Campus network design

18CSS202J

Computer communication project Report

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Submitted to

M. RAJALAKSHMI

in partial fulfilment for the award of the degree of

BACHELOR OF TECHNOLOGY
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KATTANKULATHUR - 603203

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Project Scope:

Design a computer network for a college. There are 50 users in the college. 20 users in the main building, 20 users in the annex campus tech park building, and 10 users in annex campus hospital block. Every building has a lobby which is 200 square feet open space, where wireless access to the network is required. Only authorized personal should have access to the wireless network.
The distance between annex campus hospital block and the main building is 300 meters. The distance between annex campus tech park and the main building is 90 meters. The distance between annex campus hospital block and tech park is 70 meters. A high-speed cable internet connection is available in the main building which needs to be shared among the users. The necessary equipment's and appropriate topology required for the campus network design along with the IP address schema, IP address management, secure wireless access, internet sharing, features and services should be worked out. A bill of material should be included with products from Microsoft, Cisco, D-LINK or Net gear with appropriate quantity which can be used for setting up of the campus infrastructure.

Campus Plan:

- Campus consists of 3 building
- Each building contains a computer lab
- There are various faculty offices
- An administration block and Library contain in main building

Network Requirement Analysis:

- Providing network services to 50 users
- 20 in the main building
- 20 in the tech park
- 10 in the Hospital building
- Flexible network architecture
- Selecting well-structured topology

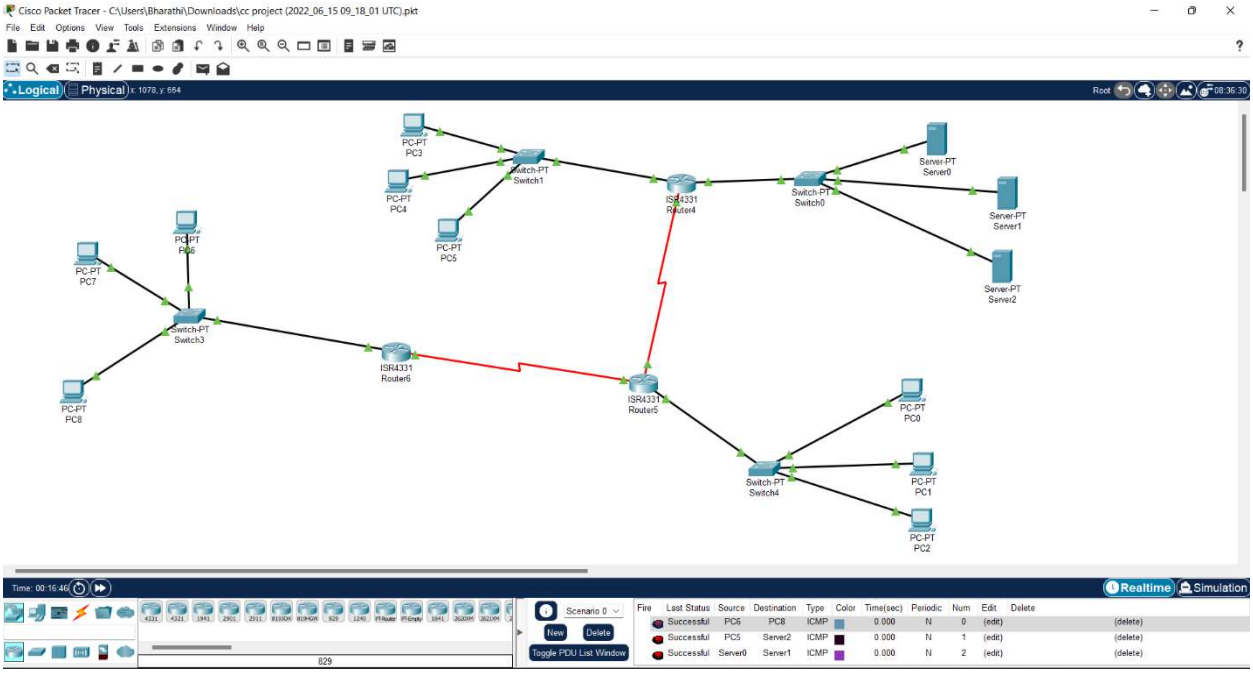
Network Topology:

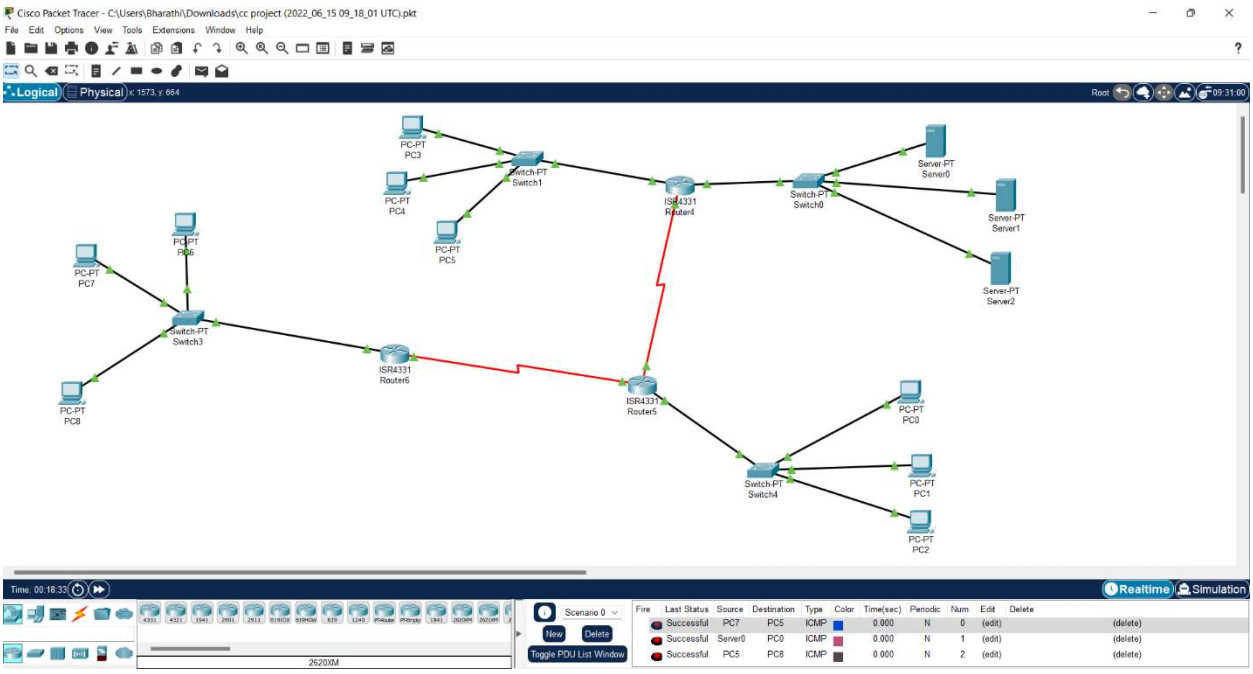
- The campus may have multiple building i.e., different department
- The network is designed keeping in view the architectural layout of the university
- Star topology design and top-down approach is adopted
- Network design fulfills the requirements of 50 users

Design Layout:

- A Central router sends/receives all packets to other routers.
- There is a separate router for each department buildings on campus Each router will connect its department to the central hub.
- Connections are made using switches.
- PCs are connected.
- Wi-Fi connectivity is available in all department.
- The Internet is being provided to the central router by an Internet Services Provider.
- It is the further supplied by the main router to another router.

Snapshot:


Cisco Packet Tracer - C:\Users\Bharathi\Downloads\cc project (2022_06_15 09_18_01 UTC).pkt
File Edit Options View Tools Extensions Window Help
Logical Physical
PC-PT PC3
Switch-PT Switch1
PC-PT PC4
PC-PT PC5
ISR4331 Router4
Switch-PT Switch0
Server-PT Server0
Server-PT Server1
Server-PT Server2
PC-PT PC6
PC-PT PC7
Switch-PT Switch3
ISR4331 Router6
PC-PT PC8
ISR4331 Router5
PC-PT PC0
Switch-PT Switch4
PC-PT PC1
PC-PT PC2
Realtime Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC5 PC8 ICMP 0.000 N 0 (edit) (delete)
Successful PC5 Server2 ICMP 0.000 N 1 (edit) (delete)
Successful Server0 Server1 ICMP 0.000 N 2 (edit) (delete)
829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ISR4331 Router6
PC-PT PC8
ISR4331 Router5
PC-PT PC0
Switch-PT Switch4
PC-PT PC1
PC-PT PC2
Realtime Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC7 PC5 ICMP 0.000 N 0 (edit) (delete)
Successful Server0 PC0 ICMP 0.000 N 1 (edit) (delete)
Successful PC5 PC8 ICMP 0.000 N 2 (edit) (delete)
2620XM

Bill of material:

1.Router:

Quantity:4
Price:4 x $4950

2.Switches:

Quantity:3
Price:3 x $ 293

3.Cable:

Quantity:17
Price:17 x $50

4.Connector:

Quantity:5
Price:5 x $1.28

5.PCs:

Quantity:9
Price:9 x $100

Total Price: $224.61

Features and Services:

- Security Services
- DNS Services
- Internet Services
- Resources Sharing
- Proxy Services
- Remote Access
- Voice over IP
- Network Redundancy

Conclusion:

- Star topology provides a central hub from which all other connections are derived
- Faults in the network can be located and fixed easily
- Top-down approach handles user requirements at all levels
- Total Cost is $224.61
- The described network aims to provide an optimal, scalable and maintainable

Reference:

- Campus Network Design - YouTube
- CAMPUS NETWORK DESIGN. I'm from Bennett university 4th year of… | by Praveen Ravula | Medium
- 1: Packets (data) Sending from MECHANICAL Department. | Download Scientific Diagram (researchgate.net)
- CAMPUS/UNIVERSITY NETWORK DESIGN & CONFIGURATION ON PACKET TRACER SIMULATION | by oluyede Segun (jr) | Medium
- Campus Network Design Models | Network Computing