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College Network Scenario Implementation by using Cisco Packet Tracer

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Abstract: Different users are there for the project; the users are present in different groups at different places. By this, a request is induced by one of the other user to interface with other user/users or sharing some data with them. There can be a condition where a message is to be broadcasted to entire college by a user. So this paper is about communication among divergent users present at different sites, sharing this common network. CNS Stands for the college network scenario.

Keyword: CNS, CCNA, CISCO, IP, ROUTER, VLAN.

1. INTRODUCTION OF CNS

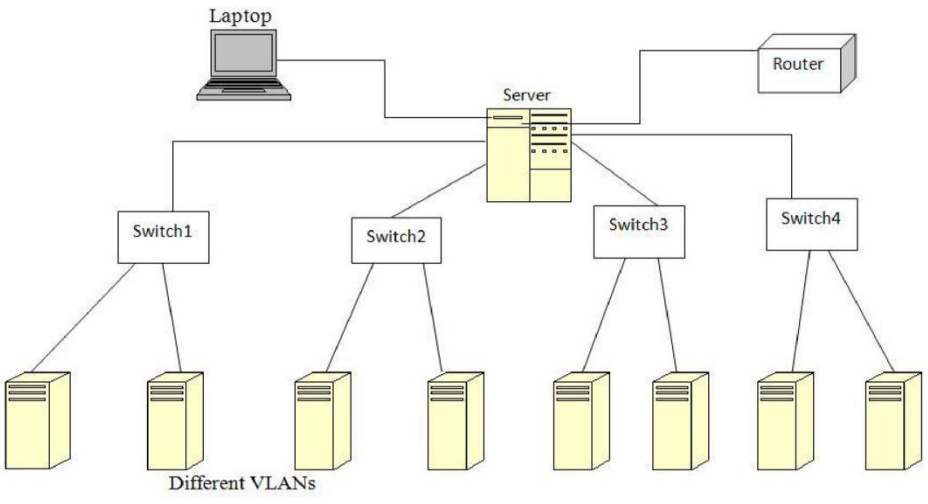
This College Network Scenario is about designing a topology of a network that is a LAN (Local Area Network) for a College in which various computers of different departments are set up so that they can interact and communicate with each other by interchanging data. To design a networking scenario for a college which connect various departments to each other's, it puts forward communication among different departments. CNS is used to design a systematic and well planned topology, satisfying all the necessities of the college (i.e. client). CNS come up with a network with good performance. CNS is also providing security and authentication to forbid unauthorized logins.

2. TECHNOLOGY TO BE USED

CCNA: Cisco Certified Network Associate .CCNA is a well-liked certification in computer networking that is developed by Cisco Systems. CCNA is discovered by the Cisco, to identify basic capability in installation and maintenance of medium-sized networks.

The technology is used for connecting various devices like routers, switches and different end devices to communicate with each other and interchanging data. To construct a methodical and reliable network, is scalable too. Portability is one of the characteristics of this work application of the CNS.

3. BASIC ARCHITECTURE



The basic architecture of CNS generally make use of various types of computers, router, servers, switches, VLAN connections, personal PC's and Laptops.

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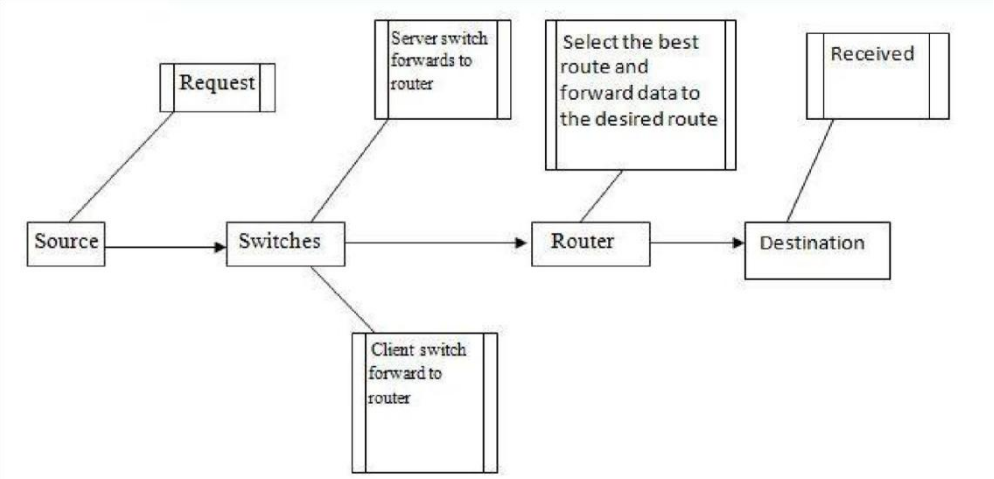
4. WORKING OF CNS

