

Computer Networking – Workshop No. 1

Packet Tracer Basics

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INTRODUCTION

This report presents the design and implementation of a computer network simulation project, focuses on utilizing Packet Tracer, a network simulation tool, to create a functional network that meets specific set requirements.

The primary objective of this workshop is to achieve the challenge of being an internship computer engineer at the university, who is tasked with designing a network that includes:

1. An on-premises server hosting the university's home webpage
2. Cloud connectivity
3. Wireless network setup
4. Home network setup

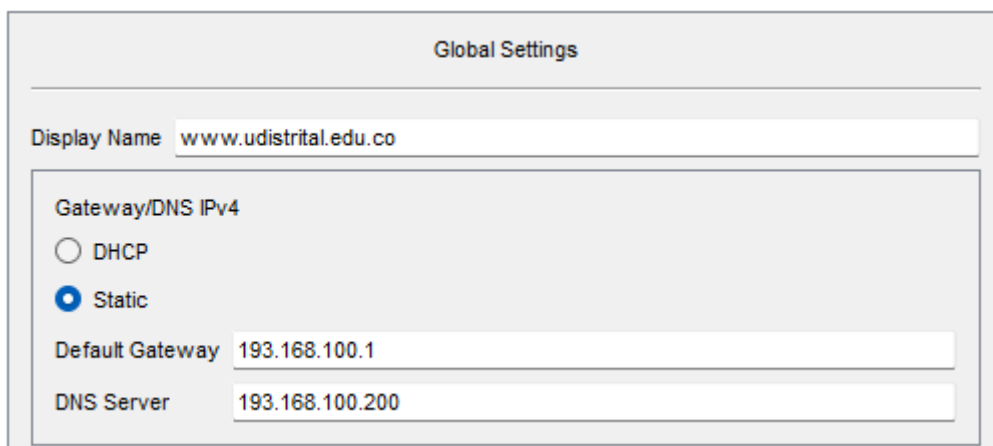
This comprehensive network design incorporates various elements such as server configuration, DNS and DHCP services, cloud connections, and wireless networking. The simulation aims to create a fully functional system where client devices can access the university's website through the designed network infrastructure.

The following report will detail the network design process, technical decisions made during implementation, and the results of connectivity tests performed as per the workshop requirements. All components of this project, including the Packet Tracer (.pkt) file, HTML file for the university's homepage, and this report, are stored in a GitHub repository for easy access and evaluation.

PROCESS DESCRIPTION

Step 1: Server Configuration

Set server configuration, Fast Ethernet and Global Settings.



The screenshot shows the 'Global Settings' window in Packet Tracer. It features a 'Display Name' field with the value 'www.udistrital.edu.co'. Below this is a section for 'Gateway/DNS IPv4' with two radio buttons: 'DHCP' (unselected) and 'Static' (selected). Under the 'Static' option, there are two text input fields: 'Default Gateway' with the value '193.168.100.1' and 'DNS Server' with the value '193.168.100.200'.

FastEthernet0

Port Status

☒ On

Bandwidth

☐ 100 Mbps
☐ 10 Mbps
☒ Auto

Duplex

☐ Half Duplex
☐ Full Duplex
☒ Auto

MAC Address

0001.4270.3AE6

IP Configuration

☐ DHCP
☒ Static

IPv4 Address

193.168.100.200

Subnet Mask

255.255.255.0

Step 2: Edit HTTP Services

Delete all web pages but index.html, edit this file.

HTTP

☒ On
☐ Off

HTTPS

☒ On
☐ Off

File Manager

	File Name	Edit	Delete
1	index.html	(edit)	(delete)

File Name: index.html

```

<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Universidad Distrital Francisco José de Caldas</title>
  <style>
    body {
      font-family: Arial, sans-serif;
      line-height: 1.6;
      margin: 0;
      padding: 0;
      background-color: #f4f4f4;
    }
    header {
      background-color: #003366;
      color: #ffffff;
      text-align: center;
      padding: 1rem;
    }
    main {
      padding: 2rem;
      max-width: 800px;
      margin: 0 auto;
      background-color: #ffffff;
      box-shadow: 0 0 10px rgba(0,0,0,0.1);
    }
    h1 {
      color: #003366;
    }
    .welcome-message {
      font-size: 1.2rem;
      color: #333;
      border-left: 4px solid #003366;
      padding-left: 1rem;
      margin: 1rem 0;
    }
  </style>
</head>
<body>

```

File Manager

Save

Step 3: Check DHCP Services

Verify DHCP service power-on and add a new pool.

