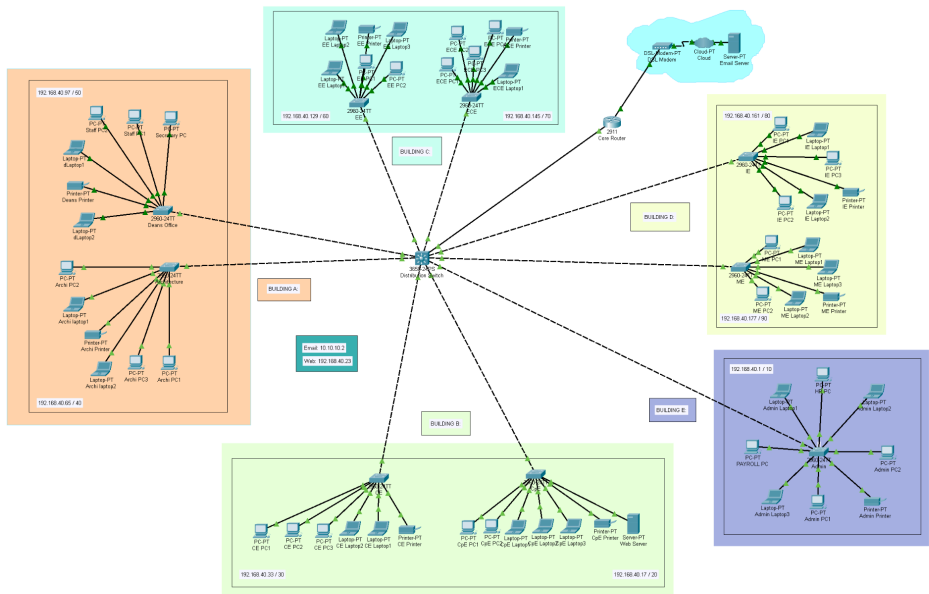


A. Project Overview

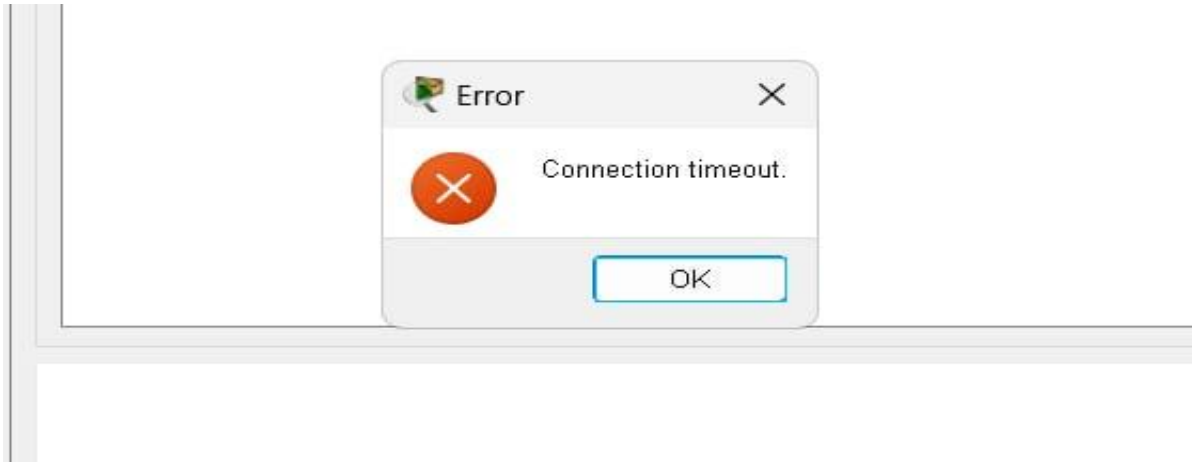


This project focuses on designing and implementing a network topology for the College of Engineering and Architecture at Don Honorio Ventura State University – Bacolor Campus. The network consists of five buildings, each departments equipped with PCs, laptops, and a printer in every building. The network topology has three layers: a core layer (core router), a distribution layer (distribution switch), and access layers (end devices). This approach ensures scalability and future-proofing of the network infrastructure.

VLANs are configured using a multi-layer switch to enable efficient network segmentation. Building E serves as a DHCP server for dynamic IP allocation, while Buildings A, B, C, and D use static IP configurations. Subnetting is implemented to optimize IP address management within the 192.168.40.0 address space, ensuring appropriate IP addresses, subnet masks, and gateways are assigned to all interfaces.

The Computer Engineering Department in Building B hosts a web server, accessible via its IP address, and an external email server operates with the dhvsu.com domain. Proper cabling connects all devices, ensuring reliable communication across the network. This comprehensive setup supports seamless connectivity, communication, and resource sharing across all departments, enhancing the academic and administrative functions of the College of Engineering and Architecture.

C. Troubleshooting Process



Connection timeout happens due to wrong IP config and a faulty router, interfering with server communication. Fixing IP settings and router connection resolves the issue, restoring system function.

A tricky VLAN setup It seemed tough at first, but after a few tries we got it fixed. Later, we also fixed some subnetting and IP configuration mistakes, which helped everything work smoothly.

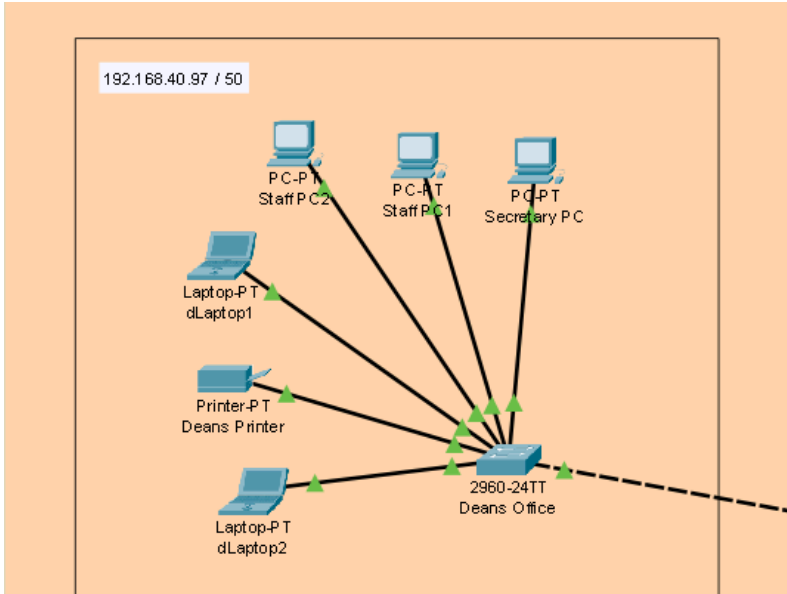
I had a tough time setting up the email server on the cloud. Eventually, I found the solution: configuring it externally. To fix it, I made sure the router had the right IP settings and checked them thoroughly. Turns out, the router couldn't talk to the server because its IP wasn't set correctly on the interface leading to the server.

D. Implementation Details

Building A serves as the administrative hub, the Dean's office, staff, secretary, and the Architecture Department. Building B has the Civil Engineering and Computer Engineering Department as the host for the Web Server. Building C is designated for the Electrical and Electronics Engineering Department. Building D is for the Industrial Engineering and Mechanical Engineering Departments. Lastly, Building E is dedicated to administrative functions, providing space for Administrative Staff, HR, and Payroll departments.

(Note: Printers were configured with their respective default gateways to facilitate efficient network communication.)

Building A Dean's Office:



Staff PC1

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.98

Subnet Mask 255.255.255.224

Default Gateway 192.168.40.97

DNS Server 0.0.0.0

Staff PC2

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.99

Subnet Mask 255.255.255.224

Default Gateway 192.168.40.97

DNS Server 0.0.0.0

dLaptop1

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.100

Subnet Mask 255.255.255.224

Default Gateway 192.168.40.97

DNS Server 0.0.0.0

dLaptop2

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

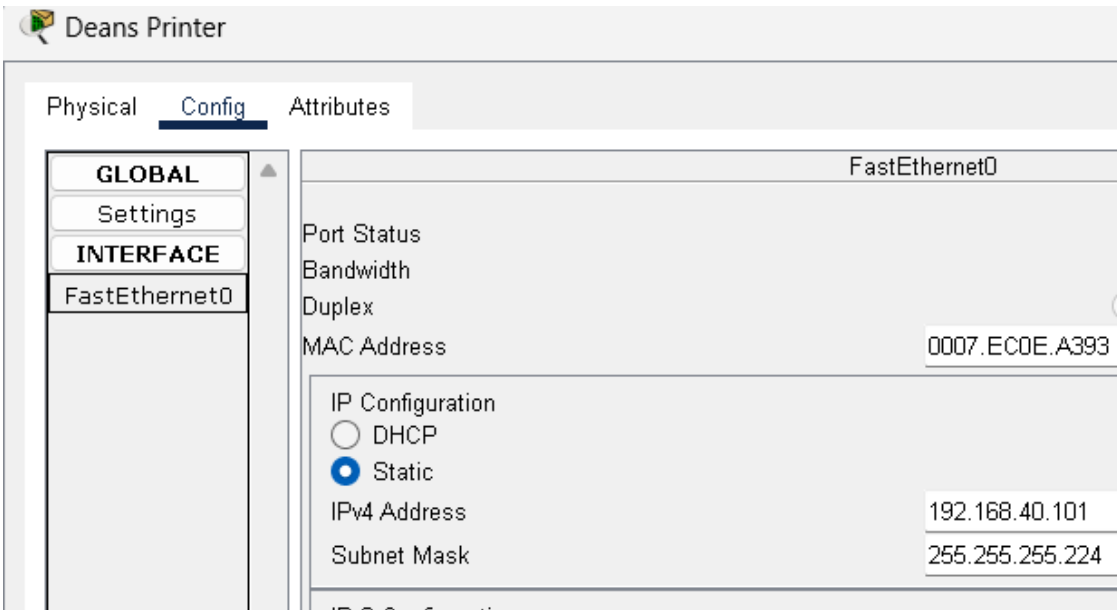
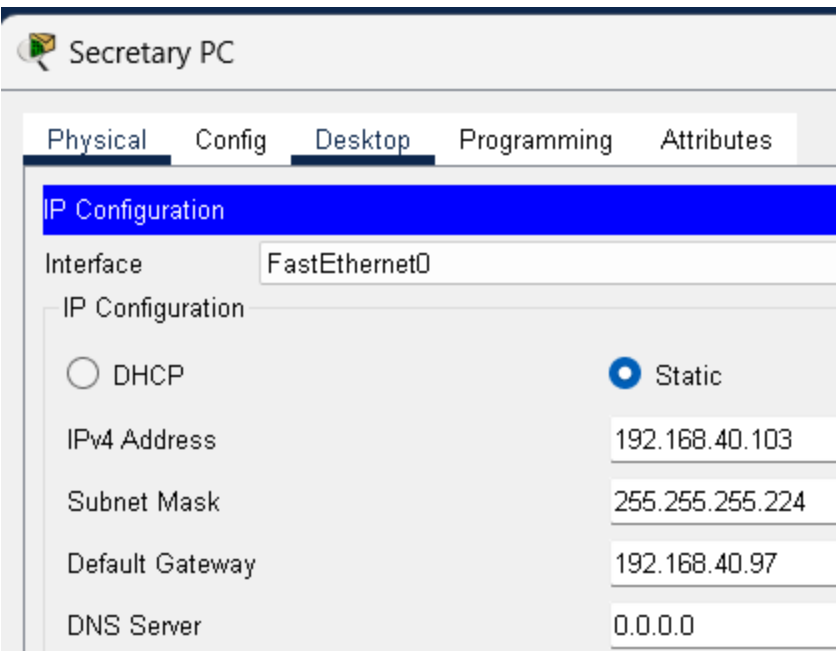
☐ DHCP ☒ Static

IPv4 Address 192.168.40.102

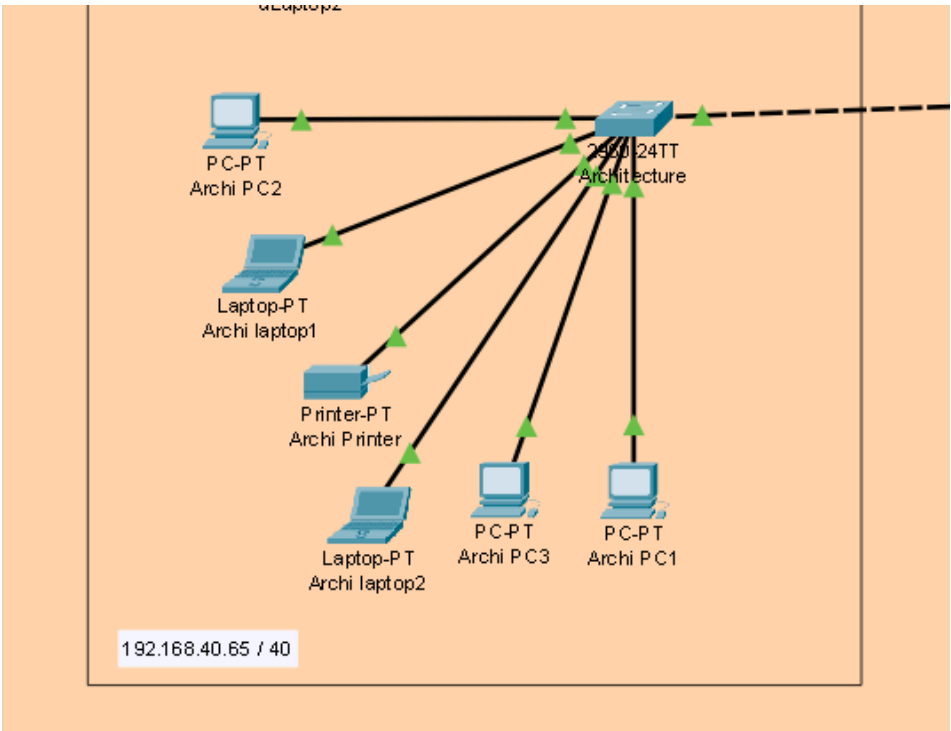
Subnet Mask 255.255.255.224

Default Gateway 192.168.40.97

DNS Server 0.0.0.0



Building A ARCHITECTURE:



Archi PC1

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.66

Subnet Mask255.255.255.224

Default Gateway192.168.40.65

DNS Server0.0.0.0

Archi PC2

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.67

Subnet Mask255.255.255.224

Default Gateway192.168.40.65

DNS Server0.0.0.0

Archi PC3

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.71

Subnet Mask255.255.255.224

Default Gateway192.168.40.65

DNS Server0.0.0.0

Archi laptop1

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.68

Subnet Mask255.255.255.224

Default Gateway192.168.40.65

DNS Server0.0.0.0

Archi laptop2

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.70

Subnet Mask255.255.255.224

Default Gateway192.168.40.65

DNS Server0.0.0.0

Archi Printer

PhysicalConfigAttributes

GLOBAL

Settings

INTERFACE

FastEthernet0

FastEthernet0

Port Status

Bandwidth

Duplex

MAC Address000A.F3B5.010C

IP Configuration

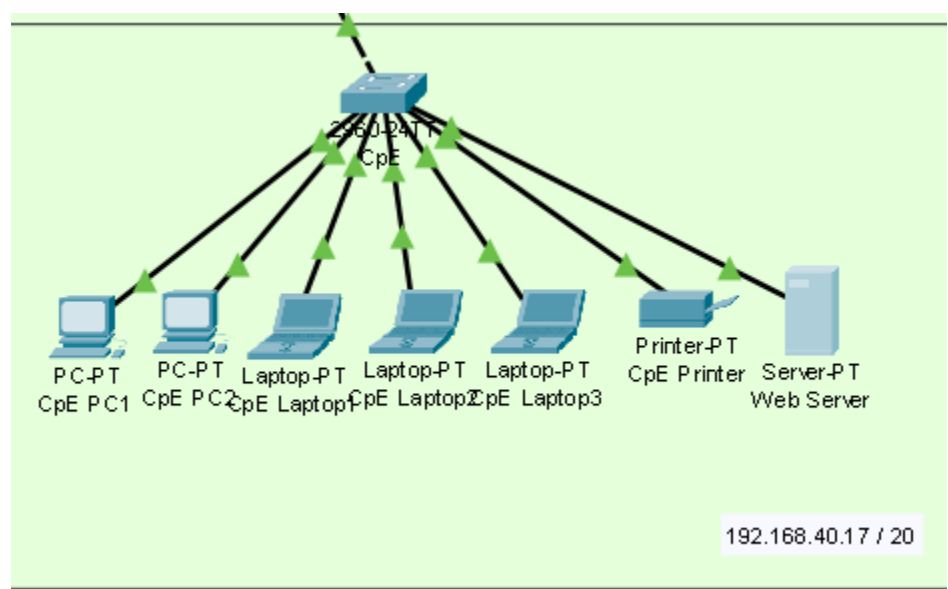
☐ DHCP

☒ Static

IPv4 Address192.168.40.69

Subnet Mask255.255.255.224

Building B CPE Department host the web server ip 192.168.40.23):



