

## ASSIGNMENT 2 FRONT SHEET

<b>Qualification</b>	<b>TEC Level 5 HND Diploma in Computing</b>		
<b>Unit number and title</b>	<b>Unit 2: Networking</b>		
<b>Submission date</b>		<b>Date Received 1st submission</b>	
<b>Re-submission Date</b>		<b>Date Received 2nd submission</b>	
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		<b>Student's signature</b>	hai

### Grading grid

P5	P6	P7	P8	M3	M4	D2

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## A. Introduction

Nguyen Networking Limited is embarking on a pivotal networking endeavor tailored for a local educational institution. This institution boasts a dynamic community, comprising 200 students, 15 teachers, and 12 staff members, all housed within a multi-floor facility. In addition to its human resources, the institution features specialized assets such as student lab computers and printers, strategically positioned throughout the premises.

The overarching goal of this project is to optimize connectivity and collaboration within the institution, with a keen focus on three key objectives: ensuring seamless connectivity, implementing robust security measures, and facilitating streamlined access to resources across all levels of the organization. Nguyen Networking Limited is committed to leveraging its expertise and state-of-the-art solutions to construct a network infrastructure that not only meets but exceeds these objectives.

Through a combination of meticulous planning, efficient deployment strategies, and unwavering ongoing support, we are poised to revolutionize the institution's technological landscape. Our aim is to create an environment that fosters innovation, facilitates seamless collaboration, and empowers educational excellence. With Nguyen Networking Limited at the helm, the institution's stakeholders will be equipped to navigate and thrive in today's rapidly evolving digital landscape.

## B. Content

### P5. Design a networked system to meet a given specification.

#### 1. The difference between logical and physical design

Physical Design	Logical Design
The physical design is highly detailed.	Logical design is a high-level design and doesn't provide any detail.
Physical design is more graphical than textual; however, it can comprise both.	Logical design can be textual, graphic, or both.
A physical design focuses on specific solutions explaining how they are assembled or configured	A logical design focuses on satisfying the design factors, including risks, requirements, constraints, and assumptions.

#### 2. The USER Requirement for the design

User requirements for the design:

- ✓ Building: 3 floors, all computers and printers are on the ground floor apart from the IT labs – one lab located on the first floor and another located on the second floor.
- ✓ People: 200 students, 15 teachers, 12 marketing and administration staff, 5 higher managers including the head of academics and the program manager, and 3 computer network administrators.

