



INDIVIDUAL ASSIGNMENT

CT133-3-2-SRE

SWITCHING AND ROUTING ESSENTIALS

APU2F2202CS (CYB), APD2F2202CS (CYB)

Weightage: 40%

MODULE CODE : CT133-3-2-SRE

Lecture Name : Noris binti Ismail

Student Name	Intake Code	TP Number
AASHRITA JAGADESWARARAO NANDAMURI	APD2F2202CS(CYB)	TP063125

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1.0. Introduction

Cyber Networks Inc. is a networking company that has planned to expand their services and location in several branches (Remote Office Branch) and (Remote Branch). The network administrator intends to replace the present setup with a new VLAN architecture to improve the network's efficiency and security, particularly at the HQ branch in KL. Aside from that, the Management department at HQ will handle the Remote Office Branch (Server Farm) remotely.

The network administrator has planned to introduce WLC WLAN at the Remote Branch in Krung Thep, Thailand, to make wireless network configuration and access easier. The process of designing and implementing a computer network architecture.

A varied set of professionals in the field of digital technologies is responsible for the design of computer networks. This is done before the actual infrastructure of a network is installed. In the process of creating a network, it is required to assess, comprehend, and define the scope of the network that would be executed.

Objectives:

- To encourage the active usage of network security tools such as Cisco Packet.
- Tracer infrastructure is set up correctly.
- To provide the firm a clear picture of the proposed network.
- Produce a prototype that satisfies the company's quality and objectives.

WLAN ARCHITECTURE:

VLANs are used extensively in the KL network. VLAN 10 is used for Human Resources, VLAN 20 is used for Design, VLAN 30 is used for Delivery, VLAN 50 is used for Management, VLAN 99 is used as Blackhole, and VLAN 100 is used as Native. These departments are divided by VLAN to increase network efficiency by minimizing traffic on switches, strengthening security by building a virtual barrier, and increasing bandwidth performance.

When untagged traffic is received on a trunk port, it is forwarded natively. It allows the VLAN to accommodate legacy devices or devices that are no longer in use. These, unlike some wireless access points, do not identify their communication and are merely network-attached devices. All unused ports are allocated to the Blackhole VLAN for security reasons. Previously, if a network had 100 Access Points (AP), each one had to be separately monitored and managed.

A Wireless LAN Controller (WLC) allows you to control up to 150 APs from a single location. The WLC is accessible via the management PC at the Thailand branch to be configured or used. Because of the features possessed by a WLC, scalability is not a concern. Only two APs are used in the model to show how it is configured and handled, but hundreds can be added. WLCs are top tier in terms of security since all traffic is routed via a single point (the WLC) rather than across many APs.

2. CONFIGURATIONS:

1. Distribution Switch (Dis_SW)

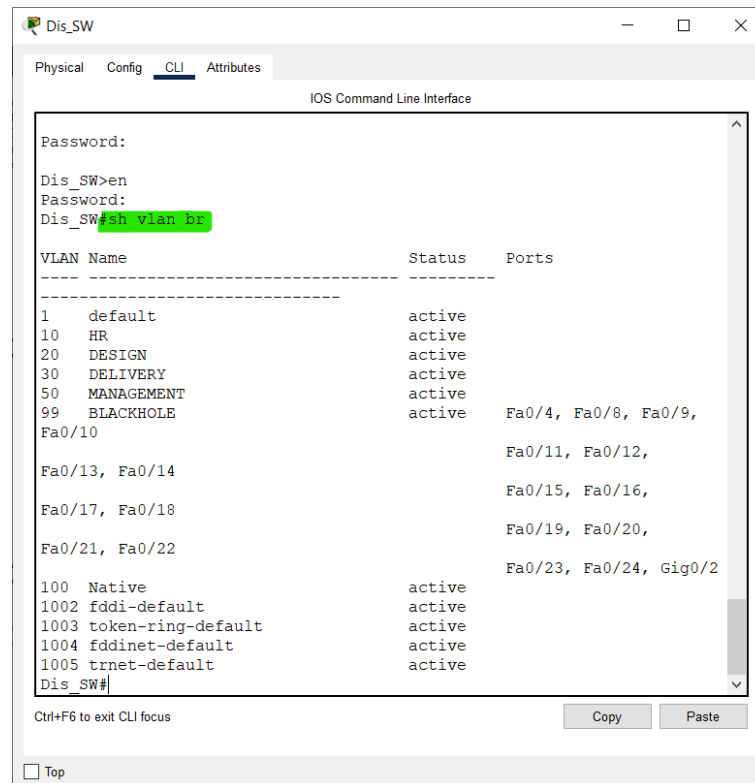


Figure 1: VLAN configuration

Each VLAN was assigned a name according to the requirement also the ports enabled can be seen.

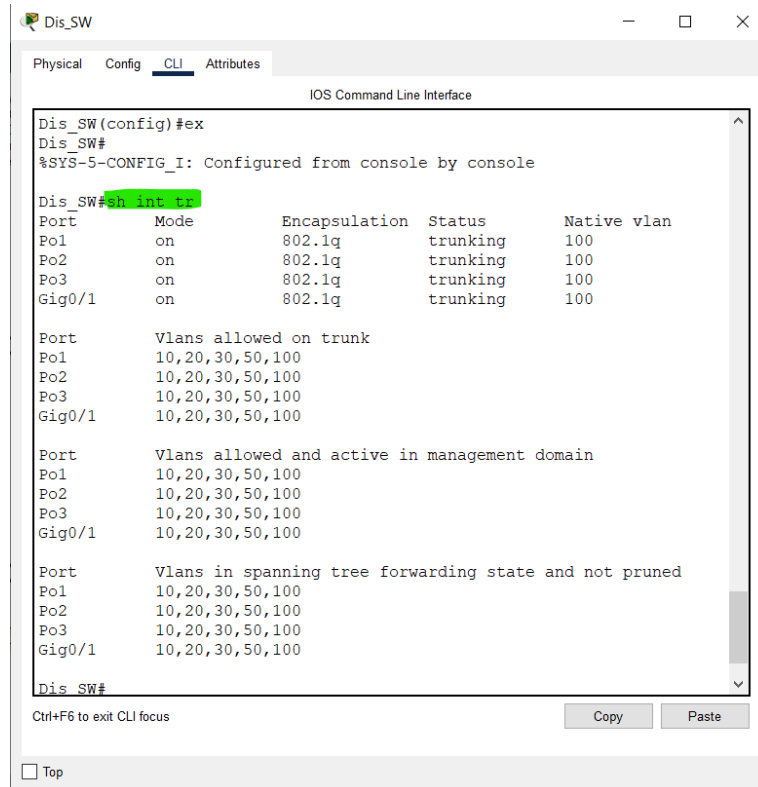


Figure 2: VLAN Trunk configuration

2. Delivery Switch

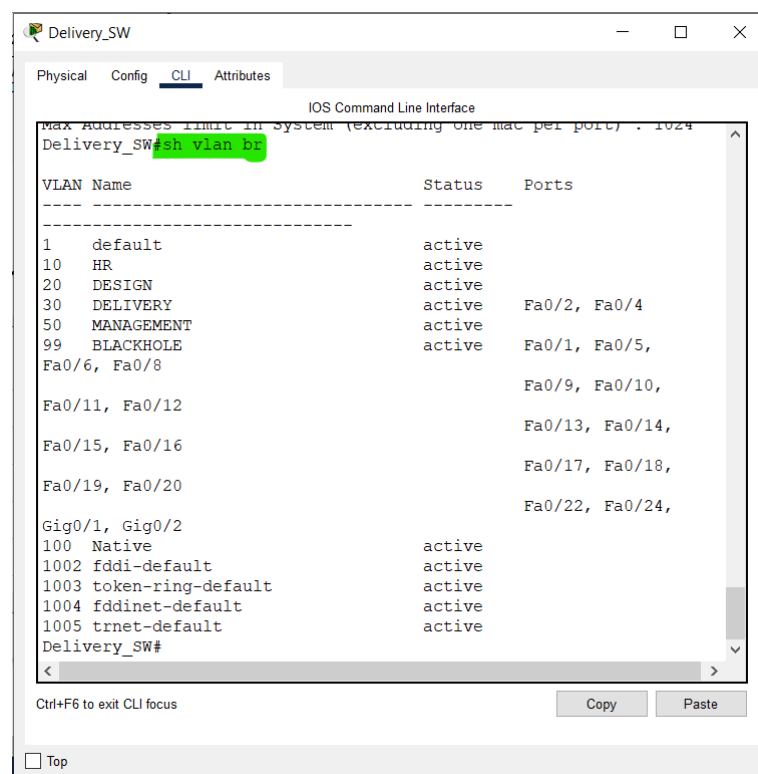


Figure 3: VLAN configuration

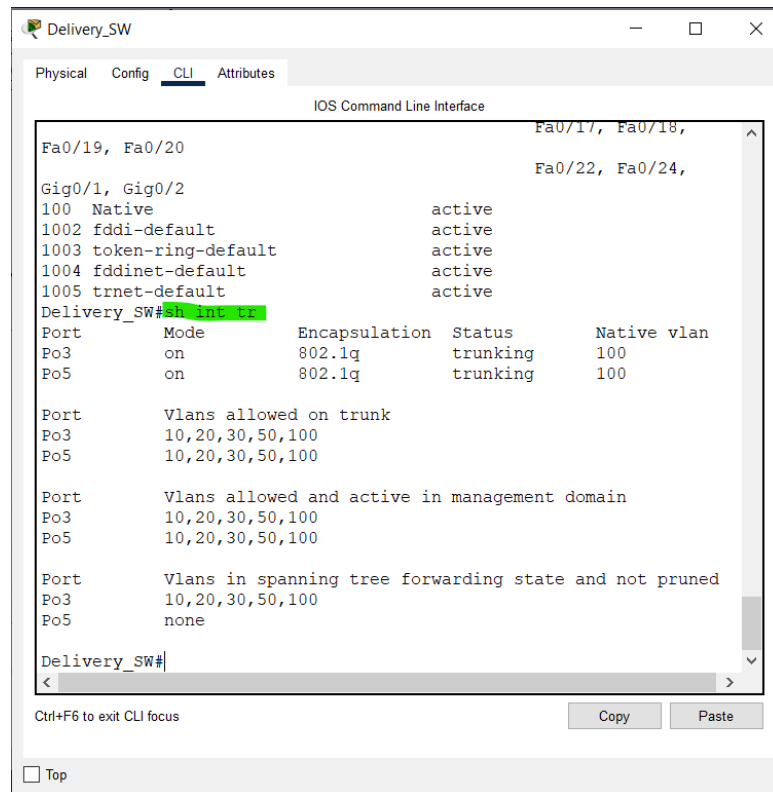


