Computer Networking
Season 2024-III
Workshop No. 1 – Packet Tracer Basics

Computer Engineering
Universidad Distrital Francisco José de Caldas

Introduction

The main purpose of the workshop was to create a simulated network using Packet Tracer, allowing access to the university's website from various devices connected to the network.

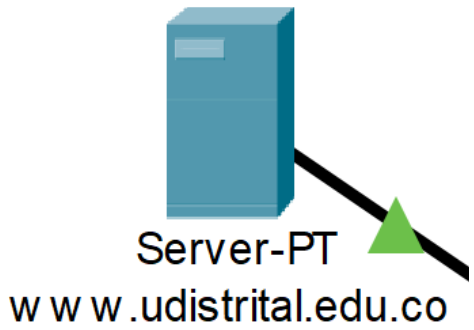
Configurations were carried out on the server, including services such as HTTP, DHCP, and DNS, in addition to connecting several devices to validate network accessibility and proper functioning.

Network Design

The network was designed with a server located at the university that connects to the Internet and a home network. Below are the details and configuration instructions for the server and the devices involved.

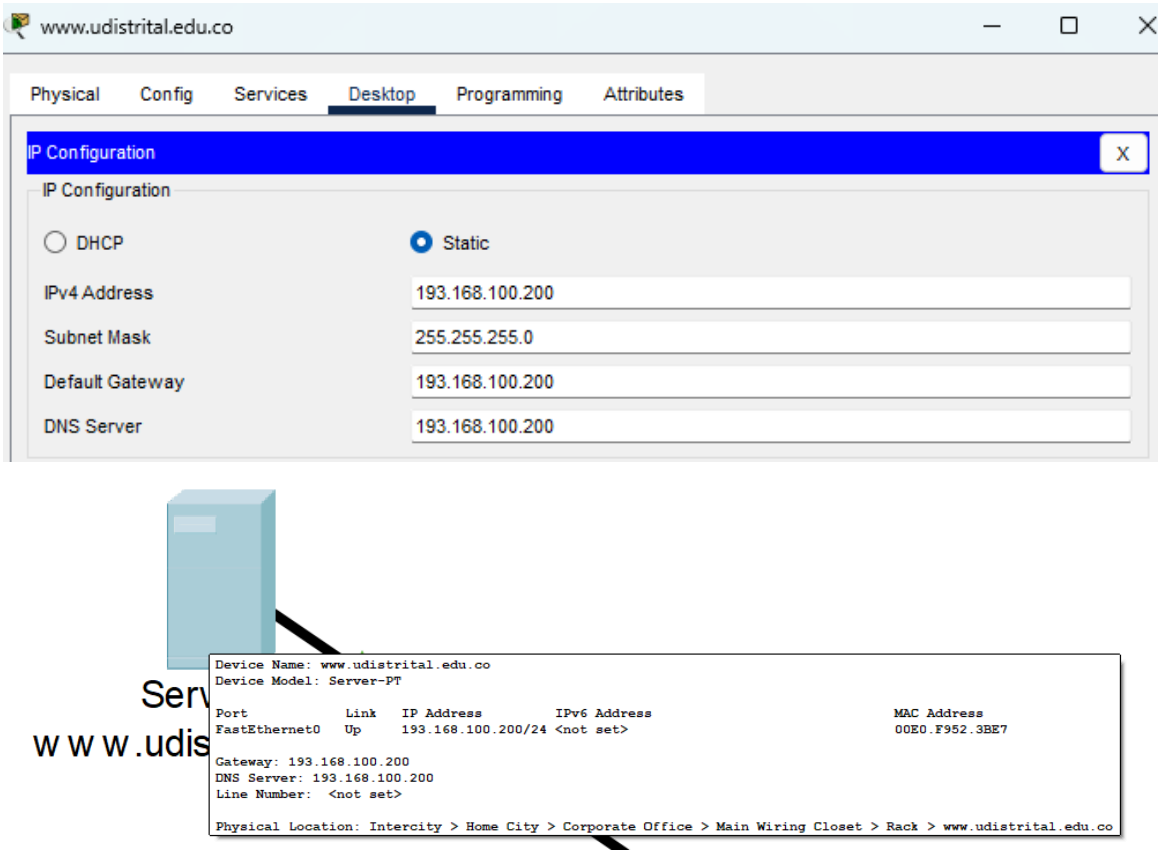
1. You are now an internship computer engineer at *Universidad Distrital Francisco José de Caldas*. You need to create a server *on-premises* with the home web page of the university. The server must:

   (a) Have be recognized by the name www.udistrital.edu.co.

