Practice Exam Questions for Nokia SR Linux EVPN and Data Center Interconnect (exam number: 4A0-D03)

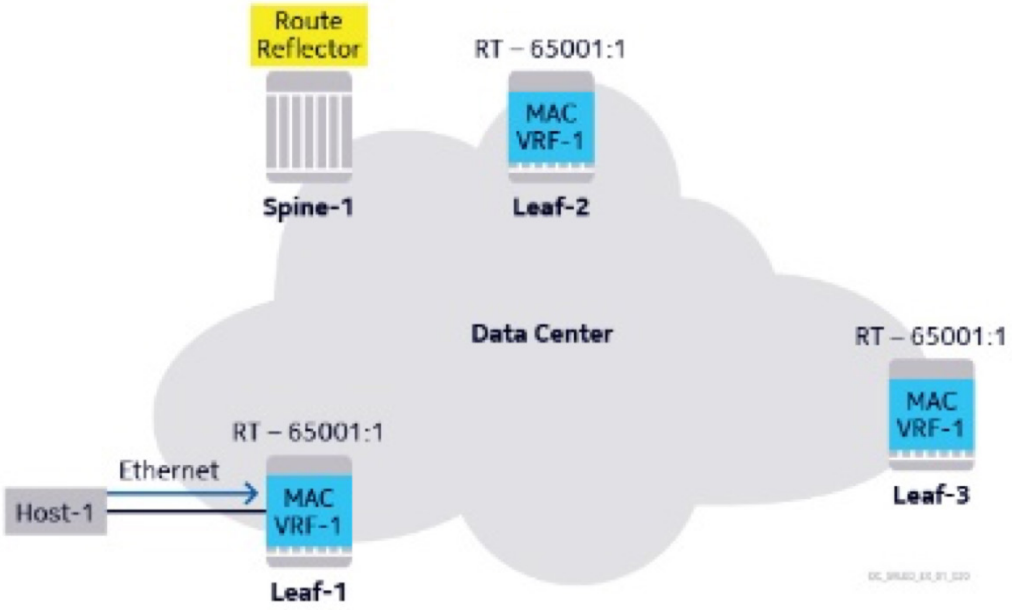
The following questions will test your knowledge and help prepare you for the Nokia SR Linux EVPN and Data Center Interconnect written exam. Compare your responses with the Answer Key at the end of the document.

1. Which EVPN route-type (RT) is used to auto-discover other PEs connected to the same Ethernet Segment?
   a. RT-1 Ethernet Auto-Discovery
   b. RT-2 MAC/IP Advertisement
   c. RT-3 Inclusive Multicast Ethernet Tag
   d. RT-4 Ethernet Segment

2. Which of the following information is NOT found in an extended community in a BGP EVPN update?
   a. BGP route target
   b. Ethernet Segment identifier label
   c. Ethernet Segment import route target
   d. Route distinguisher

3. Which of the following descriptions references an IP-VRF?
   a. A virtual interface connecting a Layer 2 EVPN to a Layer 3 EVPN.
   b. Contains a virtual routing and forwarding table for MAC addresses.
   c. Can be connected to a MAC-VRF using an integrated routing and bridging interface.
   d. Used to interconnect a number of CE devices that are sharing the same Layer 2 segment.

4. Consider the exhibit. Which of the following EVPN route types is used by Leaf-1 to advertise the Host-1 MAC address to Leaf-2 and Leaf-3?



a. EVPN route-type 1
b. EVPN route-type 2
c. EVPN route-type 3
d. EVPN route-type 5

5. Which of the following statements about the use of route reflectors in the BGP EVPN control plane is FALSE?
   a. Each leaf router will have a unique autonomous system number for the BGP EVPN session to the route reflectors.
   b. Route reflectors are used to alleviate the requirement of a full mesh of BGP sessions between the leaf routers.
   c. Route reflectors can be implemented as a virtual network function (VNF) on a hypervisor.
   d. Each leaf router establishes a BGP EVPN session with the route reflectors.

6. Which of the following statements about the use of VXLAN in the data center is FALSE?
   a. It leverages the underlay IP networks.
   b. It was designed to work with EVPN networks.
   c. It can load balance if the underlay IP network is configured with ECMP.
   d. It allows the creation of a Layer 2 overlay network that can span the entire data center.

