

**CCNA 3 Final REVIEW  
MODULE 1 STUDY GUIDE**

1. VLSM stands for:  
**Variable length subnet masks**
  
2. The purpose VLSM was designed was to:  
**Reduce IP waste in networks with large subnets**
  
3. Dynamic routing protocols that support VLSM include:  
**RIP v2, OSPF, EIGRP**
  
4. VLSM is sometimes referred to as \_\_\_\_\_.  
**Classless subnetting**
  
5. What is an “autonomous system”?  
**An entire system that is managed by an administrator**
  
6. What is meant by “route aggregation”?
  
7. How can you take advantage of route aggregation using VLSM?
  
8. Is RIP v. 1 a classful or classless protocol? RIP v. 2? What does this mean?  
**Classful. VLSM is not supported in RIP v1**
  
9. Because it’s a new protocol, can RIP v. 2 hop more than 16 times?  
**No**
  
10. What is the configuration command to start RIP v. 2 running?  
**Version 2**
  
11. What show commands can you use to ensure that RIP v. 2 has started running?  
**Show ip rip**
  
12. What is the command to flush (clear) the routing table to force an update?

13. What will you see if you use the **debug ip rip** command?

14. How do you turn off the debugging function?

No debug ip rip

15. What are the three (3) ways that routers learn about routes (networks)? Briefly explain each one.

16. What are the two commands that can be used to enter a default route?

Ip route

Ip default gateway

17. If you want to use the **ip route** command to specify a default network, how would you enter it?

## CCNA FINAL REVIEW MODULE 2 STUDY GUIDE

1. What are the two main ways of classifying dynamic IGP routing protocols?

**Distance-Vector and Link-State**

2. Which ones are also known as “shortest path first” protocols? Why?

**Link-State**

3. Fill in the following table:

Type	Protocol(s)	Advantages	Disadvantages
Distance-Vector	<b>RIP</b>		<b>Max 16 hops</b>
Link-State	<b>OSPF, IGRP</b>		

4. What are “hello” packets used for?

5. What are the five things that link state protocols use to maintain their tables:

6. What is meant by a “link” when talking about link state protocols?

7. How does a link state protocol build its topological database? What kind of information is in it?

8. What are the three types of networks recognized by OSPF?

9. What is the DR and the BDR in an OSPF network? What do they do?

10. What is the multicast address used by the DR to send out LSAs to all other OSPF routers? For LSAs just to other designated (and backup) routers?

11. What is a hello packet used for and what is the multicast address used for it? Why this address?
12. What is the default hello interval?
13. What is the main area of an OSPF network designated?
14. What is the command used to start OSPF routing on a router?
15. What is the processor ID?
16. What is the command used to identify networks on an OSPF router?
17. What does an OSPF router use for its router ID? How can you force a different ID?
18. What is a Loopback?
19. What is the command used to set a Loopback?
20. What is the recommended subnet mask to use on a Loopback interface?
21. What is a “priority” number used for? How can you change it?
22. Why must you set the bandwidth on an interface running OSPF? What is the default bandwidth? How can you change it?
23. How can OSPF routers authenticate each other?

24. What is the difference between default authentication and a message-digest authentication procedure? What is the command to do the latter?
  
25. What is the relationship between the “hello” packet interval and the “dead” interval? What is meant by the “dead” interval?
  
26. What would happen if routers in the OSPF network have different hello intervals configured?
  
27. What is the best way to define a default route on an OSPF router?
  
28. How can you make sure that this information is propagated to other routers in the area?
  
29. List some of the show commands you can use to make sure that OSPF is functioning correctly.

## CCNA FINAL REVIEW MODULE 3 STUDY GUIDE

1. What is the difference between IGRP and EIGRP?  
EIGRP supports VLSM
2. Why is EIGRP referred to as a hybrid protocol?  
Combines the best of both link-state and distance-vector protocols
3. Can IGRP and EIGRP routers “talk” to each other? Why or why not?
4. List the three tables that EIGRP maintains and briefly describe each one.
5. List the five pieces of information found in the topology table and briefly describe each one.
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6. What is DUAL?
7. What is the difference between a “feasible successor” route and a “successor” router?
8. What makes EIGRP able to support IP, IPX, and AppleTalk?
9. What is RTP? What does it do?
10. What are the five EIGRP packet types? Briefly describe each one.
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11. What are the commands used to start EIGRP running on a router?

12. If you do not want to summarize routes, what is the command to turn it off? Why might you not want to summarize (aggregate) routes?

13. List some of the show commands you can use to verify that EIGRP is running correctly.

14. Which table built by EIGRP is considered the most important? List the fields of information contained in this table and briefly describe each one.

