APPENDIX B
LAB #1 - INITIAL NETWORK CONFIGURATION ANSWERS
PART #1 - INITIAL SWITCH CONFIGURATION ANSWERS

Review Questions:

1. What configuration command is used to set both the IP address and subnet mask of a Catalyst 1900 switch?

   ip address *ip-address subnet-mask*

2. What mode must you be in order to configure the default gateway of the switch?

   configuration mode

3. What command is used to go from user mode to privileged mode?

   enable

4. What mode must you be in order to ping from the Catalyst 1900 switch?

   privileged

5. What command can you use to verify the IP address, subnet mask and default gateway in a Catalyst 1900 switch?

   show ip

PART #2 – INITIAL ROUTER CONFIGURATION ANSWERS

Review Questions:

1. Why did the router automatically start the Setup script when you turned it on?

   Setup starts automatically when NVRAM is empty.

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APPENDIX B
LAB #1 - INITIAL NETWORK CONFIGURATION ANSWERS (cont.)
PART #2 – INITIAL ROUTER CONFIGURATION ANSWERS (cont.)

2. What is the difference between the **enable secret** password and the **enable password**?

   The **enable secret** password is always encrypted, uses an encryption algorithm, is only used in IOS 10.2(x) and up, and has precedence over the **enable password** if it is present.

   The **enable password** must be manually encrypted, and if so, uses an older and less reliable encryption algorithm. It is available in all versions. And it is not used if an **enable secret** password is present in the configuration file.

3. What is the difference between a virtual terminal password and a console password?
   The virtual terminal password is used as the initial password for telnet sessions. The console password is the initial password for only the console port itself. Only the VTY password can be entered in Setup.

4. What command did you use to copy the running configuration to NVRAM?

   copy running-config startup-config

5. What command did you use to examine the active running configuration?

   show running-config

LAB #2 - NETWORK MANAGEMENT ANSWERS
PART #1 – NETWORK DISCOVERY ANSWERS

Review Questions:

1. What command displays the IP address of a directly connected Cisco neighbor?

   show cdp neighbor detail

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APPENDIX B
LAB #2 - NETWORK MANAGEMENT ANSWERS (cont.)
PART #1 – NETWORK DISCOVERY ANSWERS (cont.)

2. What command displays the local IP address and subnet mask of router interfaces?

   show ip interface

3. What type of information can be gathered from a generic **show cdp neighbor** screen?

   neighbor device name, neighbor device type, local interface connected to neighbor, neighbor interface

4. What command is used to verify if CDP is enabled on a router interface?

   show cdp interface

PART #2 – REMOTE ACCESS ANSWERS

Lab Questions:

9. What command did you use to verify this (# of open telnet sessions)?
   show sessions displays the number of telnet sessions initiated from this router during the active session.

10. What does your router do with the telnet sessions that you have initiated when you logout?
    The outbound telnet sessions are terminated.

    What do you think happens to devices that are logged into you when you logout of your router?
    The inbound telnet sessions are not affected when you logout of the router.

Review Questions:

1. What is the key sequence to suspend a telnet session back to the starting point?
   The key sequence <shft><ctrl><6> <x> suspends a telnet session.

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APPENDIX B
LAB #2 - NETWORK MANAGEMENT ANSWERS (cont.)
PART #2 – REMOTE ACCESS ANSWERS (cont.)

2. Which command allows you to determine who has telnetted into your router?

   show users displays the current telnet sessions to your router.

3. Which two commands allow you to see telnet sessions that have been originated from your router?

   show users and **show sessions** display telnet sessions from your router.

4. Which port number, in a Cisco router, represents the console port?

   The console port is always port 0 on a Cisco router.

5. Which command terminates a telnet session into your router?

   clear line is used to terminate a telnet session into your router.

PART #3 – USING A TFTP SERVER ANSWERS

Review Questions:

1. What network-layer (OSI layer 3) protocol does TFTP use? IP.

2. What transport-layer (OSI layer 4) protocol does TFTP use? UDP.

3. What does the ‘!’ character mean during TFTP transfers?

   '!' is a successful TFTP packet, approximately 512 bytes.

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APPENDIX B
LAB #2 - NETWORK MANAGEMENT ANSWERS (cont.)
PART #3 – USING A TFTP SERVER ANSWERS (cont.)

4. What other configuration file 'copy' commands are available in the Cisco Routers? Explain each of these commands?

copy startup-config running-config – copies the config file from NVRAM to RAM

copy running-config startup-config – copies the config from RAM to NVRAM after automatically erasing NVRAM (erase startup-config)

copy tftp running-config – copies the config from a TFTP server to RAM

copy running-config tftp – copies the config from RAM to a TFTP server

copy tftp startup-config – copies the config from a TFTP server to NVRAM after automatically erasing NVRAM (erase startup-config)

copy startup-config tftp – copies the config from NVRAM to a TFTP server (no good reason to do this)

5. What was the difference between **copy tftp start** and the **copy tftp run**?

copy tftp start replaces the startup configuration file in NVRAM with a configuration file from a TFTP server. **copy tftp run** merges a configuration file from a TFTP server with the active configuration file in RAM.

