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Therefore we will remove this command and replace it with the eigrp stub command: R3# configure terminal R3(config)# router eigrp 123 R3(config-router)# no eigrp stub receive-only R3(config-router)# eigrp stub R3(config-router)# end Now R3 will send updates containing its connected and summary routes to other routers. Notice that the eigrp stub command equals to the eigrp stub connected summary because the connected and summary options are enabled by default. Next we will configure router R3 so that it has only 2 subnets of 10.0.0.0 network. Use the show ip route command on R3 to view its routing table R3# show ip route Because we want the routing table of R3 only have 2 subnets so we have to summary sub-networks at the interface which is connected with R3, the s0/0 interface of R4. There is one interesting thing about the output of the show ip route shown above: the 10.2.3.0/24, which is a directly connected network of R3. We can't get rid of it in the routing table no matter what technique we use to summary the networks. Therefore, to make the routing table of R3 has only 2 subnets we have to summary other subnets into one subnet. In the output if we don't see the summary line (like 10.0.0.0/8 is a summary?) then we should use the command ip summary-address eigrp 123 10.2.0.0 255.255.0.0 so that all the ping can work well. In conclusion, we will use the ip summary-address eigrp 123 10.2.0.0 255.255.0.0 at the interface s0/0 of R4 to summary. R4> enable R4# configure terminal R4(config)# interface s0/0 R4(config-if)# ip summary-address eigrp 123 10.2.0.0 255.255.0.0 Now we jump back to R3 and use the show ip route command to verify the effect, the output is shown below: (But please notice that the ip addresses and the subnet masks in your real exam might be different so you might use different ones to solve this question) Just for your information, notice that if you use another network than 10.0.0.0/8 to summary, for example, if you use the command ip summary-address eigrp 123 10.2.0.0 255.255.0.0 you will leave a /16 network in the output of the show ip route command. But in your real exam, if you don't see the line "10.0.0.0/8 is a summary,....Null0" then you can summary using the network 10.2.0.0/16. This summarization is better because all the pings can work well. Finally don't forget to use the copy running-config startup-config command on routers R3 and R4 to save the configurations. R3(config-if)# end R3# copy run start R4(config-if)# end R4# copy run start QUESTION 42Lab Simulation 3 - IPv6 OSPF Virtual Link Answer: To troubleshoot the problem, first issue the show running-config on all of 4 routers. Pay more attention to the outputs of routers R2 and R3. The output of the "show running-config" command of R2: And the output of the "show running-config" command of R3: We knew that all areas in an Open Shortest Path First (OSPF) autonomous system must be physically connected to the backbone area (Area 0). In some cases, where this is not possible, we can use a virtual link to connect to the backbone through a non-backbone area. The area through which you configure the virtual link is known as a transit area. In this case, the area 11 will become the transit area. Therefore, routers R2 and R3 must be configured with the area <area id> virtual-link <neighbor router-id> command. + Configure virtual link on R2 (from the first output above, we learned that the OSPF process ID of R2 is 1): R2> enable R2# configure terminal R2(config)# ipv6 router ospf 1 R2(config-rtr)# area 11 virtual-link 3.3.3.3 Save the configuration: R2(config-rtr)# end R2# copy running-config startup-config (Notice that we have to use neighbor router-id 3.3.3.3, not R2's router-id 2.2.2.2) + Configure virtual link on R3 (from the second output above, we learned that the OSPF process ID of R3 is 1 and we have to disable the wrong configuration of "area 54 virtual-link 4.4.4.4"): R3> enable R3# configure terminal R3(config)# ipv6 router ospf 1 R3(config-rtr)# no area 54 virtual-link 4.4.4.4 R3(config-rtr)# area 11 virtual-link 2.2.2.2 Save the configuration: R3(config-rtr)# end R3# copy running-config startup-config You should check the configuration of R4, too. R4(config)# ipv6 router ospf 1 R4(config-router)# no area 54 virtual-link 3.3.3.3 R4(config-router)# end After finishing the configuration don't forget to ping between R1 and R4 to make sure they work well! Note: If you want to check the routing information, use the show ipv6 route command, not "show ip route". QUESTION 43Lab Simulation 4 - Policy Based Routing You are a network engineer with ROUTE.com, a small IT company. ROUTE.com has two connections to the Internet; one via a frame relay link and one via an EoMPLS link. IT policy requires that all outbound HTTP traffic use the frame relay link when it is available. All other traffic may use either link. No static or default routing is allowed. Choose and configure the appropriate path selection feature to accomplish this task. You may use the Test Workstation to

