

Nokia Services Architecture

(exam number: 4A0-104)

The following questions will test your knowledge and prepare you for the Nokia Services Architecture Fundamentals written exam. Compare your responses with the Answer Key at the end of the document.

1. Which of the following services provides a Layer 2 multipoint-to-multipoint VPN service?
 - A. VPWS
 - B. VPLS
 - C. VPRN
 - D. IES
2. Which of the following statements about transport tunnels used by services is TRUE?
 - A. A transport label remains unchanged across the service provider's network.
 - B. Two service tunnels cannot be bound to the same transport tunnel.
 - C. Multiple transport tunnels can be carried on a single network port.
 - D. Packets transmitted on a GRE transport tunnel do not have a service label
3. Which of the following statements about SDPs is TRUE?
 - A. An SDP is specific to one service type.
 - B. An SDP uses the system IP address to identify the far-end router.
 - C. An SDP can simultaneously support GRE and MPLS encapsulation.
 - D. SDP IDs must be globally unique.
4. Which of the following about how MPLS transport tunnels are used in a service provider network is TRUE?
 - A. The MPLS transport tunnels are used to signal the type of service being used by the customer.
 - B. The MPLS transport tunnels are used by PE routers to identify to which customer the data belongs.
 - C. The MPLS transport tunnels are used to exchange Layer 2 service labels between PE routers.
 - D. The MPLS transport tunnels are used to transmit customer data across the service provider network.



5. Which of the following descriptions best defines a Service Distribution Point (SDP)?
 - A. Logical representation of the transport tunnel that delivers customer data to the egress PE.
 - B. Subscriber's point of entry to the service provider network.
 - C. Identifier used to signal service labels.
 - D. Identifier used to group services together for accounting purposes.
6. Which of the following SAP encapsulations does NOT support multiple services on a port?
 - A. Dot1q
 - B. Null
 - C. QinQ
 - D. ATM
7. Which of the following statements about SAP 1/1/1:7.* is FALSE?
 - A. It accepts only Q-in-Q frames with an outer tag of 7 and an inner tag of any value.
 - B. The outer tag of an accepted frame is stripped.
 - C. The inner tag of an accepted frame is passed transparently.
 - D. Port 1/1/1 must be configured for Q-in-Q Ethernet encapsulation.
8. An IES interface is configured with a spoke SDP that uses GRE encapsulation. The network port associated with the SDP has an MTU of 9000 bytes. What is the VC-MTU for the IES?
 - A. 8944
 - B. 8964
 - C. 8978
 - D. 8986
9. A dot1Q SAP 1/1/1:* configured on an ePipe service on a Nokia 7750 SR has an MTU of 1518 bytes. What should the configured value of the service MTU be so that the ePipe carries full-size Ethernet frames received on the default SAP?
 - A. 1510
 - B. 1514
 - C. 1518
 - D. 1522
10. Consider an ePipe service configured with SAP 1/1/1:10.11 at one site and SAP 1/1/2:20 at the other site. If SAP 1/1/1:10.11 accepts an ingress frame, which of the following statements is TRUE?
 - A. The frame is dropped at the egress SAP 1/1/2:20.
 - B. The frame egresses 1/1/2:20 with an outer VLAN tag of 20 and an inner tag of 11.
 - C. The frame egresses 1/1/2:20 with a VLAN tag of 20.
 - D. The frame egresses 1/1/2:20 with a VLAN tag of 11.

11. Which of the following SAPs accepts all untagged, dot1Q, or Q-in-Q frames, and forwards VLAN tags transparently across a service?
- SAP 1/1/1
 - SAP 1/1/1:1.*
 - SAP 1/1/1:0
 - SAP 1/1/1:1
12. An ePipe service receives a frame on SAP 1/1/2:7 and transmits it on SAP 1/1/2:5.20. Which of the following statements about the transmitted frame is TRUE?
- The frame will have an outer VLAN tag of 5 and an inner tag of 20.
 - The frame will have an outer VLAN tag of 5, followed by a tag of 20, and an innermost tag of 7.
 - The frame will have a single VLAN tag of 7.
 - The frame will have a single VLAN tag of 20.
13. Consider the exhibit. The SDP used for ePipe service 10 uses MPLS encapsulation. Based on the given output, what is the MTU of the network port associated with the spoke SDP?

```
R01# show service id 10 base
```