Web Server

Physical Config Services **Desktop** Programming Att

IP Configuration

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.23

Subnet Mask 255.255.255.240

Default Gateway 192.168.40.17

DNS Server 0.0.0.0

CpE PC1

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.18

Subnet Mask 255.255.255.240

Default Gateway 192.168.40.17

DNS Server 0.0.0.0

CpE PC2

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.19

Subnet Mask 255.255.255.240

Default Gateway 192.168.40.17

DNS Server 0.0.0.0

CpE Laptop1

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.20

Subnet Mask 255.255.255.240

Default Gateway 192.168.40.17

DNS Server 0.0.0.0

CpE Printer

Physical **Config** Attributes

GLOBAL

Settings

INTERFACE

FastEthernet0

Port Status

Bandwidth

Duplex

MAC Address 00D0.D36E.8400

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.22

Subnet Mask 255.255.255.240

CpE Laptop2

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.21

Subnet Mask255.255.255.240

Default Gateway192.168.40.17

DNS Server0.0.0.0

CpE Laptop3

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

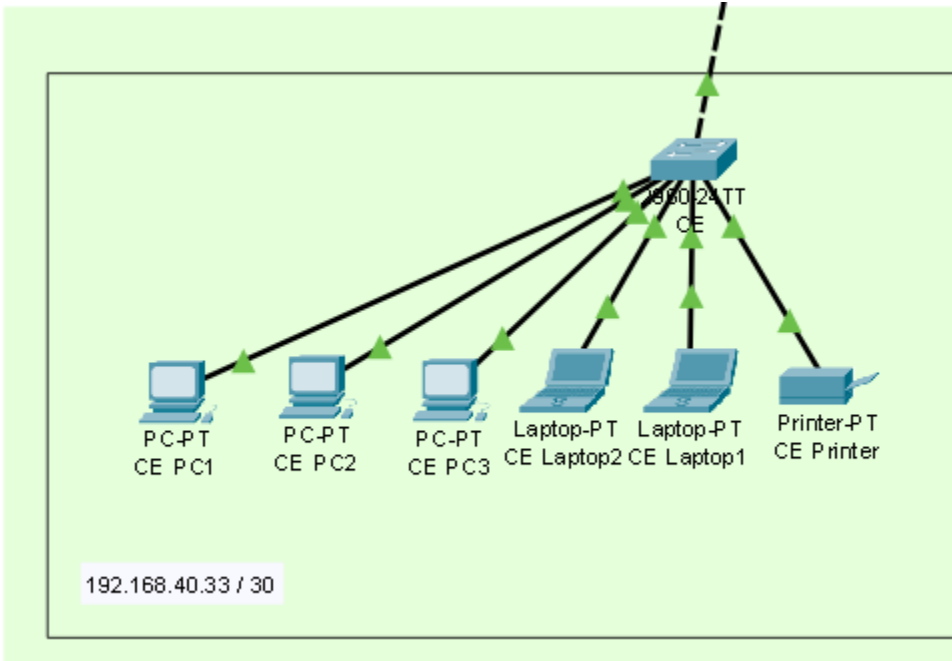
IPv4 Address192.168.40.22

Subnet Mask255.255.255.240

Default Gateway192.168.40.17

DNS Server0.0.0.0

Building B CE Department:



CE PC1

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.34

Subnet Mask255.255.255.224

Default Gateway192.168.40.33

DNS Server0.0.0.0

CE PC2

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.35

Subnet Mask255.255.255.224

Default Gateway192.168.40.33

DNS Server0.0.0.0

CE PC3

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.38

Subnet Mask255.255.255.224

Default Gateway192.168.40.33

DNS Server0.0.0.0

CE Laptop1

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.36

Subnet Mask255.255.255.224

Default Gateway192.168.40.33

DNS Server0.0.0.0

CE Laptop2

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.37

Subnet Mask255.255.255.224

Default Gateway192.168.40.33

DNS Server0.0.0.0

CE Printer

PhysicalConfigAttributes

GLOBAL

Settings

INTERFACE

FastEthernet0

FastEthernet0

Port Status

Bandwidth

Duplex

MAC Address000C.8588.9087

IP Configuration

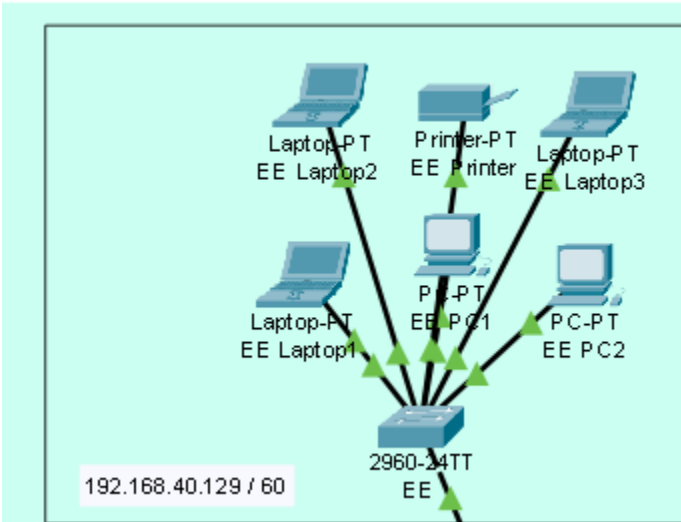
☐ DHCP

☒ Static

IPv4 Address192.168.40.39

Subnet Mask255.255.255.224

Building C EE Department:



EE PC1

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.131

Subnet Mask255.255.255.240

Default Gateway192.168.40.129

DNS Server0.0.0.0

EE PC2

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.132

Subnet Mask255.255.255.240

Default Gateway192.168.40.129

DNS Server0.0.0.0

EE Laptop1

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.130

Subnet Mask255.255.255.240

Default Gateway192.168.40.129

DNS Server0.0.0.0

EE Laptop2

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.133

Subnet Mask255.255.255.240

Default Gateway192.168.40.129

DNS Server0.0.0.0

EE Laptop3

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.135

Subnet Mask255.255.255.240

Default Gateway192.168.40.129

DNS Server0.0.0.0

EE Printer

PhysicalConfigAttributes

GLOBAL

Settings

INTERFACE

FastEthernet0

FastEthernet0

Port Status

Bandwidth

Duplex

MAC Address0007.EC20.EDE5

IP Configuration

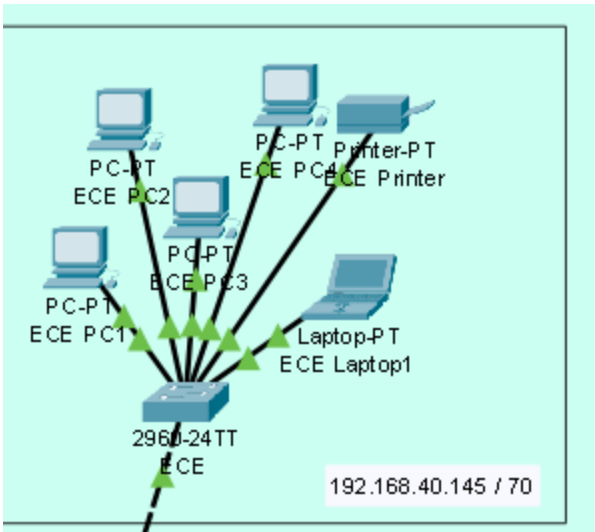
☐ DHCP

☒ Static

IPv4 Address192.168.40.134

Subnet Mask255.255.255.240

Building C ECE Department:



ECE PC1

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.146

Subnet Mask 255.255.255.240

Default Gateway 192.168.40.145

DNS Server 0.0.0.0

ECE PC2

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.149

Subnet Mask 255.255.255.240

Default Gateway 192.168.40.145

DNS Server 0.0.0.0

ECE PC3

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.150

Subnet Mask 255.255.255.240

Default Gateway 192.168.40.145

DNS Server 0.0.0.0

ECE PC4

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.147

Subnet Mask 255.255.255.240

Default Gateway 192.168.40.145

DNS Server 0.0.0.0

ECE Laptop1

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.148

Subnet Mask 255.255.255.240

Default Gateway 192.168.40.145

DNS Server 0.0.0.0

ECE Printer

PhysicalConfigAttributes

GLOBAL

Settings

INTERFACE

FastEthernet0

FastEthernet0

Port Status

Bandwidth

Duplex

MAC Address0001.96A0.2636

IP Configuration

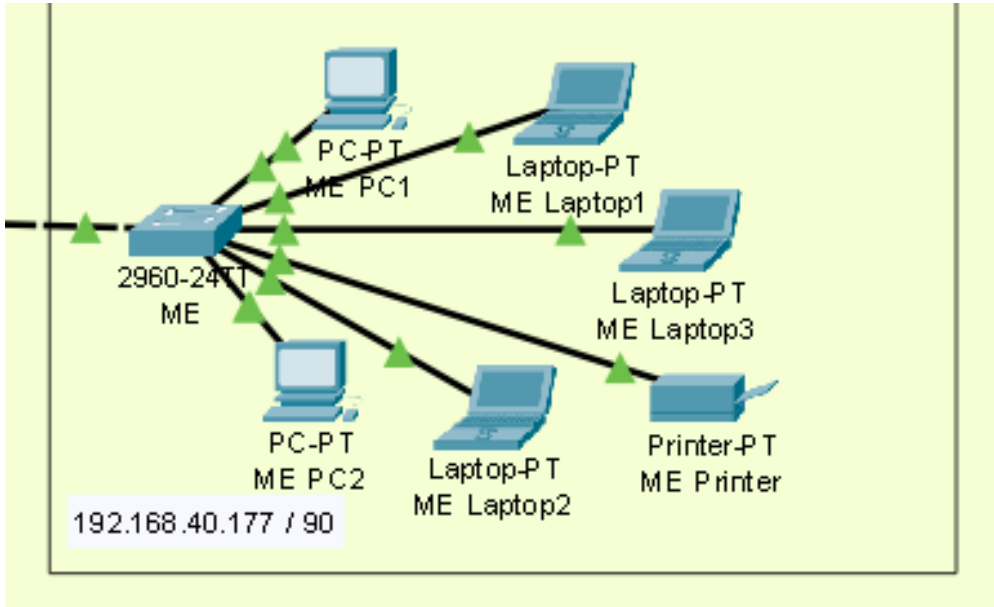
DHCP

Static

IPv4 Address192.168.40.151

Subnet Mask255.255.255.240

Building D ME Department:



ME PC1

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

DHCP

Static

IPv4 Address192.168.40.178

Subnet Mask255.255.255.240

Default Gateway192.168.40.177

DNS Server0.0.0.0

ME PC2

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

DHCP

Static

IPv4 Address192.168.40.181

Subnet Mask255.255.255.240

Default Gateway192.168.40.177

DNS Server0.0.0.0

ME Laptop1

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.179

Subnet Mask255.255.255.240

Default Gateway192.168.40.177

DNS Server0.0.0.0

ME Laptop2

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.182

Subnet Mask255.255.255.240

Default Gateway192.168.40.177

DNS Server0.0.0.0

ME Laptop3

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.40.180

Subnet Mask255.255.255.240

Default Gateway192.168.40.177

DNS Server0.0.0.0

ME Printer

PhysicalConfigAttributes

GLOBAL

Settings

INTERFACE

FastEthernet0

FastEthernet0

Port Status

Bandwidth

Duplex

MAC Address0060.5C81.1A86

IP Configuration

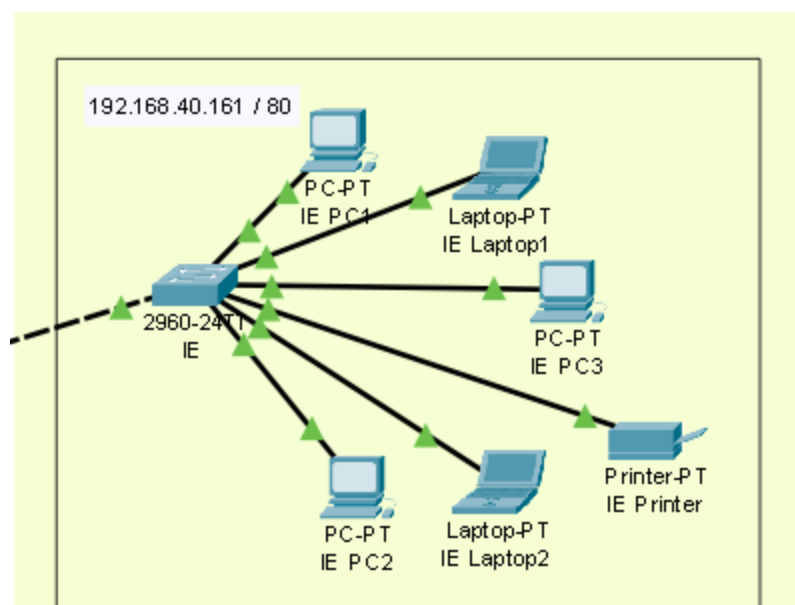
☐ DHCP

☒ Static

IPv4 Address192.168.40.183

Subnet Mask255.255.255.240

Building D IE Department:



IE PC1

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.162

Subnet Mask 255.255.255.240

Default Gateway 192.168.40.161

DNS Server 0.0.0.0

IE PC2

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.165

Subnet Mask 255.255.255.240

Default Gateway 192.168.40.161

DNS Server 0.0.0.0

IE PC3

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.40.163

Subnet Mask 255.255.255.240

Default Gateway 192.168.40.161

DNS Server 0.0.0.0

IE Laptop1

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

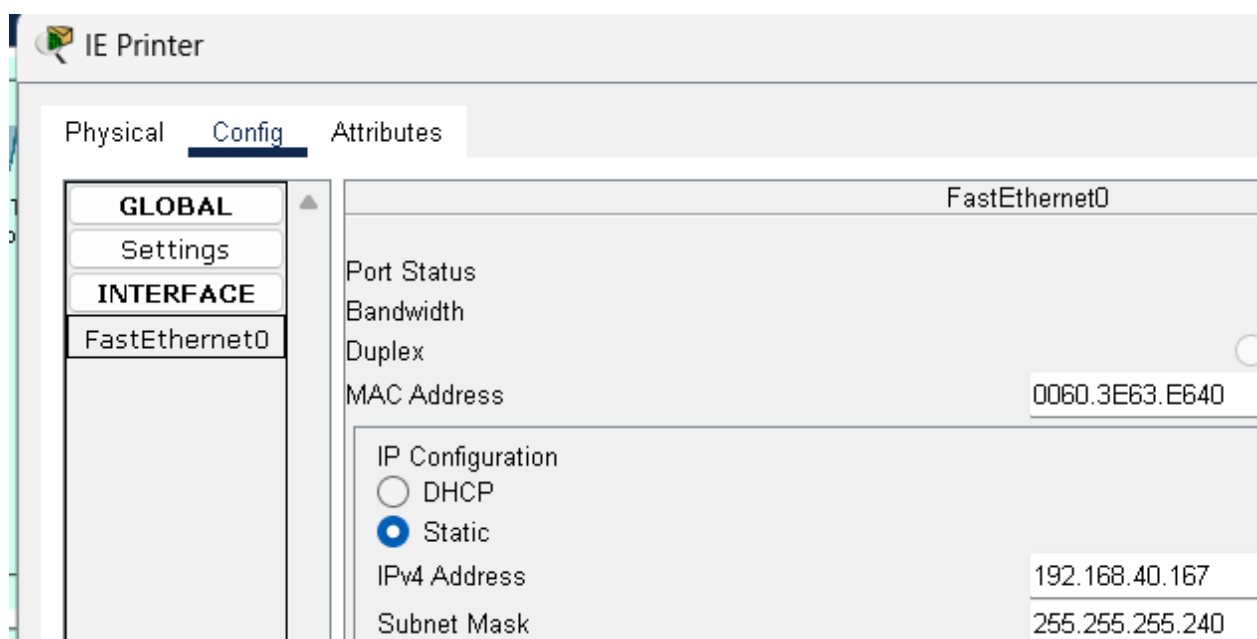
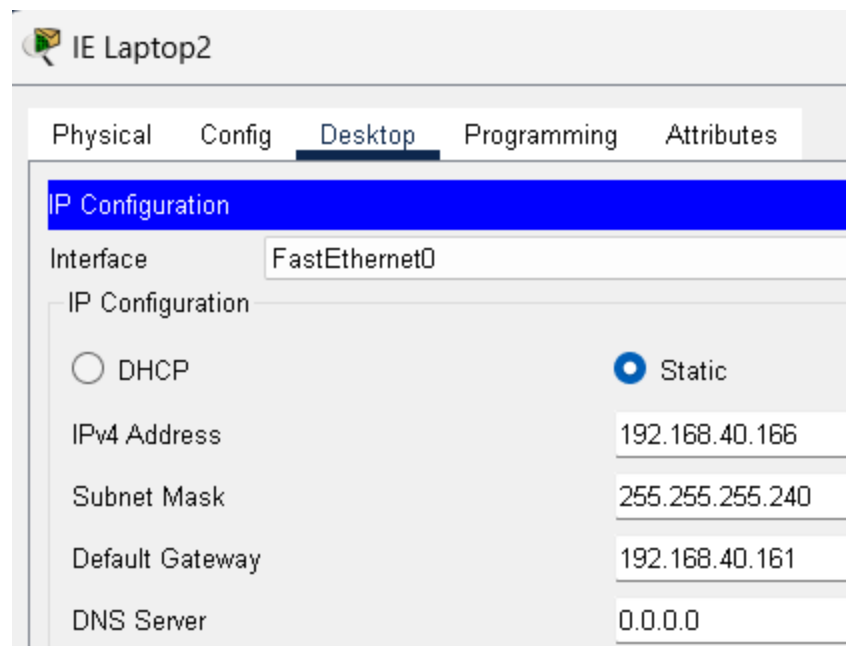
☐ DHCP ☒ Static