- ### 3. Logical design of the network based on user requirement

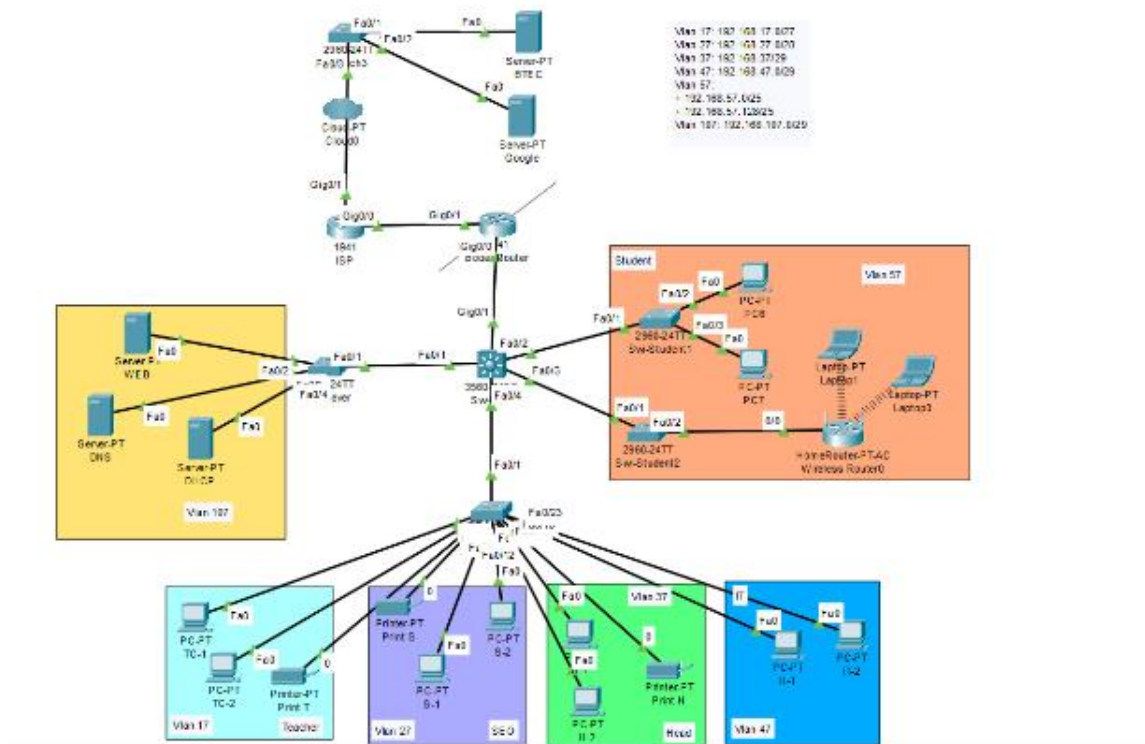


Figure 1: Logical design

#### 4. Physical design of the network based on user requirement

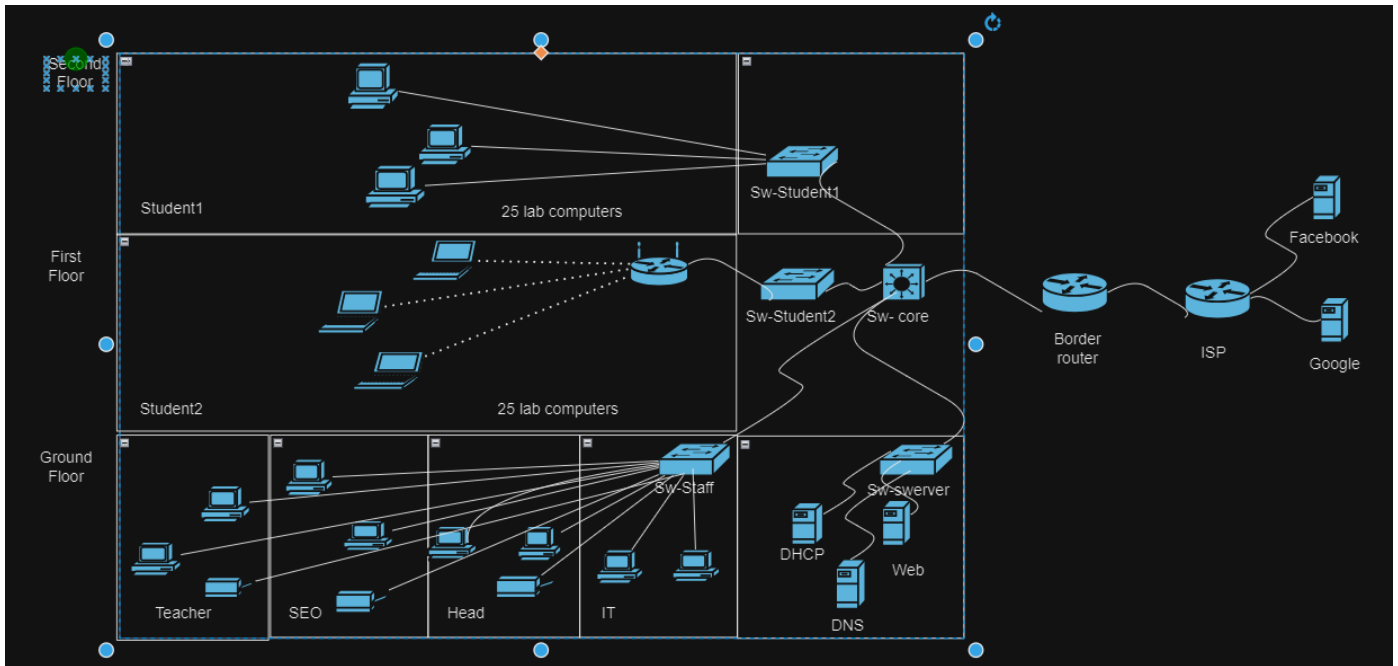


Figure 2:Physical design

## 5. Addressing table for the network you design

Type of user	Vlan	Network Address	Subnets Mask	Default Gateway	DHCP	DNS
Teacher	17	192.168.17.0	255.255.255.224	192.168.17.1	192.168.107.2	192.168.107.3
SEO	27	192.168.27.0	255.255.255.240	192.168.27.1	192.168.107.2	192.168.107.3
Head	37	192.168.37.0	255.255.255.248	192.168.37.1	192.168.107.2	192.168.107.3
IT	47	192.168.47.0	255.255.255.248	192.168.47.1	192.168.107.2	192.168.107.3
Student	57	192.168.57.0	255.255.255.0	192.168.57.1	192.168.107.2	192.168.107.3
server	107	192.168.107.0	255.255.255.248	192.168.107.1	192.168.107.2	192.168.107.3

### **Explain the subnetmask division:**

Split Subnet Mask brings some benefits as follows:

**Easier network management:** Dividing the network into smaller subnets makes it easier to manage devices on the network.

**Enhance network security:** Split subnet mask helps isolate subnets from each other, helping to increase network security.

**Optimal performance network:** Split network mask helps minimize minimum broadcast, helping to optimize network performance.

### **P6. Design a maintenance schedule to support the networked system.**

#### **1. Network maintenance definition.**

Network maintenance is essentially what you need to do to keep your network up and running smoothly. This definition encompasses some duties such as installing and configuring hardware and software, troubleshooting network problems, monitoring and improving network performance and planning for network growth.

#### **2. Task for the maintenance plan.**

- **Troubleshooting Problems:** Proactively identify and resolve network issues, distinguishing between internal and external causes. Utilize network monitoring tools for early detection.
- **Performing Data and Configuration Backups:** Regularly back up critical data and network configurations, ensuring backups are accessible, verified, and up to date.
- **Device Inventory Management:** Maintain an accurate inventory of all network devices, tracking their status, updates, and lifecycle for efficient maintenance and replacement.
- **Malware/Ransomware Protection:** Implement robust security measures to protect against evolving threats, including regular updates, scans, and configuration adjustments.
- **Power Checks:** Test and maintain UPS systems to ensure uninterrupted power supply, scaling capacity with network growth.
- **Network Documentation:** Document all network components, maintenance activities, and relevant details to facilitate troubleshooting and knowledge transfer.
- **Hardware Checks:** Regularly inspect and maintain network hardware for damage, dust, and connectivity issues to prevent failures.
- **Compliance Checks:** Ensure network operations comply with legal and industry regulations, implementing necessary policies and security standards.
- **Preemptive Repairs:** Conduct scheduled maintenance to address potential issues before they disrupt network operations.



- **Configurations and Upgrades:** Regularly update software and devices to address security vulnerabilities and accommodate organizational changes.
- **Future Network Growth Planning:** Plan for network scalability and expansion based on past performance, recurring issues, and anticipated needs.

### 3. Maintenance schedule

	Daily	Weekly	Monthly	Yearly
<b>System Checks: Check for any physical damage or signs of wear on networking equipment.</b>	x			
<b>Software Updates</b>		x		
<b>Cable and Physical Infrastructure Inspection</b>			x	
<b>Data Backup</b>	x			
<b>User Account Management.</b>		x		
<b>Monitoring Network Performance:</b>			x	
<b>Server access reviewed</b>		x		
<b>Firewall Rules reviewed</b>		x		
<b>Hardware physically cleaned and errors checked</b>			x	
<b>System Performance Optimization</b>			x	
<b>Security Checks</b>		x		
<b>System Error Checking and Handling</b>			x	
<b>Security Audits</b>				x
<b>Check and Replace Old Hardware</b>				x
<b>Scaling and Future Planning</b>				x



- **Name the Vlans:**

```
SW-core#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW-core(config)#line vty 0 4
SW-core(config-line)#password cisscol23
SW-core(config-line)#login
SW-core(config-line)#end
SW-core#en
SW-core#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW-core(config)#vtp domain btec.vn
Changing VTP domain name from NULL to btec.vn
SW-core(config)#vtp mode server
Device mode already VTP SERVER.
SW-core(config)#vtp password btecl23
Setting device VLAN database password to btecl23
```

*Figure 5: Set the domain, mode, and VTP password.*

➤ **Trunking Configuration:**

```
SW-core#en
SW-Switch>en
SW-Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW-Switch(config)#hostname SW-Staff
SW-Staff(config)#vtp domain btec.vn
Changing VTP domain name from NULL to btec.vn
SW-Staff(config)#vtp mode client
Setting device to VTP CLIENT mode.
SW-Staff(config)#vtp pass btecl23
Setting device VLAN database password to btecl23
SW-Staff(config)#int f0/1
SW-Staff(config-if)#sw mode trunk
SW-Staff(config-if)#int range f0/2-10
SW-Staff(config-if-range)#sw mode acc
SW-Staff(config-if-range)#sw acc vlan 17
SW-Staff(config-if-range)#int range f0/11-15
SW-Staff(config-if-range)#sw mode acc
SW-Staff(config-if-range)#sw acc vlan 27
SW-Staff(config-if-range)#int range f0/16-21
SW-Staff(config-if-range)#sw mode acc
SW-Staff(config-if-range)#sw acc vlan 37
SW-Staff(config-if-range)#int range f0/22-24
SW-Staff(config-if-range)#sw mode acc
SW-Staff(config-if-range)#sw acc vlan 47
SW-Staff(config-if-range)#
```

*Figure 6:Name the Vlans*

- **Configure trunk ports on interfaces f0/1-4.**

*Figure 6:Configure trunk ports on interfaces f0/1-4*

```
SW-core(config)#int range f0/1-4
SW-core(config-if-range)#sw trunk enc dot1Q
SW-core(config-if-range)#sw mode trunk
```

❖ **Sw Server**

❖ **Sw-Staff:**

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname SW-Staff
SW-Staff(config)#vtp domain btec.vn
Changin Switch>en
SW-Staff Switch#conf t
Setting Enter configuration commands, one per line. End with CNTL/Z.
SW-Staff Switch(config)#hostname SW-student1
Setting SW-student1(config)#vtp domain btec.vn
SW-Staff Domain name already set to btec.vn.
SW-Staff SW-student1(config)#vtp mode client
SW-Staff Setting device to VTP CLIENT mode.
SW-Staff SW-student1(config)#vtp pass btec123
SW-Staff Setting device VLAN database password to btec123
SW-Staff SW-student1(config)#int f0/1
SW-Staff SW-student1(config-if)#sw mode trunk
SW-Staff SW-student1(config-if)#int range f0/2-10
SW-Staff SW-student1(config-if-range)#sw mode acc
SW-Staff SW-student1(config-if-range)#sw acc vlan 57
SW-Staff SW-student1(config-if-range)#
SW-Staff (config-if-range)#int range f0/20-24
SW-Staff (config-if-range)#sw mode acc
SW-Staff (Figure 8:Sw-Student
SW-Staff (
```

*Figure 7:Sw-Staff*

#### ❖ Sw-Student:

#### ❖ IP address for each VLAN

```
SW-core(config-vlan)#int vlan 17
SW-core(config-if)#ip add 192.168.17.1 255.255.255.224
SW-core(config-if)#no shutdown
SW-core(config-if)#int vlan 27
SW-core(config-if)#ip add 192.168.27.1 255.255.255.240
SW-core(config-if)#no shutdown
SW-core(config-if)#int vlan 37
SW-core(config-if)#ip add 192.168.37.1 255.255.255.248
SW-core(config-if)#no shutdown
SW-core(config-if)#int vlan 47
SW-core(config-if)#ip add 192.168.47.1 255.255.255.248
SW-core(config-if)#no shutdown
SW-core(config-if)#int vlan 57
SW-core(config-if)#ip add 192.168.57.1 255.255.255.0
SW-core(config-if)#no shutdown
SW-core(config-if)#int vlan 107
SW-core(config-if)#ip add 192.168.107.1 255.255.255.248
SW-core(config-if)#no shutdown
SW-core(config-if)#exit
```

*Figure 9:IP address for each VLAN*

#### ❖ relay Configuration:

```
SW-core>en
SW-core#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW-core(config)#int vlan 17
SW-core(config-if)#ip helper-address 192.168.107.2
SW-core(config-if)#int vlan 27
SW-core(config-if)#ip helper-address 192.168.107.2
SW-core(config-if)#int vlan 37
SW-core(config-if)#ip helper-address 192.168.107.2
SW-core(config-if)#int vlan 47
SW-core(config-if)#ip helper-address 192.168.107.2
SW-core(config-if)#int vlan 57
SW-core(config-if)#ip helper-address 192.168.107.2
SW-core(config-if)#
SW-core(config-if)#
```

Figure 10:relay Configuration

#### ❖ Assign VLANs to ports

```
SW-core>en
SW-core#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW-core(config)#
SW-core(config)#access-list 110 deny ip 192.168.17.0 0.0.0.255 192.168.27.0 0.0.0.31
SW-core(config)#access-list 110 deny ip 192.168.17.0 0.0.0.255 192.168.37.0 0.0.0.15
SW-core(config)#access-list 110 deny ip 192.168.17.0 0.0.0.255 192.168.47.0 0.0.0.7
SW-core(config)#
SW-core(config)#ex
```

Figure 11:Assign VLANs to ports

#### ❖ Routing Configuration

```
SW-core#en
SW-core#conf
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
SW-core(config)#int g0/1
SW-core(config-if)#no shu
SW-core(config-if)#no switchport
SW-core(config-if)#ip add 1.1.1.1 255.255.255.252
SW-core(config-if)#ex
SW-core(config)#ip route 0.0.0.0 0.0.0.0 1.1.1.2
SW-core(config)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
```

Figure 12:Routing Configuration

#### ❖ Border Router Configuration

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int g0/0
Router(config-if)#no shu

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)#ip add 1.1.1.2 255.255.255.252
Router(config-if)#ex
Router(config)#ip routr 0.0.0.0 0.0.0.0 1.1.1.1
^
% Invalid input detected at '^' marker.

Router(config)#ip route 0.0.0.0 0.0.0.0 1.1.1.1
Router(config)#
Router(config)#int g0/1
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
ip add 2.2.2.2 255.255.255.252
Router(config-if)#ex
Router(config)#ip route 0.0.0.0 0.0.0.0 2.2.2.1
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
%IP-4-DUPADDR: Duplicate address 2.2.2.2 on GigabitEthernet0/1, sourced by 0002.4A80.B304

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to down
```

*Figure 13:Border Router Configuration*

#### ❖ ISP Router Configuration:



```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int g0/0
Router(config-if)#no shu

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)#ip add 1.1.1.2 255.255.255.252
Router(config-if)#ex
Router(config)#ip routr 0.0.0.0 0.0.0.0 1.1.1.1
      ^
% Invalid input detected at '^' marker.

Router(config)#ip route 0.0.0.0 0.0.0.0 1.1.1.1
Router(config)#
Router(config)#int g0/1
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
ip add 2.2.2.2 255.255.255.252
Router(config-if)#ex
Router(config)#ip route 0.0.0.0 0.0.0.0 2.2.2.1
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
%IP-4-DUPADDR: Duplicate address 2.2.2.2 on GigabitEthernet0/1, sourced by 0002.4A80.B304

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to down
```

*Figure 14:ISP Router Configuration*

### ❖ Internet Router Configuration

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int g0/0
Router(config-if)#no shut

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
ip add 3.3.3.2 255.255.255.252
Router(config-if)#ex
Router(config)#ip route 0.0.0.0 0.0.0.0 3.3.3.1
Router(config)#
```

*Figure 15:Internet Router Configuration*

### ❖ Servers DHCP configuration

Figure 16: Servers DHCP configuration

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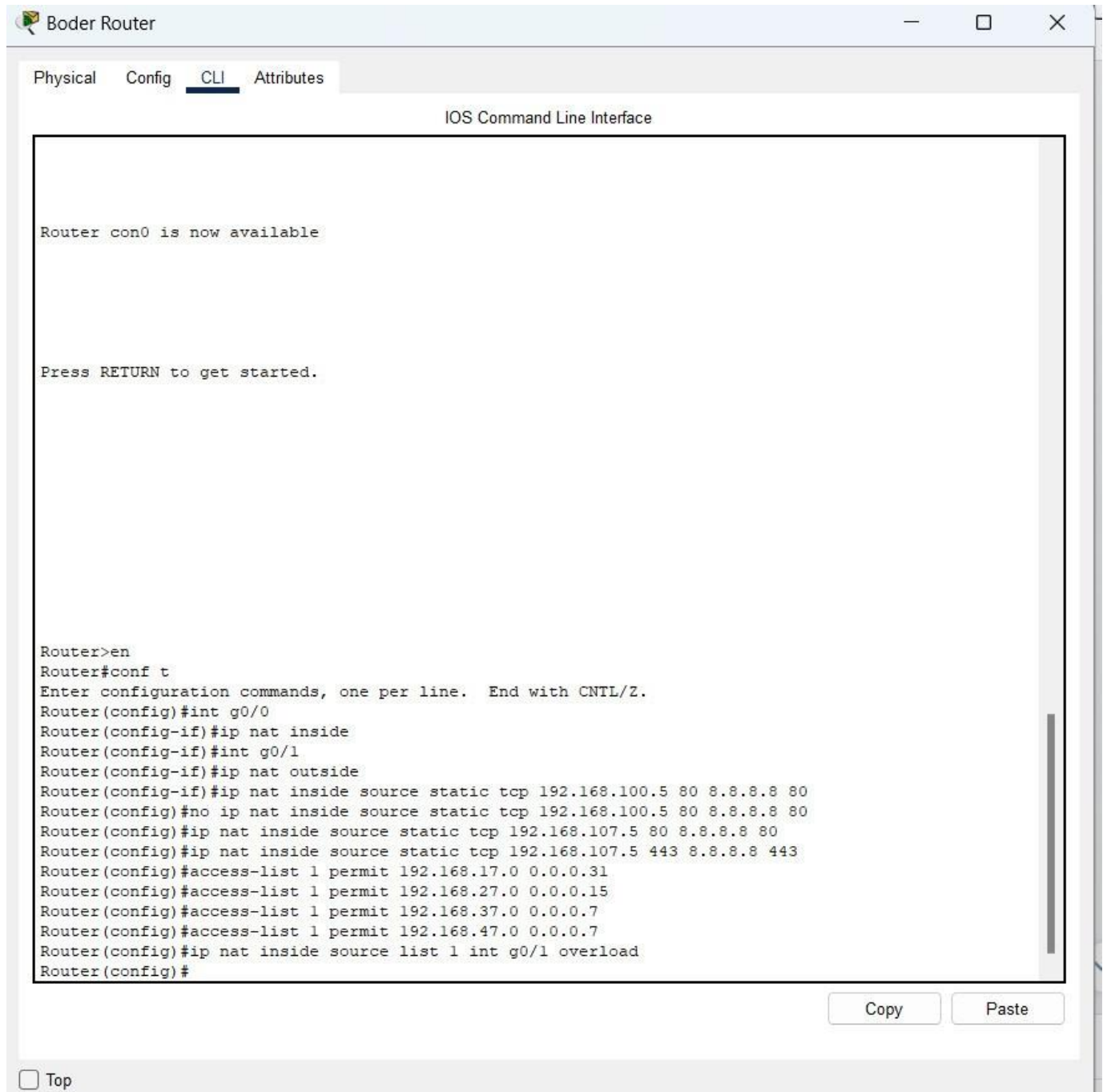


Figure 17: Boder router configuration

## P8. Document and analyze test results against expected results

- Set passwords for console and enable mode

Switch>en

Switch#conf t

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

```
Switch(config)#hostname SW-core
SW-core(config)#line console 0
SW-core(config-line)#password 123
SW-core(config-line)#login
Switch>en
Switch#conf t
Switch(config)#Enable secret admin
Switch(config)#exit
```

- **Set the domain, mode, and VTP password.**

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW-core(config)#line vty 0 4
SW-core(config-line)#password cisco123
SW-core(config-line)#login
SW-core(config-line)#^Z
SW-core#
%SYS-5-CONFIG_I: Configured from console by console
conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW-core(config)#vtp domain btec.vn
Changing VTP domain name from NULL to btec.vn
SW-core(config)#vtp mode server
Device mode already VTP SERVER.
SW-core(config)#vtp password btec123
```

- **Configure trunk ports on interfaces f0/1-4.**

```
Setting device VLAN database password to btec123
SW-core(config)#int range f0/1-4
SW-core(config-if-range)#sw trunk enc dot1Q
SW-core(config-if-range)#sw mode trunk
SW-core(config-if-range)#end
```

