642-902

Cisco
Implementing Cisco IP Routing

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QUESTION: 1
The Company WAN is displayed in the following diagram:
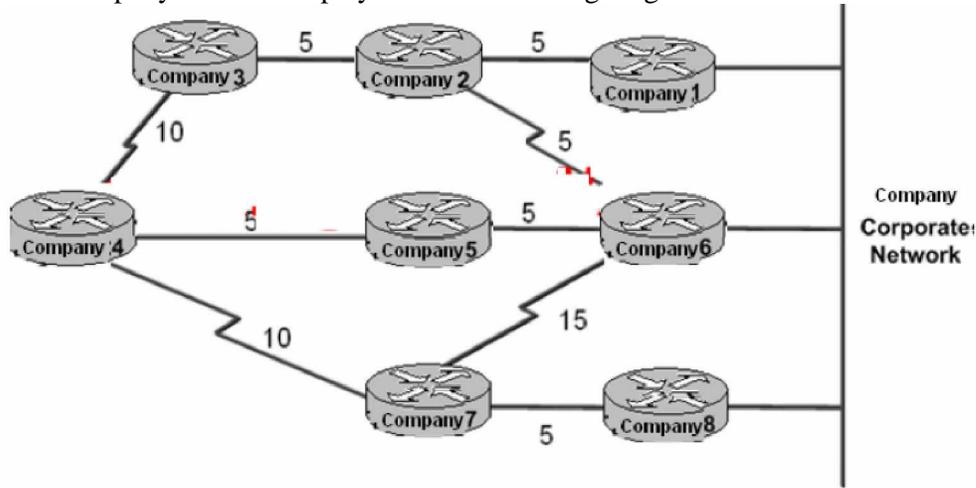
Traffic from Company4 to the Company Corporate Network is distributed between the links with unequal costs in the EIGRP network by configuring the variance command on Company4 to 2. How many paths will participate in the load sharing?

A. 1
B. 2
C. 3
D. 4
E. 5
F. 6

Answer: B

Explanation:
If a path is not a feasible successor, the path is not used in load balancing. In this case the FD is 10, which means that only the paths with a total distance of 20 or less will be chosen. This leaves us only the paths from Company4-Company5-Company6 and Company4-Company7-Company8.

Reference:
CCNP Self-Study CCNP BSCI Exam certification guide p.485

QUESTION: 2
Five Company routers are connected together as shown in the diagram below: Exhibit:
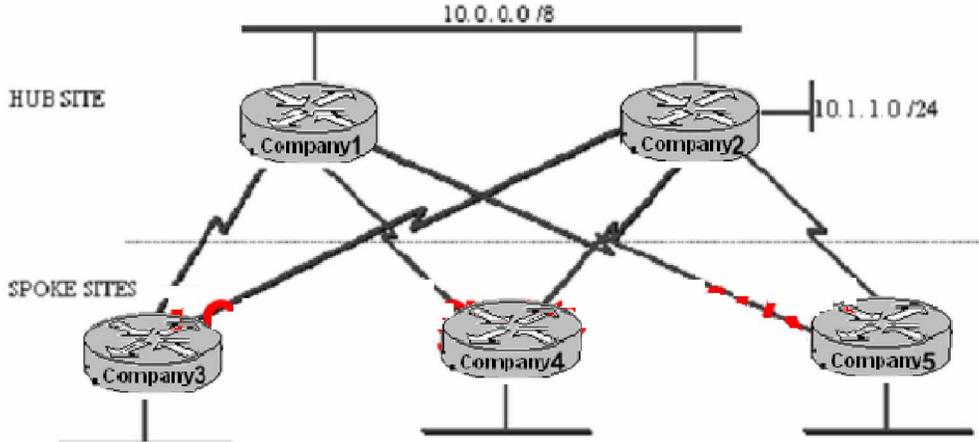
You work as a network engineer at Company.com. You study the exhibit carefully. Company1 and Company2 are summarizing the 10.0.0.0/8 network and advertising it to all routers. Which two EIGRP configurations will prevent unnecessary EIGRP updates from being sent and possibly causing 10.0.0.0/8 from being SIA on router Company1 or Company2? (Select two)

A. Configure Company3, Company4, and Company5 as EIGRP stub routers.
B. Configure an ACL on the interface of Company1 and Company2.
C. Configure Company1 and Company2 as EIGRP stub routers.
D. Configure summary routes on Company1 and Company2
E. Configure static routing on Company3, Company4, and Company5