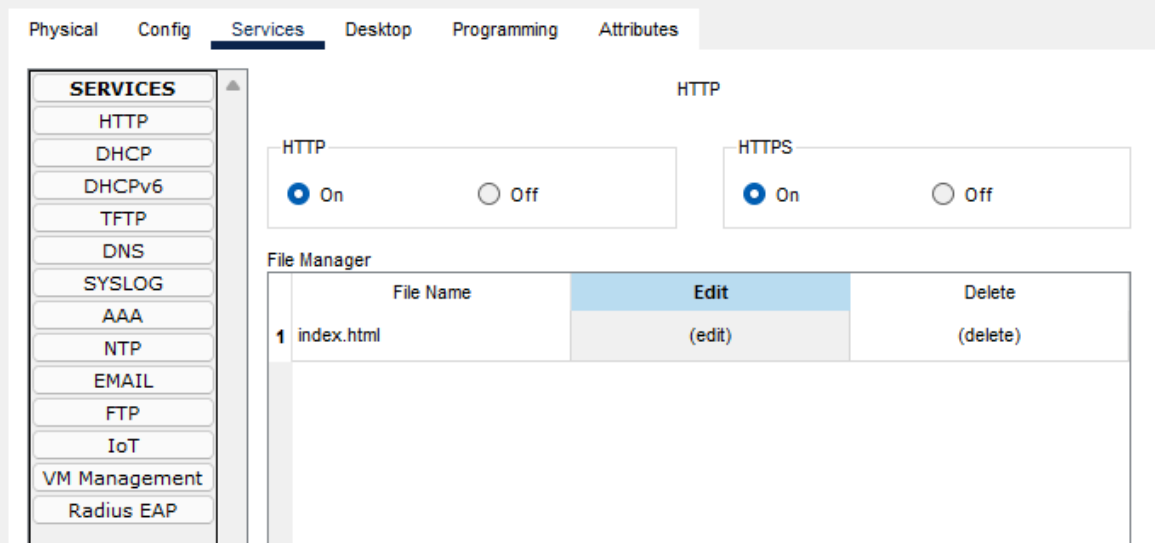


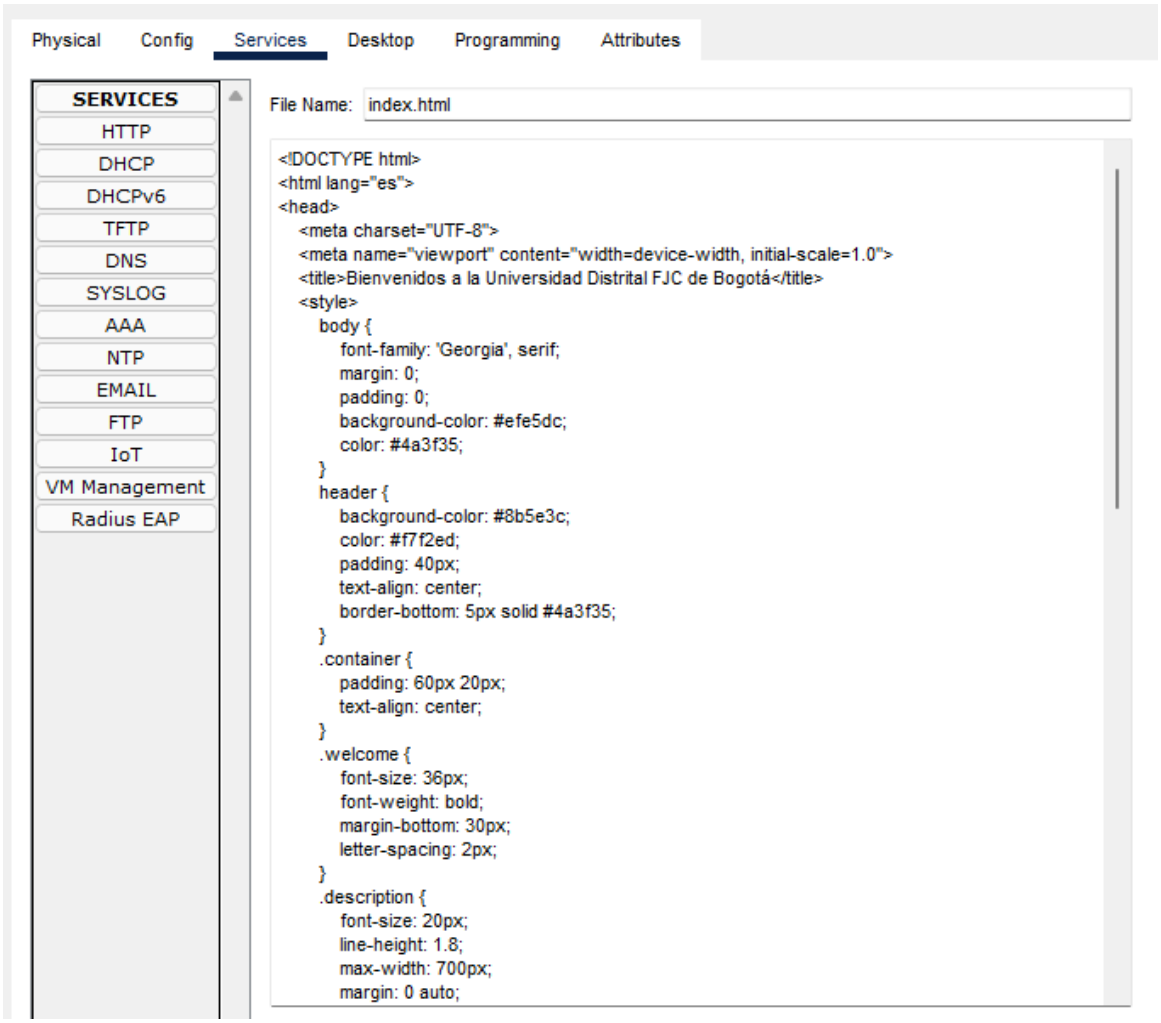
(b) Have a public static IP address, and a default gateway. In this sense, next values should be used:

- **IPv4 Address:** 193.168.100.200
- **DNS Server:** 193.168.100.200
- **Default Gateway:** 193.168.100.1
- **Subnet Mask:** 255.255.255.0



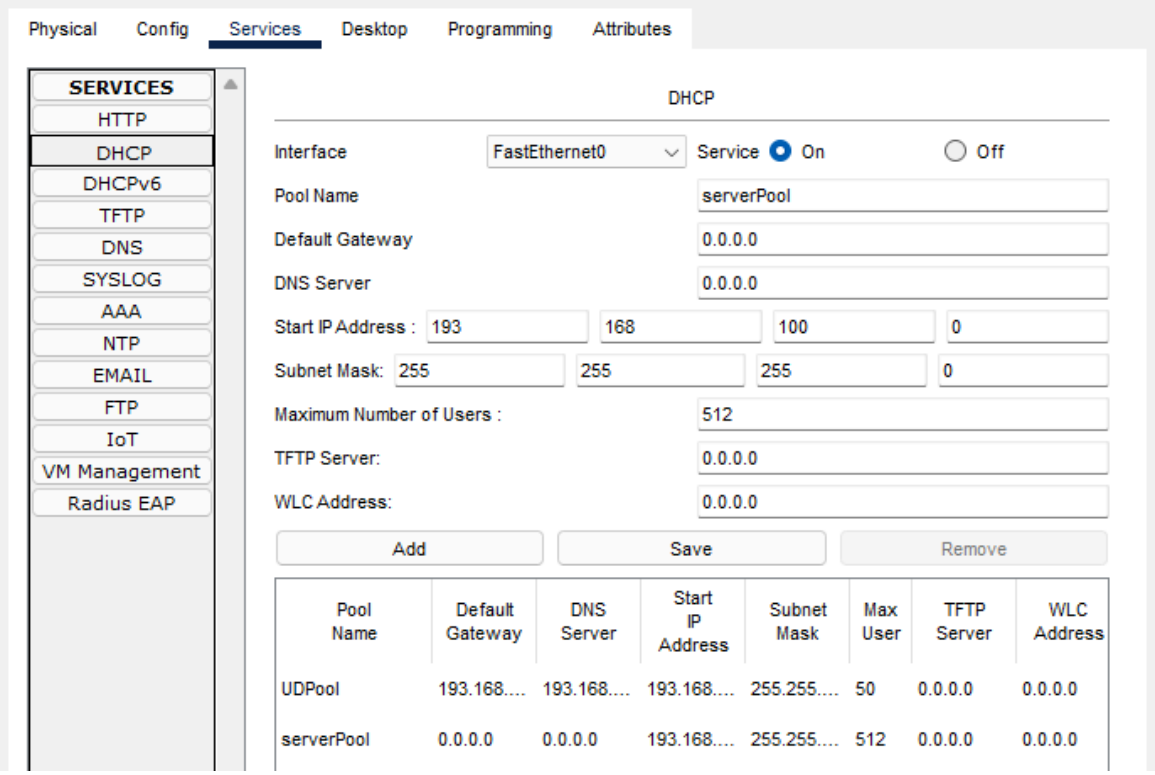
(c) In HTTP services, delete all web pages but *index.html*. Edit this file and add a welcome message from the university (be creative, you could add a .css file if you want).




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
<!DOCTYPE html>
<html lang="es">
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>Bienvenidos a la Universidad Distrital FJC de Bogotá</title>
<style>
body {
font-family: 'Georgia', serif;
margin: 0;
padding: 0;
background-color: #efe5dc;
color: #4a3f35;
}
header {
background-color: #8b5e3c;
color: #f7f2ed;
padding: 40px;
text-align: center;
border-bottom: 5px solid #4a3f35;
}
.container {
padding: 60px 20px;
text-align: center;
}
.welcome {
font-size: 36px;
font-weight: bold;
margin-bottom: 30px;
letter-spacing: 2px;
}
.description {
font-size: 20px;
line-height: 1.8;
max-width: 700px;
margin: 0 auto;