- **Name the Vlans**

```
SW-core#en
SW-core#conf t
```

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

```
SW-core(config)#ip routing
```

```
SW-core(config)#vlan 17
```

```
SW-core(config-vlan)#name teacher
```

```
SW-core(config-vlan)#vlan 27
```

```
SW-core(config-vlan)#name SEO
```

```
SW-core(config-vlan)#vlan 37
```

```
SW-core(config-vlan)#name Head
```

```
SW-core(config-vlan)#vlan 47
```

```
SW-core(config-vlan)#name IT
```

```
SW-core(config-vlan)#vlan 57
```

```
SW-core(config-vlan)#name student
```

```
SW-core(config-vlan)#vlan 107
```

```
SW-core(config-vlan)#name server
```

```
SW-core(config-vlan)#int vlan 17
```

- **IP address for each vlan**

```
SW-core(config-vlan)#int vlan 17
```

```
SW-core(config-if)#ip add 192.168.17.1 255.255.255.224
```

```
SW-core(config-if)#no shutdown
```

```
SW-core(config-if)#int vlan 27
```

```
SW-core(config-if)#ip add 192.168.27.1 255.255.255.240
```

```
SW-core(config-if)#no shutdown
```

```
SW-core(config-if)#int vlan 37
```

```
SW-core(config-if)#ip add 192.168.37.1 255.255.255.248
```

```
SW-core(config-if)#no shutdown
```

```
SW-core(config-if)#int vlan 47
```

```
SW-core(config-if)#ip add 192.168.47.1 255.255.255.248
```

```
SW-core(config-if)#no shutdown
```

```
SW-core(config-if)#int vlan 57
SW-core(config-if)#ip add 192.168.57.1 255.255.255.0
SW-core(config-if)#no shutdown
SW-core(config-if)#int vlan 107
SW-core(config-if)#ip add 192.168.107.1 255.255.255.248
SW-core(config-if)#no shutdown
SW-core(config-if)#exit
```

- **relay Configuration:**

```
SW-core(config)#int vlan 17
SW-core(config-if)#ip helper-address 192.168.107.2
SW-core(config-if)#int vlan 27
SW-core(config-if)#ip helper-address 192.168.107.2
SW-core(config-if)#int vlan 37
SW-core(config-if)#ip helper-address 192.168.107.2
SW-core(config-if)#int vlan 47
SW-core(config-if)#ip helper-address 192.168.107.2
SW-core(config-if)#int vlan 57
SW-core(config-if)#ip helper-address 192.168.107.2
```

- **Assign VLANs to ports**

```
SW-core(config)#access-list 110 deny ip 192.168.17.0.0.0.0.255 192.168.27.0.0.0.0.31
SW-core(config)#access-list 110 deny ip 192.168.17.0.0.0.0.255 192.168.37.0.0.0.0.15
SW-core(config)#access-list 110 deny ip 192.168.17.0.0.0.0.255 192.168.47.0.0.0.0.7
```

- **Routing Configuration**

```
SW-core(config-if)#int g0/1
SW-core(config-if)#ip address 1.1.1.1 255.255.255.252
SW-core(config-if)#no shutdown
```

- **Configuration on Sw-staff**

```
Switch(config)#hostname SW-Staff
SW-Staff(config)#vtp domain btec.vn
Changing VTP domain name from NULL to btec.vn
SW-Staff(config)#vtp mode client
Setting device to VTP CLIENT mode.
SW-Staff(config)#vtp pass btec123
Setting device VLAN database password to btec123
SW-Staff(config)#int f0/1
```

```
SW-Staff(config-if)#sw mode trunk
SW-Staff(config-if)#int range f0/2-10
SW-Staff(config-if-range)#sw mode acc
SW-Staff(config-if-range)#sw acc vlan 17
SW-Staff(config-if-range)#int range f0/11-15
SW-Staff(config-if-range)#sw mode acc
SW-Staff(config-if-range)#sw acc vlan 27
SW-Staff(config-if-range)#int range f0/16-21
SW-Staff(config-if-range)#sw mode acc
SW-Staff(config-if-range)#sw acc vlan 37
SW-Staff(config-if-range)#int range f0/22-24
SW-Staff(config-if-range)#sw mode acc
SW-Staff(config-if-range)#sw acc vlan 47
```

- **Configuration above Sw-server**

Switch>en

Switch#conf t

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

Switch(config)#hostname SW-server

SW-server(config)#vtp domain btec.vn

Domain name already set to btec.vn.

SW-server(config)#vtp mode client

Setting device to VTP CLIENT mode.

SW-server(config)#vtp pass btec123

Setting device VLAN database password to btec123

SW-server(config)#int f0/1

SW-server(config-if)#sw mode trunk

SW-server(config-if)#int range f0/2-4

SW-server(config-if-range)#sw mode acc

SW-server(config-if-range)#sw acc vlan 107

- **Configuration on Sw-student**

```
Sw- student 1
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname SW-student1
SW-student1(config)#vtp domain btec.vn
Domain name already set to btec.vn.
SW-student1(config)#vtp mode client
Setting device to VTP CLIENT mode.
SW-student1(config)#vtp pass btec123
Setting device VLAN database password to btec123
SW-student1(config)#int f0/1
SW-student1(config-if)#sw mode trunk
SW-student1(config-if)#int range f0/2-10
SW-student1(config-if-range)#sw mode acc
SW-student1(config-if-range)#sw acc vlan 57
```

- **Border Router Configuration:**

```
Router(config)#ip route 192.168.0.0 255.255.0.0 10.10.12.1

Router(config)#ip route 0.0.0.0 0.0.0.0 1.1.1.2

Router(config)#int g0/0

Router(config)#ip add 1.1.1.2 255.255.255.252

Router(config)#no sh
```

- **ISP Router Configuration:**

```
Router(config)#int g0/0
Router(config-if)#no shut
Router(config-if)#ip add 2.2.2.1 255.255.255.252
Router(config-if)#ex
Router(config)# ip route 0.0.0.0 0.0.0.0 2.2.2.2
```

```
Router(config)#int g0/1
Router(config-if)#no shut
Router(config-if)#ex
Router(config)# ip route 0.0.0.0 0.0.0.0 3.3.3.2
```

## 2. Testting.

### 1. Testing.

- Check password

```
SW-core#show vtp as
SW-core#show vtp as
SW-core#show vtp pas
VTP Password: btec123
```

