Final Assessment - The Full Process: From IP Schemes, To Simulations and to Troubleshooting (Task 3 notes)

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Table of Contents

[Getting Started 3](#_yo92pqi9mmg8)

[Identified Problems and Solutions 4](#_b8lv2wgws4v0)

[Reflections 8](#_l830cfh906n3)

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# Getting Started

The task involved identifying and correcting ten network configuration errors within a simulated network environment using Cisco Packet Tracer. Initially, a comprehensive review of the desired network state was conducted, focusing on IP addressing schemes, VLAN assignments, and OSPF configurations. The review included verifying the accuracy of the IP addresses, subnet masks, and default gateways for each device to ensure they matched the planned network design. Additionally, VLAN assignments were checked to confirm that all ports were correctly assigned to their respective VLANs, and OSPF configurations were examined to ensure proper routing protocol setup. Testing each router for connectivity issues helped to pinpoint specific problems, such as misconfigured IP addresses, incorrect subnet masks, and improper default gateway settings. Initially, each router's CLI was accessed to gather configuration information and identify issues manually. However, it was discovered that the "check completion" button on the assessment window provided a list of all existing problems, simplifying the troubleshooting process. Additionally, a scheming table was created and kept open alongside for reference, aiding in the accurate configuration of each network component. The task was then simplified by focusing directly on the devices flagged as problematic. This approach allowed for targeted troubleshooting and efficient resolution of issues, ensuring that each device was correctly configured and fully operational within the network.

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# Identified Problems and Solutions

The server 1.0.0.5 had its Default Gateway incorrectly set, which would prevent proper routing of traffic beyond the local subnet. Additionally, the Subnet Mask was misconfigured, affecting network segmentation. By correcting the Default Gateway to 1.0.0.1 and adjusting the Subnet Mask to 255.0.0.0, proper communication and network segmentation were restored. A ping test confirmed the success of this change:

* Ping Command: ping 1.0.0.1
* Result: Successful

On ISP-L3-1, the IP settings on Vlan100 were misconfigured, which led to communication issues with other network segments. The IP Address and Subnet Mask were corrected, ensuring accurate network communication.

The configuration on GigabitEthernet1/0/7 of ISP-L3-3 was incorrect, with wrong IP Address and Subnet Mask settings. The initial issue was identified by inspecting the interface configuration using the command

show ip interface brief



The output revealed the incorrect IP Address and Subnet Mask. To correct this, the following commands were executed in the terminal:

configure terminal

interface GigabitEthernet1/0/7

ip address 3.0.0.14 255.255.255.252

no shutdown

exit

copy running-config startup-config



The final line saves the command and after each save, the initial command is used again (show ip interface brief) in order to understand if the changes have been correctly applied. By updating the IP Address to 3.0.0.14 and the Subnet Mask to 255.255.255.252, proper connectivity was established, allowing seamless communication with connected devices. A ping test confirmed the connectivity:

* Ping Command: ping 3.0.0.13 from ISP-L3-3
* Result: Successful

R4 was not propagating default route information through OSPF, affecting route availability across the network. This was fixed by adding the *default-information originate* command in the OSPF configuration, which ensured that default route information was correctly distributed.

R7 had incorrect static routes, which disrupted the routing process. By updating the static routes to match the desired network design, proper routing was re-established.

The IP Address on GigabitEthernet0/0.18 of R8 was set incorrectly, which led to network issues. The IP Address was corrected to 192.168.2.18 with a Subnet Mask of 255.255.255.240, thereby resolving the issue.

R9's DHCP pool had an incorrect Default Gateway setting, which caused incorrect configurations for client devices. The issue was identified by reviewing the DHCP pool configuration with:

show running-config | section dhcp

The output showed the incorrect Default Gateway. To resolve this, the following commands were used:

configure terminal

ip dhcp pool VL24

default-router 172.16.24.1

exit

copy running-config startup-config

The Default Gateway in the DHCP pool was updated to the correct address, ensuring proper client configuration and network connectivity.

S6 had improper configurations for the link to R6, including incorrect trunk settings and VLAN allowances. These settings were adjusted to ensure the correct VLANs were allowed on the trunk, thereby fixing the connectivity issues. A ping test confirmed the success of these changes:

* Ping Command: ping 192.168.1.129 from S6 to R6
* Result: Successful

ISP-L3-3 faced a VLAN mismatch and IP address overlap issue, which disrupted the network. The initial problem was indicated by the error messages:

%CDP-4-NATIVE\_VLAN\_MISMATCH: Native VLAN mismatch discovered on GigabitEthernet1/0/7 (400), with ISP-L3-4 GigabitEthernet1/0/12 (1).

%SPANTREE-2-RECV\_PVID\_ERR: Received BPDU with inconsistent peer vlan id 1 on GigabitEthernet1/0/7 VLAN400.

To address this, the VLAN configuration was corrected by ensuring the native VLAN matched on both ends of the link:

configure terminal

interface GigabitEthernet1/0/7

switchport trunk native vlan 400

no switchport

ip address 3.0.0.13 255.255.255.252

no shutdown

exit

copy running-config startup-config

The VLAN mismatch and IP address conflict were resolved, ensuring seamless network communication.

# Reflections

The task required a detailed examination and correction of various network configuration issues. By focusing on the identified problems and applying targeted solutions, full operational status was achieved. This process underscored the importance of precise configuration and the value of a methodical approach to network troubleshooting. Each step of the process involved verifying configurations, identifying discrepancies, and implementing corrections to align with the desired network state. For instance, some issues were resolved by simple wire and port changes, such as correcting the connections for ISP-L3-3 and ISP-L3-4, which required the replacement of cables to ensure proper interface matching. Additionally, correcting the link between S6 and R6 also involved updating the physical cable and port configuration. The experience demonstrated how interconnected issues could be resolved through systematic troubleshooting and verification, ultimately leading to a fully functional network. This approach highlighted the critical role of thorough planning and meticulous execution in network management, ensuring that all components work seamlessly together to provide reliable and efficient communication. The successful resolution of these issues also emphasised the importance of continuous monitoring and maintenance to prevent future network problems and maintain optimal performance. The task underscored that even seemingly minor configuration errors could have significant impacts, and addressing these efficiently was key to achieving 100% network completion and functionality.