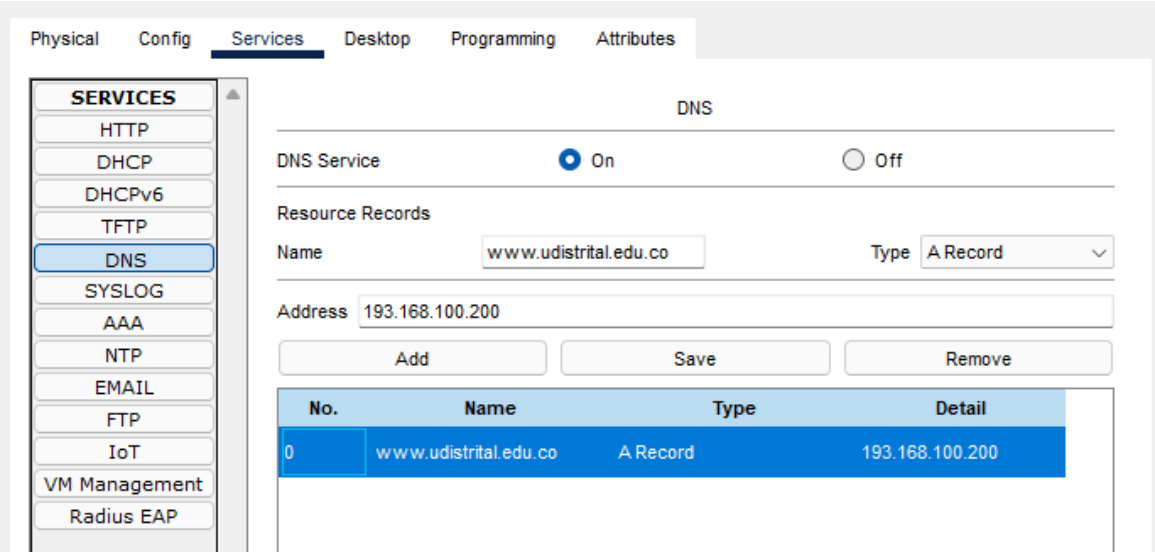
(d) In DHCP services check the service is *on* and add a new pool with next values:

- **Pool Name:** UDPool
- **Default Gateway:** 193.168.100.200
- **DNS Server:** 193.168.100.200
- **Start IP Address:** 193.168.100.1
- **Subnet Mask:** 255.255.255.0
- **Maximum Users:** 50

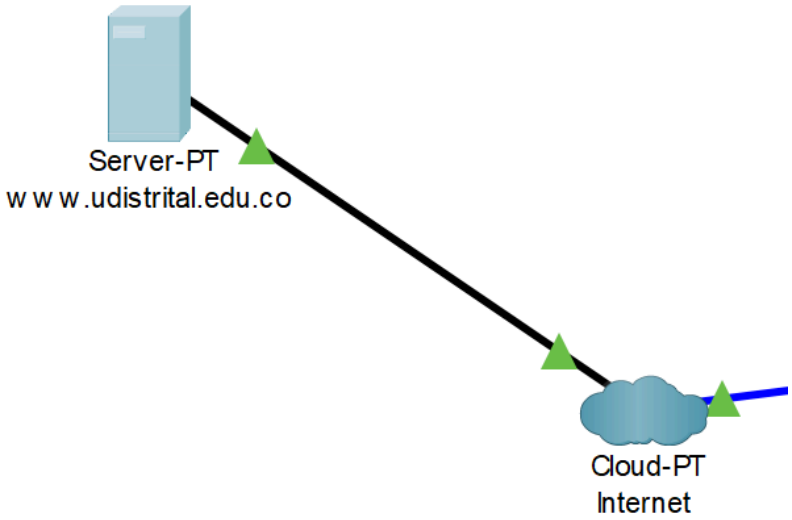


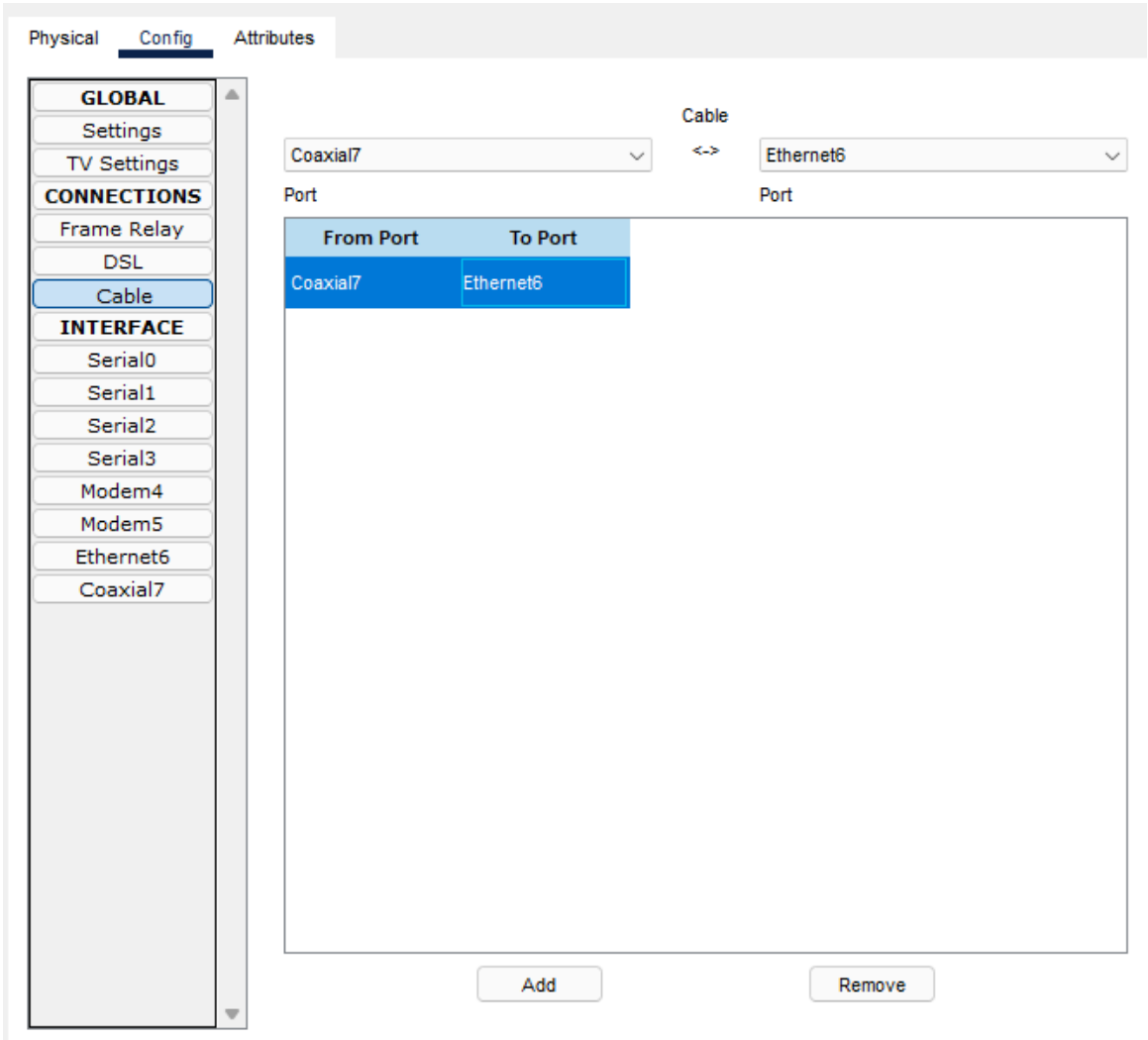
(e) In DNS services, check the service is *on* and add a new rule with next values:

- **Name:** www.udistrital.edu.co
- **Type:** A Record
- **Address:** 193.168.100.200