This job with respect to the College's Networking Scenario is to provide a systematic, secure, valid, dependable communication among different departments. The work is done keeping in mind the complexity and cost factor. Various departments can simply divide the required data without any problem and can exchange their data without going to them physically, for example like a phone call, thus conserving energy and time.



Major components and their communication

5. REQUIREMENTS

The following division talk about the requirements interconnected to the interfaces for using communication by taking lots of data. These data combine client, software interfaces and other hardware that privilege the system to take its loads

5.1 User Interfaces

The requirements represents in this module discuss the CNS interfaces. The requirements are gathered in order to the main characteristics implemented in the system. The requirements always maintain the movements interconnected with the subheading characteristics.

5.2 Interface Formats

- The screen will be shown in virtual topology which that the college designed.
- The network simulator that is Cisco Packet Tracer is a straightforward ,easy for implementation and gives a visual attraction of graphical user interface.
- It will displayed five switches ,different VLANs and 1 router interconnected with each other.
- By clicking administrator, It will open graphical user interface for respective device.
- The configuration can be done by selecting CLI (command line interface.

5.3 System Interface

In this scenario, giving data to any end device, the welcome page will be appeared for this respective system i.e. a Graphical User Interface in the following banner "Welcome to VIT" . Unauthorized user are not able to access ! "and appear a log in form to the authorized user by giving login credentials. We can reset the password by the help of network administrator.

5.4 Hardware Interfaces

To run the cisco packet simulator, We need some basic requirements, That is given below:-
Random access memory (RAM): 512 MB
Central Processing Unit (CPU): Intel Pentium Dual core.
Storage: 500 MB of free disk space
Display resolution: 800 x 600
Adobe Flash Player

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Recommended H/w:

CPU: Intel Pentium III 1.0 GHz
Display resolution: 1024 x 768
Storage: 300 MB free disk space
RAM: > 512 MB

Run the module i.e. for a live project (a network), the hardware requirements are:
5 Switches (Cisco 2950 switch)
1 Router (Cisco 1841 router)
Computer Systems (Generic)
1 Computer system for server
Cross over cable
Straight through cable

5.5 Software Interfaces

The requirements required in the CNS are as follows:
Operating System: - Microsoft Windows 7.
Adobe Flash Player.
Cisco Packet Tracer

5.6 Communication Interfaces

- The execution of the system will be in the existing network.

- The system is mainly based on a client-server application where the server providing data to access all the services .

6. IP DESCRIPTION OF CNS

An IP address is a numerical tag assigned to each device (e.g., computer, printer, etc.) taking part in a computer network that uses the Internet Protocol for any communication. It is a 32-bit number. One is IPv4 and the other is IPv6. IPv4 is of 32 bit and is represented as X.X.X.X i.e. each octet is parted by a dot. For e.g.: 191.157.2.2 .In this project IPv4 is used. The assignment of IP address is reliant upon the number of hosts existing in the network.
Depending on the number of hosts present in the college; for this network the IP to be used is a class B IP addresses i.e. 172.16.0.0 with a subnet mask of 255.255.0.0. And this IP is then distributed among different VLANs and ports for communication.
The larger IP is fragmented into smaller networks by using the idea of VLSM (Variable Length Subnet Mask). Variable Length Subnet Masking (VLSM) - is a method that permits network administrators to divide an IP address space into subnets of different sizes.VLSM is the breaking down of IP addresses into subnets (multiple levels) and assigning it based on the individual needs on a network.

7. PRODUCT FEATURES

1. This network is based on client-server architecture.
2. Tree topology is used here.
3. 4 client switches are present for the four levels of college and they are associated to a server switch.
4. All the departments are categorized into various VLANs, which are connected to the 4 switches based on the sequence in which they are accommodated on the storey.
5. Likewise, various departments limited into VLANs and share switches corresponding to their levels.
6. A request is made by any system of any department and it is forwarded to client switch which furthermore transmits it to the server.
7. Port-securities are there that are executed on various ports of the switches and gives reliability.
8. The data is then transferred to its connected router.

