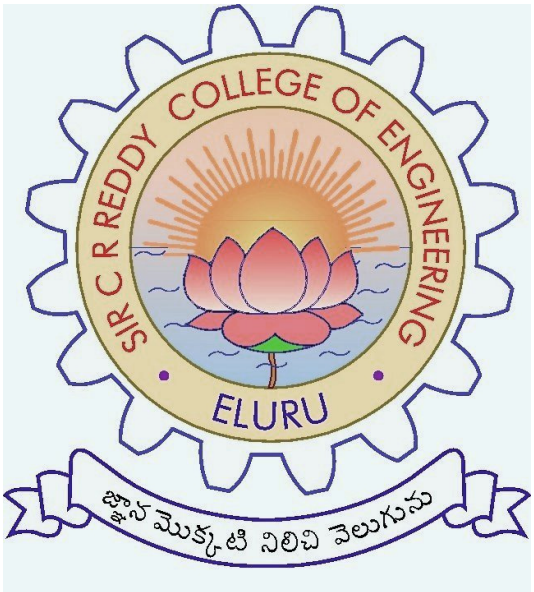
SIR C.R.REDDY COLLEGE OF ENGINEERING
ELURU – 534 007

DATA COMMUNICATIONS AND NETWORK PROGRAMMING

LABORATORY MANUAL

IV/ IV B.Tech (CSE) : II - SEMESTER



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SIR C.R.REDDY COLLEGE OF ENGINEERING

STUDY OF LABORATORY ENVIRONMENT

HARDWARE & SOFTWARE SPECIFICATIONS:

Server Configuration:

- P-4 800MHz Intel-compatible processor
- 1 GB RAM & 36 GB hard drive
- 24x CD-ROM drive
- 3.5 in. Floppy Drive & 15 in. Monitor.
- 56K Modem (Internet)
- 10/100 Mbps Ethernet capability (LAN)
- 16-bit sound capability in built
- 1024x768 Resolution (>256 colors) Video Card
- Operating System - Microsoft Windows NT
- Productivity Software - MSOffice 98,office XP
- Internet utilities - Microsoft Internet Explorer 6.x
  Or Netscape 5.x, telnet 1.0

CLIENT CONFIGURATION:

- P-4 800MHz Intel-compatible processor
- 128 MB RAM & 10GB hard drive
- 24x CD-ROM drive
- 3.5 in. Floppy Drive
- 10/100 Mbps Ethernet capability (LAN)
- 16-bit sound capability
- 15 in. Monitor.
- Operating System - Microsoft windows NT
- Productivity Software – MS Office 98,office XP
- Internet utilities - Microsoft Internet Explorer 6.x Or Netscape 5.x, telnet 1.0

Network & servers:

We have a Client-Server Network with two NT fileservers, Novell NetWare server(C, C++, Cobol), Linux server based on Redhat 7.2 distribution and Internet proxy for Internet access.

Telnet:

Telnet is a internetworking utility invoked by telnet <host argument> command, used to communicate with another host using the TELNET protocol with the given host argument.

Linux Operating System:

Linux is a complete operating system that is similar but not identical to UNIX. Some of the features provided by Linux are multi-user, multitasking, GUI (xwindow), n/w connectivity and n/w services .

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DATA COMMUNICATIONS LAB

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a). Windows peer -to-peer Network
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a). Windows peer -to-peer Network
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2.7 TERMINAL NETWORK WITH UNIX/LINUX SERVER, Terminal server, and one or two terminals

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NETWORK PROGRAMMING LAB

Program-1:

Aim: Program for Identifying well known Ports.

Algorithm:

Step 1: Initialize an array with well - known ports.

Step 2: iterate the array in for loop

Step 3: Create a new client socket for the current value of the loop as the port number.

Step 4: If Exception is caught, print the port is inactive, else print the port as active.

```
import java.io.*;
import java.lang.*;
import java.net.*;
import java.util.*;
public class ports
{
 public static void main(String args[]) throws Exception
  {
   int p[]={7,9,13,20,21,22,23,25,80,110};
   String s1[]={"Echo","Discard","Daytime","Ftpdata","Ftp","ssh","Telnet","SMTP","HTTP","POP"};
   for(int i=0;i<10;i++)
   try
   {
    Socket s=new Socket("192.168.1.6",p[i]);
    System.out.println("port\t"+p[i]+""+s1[i]+"\t is active");
    }
   catch(Exception e)
   {
    System.out.println("port\t"+p[i]+""+s1[i]+"\t is not active");
   }
  }
}
```

Output:

```
Port 7 Echo is active
Port 9 Discard is active
Port 13 Daytime is active
Port 20 Ftpdata is active
Port 21 Ftp is active
Port 22 ssh is active
Port 23 Telnet is not active
Port 25 SMTP is active
Port 80 HTTP is active
```

Port 110 POP is not active

Program- 2:

Aim: Program for One to One chatting Application.

Algorithm:

SERVER

Step 1: Create a new Server Socket.
Step 2: Accept a connection from the client side by the accept()method for that socket.
Step 3: Initialize the data input stream, data output stream and Buffered Reader.
Step 4: Send if to the client through the connected port by Run a loop continuously to read input stream.
Step 5: Read the input buffer line and print to the output stream through same port(Sending and Receiving)

CLIENT

Step 1: Create a Client Socket with the above Server's IP address and the port number.
Step 2: Initialize input stream, output stream and Stream buffered reader and generate input stream.
Step 3: Send the input steam in to the buffer by running a loop continuously (to read input stream).
Step 4: Read input buffer line and print to the output stream. (Send the Message in the buffer to the server)
Step 5: Then server generate display Message

/*Program for One to One chatting Application Client*/

```
import java.io.*;
import java.net.*;
public class client
{
public static void main(String a[])throws Exception
{
String message,message1;
message="hai";message1="hai";
Socket s=new Socket("localhost",3000);
try
{
```

```
DataInputStream in1=new DataInputStream(s.getInputStream());
DataOutputStream out1=new DataOutputStream(s.getOutputStream());
BufferedReader br= new BufferedReader(new InputStreamReader(System.in));
do
{
 System.out.print("client>");
 message=br.readLine();
 out1.writeUTF(message);
 message1=in1.readUTF();
 System.out.println("server>"+message1);
}while(!message1.equals("bye"));
}
catch(Exception e)
{
}
finally
{
System.out.println("connection terminated");
s.close();
}
}
}
```

output:

```
[cs459@cseoracleserver ~]$ vi client.java
[cs459@cseoracleserver ~]$ javac client.java
[cs459@cseoracleserver ~]$ java client
client>hai
server>hello
client>hru
server>ntg
client>bye
connection terminated
```

/* Program for One to One chatting Application Server */

```
import java.io.*;
import java.net.*;
public class server
{
public static void main(String a[])throws Exception
{
String message;
message="hai";
System.out.println("waiting for the connection");
ServerSocket ss=new ServerSocket(3000);
Socket s=ss.accept();
try
{
DataInputStream in1=new DataInputStream(s.getInputStream());
DataOutputStream out1=new DataOutputStream(s.getOutputStream());
BufferedReader br= new BufferedReader(new InputStreamReader(System.in));
while(!message.equals("bye"))
{
```

```
 message=in1.readUTF();
 System.out.println("client>"+message);
 if(message.equals("bye"))
 continue;
 System.out.print("server>");
 message=br.readLine();
 out1.writeUTF(message);
}
}
catch(Exception e)
{
}
finally
{
System.out.println("connection terminated");
ss.close();
}
}
}
```

output:

```
[cs489@cseoracleserver java]$ vi server.java
[cs489@cseoracleserver java]$ javac server.java
[cs489@cseoracleserver java]$ java server
waiting for the connection
client>hello
server>hai
client>bye
connection terminated
```

Program-3:

Aim: Program for Many to Many chatting Application.

Algorithm:

Server:

Step1: Create a sever socket for the server

Step2: Accept the connection for each client and start the service for each client.

Step3: Create a thread for each client

Step4: If Client in connected, read the Input steam from the client and write to the server and all the other clients

Step5: Run continuously a run() method of thread to read the client data

Client:

Step 1: Create a Client socket to the server

Step 2: Create a thread for the client

Step 3: Run a loop continuously to read the data from client and send to server

Step 4: If exception occurs in reading the data stream, close the connection to the server.

/*Program for Many to Many chatting Application server*/

```
import java.io.*;
import java.net.*;
public class manyserver {
   ServerSocket Server;
   static Socket clients[] = new Socket[100];
   int numofclients = 1;
   int i = 1;
   static String clientsnames[] = new String[100];
   public void startserver(int port) throws Exception {
      try {
         ServerSocket server = new ServerSocket(port);
         while (numofclients++ < 100) {
            clients[i] = server.accept();
```

```
                clientsnames[i] = new String(Integer.toString(i));
                Thread th = new Thread(new ManyChatter(clients[i], i));
                th.start();
                i++;
            }
        } catch (Exception e) {
        }
    }
    public static void main(String xyz[]) {
        if (xyz.length != 1) {
            System.out.println("usage:java MainServer<port>");
            System.exit(0);
        }
        int port = Integer.parseInt(xyz[0]);
        try {
            manyserver r = new manyserver();
            r.startserver(port);
        } catch (Exception e) {
        }
    }
    public void datatoServer(String msg, int i) throws Exception {
        for (int j = 1; j < 100; j++) {
            if (clients[j] != null) {
                try {
                    DataOutputStream data = new DataOutputStream(clients[j].getOutputStream());
                    data.writeUTF(clientsnames[i] + "=" + msg);
                } catch (Exception e) {
                }
            }
        }
    }
}
class ManyChatter extends manyserver implements Runnable {
    Socket s = null;
    String msg = null;
    DataInputStream in = null;
```

```
    int i = 1;
    public ManyChatter(Socket rs, int i) throws Exception {
        s = rs;
        this.i = i;
        System.out.println("client connected");
        in = new DataInputStream(s.getInputStream());
        DataOutputStream out = new DataOutputStream(s.getOutputStream());
    }
    public void run() {
        try {
            while (true) {
                msg = in.readUTF();
                datatoServer(msg, i);
            }
        } catch (Exception e) {
            System.out.println("client disconnected");
        }
    }
}
```

output:

```
[cs462@cseoracleserver java]$ vi manyserver.java
[cs462@cseoracleserver java]$ javac manyserver.java
[cs462@cseoracleserver java]$ java manyserver 3030
client connected
client connected
client disconnected
client disconnected
```

/*Program for Many to Many chatting Application Client*/

```
import java.io.*;
import java.net.*;
public class manyclient {
    DataInputStream in = null;
    DataOutputStream out = null;
    BufferedReader br = null;
    Socket s = null;
    String msg = null;
    String server;
    int port;
    public manyclient(String args[]) {
        try {
```

```
            server = args[0];
            port = Integer.parseInt(args[1]);
            s = new Socket(server, port);
            in = new DataInputStream(System.in);
            out = new DataOutputStream(s.getOutputStream());
            System.out.println(s.toString());
            clientReader r = new clientReader(new DataInputStream(s.getInputStream()));
            r.start();
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
    public static void main(String args[]) throws Exception {
        if (args.length != 2) {
            System.out.println("usage java manyclient <server name>ip.address<port>");
            System.exit(0);
        }
        manyclient cc = new manyclient(args);
        cc.receive();
    }
    public void receive() throws Exception {
        try {
            while (true) {
                msg = in.readLine();
                out.writeUTF(msg);
            }
        } catch (Exception e) {
            System.out.println(e + "=");
            System.exit(0);
        }
    }
}
class clientReader extends Thread {
    DataInputStream in = null;
    public clientReader(DataInputStream i) {
        in = i;
    }
    public void run() {
        try {
            while (true) {
                System.out.println(in.readUTF());
            }
        } catch (Exception e) {
            System.out.println(e);
        }
    }
}
```

output:

```
[cs489@cseoracleserver ~]$ vi manyclient.java
[cs489@cseoracleserver ~]$ javac manyclient.java
[cs489@cseoracleserver ~]$ java manyclient 192.168.1.6 3030
Socket[addr=/192.168.1.6,port=3030,localport=39868]
hai
1=hai
2=hai
hello
1=hello
2=fine

[cs489@cseoracleserver ~]$ vi manyclient.java
[cs489@cseoracleserver ~]$ javac manyclient.java
[cs489@cseoracleserver ~]$ java manyclient 192.168.1.6 3030
Socket[addr=/192.168.1.6,port=3030,localport=39874]
hai
2=hai
1=hello
fine
2=fine
hai
2=hai
```

Program-4:

Aim: Program for Data Retrieval from Remote Database.

Algorithm:

Step 1: Load oracle driver

Step 2: Get a connection object using *getconnection()* method

Step 3: Create statement object

Step 4: Write the SQL Query and store the result in a resultset object

Step 5: While data present in resultset output data

```
/*Program for Data Retrieval from Remote Database*/
import java.sql.*;
public class rdb {
public static void main(String s[]) throws Exception
try {
Class.forName("oracle.jdbc.driver.OracleDriver");
Connection con = DriverManager.getConnection("jdbc:oracle:thin:scott/tiger@192.168.6.37:1521:XE");
Statement stmt = con.createStatement();
ResultSet rs = stmt.executeQuery("select * from  sample");
System.out.println("Name \t RegNo ");
while (rs.next()) {
System.out.println(rs.getString(1)+"\t"+rs.getString(2));
 }
}
catch (SQLException e) {
System.out.println(e.getMessage());
}
}
}
```

OUTPUT:

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Name	RegNo
pranaya	690755089
ramya	690755094
Bhargavi	690755010
Hanisha	690755059

Program-5:

Aim: Program for Simulating SMTP Client.

Algorithm:

Step1: Create a client socket to the SMTP port(25)

Step2: Extract the first 3 letters of the response code.

Step3: If it is 421 close the connection.

Step4: If it is 250 then send "HELLO Server name" to the server.

Step5: If it is 250 then send Mail from sender mail" to the server.

Step6: If it is250 then send "RCPT to: receipent_e-mail" to the server

Step7: If it is 250 then send "DATA" to server

Step8: If 354 then send Multi line message with header of the mail.

Step9: For completing the message send "." on a single line.

Step10: This sends the mail to the server.

Step11: Close The connection to the server.