Figure 18:Check password

- Check configure VTP and check status.

```
SW-core#show vtp status
VTP Version capable      : 1 to 2
VTP version running      : 1
VTP Domain Name          : btec.vn
VTP Pruning Mode          : Disabled
VTP Traps Generation      : Disabled
Device ID                 : 0005.5EC3.C500
Configuration last modified by 0.0.0.0 at 3-1-93 00:00:00
Local updater ID is 192.168.17.1 on interface Vl17 (lowest numbered VLAN interface found)

Feature VLAN :
-----
VTP Operating Mode        : Server
Maximum VLANs supported locally : 1005
Number of existing VLANs   : 11
Configuration Revision     : 36
MD5 digest                : 0xF5 0x18 0x3E 0x88 0x4A 0x19 0xC5 0xBC
                          : 0xA3 0x3B 0xC6 0x33 0x96 0x45 0x46 0x9E
```

Figure 19:Check configure VTP and check status

- Check Vlan:

```
17  teacher  active
27  SEO      active
37  Head     active
47  IT       active
```

Figure 20:Check Vlan

## - Check Trunking

```
SW-core>en
SW-core#show int trunk
Port      Mode      Encapsulation  Status      Native vlan
Fa0/1     on        802.1q         trunking    1
Fa0/2     on        802.1q         trunking    1
Fa0/3     on        802.1q         trunking    1
Fa0/4     on        802.1q         trunking    1

Port      Vlans allowed on trunk
Fa0/1     1-1005
Fa0/2     1-1005
Fa0/3     1-1005
Fa0/4     1-1005

Port      Vlans allowed and active in management domain
Fa0/1     1,17,27,37,47,57,107
Fa0/2     1,17,27,37,47,57,107
Fa0/3     1,17,27,37,47,57,107
Fa0/4     1,17,27,37,47,57,107

Port      Vlans in spanning tree forwarding state and not pruned
Fa0/1     1,17,27,37,47,57,107
Fa0/2     1,17,27,37,47,57,107
Fa0/3     1,17,27,37,47,57,107
Fa0/4     1,17,27,37,47,57,107
```

Figure 21:Check Trunking

## - Check configure VTP and check status of Sw- server:

```
SW-server#show vtp status
VTP Version capable      : 1 to 2
VTP version running      : 1
VTP Domain Name          : btec.vn
VTP Pruning Mode         : Disabled
VTP Traps Generation     : Disabled
Device ID                : 0001.64CC.3600
Configuration last modified by 0.0.0.0 at 3-1-93 00:00:00

Feature VLAN :
-----
VTP Operating Mode       : Client
Maximum VLANs supported locally : 255
Number of existing VLANs : 11
Configuration Revision   : 48
MD5 digest               : 0x15 0x63 0x4A 0xDF 0x8F 0x09 0x1E 0xD3
                        : 0x1F 0x72 0x9A 0xDB 0x1F 0x40 0xBE 0x22
```

Figure 22:Check configure VTP and check status of Sw- server



- Check configure VTP and check status of Sw- staff:

```
SW-Staff>en
SW-Staff#show vtp status
VTP Version capable      : 1 to 2
VTP version running      : 1
VTP Domain Name         : btec.vn
VTP Pruning Mode         : Disabled
VTP Traps Generation     : Disabled
Device ID                : 000A.F38E.0400
Configuration last modified by 0.0.0.0 at 3-1-93 00:00:00

Feature VLAN :
-----
VTP Operating Mode       : Client
Maximum VLANs supported locally : 255
Number of existing VLANs : 11
Configuration Revision   : 48
MD5 digest               : 0x15 0x63 0x4A 0xDF 0x8F 0x09 0x1E 0xD3
                        : 0x1F 0x72 0x9A 0xDB 0x1F 0x40 0xBE 0x22
```

*Figure 23:Check configure VTP and check status of Sw- staff*

- Check configure VTP and check status of Sw- student:

```
SW-student1#show vtp status
VTP Version capable      : 1 to 2
VTP version running      : 1
VTP Domain Name         : btec.vn
VTP Pruning Mode         : Disabled
VTP Traps Generation     : Disabled
Device ID                : 0001.6421.5300
Configuration last modified by 0.0.0.0 at 3-1-93 00:00:00

Feature VLAN :
-----
VTP Operating Mode       : Client
Maximum VLANs supported locally : 255
Number of existing VLANs : 11
Configuration Revision   : 48
MD5 digest               : 0x15 0x63 0x4A 0xDF 0x8F 0x09 0x1E 0xD3
                        : 0x1F 0x72 0x9A 0xDB 0x1F 0x40 0xBE 0x22
```

*Figure 24:Check configure VTP and check status of Sw- student*

- Check services DHCP:

**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 : 192 168 107 0

Subnet Mask: 255 255 255 248

Maximum Number of Users : 512

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

Buttons: Add Save Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
student	192.168.57.1	192.168.1...	192.168.57.2	255.255.2...	250	0.0.0.0	0.0.0.0
IT	192.168.47.1	192.168.1...	192.168.47.2	255.255.2...	6	0.0.0.0	0.0.0.0
head	192.168.37.1	192.168.1...	192.168.37.2	255.255.2...	6	0.0.0.0	0.0.0.0
SEO	192.168.27.1	192.168.1...	192.168.27.2	255.255.2...	10	0.0.0.0	0.0.0.0
teacher	192.168.17.1	192.168.1...	192.168.17.2	255.255.2...	25	0.0.0.0	0.0.0.0
serverPool	0.0.0.0	0.0.0.0	192.168.1...	255.255.2...	512	0.0.0.0	0.0.0.0

