

STUDY AND ANALYSIS OF LOCAL AREA NETWORK BY USING PACKET TRACER

ABSTRACT

In our new era PCs become our part of life for every personal and professional requirement. Majority of organizations depend on the finest possible working of their systems for correspondences, organization, mechanization, online business solutions, and so on. LAN is the best fundamental and significant PC system claimed by discrete organizations and might be utilized for interconnection of wide region systems. A LAN provides effective cost sharing of fast processing information handling gear, for example, mass stockpiling media, centralized server PCs or tiny computers and various types of printers. Asset sharing is generally similar as significant where a Local Area Network (LAN) serves as the entrance path for an Internet. In view of this, framework supervisor's requirement professional tools to help them with the motivation of improvement of QoS and maintenance of LANs. So in our present article, a LAN system is structured utilizing Cisco Packet Tracer. This article explains just how the apparatus can be used to build up a re-enactment model of the Local Area Network (LAN) for College of Engineering which contains different departments like Bio Technology (BT), Civil, Mechanical, ECE and EEE of our University. The examination gives knowledge into different ideas such as IP address setup, topology plan and how to send data as packets in a solitary network and for the usage of Virtual Local Area Networks to isolate the heavy traffic produced by various departments by using a main Server.

CHAPTER I

INTRODUCTION

1.1 INTRODUCTION OF THE PROJECT

The requirement for PC systems administration was an effect of the requirement to use PCs for exchanging information in an association in form of messages or packets, exchanging documents and data bases, etc. Regardless of whether the organization is situated in one structure or spread over a huge grounds, the requirement for systems administration the computers cannot be over underscored. As the name assumes, a Local Area Network (LAN) connects PCs in a limited physical territory. It gives high-data transfer capacity correspondence over cheap transmission media .The corporate LAN has developed from an easy basis business segment to a profoundly vibrant, noticeable core asset that activities depend on to help everyday tasks to their market accomplishment. E-Governance is a system of open segment order and is a significant advance in the adjustment of metropolitan organization, with E-Governance joins the utilization of ICT's [6] by government's association. The anticipated calculation utilizes insight of calculation for security of substance in e-governance executing a standard based methodology from computational Knowledge and client's present purpose of area data. On a work area PC, a recreation model had been actualized and assessments utilizing meandering client's continuous position-based data exhibits that proposed system can capably preserve wandering client position secrecy while giving better execution, ensured position privacy, and better nature of administration in e-Governance.

1.2 OVERVIEW

The requirement for PC systems administration was an effect of the requirement to use PCs for exchanging information in an association in form of messages or packets, exchanging documents and data bases, etc. Regardless of whether the organization is situated in one structure or spread over a huge grounds, the requirement for systems administration the computers cannot be over underscored. As the name assumes, a Local Area Network (LAN) connects PCs in a limited physical territory. It gives high-data transfer capacity correspondence over cheap transmission media .The corporate LAN has developed from an easy basis business

segment to a profoundly vibrant, noticeable core asset that activities depend on to help everyday tasks to their market accomplishment. E-Governance is a system of open segment order and is a significant advance in the adjustment of metropolitan organization, with E-Governance joins the utilization of ICT's by government's association. The anticipated calculation utilizes insight of calculation for security of substance in e-governance executing a standard based methodology from computational Knowledge and client's present purpose of area data. On a work area PC, a recreation model had been actualized and assessment utilizing meandering client's continuous position-based data exhibits that proposed system can capably preserve wandering client position secrecy while giving better execution, ensured position privacy, and better nature of administration in e-Governance.

1.3 OBJECTIVE

The following are the main objectives of this study:

1. Implementing RAIVPN by creating LAB environment in Packet Tracer or GNS3
2. Provide remote access to only authorized personnel to various Networking devices located within the periphery of University
3. Mitigating the overhead of sharing files and confidential data using the internet from both sides by providing remote access to remote users

1.4 ORGANIZATION PROFILE

Ascox Techno Soft is a leading software development and web designing company which born on 2014n in Madurai, TamilNadu, India. We are the young and energetic team committed to the permit of excellence. Our successful projects with client requirements have represented our reputation as superior providers. Ascox Techno Soft has established multi-branches at Chennai and Coimbatore for Continuous and better serve its Clients. Ascox Techno Soft's differentiation point meets with three philosophies.