DHCP

Interface FastEthernet0 Service ☒ On ☐ Off

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 Number of Users : 50

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
UDPool	193.168....	193.168....	193.168....	255.255....	50	0.0.0.0	0.0.0.0
serverPool	0.0.0.0	0.0.0.0	193.168....	255.255....	512	0.0.0.0	0.0.0.0

Step 4: Check DNS Services

Verify DNS service power-on and add a new rule.

DNS

DNS Service ☒ On ☐ Off

Resource Records

Name www.udistrital.edu.co Type A Record

Address 193.168.100.200

Add Save Remove

No.	Name	Type	Detail
0	www.udistrital.edu.co	A Record	193.168.100.200

Step 5: Set Cloud “Internet” and connect to the server

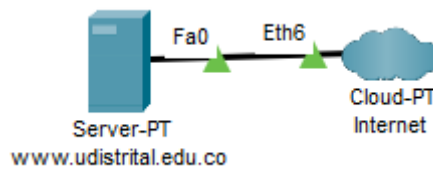
Add a Cloud “Internet” and set, then connect the Cloud to the server previously set.

Cloud

Coaxial7 <--> Ethernet6

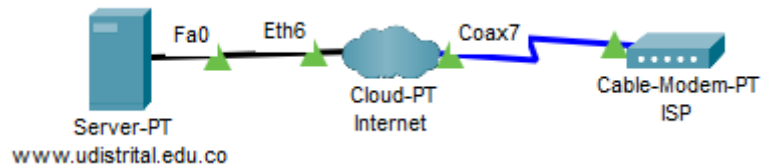
Port Port

From Port	To Port
Coaxial7	Ethernet6



Step 6: Connect a Cable-Modem- PT “ISP” to the Cloud “Internet”

Connect the Cable-Modem to “Internet”

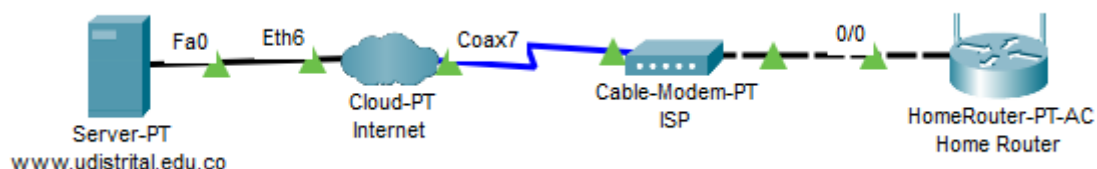


Step 7: Implement, set and connect Home Router

Set Home Router configuration, LAN Settings and Wireless Settings, then connect to “ISP”

LAN Settings	
IP Configuration	
IPv4 Address	192.168.0.1
Subnet Mask	255.255.255.0

Wireless 2.4G Settings	
SSID	UD_Invitados
2.4 GHz Channel	6 - 2.437GHz
Coverage Range (meters)	20.00
Authentication <input checked="" type="radio"/> Disabled <input type="radio"/> WEP WEP Key <input type="radio"/> WPA-PSK <input type="radio"/> WPA2-PSK PSK Pass Phrase <input type="radio"/> WPA <input type="radio"/> WPA2	
RADIUS Server Settings	
IP Address	
Shared Secret	
Encryption Type	Disabled



Step 8: Implement, set and connect PC-PT

Set PC-PT configuration, Fast Ethernet Settings, then connect to Home Router

FastEthernet0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input checked="" type="radio"/> Half Duplex <input type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	00D0.BCB8.A804
IP Configuration <input checked="" type="radio"/> DHCP <input type="radio"/> Static IPv4 Address <input type="text"/> Subnet Mask <input type="text"/>	

