



## **CCIT FLOOR 2 NETWORK INFRASTRUCTURE**

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Class:

**2CS1**

**CEP CCIT FACULTY OF ENGINEERING**

**UNIVERSITY OF INDONESIA**

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## **PROJECT INFORMATION**

Project Title : CCIT Floor 2 Network Infrastructure

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## **CERTIFICATE OF ORIGINALITY**

This is to certify that the project report titled "CCIT Floor 2 Network Infrastructure" is an original work completed by Kheyral Sutan Dumas, Naufal Fauzan Wildani, and Wygho Sandova Putra Maulana. This project has been submitted in partial fulfillment of their course requirement at the National Institute of Information Technology (NIIT).

The project report has been prepared under our guidance and supervision, and it is ensured that the work presented in this report is the result of the individual efforts of the aforementioned students. The contents of this report have not been submitted to any other institution or organization for the award of any degree, diploma, or other similar recognition.

Author acknowledge that the ideas, designs, and implementations presented in this project report are the intellectual properties of the students mentioned above. Any use or reproduction of this work must give proper credit to the original authors.

Author hereby endorse the authenticity and originality of the work presented in this project report and confirm that it meets the academic standards and requirements set forth by the National Institute of Information Technology (NIIT).

## **ACKNOWLEDGEMENT**

Author would like to acknowledge the completion of the insightful paper entitled "CCIT Floor 2 Network Infrastructure." This paper comprehensively discusses the integration of Networking Technology in the functioning of analyzing efficiency, security, and convenience inside the infrastructure.

The contents of this paper provide a detailed overview of potential benefits of Networking Technology. The authors have meticulously examined the various aspects of Network Technology, such as Routing, IP Services, Webserver, and other Network services. Furthermore, the paper explores the challenges associated with the implementation of Networking in CCIT, offering valuable insights for future research and development in this area.

Overall, the paper serves as a significant contribution to the growing body of knowledge on Networking applications in the context of implementing network infrastructure.

Depok, 4 April 2024

Authors

## **SYSTEM ANALYSIS**

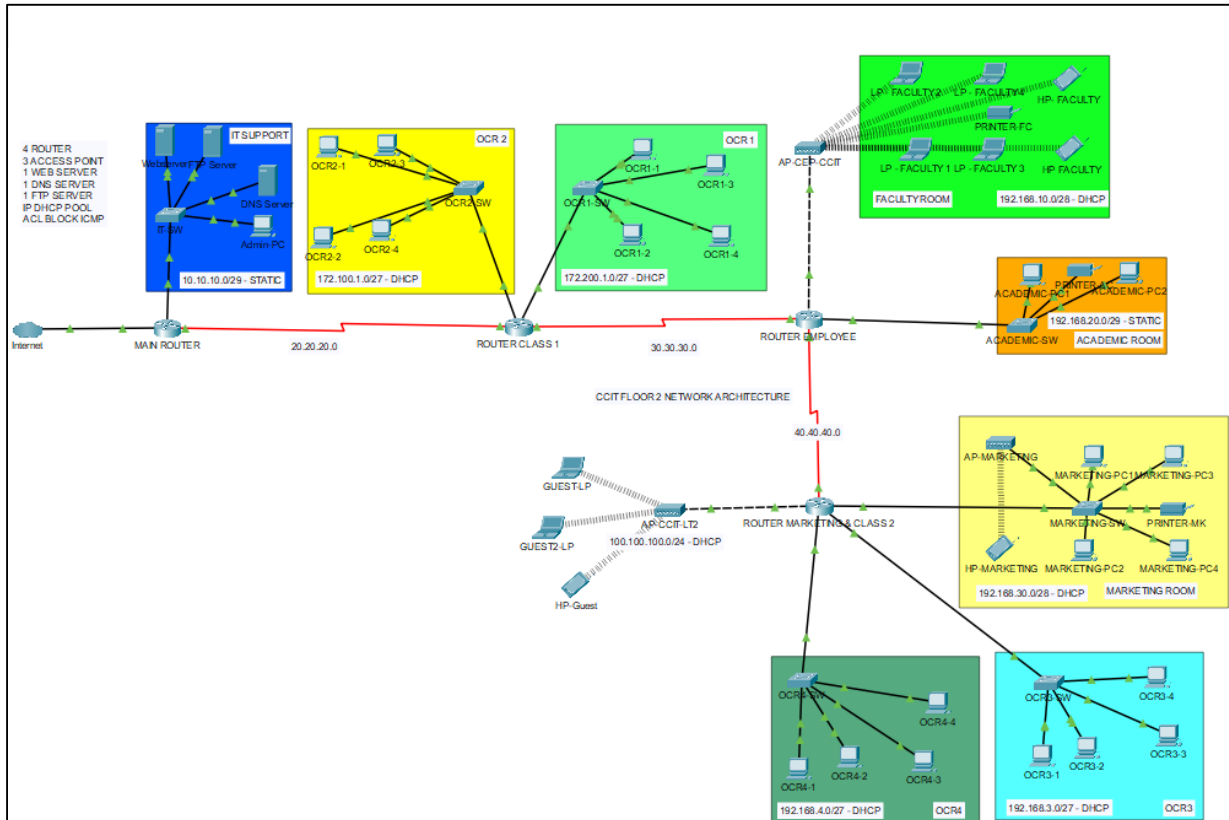
This paper "CCIT Floor2 Network Infrastructure" delves into the integration of Network Infrastructure. The study aims to research The paper specifically focusing on the infrastructure of CCIT floor 2.

The study aims to research, analyze the network architecture and resources within this particular environment, aiming to understanding its efficiency, reliability, and scalability. By examining the current infrastructure, including routers, switches, cables, and other networking components, the research endeavors to identify potential bottlenecks, vulnerabilities, and areas for improvement. Furthermore, the paper explores emerging technologies and best practices in network design and management, considering factors such as bandwidth requirements, security protocols, and future scalability.

Through rigorous empirical analysis and simulation, the study seeks to propose recommendations and strategies for optimizing the CCIT floor 2 network infrastructure, ensuring seamless connectivity, robust security, and efficient resource utilization.

Ultimately, the paper aspires to suggest a comprehensive framework for designing, implementing, and maintaining network infrastructures tailored to the specific needs and requirements of CCIT floor 2, thereby facilitating enhanced communication, collaboration, and productivity within the academic and professional community.

## NETWORK TOPOLOGY



SECTION	NETWORK ADDRESS	SUBNETMASK	AVAILABLE HOST
IT SUPPORT	10.10.10.0	255.255.255.248	6
OCR 2	172.100.1.0	255.255.255.224	30
OCR 1	172.200.1.0	255.255.255.224	30
FACULTY	192.168.10.0	255.255.255.240	14
ACADEMIC	192.168.20.0	255.255.255.248	4
MARKETING	192.168.30.0	255.255.255.240	14
WIFI MKTING	192.168.30.0	255.255.255.240	14
WIFI CCIT LT2	100.100.100.0	255.255.255.0	254
OCR 4	192.168.4.0	255.255.255.224	30
OCR 3	192.168.3.0	255.255.255.224	30

## NETWORK DEVICES

### IT Support

Devices	Device Name	IP Address	Gateway	Features
Routers PT-Empty	Main-Router	FA 0/0 10.10.10.1/29 SE 0/1 20.20.20.1	ISP IP	Routing Information Protocol (RIP)
Server	Web DNS FTP	10.10.10.2 10.10.10.5 10.10.10.3	10.10.10.1	- Webserver - DNS - FTP
Switch PT-Empty	IT-SW	-	-	-
PC	Admin-PC	10.10.10.4	10.10.10.1	- Browser - CMD