IPv4 Address 192.168.40.164

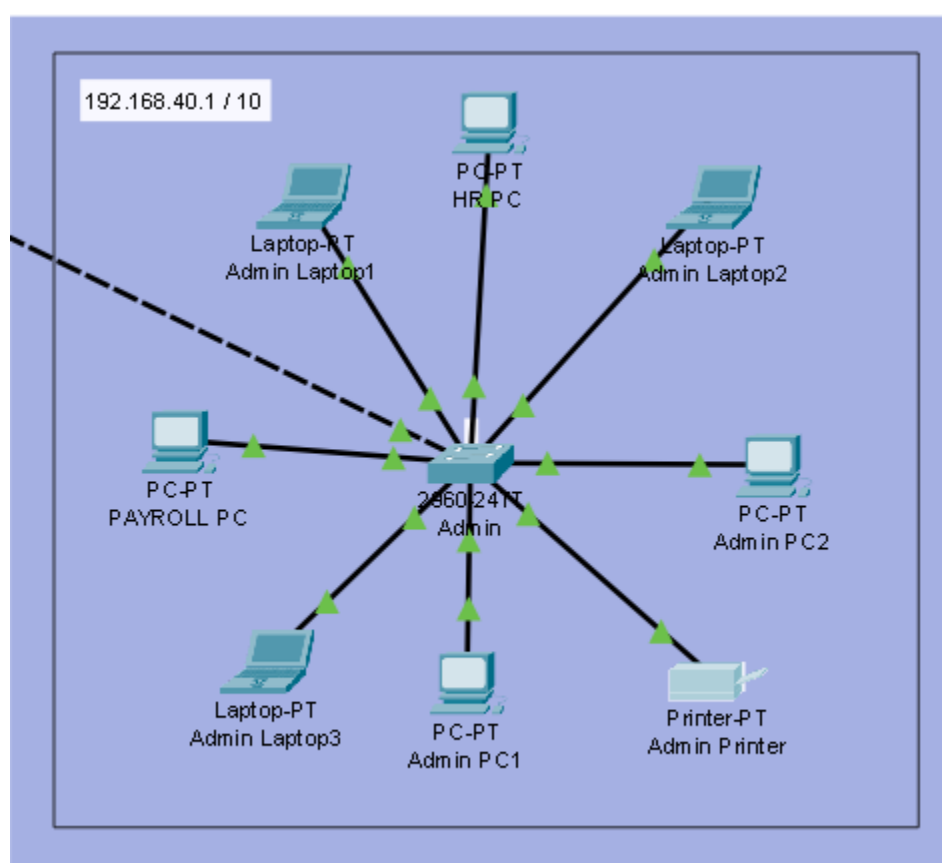
Subnet Mask 255.255.255.240

Default Gateway 192.168.40.161

DNS Server 0.0.0.0



Building E Administrative Staffs, HR, and Payroll:



Admin PC1

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☒ DHCP

☐ Static

IPv4 Address192.168.40.2

Subnet Mask255.255.255.240

Default Gateway192.168.40.1

DNS Server0.0.0.0

Admin PC2

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☒ DHCP

☐ Static

IPv4 Address192.168.40.3

Subnet Mask255.255.255.240

Default Gateway192.168.40.1

DNS Server0.0.0.0

Admin Laptop1

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☒ DHCP

☐ Static

IPv4 Address192.168.40.6

Subnet Mask255.255.255.240

Default Gateway192.168.40.1

DNS Server0.0.0.0

Admin Laptop2

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☒ DHCP

☐ Static

IPv4 Address192.168.40.7

Subnet Mask255.255.255.240

Default Gateway192.168.40.1

DNS Server0.0.0.0

Admin Printer

PhysicalConfigAttributes

GLOBAL

Settings

INTERFACE

FastEthernet0

FastEthernet0

Port Status

Bandwidth

Duplex

MAC Address0060.3E25.C014

IP Configuration

☒ DHCP

☐ Static

IPv4 Address192.168.40.9

Subnet Mask255.255.255.240

Admin Laptop3

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☒ DHCP

☐ Static

IPv4 Address192.168.40.8

Subnet Mask255.255.255.240

Default Gateway192.168.40.1

DNS Server0.0.0.0

HR PC

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☒ DHCP

☐ Static

IPv4 Address192.168.40.4

Subnet Mask255.255.255.240

Default Gateway192.168.40.1

DNS Server0.0.0.0

VLAN

CLI configuration assigns specific VLANs to the Fast Ethernet ports 1 through 24. Each VLAN is associated with a particular department or group. Assigning VLANs to specific ports helps segregate network traffic and manage access for different departments or groups within the network.

Admin

PhysicalConfigCLIAttributes

IOS Command Line Interface

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up

%LINK-3-UPDOWN: Interface FastEthernet0/9, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down

%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up

Switch>en

Switch#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#int range fa01/-24

% Invalid input detected at '^' marker.

Switch(config)#switchport mode access

% Invalid input detected at '^' marker.

Switch(config)#switchport access vlan 10

% Invalid input detected at '^' marker.

Switch(config)#int range fa0/1-24

Switch(config-if-range)#switchport mode access

Switch(config-if-range)#switchport access vlan 10

% Access VLAN does not exist. Creating vlan 10

Switch(config-if-range)#

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/1 (10), with Switch GigabitEthernet1/0/2 (1).

Switch(config-if-range)#do wr

Building configuration...

[OK]

Switch(config-if-range)#

Copy

Paste

☐ Top

CpE

Physical

Config

CLI

Attributes

IOS Command Line Interface

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
%LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 20
% Access VLAN does not exist. Creating vlan 20
Switch(config-if-range)#do wr
Building configuration...
[OK]
Switch(config-if-range)#

