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Exam : 300-540

Title : Designing and Implementing Cisco Service Provider Cloud Network Infrastructure

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Cisco 300-540 Exam Syllabus Topics:

Topic	Details

Topic 1	<ul style="list-style-type: none"> Cloud Interconnect: This section of the exam measures the skills of Service Provider Network Engineers and covers how large networks interconnect with cloud platforms and carrier-neutral facilities. Candidates are expected to understand various connectivity options to cloud providers, customer sites, and other neutral facilities, as well as evaluate WAN connectivity models such as direct connect, MPLS or segment routing, and IPsec VPN links. The domain also includes the ability to troubleshoot advanced data center interconnect solutions, including EVPN VXLAN, EVPN over SR MPLS, ACI-based connectivity, and pseudowire architectures supporting cloud-to-cloud and cloud-to-edge communication.
Topic 2	<ul style="list-style-type: none"> High Availability: This section of the exam measures the skills of Cloud Infrastructure Architects and covers the design and implementation of redundancy and resiliency mechanisms in virtualized network functions and distributed cloud platforms. It includes data plane redundancy for VNFs, high availability within a single VIM control plane, and resilient compute, vNIC, and top-of-rack switching. The exam requires an understanding of multi-homing, EVLAG configurations, virtual private cloud deployment, and ECMP strategies for NFVI integrations with physical routing protocols such as BGP, OSPF, and IS-IS. Candidates must also recommend suitable high-availability models involving DNS, routing, and load balancing.
Topic 3	<ul style="list-style-type: none"> Service Assurance and Optimization: This section of the exam measures the skills of Cloud Operations Engineers and covers assurance mechanisms used to maintain performance, stability, and visibility across NFVI environments. It includes network assurance concepts such as MANO frameworks, VNF workload monitoring, VIM control plane KPIs, and streaming telemetry with gRPC and gNMI. Candidates must understand cloud infrastructure performance monitoring tools, including SR-PM, NetFlow, IPFIX, syslog, SNMP traps, RMON, cloud agents, and automated fault management systems. The domain also touches on diagnosing NFVI-related errors and optimizing VNFs using techniques such as SR-IOV and software-accelerated virtual switching technologies like DPDK and VPP.
Topic 4	<ul style="list-style-type: none"> Security: This section of the exam measures the skills of Network Security Engineers and covers the implementation of infrastructure-level protection in cloud and NFVI ecosystems. It includes topics such as ACLs, uRPF, RTBH, router hardening, BGP flowspec, TACACS, and MACSEC. Candidates should understand DoS mitigation methods and apply security practices within NFVI, focusing on API protection, securing the control and management plane, and segmentation strategies in service provider cloud environments. The domain also evaluates basic knowledge of TLS, mTLS, and general cloud security solutions related to DNS protection, zero-day defenses, and malware detection.
Topic 5	<ul style="list-style-type: none"> Virtualized Architecture: This section of the exam measures the skills of Cloud Network Engineers and covers the foundational concepts of virtualized infrastructures used in modern service provider and cloud environments. Candidates are expected to understand constraints in IaaS designs, determine appropriate cloud service models, and demonstrate awareness of container orchestration compared to traditional virtual machines. The exam also evaluates the ability to implement key virtualization functions such as NFV, VNF, NSO, and virtualized Cisco platforms. Learners must be able to deploy NFV with automation tools, manage VNF onboarding, work with NSO-driven orchestration, and use protocols like NETCONF, RESTCONF, REST APIs, and gNMI within automated cloud ecosystems. A general understanding of supporting platforms such as OpenStack also forms part of the required knowledge in this domain.

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Cisco Designing and Implementing Cisco Service Provider Cloud Network Infrastructure Sample Questions (Q145-Q150):

NEW QUESTION # 145

Which of the following are benefits of using streaming telemetry for network assurance? (Select two)

- A. Real-time data collection
- B. Improved scalability and flexibility
- C. Increased network latency
- D. Reduced monitoring capabilities

Answer: A,B

NEW QUESTION # 146

EVPN VXLAN is used to:

- A. Encrypt data at the transport layer
- B. Simplify network topology by eliminating virtual connections
- C. Provide layer 2 connectivity over a layer 3 network
- D. Reduce the bandwidth available between sites

Answer: C

NEW QUESTION # 147

An engineer must create a new VPC and deploy several Amazon EC2 instances in AWS. Only SSH connections originating from IP address 20.20.20.20 must be allowed to reach the EC2 instances. What must be configured?

- A. Resource group
- B. Security group
- C. Access control list
- D. Web application firewall

Answer: B

Explanation:

Comprehensive and Detailed Explanation

AWS Security Groups act as the primary stateful firewalls for EC2 instances.

To restrict SSH (TCP/22) to a single host (20.20.20.20/32), a Security Group must be configured with:

* Inbound rule: TCP 22

* Source: 20.20.20.20/32

ACLs operate at the subnet level but are not used for instance-specific SSH restrictions.