generate HTTP traffic to validate your solution. Answer: (1) First create the access list that catches the HTTP traffic: R1(config)# access-list 101 permit tcp any any eq www (2) Configure the route map that sets the next hop address to be ISP1 and permits the rest of the traffic: R1(config)# route-map pbr permit 10 R1(config-route-map)# match ip address 101 R1(config-route-map)# set ip next-hop 10.1.100.2 R1(config-route-map)# exit R1(config)# route-map pbr permit 20 (3) Apply the route-map on the interface to the server in the EIGRP Network: R1(config-route-map)# exit R1(config)# int fa0/1 R1(config-if)# ip policy route-map pbr R1(config-if)# exit R1(config)# exit

QUESTION 44 Lab Simulation - EIGRP OSPF Redistribution

You are a network engineer with ROUTE.com, a small IT company. They have recently merged two organizations and now need to merge their networks as shown in the topology exhibit. One network is using OSPF as its IGP and the other is using EIGRP as its IGP. R4 has been added to the existing OSPF network to provide the interconnect between the OSPF and EIGRP networks. Two links have been added that will provide redundancy. The network requirements state that you must be able to ping and telnet from loopback 101 on R1 to the OSPF domain test address of 172.16.1.100. All traffic must use the shortest path that provides the greatest bandwidth. The redundant paths from the OSPF network to the EIGRP network must be available in case of a link failure. No static or default routing is allowed in either network. A previous network engineer has started the merger implementation and has successfully assigned and verified all IP addressing and basic IGP routing. You have been tasked with completing the implementation and ensuring that the network requirements are met. You may not remove or change any of the configuration commands currently on any of the routers. You may add new commands or change default values.

Answer: R2# show interface s0/0/0 Write down these 5 parameters, notice that we have to divide the Delay by 10 because the metric unit is in tens of microsecond. For example, we get Bandwidth=1544 Kbit, Delay=20000 us, Reliability=255, Load=1, MTU=1500 bytes then we would redistribute as follows: R2# config terminal R2(config)# router ospf 1 R2(config-router)# redistribute eigrp 100 metric-type 1 subnets R2(config-router)# exit R2(config-router)# router eigrp 100 R2(config-router)# redistribute ospf 1 metric 1544 2000 255 1 1500 Note: In fact, these parameters are just used for reference and we can use other parameters with no problem. If the delay is 20000us then we need to divide it by 10, that is 20000 / 10 = 2000) For R3 we use the show interface fa0/0 to get 5 parameters too R3# show interface fa0/0 For example we get Bandwidth=10000 Kbit, Delay=1000 us, Reliability=255, Load=1, MTU=1500 bytes R3# config terminal R3(config)# router ospf 1 R3(config-router)# redistribute eigrp 100 metric-type 1 subnets R3(config)# exit R3(config-router)# router eigrp 100 R3(config-router)# redistribute ospf 1 metric 10000 100 255 1 1500 Finally you should try to "show ip route" to see the 172.16.100.1 network (the network behind R4) in the routing table of R1 and make a ping from R1 to this network. Note: If the link between R2 and R3 is Fast Ethernet link, we must put the command below under EIGRP process to make traffic from R1 to go through R3 (R1 -> R2 -> R3 -> R4), which is better than R1 -> R2 -> R4. R2(config-router)# distance eigrp 90 105 This command sets the Administrative Distance of all EIGRP internal routes to 90 and all EIGRP external routes to 105, which is smaller than the Administrative Distance of OSPF (110) -> the link between R2 & R3 will be preferred to the serial link between R2 & R4. Note: The actual OSPF and EIGRP process numbers may change in the actual exam so be sure to use the actual correct values, but the overall solution is the same.

QUESTION 45 You have been asked to evaluate how EIGRP is functioning in a customer network. Traffic from R1 to R6's Loopback address is load shared between R1-R2-R4-R6 and R1-R3-R5-R6 paths. What is the ratio of traffic over each path? A. 1:1 B. 1:5 C. 6:8 D. 19:80 Answer: D Explanation: First, find the IP address of the loopback0 interface on R6: We see that it is 150.1.6.6, so we issue the "show ip route 150.1.6.6" command from R1 and see this: Notice the "traffic share count" shows 19 for the first path, and 80 for the second path.

