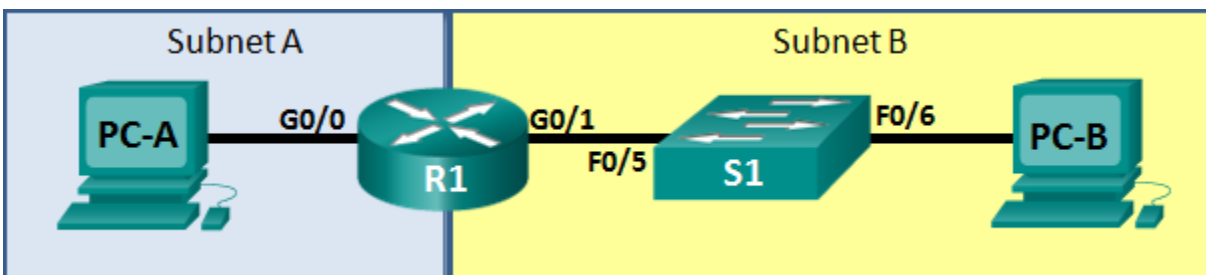**CCNA: Introduction to Networks**

Skills Assessment – Student Training Exam

Topology

Assessment Objectives

Part 1: Develop the IPv4 Address Scheme (15 points, 20 minutes)

Part 2: Initialize and Reload Devices (10 points, 5 minutes)

Part 3: Configure Device IPv4 and Security Settings (30 points, 20 minutes)

Part 4: Test and Verify IPv4 End-to-End Connectivity (8 points, 10 minutes)

Part 5: Configure IPv6 Addressing on R1 (10 points, 10 minutes)

Part 6: Test and Verify IPv6 End-to-End Connectivity (7 points, 10 minutes)

Part 7: Use the IOS CLI to Gather Device Information (10 points, 10 minutes)

Part 8: Save the R1 Configuration to a TFTP Server (10 points, 10 minutes)

Scenario

In this Skills Assessment (SA) you will configure the devices in a small network. You must configure a router, switch and PCs to support both IPv4 and IPv6 connectivity. You will configure security, including SSH, on the router. You will test and document the network using common CLI commands. Finally, you will save the router configuration to a TFTP server.

Required Resources

- 1 Router (Cisco 1941 with Cisco IOS Release 15.2(4)M3 universal image or comparable)
- 1 Switch (Cisco 2960 with Cisco IOS Release 15.0(2) lanbasek9 image or comparable)
- 2 PCs (Windows 7, Vista, or XP with terminal emulation program, such as Tera Term)
- Server with TFTP Services
- Console cable to configure the Cisco IOS devices via the console ports
- Ethernet cables as shown in the topology

Part 1:   Develop the IPv4 Addressing Scheme

Total points: 15

Time: 20 minutes

Given an IP address and mask of ____**192.168.25.0 / 24** ___ (address / mask), design an IP addressing scheme that satisfies the following requirements. Network address/mask and the number of hosts for Subnets A and B will be provided by your instructor.

Subnet	Number of Hosts
Subnet A	**2**
Subnet B	**25**

The 0th subnet is used. No subnet calculators may be used. All work must be shown on the other side of this page.

Subnet A		
Specification	**Student Input**	**Points**
Number of bits in the subnet		(5 points)
IP mask (binary)		
New IP mask (decimal)		
Maximum number of usable subnets (including the 0th subnet)		
Number of usable hosts per subnet		
IP Subnet		
First IP Host address		
Last IP Host address		

Subnet B		
Specification	**Student Input**	**Points**
Number of bits in the subnet		(5 points)
IP mask (binary)		
New IP mask (decimal)		
Maximum number of usable subnets (including the 0th subnet)		
Number of usable hosts per subnet		
IP Subnet		
First IP Host address		
Last IP Host address		

Host computers will use the first IP address in the subnet. The network router will use the LAST network host address. The switch will use the second to the last network host address.

