

Packet Sniffer w C#

main.cs

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Text;
using System.Windows.Forms;
using System.Net.Sockets;
using System.Net;

namespace MJsniffer
{
    public enum Protocol
    {
        TCP = 6,
        UDP = 17,
        Unknown = -1
    };

    public partial class MJsnifferForm : Form
    {
        private Socket mainSocket; // Socket który przechwytuje
        // wszystkie pakiety
        private byte[] byteData = new byte[4096];
        private bool bContinueCapturing = false; // flaga która
        // sprawdza czy pakiety zostały złapane poprawnie
        private delegate void AddTreeNode(TreeNode node);

        public MJsnifferForm()
        {
            InitializeComponent();
        }

        private void btnStart_Click(object sender, EventArgs e)
        {
            if (cmbInterfaces.Text == "")
            {
                MessageBox.Show("Select an Interface to capture the
                packets.", "Sniffer",
                MessageBoxButtons.OK, MessageBoxIcon.Error);
                return;
            }

            try
            {

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```
        if (!bContinueCapturing)
        {
            btnStart.Text = "&Stop";
            bContinueCapturing = true;

            mainSocket = new Socket(AddressFamily.InterNetwork,
SocketType.Raw, ProtocolType.IP);
            mainSocket.Bind(new
IPEndPoint(IPAddress.Parse(cmbInterfaces.Text), 0));

            mainSocket.SetSocketOption(SocketOptionLevel.IP,
SocketOptionName.HeaderIncluded, true);

            byte[] byTrue = new byte[4] { 1, 0, 0, 0 };
            byte[] byOut = new byte[4] { 1, 0, 0, 0 };

            mainSocket.IOControl(IOControlCode.ReceiveAll,
byTrue, byOut);

            mainSocket.BeginReceive(byteData, 0,
byteData.Length, SocketFlags.None,
                new AsyncCallback(OnReceive), null);
        }
        else
        {
            btnStart.Text = "&Start";
            bContinueCapturing = false;
            mainSocket.Close();
        }
    }
    catch (Exception ex)
    {
        MessageBox.Show(ex.Message, "Sniffer",
MessageBoxButtons.OK, MessageBoxIcon.Error);
    }
}

private void OnReceive(IAsyncResult ar)
{
    try
    {
        int nReceived = mainSocket.EndReceive(ar);
        ParseData(byteData, nReceived);

        if (bContinueCapturing)
        {
            byteData = new byte[4096];
            mainSocket.BeginReceive(byteData, 0,
byteData.Length, SocketFlags.None,
                new AsyncCallback(OnReceive), null);
        }
    }
}
```

```
    }  
    catch (ObjectDisposedException) { }  
    catch (Exception ex)  
    {  
        MessageBox.Show(ex.Message, "Sniffer",  
        MessageBoxButtons.OK, MessageBoxIcon.Error);  
    }  
}  
  
private void ParseData(byte[] byteData, int nReceived)  
{  
    TreeNode rootNode = new TreeNode();  
    IPHeader ipHeader = new IPHeader(byteData, nReceived);  
    TreeNode ipNode = MakeIPTreeNode(ipHeader);  
    rootNode.Nodes.Add(ipNode);  
  
    switch (ipHeader.ProtocolType)  
    {  
        case Protocol.TCP:  
            TCPHeader tcpHeader = new TCPHeader(ipHeader.Data,  
            ipHeader.MessageLength);  
            TreeNode tcpNode = MakeTCPTreeNode(tcpHeader);  
            rootNode.Nodes.Add(tcpNode);  
  
            if (tcpHeader.DestinationPort == "53" ||  
            tcpHeader.SourcePort == "53")  
            {  
                TreeNode dnsNode =  
                MakeDNSTreeNode(tcpHeader.Data, (int)tcpHeader.MessageLength);  
                rootNode.Nodes.Add(dnsNode);  
            }  
            break;  
  
        case Protocol.UDP:  
            UDPHeader udpHeader = new UDPHeader(ipHeader.Data,  
            (int)ipHeader.MessageLength);  
            TreeNode udpNode = MakeUDPTreeNode(udpHeader);  
            rootNode.Nodes.Add(udpNode);  
  
            if (udpHeader.DestinationPort == "53" ||  
            udpHeader.SourcePort == "53")  
            {  
                TreeNode dnsNode =  
                MakeDNSTreeNode(udpHeader.Data,  
                Convert.ToInt32(udpHeader.Length) - 8);  
                rootNode.Nodes.Add(dnsNode);  
            }  
            break;  
  
        case Protocol.Unknown:  
            break;  
    }  
}
```

```
    }

    AddTreeNode addTreeNode = new AddTreeNode(OnAddTreeNode);
    rootNode.Text = ipHeader.SourceAddress.ToString() + " - " +
ipHeader.DestinationAddress.ToString();
    treeView.Invoke(addTreeNode, new object[] { rootNode });
}

