** <https://supportforums.cisco.com/docs/DOC-21837>

Loop prevention in BGP is done by verifying the AS number in the AS Path. If the receiving router sees its own AS number in the AS Path of the received BGP

packet, the packet is dropped. The receiving Router assumes that the packet was originated from its own AS and has reached the same place from where it originated initially.

The feature could be a disaster if customers are using same AS number along the various sites and disallows customer sites having identical AS numbers to be linked by another AS number. In such a scenario, routing updates from one site will be dropped when the other site receives them.

To override this feature, AS-Override function causes to replace the AS number of originating router with the AS number of the sending BGP router. The command is neighbor ip-address as-override and can only be executed under the VPNv4 address-family

#### NEW QUESTION 10

Which BGP extended community is used to control the distribution of VPN routing information and to identify routers that may receive a set of routes that carry the community?

- A. SOO
- B. RT
- C. opaque
- D. route origin
- E. RD

**Answer:** B

**Explanation:** <http://blog.initialdraft.com/archives/1537/>

Route Target is a 64-bits BGP community used for tagging prefixes. When exporting prefixes from the VRF, we add to the prefixes a Route-Target community, so when the PE in the remote site has to import prefixes into the VRF, it can easily identify which prefixes to import.

#### NEW QUESTION 15

In which configuration mode is a route distinguisher configured in a Cisco IOS XR router?

- A. config-vrf
- B. config-vrf-af
- C. config-bgp
- D. config-bgp-af
- E. config-bgp-vrf

**Answer:** E

**Explanation:** [http://www.cisco.com/en/US/docs/ios\\_xr\\_sw/iosxr\\_r3.6/routing/configuration/guide/rc36book.pdf](http://www.cisco.com/en/US/docs/ios_xr_sw/iosxr_r3.6/routing/configuration/guide/rc36book.pdf)

#### Neighbor Address Family Configuration Mode

The following example shows how to enter neighbor address family configuration mode:

```
RP/0/RP0/CPU0:router(config)# router bgp 112
RP/0/RP0/CPU0:router(config-bgp)# neighbor 10.0.0.1
RP/0/RP0/CPU0:router(config-bgp-nbr)# address-family ipv4 unicast
RP/0/RP0/CPU0:router(config-bgp-nbr-af)#
```

#### VRF Configuration Mode

The following example shows how to enter VPN routing and forwarding (VRF) configuration mode:

```
RP/0/RP0/CPU0:router(config)# router bgp 140
RP/0/RP0/CPU0:router(config-bgp)# vrf vrf_A
RP/0/RP0/CPU0:router(config-bgp-vrf)#
```

#### VRF Address Family Configuration Mode

The following example shows how to enter VRF address family configuration mode:

```
RP/0/RP0/CPU0:router(config)# router bgp 112
RP/0/RP0/CPU0:router(config-bgp)# vrf vrf_A
RP/0/RP0/CPU0:router(config-bgp-vrf)# address-family ipv4 unicast
RP/0/RP0/CPU0:router(config-bgp-vrf-af)#
```

#### VRF Neighbor Configuration Mode

The following example shows how to enter VRF neighbor configuration mode:

```
RP/0/RP0/CPU0:router(config)# router bgp 140
RP/0/RP0/CPU0:router(config-bgp)# vrf vrf_A
RP/0/RP0/CPU0:router(config-bgp-vrf)# neighbor 11.0.1.2
RP/0/RP0/CPU0:router(config-bgp-vrf-nbr)#
```

#### NEW QUESTION 18

Refer to the exhibit.

```
route-policy filter
pass
end-policy
!
router bgp 1234
  bgp router-id 10.2.2.2
  address-family ipv4 unicast
    network 192.168.0.0/24
    network 192.168.1.0/24
  !
  neighbor-group share
    remote-as 1234
    update-source Loopback0
    address-family ipv4 unicast
      route-policy filter in
      route-reflector-client
  !
  !
  neighbor 10.1.1.1
    use neighbor-group share
  !
  !
vrf INTERNET
  rd 1:1
  address-family ipv4 unicast
    redistribute connected
  !
  !
  !
```

Given the output shown, which two statements are true? {Choose two.}

- A. The configured remote AS for neighbor 10.1.1.1 is 1234.
- B. Both prefixes that are referenced by network commands will be visible with the show bgp command from the information that is shown in the output.
- C. The neighbor 10.1.1.1 cannot learn any routes from this router.
- D. The router cannot learn any routes for neighbor 10.1.1.1.
- E. Routes from the Internet VRF that are injected into BGP through redistribution will be advertised to neighbor 10.1.1.1.

**Answer:** AC

#### NEW QUESTION 19

Which Layer 2 VPN technology is implemented over an IP core network without the need for MPLS?

- A. VPLS
- B. VPWS
- C. AToM
- D. L2TPv3

**Answer:** D

**Explanation:** [http://www.cisco.com/en/US/docs/ios/12\\_3t/12\\_3t2/feature/guide/gtl2tpv3.html#wp1040784](http://www.cisco.com/en/US/docs/ios/12_3t/12_3t2/feature/guide/gtl2tpv3.html#wp1040784)

The Layer 2 Tunnel Protocol Version 3 feature expands on Cisco support of the Layer 2 Tunnel Protocol Version 3 {L2TPv3}. L2TPv3 is an Internet Engineering Task Force {IETF} I2tpext working group draft that provides several enhancements to L2TP for the capability to tunnel any Layer 2 payload over L2TP. Specifically, L2TPv3 defines the L2TP protocol for tunneling Layer 2 payloads over an IP core network using Layer 2 virtual private networks {VPNs}. Benefits of this feature include the following:

- L2TPv3 simplifies deployment of VPNs
- L2TPv3 does not require Multiprotocol Label Switching
- L2TPv3 supports Layer 2 tunneling over IP for any payload

#### NEW QUESTION 20

Which two Layer 2 VPN methods support interworking between customer sites with different Layer 2 encapsulation at each end {for example, Frame Relay to Ethernet interworking}? {Choose two.}

- A. AToM
- B. VPLS
- C. GET VPN
- D. L2TPv3

**Answer:** AD

**Explanation:** [http://www.cisco.com/en/US/docs/ios/12\\_3t/12\\_3t2/feature/guide/gtl2tpv3.html#wp1040784](http://www.cisco.com/en/US/docs/ios/12_3t/12_3t2/feature/guide/gtl2tpv3.html#wp1040784)

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- L2TPv3 simplifies deployment of VPNs
- L2TPv3 does not require Multiprotocol Label Switching
- L2TPv3 supports Layer 2 tunneling over IP for any payload [http://www.cisco.com/en/US/products/ps6646/products\\_ios\\_protocol\\_option\\_home.html](http://www.cisco.com/en/US/products/ps6646/products_ios_protocol_option_home.html)

Cisco Any Transport over MPLS {AToM} is a solution for transporting Layer 2 packets over an MPLS backbone. It enables Service Providers to supply connectivity between customer sites with existing data link layer {Layer 2} networks via a single, integrated, packet-based network infrastructure: a Cisco MPLS network.



Without separate networks that each have network management environments, Service Providers can deliver Layer 2 connections over an MPLS backbone. Cisco AToM provides a common framework to encapsulate and transport supported Layer 2 traffic types over an MPLS network core. Service Providers can use a single MPLS network infrastructure to offer connectivity for supported Layer 2 traffic and for IP traffic in Layer 3 VPNs.

### NEW QUESTION 23

What are the two AToM interworking modes? {Choose two.}

- A. bridged {interworking ethernet}
- B. routed {interworking ip}
- C. label-switched {interworking mpls}
- D. transparent {interworking transparent}

**Answer: AB**

**Explanation:** [http://www.cisco.com/en/US/docs/ios/ios\\_xe/mpls/configuration/guide/mp\\_l2vpn\\_intrntwkg\\_xe.html](http://www.cisco.com/en/US/docs/ios/ios_xe/mpls/configuration/guide/mp_l2vpn_intrntwkg_xe.html)

Interworking is a transforming function that is required to interconnect two heterogeneous attachment circuits {ACs}. Several types of interworking functions exist. The function that is used would depend on the type of ACs being used, the type of data being carried, and the level of functionality required. The two main Layer 2 Virtual Private Network {L2VPN} interworking functions supported in Cisco IOS XE software are bridged and routed interworking.

Layer 2 {L2} transport over multiprotocol label switching {MPLS} and IP already exists for like-to-like ACs, such as Ethernet-to-Ethernet or Point-to-Point Protocol {PPP}-to-PPP. L2VPN Interworking builds on this functionality by allowing disparate ACs to be connected. An interworking function facilitates the translation between different L2 encapsulations.

### NEW QUESTION 26

Which method is used to provide inter-AS AToM services?

- A. back-to-back VRF
- B. targeted LDP
- C. pseudowire stitching
- D. AToM interworking
- E. Cisco MPLS TE tunnels
- F. autodiscovery

**Answer: C**

**Explanation:** [http://www.cisco.com/en/US/docs/optical/cpt/r9\\_3/configuration/guide/cpt93\\_configuration\\_chapter\\_0111.html](http://www.cisco.com/en/US/docs/optical/cpt/r9_3/configuration/guide/cpt93_configuration_chapter_0111.html)

#### Understanding L2VPN Pseudowire Stitching

L2VPN Pseudowire Stitching defines a static or dynamically configured set of two or more pseudowire segments that behave and function as a single point-to-point pseudowire. L2VPN Pseudowire Stitching enables L2VPN pseudowires to extend across two separate MPLS networks or across an inter-AS boundary, as shown in [Figure 1](#) and [Figure 2](#).

L2VPN Pseudowire Stitching connects two or more contiguous pseudowire segments to form an end-to-end multihop pseudowire. This end-to-end pseudowire functions as a single point-to-point pseudowire.

As shown in [Figure 2](#), L2VPN Pseudowire Stitching enables you to keep the IP addresses of the edge PE routers private across inter-AS boundaries. You can use the IP address of the Autonomous System Boundary Routers (ASBRs) and treat them as pseudowire aggregation (PE-agg) routers. The ASBRs join the pseudowires of the two domains.

