Implementation of College Network Scenario Module by Using CCNA

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Abstract– **There is different users of the project; basically the users are present at different places in different groups. By this, a request is generated by one user of either to communicate with other user or users or sharing some data with them. There can be a state where a message is to be broadcasted by a user to entire college. So this paper is about communication among different users present at different locations, sharing this common network. CNS Stands for the college network scenario.**

Keyword- **CNS, CCNA, CISCO, IP, ROUTER, VLAN**

I. INTRODUCTION OF CNS

The CNS is about designing a topology of a network that is a LAN(Local Area Network) for a College in which different computers of different departments are arranged so that can communicate and interact with each other by exchanging data. To design a networking scenario for a college which connect different departments to each other's? It provides communication among different departments. CNS is used to design an efficient topology, fulfilling all the necessities of the college (that is client). CNS provides a network with good performance. CNS is also providing security and authentication to prohibit unauthorized logins.

II. TECHNOLOGY TO BE USED

CCNA: Cisco Certified Network Associate [1] [2] .CCNA is a popular certification in computer networking developed by Cisco [3] Systems. CCNA is discovered by the Cisco, to recognize basic competency in installation and support of medium-sized networks.

The technology is used for connecting different devices like switches, routers, and different end devices to communicate with each other and exchanging data. To build an efficient and reliable network, is scalable too.

Portability is one of the features of this work implementation of the CNS.

III. BASIC ARCHITECTURE
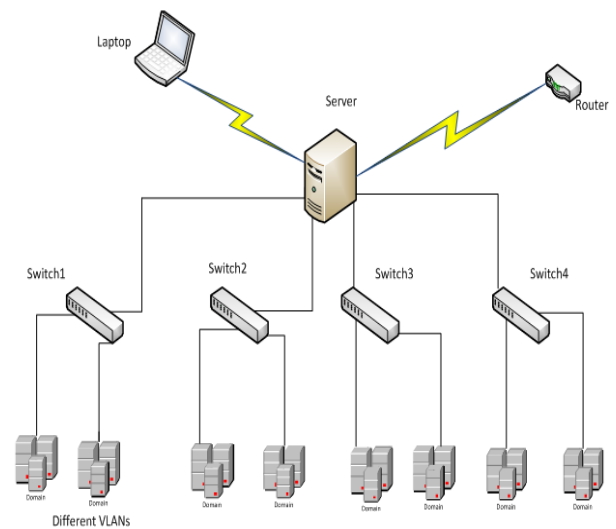
Different VLANs

The basic architecture of CNS uses basically different-different types of VLAN connections, various computers, Switches, Server, Router, Laptops and personal PC's.

IV. WORKING OF CNS

This work about CNS (College's Networking Scenario) is to provide an efficient, safe, authenticated, reliable communication among different departments. The work is build keeping in mind the cost and complexity factor. With different departments can easily share the desired data without any problem and can exchange their data without going physically to them just like a phone call, hence saving time and energy.

Major Components and their communication
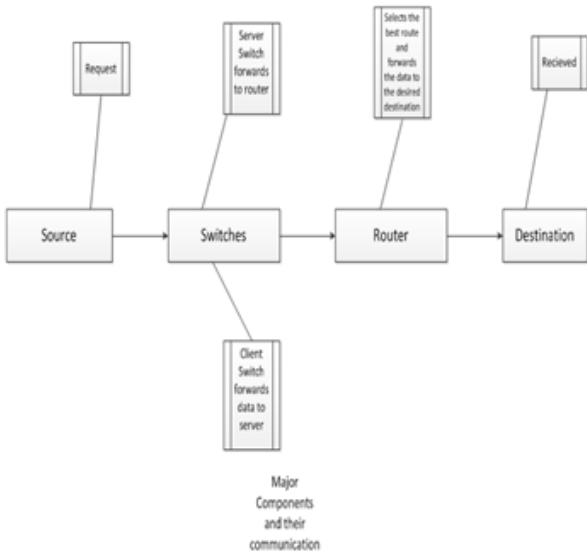
V. INTERFACE REQUIREMENTS

The following section discusses the requirements related to the interfaces used to communicate with lot of values. These values include client and other hardware and software interfaces that permit the system to carry out its tasks

5.1 User Interfaces

The requirements presented in this section describe the interfaces for CNS. The requirements are collected according to the main features provided by the system. A subheading of requirements always support the activities associated with the feature named by the subheading.