### OCR 2

Devices	Device Name	IP Address	Gateway	Features
Routers PT-Empty	Router-Class1	FA 2/0 172.100.1.1/27 SE 1/0 30.30.30.1	SE 0/0 20.20.20.2	- DHCP Pool - Access Control List - RIP
Switch PT-Empty	OCR2-SW	-	-	-
PC	OCR2-1 s/d 4	172.100.1.0/27 (DHCP)	172.100.1.1	- Browser - CMD

## NETWORK DEVICES

### OCR 1

Devices	Device Name	IP Address	Gateway	Features
Routers PT-Empty	Router- Class1	FA 3/0 172.200.1.1/27 SE 1/0 30.30.30.1	SE 0/0 20.20.20.2	- RIP - DHCP Pool - ACL
Switch PT-Empty	OCR1-SW	-	-	-
PC	OCR1-1 s/d 4	172.200.1.0/27 (DHCP)	172.200.1.1	- Browser - CMD

### Faculty

Devices	Device Name	IP Address	Gateway	Features
Routers PT-Empty	Router- Employee	FA 2/0 192.168.10.1/28 SE 1/0 40.40.40.1	SE 0/0 30.30.30.2	- RIP - DHCP Pool - ACL
Access Point-PT	CCIT- Faculty	-	192.168.10.1	-
Laptop	LP-1 s/d 4	192.168.10.0/28 (DHCP)	192.168.10.1	- Browser - CMD - Wireless



## NETWORK DEVICES

### Academic

Devices	Device Name	IP Address	Gateway	Features
Routers PT-Empty	Router- Employee	FA 3/0 192.168.20.1/29 SE 0/1 40.40.40.1/8	SE 0/0 30.30.30.2/8	- DHCP Pool - ACL - RIP
Switch PT-Empty	Academic- SW	-	-	-
PC	Academic PC 1 s/d 2	192.168.20.2/29 192.168.20.3/29	FA 3/0 192.168.20.1	- Browser - CMD
Printer	Printer-AC	192.168.20.4/29	192.168.20.1	- Wireless

### Guest

Devices	Device Name	IP Address	Gateway	Features
Routers PT-Empty	Router- Marketing &Class 2	FA 1/0 100.100.100.1/24	SE 0/0 40.40.40.2/8	- DHCP Pool - ACL - RIP
Access Point-PT	CCIT-LT2	-	100.100.100.1	- Wireless
Laptop	LP-Guest 1 s/d 2	100.100.100.0/24	100.100.100.1	- Browser - CMD - Wireless
Handphone	HP-Guest	100.100.100.0/24	100.100.100.1	- Wireless

## NETWORK DEVICES

### Marketing

Devices	Device Name	IP Address	Gateway	Features
Routers PT-Empty	Router-Marketing &Class 2	FA 2/0 192.168.30.1/28	SE 0/0 40.40.40.2/8	- DHCP Pool - ACL - RIP
Switch PT-Empty	Marketing-SW	-	-	-
Access Point-PT	CCIT-Marketing	-	192.168.30.1	- Wireless
PC	Marketing-PC 1 s/d 4	192.168.30.0/28	192.168.30.1	- Browser - CMD -Wireless
Printer	Printer-MK	192.168.30.0/28	192.168.30.1	- Wireless
Handphone	HP-Guest	192.168.30.0/28	192.168.30.1	- Wireless

## NETWORK DEVICES

### OCR 4

Devices	Device Name	IP Address	Gateway	Features
Routers PT-Empty	Router-Marketing &Class 2	FA 3/0 192.168.4.1/27	SE 0/0 40.40.40.2/8	- DHCP Pool - ACL - RIP
Switch PT-Empty	OCR1-SW	-	-	-
PC	OCR1-1 s/d 4	192.168.4.0/27 (DHCP)	192.168.4.1	- Browser - CMD

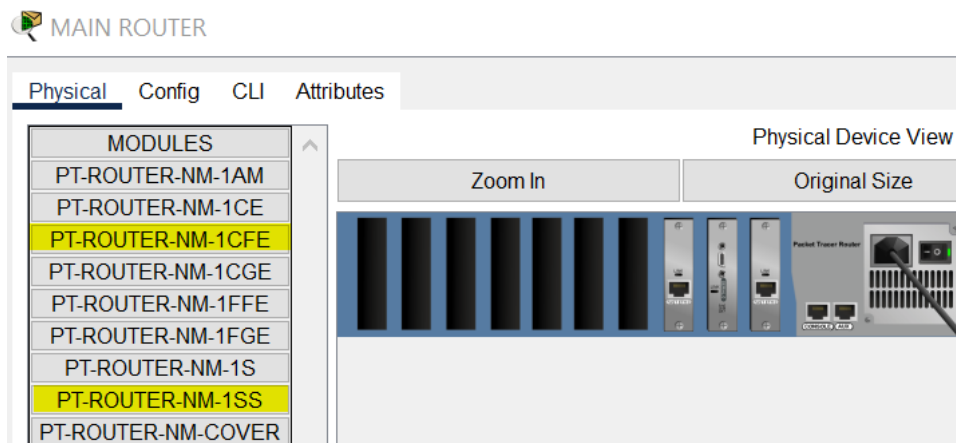
### OCR 3

Devices	Device Name	IP Address	Gateway	Features
Routers PT-Empty	Router-Marketing &Class 2	FA 4/0 192.168.3.1/27	SE 0/0 40.40.40.2/8	- DHCP Pool - ACL - RIP
Switch PT-Empty	OCR1-SW	-	-	-
PC	OCR1-1 s/d 4	192.168.3.0/27 (DHCP)	192.168.3.1	- Browser - CMD

## CONFIGURATION

### 1. Setting up interfaces on PT-Empty Devices

Interfaces should be installed on each PT-Empty device to establish connectivity within the network topology.

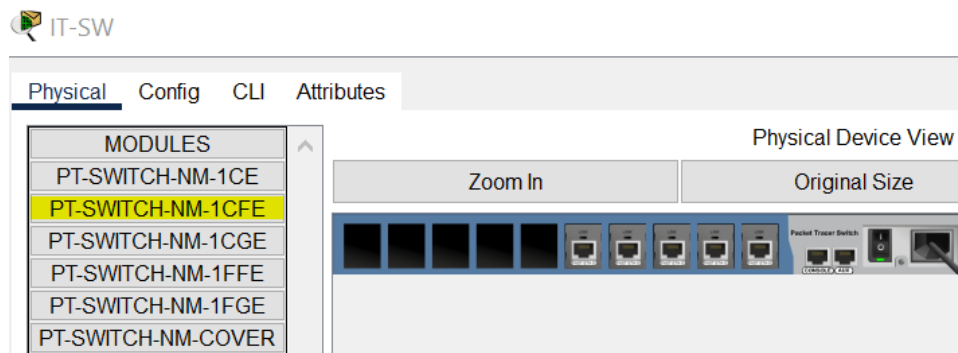


The Fast Ethernet interface should be equipped with module 1CFE, while the serial interface should utilize module 1SS for optimal performance and compatibility.

This procedure should be replicated across all routers, with necessary adjustments made to accommodate the specific port and interface requirements dictated by the network topology.

## CONFIGURATION

Similar configuration steps should be undertaken for switches, but switches will only employ module 1CFE for interface configuration.



Next, establish connections using cables based on the following criteria:

DEVICES	CABLES
Router to Router	Serial Interfaces
Router to Switch	Straight Trough – Fast Ethernet
Router to Access Point	Cross Over – Fast Ethernet
Switch to End-Devices	Straight Trough – Fast Ethernet
Switch to Server	Straight Trough – Fast Ethernet
Switch to Access Point	Straight Trough – Fast Ethernet

## CONFIGURATION

### 2. Configuration within Routers

Configuration with the routers will be initiated first. The Command Line Interface (CLI) can be accessed by opening the router interface. All settings within this router should be noted and retained. Adjust interface configurations according to the cable topology specific to your devices. IP Address configuration should be prioritized initially.