15. What is the most common problem that keeps RIP tables from updating?

16. What is the most common type of networking problem?

Layer 1: Cabling Problem

## CCNA FINAL REVIEW MODULE 4 STUDY GUIDE

1. Why is Ethernet described as a collision-prone network?
2. What networking device can help cut down or even eliminate collisions on an Ethernet network? Why?
3. What does the term “microsegmentation” mean?  
**Connecting each device to a switch to maintain a collision-free network**
4. Fill in the following table:

Item	Layer
Router	<b>3</b>
Switch	<b>2</b>
Bridge	<b>3</b>
Passive hub	<b>1</b>
Active hub	<b>1</b>
Transceiver	<b>1</b>
IP address	<b>3</b>
MAC address	<b>2</b>
Packets	<b>3</b>
Frames	<b>2</b>
Data segments	<b>4</b>
Repeater	<b>1</b>

5. What is the most common LAN architecture used today?
6. Explain CSMA/CD. What does it stand for and how does it apply to Ethernet networks?
7. What is meant by “half-duplex” technology?
8. What does the term “latency” mean?

9. What are the three sources of latency on an Ethernet network?
10. What is meant by “bit time” in Ethernet networks?
11. What is meant by the term “attenuation” when talking about data networks? What causes it?
12. What is meant by “full duplex” technology? Which Ethernet connections can take advantage of it? What does it take in order to create a full duplex network?
13. How many wires does it take to make a full-duplex cable? How much of the bandwidth is available on a full-duplex network?
14. Is there an advantage of segmenting a network using switches instead of routers?  
Disadvantages?  
**Advantages: Cheaper, faster**  
**Disadvantages: No broadcast segmentation**
15. What is the main reason for LAN segmentation?  
**Reduce collision domain sizes**
16. Are there more or fewer collision domains in a microsegmented LAN? Why?  
**Fewer. There are no collisions because each host has a dedicated connection to the switch.**
17. What are the two main functions of switching devices?
18. What type of circuits does a switched LAN create? What is one advantage of using switches on a LAN?
19. What is the difference between a symmetric and asymmetric switch?

20. Where does a switch store destination and transmission data? Describe the difference between the two main types.

21. What are the two switching methods? What are the main differences between the two?

22. What are the two sub-types of cut-through switching?

23. What are the two main reasons to use of Ethernet switches in a network?

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24. What are the three main frame transmission modes used by Ethernet switches?

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25. What is the fourth mode? What is different about it?

26. What does a bridge use to forward data packets? How does it learn this information?

27. How does a switch learn MAC addresses? What happens when a switch adds a new MAC address to its table?

28. What is Content-Addressable memory (CAM) used for in switch applications?

29. What do switches/bridges use to filter frames?

30. Can switches filter broadcast or multicast frames? Why or why not?

**No. They are based on MAC addresses instead of IP addresses.**



31. What are the three ways of communicating on a data network? Briefly describe each one.

32. What is the MAC address for a broadcast message?

FFFF.FFFF.FFFF

## CCNA FINAL REVIEW MODULE 5 STUDY GUIDE

33. What are the four components that make up a successful network design? Briefly describe each one.

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34. To maximize bandwidth and availability of resources, what should you consider when designing a LAN?

35. What are the two main groups of servers? Give some examples of each would do and would be located.

36. What are the steps you should follow in order to create a successful network design?

37. What is meant by “availability”? Give some examples.

38. What layers of the OSI model are you primarily working with when you’re designing a network? What is involved at each layer?

Layer 1

39. What are MDFs and IDFs? What would you find in them?

Main Distribution Facilities: Central office

Independent Distribution Facilities: Wiring Closets

40. What is the difference between horizontal cabling and vertical cabling?

41. List some of the documents you should create as you design and build your network.

42. What is the hierarchical design model? Why would you want to use it? What are the three layers of this design model? Briefly describe each one.
43. What layer of the OSI model do access switches run at? What are they designed to do? List a few of the Cisco models.
44. What layer of the OSI model do distribution switches run at? What are they designed to do? List a few of the Cisco models.
45. What layer of the OSI model do core switches run at? What are they designed to do? List a few of the Cisco models.