Figure 7. L2VPN Pseudowire Stitching in an Intra-AS Topology

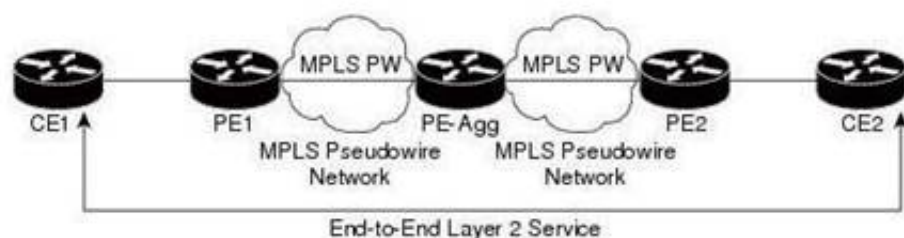
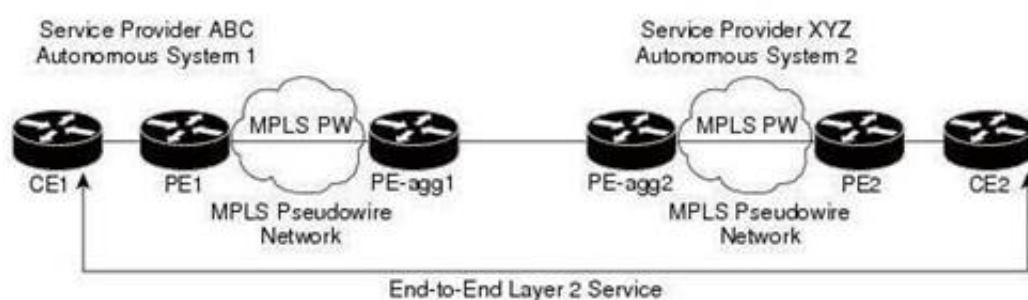


Figure 8. L2VPN Pseudowire Stitching in an Inter-AS Topology



#### Restrictions for L2VPN Pseudowire Stitching

- L2VPN Pseudowire Stitching is supported with AToM.
- Only static, on-box provisioning is supported.
- Sequencing numbers in AToM packets are not processed by L2VPN Pseudowire Stitching. The feature passes the sequencing data through the cross-connect packet paths, a process that is called transparent sequencing. The end point PE to CE connections enforce the sequencing.
- You can ping the adjacent next-hop PE router. End-to-end LSP pings are not supported.
- Do not configure IP or Ethernet interworking on a router where L2VPN Pseudowire Stitching is enabled. Instead, configure interworking on the routers at the edge PEs of the network.
- The control word negotiation results must match. If either segment does not negotiate the control word, the control word is disabled for both segments.
- AToM Graceful Restart is negotiated independently on each pseudowire segment. If there is a transient loss of the LDP session between two AToM PE routers, packets continue to flow.
- Per-pseudowire QoS is not supported. The TE tunnel selection is supported.
- Attachment circuit interworking is not supported.
- [NTP-J34 Configure the Pseudowire Stitching Using Cisco IOS Commands](#)

#### NTP-J34 Configure the Pseudowire Stitching Using Cisco IOS Commands

Purpose	This procedure configures L2VPN Pseudowire Stitching on each of the PE routers.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

#### NEW QUESTION 29

Which Layer 2 protocol parameters can be carried inside the control word when implementing AToM service?

- A. PW ID
- B. Frame Relay FECN, BECN, and DE bits
- C. encapsulation type
- D. VC type

**Answer:** B

**Explanation:** [http://www.cisco.com/en/US/products/ps6603/products\\_qanda\\_item09186a008009d4e3.shtml#wp39173](http://www.cisco.com/en/US/products/ps6603/products_qanda_item09186a008009d4e3.shtml#wp39173)

Q. How does Frame Relay over MPLS work?

A. Traffic is encapsulated in MPLS packets and forwarded across the MPLS network. When encapsulating Frame Relay over MPLS, the Frame Relay header and the frame check sequence {FCS} are stripped from the packet. The bits for Backward Explicit Congestion Notification {BECN}, Forward Explicit Congestion Notification {FECN}, Discard Eligibility {DE} and Command/Response {C/R} are carried across the MPLS network in the "Control Word" header.

#### NEW QUESTION 30

Which two methods can be used for VPLS PW signaling? {Choose two.}

- A. static
- B. BGP
- C. IGP
- D. LDP
- E. RSVP

**Answer:** BD

**Explanation:**



### VPLS Discovery and Signaling

VPLS is a Layer 2 multipoint service and it emulates a LAN service across a WAN. VPLS enables service providers to interconnect several LAN segments over a packet-switched network and make them behave as a single LAN. Service providers can provide a native Ethernet access connection to customers using VPLS.

The VPLS control plane consists of two important components, autodiscovery and signaling:

- VPLS Autodiscovery eliminates the need to manually provision VPLS neighbors. VPLS Autodiscovery enables each VPLS PE router to discover other provider edge (PE) routers that are part of the same VPLS domain.
- Once the PEs are discovered, pseudowires (PWs) are signaled and established across pairs of PE routers, forming a full mesh of PWs across PE routers in a VPLS domain.

**Figure 10 VPLS Autodiscovery and Signaling**

L2-VPN	Multipoint	
Discovery	BGP	
Signaling Protocol	LDP	BGP
Tunneling Protocol	MPLS	

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### BGP-based VPLS Autodiscovery

An important aspect of VPN technologies, including VPLS, is the ability of network devices to automatically signal information to other devices, about any association with a particular VPN. Autodiscovery requires this information to be distributed to all members of a VPN. VPLS is a multipoint mechanism for which BGP is well-suited.

BGP-based VPLS autodiscovery eliminates the need to manually provision VPLS neighbors. VPLS autodiscovery enables each VPLS PE router to discover other provider edge (PE) routers that are part of the same VPLS domain. VPLS Autodiscovery also tracks occurrences when PE routers are added to, or removed from, the VPLS domain. When the discovery process is complete, each PE router has the information required to setup VPLS pseudowires (PWs).

### BGP Auto Discovery With BGP Signaling

The implementation of VPLS in a network requires the establishment of a full mesh of PWs between the provider edge (PE) routers. The PWs can be signaled using BGP signaling.

### NEW QUESTION 32

VPWS/EoMPLS offers which type of Ethernet services as defined by the MEF?

- A. E-Tree
- B. E-LAN
- C. E-Line
- D. E-Interworking

**Answer: C**

#### Explanation:

- E-Line is based on a point-to-point Ethernet Virtual Connection. Two E-Line services are defined:
  - Ethernet Private Line {EPL}: A very simple and basic point-to-point service characterized by low frame delay, frame delay variation, and frame loss ratio. No service multiplexing is allowed, and other than a committed information rate {CIR} no class of service {CoS} {Bandwidth Profiling} is allowed.
  - Ethernet Virtual Private Line {EVPL}: A point-to-point service wherein service multiplexing {more than one Ethernet Virtual Connection} is allowed. The individual Ethernet Virtual Circuits can be defined with a rich set of Bandwidth Profiles and Layer 2 Control Protocol Processing methods as defined by the Metro Ethernet Forum.

### NEW QUESTION 35

When implementing H-VPLS with QinQ access on Cisco Metro Ethernet switches, which two commands enable the QinQ tagging? {Choose two.}

- A. encapsulation dot1q {customer-vlan} second-tag {sp-vlan}
- B. encapsulation dot1q {sp-vlan} second-tag {customer-vlan}
- C. switchport mode dot1q-tunnel
- D. switchport mode trunk
- E. switchport access vlan {sp-vlan}
- F. switchport access vlan {customer-vlan}

**Answer: CE**

### NEW QUESTION 36

When implementing VPLS on Cisco IOS XR routers, the customer-facing subinterfaces on the PE routers are assigned to which Cisco EVC component?

- A. bridge group
- B. bridge domain
- C. VFI
- D. Layer 2 transport
- E. BVI

**Answer: B**

#### Explanation:

<b>l2vpn</b>  <b>Example:</b> RP/0/RSP0/CPU0:router (config-subif)#l2vpn	Enters L2VPN configuration mode.
<b>bridge group bridge-group-name</b>  <b>Example:</b> RP/0/RSP0/CPU0:router (config-l2vpn)#bridge group ce-doc-examples	Enters configuration mode for the named bridge group. This command creates a new bridge group or modifies the existing bridge group if it already exists. A bridge group organizes bridge domains.
<b>bridge-domain domain-name</b>  <b>Example:</b> RP/0/RSP0/CPU0:router (config-l2vpn-bg)#bridge-domain ac-example	Enters configuration mode for the named bridge domain. This creates a new bridge domain modifies the existing bridge domain if it already exists.
<b>interface [GigabitEthernet   TenGigE] instance.subinterface</b>  <b>Example:</b> RP/0/RSP0/CPU0:router (config-l2vpn-bg-bd)#inter face GigabitEthernet0/5/0/0.20	Assigns the matching VLAN Id and Ethertype to the interface.
<b>interface [GigabitEthernet   TenGigE] instance.subinterface</b>  <b>Example:</b> RP/0/RSP0/CPU0:router (config-l2vpn-bg-bd-ac)#in terface GigabitEthernet0/5/0/1.15	Adds an interface to a bridge domain that allows packets to be forwarded and received from other interfaces that are part of the same bridge domain. The interface now becomes an attachment circuit on this bridge domain.
<b>end</b> <b>or</b> <b>commit</b>  <b>Example:</b> RP/0/RSP0/CPU0:router (config-l2vpn-bg-bd-ac)# end <b>or</b> RP/0/RSP0/CPU0:router (config-l2vpn-bg-bd-ac)# commit	Saves configuration changes.  <ul style="list-style-type: none"> <li>When you issue the <b>end</b> command, the system prompts you to commit changes:   Uncommitted changes found, commit them before  exiting(yes/no/cancel)?  [cancel]:   <ul style="list-style-type: none"> <li>Entering <b>yes</b> saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode.</li> <li>Entering <b>no</b> exits the configuration session and returns the router to EXEC mode without committing the configuration changes.</li> <li>Entering <b>cancel</b> leaves the router in the current configuration session without exiting or committing the configuration changes.</li> </ul> </li> </ul>

#### NEW QUESTION 41

What is an advantage of using the Cisco EVC infrastructure to implement carrier-class Ethernet services that are not available on non-EVC-capable platforms?

