Experiment No.: **Date:**

Title: **1)** IP networking and Network Commands

2) Configuration of WEB , SMTP , FTP server

Learning Objectives: At the end of this experiment, students will be able to:

- Design their own computer networks using the concept of IP networking.
- Configure various ports of router
- Configure various servers like DNS, DHCP, WEB, FTP and SMTP.

Pre-requisite: Basic concept of classes of IPv4 networking, hardware and software components of network, IP addressing classes

Apparatus: Cisco Packet Tracer

Theory:

IP addressing

Networks can be constructed to fit many needs and in a wide range of sizes. The larger a network, the more complicated its structure and topology. Because of hardware restrictions, a single network segment can have a limited number of hosts connected to it. if we have more machines to connect than the hardware allows, we can use switches and routers (also called gateways) to connect these individual segments. A router is simply a machine connected to more than one segment. It transfers data from one segment (or network) to the other .To identify each host in a network, IP addressing is used. Without IP addresses routing would be impossible For large scale networks , Class A IP addressing is used. For medium scale networks, Class B IP addressing is used. For small size networks, Class C IP addressing is used.

Commands:

1) **Ping Command: -** The ping is a Command Prompt command used to test the ability of the source computer to reach a specified destination computer. The ping

command is usually used as a simple way to verify that a computer can communicate over the network with another computer or network device.

2) **Ipconfig Command:-** Ipconfig command displays the IP address, subnet mask, and default gateway values for each interface of a network.
3) **Tracert :-** Tracert is a computer network diagnostic tool for displaying the route (path) and measuring transit delays of packets across an Internet Protocol (IP) network. If you're visiting a Web site and pages are appearing slowly, you can use tracert to figure out where the longest delays are occurring.
4) **Netstat: -** Netstat command displays all active TCP connections with the listening state, as well as UDP ports that are being listened to.
5) **Nslookup :- Nslookup** is a network administration command-line tool available for many computer operating systems for querying the Domain Name System (DNS) to obtain domain name.

Configuring servers

Web server:-The primary function of a web server is to store, process and deliver web pages to clients. The communication between client and server takes place using the Hypertext Transfer Protocol (HTTP). Pages delivered are most frequently HTML documents, which may include images, style sheets and scripts in addition to text content.

A user agent, commonly a web browser initiates communication by making a request for a specific resource using HTTP and the server responds with the content of that resource or an error message if unable to do so.

SMTP server:- SMTP stands for Simple Mail Transfer Protocol. It is a TCP/IP protocol that specifies how computers exchange electronic mail. It works with post office protocol (POP).

FTP server: FTP stands for File Transfer Protocol is defined as a protocol for file transfer between hosts over a network. The primary function of FTP is transferring files efficiently and reliably among hosts and allowing the convenient use of remote file storage capabilities.

DHCP server: Dynamic Host Configuration Protocol (DHCP) is a client/server protocol that automatically provides an Internet Protocol (IP) host with its IP address and other related configuration information such as the subnet mask and default gateway.

DNS server: Domain Name System (DNS) is a standard technology for managing public names of Web sites and other Internet domains. it translates domain names, which can be easily memorized by humans, to the numerical IP addresses needed for the purpose of computer services and devices worldwide. The Domain Name System is an essential component of the functionality of most Internet services because it is the Internet's primary directory service.

Procedure:

1. Design one network of class A and another network of class B and connect them using switches and routers.
2. Assign IP addresses manually and dynamically using DHCP and DNS server.
3. Configure various ports of router now run ping and ipconfig commands from command prompt to check whether the hosts in two different networks are able to communicate.
4. Configure WEB server and add the name of web server and corresponding ip address into dns server, check from the web browser whether the web server is properly configured or not.
5. Configure FTP server, add users, check to see from command prompt whether ftp server has been properly configured or not
6. Configure SMTP server, add users, check to see from email tab whether the smtp server has been properly configured
7. Run Nslookup, tracert, netstat commands from command prompt and see the result.

Result and Discussion:

Conclusion: