

**400-201**

Number: 400-201  
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**400-201**

**CCIE Service Provider Written Exam**

**Version 5.0**

## Exam A

### QUESTION 1

A service provider is implementing Ethernet solutions for clients that are not being provisioned within the MPLS core network. Which solution allows the Service Provider to complete Ethernet circuit provisioning in this scenario?

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

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

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:

- Simplifies deployment of VPNs.
- Does not require Multiprotocol Label Switching (MPLS) virtual private network (VPN).
- Supports Layer 2 tunneling over IP for any payload.
- Supports data encapsulation directly over IP (IP protocol number 115), not using User Datagram Protocol (UDP)
- Supports point-to-point sessions, not point-to-multipoint or multipoint-to-point sessions
- Supports sessions between the same Layer 2 protocols, for example Frame Relay-to-Frame Relay or ATM-to-ATM.

### QUESTION 2

Which is the main characteristic of LTE architecture comparing to other mobile architectures?

- A. Provides supports to deploy Layer 3 MPLS VPN model, where other mobile architectures do not support.
- B. Offers node redundancy with the static route configured on the IP NodeB using the HSRP/VRRP virtual ip address.
- C. Provides a simpler, less hierarchical model with the capability of simplistically distributing the core gateways.
- D. Introduces a hierarchical model with connection-oriented service requirements and one-to-one relationships.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

<https://books.google.co.in/books?id=-fyjBAAQBAJ&pg=PA50&lpg=PA50&dq=LTE+Provides+a+simpler+less+hierarchical+model+with+the+capability>

+of+simply+the+core+gateways.&source=bl&ots=Bwpk3CQ\_jN&sig=2-kgrCA\_7hEX3kuvSxWV2AnAS0&hl=en&sa=X&ved=0CB0Q6AEwAGoVChMI\_5La8tbCxlVgZ6OCh1N7gHa#v=onepage&q=LTE%20Provides%20a%20simpler%20C%20less%20hierarchical%20model%20with%20the%20capability%20of%20simply%20distributing%20the%20core%20gateways.&f=false

### QUESTION 3

Refer to the exhibit.

```
ntp server 10.0.1.1
ntp server 10.0.2.1
ntp server 10.0.3.1
ntp server 10.0.4.1

interface Gigabit Ethernet0/0
 ip address 10.100.1.4.255.255.255.0
```

A service provider has multiple time sources in the environment for NTP. The time source at 10.0.4.1 is intended to be seen as a primary time source. What command can be issued on PE4 to fix the configuration, ensuring the proper NTP source will be issued?

A. ntp peer 10.0.4.1

- B. ntp peer 10.0.4.1 prefer
- C. ntp server 10.0.4.1 source GigabitEthernet0/0
- D. ntp server 10.0.4.1 prefer

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/5\\_x/nx-os/system\\_management/configuration/guide/sm\\_nx\\_os\\_cg/sm\\_3ntp.html#wp1106725](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/5_x/nx-os/system_management/configuration/guide/sm_nx_os_cg/sm_3ntp.html#wp1106725)

#### **QUESTION 4**

Which are the three benefits of using the Yang model? (Choose three.)

- A. Reduce lab footprint
- B. Improve access to resources
- C. Support interoperability that provides a standard way to model management data
- D. Support simplified network management applications
- E. Provide a scale virtual lab environment
- F. Support programmatic interfaces

**Correct Answer:** CDF

**Section:** (none)

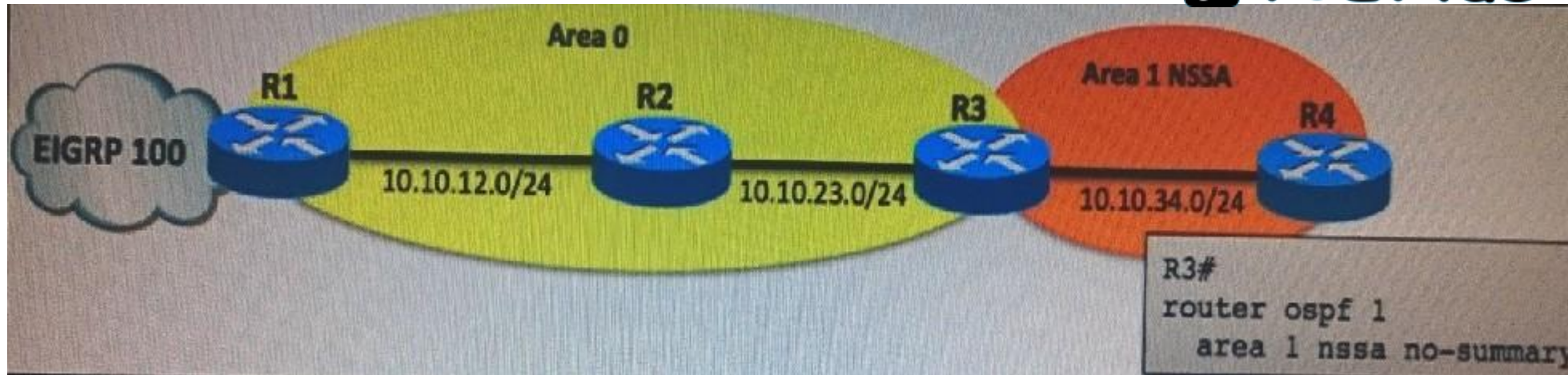
**Explanation**

**Explanation/Reference:**

<https://tools.ietf.org/html/rfc6020#page-11>

#### **QUESTION 5**

Refer to the exhibit. How will the redistributed routes on R1 from EIGRP into OSPF be installed in the R4 routing table?



- A. as a default route with an E2 route type
- B. as a default route with an IA route type
- C. as specific routes with an E2 route type
- D. as specific routes with an N2 route type
- E. as a default route with an N2 route type

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

<http://www.cisco.com/c/en/us/support/docs/ip/open-shortest-path-first-ospf/6208-nssa.html>

<http://www.cisco.com/image/gif/paws/6208/nssa.pdf>

#### QUESTION 6

Drag and drop the IOS XR NTP access group options on the left to the right from the least restrictive (top) to the most restrictive order (bottom).

**Select and Place:**

peer	1
query-only	2
serve	3
serve-only	4

**Correct Answer:**

	peer
	serve
	serve-only
	query-only

**Section: (none)**

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/c/en/us/td/docs/routers/crs/software/crs\\_r4-2/system\\_management/command/reference/b\\_sysman\\_cr42crs/b\\_sysman\\_cr42crs\\_chapter\\_01010.html](http://www.cisco.com/c/en/us/td/docs/routers/crs/software/crs_r4-2/system_management/command/reference/b_sysman_cr42crs/b_sysman_cr42crs_chapter_01010.html)

**QUESTION 7**

Which Cisco IOS XR Virtualization technology provides full isolation between virtualized routing instances for extra control plane resources?

- A. HVR
- B. SVR
- C. SDR
- D. DRP

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation :

[http://www.cisco.com/en/US/solutions/collateral/ns341/ns524/ns562/ns573/white\\_paper\\_c11-512753\\_ns573\\_Networking\\_Solutions\\_White\\_Paper.html](http://www.cisco.com/en/US/solutions/collateral/ns341/ns524/ns562/ns573/white_paper_c11-512753_ns573_Networking_Solutions_White_Paper.html)

**QUESTION 8****DRAG DROP**

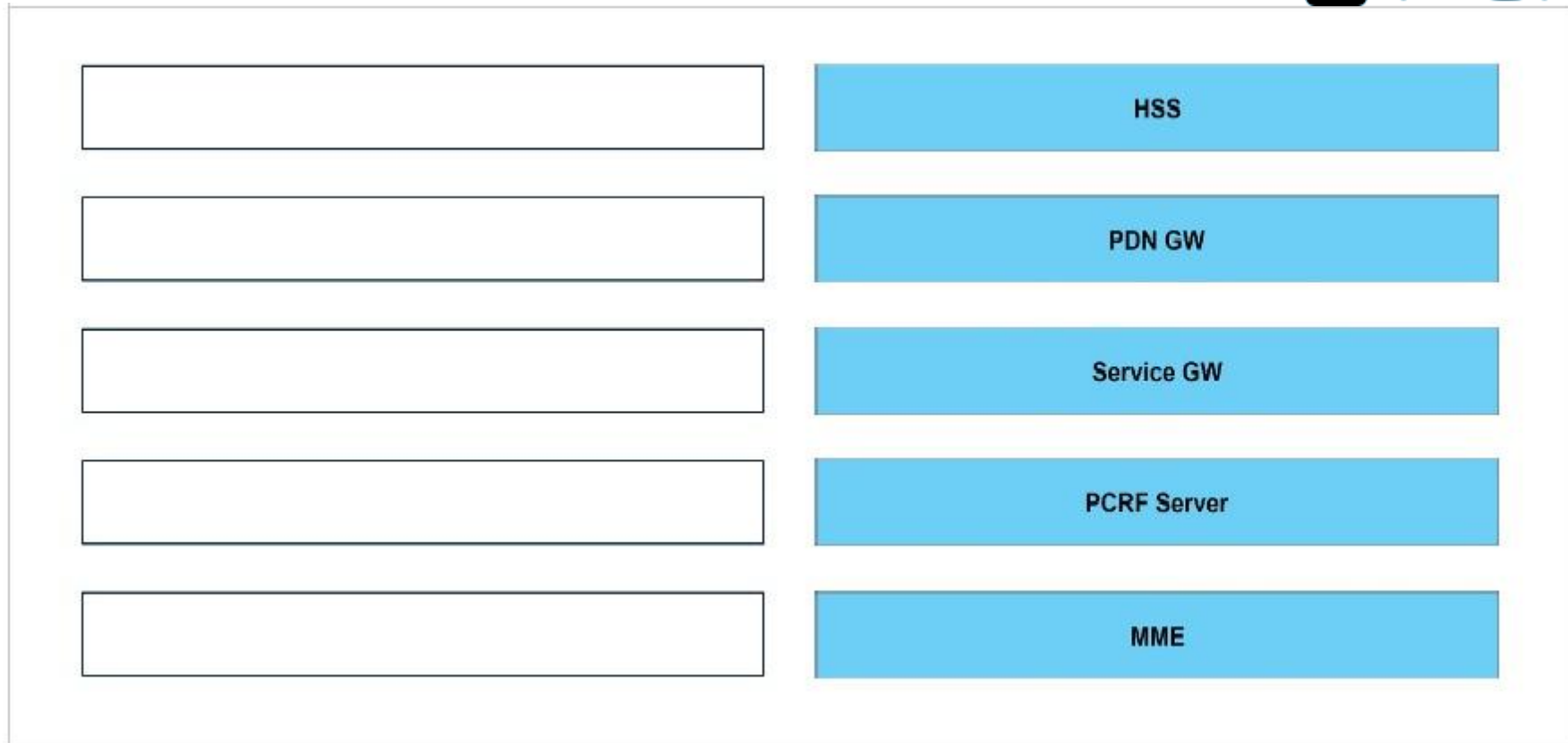
Drag and drop Evolved Packet Core functional entities on the left to the correct description on the right.

Select and Place:

HSS	is the concatenation of HLR and AuC.
MME	is the termination point of the packet data interface towards the PDN.
PCRF Server	is the termination point of the packet data interface towards E-UTRAN.
PDN GW	manages the service policy and sends QoS setting information for each user session and accounting rule information.
Service GW	is in charge of all the Control Plane functions related to subscriber and session management.

**Correct Answer:**





**Section: (none)**

**Explanation**

**Explanation/Reference:**

**HSS – Is the concatenation of HLR and AuC**

<http://www.ciscopress.com/articles/article.asp?p=1681067>

**MME – Is in charge of all the Control plane functions related to subscriber and session management**

[https://books.google.co.in/books?id=gXAuo6c72nkC&pg=PA40&lpg=PA40&dq=MME+is+in+charge+of+all+the+Control+plane+functions+related+to+subscriber+and+session+management&source=bl&ots=MmEH-k4pml&sig=u\\_QAZwOdAFTuHCizOQ4HzChhoS4&hl=en&sa=X&ved=0CB0Q6AEwAGoVChMI sPHs2-vLxwIVSxuOCh1t\\_AG2#v=onepage&q=MME%20is%20in%20charge%20of%20all%20the%20Control%20plane%20functions%20related%20to%20subscriber%20and%20session%20management&f=false](https://books.google.co.in/books?id=gXAuo6c72nkC&pg=PA40&lpg=PA40&dq=MME+is+in+charge+of+all+the+Control+plane+functions+related+to+subscriber+and+session+management&source=bl&ots=MmEH-k4pml&sig=u_QAZwOdAFTuHCizOQ4HzChhoS4&hl=en&sa=X&ved=0CB0Q6AEwAGoVChMI sPHs2-vLxwIVSxuOCh1t_AG2#v=onepage&q=MME%20is%20in%20charge%20of%20all%20the%20Control%20plane%20functions%20related%20to%20subscriber%20and%20session%20management&f=false)

**PCRF Server – Manages the service policy and sends QoS setting information for each user session and accounting rule information**

<https://books.google.co.in/books?id=9cAbIFPGvMkC&pg=PA260&lpg=PA260&dq=PCRF+Server+%E2%80%93+Manages+the+service+policy+and+sends+QoS+setting+information+for+each+user+session+and+accounting+rule+information&source=bl&ots=3rYTYNb7To&sig=QXky7ItQgrs5Y11SXYboPARZJAO&hl=en&sa=X&ved=0CCEQ6AEwAWoVChMIhOWRmezLxwIVECSOCh2OCACy#v=onepage&q=PCRF%20Server%20%E2%80%93%20Manages%20the%20service%20policy%20and%20sends%20QoS%20setting%20information%20for%20each%20user%20session%20and%20accounting%20rule%20information&f=false>

**PDN GW – Is the termination point of the packet data interface towards the PDN**

<https://books.google.co.in/books?id=gXAuo6c72nkC&pg=PA40&lpg=PA40&dq=PDN+GW+is+the+termination+point+of+the+packet+data+interface+towards+the+PDN&source=bl&ots=MmEH-k4rvo&sig=yl4mXwWKuRM9LiFQweCIHqHCfOc&hl=en&sa=X&ved=0CC4Q6AEwA2oVChMIpaez5-zLxwIVi22OCh3VFwo0#v=onepage&q=PDN%20GW%20is%20the%20termination%20point%20of%20the%20packet%20data%20interface%20towards%20the%20PDN&f=false>

**Service GW - Is the termination point of the packet data interface towards E-UTRAN**

<https://books.google.co.in/books?id=DTsTAAAAQBAJ&pg=PA35&lpg=PA35&dq=Service+GW++Is+the+termination+point+of+the+packet+data+interface+towards+E-UTRAN&source=bl&ots=zR3K6DHjKA&sig=Koc5ghWqJgky0qsJo1TQTA3b-tw&hl=en&sa=X&ved=0CCIQ6AEwAWoVChMIqv30ou3LxwIVw5COCh0w6QCQ#v=onepage&q=Service%20GW%20%20Is%20the%20termination%20point%20of%20the%20packet%20data%20interface%20towards%20E-UTRAN&f=false>

**QUESTION 9**

Which BGP feature improves the convergence and response time to adjacency changes with BGP neighbors?