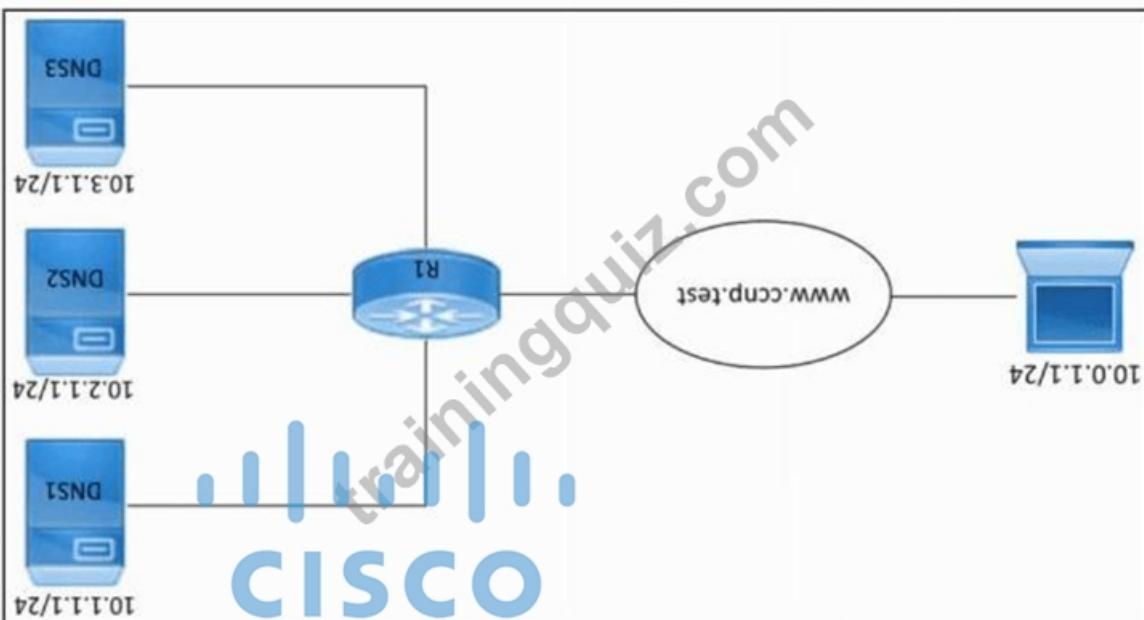
WAFs operate at the subnet level but are not as WAF controls HTTP/HTTPS traffic, not SSH

WAF controls HTTP/HTTPS traffic, not S3

Resource groups only organize

NEW QUESTION # 148

```
R1 Configuration
cisco
<output omitted>
ip domain lo0
ip domain broadcast
ip http www cisco test 10.1.1.1 10.2.1.1 10.3.1.1
<output omitted>
```



Refer to the exhibit. An engineer must configure Cisco IOS SLB for DNS on router R1 to meet these requirements:

The first DNS request to www.ccnp.test
must be redirected to the DNS server at 10.1.1.1;

The second DNS request to www.ccnp.test
must be redirected to the DNS server at 10.2.1.1;

The third DNS request to www.ccnp.test
must be redirected to the DNS server at 10.3.1.1.

In each case, the other two addresses must also be attempted if the first one fails. The indicated configuration was applied to R1; however, the load balancing failed. Which command must be run on R1 to resolve the issue?

- A. ip domain retry 3
- B. **ip domain round-robin**
- C. maximum-paths 3
- D. ip dns server

Answer: B

Explanation:

On R1 the configuration (simplified) is:

ip domain lookup

ip domain name ccnp.test

ip host www.ccnp.test 10.1.1.1 10.2.1.1 10.3.1.1

The ip host command statically maps the hostname www.ccnp.test

to three IP addresses. By default, Cisco IOS will always return these IP addresses to DNS queries in the same order they are configured (10.1.1.1, then 10.2.1.1, then 10.3.1.1). This means that clients will always attempt 10.1.1.1 first and will not achieve per-query load balancing across all three servers.

To enable DNS-based load balancing so that each successive query rotates the order of the addresses, Cisco IOS provides the command:

ip domain round-robin

This command enables round-robin rotation of multiple A records associated with a single hostname defined by ip host. With this feature enabled:

1st query: response order 10.1.1.1, 10.2.1.1, 10.3.1.1

2nd query: response order 10.2.1.1, 10.3.1.1, 10.1.1.1

3rd query: response order 10.3.1.1, 10.1.1.1, 10.2.1.1

Clients will typically try the first IP address in the list and use the others if the first one fails, exactly matching the requirement.

Why other options are incorrect:

A). ip domain retry 3 controls how many times the router retries DNS queries to a server; it does not control the order of multiple A records.

C). ip dns server turns the router into a DNS server but does not itself provide round-robin behavior for statically defined hosts.

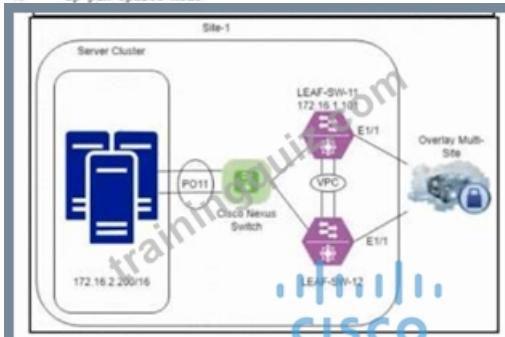
D). maximum-paths 3 is a routing (IP forwarding) parameter for equal-cost multipath, unrelated to DNS resolution.

NEW QUESTION # 149

```

1  site-1, ingress ELAM done on LEAF-SW-11
2  module-1(TAH-elam-line19)#
3  HOMEWOOD ELAM REPORT SUMMARY
4  slot -1, asic-0, slice -0
5  =====
6  Incoming Interface: Eth1/1
7  Src IP: 10.30.1.1, Dst IP: 10.30.1.1
8  Outgoing Interface Info: met_ptz0
9
10  Packet Type: IPv4
11  Outer DstIPv4 address: 239.1.1.0
12  Outer SrcIPv4 address: 10.30.1.1
13  Ver: 4, TOS: 0x0, Don't Fragment = 0
14  Proto = 17, TTL = 253, More Fragments = 0
15  Hdr len: 20, Fkt len: 150, Checksum = 0x6b8c
16
17  Inner Payload
18  Type: IPv4
19
20  Inner DstIPv4 address: 239.1.1.0
21  Inner SrcIPv4 address: 10.64.1.100
22  **skip**
23
24  LEAF-SW-11# show run
25  configure profile VLAN64
26  vni 11
27  vn-segment 16535
28  interface nve1
29  member vni 16535
30  member vni 16535
31  mcast-group 239.1.1.0
32  evpn
33  vni 16535 12
34  rd auto
35  route-target import auto
36  route-target export auto
37
38  interface Ethernet1/1
39  ip access-group TEST in
40  ip address 10.30.254.129/30
41  ip router isis UNDERLAY
42  ip pim sparse-mode

```



Refer to the exhibit. An engineer is troubleshooting an issue with switch LEAF-SW-11. The engineer observes that several main servers on the VXLAN BGP EVPN Multi-Site network experience 50-60% packet loss inbound and outbound, and all the DCI tracking interfaces are down. Which two actions must be taken to resolve the issue? (Choose two.)

- A. On the Nexus switch, run the inner ipv4 dst_ip 172.16.2.200 command against module-1.
- B. On LEAF-SW-11, run the inner ipv4 src_ip 172.16.2.200 command against module-1.
- C. On the Nexus switch, run the ip access-list permit ip address 172.16.2.200 command.
- D. **On LEAF-SW-11, enable the multisite ingress-replication command for the L2VNI of VLAN 11.**
- E. **On LEAF-SW-11, run the evpn multisite dci-tracking command against interface Eth1/1.**

Answer: D,E

Explanation:

In a VXLAN BGP EVPN Multi-Site environment:

* DCI tracking monitors the health of the DCI links. If all DCI-tracking interfaces go down, the leaf can incorrectly keep advertising or learning remote MAC/IP reachability, leading to packet loss and sub-optimal forwarding for servers in that VLAN/L2VNI.

* For proper operation, each DCI-facing interface must be enabled with evpn multisite dci-tracking so that the Multi-Site border leaf tracks reachability over that link.

* When using EVPN Multi-Site, BUM (broadcast, unknown unicast, multicast) traffic toward remote sites is typically handled via ingress replication, not multicast groups, for each L2VNI participating in Multi-Site. The configuration snippet shows an L2VNI (vn-segment 16535) still mapped to mcast-group 239.1.1.0, which is inconsistent with Multi-Site recommendations and contributes to packet loss.

Therefore, to fix the problem:

- * Enable DCI tracking on the uplink:
- * interface Ethernet1/1
- * evpn multisite dci-tracking

This restores proper DCI-link state monitoring for Multi-Site. #Option C

* Change the L2VNI behavior from multicast to Multi-Site ingress replication:

Under the VNI for VLAN 11, configure:

```

evpn
vni 16535 12
multisite ingress-replication

```

or the equivalent command for the specific NX-OS release, thereby aligning the L2VNI with EVPN Multi-Site design and eliminating packet loss. #Option D Options A and B are ELAM (embedded logic analyzer) filters used only for packet capture and do not resolve the forwarding issue.

Option E is an ACL line unrelated to EVPN VXLAN or DCI tracking and does not address the underlying problem

NEW QUESTION # 150

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