Write down the IP address information for each device:

Device	IP address	Subnet Mask	Gateway	Points
PC-A				(5 points)
R1-G0/0			N/A	
R1-G0/1			N/A	
S1			N/A	
PC-B				

Before proceeding, verify your IP addresses with the instructor.

Instructor Sign-off Part 1: _____

Points: _____ of <u>15</u>

Part 2: Build your Topology

> **Total points: 10**
>
> **Time: 5 minutes**

Step 1: **Add Devices to Packet Tracer and cable appropriately.** (5 points)

Step 2: Add a Server to the topology, SV-1 (for TFTP backup in Step 8), and attach to switch port F0/1

(5 points)

> **Instructor Sign-off Part 2: _____**
>
> **Points: _____ of <u>10</u>**

Part 3: Configure Device IPv4 and Security Settings

> **Total points: 30**
>
> **Time: 20 minutes**

Step 1: Configure host computers.

After configuring each host computer, record the host network settings with the **ipconfig /all** command.

PC-A Network Configuration		Points
Description		(2 points)
Physical Address		
IP Address		
Subnet Mask		
Default Gateway		

PC-B Network Configuration		Points
Description		(2 points)
Physical Address		
IP Address		
Subnet Mask		
Default Gateway		

Step 2: Configure R1.

Configuration tasks for R1 include the following:

Task	Specification	Points
Disable DNS lookup		(1 point)
Router name	R1	(1 point)
Domain name	ccna-lab.com	(1 point)
Encrypted privileged exec password	ciscoenpass	(1 point)
Console access password	ciscoconpass	(1 point)
Telnet access password	ciscovtypass	(1 point)
Set the minimum length for passwords	10 characters	(2 points)
Create an administrative user in the local database	Username: admin Password: admin1pass	(2 points)
Set login on VTY lines to use local database		(1 point)
Set VTY lines to accept ssh and telnet connections only		(2 points)
Encrypt the clear text passwords		(1 point)
MOTD Banner		(1 point)
Interface G0/0	Set the description Set the Layer 3 IPv4 address Activate Interface	(2 points)
Interface G0/1	Set the description Set the Layer 3 IPv4 address Activate Interface	(2 points)
Generate a RSA crypto key	1024 bits modulus	(2 points)

Step 3: Configure S1.

Configuration tasks for R1 include the following:

Task	Specification	Points
Switch name	S1	(1 point)

Configure Management Interface (SVI)	Set the Layer 3 IPv4 address	(1 point)
Encrypted privileged exec password	ciscoenpass	(1 point)
Console access password	ciscoconpass	(1 point)
Telnet access password	ciscovtypass	(1 point)

Instructor Sign-off Part 3: _____

Points: _____ of <u>30</u>

Part 4: Test and Verify IPv4 End-to-End Connectivity

Total points: 8

Time: 10 minutes

Step 1: Verify network connectivity.

Use the ping command to test connectivity between all network devices.

Note: If pings to host computers fail, temporarily disable the computer firewall and retest. To disable a Windows 7 firewall, select Start > Control Panel > System and Security > Windows Firewall > Turn Windows Firewall on or off, select **Turn off Windows Firewall**, and click **OK**.

Use the following table to methodically verify connectivity with each network device. Take corrective action to establish connectivity if a test fails:

From	To	IP Address	Ping Results	Points
PC-A	R1, G0/0			(1 point)
PC-A	R1, G0/1			(1 point)
PC-A	S1 VLAN 1			(1 point)
PC-A	PC-B			(1 point)
PC-B	R1, G0/1			(1 point)
PC-B	R1, G0/0			(1 point)
PC-B	S1 VLAN 1			(1 point)

In addition to the ping command, what other command is useful in displaying network delay and breaks in the path to the destination? (1 point)

_____

tracert or traceroute

Instructor Sign-off Part 4: _____

Points: _____ of 8

Part 5: Configure IPv6 Addressing on R1

Total points: 10

Time: 10 minutes

Given an IPv6 network address of **2001:DB8:ACAD::/64**, configure IPv6 addresses for the Gigabit interfaces on R1. Use **FE80::1** as the link-local address on both interfaces.

Step 1: Configure R1.