private TreeNode MakeIPTreeNode(IPHeader ipHeader)
{
    TreeNode ipNode = new TreeNode("IP");
    ipNode.Nodes.Add("Ver: " + ipHeader.Version);
    ipNode.Nodes.Add("Header Length: " +
ipHeader.HeaderLength);
    ipNode.Nodes.Add("Differentiated Services: " +
ipHeader.DifferentiatedServices);
    ipNode.Nodes.Add("Total Length: " + ipHeader.TotalLength);
    ipNode.Nodes.Add("Identification: " +
ipHeader.Identification);
    ipNode.Nodes.Add("Flags: " + ipHeader.Flags);
    ipNode.Nodes.Add("Fragmentation Offset: " +
ipHeader.FragmentationOffset);
    ipNode.Nodes.Add("Time to live: " + ipHeader.TTL);

    string protocolStr = ipHeader.ProtocolType switch
    {
        Protocol.TCP => "TCP",
        Protocol.UDP => "UDP",
        _ => "Unknown"
    };
    ipNode.Nodes.Add("Protocol: " + protocolStr);

    ipNode.Nodes.Add("Checksum: " + ipHeader.Checksum);
    ipNode.Nodes.Add("Source: " +
ipHeader.SourceAddress.ToString());
    ipNode.Nodes.Add("Destination: " +
ipHeader.DestinationAddress.ToString());

    return ipNode;
}

private TreeNode MakeTCPTreeNode(TCPHeader tcpHeader)
{
    TreeNode tcpNode = new TreeNode("TCP");
    tcpNode.Nodes.Add("Source Port: " + tcpHeader.SourcePort);
    tcpNode.Nodes.Add("Destination Port: " +
tcpHeader.DestinationPort);
    tcpNode.Nodes.Add("Sequence Number: " +
tcpHeader.SequenceNumber);

    if (!string.IsNullOrEmpty(tcpHeader.AcknowledgementNumber))
```

```
        tcpNode.Nodes.Add("Acknowledgement Number: " +
tcpHeader.AcknowledgementNumber);

        tcpNode.Nodes.Add("Header Length: " +
tcpHeader.HeaderLength);
        tcpNode.Nodes.Add("Flags: " + tcpHeader.Flags);
        tcpNode.Nodes.Add("Window Size: " + tcpHeader.WindowSize);
        tcpNode.Nodes.Add("Checksum: " + tcpHeader.Checksum);

        if (!string.IsNullOrEmpty(tcpHeader.UrgentPointer))
            tcpNode.Nodes.Add("Urgent Pointer: " +
tcpHeader.UrgentPointer);

        return tcpNode;
    }

    private TreeNode MakeUDPTreeNode(UDPHeader udpHeader)
    {
        TreeNode udpNode = new TreeNode("UDP");
        udpNode.Nodes.Add("Source Port: " + udpHeader.SourcePort);
        udpNode.Nodes.Add("Destination Port: " +
udpHeader.DestinationPort);
        udpNode.Nodes.Add("Length: " + udpHeader.Length);
        udpNode.Nodes.Add("Checksum: " + udpHeader.Checksum);
        return udpNode;
    }

    private TreeNode MakeDNSTreeNode(byte[] byteData, int nLength)
    {
        DNSHeader dnsHeader = new DNSHeader(byteData, nLength);
        TreeNode dnsNode = new TreeNode("DNS");
        dnsNode.Nodes.Add("Identification: " +
dnsHeader.Identification);
        dnsNode.Nodes.Add("Flags: " + dnsHeader.Flags);
        dnsNode.Nodes.Add("Questions: " +
dnsHeader.TotalQuestions);
        dnsNode.Nodes.Add("Answer RRs: " +
dnsHeader.TotalAnswerRRs);
        dnsNode.Nodes.Add("Authority RRs: " +
dnsHeader.TotalAuthorityRRs);
        dnsNode.Nodes.Add("Additional RRs: " +
dnsHeader.TotalAdditionalRRs);
        return dnsNode;
    }

    private void OnAddTreeNode(TreeNode node)
    {
        treeView.Nodes.Add(node);
    }

    private void SnifferForm_Load(object sender, EventArgs e)
```

```
{  
    string strIP = null;  
    IPEndPoint hostEntry =  
Dns.GetHostEntry(Dns.GetHostName());  
  
    if (hostEntry.AddressList.Length > 0)  
    {  
        foreach (IPAddress ip in hostEntry.AddressList)  
        {  
            strIP = ip.ToString();  
            cmbInterfaces.Items.Add(strIP);  
        }  
    }  
}  
  
private void SnifferForm_FormClosing(object sender,  
FormClosingEventArgs e)  
{  
    if (bContinueCapturing)  
    {  
        mainSocket.Close();  
    }  
}  
  
private void treeView_AfterSelect(object sender,  
TreeViewEventArgs e) { }  
  
private void label1_Click(object sender, EventArgs e) { }  
}
```

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