Government Girls' Polytechnic, Bilaspur

Name of the Lab: **Networking Lab**

Practical : **Computer Networking Lab**

Class: **6th Semester (ET&T)**

Teachers Assessment: 20 End Semester Examination: 50

EXPERIMENT NO:- 1

OBJECTIVE :- Case study of network operating systems: - windows 2000, window-NT, Novell network ,and primary domain controllers.
HARDWARE & SYSTEM SOFTWARE REQUIRED :- Window 2000 , window NT
SOFTWARE REQUIRED :- Not required
THEORY :-

Windows NT is an operating system created by Microsoft Corporation. Its interface is similar to that of
Windows 95/98 and includes some of the following features:
1. Multitasking. Windows: NT allows the computer user to do more than one task simultaneously. For
example, while a document is printing out, the user can also check email or run another program.
2. Task Manager: This Windows NT feature allows users to manage the different tasks and programs
they are running. Users can see which applications are running and choose to go a particular
application while running other tasks simultaneously.
3. Other Operating System Support. Windows NT is a multi-functional operating system that allows
software written for other operating systems (i.e. Windows 95/98, Windows 3.x, OS/2) to be used.
4. Desktop: A desktop is the area on the screen where users can store files and shortcuts to certain
programs.
5. Internet Accessibility. Windows NT comes integrated with various internet applications such as
FTP, Telnet, and Internet Explorer.
6. Security. Windows NT comes packaged with high security functions that monitor for memory
resources and password access to files and computers.

7. Multiple User Profiles. A main feature of Windows NT is to provide an operating system to a
network of computers. Once user profiles are created, different users can logon to Windows NT and
access the available resources. A different desktop will be selected based on the preferences of the
individual user.
8. Long Files Names. Users are no longer limited to filenames that are 8 characters long.
9. Right clicking: Users can right-click the mouse on different areas of their screen (and in different
applications) to get a menu with different options related to the application.

A Primary Domain Controller (PDC): is a server computer in a Windows domain. A domain is a group of computers (technically named a "forest"), where access to a variety of computer resources is controlled by the PDC. Various account types exist in the domain, the most basic is the "guest" or "anonymous login" account. The PDC has an administration account which has overall total control of the domain resources.

FLOW CHART (IF REQUIRED) :- Not required.
PROGRAM INPUTS & OUTPUT :- Not required
OBSERVATIONS :- windows 2000, window-NT, Novell network, and primary domain controllers are studied.

EXPERIMENT NO:- 2

OBJECTIVE :- Installation and configuring of Novell and NT server.

HARDWARE & SYSTEM SOFTWARE REQUIRED :- Window server
SOFTWARE REQUIRED :- Not required
THEORY :- Installation

To be able to install SEM properly, it is necessary to log on under NT with the user to whom the
rights have been given; under Windows 9x, this is not important.
Insert AIMS maintenance CD, setup starts automatically.Select installation language, Input name, company and AIMS serial number
1: Input name, company, serial no. Specify installation directory; the default is C:\Programs\AIMS. If a version of SEM is already installed, you
will be asked whether the existing database is to be updated; if you click on Yes, the installation is continued,
otherwise it is stopped.
2: Question as to whether database is to be updated
Select custom or typical installation. If the typical installation is chosen, all components are selected and,
under Windows NT, you will be asked whether the System Error Monitor Server should be installed as
the service or, under Windows 9x, whether a link is to be created in the auto start folder (for more details,
see below).
If custom installation is chosen, two windows appear in succession and permit the desired components to
be selected or deselected.
3: Selection of software components
For SEM installation ,only the System Error Monitor must be selected here, the rest are not required.

If the SEM Server was selected, you will next be asked whether the System Error Monitor Server is to be
installed as a service. In Windows 9x, you will be asked whether a link is to be created in the autostart
folder.
5: Question as to whether System Error Monitor is to be installed
If you click on Yes, the NT Service is installed and there follows a window in which the service logon data
can be entered.
6: Data for NT Service account
In the case of an input error or if it is desired to change the settings, it is possible to configure the service manually after the installation (see Section "6.2 NT Service configuration").
If you click on No, the service is not installed and there follows a question as to whether a link to the
System Error Monitor Server is to be created in autostart so that it can be started automatically with
every system start.