7. Which of the following parameters for an L2 EVPN is NOT found in the bgp-evpn configuration?
   a. Encapsulation type
   b. Route target
   c. VXLAN interface
   d. EVI

8. Consider the exhibit. Which of the following statements is FALSE?

```
--[ + running ]--[  ]--
A:leaf1# show network-instance default protocols bgp neighbor 100.0.1.1 received-routes evpn
-------------------------------------------------------------------------------
Peer        : 100.0.1.1, remote AS: 64512, local AS: 64512
Type        : static
Description : None
Group       : BGP-evpn
-------------------------------------------------------------------------------
Status codes: u=used, *=valid, >=best, x=stale
Origin codes: i=IGP, e=EGP, ?=incomplete
-------------------------------------------------------------------------------
Type 2 MAC-IP Advertisement Routes
+--------+-----------------+-----+-------------------+---------+-----------+-----+---------+------+
| Status |      Route-     | Tag |    MAC-address    |   IP-   | Next-Hop  | MED | LocPref | Path |
|        |  distinguisher  | -ID |                   | address |           |     |         |      |
+========+=================+=====+===================+=========+===========+=====+=========+======+
| u*>    | 100.0.2.3:100   |  0  | 00:00:00:00:00:03 | 0.0.0.0 | 100.0.2.3 |  -  | 100     |      |
+--------+-----------------+-----+-------------------+---------+-----------+-----+---------+------+
Type 3 Inclusive Multicast Ethernet Tag Routes
+--------+-----------------+-----+---------------+-----------+-----+---------+------+
| Status |      Route-     | Tag | Originator-IP | Next-Hop  | MED | LocPref | Path |
|        | distinguisher   | -ID |               |           |     |         |      |
+========+=================+=====+===============+===========+=====+=========+======+
| u*>    | 100.0.2.2:100 | 0   | 100.0.2.2     | 100.0.2.2 |  -  | 100     |      |
| u*>    | 100.0.2.3:100 | 0   | 100.0.2.3     | 100.0.2.3 |  -  | 100     |      |
+--------+-----------------+-----+---------------+-----------+-----+---------+------+
-------------------------------------------------------------------------------
0 Ethernet Auto-Discovery routes 0 used, 0 valid
1 MAC-IP Advertisement routes 1 used, 1 valid
2 Inclusive Multicast Ethernet Tag routes 2 used, 2 valid
0 Ethernet Segment routes 0 used, 0 valid
0 IP Prefix routes 0 used, 0 valid
```

a. Leaf1 has an L2 EVPN service that spans two remote PEs.
b. Leaf1 and its BGP neighbor are both in the same autonomous system.
c. Host MAC 00:00:00:00:00:03 is connected to BGP neighbor 100.0.1.1.
d. The L2 EVPN flooding list includes PEs 100.0.2.2 and 100.0.2.3.

9. Which of the following statements about MAC mobility is FALSE?
a. When a PE advertises a MAC for the first time, there is no sequence number in the route update.
b. When the VM migrates to another PE, the new PE will learn the MAC on a local interface.
c. When a PE advertises a local MAC that was previously learned through EVPN, it increments the sequence number in the route update.
d. When the original PE receives the route update with the higher sequence number, it will identify the MAC as a protected MAC.

10. Which of the following statements about the use of ARP is TRUE?
a. A host sends an ARP request to learn the IP address of a known MAC.
b. An ARP request is sent as a broadcast message through the L2 EVPN instance.
c. A leaf enables proxy-ARP to broadcast GARP to all remote peers in the L2 EVPN instance.
d. The ARP response is sent as a broadcast message through the L2 EVPN instance.

11. Consider the exhibit. Which of the following statements is FALSE?

```
--{ + running }--[ network-instance mac-vrf1 ]--
A:leaf1# info bridge-table proxy-arp
    bridge-table {
        proxy-arp {
            admin-state enable
            dynamic-learning {
                admin-state enable
            }
            static-entries {
                neighbor 192.168.100.250 {
                    link-layer-address 00:00:00:00:02:50
                }
            }
        }
    }
```

```
--{ + running }--[  ]--
A:leaf1# show network-instance mac-vrf1 bridge-table mac-table all
-----------------------------------------------------------------------------------------------------------
-
Mac-table of network instance mac-vrf1
+-------------------+--------------------------+-----------+---------+--------+-------+-------------+
|      Address      |          Destination     |   Dest    |  Type   | Active | Aging | Last Update |
|                   |                          |   Index   |         |        |       |             |
+===================+==========================+===========+=========+========+=======+=============+
| 00:00:00:00:00:01 | ethernet-1/10.100        | 6         | learnt  | true   | 300   | 2022-09-21T1|
| 00:00:00:00:00:03 | vxlan-interface:vxlan1.1 | 370116100 | evpn    | true   | N/A   | 2022-09-21T1|
|                   | vtep:100.0.2.3 vni:100   | 156       |         |        |       |             |
| 1A:B0:0C:FF:00:00 | reserved                 | 0         | reserved| false  | N/A   | 2022-09-21T1|
| 1A:B0:0D:FF:00:00 | vxlan-interface:vxlan1.1 | 370116100 | evpn-   | true   | N/A   | 2022-09-21T1|
|                   | vtep:100.0.2.2 vni:100   | 154       | static  |        |       |             |
| 1A:B0:0E:FF:00:00 | vxlan-interface:vxlan1.1 | 370116100 | evpn-   | true   | N/A   | 2022-09-21T1|
|                   | vtep:100.0.2.3 vni:100   | 156       | static  |        |       |             |
+-------------------+--------------------------+-----------+---------+--------+-------+-------------+
```

