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Computer Network Exam I

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CSE - B + 3rd yr

Aim: To Create & configure a suitable network topology for both LAN and WAN using Cisco Packet Tracer, involving 10-15 computers, switches, and routers. The goal is to simulate the transmission message from one computer to another computer in the network, ensuring proper connectivity and communication across different network segments.

Procedure :

1. Topology

LAN configuration :

1. Design a network at least 10 computers connected to switch. Ensure the LAN segment has appropriate switch connectivity.
2. Implement WAN configuration to connect the LAN network to another network using routers. This involves creating a broader network structures to facilitates communication between distinct LANs.

2. Network Setup in Cisco Packet Tracker

Add Devices :

1. Place and connect 10-15 computers within the LAN segment.
2. Add at least 2 switches to facilitates the connections of the computers.
3. Introduces at least 2 routers, to establish WAN connectivity.



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3 Configure IP Address:

1. Assign IP addresses to all computers within the LAN segment, ensuring each computer has a unique address with the subnet mask.
2. Configure router interface with appropriate IP address that enables routing between LAN and WAN segment.
3. Set up routing protocols or static routes as required to ensure seamless communication between different LAN through the WAN.
4. configuration steps.

LAN configuration steps:

1. Connect computers to the switches using network cables.
2. Configure the router interfaces with IP address that facilitate communication across the WAN.
3. Set up routing either static or dynamic, to ensure that the routers traffic between different LAN.

WAN configuration:

1. Connect the routers to each other establish the WAN connection.
2. Configure router interfaces with IP address that facilitate communication across the wan.
3. Set up routing either static or dynamic, to ensure that the routers traffic between different WAN Segment.



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4. Simulation: send a message.

1. Use cisco packet tracer simulation mode to monitor and test network activity
2. Configure and send a message from a computer in one network (P.S, LAN 1) to a computer in another network (LAN 2)
3. Capture and verify the message transmission to ensure that the message is successfully delivered from one network to the other.

Result:-

Network Topology and configuration:

LAN setup:-

Computers: 12 computers were placed and connected successfully.
Switches: 2 switches were used to manage the LAN connection.
IP Configuration: IP address were assign to all computer with same sub net.

WAN Setup:-

Routers: 2 routers were configured to connect two LANs
Routers IP configurations: Routers were assigned IP address on their interface to connect the LANs and each other.

Routing Protocol: static routes were implemented to ensure traffic can flow between LAN segment



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Message Transmission:-

- A message successfully sent from a computer in LAN 1 to a computer in LAN 2.

The simulation mode in Cisco packet tracer confirmed that the message was routed correctly through the WAN and arrived at the designated computer. Demonstrating successful inter-network communication.



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CN LAB EXAM - 2

Aim: To design and configure a network topology using RIP & OSPF routing protocol in Cisco Packet Tracer, ensuring communication b/w two LANs through proper IP address assignment & routing protocol configuration.

Materials required: Cisco packet tracer software, 2 routers, two switches, 10 computers, Ethernet cable for connection.

Procedure:

→ Network Topology Design: Create a network topology design a topology that includes 10-12 computers across 2 LAN's. Use at least 2 switches to connect computers with LAN. Use 2 routers connected via a WAN link to connect the LAN.

→ IP Address configuration: Assign IP address to computer. Use the last three digits of your roll no. as the last octet of the IP address.

LAN 1 Subnet: 192.168.1.0/24

LAN 2 Subnet: 192.168.2.0/24

Ex roll no: 122 IP address Link 192.168.1.122 for LAN 1
IP address Link 192.168.2.0.122 for LAN 2

Routing protocol configuration: Configure RIP on Router 1. Enable RIP v1 & the network associated with Router 1, configure OSPF on Router 2 & network associated with Router 2, Ensure Inter-LAN communication: verify that the routing protocol allows communication b/w the two LANs.



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- Cisco Packet Tracer configuration steps:
Add devices & connection - Add computer, switches & router and connect them using appropriate cable, configure IP address: set IP address to all devices according to subnet plan, Routing Setup - configure the protocol on each router (RIP for router 1 & OSPF for router 2). Verify that both router 1 & OSPF for router 2 can share information & that static routes can be set if necessary.
- Simulation: use simulation mode - Test message transmission from one computer in LAN 1 to LAN 2 verify successful transmission. Ensure that the message reaches the destination computer without any issues.

Result: The network topology was successfully configured using RIP & OSPF routing protocols. The IP addresses were assigned according to roll no. & communication b/w the LANs was verified using cisco packet tracer's simulation mode.



CASE STUDY REPORT: Exploring Field Test Mode On SmartPhones

Introduction

The objective of this case study is to explore and understand key network information available on Smart Phones through field test mode or similar diagnostics tool. By using this features, we will gather technical details about network setting & performance across various devices, including Android, iPhone & Samsung models. This information is vital for understanding how smartphones communicate with network & can aid in trouble-shooting & improve connectivity.

Key Network Information & Their Importance:-

- (i) IMEI Number: It stands for International Mobile Equipment Identity. It is unique 15 digit number that identifies a mobile device. It can be used to track the device in case of theft and lock it from network unless even with a new sim.



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(ii) MAC Address: It stands Media Access Control. The MAC address is a unique identifier assigned to a device's network interface. It is embedded on the hardware and is essential for locating devices on local Network. It enhances the network security.

(iii) IP Address: It stands for Internet protocol. It is a identifier of a device on a network.. allowing device common two types (a) Public IP Address (b) Private IP Address

(a) Public IP Address: Assigned by Internet Service provider (ISP) for communication b/w network.

(b) Public IP address: Assigned Internet service provider (ISP) for communication b/w Internet.

(iv) Network Operator / Brand: The name of cellular provider offering networking services. It determines the mobile service & the network type .(e.g., 4G, 5G, etc.)

(v) Network Type '(4G LTE, 5G, etc. --)'. Refers to the generation & type of mobile network the device is connected to. It can show the speed & capabilities of the network in data transmission.



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Signal Strength (measured in dBm) :- It indicates the power of the network signal the phone is receiving. It is measured in decibels per milliwatt (dBm), with values closer to zero being better. It affects call quality & Internet speed.

Mobile Location Information (LAC - Location Area Code & CID - cell ID) :- LAC & CID represents the unique identifier for the current mobile tower & its location. useful to determine current network coverage & location tracking.

Steps to Scan Field Test Mode:-

(i) Android :- open phone dial & enter *#3001#12345# to info. Now navigate to phone Info. & wifi Info for network details. Take screen shot of details.

(ii) Details collected : IMEI, MAC address, IP Address, network type (5G/LTE), signal strength, operating Information. Signal strength recorded at -95 dBm, network type 5G/LTE, network operator is Airtel Telecom.



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IMEI Number: 4499107985215403

MAC Address: 5c: a0:6c:2d:51:45

IP Address: 32.90.48.3.3649.3620.8000

Network Operator / Brand (cellular provider)

Operator: Airtel 4G

Network Type (4G, LTE, 5G, etc): 4G LTE

Signal Strength (in dBm): -85dBm

Conclusion

By accessing field Test Mode on my iOS devices, I was able to gather critical networking details. This process enhanced my understanding of mobile networkingperf performance the significance of parameters like IMEI, signal strength, etc . . . ensuring seamless communication.