using System;

using System.Collections.Generic;

using System.IO;

using System.Threading.Tasks;

using System.Xml.Linq;

using System.Xml.XPath;

namespace SSE

{

public class **AddServiceClient**

{

private readonly string \_serviceLocation;

public AddServiceClient(string serviceLcoation)

{

\_serviceLocation = serviceLcoation;

}

/// <summary>

/// Sends a SOAP request via HTTP to a Web service endpoint.

/// </summary>

public async Task<int> Add(int a, int b)

{

// prepare request

XNamespace ws = "http://vsr.informatik.tu-chemnitz.de/edu/2008/pvs/soapwebservice";

XElement request = new XElement(ws + "Add",

new XElement(ws + "a", a),

new XElement(ws + "b", b));

// build soap message

string content =

"<?xml version=\"1.0\" encoding=\"utf-8\"?>" +

"<soap12:Envelope xmlns:xsi=\"http://www.w3.org/2001/XMLSchema-instance\" xmlns:xsd=\"http://www.w3.org/2001/XMLSchema\" xmlns:soap12=\"http://www.w3.org/2003/05/soap-envelope\">" +

"<soap12:Body>" +

request +

"</soap12:Body></soap12:Envelope>";

// send over HTTP

Dictionary<string, string> para = new Dictionary<string, string>();

para["content-type"] = "application/soap+xml; charset=utf-8";

HttpMessage answer = await HttpRequest.Post(\_serviceLocation, content, para);

// parse body content of resulting XML

var doc = new XPathDocument(new StringReader(answer.Content));

var navigator = doc.CreateNavigator();

return Int32.Parse(navigator.SelectSingleNode("//\*[1]/\*[1]/\*[1]/\*[1]").Value);

}

}

}

using System;

using System.Collections.Generic;

using System.Linq;

namespace SSE

{

public class **HttpMessage**

{

public const string GET = "GET";

public const string POST = "POST";

public const string PUT = "PUT";

public const string DELETE = "DELETE";

public const string HEAD = "HEAD";

public const string OPTIONS = "OPTIONS";

public const string TRACE = "TRACE";

public string Method = "";

public string Host = "";

public string Resource = "";

public Dictionary<string, string> Headers = new Dictionary<string, string>();

public string Content = "";

public string StatusCode = "";

public string StatusMessage = "";

/// <summary>

/// Construct an HTTP request.

/// </summary>

public HttpMessage(string method, string host, string resource, Dictionary<string, string> headers, string content)

{

this.Method = method;

this.Host = host;

this.Resource = resource;

this.Headers = headers;

if (Headers == null)

Headers = new Dictionary<string, string>();

this.Content = content;

StatusCode = null;

StatusMessage = null;

}

/// <summary>

/// Construct an HTTP response.

/// </summary>

public HttpMessage(string statusCode, string statusMessage, Dictionary<string, string> headers, string content)

{

this.Method = null;

this.Host = null;

this.Resource = null;

this.Headers = headers;

if (Headers == null)

Headers = new Dictionary<string, string>();

this.Content = content;

StatusCode = statusCode;

StatusMessage = statusMessage;

}

/// <summary>

/// Constructs an HTTP message by parsing a (received) string.

/// </summary>

/// <param name="message"></param>

public HttpMessage(string message)

{

// loop through lines in message

var lines = message.Split(new string[] { "\r\n", "\n" }, StringSplitOptions.None);

var firstLine = lines.First();

// parse first line

var parts = firstLine.Split(' ');

if (parts.Count() != 3)

{

throw new FormatException("Malformed HTTP message: " + firstLine);

}

if (parts[0] == "HTTP/1.0" || parts[0] == "HTTP/1.1")

{ // is response

StatusCode = parts[1];

StatusMessage = parts[2];

}

else

{ // is request

Method = parts[0];

Resource = parts[1];

}

// parse other lines

for (int i = 1; i < lines.Count(); i++)

{

var line = lines[i];

if (line == "")

{ // empty line -> end of header; the rest is content

Content = String.Join("\n", lines.Skip(i + 1));

break;

}

else

{ // parse header (name-value-pair)

var colonAt = line.IndexOf(':');

if (colonAt == -1)

{

throw new FormatException("Malformed header: " + line);

}

var name = line.Substring(0, colonAt).ToLower().Trim();

var value = line.Substring(colonAt + 1).Trim();

if (name == "host")

{

Host = value;

}

else

{

Headers[name] = value;

}

}

}

}

/// <summary>

/// Returns the string representation of the message.