- A. reducing BGP scanner timing to the minimum that is supported
- B. BGP Multihop
- C. Next-Hop Address Tracking
- D. Fast Peering Session Deactivation
- E. TTL Security Check

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/c/en/us/td/docs/ios/12\\_2sb/feature/guide/sbbnhop.html](http://www.cisco.com/c/en/us/td/docs/ios/12_2sb/feature/guide/sbbnhop.html)

**QUESTION 10**

Which are the two purposes of the MPLS label value 1? (Choose two.)

- A. it is used for MPLS OAM packets.
- B. it indicates an implicit null label.
- C. it is used for VPNv6 packets.

- D. it is used to carry the QoS value in the label stack.
- E. it indicates an explicit null label.
- F. it indicates a router alert label.

**Correct Answer:** CF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

<http://www.cisco.com/c/en/us/support/docs/multiprotocol-label-switching-mpls/mpls/4649-mpls-faq-4649.html#qa3>

<http://www.iana.org/assignments/mpls-label-values/mpls-label-values.xhtml> IPv4 Explicit NULL Label ----> 0

Router Alert Label ----> 1

IPv6 Explicit NULL Label -----> 2

Implicit NULL Label -----> 3

OAM Alert Label -----> 14

#### **QUESTION 11**

Refer to the exhibit. Why is R3 unable to install 1.1.1.1/32 in its routing table?



```
R3#show ip route 1.1.1.1
% Network not in table
```

```
hostname R1
!
router bgp 12
 network 1.1.1.1 mask 255.255.255.255
 neighbor 10.10.12.2 remote-as 12
 neighbor 10.10.12.2 advertise-map ADV non-exist-map EXIST
!
ip prefix-list ADV seq 5 permit 1.1.1.1/32
ip prefix-list EXIST seq 5 permit 11.11.11.11/32
!
route-map ADV permit 10
 match ip address prefix-list ADV
!
route-map EXIST seq 5 permit 10
 match ip address prefix-list EXIST
```

```
R1#show ip route 1.1.1.1 | i directly
* directly connected, via Loopback0
```

```
R1#show ip route 11.11.11.11 | i directly
* directly connected, via Loopback11
```

```
R1#sh bgp ipv4 uni 11.11.11.11/32
% Network not in table
```

```
R02#sh bgp ipv4 uni | i 1.1.1.1/32
*> 1.1.1.1/32 0.0.0.0 0 32768 1
```

```
hostname R2
!
router ospf 1
 redistribute bgp 12 subnets
!
router bgp 12
 neighbor 10.10.12.1 remote-as 12
 neighbor 10.10.12.1 prefix-list ROUTE-IN in
!
ip prefix-list ROUTE-IN permit 0.0.0.0/0 le 32
```



- A. 11.11.11.11/32 exists in the routing table, so the conditional advertising is not working.
- B. The route is filtered out by the **ip prefix-list ROUTE-IN** command.
- C. 11.11.11.11/32 is advertising in the BGP table, so conditional advertising is not working.
- D. The **bgp redistribute-internal** command is missing under the R2 BGP process.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 12

An engineer wants to configure Fast Reroute in the network. Which methodology eliminates RSVP configuration in the network?

- A. Enable LDP Fast Synch.
- B. Enable IP Fast Reroute.
- C. Enable the auto tunnel primary feature.
- D. Enable Cisco MPLS TE Fast Reroute.
- E. Enable the auto tunnel backup feature.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/en/US/docs/ios/12\\_0st/12\\_0st10/feature/guide/fastrout.html](http://www.cisco.com/en/US/docs/ios/12_0st/12_0st10/feature/guide/fastrout.html)

### QUESTION 13

What are three actions that the control word performs in MPLS ATOM? (Choose three.)

- A. is used to identify the VC label
- B. is used for padding small packets
- C. preserves the sequence of the transported frames
- D. facilitates the load balancing of ATOM packets in the MPLS backbone network
- E. carries control bits of the Layer 3 header of the transported protocol
- F. is used to identify the tunnel label

**Correct Answer:** BCD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

<https://ccdewiki.wordpress.com/2013/05/28/control-word-on-atom/>

#### **QUESTION 14**

What are two advantages of Cisco IOS XR Software over Cisco IOS Software? (Choose two.)

- A. a configuration that is grouped by interface
- B. a configuration that is grouped by process
- C. one-stage configuration
- D. a monolithic OS
- E. a two-stage configuration

**Correct Answer:** BE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 15**

Which are two major changes SyncE offers over traditional Ethernet to make it suitable for clock distribution? (Choose two.)

- A. SyncE introduces the concept of "Boundary Clocks" and "Transparent Clocks" improving network scalability and accuracy of clock synchronization.
- B. Industry standard that guarantee interoperability, since granular details, such as specific field values are specified.
- C. A mandated clock accuracy of 4.6ppm.
- D. The ESMC protocol for clock selection, distribution, management, traceability, and failover.
- E. High-priority synchronization packets so it can continually adjust its own oscillator.

**Correct Answer:** CD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

<http://www.cisco.com/c/en/us/support/docs/optical/synchronous-optical-network-sonet/23718-timefaq-23718.html>

<http://cp.literature.agilent.com/litweb/pdf/5990-4386EN.pdf>

**QUESTION 16**

What is the PPMP label used for?

- A. for the ingress replication model with BIDIR-PIM in an overlay model
- B. only for the inter-AS mVPN models that use mLDP
- C. for the partitioned mVPN model with PIM signaling in an overlay model
- D. only for unicast over MPLS VPN
- E. for all the default MDT and mVPN models

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

<http://lostintransit.se/tag/bgp/>

<https://tools.ietf.org/html/draft-rosen-l3vpn-mvpn-mspsmi-08#section-3.2.2.1>

**QUESTION 17**

Based on the following configuration:

**vrf definition ABC**

**rd 10.0.0.1:1000**

**!**

**address-family ipv4**

**route-target export 1:1**

**route-target import 1:1**

**mdt default 232.0.0.1**

Which two statements about multicast VPN configuration are true? (Choose two.)

- A. The multicast tree is created based only on the existence of active sources or receivers behind PEs in the ABC VRF.
- B. The service provider core network is required to support SSM.
- C. Multicast needs to be enabled only on ABC VRF and is tunneled to participating PE routers in the ABC VRF.
- D. The SP core network is required in order to enable the BGP Multicast Address Family on all peering.
- E. Multicast is required for the core network in addition to the ABC VRF.
- F. The multicast tree exists regardless of whether there are any active sources or receivers in the ABC VRF.

**Correct Answer:** EF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

<http://www.ciscopress.com/articles/article.asp?p=32100&seqNum=4> [http://www.cisco.com/en/US/tech/tk828/technologies\\_white\\_paper09186a00800a3db6.shtml](http://www.cisco.com/en/US/tech/tk828/technologies_white_paper09186a00800a3db6.shtml)

**QUESTION 18**

An engineer is implementing an MPLS within the core of the Service Provider network. What two components are required to build the control and data plane for MPLS Label Switched Paths? (Choose two.)

- A. FIB
- B. CEF
- C. LDP
- D. LFIB
- E. OSPF

**Correct Answer:** BC

**Section:** (none)

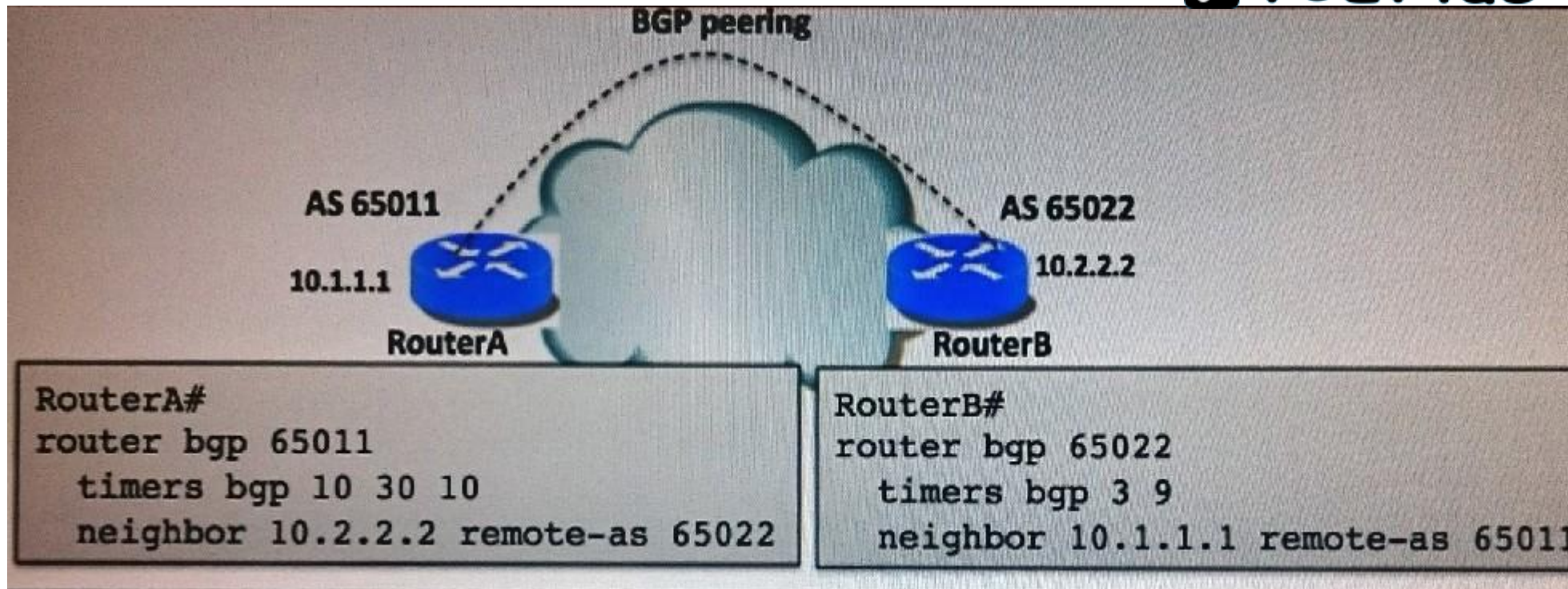
**Explanation**

**Explanation/Reference:**

**QUESTION 19**

Refer to the exhibit. After the BGP TCP negotiation between RouterA and RouterB, what will be the value of the keep alive timer and the hold-down timer, respectively?





- A. 3 seconds and 9 seconds
- B. 60 seconds and 180 seconds
- C. 10 seconds and 9 seconds
- D. no value, because BGP negotiation will not be successful
- E. 10 seconds and 10 seconds
- F. 10 seconds and 30 seconds
- G. 3 seconds and 30 seconds
- H. 3 seconds and 10 seconds

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 20**

In a routing virtualization concept, which are the two main techniques for creating virtualized router entities as defined by their physical and operational characteristics? (Choose two.)

- A. VDC
- B. SVR
- C. DRP
- D. HVR
- E. SDR

**Correct Answer:** BD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/en/US/solutions/collateral/ns341/ns524/ns562/ns573/white\\_paper\\_c11-512753\\_ns573\\_Networking\\_Solutions\\_White\\_Paper.html](http://www.cisco.com/en/US/solutions/collateral/ns341/ns524/ns562/ns573/white_paper_c11-512753_ns573_Networking_Solutions_White_Paper.html)

**QUESTION 21**

Which two statements about Unified MPLS are true? (Choose two.)

- A. Unified MPLS works on Cisco IOS XR Software only.
- B. Unified MPLS extends MPLS across multidomain networks in a scalable manner.
- C. New technologies or protocols are not used; only MPLS, LDP, IGP, and BGP are used.
- D. ABR loopback prefixes should always be redistributed from the core IGP into the aggregation IGP.
- E. The RRs are part of the control path only.

**Correct Answer:** BD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

<http://www.cisco.com/c/en/us/support/docs/multiprotocol-label-switching-mpls/mpls/116127-configure-technology-00.pdf>

**QUESTION 22**

Customers connecting to a Service Provider for Internet access are intending to implement redundant peering. The design requirements call for preferring a primary link for both ingress and egress traffic. Secondary links should be used only during primary outages. What two BGP deployment options will accomplish this design goal? (Choose two.)

- A. On the router handling the secondary link, advertise routes with a MED value of 0.
- B. On the router handling the primary link, set the weight for all incoming routes to be a value of 0.

- C. On the router handling the secondary link, advertise all routes with a longer AS-PATH value.
- D. On the router handling the primary link, advertise all routes with a longer AS-PATH value.
- E. On the router handling the secondary link, set the local preference for all incoming routes to be a value of 0.

**Correct Answer:** CE

**Section:** (none)

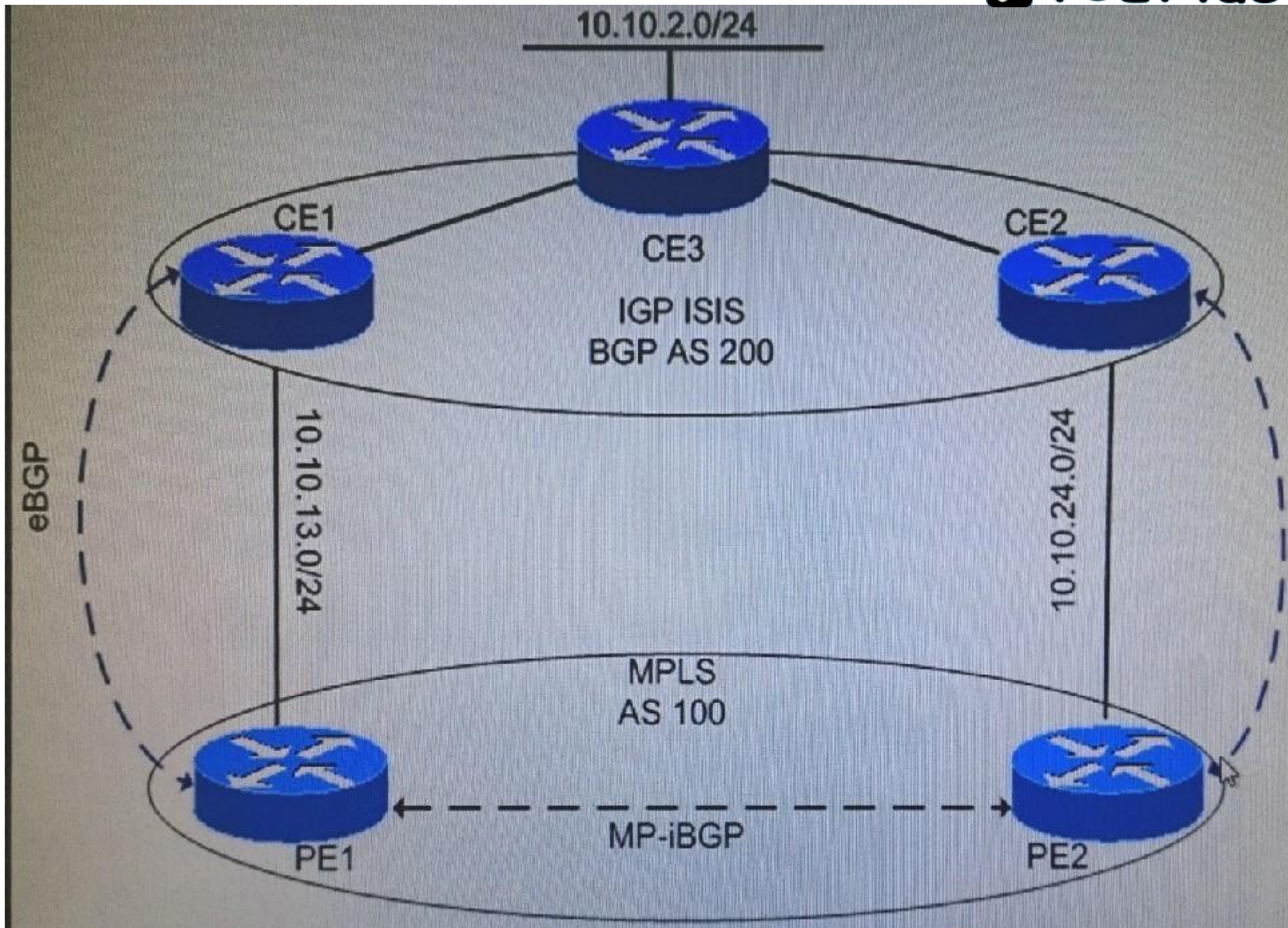
**Explanation**

**Explanation/Reference:**

### **QUESTION 23**

Refer to the exhibit. A customer is running IS-IS within a network and is using BGP as a CE-PE routing protocol. Which action allows CE1 to get the subnet 10.10.2.0/24 over the CE1-PE1 link, regardless of whether there is a flap in the MPLS link or backdoor link?





- A. Configure the **neighbor <PE1-IP>weight 33768** command on CE1 under the BGP process.
- B. Configure the **distance bgp 115 200 200** command on CE1 under the BGP process.
- C. Configure the **distance 30 ip** command on CE1 under the IS-IS process.
- D. Configure the **distance bgp 115 200 200** command on CE2 under the BGP process.
- E. Configure the **neighbor <PE1-IP>weight 33768** command on CE2 under the BGP process.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 24

Which are the two fundamental ways in which IEEE 1588 differs from SyncE? (Choose two.)

- A. In addition to frequency synchronization, it achieves ToD synchronization to achieve phase alignment which is required for multi-channel communication.
- B. It is a purely-based solution, with the actual clock values being passed inside the payloads of special packets dedicated to that task.
- C. It offers two major changes over traditional Ethernet to make it suitable for clock distribution: a mandated clock accuracy and the ESMC protocol for clock selection, distribution, management, traceability, and failover.
- D. SyncE is a Cisco proprietary ToD technology where IEEE 1588 is a industry standard recommended for interoperability across vendor devices.
- E. IEEE 1588 applies to voice-only systems or with low-bandwidth data traffic.

**Correct Answer:** AB

**Section:** (none)

**Explanation**

**Explanation/Reference:**

[http://www.eetimes.com/document.asp?doc\\_id=1278660](http://www.eetimes.com/document.asp?doc_id=1278660)

#### QUESTION 25

In a Layer 2 VPN service, which is the default behavior of an EVC-based platform with regards to VLAN manipulation?

- A. keeps the VLAN tag of the incoming frame
- B. attaches two VLAN tags to the incoming frame
- C. removes the VLAN tag from the incoming frame
- D. removes all the VLAN tags from the incoming frame

E. sets the VLAN tag of the incoming frame

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

<http://www.cisco.com/c/en/us/support/docs/routers/asr-9000-series-aggregation-services-routers/116453-technote-ios-xr-l2vpn-00.html#anc7>

#### **QUESTION 26**

When IPv6 is enabled on an interface, which three multicast addresses does the configured interface automatically join? (Choose three.)

- A. FF01::2
- B. FEC0::1
- C. FF02:0:0:0:0:1:FF00::/104
- D. FF02::1
- E. FF01::1
- F. FF02::2
- G. FF02::D
- H. FF02::5

**Correct Answer:** CDF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/4\\_1/configuration/guides/cli\\_4\\_1/clibook/ipv6.pdf](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/4_1/configuration/guides/cli_4_1/clibook/ipv6.pdf)

<https://www.iana.org/assignments/ipv6-multicast-addresses/ipv6-multicast-addresses.xml>

#### **QUESTION 27**

Which two frame types are correct when configuring T3 interfaces? (Choose two.)

- A. M23
- B. G.832
- C. Extended Super Frame
- D. C-bit parity
- E. G.751
- F. Super Frame



**Correct Answer:** AD

**Section:** (none)

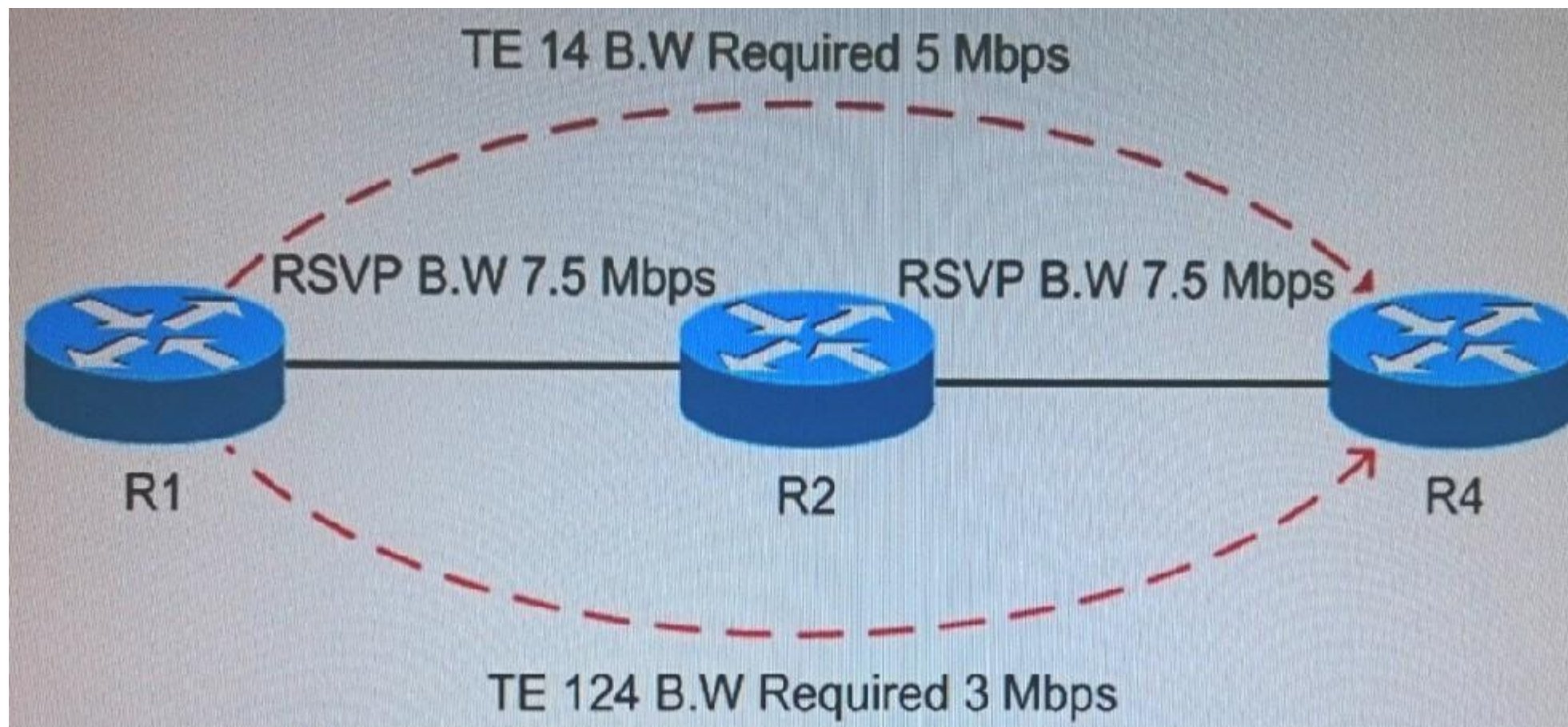
**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/c/en/us/td/docs/routers/crs/software/crs\\_r4-2/interfaces/configuration/guide/hc42crsbook/hc42t3e3.html](http://www.cisco.com/c/en/us/td/docs/routers/crs/software/crs_r4-2/interfaces/configuration/guide/hc42crsbook/hc42t3e3.html)

**QUESTION 28**

Refer to the exhibit. The referenced TE tunnels compete for bandwidth requirements over the limited available bandwidth that is provisioned. Which core MPLS component erases a conflict and provides admission control for any new added TE tunnel?



A. link management

- B. link attributes
- C. MPLS TE priorities
- D. RSVP

**Correct Answer:** D

**Section:** (none)

**Explanation**

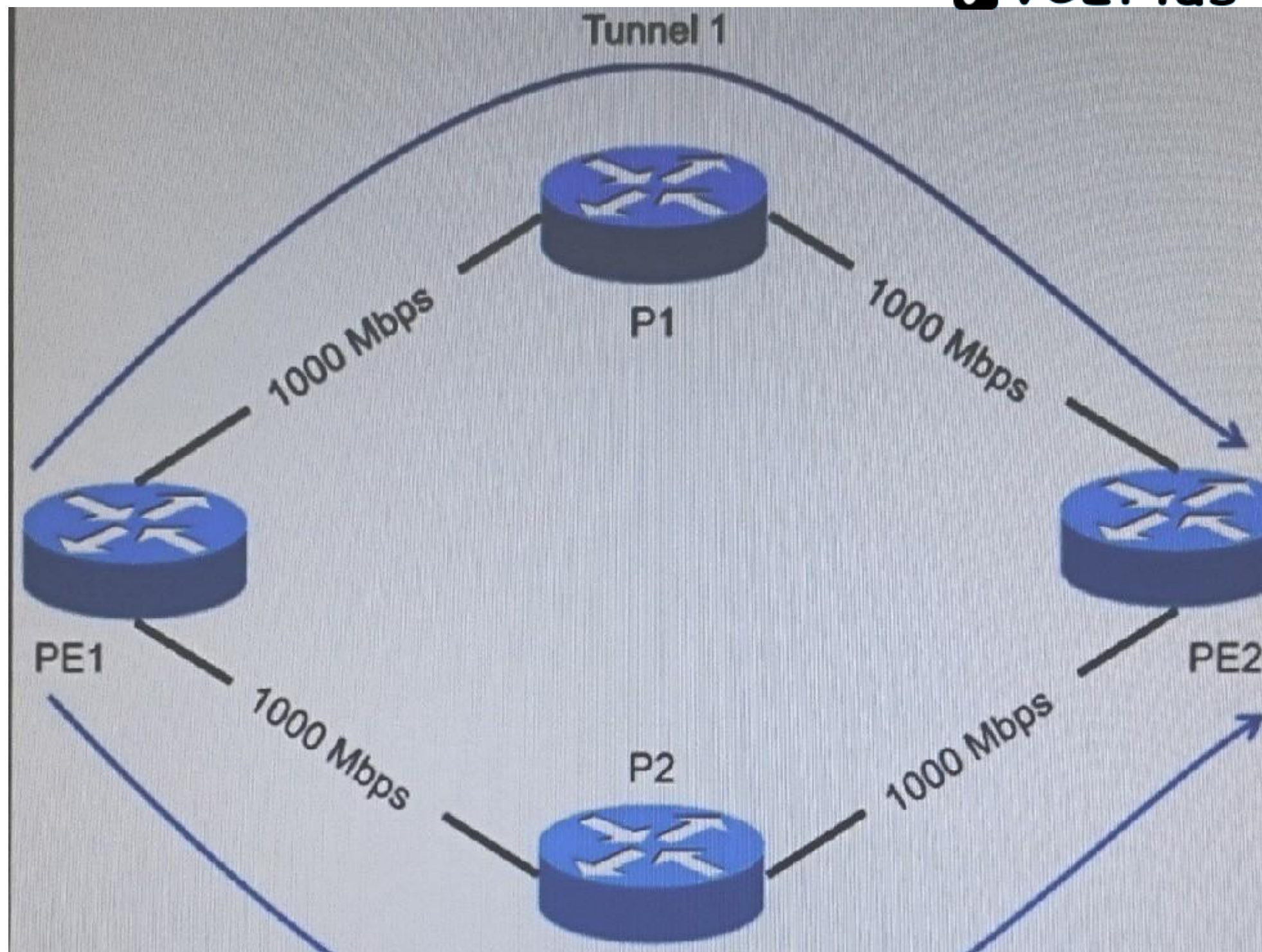
**Explanation/Reference:**

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/5\\_x/nx-os/mpls/configuration/guide/mpls\\_cg/mp\\_te\\_RSVP.pdf](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/5_x/nx-os/mpls/configuration/guide/mpls_cg/mp_te_RSVP.pdf)

**QUESTION 29**

Refer to the exhibit. Two MPLS TE tunnels are configured with a total bandwidth guarantee of 100 Mbps. However, Tunnel 1 has a requirement to have one-fifth of this total bandwidth. Which two configurations accomplish this goal? (Choose two.)