a. MAC 00:00:00:00:02:50 is not in the MAC-table because it has not been learned on a local interface or from an EVPN update.

b. The reserved address 1A:B0:0C:FF:00:00 needs to be statically defined in mac-vrf1.

c. The reserved MAC address is used by the leaf routers when issuing ARP probes.

d. ARP packets will be snooped by leaf1 and the information will be used to populate the ARP table for mac-vrf1.

12. Which of the following statements about asymmetric routing is FALSE?

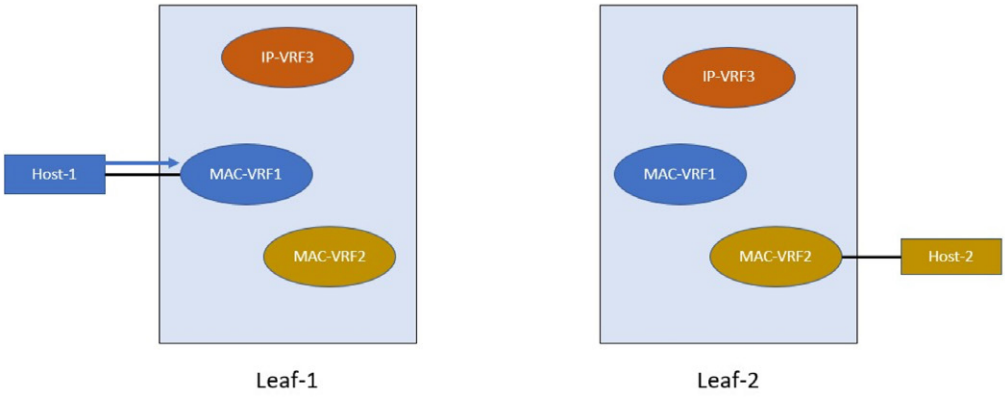
a. The ingress PE will perform MAC forwarding as well as IP routing.

b. The L3 EVPN instances on the PEs are interconnected using routed-VXLAN interfaces.

c. All the MAC-VRFs connected by the L3 EVPN are instantiated on each PE.

d. Each PE must have the full ARP table for all of the hosts that are participating in the L3 EVPN.

13. Consider the exhibit. IP-VRF3, the L3 EVPN, is configured to use asymmetric routing. Host-1 is sending a packet to Host-2. Which of the following statements is FALSE?



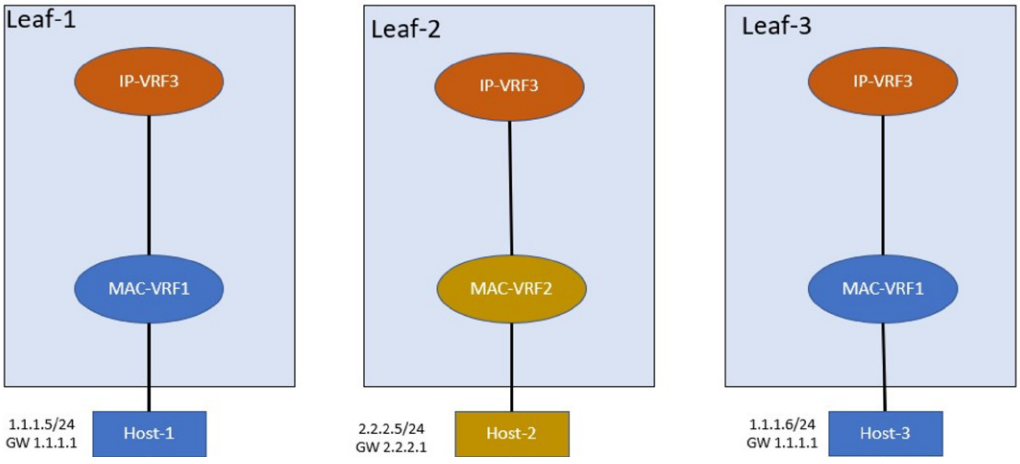
a. The ingress PE will do both MAC forwarding and IP routing.
b. The IP-VRF on Leaf-1 must have an IRB interface to each MAC-VRF.
c. The ingress PE must have all host IP/MAC information in its ARP table.
d. Host-1 sends data to Host-2 using a bridged-VXLAN interface between the two instances of MAC-VRF1.