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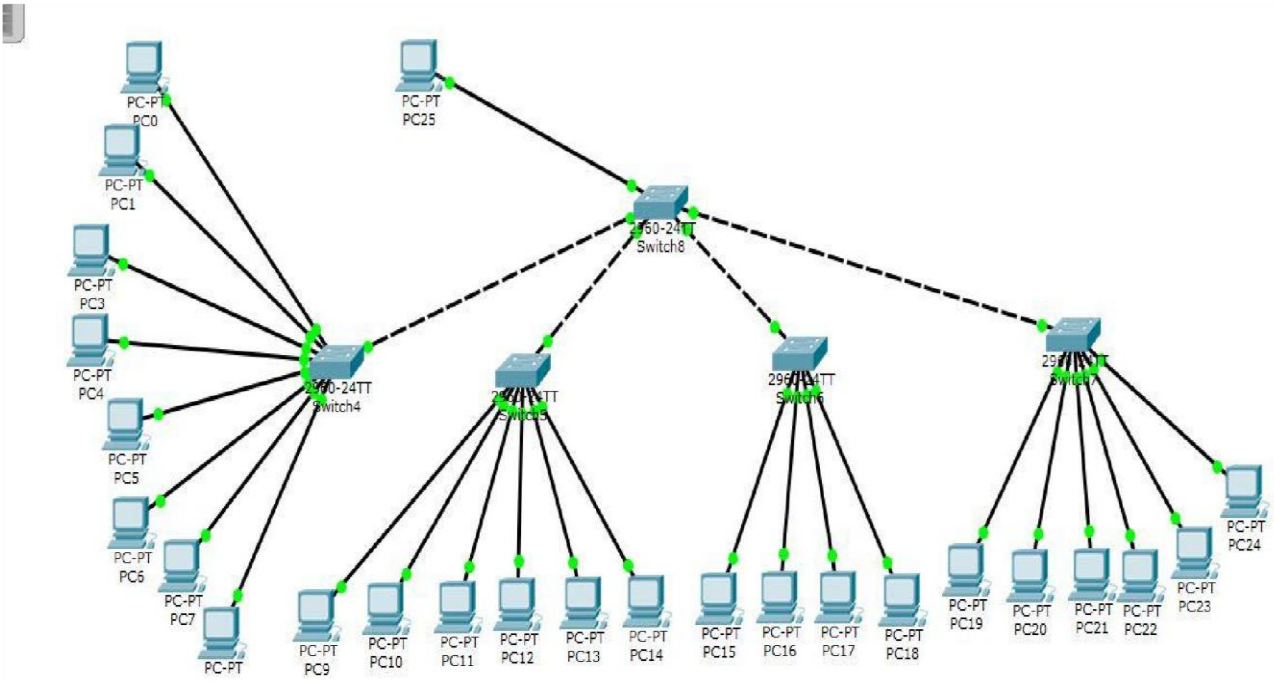
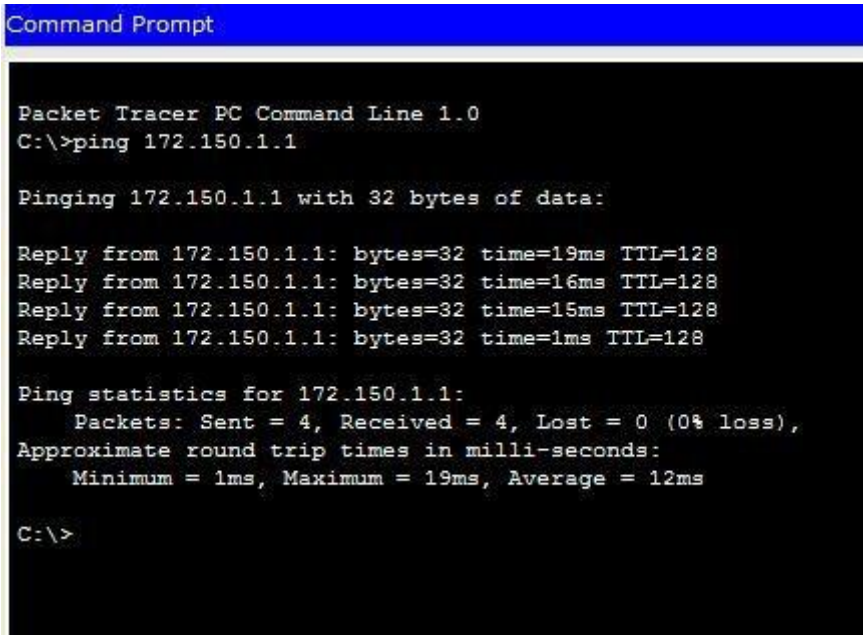
9. Router serves as DHCP server for assigning IPs to the host computers and also generally routes the data to the desired destination.
10. All appliances are under the reliability of their respective passwords known to the network executive only.
11. User can change the password any time they want to.