- A. PW redundancy
- B. interworking support
- C. PW stitching support
- D. flexible frame-matching support and VLAN tag manipulation
- E. local cross-connect support

**Answer: D**

**Explanation:** [http://www.cisco.com/web/YU/events/expo\\_08/pdfs/Carrier\\_Ethernet\\_Marek\\_Moskal.pdf](http://www.cisco.com/web/YU/events/expo_08/pdfs/Carrier_Ethernet_Marek_Moskal.pdf)

### EVC : Flexible Frame Matching

EVC stands for Ethernet Virtual Connection and in Cisco's platforms it's used to represent Cisco's software architecture to address Carrier Ethernet Services. In MEF (Metro Ethernet Forum) terminology EVC means "Ethernet Virtual Connection/Circuit", but here EVC represents also the whole Carrier Ethernet software infrastructure developed by Cisco.

EVC has many advantages (which i will try to describe in future posts), one of them being the Flexible Frame Matching. Flexible Frame Matching is a functionality that allows each service instance to match frames with either a unique single vlan, or a list/range of vlans. It can also match single/double tagged frames, untagged frames, or everything else that belongs to the default category.



#### NEW QUESTION 44

When implementing a Layer 2 transport subinterface on a Cisco IOS XR router, which encapsulation option is used to match any packets that are not matched by any other service instances?

- A. default
- B. untagged
- C. any
- D. tag

**Answer: A**

**Explanation:**

Command	Description
<code>encapsulation dot1q</code>	Defines the <b>matching</b> criteria to map 802.1Q frames ingress on an interface to the appropriate service instance.
<code>encapsulation dot1ad dot1q</code>	Defines the <b>matching</b> criteria to be used in order to map single-tagged 802.1ad frames ingress on an interface to the appropriate service instance.
<code>encapsulation dot1q second-dot1q</code>	Defines the <b>matching</b> criteria to map Q-in-Q ingress frames on an interface to the appropriate service instance.
<code>encapsulation untagged</code>	Defines the <b>matching</b> criteria to map untagged ingress Ethernet frames on an interface to the appropriate service instance.

#### encapsulation default

To configure the default service instance on a port, use the **encapsulation default** command in the interface configuration mode. To delete the default service instance on a port, use the **no** form of this command.

**encapsulation default**

**no encapsulation default**

#### Syntax Description

This command has no keywords or arguments.

#### Command Default

No default service instance is configured on the port.

#### Command Modes

Interface configuration

#### Command History

Release	Modification
Release 3.7.2	This command was introduced.

#### Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If the default service instance is the only one configured on a port, the **encapsulation default** command **matches** all ingress frames on that port. If the default service instance is configured on a port that has other non-default service instances, the **encapsulation default** command **matches** frames that are **unmatched** by those non-default service instances (anything that does not meet the criteria of other services instances on the same physical interface falls into this service instance).

Only a single default service instance can be configured per interface. If you attempt to configure more than one default service instance per interface, the **encapsulation default** command is rejected.

Only one encapsulation command must be configured per service instance.

#### NEW QUESTION 49

When configuring VPLS on the Cisco ASR 9000, which three configurations are required under the l2vpn configuration mode? {Choose three.}

- A. bridge-group
- B. bridge-domain
- C. xconnect
- D. vfi
- E. encapsulation

**Answer: ABD**

**Explanation:**



<b>l2vpn</b>  <b>Example:</b> RP/0/RSP0/CPU0:router (config-subif)#l2vpn	Enters L2VPN configuration mode.
<b>bridge group bridge-group-name</b>  <b>Example:</b> RP/0/RSP0/CPU0:router (config-l2vpn)#bridge group ce-doc-examples	Enters configuration mode for the named bridge group. This command creates a new bridge group or modifies the existing bridge group if it already exists. A bridge group organizes bridge domains.
<b>bridge-domain domain-name</b>  <b>Example:</b> RP/0/RSP0/CPU0:router (config-l2vpn-bd)#bridge-domain ac-example	Enters configuration mode for the named bridge domain. This creates a new bridge domain modifies the existing bridge domain if it already exists.
<b>interface [GigabitEthernet   TenGigE]</b> instance.subinterface  <b>Example:</b> RP/0/RSP0/CPU0:router (config-l2vpn-bd)#inter face GigabitEthernet0/5/0/0.20	Assigns the matching VLAN Id and Ethertype to the interface.
<b>interface [GigabitEthernet   TenGigE]</b> instance.subinterface  <b>Example:</b> RP/0/RSP0/CPU0:router (config-l2vpn-bd-ac)#in terface GigabitEthernet0/5/0/1.15	Adds an interface to a bridge domain that allows packets to be forwarded and received from other interfaces that are part of the same bridge domain. The interface now becomes an attachment circuit on this bridge domain.
<b>end</b> Or <b>commit</b>  <b>Example:</b> RP/0/RSP0/CPU0:router (config-l2vpn-bd-ac)# end Or RP/0/RSP0/CPU0:router (config-l2vpn-bd-ac)# commit	Saves configuration changes. <ul style="list-style-type: none"> <li>When you issue the <b>end</b> command, the system prompts you to commit changes:  Uncommitted changes found, commit them before exiting(yes/no/cancel)?  [cancel]:  <ul style="list-style-type: none"> <li>Entering <b>yes</b> saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode.</li> <li>Entering <b>no</b> exits the configuration session and returns the router to EXEC mode without committing the configuration changes.</li> <li>Entering <b>cancel</b> leaves the router in the current configuration session without exiting or committing the configuration changes.</li> </ul> </li> </ul>

### Restrictions for Implementing Virtual Private LAN Services on Cisco IOS XR Software

The following restrictions are listed for implementing VPLS:

- All attachment circuits in a bridge domain on an Engine 3 line card must be the same type (for example, port, dot1q, qinq, or qinany), value (VLAN ID), and EtherType (for example, 0x8100, 0x9100, or 0x9200). The Cisco CRS-1 router supports multiple types of attachment circuits in a bridge domain.
- The Engine 3 line cards, cannot simultaneously have attachment circuits and MPLS-enabled on any one of its interfaces. The line card cannot be Edge-facing and Core-facing at the same time. Line cards on the Cisco CRS-1 router can be Edge-facing and Core-facing at the same time.
- The line card requires ternary content addressable memory (TCAM) Carving configuration. The Cisco CRS-1 router however, does not require the TCAM Carving configuration.
- Virtual Forwarding Instance (VFI) names have to be unique, because a bridge domain can have only one VFI.
- On the Cisco CRS-1 router, a VPLS pseudowire (PW) can be configured only under VFI.
- The Cisco CRS-1 router does not support VPLS with TE core tunnels.
- A PW cannot belong to both a peer-to-peer (P2P) cross-connect group and a VPLS bridge-domain. This means that the neighboring IP address and the pseudowire ID have to be unique on the router, because the pseudowire ID is signaled to the remote provider edge.
- You cannot manually set up a PW on one PE and use auto-discovery on the other PE to configure the same PW in the other direction. The auto-discovery feature is supported only on the Cisco XR 12000 Series Router.

### NEW QUESTION 53

Which option is the correct command to define an interface as Layer 2 on the Cisco ASR 9000?

- A. RP/0/RSP0/CPU0:R1(config)#int gigabitEthernet 0/6/0/0 l2transport
- B. RP/0/RSP0/CPU0:R1(config)#int gigabitEthernet 0/6/0/0 layer2
- C. RP/0/RSP0/CPU0:R1(config)#int gigabitEthernet 0/6/0/0 switchport
- D. RP/0/RSP0/CPU0:R1(config)#int gigabitEthernet 0/6/0/0 xconnect

**Answer: A**

**Explanation:**

### Configuring Layer 2 Protocol Tunneling: Example

This section includes configuration examples for L2PT in the forward and reverse modes.

#### Configuring L2PT in forward mode

The following example shows how to configure L2PT in the forward mode:

At the customer facing router (encapsulation end):

```
!  
interface GigabitEthernet0/1/0/1  
    negotiation auto  
!  
interface GigabitEthernet0/1/0/1.1 l2transport  
    encapsulation default  
    l2protocol cpsv tunnel  
!  
interface GigabitEthernet0/1/0/2  
    negotiation auto  
!  
interface GigabitEthernet0/1/0/2.1 l2transport  
    encapsulation default  
!  
l2vpn  
    xconnect group examples  
        p2p rl-connect  
            interface GigabitEthernet0/1/0/1.1  
            interface GigabitEthernet0/1/0/2.1  
        !  
    !  
!
```

#### NEW QUESTION 57

When implementing MPLS Layer 3 VPN services, which CE-PE routing method does not require the use of the redistribute command to enable the customer routes to be advertised through the MPLS cloud between the customer sites?

- A. EIGRP
- B. OSPF
- C. IS-IS
- D. BGP
- E. static routing
- F. OSPF or IS-IS

**Answer:** D

#### NEW QUESTION 58

With Layer 3 MPLS VPN implementations on Cisco IOS XR PE routers, an interface is assigned to a VRF using the vrf command in which configuration mode?

- A. RP/0/RP0/CPU0:PE{config-vrf}#
- B. RP/0/RP0/CPU0:PE{config-if}#
- C. RP/0/RP0/CPU0:PE{config-bgp}#
- D. RP/0/RP0/CPU0:PE{config-bgp-af}#

**Answer:** B

**Explanation:**



	Command or Action	Purpose
Step 1	<code>configure</code>  Example: RP/0/RP0/CPU0:router# configure	Enters global configuration mode.
Step 2	<code>interface type instance</code>  Example: RP/0/RP0/CPU0:router (config)# interface pos 0/3/0/0	Enters interface configuration mode.
Step 3	<code>vrf vrf-name</code>  Example: RP/0/RP0/CPU0:router (config-if)# vrf vrf_A	Configures a VRF instance and enters VRF configuration mode.
Step 4	<code>ipv4 address ipv4-address mask</code>  Example: RP/0/RP0/CPU0:router (config-if)# ipv4 address 192.168.1.27 255.255.255.0	Configures a primary IPv4 address for the specified interface.
Step 5	<code>end</code> or <code>commit</code>  Example: RP/0/RP0/CPU0:router (config-if)# end or RP/0/RP0/CPU0:router (config-if)# commit	Saves configuration changes.  <ul style="list-style-type: none"> <li>When you issue the <b>end</b> command, the system prompts you to commit changes: Uncommitted changes found, commit them before exiting (yes/no/cancel)? [cancel]:  <ul style="list-style-type: none"> <li>Entering <b>yes</b> saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode.</li> <li>Entering <b>no</b> exits the configuration session and returns the router to EXEC mode without committing the configuration changes.</li> <li>Entering <b>cancel</b> leaves the router in the current configuration session without exiting or committing the configuration changes.</li> </ul> </li> <li>Use the <b>commit</b> command to save the configuration changes to the running configuration file and remain within the configuration session.</li> </ul>

#### NEW QUESTION 61

What is required on a Cisco IOS XR router to assign an interface to a VRF?