14. Which of the following statements about an L3VPN using symmetric routing is FALSE?
a. The L3VPN will utilize EVPN RT5 updates to exchange prefix information.
b. The RT5 update can include an overlay index to define the next-hop information.
c. The IRB's MAC address and IP address are advertised in an RT2 update.
d. If the overlay index cannot be resolved, the IP prefix will not be installed in the L3VPN route-table.

15. Which of the following statements about the use of an IRB sub-interface is TRUE?
a. It is used to enable inter-subnet routing.
b. IP-VRF can have only one IRB sub-interface.
c. MAC-VRF can have multiple IRB sub-interfaces.
d. The IRB sub-interface supports only one IP address.

16. Which of the following symmetric routing options requires the leaf router to advertise an EVPN RT2 update with two VNI labels for each entry?
a. Host routing
b. Prefix routing interface-less
c. Prefix routing interface-ful numbered
d. Prefix routing interface-ful unnumbered

17. Consider the exhibit. The network is designed to use interface-less symmetric routing with ECMP. The IRB interfaces on Leaf-1 and Leaf-3 will use the same IP address. Which of the following statements is FALSE?



a. A bridged VXLAN interface is required between Leaf-1 and Leaf-3.
b. The IRB interfaces on Leaf-1 and Leaf-3 will require anycast gateway to be configured.
c. The IRB interfaces on Leaf-1 and Leaf-3 will need to be configured to snoop ARP messages and advertise out the individual host routes.
d. EVPN RT2 is used to exchange L3 prefix information between the three leaf routers in IP-VRF3.

18. Consider the exhibit. Which of the following statements is FALSE?

```
--{ + running }--[  ]--
A:leaf1# info interface irb1
    interface irb1 {
        subinterface 100 {
            ipv4 {
                admin-state enable
                address 192.168.100.254/24 {
                    anycast-gw true
                }
                arp {
                    host-route {
                        populate dynamic {
                        }
                    }
                }
            }
            anycast-gw {
            }
        }
    }
```

a. The IP address configured on this IRB interface can be used on another IRB interface in the same L3EVPN.
b. The hosts connected to the MAC-VRF that is using this IRB will have 192.168.100.254 as their gateway address.
c. The IRB will snoop all ARP and GARP messages.
d. The IRB will use the MAC/IP information to populate the ARP cache for the MAC-VRF connected to the IRB.

19. An L3 EVPN on a leaf router is being configured to use BGP to peer with a customer VNF. Which of the following statements is FALSE?
    a. I-BGP is used between the leaf router and the customer VNF.
    b. The L3 EVPN must be configured with an autonomous system number.
    c. If the neighbor peer address is not directly connected, multi-hop must be enabled on BGP.
    d. By default, BGP will not exchange any updates with the customer VNF once it has become established.

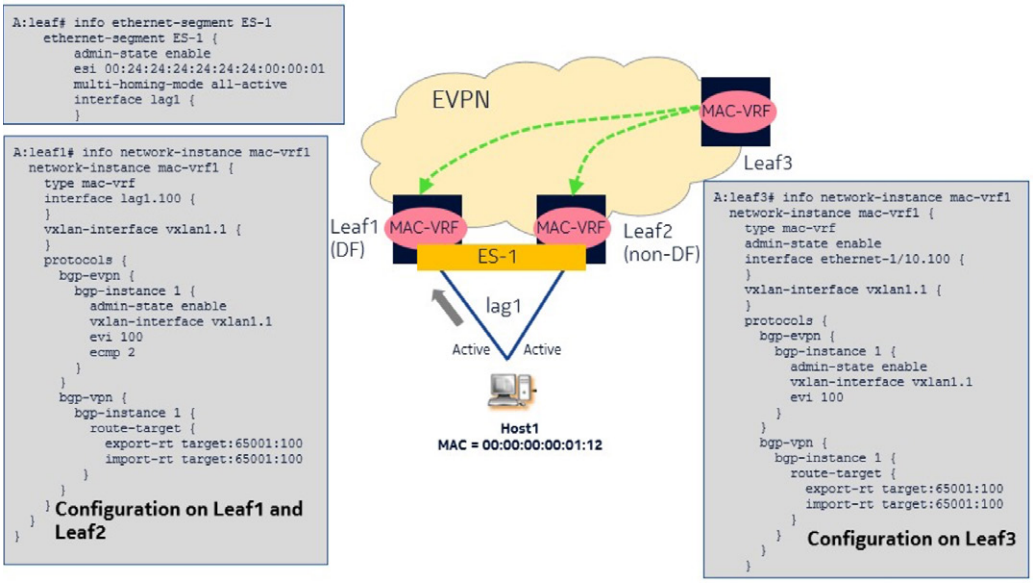
20. Which of the following statements describes the operation of the multi-homing single active mode in Nokia SR Linux?
    a. It will support up to four active uplinks.
    b. All connected leafs forward traffic to or from the connected host.
    c. Traffic is load-balanced over all links.
    d. It is useful for deterministic QoS behavior.

