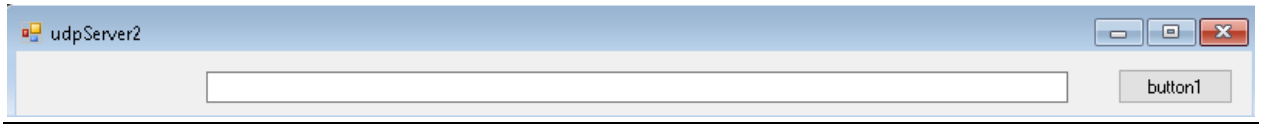
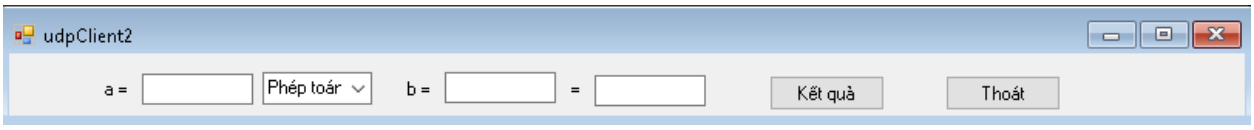


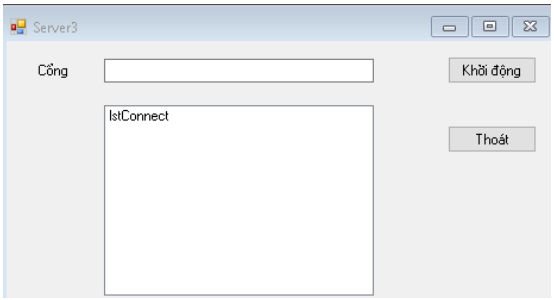

```
public partial class udpServer2 : Form
{

    Socket serverSocket;
  bool isRunning;

    public udpServer2()
    {
        InitializeComponent();
    }

    private void udpServer2_Load(object sender, EventArgs e)
    {
        Thread serverThread = new Thread(RunServer);
        serverThread.IsBackground = true;
        serverThread.Start();
    }

    private void RunServer()
    {
        isRunning = true;
        try
        {
            serverSocket = new Socket(AddressFamily.InterNetwork, SocketType.Stream, ProtocolType.Tcp);
            serverSocket.Bind(new IPEndPoint(IPAddress.Any, 8080));
            serverSocket.Listen(5);
            MessageBox.Show("Server đang chạy");

            while (isRunning) // Kiểm tra biến isRunning
            {
                if (serverSocket.Poll(1000, SelectMode.SelectRead)) // Kiểm tra có kết nối không
                    continue;

                Socket clientsSocket = serverSocket.Accept();
                Thread clientThread = new Thread(() => HandleClient(clientsSocket));
                clientThread.Start();
            }
        }
        catch (Exception ex)
        {
            if (isRunning) // Chỉ báo lỗi nếu server chưa đóng
                MessageBox.Show("Lỗi Server: " + ex.Message);
        }
    }


    private void HandleClient(Socket clientsSocket)
    {
        byte[] buffes = new byte[1024];
        int receivedBytes;
        try
```

```
        {
            while ((receivedBytes = clientsSocket.Receive(buffes)) > 0)
            {
                string s = Encoding.UTF8.GetString(buffes, 0, receivedBytes);
                if (string.IsNullOrEmpty(s)) break;
                if (s.ToUpper().Equals("QUIT")) break;

                string[] arr = s.Split('#');
                if (arr.Length != 3) continue;

                int a, b, kq = 0;
                if (!int.TryParse(arr[0], out a) || !int.TryParse(arr[2], out b)) continue;

                switch (arr[1])
                {
                    case "cộng":
                        kq = a + b;
                        break;
                    case "trừ":
                        kq = a - b;
                        break;
                    case "nhân":
                        kq = a * b;
                        break;
                    case "chia":
                        kq = (b != 0) ? (a / b) : int.MaxValue;
                        break;
                    default:
                        kq = 0;
                        break;
                }

                string response = kq.ToString(); // Gửi kết quả thay vì dữ liệu thô
                clientsSocket.Send(Encoding.UTF8.GetBytes(response));
            }
        }
        catch (Exception ex)
        {
            MessageBox.Show("Lỗi Client: " + ex.Message);
        }
        finally
        {
            clientsSocket.Close();
        }
    }

    private void button1_Click(object sender, EventArgs e)
    {
        isRunning = false; // Dừng vòng lặp trong RunServer
        serverSocket?.Close(); // Đóng socket server nếu có
        Application.Exit(); // Thoát ứng dụng
    }
}
```




```
public partial class udpForm1 : Form
{
    //1 Tạo socket client
    Socket clientSocket = new Socket(AddressFamily.InterNetwork, SocketType.Stream, ProtocolType.Tcp);
    string s;

    public udpForm1()
    {
        InitializeComponent();
    }


    private void udpForm1_Load(object sender, EventArgs e)
    {

        //2 Kết nối đến server
        try
        {
            clientSocket.Connect(new IPEndPoint(IPAddress.Parse("192.168.43.17"), 8080));
            MessageBox.Show("Kết nối thành công!");
        }
        catch (Exception ex)
        {
            MessageBox.Show("Không tìn thấy server!");
        }

    }
    private void btnkq_Click(object sender, EventArgs e)
    {
        if (lable1.Text != "" && cbbpheptoan.Text != "" && lable2.Text != "") send();
    }

    public void send()
    {
        s = txta.Text + '#' + cbbpheptoan.Text + '#' + txtb.Text;
        clientSocket.Send(Encoding.UTF8.GetBytes(s));