Service Basic Information					
Service Id	: 10	Vpn Id	: 0		
Service Type	: Epipe				
MACSec enabled	: no				
Name	: epipe1				
Description	: (Not Specified)				
Customer Id	: 1	Creation Origin	: manual		
Last Status Change	: 05/22/2025 14:13:27				
Last Mgmt Change	: 05/22/2025 14:13:14				
Test Service	: No				
Admin State	: Up	Oper State	: Up		
MTU	: 1514				
Vc Switching	: False				
SAP Count	: 1	SDP Bind Count	: 1		
Per Svc Hashing	: Disabled	Lbl Eth/IP L4 TEID	: Disabled		
Ignore MTU Mismatch	: Disabled				
Vxlan Src Tep Ip	: N/A				
Force QTag Fwd	: Disabled				
Lcl Switch Svc St	: sap				
Oper Group	: <none>				

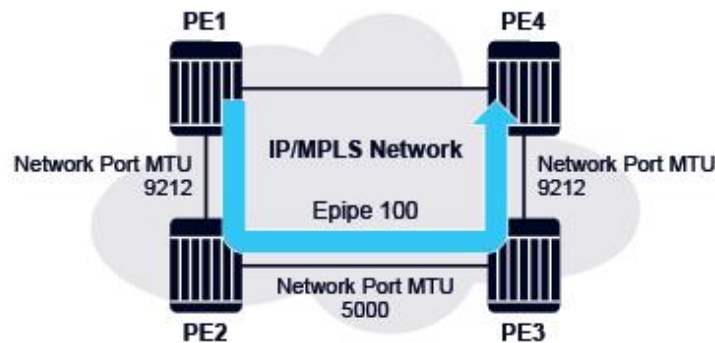
Service Access & Destination Points					
Identifier	Type	AdmMTU	OprMTU	Adm	Opr
sap:1/1/2	null	1514	1514	Up	Up
sdp:8:10 S(10.10.10.8)	Spok	0	8914	Up	Up

- 8914 bytes
- 8922 bytes
- 8928 bytes
- 8934 bytes
- 8936 bytes

14. Which of the following statements about ePipe service configuration on the Nokia 7750 SR is FALSE?

- A. VC-IDs must match on both PEs.
- B. Service MTU values must match on both PEs.
- C. The port associated with SAP must be in access mode.
- D. SDP ID values must match on both PEs.

15. Consider the exhibit. PE1 has an ePipe service that is using RSVP-TE LSP with ad spec enabled as the transport for the SDP. What is the effective SDP path MTU of the ePipe service on PE1?



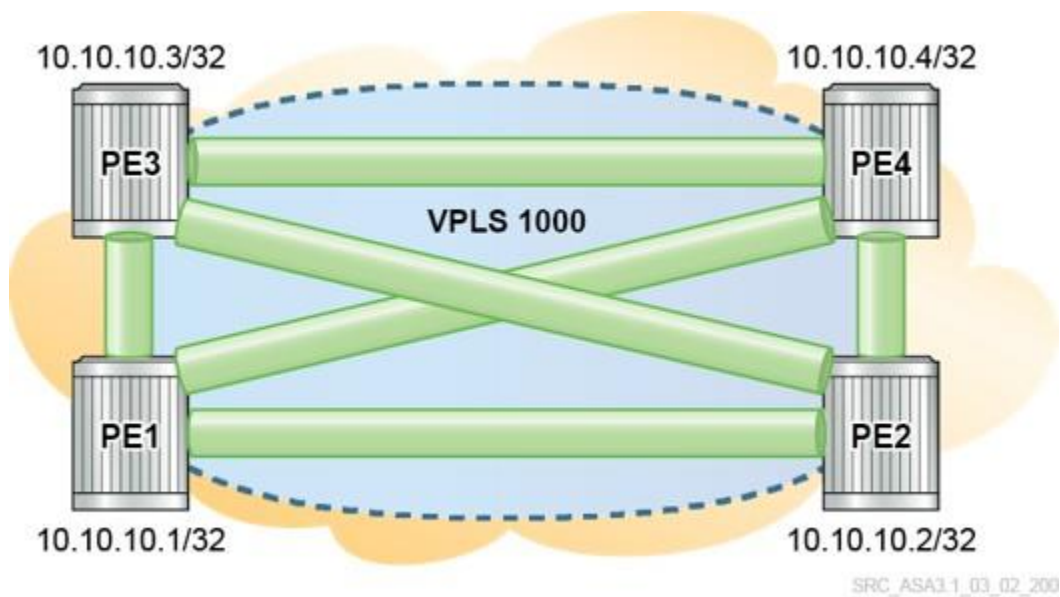
BRG_NRSBQ1.0_01_010

- A. 4964 bytes
- B. 4978 bytes
- C. 5000 bytes
- D. 9190 bytes
- E. 9212 bytes

16. Which of the following statements about traffic flooding within a VPLS is FALSE?

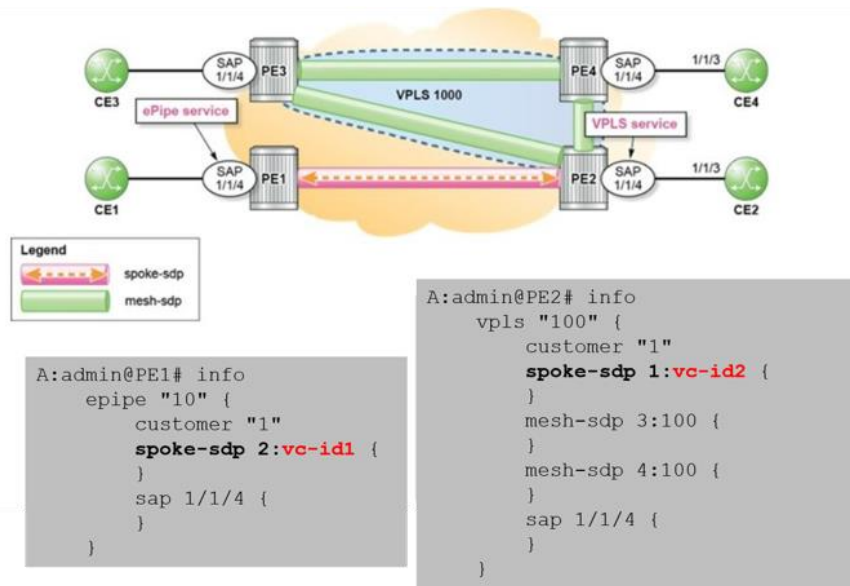
- A. Unknown traffic received on a spoke SDP is transmitted to all the SAPs in the VPLS.
- B. Unknown traffic received on an SAP is transmitted to all other SAPs in the VPLS.
- C. Unknown traffic received on an SAP is transmitted to mesh SDPs in the VPLS.
- D. Unknown traffic received on a mesh SDP is transmitted to other mesh SDPs in the VPLS.

17. Which of the following statements about SDPs in a VPLS is FALSE?
- A. The type of SDP determines how flooded traffic is transmitted.
 - B. Mesh SDPs ensure that all PEs receive only one instance of a broadcast frame.
 - C. Spoke SDPs require the routers at both ends to be directly connected.
 - D. Mesh SDPs and spoke SDPs can be used in the same VPLS.
18. Which of the following statements about VPLS MAC learning is FALSE?
- A. Both customer CE routers and PEs perform MAC learning.
 - B. PEs maintain a separate FDB for each VPLS configured on the router.
 - C. The FDB only stores the MAC addresses of the customer's attached devices.
 - D. After a PE floods a frame, all PE routers in the VPLS learn the source MAC address of the frame.
19. Consider the exhibit. VPLS 1000 is configured on all PE routers in the shown network. How many service labels must be signaled among the PE routers to bring up the fully meshed VPLS?



- A. 1
- B. 4
- C. 8
- D. 12
- E. 16

20. Consider the exhibit. ePipe 10 is configured to terminate on VPLS 100 as shown in the exhibit. Which of the following statements is TRUE about the values of vc-id1 and vc-id2 for the ePipe service to be operationally UP?



