

**TỔNG LIÊN ĐOÀN LAO ĐỘNG VIỆT NAM**  
**TRƯỜNG ĐẠI HỌC TÔN ĐỨC THẮNG**  
**KHOA CÔNG NGHỆ THÔNG TIN**



**ĐỒ ÁN MÔN**  
**GIAO THỨC MẠNG MÁY TÍNH**

*Người hướng dẫn:* **TS TRƯƠNG ĐÌNH TÚ**

*Người thực hiện:* **NGUYỄN HUY HƯNG – 52100416**

**ĐẶNG MINH PHONG – 52100987**

**Lớp : 21050401**

**Khoá : K25**

**THÀNH PHỐ HỒ CHÍ MINH, NĂM 2023**

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## LỜI CẢM ƠN

Nhóm em xin gửi lời cảm ơn đến quý thầy, cô trong khoa Công nghệ thông tin đã tạo điều kiện để nhóm có cơ hội được tìm hiểu, áp dụng thực tế những kiến thức đã học vào báo cáo. Từ đây trau dồi, thấu hiểu sâu và học hỏi thêm nhiều các kiến thức mới có tính liên hệ với nội dung của bài. Nhóm cũng xin gửi lời chân thành gửi đến thầy Trương Đình Tú về những kiến thức, kinh nghiệm mà thầy đã chia sẻ, gợi ý và gợi mở cho sinh viên những nguồn tài liệu có thể tham khảo và trải nghiệm rõ hơn về các quá trình mà những nội dung môn học hoạt động như thế nào. Nhóm em xin chúc thầy có một sức khỏe dồi dào, tràn đầy năng lượng tích cực, niềm hạnh phúc để tiếp tục sự nghiệp giảng đường đào tạo ra thêm những thế hệ sinh viên tài giỏi trong tương lai.

## **ĐỒ ÁN ĐƯỢC HOÀN THÀNH TẠI TRƯỜNG ĐẠI HỌC TÔN ĐỨC THẮNG**

Tôi xin cam đoan đây là sản phẩm đồ án của chúng tôi và được sự hướng dẫn của TS Trương Đình Tú;. Các nội dung nghiên cứu, kết quả trong đề tài này là trung thực và chưa công bố dưới bất kỳ hình thức nào trước đây. Những số liệu trong các bảng biểu phục vụ cho việc phân tích, nhận xét, đánh giá được chính tác giả thu thập từ các nguồn khác nhau có ghi rõ trong phần tài liệu tham khảo.

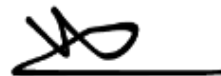
Ngoài ra, trong đồ án còn sử dụng một số nhận xét, đánh giá cũng như số liệu của các tác giả khác, cơ quan tổ chức khác đều có trích dẫn và chú thích nguồn gốc.

**Nếu phát hiện có bất kỳ sự gian lận nào tôi xin hoàn toàn chịu trách nhiệm về nội dung đồ án của mình.** Trường đại học Tôn Đức Thắng không liên quan đến những vi phạm tác quyền, bản quyền do tôi gây ra trong quá trình thực hiện (nếu có).

*TP. Hồ Chí Minh, ngày tháng năm*

*Tác giả*

*(ký tên và ghi rõ họ tên)*



*Nguyễn Huy Hưng*



*Đặng Minh Phong*

## **PHẦN XÁC NHẬN VÀ ĐÁNH GIÁ CỦA GIẢNG VIÊN**

**Phần xác nhận của GV hướng dẫn**

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Tp. Hồ Chí Minh, ngày      tháng      năm  
(kí và ghi họ tên)

**Phần đánh giá của GV chấm bài**

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Tp. Hồ Chí Minh, ngày      tháng      năm  
(kí và ghi họ tên)

## TÓM TẮT

Đồ án về việc xây dựng và triển khai hệ thống mạng cho ĐH Kinh tế gồm 3 chi nhánh ở TP. Hồ Chí Minh, cụ thể là cơ sở A, cơ sở B và cơ sở C. Mỗi cơ sở sẽ được xây dựng hệ thống mạng trên khu vực thứ nhất (A1, B1, C1). Tào nhà Server chính của trường sẽ được đặt tại cơ sở A.

Trong quá trình thực hiện đồ án thì sẽ áp dụng các công nghệ như: OSPF, SSH, DHCP, STP, HSRP, ...

## MỤC LỤC

CHƯƠNG 1 – GIỚI THIỆU VÀ KHẢO SÁT .....	3
1.1 Giới thiệu đề tài.....	3
1.2 Mô tả đề tài.....	3
CHƯƠNG 2 – MÔ HÌNH HỆ THỐNG.....	4
2.1 Sơ đồ luận lý (Logical Topology) .....	4
2.2 Sơ đồ vật lý (Physical Topology).....	4
CHƯƠNG 3 – THÔNG TIN CÀI ĐẶT CẤU HÌNH HỆ THỐNG.....	6
3.1 Thông tin kết nối port trong hệ thống .....	6
3.1.1 Chi nhánh 1 - Cơ sở A .....	6
3.1.2 Chi nhánh 2 - Cơ sở B.....	7
3.1.3 Chi nhánh 3 – Cơ sở C .....	8
3.2 Thông tin vlan, interface vlan trong hệ thống .....	9
3.3 Thông tin thiết kế quy hoạch địa chỉ IP (IP planning) .....	9
CHƯƠNG 4 – CẤU HÌNH HẠ TẦNG .....	10
4.1 Cấu hình vlan, interface, port channel .....	10
4.1.1 CHI NHÁNH A .....	10
4.1.2 CHI NHÁNH B.....	14
4.1.3 CHI NHÁNH C.....	18
4.1.4 Cấu hình CORE Router.....	24
4.2 Cấu hình Server.....	26
4.2.1 DHCP Server.....	26
4.2.2 DNS Server .....	32
4.2.3 Web server và dịch vụ web .....	34
4.2.4 FTP Server .....	37

4.2.5 Mail Server.....	44
4.3 Cấu hình định tuyến OSPF.....	49
4.4 Cấu hình STP và HSRP.....	66
4.5 Cấu hình DHCP Snooping .....	68
4.6 Cấu hình SSH.....	71



# CHƯƠNG 1 – GIỚI THIỆU VÀ KHẢO SÁT

## 1.1 Giới thiệu đề tài

Nội dung bài đồ án cuối kì môn Giao thức mạng máy tính của nhóm chúng em sẽ trình bày về việc triển khai hệ thống mạng máy tính cho 3 chi nhánh ở TPHCM của trường ĐH Kinh tế.

## 1.2 Mô tả đề tài

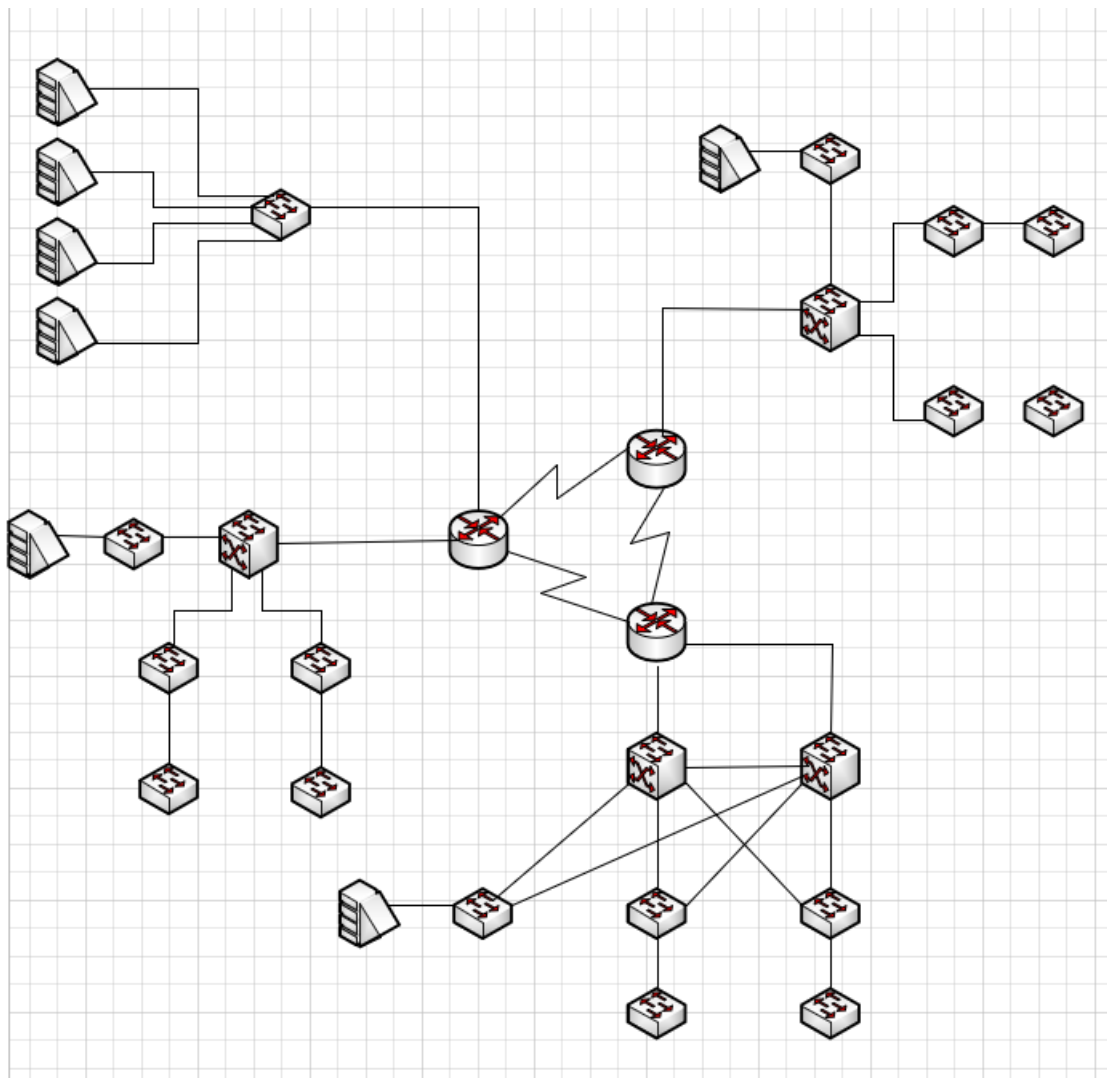
Đề tài triển khai sơ đồ mạng cho các cơ sở trường ĐH Kinh tế với 3 cơ sở:

- Cơ sở A: 59C Nguyễn Đình Chiểu, phường 6, quận 3, TPHCM
- Cơ sở B: 279 Nguyễn Tri Phương, phường 5, quận 10, TPHCM
- Cơ sở C: 91 đường 3 tháng 2, phường 11, quận 10, TPHCM

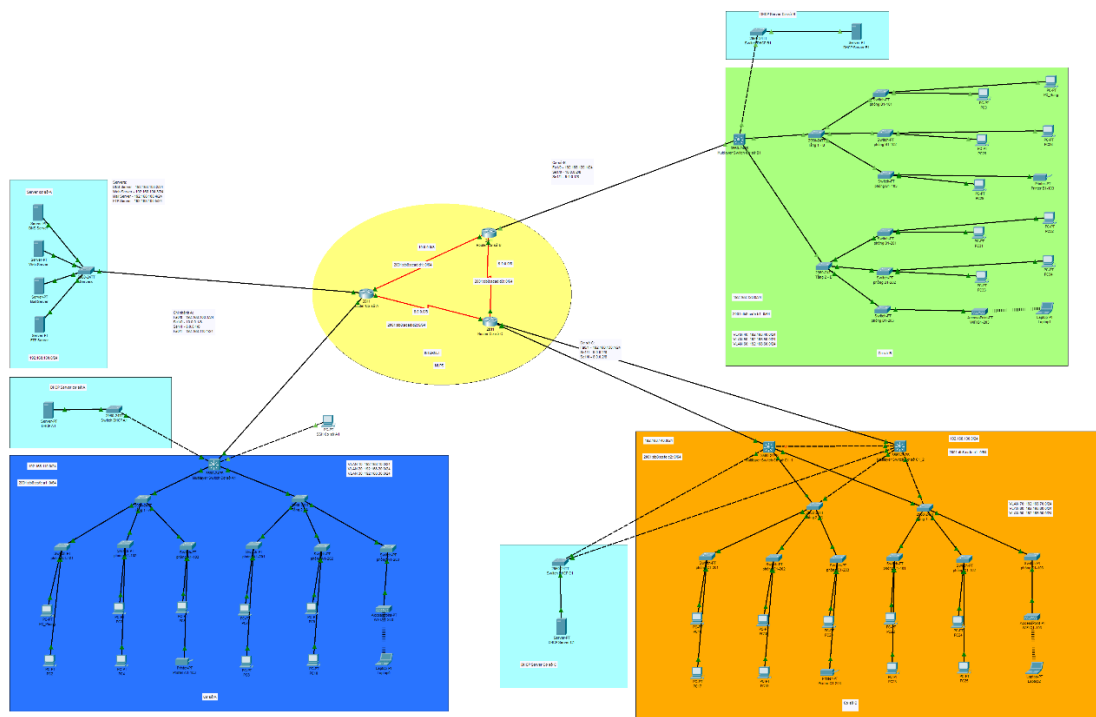
Các thao tác tiến hành trong đề tài: cấu hình VLAN, cấu hình trunk, sử dụng một vài giao thức STP, SSH, DHCP snooping, ... Ngoài ra có cấu hình DHCP IPv4, IPv6 cho các thiết bị đầu cuối (end device) cũng như các thiết bị định tuyến (router), thiết bị chuyển mạch (switch)

## CHƯƠNG 2 – MÔ HÌNH HỆ THỐNG

### 2.1 Sơ đồ luận lý (Logical Topology)



### 2.2 Sơ đồ vật lý (Physical Topology)



Các thiết bị sử dụng trong sơ đồ:

- Máy tính, laptop, máy in: 35 thiết bị
- WiFi (access point): 3 thiết bị
- Switch: 28 thiết bị
- Multilayer Switch: 4 thiết bị
- Router: 3 thiết bị tương ứng cho 3 cơ sở
- Server: 7 thiết bị gồm
  - DHCP Server: 3 thiết bị
  - DNS Server: 1 thiết bị
  - Web Server: 1 thiết bị
  - Mail Server: 1 thiết bị
  - FTP Server: 1 thiết bị

## CHƯƠNG 3 – THÔNG TIN CÀI ĐẶT CẤU HÌNH HỆ THỐNG

### 3.1 Thông tin kết nối port trong hệ thống

#### 3.1.1 Chi nhánh 1 - Cơ sở A

No	Source Device	Destination Device	Source Interface	Destination Interface	Protocol	Trunking/VLAN
Tầng 1 - A	Multilayer Switch	Tầng 1 - A	Fa0/3	Fa0/4	Ethernet	Trunking
	Tầng 1 - A	phòng A1-101	Fa0/1	Fa0/1		
	Tầng 1 - A	phòng A1-102	Fa0/2	Fa0/1		
	Tầng 1 - A	phòng A1-103	Fa0/3	Fa0/1		
Tầng 2 - A	Multilayer Switch	Tầng 2 - A	Fa0/4	Fa0/4	Ethernet	Trunking
	Tầng 2 - A	phòng A1-201	Fa0/1	Fa0/1		
	Tầng 2 - A	phòng A1-202	Fa0/2	Fa0/1		
	Tầng 2 - A	phòng A1-203	Fa0/3	Fa0/1		
DHCP Server cơ sở A	Multilayer Switch	Switch DHCP A1	Fa0/2	Fa0/2	Ethernet	Trunking

No	Source Device	Destination Device	Source Interface	Destination Interface	Protocol	Trunking/VLAN
Tầng 1 - A	phòng A1-101	PC_Phong	Fa2/1	Fa0	Ethernet	VLAN10
		PC2	Fa1/1	Fa0		
	phòng A1-102	PC3	Fa2/1	Fa0		VLAN20
		PC4	Fa1/1	Fa0		
	phòng A1-103	PC5	Fa2/1	Fa0		VLAN30
		Printer A1-103	Fa1/1	Fa0		
Tầng 2 - A	phòng A1-201	PC7	Fa1/1	Fa0	Ethernet	VLAN10
		PC8	Fa2/1	Fa0		
	phòng A1-202	PC9	Fa2/1	Fa0		VLAN20
		PC10	Fa1/1	Fa0		
	phòng A1-203	WIFI A1-203	Fa1/1	Port 0		VLAN30
		Laptop0			Wireless	
DHCP Server cơ sở A	Switch DHCP A1	Server DHCP A1	Fa0/1	Fa0	Ethernet	Trunking

No	Source Device	Destination Device	Source Interface	Destination Interface	Protocol	Trunking/VLAN
Server cơ sở A	Servers	DNS Server	Fa0/2	Fa0	Ethernet	Trunking
		Web Server	Fa0/3	Fa0		
		Mail Server	Fa0/4	Fa0		
		FTP Server	Fa0/5	Fa0		