Configuration tasks for R1 include the following:

Task	Specification	Points
Configure G0/0 to use the first address in subnet A.	Assign the IPv6 unicast address Assign the IPv6 link-local address	(4 points)
Configure G0/1 to use the first address in subnet B.	Assign the IPv6 unicast address Assign the IPv6 link-local address	(4 points)
Enable IPv6 unicast routing.		(2 points)

Instructor Sign-off Part 5: _____

Points: _____ of 10

Part 6: Test and Verify IPv6 End-to-End Connectivity

Total points: 7

Time: 10 minutes.

Step 1: Obtain the IPv6 address assigned to host PCs.

PC-A IPv6 Network Configuration		Points
Description		(1 point)
Physical Address		
IPv6 Address		
Default Gateway		

PC-B IPv6 Network Configuration		Points
Description		(1 point)
Physical Address		
IPv6 Address		
IPv6 Default Gateway		

Step 2: Use the ping command to verify network connectivity.

IPv6 network connectivity can be verified with the ping command. Use the following table to methodically verify connectivity with each network device. Take corrective action to establish connectivity if a test fails:

From	To	IP Address	Ping Results	Points
PC-A	R1, G0/0			(1 point)

PC-A	R1, G0/1			(1 point)
PC-A	PC-B			(1 point)
PC-B	R1, G0/1			(1 point)
PC-B	R1, G0/0			(1 point)

Instructor Sign-off Part 6: _____

Points: _____ of 7

Part 7:   Use the IOS CLI to Gather Device Information

Total points: 10

Time: 10 minutes

Step 1:   Issue the appropriate command to discover the following information:

Description	Student Input	Points
Router Model		(2 points)
IOS Image File		
Total RAM		
Total Flash Memory		
Configuration Register		
CLI Command Used		

Step 2:   Enter the appropriate CLI command needed to display the following on R1:

Command Description	Student Input (command)	Points
Display a summary of important information about the interfaces on R1.		(1 point)
Display the IPv4 routing table.		(1 point)
Display the Layer 2 to Layer 3 mapping of addresses on R1.		(1 point)
Display detailed IPv4 information about interface G0/0 on R1.		(1 point)
Display the IPv6 routing table.		(1 point)
Display a summary of IPv6 interface addresses and status.		(1 point)
Display information about the devices connected to R1. Information should include Device ID, Local Interface, Hold time, Capability, Platform, and Port ID.		(1 point)
Save the current configuration so it will be used the next time the router is started.		(1 point)

Instructor Sign-off Part 7: _____

Points: _____ **of 10**

Part 8: Save the R1 Configuration to a TFTP Server.

Total points: 10

Time: 10 minutes

Save the current configuration for R1 to the TFTP Server on PC-A. You will need to add a server to your topology, cable it to the switch, and give it an IPV4 address. TFTP services are configured by default. You can see files on the TFTP server by clicking the Services tab on the server and clicking the TFTP button. You can verify that the file arrived by looking here after you successfully copy your configuration to the TFTP server. Document the command used below:

Description	Student Input	Points
CLI Command		(5 Points)
Address of remote host		
Destination Filename		

Instructor Sign-off Part 8: _____

Points: _____ **of 10**

Part 9: Cleanup IMPORTANT!

Save your PACKET TRACER FILE and COMPLETED PDF and email to mmcginn2@ivytech.edu. Failure to email your files will result in zero grade.

Router Interface Summary Table

Router Interface Summary				
Router Model	**Ethernet Interface #1**	**Ethernet Interface #2**	**Serial Interface #1**	**Serial Interface #2**
1800	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
1900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2801	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)
2811	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)

Note: To find out how the router is configured, look at the interfaces to identify the type of router and how many interfaces the router has. There is no way to effectively list all the combinations of configurations for each router class. This table includes identifiers for the possible combinations of Ethernet and Serial interfaces in the device. The table does not include any other type of interface, even though a specific router may contain one. An example of this might be an ISDN BRI interface. The string in parenthesis is the legal abbreviation that can be used in Cisco IOS commands to represent the interface.