- A. vc-id1 must be set to 10 and vc-id2 must be set to 100.
- B. vc-id1 and vc-id2 must be set to same value.
- C. vc-id1 and vc-id2 must be set to 10.
- D. vc-id1 and vc-id2 must be set to 100.
21. What happens by default on a Nokia 7750 SR when a tagged frame is received at the ingress of SAP 1/1/1:* in a VPLS?
- A. The FCS is kept in the customer frame. The VLAN tag is kept and transported over the network.
- B. The FCS is kept in the customer frame. The VLAN tag is removed.
- C. The FCS is removed from the frame. The VLAN tag is kept and transported over the network.
- D. The FCS is removed from the frame. The VLAN tag is removed.
22. Which of the following statements distinguishes a VPLS service from a VPWS service?
- A. VPLS can signal service labels using T-LDP protocol.
- B. VPLS performs MAC learning to build an FDB containing the addresses of customer devices.
- C. VPLS supports SAP encapsulations of type null, dot1Q and Q-in-Q.
- D. VPLS can operate over a single local site or over geographically-dispersed sites.

23. Which of the following statements is TRUE when a broadcast frame is received on a mesh SDP in a VPLS?

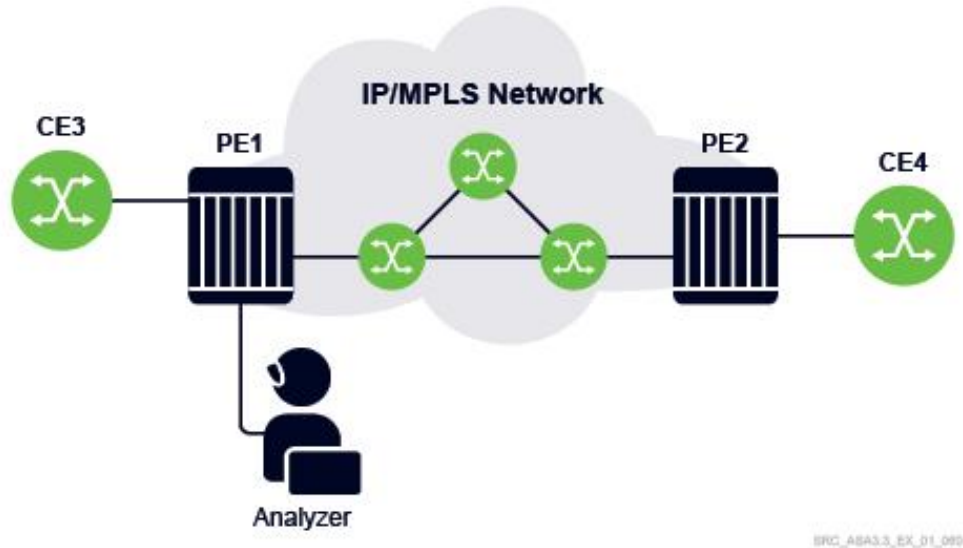
- A. The broadcast frame is flooded to every SAP, spoke SDP, and mesh SDP.
- B. The broadcast frame is flooded only on every SAP.
- C. The broadcast frame is flooded on every SAP and spoke SDP.
- D. The broadcast frame is discarded to prevent a forwarding loop.

24. Consider the exhibit. Which of the following causes the highlighted mesh SDPs to be operationally down on both PE1 and PE3?