Figure 25: Check services DHCP

- **TC-1 computer is dynamically assigned IP by DHCP:**

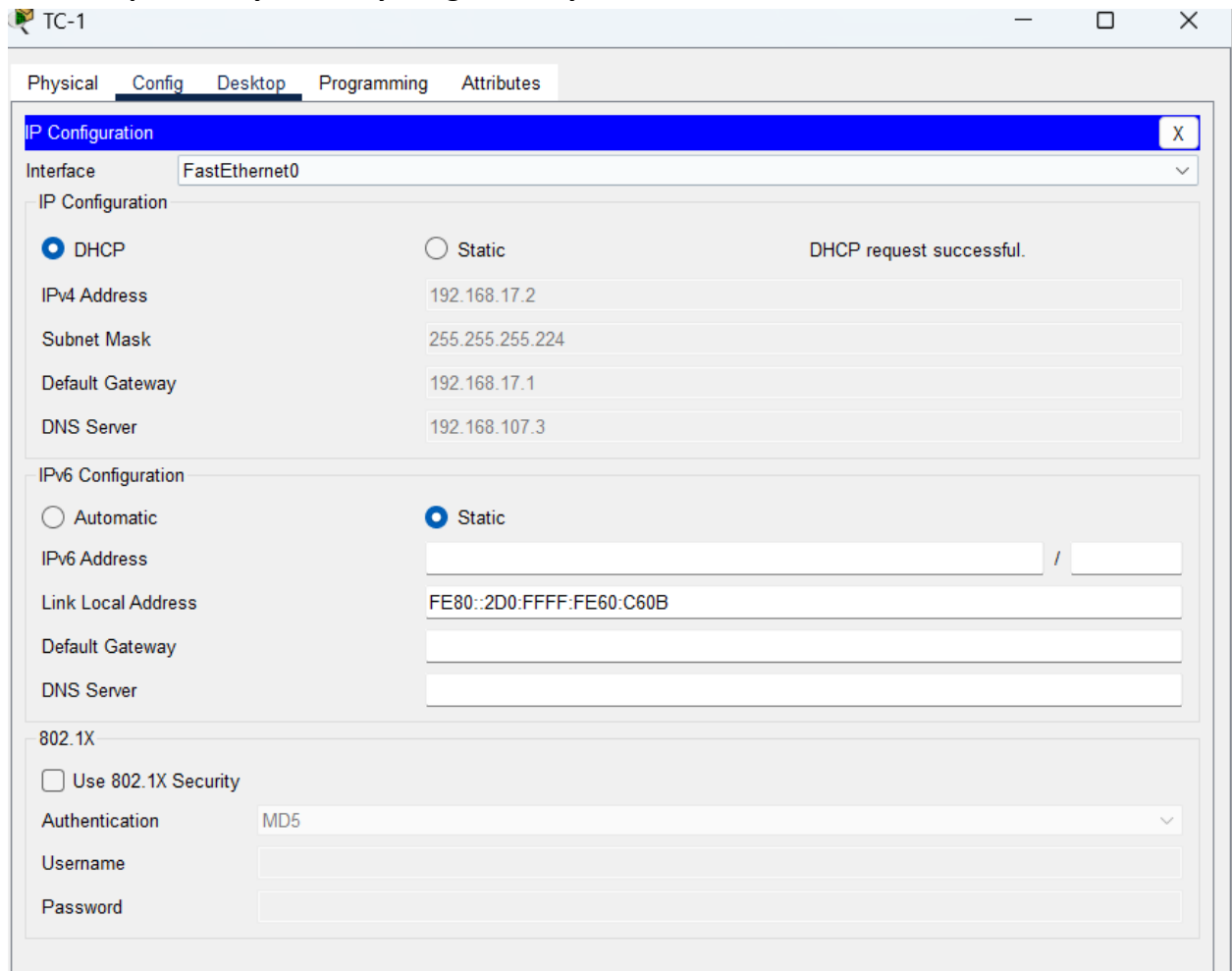


Figure 26:TC-1 computer is dynamically assigned IP by DHCP

- **Ping Realtime:**

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	TC-1	Sw-Core	ICMP		0.000	N	0	(edit)	(delete)
	Successful	TC-1	DHCP	ICMP		0.000	N	1	(edit)	(delete)
	Successful	TC-1	DNS	ICMP		0.000	N	2	(edit)	(delete)

Figure 27:Ping Realtime

- Check ping after configuring an access control list:





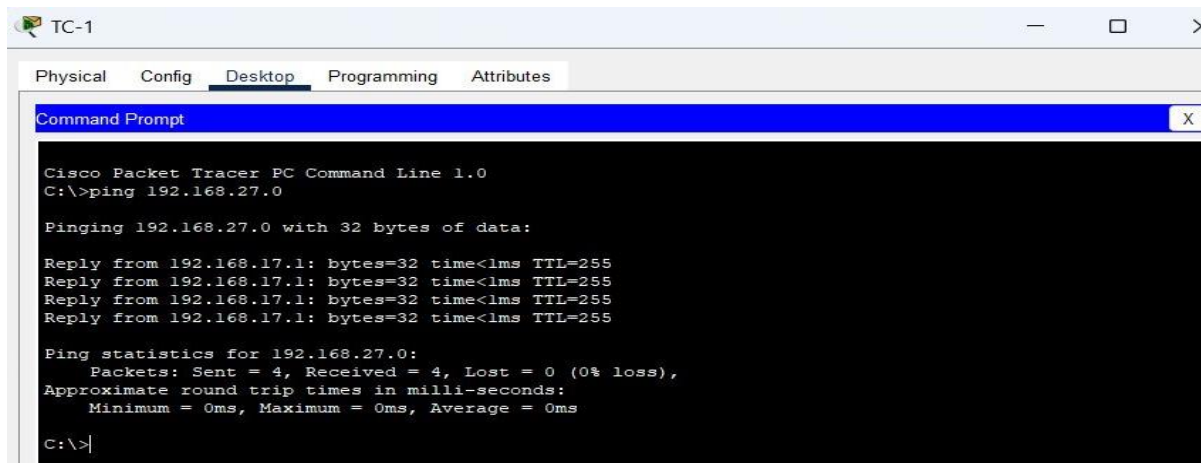
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	TC-1	PC6	ICMP		0.000	N	0	(edit)	(delete)
	Failed	Swi-S...	TC-1	ICMP		0.000	N	1	(edit)	(delete)