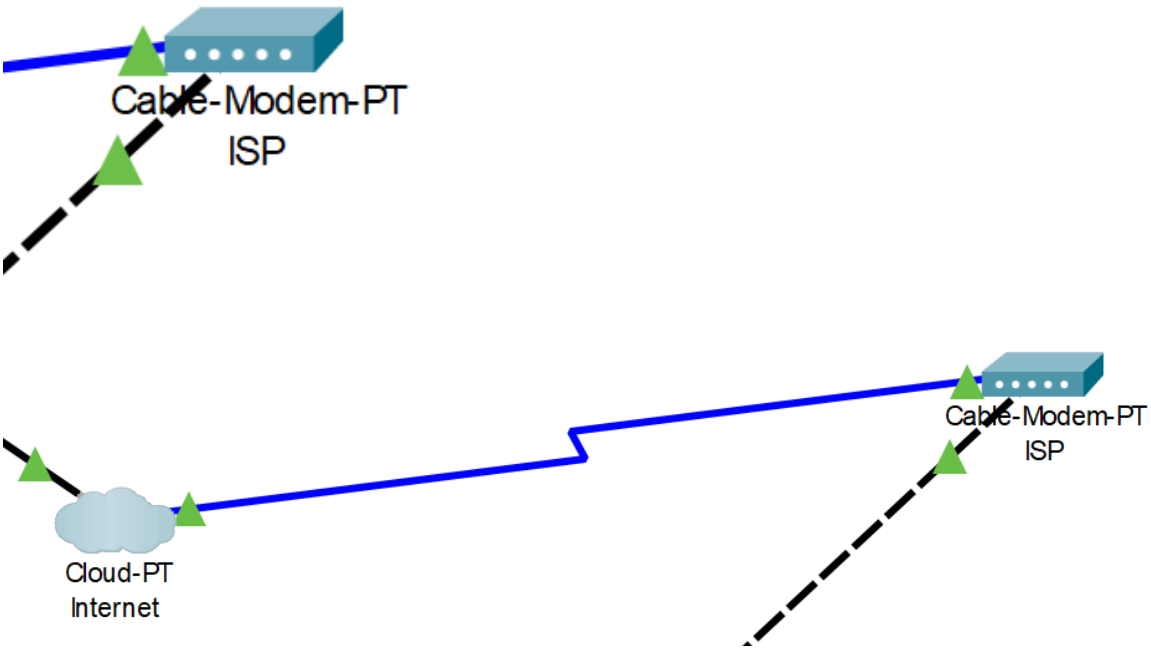


2. You need to connect your server to the *cloud*. So, using a *Cloud-PT* called Internet using the Ethernet6 in Cable mode, to the FastEthernet0/0 of the server. Here it is important you relate into the *Internet* the cable relation from Coaxial7 to Ethernet6.




Physical
Config
Attributes
GLOBAL
Settings
TV Settings
CONNECTIONS
Frame Relay
DSL
Cable
INTERFACE
Serial0
Serial1
Serial2
Serial3
Modem4
Modem5
Ethernet6
Coaxial7
Cable
Coaxial7
<->
Ethernet6
Port
Port
From Port
To Port
Coaxial7
Ethernet6
Add
Remove

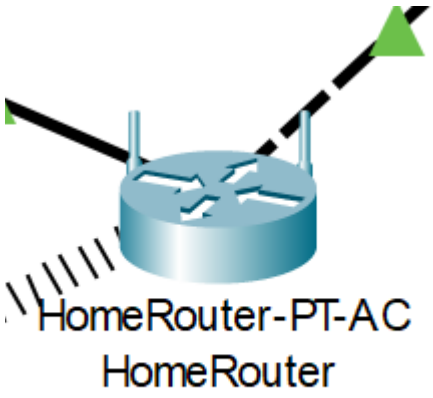
3. You need to connect a *Cable-Modem-PT* to the *Internet*. So, using a *Cable-Modem-PT* called ISP using the Port0 to the Coaxial7 of the internet.

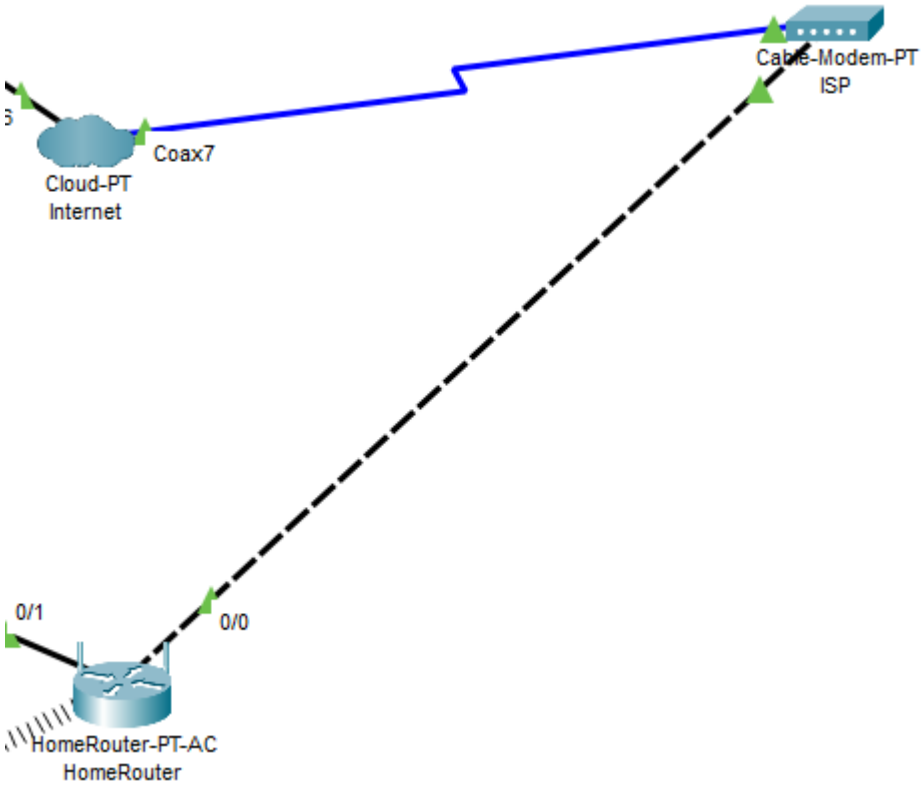


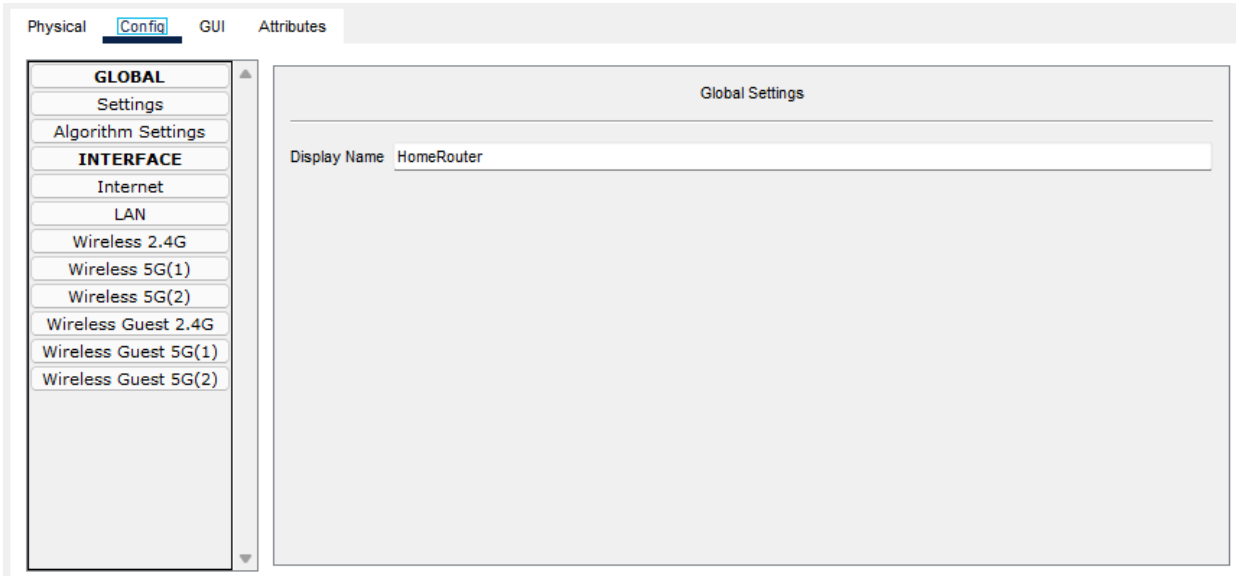
4. As you want to test any student could reach the university website, it is necessary to run some tests from your home. So, you contact the *ISP* and ask for a *internet service at home*. They give you a *wireless router* called HomeRouter with the following values:

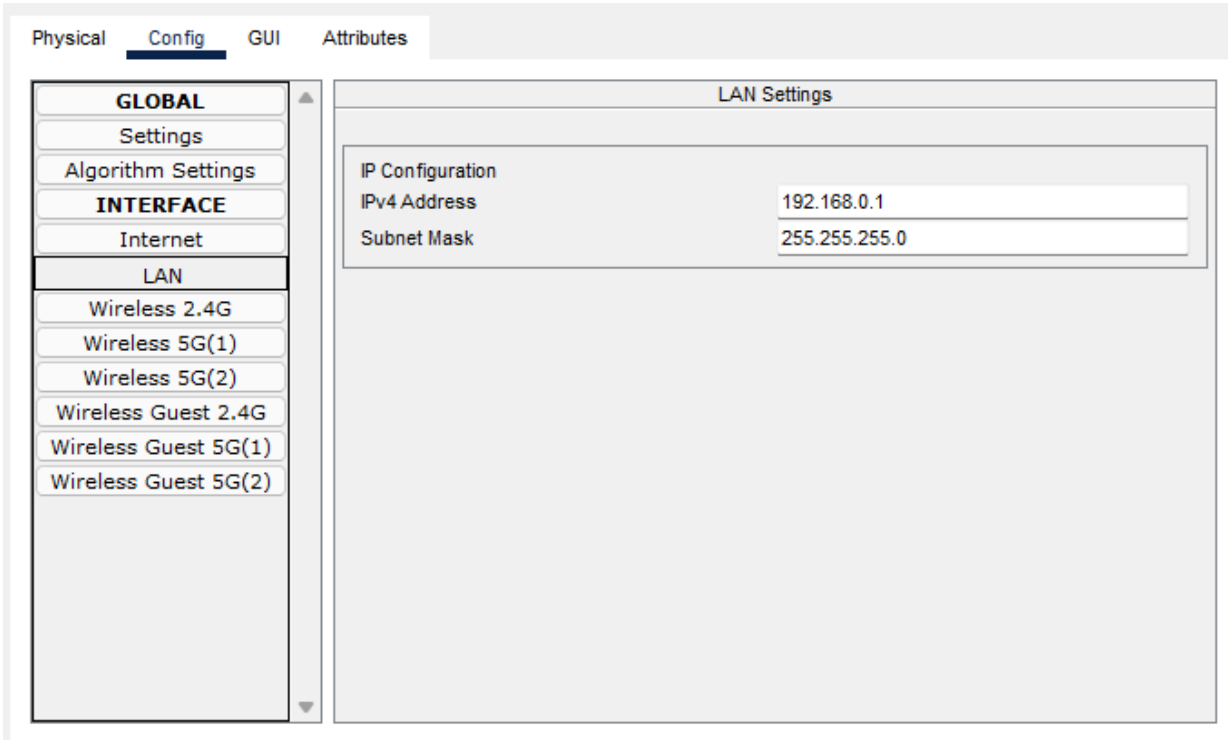
- **IPv4 LAN Address:** 192.168.0.1
- **LAN Subnet Mask:** 255.255.255.0
- **Wireless *SSID*:** UD_Invitados
- **Coverage Range (*meters*):** 20

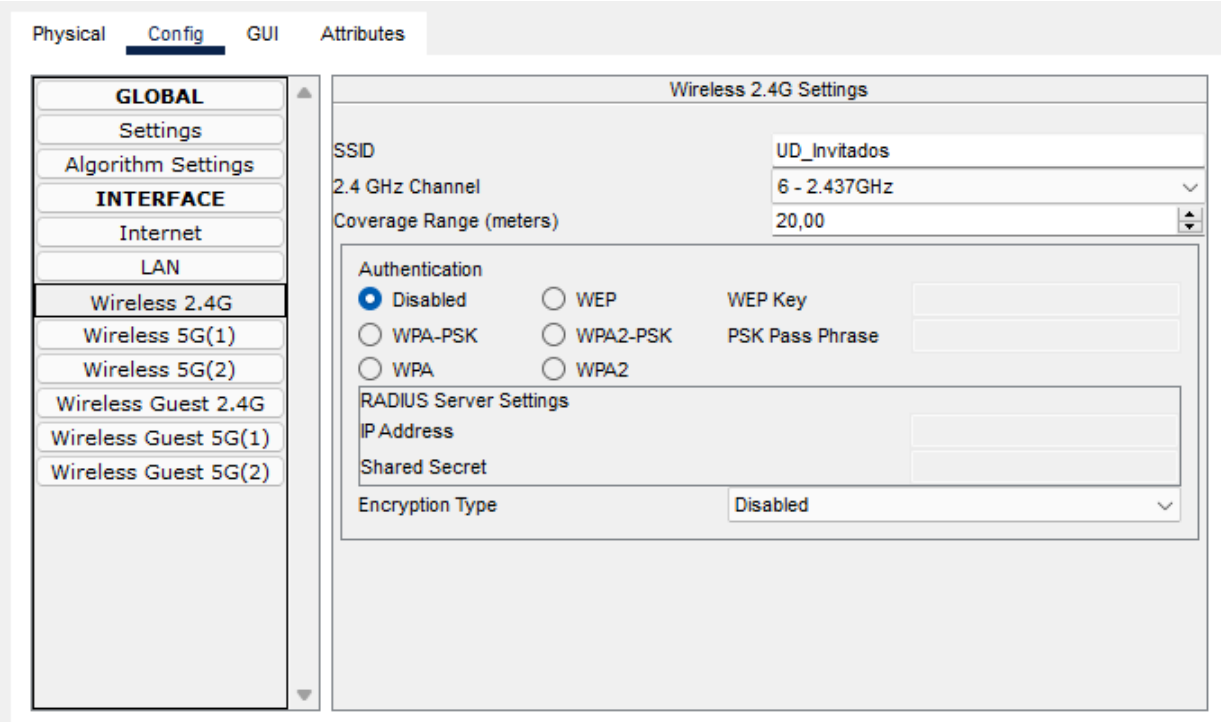
You need to connect the *HomeRouter* to the *ISP*.


HomeRouter-PT-AC
HomeRouter


Cable-Modem-PT
ISP
Coax7
Cloud-PT
Internet
0/1
0/0
HomeRouter-PT-AC
HomeRouter

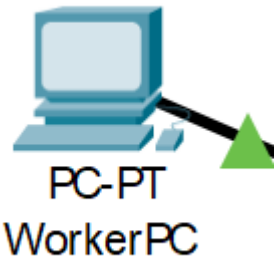

Physical
Config
GUI
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
Internet
LAN
Wireless 2.4G
Wireless 5G(1)
Wireless 5G(2)
Wireless Guest 2.4G
Wireless Guest 5G(1)
Wireless Guest 5G(2)
Global Settings
Display Name
HomeRouter