PE1# show service id 500 base		PE3# show service id 200 base	
<pre>===== Service Basic Information ===== Service Id : 500 Vpn Id : 0 Service Type : VPLS MACSec enabled : no Name : vpls1 Description : (Not Specified) Customer Id : 500 Creation Origin : manual Last Status Change: 05/22/2025 14:31:37 Last Mgmt Change : 05/22/2025 14:31:37 Etree Mode : Disabled Admin State : Up MTU : 1514 SAP Count : 0 Snd Flush on Fail: Disabled SHCV pol IPv4 : None Propagate MacFlush: Disabled Allow IP Intf Bind: Disabled Fwd-IPv4-Mcast-To*: Disabled Mcast IPv6 scope : mac-based Def. Gateway IP : None Temp Flood Time : Disabled Temp Flood Chg Cnt: 0 SPI load-balance : Disabled TEID load-balance: Disabled Lbl Eth/IP L4 TEID: Disabled Src Tep IP : N/A Vxlan ECMP : Disabled MPLS ECMP : Disabled Ignore MTU Mismatch*: Disabled Tunnel ELMI : Disabled =====</pre>		<pre>===== Service Basic Information ===== Service Id : 200 Vpn Id : 0 Service Type : VPLS MACSec enabled : no Name : vpls1 Description : (Not Specified) Customer Id : 200 Creation Origin : manual Last Status Change: 05/22/2025 14:31:37 Last Mgmt Change : 05/22/2025 14:31:37 Etree Mode : Disabled Admin State : Up MTU : 1514 SAP Count : 0 Snd Flush on Fail: Disabled SHCV pol IPv4 : None Propagate MacFlush: Disabled Allow IP Intf Bind: Disabled Fwd-IPv4-Mcast-To*: Disabled Mcast IPv6 scope : mac-based Def. Gateway IP : None Temp Flood Time : Disabled Temp Flood Chg Cnt: 0 SPI load-balance : Disabled TEID load-balance: Disabled Lbl Eth/IP L4 TEID: Disabled Src Tep IP : N/A Vxlan ECMP : Disabled MPLS ECMP : Disabled Ignore MTU Mismatch*: Disabled Tunnel ELMI : Disabled =====</pre>	
<pre>===== Service Access & Destination Points ===== Identifier Type AdmMTU OprMTU Adm Opr ----- sdp:2:500 M(10.10.10.2) Mesh 0 8914 Up Up sdp:3:500 M(10.10.10.3) Mesh 0 8914 Up Down sdp:4:500 M(10.10.10.4) Mesh 0 8914 Up Up =====</pre>		<pre>===== Service Access & Destination Points ===== Identifier Type AdmMTU OprMTU Adm Opr ----- sdp:1:200 M(10.10.10.1) Mesh 0 1492 Up Down sdp:2:200 M(10.10.10.2) Mesh 0 1492 Up Down sdp:4:200 M(10.10.10.4) Mesh 0 1492 Up Down =====</pre>	

- A. The SDP IDs are different between PE1 and PE3.
- B. The SDP path MTUs are different between PE1 and PE3.
- C. The VPLS is disabled on PE3.
- D. The VC-IDs are different between PE1 and PE3.

25. Consider the exhibit. The operator at PE1 wants to analyze traffic between PE2 and CE4. On a Nokia 7750 SR, which of the following is NOT required as part of the configuration?



- A. PE1 needs a mirror destination with the remote source specified.
 - B. PE2 needs a mirror destination with an SDP specified.
 - C. PE1 needs a mirror source specified.
 - D. PE2 needs a mirror source specified.
26. Which of the following statements about mirror slicing on a Nokia 7750 SR is FALSE?
- A. It allows network operators to monitor only the customer data portion that they need to analyze.
 - B. It supports the configuration of multiple slices in a mirror service.
 - C. It reduces the size of the data that is replicated.
 - D. It is configured in the mirror destination context.
27. Which of the following statements about the "oam lsp-trace" command on a Nokia 7750 SR is FALSE?
- A. It is used for hop-by-hop fault localization and path tracing.
 - B. The MPLS echo request packet is sent to the control plane of each transit LSR.
 - C. Each transit LSR performs various checks to verify that it is indeed a transit LSR for the LSP path.
 - D. It verifies the LSP path in both directions.



28. Consider the exhibit. The svc-ping tool is used on the Nokia 7750 SR PE1 to verify the end-to-end connectivity of ePipe 100. The far end PE router has an IP address of 10.10.10.6. Which of the following statements is TRUE?

```
PE1# oam svc-ping 10.10.10.6 service 100 local-sdp
```

- A. The ping is sent to the far end in-band using the SDP.
 - B. The return ping from the far end to PE1 is sent in-band.
 - C. The command tests the round-trip connectivity of the ePipe service.
 - D. The command output shows the hops taken between PE1 and the far end.
29. What is the purpose of using the "oam svc-ping" command?
- A. It is used to verify the end-to-end connectivity for a service.
 - B. It is used to verify if an MPLS LSP reaches the egress LER for a FEC.
 - C. It is used to verify the MTU for an SDP in an MPLS network.
 - D. It is used to verify the path of an MPLS LSP for a FEC.
 - E. It is used to verify connectivity for an SDP in an MPLS network.
30. Which of the following statements is TRUE when configuring a local mirror service on a Nokia 7750 SR?
- A. The mirror source must be configured before the mirror destination service.
 - B. The mirror source must specify a SAP ID as source type.
 - C. The mirror destination must specify an SDP as mirror destination.
 - D. The mirror source ID must be the same as the mirror destination service ID.