- A. Assign the VRF to the interface, and then re-enable Cisco Express Forwarding on the interface.
- B. Assign the VRF to the interface, and then reset the CE-to-PE routing protocol process.
- C. Shut the interface, assign the VRF to the interface, and then no shut the interface.
- D. Remove the IP address configuration on the interface, assign the VRF to the interface, and then reconfigure the IP address on the interface.

**Answer:** D

**Explanation:** [http://www.cisco.com/en/US/docs/ios\\_xr\\_sw/iosxr\\_r3.5/mps/configuration/guide/gc35v3.html#wp1080845](http://www.cisco.com/en/US/docs/ios_xr_sw/iosxr_r3.5/mps/configuration/guide/gc35v3.html#wp1080845)

#### Configuring VRF Interfaces on PE Routers for Each VPN Customer

Perform this task to associate a VPN routing and forwarding (VRF) instance with an interface or a subinterface on the PE routers.



**Note** You must remove IPv4/IPv6 addresses from an interface prior to assigning, removing, or changing an interface's VRF. If this is not done in advance, any attempt to change the VRF on an IP interface is rejected.

#### NEW QUESTION 66

When implementing VPLS on Cisco IOS XR routers, the VPLS PW neighbors can be statically defined under which configuration mode?

- A. bridge group
- B. bridge-domain
- C. vfi
- D. mpls ldp
- E. l2transport

**Answer:** C

**Explanation:**



### Restrictions for Implementing Virtual Private LAN Services on Cisco IOS XR Software

The following restrictions are listed for implementing VPLS:

- All attachment circuits in a bridge domain on an Engine 3 line card must be the same type (for example, port, dot1q, qinq, or qinany), value (VLAN ID), and EtherType (for example, 0x8100, 0x9100, or 0x9200). The Cisco CRS-1 router supports multiple types of attachment circuits in a bridge domain.
- The Engine 3 line cards, cannot simultaneously have attachment circuits and MPLS-enabled on any one of its interfaces. The line card cannot be Edge-facing and Core-facing at the same time. Line cards on the Cisco CRS-1 router can be Edge-facing and Core-facing at the same time.
- The line card requires ternary content addressable memory (TCAM) Carving configuration. The Cisco CRS-1 router however, does not require the TCAM Carving configuration.
- Virtual Forwarding Instance (VFI) names have to be unique, because a bridge domain can have only one VFI.
- On the Cisco CRS-1 router, a VPLS pseudowire (PW) can be configured only under VFI.
- The Cisco CRS-1 router does not support VPLS with TE core tunnels.
- A PW cannot belong to both a peer-to-peer (P2P) cross-connect group and a VPLS bridge-domain. This means that the neighboring IP address and the pseudowire ID have to be unique on the router, because the pseudowire ID is signaled to the remote provider edge.
- You cannot manually set up a PW on one PE and use auto-discovery on the other PE to configure the same PW in the other direction. The auto-discovery feature is supported only on the Cisco XR 12000 Series Router.

### NEW QUESTION 71

On Cisco IOS XR platforms using the EVC infrastructure, which command is used to enable a Layer 2 VPN subinterface?

- A. interface gi0/0/0/0.10 switchport access vlan 10
- B. interface gi0/0/0/0.10 switchport mode tunnel dot1q-tunnel
- C. interface gi0/0/0/0.10 switchport mode trunk
- D. interface gi0/0/0/0.10 bridge-group 10
- E. interface gi0/0/0/0.10 l2transport

**Answer: E**

**Explanation:**

	Command or Action	Purpose
<b>Step 1</b>	<code>configure</code>  <b>Example:</b> RP/0/RP0/CPU0:router# configure	Enters global configuration mode.
<b>Step 2</b>	<code>interface type interface-id</code>  <b>Example:</b> RP/0/RP0/CPU0:router (config)# interface GigabitEthernet 0/0/0/0	Enters interface configuration mode and configures an interface.
<b>Step 3</b>	<code>l2transport</code>  <b>Example:</b> RP/0/RP0/CPU0:router (config-if)# l2transport	Enables L2 transport on the selected interface.
<b>Step 4</b>	<code>exit</code>  <b>Example:</b> RP/0/RP0/CPU0:router (config-if-l2)# exit	Exits the current configuration mode.
<b>Step 5</b>	<code>interface type interface-id</code>  <b>Example:</b> RP/0/RP0/CPU0:router (config)# interface GigabitEthernet0/0/0/0	Enters interface configuration mode and configures an interface.
<b>Step 6</b>	<code>dot1q native vlan vlan ID</code>  <b>Example:</b> RP/0/RP0/CPU0:router (config-if)# dot1q vlan 1	Assigns the native VLAN ID of a physical interface trunking 802.1Q VLAN traffic.
<b>Step 7</b>	<code>end</code> or <code>commit</code>  <b>Example:</b> RP/0/RP0/CPU0:router (config-if)# end or RP/0/RP0/CPU0:router (config-if)# commit	Saves configuration changes.  <ul style="list-style-type: none"> <li>• When you issue the <code>end</code> command, the system prompts you to commit changes:  Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:   <ul style="list-style-type: none"> <li>– Entering <b>yes</b> saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode.</li> <li>– Entering <b>no</b> exits the configuration session and returns the router to EXEC mode without committing the configuration changes.</li> <li>– Entering <b>cancel</b> leaves the router in the current configuration session without exiting or committing the configuration changes.</li> </ul> </li> <li>• Use the <code>commit</code> command to save the configuration changes to</li> </ul>

## NEW QUESTION 73

### DRAG DROP

Drag the standard on the left to match the correct description on the right.	
802.1ag	QinQ
802.1ad	PBB (also known as MAC-in-MAC)
802.1ah	Connectivity Fault Management

### Answer:

#### Explanation: Benefits of IEEE 802.1ah standard

The benefits of IEEE 802.1ah provider backbone bridges are as follows:

- Increased service instance scalability
- MAC address scalability

#### IEEE 802.1ah Standard for Provider Backbone Bridging Overview

The IEEE 802.1ah Provider Backbone Bridge feature encapsulates or decapsulates end user traffic on a Backbone Edge Bridge {BEB} at the edge of the Provider Backbone Bridged Network {PBBN}. A Backbone Core Bridge {BCB} based network provides internal transport of the IEEE 802.1ah encapsulated frames within the PBBN.

Overview of OAM The advent of Ethernet as a metropolitan and wide-area networking technology has accelerated the need for a new set of OAM protocols.

Service provider networks are large and complex with a wide user base, and they often involve different operators that must work together to provide end-to-end services to enterprise customers. While enterprise end-customer demands continue to increase, so do the requirements for service provider Ethernet networks, particularly in the areas of availability and mean time to repair {MTTR}. Ethernet OAM addresses these challenges and more, thereby directly impacting the competitiveness of the service provider. Ethernet has been used as a LAN technology for many years, and enterprises have managed these networks effectively, primarily with the use of Internet protocols such as Simple Network Management Protocol {SNMP}, ICMP Echo {or IP Ping}, IP Traceroute, and Cisco

Unidirectional Link Detection Protocol {UDLD} and Layer 2 Traceroute

{supported in Cisco Catalyst® OS and some Cisco IOS® Software-based platforms}. In addition to these troubleshooting protocols, Cisco provides a wealth of other configuration, fault, network management, and performance management tools. Cisco also supports MPLS OAM capabilities such as Virtual Circuit Connectivity Verification {VCCV} and Label Switched Path {LSP} ping on the Carrier Ethernet platforms. To complement these OAM capabilities and to ensure that Ethernet can deliver the required customer service-level agreements {SLAs}, Cisco has developed comprehensive Ethernet and IP SLA agents, along with an embedded event manager {EEM}, and IPTV video quality tools for automated measurement and troubleshooting of Carrier Ethernet deployments.

Ethernet OAM addresses the following challenges:

- The existing protocols mentioned earlier will not work unless the Ethernet layer is operating properly, making Ethernet OAM a prerequisite.
- Many service providers do not want to overlay an IP infrastructure simply for management and troubleshooting of Layer 2 Ethernet services.
- The current management protocols lack the per-customer or per-service granularity that is required to manage the individual Layer 2 Ethernet services provided to enterprises.
- The existing protocols do not assist with provisioning of Ethernet services, which is particularly difficult when the service provider and end customer must coordinate the configurations on their respective Ethernet equipment. Ethernet OAM is a broad topic, but this paper will focus on three main areas of Ethernet OAM that are most in need by service providers and are rapidly evolving in the standards bodies: Service Layer OAM {IEEE 802.1ag Connectivity Fault Management}, Link Layer OAM {IEEE 802.3ah OAM}, and Ethernet Local Management

Interface {MEF-16 E-LMI}. Each of these different OAM protocols has unique objectives and is complementary to the others IEEE 802.1ad[[note 1](#)] is an Ethernet networking standard informally known as IEEE 802.1QinQ and is an amendment to IEEE standard IEEE 802.1Q-1998. The technique is also known as provider bridging, Stacked VLANs or simply QinQ or Q-in-Q.

The original 802.1Q specification allows a single VLAN header to be inserted into an Ethernet frame. QinQ allows multiple VLAN headers to be inserted into a single frame, an essential capability for implementing Metro Ethernet network topologies. Just as QinQ extends 802.1Q, QinQ itself is extended by other Metro Ethernet protocols.[specify] In a multiple VLAN header context, out of convenience the term "VLAN tag" or just "tag" for short is often used in place of "802.1Q VLAN header". QinQ allows multiple VLAN tags in an Ethernet frame; together these tags constitute

a tag stack. When used in the context of an Ethernet frame, a QinQ frame is a frame that has 2 VLAN 802.1Q headers {double-tagged}.