21. Which of the following statements about the use and operation of EVPN route type 4 is FALSE?
    a. It is advertised with two EVPN extended communities.
    b. It is used to discover which PEs are connected to the same Ethernet Segment.
    c. The route-target used is auto-generated from the value of the ESI.
    d. An import policy configuration is required to allow the import of BGP routes with matching ES-import route-targets.

22. Which of the following statements about the use and operation of a designated forwarder in a MAC-VRF using a multi-homed Ethernet Segment is FALSE?
    a. It avoids sending duplicate traffic to a multi-homed host.
    b. A MAC-VRF can have one or more designated forwarders based upon the selected election algorithm.
    c. Each MAC-VRF associated to an Ethernet Segment can have a different designated forwarder.
    d. Non-designated forwarders in a single-active multi-homing mode will bring the host interface operationally down.

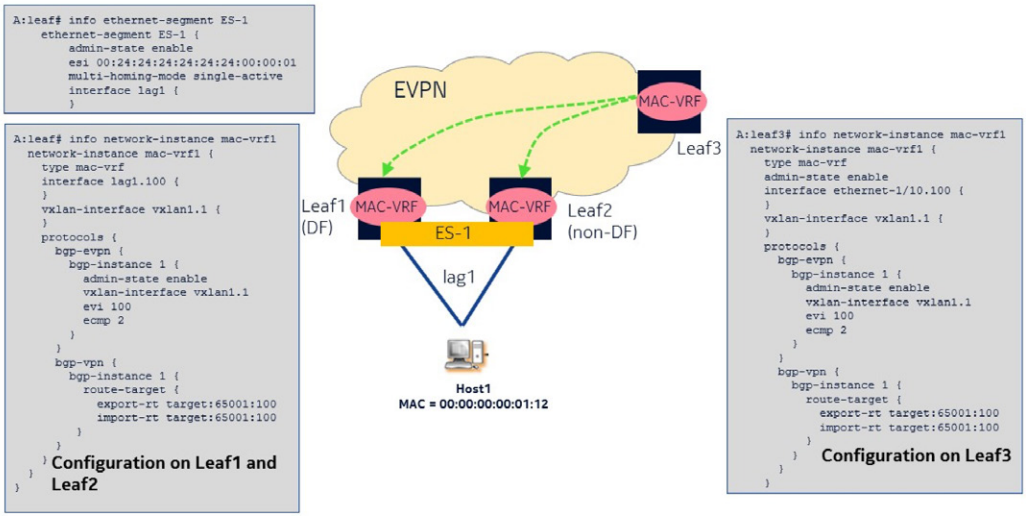
23. Which of the following is NOT a use of the EVPN route type 1 AD per ES update?
    a. It advertises an Ethernet Segment and its multi-homing type.
    b. It is sent when the Ethernet Segment is associated with at least one active MAC-VRF.
    c. A single update may be sent that includes all the route-targets of the associated MAC-VRFs.
    d. It is used by the remote peers to implement aliasing.