QUESTION 46 You have been asked to evaluate how EIGRP is functioning in a customer network. What type of route filtering is occurring on R6? A. Distribute-list using an ACL B. Distribute-list using a prefix-list C. Distribute-list using a route-map D. An ACL using a distance of 255 Answer: A Explanation: The configuration on R6 is as follows: This is a standard distribute list using access list number 1.

QUESTION 47 You have been asked to evaluate how EIGRP is functioning in a customer network. Which key chain is being used for authentication of EIGRP adjacency between R4 and R2? A. CISCO B. EIGRPC C. key D. MD5 Answer: A Explanation: R4 and R2 configs are as shown below: Clearly we see the actual key chain is named CISCO.

QUESTION 48 You have been asked to evaluate how EIGRP is functioning in a customer network. What is the advertised distance for the 192.168.46.0 network on R1? A. 333056 B. 1938688 C. 1810944 D. 307456 Answer: C Explanation: R1's routing table is as follows The numbers after the route specify the administrative distance of the route (90 for EIGRP) and the distance metric of that particular route, which is shown as 1810944 for the 192.168.46.0 route.

QUESTION 49 You have been asked to evaluate how EIGRP is functioning in a customer network. What percent of R1's interfaces bandwidth is EIGRP allowed to use? A. 10 B. 20 C. 30 D. 40 Answer: B Explanation: The relevant configuration of R1 is shown below: ip bandwidth-percent eigrp 1 20 = the EIGRP AS20 = 20% of the bandwidth

QUESTION 50 Scenario: You have been asked to evaluate an OSPF network setup in a test lab and to answer questions a customer has about its operation. The customer has disabled your access to the show running-config command. How old is the Type 4 LSA from Router 3