        byte[] buffer = new byte[1024];
        int receivedBytes = clientSocket.Receive(buffer);
        string response = Encoding.UTF8.GetString(buffer, 0, receivedBytes);
        txtkq.Text = response.ToString();
    }

    private void btnthoat_Click(object sender, EventArgs e)
    {
        try
        {
            s = "QUIT";
            clientSocket.Send(Encoding.UTF8.GetBytes(s));
            // Gửi thông báo đóng kết nối đến server (nếu cần)
            clientSocket.Shutdown(SocketShutdown.Both);
            clientSocket.Close();
```

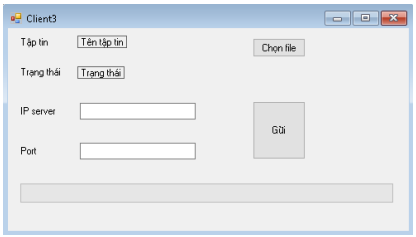
```
        }
        catch (Exception ex)
        {
            MessageBox.Show("Lỗi khi đóng kết nối: " + ex.Message, "Lỗi", MessageBoxButtons.OK,
MessageBoxIcon.Error);
        }

        // Đóng ứng dụng
        this.Close();
    }
}
```




```
public partial class Server3 : Form
{
    int BufferSize = 1024;
    private delegate void dlgAddItem(String str);
    private void AddItem(String str)
    {
        if (this.lstConnect.InvokeRequired)
        {
            this.Invoke(new dlgAddItem(AddItem), str);
        }
        else { this.lstConnect.Items.Add(str); }
    }

    public Server3()
    {
        InitializeComponent();
    }

    private void Server3_Load(object sender, EventArgs e)
    {

    }

    private void btnStart_Click(object sender, EventArgs e)
    {
```

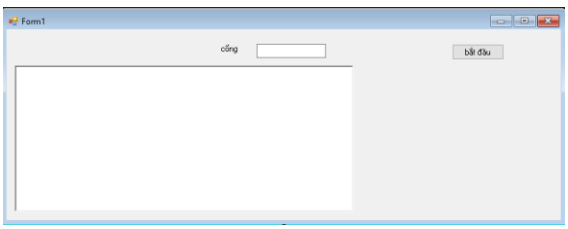
```
    Thread thdListener = new Thread(new ThreadStart(ListenerThead));
    thdListener.Start();
    AddItem("Server đã khởi động");
}

public void ListenerThead()
{
    try
    {
        ReceiveTCP(int.Parse(txtPort.Text));
    }
    catch (Exception ex)
    {
        MessageBox.Show("Lỗi đọc cổng");
    }
}

public void ReceiveTCP(int portN)
{
    TcpListener Listener = null;
    try
    {
        Listener = new TcpListener(IPAddress.Any, portN);
        Listener.Start();
        byte[] RecData = new byte[BufferSize];
        int RecBytes;
        while (true)
        {
            TcpClient client = null;
            NetworkStream networkStream = null;
            if (Listener.Pending())
            {
                client = Listener.AcceptTcpClient();
                networkStream = client.GetStream();
                AddItem("Kết nối với client");
                string SaveFileName = "Z:/TH3/Server3/test01.txt";
                int totalrecbytes = 0;
                FileStream Fs = new FileStream(SaveFileName, FileMode.OpenOrCreate, FileAccess.Write);
                while ((RecBytes = networkStream.Read(RecData, 0, RecData.Length)) > 0)
                {
                    Fs.Write(RecData, 0, RecBytes);
                    totalrecbytes += RecBytes;
                }
                Fs.Close();
                networkStream.Close();
                client.Close();
                AddItem("Đã lưu tập tin");
            }
        }
    }
    catch (Exception ex)
    {
        MessageBox.Show("Lưu file thất bại");
    }
}
```

```
    private void buttonThoat_Click(object sender, EventArgs e)
    {
        Application.Exit();
    }


}
```




```
public partial class Client3 : Form
{
    int BufferSize = 1024;
    public Client3()
    {
        InitializeComponent();
    }

    private void btnChonFile_Click(object sender, EventArgs e)
    {
        if (fdlg.ShowDialog() == DialogResult.OK)
        {
            lblFile.Text = fdlg.FileName;
        }
    }

    private void btnSend_Click(object sender, EventArgs e)
    {
        try
        {
            if (lblFile.Text != "")
                SendTCP(lblFile.Text, txtIP.Text, int.Parse(txtPort.Text.Trim()));
        }
        catch (Exception ex)
        {
            MessageBox.Show(ex.ToString());
        }

    }

    public void SendTCP(string M, string IPA, Int32 PortN)
    {
        byte[] SendingBuffer = null;
        TcpClient client = null;
        NetworkStream netstream = null;
        try
        {
            client = new TcpClient(IPA, PortN);
```

```
            MessageBox.Show("Kết đến server thành công");
            lblState.Text = "Kết nối server...\n";
            netstream = client.GetStream();