/*Program for Simulating SMPT Client*/

```
import java.io.*;
import java.net.*;
import java.util.*;
import java.lang.*;
public class smtp {
   Socket s;
   DataInputStream din, in;
   DataOutputStream out;
   PrintWriter pw;
   public static void main(String args[]) throws Exception {
      smtp ob = new smtp();
   }
   public smtp() {
      try {
         s = new Socket("localhost", 25);
         din = new DataInputStream(System.in);
```

```
        in = new DataInputStream(s.getInputStream());
        out = new DataOutputStream(s.getOutputStream());
        pw = new PrintWriter(out);
        String data;
        checkfor(true, 220);
        System.out.println("hello localhost");
        System.out.println("Enter from address:");
        data = din.readLine();
        send("mail from :" + data + "@192.168.1.6");
        checkfor(true, 250);
        System.out.println("Enter the destination address:");
        data = din.readLine();
        send("Rcpt to:" + data + "@192.168.1.6");
        checkfor(true, 250);
        send("DATA");
        checkfor(true, 354);
        System.out.println(" Enter content: terminate line with .");
        do {
            data = din.readLine();
            send(data);
        } while (!(data.equals(".")));
        checkfor(true, 250);
        System.out.println("Exiting successfully");
    } catch (Exception e) {
        System.out.println(e.getMessage());
    }
}
public void checkfor(boolean b, int replycode) {
    String reply;
    try {
        reply = in.readLine();
        System.out.println(reply);
        int r = Integer.parseInt(reply.substring(0, 3));
        if (!((b && r == replycode) || (!b && r != replycode))) {
            System.out.println("error occured " + r + "expend" + replycode);
            System.exit(0);
        } else {
            return;
```

```
            }
        } catch (Exception e) {
            System.out.println("Error is reply");
        }
    }
    public void send(String msg) {
        pw.println(msg);
        pw.flush();
        return;
    }
}
```

output:

```
[cs462@cseoracleserver java]$ vi smtp.java

[cs462@cseoracleserver java]$ javac smtp.java

Note: smtp.java uses or overrides a deprecated API.

Note: Recompile with -deprecation for details.

[cs489@cseoracleserver java]$ java smtp

220 localhost.localdomain ESMTP Sendmail 8.13.1/8.13.1; Thu, 2 Feb 2012 10:56:54 +0530

hello localhost

Enter from address:

pranaya

250 2.1.0 pranaya@192.168.1.6... Sender ok

Enter the destination address:

ramya

250 2.1.5 ramya@192.168.1.6... Recipient ok (will queue)

354 Enter mail, end with "." on a line by itself

 Enter content: terminate line with .

hai how are you.

.

250 2.0.0 q125QsMU011543 Message accepted for delivery
```

Exiting successfully

Program-6:

Aim: Program for Simulating Telnet Client.

Algorithm:

Step1: Create a new socket for the entered Sever address and port number

Step2: Open a socket to connect to server at port 23. (If input data given at runtime is not sufficient prompt the user for correct input)

Step3: Link the Data Input and output stream in and out to the corresponding socket and start a thread to read from server.

Step4: Run two threads Thread"!: Reading the input and transmitting it to the output stream until 'quit' or 'exit' s given Thread2: Reading the data from socket into valuable data.

Step5: Start a thread to read from user. If DATAFROMSERVER=TRUE then *goto* Step 6 else *goto* Step-13.

Step6: If data =1AC write to out *goto* Step 12

Step7: If data=DO Check for next bits and write IAC , WONT & DO *goto* 11

Step8: If data=WILL and next bits are status or suppress GO A

HEAD then write IAC & DO

ELSE write IAC and DON'T *goto* Step 12

Step9: If data-^WONT and next bits exits ti.en Write IAC, DON'T and those

bits *goto* Step 12

Step10: If data=CR or LF *goto* Step 12

Step11: Else print the data on to screen

Step12: Read next data *goto* Step 6

Step13: END

/*Program for Simulating Telnet Client*/

```
import java.io.*;
import java.net.*;
import java.util.*;
public class telnet {
    public static void main(String args[]) throws Exception {
        TelnetClient tc = new TelnetClient(args);
        tc.start();
    }
}
class TelnetClient extends Thread implements NVTCharacterSet {
    private String ServerAddress;
    private int port;
    private Socket s;
    private DataInputStream in;
    private DataOutputStream out;
    public TelnetClient(String args[]) throws Exception {
        if (args.length != 2) {
            System.out.println("java TELNET<server addr> <port>");
            System.exit(0);
        }
        s = new Socket(new String(args[0]), Integer.parseInt(args[1]));
        in = new DataInputStream(System.in);
        out = new DataOutputStream(s.getOutputStream());
        ReadFromServer em = new ReadFromServer(new DataInputStream(s.getInputStream()), out);
        em.start();
    }
    public void run() {
        try {
            readfromuser();
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
    private void readfromuser() throws Exception {
        int i = 0;
```

```
        String command;
        boolean CONNECTED = true;
        while (CONNECTED) {
           command = in.readLine();
           if (command.equalsIgnoreCase("quit") || (command.equalsIgnoreCase("QUIT"))) {
              s.close();
              System.exit(0);
           }
           i = 0;
           while (i < command.length()) {
              out.write(command.charAt(i));
              i++;
           }
           out.write(LF);
           out.write(LR);
        }
     }
}
class ReadFromServer extends Thread implements NVTCharacterSet {
     private DataInputStream in;
     private DataOutputStream out;
     ReadFromServer(DataInputStream i, DataOutputStream o) {
        in = i;
        out = o;
     }
     public void run() {
        String str = "";
        boolean DataFromSERVER = true;
        Set EchoOn;
        int data = 1, opt = 1;
        try {
           while (DataFromSERVER) {
              data = in.read();
              switch (data) {
                 case IAC:
                    switch (data = in.read()) {
                       case IAC:
                          out.write(IAC);
```

```
        break;
    case DO:
        opt = in.read();
        switch (opt) {
            default:
                out.write(IAC);
                out.write(WONT);
                out.write(opt);
                break;
        }
        break;
    case DONT:
        opt = in.read();
        out.write(IAC);
        out.write(WONT);
        out.write(opt);
        break;
    case WILL:
        opt = in.read();
        switch (opt) {
            case STATUS:
            case SUPRESSGOAHEAD:
                out.write(IAC);
                out.write(WONT);
                out.write(opt);
                break;
            default:
                out.write(IAC);
                out.write(WONT);
                out.write(opt);
        }
        break;
    case WONT:
        opt = in.read();
        out.write(IAC);
        out.write(WONT);
        out.write(opt);
    case LR:
```

```
                    break;
                case LF:
                    break;
                case 34:
                default:
                    System.out.println("*" + data);
                }
                break;
            default:
                System.out.print((char) data);
            }
          }
        } catch (Exception e) {
          System.out.println(e);
        }
    }
}
interface NVTCharacterSet {
    int IAC = 255, DO = 253, WILL = 251, WONT = 252, DONT = 254, LR = 13, LF = 10, STATUS = 5;
    int SUPRESSGOAHEAD = 3, ECHO = 1;
}
```

output:

```
[cs489@cseoracleserver java]$ javac -d telnet.java

[cs489@cseoracleserver java]$ java telnet 192.168.1.6 23

Red Hat Enterprise Linux ES release 4 (Nahant Update 3)

Kernel 2.6.9-34.ELsmp on an i686

login: cse

cse

Password:
```

Program-7:

Aim: Program for Simple file transfer between two systems,
(without using Protocols)

Algorithm:

File Transfer Client:

Step 1: Create a Socket to connect to a server at a particular port

Step 2: Create a File Input Stream to access data from the fife .

Step 3: While not end of file read data from file write it onto socket.

Step 4: Close socket File Transfer

File Transfer Server:-

Step 1: Open a Server Socket to hear for client connected.

Step 2: Create a File Output Stream object to write data to the file

Step 3: While data present at the Server Sockets read the data and write it into the new file

Step 4: Close Server Socket

```
/*Program for Simple file transfer between two systems,
 (without using Protocols) client*/
import java.io.*;
import java.net.*;
import java.util.*;
import java.lang.*;
class ftpclient {
    public static void main(String arg[]) throws Exception {
        Socket s = new Socket("192.168.1.6", 8360);
        FileInputStream fis = new FileInputStream("infile.txt");
        DataOutputStream out = new DataOutputStream(s.getOutputStream());
```

```
        if (fis == null) {
            System.out.println("Input file does not exist");
            System.exit(0);
        } else {
            System.out.println("Input file has information");
        }
        int i;
        while ((i = fis.read()) != -1) {
            out.write(i);
        }
        s.close();
    }
}
```

output:

```
[cs489@cseoracleserver java]$ vi ftpclient.java

[cs489@cseoracleserver java]$ vi infile.txt

[cs489@cseoracleserver java]$ javac ftpclient.java

[cs489@cseoracleserver java]$ java ftpclient

Input file has information
```

/*Program for Simple file transfer between two systems,
(without using Protocols) Server*/

```
import java.io.*;
import java.net.*;
public class ftpserver {

    public static void main(String args[]) throws Exception {
        ServerSocket t = new ServerSocket(8360);
        Socket s = t.accept();
        FileOutputStream file = new FileOutputStream("abc.txt");
        DataInputStream in = new DataInputStream(s.getInputStream());
        int i;
        while ((i = in.read()) != -1) {
            file.write(i);
        }
        s.close();
        System.out.println("file has been copied");
    }
}
```

output:

```
[cs489@cseoracleserver java]$ vi ftpserver.java

[cs489@cseoracleserver java]$ javac ftpserver.java

[cs489@cseoracleserver java]$ java ftpserver

file has been copied

[cs489@cseoracleserver java]$ vi abc.txt
```

Program-8:

Aim: Program for a implementing HTTP.

Algorithm:

Step1: create a HTTP connection.
Step2 : read url from arguments.
Step 3: connect the url to open HTTP
Step 4: check whether url contains information or not
Step 5: if present print as a valid url else as invalid url

```
/*Program for a implementing HTTP Server*/

import java.net.*;
import java.util.*;

public class http {

   public static void main(String args[]) {
      try {
         URL u = new URL(args[i]);
         HttpURLConnection http = (HttpURLConnection) u.openConnection();
         if (u.openConnection().getContentLength() > 0) {
            System.out.println(u + " is a valid URL");
         } else {
            System.out.println("URL not identified");
         }
      } catch (Exception e) {
         System.out.println(e.getMessage());
      }
   }
}
```

output:

```
[cs489@cseoracleserver java]$ vi http.java

[cs489@cseoracleserver java]$ javac http.java

[cs489@cseoracleserver java]$ java http http://www.google.com

http://www.google.com is a valid URL
```

Program-9:

Aim: Program for Downloading Image files.

Algorithm:

Step1: Create a URL connection object to point image file

Step2: Open this URL connection

Step3: From this connection get the inputstream to store the image data in bufferedimage

Step4: write the buffer to a image in .jpg format using ImageIO

Step5: close the connection.

/*Program for Downloading Image files*/

```
import java.awt.image.BufferedImage;
import javax.imageio.ImageIO;
import java.io.*;
import java.net.URL;
public class image1 {
 public static void main(String[] argv) throws Exception {
 BufferedImage image;
 try {
 URL url = new URL("ftp://192.168.1.6/CSIT/new/love%20aajkal/Folder.jpg");
 image = ImageIO.read(url);
 ImageIO.write(image, "jpg", new File("out.jpg"));
 } catch (Exception e) {
 System.out.println(e.getMessage());
  }
 }
```

```
}
```

output:

```
[cs489@cseoracleserver java]$ vi image1.java

[cs489@cseoracleserver java]$ javac image1.java

[cs489@cseoracleserver java]$ java image1

[cs489@cseoracleserver java]$ eog -f out.jpg
```

SIR C.R.REDDY COLLEGE OF ENGINEERING

DATA COMMUNICATIONS LAB

1.1 PC-TO-PC COMMUNICATIONS UNDER DOS WITH NULL MODEM

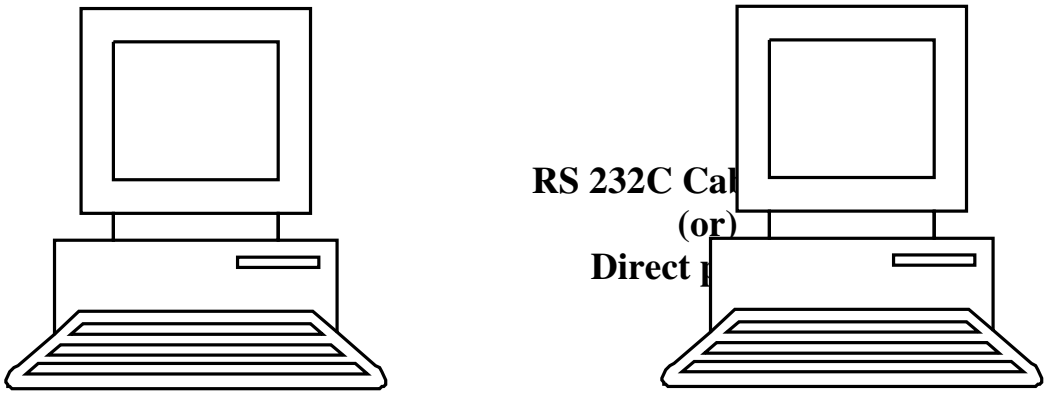
AIM: To study and implement PC to PC communication under dos with null modem.

a) Using serial ports and RS 232 cable.
b) Using parallel ports and direct parallel cable.

MATERIALS REQUIRED:

RS 232C cable with end connectors: 9 and/or 25 pin D type Female connectors,Direct Parallel Cable with end connectors: two 25 pin D type Male connectors,Two PC's with Dos containing INTERLINK.EXE and INTERSVR.EXE Commands.

EXPERIMENTAL DIAGRAM:



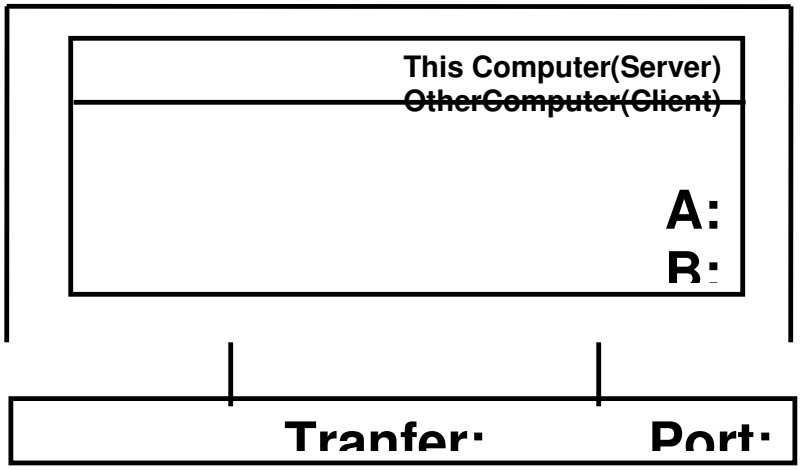
PROCEDURE:

1.Get RS 232 Cable.
2.Verify for serial port (COM1, COM2) in your PC'S. These are generally 9 pin or 25 pin D type male connector at rear panel of PC'S.
3.Insert the RS 232C Cable Female connector to avaliable PC' S serial port male connectors,for example COM1.
4. Boot your systems in DOS mode and search for executable commands: INTERLINK.EXE and INTERSVR.EXE. If not found copy INTERSVR.EXE from DOS floppy in one system (into C\:) which you want to configure as client and copy INTERSVR.EXE from DOS floppy in other system (into c:\) which you want to configure as server.
5.Open config.sys file in client PC with DOS editor(edit command) . Include the following line: DEVICE=C:\INTERLNK.EXE. Save the config.sys file.Exit from the editor and REBOOT the system (cl+Alt+Delete).
6. Execute INTERSVR.EXE at the command prompt in the server.Observe the screen for the following and record.
7.Execute the INTERLNK.EXE at the command prompt in the client. If no errors,client gets connected to the server screen and client screen as shown.Record the observations.
8.Perform the following :File Copying,File Editing and executing some commands from client only.

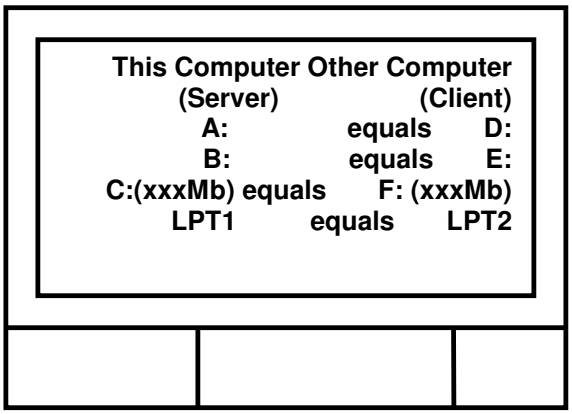
PROBLEMS:

1)Identify DOS commands that are not executing.
2)Establish the communications through Parallel Ports(Part B of the experiment) and write down the differences between Serial and parallel data communication.