### 3.1.2 Chi nhánh 2 - Cơ sở B

No	Source Device	Destination Device	Source Interface	Destination Interface	Protocol	Trunking/VLAN
Tầng 1 - B	Multilayer Switch	Tầng 1 - A	Fa0/3	Fa0/1	Ethernet	Trunking
	Tầng 1 - B	phòng B1-101	Fa0/2	Fa0/1		
	Tầng 1 - B	phòng B1-102	Fa0/3	Fa0/1		
	Tầng 1 - B	phòng B1-103	Fa0/4	Fa0/1		
Tầng 2 - B	Multilayer Switch	Tầng 2 - A	Fa0/4	Fa0/1	Ethernet	Trunking
	Tầng 2 - B	phòng B1-201	Fa0/2	Fa0/1		
	Tầng 2 - B	phòng B1-202	Fa0/3	Fa0/1		
	Tầng 2 - B	phòng B1-203	Fa0/4	Fa0/1		
DHCP Server cơ sở B	Multilayer Switch	Switch DHCP B1	Fa0/2	Fa0/1	Ethernet	Trunking
No	Source Device	Destination Device	Source Interface	Destination Interface	Protocol	Trunking/VLAN
Tầng 1 - B	phòng B1-101	PC_Hung	Fa2/1	Fa0	Ethernet	VLAN40
		PC0	Fa1/1	Fa0		
	phòng B1-102	PC26	Fa1/1	Fa0		VLAN50
		PC28	Fa2/1	Fa0		
	phòng B1-103	PC29	Fa1/1	Fa0		VLAN60
		Printer B1-103	Fa2/1	Fa0		
Tầng 2 - B	phòng B1-201	PC31	Fa1/1	Fa0	Ethernet	VLAN40
		PC32	Fa2/1	Fa0		
	phòng B1-202	PC33	Fa1/1	Fa0		VLAN50
		PC34	Fa2/1	Fa0		
	phòng B1-203	WIFI B1-203	Fa1/1	Port 0	Wireless	VLAN60
		Laptop0				
DHCP Server cơ sở B	Switch DHCP B1	Server DHCP B1	Fa0/2	Fa0	Ethernet	Trunking

### 3.1.3 Chi nhánh 3 – Cơ sở C

No	Source Device	Destination Device	Source Interface	Destination Interface	Protocol	Trunking/VLAN
Tầng 1 - C	Multilayer Switch	Tầng 1 - C	Fa0/3	Fa0/1	Ethernet	Trunking
	Multilayer Switch		Fa0/2	Fa0/5		
	Tầng 1 - C	phòng C1-101	Fa0/2	Fa0/1		
	Tầng 1 - C	phòng C1-102	Fa0/3	Fa0/1		
	Tầng 1 - C	phòng C1-103	Fa0/4	Fa0/1		
Tầng 2 - C	Multilayer Switch	Tầng 2 - C	Fa0/4	Fa0/1	Ethernet	Trunking
	Multilayer Switch		Fa0/3	Fa0/5		
	Tầng 2 - C	phòng C1-201	Fa0/2	Fa0/1		
	Tầng 2 - C	phòng C1-202	Fa0/3	Fa0/1		
	Tầng 2 - C	phòng C1-203	Fa0/4	Fa0/1		
DHCP Server cơ sở C	Multilayer Switch	Switch DHCP C1	Fa0/2	Fa0/1	Ethernet	Trunking
	Multilayer Switch		Fa0/4	Fa0/3		
No	Source Device	Destination Device	Source Interface	Destination Interface	Protocol	Trunking/VLAN
Tầng 1 - C	phòng C1-101	PC22	Fa1/1	Fa0	Ethernet	VLAN70
		PC23	Fa2/1	Fa0		
	phòng C1-102	PC24	Fa1/1	Fa0		VLAN80
		PC25	Fa2/1	Fa0		
	phòng C1-103	WIFI C1-103	Fa1/1	Port 0	Wireless	VLAN90
	Laptop2					
Tầng 2 - C	phòng C1-201	PC16	Fa1/1	Fa0	Ethernet	VLAN70
		PC17	Fa2/1	Fa0		
	phòng C1-202	PC18	Fa1/1	Fa0		VLAN80
		PC19	Fa2/1	Fa0		
	phòng C1-203	PC20	Fa1/1	Fa0		VLAN90
		Printer C1-203	Fa2/1	Fa0		
DHCP Server cơ sở C	Switch DHCP C1	Server DHCP C1	Fa0/2	Fa0	Ethernet	Trunking

### 3.2 Thông tin vlan, interface vlan trong hệ thống

No.	VLAN name	VLAN ID	VLAN description		
Remote Site				Subnet	Default Gateway
1	VLAN10	10	Cơ sở A	192.168.10.0/24	192.168.10.1
2	VLAN20	20		192.168.20.0/24	192.168.20.1
3	VLAN30	30		192.168.30.0/24	192.168.30.1
4	VLAN40	40	Cơ sở B	192.168.40.0/24	192.168.40.1
5	VLAN50	50		192.168.50.0/24	192.168.50.1
6	VLAN60	60		192.168.60.0/24	192.168.60.1
7	VLAN70	70	Cơ sở C	192.168.70.0/24	192.168.70.1
8	VLAN80	80		192.168.80.0/24	192.168.80.1
9	VLAN90	90		192.168.90.0/24	192.168.90.1
HeadOffice Site				Subnet	Default Gateway
1	Server	100	Server đặt tại Cơ sở A	192.168.100.0/24	192.168.100.1

### 3.3 Thông tin thiết kế quy hoạch địa chỉ IP (IP planning)

No	Device	VLAN	IP Address	Subnet	Gateway
Server					
1	DNS Server	100	192.168.100.2	255.255.255.0	192.168.100.1
			2001:1111:2222:3333::		
2	Web Server	100	192.168.100.3	255.255.255.0	192.168.100.1
3	Mail Server	100	192.168.100.4	255.255.255.0	192.168.100.1
4	FTP Server	100	192.168.100.5	255.255.255.0	192.168.100.1
5	DHCP Server A1	1	192.168.1.2	255.255.255.0	192.168.1.1
6	DHCP Server B1	2	192.168.3.2	255.255.255.0	192.168.2.1
7	DHCP Server C1	3	192.168.3.5	255.255.255.0	192.168.3.3
Switch					
8	Multilayer Switch Cơ sở A1	110	192.168.110.2	255.255.255.0	192.168.110.1
			2001:DB8:CAFE:A1::0		
9	Multilayer Switch Cơ sở B1	120	192.168.120.2	255.255.255.0	192.168.120.1
			2001:DB8:CAFE:B1::0		
10	Multilayer Switch Cơ sở C1_1	130	192.168.130.2	255.255.255.0	192.168.130.1
			2001:DB8:CAFE:C1::0		
11	Multilayer Switch Cơ sở C1_2	140	192.168.140.2	255.255.255.0	192.168.140.1
			2001:DB8:CAFE:C2::0		
Access Point					
12	WIFI A1-203	30	DHCP	255.255.255.0	192.168.30.1
13	WIFI B1-203	40	DHCP	255.255.255.0	192.168.40.1
14	WIFI C1-103	90	DHCP	255.255.255.0	192.168.90.1

## CHƯƠNG 4 – CẤU HÌNH HẠ TẦNG

### 4.1 Cấu hình vlan, interface, port channel

#### 4.1.1 CHI NHÁNH A

Có 3 VLAN là 10, 20, 30

- Multislayer Switch Cơ sở A:

```

conf ter
vlan10
namev10
vlan20
namev20
vlan30
namev30
vlan999
namev999
ipv6 unicast-routing
interface vlan10
ip address 192.168.10.1 255.255.255.0
ip helper-address 192.168.1.2
ipv6 enable
ipv6 address 2001:DB8:CAFE:A1::1/64
interface Vlan20
ipaddress192.168.20.1 255.255.255.0
ip helper-address 192.168.1.2
ipv6 enable
ipv6 address 2001:DB8:CAFE:A2::1/64
interface Vlan30
ip address192.168.30.1 255.255.255.0

```



```

ip helper-address 192.168.1.2
ipv6 enable
ipv6 address 2001:DB8:CAFE:A3::1/64
interface Vlan999
ip address 192.168.1.1 255.255.255.0
interface FastEthernet0/1
no switchport
ip address 192.168.110.2 255.255.255.0
ipv6 address 2001:DB8:CAFE:A1::2/64
interface FastEthernet0/2
switchport trunk encapsulation dot1q
switchport mode trunk
interface FastEthernet0/3
switchport trunk encapsulation dot1q
switchport mode trunk
interface FastEthernet0/4
switchport trunk encapsulation dot1q
switchport mode trunk
ip routing

```

- Tầng 1 – A / Tầng 2 - A

```

configure terminal
vlan 10
name v10
vlan 20
name v20
vlan 30

```

```
name v30
vlan 999
name v999
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet0/2
switchport mode trunk
interface FastEthernet0/3
switchport mode trunk
interface FastEthernet0/4
switchport mode trunk
```

- phòng A1-101 / phòng A1-201

```
configure terminal
vlan 10
name v10
vlan 20
name v20
vlan 30
name v30
vlan 999
name v999
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet0/2
switchport mode access
switchport access vlan 10
```

```
interface FastEthernet0/3
switchport mode access
switchport access vlan 10
```

- phòng A1-102 / phòng A1-202

```
configure terminal
vlan 10
name v10
vlan 20
name v20
vlan 30
name v30
vlan 999
name v999
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet1/1
switchport mode access
switchport access vlan 20
interface FastEthernet2/1
switchport mode access
switchport access vlan 20
```

- phòng A1-103 / phòng A1-203

```
name v30
vlan 999
name v999
```

```

interface FastEthernet0/1
switchport mode trunk
interface FastEthernet1/1
switchport mode access
switchport access vlan 30
interface FastEthernet2/1
switchport mode access
switchport access vlan 30

```

#### **4.1.2 CHI NHÁNH B**

Có 3 VLAN là 40, 50, 60

- Multilayer Switch Cơ sở B:

```

configure terminal
vlan 40
name v40
vlan 50
name v50
vlan 60
name v60
vlan 999
name v999
ipv6 unicast-routing
interface Vlan40
ip address 192.168.40.1 255.255.255.0
ip helper-address 192.168.2.2
ipv6 enable
ipv6 address 2001:DB8:CAFE:A40::1/64

```

```
interface Vlan50
ip address 192.168.50.1 255.255.255.0
ip helper-address 192.168.2.2
ipv6 enable
ipv6 address 2001:DB8:CAFE:A50::1/64
interface Vlan60
ip address 192.168.60.1 255.255.255.0
ip helper-address 192.168.2.2
ipv6 enable
ipv6 address 2001:DB8:CAFE:A60::1/64
interface Vlan999
ip address 192.168.2.1 255.255.255.0
interface FastEthernet0/1
no switchport
ip address 192.168.120.2 255.255.255.0
ipv6 address 2001:DB8:CAFE:B1::2/64
interface FastEthernet0/2
switchport trunk encapsulation dot1q
switchport mode trunk
interface FastEthernet0/3
switchport trunk encapsulation dot1q
switchport mode trunk
interface FastEthernet0/4
switchport trunk encapsulation dot1q
switchport mode trunk
ip routing
```

- Tầng 1 – B / Tầng 2 – B

configure terminal

vlan 40

name v40

vlan 50

name v50

vlan 60

name v60

vlan 999

name v999

interface FastEthernet0/1

switchport mode trunk

interface FastEthernet0/2

switchport mode trunk

interface FastEthernet0/3

switchport mode trunk

interface FastEthernet0/4

switchport mode trunk

- phòng B1-101 / phòng B1-201

configure terminal

vlan 40

name v40

vlan 50

name v50

vlan 60

name v60

```
vlan 999
name v999
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet1/1
switchport mode access
switchport access vlan 40
interface FastEthernet2/1
switchport mode access
switchport access vlan 40
```

- phòng B1-102 / phòng B1-202

```
configure terminal
vlan 40
name v40
vlan 50
name v50
vlan 60
name v60
vlan 999
name v999
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet1/1
switchport mode access
switchport access vlan 50
interface FastEthernet2/1
```

```
switchport mode access
switchport access vlan 50
```

- phòng B1-103 / phòng B1-203

```
configure terminal
vlan 40
name v40
vlan 50
name v50
vlan 60
name v60
vlan 999
name v999
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet1/1
switchport mode access
switchport access vlan 60
interface FastEthernet2/1
switchport mode access
switchport access vlan 60
```

### **4.1.3 CHI NHÁNH C**

Có 3 vlan 70, 80, 90

- Multilayer Switch Cơ sở C1\_1

```
configure terminal
vlan 70
```



```
name v70
vlan 80
name v80
vlan 90
name v90
vlan 999
name v999
ipv6 unicast-routing
interface Vlan70
ip address 192.168.70.1 255.255.255.0
ip helper-address 192.168.3.5
ipv6 enable
ipv6 address 2001:DB8:CAFE:A70::1/64
interface Vlan80
ip address 192.168.80.1 255.255.255.0
ip helper-address 192.168.3.5
ipv6 enable
ipv6 address 2001:DB8:CAFE:A80::1/64
interface Vlan90
ip address 192.168.90.1 255.255.255.0
ip helper-address 192.168.3.5
ipv6 enable
ipv6 address 2001:DB8:CAFE:A90::1/64
interface Vlan999
ip address 192.168.3.1 255.255.255.0
interface FastEthernet0/1
no switchport
```

```
ip address 192.168.130.2 255.255.255.0
ipv6 enable
ipv6 address 2001:DB8:CAFE:C1::2/64
interface FastEthernet0/2
switchport trunk encapsulation dot1q
switchport mode trunk
interface FastEthernet0/3
switchport trunk encapsulation dot1q
switchport mode trunk
interface FastEthernet0/4
switchport trunk encapsulation dot1q
switchport mode trunk
ip routing
```

- Multilayer Switch Cơ sở C1\_2

```
configure terminal
vlan 70
name v70
vlan 80
name v80
vlan 90
name v90
vlan 999
name v999
ipv6 unicast-routing
interface Vlan70
ip address 192.168.70.1 255.255.255.0
```

```
ip helper-address 192.168.3.5
ipv6 enable
ipv6 address 2001:DB8:CAFE:A70::1/64
interface Vlan80
ip address 192.168.80.1 255.255.255.0
ip helper-address 192.168.3.5
ipv6 enable
ipv6 address 2001:DB8:CAFE:A80::1/64
interface Vlan90
ip address 192.168.90.1 255.255.255.0
ip helper-address 192.168.3.5
ipv6 enable
ipv6 address 2001:DB8:CAFE:A90::1/64
interface Vlan999
ip address 192.168.3.2 255.255.255.0
interface FastEthernet0/1
no switchport
ip address 192.168.140.2 255.255.255.0
ipv6 address 2001:DB8:CAFE:C2::2/64
interface FastEthernet0/2
switchport trunk encapsulation dot1q
switchport mode trunk
interface FastEthernet0/3
switchport trunk encapsulation dot1q
switchport mode trunk
interface FastEthernet0/4
switchport trunk encapsulation dot1q
```

```
switchport mode trunk
```

```
ip routing
```

- Tầng 1 – C / Tầng 2 – C

```
configure terminal
```

```
vlan 70
```

```
name v70
```

```
vlan 80
```

```
name v80
```

```
vlan 90
```

```
name v90
```

```
vlan 999
```

```
name v999
```

```
interface FastEthernet0/1
```

```
switchport mode trunk
```

```
interface FastEthernet0/2
```

```
switchport mode trunk
```

```
interface FastEthernet0/3
```

```
switchport mode trunk
```

```
interface FastEthernet0/4
```

```
switchport mode trunk
```

- phòng C1-101 / phòng C1-201

```
configure terminal
```

```
vlan 70
```

```
name v70
```

```
vlan 80
```

```
name v80
vlan 90
name v90
vlan 999
name v999
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet1/1
switchport mode access
switchport access vlan 70
interface FastEthernet2/1
switchport mode access
switchport access vlan 70
```

- phòng C1-102 / phòng C1-202

```
configure terminal
vlan 70
name v70
vlan 80
name v80
vlan 90
name v90
vlan 999
name v999
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet1/1
```

```

switchport mode access
switchport access vlan 80
interface FastEthernet2/1
switchport mode access
switchport access vlan 80

```

- phòng C1-103 / phòng C1-203

```

configure terminal
vlan 70
name v70
vlan 80
name v80
vlan 90
name v90
vlan 999
name v999
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet1/1
switchport mode access
switchport access vlan 90
interface FastEthernet2/1
switchport mode access
switchport access vlan 90

```

#### **4.1.4 Cấu hình CORE Router**

- Router cơ sở A

```

ip unicast-routing
interface FastEthernet0/0
ip address 192.168.123.1 255.255.255.0
interface FastEthernet0/1
ip address 192.168.110.1 255.255.255.0
ipv6 address FE80::1 link-local
ipv6 address 2001:DB8:CAFE:A1::1/64
interface Serial1/0
ip address 10.0.0.1 255.0.0.0
ipv6 address 2001:DB8:ACAD:D1::1/64
interface Serial1/1
ip address 8.0.0.1 255.0.0.0
ipv6 address 2001:DB8:ACAD:D2::1/64

