

Name _____ Date _____

Module 2 - Single-Area OSPFv2 Configuration

Enterprise Networking, Security, and Automation– Semester 3

Student Version

Module 2 Sections:

- 2.0 Introduction
- 2.1 OSPF Router ID
- 2.2 Point-to-Point OSPF Networks
- 2.3 Multiaccess OSPF Networks
- 2.4 Modify Single-Area OSPFv2
- 2.5 Default Route Propagation
- 2.6 Verify Single-Area OSPFv2
- 2.7 Module Practice and Quiz

Required Materials:

Reading Organizer

Packet Tracer Activities: None

Labs: None

Module's 1 - 2 Exam

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Name _____ Date _____

Module 2

Reading Organizer

Student Version

Note: The Reading Organizer has weighted scoring. Any question with the word **explain, define, or describe** in it is expected to have a longer answer and is worth two points each.

After completion of this module, you should be able to:

- Configure an OSPFv2 router ID.
- Configure single-area OSPFv2 in a point-to-point network.
- Configure the OSPF interface priority to influence the DR/BDR election in a multiaccess network.
- Implement modifications to change the operation of single-area OSPFv2.
- Configure OSPF to propagate a default route.
- Verify a single-area OSPFv2 implementation.

2.1 OSPF Router ID

1. What is the foundation on which OSPF bases its entire process?
2. OSPFv2 is enabled using the _____ global configuration mode command
3. The process-id value represents a number between _____ and _____ and is selected by the _____.
4. The process-id value is _____ significant, which means that it does not have to be the same value on the other OSPF routers to establish adjacencies with those neighbors.
5. It is considered best practice to use the same _____ on all OSPF routers.
6. What router prompt is shown after entering the router ospf process-id command on router R1?

7. How is an OSPF router ID represented?

8. What two ways can a router ID be defined?

a.

b.

9. Explain the two ways a router ID is used by an OSPF-enabled router.

a.

b.

10. Describe the three criteria Cisco routers use to derive the router ID.

a.

b.

c.

11. OSPF does not need to be _____ on an interface for that interface to be chosen as the router ID.

12. What subnet mask is recommended for an IPv4 loopback interface address that will be used for a router ID?
13. Does a 32-bit host route get advertised as a route to other OSPF routers?
14. Use the _____ router configuration mode command to manually assign a router ID.
15. Once a router selects a router ID, an active OSPF router does not allow the router ID to be changed unless what happens?
- a.
 - b.
16. What command can you use to reset the OSPF adjacencies.

2.2 Point-to-Point OSPF Networks

17. Write out the basic syntax for the OSPF network command.
- Router(config-router)# _____
18. The wildcard mask is typically the _____ of the subnet mask configured on that interface.
19. What is the easiest method for calculating a wildcard mask?
20. What is the advantage of specifying the interface with its specific IP address when setting up OSPF?
21. What is the syntax to configure OSPF directly on the interface?

Router(config-if)# _____

22. By _____, OSPF messages are forwarded out all OSPF-enabled interfaces.

23. List and explain how sending out unneeded messages on a LAN negatively affects the network.

a. _____ -

b. _____ -

c. _____ -

24. What router configuration mode command can you use to prevent the transmission of routing messages through a router interface?

25. Which command can you use to verify that an interface is passive?

26. What command can you use to make all interfaces passive

27. Interfaces that should not be passive can be re-enabled using the _____ command.

28. By default, Cisco routers elect a DR and BDR on Ethernet interfaces, even if there is only one other device on the link. What command will verify this?

29. The DR/ BDR election process is unnecessary on a point-to-point network. Which command can you use to disable the DR/BDR election process?

2.3 Multiaccess OSPF Networks

30. What makes Multiaccess OSPF networks unique?

31. OSPF elects a _____ and _____ as a solution to manage the number of adjacencies and the flooding of link-state advertisements (LSAs).

32. What multicast IPv4 address does the designated router use to send LSAs to all OSPF routers?

33. Why is a backup designated router (BDR) also elected?

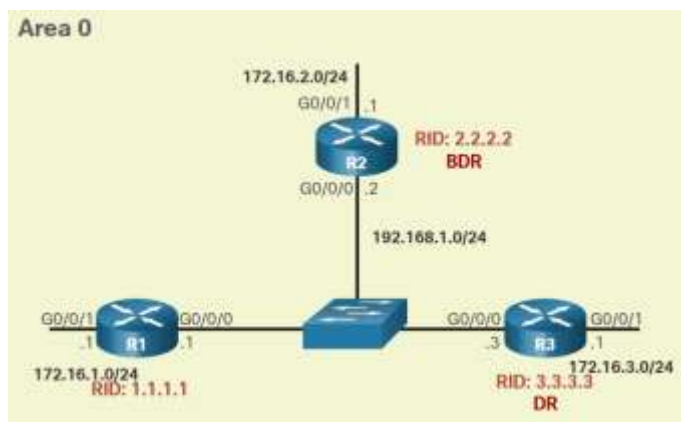
34. The BDR listens _____ and maintains a relationship with all the routers.