- A. Configure **tunnel mpls traffic-eng bandwidth 20000** under the Tunnel 1 interface.
- B. Configure **bandwidth 20000** under the Tunnel 1 interface.
- C. Configure **tunnel mpls traffic-eng bandwidth 80000** under the Tunnel 2 interface.
- D. Configure **bandwidth 80 Mbps** under physical interfaces in the path PE1-P2-PE2.
- E. Configure **bandwidth 20 Mbps** under physical interfaces in the path PE1-P1-PE2
- F. Configure **bandwidth 80000** under the Tunnel 2 interface.

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

See Configuration Guide

### QUESTION 30

What are three main characteristics of mLDP that differ from RSVP-TE? (Choose three.)

- A. The LSPs are built from tailend to headend.
- B. The LSPs are built from headend to tailend.
- C. It supports only P2MP LSPs.
- D. It supports both P2MP and MP2MP LSPs.
- E. Signaling is periodic.
- F. No periodic signaling is performed.

**Correct Answer:** ADF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/c/dam/en/us/products/ios-nx-os-software/multicast-label-distribution-protocol-mldp/whitepaper\\_c11-598929\\_v1.pdf](http://www.cisco.com/c/dam/en/us/products/ios-nx-os-software/multicast-label-distribution-protocol-mldp/whitepaper_c11-598929_v1.pdf)

### QUESTION 31

The product team at an ISP that offers VoIP services wants to add two-way video conferencing to their product offering. Which three QoS methods can be applied for real-time traffic on WAN links with speeds that are slower than 768 Kbps? (Choose three.)

- A. Apply MLP link fragmentation and interleaving to the interface.
- B. Apply LLQ with both voice traffic and video traffic in the same priority queue.
- C. Apply CBWFQ with VoIP traffic in its own class, which is marked with a PHB value of EF.

- D. Apply CBWFQ with video traffic in its own class, which is marked with a PHB value of AF41.
- E. Apply voice-adaptive fragmentation to ensure that large video packets are fragmented and interleaved.
- F. Apply LLQ with video traffic that is dedicated in the priority queue.

**Correct Answer:** ACD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/c/en/us/td/docs/solutions/Enterprise/WAN\\_and\\_MAN/QoS\\_SRND/QoS-SRND-Book/WANQoS.html](http://www.cisco.com/c/en/us/td/docs/solutions/Enterprise/WAN_and_MAN/QoS_SRND/QoS-SRND-Book/WANQoS.html)

### QUESTION 32

An R1 router requires an equal load balancing to reach the prefix 192.168.0.0/16 over two exit points: through R2 and R3 routers. Which two options must be configured on the R1 router to achieve this goal? (Choose two.)

- A. The BGP maximum path feature must be configured on R1.
- B. The BGP PIC core must be enabled on R1
- C. Weight, local-pref, MED, as-path length, origin, and the BGP next-hop IGP cost must be the same for the R2 and R3 IBGP updates to R1.
- D. The BGP Link Bandwidth feature must be applied on R1.
- E. BGP extended community exchange must be enabled between IBGP neighbors.

**Correct Answer:** DE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/c/en/us/td/docs/ios/12\\_2s/feature/guide/fsbgplb.html#wp1058373](http://www.cisco.com/c/en/us/td/docs/ios/12_2s/feature/guide/fsbgplb.html#wp1058373)

### QUESTION 33

An engineer has just configured IOS-XR with out-of-band MPP. Which are the three results that will occur? (Choose three.)

- A. Management traffic to RP from all non-MPP interfaces is dropped
- B. RP/DRP Ethernet Interfaces are not default out-of-band interfaces.
- C. MPP configuration changes doesn't affect active sessions established before the changes
- D. Interfaces configured for out-of-band MPP are still part of global routing/forwarding
- E. If MPP is disabled and a protocol is activated, all interfaces cannot pass traffic
- F. LPTS will provide rate limiting

**Correct Answer:** ACF

**Section:** (none)

### Explanation

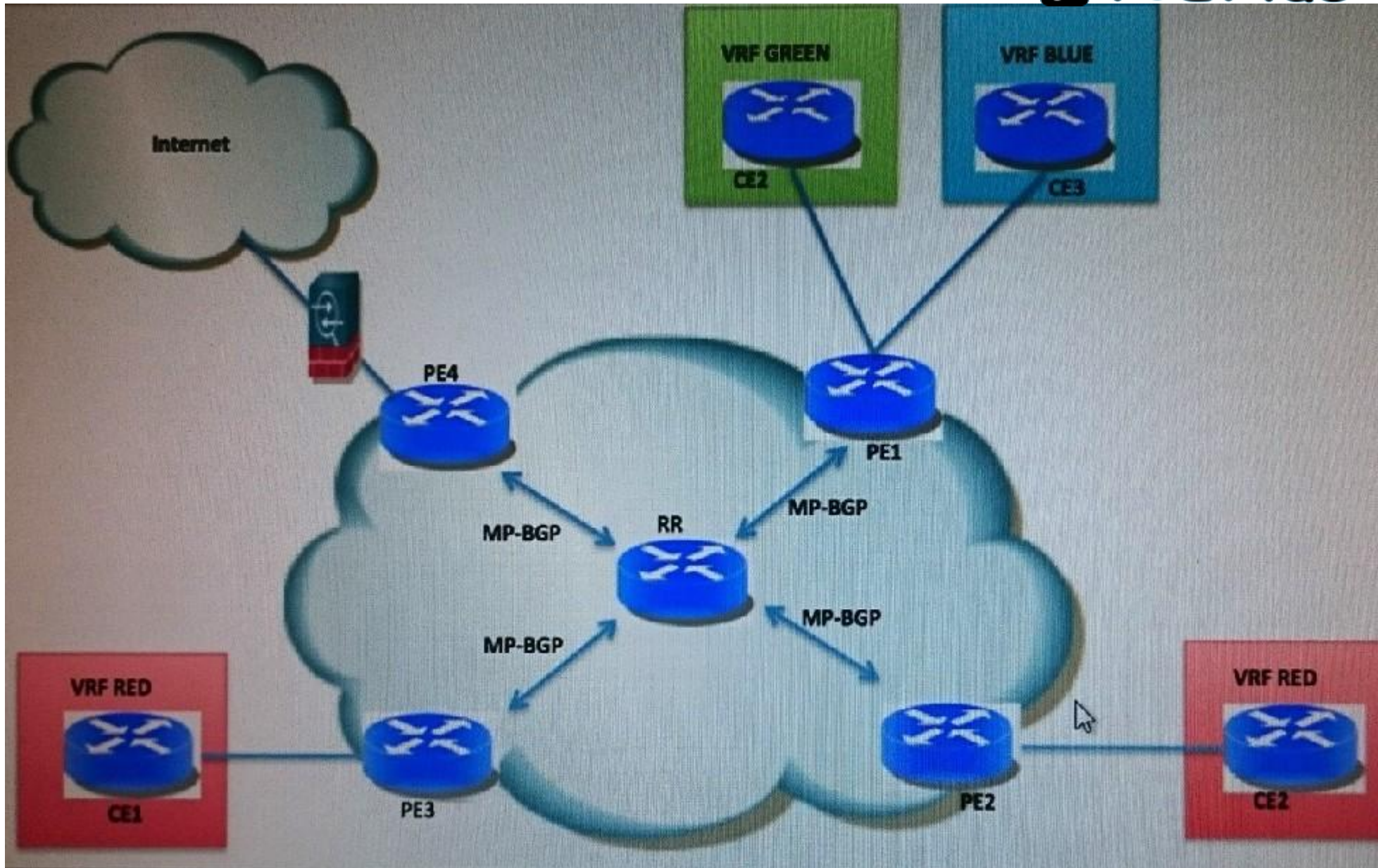
#### Explanation/Reference:

<https://supportforums.cisco.com/document/93456/asr9000xr-local-packet-transport-services-lpts-copp>

#### QUESTION 34

Refer to the exhibit. The Service Provider is deploying Internet service to its VRF customers by using **vrf INTERNET**. A dedicated firewall provides NAT functionally towards the Internet. Assume that IP address overlapping between VRFs is not an issue.





Which three configuration steps are required to add Internet service to the VRF customers? (Choose three.)

- A. Export the RD of **vrf INTERNET** from all customer VRFs.
- B. Originate a default route on PE4 in **vrf INTERNET**.
- C. Import the RD from **vrf INTERNET** in all customer VRFs.
- D. Originate a default route on the firewall in **vrf INTERNET**.
- E. Import the VRF "INTERNET" Route Target in all customer VRFs.
- F. Import the Route Target of all customer VRFs in **vrf INTERNET**.
- G. Leak all VRF routes to the global routing table.

**Correct Answer:** BCG

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 35**

**DRAG DROP**

Drag and drop the MPLS operation listed on the left to the correct order of the operation on the right.

**Select and Place:**

Edge LSR at egress removes label and delivers packets

Ingress edge LSR receives packets, performs layer 3 value-added services, and "labels" packets

Existing Routing Protocols (e.g. OSPF, IS-IS) establish reachability to destination networks

LRS switches packets using Label Swapping

LDP establishes "label" to destination network mappings.

**Correct Answer:**

Existing Routing Protocols (e.g. OSPF, IS-IS) establish reachability to destination networks

LDP establishes "label" to destination network mappings.

Ingress edge LSR receives packets, performs layer 3 value-added services, and "labels" packets

LSR switches packets using Label Swapping

Edge LSR at egress removes label and delivers packets

Section: (none)

Explanation

Explanation/Reference:

#### QUESTION 36

QoS is applied on an outgoing interface as shown below:

**policy-map COS-OUT**

**class DATA**

**random-detect dscp-based**

**random-detect exponential-weighting-constant 9**

**random-detect dscp 26 39 117 30**

**random-detect dscp 28 19 35 20**



What will the QoS result be for egress traffic with an average queue depth of 40 that is marked as DSCP AF32?

- A. Traffic will be dropped with a random rate less than the one defined by MPD.
- B. All traffic will be tail dropped.
- C. Traffic will be dropped with a rate of 1 packet out of 20.
- D. Traffic will be dropped with a rate of 1 packet out of 30.

**Correct Answer:** C

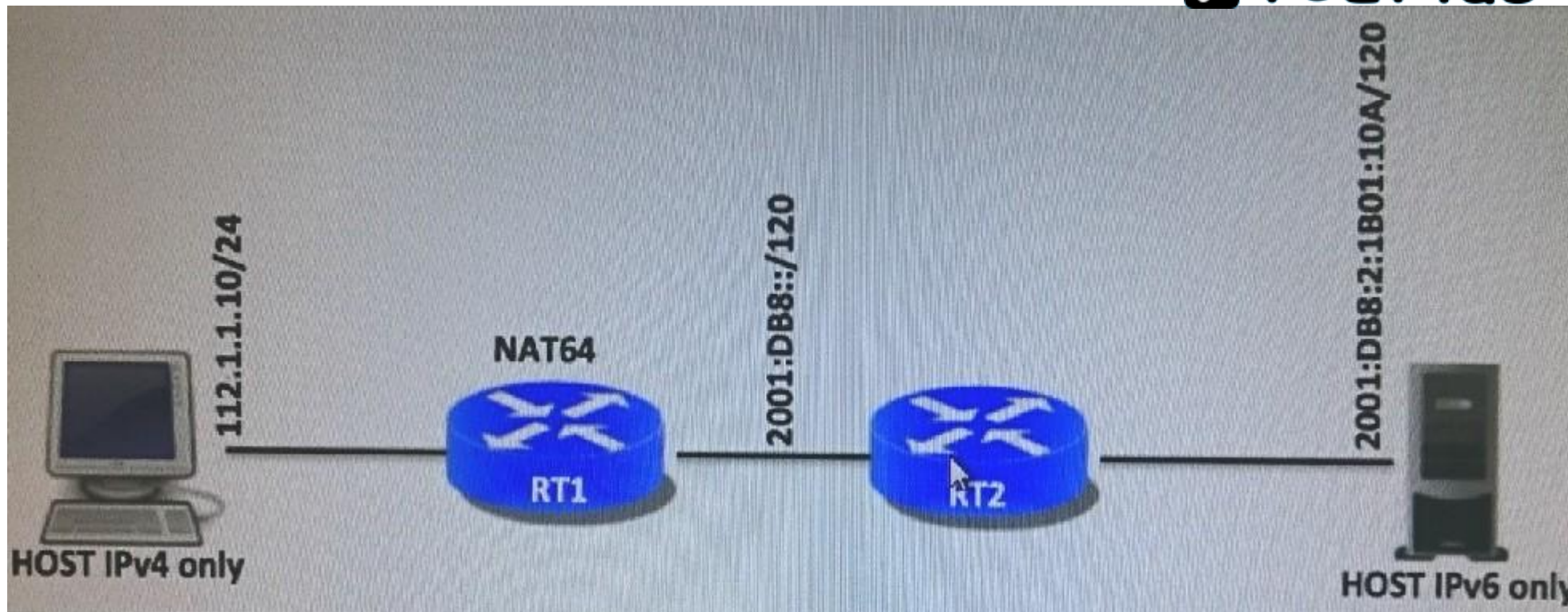
**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 37

Refer to exhibit. NAT64 stateless configuration has been applied on RT1 router. The NAT64 prefix stateless used on this scenario is 2001:DB8:2::/96. 'Host IPv4 only' needs to test the connectivity with 'Host IPv6 only' using a ping command. Which is the correct ping command 'Host IPv4 only' should use?