```

- **Router cơ sở B**

```

ip unicast-routing
interface FastEthernet0/1
ip address 192.168.120.1 255.255.255.0
ipv6 address FE80::1 link-local
ipv6 address 2001:DB8:CAFE:B1::1/64
interface Serial1/0
ip address 10.0.0.2 255.0.0.0
ipv6 address 2001:DB8:ACAD:D1::2/64
interface Serial1/1
ip address 9.0.0.1 255.0.0.0
ipv6 address 2001:DB8:ACAD:D3::1/64

```

## - Router cơ sở C

```

ip unicast-routing
interface FastEthernet0/0
ip address 192.168.140.1 255.255.255.0
ipv6 address FE80::1 link-local
ipv6 address 2001:DB8:CAFE:C2::1/64
interface FastEthernet0/1
ip address 192.168.130.1 255.255.255.0
ipv6 address FE80::1 link-local
ipv6 address 2001:DB8:CAFE:C1::1/64
interface Serial1/0
ip address 8.0.0.2 255.0.0.0
ipv6 address 2001:DB8:ACAD:D2::2/64
interface Serial1/1
ip address 9.0.0.2 255.0.0.0
ipv6 address 2001:DB8:ACAD:D3::2/64

```

## 4.2 Cấu hình Server

### 4.2.1 DHCP Server

#### - DHCP Server A1



DHCP A1

Physical Config Services Desktop Programming Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Global Settings

Display Name DHCP A1

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway 192.168.1.1

DNS Server 192.168.100.2

Gateway/DNS IPv6

☐ Automatic

☒ Static

Default Gateway

DNS Server

☐ Top

Physical Config **Services** Desktop Programming Attributes

**SERVICES**

- HTTP
- DHCP**
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

**DHCP**

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: serverPool

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

Start IP Address : 192 168 1 0

Subnet Mask: 255 255 255 0

Maximum Number of Users : 255

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
Vlan 30	192.168.30.1	192.168.100.2	192.168.30.10	255.255.255.0	246	0.0.0.0	0.0.0.0
Vlan 20	192.168.20.1	192.168.100.2	192.168.20.10	255.255.255.0	246	0.0.0.0	0.0.0.0
Vlan 10	192.168.10.1	192.168.100.2	192.168.10.10	255.255.255.0	246	0.0.0.0	0.0.0.0
serverPool	0.0.0.0	0.0.0.0	192.168.1.0	255.255.255.0	255	0.0.0.0	0.0.0.0

☐ Top

## - DHCP Server B1

DHCP Server B1

Physical Config Services Desktop Programming Attributes

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

FastEthernet0

Global Settings

Display Name DHCP Server B1

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway 192.168.2.1

DNS Server 192.168.100.2

Gateway/DNS IPv6

☐ Automatic

☒ Static

Default Gateway

DNS Server

☐ Top

Physical Config **Services** Desktop Programming Attributes

**SERVICES**

- HTTP
- DHCP**
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

**DHCP**

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: serverPool

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

Start IP Address : 192 168 2 0

Subnet Mask: 255 255 255 0

Maximum Number of Users : 255

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
vlan 40	192.168.40.1	192.168.100.2	192.168.40.10	255.255.255.0	246	0.0.0.0	0.0.0.0
vlan 50	192.168.50.1	192.168.100.2	192.168.50.10	255.255.255.0	246	0.0.0.0	0.0.0.0
vlan 60	192.168.60.1	192.168.100.2	192.168.60.10	255.255.255.0	246	0.0.0.0	0.0.0.0
serverPool	0.0.0.0	0.0.0.0	192.168.2.0	255.255.255.0	255	0.0.0.0	0.0.0.0

☐ Top

- DHCP Server C1

DHCP Server C1

Physical Config Services Desktop Programming Attributes

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

FastEthernet0

Global Settings

Display Name DHCP Server C1

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway 192.168.3.3

DNS Server 192.168.100.2

Gateway/DNS IPv6

☐ Automatic

☒ Static

Default Gateway

DNS Server

☐ Top

Physical Config **Services** Desktop Programming Attributes

**SERVICES**

- HTTP
- DHCP**
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

**DHCP**

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: serverPool

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

Start IP Address : 192 168 3 0

Subnet Mask: 255 255 255 0

Maximum Number of Users : 255

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

**Add** **Save** **Remove**

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
vlan 80	192.168.80.3	192.168.100.2	192.168.80.10	255.255.255.0	246	0.0.0.0	0.0.0.0
vlan 70	192.168.70.3	192.168.100.2	192.168.70.10	255.255.255.0	246	0.0.0.0	0.0.0.0
vlan 90	192.168.90.3	192.168.100.2	192.168.90.10	255.255.255.0	246	0.0.0.0	0.0.0.0
serverPool	0.0.0.0	0.0.0.0	192.168.3.0	255.255.255.0	255	0.0.0.0	0.0.0.0

☐ Top

## 4.2.2 DNS Server

The screenshot shows a window titled "DNS Server" with a blue header bar. Below the header is a tabbed interface with tabs labeled "Physical", "Config", "Services", "Desktop", "Programming", and "Attributes". The "Config" tab is selected and highlighted with a blue border. On the left side of the "Config" tab is a vertical sidebar with a tree view containing the following items: "GLOBAL" (bold), "Settings", "Algorithm Settings", "INTERFACE" (bold), and "FastEthernet0". The main area of the window displays the "Global Settings" for the selected interface. It is divided into two sections: "Gateway/DNS IPv4" and "Gateway/DNS IPv6". In the IPv4 section, the "Display Name" is "DNS Server". Under "Gateway/DNS IPv4", the "DHCP" radio button is unselected, and the "Static" radio button is selected. The "Default Gateway" is set to "192.168.100.1" and the "DNS Server" is set to "192.168.100.2". In the IPv6 section, the "Automatic" radio button is unselected, and the "Static" radio button is selected. The "Default Gateway" and "DNS Server" fields are empty. At the bottom left of the window, there is a "Top" button with a small square icon to its left.

DNS Server

Physical **Config** Services Desktop Programming Attributes

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

FastEthernet0

Global Settings

Display Name DNS Server

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway 192.168.100.1

DNS Server 192.168.100.2

Gateway/DNS IPv6

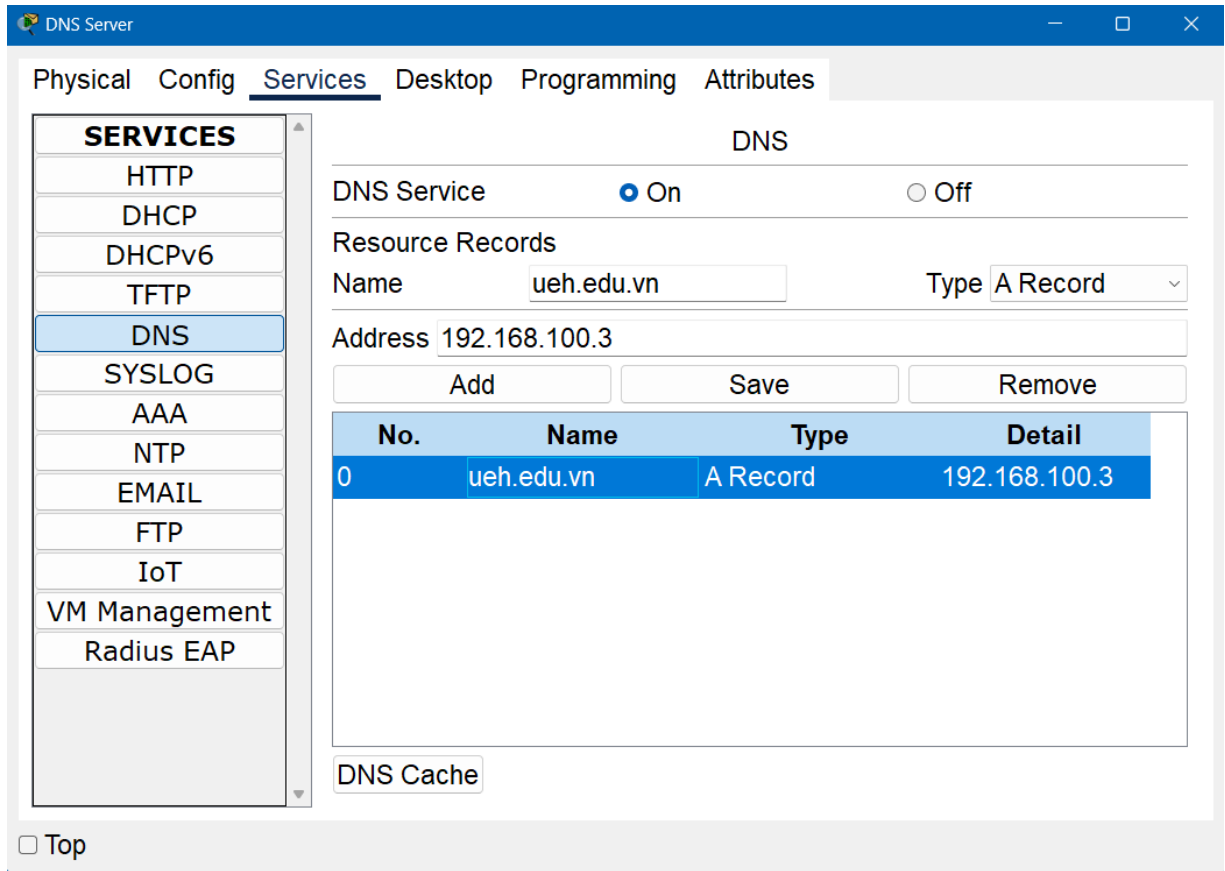
☐ Automatic

☒ Static

Default Gateway

DNS Server

Top



### 4.2.3 Web server và dịch vụ web



Web Server

Physical Config Services Desktop Programming Attributes

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

FastEthernet0

Global Settings

Display Name

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway

DNS Server

Gateway/DNS IPv6

☐ Automatic

☒ Static

Default Gateway

DNS Server

☐ Top

The screenshot shows a web browser window titled "Web Server" with a blue header bar. Below the header is a navigation menu with tabs: "Physical", "Config", "Services" (which is highlighted with a blue underline), "Desktop", "Programming", and "Attributes". The main content area is divided into two parts. On the left is a vertical list of services under the heading "SERVICES". The services listed are: HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, FTP, IoT, VM Management, and Radius EAP. On the right is a text editor area. At the top of this area is a label "File Name:" followed by the text "index.html". Below this is a large text box containing HTML code. At the bottom right of the text box are two buttons: "File Manager" and "Save". At the bottom left of the window is a link labeled "Top" with a small square icon to its left.

Web Server

Physical Config Services Desktop Programming Attributes

**SERVICES**

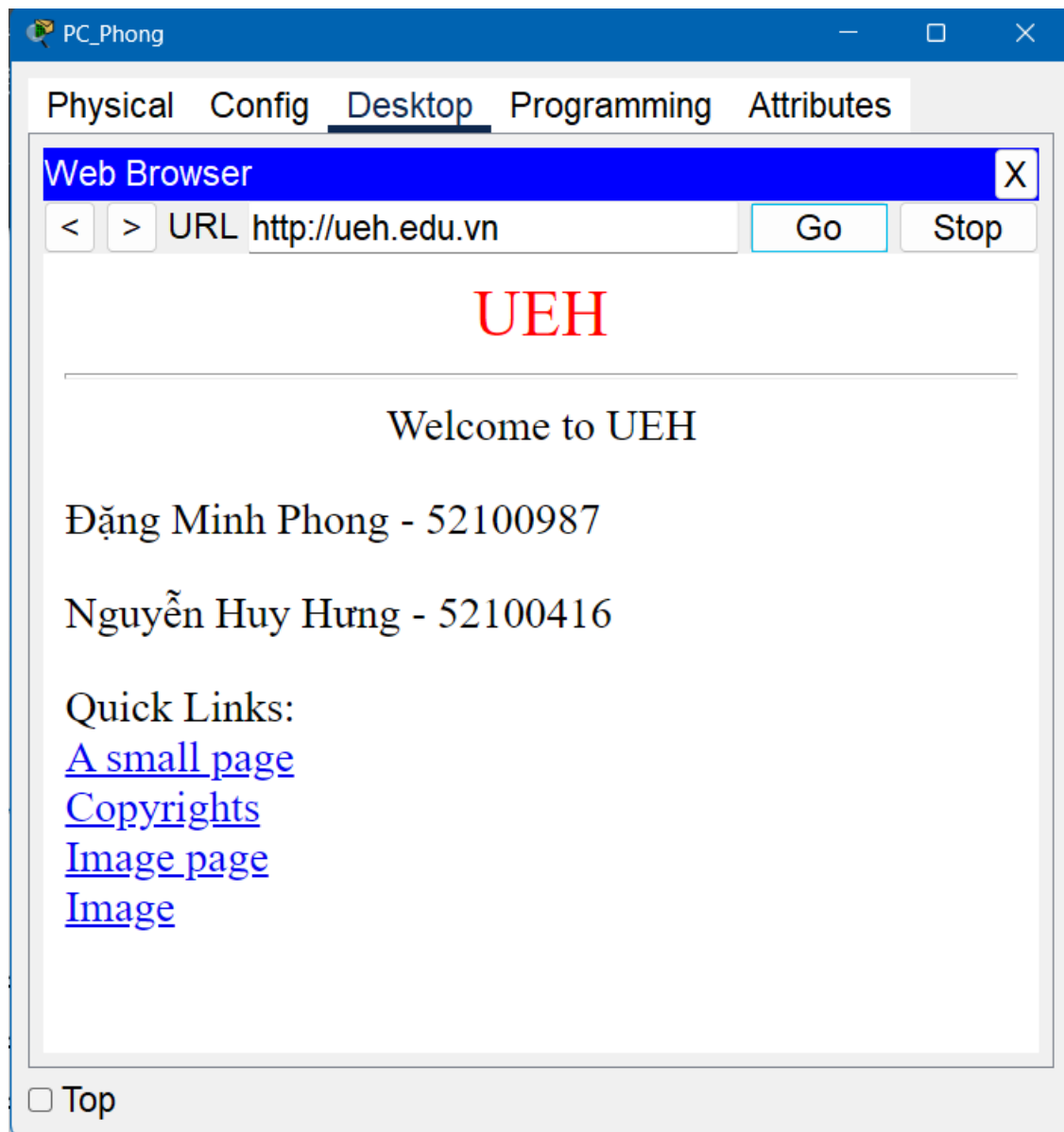
- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

File Name: index.html

```
<html>
<center><font size='+2' color='red'>UEH</font></center>
<center><hr>Welcome to UEH</center>
<p> Đặng Minh Phong - 52100987</p>
<p> Nguyễn Huy Hưng - 52100416</p>
<p>Quick Links:
<br><a href='helloworld.html'>A small page</a>
<br><a href='copyrights.html'>Copyrights</a>
<br><a href='image.html'>Image page</a>
<br><a href='cscoptlogo177x111.jpg'>Image</a>
</html>
```