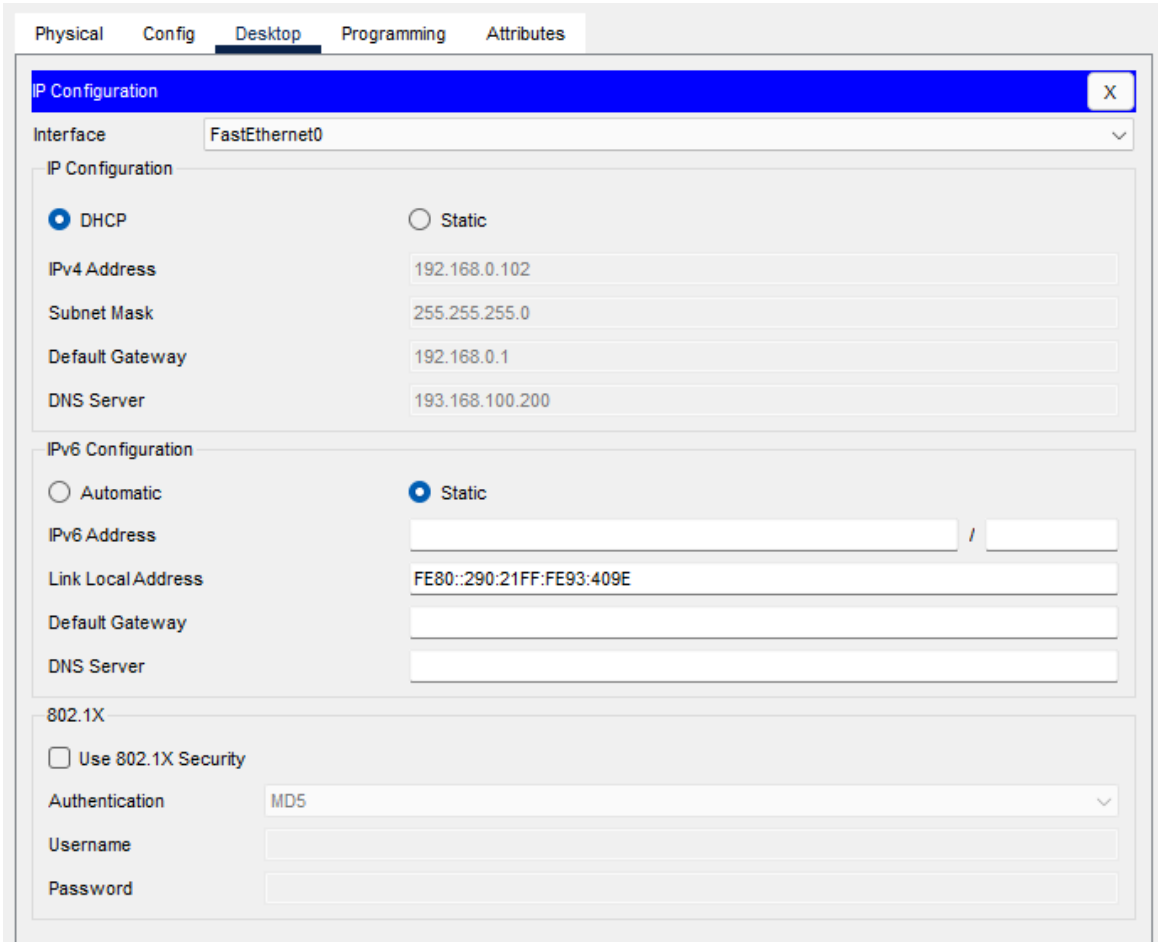

Physical
Config
GUI
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
Internet
LAN
Wireless 2.4G
Wireless 5G(1)
Wireless 5G(2)
Wireless Guest 2.4G
Wireless Guest 5G(1)
Wireless Guest 5G(2)
LAN Settings
IP Configuration
IPv4 Address
192.168.0.1
Subnet Mask
255.255.255.0