            FileStream Fs = new FileStream(M, FileMode.Open, FileAccess.Read);
            int NoOfPackets = Convert.ToInt32(Math.Ceiling(Convert.ToDouble(Fs.Length) /
Convert.ToDouble(BufferSize)));
            progressBar1.Maximum = NoOfPackets;
            int TotalLength = (int)Fs.Length, CurrentPacketLength;
            for (int i = 0; i < NoOfPackets; i++)
            {
               if (TotalLength > BufferSize)
               {
                  CurrentPacketLength = BufferSize;
                  TotalLength = TotalLength - CurrentPacketLength;
               }
               else CurrentPacketLength = TotalLength;

               SendingBuffer = new byte[CurrentPacketLength];
               Fs.Read(SendingBuffer, 0, CurrentPacketLength);
               netstream.Write(SendingBuffer, 0, (int)SendingBuffer.Length);
               if (progressBar1.Value >= progressBar1.Maximum)
                  progressBar1.Value = progressBar1.Minimum;
               progressBar1.PerformStep();
            }
            lblState.Text = lblState.Text + " Đã gửi " + Fs.Length.ToString() + " bytes đến Server";
            Fs.Close();
         }
         catch (Exception ex)
         {
            MessageBox.Show(ex.ToString());
         }
         finally
         {
            netstream.Close(); client.Close();
         }
      }


   }
```

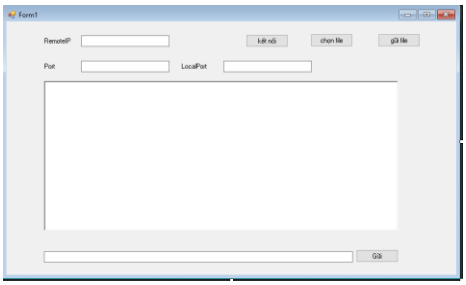



```
   public partial class Form1 : Form
   {
      TcpListener listener = null;
      NetworkStream netStream = null;
```

```
TcpClient client = null;
Thread listenThread = null;
Thread receiveThread = null;

const int BUFFER_SIZE = 8192;

public Form1()
{
   InitializeComponent();
}

private void Form1_Load(object sender, EventArgs e)
{
   CheckForIllegalCrossThreadCalls = false;
   this.FormClosed += (s, ev) => StopServer();
}
private void btnStart_Click(object sender, EventArgs e)
{
   int port = int.Parse(txtPort.Text.Trim());
   listener = new TcpListener(IPAddress.Any, port);
   listener.Start();

   listenThread = new Thread(() =>
   {
      AppendLog($"□ Đang chờ client kết nối trên port {port}...");
      client = listener.AcceptTcpClient(); // Block đến khi có client
      netStream = client.GetStream();
      AppendLog("✓✓ Client đã kết nối!");

      receiveThread = new Thread(ReceiveData);
      receiveThread.Start();
   });
   listenThread.Start();
}
private void ReceiveData()
{
   try
   {
      byte[] buffer = new byte[BUFFER_SIZE];
      MemoryStream ms = null;
      string fileName = "";
      bool isReceivingFile = false;

      while (true)
      {
         int bytesRead = netStream.Read(buffer, 0, buffer.Length);
         if (bytesRead == 0) break;

         // Nếu đang không ở chế độ nhận file, ta kiểm tra header
         if (!isReceivingFile)
         {
            string header = Encoding.UTF8.GetString(buffer, 0, bytesRead);

            if (header.StartsWith("<FILE>:"))
            {
               fileName = header.Substring(7).Trim();
```

```
                ms = new MemoryStream();
                isReceivingFile = true;
                AppendLog($"📥 Bắt đầu nhận file: {fileName}");
                continue;
            }

            if (header == "<EOF>")
            {
                // Đề phòng nếu nhận EOF mà chưa có dữ liệu
                continue;
            }

            // Nếu không phải là file, xem là tin nhắn
            string msg = Encoding.UTF8.GetString(buffer, 0, bytesRead);
            AppendLog("💬 Client: " + msg);
        }
        else
        {
            // Kiểm tra nếu buffer chứa EOF
            string maybeEOF = Encoding.UTF8.GetString(buffer, 0, bytesRead);
            if (maybeEOF.Contains("<EOF>"))
            {
                // Cắt bỏ phần "<EOF>" nếu có
                int eofIndex = maybeEOF.IndexOf("<EOF>");
                if (eofIndex > 0)
                    ms.Write(buffer, 0, eofIndex);

                // Lưu file
                string saveDir = @"C:\ReceivedFiles";
                Directory.CreateDirectory(saveDir);
                string savePath = Path.Combine(saveDir, fileName);
                File.WriteAllBytes(savePath, ms.ToArray());

                ms.Close();
                ms = null;