File Manager Save

☐ Top



#### 4.2.4 FTP Server

FTP Server

Physical Config Services Desktop Programming Attributes

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

FastEthernet0

Global Settings

Display Name

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway

DNS Server

Gateway/DNS IPv6

☐ Automatic

☒ Static

Default Gateway

DNS Server

☐ Top

FTP Server

Physical

Config

Services

Desktop

Programming

Attributes

**SERVICES**

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

IoT

VM Management

Radius EAP

FTP

Service ☒ On ☐ Off

User Setup

Username  Password

☐ Write ☐ Read ☐ Delete ☐ Rename ☐ List

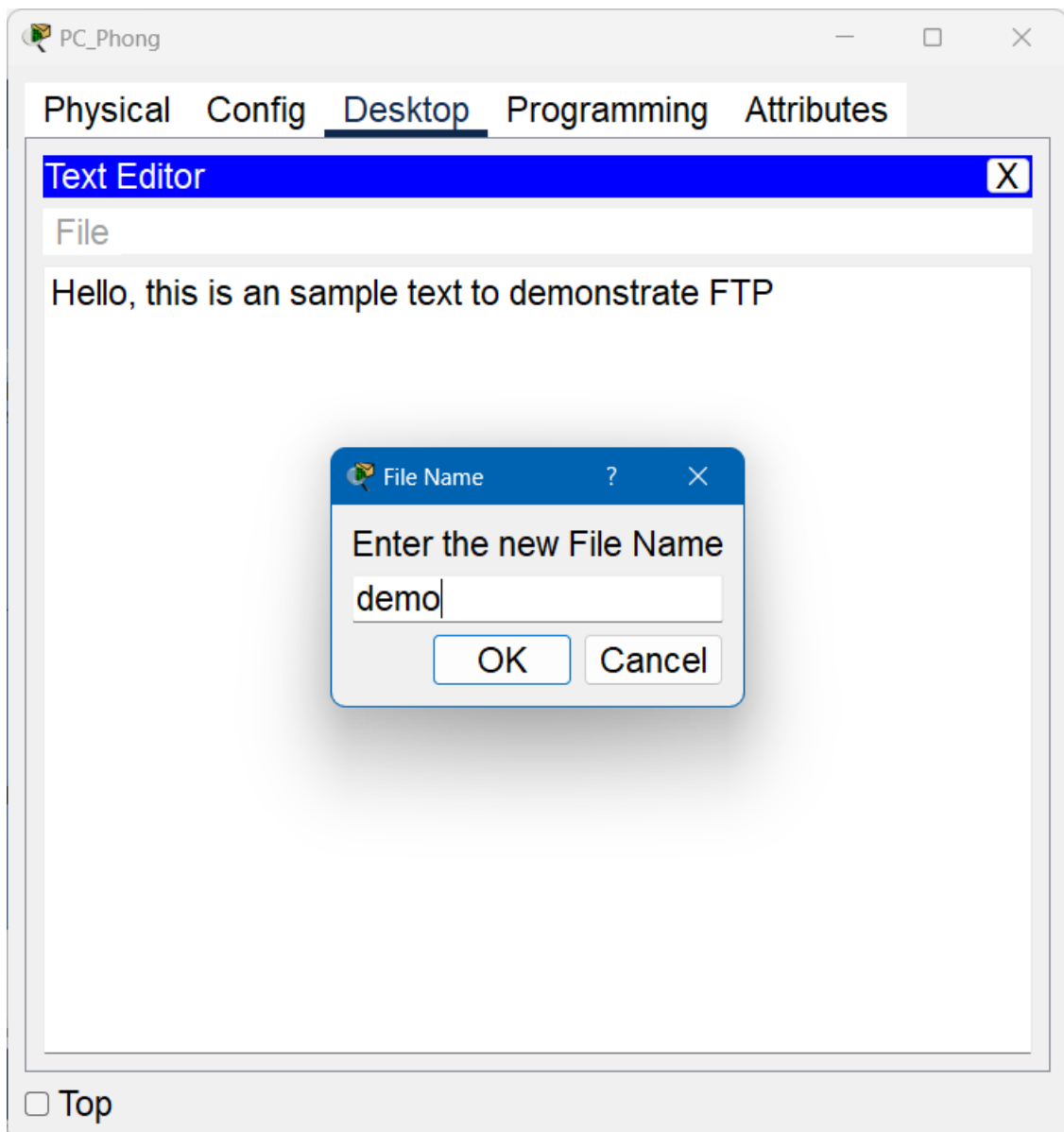
	Username	Password	Permission	
1	cisco	cisco	RWDNL	Add
2	hung	12345	RWDNL	Save
3	phong	12345	RWDNL	Remove

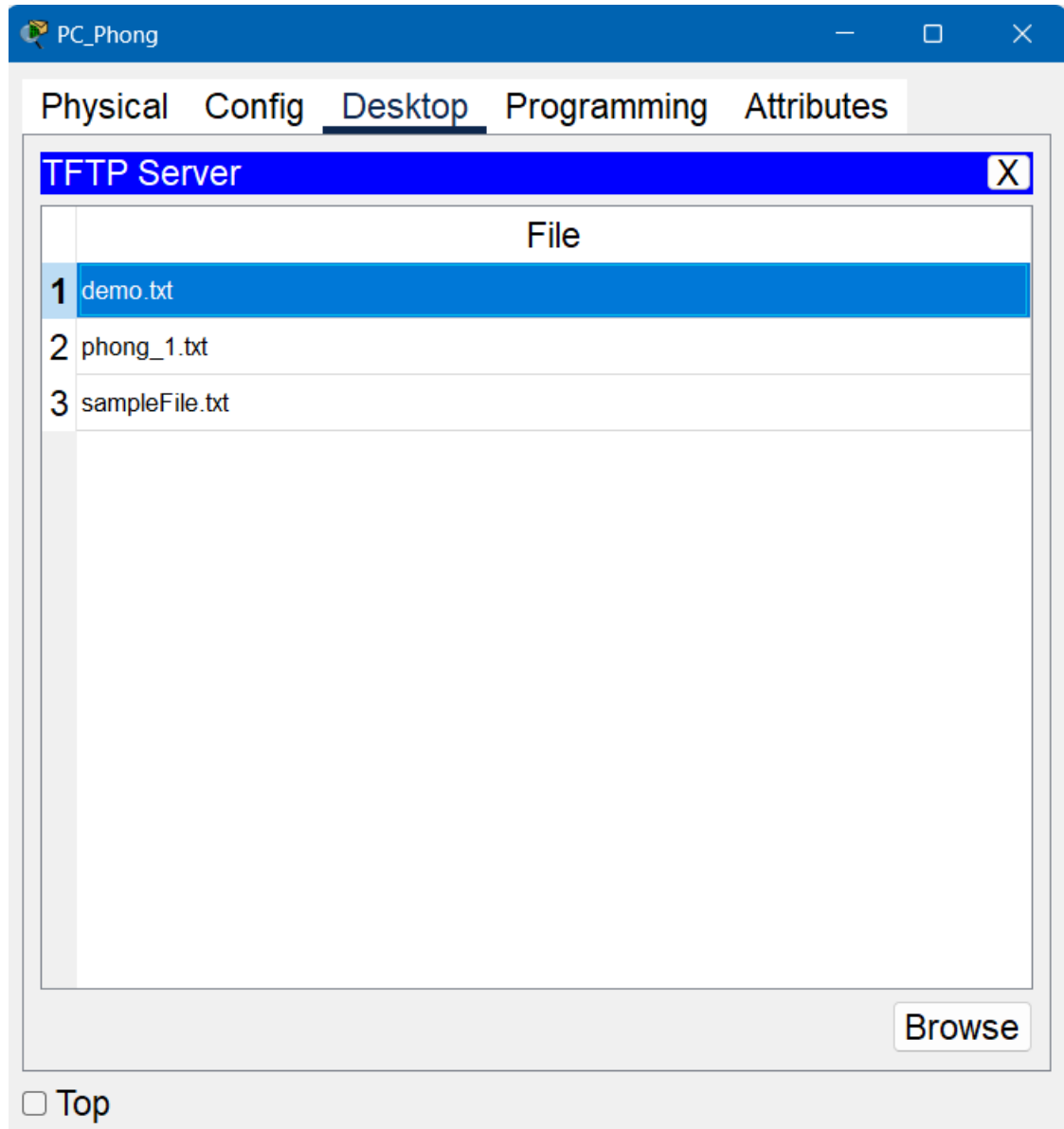
File

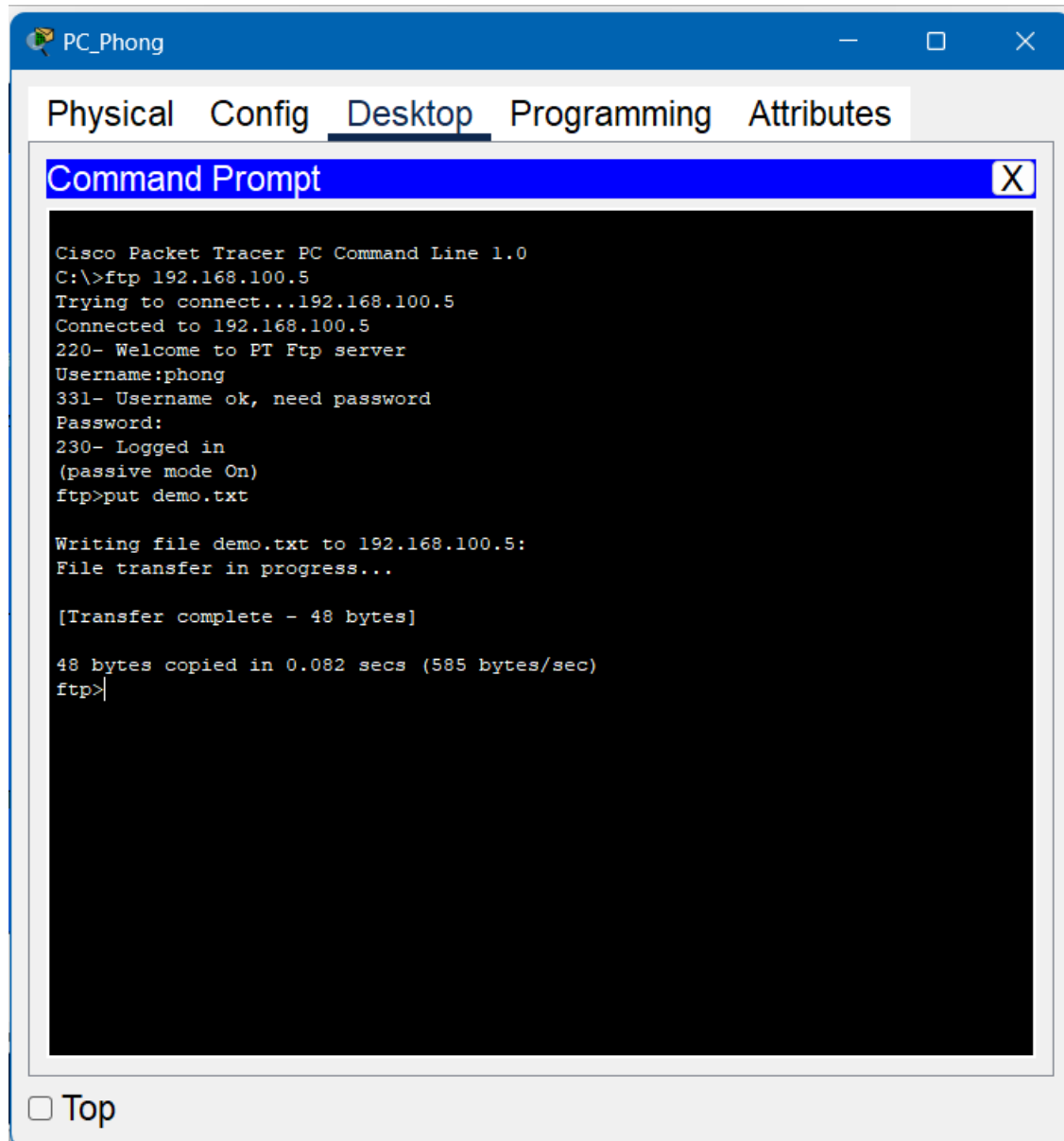
1	asa842-k8.bin
2	asa923-k8.bin
3	c1841-advipservicesk9-mz....

Remove

☐ Top



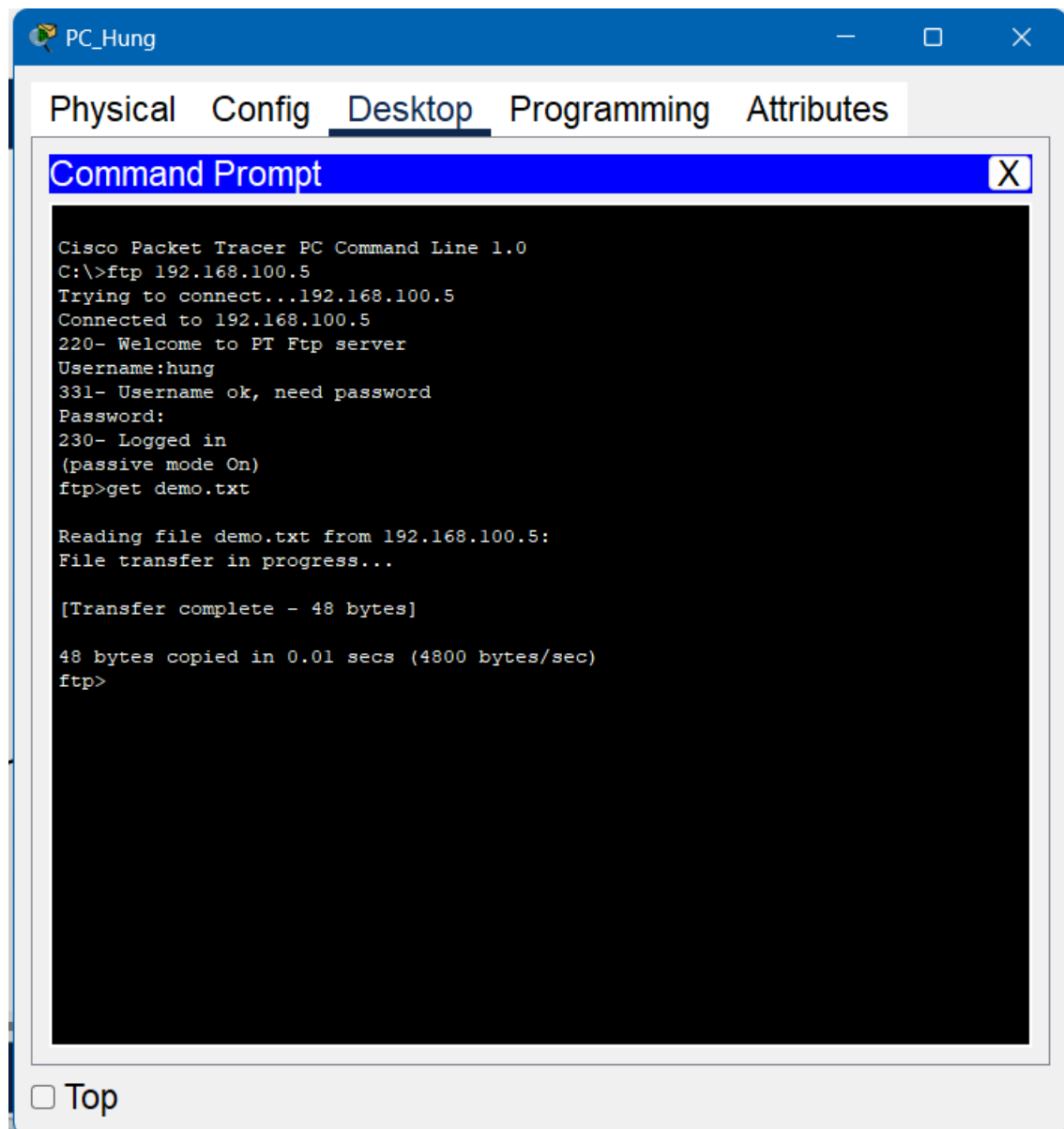


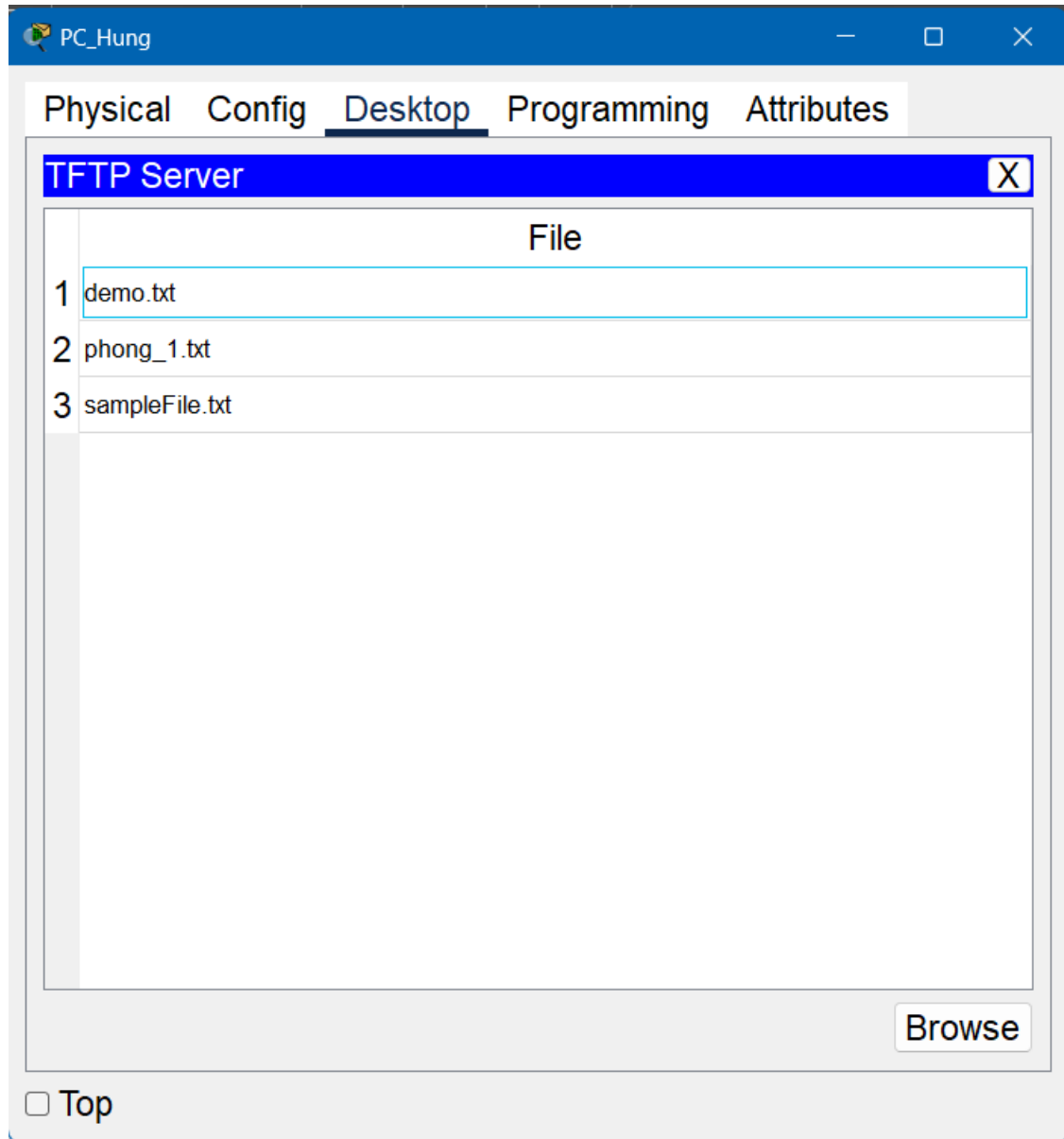


	File
25	cgr1000-universalk9-mz.SPA....
26	cgr1000-universalk9-mz.SPA....
27	demo.txt