Copy

Paste

☐ Top

Deans Office

Physical

Config

CLI

Attributes

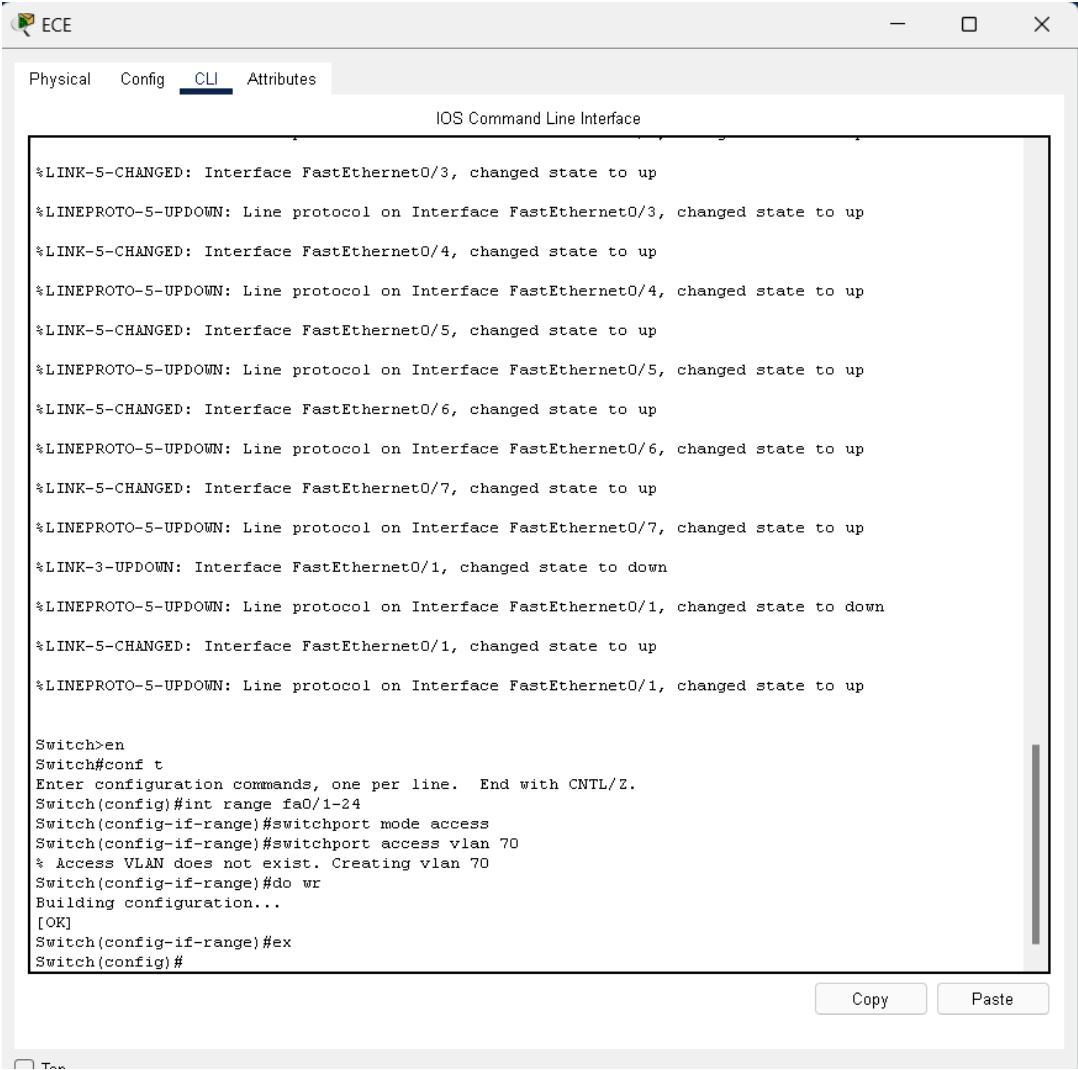
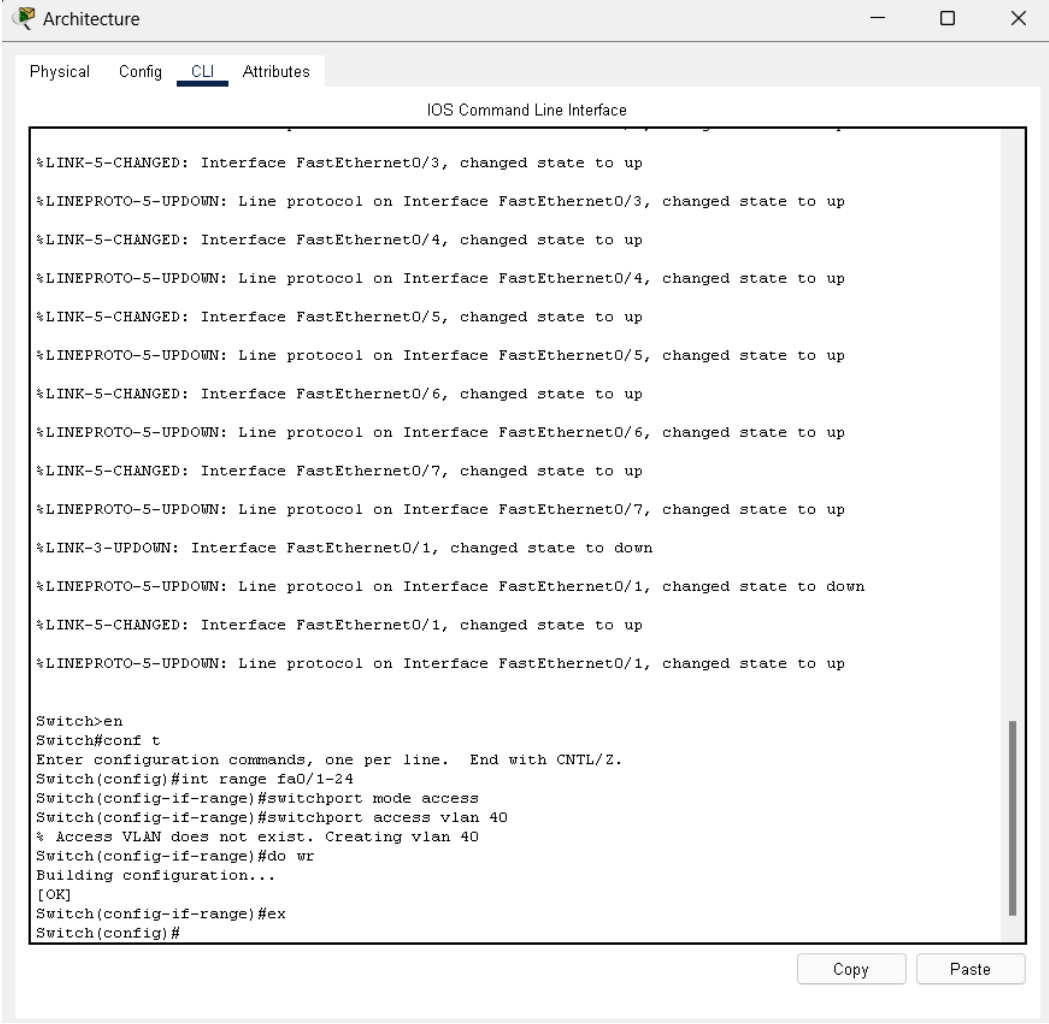
IOS Command Line Interface

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 50
% Access VLAN does not exist. Creating vlan 50
Switch(config-if-range)#do wr
Building configuration...
[OK]
Switch(config-if-range)#ex
Switch(config)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/1 (50), with Switch GigabitEthernet1/0/6 (1).

Copy

Paste




```

    --- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]:

Press RETURN to get started!

Press RETURN to get started!

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#
Router(config-if)#no sh

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
ex
Router(config)#int g0/0
Router(config-if)#no sh

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#ex
Router(config)#

```

```

Switch FastEthernet0/1 (90).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on GigabitEthernet1/0/2 (1), with
Switch FastEthernet0/1 (10).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on GigabitEthernet1/0/9 (1), with
Switch FastEthernet0/1 (80).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on GigabitEthernet1/0/8 (1), with
Switch FastEthernet0/1 (70).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on GigabitEthernet1/0/4 (1), with
Switch FastEthernet0/1 (30).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on GigabitEthernet1/0/5 (1), with
Switch FastEthernet0/1 (40).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on GigabitEthernet1/0/7 (1), with
Switch FastEthernet0/1 (60).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on GigabitEthernet1/0/6 (1), with
Switch FastEthernet0/1 (50).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on GigabitEthernet1/0/3 (1), with
Switch FastEthernet0/1 (20).

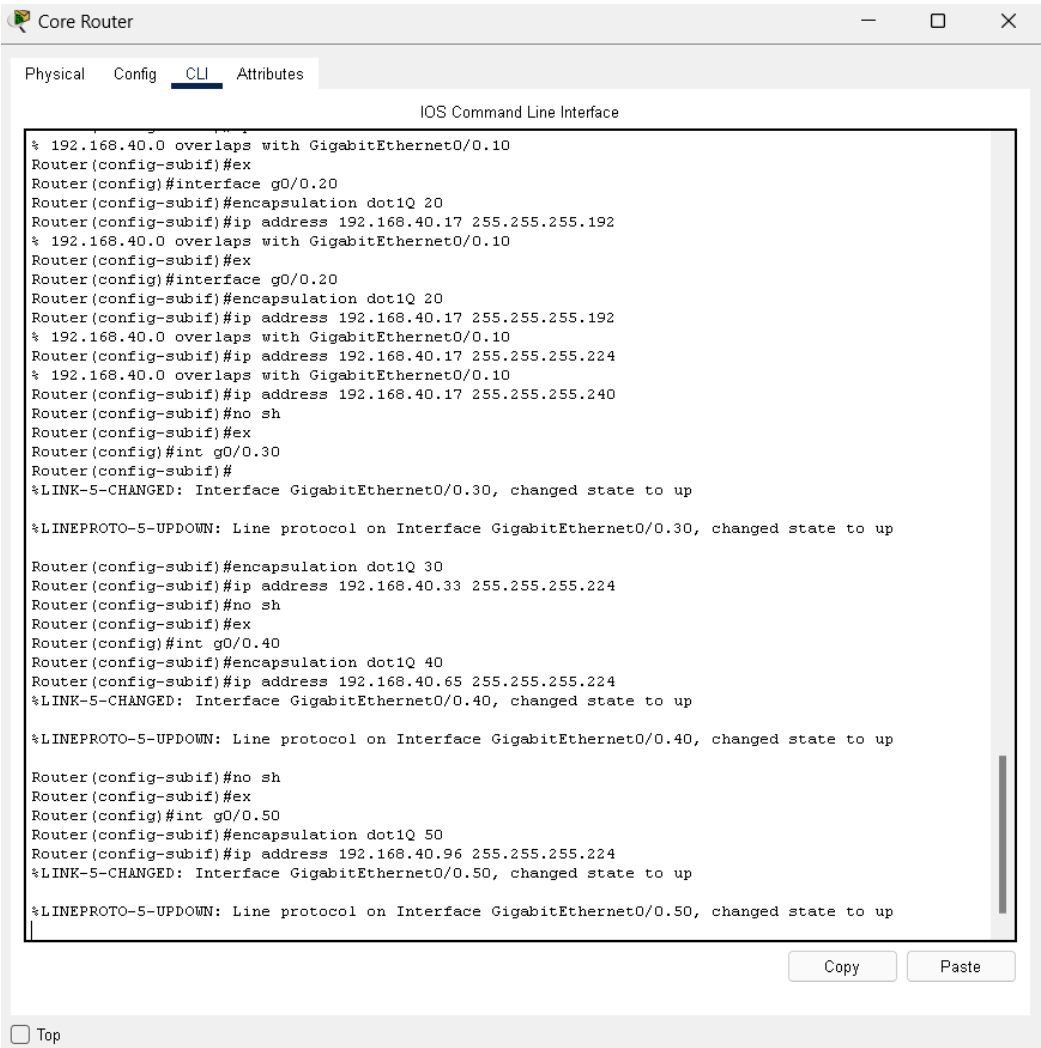
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on GigabitEthernet1/0/10 (1), with
Switch FastEthernet0/1 (90).

Press RETURN to get started!

Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#int range g1/0/2
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 10
% Access VLAN does not exist. Creating vlan 10
Switch(config-if-range)#

```

It displays the vlan mismatch in the distribution switch simply because the switchport in the distribution switch is not connected to the virtual lan thus configuring it in the CLI to create specific vlans.