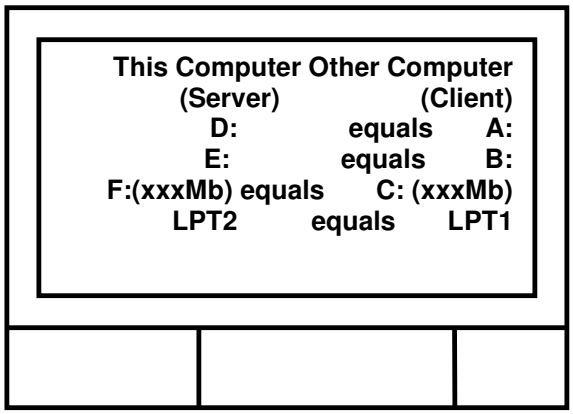
MICROSOFT Interlnk Server Version



Server



Client



Serial Port (RS 232CCable) connector details:-

9 Pin D-type Female Connector	9 Pin D-type Female Connector	25 Pin D-Type Female Connector	25 Pin D-type FemaleConnector
Pin no.5	Pin no.5		Pin no.7
(Signal ground to Signal ground)			(Signal ground to Signal ground)
Pin no.3 ⟶	Pin no.2	⟶	Pin no.2 Pin no.3
(Transmit to Receive)			(Transmit to Receive)
Pin no.7 ⟶	Pin no.8	⟶	Pin no.4 Pin no.5
(RTS to CTS)			(RTS to CTS)
Pin no.6 ⟷	Pin no.4	⟵	Pin no.6 Pin no.20
(DSR to DTR)			(DSR to DTR)
Pin no.2 ⟵	Pin no.3		Pin no.3 Pin no.2
(Receive to Transmit)			(Receive to

Transmit)

Pin no.8 ← Pin no.7 ← Pin no.5

Pin no.4

(CTS to RTS) (CTS to RTS)

Pin no.4 ← Pin no.6 ← Pin no.20

Pin no.6

(DTR to DSR) (DTR to DSR)

Parallel Port (Direct Parallel Cable For 4-bit DATA) Connector details:-

25 pin D-type Male Connector		25 pin D-type Male Connector
Pin no.2	↔ (DATA1 to N/C)	Pin no.15
Pin no.3	↔ (DATA2 to Select)	Pin no.13
Pin no.4	↔ (DATA2 to PE)	Pin no.2
Pin no.5	↔ (DATA2 to ACK)	Pin no.10
Pin no.6	↔ (DATA2 to BUSY)	Pin no.11
Pin no.15	↔ (N/C to DATA1)	Pin no.2
Pin no.13	↔ (Select to DATA2)	Pin no.3
Pin no.12	↔ (PE to DATA3)	Pin no.4
Pin no.10	↔ (ACK to DATA4)	Pin no.5

Pin no.11 ⟷ **Pin no.6**
(BUSY to DATA5)
Pin no.25 ⟷ **Pin no.25**
(GROUND to GROUND)

1.2 PCTOPC COMMUNICATION UNDER DOS WITH MODEM AND 4-LINE EXCHANGE

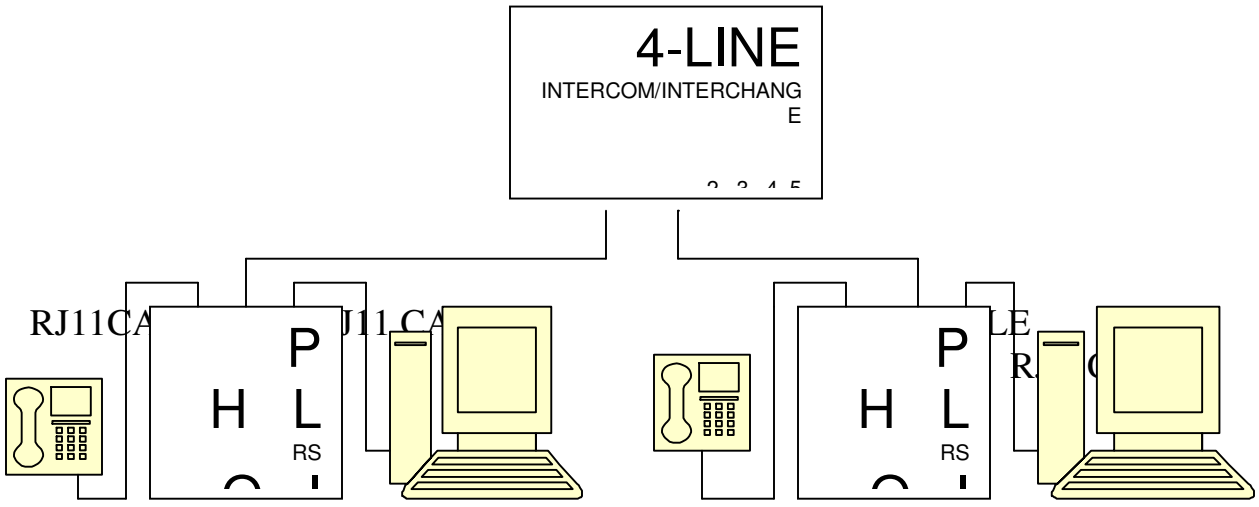
AIM: To get familiarized with pc to pc communications using modems under Dos

.

MATERIALS REQUIRED:

Pcs-2nos, modems - 2nos, 4line intercom/exchange-1nos2-wire RJ11 cables-4nos RS232C cables-2nos, COMIT communication software

EXPERIMENTAL DIAGRAM:

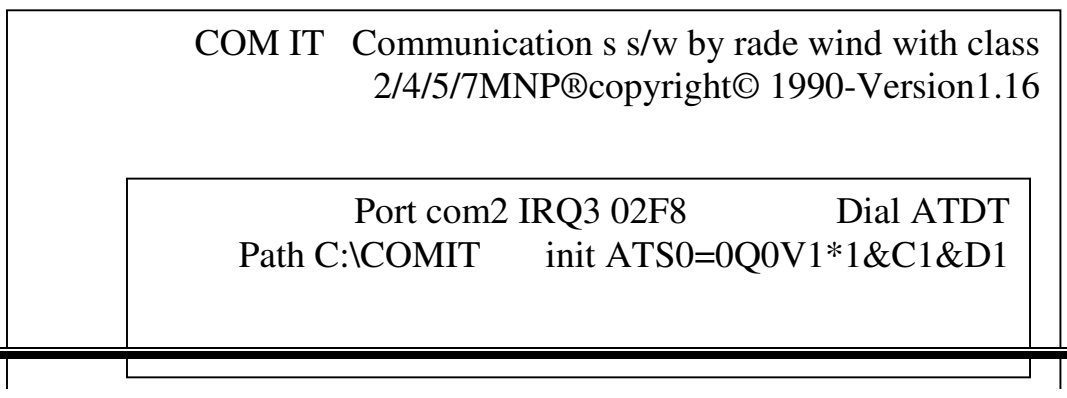


PROCEDURE:

1.Do not switch on power to both pc s
2.Make connections according to experimental diagram
3.Switch on power to exchange only and check for voice communications by diaphones (phone no s 3 and 5)
4.Switch on power to modem at each pc and note status of each modem (led indicator)
5.Switch on power to both pc s search for COMIT directory in C drive If not found insert the COMIT software from floppy to both pc s
6.Change to COMIT directory and execute the command COMIT.EXE then you the dialing directory of the COMIT as shown in the figure below.(do the same for both pc s).

7.Noties the various function keys of COMIT at the bottom of the dialing directory are familiarize with various menus and submenus of COMIT software.
8.Configure one system as host and another one as terminal.
9.Host setup

To configure host press ”l” at the dialing directory. Then main menu of the dialing directory will be displayed from the main menu. Select setups by moving arrow keys then press “enter” keys or press ”s” then submenu of setup will be displayed. From the submenu of setups, select Host options and paths with the help of arrow keys or press “h”. Here assign the default receive path, default send path, baud rate, whether it is private system or not, Etc. then press “Esc” at first line or “Enter” at the last line. Save and changes made. This will close the host configuration.



Name	number	Bits	Rate	MNP	Echo	Term
Dc lab	3	8N1	2400	N	N	TTY

Dialing

[/]menu [A]Addentry [S] script[] Up[F4]Delete entry[F5] goto [Enter]Dial[R]receive[N]Notes[]Down[F2]Insert last deleted[F6]sort

10 Terminal setup:

To configure terminal Press “l” at the dialing directory of the COMIT the main menu of the COMIT will be displayed. Select Setups by moving arrow key and “enter” or press “S”. At the submenu of the select Terminal option and paths by moving arrow keys and “enter” or press “T”. In the terminal options and paths screen, set the default work file directory, Send path, Receive path, etc then press Enter at the last line and save the settings when set up prompts. This will close terminal configuration.

(Dialing directory>Press”/”> press ”S”>Press ”T”)

At the dialing directory in the terminal PC, notice the various function keys of COMIT at the bottom of the Dialing Directory. Press ”A” to add entry, type the name and the name field, enter the phone number of host in the Number field, set the connection preferences (data bits, parity bits, stop bits) for bits field, set the band rate (modem speed protocol, echo (y/n) and terminal type(voice, tty, ascii) with help of space bar.

11 Communication:

Configure one system in host mode

(Dialing Directory> Press "/" (Menu) >Press "O" go online)> Press "H" (Now as a host).

Configure one system in terminal mode

Dial from the terminal which is configured as a terminal

(Dialing directory> Press "/" (Menu) >Press "O" (GO online)> Press "T" (Now as terminal)

Communication status will be shown on the both systems. After establishing connections COMIT welcome screen will be displayed at the terminal.

12 Working:

After establishing connections do not do any thing on the host. Access the host from terminal with the help of given menu solve the following problems.

PROBLEMS:

1. Verify the functions of COMIT software shown on the screen after line connections between PCs via modem.
2. Verify the files in the host from the terminal and download some files from host and upload some files to host.
3. Verify the security issues in the COMIT and implement them.

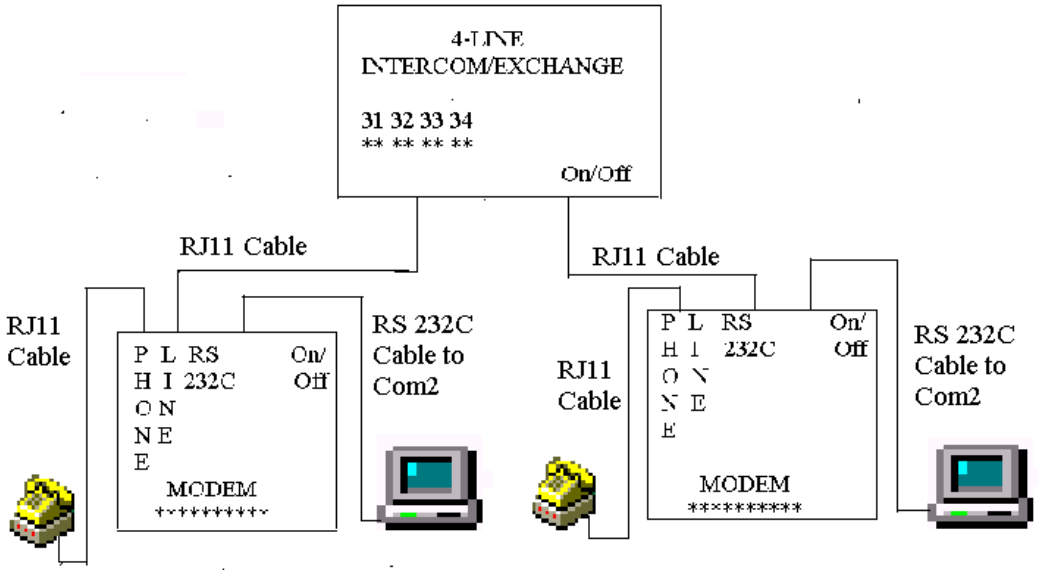
1.4 PC-TO-PC_ COMMUNICATION UNDER WIN 98'S DIAL-UP NETWORKING WITH MODEM AND4LINEXCHANGE

AIM: To study and implement the communication between pc to remote pc (server) with MODEM under window's 98 using Dial-up Networking.

MATERIALS REQUIRED:

Two PCs, Two MODEMs,4-LINE intercom/exchange. Two Telephones, Two RS 232C Cables. (To Connect modem to pc com port), Four RJ 11 Cables (to connect Exchange), Dial-up networking program. And Dial-up server program.

EXPERIMENTAL DIAGRAM:



PROCEDURE:

Hardware Setup
Modems Installation And Configurations.
Network components Installation and Configuration
Sharing Resources
Dial-up Client setup
Dial-up Server setup
Establishing a connection

1.Make the connections according to the experimental diagram as shown in the above figure. Verify the connections carefully to avoid loose contacts. Then switch on the power to exchange only and check for voice communication by dialing at phones.

2.Assume one system is server and another one is client switch on the power to PCs do the following steps 3&4 in both systems after getting the desktop.

3. Switch on the power to modem. Check whether the modem is preinstalled or not.

(start>settings>control panel>modem>open modem icon and identify the required modem in the modem properties sheet general tab)

Install the modem in both systems and configure then properly if not preinstalled to install modem

(Start>settings>control panel>modem>open>add, then setup will guide you through the entire installation).

After successful installation check the modem whether it is responding or not in diagnostics tab of modem properties sheet by click on more info command button then verify the status of modem in the device managers

(start>settings>control panel>network>open>configuration)

Required Network components are

1.Dial-up Adapter:1.Microsoft Dial-up Adapter.

2.Protocols:1.ipx/spx- compatible protocol

2.NetBEUI

3.TCP/IP

3.Client: client for Microsoft networks

4.Service: file and print sharing for Microsoft Networks,

from the network property sheet click add command button in the configuration tab to open the select network component type dialog box. Select adapter and click add here select Microsoft from manufactures list and dialup adapter from dialup adapters list follow.

The above procedure to install the required protocols, clients and services

1.select client for Microsoft Networks in the primary Network logon dialog box.

2.give unique name and same workgroup name for both systems in the identification tab.

3.assign share level access control in access control tab

Sharing:

You must have to share the server resources other wise you can not access the server

or you can not establish the connection you can share drivers printers and folders

Select sharing tab>select shared as radio and give share name and comment . in the

access type to share the C drive, open My computer>select and right click on C drive>

choose sharing. In the C drive properties sheet, field select the radio button what type of access you want to give to the client. You can assign read only or full or both accesses. Configure one system as a Dial-Up client and another system as Dial-Up server.

5.Dial-Up client setup

Dialup client configuration:

Check whether Dialup Networking program is installed or not.

(Start>programs>accessories>communications>Dial-up Networking).

If not preinstalled install if from windows 98 CDROM.

(start>settings>control panel>add/remove programs>windows setup>communications>details. Here check mark the check box of Dialup Networking then click on ok> apply>ok).

If system prompts for reboot click on yes open the Dialup Networking program.

(start>programs>accessories>communications>Dialup Networking).

From Dialup Networking windows create a new connection by opening make new connection icon or from connection menu drop down list.

In the make new connection window give a name(dc lab) for your connection in the type a name field and select a modem through which modem you want to dial .You can configure yours modem here by clicking on configure button if it is not pre configured then go for next.