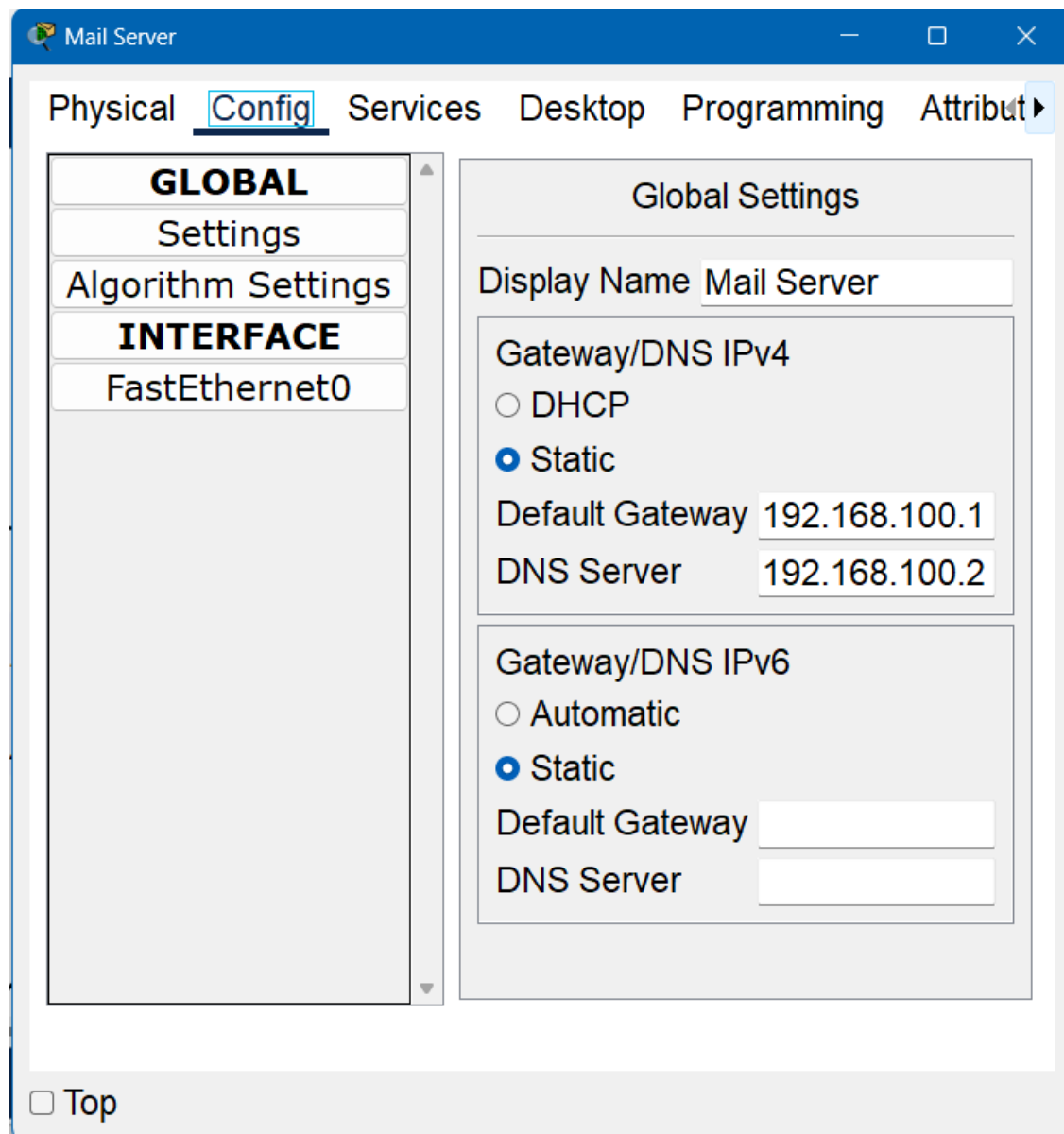
Remove







#### 4.2.5 Mail Server



The image shows a window titled "Mail Server" with a blue header bar. Below the header is a navigation bar with tabs: "Physical", "Config" (which is highlighted with a blue underline), "Services", "Desktop", "Programming", and "Attribut" (with a right-pointing arrow). The main content area is divided into two panes. The left pane contains a tree view with the following items: "GLOBAL" (bold), "Settings", "Algorithm Settings", "INTERFACE" (bold), and "FastEthernet0". The right pane is titled "Global Settings" and contains the following fields: "Display Name" with the value "Mail Server", "Gateway/DNS IPv4" with radio buttons for "DHCP" and "Static" (the "Static" option is selected), "Default Gateway" with the value "192.168.100.1", and "DNS Server" with the value "192.168.100.2". Below these fields is a section for "Gateway/DNS IPv6" with radio buttons for "Automatic" and "Static" (the "Static" option is selected), and empty input fields for "Default Gateway" and "DNS Server". At the bottom left of the window, there is a "Top" button with a square icon.

Mail Server

Physical Config Services Desktop Programming Attribut ▶

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

FastEthernet0

Global Settings

Display Name Mail Server

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway 192.168.100.1

DNS Server 192.168.100.2

Gateway/DNS IPv6

☐ Automatic

☒ Static

Default Gateway

DNS Server

Top

Mail Server

Physical

Config

**Services**

Desktop

Programming

Attributes

**SERVICES**

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

**EMAIL**

FTP

IoT

VM Management

Radius EAP

EMAIL

SMTP Service  
☒ ON ☐ OFF

POP3 Service  
☒ ON ☐ OFF

Domain Name: ueh.edu.vn 

Set

User Setup

User 52100987 Password 12345

52100987

52100416

+

-

Change

Password

☐ Top

PC\_Phong

Physical Config Desktop Programming Attributes

Compose Mail X

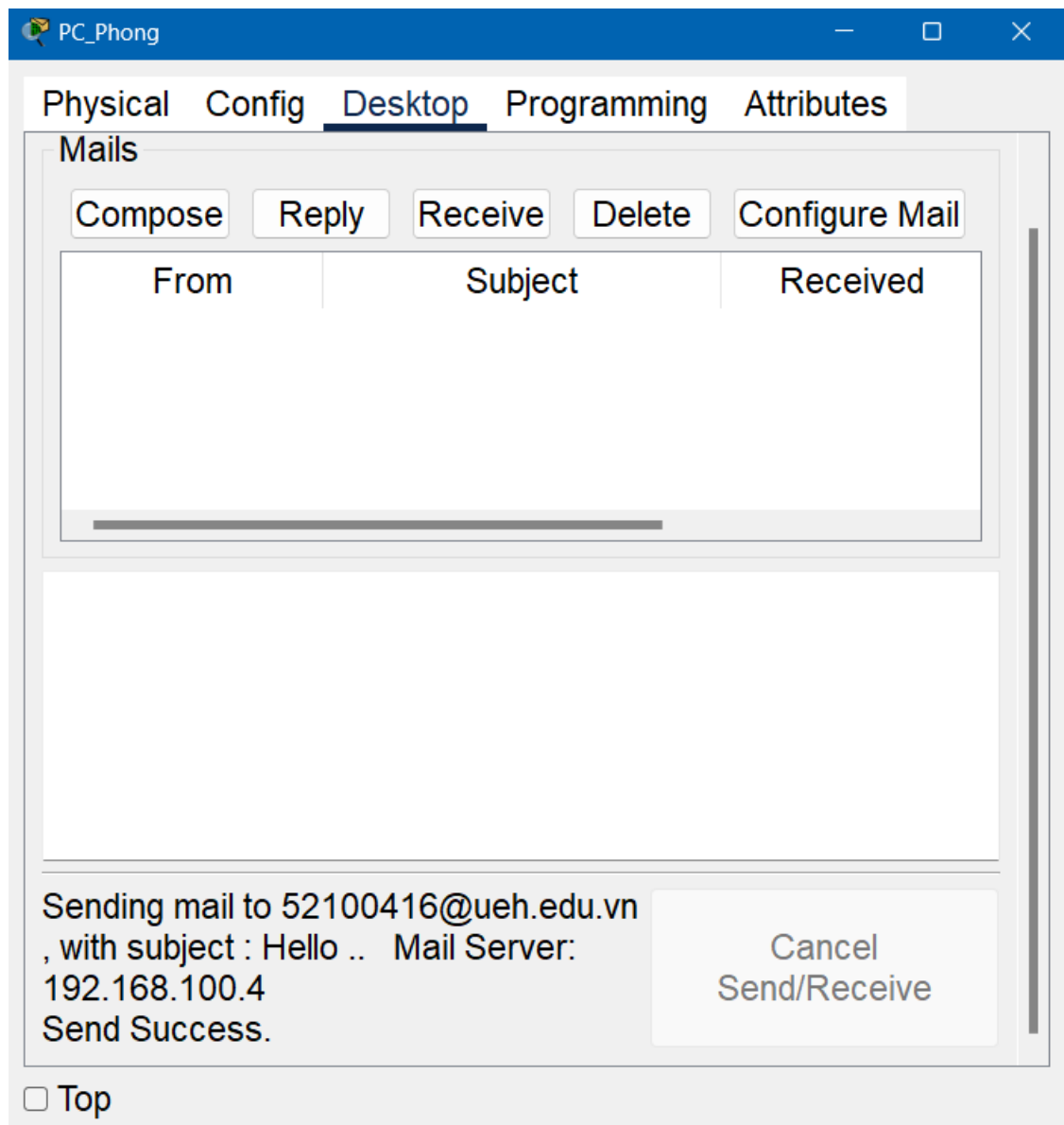
Send To: 52100416@ueh.edu.vn

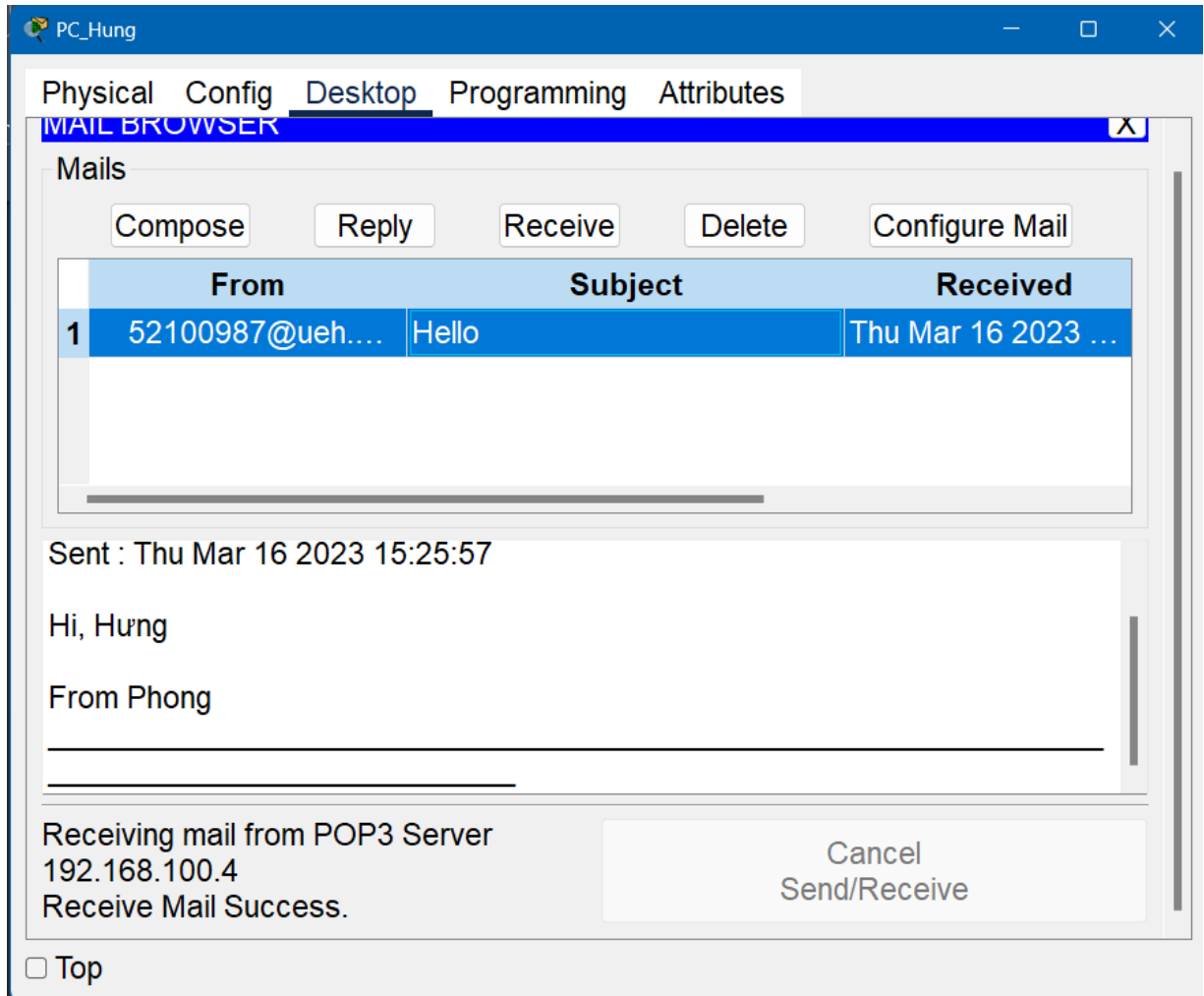
Subject: Hello

Hi, Hưng

From Phong

☐ Top





### 4.3 Cấu hình định tuyến OSPF

#### Cơ sở A

- Router Cơ sở A

```
router ospf 1
network 10.0.0.0 0.255.255.255 area 0
network 8.0.0.0 0.255.255.255 area 0
```

```
network 192.168.100.0 0.0.0.255 area 1
network 192.168.110.0 0.0.0.255 area 1
ipv6 router ospf 1
router-id 1.1.1.1
int se1/0
ipv6 ospf 1 area 0
int s1/1
ipv6 ospf 1 area 0
int f0/1
ipv6 ospf 1 area 0
```



