Expt. No. 2 Page No. 5 Date

Aim :- Understanding and using of commands like ping, ipconfig, hostname, getmac, arp, nslookup, tracert

Software Used :- cmd or command prompt

Theory :-

1> Ping : It is one of the most used networking utilities for detecting devices on a network and for trouble shooting network problems. You can use ping command to test the availability of a networking device. When you ping a device you send that device a short message which which it then sends back (the echo) the general format is 'ping hostname' or 'ping IPaddress'.

Ping commands used here
1> ping nitdelhi.ac.in
2> ping 127.0.0.1
3> Ping /? (advanced)

2> ipconfig : Another indispensable and frequently used utility that is used for finding network information about your local machine like IP address, DNS addresses etc
Basic Use : Finding your IP addresses and

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Default gateway ipconfig has a no. of switches the one we used here is —

→ ipconfig / all : displays more information about the network setup on your systems including the MAC address

Others —

ipconfig / release : release the current IP address

ipconfig / renew : renew IP address

ipconfig / ? : shows help

ipconfig / flushdns : flush the dns cache

3> hostname → A very simple command that displays the host name of your machine. This is much quicker than going to the control panel > system route.

4> arp → This is used for showing the address resolution cache. This command must be used with a command line switch arp - a is the most common.

5> nslookup → used for checking DNS record entries. It is used for quering the domain name system (DNS) to obtain domain name or IP address mapping information.

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The main use of lookup is for troubleshooting DNS related problems using nslookup →

- Find the IP address of a host
- Find the domain name of an IP address
- Find mail servers of a domain

6) tracert → The tracert command is a command prompt command that is used to show several details about the path that a packet takes from the computer or device you are on to whatever destination you specify.

7) getmac → Another very simple command that shows the MAC address of your network interfaces.

Result → We have successfully used commands like ping, ipconfig, hostname, getmac, arp, nslookup, tracert.

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Expt. No. 5 Page No. 8 Date

Aim :- To implement various network topologies in Cisco Packet Tracer

Software :- Cisco Packet Tracer

Theory :- The arrangement of a network that comprises nodes and connecting lines via sender and receiver is referred to as Network Topology. The various network topologies are -

1) Star Topology : In star topology all the nodes are connected to a single device known as central device. If the central device is damaged, then the whole network fails.

2) Bus Topology : In Bus topology all the nodes are connected to a single cable known as central cable or bus.

3) Ring Topology : In Ring topology all the nodes are exactly connected to two or more nodes and thus forming a single continuous path for the transmission.

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4) Mesh Topology : In mesh topology all the nodes are individually connected to other nodes It does not need any central switch or hub to control the connectivity among the nodes.

5) Tree Topology : Tree topology is a combination of star & bus topology. Ethernet protocol is used in this topology.

6) Hybrid Topology : Hybrid topology is a combination of different topologies to form a resulting topology.

Result : We successfully implemented the various network topologies in CPT.

Conclusion : The network topology differs from place to place But however, all of them have their advantage and disadvantages, if the server problem access or server gets down, then topologies faces its failure.

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Expt. No. 4 Page No. 10 Date

Aim :- To study the IOS commands
(i) to configure switch using IOS command
(ii) to configure router using IOS command

Objectives

To configure the following -

(i) Hostname
(ii) Password
(iii) Banner Message
(iv) IP address on VLAN1 interface
(v) copying and erasing configuration

Software Used :- Cisco Packet Tracer

Theory :-

Hostname : Specifies the hostname for the ASA or for a context. The name can be upto 63 characters. A hostname must start and end with a letter or a digit and have hyphen as special character.

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Password : Changes the enable password which let you enter privileged Ex EC mode By default, the enable password is blank The password argument is a case-sensitive password upto 16 alphanumeric and special character.

Banner Messages : This is used to configure banner on Cisco devices with required banner type.

Procedure

(A) For Switch Configuration

(1) Go to desktop of customer PC, open terminal
(2) Go to global configuration mode, enter the command hostname followed by the new hostname press enter.
(3) Enter the command enable secret Pass 1, where Pass I is the desired password.
(4) Enter the command enable password followed by derived password.
(5) Enter command console line.
(6) Now in the sub configuration mode enter the command password followed by desired password.