In this window give area code, telephone number and country or region code of server location. then click on ok.

Now you have to configure server type for your new connection (dc lab). To configure server type for dc lab.

Open the Dialup Networking>Right click on dc lab>from the drop down list select properties window you have the four tabs.

1.general tab 2.server type tab. 3.scripting tab 4.multilink tab.

In the general tab you can verify for the area code, telephone number, country code and your modem.

You can configure your modems here also by clicking on configure button if needed to configure server type click on server types tab, in the type of Dialup server dialog box select PPP: internet windows NT server and windows 98.

In allowed network protocols field check mark the check boxes of

NetBEUI, IPX/SPX compatible protocols and TCP/IP (optional).
If you are using scripting then go for scripting tab other wise leave it as it is.
If your using more than one device to connect server , then go for multi link tab to configure then other wise leave it as it is this will finish the client configuration.

7.Dialup Server Setup:

check whether the Dialup server is preinstalled or not.
(start>programs>accessories>communications>Dialup networking>connections menu>Dialup server).
If not preinstalled install it from the windows 98 CDROM.
(start>setting>control panel>add/remove programs>windows setup>communications>details. Here check mark the check box of dialup networking and dialup server then click on ok>apply>ok). Open the dialup server.
(start>programs>accessories>communications>dialup networking>connections menu>dialup server).
In the dialup server window select caller access radio button .then assign password for server to restrict unauthorized user to access the server.
Configure server type by click on server type command tab, here configure the server as PPP: internet, windows NT server, windows 98. click on apply and ok. This completes the dialup server configuration.

8.Estblishing The Communication;

Activate the server:
Start>programs>accessories>communications>dialup networking>from connections menu>select dialup server>select allow caller access radio button>apply>ok.
Activate the client:
Start>programs>accessories>communications>dialup networking>double click on your connection after establishing connection through configuration dialog box you can access the server.
to find the computer, start>find>computer. Here in the named text box give your server computer name, which is given as computer name in the identification tab of the network neighborhood properties then click on find now command button.
Assign drive letters to your server shared resources by mapping network drive. Right click my computer, from the drop down list of the drive list box and type the drive letter of the server including full path in the path text box.

PROBLEMS:

Run an application for example note pad of server from the client. Create a document and save document in the host and also in guest.

1.5. PC-to-PC COMMUNICATIONS UNDER WIN98'S HYPER TERMINAL WITH MODEM AND 4-LINE EXCHANGE

AIM: To study and implement the Text based Communication between pc-to-pc using windows Hyper Terminal

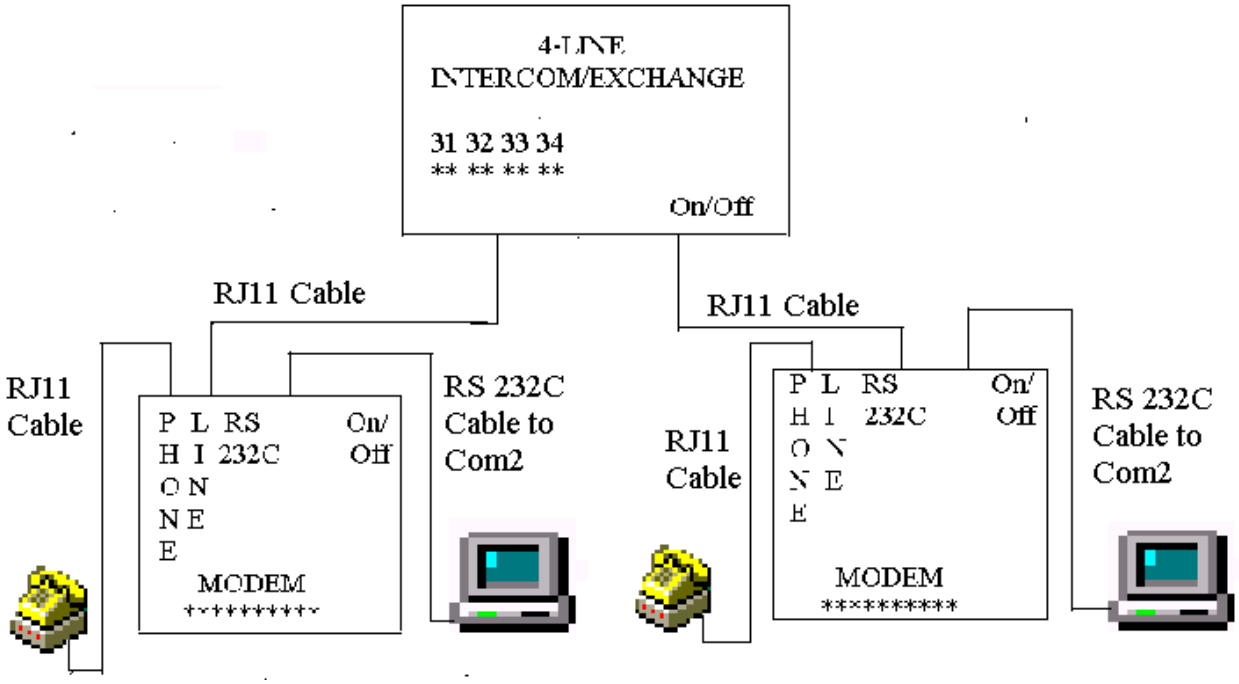
A. Using serial ports and modem

B. Using serial ports and serial cable

MATERIALS REQUIRED:

Two pc's, Two modems, 4-Line intercom/Exchange, Two telephones, Two RS232C Cables, 4 RJ11 Cables and Windows Hyper Terminal Program.

EXPERIMENTAL DIAGRAM:



PROCEDURE:

1. Make connections according to the experimental diagram. Avoid the loose contacts, Verify the connections carefully, then switch on the

power to exchange only and check for voice communication through dialing at p hones.

2. Switch on the power o both the pc's, after getting the desktop screen install the modems in both systems as per Step 3.
3. Switch on the power to modem. Check whether the modem is preinstalled or not.
   (Start>Settings>Control panel>Modem>Open modem Icon and identify the required modem in the modem properties sheet general tab).
   Install the modem and configure properly if not pre installed.
   To install modem
(Start>Settings>Control panel>Modem>open>Add then setup will guide you through the entire installation).

   After successful installation check the modem whether it is responding or not in the Diagnostics tab of modem properties sheet by click on *More Info..* command button. Then verify the status of the modem in the Device Manager.
   (Start>Settings>Control panel>System>Device Manager>Modem> (Ex. Standard Modem)>Properties). (Do the same for another system also).
4. Check whether the Hyper terminal Program is installed or not.
   (Start>Programs>Accessories>Communications>Hyper Terminal)
   Install the Hyper Terminal Program from Add/Remove Programs tool in the Control panel if not preinstalled.
   (Start>Settings>Control panel>Add/Remove Programs>windows Setup>Communications>Details>check mark the Hyper Terminal>OK>Apply>OK)
   Setup may or may not require windows98 CDROM. If setup prompts for rebooting click yes. (Do the above for both PCs).
5. Open the Hyper Terminal Program in both PCs.
   (Start>Programs>Accessories>Communications>Hyper Terminal).
6. From Hyper Terminal window open the **Hyperterm** icon by double clicking on it. Now *connection description* window will appear cancel it.
7. Choose make new connection from file menu of the New Connection window, and then the setup will guide you through the entire process. Follow the instruction on the screen. When prompts for details give

appropriate details about your connection like Name (ex. Dc lab) the connection, Icon selection, Phone Number, etc.

8. After completion of your connection set the properties for your recently created connection (Dc lab). You can set properties such as Phone number, Modem configuration, Back set buffer, ASCII setup, function keys, Emulation, Terminal setup, Icon, etc., for your connection by choosing *Dc lab>File>Properties*
9. Set one computer in the wait for a call mode.
   (Open your connection (Dc lab)>Open Connection menu>from drop down list choose *wait for a call*).
10. Dial the Remote computer, which in *wait for call* mode from the other computer by choosing call in the connection menu.
    (Open your connection (Dc lab)>Open Connection menu>from drop down list choose *Call).*

PROBLEM:

1. Send and Receive files.
2. Make connection using Serial Ports and Serial Cable.

1.7 INTERNET CONNECTION SETUP USING DIAL-UP NETWORKING

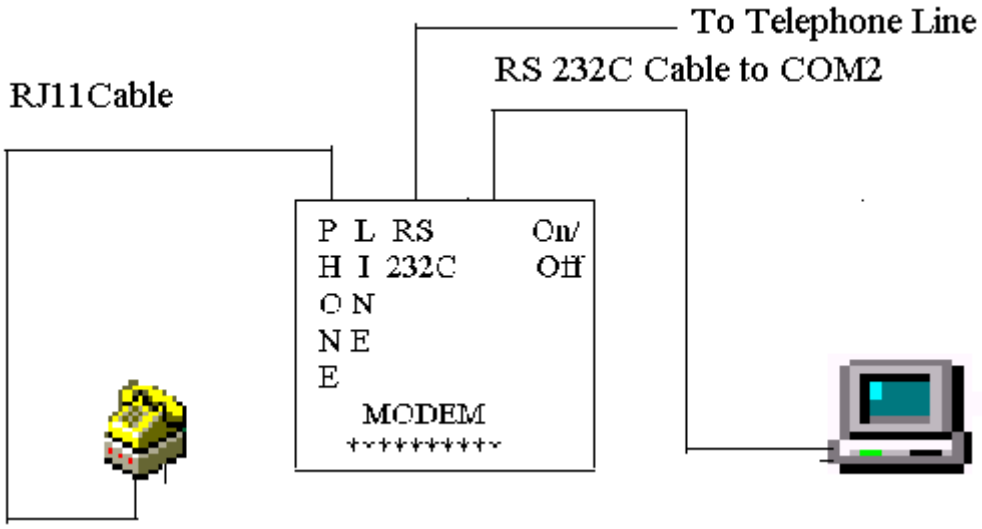
AIM:

To study and implement the setting up of internet connection.

MATERIALS REQUIRED:

One pc, One modem, Telephone line, Internet Account and RS232 c cable, RJII cable, Dial-up networking program, Browser.

EXPERIMENTAL DIAGRAM:



PROCEDURE:

1. Procure the details about your connection.
   (Type of Internet Account, User name, Password, DNS Server Address, IP Address, Dial up access number).
2. Make the connections according to the experimental diagram.
   (Connect the Modem Serial Port to the PC's serial port, Line to modem's link jack and Modem's Telephone jack to Telephone).

Verify the connections to avoid loose contacts.

3. Switch on the power to the pc. Switch on the power to the Modem
4. Check whether the Modem is preinstalled or not.

(Start>Settings>control panel>Modem>Open Modem Icon and identify the required modem in the Modem properties sheet general tab).

Install the Modem in both PC's and configure them properly if not preinstalled. To install Modem

(Start>Settings>Control panel>Modem>Open>Add, then setup will guide you through the entire installation).

After successful installation check the Modem by communicating whether it is responding or not in the *Diagnostics tab* of Modem properties sheet by click on *More Info..* command button. Then verify the status of the Modem in the Device Manager.

(Start>Settings>Controlpanel>System>DeviceManager>Modem>Propert -ies).

5. Install the Dial-up Adapter and Protocol(TCP/IP).
   (Start>Settings>Control panel>Networks>In the Configuration tab Click on *Add* command button). Here install adapter and protocol setup may or may not require windows 98 CD-ROM. Then reboot, if setup prompts for reboot.
6. Check whether the Dial-Up Networking Program is installed or not.

(Start>Programs>Accessories>Communications>Dialup Networking).

Install the Dial up networking Program if not preinstalled.

(Start>Settings>Controlpanel>Add/Removeprograms>Windows Setup>Here select Communication and then click on details>Here check mark the Dialup networking>Click on OK).

7. To make a connection

(Start>Programs>Accessories>Communications>Dial Up Networking).

From Dial up networking windows create your own connection by opening *Make new*

Connection Icon. In the Make new connection window Give a name(Ex. VSNL) for your

Connection in the type a name field, Select a modem through which modem you want to dial. You can configure your modem here by clicking on *Configure* button.

Modem *Configuration includes* port, speed, connection preferences,

call preferences, flow control, connection control, dial control, status control settings. Then go for *Next.*

In this window give Area Code, Telephone number and Country or region code of server location. Then click on *Next* then *Finish.*

8. Now you have to configure Server type for your new connection (VSNL). To configure

   Server type for your new connection, Open the *Dialup networking*>Right click on your connection(VSNL)>from the dop down list select *properties*>in the properties window you have the four tabs.

   1. *General tab* 2. *Server Type tab* 3. *Scripting tab* 4. *Multilink tab.*

   In the *General* tab you can verify for the Area code, Telephone number, Country code and your Modem.

   To configure *Server Type* tab click on Server Types tab, in the type of dialup server dialog box select *PPP: Internet, Windows NT Server, Windows 98.*

   In *Advances options* field ckeck mark the check boxes as per your requirement.

   In *Allowed network protocols* field check mark the check box of TCP/IP protocols.

   If you are using scripting then go for Scripting tab. Otherwise leave it as it is.

   If you are using more than one device to connect server then go for multilink tab to configure them otherwise leave it as it is.

   This will finish the configuration.

9. To browse the Internet and to test your connection. Open the connection just you have created, give your username and password. After connected open the Browser.

PROBLEM: Create E-Mail account or check E-mail account. Familiarize accessing a website.

2.2 THIN ETHERNET LAN WITH STAR TOPOLOGY

a)Windows Peer to Peer Network
b)Windows NT Client Server Network

AIM:

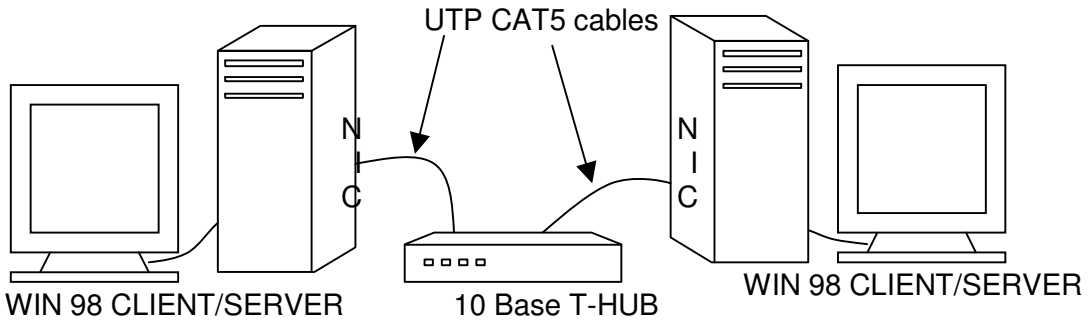
a) To create and familiarize windows 98 Peer to Peer Thin Ethernet LAN with Star Topology
b) To create and familiarize windows NT Client Server Thin Ethernet LAN with Star Topology

MATERIALS REQUIRED:

Hardware: Two PC's with Network Interface Cards (NICs) / PCI Ethernet Adapters with RJ 45 connector, one active or passive HUB with a minimum of two 10 base-T ports,
1- mtr CAT5 UTP Cable(Thin Ethernet/10-Base T).

Software: Windows 98

EXPERIMENTAL DIAGRAM:



THIN ETHERNET Peer to Peer Network LAN with STAR TOPOLOGY

PROCEDURE:

1. Do not switch on power to PCs
2. Make the connections according to the experimental diagram with 10 Mbps Ethernet PCI Adapters (NICs) placed in the corresponding slots of both PCs. Install the active or passive HUB and take the two RJ 45 CAT5 UTP cables with both ends are RJ 45 connectors and connect the one end to the one port of the HUB and another end to the Network cards RJ 45 connector. Now go for software installation and configuration.
3. Switch on the power to both PCs and boot with Windows 98. At each PC, configure Network Hardware and Software using the next step.
4. Install the Network components from Network icon in the control panel.
   (start >settings>control panel>Network>open) -> display the Network Dialog Box with 3 tabs: Configuration, Identification and Access Control.
   Required Network components are Network Adaptor, Protocols, Client and Service

Adapter:	Network Interface Card of user choice
Protocol:	TCP/IP
Client :	Client for Microsoft Networks
Service:	File and Print Sharing for Microsoft Networks.

To install Network Adapter from the Network dialog box Window, click the Add button on the configuration tab to display the select Network component type dialog box window. Select Adapter and click the Add button. From the select Network adapter dialog box window, select Network adapters manufacturer from the manufacturers list and Network adapter from the Network adapters list, and click OK. If you want to install Network Interface Card drivers which are supplied with card from manufacturers,

click Have disk command button and give the appropriate path at path dialog box and then click OK.

To install protocols, click Add command button in the configuration tab of Network dialog box window to open the select Network component type dialog box. Select protocol and click Add button. Here select Microsoft from the manufacturers list then select TCP/IP from the Network protocols list then click on OK.

To install Client from the Network window, click Add button in the configuration tab of network window to open the select Network component type window. Select Client and click Add button. From the server Network Client window, select Microsoft from the manufacturers list and then select Client for Microsoft Networks from the Network Clients list. Click OK.

To install Service from the Network window, click Add button in the configuration tab of Network window to open the select Network component type window. Select service and click Add button. From the select Network service window, select Microsoft from the manufacturers list and then select File and Print sharing for Microsoft Network from the Network service list. Click OK to display Network dialog box window.

4 b) Configuration of the installed Network components from the Network dialog box window.

To configure the installed Network adapter, select the installed Network Adapter in the installed list of Network components in configuration tab and click Properties command button to display the adapter properties dialog box window. In Driver type tab, select Enhanced mode (32 bit and 16 bit) NDIS Driver radio button. In Bindings tab, check mark the check box of the NET BEUI. Settings/Configurations for other tabs or optional and dependant on Network Adapter.

To configure the installed protocol, select the TCP/IP protocol and click on Properties command button to open the Properties sheet of TCP/IP, click on IP address tab and select specify IP address radio button, then give the Class C type IP address in the IP address field

and specify the subnet mask (Class C type) of the Network then click on Apply and OK.

To configure the installed Client, select the Client for Microsoft Network in the installed list of Network components of configuration Tab and click Properties command button to display Client for Microsoft Network Properties dialog box window. In logon validation part, clear the check mark in the check box of "Logon to windows NT domain" if marked and nothing is to be typed in windows NT domain text box. In the network logon options, select any one of the radio buttons.

To configure the install service, select the file and print sharing for Microsoft Networks in installed list of Network components of configuration tab and click Properties command to display File and Printer sharing for Microsoft Networks properties dialog box window. Use default selections for property list and value list. Click OK.

- In the primary Network logon drop down list box of configuration tab on the Network dialog box window, select client for Microsoft Networks and click the file and print sharing button to display file and print sharing dialog box. Select the check boxes for your system resources you want to share: files on any drives, and /or printers attached to your computer. Click OK to return to the Network dialog box window.
- Click identification tab on the Network dialog box window. In the computer name text box type unique name of PC (example PC1 for one PC and PC2 for other PC) and in the workgroup text box, type MSC that must be the same for other PC also. In the computer description text box, type Network PC (Optional).
- Click Access control tab on the Network dialog box window. Select share-level access control radio button if not selected.

Click OK for installing and configuring the Network components. If the installation requires windows 98 CD, insert it and give the path and click OK. Reboot the system. Check the desktop for Network Neighborhood icon. If not displayed, reinstalled the Network

components. If installed check whether the Network works using the following steps.

1. Double click the Network Neighborhood icon on the desktop to display Network Neighborhood window to see all the computers on the Network.
2. If you want to see the names of all the computers on the network, double click the Entire Network icon and then the Workgroup icon.

5. Sharing the Disk Drives, Folders and printers for other computers to access over Network:

Making a drive sharable Follow the steps 1 to 6 to share C drive.

1. Double click my computer on the desktop.
2. Right click C drive and click sharing in the pull-down menu to display C: Drive properties dialog box window.
3. Click the shared as radio button.
4. In the share name text box, type nwdrive1 as shared drive name that appears in other computer's folder windows(opening My computer) and Network Neighborhood of windows explorer (\\ this computer name\shared drive name). In the comment text box, type your comment, if you want, to further identify this drive.
5. Click full radio button as the Access type to allow users to read from and write to the shared data.
6. In the Full Access password text box, type password, if you want. Click Apply and OK to close the C: Drive properties dialog box window. You now see a hand as part of the drive icon, signifying that the drive is shared.

6. Create a user with the help of Users icon in control panel.

Start>settings>control panel>users. Open to display User settings dialog box

Window. Click New User command button to display Add User dialog box

Window.

1. Click Next button to create a new user.

2. Type a Name for the new user in the User name text box and click Next> button to display Enter New Password dialog box window.
3. If you want password, Type password in Password text box and type again same password in Confirm password text box. Click Next> button to display Personalized Items Settings dialog box window. Click the required check boxes in the Items list. Click radio button corresponding to "Create new items to save space" text . Click Next> button to display Ready to Finish dialog box window and click Finish button.
4. Click Close button in the User settings dialog box window.
5. Restart the computer when prompted to do so.

7. Logon as a user in both systems. Double-click the Network Neighborhood icon on the desktop to display Network Neighborhood window to see all the computers(computer names:PC1 and PC2) on the network. Access the other PC's resources by double clicking the other PCs name. To map the network dives(other PCs drives) select My computer icon on the desktop and Right click. Select Map Network Drive to open the Map Network Drive dialog box window. In the path text box, type full path of the network drive

as \\computer name\ drive letter, and then select the available drive letter from the drop down list of Drive text box.

PROBLEMS:

1: Perform the file operations over the network drives with your PC.
2: Run one application available on the network drive and store the results at your PC.

b) Windows NT Client-Server Network

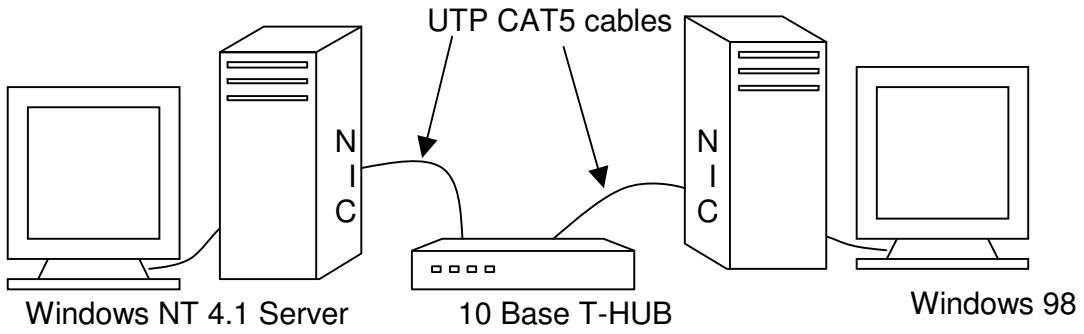
MATERIALS REQUIRED:

Hardware: Two PC's with Network Interface Cards (NICs) / PCI Ethernet Adapters with RJ 45 connector, one active or passive HUB with a minimum of two 10 base-T ports, 1- mtr

CAT5 UTP Cable(Thin Ethernet/10-Base T).

Software: Windows NT 4.1 server(server) and Windows 98(Client).

EXPERIMENTAL DIAGRAM:



THIN ETHERNET Client-Server Network LAN with STAR TOPOLOGY

PROCEDURE:

Hardware setup according to the experimental diagram
Network components installation and configuration in the server
Creating user account in the Windows NT server
Assigning Rights to User and Group
Sharing resources of the server
Network components installation and configuration in the client
Sharing resources of the client
Login as a User and Accessing the Network Server.

1. Do not switch on power to PCs.
2. Make the connections according the experimental diagram with 10 Mbps Ethernet PCI adapters (NICs) placed in the corresponding slots of both PCs .Install the Active or passive HUB and take the two RJ 45 CAT5 UTP cables with both ends are RJ45 connectors and connect the one end to the one port of the Hub and another end to the Network card's RJ 45 connector. Now go for software installation and configuration.
3. Switch on power to both PCs. Boot one PC with WIN NT server and other PC with WIN 98.
4. Install the Network components in server PC from Network icon in the control panel.
   (start>settings>control panel>network>open)-> Display the Network dialog box with five tabs. Identification, Services, Protocols, Adapters and Bindings.
   Required Network components are Network Adapter, protocols, client and service.
   Adapter -Network interface card of user choice.
   Protocol -TCP/IP
   Client - Client for Microsoft Networks

   In the Identification tab of the Network dialog box window, Note the Computer name and Domain. You can change the Computer name and Domain by clicking change command button.
   In the Network dialog box window, click Adapter tab and then click Add command button to display Select Network Adapter dialog box window. Select Network Adapter(Realtek RTL8029 PCI Adapter) from the listed network adapters. Click OK. If you want to install Network card drivers which are supplied with Network card from manufacturer ,click Have disk command button and follow the responses.
   To INSTALL protocol, click Add command button in the protocols tab of the Network dialog box window to display the Select Network Protocol dialog box window. Click NetBEUI(NetBEUI is sufficient for small networks) protocol from the listed protocols and click OK.
   To INSTALL services, click services tab of the Network dialog box window to display Network Services list box. Check for the following installed services: Computer Browser, Workstation and Server in the

Network services list box. If you want to install additional services click Add command button to open the select services dialog box window. Select the required service and click OK.

In the Bindings tab of the Network dialog box window, record the binding for all services, all protocols and all adapters. Click close button and restart.

Wherever (at the time of installation and configuration of Network components) setup prompts for windows NT4.1 CD to copy needed files, insert it or give the path of backup cab files.

5. To create the User Account ,open the User manager for Domains.
   Start>programs>Administrative tools>Administrative Wizards>
   Add user account
   - In the Add user Account dialog give the Domain Name which is given as Domain name in the Identification tab of the network properties sheet. Click on Next button.
   - Here type user full name in the user full name text box, type Log in name in the next (middle) text box (this must be unique in the network) and type Description for this user in the last text box then click Next.
   - Type the password and confirm that password by typing same the above. Check mark the check box this password never expires and select the User is not allowed to change the password radio button then click on Next button.
   - Here select the Group from the available listed groups and click on Add. Then the selected group will be shown in the selected group field. If you not select the any group, the user is going to the Domain User group by default.
   - Here if you want to provide profile, logon script, Home directory and Dial-up Networking. Check mark the appropriate check boxes then click on Next. Otherwise leave blank Windows NT server will automatically assigns the defaults. If you check mark the any check boxes of profile, logon script, Home directory and Dial-up networking you have to specify the profile, logon script, Home directory and Dial-up Networking in the next steps of the setup.

6. Logging on to Server:

Click on start button and select log off in the log off confirmation box and click on Yes. In User name and password text boxes give your name and password and type the Domain name which is given as domain name in the identification tab of network properties sheet of the windows NT server and click OK. After successful logon, open the Network Neighborhood to browse or access the network.

PROBLEMS :

1:Perform the file operations over network drives with your PC.
2:Run one application available on network drive and store the results at your PC.

2.3 THICK ETHERNET LAN WITH BUS TOPOLOGY

a)Windows Peer to Peer Network
b)Windows NT Client-Server Network

AIM:

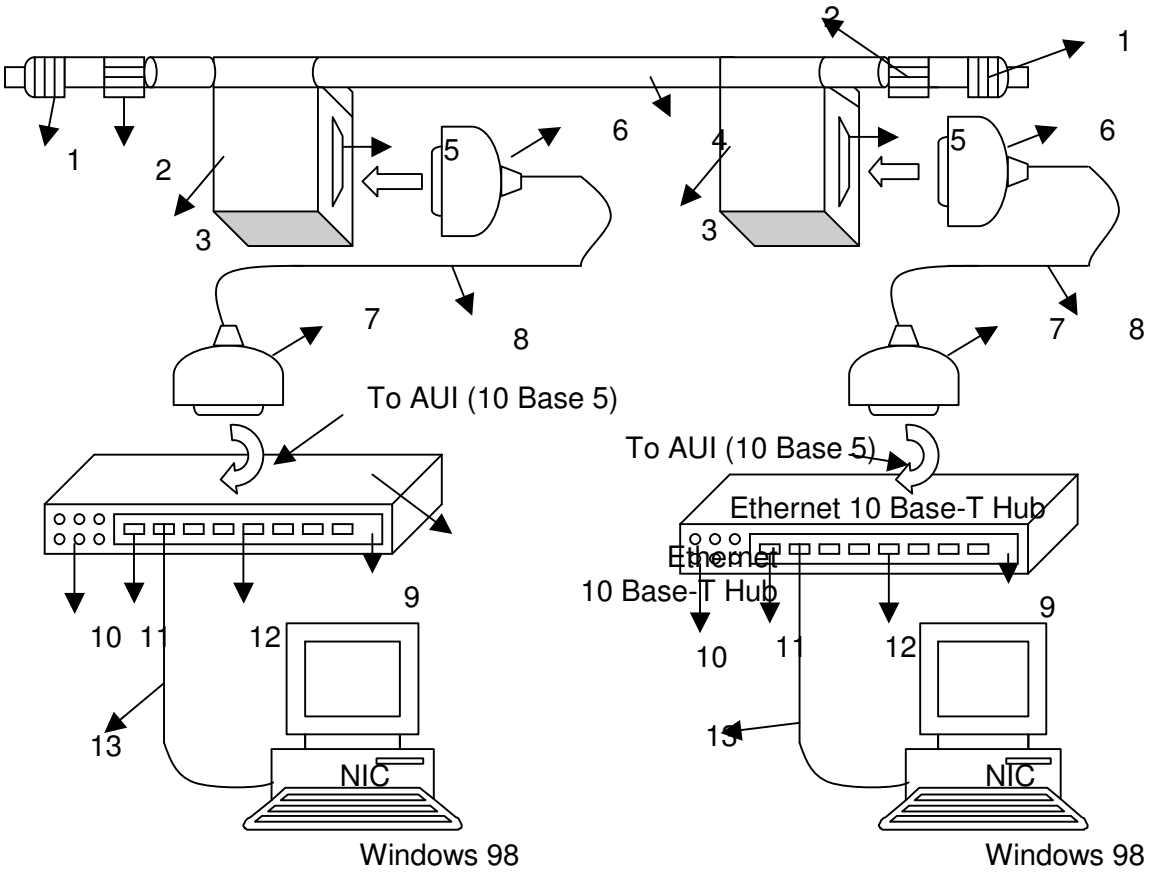
a)To create and familiarize WIN 98 peer-to-peer Thick Ethernet LAN with BUS topology.
b)To create and familiarize WIN NT client-server Thick Ethernet LAN with BUS topology.