Follow the command bellow in Command Line Interface. After this step is to repeat the main router's configurations for routers with DHCP clients, as well as to set up extra DHCP settings.

#### MAIN ROUTER (STATIC)

##### // Enabling router privileges mode

```
Router> enable
```

```
Router# configure terminal
```

##### // Setup router password

```
Router(config)# enable password routerpassword1
```

##### // Setup IP Network IT Support

```
Router(config)# interface fastethernet 0/0
```

```
Router(config-if)# ip address 10.10.10.1 255.255.255.248
```

```
Router(config-if)# no shutdown
```

##### // Setup IP Network Serial Interfaces

```
Router(config)# interface serial 1/0
```

```
Router(config-if)# ip address 20.20.20.1 255.0.0.0
```

```
Router(config-if)# no shutdown
```

## CONFIGURATION

### ROUTER CLASS 1 (DHCP)

#### // Enabling router privileges mode

Router> enable

Router# configure terminal

#### // Setup router password

Router(config)# enable password routerpassword2

#### // Setup IP Network OCR2 and OCR3

Router(config)# interface fastethernet 2/0

Router(config-if)# ip address 172.100.1.1 255.255.255.224

Router(config-if)# no shutdown

Router(config-if)# exit

Router(config)# interface fastethernet 3/0

Router(config-if)# ip address 172.200.1.1 255.255.255.224

Router(config-if)# no shutdown

#### // Setup IP Network Serial Interfaces

Router(config)# interface serial 0/0

Router(config-if)# ip address 20.20.20.2 255.0.0.0

Router(config-if)# no shutdown

Router(config)# exit

Router(config)# interface serial 1/0

Router(config-if)# ip address 30.30.30.1 255.0.0.0

Router(config-if)# no shutdown

#### //Setup DHCP Pool OCR2 and OCR1

Router(config)# ip dhcp pool OCR2

Router(dhcp-config)# network 172.100.1.0 255.255.255.224

Router(dhcp-config)# default-router 172.100.1.1

Router(dhcp-config)# dns-server 10.10.10.5

Router(dhcp-config)# exit

Router(config)# ip dhcp pool OCR1

Router(dhcp-config)# network 172.200.1.0 255.255.255.224

Router(dhcp-config)# default-router 172.200.1.1

Router(dhcp-config)# dns-server 10.10.10.5

## CONFIGURATION

### ROUTER EMPLOYEE (DHCP & STATIC)

#### // Enabling router privileges mode

Router> enable

Router# configure terminal

#### // Setup router password

Router(config)# enable password routerpassword3

#### // Setup IP Network FACULTY and ACADEMIC

Router(config)# interface fastethernet 2/0

Router(config-if)# ip address 192.168.10.1 255.255.255.224

Router(config-if)# no shutdown

Router(config-if)# exit

Router(config)# interface fastethernet 3/0

Router(config-if)# ip address 192.168.20.1 255.255.255.224

Router(config-if)# no shutdown

#### // Setup IP Network Serial Interfaces

Router(config)# interface serial 0/0

Router(config-if)# ip address 30.30.30.2 255.0.0.0

Router(config-if)# no shutdown

Router(config)# interface serial 1/0

Router(config-if)# ip address 40.40.40.1 255.0.0.0

Router(config-if)# no shutdown

#### //Setup DHCP Pool FACULTY

Router(config)# ip dhcp pool FACULTY

Router(dhcp-config)# network 192.168.10.0 255.255.255.240

Router(dhcp-config)# default-router 192.168.10.1

Router(dhcp-config)# dns-server 10.10.10.5

#### // ACADEMIC IP is Static



## CONFIGURATION

### ROUTER MARKETING & CLASS 2 (DHCP)

#### // Enabling router privileges mode

```
Router> enable
```

```
Router# configure terminal
```

#### // Setup router password

```
Router(config)# enable password routerpassword4
```

#### // Setup IP Network MARKETING & WiFi, GUEST, OCR4, and OCR3

```
Router(config)# interface fastethernet 2/0
```

```
Router(config-if)# ip address 192.168.30.1 255.255.255.240
```

```
Router(config-if)# no shutdown
```

```
Router(config-if)# exit
```

```
Router(config)# interface fastethernet 1/0
```

```
Router(config-if)# ip address 100.100.100.1 255.255.255.0
```

```
Router(config-if)# no shutdown
```

```
Router(config-if)# exit
```

```
Router(config)# interface fastethernet 3/0
```

```
Router(config-if)# ip address 192.168.4.1 255.255.255.224
```

```
Router(config-if)# no shutdown
```

```
Router(config-if)# exit
```

```
Router(config)# interface fastethernet 4/0
```

```
Router(config-if)# ip address 192.168.3.1 255.255.255.224
```

```
Router(config-if)# no shutdown
```

#### // Setup IP Network Serial Interfaces

```
Router(config)# interface serial 0/0
```

```
Router(config-if)# ip address 40.40.0.2 255.0.0.0
```

```
Router(config-if)# no shutdown
```

## CONFIGURATION

### **// Setup DHCP Pool for MARKETING & WiFi, GUEST, OCR4, OCR3**

```
Router(config)# ip dhcp pool MARKETING
Router(dhcp-config)# network 192.168.30.0 255.255.255.240
Router(dhcp-config)# default-router 192.168.30.1
Router(dhcp-config)# dns-server 10.10.10.5
Router(dhcp-config)# exit
Router(config)# ip dhcp pool CCIT-LT2
Router(dhcp-config)# network 100.100.100.0 255.255.255.0
Router(dhcp-config)# default-router 100.100.100.1
Router(dhcp-config)# dns-server 10.10.10.5
Router(dhcp-config)# exit
Router(config)# ip dhcp pool OCR4
Router(dhcp-config)# network 192.168.4.0 255.255.255.224
Router(dhcp-config)# default-router 192.168.4.1
Router(dhcp-config)# dns-server 10.10.10.5
Router(dhcp-config)# exit
Router(config)# ip dhcp pool OCR3
Router(dhcp-config)# network 192.168.3.0 255.255.255.224
Router(dhcp-config)# default-router 192.168.3.1
Router(dhcp-config)# dns-server 10.10.10.5
```

## CONFIGURATION

After the IP addresses have been assigned, routing will be configured, which involves creating paths to connect all of the different networks using the dynamic Routing Information Protocol (RIP), starting with the main router and continuing to the marketing router.

The rules of RIP routing, put the source network (the section IP that has been assigned) and the paths network (the IP that has been assigned into the serial interface).

### Main Router

The screenshot shows the configuration window for the 'MAIN ROUTER'. The 'Config' tab is selected. In the left sidebar, the 'ROUTING' section is expanded, and 'RIP' is highlighted. The main area shows the 'RIP Routing' configuration. There is a 'Network' field with a yellow 'Add' button. Below this is a table with the following data:

Network Address
10.0.0.0
20.0.0.0
30.0.0.0
40.0.0.0

### Router Class 1

The screenshot shows the configuration window for 'ROUTER CLASS 1'. The 'Config' tab is selected. In the left sidebar, the 'ROUTING' section is expanded, and 'RIP' is highlighted. The main area shows the 'RIP Routing' configuration. There is a 'Network' field with a grey 'Add' button. Below this is a table with the following data:

Network Address
20.0.0.0
30.0.0.0
40.0.0.0
172.100.0.0
172.200.0.0

# CONFIGURATION

## Router Employee

ROUTER EMPLOYEE

Physical Config CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings

**ROUTING**

- Static
- RIP**

**INTERFACE**

- Serial0/0
- Serial1/0
- FastEthernet2/0
- FastEthernet3/0

RIP Routing

Network

Add

Network Address
20.0.0.0
30.0.0.0
40.0.0.0
192.168.10.0
192.168.20.0

## Router Marketing & Class 2

ROUTER MARKETING & CLASS 2

Physical Config CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings

**ROUTING**

- Static
- RIP**

**INTERFACE**

- Serial0/0
- FastEthernet1/0
- FastEthernet2/0
- FastEthernet3/0
- FastEthernet4/0

RIP Routing

Network

Add

Network Address
20.0.0.0
30.0.0.0
40.0.0.0
100.0.0.0
192.168.3.0
192.168.4.0
192.168.30.0

## CONFIGURATION

### 3. Setting up Access Point for Faculty, Guest & Marketing

Setting up the access point for both CCIT guests and Faculty will be the next step, Don't forget to turn on port 0 also.