Router Cơ sở A

Physical Config CLI Attributes

### IOS Command Line Interface

```

00:00:45: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.140.1 on FastEthernet0/1
from LOADING to FULL, Loading Done

RouterA>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
       area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

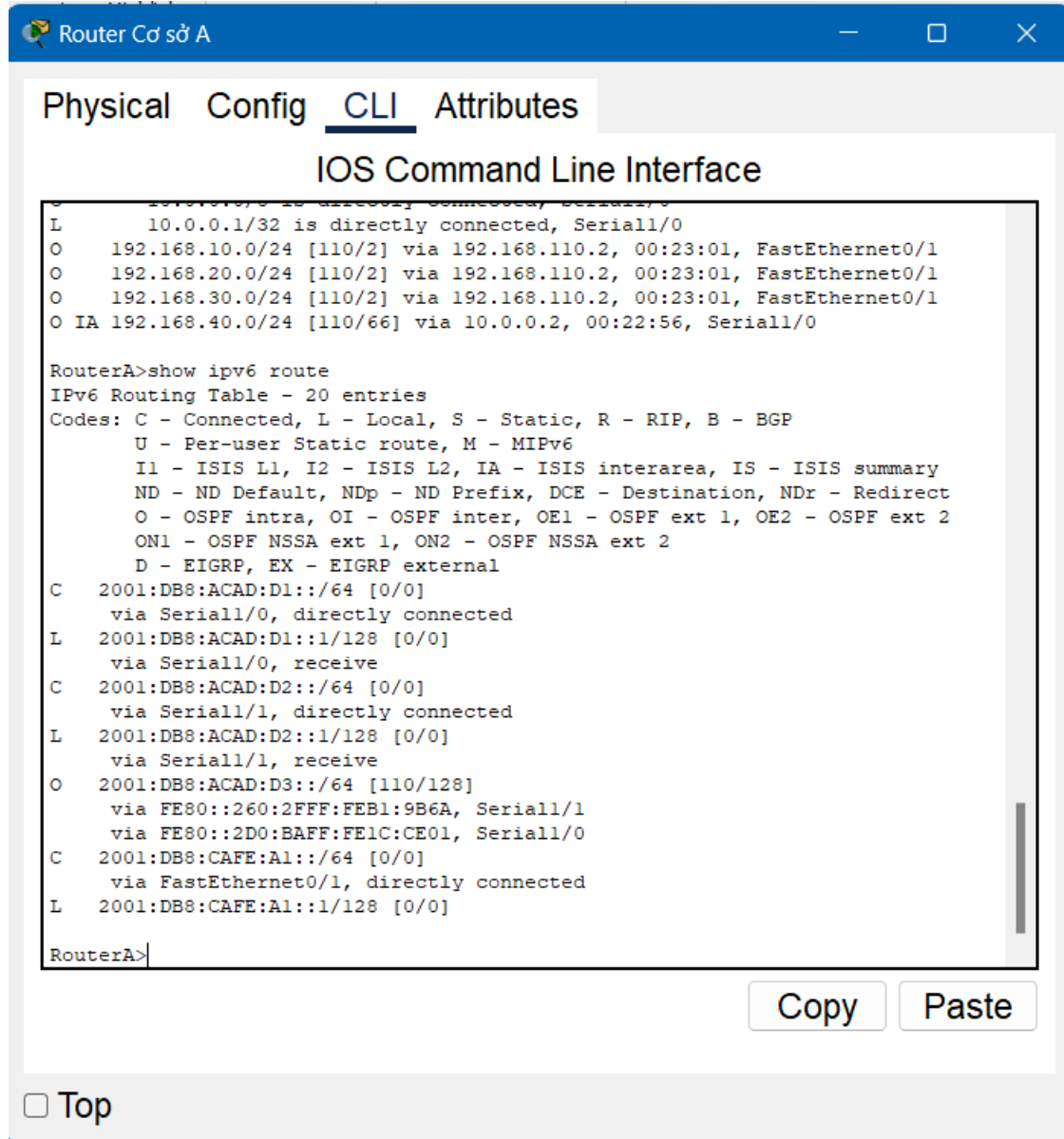
      8.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       8.0.0.0/8 is directly connected, Serial1/1
L       8.0.0.1/32 is directly connected, Serial1/1
O       9.0.0.0/8 [110/128] via 10.0.0.2, 00:23:31, Serial1/0
        [110/128] via 8.0.0.2, 00:23:31, Serial1/1
      10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.0.0.0/8 is directly connected, Serial1/0
L       10.0.0.1/32 is directly connected, Serial1/0
O       192.168.10.0/24 [110/2] via 192.168.110.2, 00:23:01, FastEthernet0/1
O       192.168.20.0/24 [110/2] via 192.168.110.2, 00:23:01, FastEthernet0/1
O       192.168.30.0/24 [110/2] via 192.168.110.2, 00:23:01, FastEthernet0/1
O IA    192.168.40.0/24 [110/66] via 10.0.0.2, 00:22:56, Serial1/0

RouterA>

```

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☐ Top



## - Multilayer Switch Cơ sở A1

ipv6 router ospf 1

int f0/1

ipv6 ospf 1 area 0

int vlan 10

ipv6 ospf 1 area 0

int vlan 20

52

ipv6 ospf 1 area 0

int vlan 30

ipv6 ospf 1 area 0

Multilayer Switch Cơ sở A1

Physical
Config
**CLI**
Attributes

### IOS Command Line Interface

```

00:00:45: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.110.1 on FastEthernet0/1
from LOADING to FULL, Loading Done

SWA1>enable
SWA1#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
       area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

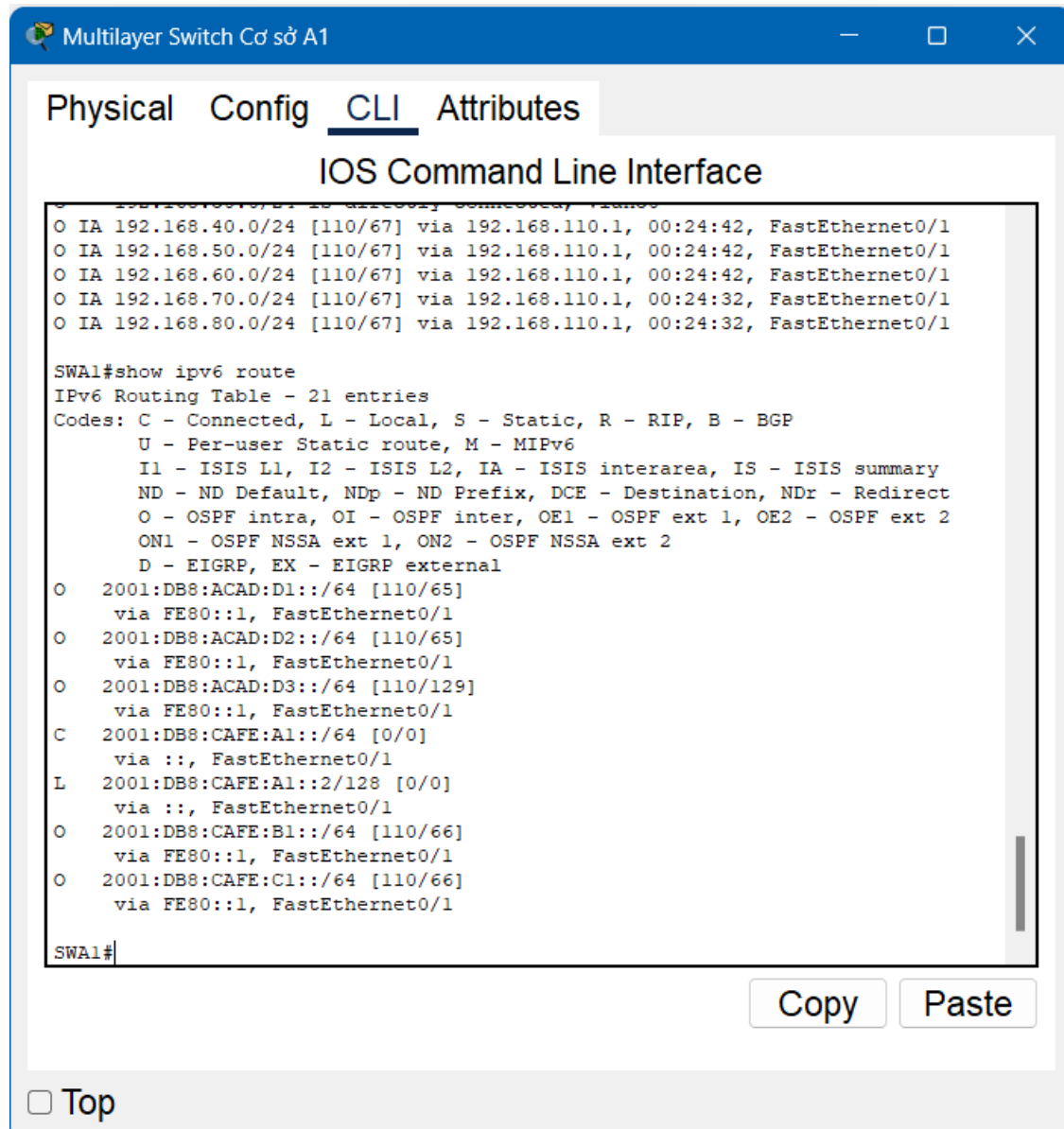
O IA 8.0.0.0/8 [110/65] via 192.168.110.1, 00:24:52, FastEthernet0/1
O IA 9.0.0.0/8 [110/129] via 192.168.110.1, 00:24:52, FastEthernet0/1
O IA 10.0.0.0/8 [110/65] via 192.168.110.1, 00:24:52, FastEthernet0/1
C    192.168.1.0/24 is directly connected, Vlan999
C    192.168.10.0/24 is directly connected, Vlan10
C    192.168.20.0/24 is directly connected, Vlan20
C    192.168.30.0/24 is directly connected, Vlan30
O IA 192.168.40.0/24 [110/67] via 192.168.110.1, 00:24:42, FastEthernet0/1
O IA 192.168.50.0/24 [110/67] via 192.168.110.1, 00:24:42, FastEthernet0/1
O IA 192.168.60.0/24 [110/67] via 192.168.110.1, 00:24:42, FastEthernet0/1
O IA 192.168.70.0/24 [110/67] via 192.168.110.1, 00:24:32, FastEthernet0/1
O IA 192.168.80.0/24 [110/67] via 192.168.110.1, 00:24:32, FastEthernet0/1

SWA1#

```

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☐ Top



## Cơ sở B

- Router cơ sở B

router ospf 1

network 192.168.120.0 0.0.0.255 area 2

```
network 10.0.0.0 0.255.255.255 area 0
network 9.0.0.0 0.255.255.255 area 0
ipv6 router ospf 1
router-id 2.2.2.2
int se1/0
ipv6 ospf 1 area 0
int s1/1
ipv6 ospf 1 area 0
int fa0/1
ipv6 ospf 1 area 0
```

Router Cơ sở B

Physical Config CLI Attributes

### IOS Command Line Interface

```

Router>show ip toute
      ^
% Invalid input detected at '^' marker.

Router>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
       area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

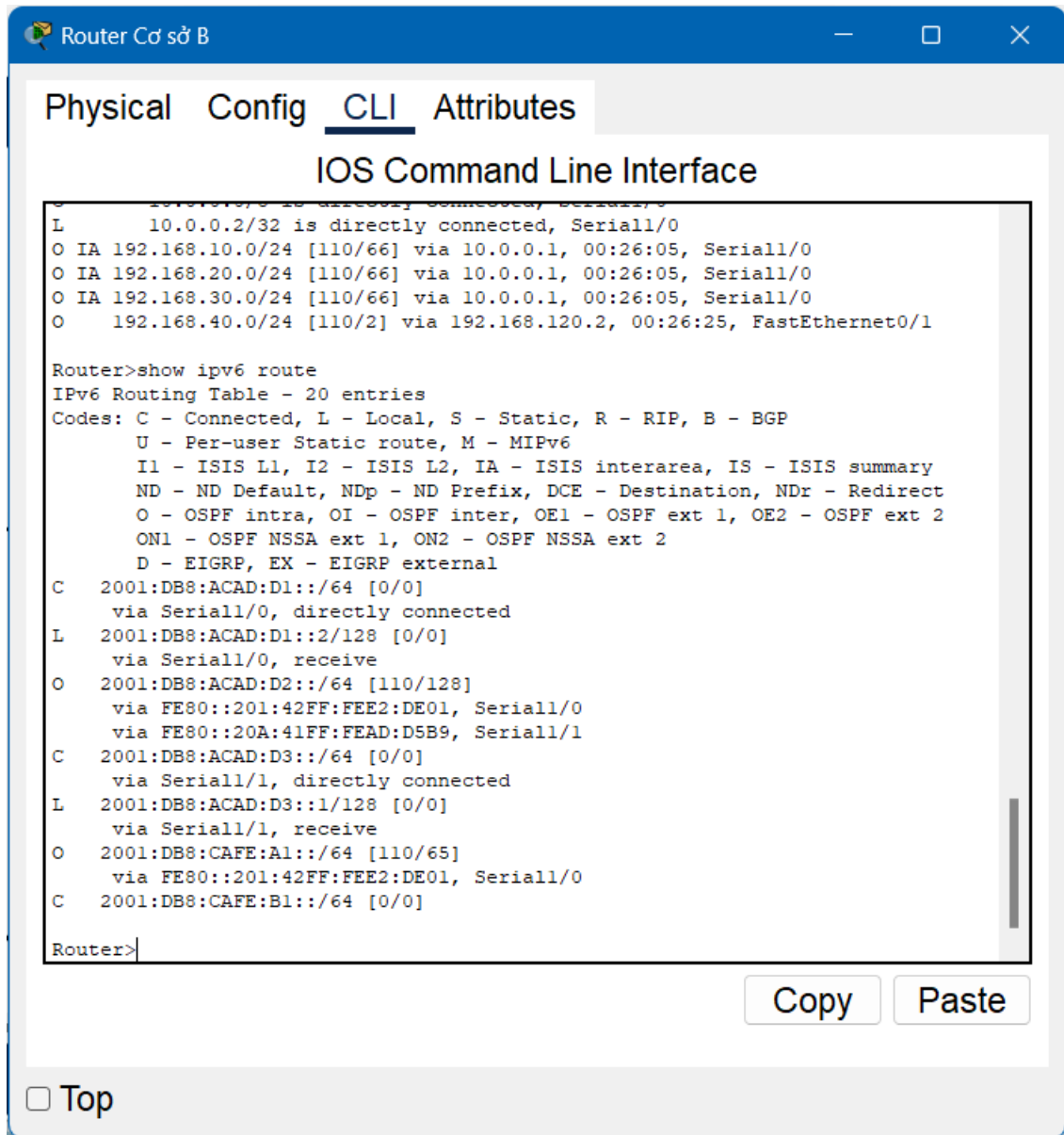
O    8.0.0.0/8 [110/128] via 9.0.0.2, 00:26:40, Serial1/1
      [110/128] via 10.0.0.1, 00:26:40, Serial1/0
      9.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    9.0.0.0/8 is directly connected, Serial1/1
L    9.0.0.1/32 is directly connected, Serial1/1
      10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    10.0.0.0/8 is directly connected, Serial1/0
L    10.0.0.2/32 is directly connected, Serial1/0
O IA 192.168.10.0/24 [110/66] via 10.0.0.1, 00:26:05, Serial1/0
O IA 192.168.20.0/24 [110/66] via 10.0.0.1, 00:26:05, Serial1/0
O IA 192.168.30.0/24 [110/66] via 10.0.0.1, 00:26:05, Serial1/0
O    192.168.40.0/24 [110/2] via 192.168.120.2, 00:26:25, FastEthernet0/1

Router>

```

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☐ Top



#### - Multilayer Switch Cơ sở B1

ipv6 router ospf 1

int f0/1

ipv6 ospf 1 area 0

int vlan 40

ipv6 ospf 1 area 0

int vlan 50

ipv6 ospf 1 area 0

int vlan 60

ipv6 ospf 1 area 0

Multilayer Switch Cơ sở B1

Physical
Config
**CLI**
Attributes

### IOS Command Line Interface

```

00:00:45: %OSPFv3-5-ADJCHG: Process 1, Nbr 2.2.2.2 on FastEthernet0/1 from
LOADING to FULL, Loading Done

Switch>enable
Switch#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

O IA 8.0.0.0/8 [110/129] via 192.168.120.1, 00:27:15, FastEthernet0/1
O IA 9.0.0.0/8 [110/65] via 192.168.120.1, 00:27:15, FastEthernet0/1
O IA 10.0.0.0/8 [110/65] via 192.168.120.1, 00:27:15, FastEthernet0/1
C    192.168.2.0/24 is directly connected, Vlan999
O IA 192.168.10.0/24 [110/67] via 192.168.120.1, 00:27:00, FastEthernet0/1
O IA 192.168.20.0/24 [110/67] via 192.168.120.1, 00:27:00, FastEthernet0/1
O IA 192.168.30.0/24 [110/67] via 192.168.120.1, 00:27:00, FastEthernet0/1
C    192.168.40.0/24 is directly connected, Vlan40
C    192.168.50.0/24 is directly connected, Vlan50
C    192.168.60.0/24 is directly connected, Vlan60
O IA 192.168.70.0/24 [110/67] via 192.168.120.1, 00:27:00, FastEthernet0/1
O IA 192.168.80.0/24 [110/67] via 192.168.120.1, 00:27:00, FastEthernet0/1

Switch#

```

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☐ Top



Multilayer Switch Cơ sở B1

Physical Config CLI Attributes

### IOS Command Line Interface

```

C 192.168.40.0/24 is directly connected, Vlan40
C 192.168.50.0/24 is directly connected, Vlan50
C 192.168.60.0/24 is directly connected, Vlan60
O IA 192.168.70.0/24 [110/67] via 192.168.120.1, 00:27:00, FastEthernet0/1
O IA 192.168.80.0/24 [110/67] via 192.168.120.1, 00:27:00, FastEthernet0/1

Switch#show ipv6 route
IPv6 Routing Table - 18 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route, M - MIPv6
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       ND - ND Default, NDp - ND Prefix, DCE - Destination, NDR - Redirect
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
       D - EIGRP, EX - EIGRP external
O 2001:DB8:ACAD:D1::/64 [110/65]
  via FE80::1, FastEthernet0/1
O 2001:DB8:ACAD:D2::/64 [110/129]
  via FE80::1, FastEthernet0/1
O 2001:DB8:ACAD:D3::/64 [110/65]
  via FE80::1, FastEthernet0/1
O 2001:DB8:CAFE:A1::/64 [110/66]
  via FE80::1, FastEthernet0/1
C 2001:DB8:CAFE:B1::/64 [0/0]
  via ::, FastEthernet0/1
L 2001:DB8:CAFE:B1::2/128 [0/0]
  via ::, FastEthernet0/1
O 2001:DB8:CAFE:C1::/64 [110/66]
  via FE80::1, FastEthernet0/1

Switch#