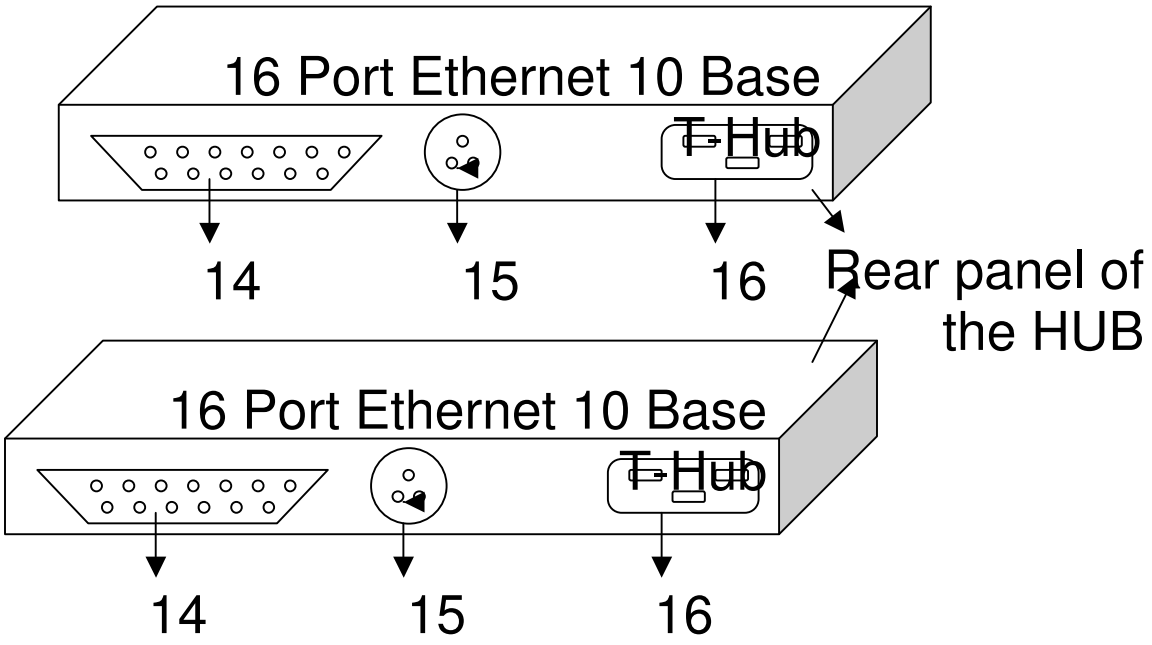
MATERIALS REQUIRED:

HARDWARE: Two PCs with Network Interface cards (NICs)/PCI Ethernet adapters,1-mtr Thick Ethernet Coaxial cable(10-Base5),Two Ethernet Transceivers, Two thicknet terminators, Two drop cables with end connectors are DB15 connectors(one is DB15 male and another one is DB15 female connector),Two Hubs with AUI port and two CAT5UTP cables.

SOFTWARE: WINDOWS 98

EXPERIMENTAL DIAGRAM:


1
2
3
5
6
7
8
To AUI (10 Base 5)
9
10
11
12
13
NIC
Windows 98
1
2
3
4
5
6
7
8
To AUI (10 Base 5)
Ethernet 10 Base-T Hub
Ethernet
10 Base-T Hub
9
10
11
12
13
NIC
Windows 98



1. Thicknet (10 Base 5) Terminator
2. Thicknet (10 Base 5) Co-axial Cable Connector
3. Ethernet Transceiver
4. Thicknet (RG:9) Co-axial Cable
5. DB-15 Male Connector
6. DB-15 Female Connector (to Ethernet Transceiver DB-15 Female Connector)
7. DB-15 Male Connector (to 10 Base 5 Ethernet HUB AUI connector)
8. Thicknet drop cable with end connectors are DB-15 connectors
9. Front panel of the 16 port Ethernet 10 Base 5 HUB.
10. Port Status Indicators (LEDS)
11. Up link port (RJ 45)
12. Ports from 1 to 16 (RJ 45)
13. CAT5 C/U UTP cable (from HUB port to NIC of PC)
14. AUI Thick Ethernet (10 Base 5) Connector (DB 15 Female Connector).
15. BNC for 10 Base 5

16. Power Connector

PROCEDURE:

1. Do not switch on power PC's
2. Find out the above mentioned materials at your experimental sight and make the connections according to the experimental diagram shown above. If the connections are previously made, then verify the connections according to the experimental diagrams. If the connections are correct go to next step.
3. Switch on the power to both PCs and boot with WINDOWS 98. At each PC, configure Network Hardware and Software using the next step.
4. (a) Install the Network Components from Network Icon in the Control Panel.
   (*Start > settings > control panel>Network>open) -> Display the Network Dialog box with three tabs: Configuration, Identification and access control.*

   Required Network components are Network Adapter, Protocols, Client and Service.

   Adapter - Network Interface card of User choice
   Protocol - NetBEUI
   Client - Client for Microsoft Networks
   Service - File and print sharing for Microsoft Networks

To install Network Adapter from the Network Dialog Box window, Click the Add button on the configuration tab to display the select Network component type dialog box window. Select adapter and click Add button. From the select Network Adapter dialog box window, select Network Adapter's Manufacturer from the manufacturers list and Network adapter from the Network adapters list, and click OK. If you want to install Network Interface card drivers which are supplied with card from manufacturer, click Have disk command button and give the appropriate path at path dialog box and then click OK.

To install protocols from the Network window, click Add button in the configuration tab of Network window to open the select Network component type window. Select protocol and click Add button. From the select Network protocol window, select Microsoft from the manufacturers list. Select NetBEUI from the Network Protocols list Click OK.

To Install Client from the Network window, click Add button in the configuration tab of network window to open the select network component type window. Select client and click Add button from the Select Network client window, select Microsoft from the manufacturers list and then select client for Microsoft Network from the Network clients list. Click OK.

To Install service from the Network window, click Add button in the configuration tab of network window to open the select network component type window. Select service and click Add button. From the Select Network service window, select Microsoft from the Manufacturers list and then select file and print sharing for Microsoft Networks from the Network service list. Click OK to display the network dialog box window.

4 (b) Configuration of the install network components from the network dialog box window.

To configure the installed network Adapter, select the installed network adapter in the installed list of network components of configuration tab and click properties command button to display the adapter properties dialog box window. In driver type tab, select Enhanced mode (32 bit and 16 bit) NDIS driver radio button. In Bindings tab, check mark the check box of the NetBEUI. Settings/configurations for other tabs are optional and dependent on network adapter.

To configure the installed protocol(s) NetBEUI, select the NetBEUI protocol in the installed list of network components of configuration tab and click properties command button display the NetBEUI properties dialog box window. In Bindings tab, check mark the check boxes of "Client for Microsoft Networks and file and printer sharing for Microsoft networks" Settings/configurations for other tabs are optional.

To configure the installed client, select the client for Microsoft Networks in the installed list of network components of configuration lab and click properties command to display client for Microsoft Networks properties dialog box window. In Logon validation part, clear the check mark I the check box of "Log on to windows NT domain" if marked and

nothing is to be typed in windows NT domain text box. In the Network logon options, select any one of the radio buttons.

To configure the installed service, select the file and printer sharing for Microsoft networks in the installed list of network components of configuration tab and click properties command to display file and printer sharing for Microsoft Networks properties dialog box window. Use default selections for property list and value list. Click OK.

- In the primary Network Logon drop-down list box of configuration tab on the network dialog box window. Select client for Microsoft Networks and click the file and print sharing button to display file and print sharing dialog box. Select the check boxes for your system resources you want to share files on any drives, and/or printers attached to your computer. Click OK to return to the network dialog box window.
- Click identification tab on the network dialog box window. In the computer name text box type unique name of PC (example PC1 for one PC and PC2 for other PC) and in the workgroup text box, type MSC that must be the same for other PC also. In the computer Description text box, type Network PC (optional)
- Click Access Control tab on the Network dialog Box window. Select share-level access control radio button if not selected.

Click OK for installing and configuring the network components. If the installation requires WIN 98 CD, insert it and give the path and click OK. Reboot the system. Check the desktop for Network Neighborhood icon. If not displayed, reinstall the network components. If installed check whether the network works using the following steps:

1. Double-click the network Neighborhood icon on the desktop to display network Neighborhood window to see all the computers on the network.
2. if you don't see the names of all the computers on the network, double click the Entire network icon and then the workgroup icon.

5. Sharing the Disk drives, folders and printers for other computers to

access over network.
Making a drive sharable: follow the steps 1 to 6 to share c drive.

1. Double click My computer on the desktop
2. Right click C drive and click sharing in the pull-down menu to display C: drive properties dialog box window.
3. Click the shares as radio button.
4. In the Share Name text box, type nwdrive1 ad shared drive name that appears in other computers folder windows (opening My computer) and Network Neighborhood of windows explorer (\\ this computer name\shared drive name). In the Comment text box, type your comment, if you want, to further identify this drive.
5. Click Full radio button as the Access type to allow users to read from and write to the shared drive.
6. In the full Access password text box, type password if you want click Apply and OK to close the C: drive properties dialog box window. You now see a hand as part of the drive icon, signifying that the drive is shared.

6. Create a user with the help of users icon in control panel.
Start>Settings>Control panel>users>open to display user settings dialog box window.
Click new user command button to display add user dialog box window.

1. Click next> button to create a new user.
2. Type a name for the new user in the user name text box and click Next button to display enter new password dialog box window.
3. If you want password, type password in password text box and type again same password in confirm password text box. Click Next>button to display personalized items settings dialog box window. Click the required check boxes in the items list. Click radio button corresponding to “create new items to save disk space“ text. Click next>button to display Ready to Finish dialog box window and click Finish Button.
4. Click close button in the user settings dialog box window.

5. Restart the computer when prompted to do so. Or
   Start Log Off yes

7. Login as a user in both systems. Double-click the Network Neighborhood icon on the desktop to display network Neighborhood window to see all the computers (computer names: PC1 and PC2) on the network. Access the other Pc's resources b7y double clicking the other PC's name. To map the network drives (other PC's drives). Select My computer icon on desktop and right click. Select map network drive to open the map network drive dialog box window. In the path text box, type full path of the network drive as \\computername\driveletter, and then select the available drive letter from the drop down list of drive text box.

PROBLEMS:

1. Perform the file operations over network drives with your PC.
2. Run one application available on network drive and store the results at your PC.

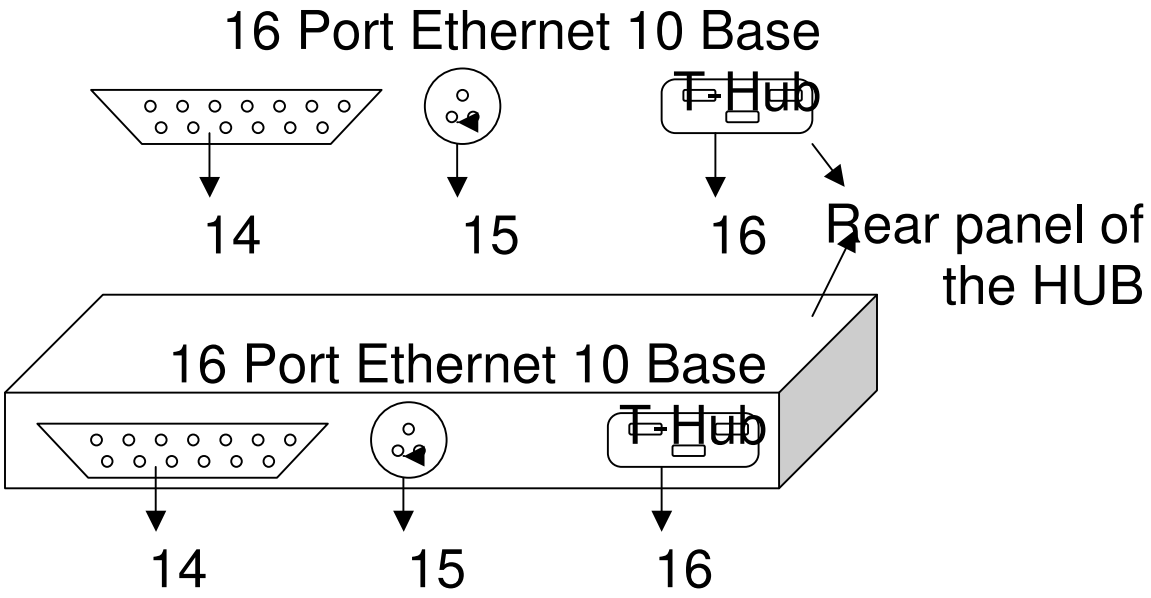
b) WINDOWS NT CLIENT-SERVER NETWORK

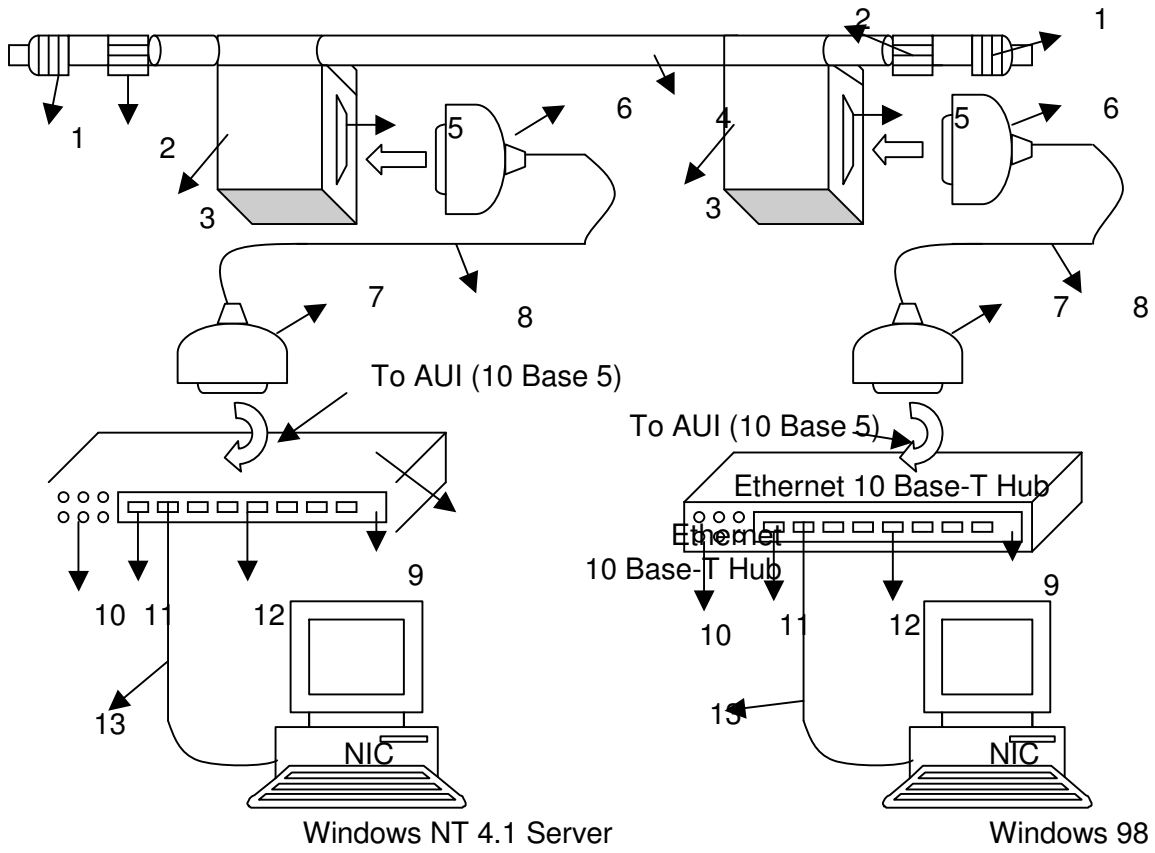
MATERIALS REQUIRED:

HARDWARE: Two PCs with Network interface cards (NICs)/PCI Ethernet adapters,1-mtr Thick Ethernet Coaxial cable(10-Base5), Two Ethernet Transceivers, Two Thicknet Terminators, Two drop cables with end connectors are DB 15 connectors(one is DB15 male and another one is DB 15 Female connector), Two Hubs with AUI port and two CAT5 UTP cables.