- A. ping 27.1.1.10
- B. ping 27.1.1.10 source 2001:db8:2::7001:10A
- C. ping 2001:db8:2::7001:10A
- D. ping 2001:db8:2::112.1.1.10
- E. ping 2001:db8:2::27.1.1.10
- F. ping 2001:db8:2::1B01:10A

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 38

Which is the RP address of the IPv6 multicast address FF76:0:130:1234:5678:9abc::4321?

- A. 4321:5678:9abc::30
- B. 4321:5678:9abc::13
- C. 1234:5678:9abc::130
- D. 1234:5678:9abc::1
- E. 1234:5678:9abc::13

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: [http://www.netcraftsmen.com/wp-content/uploads/2014/12/20090429-CMU-Introduction\\_to\\_IP\\_Multicast.pdf](http://www.netcraftsmen.com/wp-content/uploads/2014/12/20090429-CMU-Introduction_to_IP_Multicast.pdf) page 53

#### QUESTION 39

A Server Provider is seeing an increasing amount of attacks against its customers. For which kind of attack would an engineer want to design a Backscatter Traceback solution?

- A. Rogue DNS/DHCP Servers
- B. IP Spoofing
- C. Ping of Death
- D. Distributed Denial of Service
- E. Network Attack TCP/UDP Scan

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: [http://www.cisco.com/web/about/security/intelligence/sp\\_infrastruct\\_scty.html](http://www.cisco.com/web/about/security/intelligence/sp_infrastruct_scty.html)  
[http://www.cisco.com/web/about/ac123/ac147/archived\\_issues/ipj\\_10-4/104\\_ip-spoofing.html](http://www.cisco.com/web/about/ac123/ac147/archived_issues/ipj_10-4/104_ip-spoofing.html)

#### QUESTION 40

Which QoS method is available when GRE is used to provide MPLS VPN services over an IP-only core?

- A. matching MPLS EXP on the physical interface
- B. matching EXP on the tunnel interface
- C. matching DSCP on the physical interface
- D. matching DSCP on the tunnel interface

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 41**

A Service Provider wants to extend MPLS WAN endpoints in the cloud at the edge of a customer network within the cloud. Which platform will meet this requirement?

- A. Cisco NX-OS
- B. Cisco CSR1000v
- C. Cisco ISR Routers running IOS
- D. Cisco CRS-1
- E. Cisco ASR Routers running IOS-XR

**Correct Answer:** B

**Section:** (none)

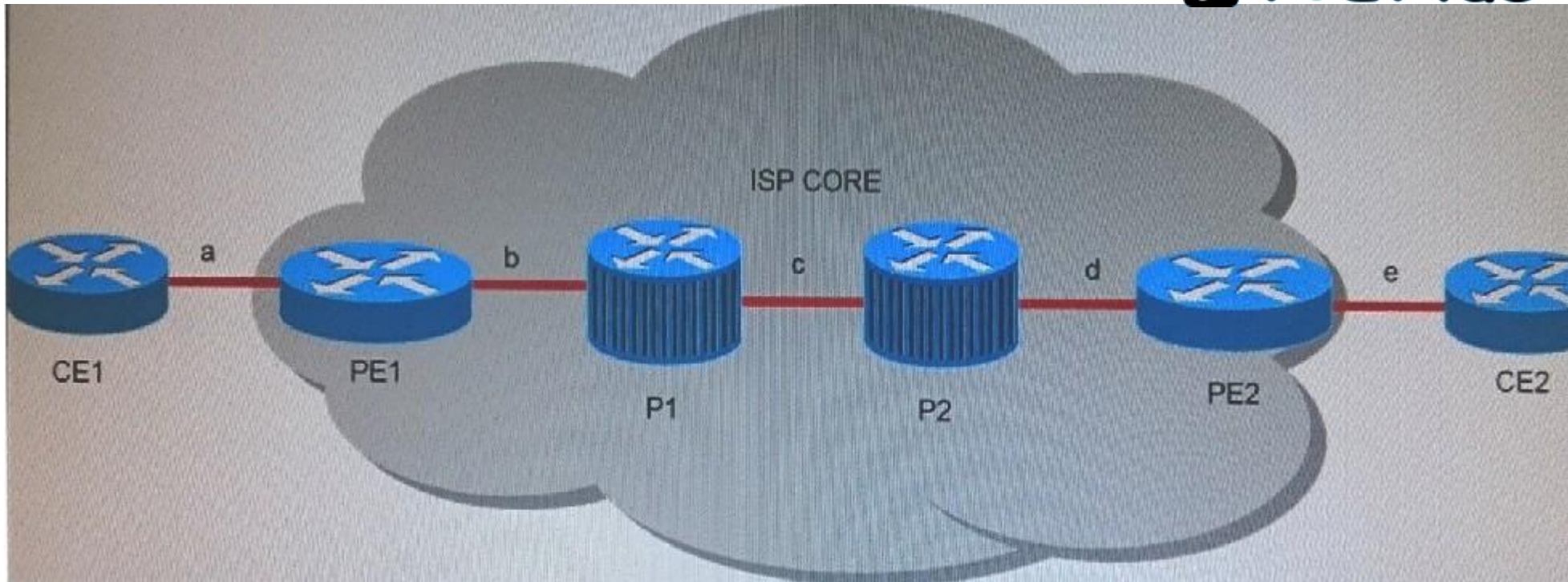
**Explanation**

**Explanation/Reference:**

<http://www.cisco.com/c/en/us/products/collateral/routers/cloud-services-router-1000v-series/datasheet-c78-733443.html>

**QUESTION 42**

Refer to the exhibit. In the short-pipe QoS mode, this customer has QoS control for which two links? (Choose two.)



- A. a
- B. c
- C. d
- D. b
- E. e

**Correct Answer:** AE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 43

MPLS Service Providers use Route Distinguishers and Route Targets as methods to control routing for customer VRFs. Which two statements are true about Route Distinguishers and Route Targets? (Choose two.)

- A. Route Targets are values that are used by a PE router to uniquely identify a VRF within its local MP-BGP VPNv4 table.
- B. Route Distinguishers are used by PE routers by exporting and importing routes into a local VRF.
- C. Route Targets are used by PE routers to define how to import and export prefixes into a local VRF database.
- D. Route Targets are extended communities that are used by MP-BGP to identify routes as they are advertised to neighbor PE routers.
- E. Route Distinguishers are values that are used by a PE router to uniquely identify a VRF within its local MP-BGP VPNv4 table.

**Correct Answer:** CE

**Section:** (none)

**Explanation**

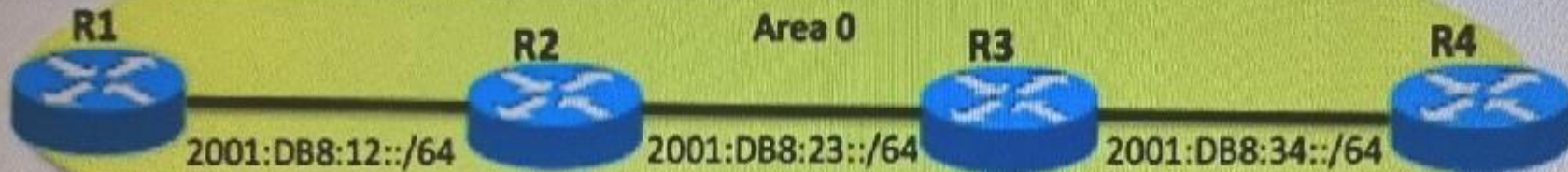
**Explanation/Reference:**

#### **QUESTION 44**

Refer to the exhibit. OSPFv3 is already running, and R1 has added a new subnet (loopback 11). What is the reason code on R4 when executing the command **show ipv6 ospf statistics**?



```
R1#
interface Loopback11
  ipv6 address 2001:DB8::1/128
  ipv6 ospf 10 area 0
```



```
R4# show ipv6 ospf statistic
```

```
Area 0: SPF algorithm executed 5 times
SPF calculation time
```

Delta T	SPT	Prefix	D-Int	Sum	D-Sum	Ext	D-Ext	Total	Reason
00:00:03	0	1	0	0	0	0	0	1	???

- A. P (partial)
- B. N (network)
- C. R (router)
- D. L (link)

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 45**

A network engineer is designing the BGP architecture with a requirement of preventing the AS from becoming a Transit AS path, using the following configuration:

```
router bgp 65000
```

```
neighbor 10.0.0.1 route-map BGP-ROUTE-POLICY in
```

The goal is to prevent routes learned from 10.0.0.1 from being advertised to any other eBGP peering in the AS 65000. What command should be used within the route map to achieve this goal while keeping existing route policies in place?

- A. set community no-export additive
- B. set community no-advertise
- C. set community no-advertise additive
- D. set community no-export

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Reference: <http://www.cisco.com/c/en/us/support/docs/ip/border-gateway-protocol-bgp/26634-bgp-toc.html>

**QUESTION 46**

An IS-IS enabled router with multiple IS-IS neighbors is required to have BFD sessions with all neighbors. Which BFD mode should you use when you want to save the overhead of periodic protocol control packets?

- A. echo
- B. asynchronous
- C. demand
- D. active

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

<https://tools.ietf.org/html/rfc5880#section-3.1>

RFC - 5880



**QUESTION 47**

A Service Provider is designing control policies at the customer edge of the network, in order to prevent usage that exceeds the contracted terms. A new client that is contracted for only 2 Gbps is connecting to the Service Provider edge with a 10 Gbps interface. Which two QoS strategies meet the design goal? (Choose two.)

- A. On the service Provider edge, enable traffic shaping on the customer port.
- B. On the customer edge device, enable traffic shaping on the interface that is connected to the Service Provider.
- C. On the customer edge device, enable policing on the interface that is connected to the Service Provider.
- D. On the service Provider edge, enable policing on the customer port.
- E. On the service Provider edge, enable WRED on the customer port.
- F. On the customer edge, enable WRED on the interface that is connected to the Service Provider.

**Correct Answer:** BD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/qos\\_plcshp/configuration/xr-3s/asr1000/qos-plcshp-xr-3s-asr-1000-book/qos-plcshp-overview.html](http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/qos_plcshp/configuration/xr-3s/asr1000/qos-plcshp-xr-3s-asr-1000-book/qos-plcshp-overview.html)

**QUESTION 48**

SSO was configured on a Cisco ASR 1006 Router by using two RPs. When the main RP failed, a service disruption occurred. What are two reasons that the SSO did not work? (Choose two.)

- A. The standby RP has a different DRAM configuration than the primary RP.
- B. HSRP and NSF are not configured.
- C. The ESP that is installed in the Cisco ASR 1006 Router does not support SSO.
- D. The standby RP was not ready to switch over when the primary RP failed.
- E. The standby RP has a different IOS version than the primary RP.

**Correct Answer:** BE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/c/en/us/td/docs/routers/asr1000/configuration/guide/chassis/asrswcfg/High\\_Availability.html](http://www.cisco.com/c/en/us/td/docs/routers/asr1000/configuration/guide/chassis/asrswcfg/High_Availability.html)

**QUESTION 49**

A Service Provider connects to a client site that has two CEs. These CEs have a backdoor link for backup. OSPF is used as the routing protocol in this environment. You want to ensure that client traffic prefers the service provider connections for routing instead of the secondary connection. Which option

describes the default behavior and the action that accomplishes your goal?

- A. The routes to the Service Provider are not preferred, due to the increased OSPF cost through the service provider network. Ensure that the cost on the links to the service provider are lower than the secondary connection.
- B. The routes to the Service Provider are seen as external type 1 in the OSPF database. Configure a domain ID that is the same across all PEs, to ensure that customers see routes as intra-area.
- C. The routes to the Service Provider are seen as inter-area OSPF routes through the network. Configure a sham link to create a new intra-area path across the service provider network between the PE routers that service the client.
- D. The routes to the Service Provider are seen as equal and cause nondeterministic traffic patterns. Ensure that the secondary connection has a higher cost than the links to the service provider.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/iproute\\_ospf/configuration/15-sy/iro-15-sy-book/iro-sham-link.html#GUID-BEA06826-713E-4F71-B4A4-9E3DA3BAC3FC](http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/iproute_ospf/configuration/15-sy/iro-15-sy-book/iro-sham-link.html#GUID-BEA06826-713E-4F71-B4A4-9E3DA3BAC3FC)

#### QUESTION 50

An engineer is working to provide high availability to a Service Provider core network. Which BGP command enables a backup path to be installed in the RIB and CEF tables?