24. Consider the exhibit. Host1 sends data to Leaf1. Which of the following statements is FALSE?



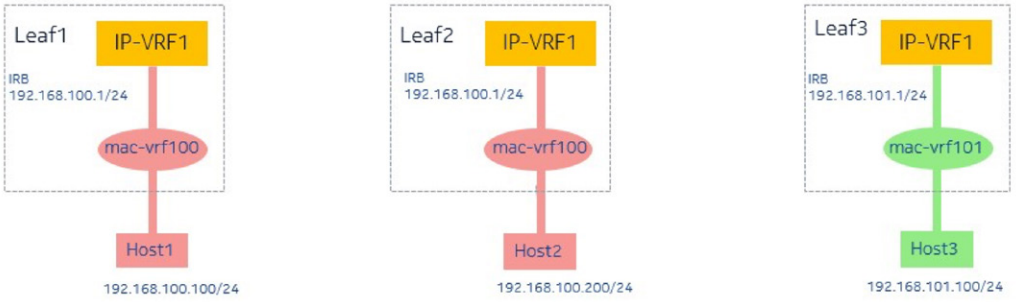
a. Leaf1 and Leaf2 will elect a designated forwarder for the MAC-VRF.
b. Leaf1 learns Host1's MAC address and advertises to Leaf2 and Leaf3 with its export route-target.
c. Leaf3 has a matching import route-target so it will import the MAC address of Host1 into its FDB.
d. Leaf3 will be able to load balance traffic to Host1 between Leaf1 and Leaf2.

25. Consider the exhibit. Which of the following statements is TRUE?



a. Leaf1 and Leaf2 use the preference-based algorithm to elect the DF.
b. Leaf3 will be able to load balance Host1 traffic between Leaf1 and Leaf2.
c. Leaf2 will automatically power off the link connected to Host1.
d. Leaf1 is the only leaf router that can forward BUM traffic to Host1.

26. Consider the exhibit. The network is designed using symmetric routing. How can Leaf3 know whether to send traffic to Host2 through Leaf2?



a. Leaf1 and Leaf2 mac-vrf100 will advertise EVPN RT2 with the connected host's IP and MAC addresses to Leaf3 IP-VRF1.

b. Leaf3 IP-VRF1 will require ARP snooping so it will be able to populate the L3 forwarding data base with the host IP addresses.

c. Leaf1 and Leaf2 will require that ARP snooping be enabled on the IRB interface so that they can identify the local host IP addresses and advertise them to Leaf3.

d. Leaf3 mac-vrf101 will require ARP snooping so that it can populate the proxy-ARP table that IP-VRF1 can use to identify the correct next hop for the remote hosts.

27. Consider the exhibit. Which of the following statements is TRUE?

```
--{ + running }--[  ]--
A:leaf1# info network-instance ip-vrf-100
    network-instance ip-vrf-100 {
        type ip-vrf
        admin-state enable
        interface irb100.100 {
        }
        interface irb100.101 {
        }
    }
```

```
--{ + running }--[  ]--
A:leaf1# info network-instance mac-vrf100
    network-instance mac-vrf100 {
        type mac-vrf
        admin-state enable
        interface ethernet-1/10.100 {
        }
        interface irb100.100 {
        }
        vxlan-interface vxlan1.1 {
        }
        protocols {
            bgp-evpn {
            }
            bgp-vpn {
            }
        }
    }
--{ + running }--[  ]--
```

```
--{ +* candidate shared default }--[ interface irb100 ]--
A:leaf1# info subinterface 100
    subinterface 100 {
        ipv4 {
            admin-state enable
            address 192.168.100.254/24 {
                anycast-gw true
            }
        arp {
                learn-unsolicited true
                evpn {
                    advertise dynamic {
                    }
                }
            }
        }
        anycast-gw {
        }
    }
```

a. Leaf1 will generate EVPN RT5 updates for ip-vrf-100 for the prefixes connected to the IRB interfaces.

b. Leaf1 will generate EVPN RT5 updates for ip-vrf-100 for the individual host routes connected to the mac-vrf(s).

c. The Leaf1 ip-vrf-100 L3 forwarding table will contain learned remote prefixes and host routes from the other participating leaf routers.

d. The IP address associated to the IRB interface can be utilized on other IRB interfaces connected to the L3 EVPN instances on remote leaf routers.

28. Which of the following statements about deploying the centralized router variant of Layer 3 multi-homing is TRUE?
    a. The leaf routers advertise the customer prefixes to the centralized router using EVPN route-type 5.
    b. The centralized router uses the EVPN route-type 1 to advertise itself as a backup for the Ethernet Segment.
    c. Remote leaf routers send customer traffic to the centralized router should the primary PE for the Ethernet Segment fail.
    d. The leaf routers connected to the Ethernet Segment maintain a BGP peering session with the CE routers.

29. Consider the exhibit. All leaf routers attached to the Ethernet Segment have the same configuration. Which of the following statements is FALSE?