AP-CEP-CCIT

Physical Config Attributes

GLOBAL Settings INTERFACE Port 0 Port 1

Port 1

Port Status ☒ On

SSID CCIT-FACULTY

2.4 GHz Channel 6

Coverage Range (meters) 140.00

Authentication ☐ Disabled ☒ WPA2-PSK ☐ WEP

WEP Key

PSK Pass Phrase ccitfui

User ID

Password

Encryption Type AES

AP-CCIT-LT2

Physical Config Attributes

GLOBAL Settings INTERFACE Port 0 Port 1

Port 1

Port Status ☒ On

SSID CCIT-LT2

2.4 GHz Channel 6

Coverage Range (meters) 140.00

Authentication ☐ Disabled ☒ WPA2-PSK ☐ WEP

WEP Key

PSK Pass Phrase industry5.0

User ID

Password

Encryption Type AES

AP-MARKETING

Physical Config Attributes

GLOBAL Settings INTERFACE Port 0 Port 1

Port 1

Port Status ☒ On

SSID CCIT-MARKETING

2.4 GHz Channel 6

Coverage Range (meters) 140.00

Authentication ☐ Disabled ☒ WPA2-PSK ☐ WEP

WEP Key

PSK Pass Phrase ftuiccit

User ID

Password

Encryption Type AES

## CONFIGURATION

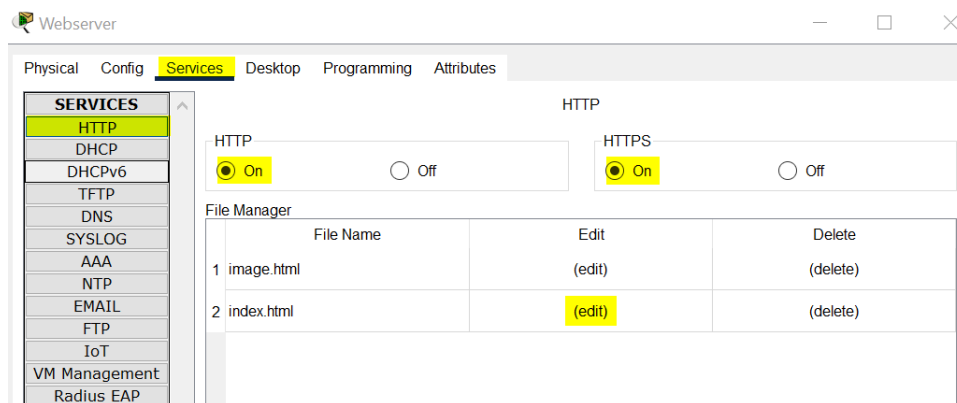
### 4. Server Configuration

All server services, including web, DNS, and FTP servers, will now be set up. It should be noted that modifications within index.html files are permissible.

In the DNS server setup, names for web domain can be inputted, along with the address of web server (which also DNS and FTP will be set up later along with end devices), and then the "add" button can be pressed.

For the FTP server configuration, the process is similar to setting up the DNS and web server. The key difference lies in the services offered. Here, admin can input usernames and passwords for the server, along with their respective permissions.

### Webserver



# CONFIGURATION

Webserver

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

```
</nav>
</header>

<section id="introduction">
<h2>About CCIT</h2>
<p>The Center for Creative Innovation and Technology (CCIT) at the Faculty of Engineering, Universitas Indonesia (FTUI) is a hub for innovation, research, and technology development.</p>
</section>

<section id="services">
<h2>Our Services</h2>
<ul>
<li>Research and Development</li>
<li>Consultancy</li>
<li>Training and Workshops</li>
<li>Prototyping Services</li>
</ul>
</section>
```

## DNS Server

DNS Server

Physical Config **Services** Desktop Programming Attributes

**SERVICES**

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

DNS

DNS Service ☒ On ☐ Off

Resource Records

Name  Type ARecord

Address

Add Save Remove

No.	Name	Type	Detail
0	ccit.com	ARcord	10.10.10.2

## FTP Server

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	admin	admin	RWDNL
2	cisco	cisco	RWDNL

Add Save Remove

## CONFIGURATION

### 5. Security Configuration with Access Control List

The final configuration involves implementing a security protocol using ACL (Access Control List). Specifically, blocking incoming ICMP protocol to the server, preventing any potential DoS attacks on the web server from within the CCIT network, this setting will be initiated to routers bellow.

#### ROUTER CLASS 1

**// Enabling router privileges mode**

Router> enable

Router# configure terminal

**// Setup ACL on Port 2/0 and 3/0**

Router(config)# access-list 100 deny icmp 172.100.1.0 0.0.0.31 host 10.10.10.2

Router(config)# access-list 100 permit ip any any

Router(config)# interface 2/0

Router(config-if)# ip access-group 100 in

Router(config-if)# exit

Router(config)# access-list 101 deny icmp 172.200.1.0 0.0.0.31 host 10.10.10.2

Router(config)# access-list 101 permit ip any any

Router(config)# interface 3/0

Router(config-if)# ip access-group 101 in



## CONFIGURATION

### ROUTER EMPLOYEE

**// Enabling router privileges mode**

Router> enable

Router# configure terminal

**// Setup ACL on Port 2/0 and 3/0**

Router(config)# access-list 100 deny icmp 192.168.10.0 0.0.0.15 host 10.10.10.2

Router(config)# access-list 100 permit ip any any

Router(config)# interface 2/0

Router(config-if)# ip access-group 100 in

Router(config-if)# exit

Router(config)# access-list 101 deny icmp 192.168.20.0 0.0.0.7 host 10.10.10.2

Router(config)# access-list 101 permit ip any any

Router(config)# interface 3/0

Router(config-if)# ip access-group 101 in

## CONFIGURATION

### ROUTER MARKETING & CLASS 2

**// Enabling router privileges mode**

Router> enable

Router# configure terminal

**// Setup ACL on Port 2/0, 1/0, 3/0 and 4/0**

Router(config)# access-list 100 deny icmp 192.168.30.0 0.0.0.15 host 10.10.10.2

Router(config)# access-list 100 permit ip any any

Router(config)# interface 2/0

Router(config-if)# ip access-group 100 in

Router(config-if)# exit

Router(config)# access-list 101 deny icmp 100.100.100.0 0.0.0.255 host 10.10.10.2

Router(config)# access-list 101 permit ip any any

Router(config)# interface 1/0

Router(config-if)# ip access-group 101 in

Router(config-if)# exit

Router(config)# access-list 102 deny icmp 192.168.4.0 0.0.0.31 host 10.10.10.2

Router(config)# access-list 102 permit ip any any

Router(config)# interface 3/0

Router(config-if)# ip access-group 102 in

Router(config-if)# exit

Router(config)# access-list 103 deny icmp 192.168.3.0 0.0.0.31 host 10.10.10.2

Router(config)# access-list 103 permit ip any any

Router(config)# interface 4/0

Router(config-if)# ip access-group 103 in

## CONFIGURATION

### 6. End-Devices & Server setup

Now it's time to configure the end devices. Configuring end devices involves simply changing the IP mode in each device and adjusting their network settings using either static or DHCP by going to desktop and click on IP Configuration.