SOFTWARE: Windows NT 4.1 server(server) and Windows 98(client).

EXPERIMENTAL DIAGRAM:





1. Thicknet (10 Base5) Terminator.
2. Thicknet (10 Base5) Coaxial cable connector.
3. Ethernet Transceiver
4. Thicknet (RG-9) Coaxial cable.
5. DB-15 Male Connector.
6. DB-15 Female Connector(to Ethernet Transceiver DB-15 Female connector).
7. DB-15 Male Connector (To 10 Base 5 Ethernet HUB AUI Connector).
8. Thicknet Drop Cable with end connectors are DB-15 connector.
9. Front Panel of the 16 port Ethernet 10 Base 5 HUB.
10. Ports Status Indicators (LEDs).
11. Up link Port (RJ 45).
12. Ports from 1 to 16 (RJ 45).
13. CAT5 C/U UTP Cable (from HUB port to NIC of PC).

14. AUI Thick Ethernet (10 Base 5) connector (DB 15 Female Connector).
15. BNC for 10Base2.
16. Power Connector.

PROCEDURE:

Hardware setup according to the experimental diagram.
Network Components installation and configuration in the server.
Creating User Account in the Windows NT Server.
Assigning Rights to User and Group.
Sharing Resources of the server.
Network components installation and configuration in the client.
Sharing Resources of the client.
Login as a User and Accessing the Network/server.

1. Do not switch on power to PCs.
2. Make the connections according to the experimental diagram with 10Mbps Ethernet PCI Adapters (NICs) placed in the corresponding slots of both PCs. (Connect the T-connectors to both NICs and take the RG-58 Coaxial cable (Thicknet 10Base2) with a minimum of 0.5 mts and maximum of 16mts and connect one end to one PC and another end to the other PC and terminate both ends with 50 Ohms terminators).
3. Switch on the power to PCs. Boot one PC with WIN NT server & Other PC with WIN 98.
4. Install the Network components in server PC from Network icon in the control panel.
   (Start>settings>control panel>Network>open)-> Display the Network Dialog box.
   Required Network components are Network Adapter, protocols, client and service.
   Adapter - Network interface card of user choice.
   Protocol - NetBEUI
   Client - Client for Microsoft Networks.
   Service - File and Print Sharing for Microsoft Networks.

   In the Identification tab of the Network dialog box window, Note the Computer name and Domain. You can change the computer

name and Domain by clicking Change command button.

In the Network dialog box window, click Adapter tab and then Add command button to display Select Network Adapter dialog box window. Select Network Adapter (Realtek RTL8029 PCI Adapter) from the listed network adapters. Click OK. If you want to install Network card drivers, which are supplied with Network card from manufacturer, click Have disk command button and follow the responses.

To INSTALL protocol, click Add command button in the protocols tab of the Network dialog box window. It displays the Select Network Protocol dialog box window. Click NetBEUI (NetBEUI is sufficient for small networks) protocol from the listed protocols and click OK.

To INSTALL services, click services tab of the Network dialog box window to display Network Services list box. Check for the following installed services: Computer Browser, Workstation and Server in the Network Services list box. If you want to install additional services click Add command button to open the select services dialog box window. Select the required service and click OK.

In the Binding tab of the Network dialog box window, record the binding for all services, all protocols and all adapters. Click close button and restart.

Wherever Setup prompts for Window NT 4.1 cd to copy needed files, insert it or give the path of backup files.

5. To create the User Account, open the Manager for Domains. Start>programs>Administrative tools> User manager for domains > user > new user.

In the New user dialog box window, type ‘dclab’ in the user name text box, ‘Msc_dclab’ in the full name text box, ‘Experiment2.1’ in the description text box and type ‘dclab123’ in the password and confirm password text boxes. Check mark the check boxes of user cannot change password and password never expires as per your requirement. Click Add command button. Click close command button to close the Add user dialog box window.

Double-Click ‘dclab’ from the username field of user manager – AUENGG window to display user properties window for verifying the

entry of user name and its properties.

By default newly created user will be related to the domain work group. If you want to change the group or to add this user to other groups, click Groups Applet at the bottom of the user properties of the dialog box window to display Group Memberships dialog box window. Click the required group from the available groups in the Not Member of list and click Add command button to show in the Member of list. Click OK.

Click Profile applet at the bottom of the user properties window to display User Environment Profile. If all users need same user environment (desktop settings, etc.) as a mandatory, type\\ server name\profile folder name \ user name in user profile path text box of user profile part. If a particular cmd or exe or bat file is to be run each time when user logs on, type that file name in the logon script name text box. Type \dclab\batch1 in local path text box of Home Directory part. If you login with path Windows NT automatically creates the default Home Directory and profile for this user at the time of user login. Click OK.

To see the logon hours to this user dclab, click on hours button at the bottom of the user properties sheet. By default all hours of all days are assigned to allow access. Select all hours of all days by pointing the mouse at the top left corner, hold down the left mouse button and drag it to bottom right corner then click on Disallow command button. Select 6 pm to 8pm or as you wish then click Allow command button. This will close the assigning logon hours to this user.

Click on Logon to button at the bottom of user properties sheet. This will shows the logon workstations properties sheet. By default user may log on to this domain from any workstation in the network, but you (administrator) can restrict a user to logging on by specified workstation select group to log to these workstations radio button and type workstation name in the any number text box.

Click on Account button to set the account properties: Never radio button in account expires field that the account will not expires forever and End of specifies that the account will expire at that specified date. Click on Never. Then select Global Account radio button in the account Type field and click on OK.

If you want to permit the user to access the network from a remotely using dialup networking then go to set the dial in properties by clicking on Dialin button in the user properties sheet. Now click on OK to close the user properties.

6. To assign rights to this user open the User Rights policy.

Start > programs > administrative tools>user manager for domains > select 'dclab' (user name) from the listed username field, select user rights to open the user right policies properties sheet from the drop down list of policies in the main menu. In the user rights policies select access this computer from network from the drop down list of right dialog box, then click on Add command button to open the Add users and Groups window, select the domain from the drop list of list names from dialog box. Click on show user command button to view the all users in this domain. Select user (dclab) from the names list then click on Add command button, this added user (dclab) will now shown in the Add names list then click on OK. Now the added user will shown in the grant to list. Then click on OK to close the user rights policy.

7. Sharing the Available Resources of the Server

You can share the Drives, printers, folders and files (if the file system is NTFS)

To share the C: drive open my computer > select and right click on C drive > choose sharing from the drop down list. In the |C| properties window, select sharing tab > select shared as Radio button then click New share command button and give share name (identifies the shared button to display access through share permissions dialog box window (by default permissions of new share are assigned to Everyone full control). Click OK.

8.Install and configure the Network Components the client from Network tool in the control panel

Start > settings > control > network > open

8.To install and configure the network components, follow the stops given in section (a) (procedure step 4) except client (client for Microsoft Networks) configuration that is given below.

To configure the installed client, select the client for Microsoft network in the installed network components of configuration tab and click properties command to display client for Microsoft networks properties dialog box window. In Logon validation part, check mark the check box "Log on to windows NT domain" and type windows NT domain name which is given as domain name in the identification tab of the Network

dialog box window of windows NT server in the network logon options, select any one of the radio buttons.

9. Sharing the Disk Drivers, Folders and printer for other computers to access over network.
Follow the step5 in the procedure of section (a)

10.Logging on to server from CLIENT's desktop.

Click start button, select logoff and click on display log off window dialog box window. Click Yes to display enter network password dialog box window. In username text box, type user name who has an account with the server. Enter password in the password text box. Click OK. After successful logon, open the network Neighborhood to browse or access the network.

PROBLEMS:

1. Perform the file operations over network drives with your PC
2. Run one application available on network drives and store the results at your PC.

2.5 THIN ETHERNET LAN WITH STAR TOPOLOGY using Novell Netware Olient-Server Network

AIM: To create and familiarize thin Ethernet LAN with star Topology

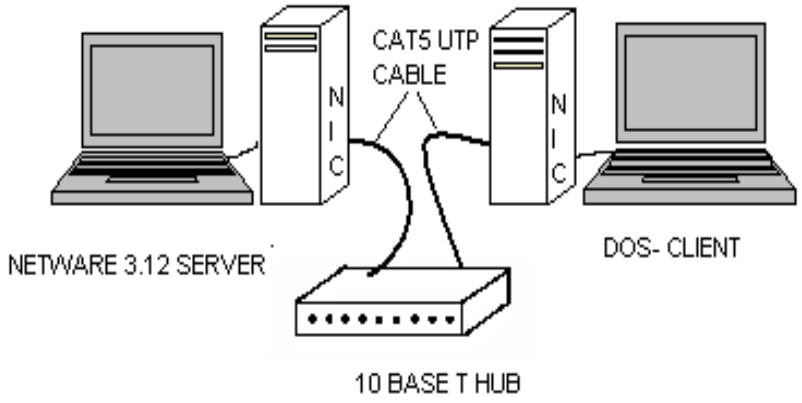
using Novell NetWare Clint-Server model Network.

MATERIALS REQUIED:

Hardware: Two pCs (one is Novell Server 3.12 and another one is Node).Two Ethernet Cards with RJ45connector. One Active or Passive Hub with a minimum if two ports and two CAT5 C/U UTP Cables.

Software: Novell Netware 3.12 Server and Dos.

EXPERIMENTAL DIAGRAM:



PROCEDURE:

Exeperimental Setup.
Server Setup

Client Setup.
Login and Logout.
User and Group Creation.
Assigning Restriction and Providing rights
Mapping drives and writing Login Scripts.

(1) Do not switch on power to PC
(2) Make the connections according toto the experimentel diagram with 10Mbps Ethernet PCI adapters(NICs) placed in the corresponding slots of boths PCS.Connect the T-connectors to both NICSand take the RG-58 Coaxial cable(thinnet 10Base2) with a minimum of 0.5mts and maximum of 10mts and connect one end to one PCand another end to the other PC and terminate bioth ends with 50 Ohms terminators.
(3)Switch on the Power to both PCs/boot with DES at the command prompt of the server pc,change to the directory9server.312()where the server software is loadded and execute the SERVER.EXE command to run server program.
Now mount the requried Volumes with 'MOUNT"(EX:CSSE:dismount VOL1) command . Toview the available volumes in the Server ,type "load install"at the server console prompt and press enter.
EX: CSSE (server name):load install
From the "installation options" list choose "volume options" and press enter to display the available volumes .If you want to create new volumes ,press "insert"key on the keyboard.if free space is available create new volume menu will appear, type name of the volume,volume size,etc.,and press Esc. When it prompt to Save,select Yes and press Enter then the newly created volume will be displayed in the volumelist, To delete volume, select volume and press "Del"key on the keyboard. To create or modifiedthe AUTOEXEC.NCF and STARTUP.NCF files, select System Option and press Enter to display the Available System Option list. Choose Exit and press Enter to come back to the Server Console command prompt . Familiarize the Available Option of the load install and also load moniter.
(4) Preparing to Connect to Network from Client or workstation or Node:
Switch on the power to workstation;Insert the DOS boot diskette with client software into the floffy drive .At the command prompt , search for the directory(NWCLIENT) where the Netware client software is loaded and change to that directory. Execute the following commands LSL-Link Support Layer,NE2000-Network Adapter Driver, IPXODL Communication

Protocol . VLM-Virtual Loadable Modules for services and change to the F drive -sys volume of server.

A:\NWCLIENT>Set Nwlanguage =english
A:\NWCLIENT>LSL
A:\NWCLIENT>NE2000.COm
A:\NWCLIENT>IP{XODI.COM
A:\NWCLIENT>VLM
A:>F

(5) Logon the network using login command

F:\>logoin

Type user name:Supervisor
Type passwordd:
F:\public>
To log out from this servertype logout
(6) To create a new user and group at the work station
Adding an user
login as asopervisor. At the command promt ,type "SYSCON" command to invoke the system console utility from avaliable topics of the SYScon, choos user information and press enter to display the user names list.Press"Insert" key on tne key board to add the user. At the user name prompt type a name for new user and press enter. When its prompts for home directory of the new user,type home directory name and press enter and confirm the verifcation of the new directory by choosing Yes and press enter .Users name list displays added username Adding Group
From the availa ble topic of the Syscon,choose group information and press enetr to display groups list,here press "Insert"key on the key board to add the new group and give the name for this group at the prompt and press Esc key group list displays added group name.
(7) Assining restrictions and providing rights.

As a supervisor , enter the command "Syscon" to invoke the system console utility. Select user information option from the avaliable topics list. From listed user menu, select "user" you want and press enter to display the user properties.Select"Change pass word" option to change or set pass word for this user.Select "Account restrictions " to set the pass word length, max connections etc Select "Time restrictions" and press enter to set the timings to restric to the user based on the time select " Volume /disk restrictions" option and press enter to advocate from space on the avilable.
monted volumes of file server.

familiarised the other avaliable option in the user properties.

(8) Mapping Drivers

drive pointers mapping

1.Netware uses letters to identify various locations within the networks directory structures.

2.Search pointers mapping

Search drive mapping act like the DOS path command instructing the netware(and DOS)

where to look for the command you type .

to view the current mappings,execute 'map' command this will show the currently mapped drive pointers and the search mappings.

Notice the drive letters search numbers which are not used.

syntax: F:>mapdrive_letter:=path(to map a drive pointer)

Ex : F:>map G:=\username\myname

G is the drive letter

\username\myname,is the full path of the directry

Syntax : F:>Sn:=path(to create a search map)(where the 1 to 16)

Ex :F:.>map S4:=G

writing login script(login scripts are small programs that run every time you login to the your network.Login scripts are perticularly usefull for setting up drive mappings displaying messages while login ,etc):execute SYSCON command at F:\PUBLIC choose user information

select user name . Press enter to display the user properties menu.Select login script option Press enter to display the login script for user . Type commands you wish to run.Press ESC to exit from login script and save login script.