There is a mild confusion regarding the naming because the 802.1ad standard was grown out of the 802.1QinQ protocol {which was developed based the trademarked method 802.1Q, with capital "Q" as a distinction instead of the 802.1q as the standardised protocol} which originally used 0x9100 as ethernet type instead of 0x88a8. While the network industry usually mix the naming the proper, standardised name is 802.1ad which sometimes gets appended by the other alternative names mentioned above; the plain "802.1QinQ" name usually refers to the old standard which is now considered obsolete

## NEW QUESTION 74

### DRAG DROP

Match the LAN type on the left to the correct MEF service type on the right.	
point-to-point	E-Tree
multipoint-to-multipoint	E-Line
rooted multipoint	E-LAN

### Answer:

**Explanation:** Business subscribers are an important segment of many service providers' customer base. The main business services that must be provided by the network today are:

- MPLS VPN
- Carrier Ethernet connectivity
- Managed services

Carrier Ethernet connectivity services have been defined by the Metro Ethernet Forum {MEF} to include ELine, E-LAN, and E-Tree service types, which are defined as follows:



- E-Line is based on a point-to-point Ethernet Virtual Connection. Two E-Line services are defined:
  - Ethernet Private Line {EPL}: A very simple and basic point-to-point service characterized by low frame delay, frame delay variation, and frame loss ratio. No service multiplexing is allowed, and other than a committed information rate {CIR} no class of service {CoS} {Bandwidth Profiling} is allowed.
  - Ethernet Virtual Private Line {EVPL}: A point-to-point service wherein service multiplexing {more than one Ethernet Virtual Connection} is allowed. The individual Ethernet Virtual Circuits can be defined with a rich set of Bandwidth Profiles and Layer 2 Control Protocol Processing methods as defined by the Metro Ethernet Forum.
- E-LAN is based on a multipoint-to-multipoint Ethernet Virtual Connection. Service multiplexing {more than one Ethernet Virtual Circuit at the same UNI} is permitted, as is the rich set of performance assurances defined by the MEF such as CIR with an associated Committed Burst Size {CBS} and Excess Information Rate {EIR}.
- E-Tree is a point-to-multipoint ELAN service in which the spoke "leaves" can communicate with the hub or "root" location but not with each other. Typical application for E-Tree is in franchise operations.

## NEW QUESTION 77

Refer the exhibit.

**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**

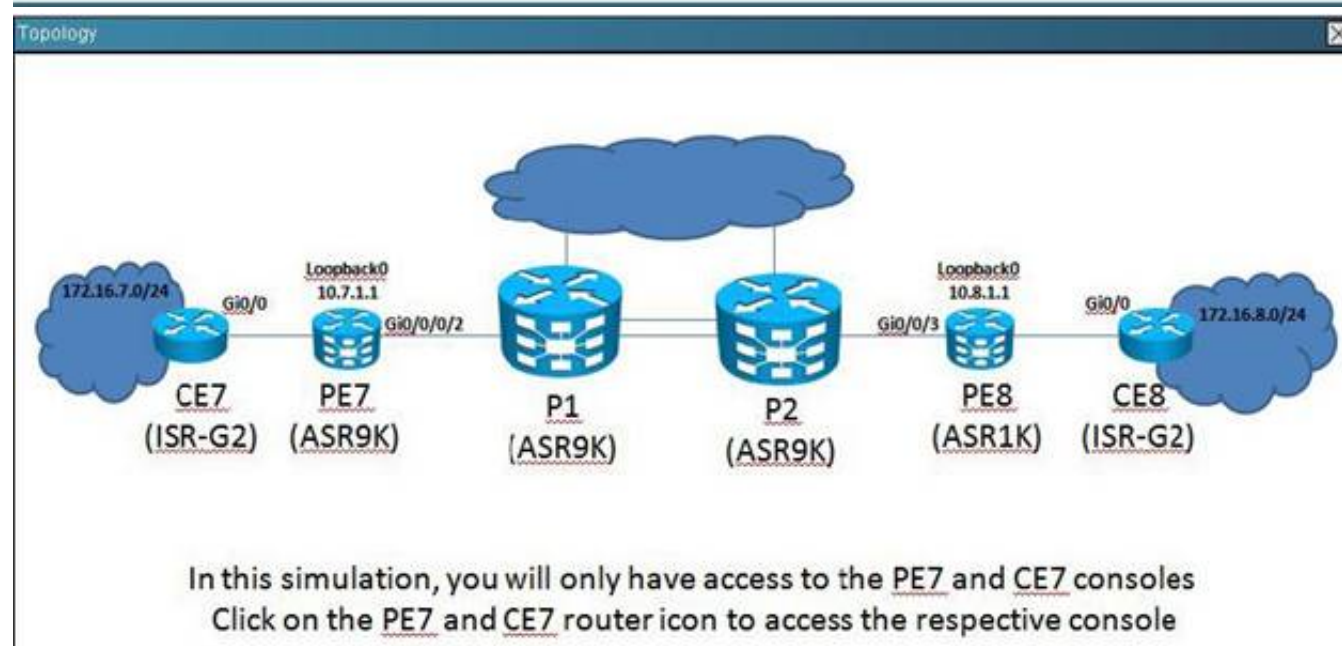
Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the CE7 and PE7 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.

The CE7 router is an ISR-G2 router and the PE7 router is an ASR9K router.

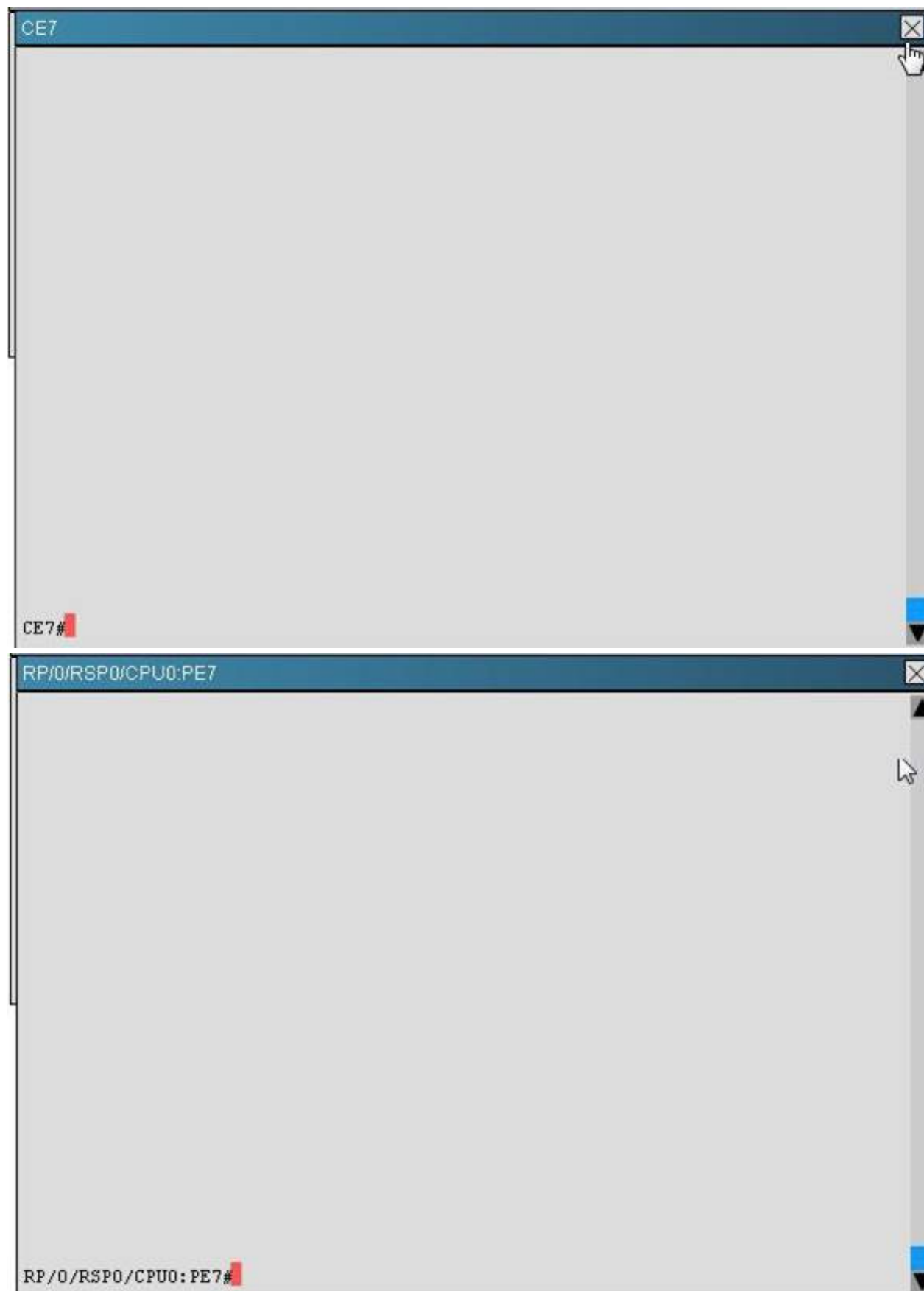
OSPF is the IGP running between all the PE and P routers and LDP is also running between all the PE and P routers.

The questions in this simulation are regarding the MPLS layer 3 VPN configurations on the PE routers where CE7

Scenario	Instructions	Topology	CE7	RP/0/RSP0/CPU0:PE7	Questions
----------	--------------	----------	-----	--------------------	-----------







On PE7, which interface connects to the CE7 and what is the name of the VRF that interface is associated to? {Choose two.}

- A. Gi0/0/0/0
- B. Gi0/0/0/1
- C. Gi0/0/0/2
- D. Customer\_1
- E. Customer\_A
- F. Customer\_CE7

**Answer:** BC

**Explanation:** # show ip vrf interfaces

#### NEW QUESTION 81

Refer the exhibit.

### 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 CE7 and PE7 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.