```

☐ Top

## Cơ sở C

- Router cơ sở C1

router ospf 1

network 9.0.0.0 0.255.255.255 area 0

```
network 8.0.0.0 0.255.255.255 area 0
network 192.168.130.0 0.0.0.255 area 3
network 192.168.140.0 0.0.0.255 area 3
ipv6 router ospf 1
router-id 1.1.1.1
int se1/0
ipv6 ospf 1 area 0
int s1/1
ipv6 ospf 1 area 0
int f0/1
ipv6 ospf 1 area 0
int f0/0
ipv6 ospf 1 area 0
```

Router Cơ sở C

Physical Config CLI Attributes

IOS Command Line Interface

```

00:00:45: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.130.2 on FastEthernet0/1
from LOADING to FULL, Loading Done

Router>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
       area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

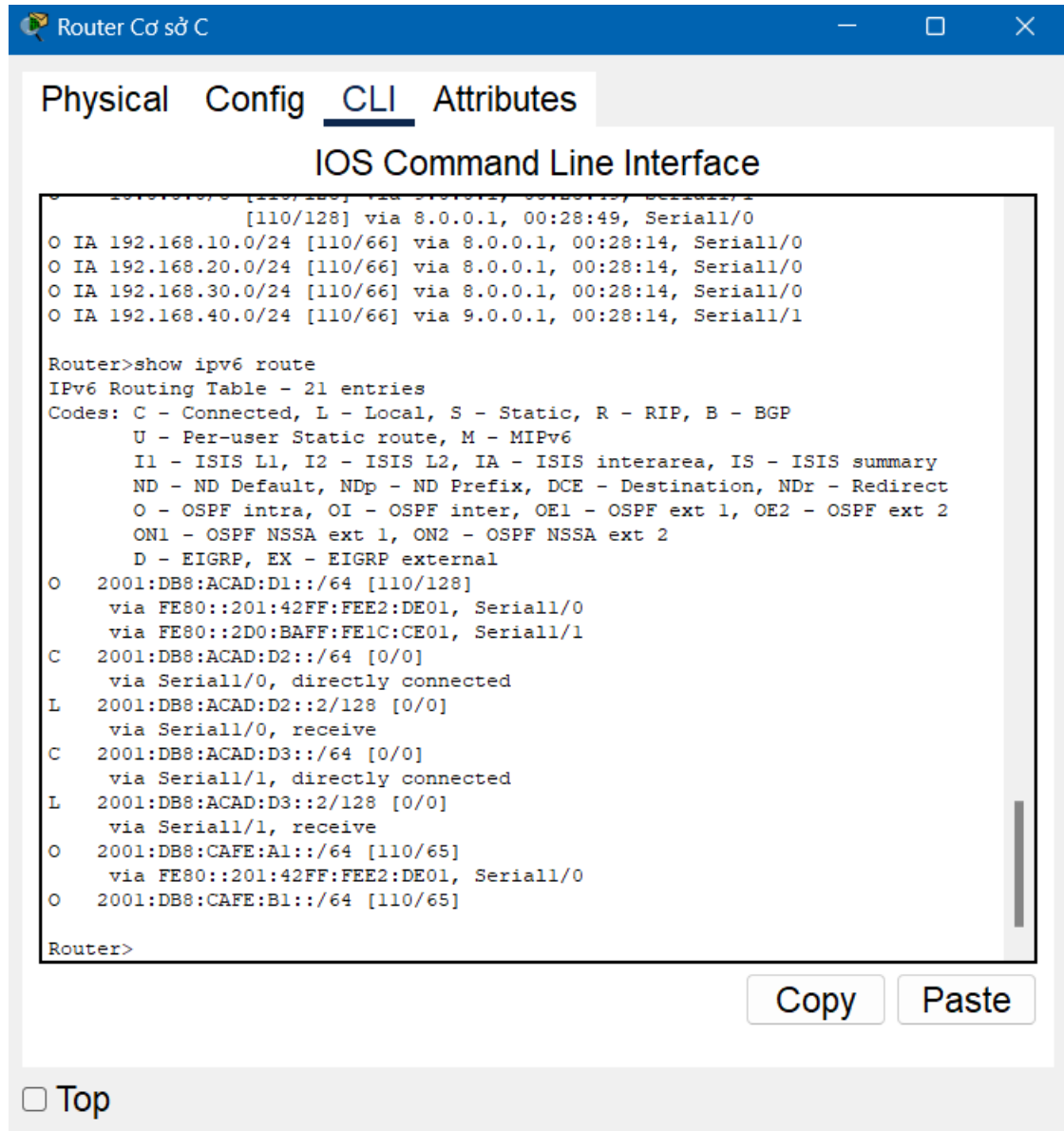
      8.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       8.0.0.0/8 is directly connected, Serial1/0
L       8.0.0.2/32 is directly connected, Serial1/0
      9.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       9.0.0.0/8 is directly connected, Serial1/1
L       9.0.0.2/32 is directly connected, Serial1/1
O       10.0.0.0/8 [110/128] via 9.0.0.1, 00:28:49, Serial1/1
         [110/128] via 8.0.0.1, 00:28:49, Serial1/0
O IA 192.168.10.0/24 [110/66] via 8.0.0.1, 00:28:14, Serial1/0
O IA 192.168.20.0/24 [110/66] via 8.0.0.1, 00:28:14, Serial1/0
O IA 192.168.30.0/24 [110/66] via 8.0.0.1, 00:28:14, Serial1/0
O IA 192.168.40.0/24 [110/66] via 9.0.0.1, 00:28:14, Serial1/1

Router>

```

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☐ Top



## - Multilayer Switch Cơ sở C1\_1

ipv6 router ospf 1

int f0/1

ipv6 ospf 1 area 0

int vlan 70

ipv6 ospf 1 area 0

```
int vlan 80
```

```
ipv6 ospf 1 area 0
```

```
int vlan 90
```

```
ipv6 ospf 1 area 0
```

Multilayer Switch Cơ sở C1\_1

Physical Config CLI Attributes

### IOS Command Line Interface

```
Switch>enable
Switch#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
       area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

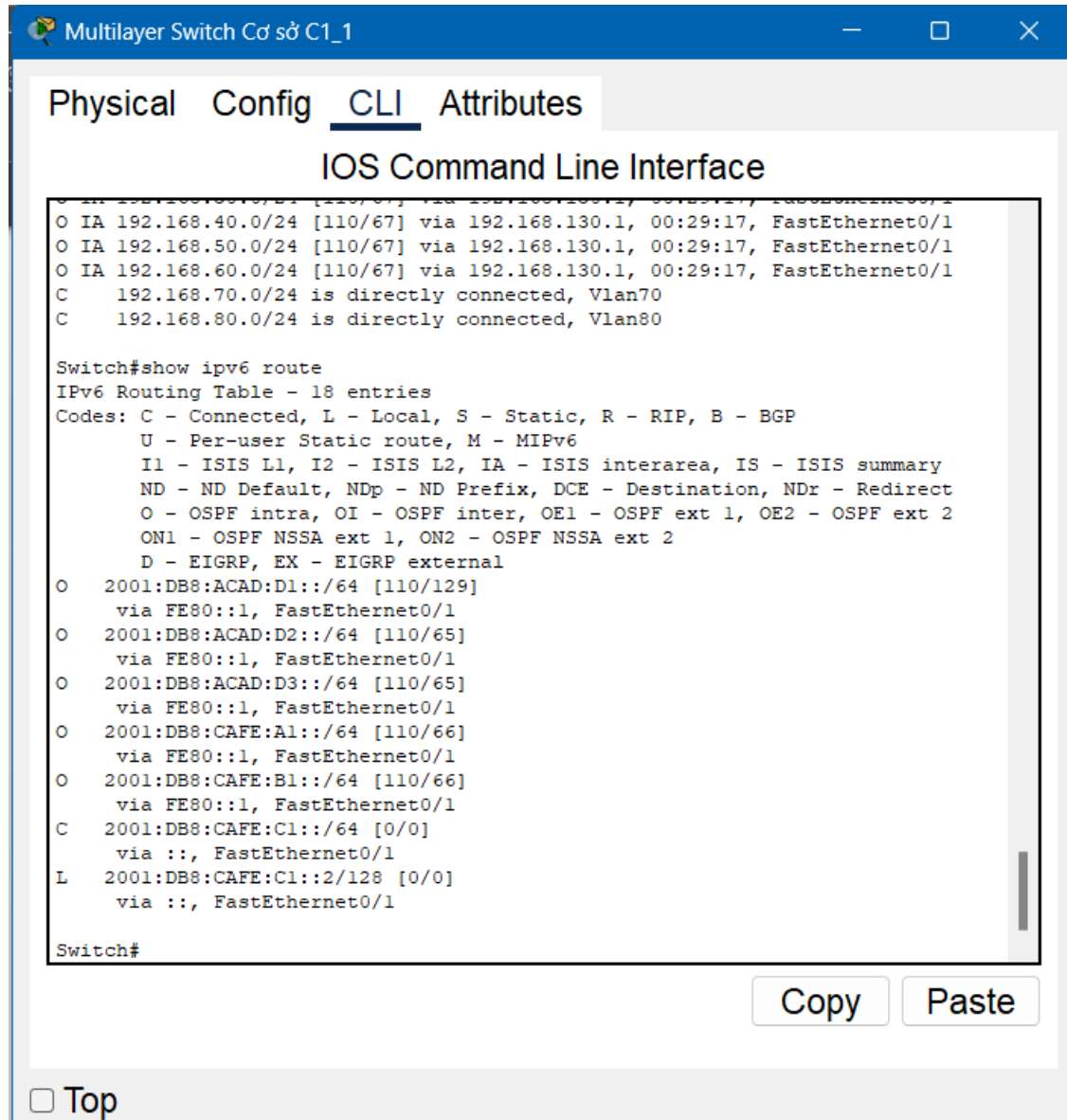
Gateway of last resort is not set

O IA 8.0.0.0/8 [110/65] via 192.168.130.1, 00:29:17, FastEthernet0/1
O IA 9.0.0.0/8 [110/65] via 192.168.130.1, 00:29:17, FastEthernet0/1
O IA 10.0.0.0/8 [110/129] via 192.168.130.1, 00:29:17, FastEthernet0/1
C    192.168.3.0/24 is directly connected, Vlan999
O IA 192.168.10.0/24 [110/67] via 192.168.130.1, 00:29:17, FastEthernet0/1
O IA 192.168.20.0/24 [110/67] via 192.168.130.1, 00:29:17, FastEthernet0/1
O IA 192.168.30.0/24 [110/67] via 192.168.130.1, 00:29:17, FastEthernet0/1
O IA 192.168.40.0/24 [110/67] via 192.168.130.1, 00:29:17, FastEthernet0/1
O IA 192.168.50.0/24 [110/67] via 192.168.130.1, 00:29:17, FastEthernet0/1
O IA 192.168.60.0/24 [110/67] via 192.168.130.1, 00:29:17, FastEthernet0/1
C    192.168.70.0/24 is directly connected, Vlan70
C    192.168.80.0/24 is directly connected, Vlan80

Switch#
```

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☐ Top



#### - Multilayer Switch Cơ sở C1\_2

ipv6 router ospf 1

int f0/1

ipv6 ospf 1 area 0

int vlan 70

ipv6 ospf 1 area 0

```
int vlan 80
```

```
ipv6 ospf 1 area 0
```

```
int vlan 90
```

```
ipv6 ospf 1 area 0
```

Multilayer Switch Cơ sở C1\_2

Physical Config CLI Attributes

### IOS Command Line Interface

```

Switch>enable
Switch#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
       area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

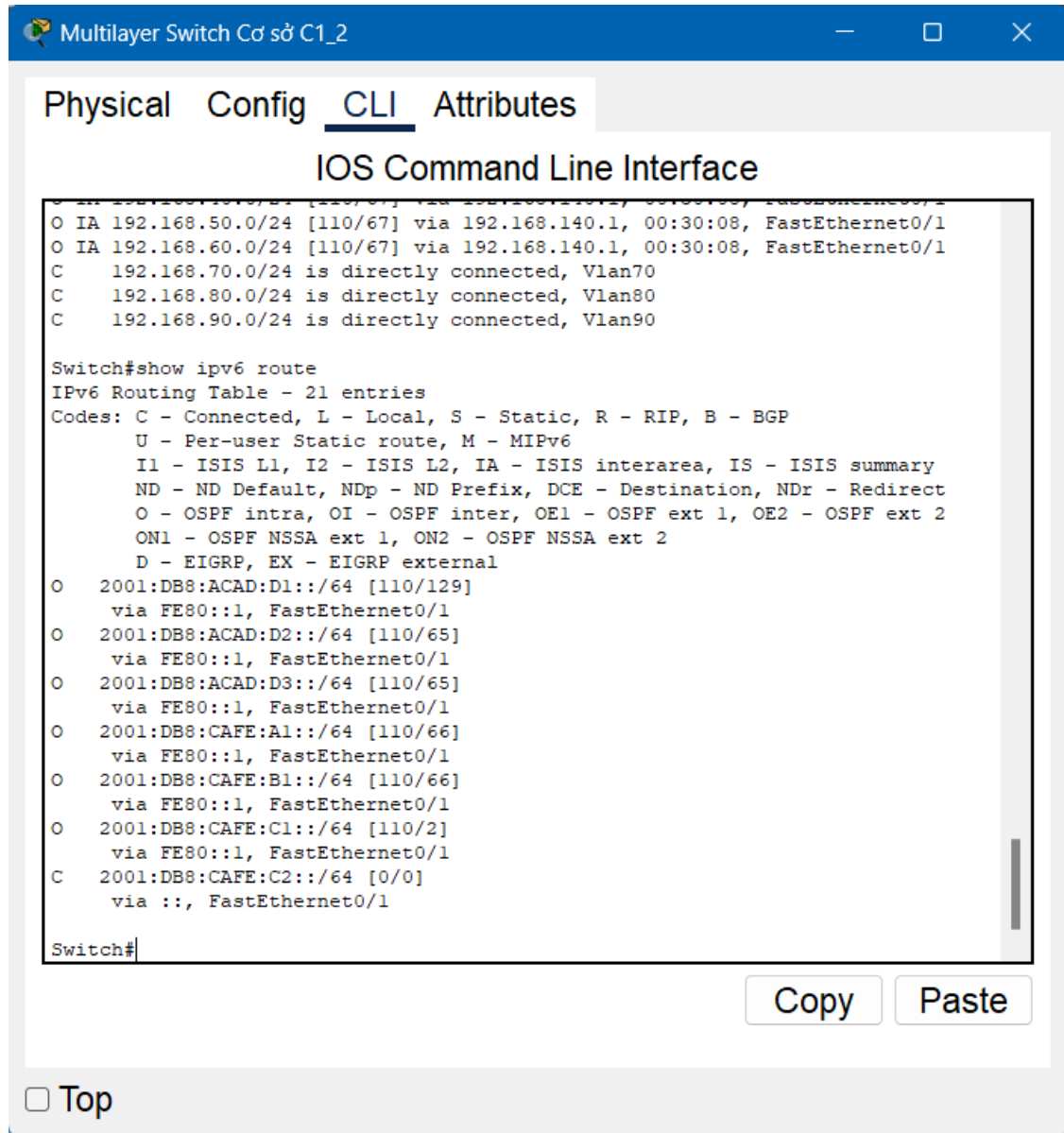
O IA 8.0.0.0/8 [110/65] via 192.168.140.1, 00:30:08, FastEthernet0/1
O IA 9.0.0.0/8 [110/65] via 192.168.140.1, 00:30:08, FastEthernet0/1
O IA 10.0.0.0/8 [110/129] via 192.168.140.1, 00:30:08, FastEthernet0/1
C    192.168.3.0/24 is directly connected, Vlan999
O IA 192.168.10.0/24 [110/67] via 192.168.140.1, 00:30:08, FastEthernet0/1
O IA 192.168.20.0/24 [110/67] via 192.168.140.1, 00:30:08, FastEthernet0/1
O IA 192.168.30.0/24 [110/67] via 192.168.140.1, 00:30:08, FastEthernet0/1
O IA 192.168.40.0/24 [110/67] via 192.168.140.1, 00:30:08, FastEthernet0/1
O IA 192.168.50.0/24 [110/67] via 192.168.140.1, 00:30:08, FastEthernet0/1
O IA 192.168.60.0/24 [110/67] via 192.168.140.1, 00:30:08, FastEthernet0/1
C    192.168.70.0/24 is directly connected, Vlan70
C    192.168.80.0/24 is directly connected, Vlan80
C    192.168.90.0/24 is directly connected, Vlan90

Switch#