35. What happens if the DR stops producing Hello packets?

36. Once the DR and BDR are elected, what do all the other routers become?

37. _____ use the multiaccess address _____.

38. Which router in the diagram is the DR and BDR?



a. Designated Router _____

b. Backup Designated Router _____

39. What command can you use to verify the roles of the OSPFv2 router?

40. To verify the OSPFv2 adjacencies, use the show _____ command.

41. List and describe the different states neighbors in multiaccess networks can be.

a. _____ -

b. _____ -

c. _____ -

d. _____ -

42. The normal state for an OSPF router is usually _____.

43. Explain how do the DR and BDR get elected?

44. What is the range of numbers that the priority can be configured to?

45. What happens if an interface priority value is set to 0?

46. Describe the three ways a router ID is determined.

1.

2.

3.

47. What happens if a new router with a higher priority or higher router ID is added to the network after the DR and BDR election?

48. What are the three events that will force a new DR election?

a.

b.

c.

49. If a DR fails and the BDR is promoted to DR, how is a new BDR selected?

50. What command can be used to set the priority of an interface?

2.4 Modify Single-Area OSPFv2

51. What metric does OSPF use to determine the best path of a packet across a network?

52. A _____ indicates a better path than a _____.

53. The Cisco cost of an interface is inversely proportional to the bandwidth of the interface. Therefore, a _____ bandwidth indicates a _____ cost.

54. Because the OSPF cost value must be an integer, FastEthernet, Gigabit Ethernet, and 10 GigE interfaces share the same cost. Explain the two ways to correct this situation.

a.

b.

55. Changing the reference bandwidth does not affect the actual bandwidth capacity on the link. What is it doing?

56. What command can you use to adjust the reference bandwidth?

57. What else is required if you change the reference bandwidth on a single router in your network?

58. Which command do you use to return to the default reference bandwidth?

59. The _____ command must be configured consistently on all routers in the OSPF domain to ensure accurate route calculations.

60. The cost of an OSPF route is the _____ from one router to the destination network.

61. One reason to change the cost value is because other _____ may calculate OSPF in a different manner.

62. Which command can you use to change the cost value reported by the local OSPF router to other OSPF routers?

63. Although using the _____ command is the recommended method to manipulate the OSPF cost values, an administrator could also do this by using the _____ command.

64. OSPFv2 Hello packets are transmitted to multicast address _____ every _____ seconds.

65. Explain what the Dead interval is.

66. Describe what happens if the Dead interval expires before the routers receive a Hello packet.

67. Cisco uses a default of _____ the Hello interval. This is _____ on multiaccess and point-to-point networks.

68. On non-broadcast multiaccess (NBMA) networks, the default Hello interval is _____ seconds and the default dead interval is _____ seconds.

69. The OSPF Hello and Dead intervals are configurable on a _____ basis.

70. The OSPF intervals must _____ or a neighbor adjacency does not occur.

71. What command is used to verify the currently configured OSPFv2 interface intervals?

72. Which command can you use to see the Dead Time count down?

73. OSPFv2 Hello and Dead intervals can be modified manually using what interface configuration mode commands?

Router(config-if)# _____

Router(config-if)# _____

74. What commands can you use to reset the hello and dead intervals to their default settings?

a.

b.

2.5 Default Route Propagation

75. What is the router located between an OSPF routing domain and a non-OSPF network called?

76. Explain what the *default-information originate* router configuration command does.

77. What command can you use to to verify the default route settings?

2.6 Verify Single-Area OSPFv2

78. List and describe two commands that are particularly useful for verifying routing.

a. _____ -

b. _____ -

79. List additional commands that can be used to determine that OSPF is operating as expected.

- a.
- b.
- c.
- d.

80. Explain what the *show ip ospf neighbor* command is used to verify?

81. Explain what can happen if two routers do not establish adjacency?

82. List the reasons two routers may not form an OSPFv2 adjacency.

- a.
- b.
- c.
- d.

83. The _____ command is a quick way to verify vital OSPF configuration information.

84. The _____ command can also be used to examine the OSPFv2 process ID and router ID,

85. _____ command provides a detailed list for every OSPFv2-enabled interface.

86. To get a quick summary of OSPFv2-enabled interfaces, use the *show ip ospf interface brief* command. List the important information this command is useful for showing.

a.

b.

c.

d.

e.