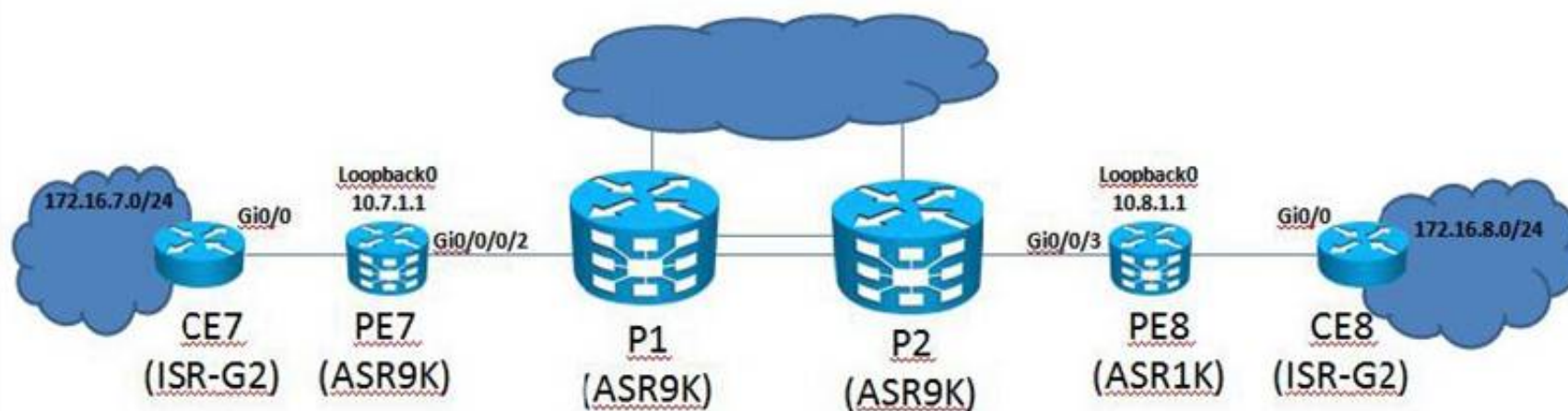
The CE7 router is an ISR-G2 router and the PE7 router is an ASR9K router.

OSPF is the IGP running between all the PE and P routers and LDP is also running between all the PE and P routers.

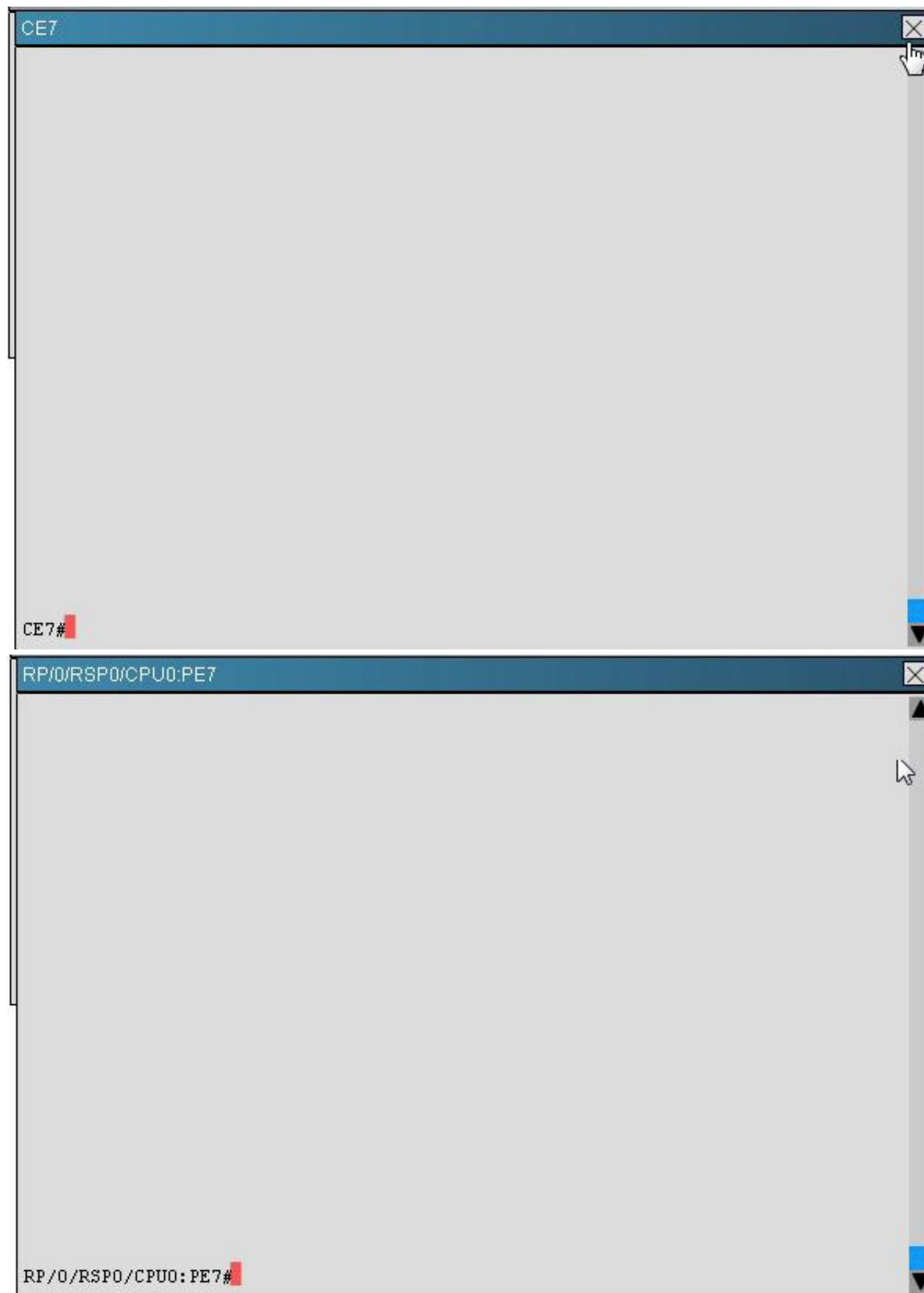
The questions in this simulation are regarding the MPLS layer 3 VPN configurations on the PE routers where CE7

Scenario	Instructions	Topology	CE7	RP/0/RSP0/CPU0:PE7	Questions
----------	--------------	----------	-----	--------------------	-----------

### Topology



In this simulation, you will only have access to the PE7 and CE7 consoles  
Click on the PE7 and CE7 router icon to access the respective console



What type of routing is used between CE7 and PE7?

- A. OSPF
- B. BGP
- C. is-is
- D. RIPv2
- E. Static routing

**Answer:** E

**Explanation:** # show ip route

**NEW QUESTION 84**

Refer the exhibit.



### 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 CE7 and PE7 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.

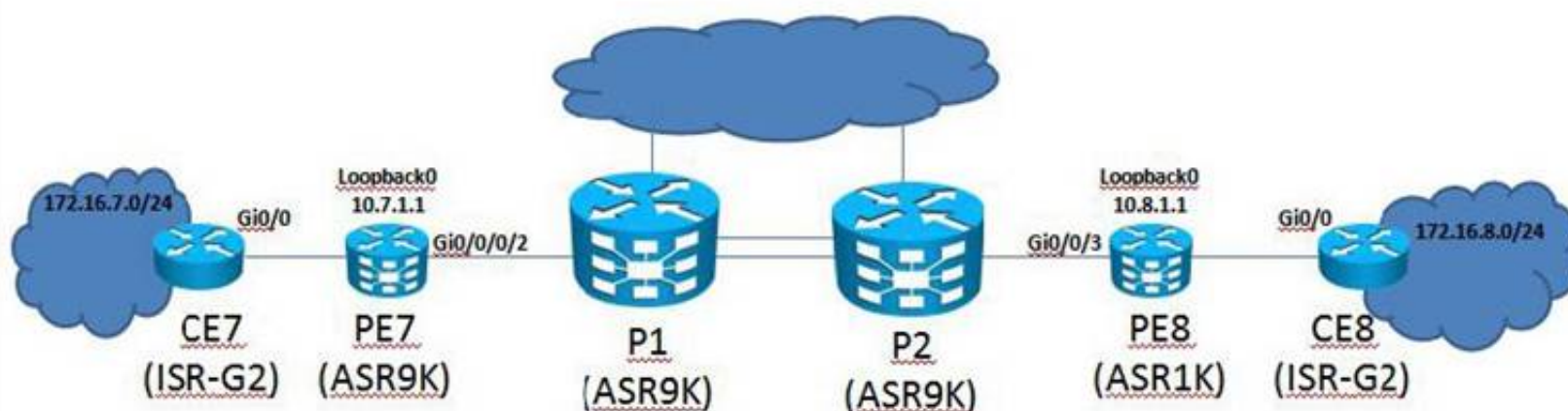
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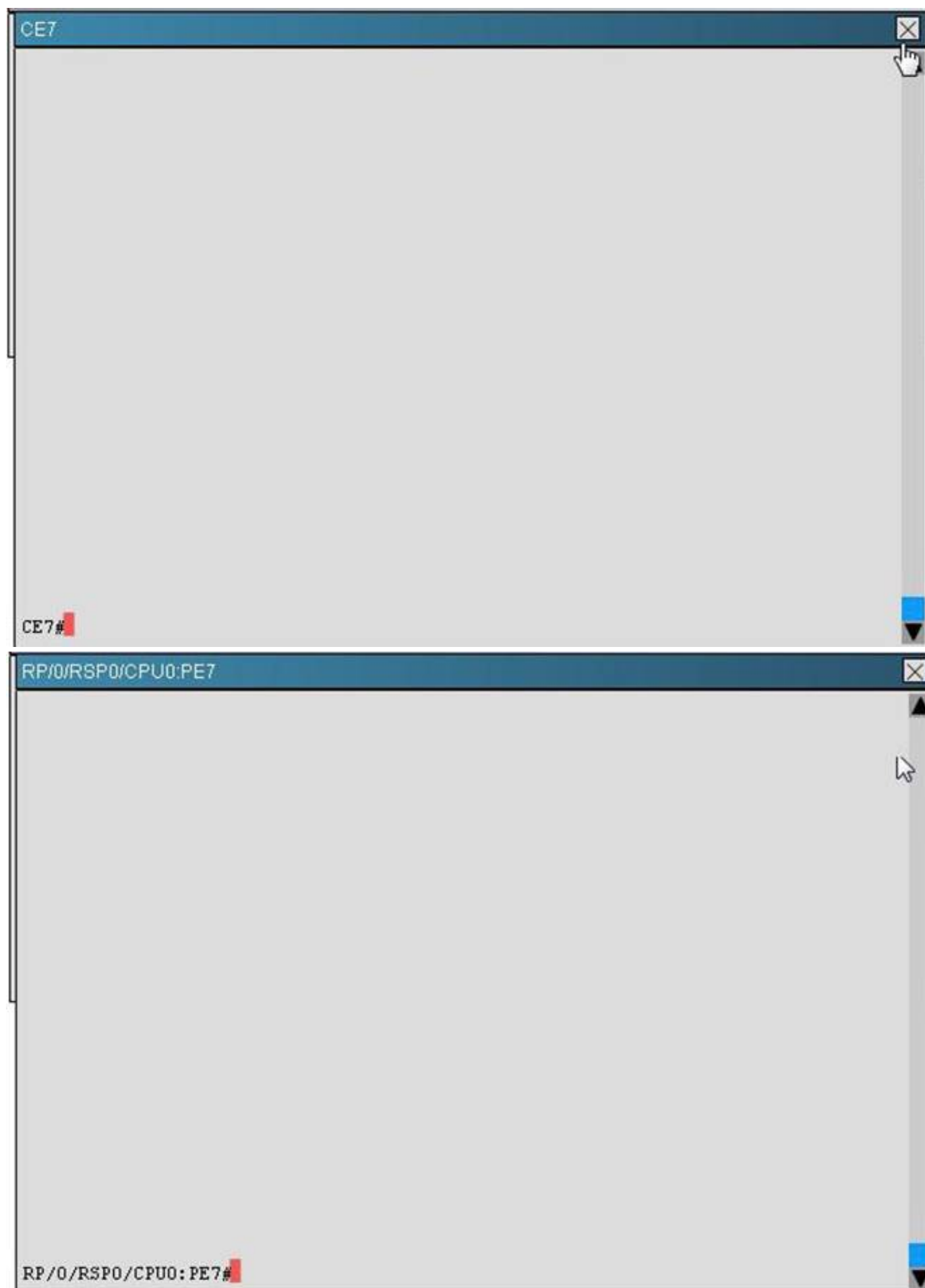
The questions in this simulation are regarding the MPLS layer 3 VPN configurations on the PE routers where CE7