31. Consider the exhibit. IES 100 on PE1 has a spoke termination to VPLS 10 on PE2. The service MTU of VPLS 10 is set to 1514. Which of the following configurations is required to bring the shown SDP up?

```
*A:PE1# show service id 100 sdp 2:100 detail
Service Destination Point (Sdp Id : 2:100) Details
=====
Sdp Id 2:100  -(10.10.10.2)
SDP Id       : 2:100                      Type           : Spoke
VC Type      : Ether                      VC Tag          : n/a
Admin Path MTU : 0                        Oper Path MTU    : 1556
< .. output omitted .. >
Class Fwding State : Down
Flags          : ServiceMTUMismatch
< .. output omitted .. >
```

- A. Set the ip-mtu of the IES to 1514.
 - B. Set the ip-mtu of the IES to 1500.
 - C. Set the service MTU of VPLS 10 to 1578.
 - D. Set the service MTU of VPLS 10 to 1542.
32. Which of the following statements about a VPRN service label is TRUE?
- A. It is pushed onto customer packets by the CE.
 - B. It is used to identify which VPRN a packet belongs to.
 - C. It contains the customer's IP address.
 - D. It is exchanged for a transport label during transport.
33. Which of the following configuration steps is NOT required for the successful operation of a VPRN service on Nokia 7750 SRs?
- A. Configure SDPs between PE routers.
 - B. Configure an IGP for the provider core routing.
 - C. Configure MP-BGP between PE routers.
 - D. Configure a CE-PE routing protocol.

34. Consider the exhibit. Based upon the output shown, how many prefixes has PE1 learned from other PEs for VPRN service 10?

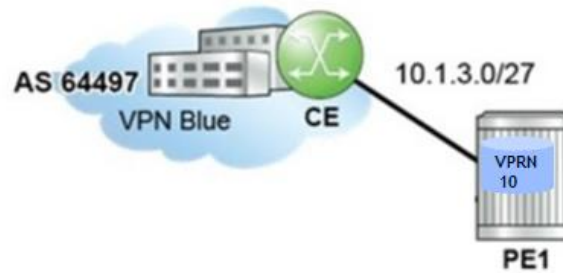
```

PE1# show router 10 fib 1
=====
FIB Display
=====
Prefix                                     Protocol
  NextHop
-----
10.1.3.0/27                               LOCAL
   10.1.3.0 (toCE1)
10.2.4.0/27                               BGP_VPN
   10.10.10.2 (VPRN Label:131069 Transport:LDP)
10.10.10.3/32                             BGP
   10.1.3.3 Indirect (toCE1)
10.10.10.4/32                             BGP_VPN
   10.10.10.2 (VPRN Label:131069 Transport:LDP)
192.168.1.0/27                             BGP
   10.1.3.3 Indirect (toCE1)
192.168.2.0/27                             BGP_VPN
   10.10.10.2 (VPRN Label:131069 Transport:LDP)
-----
Total Entries : 6
-----

```

- A. 0
- B. 2
- C. 3
- D. 6

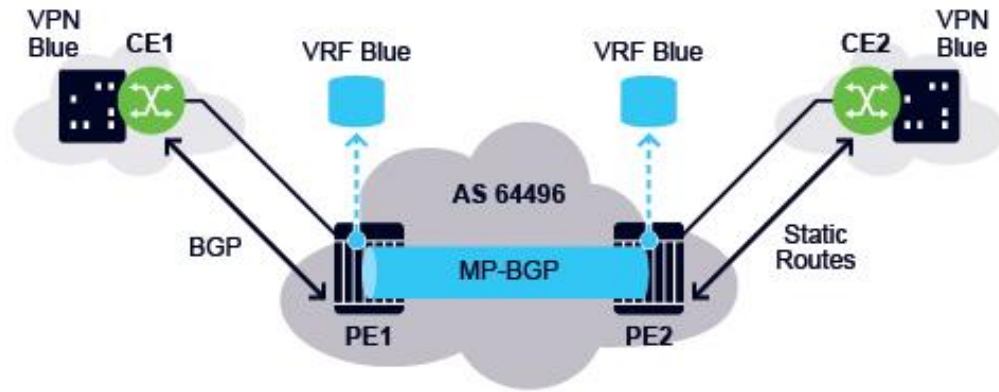
35. Consider the exhibit. BGP is used as the PE-CE routing protocol in VPRN 10, as shown. Which of the following statements about BGP configuration on PE1 is TRUE?



```
(gl)[/configure service]
A:admin@PE1# info
  vprn "10" {
    <..output omitted..>
    autonomous-system 64496
    bgp {
      group "toCE1" {
        peer-as 64497
        family {
          ipv4 true
        }
      }
      neighbor "10.1.3.3" {
        group "toCE1"
      }
    }
  }
}
```