                isReceivingFile = false;

                AppendLog($"✅ Đã lưu file: {fileName}");
            }
            else
            {
                // Ghi dữ liệu nhị phân vào MemoryStream
                ms.Write(buffer, 0, bytesRead);
            }
        }
    }
    catch (Exception ex)
    {
        AppendLog("❌ Lỗi nhận dữ liệu: " + ex.Message);
    }
}

private void AppendLog(string text)
{
```

```
            rtxLog.AppendText(text + "\r\n");
        }

        private void StopServer()
        {
            try
            {
                receiveThread?.Abort();
                listenThread?.Abort();
                netStream?.Close();
                client?.Close();
                listener?.Stop();
            }
            catch { }
        }

    }
```

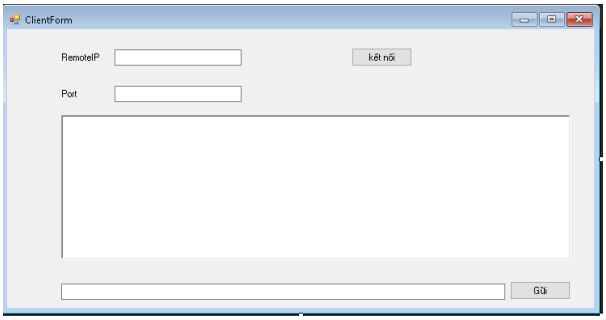



```
    public partial class Form1: Form
    {
        TcpClient tcpClient = null;
        NetworkStream netStream = null;
        Thread receiveThread = null;
        const int BUFFER_SIZE = 8192;

        string filePath = "", fileName = "";

        public Form1()
        {
            InitializeComponent();
        }

        private void Form1_Load(object sender, EventArgs e)
        {
            CheckForIllegalCrossThreadCalls = false;
            this.FormClosed += new FormClosedEventHandler(closeForm);
        }

        private void closeForm(object sender, EventArgs e)
        {
            try
            {
                receiveThread?.Abort();
                netStream?.Close();
```

```
            tcpClient?.Close();
        }
        catch { }
    }

    private void openinput(bool state)
    {
        btnGui.Enabled = !state;
        btnSendFile.Enabled = !state;
        btnBrowseFile.Enabled = !state;
        txtIPR.ReadOnly = !state;
        txtPortL.ReadOnly = !state;
        txtPortR.ReadOnly = !state;
        btntKN.Enabled = state;
    }

    private void btntKN_Click(object sender, EventArgs e)
    {
        try
        {
            string ip = txtIPR.Text.Trim();
            int port = int.Parse(txtPortR.Text.Trim());

            tcpClient = new TcpClient();
            tcpClient.Connect(ip, port);
            netStream = tcpClient.GetStream();

            openinput(false);

            receiveThread = new Thread(new ThreadStart(ReceiveData));
            receiveThread.Start();
        }
        catch (Exception ex)
        {
            MessageBox.Show("Lỗi kết nối: " + ex.Message);
        }
    }

    private void btnGui_Click(object sender, EventArgs e)
    {
        try
        {
            string message = txtMsg.Text;
            byte[] data = Encoding.UTF8.GetBytes(message);
            netStream.Write(data, 0, data.Length);
            rtxMsg.AppendText("Send: " + message + "\r\n");
        }
        catch (Exception ex)
        {
            MessageBox.Show("Lỗi gửi tin nhắn: " + ex.Message);
        }
    }

    private void ReceiveData()
    {
        try
```

```
    {
        byte[] buffer = new byte[BUFFER_SIZE];
        MemoryStream ms = null;
        string receivedFileName = "";

        while (true)
        {
            int bytesRead = netStream.Read(buffer, 0, buffer.Length);
            if (bytesRead == 0) break; // Ngắt kết nối

            string header = Encoding.UTF8.GetString(buffer, 0, bytesRead);

            if (header.StartsWith("<FILE>:"))
            {
                receivedFileName = header.Substring(7);
                ms = new MemoryStream();
                continue;
            }

            if (header == "<EOF>")
            {
                string saveDir = @"C:\ReceivedFiles";
                Directory.CreateDirectory(saveDir);
                string savePath = Path.Combine(saveDir, receivedFileName);
                File.WriteAllBytes(savePath, ms.ToArray());
                rtxMsg.AppendText($"[Đã nhận file: {receivedFileName}]\r\n");
                ms.Close();
                ms = null;
                continue;
            }

            if (ms != null)
            {
                ms.Write(buffer, 0, bytesRead);
            }
            else
            {
                string text = Encoding.UTF8.GetString(buffer, 0, bytesRead);