Scenario	Instructions	Topology	CE7	RP/0/RSP0/CPU0:PE7	Questions
----------	--------------	----------	-----	--------------------	-----------

### Topology



In this simulation, you will only have access to the PE7 and CE7 consoles  
Click on the PE7 and CE7 router icon to access the respective console



On PE7, which three statements are correct regarding the MPLS VPN configurations used to support the connectivity between the CE7 and CE8 sites? {Choose three.}

- A. The RD is 1:1
- B. The import and export RTs are 1:1
- C. Interface Gi0/0/0/0 is associated to the "default" VRF
- D. The network that connects PE7to CE7 is redistributed into multiprotocol IBGP
- E. The multiprotocol IBGP routes learned have a BGP origin code of "i"

**Answer:** BCE

**Explanation:** # show ip route show ip vrf  
show ip vrf detail

#### NEW QUESTION 86

Refer the exhibit.

### 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.

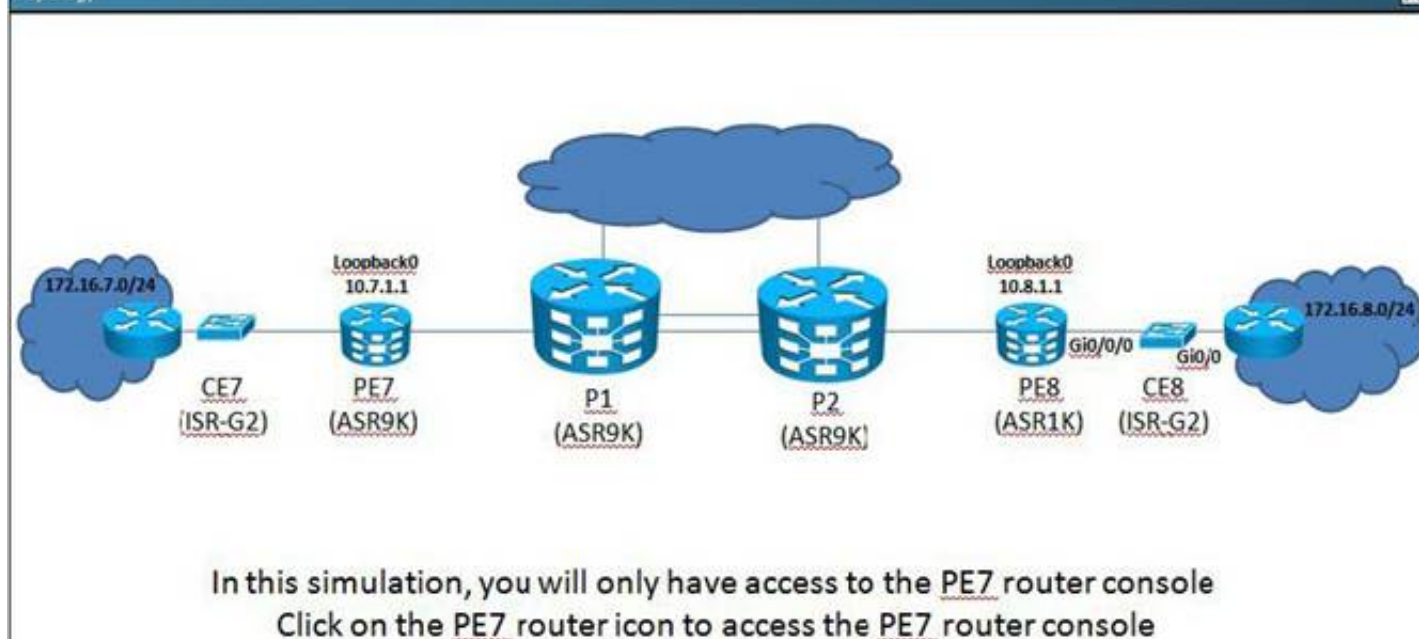
All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.

### Scenario

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

The PE7 router is an ASR9K router.

### Topology



RP/0/RSP0/CPU0:PE7

Which statement is correct regarding the pseudowire on connects PE7 to the 10.8.1.1 neighbor?

- A. The control word is enabled on both ends of the pseudowire
- B. The MTU size is 1500 bytes on both ends of the pseudowire
- C. Pseudowire backup is enabled
- D. The pseudowire is in the down state

**Answer:** B

**Explanation:**



show xconnect all  
show ip interface brief  
show mpls l2transport vc  
show cable l2-vpn xconnect mpls-vc-map

#### NEW QUESTION 89

Which VPN technology allows remote sites with dynamic IP addresses to connect to a central hub?

- A. static IPsec tunnels
- B. site-to-site VPN
- C. DMVPN
- D. VRFs

**Answer: C**

#### NEW QUESTION 94

What is the purpose of the route distinguisher in a service provider network?

- A. to identify which prefixes should be imported
- B. to identify customer local prefixes
- C. to identify customer global prefixes
- D. to identify which prefixes should be exported from BGP

**Answer: C**

#### NEW QUESTION 99

When is it appropriate to activate the VPNv6 address family?

- A. when implementing 6PE
- B. when running dual stack at the provider edge
- C. when implementing 6to4 tunneling
- D. when implementing 6VPE

**Answer: D**

#### NEW QUESTION 100

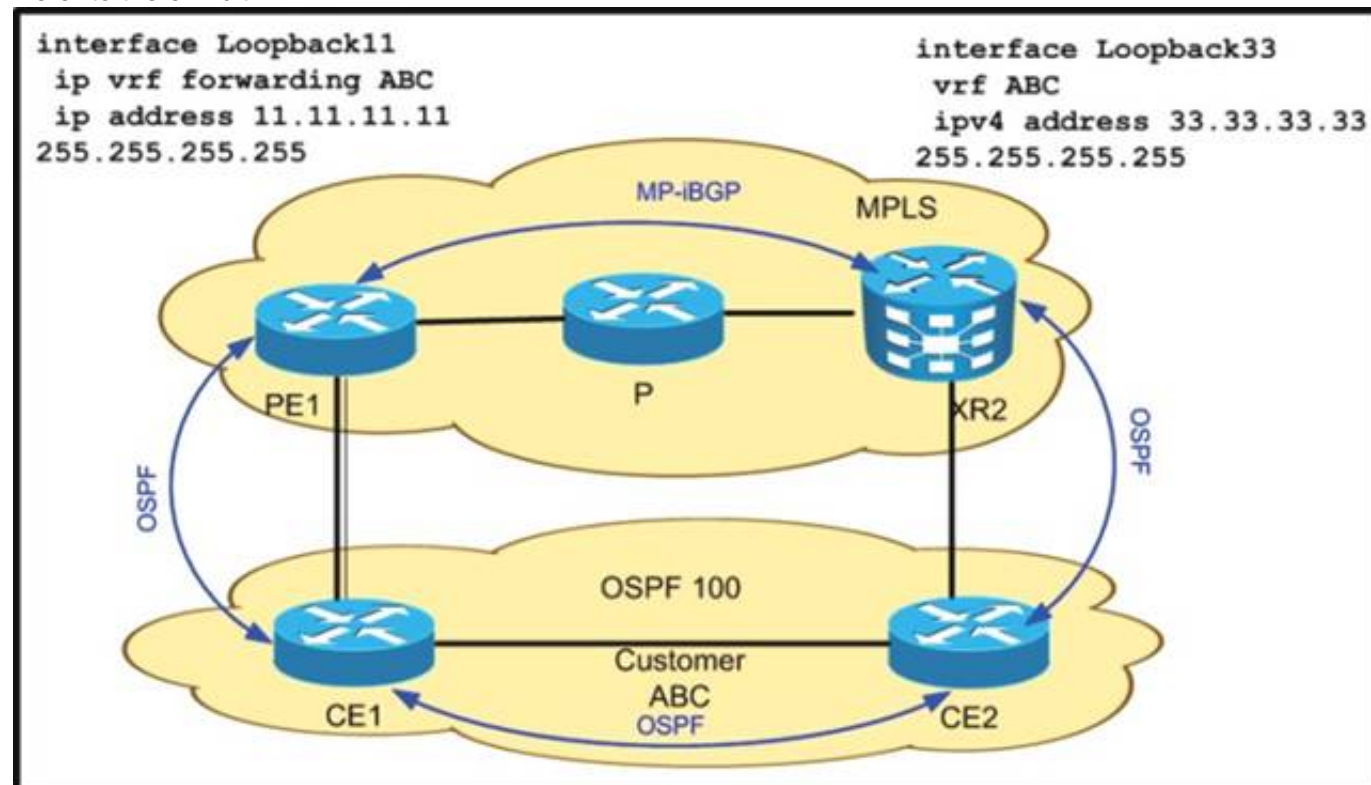
A Cisco IOS XR router is acting as a PE and is running EIGRP as the CE-PE routing protocol. SOO must be configured. Under which subconfiguration mode should SOO be configured?