In static networks, it's important to designate the gateway IP as the IP address of the router interface leading into the network. For example, if the network's IT section is received through interface 0/0, that interface's IP should be used as the gateway IP.

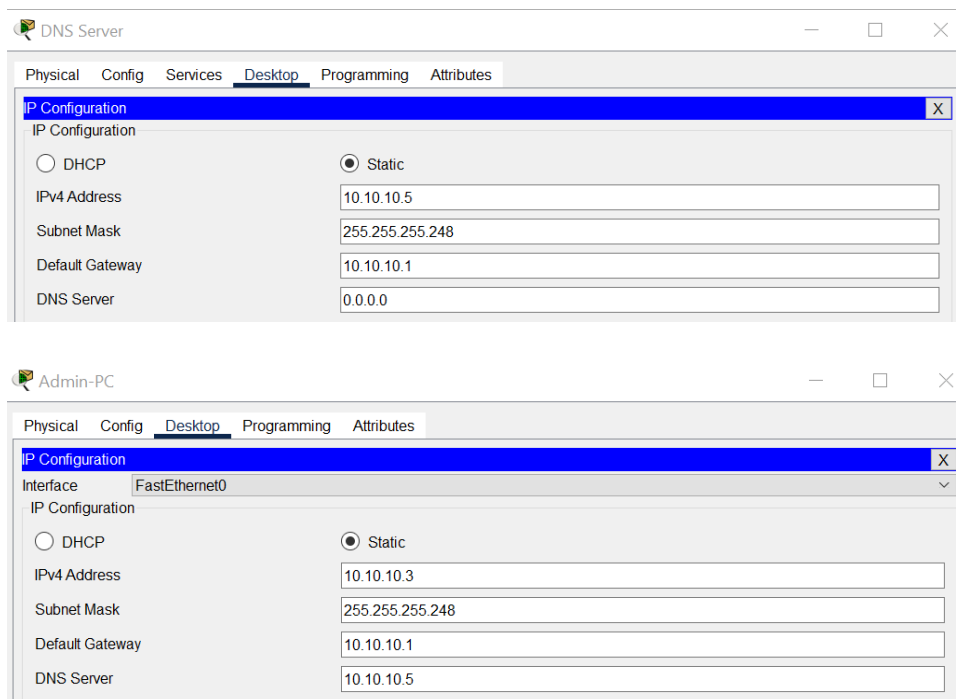
### IT Support (Static)

The image displays two screenshots of network configuration windows. The top window is titled 'FTP Server' and the bottom window is titled 'Webserver'. Both windows have a tabbed interface with 'Physical', 'Config', 'Services', 'Desktop', 'Programming', and 'Attributes' tabs. The 'Desktop' tab is selected in both. Within the 'Desktop' tab, the 'IP Configuration' sub-tab is active. In both windows, the 'Static' radio button is selected under 'IP Configuration'. The configuration fields are as follows:

Field	FTP Server Value	Webserver Value
IPv4 Address	10.10.10.6	10.10.10.2
Subnet Mask	255.255.255.248	255.255.255.248
Default Gateway	10.10.10.1	10.10.10.1
DNS Server	10.10.10.5	10.10.10.5

## CONFIGURATION

The DNS IP should be adjusted to match the one set in the DHCP pool setup otherwise, the DNS won't align with the network, causing the web server to be inaccessible through the domain name.



Additionally, for addresses within the network, options are limited to 2-6 due to the subnet's capacity of only allowing 6 hosts, with 1 already allocated to interface 0/0.

# CONFIGURATION

## OCR1 & OCR2 (DHCP)

OCR1-1

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 172.200.1.4

Subnet Mask 255.255.255.224

Default Gateway 172.200.1.1

DNS Server 10.10.10.5

OCR2-1

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 172.100.1.5

Subnet Mask 255.255.255.224

Default Gateway 172.100.1.1

DNS Server 10.10.10.5

## Academic (Static)

ACADEMIC-PC1

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.20.2

Subnet Mask 255.255.255.248

Default Gateway 192.168.20.1

DNS Server 10.10.10.5

PRINTER-AC

Physical **Config** Attributes

GLOBAL Settings

INTERFACE

FastEthernet0

Port Status ☒ On

Bandwidth ☒ Auto

Duplex ☒ Full Duplex

MAC Address 0060.5C4A.51CD

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.20.5

Subnet Mask 255.255.255.248

# CONFIGURATION

## Marketing (DHCP)

MARKETING-PC1

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 192.168.30.2

Subnet Mask 255.255.255.240

Default Gateway 192.168.30.1

DNS Server 10.10.10.15

## OCR 3 & OCR 4 (DHCP)

OCR3-1

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 192.168.3.4

Subnet Mask 255.255.255.224

Default Gateway 192.168.3.1

DNS Server 10.10.10.5

OCR4-1

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 192.168.4.5

Subnet Mask 255.255.255.224

Default Gateway 192.168.4.1

DNS Server 10.10.10.5

## CONFIGURATION

To configure the wireless network, the initial step involves changing the interface from cable to wireless.

### Faculty & Guest (Wireless DHCP)

LP - FACULTY 2

Physical Config Desktop **Programming** Attributes

MODULES

- WPC300N
- PT-LAPTOP-NM-1AM
- PT-LAPTOP-NM-1CE
- PT-LAPTOP-NM-1CFE
- PT-LAPTOP-NM-1CGE
- PT-LAPTOP-NM-1FFE
- PT-LAPTOP-NM-1FGE
- PT-LAPTOP-NM-1W
- PT-LAPTOP-NM-1W-A
- PT-LAPTOP-NM-1W-AC
- PT-LAPTOP-NM-3G/4G
- PT-HEADPHONE
- PT-MICROPHONE

Physical Device View

Zoom In Original Size

LP - FACULTY 2

Physical Config **Desktop** Programming Attributes

After click desktop find Wireless Menu.

Link Information **Connect** Profiles

Below is a list of available wireless networks. To search for more wireless networks, click the **Refresh** button. To view more information about a network, select the wireless network name. To connect to that network, click the **Connect** button below.

Wireless Network Name	CH	Signal
CCIT-LT2	1	78%
CCIT-FACULTY	1	78%

< >

Site Information

- Wireless Mode Infrastructure
- Network Type Mixed B/G
- Radio Band Auto
- Security WPA2-PSK
- MAC Address 0001.4342.2414