Figure 4:VLAN Trunking

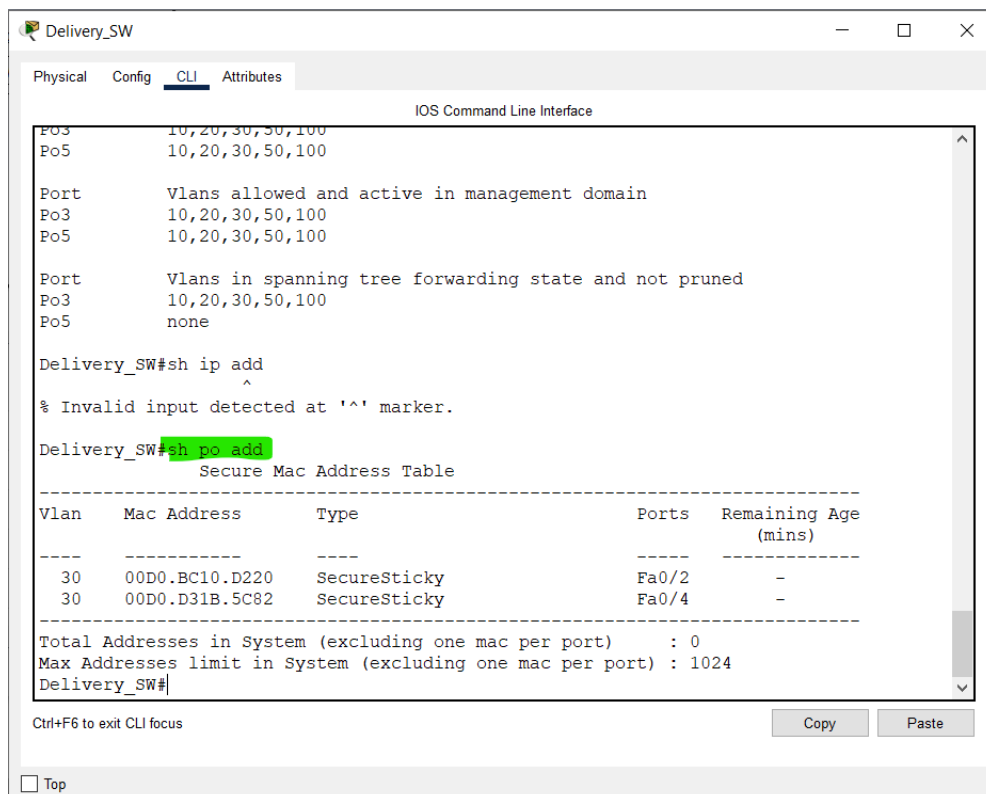


Figure 5: switchport port-security mac-address sticky

3. Design Switch

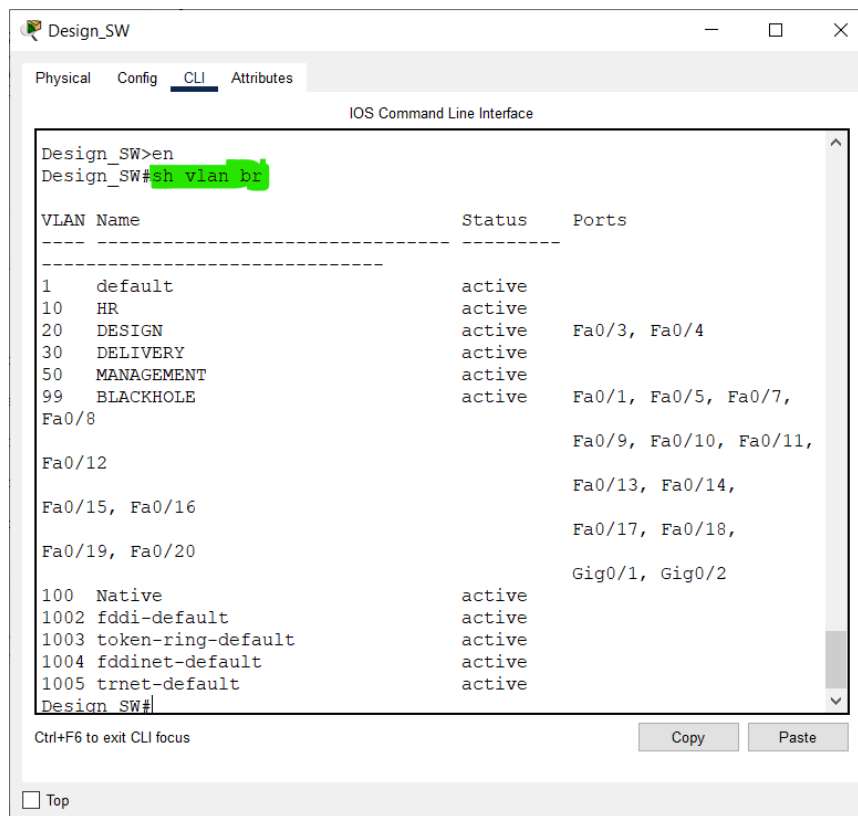


