

LinksPlatform's Platform.Communication Class Library

./Platform.Communication/Protocol/Gexf/Edge.cs

```

1  using System.Globalization;
2  using System.Xml;
3  using System.Xml.Serialization;
4
5  #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
6
7  namespace Platform.Communication.Protocol.Gexf
8  {
9      public class Edge
10     {
11         public static readonly string ElementName = "edge";
12         public const string IdAttributeName = "id";
13         public const string SourceAttributeName = "source";
14         public const string TargetAttributeName = "target";
15         public const string LabelAttributeName = "label";
16
17         [XmlAttribute(AttributeName = IdAttributeName)]
18         public long Id { get; set; }
19
20         [XmlAttribute(AttributeName = SourceAttributeName)]
21         public long Source { get; set; }
22
23         [XmlAttribute(AttributeName = TargetAttributeName)]
24         public long Target { get; set; }
25
26         [XmlAttribute(AttributeName = LabelAttributeName)]
27         public string Label { get; set; }
28
29         public void WriteXml(XmlWriter writer) => WriteXml(writer, Id, Source, Target, Label);
30
31         public static void WriteXml(XmlWriter writer, long id, long sourceNodeId, long
32             ↪ targetNodeId) => WriteXml(writer, id, sourceNodeId, targetNodeId, null);
33
34         public static void WriteXml(XmlWriter writer, long id, long sourceNodeId, long
35             ↪ targetNodeId, string label)
36         {
37             // <edge id="0" source="0" target="0" label="..." />
38             writer.WriteStartElement(ElementName);
39             writer.WriteAttributeString(IdAttributeName,
40                 ↪ id.ToString(CultureInfo.InvariantCulture));
41             writer.WriteAttributeString(SourceAttributeName,
42                 ↪ sourceNodeId.ToString(CultureInfo.InvariantCulture));
43             writer.WriteAttributeString(TargetAttributeName,
44                 ↪ targetNodeId.ToString(CultureInfo.InvariantCulture));
45             if (!string.IsNullOrEmpty(label))
46             {
47                 writer.WriteAttributeString(LabelAttributeName, label);
48             }
49             writer.WriteEndElement();
50         }
51     }
52 }

```

./Platform.Communication/Protocol/Gexf/Gexf.cs

```

1  using System;
2  using System.Xml;
3  using System.Xml.Serialization;
4
5  #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
6
7  namespace Platform.Communication.Protocol.Gexf
8  {
9      [XmlRoot(ElementName = ElementName, Namespace = Namespace)]
10     public class Gexf
11     {
12         public const string ElementName = "gexf";
13         public const string Namespace = "http://www.gexf.net/1.2draft";
14         public const string VersionAttributeName = "version";
15         public const string GraphElementName = "graph";
16         public static readonly string CurrentVersion = "1.2";
17
18         [XmlAttribute(AttributeName = VersionAttributeName)]
19         public string Version { get; set; }
20
21         [XmlElement(ElementName = GraphElementName)]
22         public Graph Graph { get; set; }
23
24         public Gexf()

```

```

25     {
26         Version = CurrentVersion;
27         Graph = new Graph();
28     }
29
30     public void WriteXml(XmlWriter writer) => WriteXml(writer, () => Graph.WriteXml(writer),
31         ↪ Version);
32
33     public static void WriteXml(XmlWriter writer, Action writeGraph) => WriteXml(writer,
34         ↪ writeGraph, CurrentVersion);
35
36     public static void WriteXml(XmlWriter writer, Action writeGraph, string version)
37     {
38         writer.WriteStartDocument();
39         writer.WriteStartElement(ElementName, Namespace);
40         writer.WriteAttributeString(VersionAttributeName, version);
41         writeGraph();
42         writer.WriteEndElement();
43         writer.WriteEndDocument();
44     }
45
46     public static void WriteXml(XmlWriter writer, Action writeNodes, Action writeEdges) =>
47         ↪ WriteXml(writer, writeNodes, writeEdges, CurrentVersion, GraphMode.Static,
48         ↪ GraphDefaultEdgeType.Directed);
49
50     public static void WriteXml(XmlWriter writer, Action writeNodes, Action writeEdges,
51         ↪ string version) => WriteXml(writer, writeNodes, writeEdges, version,
52         ↪ GraphMode.Static, GraphDefaultEdgeType.Directed);
53
54     public static void WriteXml(XmlWriter writer, Action writeNodes, Action writeEdges,
55         ↪ string version, GraphMode mode) => WriteXml(writer, writeNodes, writeEdges, version,
56         ↪ mode, GraphDefaultEdgeType.Directed);
57
58     public static void WriteXml(XmlWriter writer, Action writeNodes, Action writeEdges,
59         ↪ string version, GraphMode mode, GraphDefaultEdgeType defaultEdgeType) =>
60         ↪ WriteXml(writer, () => Graph.WriteXml(writer, writeNodes, writeEdges, mode,
61         ↪ defaultEdgeType), version);
62 }
63 }

```

./Platform.Communication/Protocol/Gexf/Graph.cs

```

1  using System;
2  using System.Collections.Generic;
3  using System.Xml;
4  using System.Xml.Serialization;
5
6  #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
7
8  namespace Platform.Communication.Protocol.Gexf
9  {
10     public class Graph
11     {
12         public static readonly string ElementName = "graph";
13         public const string ModeAttributeName = "mode";
14         public const string DefaultEdgeTypeAttributeName = "defaultedgetype";
15         public const string NodesElementName = "nodes";
16         public const string NodeElementName = "node";
17         public const string EdgesElementName = "edges";
18         public const string EdgeElementName = "edge";
19
20         [XmlAttribute(AttributeName = ModeAttributeName)]
21         public GraphMode Mode { get; set; }
22
23         [XmlAttribute(AttributeName = DefaultEdgeTypeAttributeName)]
24         public GraphDefaultEdgeType DefaultEdgeType { get; set; }
25
26         [XmlArray(ElementName = NodesElementName)]
27         [XmlArrayItem(ElementName = NodeElementName)]
28         public List<Node> Nodes { get; set; }
29
30         [XmlArray(ElementName = EdgesElementName)]
31         [XmlArrayItem(ElementName = EdgeElementName)]
32         public List<Edge> Edges { get; set; }
33
34         public Graph()
35         {
36             Nodes = new List<Node>();
37             Edges = new List<Edge>();
38         }
39     }
40 }

```

```

39
40     public void WriteXml(XmlWriter writer) => WriteXml(writer, () => WriteNodes(writer), ()
    ↪ => WriteEdges(writer), Mode, DefaultEdgeType);
41
42     private void WriteEdges(XmlWriter writer)
43     {
44         for (var i = 0; i < Edges.Count; i++)
45         {
46             Edges[i].WriteXml(writer);
47         }
48     }
49
50     private void WriteNodes(XmlWriter writer)
51     {
52         for (var i = 0; i < Nodes.Count; i++)
53         {
54             Nodes[i].WriteXml(writer);
55         }
56     }
57
58     public static void WriteXml(XmlWriter writer, Action writeNodes, Action writeEdges) =>
    ↪ WriteXml(writer, writeNodes, writeEdges, GraphMode.Static,
    ↪ GraphDefaultEdgeType.Directed);
59
60     public static void WriteXml(XmlWriter writer, Action writeNodes, Action writeEdges,
    ↪ GraphMode mode) => WriteXml(writer, writeNodes, writeEdges, mode,
    ↪ GraphDefaultEdgeType.Directed);
61
62     public static void WriteXml(XmlWriter writer, Action writeNodes, Action writeEdges,
    ↪ GraphMode mode, GraphDefaultEdgeType defaultEdgeType)
63     {
64         writer.WriteStartElement(ElementName);
65         writer.WriteAttributeString(ModeAttributeName, mode.ToString().ToLower());
66         writer.WriteAttributeString(DefaultEdgeTypeAttributeName,
    ↪ defaultEdgeType.ToString().ToLower());
67         writer.WriteStartElement(NodesElementName);
68         writeNodes();
69         writer.WriteEndElement();
70         writer.WriteStartElement(EdgesElementName);
71         writeEdges();
72         writer.WriteEndElement();
73         writer.WriteEndElement();
74     }
75 }
76 }

```

./Platform.Communication/Protocol/Gexf/GraphDefaultEdgeType.cs

```

1     using System.Xml.Serialization;
2
3     #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
4
5     namespace Platform.Communication.Protocol.Gexf
6     {
7         public enum GraphDefaultEdgeType
8         {
9             [XmlEnum(Name = "directed")]
10            Directed
11        }
12    }

```

./Platform.Communication/Protocol/Gexf/GraphMode.cs

```

1     using System.Xml.Serialization;
2
3     #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
4
5     namespace Platform.Communication.Protocol.Gexf
6     {
7         public enum GraphMode
8         {
9             [XmlEnum(Name = "static")]
10            Static,
11
12            [XmlEnum(Name = "dynamic")]
13            Dynamic
14        }
15    }