                rtxMsg.AppendText("Receive: " + text + "\r\n");
            }
        }
    }
    catch (Exception ex)
    {
        MessageBox.Show("Lỗi nhận dữ liệu: " + ex.Message);
    }
}

private void btnBrowseFile_Click(object sender, EventArgs e)
{
    OpenFileDialog ofd = new OpenFileDialog();
    if (ofd.ShowDialog() == DialogResult.OK)
    {
        filePath = ofd.FileName;
        fileName = Path.GetFileName(filePath);
        txtMsg.Text = fileName;
```

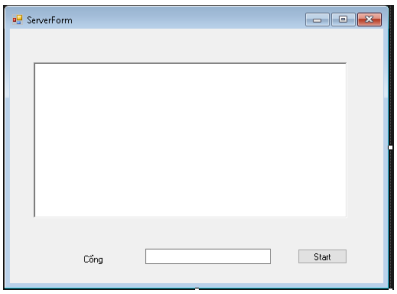
```
        }
    }
    private void btnSendFile_Click(object sender, EventArgs e)
    {
        try
        {
            if (string.IsNullOrEmpty(filePath)) return;

            // Gửi tên file
            string header = "<FILE>:" + fileName;
            byte[] headerBytes = Encoding.UTF8.GetBytes(header);
            netStream.Write(headerBytes, 0, headerBytes.Length);
            Thread.Sleep(10);

            // Gửi nội dung file
            using (FileStream fs = new FileStream(filePath, FileMode.Open, FileAccess.Read))
            {
                byte[] buffer = new byte[BUFFER_SIZE];
                int bytesRead;
                while ((bytesRead = fs.Read(buffer, 0, buffer.Length)) > 0)
                {
                    netStream.Write(buffer, 0, bytesRead);
                    Thread.Sleep(1); // tránh nghẽn buffer
                }
            }

            // Gửi EOF
            byte[] eof = Encoding.UTF8.GetBytes("<EOF>");
            netStream.Write(eof, 0, eof.Length);
            rtxMsg.AppendText($"[Đã gửi file: {fileName}]\r\n");
        }
        catch (Exception ex)
        {
            MessageBox.Show("Lỗi gửi file: " + ex.Message);
        }
    }
}
```




```
public partial class ClientForm : Form
{
```

```
private TcpClient client;
private NetworkStream stream;
public ClientForm()
{
    InitializeComponent();
}

private void btnConnect_Click(object sender, EventArgs e)
{
    string ip = txtServerIP.Text.Trim();
    int port = int.Parse(txtPort.Text.Trim());

    try
    {
        client = new TcpClient();
        client.Connect(ip, port);
        stream = client.GetStream();
        txtChat.AppendText("Đã kết nối đến server!\r\n");

        Thread receiveThread = new Thread(ReceiveData);
        receiveThread.IsBackground = true;
        receiveThread.Start();
    }
    catch (Exception ex)
    {
        MessageBox.Show("Kết nối thất bại: " + ex.Message);
    }

}

private void btnSend_Click(object sender, EventArgs e)
{
    if (stream != null && client.Connected)
    {
        byte[] data = Encoding.UTF8.GetBytes(txtMessage.Text);
        stream.Write(data, 0, data.Length);
        txtChat.AppendText("Bạn: " + txtMessage.Text + "\r\n");
        txtMessage.Clear();
    }
}

private void ClientForm_Load(object sender, EventArgs e)
{

}

private void ReceiveData()
{
    byte[] buffer = new byte[1024];
    int bytesRead;

    while (client.Connected)
    {
        try
        {
            bytesRead = stream.Read(buffer, 0, buffer.Length);
```

```
                string msg = Encoding.UTF8.GetString(buffer, 0, bytesRead);
                txtChat.Invoke(new Action(() =>
                {
                    txtChat.AppendText("Server: " + msg + "\r\n");
                }));
            }
            catch
            {
                break;
            }
        }
    }
}
```




```
public partial class ServerForm : Form
{
    private TcpListener listener;
    private TcpClient client;
    private NetworkStream stream;
    public ServerForm()
    {
        InitializeComponent();
    }

    private void btnStart_Click(object sender, EventArgs e)
    {

        int port = int.Parse(txtPort.Text);
        listener = new TcpListener(IPAddress.Any, port);
        listener.Start();
        txtLog.AppendText("Server đang lắng nghe trên cổng " + port + "\r\n");

        Thread acceptThread = new Thread(() =>
        {
            client = listener.AcceptTcpClient();
            stream = client.GetStream();
            txtLog.Invoke(new Action(() =>
            {
                txtLog.AppendText("Client đã kết nối!\r\n");
            }));
            ReceiveData();
