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File Version: 5.0



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+simplistically+distributing+the+core+gateways.&source=bl&ots=Bwpk3CQ_jN&sig=2-kgrCA_7hEX3kuvSxWVV2AnAS0&hl=en&sa=X&ved=0CB0Q6AEwAGoVChMI_5La8tbCwxIVgZ6OCh1N7gHa#v=onepage&q=LTE%20Provides%20a%20simpler%2C%20less%20hierarchical%20model%20with%20the%20capability%20of%20simplistically%20distributing%20the%20core%20gateways.&f=false

QUESTION 3

A Service Provider is offering VoIP services and a service level agreement to customers. Which configuration provides validation to customers that the service level agreement has been honored?

- A. ip sla 999 udp-jitter 209.165.200.225 1000 codec g729a tos 160
ip sla schedule 999 life forever start-time now
- B. ip sla 999 icmp-jitter 209.165.200.225 tos 160
ip sla schedule 999 life forever start-time now
- C. ip sla 999 icmp-jitter 209.165.200.225 tag VoIP-SLA
ip sla schedule 999 life forever start-time now
- D. ip sla 999 udp-jitter 209.165.200.225 1000 codec g729a tag VoIP-SLA
ip sla schedule 999 life forever start-time now

Correct Answer: D

Section: (none)

Explanation

Explanation/Reference:

QUESTION 4

A telecom company offers ISPs the ability to resell dynamic IP broadband services over its local loops, but it does not allow the resellers to install broadband network gateways. If an ISP wants to become a reseller but is unable to use NHRP, which tunneling protocol should be implemented?

- A. IP in IP
- B. IPsec
- C. L2TP
- D. GRE

Correct Answer: C

Section: (none)

Explanation

Explanation/Reference:

Explanation:

However, while OpenVPN can not be used with VoIP, L2TP can be used for VoIP. Only use this if OpenVPN is not available and you are in need of very high security/encryption.

QUESTION 5

Refer to the exhibit.

Router PE-1

```
config t
ip vrf MAINT
  rd 200:1
  route-target import 100:1
  route-target export 100:1
exit
!
interface FastEthernet/0/0
  ip vrf forwarding MAINT
  ip address 10.10.100.2 255.255.255.0
  no shut
  exit
!
logging on
logging host 10.10.100.100
logging trap debugging
end
```

The **vrf MAINT** has been provisioned and used by the Service Provider management network. The engineer discovers that syslog messages are not being received on the syslog server. IP reachability has been validated using ping. Which issue in the configuration must be corrected?

- A. **logging on** must include the **vrf MAINT** keyword.
- B. **logging host** must include the **vrf MAINT** keyword.
- C. The logging facility must be configured for syslog processing.
- D. The route targets that are configured do not match the route distinguisher.

Correct Answer: B

Section: (none)

Explanation

Explanation/Reference:

http://www.cisco.com/c/en/us/td/docs/ios/12_2sr/12_2sra/feature/guide/srvrfslg.html#wp1059076

QUESTION 6

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

QUESTION 7

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)

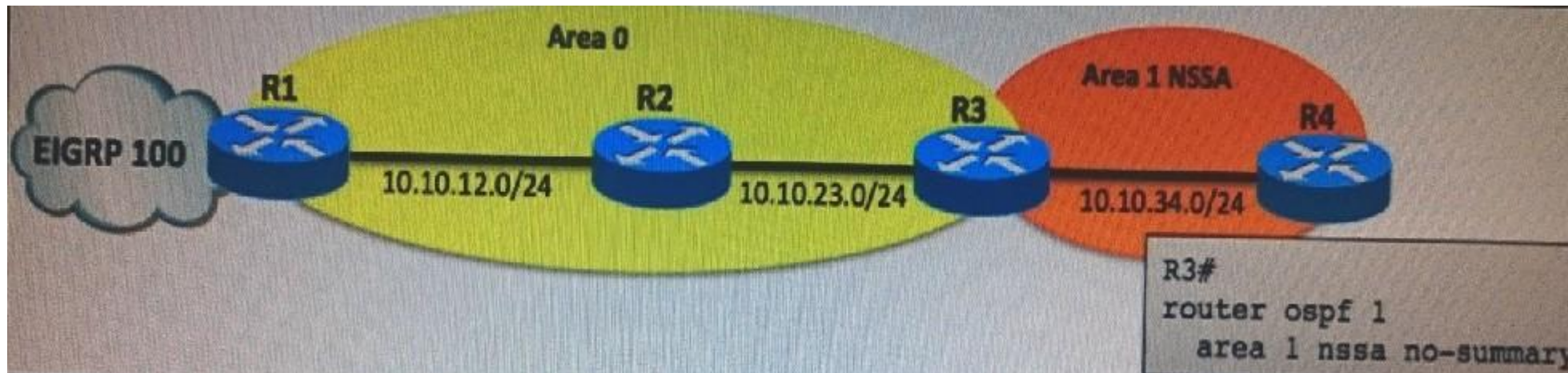
Explanation

Explanation/Reference:

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

QUESTION 8

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>

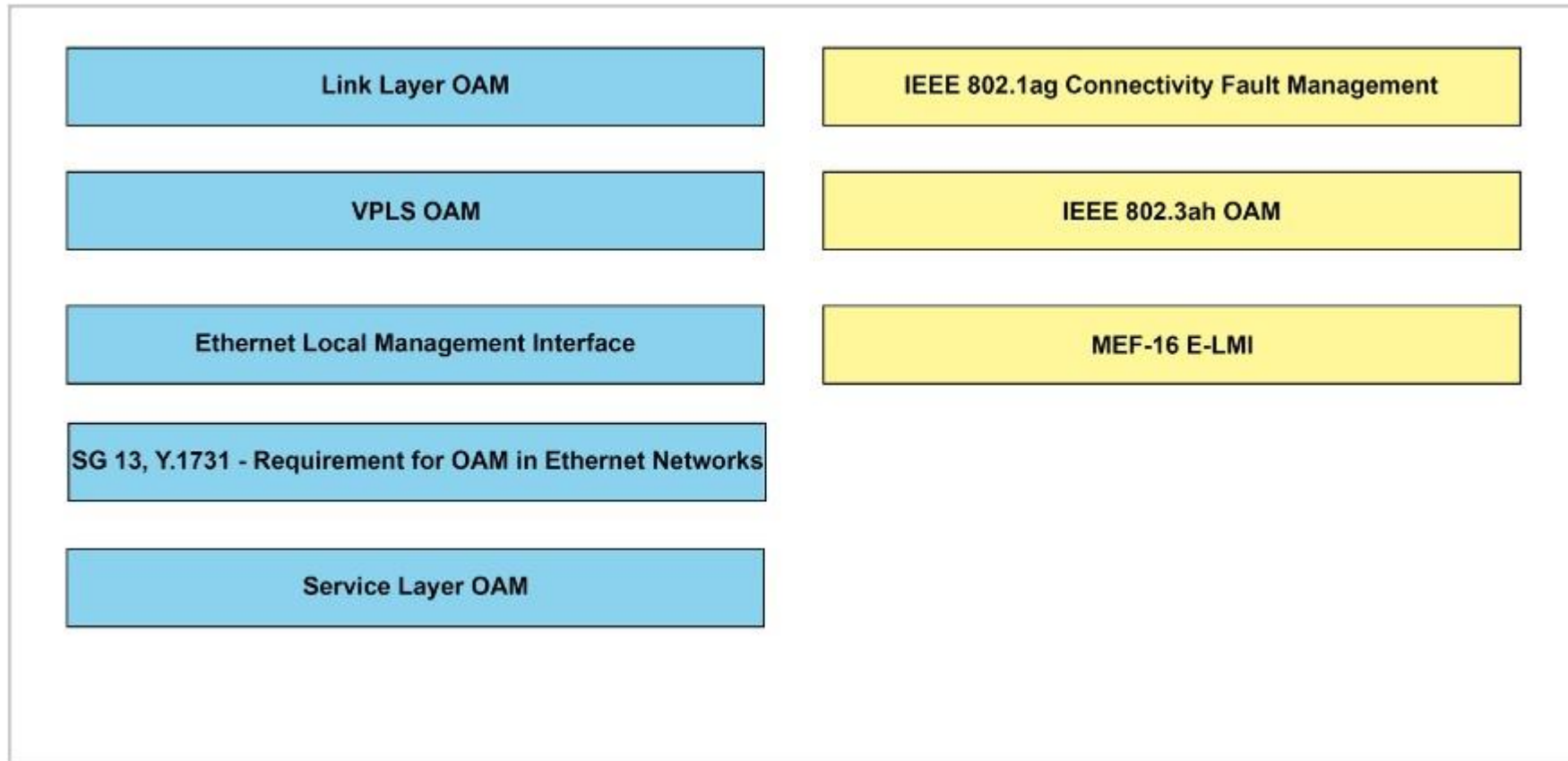
<http://www.cisco.com/image/gif/paws/6208/nssa.pdf>

QUESTION 9

DRAG DROP

Drag and drop the OAM protocol listed on the left to the correct standard on the right. Not all options will be used.