- A. maximum-paths ibgp
- B. bgp additional-paths install
- C. maximum-paths eibgp
- D. bgp additional-paths select
- E. bgp advertise-best-external

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/iproute\\_bgp/configuration/xe-3s/irg-xe-3s-book/bgp\\_best\\_external.html#GUID-66F31B75-B1E6-4B38-9B4D-6A89839930CE](http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/iproute_bgp/configuration/xe-3s/irg-xe-3s-book/bgp_best_external.html#GUID-66F31B75-B1E6-4B38-9B4D-6A89839930CE)

#### QUESTION 51

Which two flexible service mapping features that are used on the ES40 line card can classify traffic into different service instances, in order to consume fewer VLANs? (Choose two.)

- A. CoS
- B. DSCP
- C. IP precedence
- D. MPLS experimental bit
- E. ToS
- F. EtherType

**Correct Answer:** AF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference:

[http://www.cisco.com/c/en/us/td/docs/routers/7600/install\\_config/ES40\\_config\\_guide/es40\\_sw\\_config/es40\\_chap7.html#pgfId-1500091](http://www.cisco.com/c/en/us/td/docs/routers/7600/install_config/ES40_config_guide/es40_sw_config/es40_chap7.html#pgfId-1500091)

**QUESTION 52**

Refer to the exhibit.

R1

```
interface FastEthernet1/1
  ip address 10.0.1.2 255.255.255.0
  ip router isis
  ipv6 address 2001:DB8:1::2/64
  ipv6 router isis
!
interface GigabitEthernet2/1
  ip address 10.0.2.2 255.255.255.0
  ip router isis
  ipv6 address 2001:DB8:1::2/64
  ipv6 router isis
  isis circuit-type level-1
!
router isis
  net 49.0000.0000.0000.0002.00
  passive-interface Loopback0
!
```

R2

```
interface FastEthernet1/1
  ip address 10.0.1.1 255.255.255.0
  ip router isis
  ipv6 address 2001:DB8:1::1/64
  ipv6 router isis
!
interface GigabitEthernet2/1
  ip address 10.0.2.1 255.255.255.0
  ip router isis
  ipv6 address 2001:DB8:1::2/64
  ipv6 router isis
  isis circuit-type level-1
!
router isis
  net 49.0000.0000.0000.0000.00
  metric-style transition
  passive-interface Loopback0
!
address-family ipv6
  multi-topology transition
  exit -address family
```

When a traceroute is performed from a PC behind R2, the next hop on R1 for IPv4 is 10.0.1.2, and for IPv6 it is 2001:DB8:2:2. What is causing this behavior?

- A. GigabitEthernet2/1 has a Level 1-only adjacency. This causes it to be the preferred path for the IPv6 packets.
- B. When SPF ran on R2, it calculated two equal paths to R1. It was a coincidence that the packets choose different paths.
- C. Multitopology is enabled on R2, which causes the IPv6 packets to use a different path than the IPv4 packets.
- D. 2001:DB8:2::2 is on a Gigabit Ethernet interface. Because its speed is higher than Fast Ethernet, the IS-IS metric is preferred.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 53

What are the four key design requirements for mobile IP backhaul? (Choose four.)

- A. X2 interface turning point
- B. bandwidth
- C. Layer 2 Tunneling
- D. native IPv6 support
- E. DiffServQoS
- F. MPLS-enabled interface
- G. network timing distribution and recovery
- H. mandatory Layer 3 access up to a cell site

**Correct Answer:** CDGH

**Section:** (none)

**Explanation**

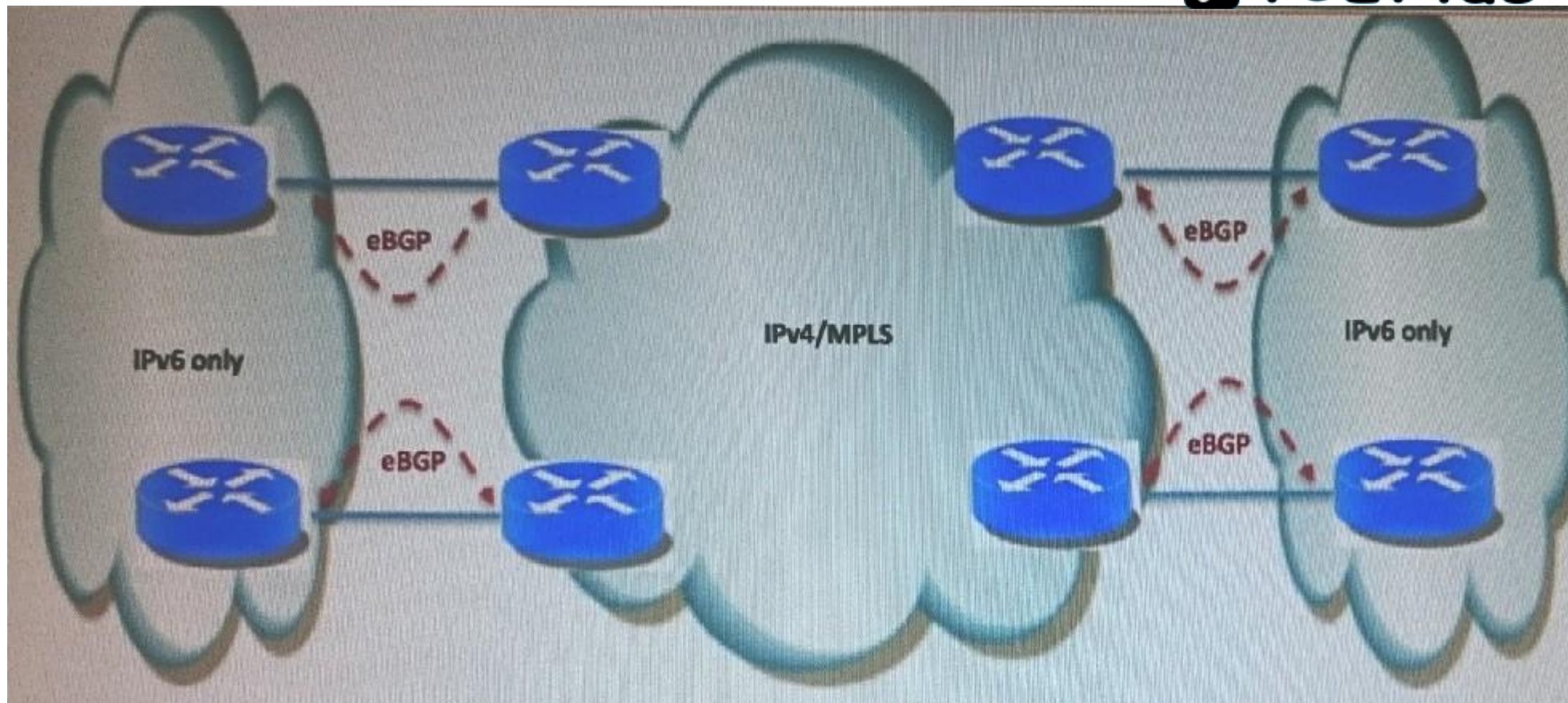
**Explanation/Reference:**

[http://www.cisco.com/web/about/ac123/ac147/archived\\_issues/ipj\\_14-3/143\\_backhaul.html](http://www.cisco.com/web/about/ac123/ac147/archived_issues/ipj_14-3/143_backhaul.html)

### QUESTION 54

Refer to the exhibit. The Service Provider does not have IPv6 support in the core, however it does have MPLS support. Customer requires IPv6 connectivity in all sites including Internet access. Without a requirement to create VRF, which method is preferred to support IPv6 traffic between these sites?





- A. 6VPE
- B. H-VPLS
- C. L2TPv3
- D. VPLS
- E. 6CE
- F. 6PE

**Correct Answer:** F

**Section:** (none)

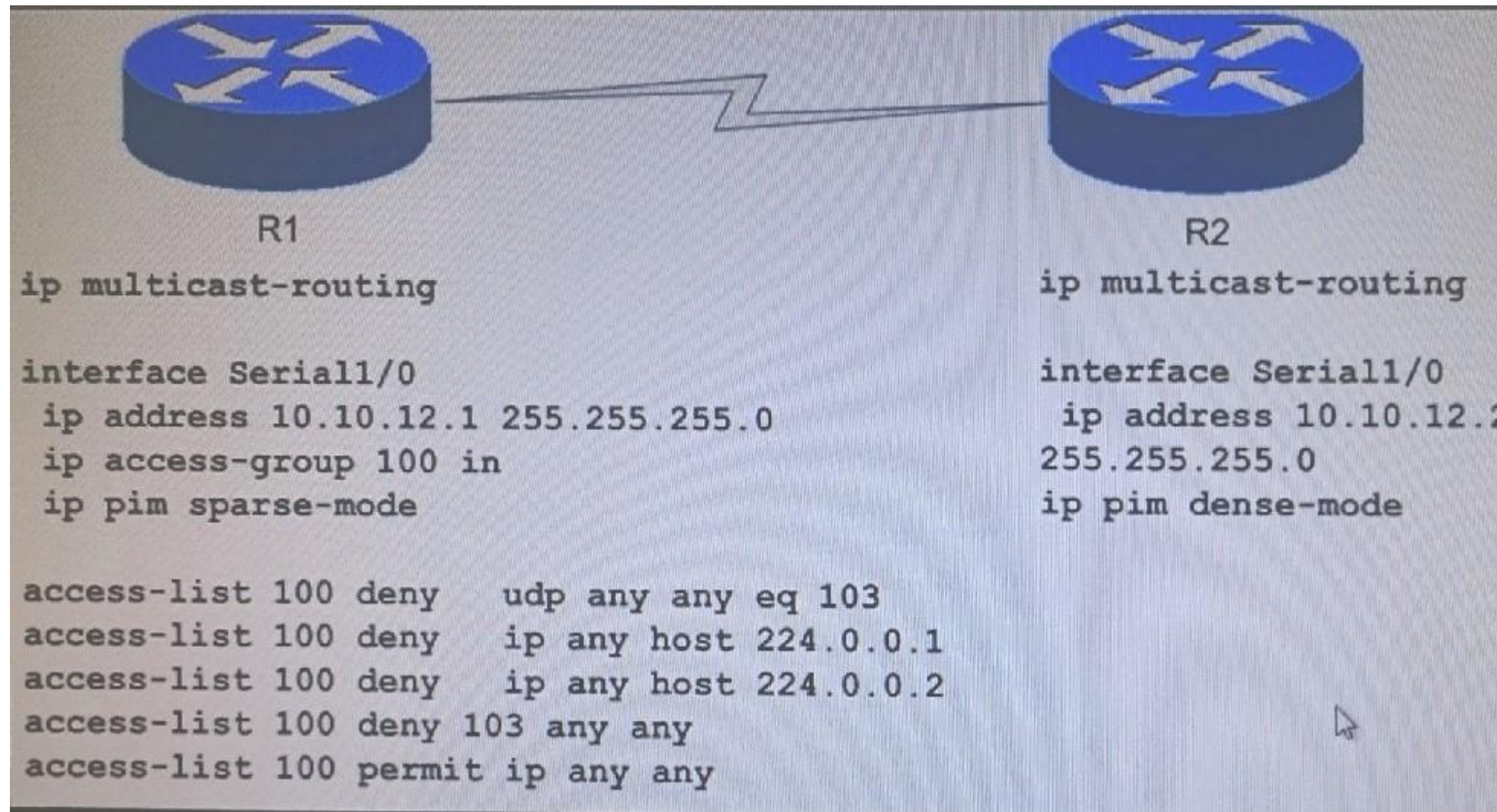
**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/products\\_data\\_sheet09186a008052edd3.html](http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/products_data_sheet09186a008052edd3.html)

**QUESTION 55**

Refer to the exhibit. R1 and R2 are multicast routers running PIM over Serial1/0. The PIM adjacency on R1 is not forming with the given configuration. What command can be entered on R1 to resolve the issue?



- A. no access-list 100 deny 103 any any
- B. no access-list 100 deny udp any anyeq 103
- C. no access-list 100 deny ip any host 224.0.0.1
- D. no access-list 100 deny ip any host 224.0.0.2

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

All PIM protocols share a common control message format. PIM control messages are sent as raw IP datagrams (protocol number 103), either multicast to the link-local ALL PIM ROUTERS multicast group, or unicast to a specific destination.

Reference: <http://www.metaswitch.com/resources/what-is-protocol-independent-multicast-pim>

#### **QUESTION 56**

A company is deciding between an HVR and SVR solution in order to finalize a virtualization project proposal. Which is an advantage of a HVR solution versus a SVR solution?

- A. A HVR solution implements dedicated data plane resources.
- B. A HVR solution implements shared control plane resources.
- C. A HVR solution introduces significant contention of resources.
- D. A HVR solution implements dedicated chassis resources.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Comparison of Virtualized Routing Architectures



Category	Hardware-Isolated Virtual Router	Software-Isolated Virtual Router
Control plane resources (CPU, memory)	Dedicated	Shared
Data plane resources (forwarding engine, queues)	Dedicated	Shared
Chassis resources (power supplies, blowers, fabric)	Shared	Shared
Management, configuration	Dedicated	Typically shared, but varies depending on degree of virtualization
Connections between virtualized routing entities	Typically external	Typically internal, but possibly external
Per-chassis scalability (routing adjacencies, prefixes)	Increased with additional logical routers	Unaffected by additional virtual routers

Reference: [http://www.cisco.com/en/US/solutions/collateral/ns341/ns524/ns562/ns573/white\\_paper\\_c11-512753\\_ns573\\_Networking\\_Solutions\\_White\\_Paper.html](http://www.cisco.com/en/US/solutions/collateral/ns341/ns524/ns562/ns573/white_paper_c11-512753_ns573_Networking_Solutions_White_Paper.html)

#### QUESTION 57

Two Service Providers are beginning a merger between AS boundaries to provide MPLS- enabled services between their networks. Customers are using both Service Providers for services and, under certain circumstances; there are requirements to extend Layer 2 VPN circuits between each provider. The providers are in the process of completing the technical merger. However, the MPLS is not supported between the providers. Which action allows MPLS Layer 2 VPN circuits to be built over the inter-AS link?