        });
        acceptThread.IsBackground = true;
```

```
            acceptThread.Start();
        }

        private void ReceiveData()
        {
            byte[] buffer = new byte[1024];
            int bytesRead;

            while (client.Connected)
            {
                try
                {
                    bytesRead = stream.Read(buffer, 0, buffer.Length);
                    string msg = Encoding.UTF8.GetString(buffer, 0, bytesRead);
                    txtLog.Invoke(new Action(() =>
                    {
                        txtLog.AppendText("Client: " + msg + "\r\n");
                    }));
                }
                catch
                {
                    break;
                }
            }
        }
    }
```

📌 3.1. Server-side TCP

```
csharp
CopyEdit
// 1. Khai báo listener
TcpListener listener = new TcpListener(IPAddress.Any, 1234);
listener.Start();

// 2. Chấp nhận kết nối từ client
TcpClient client = listener.AcceptTcpClient(); // blocking
NetworkStream stream = client.GetStream();

// 3. Đọc/Gửi dữ liệu
byte[] buffer = new byte[1024];
int bytesRead = stream.Read(buffer, 0, buffer.Length); // nhận
stream.Write(buffer, 0, bytesRead); // gửi lại

// 4. Đóng
stream.Close();
client.Close();
listener.Stop();
```

📌 3.2. Client-side TCP

```
csharp
CopyEdit
// 1. Kết nối đến server
```

```
TcpClient client = new TcpClient();
client.Connect("127.0.0.1", 1234); // IP, Port

// 2. Gửi/nhận dữ liệu
NetworkStream stream = client.GetStream();
byte[] data = Encoding.UTF8.GetBytes("Hello Server");
stream.Write(data, 0, data.Length); // gửi

byte[] buffer = new byte[1024];
int bytesRead = stream.Read(buffer, 0, buffer.Length); // nhận
string response = Encoding.UTF8.GetString(buffer, 0, bytesRead);

// 3. Đóng
stream.Close();
client.Close();
```

Mã C# – Server nhận file và lưu

```
public partial class ServerForm : Form
{
   TcpListener listener;

   public ServerForm()
   {
      InitializeComponent();
   }

   private void btnStart_Click(object sender, EventArgs e)
   {
      Thread serverThread = new Thread(StartServer);
      serverThread.IsBackground = true;
      serverThread.Start();
   }

   void StartServer()
   {
      listener = new TcpListener(IPAddress.Any, 9000);
      listener.Start();
      AppendLog("Server đã khởi động...");

      while (true)
      {
         TcpClient client = listener.AcceptTcpClient();
         Thread t = new Thread(() => ReceiveFile(client));
         t.IsBackground = true;
         t.Start();
      }
   }
```

```
    void ReceiveFile(TcpClient client)
    {
        NetworkStream ns = client.GetStream();
        BinaryReader reader = new BinaryReader(ns);

        try
        {
            string fileName = reader.ReadString();         // Đọc tên file
            long fileLength = reader.ReadInt64();          // Đọc kích thước file

            string savePath = Path.Combine(Application.StartupPath, "Received_" + fileName);
            using (FileStream fs = new FileStream(savePath, FileMode.Create, FileAccess.Write))
            {
                byte[] buffer = new byte[1024];
                long totalBytesRead = 0;

                while (totalBytesRead < fileLength)
                {
                    int bytesRead = ns.Read(buffer, 0, buffer.Length);
                    fs.Write(buffer, 0, bytesRead);
                    totalBytesRead += bytesRead;
                }
            }

            AppendLog("Đã nhận file: " + fileName);
        }
        catch (Exception ex)
        {
            AppendLog("Lỗi: " + ex.Message);
        }

        ns.Close();
        client.Close();
    }

    void AppendLog(string msg)
    {
        if (txtLog.InvokeRequired)
        {
            txtLog.Invoke(new Action(() => txtLog.AppendText(msg + Environment.NewLine)));
        }
        else
        {
            txtLog.AppendText(msg + Environment.NewLine);
        }
    }
}
```

✅ 4. Mã C# – Client gửi file

```
csharp
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using System;
using System.IO;
using System.Net.Sockets;
```
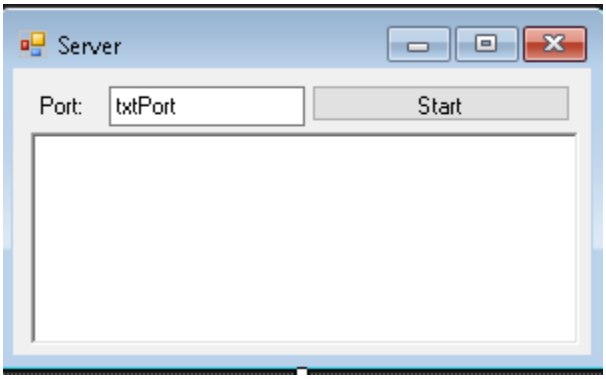

```
using System.Windows.Forms;

public partial class ClientForm : Form