8 . SCOPE OF CNS

This project is give us an efficient methodology connected among all computers that are used in a respective university or college. Apart from interconnection, The project economical is made the topology by keeping in mind about the cost. The most important points is authentication and security to prevent the unauthorized access.

9. RESULTS OF CNS





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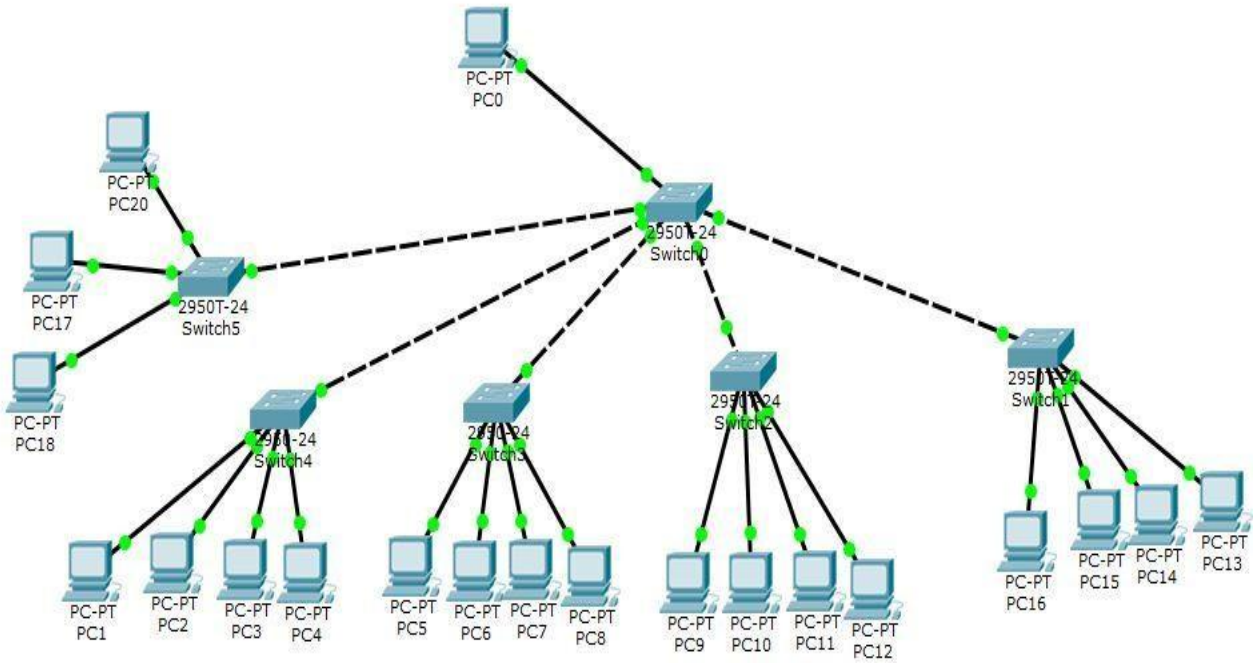
```
Command Prompt

Packet Tracer PC Command Line 1.0
C:\>ping 162.167.1.1

Pinging 162.167.1.1 with 32 bytes of data:

Reply from 162.167.1.1: bytes=32 time=1ms TTL=128
Reply from 162.167.1.1: bytes=32 time=4ms TTL=128
Reply from 162.167.1.1: bytes=32 time=2ms TTL=128
Reply from 162.167.1.1: bytes=32 time=1ms TTL=128

Ping statistics for 162.167.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 4ms, Average = 2ms
```




```
C:\>ping 172.168.1.3

Pinging 172.168.1.3 with 32 bytes of data:

Reply from 172.168.1.3: bytes=32 time=35ms TTL=128
Reply from 172.168.1.3: bytes=32 time<1ms TTL=128
Reply from 172.168.1.3: bytes=32 time<1ms TTL=128
Reply from 172.168.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 172.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 35ms, Average = 8ms

C:\>ping 172.168.1.3

Pinging 172.168.1.3 with 32 bytes of data:

Reply from 172.168.1.3: bytes=32 time=1ms TTL=128
Reply from 172.168.1.3: bytes=32 time<1ms TTL=128
Reply from 172.168.1.3: bytes=32 time=3ms TTL=128
Reply from 172.168.1.3: bytes=32 time<1ms TTL=128
```