- ✓ True Participation
- ✓ Perfect Understanding
- ✓ Patience in completing the job

In the past three years Ascox Techno Soft travelled more than 35 projects and has a large client's base of more than 20 clients all over India.

Our Mission and Vision

- ✓ Our Mission is to enriching the business growth of our clients with creative design and development to deliver high qualified solutions.
- ✓ Our Vision is to develop efficient software solutions to the most complex requirements with the highest levels of integrity. Professionalism and technological capabilities. When the project is specific and the result cannot fulfill your requirements-you need efficiently developed solutions for your software, being Ascox Techno Soft's clients, you will receive a perfect and expected solute.

CHAPTER II

LITERATURE REVIEW

2.1 Design and Analysis of a Network Topology in Cisco Packet Tracer tool

The present world is incomprehensible without messages, web based banking, talks and other significant administrations gave by the web. In this administrations PC system assume significant job to trade the data starting with one point then onto the next. So we can say correspondence arrange, alongside transportation systems, have turned out to be basic foundation in every general public that permits the progression of individuals data and merchandise. For interconnecting of several parts, organize topology depict physical as well coherent appearance and correlation between plan of PCs, links and other segment in an information correspondence system and how to be utilized for taking a parcel from one gadget and sending it through the system to another gadget on an alternate system. So in this article, we are planning a system utilizing a system test system device for example Cisco parcel tracer, while keeping centre around transport, star, work topology to comprehend different ideas, for example, topology structure, IP address arrangement and how to drive data in type of bundle in a solitary system. In this article, we actualized different topologies with best possible significant ideas similar to DHCP, DNS in a solitary system exploiting Packet Tracer tool. We have utilized basic system with switch, switch arrangement and send parcel information starting with one gadget then onto the next.

2.2 Device Positioning Policies for Large-scale Wireless Sensor Networks

Arranging gadget sending is a principal issue in executing remote sensor organizes Wireless Sensor Networks applications. This plan practice decides types, numbers and areas of gadgets so as to construct an amazing and powerful framework utilizing gadgets of restricted vitality supply and compelled limits. The arrangement plan chooses the points of confinement of numerous natural properties of a WSN, for example, inclusion, network, charge, and lifetime. In our proposal, we address the gadget sending arranging issues identified with enormous scale WSN frameworks. We consider a run of the mill arrangement of arranging situation in a varied two-level WSN made out of sensor hubs and hand-off hubs. Sensor hubs structure the lower

level of the system and are liable for giving palatable detecting inclusion to the application. We along these lines address the sensor hub arrangement regarding the detecting inclusion and hand-off hub sending as far as the correspondence network and framework lifetime. For sensor hub organization, we propose an inclusion ensured sensor hub organization structure procedure. Utilizing this method, the detecting inclusion is finished regardless of whether sensor hubs are arbitrarily scattered inside a limited range from its objective areas as indicated by a given network design. So as to check the expanded expense because of additional sensor hubs that are utilized in the inclusion ensured organization, while as yet keeping up a great detecting inclusion, we further investigation the probabilistic assets of the network based instrument hub sending within the sight of arrangement blunders.

For transfer hub organization, we propose to broaden the framework lifetime by conveying hand-off hubs as per a thickness work, which is upgraded because of the vitality utilization rate, with the goal that the vitality is scattered at an around same rate over the system. We further art the organization thickness capacity to accommodate the necessities of adjusted vitality utilization and solid sensor hub network. The methods proposed in this proposition fill the clear of accessible writing and can fill in as rules for WSN planners, arrangement suppliers and framework integrators of WSN applications. Gadget arrangement is a significant designing issue in actualizing WSN applications. The sorts, numbers, and areas of gadgets must be reasonably arranged with the goal that presentation prerequisites, for example, detecting inclusion quality, organize network, lifetime, and unwavering quality are altogether met while keeping the cost moderate.

This issue is especially significant for enormous scale WSN applications, in which countless gadgets will be utilized. Because of costly work cost, the detachment of the detecting field and the qualities of territory, purposeful situation of gadgets by people or machines can be troublesome, or even totally infeasible. In these circumstances, arrangement mistakes are unavoidably acquired in the sending exercise. Accordingly, it is important to mull over these sending blunders when the gadget arrangement plan is led. In this proposition, we propose an enormous scale WSN arrangement system under which sending blunders are joined into the organization models and the issue definitions. We likewise propose a progression of strategies and instruments to address a lot of sending issues. Computation (GCA) and two progressive

utility based covering counts range base covering (BCA) and cross breed covering (HCA). A movement of preliminaries has been directed to evaluate these computations under various structure settings. Preliminary outcomes show that, GCA has the most surprising accomplishment rate, anyway encounters a long covering time especially when the security level is high; BCA has the best adequacy, yet its anonymization cost, covering accomplishment extent and postponed time are modestly progressively terrible; HCA achieves the best as a rule execution to the extent diverse execution estimations.

The graph of Fig. 3.1 is the finished graph of the LAN and at the center it connected to switch, switch and the servers framing the Network Operating Center and every one of the

different departments in College are only a simple expansion of the system at the center. The allotted IP address picked to the inside system is 192.168.0.0 and it has been sub netted to acquire IP address obstructs that are allocated to various divisions and segments of this prescribed LAN.

3.2 CREATE AND ASSIGN IP/SUBNET MASK FOR VLANS

In this VLAN, we are assigning the default gate ways to all the VLANs with ip address and subnet mask.

Which is configured in the main switch of VLAN?

```
#ena
```

```
#config t
```

```
#VLAN 2
```

```
#VLAN 3
```

```
#int VLAN 1
```

```
#ip address 192.168.1.1(Network ID) 255.255.255.0 (Host ID)
```

```
#int VLAN 2
```

```
#ip address 192.168.2.1(Network ID) 255.255.255.0 (Host ID)
```

```
#int VLAN 3
```

```
#ip address 192.168.3.1(Network ID) 255.255.255.0 (Host ID)
```

```
#int VLAN 4
```

```
#ip address 192.168.4.1(Network ID) 255.255.255.0 (Host ID)
```

```
#int VLAN 5
```

```
#ip address 192.168.5.1(Network ID) 255.255.255.0 (Host ID)
```

```
#int VLAN 6
```

```
#ip address 192.168.6.1(Network ID) 255.255.255.0 (Host ID)
```

```
#int VLAN 7
```

```
#ip address 192.168.7.1(Network ID) 255.255.255.0 (Host ID)
```

```
#int VLAN 8
```

```
#ip address 192.168.8.1(Network ID) 255.255.255.0 (Host ID)
```

3.3 CONFIGURE DHCP SERVER

In this DHCP server, we must give the IP address, DNS server and subnet mask .After that we must go to the DHCP we assign the default gateway and DNS server address by give name to different address and add one by one to server.

3.4 CONFIGURE MODE ACCESS/TRUNK IN VLANS:

The configuration is done between the main switch and the primary switches of VLANs by using the cable interface we can trunk all the switches.

```
#int fa0/2
```

```
#switch port trunk encapsulation dot1q
```

```
#switch port mode trunk
```

In the primary switch, the interface cable are connect to the laptop and access point. Swhich is used to trunk to the PC and access point.

```
#int fa1/1
```

```
#switch port mode access
```

```
#switch port access VLAN 2
```

3.5 TELL PC IN VLANS WHERE TO GET IP:

In this VLANs, the switch of different VLAN are getting there IP address from server.

```
#int VLAN 1
```

```
#ip helper-address 192.168.10.2
```

```
#int VLAN 2
```

```
#ip helper-address 192.168.10.2
```

CHAPTER IV

SYSTEM REQUIREMENTS

4.1 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

4.2 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.

4.3 FEASIBILITY ANALYSIS

4.3.1 Technical Feasibility

Familiarity with the application

There was a medium familiarity with the application. The system developed was outside of anything done before at Cisco. Customized product demonstrations have previously been created on an ad-hoc basis within the company, but there has been no system that manages and automates the process as is being proposed. Therefore, a careful technical analysis was required to try to ensure that the system meets the needs of all the stakeholders.

Familiarity with the technology

There was a medium familiarity with the technology. The members of the product group had some prior knowledge of Cisco Contact Center solution software. The software, however, is

complicated and contains many components. Therefore, it took some time for the project team to learn how to use the software to be able to build the system. The team had excellent knowledge of the programming tools and applications used for implementation of the system. Project size this was a medium to large size project. Much analysis was needed for a proper implementation. Development of the system was somewhat complex. Much work was required to ensure that the application interacts with the rest of Contact Center solution correctly and that the application has a working and easy to use deployment capability.