In this display of CLI Panel the router is configured to set a specific ip address.

Device Name: Core Router					
Device Model: 2911					
Hostname: Router					
Port	Link	VLAN	IP Address	IPv6 Address	MAC Address
GigabitEthernet0/0	Up	--	<not set>	<not set>	0090.2198.9201
GigabitEthernet0/0.10	Up	--	192.168.40.1/28	<not set>	0090.2198.9201
GigabitEthernet0/0.20	Up	--	192.168.40.17/28	<not set>	0090.2198.9201
GigabitEthernet0/0.30	Up	--	192.168.40.33/27	<not set>	0090.2198.9201
GigabitEthernet0/0.40	Up	--	192.168.40.65/27	<not set>	0090.2198.9201
GigabitEthernet0/0.50	Up	--	192.168.40.97/27	<not set>	0090.2198.9201
GigabitEthernet0/0.60	Up	--	192.168.40.129/28	<not set>	0090.2198.9201
GigabitEthernet0/0.70	Up	--	192.168.40.145/28	<not set>	0090.2198.9201
GigabitEthernet0/0.80	Up	--	192.168.40.161/28	<not set>	0090.2198.9201
GigabitEthernet0/0.90	Up	--	192.168.40.177/28	<not set>	0090.2198.9201
GigabitEthernet0/1	Up	--	<not set>	<not set>	0090.2198.9202
GigabitEthernet0/2	Down	--	<not set>	<not set>	0090.2198.9203
Vlan1	Down	1	<not set>	<not set>	0040.0B85.1C27
Physical Location: Intercity > Home City > Corporate Office > Main Wiring Closet > Rack > Router0					

The distribution switch interfaces connecting to switches in various departments have been assigned IP addresses and subnet masks.

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int g0/1
Router(config-if)#ip address 10.10.10.1
% Incomplete command.
Router(config-if)#ip address 10.10.10.1 255.0.0.0
Router(config-if)#ex
```

The router's interface connecting to the email server in the cloud is set up and configured

Core Router

PhysicalConfigCLIAttributes

IOS Command Line Interface

```
Router(config-subif)#encapsulation dot1Q 80
Router(config-subif)#ip address 192.168.40.145 255.255.255.240
%LINK-5-CHANGED: Interface GigabitEthernet0/0.80, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.80, changed state to up

% 192.168.40.144 overlaps with GigabitEthernet0/0.70
Router(config-subif)#no sh
Router(config-subif)#ex
Router(config)#int g0/0.80
Router(config-subif)#encapsulation dot1Q 80
Router(config-subif)#ip address 192.168.40.161 255.255.255.240
Router(config-subif)#ex
Router(config)#int g0/0.90
Router(config-subif)#encapsulation dot1Q 90
Router(config-subif)#ip address 192.168.40.177 255.255.255.240
%LINK-5-CHANGED: Interface GigabitEthernet0/0.90, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.90, changed state to up

Router(config-subif)#no sh
Router(config-subif)#ex
Router(config)#do wr
Building configuration...
[OK]
Router(config)#service dhcp
Router(config)#ip dhcp pool 192.168.40.1 255.255.255.240
^
% Invalid input detected at '^' marker.

Router(config)#ip dhcp pool 192.168.40.1
Router(dhcp-config)#network 192.168.40.0 255.255.255.240
Router(dhcp-config)#default router 192.168.40.1
^
% Invalid input detected at '^' marker.

Router(dhcp-config)#default-router 192.168.40.1
Router(dhcp-config)#ex
Router(config)#do wr
Building configuration...
[OK]
Router(config)#
```

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Paste

☐ Top

The router provides an IP pool for the admin department, with the gateway set to 192.168.40.1.

```
Switch(config-if)#switchport mode trunk

Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/0/1, changed state to up
```

Enables the switch port to carry traffic for multiple VLANs, facilitating inter-VLAN communication.

192.168.40.0	192.168.40.1	255.255.255.240	<u>vlan 10</u>
192.168.40.16	192.168.40.17	255.255.255.240	<u>vlan 20</u>
192.168.40.32	192.168.40.33	255.255.255.224	<u>vlan 30</u>
192.168.40.64	192.168.40.65	255.255.255.224	<u>vlan 40</u>
192.168.40.96	192.168.40.97	255.255.255.224	<u>vlan 50</u>
192.168.40.128	192.168.40.129	255.255.255.240	<u>vlan 60</u>
192.168.40.144	192.168.40.145	255.255.255.240	<u>vlan 70</u>
192.168.40.160	192.168.40.161	255.255.255.240	<u>vlan 80</u>
192.168.40.176		255.255.255.240	<u>vlan 90</u>

The subnetting offer concise segmentation of the network into smaller, manageable subnetworks, optimizing resource allocation and network efficiency.

Cloud

Physical

Config

Attributes

GLOBAL

Settings

TV Settings

CONNECTIONS

Frame Relay

DSL

Cable

INTERFACE

Serial0

Serial1

Serial2

Serial3

Modem4

Modem5

Ethernet6

Coaxial7

DSL

Modem5

Ethernet6

Port

From Port	To Port
Modem4	Ethernet6
Modem5	Ethernet6

AddRemove

Top

Cloud Configuration

Domain Name: dhvsu.com

User Setup

User

vince

Francis

Chester

Cyrus

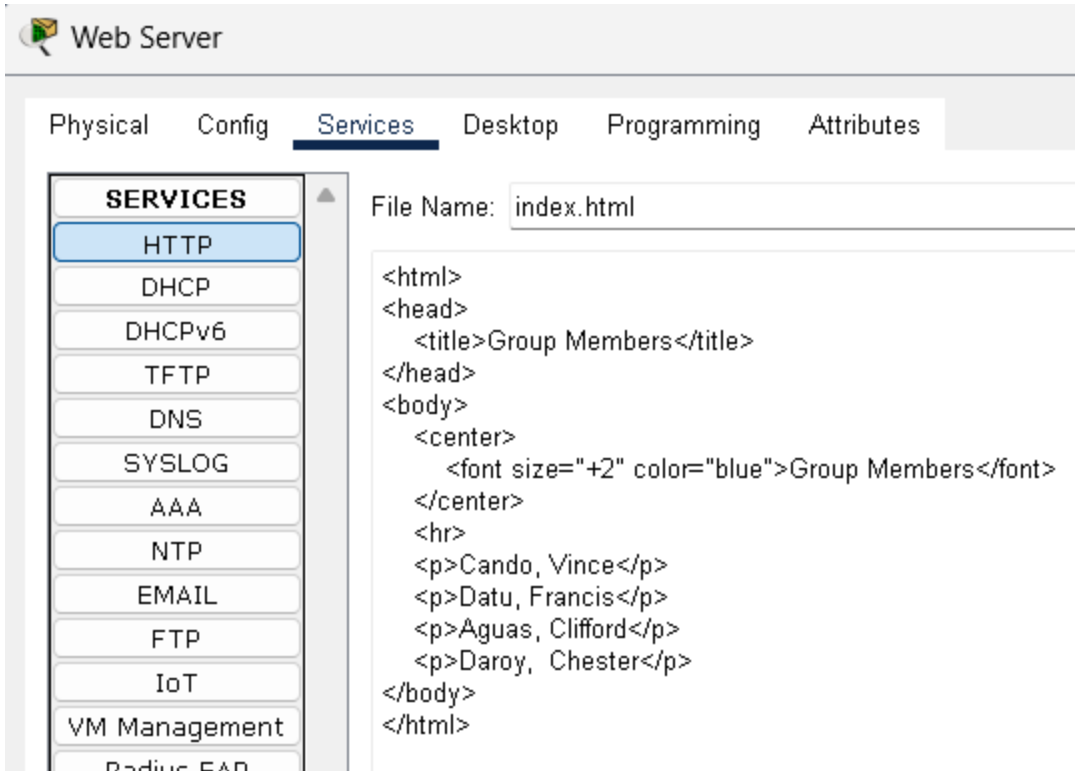
Domain Name: dhvsu.com

User Setup

User vince

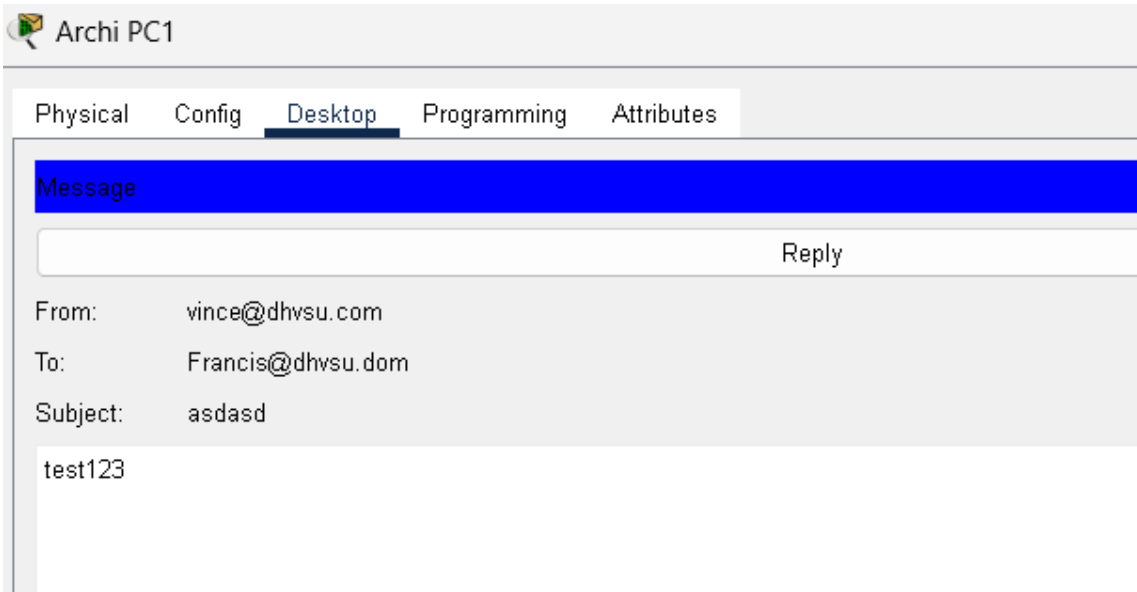
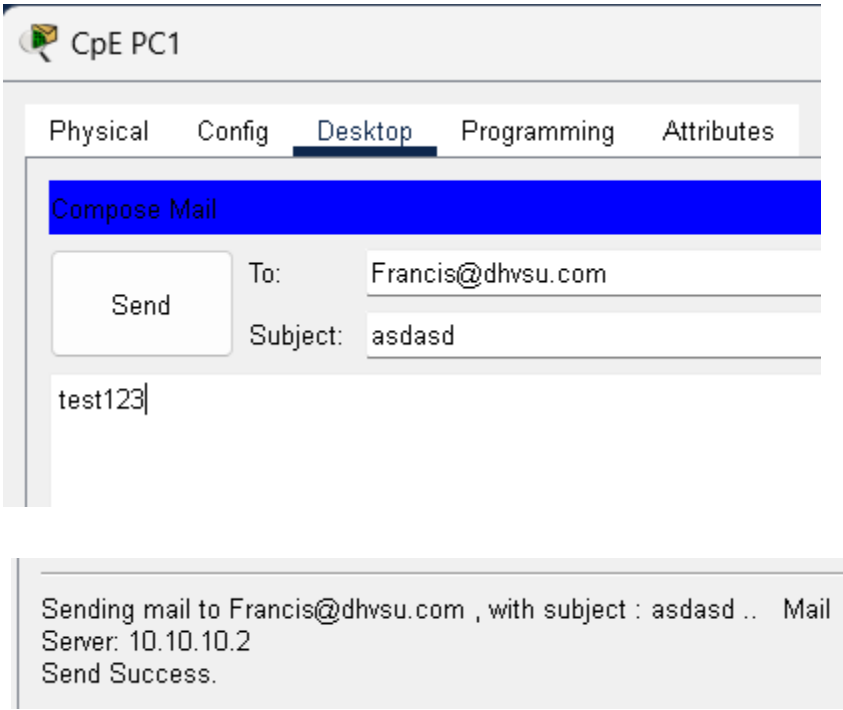
Password 123

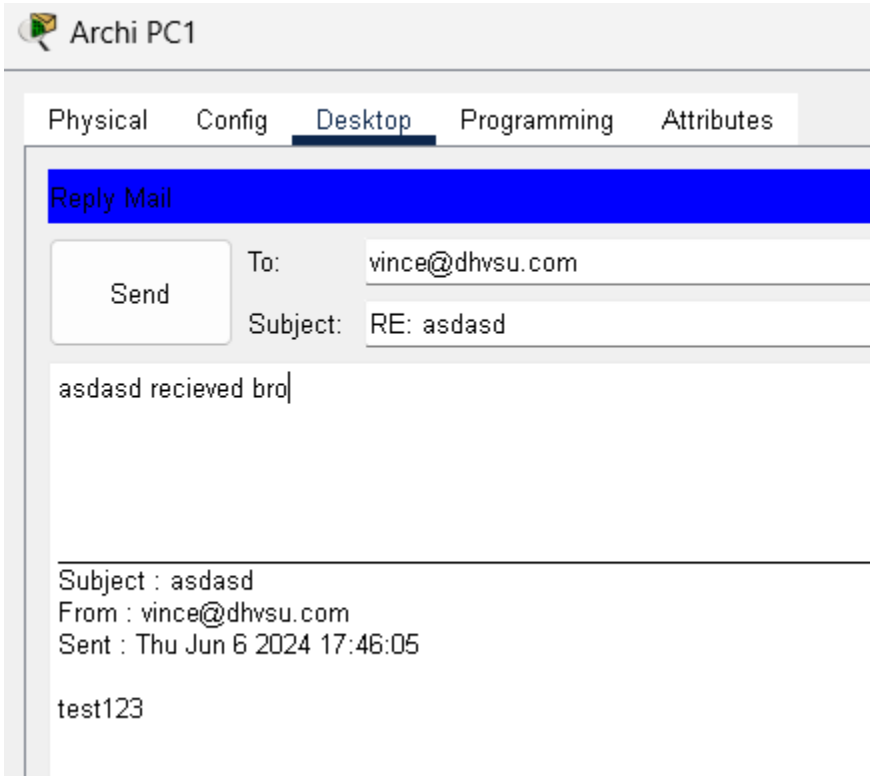
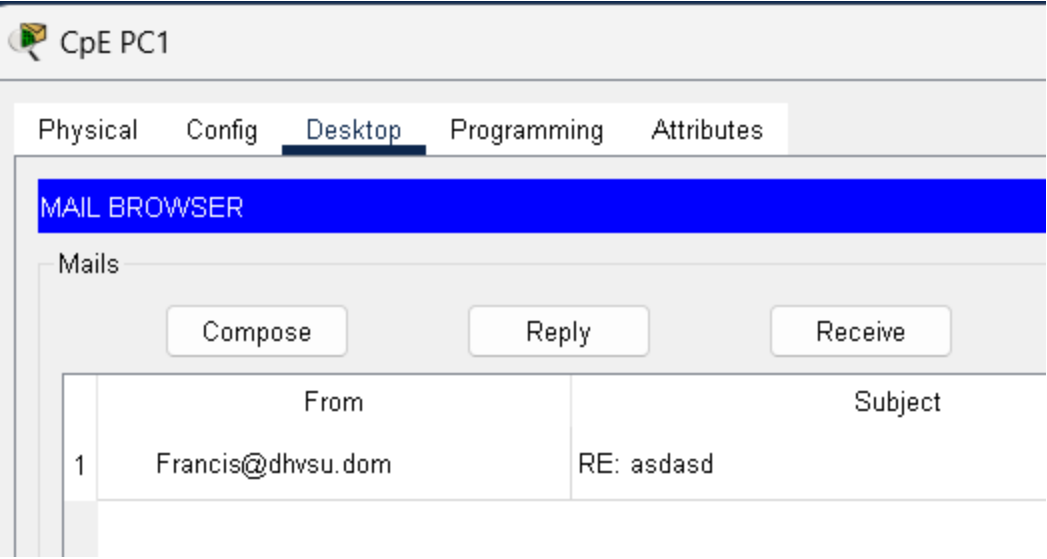
Creating Email Accounts



Editing the index of the web to display the group members.

E. Results





F. References

Krupal. (n.d.). University-Campus-Network GitHub.

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