Figure 6:VLAN conf

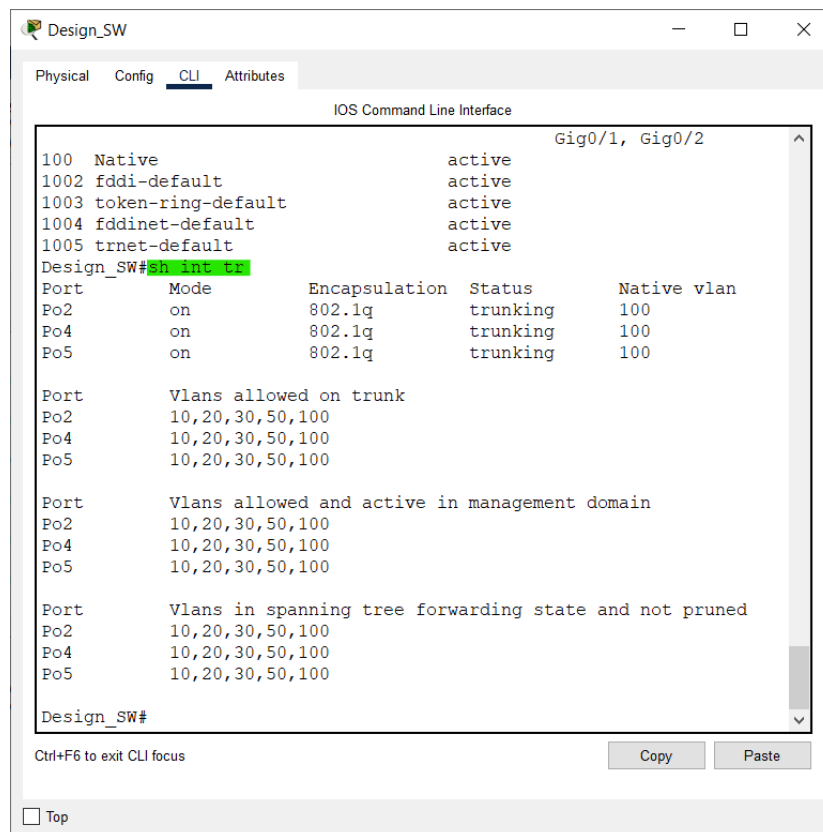


Figure 7: Int Trunking

4. HR SWITCH

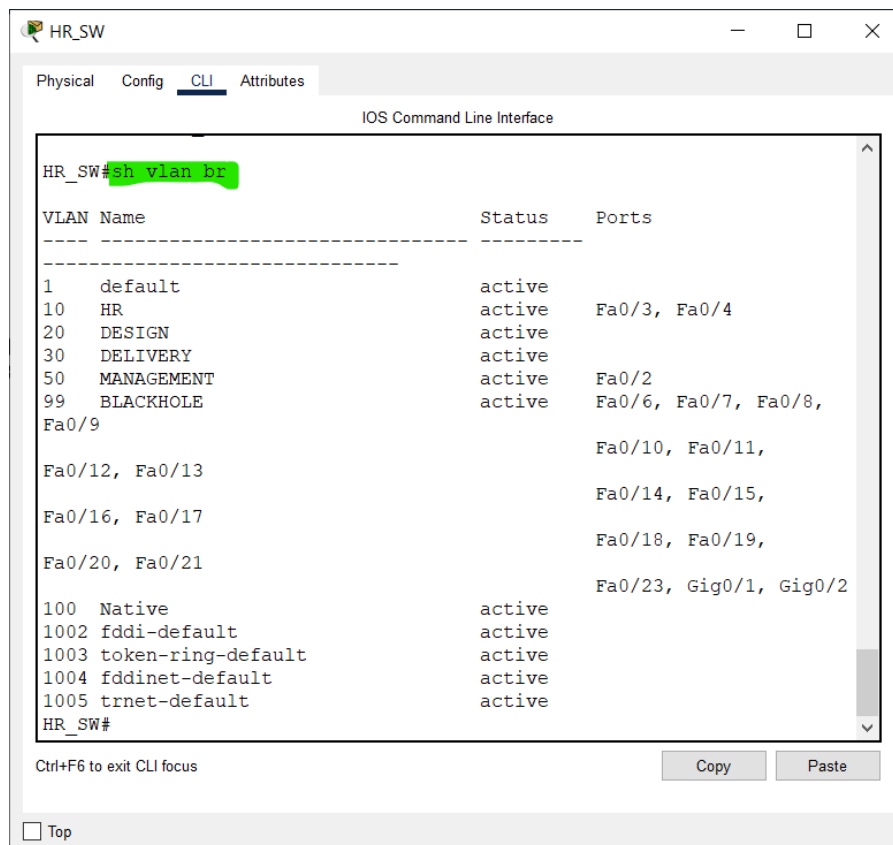


Figure 8: VLAN configuration