```

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☐ Top



## 4.4 Cấu hình STP và HSRP

### CHI NHÁNH 3

- Multilayer Switch Cơ sở C1\_2

spanning-tree mode pvst



```
interface vlan 70
standby 1 ip 192.168.70.3
standby 1 preempt
standby version 2
standby 2 ipv6 autoconfig
standby 2 priority 101
standby 2 preempt
interface vlan 80
standby 1 ip 192.168.80.3
standby 1 preempt
standby version 2
standby 2 ipv6 autoconfig
standby 2 priority 101
standby 2 preempt
interface vlan 90
standby 1 ip 192.168.90.3
standby 1 preempt
standby version 2
standby 2 ipv6 autoconfig
standby 2 priority 101
standby 2 preempt
```

- Multilayer Switch Cơ sở C1\_1

```
spanning-tree mode pvst
interface vlan 70
standby 1 ip 192.168.70.3
```

```
standby 1 priority 150
standby 1 preempt
standby version 2
standby 2 ipv6 autoconfig
standby 2 priority 151
standby 2 preempt
interface vlan 80
standby 1 ip 192.168.80.3
standby 1 priority 150
standby 1 preempt
standby version 2
standby 2 ipv6 autoconfig
standby 2 priority 151
standby 2 preempt
interface vlan 90
standby 1 ip 192.168.90.3
standby 1 priority 150
standby 1 preempt
standby version 2
standby 2 ipv6 autoconfig
standby 2 priority 151
standby 2 preempt
```

## **4.5 Cấu hình DHCP Snooping**

### **CHI NHÁNH 1**

- Switch DHCP A1

```
ip dhcp snooping
interface f0/1
switchport mode access
switchport access vlan 999
ip dhcp snooping trust
```

- Multilayer Switch Cơ sở A1

```
ip dhcp snooping
interface f0/2
ip dhcp snooping trust
```

## **CHI NHÁNH 2**

- Switch DHCP B1

```
ip dhcp snooping
interface f0/2
switchport mode access
switchport access vlan 999
ip dhcp snooping trust
```

- Multilayer Switch Cơ sở B

```
ip dhcp snooping
interface f0/2
ip dhcp snooping trust
```

**CHI NHÁNH 3****- Switch DHCP C1**

```
ip dhcp snooping
interface f0/2
switchport mode access
switchport access vlan 999
ip dhcp snooping trust
```

**- Multilayer Switch Cơ sở C1\_1**

```
ip dhcp snooping
interface f0/2
ip dhcp snooping trust
```

**- Multilayer Switch Cơ sở C1\_2**

```
ip dhcp snooping
interface f0/4
ip dhcp snooping trust
```

## 4.6 Cấu hình SSH

- Multilayer Switch Cơ sở A1

enable

configure terminal

ip domain-name SSHA1

hostname SWA1

username admin privilege 15 password admin

line vty 0 15

transport input ssh

login local

crypto key generate rsa general-keys modulus 2048

ip ssh version 2

end

write

SSH Cơ sở A1

Physical Config Desktop Programming Attributes

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

FastEthernet0

Bluetooth

Global Settings

Display Name SSH Cơ sở A1

Interfaces FastEthernet0

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway 192.168.140.1

DNS Server 192.168.100.2

Gateway/DNS IPv6

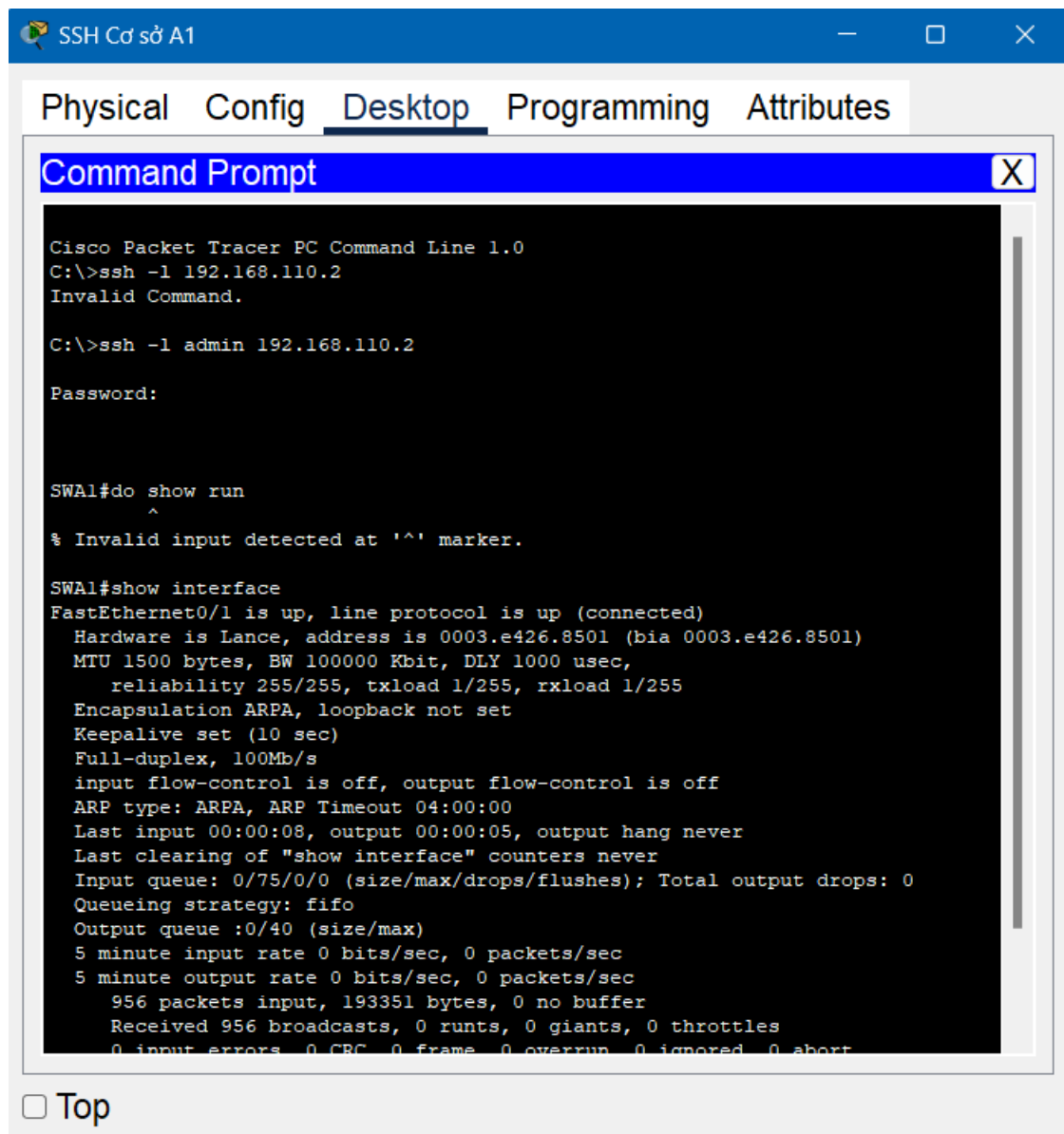
☐ Automatic

☒ Static

Default Gateway

DNS Server

☐ Top



## - Multilayer Switch Cơ sở B1

enable

configure terminal

ip domain-name SSHB1

hostname SWB1

```
username admin privilege 15 password admin
line vty 0 15
transport input ssh
login local
crypto key generate rsa general-keys modulus 2048
ip ssh version 2
end
write
```



SSH Cơ sở B1

Physical Config Desktop Programming Attributes

**IP Configuration** X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.140.2

Subnet Mask 255.255.255.0

Default Gateway 192.168.140.1

DNS Server 192.168.100.2

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::201:64FF:FE24:34A

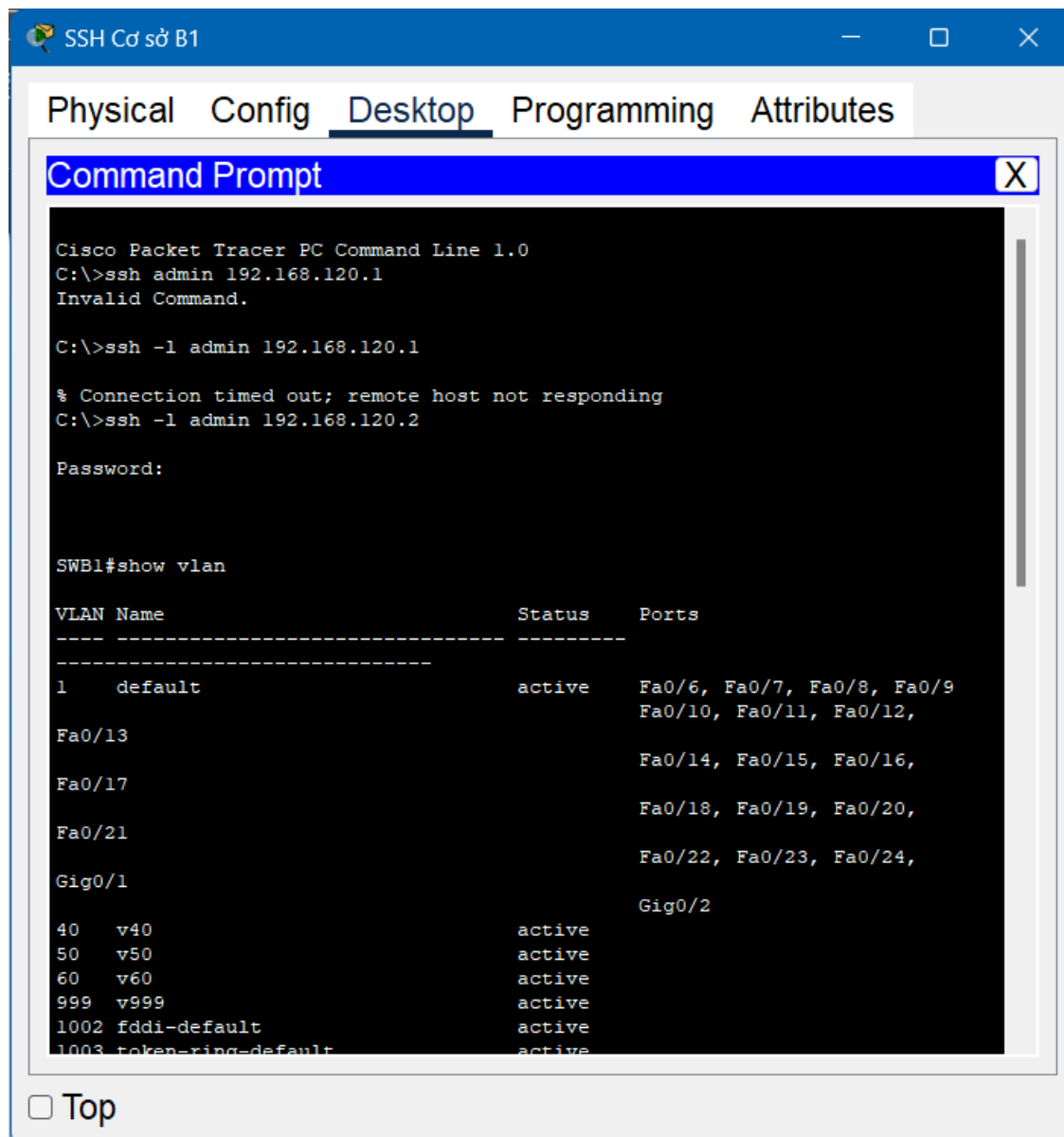
Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

☐ Top



- Multilayer Switch Cơ sở C1\_1

enable

configure terminal

ip domain-name SSHC1a

```
hostname SWC1a
username admin privilege 15 password admin
line vty 0 15
transport input ssh
login local
crypto key generate rsa general-keys modulus 2048
ip ssh version 2
end
write
```

SSH Cơ sở C1\_1

Physical Config **Desktop** Programming Attributes

**IP Configuration** X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.140.2

Subnet Mask 255.255.255.0

Default Gateway 192.168.140.1

DNS Server 192.168.100.2

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::230:F2FF:FEC8:E658

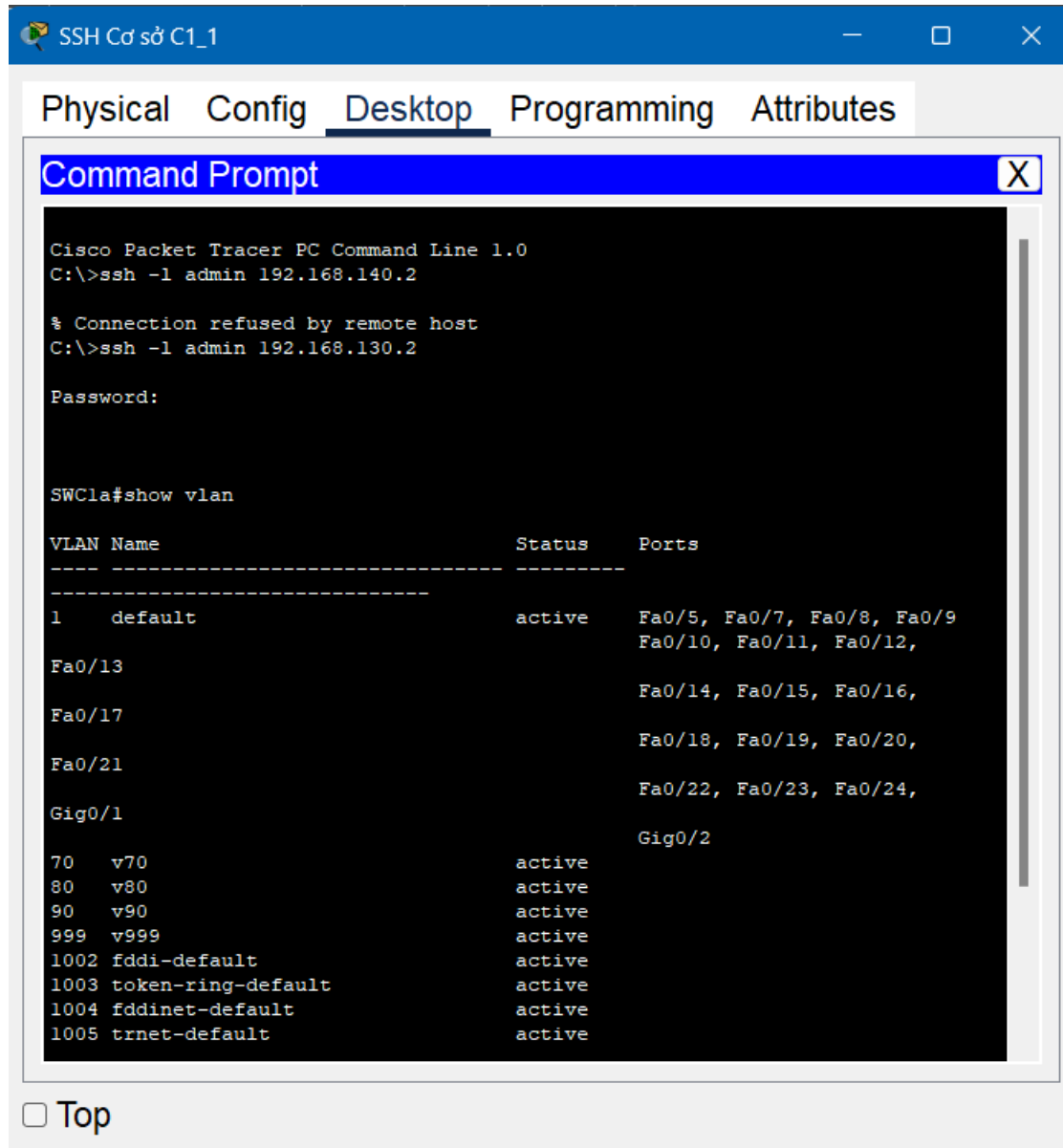
Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

☐ Top



- Multilayer Switch Cơ sở C1\_2

ip domain-name SSHC1b

hostname SWC1b

username admin privilege 15 password admin

line vty 0 15

```
transport input ssh
```

```
login local
```

```
crypto key generate rsa general-keys modulus 2048
```

```
ip ssh version 2
```

```
end
```

```
write
```

SSH Cơ sở C1\_2

Physical Config Desktop Programming Attributes

**IP Configuration** X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.150.2

Subnet Mask 255.255.255.0

Default Gateway 192.168.150.1

DNS Server 192.168.100.2

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::20B:BEFF:FE86:5A8C

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

☐ Top

SSH Cơ sở C1\_2

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ssh -l 192.168.140.2
Invalid Command.

C:\>ssh -l admin 192.168.140.2

Password:

SWC1b#show vlan
```

VLAN	Name	Status	Ports
1	default	active	Fa0/5, Fa0/7, Fa0/8, Fa0/9 Fa0/10, Fa0/11, Fa0/12, Fa0/13, Fa0/14, Fa0/15, Fa0/16, Fa0/17, Fa0/18, Fa0/19, Fa0/20, Fa0/21, Fa0/22, Fa0/23, Fa0/24, Gig0/1, Gig0/2
70	v70	active	
80	v80	active	
90	v90	active	
999	v999	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

☐ Top



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