Figure 28: Check ping after configuring an access control list

- Check computers with different VLANs can ping each other:



```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.27.0

Pinging 192.168.27.0 with 32 bytes of data:

Reply from 192.168.17.1: bytes=32 time<1ms TTL=255
Reply from 192.168.17.1: bytes=32 time<1ms TTL=255
Reply from 192.168.17.1: bytes=32 time<1ms TTL=255
Reply from 192.168.17.1: bytes=32 time<1ms TTL=255

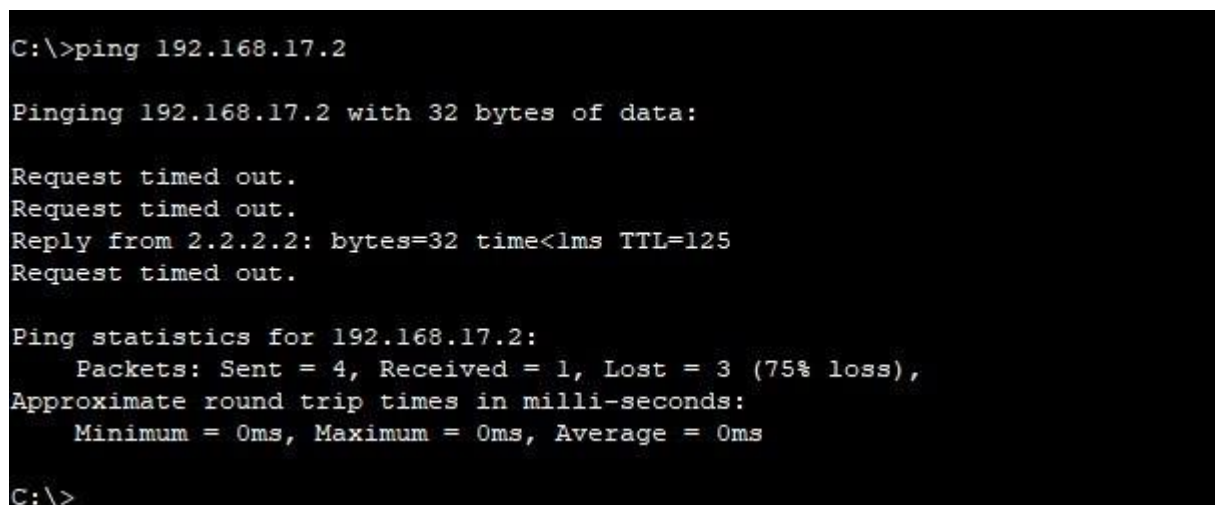
Ping statistics for 192.168.27.0:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

Figure 31: Check computers with different VLANs can ping each other

- Check ping from outside to inside after configuring NAT:



```

C:\>ping 192.168.17.2

Pinging 192.168.17.2 with 32 bytes of data:

Request timed out.
Request timed out.
Reply from 2.2.2.2: bytes=32 time<1ms TTL=125
Request timed out.

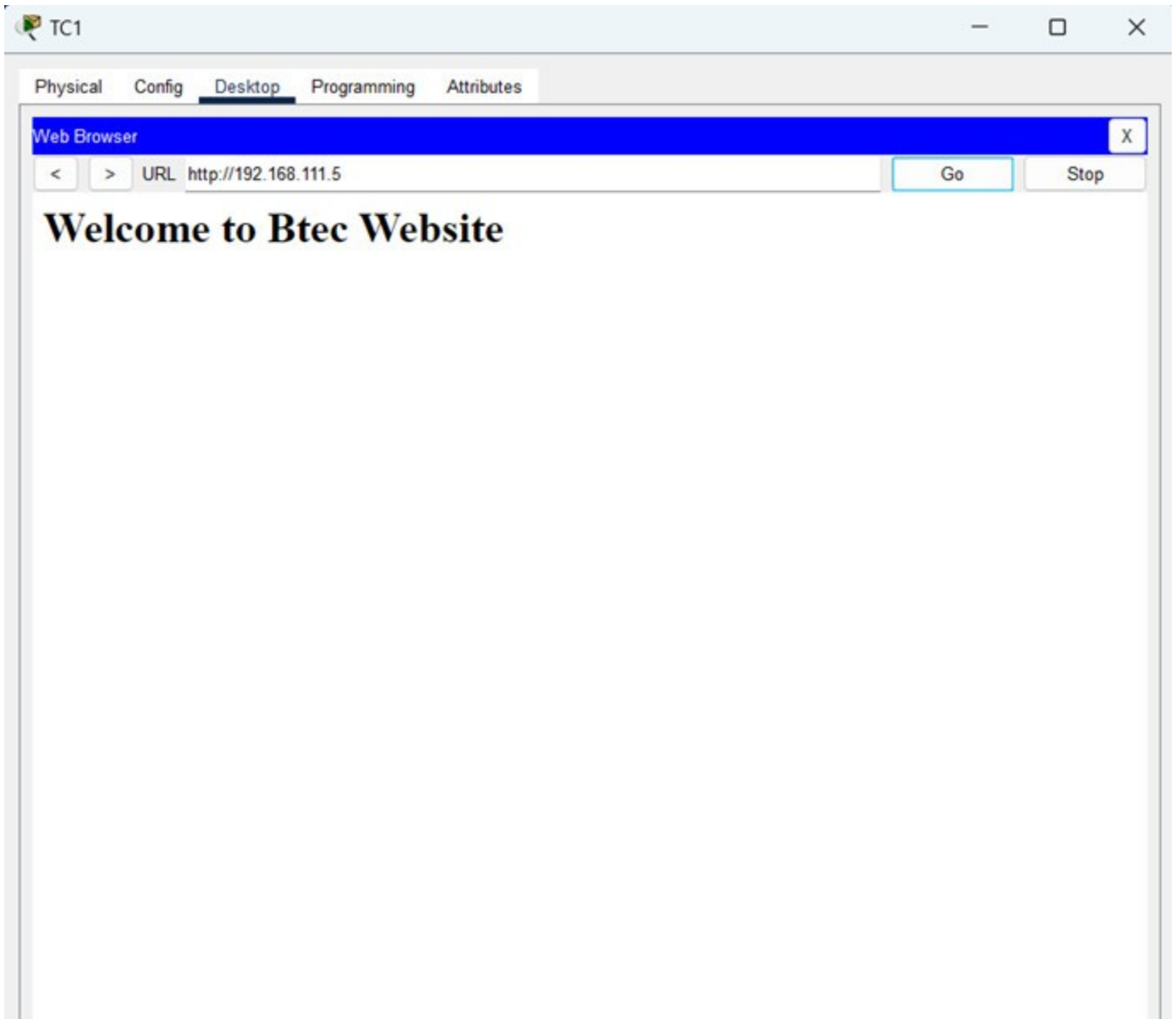
Ping statistics for 192.168.17.2:
    Packets: Sent = 4, Received = 1, Lost = 3 (75% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

Figure 29: Check ping from outside to inside after configuring NAT

Check DNS web serve:



### C. Conclusion

In conclusion, I have presented the required contents of the task are: Provide a logical and physical design of the networked system with clear explanation and addressing table; Evaluate the design to meet the requirements; Implement a networked system based on a prepared design; Document and analyze test results against expected results in this report.

### D. Reference

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