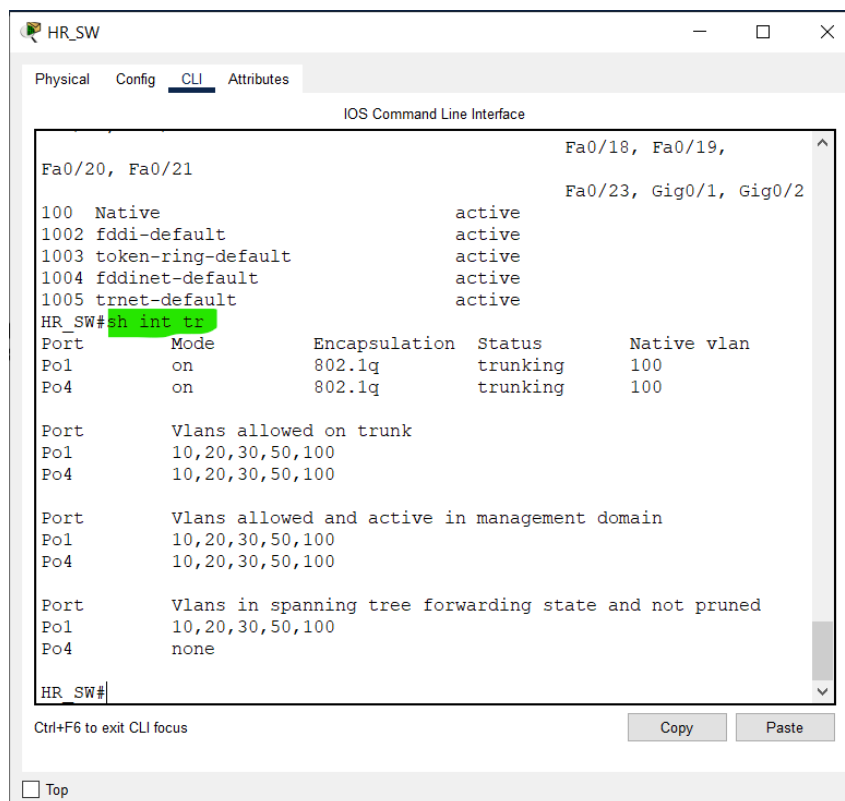


Figure 9: VLAN Trunk conf

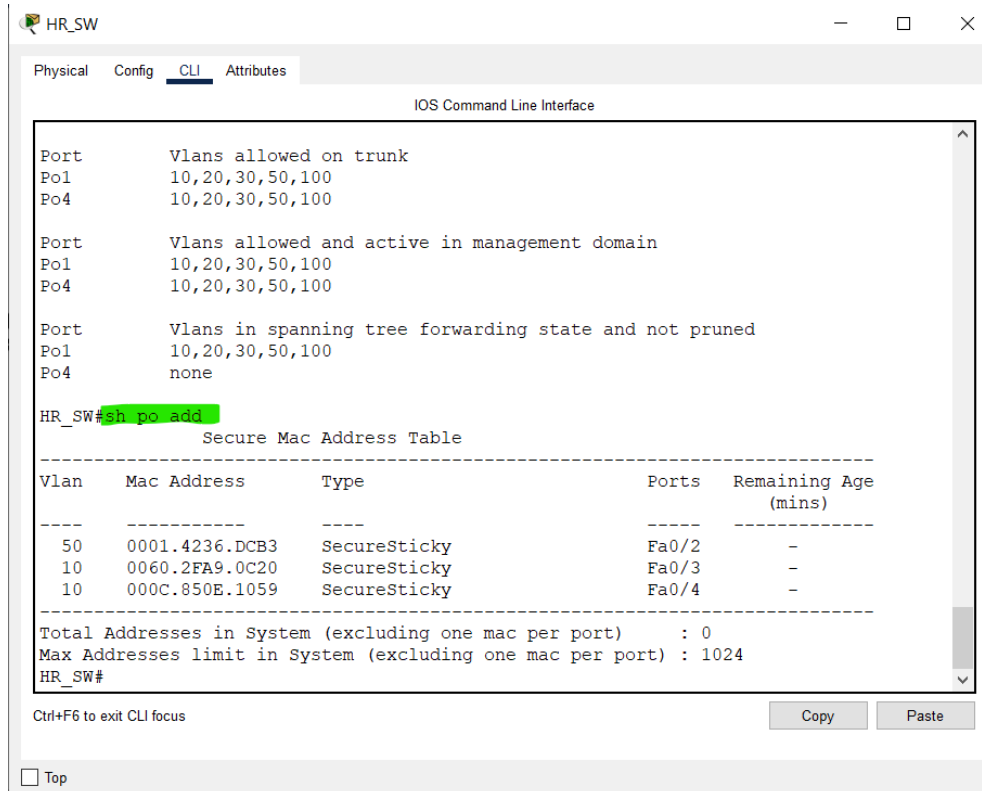


Figure 10:switchport port-security mac-address sticky

HQ-ROUTER

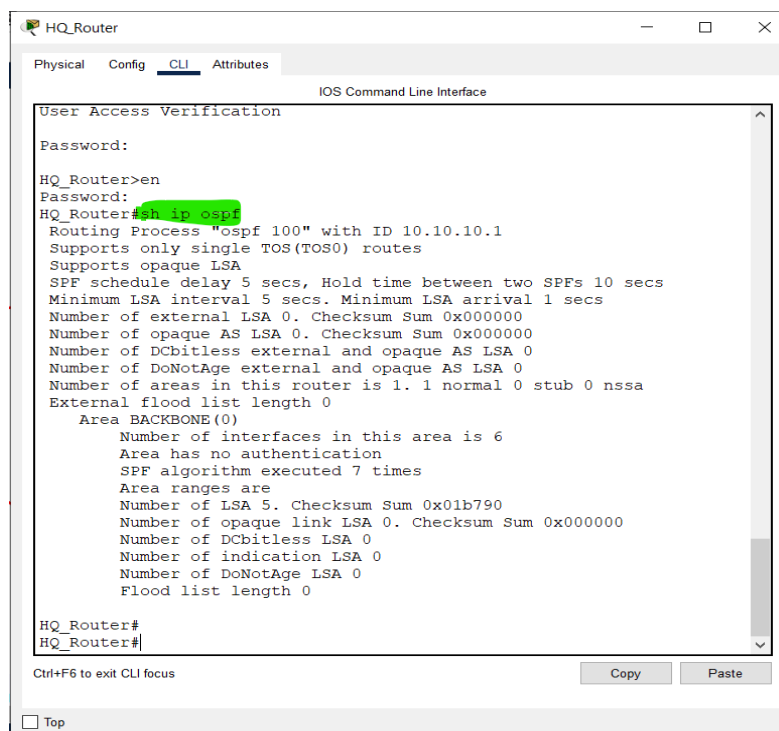