Select and Place:



Correct Answer:

	Service Layer OAM
VPLS OAM	Link Layer OAM
	Ethernet Local Management Interface
SG 13, Y.1731 - Requirement for OAM in Ethernet Networks	

Section: (none)

Explanation

Explanation/Reference:

Explanation:

http://www.cisco.com/c/en/us/products/collateral/routers/7600-seriesrouters/prod_white_paper0900aecd804a0266.html

QUESTION 10

A Service Provider provides a Layer 2 connection that is based on IEEE 802.1ad. When the customer tries to access a switch at the other side of the link by using SSH, the connection fails.

What is the cause of this failure?

A. The Service Provider omitted the command **I2protocol-tunnel stp**.

- B. The Service Provider omitted the command **l2protocol-tunnel vtp**.
- C. The Service Provider omitted the command **vlan dot1q tag native**.
- D. The Service Provider omitted the command **spanning-tree bpduguard enable**.

Correct Answer: C

Section: (none)

Explanation

Explanation/Reference:

<https://ccieblog.co.uk/qinq/802-1q-tunnelling-qinq>

QUESTION 11

In an MPLS VPN environment, the QoS marking over the MPLS backbone must be different from the one that is received from the customer. The forwarding on the egress PE is based on the marking that is set by the ingress PE. Which null label and QoS mode can achieve this?

- A. MPLS explicit null with pipe mode
- B. MPLS implicit null with short pipe mode
- C. MPLS implicit null with uniform mode
- D. MPLS explicit null with uniform mode
- E. MPLS explicit null with short pipe mode
- F. MPLS implicit null with pipe mode

Correct Answer: A

Section: (none)

Explanation

Explanation/Reference:

http://www.cisco.com/en/US/tech/tk828/technologies_q_and_a_item09186a00800a43f5.shtml#wp27379

http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/mp_te_diffserv/configuration/15-mt/mp-te-diffserv-15-mt-book/mp-diffserv-tun-mode.pdf

<https://ccdewiki.wordpress.com/2013/05/31/three-qos-models-in-mpls/>

QUESTION 12

An engineer is deploying RTBH. What is necessary routing constraint required for successful implementation?

- A. The trigger device must have an iBGP session with all the clusters/route reflectors in the autonomous system.
- B. The trigger device must redistribute the static route pointing to a null interface into the IGP process.
- C. The **no ip reachables** command must be issued on the PE router interface under attack.
- D. The attacker's destination IP address must be routed to a null interface.
- E. The eBGP sessions need to set the next-hop attribute value to the trigger device loopback interface.

Correct Answer: A

Section: (none)

Explanation

Explanation/Reference:

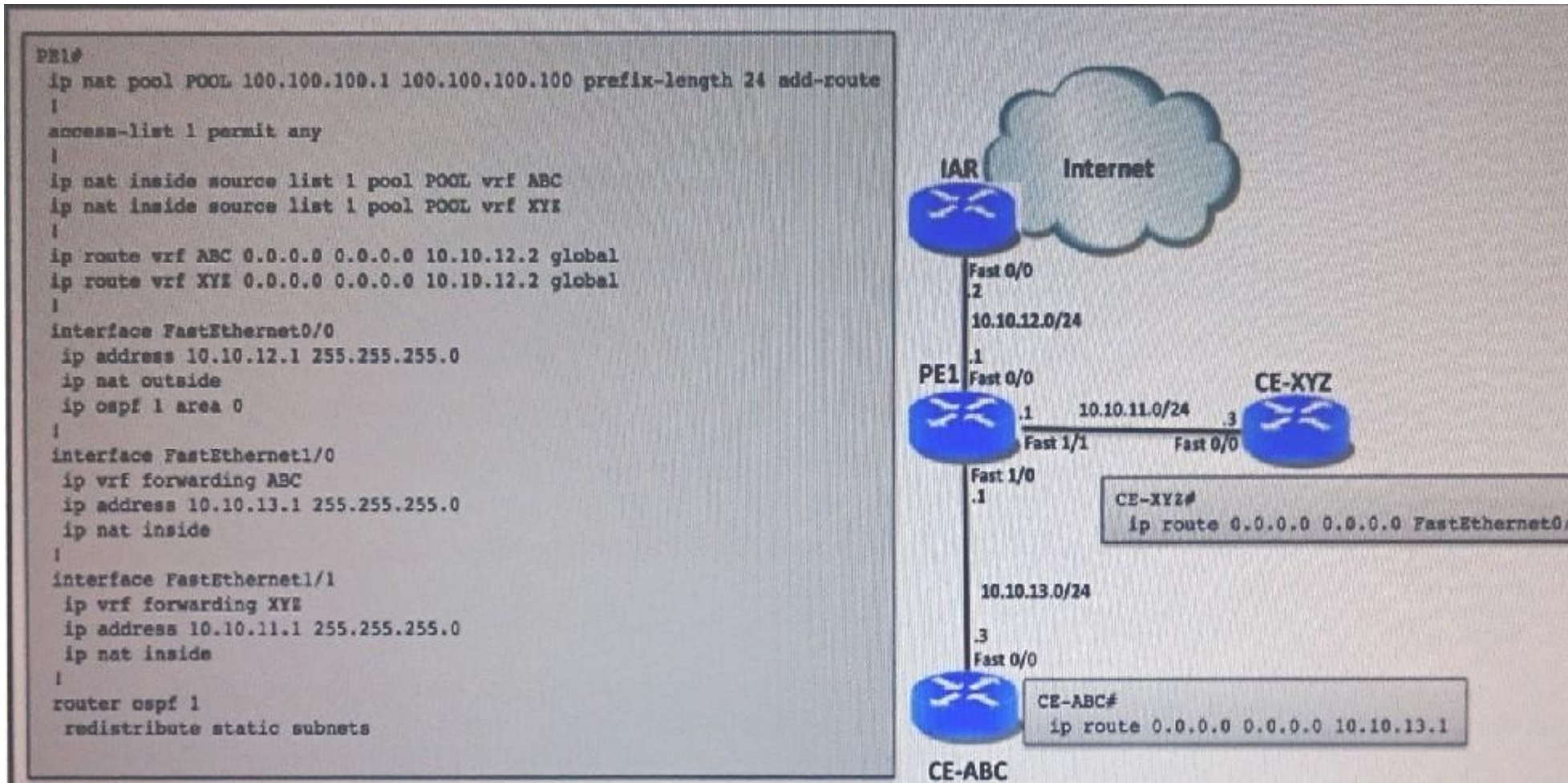
Explanation :

http://www.cisco.com/web/about/security/intelligence/ipv6_rtbf.html

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QUESTION 13

Refer to the exhibit.



ABC and XYZ MPLS VPN customers are accruing Internet access. Both CEs are sending traffic to the Internet. Which statement about their connectivity is true?

- A. Both CEs will have connectivity.
- B. Only CE-XYZ will have connectivity.
- C. Neither CEs will have connectivity, as both CEs are using the same NATed subnet.
- D. Only CE-ABC will have connectivity.
- E. Neither CEs will have connectivity, as IAR does not have route back to the NATed subnet.

Correct Answer: D

Section: (none)

Explanation

Explanation/Reference:

QUESTION 14

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

QUESTION 15

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

QUESTION 16

An engineer wants to configure MPLS TE Fast Reroute with link protection on five routers. Which methodology can reduce configuration on the point of the local repair router and successfully complete the task?

- A. Configure a backup tunnel on the PLR.
- B. Enable the autotunnel backup feature.
- C. Configure a backup tunnel on the tunnel head end router.
- D. Enable the autotunnel primary feature.