for area 1 on the router R5 based on the output you have examined? A. 1858B. 1601C. 600D. 1569 Answer: AExplanation: Part of the "show ip ospf topology" command on R5 shows this: The Link ID of R3 (3.3.3.3) shows the age is 1858. QUESTION 51Scenario: You have been asked to evaluate an OSPF network setup in a test lab and to answer questions a customer has about its operation. The customer has disabled your access to the show running-config command. Which of the following statements is true about the serial links that terminate in R3 A. The R1-R3 link needs the neighbor command for the adjacency to stay upB. The R2-R3 link OSPF timer values are 30, 120, 120C. The R1-R3 link OSPF timer values should be 10,40,40D. R3 is responsible for flooding LSUs to all the routers on the network. Answer: BExplanation: We can see the configured timers using the following command: QUESTION 52Scenario: You have been asked to evaluate an OSPF network setup in a test lab and to answer questions a customer has about its operation. The customer has disabled your access to the show running-config command. How many times was SPF algorithm executed on R4 for Area 1? A. 1B. 5C. 9D. 20E. 54F. 224 Answer: CExplanation: This can be found using the "show ip ospf" command on R4. Look for the Area 1 stats which shows this: QUESTION 53Scenario: You have been asked to evaluate an OSPF network setup in a test lab and to answer questions a customer has about its operation. The customer has disabled your access to the show running-config command. Areas of Router 5 and 6 are not normal areas, inspect their routing tables and determine which statement is true? A. R5's Loopback and R6's Loopback are both present in R5's Routing tableB. R5's Loopback and R6's Loopback are both present in R6's Routing tableC. Only R5's loopback is present in R5's Routing tableD. Only R6's loopback is present in R5's Routing tableE. Only R5's loopback is present in R6's Routing table Answer: AExplanation: Here are the routing tables of R5 and R6: QUESTION 54Drag and Drop Question Answer: QUESTION 55Drag and Drop Question Answer: QUESTION 56Refer to the exhibit. Based on this FIB table, which statement is correct? A. There is no default gateway.B. The IP address of the router on FastEthernet is 209.168.201.1.C. The gateway of last resort is 192.168.201.1. D. The router will listen for all multicast traffic. Answer: CExplanation: The 0.0.0.0/0 route is the default route and is listed as the first CEF entry. Here we see the next hop for this default route lists 192.168.201.1 as the default router (gateway of last resort). QUESTION 57Refer to the exhibit. A network administrator checks this adjacency table on a router. What is a possible cause for the incomplete marking? A. incomplete ARP informationB. incorrect ACLC. dynamic routing protocol failureD. serial link congestion Answer: AExplanation: To display information about the Cisco Express Forwarding adjacency table or the hardware Layer 3-switching adjacency table, use the show adjacency command. Reasons for Incomplete Adjacencies There are two known reasons for an incomplete adjacency: The router cannot use ARP successfully for the next-hop interface. After a clear ip arp or a clear adjacency command, the router marks the adjacency as incomplete. Then it fails to clear the entry. In an MPLS environment, IP CEF should be enabled for Label Switching. Interface level command ip route-cache cefNo ARP Entry When CEF cannot locate a valid adjacency for a destination prefix, it punts the packets to the CPU for ARP resolution and, in turn, for completion of the adjacency. <http://www.cisco.com/c/en/us/support/docs/ip/express-forwarding-cef/17812-cef-incomp.html#t4> QUESTION 58A network engineer notices that transmission rates of senders of TCP traffic sharply increase and decrease simultaneously during periods of congestion. Which condition causes this? A. global synchronizationB. tail dropC. random early detectionD. queue management algorithm Answer: AExplanation: TCP global synchronization in computer networks can happen to TCP/IP flows during periods of congestion because each sender will reduce their transmission rate at the same time when packet loss occurs. Routers on the Internet normally have packet queues, to allow them to hold packets when the network is busy, rather than discarding them. Because routers have limited resources, the size of these queues is also limited. The simplest technique to limit queue size is known as tail drop. The queue is allowed to fill to its maximum size, and then any new packets are simply discarded, until there is space in the queue again. This causes problems when used on TCP/IP routers handling multiple TCP streams, especially when bursty traffic is present. While the network is stable, the queue is constantly full, and there are no problems except that the full queue results in high latency. However, the introduction of a sudden burst of traffic may cause large numbers of established, steady streams to lose packets simultaneously. http://en.wikipedia.org/wiki/TCP_global_synchronization QUESTION 59Which three problems result from application mixing of UDP and TCP streams within a network with no QoS? (Choose three.) A. starvationB. jitterC. latencyD. windowingE. lower throughput Answer: ACEExplanation: It is a general best practice not to mix TCP-based traffic with UDP-based traffic (especially streaming video) within a single service provider class due to the behaviors of these protocols during periods of congestion. Specifically, TCP transmitters will throttle-back flows when drops have been detected. Although some UDP applications have application-level windowing, flow control, and retransmission capabilities, most UDP transmitters are completely oblivious to drops and thus never lower transmission rates due to dropping. When TCP flows are combined with UDP flows in a single service provider class and the class experiences congestion, then TCP flows will continually lower their rates, potentially giving up their bandwidth to drop-oblivious UDP flows. This effect is called TCP-starvation/UDP-dominance. This can increase latency and lower the overall throughput. TCP-starvation/UDP-dominance likely occurs if (TCP-based) mission-critical data

is assigned to the same service provider class as (UDP-based) streaming video and the class experiences sustained congestion. Even if WRED is enabled on the service provider class, the same behavior would be observed, as WRED (for the most part) only affects TCP-based flows. Granted, it is not always possible to separate TCP-based flows from UDP-based flows, but it is beneficial to be aware of this behavior when making such application-mixing decisions.

http://www.cisco.com/warp/public/cc/so/neso/vpn/vpnsp/spqsd_wp.htm QUESTION 60 Which method allows IPv4 and IPv6 to work together without requiring both to be used for a single connection during the migration process? A. dual-stack method B. 6to4 tunneling C. GRE tunneling D. NAT-PT Answer: A Explanation: Dual stack means that devices are able to run IPv4 and IPv6 in parallel. It allows hosts to simultaneously reach IPv4 and IPv6 content, so it offers a very flexible coexistence strategy. For sessions that support IPv6, IPv6 is used on a dual stack endpoint. If both endpoints support IPv4 only, then IPv4 is used. Benefits: Native dual stack does not require any tunneling mechanisms on internal networks. Both IPv4 and IPv6 run independent of each other. Dual stack supports gradual migration of endpoints, networks, and applications.

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