/// </summary>

public override string ToString()

{

// set content length

Headers["content-length"] = Content.Length.ToString();

// build first line

string message;

if (Method != null)

{

message = Method + " " + Resource + " HTTP/1.1\nhost: " + Host + "\n";

}

else

{

message = "HTTP/1.1 " + StatusCode + " " + StatusMessage + "\n";

}

// add Headers

foreach (string name in Headers.Keys)

{

message += name + ": " + Headers[name] + "\n";

}

// add content

message += "\n" + Content;

return message;

}

/// <summary>

/// Sets the value of a cookie inside an HTTP Message.

/// </summary>

public void SetCookie(string name, string value)

{

Headers["set-cookie"] = name + "=" + value;

}

/// <summary>

/// Returns a list of cookie parts inside the HTTP message.

/// </summary>

public Dictionary<string, string> GetCookies()

{

// access HTTP header parameter

Dictionary<string, string> cookies = new Dictionary<string, string>();

if (Headers.ContainsKey("cookie"))

{

// split into individual cookie parts

string[] parts = Headers["cookie"].Split(new char[1] { ';' });

foreach (string part in parts)

{

// parse name and value

int middle = part.IndexOf('=');

if (middle != -1)

{

string name = part.Substring(0, middle).Trim();

string value = part.Substring(middle + 1).Trim();

cookies[name] = value;

}

}

}

return cookies;

}

}

}

using System;

using System.Collections.Generic;

using System.Net;

using System.Net.Sockets;

using System.Threading.Tasks;

namespace SSE

{

public class **HttpRequest**

{

private HttpRequest() {}

public static Task<HttpMessage> Get(string url)

{

return Request("GET", new Url(url), null, new Dictionary<string, string>());

}

public static Task<HttpMessage> Post(string url, string content, Dictionary<string, string> headers)

{

return Request("POST", new Url(url), content, headers);

}

private static async Task<HttpMessage> Request(string method, Url url, string content, Dictionary<string, string> headers)

{

// resolve DNS

var addrs = await Dns.GetHostAddressesAsync(url.Host);

// extract a IPv4 from the list of available addresses (since tu-chemnitz.de

// is not available through IPv6 yet)

// a more general approach would be to try a request to each address

// in the list in a return the result from the first successfull request

IPAddress ipv4 = null;

foreach (var addr in addrs)

{

if (addr.AddressFamily == AddressFamily.InterNetwork)

{

ipv4 = addr;

break;

}

}

// if there is no IPv4 in the list of addresses for the given host

if (ipv4 == null)

{

throw new ArgumentException("Cannot resolve IPv4 for host: " + url.Host);

}

// construct HTTP request

var request = new HttpMessage(method, url.Host, url.Path + "?" + url.Query, headers, content);

// send TCP request

return new HttpMessage(await TcpRequest.Do(ipv4, url.Port, request.ToString()));

}

}

}

using System;

using System.Threading.Tasks;

namespace SSE

{

public class Program

{

public static void **Main**(string[] args)

{

Task.Run(async () =>

{

var client = new AddServiceClient("http://pauline.informatik.tu-chemnitz.de/SoapWebService/Service.asmx");

var answer = await client.Add(2,3);

// display result and wait for user

Console.WriteLine("Result: " + answer.ToString());

}).Wait();

}

}

}

using System.IO;

using System.Net;

using System.Net.Sockets;

using System.Text;

using System.Threading.Tasks;

namespace SSE

{

public class **TcpRequest**

{

private TcpRequest() {}

public static async Task<string> Do(IPAddress ip, int port, string message)

{

var client = new TcpClient(ip.AddressFamily);

await client.ConnectAsync(ip, port);

using (var r = new StreamReader(client.GetStream(), Encoding.ASCII))

using (var w = new StreamWriter(client.GetStream(), Encoding.ASCII))

{

await w.WriteAsync(message);

w.Flush();

var buffer = new char[4096];

var byteCount = await r.ReadAsync(buffer, 0, buffer.Length);

return new string(buffer, 0, byteCount);

}

}

}

}

using System;

using System.Text.RegularExpressions;

namespace SSE

{

/// <summary>

/// A class for generating and parsing HTTP-URIs.

/// </summary>

public class **Url**

{

const string VALID\_CHARACTERS = "abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789$-\_.~";

public string Scheme = "";

public string Host = "";

public int Port = 80;

public string Path = "";

public string Query = "";

public string FragmentId = "";

/// <summary>

/// Constructor for parsing URLs.

/// </summary>

public Url(string urlStr)

{

Match match = Regex.Match(urlStr, @"

^(?:

(?<scheme>[^:]\*)

\:\/\/(?<host>[^:^/^?^#]\*)

(?:\:(?<port>\d\*))?

)?

(?<path>\/[^?^#]\*)?

(?:\?(?<query>[^#]\*))?

(?:\#(?<fragmentid>.\*))?$

", RegexOptions.IgnorePatternWhitespace);

if (match.Success)

{

this.Scheme = match.Groups["scheme"].Value.ToLower();

this.Host = Decode(match.Groups["host"].Value);

if (match.Groups["port"].Value != "")

this.Port = Convert.ToInt32(match.Groups["port"].Value);

this.Path = Decode(match.Groups["path"].Value);

this.Query = Decode(match.Groups["query"].Value);

this.FragmentId = Decode(match.Groups["fragmentid"].Value);

}

else

{

throw new FormatException("Could not parse URL: " + urlStr);

}

}

/// <summary>

/// Constructor for building URLs from their components.

/// </summary>

public Url(string scheme, string host, int port, string path, string query, string fragmentId)

{

this.Scheme = scheme;

this.Host = host;

this.Port = port;

this.Path = path;

this.Query = query;

this.FragmentId = fragmentId;

}

/// <summary>

/// Returns the string representation of the URL.

/// </summary>

public override string ToString()

{

string url = Scheme + "://" + Host;

if (Port != 80) url += ":" + Port;

if (Path != "") url += "/" + Encode(Path.Substring(1));

if (Query != "")

{

var queryParts = Query.Split('&');

var qEncoded = "";

foreach ( var queryPart in queryParts )

{

var nameValue = queryPart.Split( '=' );

qEncoded += "&" + Encode( nameValue[0] ) + "=" + Encode( nameValue[1] );

}

url += "?" + qEncoded.Substring( 1 );

}

if (FragmentId != "") url += "#" + Encode(FragmentId);

return url;

}

/// <summary>

/// Encodes any special characters in the URL with an escaping sequence.

/// </summary>

public static string Encode(string s)

{

string result = "";

for (int i = 0; i < s.Length; i++)

{

if (VALID\_CHARACTERS.Contains(s[i].ToString()))

{

// allowed character

result += s[i];

}

else

{

// character has to be encoded as "%" + HexDigit + HexDigit

result += "%" + Convert.ToByte(s[i]).ToString("X");

}

}

return result;

}

/// <summary>

/// Decodes any escaping sequence in the URL with the corresponding characters.

/// </summary>

public static string Decode(string s)

{

while (s.Contains("%"))

{

int pos = s.IndexOf("%");

byte b = byte.Parse(s.Substring(pos + 1, 2), System.Globalization.NumberStyles.HexNumber);

s = s.Substring(0, pos) + Convert.ToChar(b) + s.Substring(pos + 3);

}

return s;

}

}

}