The settings are then displayed again and the installation is started.
After the installation, reboot the computer.

FLOW CHART (IF REQUIRED) :- Not required.
PROGRAM INPUTS & OUTPUT :- Not required
OBSERVATIONS :- Installation and configuring of Novell and NT server are studied.

EXPERIMENT NO:- 3

OBJECTIVE :- Use IP addressing in networking.

HARDWARE & SYSTEM SOFTWARE REQUIRED :- Router, switch, networking cable and computer with IP address .
SOFTWARE REQUIRED :- Not required

THEORY :- IP address is a unique identifier of a computer on TCP/IP networks and on the internet. Every computer requires a unique IP address to be a part of the internet and the IP address is provided by the internet service providers. Every IP address consists of the 32 bits and a binary system of 0s and 1s. The binary number system consist of only two types of digits 0 and 1. It is easier for us to remember the decimal numbers rather than the binary number system such as 011001101. On a same network segment, all the IP address share the same network address.

There are five classes of the IP addresses such as A, B, C, D and E and only 3 classes are in the use. Class D IP addresses are reserved for the multicast group ant cannot be assigned to hosts and the E class IP addresses are the experimental addresses and cannot be assigned to the people. Every IP address consists of 4 octets and 32 bits. Every participating host and the devices on a network such as servers, routers, switches, DNS, DHCP, gateway, web server, internet fax server and printer have their own unique addresses within the scope of the network.

TCP/IP protocols are installed by default with the Windows based operating systems. After the TCP/IP protocols are successfully installed you need to configure them through the Properties Tab of the Local Area Connection.

FLOW CHART (IF REQUIRED) :- Not required.
PROGRAM INPUTS & OUTPUT :- Not required
OBSERVATIONS :- IP address networking is performed.

EXPERIMENT NO:- 4

OBJECTIVE :- Design a network system for an organization with TCP/IP network using.
1. Class a address
2. Class b address
3. Class c address

HARDWARE & SYSTEM SOFTWARE REQUIRED :- Router, switch, networking cable and computer with IP address .
SOFTWARE REQUIRED :- Not required
THEORY :- In TCP/IP addressing classes are classified as:

Class A
The binary address for the class A starts with 0. The range of the IP addresses in the class A is between 1 to 126 and the default subnet mask of the class A is 255.0.0.0. Class A supports 16 million hosts on each of 125 networks. An example of the class A is 10.10.1.1. Class A is used for the large networks with many network devices.

Class B
The binary address for the class B starts with 10. The range of the IP address in the class B is between 128 to 191 and the default subnet mast for the class B is 255.255.0.0. Class B supports 65,000 on each of 16,000 networks. An example of the class B address is 150.10.10.10. Class B addresses scheme is used for the medium sized networks.

Class C
The binary address for the class C starts with 110. The range of the IP addresses in the class C is between 192 to 223 and the default subnet mask for the class C is 255.255.255. Class C hosts 254 hosts on each of 2 million networks. An example of the Class C IP address is 210.100.100.50. Class C is used for the small networks with less then 256 devices and nodes in a network.

FLOW CHART (IF REQUIRED) :- Not required.
PROGRAM INPUTS & OUTPUT :- Not required
OBSERVATIONS :- Class A, B, C address in TCP/IP networking are studied.

EXPERIMENT NO:- 5

OBJECTIVE :- Write a program for demonstrating: -
1. TELNET
2. FTP
3. PING

HARDWARE & SYSTEM SOFTWARE REQUIRED :- Computers with IP address and internet.
SOFTWARE REQUIRED :- Not required
THEORY :-

Telnet is a user command and an underlying TCP/IP protocol for accessing remote computers. Through Telnet, an administrator or another user can access someone else's computer remotely. On the Web, HTTP and FTP protocols allow you to request specific files from remote computers, but not to actually be logged on as a user of that computer. With Telnet, you log on as a regular user with whatever privileges you may have been granted to the specific application and data on that computer.A Telnet command request looks like this (the computer name is made-up):telnet the.libraryat.whatis.edu

The result of this request would be an invitation to log on with a userid and a prompt for a password. If accepted, you would be logged on like any user who used this computer every day.