{
    public ClientForm()
    {
        InitializeComponent();
    }

    private void btnSend_Click(object sender, EventArgs e)
    {
        if (openFileDialog1.ShowDialog() == DialogResult.OK)
        {
            string filePath = openFileDialog1.FileName;
            Thread sendThread = new Thread(() => SendFile(filePath));
            sendThread.IsBackground = true;
            sendThread.Start();
        }
    }

    void SendFile(string filePath)
    {
        try
        {
            TcpClient client = new TcpClient("127.0.0.1", 9000);
            NetworkStream ns = client.GetStream();
            BinaryWriter writer = new BinaryWriter(ns);

            FileInfo fi = new FileInfo(filePath);
            writer.Write(fi.Name);         // Gửi tên file
            writer.Write(fi.Length);       // Gửi kích thước

            byte[] buffer = new byte[1024];
            using (FileStream fs = fi.OpenRead())
            {
                int bytesRead;
                while ((bytesRead = fs.Read(buffer, 0, buffer.Length)) > 0)
                {
                    ns.Write(buffer, 0, bytesRead);
                }
            }

            AppendLog("Đã gửi file: " + fi.Name);
            ns.Close();
            client.Close();
        }
        catch (Exception ex)
        {
            AppendLog("Lỗi: " + ex.Message);
        }
    }

    void AppendLog(string msg)
    {
        if (txtLog.InvokeRequired)
        {
```

```
            txtLog.Invoke(new Action(() => txtLog.AppendText(msg + Environment.NewLine)));
        }
        else
        {
            txtLog.AppendText(msg + Environment.NewLine);
        }
    }
}
```

- .

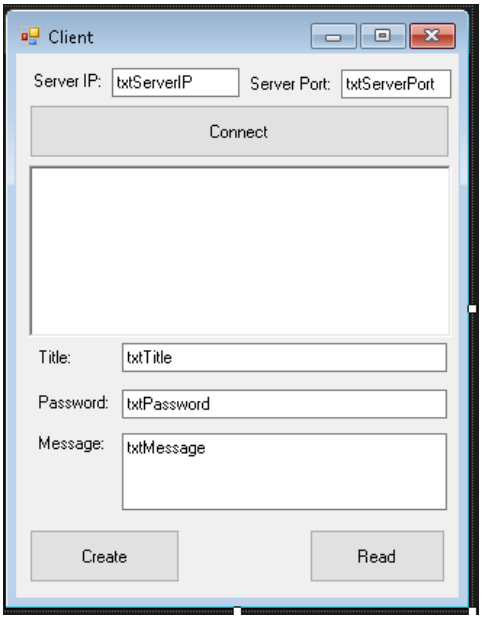
```
// TCP Server dùng đa luồng

TcpListener server = new TcpListener(IPAddress.Any, 5000);
server.Start();
Console.WriteLine("Server started...");

while (true)
{
    TcpClient client = server.AcceptTcpClient();
    Console.WriteLine("New client connected.");

    // Tạo luồng mới để xử lý client này
    Thread clientThread = new Thread(() => HandleClient(client));
    clientThread.Start();
}

void HandleClient(TcpClient client)
{
    NetworkStream stream = client.GetStream();
    StreamReader reader = new StreamReader(stream);
    StreamWriter writer = new StreamWriter(stream) { AutoFlush = true };

    try
    {
        while (true)
        {
            string msg = reader.ReadLine();
            if (msg == null) break;

            Console.WriteLine("Client said: " + msg);
            writer.WriteLine("Server received: " + msg);
        }
    }
    catch (Exception ex)
    {
        Console.WriteLine("Error: " + ex.Message);
    }
    finally
    {
        client.Close();
    }
}
```




```
    public partial class Server : Form
    {
        TcpListener Listener;
        int portN;
        String rootDir="F:/";
        public Server()
        {
            InitializeComponent();
        }
        private delegate void dlgAddInfo(string str);
        private void AddInfo(string str)
        {
            if (this.rtxInfo.InvokeRequired)
            { this.Invoke(new dlgAddInfo(AddInfo), str); }
            else
            { this.rtxInfo.AppendText(str+"\n\r"); }
        }
        private void CreJob(String[] request, StreamWriter sw)
        { //acc key pass message
            String s = "100. Tin nhan luu thanh cong";
            string fileName = rootDir +request[1]+"_"+ request[2] + ".txt";
            try
            {
                File.WriteAllText(fileName, request[3]);
            }
            catch(Exception ex)
            {
                s = "203. Khong the luu tin nhan.";
            }
            sw.WriteLine(s);
            sw.Flush();
        }
        private void ReaJob(String[] request, StreamWriter sw)
        {
            string[] files = Directory.GetFiles(rootDir);
            String s = "205. Tin nhan khong ton tai.";
            foreach (string file in files)
            {
                if (Path.GetFileName(file).StartsWith(request[1]))
                    {
                    s = "204. Sai mat khau.";
                    string fileName = rootDir + request[1] + "_" + request[2] +