5. At home, you have a *PC-PT* called WorkerPC with the following values:

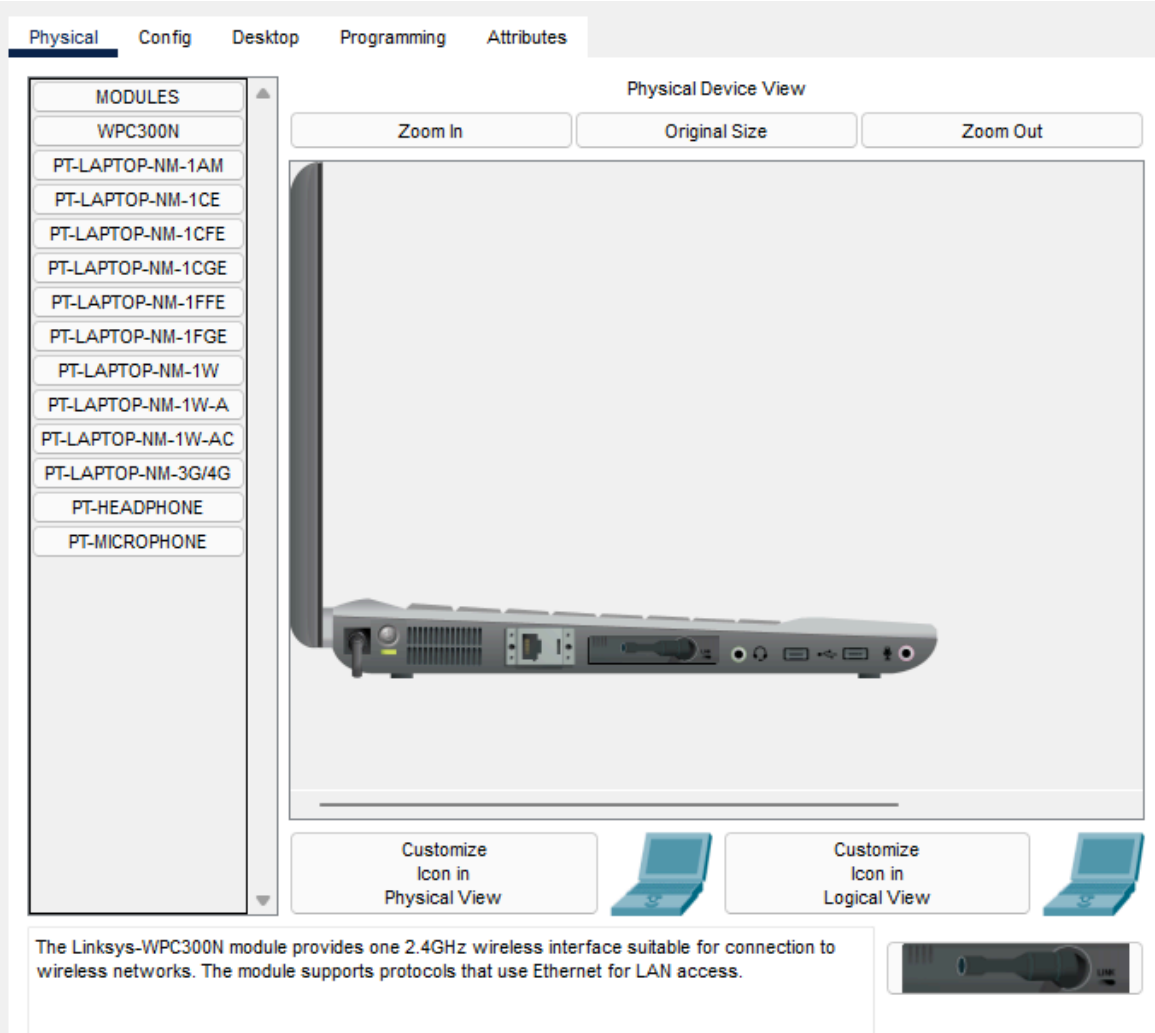
- **IPv4 Address:** DHCP

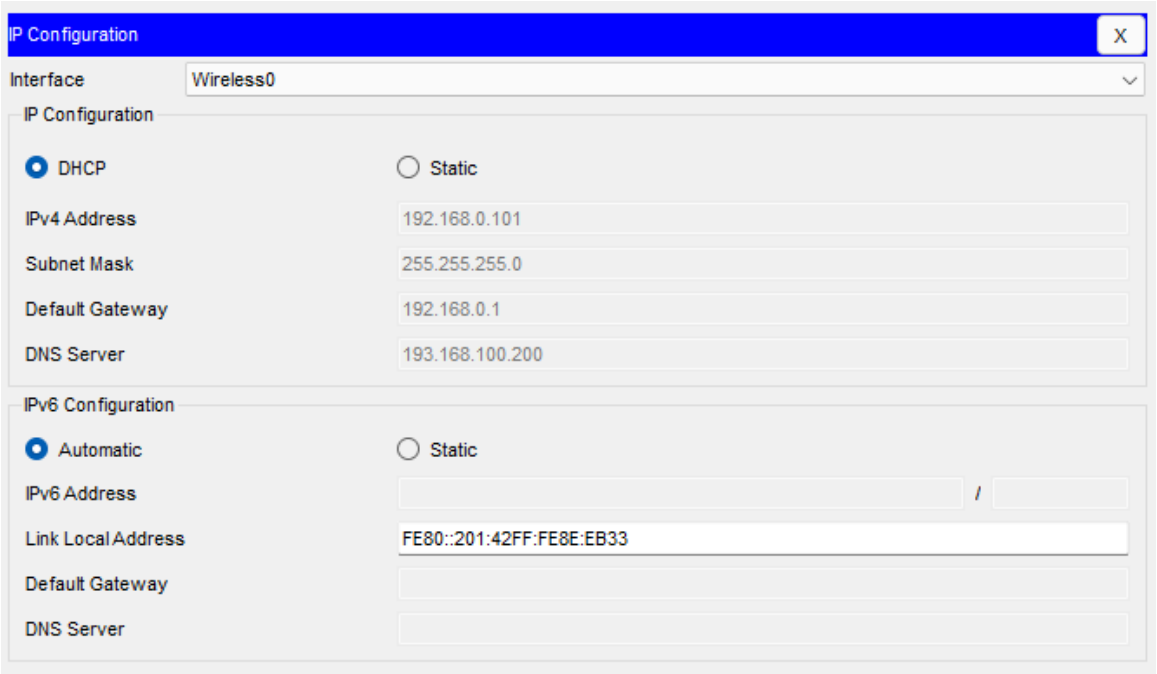


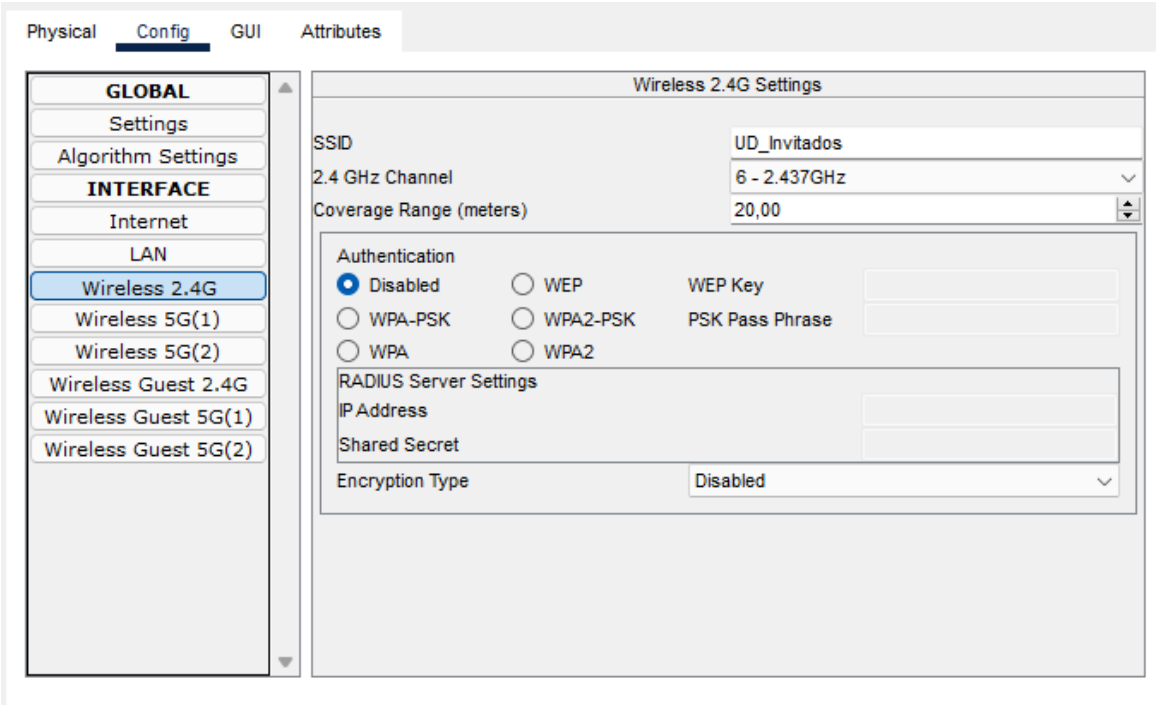

Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.0.102
Subnet Mask
255.255.255.0
Default Gateway
192.168.0.1
DNS Server
193.168.100.200
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::290:21FF:FE93:409E
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password

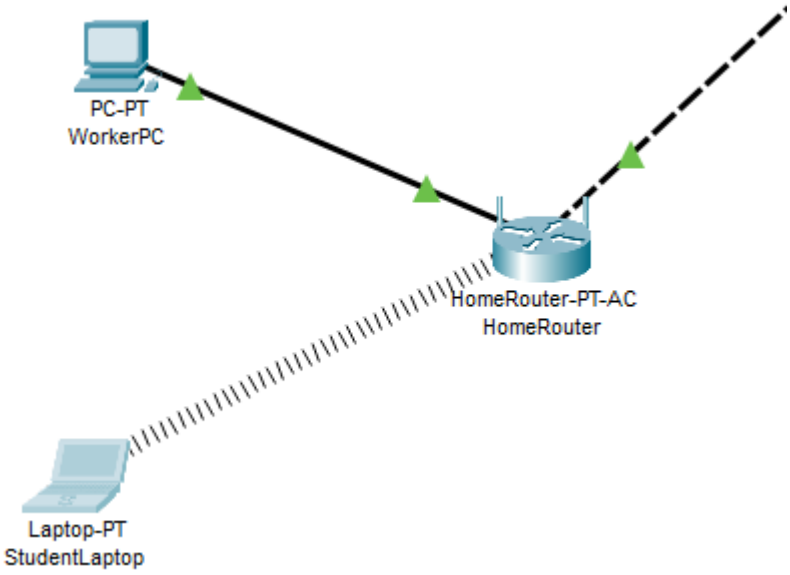
6. Also, you have a *Laptop-PT* called StudentLaptop with the following values:

- **IPv4 Address:** DHCP
- **Wireless Network:** UD_Invitados




IP Configuration
X
Interface
Wireless0
IP Configuration
DHCP
Static
IPv4 Address
192.168.0.101
Subnet Mask
255.255.255.0
Default Gateway
192.168.0.1
DNS Server
193.168.100.200
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::201:42FF:FE8E:EB33
Default Gateway
DNS Server


Physical
Config
GUI
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
Internet
LAN
Wireless 2.4G
Wireless 5G(1)
Wireless 5G(2)
Wireless Guest 2.4G
Wireless Guest 5G(1)
Wireless Guest 5G(2)
Wireless 2.4G Settings
SSID
UD_Invitados
2.4 GHz Channel
6 - 2.437GHz
Coverage Range (meters)
20,00
Authentication
Disabled
WEP
WEP Key
WPA-PSK
WPA2-PSK
PSK Pass Phrase
WPA
WPA2
RADIUS Server Settings
IP Address
Shared Secret
Encryption Type
Disabled



Home devices: Such as the WorkerPC and the StudentLaptop, were configured to obtain their IP automatically via DHCP.

