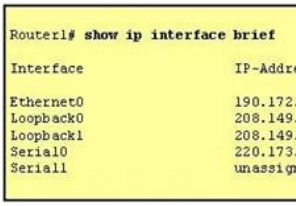
CCNA 640-802 Bible - Configure,Verify and Troubleshoot OSPF(2)

1. Refer to the exhibit. Router1 was just successfully rebooted. Identify the current OSPF router ID for Router1.



A: 190.172.32.10 B: 208.149.23.162 C: 208.149.23.194 D: 220.173.149.10 **Correct Answers: C** Explanation: Configures an OSPF router ID. Description: Router ID is the tie-breaker for OSPF path selection. The path selection process uses a variety of metrics to select a route. If all other metrics (accessibility, administrative weight, local preference, etc.) are equal, OSPF determines the router ID using the following priority: 1. Use the address configured by the ospf router-id command 2. Use the address of the loopback 0 interface 3. Use the highest IP address of any interface 4. If no interface exists, set the router-ID to 0.0.0.0 5. If no OSPF router ID is explicitly configured, OSPF computes the router-ID based on the items 2, 3, and 4 and restarts OSPF (if the process is enabled and router-ID has changed). WARNING The ospf router-id command causes the OSPF process to restart using the new router-ID (if the processes are enabled and router-ID has changed). Use ospf router-id ip-address command to set the OSPF router ID for the system. Use the no ospf router-id to configure the OSPF router ID as the default value (address of the loopback 0 interface). 2. Refer to the exhibit. A network associate has configured OSPF with the command: City(config-router)# network 192.168.12.64 0.0.0.63 area 0 After completing the configuration, the associate discovers that not all the interfaces are participating in OSPF. Which three of the interfaces shown in the exhibit will participate in OSPF according to this configuration statement? (Choose three.)

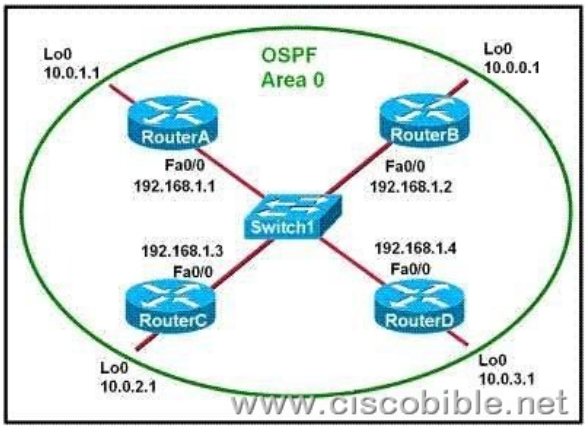
City#show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	192.168.12.48	YES	manual	up	up
FastEthernet0/1	192.168.12.65	YES	manual	up	up
Serial0/0	192.168.12.121	YES	manual	up	up
Serial0/1	unassigned	YES	unset	up	up
Serial0/1.102	192.168.12.125	YES	manual	up	up
Serial0/1.103	192.168.12.129	YES	manual	up	up
Serial0/1.104	192.168.12.133	YES	manual	up	up

City#

A:FastEthernet0 /0 B:FastEthernet0 /1 C:Serial0/0 D:Serial0/1.102 E:Serial0/1.103 F:Serial0/1.104 **Correct Answers: B, C, D** 3. The OSPF Hello protocol performs which of the following tasks? (Choose two.) A:It provides dynamic neighbor discovery. B:It detects unreachable neighbors in 90 second intervals. C:It maintains neighbor relationships. D:It negotiates correctness parameters between neighboring interfaces. E:It uses timers to elect the router with the fastest links as the designated router. F:It broadcasts hello packets throughout the internetwork to discover all routers that are running OSPF. **Correct Answers: A, C** Explanation: The Hello Packet **OSPF contains a protocol (the Hello protocol) that is used to establish and maintain relationships between neighboring nodes.** These relationships are called adjacencies. Adjacencies are the basis for the exchange of routing data in OSPF. It is through the use of this protocol, and packet type, that an OSPF node discovers the other OSPF nodes in its area. Its name is intentionally significant; the Hello protocol establishes communications between potential neighboring routers. The Hello protocol uses a special subpacket structure that is appended to the standard 24-octet OSPF header. Together, these structures form a hello packet. All routers in an OSPF network must adhere to certain conventions that must be uniform throughout the network. These conventions include the following: 1. The network mask 2. The interval at which hello packets will be broadcast (the hello interval) 3. The amount of time that must elapse before a non responding router will be declared dead (that is, the router dead interval) by the other routers in the network 4. All routers in an OSPF network must agree to use the same value for each of these parameters; otherwise, the network might not operate properly. These parameters are exchanged using hello packets. Together, they comprise the basis for neighborly communications. **They ensure that neighbor relationships (known as adjacencies) are not formed between routers in different subnets and that all members of the network agree on how frequently to stay in contact with each other.** The hello packet also includes a listing of other routers (using their unique router IDs) that the source router has recently been in contact with. This field, the Neighbor field, facilitates the neighbor discovery process. The hello packet also contains several other fields such as Designated Router and Backup Designated Router. These fields are useful in maintaining