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(7) Enter command line vty 04 and hit enter. Enter command followed by desired password.

(8) Enter the command interface Vlan1 and hit enter the command ip address followed by derived ip address and subnet mask, then type no shutdown in the next line to enable the interface.

(9) Enter the command to show running configuration to verify the configuration press space to see more details.

(B) For Router Configuration

(1) Go to the desktop of computer PC, open terminal and click on ok.

(2) Go to global configuration mode, and enter the command hostname followed by new hostname.

(3) Enter command enable secret followed by desired password.

(4) Enter command enable password followed by desired password.

(5) Enter the command line console 0 and hit enter. Now in sub configuration mode enter the command followed by derived password.

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(6) Enter the command line vty 015 and hit enter. Now in the sub-configuration mode enter the command password followed by derived product.

(7) Enter the command banner and then enter the message that is required to be displayed followed by a delimeter.

(8) Enter the command to show running config to verify the configuration. Press space to see more details.

Conclusion –

In this experiment, commands are executed to configured the switch and router using IOS commands on cli/command interface.

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Aim

To configure DHCP, DNS and Web Server

Objective

i) To create server network and client network using routers and switches
ii) To configure DHCP server
iii) To configure DNS server
iv) To configure web server

Software Used :- Cisco Packet Tracer (CPT)

Theory

DHCP

Dynamic Host Configuration Protocol (DHCP) is a network protocol used to automatically assign IP addresses and other network configuration parameters to devices on a network. In the experiment, a DHCP server i.e. configured to dynamically allocate IP addresses to client device within

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the network. This eliminates the need for manual IP address assignment, and simplifies network administration.

DNS

Domain Name system (DNS) is a hierarchical decentralized naming system for computers, services or other resources connected to the internet or a private network. It translates domain name (e.g.) www.nitdelhi.ac.in) to IP addresses, allowing user to access websites using human readable domain names. In the experiment, a DNS server is configured to provide domain name resolution services to client devices by mapping domain name to IP addresses.

Web Server

A web server is a software application that serves web pages to clients over the internet or a local

network. It hosts websites and web applications accessible via web boowsers. In the experiment, a web server is configured to host web pages and serve content to client devices. This involves installing and configuring web server software and creating and uploading web pages (HTML, CSS, JS) to the server's document root directory.

Procedure

I Network Topology Setup

(i) Launch CPT and create blank topology
(ii) Drag and drop routers and switches to create required network.
(iii) Ensure connectivity between the server network and the client network via routers and switches.

II DHCP Server Configuration

(i) Choose a server to act as DHCP server.
(ii) Access CLI of DHCP server device.

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(iii) Configure the DHCP server including IP addresses pool, subnet mask, default gateway, DNS server, lease time etc.
(iv) Verify the DHCP configuration and ensure DHCP service is enabled.

III DNS server Configuration

(i) Choose a server to act as DNS server.
(ii) Access CLI of DNS server device.
(iii) Configure DNS service by creating DNS zones, adding DNS records (A, NAME, etc) and configure forwarders if necessary.
(iv) Verify DNS configuration and ensure DNS service is enabled.

IV Web Server Configuration

(i) Create and upload web pages (HTML, CSS, JS) to web server's document root directory.
(ii) Test the web server by accessing the web pages from a client device's web browser.

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Conclusion

The experiment demonstrates the configuration of DHCP, DNS and a web server in CPT to create a server network and client network interconnected using routers and switches.

By successfully configuring and testing these services, one can understand the essential aspects of network provisioning and ensure efficient communication and service availability within the network environment.

Theory :-

FTP (File Transfer Protocol)

File Transfer Protocol is a standard network protocol used for transferring files between client and server on a computer network. It operates on application layer of OSI Model. FTP stores the file that can be

accessed and downloaded by clients using FTP software.

Email Server :-

It is a computer system that sends, receives and stores email messages. It consists of multiple components including a mail transfer agent, mail delivery agent and mail user agent. These are responsible for routing & delivering email messages b/w servers using protocols such as HTTP.