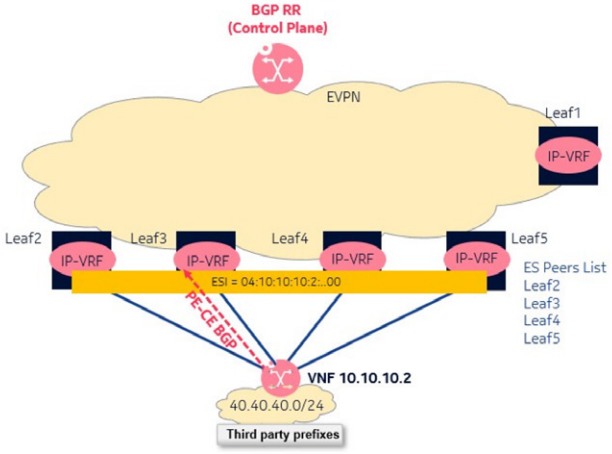
```
A:Leaf3# info system network-instance protocols
  system {
    network-instance {
      protocols {
        evpn {
          ethernet-segments {
            bgp-instance 1 {
              ethernet-segment ES-FRR {
               admin-state enable
                esi 04:02:02:02:02:00:00:00:00
                multi-homing-mode all-active
                type virtual
                next-hop 2.2.2.2 {
                  evi 1000 {
                  }
                }
              }
            }
          }
        }
        bgp-vpn {
          bgp-instance 1 {
          }
        }
      }
    }
  }
}
```

    a. The Ethernet Segment is going to be used by a Layer 3 EVPN.
    b. This is a type 4 Ethernet Segment identifier.
    c. All leaf routers connected to the Ethernet Segment can forward traffic to the customer prefixes.
    d. The 2nd, 3rd, 4th and 5th bytes of the ESI are auto-derived from the next-hop IP address.

30. Consider the exhibit. All the leaf routers have the same ES peers list. Which of the following statements is FALSE?

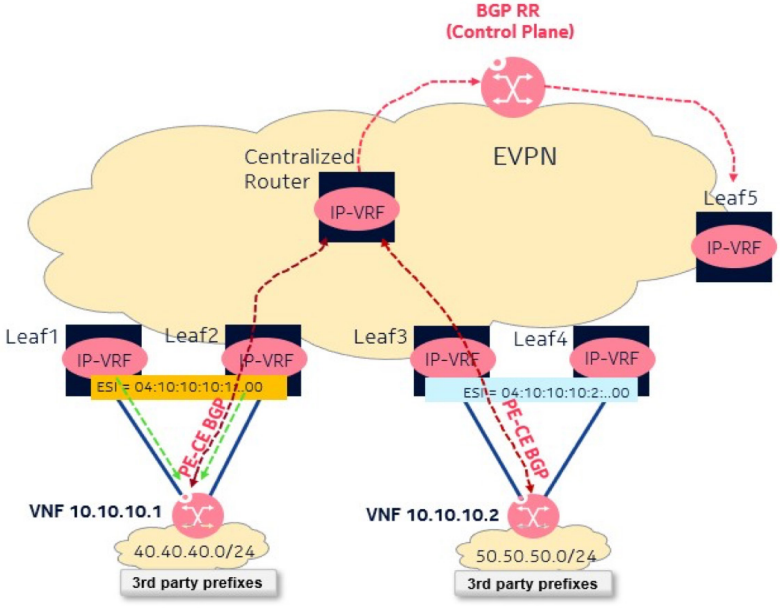
Leaf2, 3, 4 and 5

```
A:Leaf2# info system network-instance protocols
  system {
    network-instance {
      protocols {
        evpn {
          ethernet-segments {
            bgp-instance 1 {
              ethernet-segment ES-FRR {
               admin-state enable
                esi 04:10:10:10:02:00:00:00:00
                multi-homing-mode single-active
                type virtual
                next-hop 10.10.10.2 {
                  evi 10 {
                  }
                }
```



a. One of the connected leaf routers will be elected as DF.
b. All leaf routers will use AD per ES updates to advertise single active redundancy.
c. Leaf5 will use an AD per EVI update to advertise itself as primary.
d. Leaf3 will use an IP Prefix update to advertise learned customer prefixes to the route reflector.

31. Consider the exhibit. Which of the following statements about deploying the centralized router variant is FALSE?



a. The centralized router must be configured as part of the Ethernet Segments.
b. The centralized router Ethernet Segment must be implicitly configured as backup for the other Ethernet Segments.
c. The leaf routers with physical connections in the Ethernet Segment to the CE will elect a DF to forward traffic.
d. The leaf routers and the centralized router's Ethernet Segment must be configured to operate in the single active mode.

32. Which of the following statements about the integrated gateway-based data center interconnect solution is FALSE?
    a. The data center and WAN are normally managed by the same entity.
    b. The gateway must be able to provide data center EVPN and WAN VPN functions.
    c. The data center gateway and the WAN PE functions are performed by a single router.
    d. The gateway will use a single BGP instance to re-advertise route updates between the data center and WAN network.