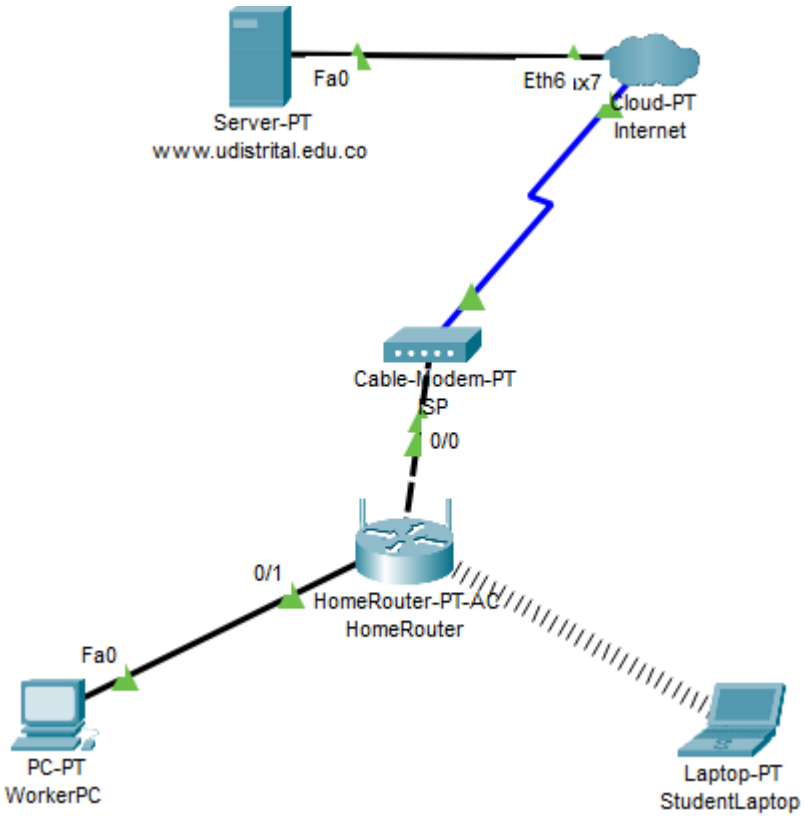
Technical Decisions

1. **Server Configuration**
   - A static public IP address (193.168.100.200) was assigned to the server, ensuring it is accessible from the Internet at all times. Additionally, the HTTP service was simplified by keeping only the main page, index.html, with a basic design.
   - The DHCP service was configured to provide IP addresses to connected devices, facilitating network management without manual configurations.
2. **DHCP Service**
   - An IP address pool named UDPool was created, with a range that supports up to 50 users, ensuring that any device connected to the network automatically receives a valid IP address.
3. **DNS Configuration:**
   - The DNS server was configured with an A record that associates the domain www.udistrital.edu.co with the IP 193.168.100.200, ensuring DNS queries are resolved correctly.

4. **Internet Connection:**
    - An Internet connection was established using Cloud-PT and a cable modem, connecting the server to the cloud and allowing remote access to the university's website.
5. **Home Network and Wireless Router:**
    - A wireless router was configured with the SSID UD_Invitados to provide connectivity to home devices. The WorkerPC and StudentLaptop connected automatically via DHCP.

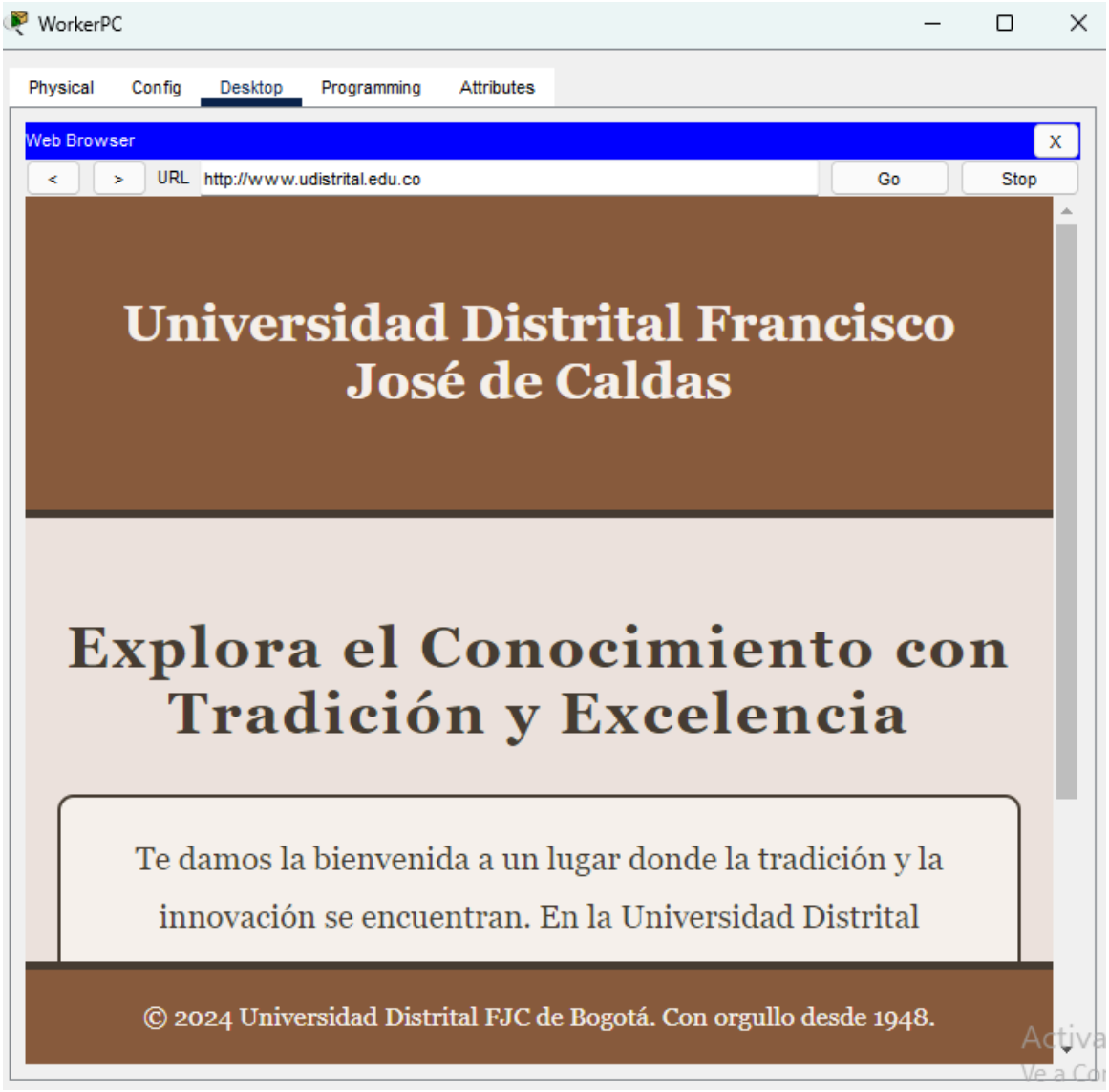
To test the network, you need to access to a web browser in the StudentLaptop and type the URL www.udistrital.edu.co. Same test should be done in the WorkerPC. The result should be the *university home page* you created into the server.

Tests and Results



Connectivity tests were carried out by accessing the domain **www.udistrital.edu.co** from two devices:

- **WorkerPC**: Connected via cable to the network and configured to obtain its IP through DHCP. The connection was successful, and the website was accessible.



- **StudentLaptop:** Connected to the wireless network with the SSID UD_Invitados. Also configured with DHCP, it successfully accessed the website.

Both devices were able to connect to the server and view the university's webpage, confirming that the network was designed and configured correctly.