5.2 Interface Formats

- On these screen is displayed the virtual topology designed for the college.
- The network simulator i.e. Cisco Packet Tracer is a simple and attractive graphical user interface.
- It displays 5 switches one router and different VLANs connected to each other.
- When administrator clicks on any of the device a graphical user interface for opens.
- The CLI (command line interface) is selected for the configuration.
- The GUI of Cisco Packet Tracer allows user to run the project on runtime mode or simulation.

5.3 System Interface

Upon entry to any end device in the scenario, the system will display the following welcome screen i.e. a GUI with a banner "Welcome to COLLEGE".

Unauthorized user prohibited! "and prompt the user for a login and password.

The network administrator has the opinion to reset his/her password.

5.4 Hardware Interfaces

The basic or we can say the minimum hardware requirements for the simulator software (i.e Cisco Packet Tracer) [4] [5] to run can be given as follows:-

CPU: Intel Pentium Dual core.

RAM: 256 MB Free

Storage: 250 MB of free disk space

Display resolution: 800 x 600

Adobe Flash Player

Language fonts supporting Unicode encoding (if viewing in languages other than English)

Recommended H/w:

CPU: Intel Pentium III 1.0 GHz or better

RAM: > 512 MB

Storage: 300 MB of free disk space

Display resolution: 1024 x 768

Sound card and speakers

Internet connectivity (if using the Multiuser feature)

Now to physically run the module i.e. for a live project (a network), the hardware requirements are:

5 Switches (Cisco 2960 switch)

1 Router   (Cisco 2811 router)

Computer Systems (Generic)

1 Computer system for server management

Cross over cable

Straight through cable

5.5 Software Interfaces

The software requirements for the CNS are as follows:

Operating System:-Microsoft Windows NT, Microsoft Windows 8, Microsoft Windows 7.

Adobe Flash Player.

Language fonts supporting Unicode encoding (if viewing in languages other than English)

Operating system updates.

Cisco Packet Tracer

Boson can also be used to develop the network.

5.6 Communication Interfaces

The system will be executed over the existing campus network.

The system follows a client-server application with the server providing data access services only.

VI.   6. IP DESCRIPTION OF CNS

IP address: An **Internet Protocol address** (**IP address**) is a numerical label assigned to each device (e.g., computer, printer) participating in a computer network that uses the Internet Protocol for communication. An IP address as a 32-bit number is defined by a designer. One is IPv4, i.e. Internet Protocol version 4 in which the IP address is of 32 bit and is represented as X.X.X.X that is each octet is separated by a dot. For e.g.: 192.168.1.1Another is Ipv6, i.e. Internet Protocol version 6 in which the IP address is of 32 bit or 128 and is represented as X:X:X:X that is each octet is separated by a dot. In this project IPv4 IP address is used. Basically the allotment of IP address depends upon the number of hosts present in the network.

Depending on the number of hosts present in the college; for this network the IP [6] 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 broken into smaller networks by using the concept of VLSM (Variable Length Subnet Mask).

Variable Length Subnet Mask: Variable Length Subnet Masking - VLSM - is a technique that allows network administrators to divide an IP address space into subnets of different sizes, unlike simple same-size Sub netting. Variable Length Subnet Mask (VLSM) in a way means sub netting a subnet. To simplify further, VLSM is the breaking down of IP addresses into subnets (multiple levels) and allocating it according to the individual need on a network. A carsful addressing follows the general rule that has been proven to amount to IP address wastage.

VII.   PRODUCT FEATURES

1. First of all the overall topology is based on tree topology which is conveniently serving the network.
2. The network is based on client-server [7] architecture.
3. Basically there are four client [8] switches which are working for the four floors of college and they are connected to a server switch.

4. All the departments are classified into different VLANs, which are connected to the four switches [9] according to the sequence in which they are accommodated on floor. For e.g. on ground floor there is department called admin for administration office of college and that is a VLAN admin is connected to switch assigned to ground floor?
5. Similarly, different departments confined into VLANs and share switches respective to their floors.
6. Now when any request is made by any system of any department it's forwarded to client switch which further forwards it to the server.
7. Now there are port-securities which are implemented on different port of the switches which provides security from unauthorized personnel from connecting to the switch.
8. After the server, the data is transferred to the router connected to it.
9. Router [10] basically routes the data to the desired destination and also serves as DHCP server for assigning IPs to the host computers.
10. One of the exciting features of this project is that every device that is whether it's a switch or a router, they have been under the security of their respective passwords which are only known to the administrator (network administrator).
11. He/she may reset the password at any time.

VIII.   SCOPE OF CNS

This project is to provide an efficient communication among the computers that are being used in a college. Apart from interaction, the topology is designed keeping in mind the cost hence making the project economical. One of the most important points is security and authentication to prohibit the unauthorized access is also there.
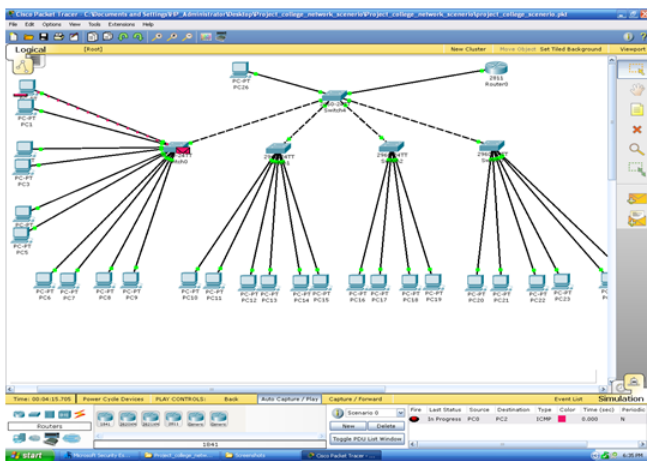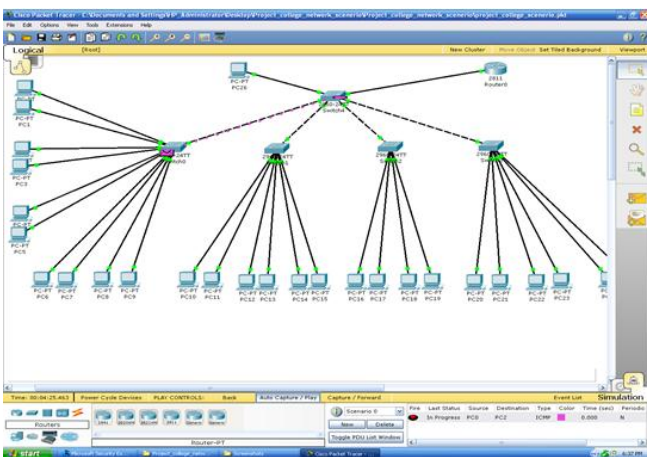
IX.   RESULTS OF CNS
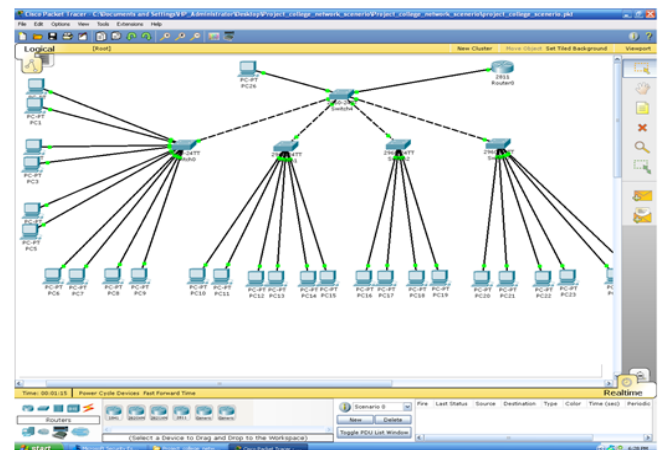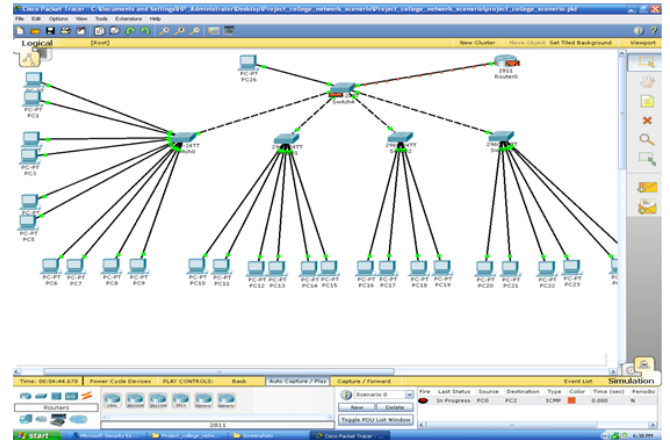
9.2 Selecting a source for sending a data
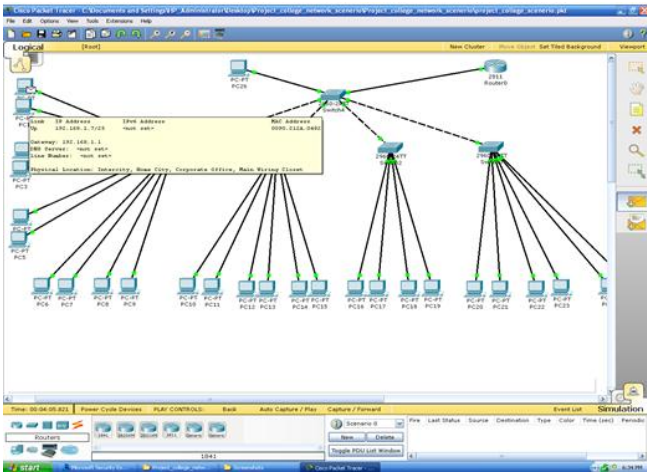
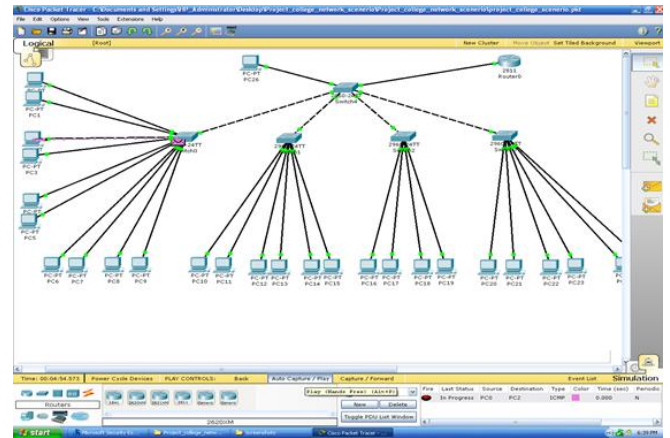*9.3 Data Is First Forwarded To Respective Switch*

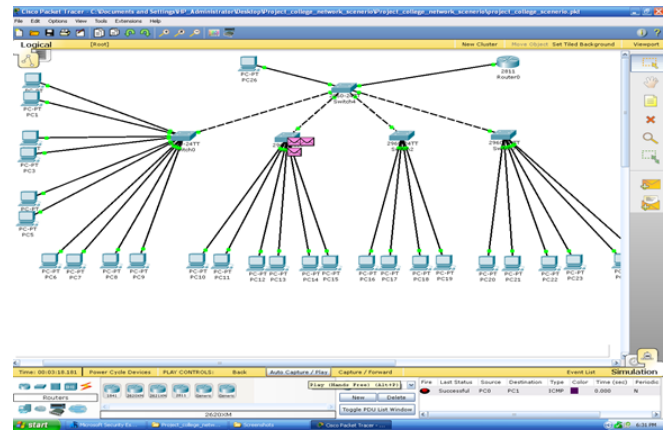*9.4 Packet Is Forwarded From Client Switch To Server Switch*

9.5 Packet Is Passed To Router For Selecting Best Path To Destination

9.6 The Router Then Sends The Data To The Destination Via Respective Switches

9.7 Successful Execution

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