- A. "family vpn-ipv4 true" must be added to the BGP configuration.
 - B. An export policy must be added to the BGP configuration.
 - C. The system IP address of CE must be used as the neighbor address.
 - D. The BGP configuration is complete.
36. Which of the following is NOT a characteristic of an IES?
- A. The SAP of an IES interface has QoS, accounting, and billing capabilities.
 - B. Multiple interfaces can be configured in a single IES.
 - C. All IP interfaces created within an IES belong to the same customer.
 - D. Each IES creates a VRF table to isolate routes from different customers.

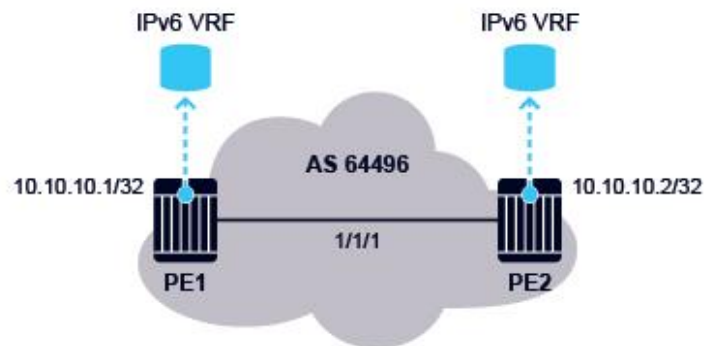
37. Consider the exhibit. Which of the following is FALSE when exporting routes in this VPRN topology?



BRG_HRBISQ1.0_01_020

- A. An export policy is required on CE1 to advertise CE1's loopback interfaces to PE1.
 - B. An export policy is required on PE1 when propagating MP-BGP routes to CE1.
 - C. An export policy is NOT required on CE2 due to the static routes.
 - D. An export policy is required on PE2 to propagate routes for CE2 to PE1.
38. Which of the following statements about 6VPE is TRUE?
- A. PEs must use a default static route to reach to the far end remote CEs.
 - B. PEs require IPv6 enabled on all interfaces.
 - C. PEs must use MP-BGP VPN-IPv6 address family.
 - D. CEs must be dual stack routers.
39. Which of the following statements about an R-VPLS service is FALSE?
- A. Both VPRN and IES interfaces are supported.
 - B. A VPLS service can only be bound to a single IP interface.
 - C. It allows the connection of a Layer 2 service to a Layer 3 service across two different routers.
 - D. Can be thought of as an internal hairpin between a Layer 2 and a Layer 3 interface.

40. Consider the exhibit. The two PEs are providing 6VPE and IPv4 VPRNs. The core network is IPv4/MPLS. Which of the following is the BGP family configuration for the MP-BGP on the PEs?



SRG_ASAS3_EX_01_039

- A.

```
family {
    ipv4 true
    ipv6 true
}
```
- B.

```
family {
    vpn-ipv4 true
    ipv6 true
}
```
- C.

```
family {
    vpn-ipv4 true
    vpn-ipv6 true
}
```
- D.

```
family {
    ipv6 true
    vpn-ipv6 true
}
```



Answer Key

1. B	11. A	21. C	31. B
2. C	12. A	22. B	32. B
3. B	13. E	23. C	33. A
4. D	14. D	24. D	34. C
5. A	15. B	25. C	35. B
6. B	16. D	26. B	36. D
7. A	17. C	27. D	37. D
8. A	18. A	28. A	38. C
9. C	19. D	29. A	39. C
10. C	20. B	30. D	40. C

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Document code:SR1911039726EN (July) CID 207218