Answer: A, D

Explanation:
A dual-homed remote will have two or more distribution (hub) routers. However, the principles of stub routing are the same as they are with a hub and spoke topology.
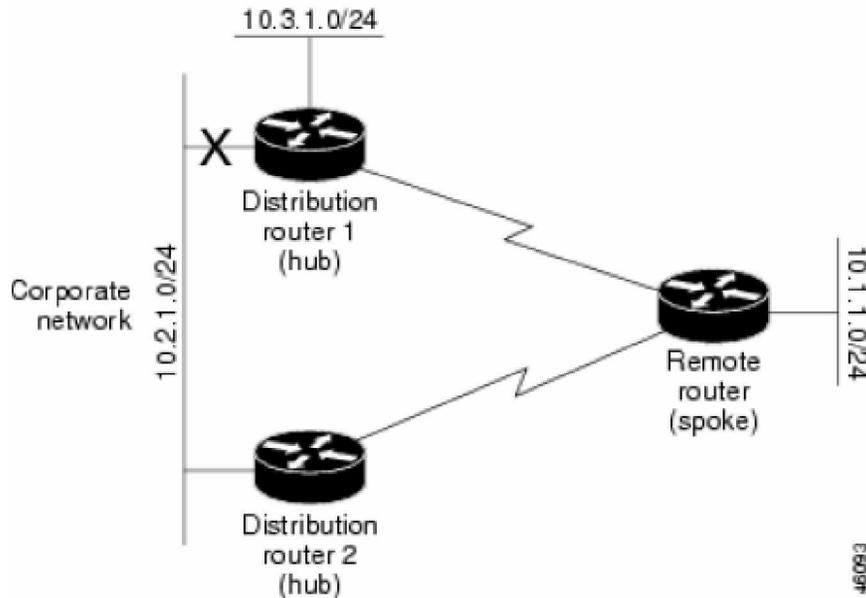
It is not desirable for traffic from distribution router 2 to travel through any remote router in order to reach network 10.3.1.0/24. If the links are sized to handle the load, it would be acceptable to use one of the backup routes. However, most networks of this type have remote routers located at remote offices with relatively slow links. This problem can be prevented if proper summarization is configured on the distribution router and remote router. It is typically undesirable for traffic from a distribution router to use a remote router as a transit path. A typical connection from a distribution router to a remote router would have much less bandwidth than a connection at the network core. Attempting to use a remote router with a limited bandwidth connection as a transit path would generally produce excessive congestion to the remote router. The EIGRP Stub Routing feature can prevent this problem by preventing the remote router from advertising core routes back to distribution routers. Routes learned by the remote router from distribution router 1 will not be advertised to distribution router 2. Since the remote router will not advertise core routes to distribution router 2, the distribution router will not use the remote router as a transit for traffic destined for the network core.

Reference:
http://www.cisco.com/en/US/products/sw/iosswrel/ps1829/products_feature_guide09186a0080087026.html

QUESTION: 3
Two Company EIGRP routers are attempting to establish themselves as neighbors. Which EIGRP multicast packet type is responsible for neighbor discovery?

A. Update
B. Query

C. Acknowledgment
D. Reply
E. Hello
F. None of the other alternatives apply

Answer: E

Explanation:
Remember that simple distance vector routers do not establish any relationship with their neighbors. RIP andIGRP routers merely broadcast or multicast updates on configured interfaces. In contrast, EIGRP routers actively establish relationships with their neighbors, much the same way that OSPF routers do.EIGRP routers establish adjacencies with neighbor routers by using small hello packets. Hellos are sent bydefault every five seconds. An EIGRP router assumes that as long as it is receiving hello packets from knownneighbors, those neighbors (and their routes) remain viable. By forming adjacencies, EIGRP routers do thefollowing: Dynamically learn of new routes that join their network Identify routers that become either unreachable or inoperable Rediscover routers that had previously been unreachable

QUESTION: 4
Company has chosen to use EIGRP for their network routing protocol. Which three statements are true regarding EIGRP? (Select three)

A. By default, EIGRP uses the Dijkstra algorithm to determine the best path to a destination network based on bandwidth and delay.
B. To speed convergence, EIGRP attempts to maintain a successor and feasible successor path for each destination.
C. EIGRP uses hellos to establish neighbor relationships.
D. By default, EIGRP performs auto-summarization across classful network boundaries.
E. EIGRP uses an area hierarchy to increase network scalability.

Answer: B, C, D

Explanation:
The default behavior of EIGRP routers is to automatically summarize routes at the network boundary.EIGRP routers maintain information regarding the successors and the feasible successors to each network destination. This information is useful in the convergence time whenever any of the links fail.EIGRP neighbors periodically use hellos to establish the relationship. Should any of the neighbors fail,triggered updates are sent to update the network regarding the topology change.

Incorrect Answer:

A: The Dijkstra algorithm is used by link state routing protocols. EIGRP is considered to be a hybrid routingprotocol.

E: EIGRP networks are inherently flat, as each router is perceived as a peer to every other EIGRP router. IS-ISand OSPF utilize hierarchical network topologies.

QUESTION: 5

You need to configure EIGRP on all routers within the Company network. Which two statements are Characteristics of the routing protocol EIGRP ? (Select two)

A. Updates are sent as broadcast.
B. Updates are sent as multicast.
C. LSAs are sent to adjacent neighbors.
D. Metric values are represented in a 32-bit format for granularity.

Answer: B, D

Explanation:

EIGRP routers establish adjacencies with neighbor routers by using small hello packets. These packets are sent to the multicast IP address of 224.0.0.10. Hellos are sent by default every five seconds. An EIGRP router assumes that as long as it is receiving hello packets from known neighbors, those neighbors (and their routes) remain viable. By forming adjacencies, EIGRP routers do the following:

Both EIGRP and IGRP use the following metric calculation:

$$metric = [K1 * bandwidth + (K2 * bandwidth)/(256 - load) + (K3 * delay)]^* [K5/(reliability + K4)]$$

The following are the default constant values:

$$K1 = 1, K2 = 0, K3 = 1, K4 = 0, K5 = 0$$

When K4 and K5 are 0, the [K5/reliability + K4)] portion of the equation is not factored in to the metric. Therefore, with the default constant values, the metric equation is as follows:

$$metric = bandwidth + delay$$

IGRP and EIGRP, which scales the value of 256, use the following equations to determined the values used in the metric calculation:

$$bandwidth \ for \ IGRP = (10000000/bandwidth)$$
$$bandwidth \ for \ EIGRP = (10000000/bandwidth)^*256$$
$$delay \ for \ IGRP = delay/10$$
$$delay \ for \ EIGRP = delay/10^*256$$

• Dynamically learn of new routes that join their network

• Identify routers that become either unreachable or inoperable
• Rediscover routers that had previously been unreachable

You have been tasked with setting up summarization in the Company EIGRP network. Which two statements are true about EIGRP manual summarization? (Select two)

A. Manual summarization is configured on a per interface basis.
B. When manual summarization is configured, auto-summarization is automatically disabled by default.
C. The summary address is assigned an administrative distance of 10 by default.
D. Manual summaries can be configured with the classful mask only.
E. The summary address is entered into the routing table and is shown to be sourced from the Null0 interface.

Answer: A, E

Explanation:
EIGRP automatically summarizes routes at the classful boundary, the boundary where the network address endsas defined by class-based addressing. In most cases, auto summarization is a good thing, keeping the routing tables as compact as possible In the presence of discontinuous sub networks, automatic summarization must be disabled for routing to work properly. To turn off auto- summarization, use the following command:Router(config-router)#no auto-summaryEIGRP also enables manual configuration of a prefix to use as a summary address. Manual summary routes areconfigured on a per-interface basis. The interface that will propagate the route summary must first be selectedand then defined with the ip summary-address eigrp command, which has the following syntax:Router(config-if)#ip summary-address eigrp autonomous-system-number ip- address maskadministrative-distanceD 2.1.0.0/16 is a summary, 00:00:22, Null0Notice that the summary route is sourced from Null0, and not an actual interface.

Router Company14 is configured as an EIGRP stub router. What are three key concepts that apply when configuring the EIGRP stub routing feature in a hub and spoke network? (Select three)

A. Stub routers are not queried for routes.
B. A hub router prevents routes from being advertised to the remote router.
C. A stub router should have only EIGRP hub routers as neighbors.
D. EIGRP stub routing should be used on hub routers only.
E. Spoke routers connected to hub routers answer the route queries for the stub router.
F. Only remote routers are configured as stubs.