4.3.2 Economic Feasibility

Direct costs to Cisco for this project amounted to a project sponsorship fee of \$15,000. Some of the economic benefits of the system can be quantified. One projected benefit of the system is time savings to employees when creating customized product demonstrations. While this is not an extensive activity at present, the potential savings would accumulate quickly.

While making many broad assumptions, this analysis shows that the system has great potential for saving employee time and cost to the company. Another desired benefit is increased sales due to improved customization of product demonstrations. While this is difficult to directly quantify, the potential sales increases are likely to be significant. Many current demos are done using either generic demo resources or an example vertical that is not in line with the business of the company for which the product is being demonstrated. A custom demo has potential to make the product more appealing to customers and lead to more sales. Therefore, the project appears to have a good economic feasibility.

4.3.3 Organizational Feasibility

Organizational feasibility appears to be medium. The project is aligned with goals of the company. Company staff has expressed a desire to have such resources available. On the other hand, only four stakeholders have participated by providing feedback on project prototypes. Therefore, eventual acceptance of the system by end users remains uncertain.

CHAPTER V

SYSTEM IMPLEMENTATION

5.1 INTRODUCTION

Cisco Packet Tracer has two modes namely Physical mode and Logical mode. This Packet Tracer is developed by Cisco for virtual design of network architectures and the topologies this tool allows all the users to create their own network designs and simulate according to present world computer networks. This software permits all users to use a graphical command line interface to run the setup of Cisco routers and devices. It is a drag drop interface which includes configuring IP address of routers, switches, PC and many more. In this we can configure switches in two different ways. Firstly, by writing some commands in CLI which is Command Line Interface and the other way is by giving IP address to the external devices which are connected for the switch. As Packet Tracer is flexible it allows users to add or it allow user to remove virtual network devices.

5.2 USER INTERFACE

The monitor will be shown in the city's digital topology.

- The Cisco Packet Tracer [5][7] network emulator is easy to implement and provides a clear appeal to the graphical user interface.
- Five switches will be shown; separate VLANs and 1 router will be connected to the VWAN.
- The interface of the command line (CLI) will allow you to adjust it or customize it

5.3 PERSONAL FIREWALLS

Personal firewall software should be deployed on each and every laptop. Ideally, these software firewalls will function within a centrally controlled system that can enforce usage with and is compatible with your hardware firewalls. All laptops with a wireless NIC must have a personal firewall installed that supports connection-specific policies. As laptops are often outside the protection of the school or district firewall, every laptop should have a personal firewall installed. This will be critical for students taking their laptops home and then returning, with potential infections, to the school WLAN. The firewall built into Vista may provide sufficient

baseline security for student laptop use, although software client licenses compatible with your firewall solution at either the school site or district head office is better. What is built into Windows XP is not sufficient. The personal firewall should be configured to block split tunneling and any ad hoc WLAN connections.

5.4 NETWORK ACTIVE CHECKING TEST (PING)

Network communications and network connectivity will be verified with the help of ping commands, tracked by the domain significant name of the device one wishes to check connectivity with. Two proposed VLAN models, have been additional to the prescribed network and the ping test was accomplished to test if the devices are linked to those VLANs are in contact with the other devices in the network.

5.5 ROUTER CONFIGURATION

The IP address should be given to router in config option, as see in the diagram those configurations should be considered according to the interface. Router to Router connection is another impactful thing which should be taken into consideration and in serial ports we can configure the connection to the routers.

5.6 SYSTEM CONFIGURATION

In system configuration the ip address is assigned to the system and the router address is filled in the gateway address to establish the connection between the router and the system.

CHAPTER VI

CONCLUSION

In our article, a Local Area Network that utilizes both wired and remote topology have been executed with some significant ideas like Dynamic Host Configuration Protocol, Domain Name System, Email, and Virtual LANs in a solitary system in Cisco Packet Tracer. Virtual Local Area Networks have been utilized to intelligently amass customers on the system, and with the guide of a switch and switch setups, information bundles directed starting with one gadget then onto the next. It is likewise important that, the design and particulars are for the underlying model and can further be created and extra usefulness can be added to expand backing and inclusion.

APPENDIX

CODING

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