Correct Answer: B

Section: (none)

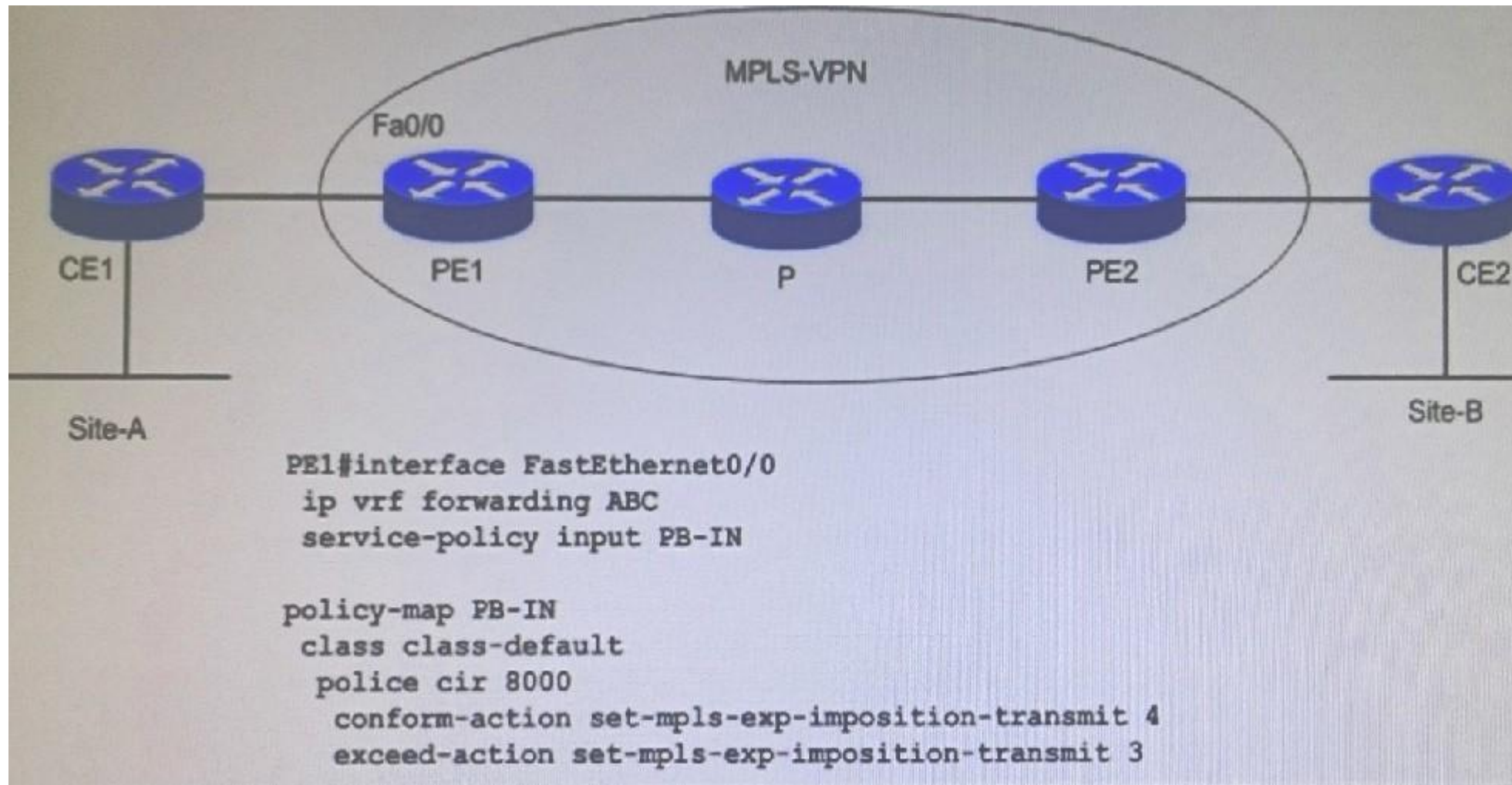
Explanation

Explanation/Reference:

http://www.cisco.com/c/en/us/td/docs/routers/crs/software/crs_r4-2/mpls/configuration/guide/b_mpls_cg42crs/b_mpls_cg42crs_chapter_0100.html#concept_F19BEEFC831436AAC9291A87F9B34E5

QUESTION 17

Refer to the exhibit. An MPLS Layer 3 VPN service has been provisioned for a customer. What will be the ToS value at Site-B for the exceeded traffic that it is sent from Site-A with ToS 2?



- A. 0
- B. 2
- C. 3
- D. 4
- E. No exceeded traffic will reach Site-B.

Correct Answer: E

Section: (none)

Explanation

Explanation/Reference:

QUESTION 18

What is NETCONF?

- A. It is a standard for installing, manipulating and deleting configuration of network devices.
- B. It is a Cisco proprietary solution to help remove the time, cost and manual steps involved in network element configuration.
- C. It is data modeling language, to help remove the time, cost and manual steps involved in network element configuration.
- D. It is a new recommendation which writes device specific CLI scripts while keeping flexibility in a vendor dependence environment.