Figure 11:OSPF

SERVER FARM SWITCH

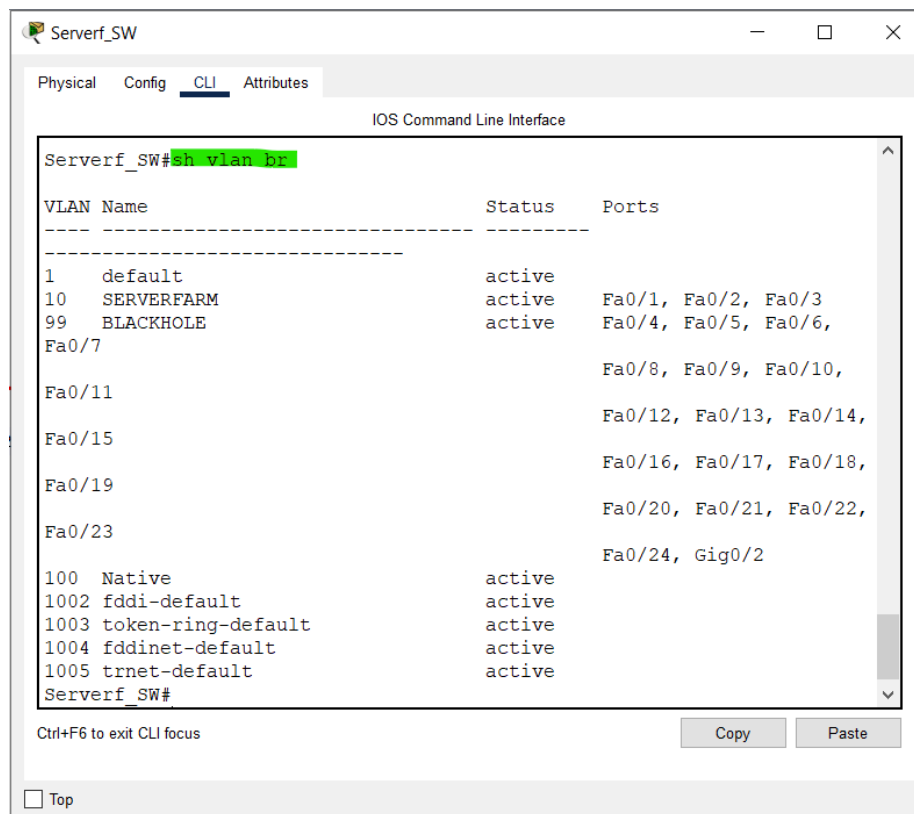


Figure 12:VLAN

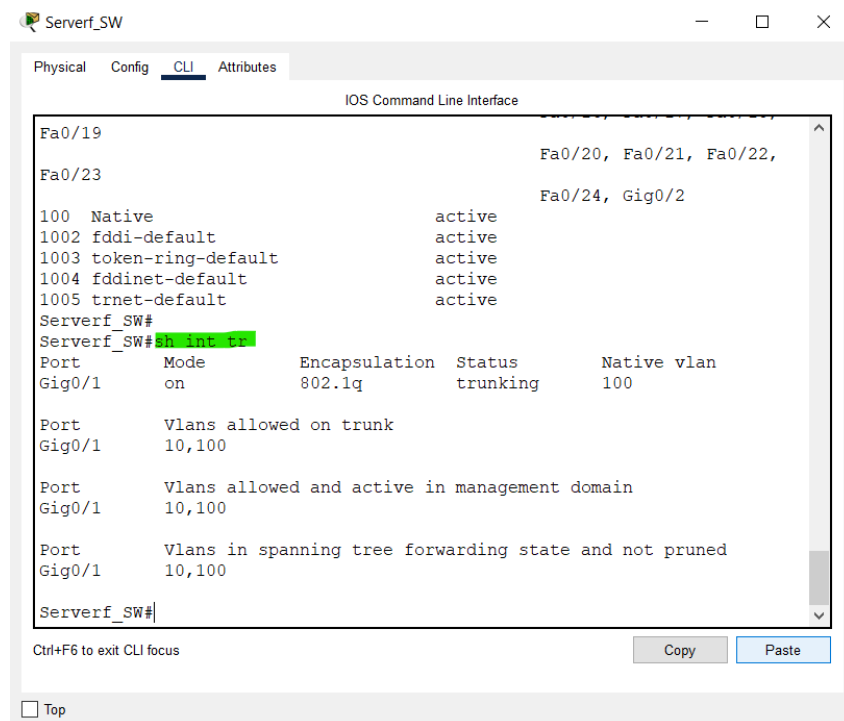
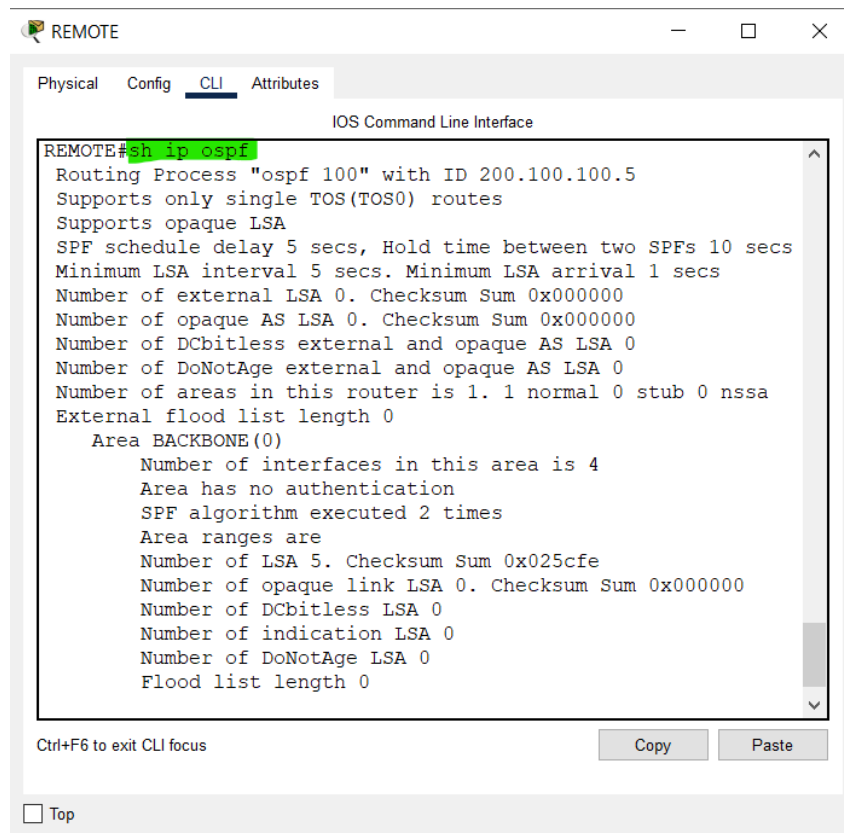