Netware login script commands:

commands	**Description**
ATTACH	Connects to more than one server during login
BREAK	turns ctrl+break feature on and off
COMPSPEC	Specifies where command processor can be found
DISPLAY	display text file on the screen
DOS BREAK	Enable or disable dos break facility
DOS SET	Assigns dos variable within login script
DOS VERIFY	Determines whether files copied usig dos COPY command are automatically verified

DRIVe	sets user default drive
EXEC(#)	Runs programs or command external to login script language
EXIT	exit from login script
FIRE PHASERS	generate sound
IF,ELSE,THEN	Make decisions within login scripts
INCLUDE	Include another login script file within login script
MACHINE	Set machine type
MAP	Map drive pointers to directories
PAUSE	temporarly halt script execution
PCCOMPATIBLE	inform script interpreter that work station is on IBM-compatable and running dos
REM	Ignores remainders of line in script
SHIFT	Shift positions of the variables for passing to dos commands.
WRITE	Send messages to user screen

Login script Identifiers

AM__PM	AM OR PM depending up on time of day
DAY	day of month as number between 1 to 31
DAY_OF_WEEK	day of week at text
NDAY_OF_WEEK	day of week as number between 1to 7
HOUR	current hour in 12 hour format
HOUR24	current hour in 24 hour format
MINUTE	current minute
SECOND	current second
GREETING TIME	morning , afternoon and evening
MONTH	current month as number between 1 and 12
MONTH NAME	current month name
YEAR	current year with all four digits
SHORT_YEAR	current year with only last four digits
FULL_NAME	user's full name
LOGIN-NAME	user's login name
NEW_MAIL	year if new mail waiting.no if not
STATION	work ststion number
P_STATION	physical work station address
MACHINE	long machine name
SMACHINE	short machine name

OS	name of work station operating system
OS_VERSION	version of OS
ERROR_LEVEL	DOS error level code returned from last EXEC(#) or ATTACH

Sample logon script:

```
FIRE PHASERS CTIMES
MAP DISPLY OFF
MAP ERRORS OFF
MAP S1:=SYS:\PUBLIC
MAP S2:=SYS:\SYSTEM
MAP G:=SYS:\PUBLIC
MAP H:=SYS:\SYSTEM
WRITE ""GOOD % GETTING TIME :% LOGIN NAME,"
WRITE "You are loged on station:%STATION:Using%OS;"
WRITE "Current time and date:%HOUR:%MINUTE:%AM_PM:";
WRITE "MONTH_NAME: %DAY: 5YEAR";
PAUSE
DIPLAY SYS:\PUBLIC\NOTIE.SCN.
```

PROBLEMS:

1) Add a user with 'student' as the name. Use password with six characters the user must belong to MSC group.Allow to login only tuseday from 6 pm to 8 pm, allow to acces only TURBO c directory on VOL1: volume with read and permissions,provide 5MB space on VOL1 to save files and write login scripts for displaying current time,date,OS details, and text file that containes your expt information using the Netware login script commands.

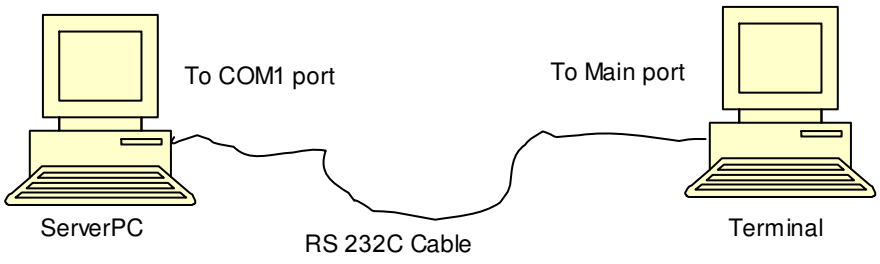
2) login as student and create a file with TURBO C and save it in user home directory and Grant and file scan permissions to all users.

2.6 TERMINAL NETWORK WITH LINUX SERVER

AIM : To Create a small Terminal Network under Linux environment and Familiarizing with the Linux Terminal Networking

MATERIALS REQUIRED:. Linux Server PC(Red Hat 7.1),Terminal(VT 100) and RS 232C Cable.

Experimental diagram



PROCEDURE:

Experimental Setup
Terminal Configuration
Server Configuration.

1. Do not switch on the power to PC and Terminal.
2. Make the connections according to the experimental diagram.

Verify for the free serial Port in the Server PC. G enerally every desktop PC has two Serial Ports.these are identified by their physical view.Generally these are DB-25 Pin or DB-9 Pin Male connectors at the rear panel of the CPU,these are Sufficient for this experiment. If you want to install more then two terminals in the Network,then the serial port I/O card is required(One Port for each Terminal).

Take the RS 232C Cable and connect the One end to the Identified free PC's serial Port either Hys0(COM1) or Hys1(COM2) and another end of the serial cable to the Terminal's serial port i,e DB-25 Pin femail connector(main connector).

3. Switch on the power to Terminal and put the terminal in Setup mode by pressing ALT+Ese(refer the terminals's manual to put the terminal in setup mode).Set the terminal display properties such as Screen ,Font,Wrapping,Columns,Intensity cursor ,etc.

Set the Communication Properties such as Data bits,Stop bits,speed,interface,Emulation,etc.Set Data bits=8-nill,Stop-bits=1,,Transmit speed=9600,Receive –Speed=Transmit,Host Interface=Full Duplex(FDX-A)and Emulation=VT-100, in Terminal. Then save the Setup by choosing Save command and press Enter,then Come back to normal mode by pressing ALT+Esc once again.

4. Server Configuration

Creating User
Assigning password
Editing the /etc/miltab file for setting terminal parameters

Switch on the Power to PC.Boot the PC with LINUX Wait a moment till the booting process is completed.

The end of booting process display the following message With login prompt. At the Login prompt.Login as root.

PCQ LINUX RELEASE 7.1
Kernel 2.4.2-2 on an i686

Localhost login: (type "root"and press enter)
Password: (type root password and press enter)

After successful login,root login shell prompt will be displayed.

To create a User in the server,follow these steps.

[root@localhost root] //adduser<dclab (user name)

Verify whether the user is created or not in the/home directory.

[root@localhost root] //cd /home
[root@localhost home] //ls
dclab

To assign the password to this user,follow the steps given below.

[root@localhost root] //password dclab
changing the password for user dclab
New UNIX password ---------- ----------(type password here)
Retype new UNIX password ------- ---------(confirm that password)
Password all authentication tokens updated successfully.

To know more options of the "address" and "password"commands,read the manual pages main command.

To verify whether the user is added or not,login as user "dclab"in the Server using the next steps.

[root@localhost root]//logout (type logout to logout from root)
localhost login:dclab (type user name to log in as user dclab)
password: -------- (type password of the dclab)
[dclab@localhost dclab]$ (type who to display he current users)
dclab Hy1 Oct 12 1925
[dclab@localhost dclab]$ logout (type logout to logff from dclab)
PCQ LINUX RELEASE 7.1
Kernel 2.4.2-2 on an i686
Localhost login:
To Edit "/etc/inittab" file for entering the details about the terminal,
Login as root and open "inittab"file with text editor (vi or ed)
[root@localhost root]//cd /etc (To change to etc directory)
[root@localhost etc]//vi inittab (to edit inittab file)
In the "inittab" file specify the terminal communication details such as band rate
(bits/second) parity,flow control,selected communication port,etc
press 'I' to get into insert mode and type the following line

Meaning of the above line:
S1 is from ttyS0.
2345means that getty is run upon entering run levels 2or 3 or 4 or 5
.respawn means that getty is killed,it will automatically start up(respawn) again.
/sbin/ageltty is the getty command.
The-L means local(ignore modem control signals)
9600 is the band rate
HyS0 means/dev/hys0(COM1 under MS DOS)
VT 100 is the type of terminal and this getty will set the environment variable TERM
this value.
For more details and more options of agelly ,see the manual pages of getty and agetty

Save and quit the inittab file by pressing Esc key and type avq. Press enter to Exit.
[root@localhost etc]//init q (type init q to see login prompt at the terminal console)
Read the manual pages of thead

duser,newgrp,passwd,chmod,chown,chgrp,vi,mkdir,rmdir and rm to solve the problems

PROBLEMS:

1).Familiarize the directory Structure at the terminal
2).Familiarize some basic commands for creating files and directories performing the file operations assigning file permissions and owner ships,etc.at terminal
3).Mounting File Systems at server
4).Administrating User and Group Accounts at server
5).Run one application available at server from other terminal.

To shutdown the system,do the following:
[root@localhost etc]//shutdown-h now observe the message during shutdown To restart the system at any time,do the following:
[root@localhost etc] //reboot <or press ctrl+alt+del>

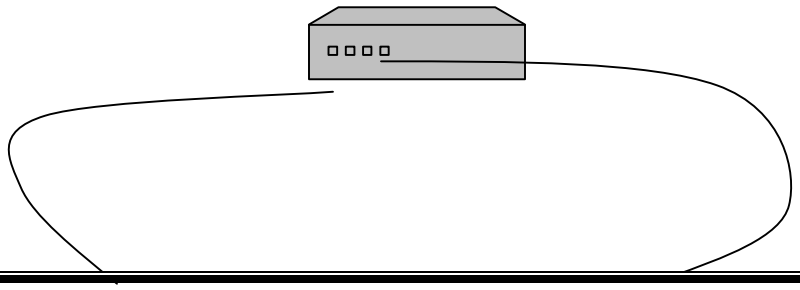
2.7 TERMINAL NETWORK with UNIX SERVER and TERMINAL SERVER

AIM: - To create and familiarize a small terminal network under UNIX environment using TERMINAL SERVER

MATERIALS REQUIRED: -

Server PC (SCO UNIX 506) with Network interface card (NIC), Terminal server, Terminal (VT100/VT220 Compatible), RS 232C Cable (With one side RJ45 Connector and other side DB 258 connector) and CAT5 UTP Cable (with end connectors RJ45 connectors).

EXPERIMENTAL DIAGRAM: -



Server PC

Terminal

TERMINAL NETWORK WITH SCO UNIX AND TERMINAL SERVER

PROCEDURE: -

Experimental setup
Terminal Configuration
Server Configuration
Terminal Server Configuration

1. Do not switch on the power supply to PC and Terminal.
2. Make the connections according to the experimental diagram with NIC installed in PC.
3. Terminal Configuration:

Switch on the power to Terminal only and put the Terminal in setup mode to configure the terminal display properties, communication properties, etc., by pressing "setup" key on the keyboard (refer the terminal's manual for setup keys to put the terminal in setup mode). In the setup mode, set the terminal properties from the displayed menu. For example to change or modify the displayed properties such as screen, font, wrapping, columns, intensity, cursor, etc., move the cursor on to 'display' menu, with the help of arrows keys and press enter to display the available options in the display menu select the appropriate tab and press enter to change settings, after completing the required changes move the cursor to 'to directory' tab and press enter to display the main menu and then select save tab and press enter and to save the modified settings and then select exit and press enter to exit from the setup mode and to put the terminal in normal

mode.

Set the communication properties such as Data bits, Stop bits, speed, interface, Emulation, etc., set data bits=8-nill, stop bits=1, transmit speed=9600, receive speed=Transmit, Host interface=Full Duplex (FDX-A) and Emulation=VT-100. These are the main settings for proper communication. Then save the setup by choosing save command and press enter. Then come back to normal mode by pressing 'Setup' key once again or from Exit command in the main directory.

4.Server Configuration:

a) Network components installation and configuration
b) Creating User, group and Assigning Password

a) Network components installation and Configuration
   Adapter
   Protocol

Switch on the power to PC you get the boot prompt shown below

SCO Open Server(TM) Release 5
Boot
:
.

At the boot prompt press enter to boot with UNIX. Then you get following

INIT SINGLE USER MODE

Type Control-d to proceed with normal Startup
(or give root password for system maintenance)

Press Control-d to boot UNIX with multi user support then at the time prompt enter current time or simply press enter to continue boot process.

INIT: New run level: 2

Current system time is Fri Oct 12 21:14:14 EDT2001
Enter new time ([[CC]YYMMDD] hhmm [ss])

Enter Login User name and Password at the login prompt
SCO logo

Scosysy login	text box	(Type User Name)
Password	text box	(Type Password)

Login Restart Help

Open The Network configuration manager

Click hardware menu in the Network Configuration Manager. From the drop down menu select and click. Add new adapter to open the select network adapter to be added dialog box window (of the kernel detects the adapter it will display adapter with the default setting accept these settings and continue). From the list of adapters, select the adapter you want to add and click continue to display the network Driver Configuration dialog box window. Give the PCI Device, Function values in the appropriate dialog boxes, these values should not conflict with the other hardware then click OK, and confirm these values when prompted. To display the Add Protocol dialog box window, Select SCO TCP/IP in the Add protocol window and click add to display the protocol configuration dialog box window. Type Host name in the local Host name text box. Type Class 'C' type IP Address box, type Class C type Net mask and Broadcast Address and also specify the Domain name, TCP connections and Pseudo and then

click OK.

Creating User Account

To Create User Account open the Account Manager

From the Account Manager on scosysy dialog box window, click User menu and then click Add New User to open the scosysy Add New User dialog box window.

Type User Name in the login text box. Select Set password now radio button to assign password at this time, Click Change Login Shell tab to display the Change login Shell New User dialog box window and select the login shell from the drop down list of select login Shell dialog box and click OK.

To specify the home directory to this User, Click Change Home directory tab and type the home directory in the Home Directory text box and click OK.

Click change group Membership tab to open the Change group. New User dialog box window .In the login text box , type name for group or select the group from the drop down list and then click OK to return to the Add New User window.(To add a user to a group, select an entity in the other groups column and click the Add button To remove a user from a group select an entity in the member of column and click on the remove button). In the Add New User dialog box window, click OK to display the set password dialog box window. Type password for this user in the Enter password text box and confirm that password by typing again in the Confirm Password text box and click OK to close the Ad New User dialog box window and get the Account Manager dialog box window. Identify the User just you created in the User list.

Creating User Account:

From the group's menu, select and click Add new Group to display the Add group dialog box window. Type name in the Group Name text box and click OK to create this group.

To modify an existing group, select group from the view menu, select a group name, and then select Modify from the group menu.

To add user to the group, select an entity in the other Users column and click on the Add button.

To remove a user from the group, select an entity Users in Group column and click on the Remove button. You can also search for a user

name to select.
5.Terminal Server Installation and Configuration in the Ethernet (10baseT) Network:
Connect a terminal to any of the serial ports of Terminal Server (TS) using RS232C serial cable.
Switch on the power to Terminal. Switch on the power to Terminal Server
Booting status of the terminal server as displayed on the terminal
Port no 1Please wait
Terminal Server initializing
Immediately type " " to make that port in virtual console
Countdown appears on the terminal that has become the virtual console. Press any key to interrupt.
The options are displayed as
Installation of terminal server
TS Configuration
Network configuration
And the prompt ">" appears
The main prompt ">" appears Press "2" and press enter
Assign the Ethernet address, IP address, Net mask and media type to TS with the following commands
Ea=Ethernet address
Ia=IP address
Im=Net mask and
Em=Ethernet media
Obtain the IP address and Net mask from the Network tool in the system administration

System Administration>Network Configuration Manager>select the TCP/IP protocol> then click Modify protocol configuration from the protocol menu> In the SCO TCP/IP configuration sheet, note down the Net mask (in hexadecimal notation) and give this at the time of terminal server configuration

For example eaIa 192.9.200.10 (decimal notation)
Im ff ff ff 0 (255.255.255.0(decimal) ff ff ff 0(hexadecimal))
Em 10base (for Ethernet 10base T)
When setup prompts for serial number, give 019607140097.
Then perform the internal and external loop back tests by giving "il" and

"el" at the prompt to check the Terminal server functionally. Both loop back tests should be done successfully. Then reboot the terminal server by power switch on and off. After default booting of terminal Server,You get the command prompt (like TS>) on the terminal screen. At the command prompt type "rlogin" and give the server IP number to connect the UNIX Server, if OK, You should get the login prompt. Then give the user name and password to login.

PROBLEMS:

1. Familiarizing with the directory structure at the terminal.
2. Familiarizing with the some basic commands
3. To create files and directories
4. To perform file copying
5. To assigning file permissions and owner ships, etc at the Terminal
6. Mounting file System at Server
7. Administrating User and group Accounts at the Server
8. Run one application available at server from terminal.

In shutdown the system, do the following

[Boot@ local host etc]//shutdown –Gn<Observe the message during shutdown>

Where n specifies the time to shutdown

Read manual page for shutdown with man command to know more options

to restart the system any time, do the following

[Root@ local host etc]//reboot