adjacencies and support the operation of the OSPF network in both periods of stability and convergence. 4. On point-to-point networks, OSPF hello packets are addressed to which address? A: 127.0.0.1 B: 172.16.0.1 C: 192.168.0.5 D: 223.0.0.1 E: 224.0.0.5 F: 254.255.255.255 **Correct Answers: E** Explanation: OSPF neighbors process multicast hello packets upon multicast address 224.0.0.5 to find neighbors dynamically. 5. Refer to the exhibit. Which two statements are true about the loopback address that is configured on RouterB? (Choose two.)



A:It ensures that data will be forwarded by RouterB. B:It provides stability for the OSPF process on RouterB. C:It specifies that the router ID for RouterB should be 10.0.0.1. D:It decreases the metric for routes that are advertised from RouterB. E:It indicates that RouterB should be elected the DR for the LAN. **Correct Answers: B, C** Explanation: A loopback interface is virtual in nature, and thus will never go down as long as the router is powered on. It doesn't rely on any physical network or cable to be plugged in. This makes it a prime choice for any good reference point. That brings us to the "why" about using it. When OSPF routers talk to one another, they all identify themselves. That is done by a RID, or Router ID value. An OSPF router may talk to many neighbors out multiple interfaces, but it only has one Router ID it uses for all conversations. How does a router choose its identifier? Well, there are a couple ways. Typically, the router chooses its highest IP address of all physical interfaces. However, if there's a loopback interface (seen as a manual intervention), the OSPF process will always use the loopback address as its RID value. In this network, stability is ensured for TK-B as it will not become the DR or the BDR because the other routers will have a higher router ID since the have a higher loopback IP address. The DR/BDR election process is as follows: A designated router (DR) is the router elected by the network by elections. The DR is elected based on the following default criteria: * If the priority setting on a OSPF router is set to 0, that means it can NEVER become a DR or BDR. * When a DR fails and the BDR takes over, there is another election to see who becomes the replacement BDR. * The router sending the Hello packets with the highest priority. * If two or more routers tie with the highest priority setting, the router sending the Hello with the highest RID (Router ID) wins. * (NOTE) A RID is the highest logical (loopback) IP address configured on a router, if no logical/loopback IP address is set then the Router uses the highest IP address configured on its interfaces. (e.g. 192.168.0.1 would be higher than 10.1.1.2) * Usually the router with the second highest priority number becomes the BDR (Backup Designated Router) * The range of priority values range from 1 - 255, with a higher value increasing its chances of becoming DR or BDR. * IF a HIGHER priority OSPF router comes online AFTER the election has taken place, it will not become DR or BDR until (at least) the DR and BDR fail. 6. Refer to the exhibit. Why was RouterA not elected as the designated router?

```
RouterA# show ip protocols
Routing Protocol is "ospf 109"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 221.130.149.10
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    190.171.23.0 0.0.0.255 area 0
    190.172.32.0 0.0.0.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    208.149.23.66         110      00:20:09
    208.149.23.194        110      00:20:09
    208.149.23.130        110      00:20:09
  Distance: (default is 110)

RouterA# show ip ospf interface
Ethernet1 is up, line protocol is up
  Internet Address 190.172.32.11/24, Area 0
  Process ID 109, Router ID 221.130.149.10, Network Type BROADCAST, Cost: 10
  Transmit Delay is 1 sec, State BDR, Priority 1
  Designated Router (ID) 208.149.23.194, Interface address 190.172.32.10
  Backup Designated router (ID) 221.130.149.10, Interface address 190.172.32.11
<output omitted>
```

A: The interface address of RouterA is a higher value than the interface address of the DR. B: The OSPF process ID of RouterA is lower than the process ID of the elected DR. C: RouterA has a lower OSPF priority value than the router elected as DR. D: RouterA is not advertising the interface with address 221.130.149.10. **Correct Answers: D** Explanation: On broadcast and non-broadcast multi-access networks, a designated router and backup designated router are elected. The election is done by first choosing the routers with the highest priority value or, if the priorities are same, choosing the routers with the highest router ID. The router ID is chosen by the highest IP address on any loopback interface or, if no loopback interfaces are configured, the highest IP address on any active physical interface. Referring to the exhibit of the "show ip protocols" command: Router ID is: 221.130.149.10 but this network is not advertised using network command on OSPF. So interface having 221.130.149.10 IP address is not participating on OSPF routing. Therefore, RouterA is not elected as the designated router.