- A. RP/0/0/CPU0:XR1{config-eigrp}
- B. RP/0/0/CPU0:XR1{config-eigrp-vrf-af-if}
- C. RP/0/0/CPU0:XR1{config-eigrp-vrf}
- D. RP/0/0/CPU0:XR1{config-eigrp-vrf-af}

**Answer: B**

#### NEW QUESTION 102

Refer to the exhibit.



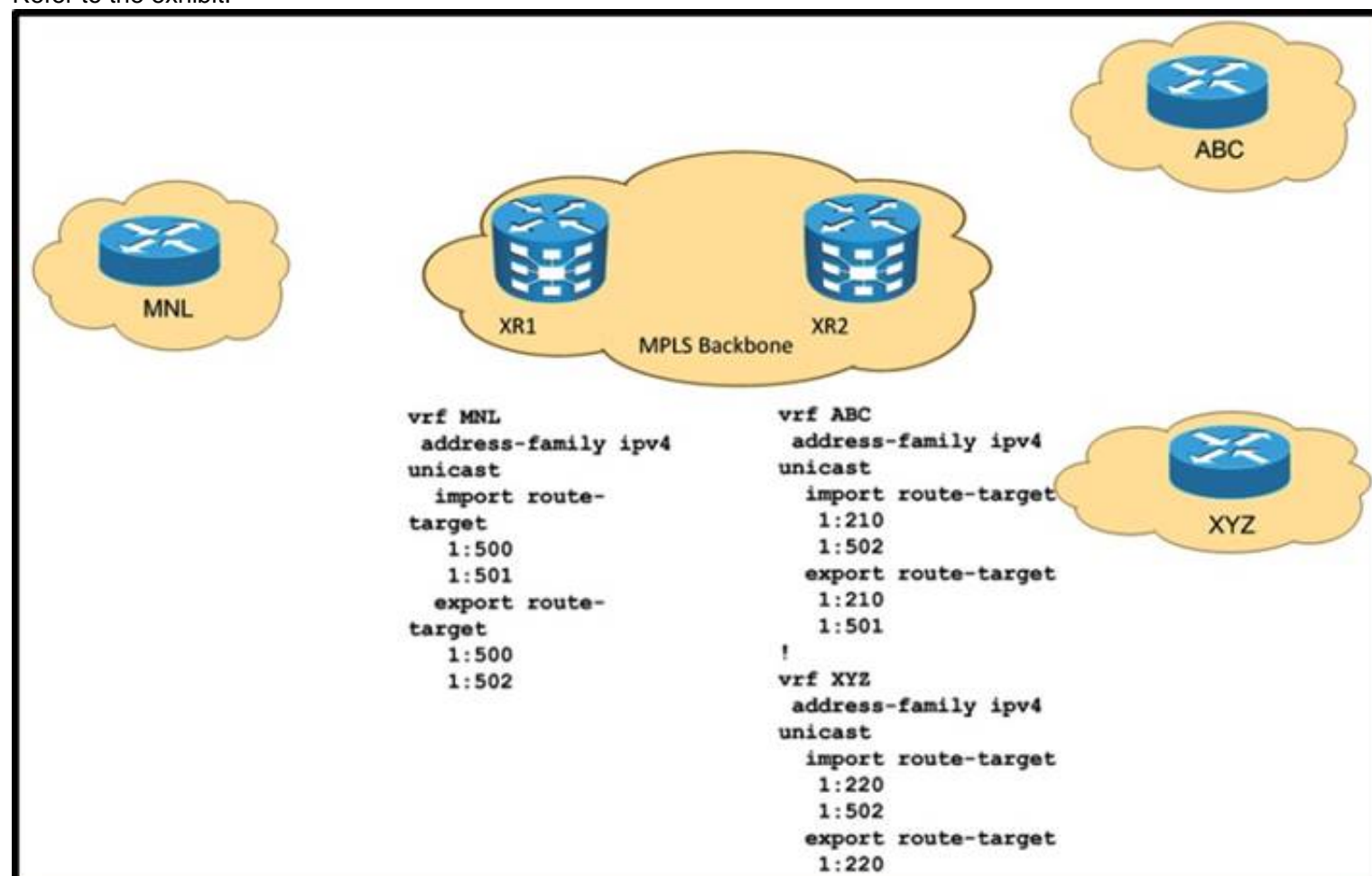
XR2 must be configured with OSPF sham-link to PE1. Which configuration achieves this goal?

- A. router ospf 100 area 0 sham-link 11.11.11.11 33.33.33.33
- B. router ospf 100vrf ABC area 0 sham-link 33.33.33.33 11.11.11.11
- C. router ospf 100area 0 sham-link 33.33.33.33 11.11.11.11
- D. router ospf 100 vrf ABCarea 0 sham-link 11.11.11.11 33.33.33.33

Answer: B

#### NEW QUESTION 106

Refer to the exhibit.



Which two descriptions outline the traffic flow among the three sites? {Choose two.}

- A. The MNL site communicates with the XYZ and ABC sites.
- B. The XYZ and ABC sites communicate using the default route that points to the MNL site.
- C. XYZ sees the MNL and ABC routes.
- D. ABC sees the MNL and XYZ routes.
- E. The MNL site acts as a central site for the ABC and XYZ sites.

Answer: AE

#### NEW QUESTION 107

Which three possible misconfigurations can occur on the backbone IGP section of an MPLS Layer 3 VPN setup? {Choose three.}

- A. configuring the LDP router ID with an incorrect loopback interface
- B. configuring the wrong AS number on a client eBGP peering
- C. configuring the wrong area number on a PE-CE OSPF link
- D. decreasing the MPLS MTU
- E. disabling MPLS on a core link
- F. disabling MPLS LDP sync in the IGP routing process

Answer: ADE

#### NEW QUESTION 112

A customer has two sites over an MPLS cloud with Ethernet connections and requires one STP domain to be transparent over the MPLS provider. Which label-switching technology can the provider use without getting involved in learning the customer MAC addresses?

- A. L2TPV3
- B. EoMPLS
- C. VPLS
- D. H-VPLS

Answer: B

#### NEW QUESTION 115

Which three commands represent valid QoS classifiers of traffic in case of an EoMPLS circuit? {Choose three.}

- A. match cos
- B. match mpls experimental
- C. match qos-group
- D. match fr-de
- E. match protocol
- F. match ip address prefix-list
- G. match tag

Answer: ABC



**NEW QUESTION 118**

Which organization provides and promotes a standards-based description of service provider services offering?

- A. MEF
- B. IETF
- C. IEEE
- D. ITU

**Answer:** A

**NEW QUESTION 121**

An engineer is configuring VPLS BGP-based autodiscovery on a Cisco IOS XE PE router. Which two configurations must be included for proper implementation? {Choose two.}

- A. router bgp 61000neighbor 172.16.10.2 remote-as 61000
- B. router bgp 61000address-family l2vpn vpls send-community extended
- C. router bgp 61000neighbor 172.16.10.2 remote-as 62000
- D. router bgp 61000address-family l2vpn vpls send-community-eBGP
- E. l2vpn vfi context vpls1 autodiscovery bgp signaling ldp router bgp 61000neighbor 172.16.10.2 remote-as 62000
- F. l2vpn vfi context vpls1 autodiscovery bgp signaling ldp router bgp 61000neighbor 172.16.10.2 remote-as 61000

**Answer:** AB

**NEW QUESTION 122**

A presale engineer is asked to advise about the various MPLS VPN designs to best fit the customer requirements. Which two MPLS L2VPN features should be highlighted as advantages over a MPLS L3VPN? {Choose two.}

- A. An MPLS L2VPN design is a more appropriate solution for disaster recovery and data backup.
- B. An MPLS L2VPN is a more redundant design compared to a MPLS L3VPN solution.
- C. An MPLS L2VPN design does not require routing interaction with the service provider network.
- D. An MPLS L2VPN design virtually extends the broadcast domain boundary allowing for the customer IGP to fully interoperate between remote sites.
- E. An MPLS L2VPN design does not require monitoring, which provides a significant cost-saving solution.

**Answer:** CD

**NEW QUESTION 127**

A network engineer working for a very large financial institution must migrate the legacy Frame Relay and ATM virtual circuits over a MPLS VPN solution. Which option is a benefit in choosing a MPLS Layer 3 VPN versus any other Layer 2 VPN design?

- A. An MPLS Layer 3 VPN design offers better scalability for large organizations.
- B. An MPLS Layer 3 VPN design requires less customer edge router configuration than any other Layer 2 VPN implementation.
- C. An MPLS Layer 3 VPN solution provides the possibility to implement overlapping IP addressing.
- D. An MPLS Layer 3 VPN design requires less provider edge router configuration than any other Layer 2 VPN implementation.

**Answer:** A

**NEW QUESTION 131**

Which Layer 2 encapsulations can AToM solution support with interworking IP feature enable?

- A. Ethernet to ATM AAL5
- B. ATM AAL5 to Frame Relay
- C. PPP to Frame Relay
- D. multipoint PPP to Frame Relay

**Answer:** A

**NEW QUESTION 135**

A service provider is tasked to write up a template for the network operations center to set up a Layer 2 VPN. Which command is the first command to issue on a Cisco IOS XR router?

- A. xconnect peer\_ip vc\_id encapsulation encapsulation\_type
- B. connect name\_pw interface\_path\_id dlci\_value l2transport
- C. l2vpn
- D. pseudowire-class class\_name

**Answer:** C

**NEW QUESTION 136**

A network engineer is troubleshooting an MPLS Layer 3 VPN and discovers that routes are being learned by CE routers, but there is no IP connectivity. Which option is the most likely cause?

- A. The provider does not have an end-to-end label switch path.
- B. The customer does not have an end-to-end label switch path.
- C. The customer is not sharing labels with the provider.
- D. The provider is not sharing labels with the customer.
- E. The providers PE to CE routing protocol is misconfigured.
- F. The customers PE to CE routing protocol is misconfigured.

**Answer:** A

**NEW QUESTION 140**

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