Refresh Connect

2.4GHz

Adapter is Active

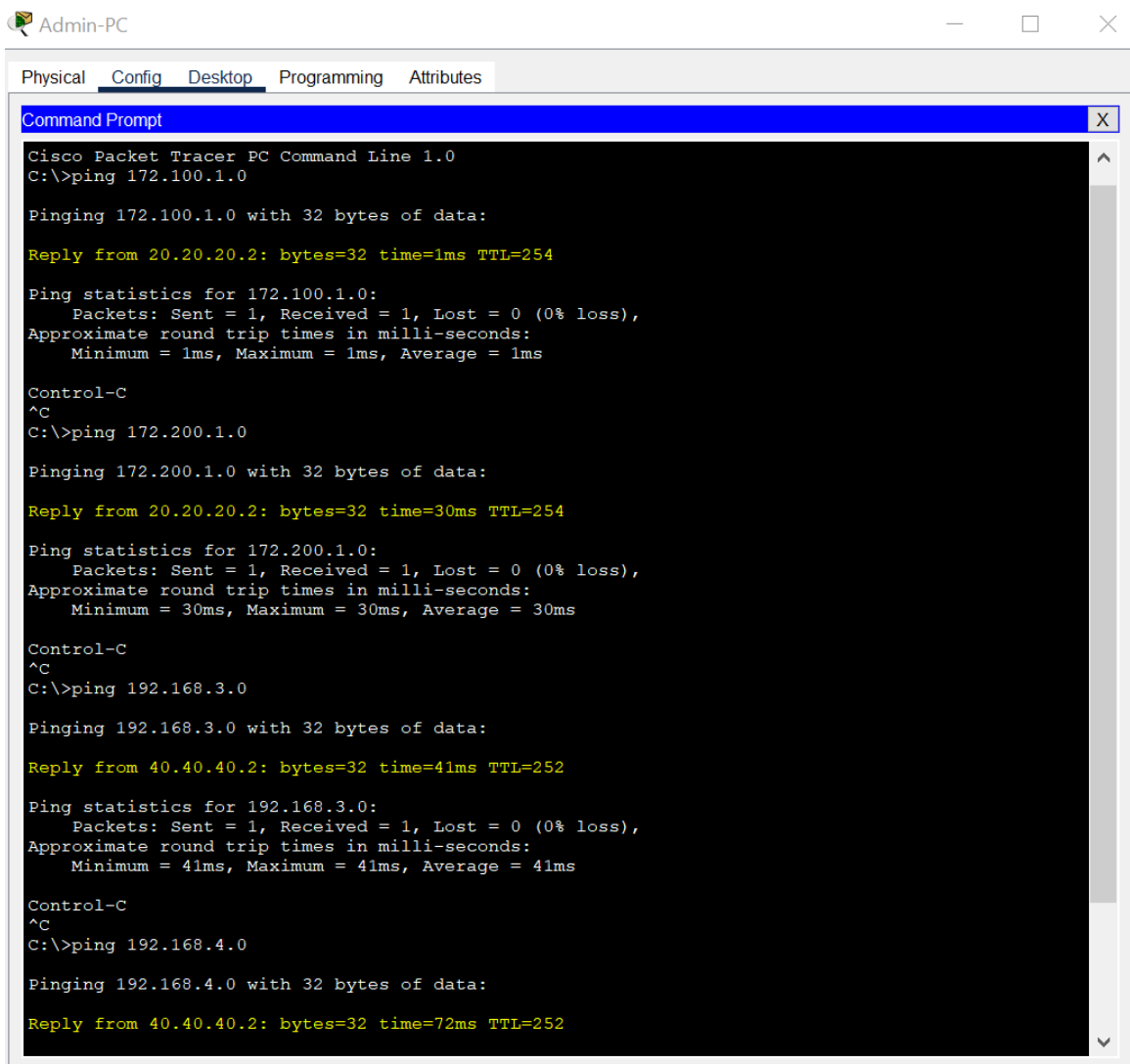
Wireless-N Notebook Adapter Wireless Network Monitor v1.0 Model No. WPC300N

# SIMULATION

## 1. Connection Testing

### IT Support to all Class

#### ICMP Testing



The screenshot shows a Cisco Packet Tracer interface with a 'Command Prompt' window open. The window displays the results of four ping commands executed from a PC. Each command is followed by a detailed response showing the number of bytes, time, and TTL, as well as ping statistics for the destination IP address.

```
Admin-PC
Physical Config Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 172.100.1.0

Pinging 172.100.1.0 with 32 bytes of data:

Reply from 20.20.20.2: bytes=32 time=1ms TTL=254

Ping statistics for 172.100.1.0:
    Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

Control-C
^C
C:\>ping 172.200.1.0

Pinging 172.200.1.0 with 32 bytes of data:

Reply from 20.20.20.2: bytes=32 time=30ms TTL=254

Ping statistics for 172.200.1.0:
    Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 30ms, Maximum = 30ms, Average = 30ms

Control-C
^C
C:\>ping 192.168.3.0

Pinging 192.168.3.0 with 32 bytes of data:

Reply from 40.40.40.2: bytes=32 time=41ms TTL=252

Ping statistics for 192.168.3.0:
    Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 41ms, Maximum = 41ms, Average = 41ms

Control-C
^C
C:\>ping 192.168.4.0

Pinging 192.168.4.0 with 32 bytes of data:

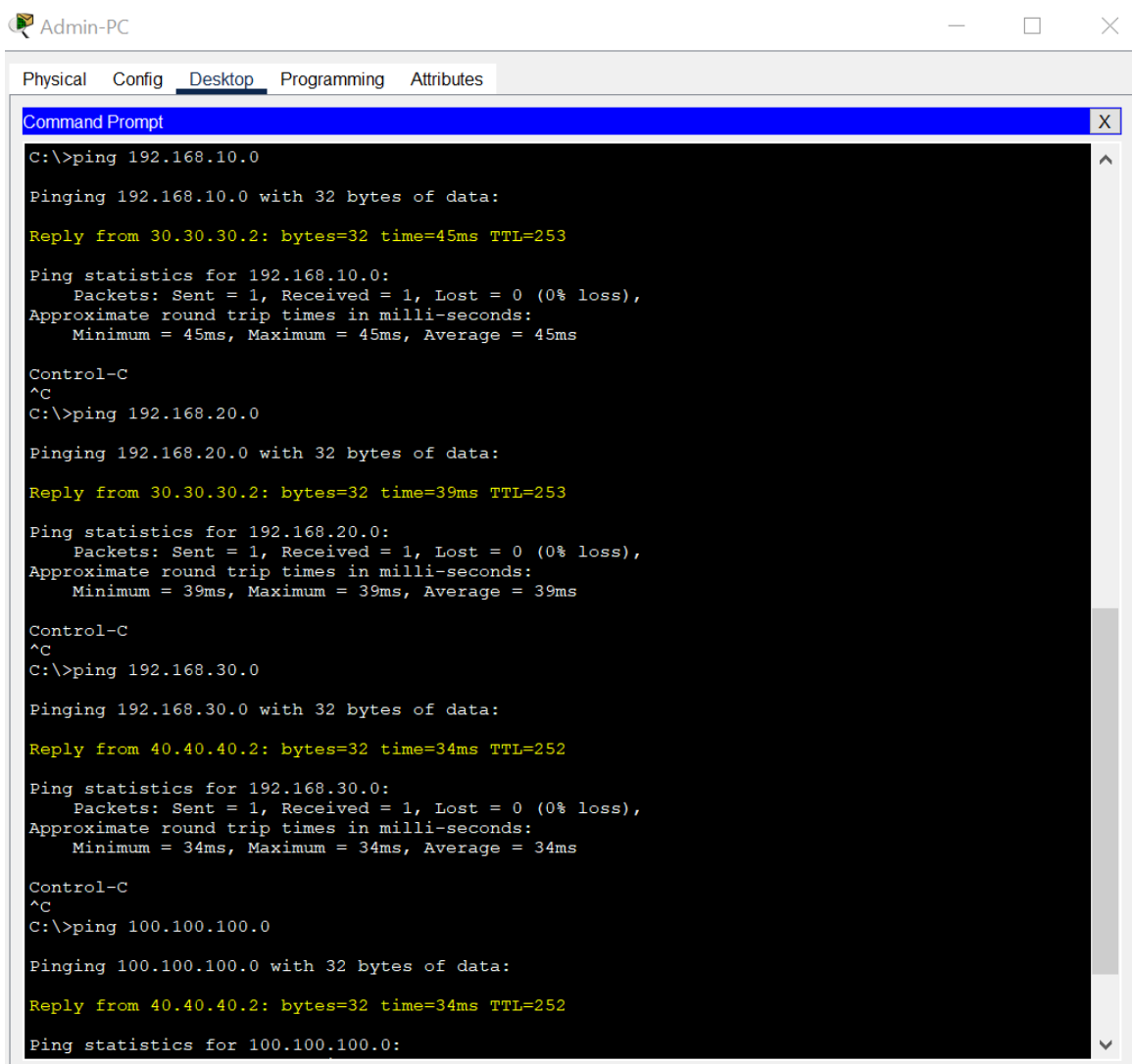
Reply from 40.40.40.2: bytes=32 time=72ms TTL=252
```



# SIMULATION

## IT Support to all non Class

### ICMP Testing



The screenshot shows a Windows Command Prompt window titled "Admin-PC" with tabs for Physical, Config, Desktop, Programming, and Attributes. The Command Prompt displays the results of four ping commands executed in sequence. Each command is followed by a detailed response showing the source IP, bytes, time, TTL, and statistics for the destination IP.

```
C:\>ping 192.168.10.0

Pinging 192.168.10.0 with 32 bytes of data:

Reply from 30.30.30.2: bytes=32 time=45ms TTL=253

Ping statistics for 192.168.10.0:
    Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 45ms, Maximum = 45ms, Average = 45ms

Control-C
^C
C:\>ping 192.168.20.0

Pinging 192.168.20.0 with 32 bytes of data:

Reply from 30.30.30.2: bytes=32 time=39ms TTL=253

Ping statistics for 192.168.20.0:
    Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 39ms, Maximum = 39ms, Average = 39ms

Control-C
^C
C:\>ping 192.168.30.0

Pinging 192.168.30.0 with 32 bytes of data:

Reply from 40.40.40.2: bytes=32 time=34ms TTL=252

Ping statistics for 192.168.30.0:
    Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 34ms, Maximum = 34ms, Average = 34ms

Control-C
^C
C:\>ping 100.100.100.0

Pinging 100.100.100.0 with 32 bytes of data:

Reply from 40.40.40.2: bytes=32 time=34ms TTL=252

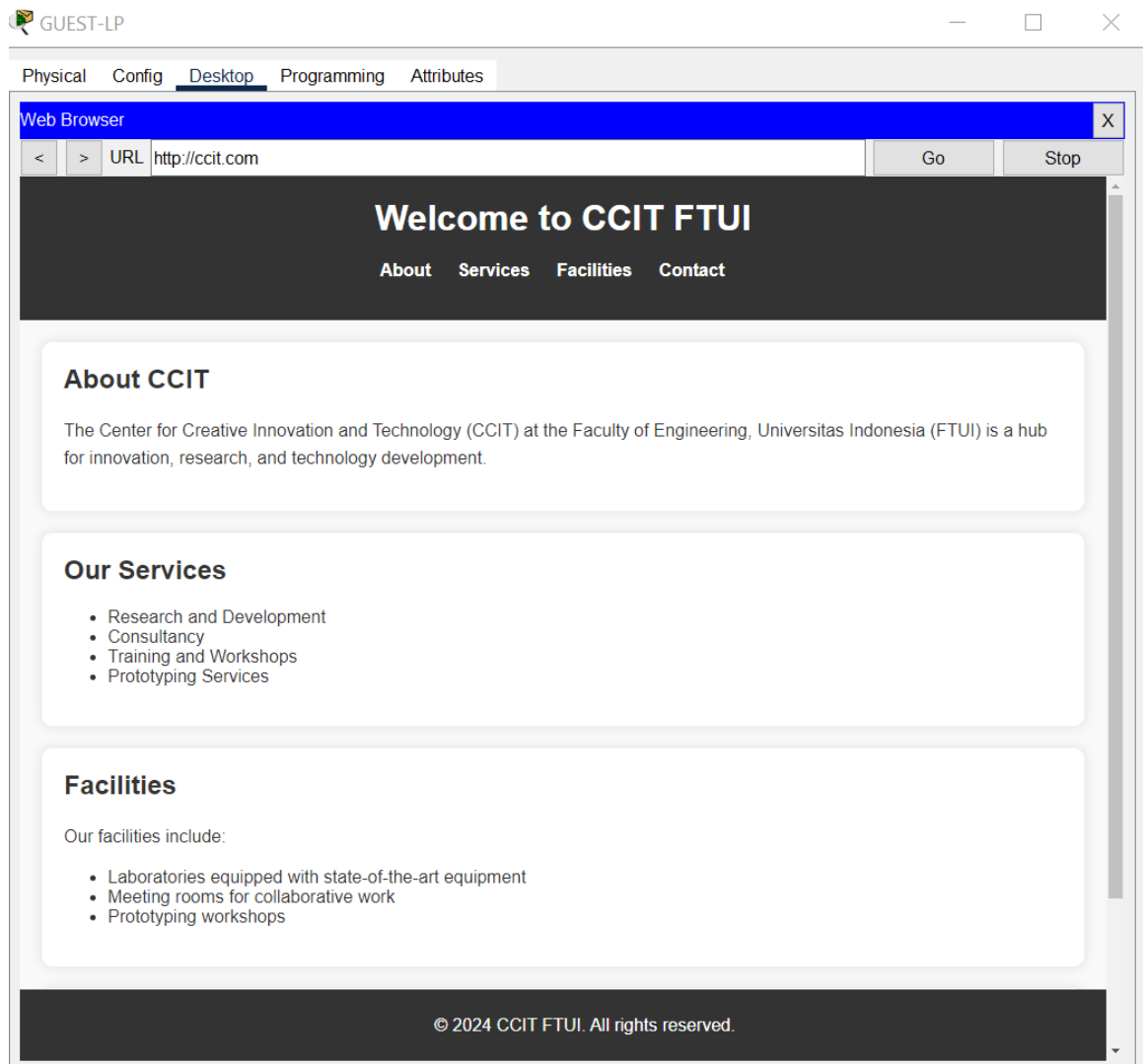
Ping statistics for 100.100.100.0:
```

# SIMULATION

## 2. Server Testing

### DNS & Webserver

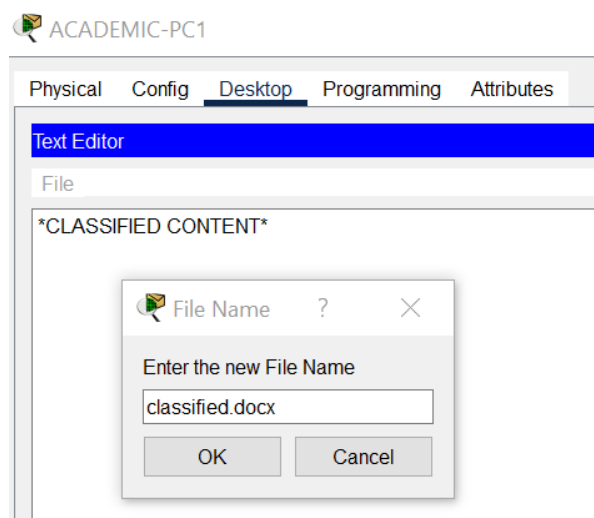
DNS and web server functionality will be tested by simply navigating to the desktop and entering the domain name, which is ccit.com.



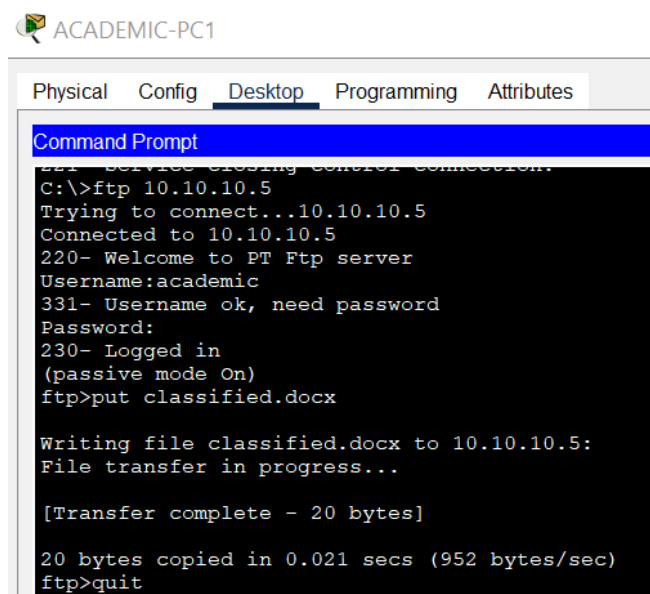
## SIMULATION

### FTP Server

Before attempting to access the server, example files will be created for later distribution to other networks.

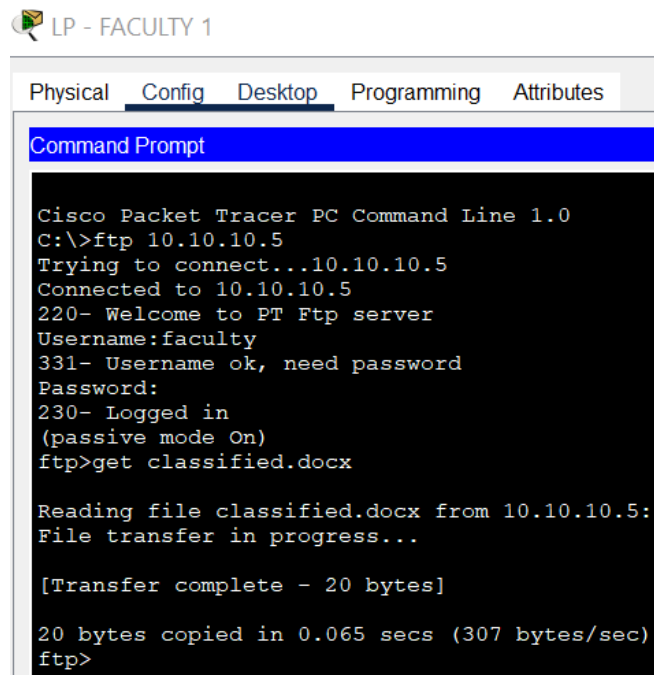


Next, these files will be uploaded to the server, enabling access for other networks.



## SIMULATION

"Classified.docx" will be accessed in another network using the FTP server.



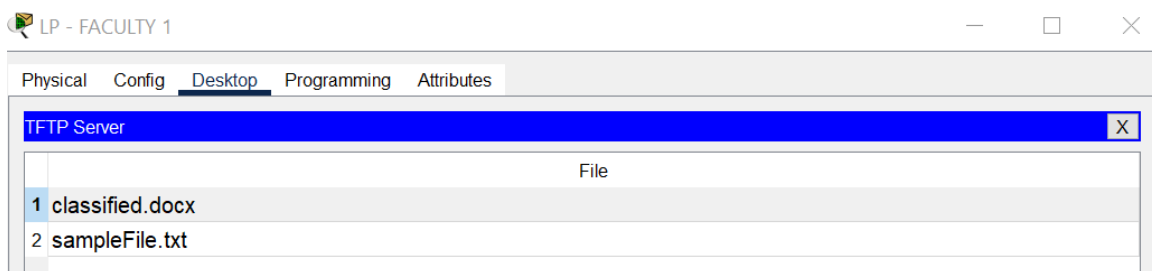
```
LP - FACULTY 1
Physical Config Desktop Programming Attributes
Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:\>ftp 10.10.10.5
Trying to connect...10.10.10.5
Connected to 10.10.10.5
220- Welcome to PT Ftp server
Username:faculty
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>get classified.docx

Reading file classified.docx from 10.10.10.5:
File transfer in progress...

[Transfer complete - 20 bytes]

20 bytes copied in 0.065 secs (307 bytes/sec)
ftp>
```

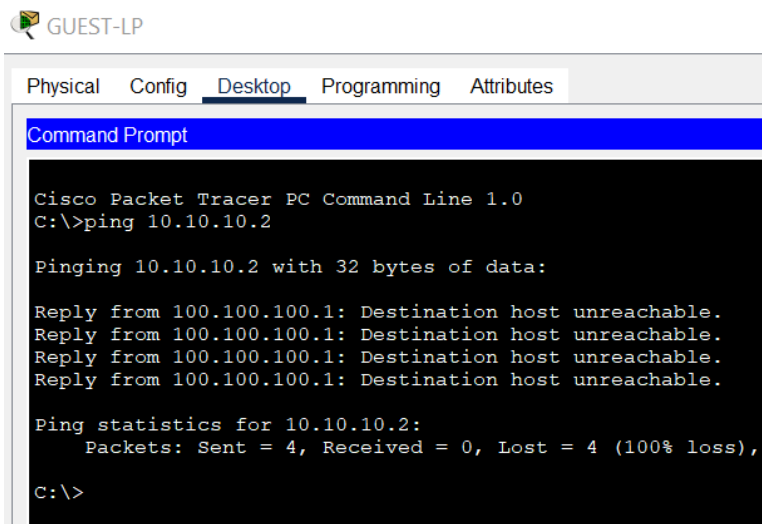


## SIMULATION

### 3. Security Testing

The security scenario primarily involves implementing ACL to prevent the ICMP protocol from reaching the web server.

#### Guest ICMP



The screenshot shows the Cisco Packet Tracer PC Command Line interface for a device named 'GUEST-LP'. The 'Desktop' tab is selected. The command prompt shows the execution of a ping command to 10.10.10.2, which results in 100% loss of packets.

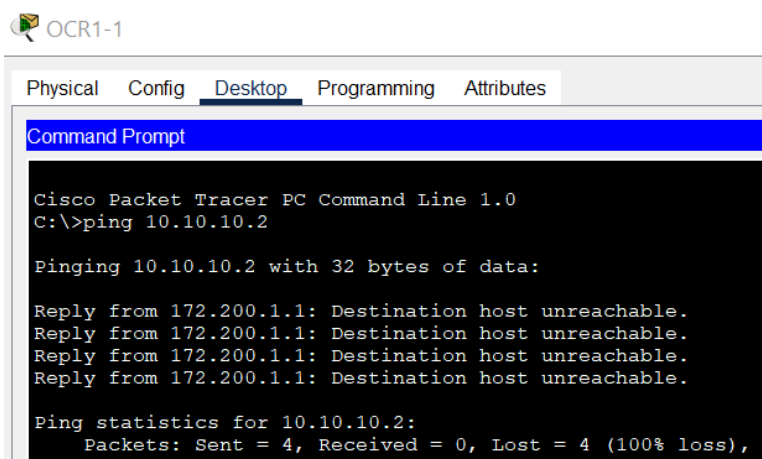
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.10.10.2

Pinging 10.10.10.2 with 32 bytes of data:

Reply from 100.100.100.1: Destination host unreachable.
Reply from 100.100.100.1: Destination host unreachable.
Reply from 100.100.100.1: Destination host unreachable.
Reply from 100.100.100.1: Destination host unreachable.

Ping statistics for 10.10.10.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>
```

#### Class ICMP



The screenshot shows the Cisco Packet Tracer PC Command Line interface for a device named 'OCR1-1'. The 'Desktop' tab is selected. The command prompt shows the execution of a ping command to 10.10.10.2, which results in 100% loss of packets.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.10.10.2

Pinging 10.10.10.2 with 32 bytes of data:

Reply from 172.200.1.1: Destination host unreachable.
Reply from 172.200.1.1: Destination host unreachable.
Reply from 172.200.1.1: Destination host unreachable.
Reply from 172.200.1.1: Destination host unreachable.

Ping statistics for 10.10.10.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

## REQUIREMENTS

**Hardware :**

1. Lenovo V14 G2

**Operating System :**

1. Windows 10 64-bit

**Software :**

1. Cisco Packet Tracer
2. Ms. Word
3. Google Chrome

## PROJECT FILE DETAILS

No	Filename	Remarks
1	2CS1 Project 1.pdf	Microsoft Words contain research paper about the project
2	ccitnetworks.pkt	Packet Tracer file contains the network simulation
3	Project 1 Presentation.pptx	Presentation file