## CCNA FINAL REVIEW MODULE 6 STUDY GUIDE

1. What types of ports/interfaces does a configurable switch normally have?
2. What do the LEDs on the switch do?
3. What is a POST? When is it performed?  
**Power-On-Self-Test: Tests equipment when the switch is powered on.**
4. What kind of cable is required to access the console port on a switch or router?  
Which port do you use? How do you know what's going on on the device?
5. Where is the power switch on a Cisco switch?  
**There is no power switch**
6. What does CLI stand for? How does it differ on a Cisco switch from a router?  
**Command Line Interface: Different commands are used on each.**
7. List (in order) the EXEC modes on the Cisco switch.  
**User EXEC and Privileged EXEC**
8. What are the steps you should follow in order to completely configure a switch that may already have a configuration on it?
9. List some of the things you should configure on a switch to ensure it is secure, yet easy to access for those authorized to do so.
10. Identify what the following commands will do on the switch:

Command	Purpose
Switch#show mac-address-table	
Switch#clear mac-address-table	
Switch(config)#mac-address-table static [mac address of host] interface [type][number] vlan [number or name]	
Switch#show port security	

## CCNA FINAL REVIEW MODULE 7 STUDY GUIDE

1. What is meant by “redundant technologies” when talking about networks? Why or why not is this a good thing?
2. What is a drawback of having a redundant switched topology?
3. What is the answer to this problem?
4. What is the IEEE standard for Spanning Tree? What does it specify
5. What are BPDUs? What information contained in these BPDUs allow the switch to create the loop-free topology?
6. What are the four elements that must exist on every switch in a spanned, switched network?
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7. Which switch will become the root bridge in a network running STP?
8. How often are BPDUs sent out by default?
9. What are the five STP states? Briefly describe each one.
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10. What is the definition of a converged switched internetwork?

11. What does the 802.1w standard define?

## CCNA FINAL REVIEW MODULE 8 STUDY GUIDE

1. What is the definition of a VLAN?
2. Is a VLAN able to contain broadcasts?
3. How does a switch that has multiple VLANs on it switch frames that come into it?
4. What are the three main ways that VLANs are organized?
5. List some of the advantages of VLANning a network.
6. What are the three basic models for determining and controlling how a packet gets assigned to a VLAN?
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7. What happens to the frame header when using any of the above models?
8. What is the most used frame tagging option used in switching? What is special about this?
9. How can you make an ATM network look like an Ethernet network?
10. What type of address must be assigned to each VLAN?
11. What characteristics should an end-to-end VLAN network comprises?
12. What does standard 802.1q pertain to?
13. What is meant by a static VLAN? What are some advantages/disadvantages of this method?

14. What is meant by a dynamic VLAN? What are some advantages/disadvantages of this method?

15. Complete the table for the commands used to configure a VLAN on a 2900 series Catalyst switch.

<b>Command</b>	<b>Purpose</b>
Switch#show version	
Switch#vlan database	
Switch(vlan)#vlan [vlan number]	
Switch(config)#interface [type] [port]	
Switch(config-if)#switchport access vlan [vlan number]	
Switch#show vlan [brief]	
Switch#show vlan id [vlan number]	
Switch#show running-config	
Switch(vlan)#no vlan [vlan number]	
Switch#show spanning-tree	
Switch#debug sw-vlan packets	

16. What are the steps you should follow to troubleshoot problems with your VLANs?

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17. What is a broadcast storm?

18. How can they be prevented?

## CCNA FINAL REVIEW MODULE 9 STUDY GUIDE

1. What is the definition of a trunk in a switched network?
2. What is a trunk designed to do if there are multiple VLANs in a network?
3. What are trunking protocols designed to do? What are the two types of trunking mechanisms? Which has become the standard? Why?
4. How does frame tagging work?
5. What is the first step you must perform on a switch before starting trunking?
6. Complete the following table:

Command	Purpose
Switch(config-if)#switchport mode trunk	
Switch(config-if)#switchport trunk encapsulation [dot1q   isl]	
Switch#show port capabilities	
Switch#show trunk [mod_num/port_num]	
Switch#erase startup-configuration	
Switch(vlan)#vtp v2-mode	
Switch(vlan)#vtp domain [name]	
Switch#show vtp status	
Switch(vlan)#vtp [client   server   transparent]	
Switch#show vtp counters	
Router(config)#interface fastethernet [port-number.subinterface-number]	
Router(config-if)#encapsulation dot1q [vlan-number]	
Router(config-if)#ip address [ip-address] [subnet-mask]	

7. What does it mean if the trunking mode has been set to “negotiate”?
8. What is VTP? Why should it be used on a VLAN’ed network?

9. What is a VTP domain?

10. What are the four items found in a VTP message?

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11. What are the three modes that switches can work in when running VTP? Briefly describe each one.

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12. What are the two types of VTP advertisements?

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13. What are the three types of VTP messages?

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14. What kinds of activities can trigger a VTP advertisement?

15. What are the two versions of VTP available now? Which is the default version? Are they interoperable?

16. Can VLANs communicate directly with one another? Why or why not?

17. What is meant by “a router on a stick”?

18. What is a “subinterface”? How are they used on a switch?