Figure 13: VLAN Trunking

REMOTE ROUTER



The screenshot shows a window titled "REMOTE" with a tabbed interface. The "CLI" tab is active, displaying the "IOS Command Line Interface". The command "sh ip ospf" has been entered, and the output shows the following details:

```
REMOTE#sh ip ospf
Routing Process "ospf 100" with ID 200.100.100.5
Supports only single TOS(TOS0) routes
Supports opaque LSA
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Minimum LSA interval 5 secs. Minimum LSA arrival 1 secs
Number of external LSA 0. Checksum Sum 0x000000
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
External flood list length 0
  Area BACKBONE(0)
    Number of interfaces in this area is 4
    Area has no authentication
    SPF algorithm executed 2 times
    Area ranges are
    Number of LSA 5. Checksum Sum 0x025cfe
    Number of opaque link LSA 0. Checksum Sum 0x000000
    Number of DCbitless LSA 0
    Number of indication LSA 0
    Number of DoNotAge LSA 0
    Flood list length 0
```

At the bottom of the CLI window, there is a status bar with the text "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste". Below the CLI window, there is a "Top" button.

Figure 14:OSPF

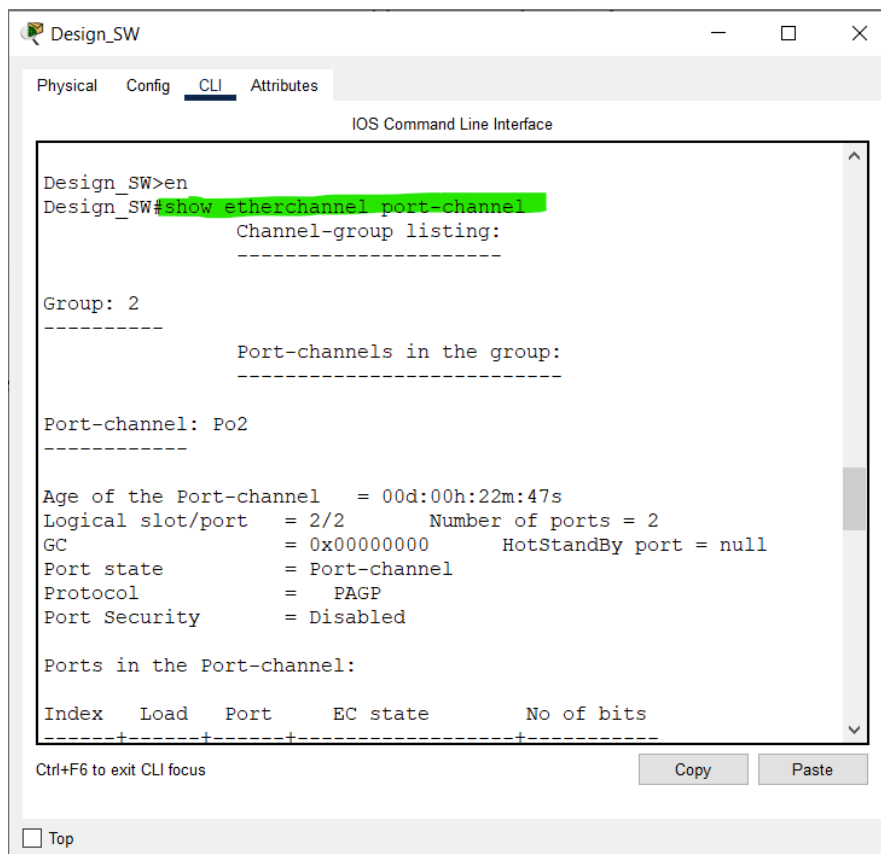
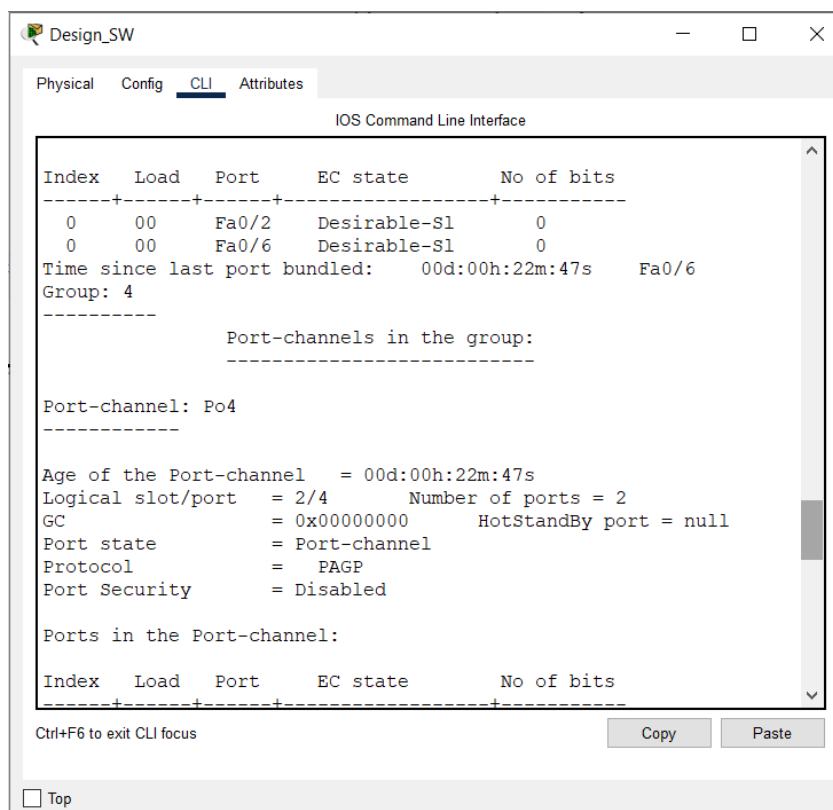
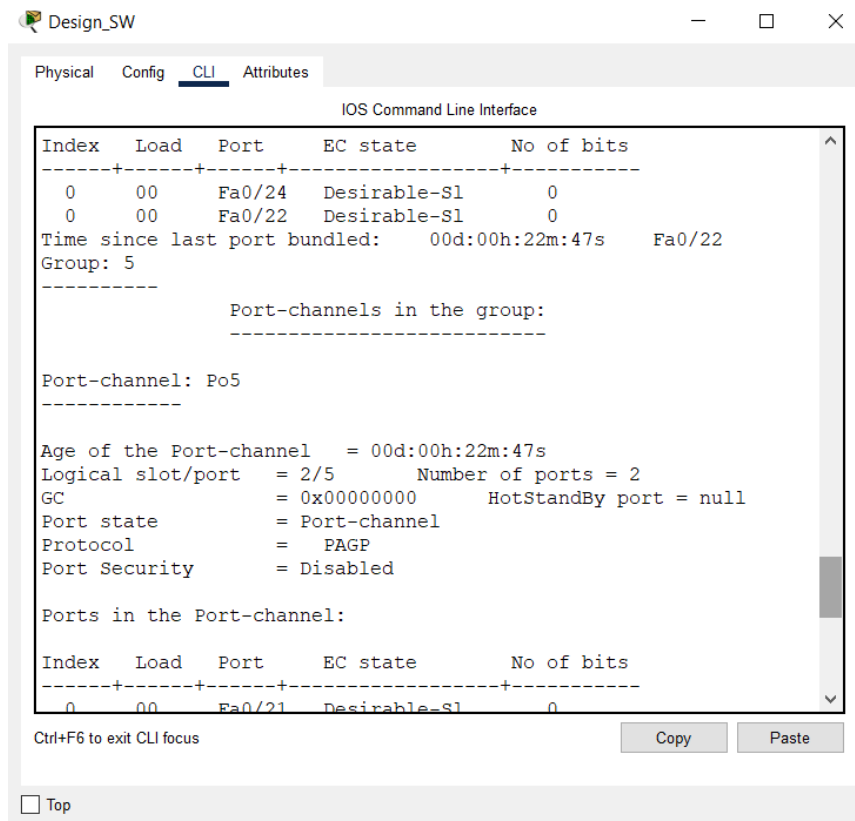


Figure 15: EtherChannel





As noted above, all configurations such as VLAN, Trunking, and access ports have been correctly established.

REFERENCES:

- Netacad | <https://lms.netacad.com/course/view.php?id=1160420>
- Cisco Networking Academy's Introduction to VLANs | Sample Chapter is provided courtesy of Cisco Press | Date: Apr 7, 2014 n.a. <https://www.ciscopress.com/articles/article.asp?p=2181837&seqNum=7>
- Cisco Loopback Interfaces Tutorial | (n.d.) <https://www.flackbox.com/cisco-loopback-interfaces#:~:text=Loopback%20provides%20redundancy%20if%20there,loopback%20address%20on%20that%20router.>