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```
Ping statistics for 172.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 1ms

C:\>ping 172.168.1.4

Pinging 172.168.1.4 with 32 bytes of data:

Reply from 172.168.1.4: bytes=32 time=35ms TTL=128
Reply from 172.168.1.4: bytes=32 time<1ms TTL=128
Reply from 172.168.1.4: bytes=32 time<1ms TTL=128
Reply from 172.168.1.4: bytes=32 time=3ms TTL=128

Ping statistics for 172.168.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 35ms, Average = 9ms
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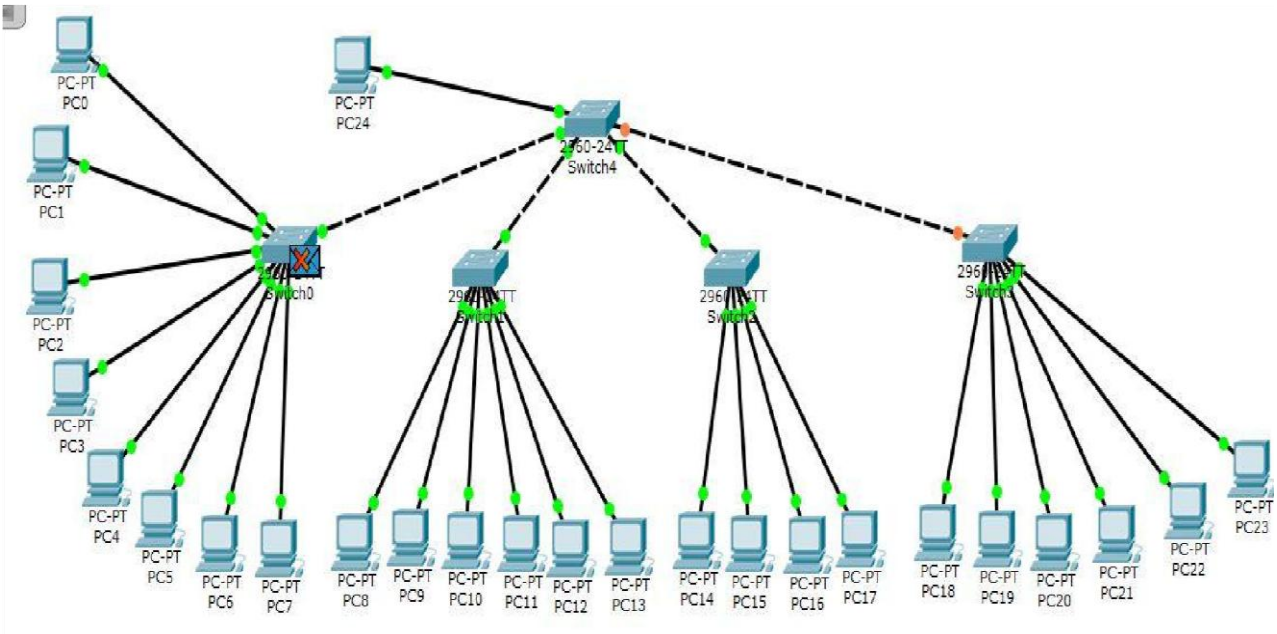

10.CONCLUSION

To Design the network outlook for the community college network scenario produces the substructure for all other exposure in the service framework such as security of the network, wireless area network, mobility as well as putting the justification to provide safety and security, operational efficiencies, virtual learning environments, and secure classrooms. This paper describes the network design scenario approved by Cisco, as well as where we can apply these scenario within the various locations of a community college network. Finally, key network foundation services such as switching, routing, multicast, and high availability are given for the full college network scenario

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