- A. Create a GRE tunnel with the **mpls ip** command between ASBRs.
- B. Create Layer 2 VPN peerings between PE routers from each provider.
- C. Create a VPNv4 peering between ASBRs to advertise labels between each provider.

D. Create a sham link between ASBR routers to enable a superbackbone peering for Layer 2 VPN signaling.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

<https://ccdewiki.wordpress.com/2013/07/02/inter-as-l2vpn-mpls-solutions/>

**QUESTION 58**

Refer to the exhibit. Which IOS command under the BGP VPNv4 address family implements a secondary backup path to the destination 192.168.1.1?



```
router#sh bgp ipv4 uni 192.168.1.1

...(ommitted outpuy)

Paths: (2 available, best #1, table TEST)
  Additional-path
  Not advertised to any peer
  65000 64912, imported path from 65000:10001:10.45.12.132/31
    192.168.1.1 (metric 122) from 172.16.232.1 (172.16.232.1)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      Community: 65000:64912
      Extended Community: RT: 65000:10000, recursive-via-host
      mpls labels in/out nolabel/16
  65000 64912, imported path from 65000:10002:10.45.12.132/31
    192.168.1.2 (metric 123) from 172.16.232.1 (172.16.232.1)
      Origin incomplete, metric 0, localpref 100, valid, internal, backup/repair
      Community: 65000:64912
      Extended Community: RT: 65000:10000, recursive-via-host
      mpls labels in/out nolabel/259
```

- A. maximum-paths ibgp2
- B. bgp additional-paths install
- C. bgp recursion host
- D. bgp advertise-best-external

**Correct Answer:** B

**Section:** (none)

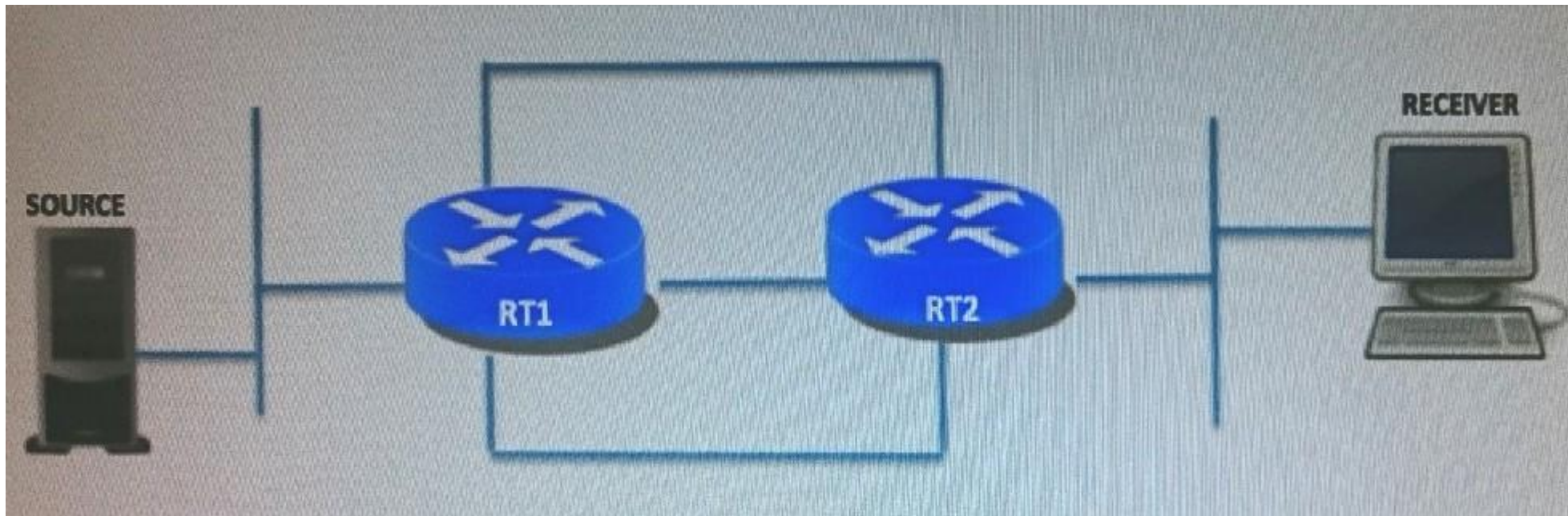
## Explanation

### Explanation/Reference:

[http://www.cisco.com/c/en/us/td/docs/routers/crs/software/crs\\_r4-2/routing/command/reference/b\\_routing\\_cr42crs/b\\_routing\\_cr42crs\\_chapter\\_01.html#wp2841279186](http://www.cisco.com/c/en/us/td/docs/routers/crs/software/crs_r4-2/routing/command/reference/b_routing_cr42crs/b_routing_cr42crs_chapter_01.html#wp2841279186)

### QUESTION 59

Refer to the exhibit. Router RT1 has three equal-cost paths back to the source. Which configuration should be applied in order to load-balance the multicast traffic across all three links.



- A. Create three static multicast routes where each pointing out to one or three interfaces.
- B. Enable PIM multipath.
- C. Create a tunnel interface between RT1 and RT2. Enable PIM on the interface tunnel and disable PIM on the three interfaces part of equal-cost path between RT1 and RT2.
- D. PIM load balance is not possible. PIM only chooses one interface for RFC check and prunes the other interfaces.

**Correct Answer: C**

**Section: (none)**

**Explanation**

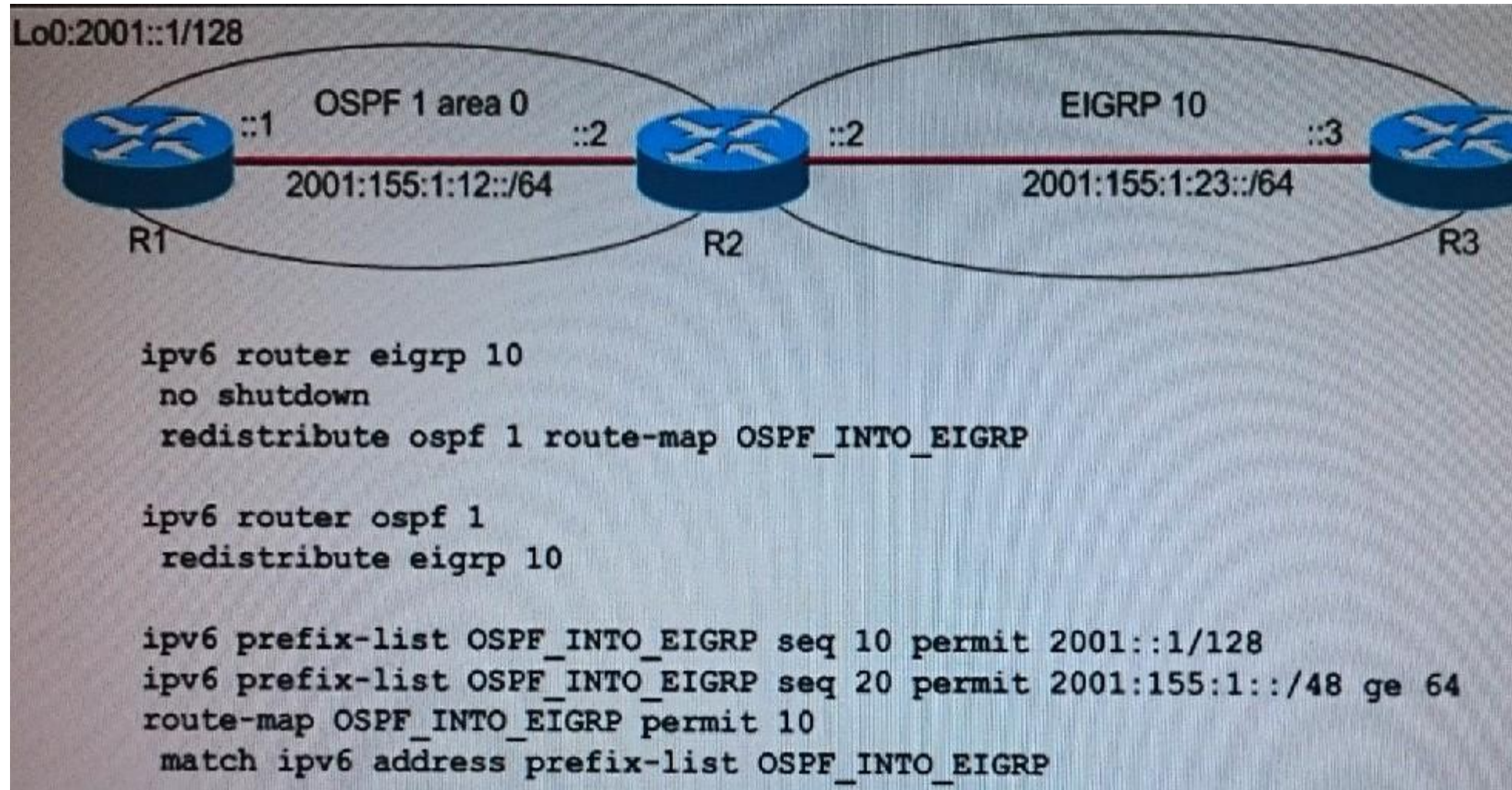


**Explanation/Reference:**

Reference: <http://www.cisco.com/c/en/us/support/docs/ip/ip-multicast/16450-mcastguide0.html>

**QUESTION 60**

Refer to the exhibit. R3 cannot install a route to R1-R2 subnet 2001:1:155:12::/64. Which action resolves this issue?



A. Add the **redistribute ospf 1 include-connected** command under the **ipv6 router eigrp 10** process.

- B. For the OSPF process, add the **no shutdown** command.
- C. For prefix-list **OSPF\_INT0\_EIGRP seq 20**, replace the prefix with **2001:155:1:12::/64**.
- D. For route-map **OSPF\_INT0\_EIGRP**, add the **set metric 1000 1 255 1 1500** command.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

<http://www.ciscopress.com/articles/article.asp?p=2273507&seqNum=8>

<https://supportforums.cisco.com/document/12110191/understand-include-connected-keyword-use-ipv6-redistribution>

#### **QUESTION 61**

A network administrator wants to implement an IP dampening feature for a network. Which parameter identifies how fast the accumulated penalty can decay exponentially?

- A. reuse threshold
- B. suppress threshold
- C. half-life period
- D. maximum suppress time

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: [http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/iproute\\_pi/configuration/15-sy/iri-15-sy-book/iri-ip-event-damp.html](http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/iproute_pi/configuration/15-sy/iri-15-sy-book/iri-ip-event-damp.html)

#### **QUESTION 62**

Refer to the exhibit. Which statement is true?

```
RP/0/RP1/CPU0:PE1#show bgp vpnv4 unicast vrf one 10.2.2.0/24
BGP routing table entry for 10.2.2.0/2, Route Distinguisher: 1:1
```

```
  Versions:
```

```
    Process          bRIB/RIB      SendTblVer
```

```
    Speaker           212          212
```

```
Last modified: Oct 2 17:33:03.837 for 3d22h
```

```
Paths: (1 available, best #1)
```

```
  Not advertised to any peer
```

```
  Path #1: Received by speaker 0
```

```
  Not advertised to any peer
```

```
  Local
```

```
    10.1.100.2 (metric 26) from 10.1.100.7 (10.1.100.2)
```

```
      Received Label 16004
```

```
      Origin incomplete, metric 0, localpref 100, valid, internal, best, group-best, import-candidate,
imported, single forwarder PE
```

```
      Received Path ID 0, Local Path ID 1, version 212
```

```
      Extended community: VRF Route Import:10.1.100.2:3 Source AS:1:0 RT:1:1
```

```
      Originator: 10.1.100.2, Cluster list: 10.1.100.7
```

```
      Connector: type: 1, Value:1:2:10.1.100.2
```

```
      Source VRF: default, Source Route Distinguisher: 1:2
```

- A. This is an inter autonomous unicast route.
- B. The BGP MED value is 26.
- C. This is an mVPN route.
- D. The route target value is 10.1.100.2:3.
- E. There is a route reflector in this network.
- F. The route did not import this route into the **VRF one**.

**Correct Answer:** E

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 63**

What BGP feature improves on DDOS mitigation by allowing instructions that are more granular and allow for source address, destination, address, L4 details, and packet specifics to be analyzed?

- A. RCMD
- B. RTBH
- C. BGP Flowspec
- D. BGPSec

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

<https://supportforums.cisco.com/document/12226726/asr9000xr-understanding-bgp-flowspec-bgp-fs>

**QUESTION 64**

When troubleshooting a DoS attack, a support engineer finds a huge number of packets that are destined to one of the core routers interface IP address. By the time the packets reach this core router, they have a TTL of 0. Based on Cisco platform running IOS 15.3S, which technique is most effective in resolving this problem?

- A. Configure LPTS.
- B. Configure an ACL on the core router interface.
- C. Configure CoPP on the core router.
- D. Configure policing on PE routers.
- E. Configure a receive ACL on the core router.

