

Soumyadyuti Dey
Data Communication & Computer Networks
BCA – Media & IT
The NorthCap University

Title of the Assignment: Smart office network design

Computer Networks – Enterprise Level Network Design and Transmission Media Simulation using Cisco Packet Tracer

Objective:

The goal of this assignment is to design and simulate a comprehensive enterprise-level network in **Cisco Packet Tracer**. This network incorporates various components such as **wired and wireless devices, servers, printers, routers, core and access switches**, and **multiple PCs**, showcasing a realistic IT infrastructure setup used in offices or institutional networks.

Tools Used Inside Cisco Packet Tracer:

- Devices simulated:
 - 1 Wireless Access Point (WRTOON)
 - 1 Router (1941)
 - 2 Switches:
 - Core Switch (2960-24TT)
 - Access Switch (2960-24TT)
 - 2 Servers:
 - File Server
 - Mail Server

- 3 Network Printers
 - 50+ PCs
 - Connection Media:
 - **Copper Straight-through Cable**
 - **Wireless Connectivity**
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Types of Transmission Media Used:

- **Copper Straight-through Cable**
Used to connect:
 - PCs to switches
 - Switches to servers
 - Switches to printers
 - Switches to router and wireless access point
 - **Wireless Media**
Used to simulate Wi-Fi connectivity via a **wireless access point (WRT1900N)**.
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Procedure Followed:

1. **Setting Up Core Infrastructure:**
 - Placed **Core Switch** and **Access Switch** to divide the internal and external segments of the network.
 - Added **Wireless Access Point, 1941 Router**, and both servers to the core network segment.
2. **Device Deployment:**
 - Added over **50 PCs**, organized in multiple logical groups representing departments or rooms.

- Added **3 Printers** and connected them to the **Access Switch**.
- Added a **File Server** and **Mail Server** to the **Core Switch**.

3. **Wiring:**

- Used **Copper Straight-through Cable** to connect:
 - All PCs to Access Switch
 - Access Switch to Core Switch
 - Core Switch to Servers
 - Core Switch to Wireless Access Point and Router
 - Printers to Access Switch

4. **IP Address Assignment:**

- Assigned static IP addresses in appropriate subnets for all devices (PCs, servers, printers, router).
- Ensured no IP conflicts and proper subnetting.

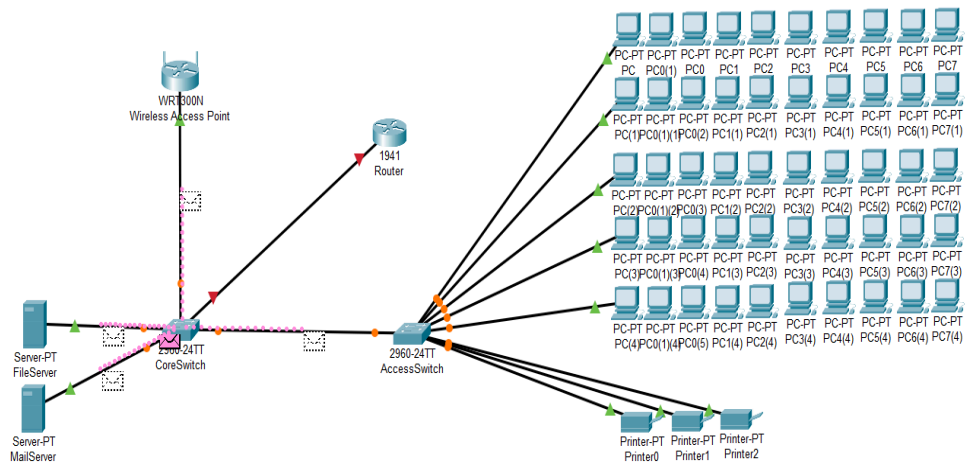
5. **Connectivity Testing:**

- Performed ping tests across devices (PC to PC, PC to server, server to router, PC to printer).
- Observed data flow through switches and verified LED link indicators turned **green**.

Observations:

- The **Core and Access Switch architecture** allowed proper hierarchical segmentation.
- Devices successfully communicated with servers and printers.
- All wired links showed active **green** status, indicating proper connections.
- **Wireless Access Point** enabled additional mobile or virtual clients to be added later.

Screenshot Proof:



Simulation Panel		
Event List		
Vis.	Time(sec)	Last Device
	2.955	CoreSwitch
	2.955	CoreSwitch
	2.956	AccessSwitch
	2.956	AccessSwitch
	2.956	AccessSwitch
	2.956	AccessSwitch
	2.956	AccessSwitch
	2.956	AccessSwitch
	2.956	AccessSwitch
	2.956	AccessSwitch
	4.953	-
	4.954	CoreSwitch
	4.954	CoreSwitch
	4.954	CoreSwitch
	4.954	CoreSwitch

Reset Simulation ☒ Constant Delay Capturing...

Play Controls