LAB #3 – CONFIGURE VLANS AND TRUNKS ANSWERS
PART #2 – CONFIGURE VLANS ANSWERS

Lab Questions:

7. What command do you use to fetch this information?

show vlans.

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APPENDIX B
LAB #3 – CONFIGURE VLANS AND TRUNKS ANSWERS (cont.)
PART #2 – CONFIGURE VLANS ANSWERS (cont.)

11.

Source			Destination			
Source Device	**Switch Port**	**VLAN**	**Your Switch**	**Your PC**	**Neighbor Switch**	**Neighbor PC**
PC	E0/1	10	NO	N/A	NO	YES
Switch	Console	1	N/A	NO	NO	NO

Explain these results: The PCs are in the same VLAN (10), and there is a VLAN 10 path between the switches. The switches are in the same VLAN (1), but there is no VLAN 1 path between the switches. The PCs and the switches are in different VLANs.

12.

Source			Destination			
Source Device	**Switch Port**	**VLAN**	**Your Switch**	**Your PC**	**Neighbor Switch**	**Neighbor PC**
PC	E0/2	11	NO	N/A	NO	NO
Switch	Console	1	N/A	NO	NO	NO

Explain these results: The PCs are in the same VLAN (11), but there is no VLAN 11 path between the switches. The switches are in the same VLAN (1), but there is no VLAN 1 path between the switches. The PCs and the switches are in different VLANs.

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APPENDIX B
LAB #3 – CONFIGURE VLANS AND TRUNKS ANSWERS (cont.)
PART #2 – CONFIGURE VLANS ANSWERS (cont.)

15.

Source			Destination			
Source Device	**Switch Port**	**VLAN**	**Your Switch**	**Your PC**	**Neighbor Switch**	**Neighbor PC**
PC	E0/1	10	YES	N/A	YES	YES
Switch	Console	10	N/A	YES	YES	YES

Source			Destination			
Source Device	**Switch Port**	**VLAN**	**Your Switch**	**Your PC**	**Neighbor Switch**	**Neighbor PC**
PC	E0/2	11	NO	N/A	NO	NO
Switch	Console	10	N/A	NO	YES	NO

Explain why in Steps #11-12, all of the pings to the switches failed, but now some of them succeed.

Earlier, the switches were in VLAN 1, while the PCs were in either VLAN 10 or 11.

Now, the switches are in VLAN 10, so PCs in VLAN 10 can actually reach the switches.

Review Questions:

1. Which command is used to determine the management VLAN of a Catalyst 1900 switch?

   show ip

2. What are the five default VLANs in any Catalyst switch?

   1, 1002, 1003, 1004 and 1005

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APPENDIX B
LAB #3 – CONFIGURE VLANS AND TRUNKS ANSWERS (cont.)
PART #2 – CONFIGURE VLANS ANSWERS (cont.)

3. What is the default name applied to a new VLAN if a name is not specified?
   VLANxxxx

4. Which command is used to change the management VLAN in a Catalyst 1900 switch?
   ip mgmt-vlan

5. Which command is used to change the VLAN on a port of a Catalyst 1900 switch?
   vlan-membership static

PART #3 – CONFIGURE ISL TRUNKS AND VTP ANSWERS

Lab Questions:

5.

Source			Destination			
Source Device	**Switch Port**	**VLAN**	**Your Switch**	**Your PC**	**Neighbor Switch**	**Neighbor PC**
PC	E0/1	10	YES	N/A	YES	YES
Switch	Console	10	N/A	YES	YES	YES

Source			Destination			
Source Device	**Switch Port**	**VLAN**	**Your Switch**	**Your PC**	**Neighbor Switch**	**Neighbor PC**
PC	E0/2	11	NO	N/A	NO	YES
Switch	Console	10	N/A	NO	YES	NO

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APPENDIX B
LAB #3 – CONFIGURE VLANS AND TRUNKS ANSWERS (cont.)
PART #3 – CONFIGURE ISL TRUNKS AND VTP ANSWERS (cont.)

Explain why a greater number of pings succeed this time compared to the same tests performed during the last lab.

The PCs in VLAN 10 can ping each other via the trunk, and both switches in VLAN 10.

The PCs in VLAN 11 can ping each other via the trunk, but no the switches which are in VLAN 10.

Review Questions:

1. What are the two different types of trunk encapsulations (only one of them is possible on a Catalyst 1900)?

   ISL and 802.1q

2. What is the default VTP mode for a Catalyst 1900 series switch?

   Server.

3. In VTP, what determines which switch will win the VTP exchange?

   The configuration revision number.