**Correct Answer: C**

**Section: (none)**

**Explanation**

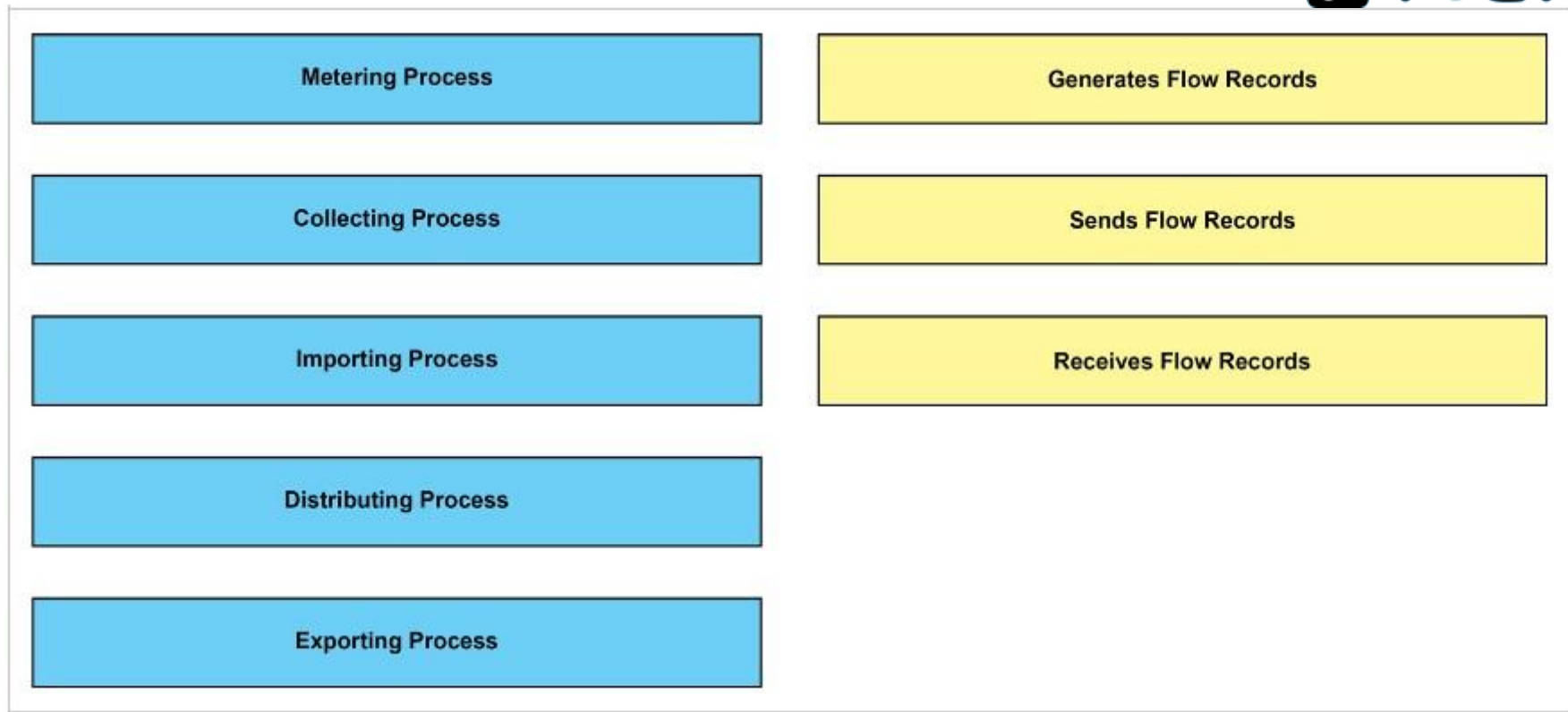
**Explanation/Reference:**

**QUESTION 65**

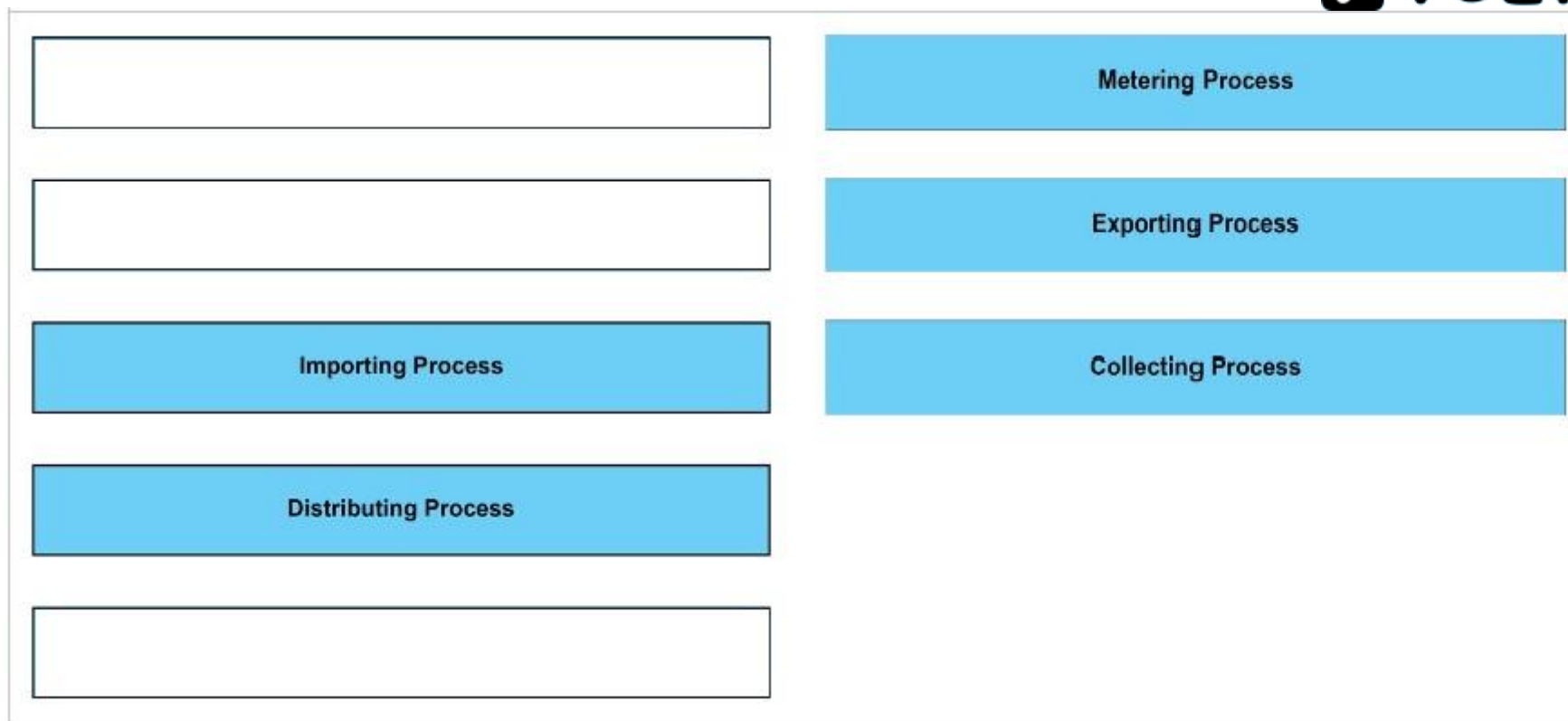
**DRAG DROP**

Drag and drop the IPFIX terminology on the left to the correct description on the right. Not all options will be used.

**Select and Place:**



**Correct Answer:**



**Section: (none)**

**Explanation**

**Explanation/Reference:**

Reference: <https://tools.ietf.org/html/rfc5101>

**QUESTION 66**

Refer to the exhibit. The configuration in the exhibit redistributes static route 172.16.0.0/24 into BGP. Which action does the route-map STATIC-TO-BGP do?

```
configure t
!  
ip route 172.16.0.0 255.255.255.0 null0  
!  
access-list 100 permit ip 172.16.0.0.0.0.0.255 any  
!  
route-map STATIC-TO-BGP permit 10  
    match ip address 100  
    set community no-export  
route-map STATIC-TO-BGP deny 100  
!  
router bgp 100  
    redistribute static-route map STATIC-TO-BGP  
!  
end
```

A. Route 172.16.0.0/24 cannot be sent to the Internet.

- B. Route 172.16.0.0/24 cannot be re-advertised beyond its neighbors.
- C. Route 172.16.0.0/24 cannot be advertised outside of AS 100.
- D. Route 172.16.0.0/24 cannot be exported from BGP to another protocol.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 67**

For MPLS inter-AS Option B, how many labels are associated with packet forwarding between the VPNv4 ASBR neighbors?

- A. 0
- B. 1
- C. 2
- D. 3

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

[http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/iproute\\_bgp/configuration/xr-3s/irg-xr-3s-book/bgp\\_nsr\\_support\\_for\\_mpls\\_vpnv4\\_and\\_vpnv6\\_inter-as\\_option\\_b.pdf](http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/iproute_bgp/configuration/xr-3s/irg-xr-3s-book/bgp_nsr_support_for_mpls_vpnv4_and_vpnv6_inter-as_option_b.pdf)

#### **QUESTION 68**

Which two statements about 10 Gigabit Ethernet WAN PHY mode are true? (Choose two.)

- A. The signal maps to an OC-192c/STM-64c payload.
- B. The nominal speed is 9.95328 Gbps.
- C. It is compatible with Packet Ethernet over SONET.
- D. The signal maps to an OC-768c/STM-256c payload.
- E. It is compatible with Packet over SONET.
- F. The nominal speed is 10.3125 Gbps.

**Correct Answer:** AB

**Section:** (none)

**Explanation**



**Explanation/Reference:**

[https://en.wikipedia.org/wiki/10\\_Gigabit\\_Ethernet](https://en.wikipedia.org/wiki/10_Gigabit_Ethernet)

**QUESTION 69**

In a secure domain router scenario, which two functions are shared amongst all SDR in the system? (Choose two.)

- A. configuration
- B. protocols
- C. routing tables
- D. chassis-control
- E. switch-fabric

**Correct Answer:** DE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Secure domain routers (SDRs) provide a means of partitioning a router into multiple, independent routers. SDRs perform routing functions in the same manner as a physical router but share resources with the rest of the system. For example, the applications, configurations, protocols, and routing tables assigned to an SDR belong to that SDR only, but other functions such as chassis control, switch fabric, and partitioning are shared with the rest of the system.

Reference: [http://www.cisco.com/c/en/us/td/docs/routers/crs/software/crs\\_r4-3/system\\_management/command/reference/b\\_sysman\\_cr43crs/b\\_sysman\\_cr43crs\\_chapter\\_01110.html](http://www.cisco.com/c/en/us/td/docs/routers/crs/software/crs_r4-3/system_management/command/reference/b_sysman_cr43crs/b_sysman_cr43crs_chapter_01110.html)

**QUESTION 70**

In which way does the DS-Lite IPv6 transitioning mechanism differ from IPv6 Dual-Stack?

- A. DS-Lite is a combination of tunnel and translation technologies.
- B. DS-Lite is a transition technology that gives full IPv6 connectivity for IPv6 capable hosts that are on the IPv4 Internet but have no native connection to an IPv6 network.
- C. DS-Lite is an automatic tunnel where the tunnel destination is determined by the IPv4 address extracted from the IPv6 address that starts with the prefix 2002::/16.
- D. DS-Lite is a stateless tunneling mechanism with a lightweight and secure manner without requiring upgrades to existing IPv4 access network infrastructure.

**Correct Answer:** A

**Section:** (none)

### Explanation

#### Explanation/Reference:

[http://www.cisco.com/c/en/us/products/collateral/service-provider/carrier-grade-ipv6-solution/white\\_paper\\_c11-558744-00.html](http://www.cisco.com/c/en/us/products/collateral/service-provider/carrier-grade-ipv6-solution/white_paper_c11-558744-00.html)

#### QUESTION 71

What is the main advantage of H-VPLS over VPLS?

- A. H-VPLS provides redundancy.
- B. H-VPLS provides security.
- C. H-VPLS improves the scalability.
- D. H-VPLS allows a broader use of protocols.

**Correct Answer: C**

**Section: (none)**

### Explanation

#### Explanation/Reference:

[http://www.cisco.com/en/US/products/ps6603/products\\_white\\_paper09186a00801ed506.shtml](http://www.cisco.com/en/US/products/ps6603/products_white_paper09186a00801ed506.shtml)

#### QUESTION 72

Which MPLS technology will achieve LAN extensions over the service provider backbone?

- A. AToM
- B. VPLS
- C. L2VPN
- D. L2TPv3

**Correct Answer: B**

**Section: (none)**

### Explanation

#### Explanation/Reference:

<https://tools.ietf.org/html/rfc7041>

#### QUESTION 73

Which two statements about forwarding equivalence class (FEC) are true? (Choose two)

- A. FEC might correspond to a destination IP subnet, but it might also correspond to any traffic class that the edge LSR considers significant.
- B. FEC is a group of IP packets that is forwarded over a different path, but with the same forwarding treatment.

- C. FEC is a group of IP packets that is forwarded over the same path, and with the same forwarding treatment.
- D. FEC is a group of IP packets that is forwarded over a different path, but with the different forwarding treatment.
- E. FEC is a group of IP packets that is forwarded over the same path, but with a different forwarding treatment.

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 74**

Cisco IOS XR has implemented a nonstop routing feature so that when RP failover occurs, the routing information can be recovered locally. Which protocol does not support the NSR feature?

- A. OSPF
- B. LDP
- C. BGP
- D. IS-IS
- E. RSVP

**Correct Answer:** E

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 75**

What is the minimum hardware configuration of the multishelf Cisco CRS-1 system?

- A. One route processor (RP) card and one modular services card (MSC)
- B. One distributed route processor (DRP) and one S13 fabric card (SFC)
- C. One line card chassis (LCC) and one fabric card chassis (FCC)
- D. One route processor (RP) and one fabric card chassis (FCC)
- E. One line card chassis (LCC) and one S13 fabric card (SFC)

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

1.4. SP high end product

A minimum of one LCC and one FCC are required to configure a multishelf system.