Answer: A, C, F

Explanation:
The Enhanced Interior Gateway Routing Protocol (EIGRP) Stub Routing feature improves network stability,reduces resource utilization, and simplifies stub router configuration.Stub routing is commonly used in a hub and spoke network topology. In a hub and spoke network, one or moreend (stub) networks are connected to a remote router (the spoke) that is connected to one or more distributionrouters (the hub). The remote router is adjacent only to one or more distribution routers. The only route for IPtraffic to follow into the remote router is through a distribution router. This type of configuration is commonlyused in WAN topologies where the distribution router is directly connected to a WAN. The distribution routercan be connected to many more remote routers. Often, the distribution router will be connected to 100 or moreremote routers. In a hub and spoke topology, the remote router must forward all nonlocal traffic to a distributionrouter, so it becomes unnecessary for the remote router to hold a complete routing table. Generally, thedistribution router need not send anything more than a default route to the remote router.When using the EIGRP Stub Routing feature, you need to configure the distribution and remote routers to useEIGRP, and to configure only the remote router as a stub. Only specified routes are propagated from the remote(stub) router. The router responds to queries for summaries, connected routes, redistributed static routes,external routes, and internal routes with the message "inaccessible." A router that is configured as a stub willsend a special peer information packet to all neighboring routers to report itsstatusasastub router.

Reference:
http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/120newft/120limit/120s/120s15/eigrpstb.htm

QUESTION: 8
You want to reduce the amount of EIGRP traffic across low speed links in the Company network. Which is the most effective technique to contain EIGRP queries?

A. Using a hierarchical addressing scheme
B. Configuring route filters
C. Establishing separate autonomous systems
D. Route summarization
E. None of the other alternatives apply

Answer: D

Explanation:
EIGRP automatically summarizes routes at the classful boundary, the boundary where the network address endsas defined by class-based addressing. In most cases, auto summarization is a good thing, keeping the routingtables as compact as possibleIn the presence of discontiguous subnetworks, automatic summarization must be disabled for routing to workproperly. To turn off auto-summarization, use the following command:Router(config-router)#no auto-summaryEIGRP also enables manual configuration of a prefix to use as a summary address. Manual summary routes areconfigured on a per-interface basis. The interface that will propagate the route summary must first be selectedand then defined with the ip summary-address eigrp command, which has the following syntax:Router(config-if)#ip summary-address eigrp autonomous-system-number ip- address maskadministrative-distance

QUESTION: 9
Routers Company1 and Company2 have formed an EIGRP neighbor relationship. In order for two routers to become EIGRP neighbors, which two values must match? (Select two)

A. K values
B. Delay
C. Autonomous system
D. Hello time
E. Hold time
F. Bandwidth

Answer: A, C

Explanation:
Despite being compatible with IGRP, EIGRP uses a different metric calculation and hop-count limitation.EIGRP scales the IGRP metric by a factor of 256. That is because EIGRP uses a metric that is 32-bits long, andIGRP uses a 24-bit metric. By multiplying or dividing by 256, EIGRP can easily exchange information withIGRP.EIGRP also imposes a maximum hop limit of 224, which is slightly less than the 255 limit for IGRP. However,this is more than enough to support most of the largest internetworks. To become the neighbor K value shouldbe matched and should belongs to same AS.

Both EIGRP and IGRP use the following metric calculation:

metric = [K1 * bandwidth + (K2 * bandwidth)/(256 - load)+(K3 * delay)]* [K5/(reliability + K4)]

The following are the default constant values:

K1 = 1, K2 = 0, K3 = 1, K4 = 0, K5 = 0

When K4 and K5 are 0, the [K5/reliability + K4)] portion of the equation is not factored in to the metric. Therefore, with the default constant values, the metric equation is as follows:

metric = bandwidth + delay

IGRP and EIGRP, which scales the value of 256, use the following equations to determined the values used in the metric calculation:

bandwidth for IGRP = (10000000/bandwidth)
bandwidth for EIGRP = (10000000/bandwidth)*256
delay for IGRP = delay/10
delay for EIGRP = delay/10*256

QUESTION: 10
Company uses EIGRP as their internal routing protocol. Which three statements are true about EIGRP operation? (Select three)

A. The maximum metric for the specific routes is used as the metric for the summary route.
B. When summarization is configured, the router will also create a route to null 0.
C. The summary route remains in the route table, even if there are no more specific routes to the network.
D. Automatic summarization across major network boundaries is enabled by default.
E. Summarization is configured on a per-interface level.

Answer: B, D, E

Explanation:
Using the ip summary-address eigrp summarization command will causes the creation of an EIGRP summarydefault route to the null 0 interface with an administrative distance of 5. Caution should be taken when usingthis as a default route. The low administrative distance of this default route can cause this route to displacedefault routes learned from other neighbors from the routing table. If the default route learned from theneighbors is displaced by the summary default route, or if the summary route is the only default route present,all traffic destined for the default route will not leave the router, instead, this traffic will be sent to the null 0interface where it is dropped.By default, Cisco routers will automatically summarize EIGRP routes across major network boundaries. WithEIGRP,

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