Correct Answer: A

Section: (none)

Explanation

Explanation/Reference:

<http://www.tail-f.com/education/what-is-netconf/>

QUESTION 19

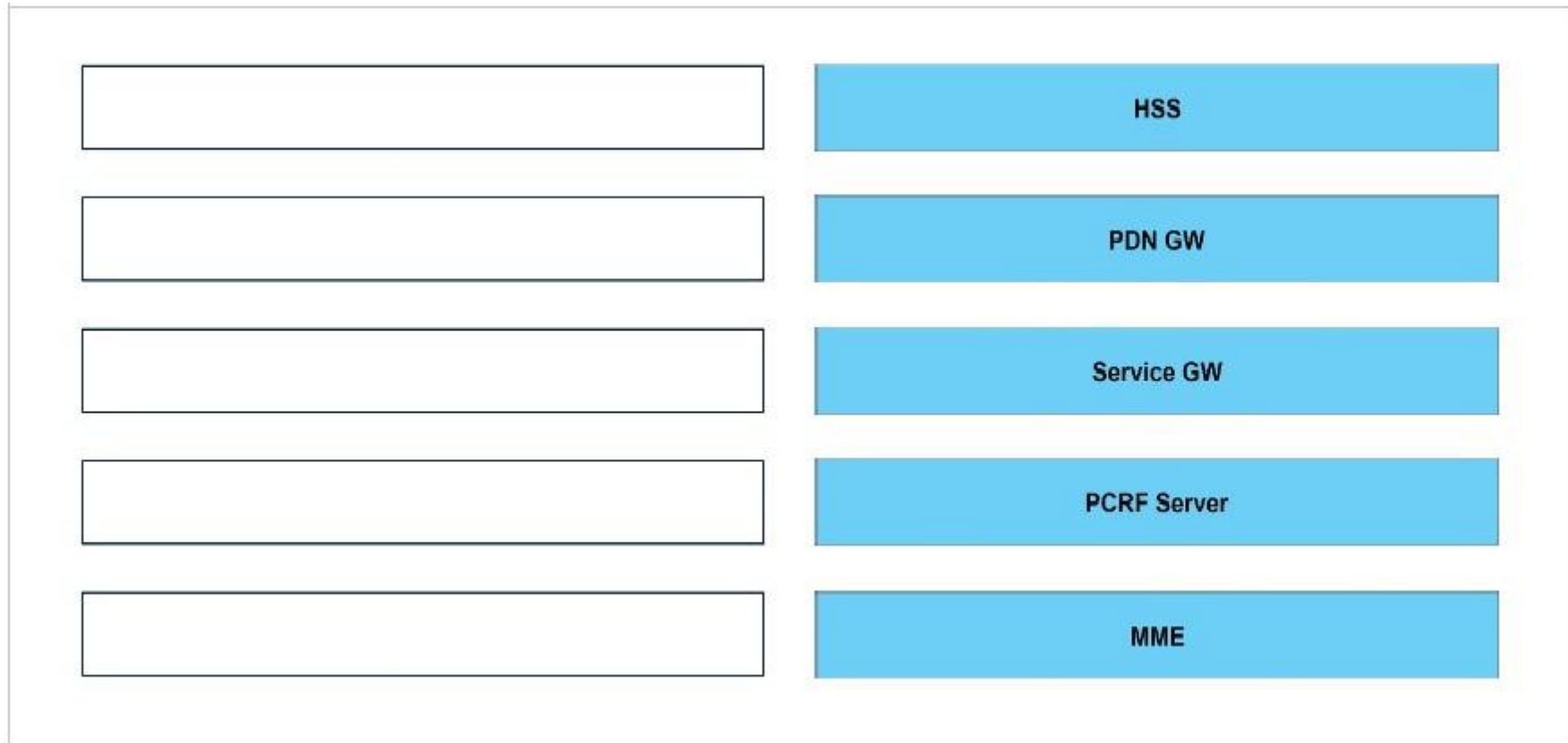
DRAG DROP

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

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 20

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

QUESTION 21

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 22

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 23

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

QUESTION 24

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 25

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 26

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 27

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-mspmsi-08#section-3.2.2.1>

QUESTION 28

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

QUESTION 29

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 30

Refer to the exhibit. Customer XYZ Site 1 is not learning prefixes from Site 2. What is the issue?