33. Which of the following statements about the gateway-less data center interconnect solution is FALSE?
    a. The IP addresses of all the leaf routers in all the interconnected data centers need to be known by the routers in each data center.
    b. The route reflectors used in the various data centers must be able to reach each other.
    c. All route targets and route distinguishers must remain unique across all the interconnected data centers.
    d. EVPN VXLAN tunnels are stitched together by the WAN PE routers.

34. Which of the following statements does NOT describe the functionality or operation of the integrated gateway-based data center interconnect solution?
    a. The integrated gateway is required to support two BGP instances to allow the re-advertisement of L2-EVPN VXLAN routes to L2 EVPN MPLS routes.
    b. The integrated gateway is required to support two BGP instances to allow the re-advertisement of L3-EVPN VXLAN routes to VPN-IPv4 or VPN-IPv6 routes.
    c. The data center gateway and the WAN-PE functions are split between two routers, a border leaf and the WAN gateway.
    d. The data center gateway needs to be able to stitch data center VXLAN tunnels to WAN tunnels.

35. Consider the exhibit. Which of the following statements is FALSE?

```
(pr)[/configure service vpls "100"]
A:admin@dcgw10# info
    admin-state enable
    customer "1"
    vxlan {
        instance 1 {
            vni 100
        }
    }
    bgp 1 {
        route-distinguisher "10.0.0.10:200"
        route-target {
            export "target:65500:200"
            import "target:65500:200"
        }
    }
    bgp 2 {
        route-distinguisher "10.0.0.10:100"
        route-target {
            export "target:64512:100"
            import "target:64512:100"
        }
    }
    bgp-evpn {
        evi 100
        vxlan 2 {
            admin-state enable
            vxlan-instance 1
        }
        mpls 1 {
            admin-state enable
            auto-bind-tunnel {
                resolution any
            }
        }
    }
```

a. This configuration is to extend an L2 EVPN across an MPLS WAN core.
b. The route-target for the updates advertised through the WAN core is “target:64512:100”.
c. The gateway can use a maximum of two paths for VXLAN tunnels to a leaf router.
d. The gateway can utilize any type of MPLS tunnel through the WAN core.

36. Consider the exhibit. Which of the following statements is FALSE?

```
(pr)[/configure service vpls "101"]
A:admin@dcgw10# info
    admin-state enable
    customer "1"
    vxlan {
        instance 1 {
            vni 1
        }
    }
    routed-vpls {
    }
    bgp 1 {
        route-target {
            export "target:64512:1"
            import "target:64512:1"
        }
    }
    bgp-evpn {
        evi 1
        routes {
            mac-ip {
                advertise false
            }
        }
        vxlan 1 {
            admin-state enable
            vxlan-instance 1
        }
-------------------------------------------------
```

a. This is a routed-VPLS that is allowed to logically connect to a VPRN.
b. The VPLS service will generate an EVPN route-type 5 towards the leaf routers.
c. The route distinguisher used by the gateway for this L2 EVPN is auto-generated.
d. The route target used by leaf routers participating in this L2 EVPN is “target:64512:1”.

37. Leaf routers are configured to support the Layer 2 multi-homing all-active mode. Which of the following statements is FALSE?
    a. An LAG is configured on the host to ensure the host will only forward BUM traffic on a single link.
    b. LACP can be used between the leaf routers and the host to detect miswiring issues.
    c. The LAG configuration on the leaf routers is mandatory when the Ethernet Segment is using all-active mode.
    d. The system-id-mac used by the LACP is the chassis MAC of each individual leaf router participating in the LAG.

38. Which of the following EVPN route-types are used for local biasing in a Layer 2 EVPN multi-homed network?
    a. Ethernet Segment routes
    b. AD per ES routes
    c. AD per EVI routes
    d. IP/MAC routes

39. Which of the following ARP functions is FALSE?
    a. A host will send an ARP message to request a MAC address for a specific IP address.
    b. The ARP message is sent as a broadcast within the subnet.
    c. All the hosts within the subnet will receive the ARP message.
    d. The owner of the IP address will generate a GARP message in response.

40. Which of the following statements about a distributed Layer 2 EVPN service is FALSE?
    a. Local interfaces use the data plane for MAC learning.
    b. The remote leaf routers will import the update based upon the route-distinguisher.
    c. The leaf router with a local MAC in its FDB will generate an EVPN RT2 update.
    d. The next-hop for the EVPN RT2 update is the IP address of the originating router.

Answer Key

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

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