4. What must be the same between two switches for them to exchange VTP information?

   The VTP domain name.

5. What are the three VTP modes of operation?

   Server, client and transparent.

APPENDIX B
LAB #4 – NETWORK EXAMINATION AND IGRP ANSWERS
PART #2 – NETWORK EXAMINATION ANSWERS

Review Questions:

1. How many total networks are in the RIP-derived IP routing table?
   There should two networks with a total of 25 entries in the routing table. The 172.16.0.0 network has 24 subnets.

2. What is the broadcast frequency (in seconds) for RIP?
   RIP broadcasts routing updates by default every 30 seconds.

3. How can you verify the broadcast frequency for RIP?
   The **show ip protocols** screen displays the update frequency of any IP routing protocol.

4. Which IP network has the largest hop count value in your IP routing table? What is this value?
   This will be different for each router in the classroom network.

PART #3 – IGRP ANSWERS

Review Questions:

1. What is the routing algorithm used by IGRP?
   Distance-vector.

2. What are the routing metrics used by IGRP?
   Bandwidth, delay, reliability, load and MTU its composite metric. IGRP also uses hops to break ties.

3. What is the broadcast frequency (in seconds) for IGRP?
   IGRP advertises every 90 seconds.

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APPENDIX B
LAB #4 – NETWORK EXAMINATION AND IGRP ANSWERS (cont.)
PART #3 – IGRP ANSWERS (cont.)

4. How can you verify the broadcast frequency for IGRP?

   The **show ip protocol** command is used to verify the broadcast frequency of any IP routing protocol.

5. Why was it only necessary to enter one network number for the three active IP interfaces when IGRP was configured?

   Only whole network numbers are configured under IGRP. Currently, one Class C network is subnetted across two or three active interfaces in the router.

LAB #5 - STANDARD IP ACCESS LISTS ANSWERS

Lab Questions:

9. Explain why the ping and telnet tests to your friends were successful (or at least should have been successful), while the ping and telnet tests to non-friends were not:

   The access list allowed packets *from* your friends, but implicitly denied packets from anyone else.

15. Explain why earlier, all the tests to non-friend devices failed, yet now all pings succeed, and the appropriate telnets fail:

    Now, the access list is only applied to the VTY ports, and thus only looks at telnet packets.

Review Questions:

1. What is the default mask when using a standard IP access list?

   The default mask in a standard IP access list is 0.0.0.0.

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APPENDIX B
LAB #5 - STANDARD IP ACCESS LISTS ANSWERS (cont.)

2. When is it not necessary to use the access list mask in a standard ACL?
   It is not necessary to use a mask in a standard IP access list if you are only using specific IP host addresses.

3. If you do not include any 'permit' statements in your access list, how many packets get through successfully? Why?
   Without any explicit permit statements in any access list, all packets are implicitly denied.

4. How does the mask used with access lists differ from those used to configure IP addresses on interfaces?
   The access list mask is an inverse mask, and is exactly opposite of the subnet mask used to configure IP addresses on interfaces.

5. Which packets are filtered with inbound access lists? How about outbound?
   Inbound access lists filter packets trying to get into the router. Outbound access only filter packets that are going through the router, not those originating from the router.

6. What type of IP packets do VTY access lists filter?
   VTY access lists only filter telnet packets.

7. Can VTY access lists be used to filter telnet traffic that flows through the router to a different destination? Why or why not?
   VTY access lists can only filter telnet session coming to the router or starting from the router, but not through the router.

8. Is it necessary to use standard or extended IP access lists to create VTY access lists?
   VTY access lists only require the use of a standard access list, since the VTY access list itself looks for telnet packets.

APPENDIX B
LAB #6 – PPP AND CHAP ANSWERS

1. Why must you manually set the encapsulation to PPP on a Cisco router?

   Since HDLC is the default encapsulation type.

2. What would happen if both ends of a serial line did not change the encapsulation type to PPP?

   The interface will not come up.

3. If a pair of serial interfaces is configured for PPP, yet only IP is configured correctly, which NCPs are established?

   The layer 3 protocols must be properly configured for the NCPs to be established. In this case, only the IP NCP would become active. Also, the CDP NCP becomes active, unless CDP has been disabled.

LAB #7 – FRAME RELAY ANSWERS

1. What must be operational for inverse ARP to be automatic?

   LMI must be operational for inverse ARP to work, and keepalive messages must be enabled for LMI to work dynamically.

2. What encapsulation type is used when talking Frame Relay to a non-Cisco router?

   You must configure the serial interface with **encapsulation frame-relay ietf** (Internet Engineering Task Force).

3. What interface command is used to send Frame Relay packets to the other end *without* sending broadcast packets?

   You must use the **frame-relay map** command, and not specify the broadcast option.

   The **frame-relay interface-dlci** command automatically comes with the **broadcast** option, which cannot be removed.

APPENDIX B