".txt";
                    if (File.Exists(fileName))
                    {
                        String[] lines = File.ReadAllLines(fileName);
```

```
                s = String.Join(" ", lines);
                break;
            }
        }
    }
    sw.WriteLine(s);
    sw.Flush();
}
private void UndefinedCommand(String[] request, StreamWriter sw)
{
    String s = "Lỗi. Lệnh không tồn tại:"+ request[0];
    byte[] data = new byte[s.Length];
    sw.Write(s, 0, s.Length);
    sw.Flush();
}
private void ThreadProc(object obj)
{
    try {
    var client = (TcpClient)obj;
    StreamReader sr = new StreamReader(client.GetStream());
    StreamWriter sw = new StreamWriter(client.GetStream());
    sw.WriteLine("Chao mung ket noi toi SecretBox");
    sw.Flush();
    while (true)
    {
        string raw = sr.ReadLine();
        string[] request = raw.Split('#');
        AddInfo("Client Command:"+raw);
        string command = "";
        if (request.Length != 0)
            command = request[0];
        switch (command.ToUpper().Trim())
        {
            case "CRE"://tạo tin nhắn
                {
                    CreJob(request, sw);
                    break;
                }
            case "REA"://đọc tin tin
                {
                    ReaJob(request, sw);
                    break;
                }
            default:
                {
                    UndefinedCommand(request, sw);
                    break;
                }
        }
    }
}
    catch (Exception ex)
    {
        MessageBox.Show(ex.ToString());
    }
}
public void ListenerThread()
{
```

```
            Listener = null;
            try
            {
                Listener = new TcpListener(IPAddress.Any, portN);
                Listener.Start();
                while (true)
                {
                    TcpClient client = null;
                    NetworkStream netstream = null;
                    if (Listener.Pending())
                    {
                        client = Listener.AcceptTcpClient();
                        netstream = client.GetStream();
                        AddInfo("Kết nối với Client.");
                        ThreadPool.QueueUserWorkItem(ThreadProc, client);
                       // netstream.Close();
                       // client.Close();
                    }
                }
            }
            catch (Exception ex)
            {
                MessageBox.Show(ex.ToString());
            }
        }
        private void btnStart_Click(object sender, EventArgs e)
        {
            Thread thdListener = new Thread(new ThreadStart(ListenerThread));
            portN = int.Parse(txtPort.Text);
            thdListener.Start();
            thdListener.IsBackground=true;
            AddInfo("Server đã khởi động");

        }
    }
```



```
    public partial class Client : Form
    {
        IPEndPoint iep;
        TcpClient client;
        StreamReader sr;
        StreamWriter sw;
        public Client()
        {
            try
            {
                InitializeComponent();

            }
            catch (Exception ex)
            {
                MessageBox.Show(ex.ToString());
            }
        }
        private void AddInfo(String cnt)
        {
            rtxInfo.AppendText(cnt + "\n\r");
        }
        private void btnConnect_Click(object sender, EventArgs e)
        {
            iep = new IPEndPoint(IPAddress.Parse(txtServerIP.Text),
int.Parse(txtServerPort.Text));
            client = new TcpClient();
            client.Connect(iep);
            sr = new StreamReader(client.GetStream());
            sw = new StreamWriter(client.GetStream());
            AddInfo(sr.ReadLine());
        }
        private void btnGet_Click(object sender, EventArgs e)
        {
            sw.WriteLine("REA#" + txtTitle.Text + "#" + txtPassword.Text);
            sw.Flush();
            AddInfo(sr.ReadLine());
        }
        private void btnSend_Click(object sender, EventArgs e)
        {
            sw.WriteLine("CRE#" + txtTitle.Text+"#" + txtPassword.Text +
"#"+txtMessage.Text);
            sw.Flush();
            AddInfo(sr.ReadLine());
        }
    }
```