Telnet is most likely to be used by program developers and anyone who has a need to use specific applications or data located at a particular host computer

File Transfer Protocol (FTP) is a standard network protocol used to copy a file from one host to another over a TCP-based network, such as the Internet. FTP is built on a client-server architecture and utilizes separate control and data connections between the client and server.[1] FTP users may authenticate themselves using a clear-text sign-in protocol but can connect anonymously if the server is configured to allow it.

The first FTP client applications were interactive command-line tools, implementing standard commands and syntax. Graphical user interface clients have since been developed for many of the popular desktop operating systems in use today.

FLOW CHART (IF REQUIRED) :- Not required.

PROGRAM INPUTS & OUTPUT :- Not required
OBSERVATIONS :- Telnet ftp and ping are studied.

EXPERIMENT NO:- 6

OBJECTIVE :- Network administration, network security, securing server, password.

HARDWARE & SYSTEM SOFTWARE REQUIRED :- firewall, security system.
SOFTWARE REQUIRED :- software firewalls.
THEORY :- Security in networking is based on cryptography, the science and art of transforming messages to make them secure and immune to attack. Cryptography can provide several aspects of security, confidentiality.
Network security
In the field of networking, the area of network security consists of the provisions and policies adopted by the network administrator to prevent and monitor unauthorized access, misuse, modification, or denial of the computer network and network-accessible resources. Network Security is the authorization of access to data in a network, which is controlled by the network administrator. Users are assigned an ID and password that allows them access to information and programs within their authority. Network Security consist of a variety of computer networks, both public and private that are used in everyday jobs conducting transactions and communications among businesses, government agencies and individuals. Networks can be private, such as within a company, and others which might be open to public access. Network Security is involved in organization, enterprises, and all other type of institutions. It does as its titles explains, secures the network. Protects and overseas operations being done.

Network security starts from authenticating the user, commonly with a username and a password. Since this requires just one thing besides the user name, i.e. the password which is something you 'know', this is sometimes termed one factor authentication. With two factor authentication something you 'have' is also used (e.g. a security token or 'dongle', an ATM card, or your mobile phone), or with three factor authentication something you 'are' is also used (e.g. a fingerprint or retinal scan).

Once authenticated, a firewall enforces access policies such as what services are allowed to be accessed by the network users Though effective to prevent unauthorized access, this component may fail to check potentially harmful content such as computer worms or Trojans being transmitted over the network. Anti-virus software or an intrusion prevention system (IPS) help detect and inhibit the action of such malware. An anomaly-based intrusion detection system may also monitor the network and traffic for unexpected (i.e. suspicious) content or behavior and other anomalies to protect resources, e.g. from denial of service attacks or an employee accessing files at strange times. Individual events occurring on the network may be logged for audit purposes and for later high level analysis.

Communication between two hosts using a network could be encrypted to maintain privacy.

Security Management for networks is different for all kinds of situations. A home or small office would only require basic security while large businesses will require high maintenance and advanced software and hardware to prevent malicious attacks from hacking and spamming.

FLOW CHART (IF REQUIRED) :- Not required.
PROGRAM INPUTS & OUTPUT :- Not required
OBSERVATIONS :- Network administration, network security, securing server, password are studied.

EXPERIMENT NO:- 7

OBJECTIVE :- Use socket programming for:
1. Client
2. Server

HARDWARE & SYSTEM SOFTWARE REQUIRED :- Socket, IP address, Port address of the system.
SOFTWARE REQUIRED :- Not required
THEORY :- Definition and Components Socket - endpoint of communication
_ Sockets - An application programming interface
(API) for interprocess communication (IPC)
_ Attributes:
1.Protocol Independent
2.Language Independent
3.Sockets implies (not requires) TCP/IP and C
4. Socket and Connection Association
5.A local host can be identified by it's protocol, IP address and port.
6.A connection adds the IP address & port of the remote host.

Socket Library Function
System calls- startup / close, data transfer, options control,other
Network configuration-lookup,host address,ports for services,other
Utility functions0
data conversion,address manipulation,error handling

FLOW CHART (IF REQUIRED) :- Not required.
PROGRAM INPUTS & OUTPUT :- Not required
OBSERVATIONS :- Socket programming: client and server are studied.