Step 9: Implement, set and connect Laptop-PT

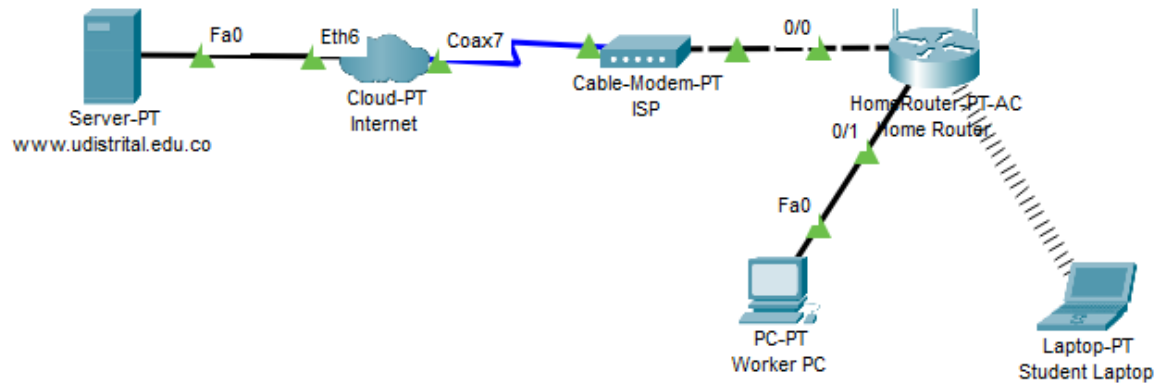
Set Laptop-PT configuration, Wireless Settings, then connect to Home Router

Wireless0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	300 Mbps
MAC Address	000A.F336.4BE4
SSID	UD_Invitados
Authentication <input checked="" type="radio"/> Disabled <input type="radio"/> WEP <input type="radio"/> WPA-PSK <input type="radio"/> WPA2-PSK <input type="radio"/> WPA <input type="radio"/> WPA2 <input type="radio"/> 802.1X Method: <input type="text"/> MD5 WEP Key <input type="text"/> PSK Pass Phrase <input type="text"/> User ID <input type="text"/> Password <input type="text"/> User Name <input type="text"/> Password <input type="text"/> Encryption Type <input type="text"/> Disabled	
IP Configuration <input checked="" type="radio"/> DHCP <input type="radio"/> Static IPv4 Address 192.168.0.101 Subnet Mask 255.255.255.0	

TEST AND RESULTS

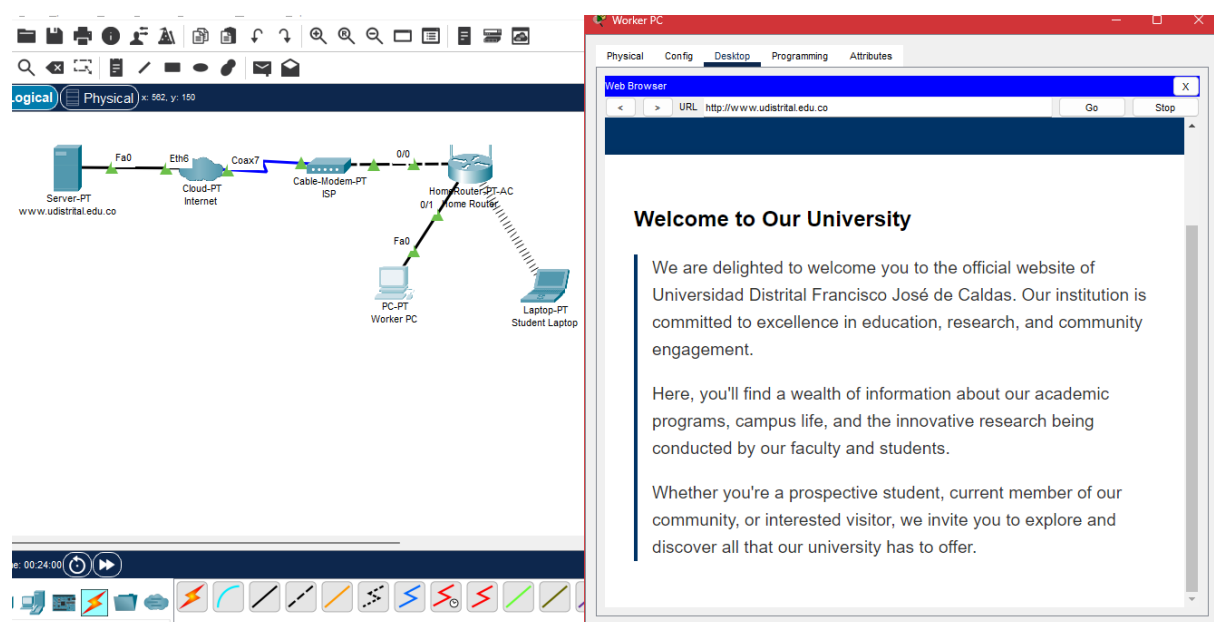
Results of the Topology

After of setting all the devices of our network we get a result like this:



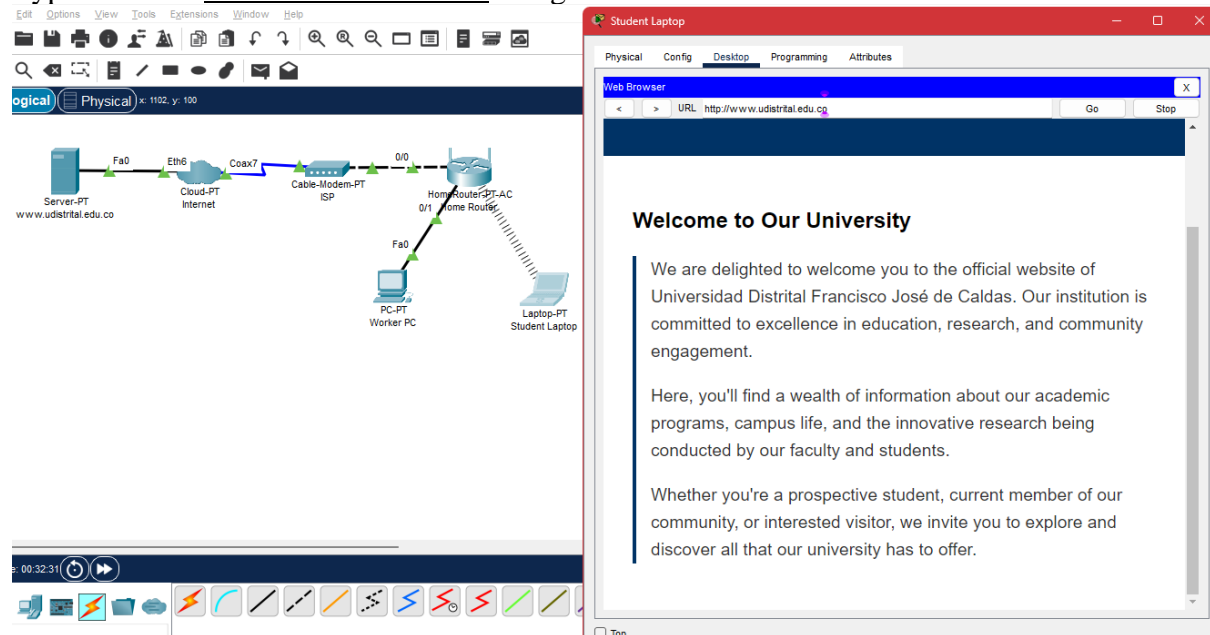
Test: Access in web browser of Worker PC

Type the URL www.udistrital.edu.co and get this:



Test: Access in web browser of Student Laptop

Type the URL www.udistrital.edu.co and get this:



CONCLUSIONS

The simulation project using Packet Tracer has successfully demonstrated the implementation of a functional computer network that meets the specified requirements. The network design incorporates key elements such as server configuration, cloud connectivity, and home network setup, effectively simulating a real-world scenario for the university's network infrastructure.

Through this project, several critical networking concepts were applied, including DHCP and DNS service configuration, server setup, and wireless networking. The successful connectivity tests, as evidenced by the ability of both wired and wireless client devices to access the university's webpage, validate the effectiveness of the network design and implementation.

This workshop has provided valuable hands-on experience in network simulation, offering insights into the complexities and considerations involved in designing and implementing a functional network infrastructure. The use of Packet Tracer as a simulation tool has proven to be an effective method for learning and applying networking principles in a controlled environment.