```

./Platform.Communication/Protocol/Gexf/Node.cs

```
1 using System.Globalization;
2 using System.Xml;
3 using System.Xml.Serialization;
4
5 #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
6
7 namespace Platform.Communication.Protocol.Gexf
8 {
9     public class Node
10    {
11        public static readonly string ElementName = "node";
12        public const string IdAttributeName = "id";
13        public const string LabelAttributeName = "label";
14
15        [XmlAttribute(AttributeName = IdAttributeName)]
16        public long Id { get; set; }
17
18        [XmlAttribute(AttributeName = LabelAttributeName)]
19        public string Label { get; set; }
20
21        public void WriteXml(XmlWriter writer) => WriteXml(writer, Id, Label);
22
23        public static void WriteXml(XmlWriter writer, long id, string label)
24        {
25            // <node id="0" label="..." />
26            writer.WriteStartElement(ElementName);
27            writer.WriteAttributeString(IdAttributeName,
28                ↪ id.ToString(CultureInfo.InvariantCulture));
29            writer.WriteAttributeString(LabelAttributeName, label);
30            writer.WriteEndElement();
31        }
32    }
33 }
```

./Platform.Communication/Protocol/Udp/UdpClientExtensions.cs

```
1 using System.Net;
2 using System.Net.Sockets;
3 using System.Runtime.CompilerServices;
4 using System.Text;
5 using Platform.Singletons;
6
7 #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
8
9 namespace Platform.Communication.Protocol.Udp
10 {
11     public static class UdpClientExtensions
12     {
13         private static readonly Encoding _defaultEncoding = Singleton.Get(() =>
14             ↪ Encoding.GetEncoding(0));
15
16         [MethodImpl(MethodImplOptions.AggressiveInlining)]
17         public static int SendString(this UdpClient udp, IPEndPoint ipEndPoint, string message)
18         {
19             var bytes = _defaultEncoding.GetBytes(message);
20             return udp.Send(bytes, bytes.Length, ipEndPoint);
21         }
22
23         [MethodImpl(MethodImplOptions.AggressiveInlining)]
24         public static string ReceiveString(this UdpClient udp)
25         {
26             IPEndPoint remoteEndPoint = default;
27             return _defaultEncoding.GetString(udp.Receive(ref remoteEndPoint));
28         }
29     }
30 }
```

./Platform.Communication/Protocol/Udp/UdpReceiver.cs

```
1 using System;
2 using System.Net.Sockets;
3 using System.Runtime.CompilerServices;
4 using System.Threading;
5 using Platform.Disposables;
6 using Platform.Exceptions;
7 using Platform.Threading;
8
9 #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
10
11 namespace Platform.Communication.Protocol.Udp
12 {
13 }
```

```

13 public delegate void MessageHandlerCallback(string message);
14
15 /// <summary>
16 /// Represents the receiver of messages transfered via UDP protocol.
17 /// Представляет получателя сообщений по протоколу UDP.
18 /// </summary>
19 public class UdpReceiver : DisposableBase //-V3073
20 {
21     private const int DefaultPort = 15000;
22
23     private bool _receiverRunning;
24     private Thread _thread;
25     private readonly UdpClient _udp;
26     private readonly MessageHandlerCallback _messageHandler;
27
28     public bool Available => _udp.Available > 0;
29
30     public UdpReceiver(int listenPort, bool autoStart, MessageHandlerCallback messageHandler)
31     {
32         _udp = new UdpClient(listenPort);
33         _messageHandler = messageHandler;
34         if (autoStart)
35         {
36             Start();
37         }
38     }
39
40     public UdpReceiver(int listenPort, MessageHandlerCallback messageHandler)
41         : this(listenPort, true, messageHandler)
42     {
43     }
44
45     public UdpReceiver(MessageHandlerCallback messageHandler)
46         : this(DefaultPort, true, messageHandler)
47     {
48     }
49
50     public UdpReceiver()
51         : this(DefaultPort, true, message => { })
52     {
53     }
54
55     public void Start()
56     {
57         if (!_receiverRunning && _thread == null)
58         {
59             _receiverRunning = true;
60             _thread = new Thread(Receiver);
61             _thread.Start();
62         }
63     }
64
65     public void Stop()
66     {
67         if (_receiverRunning && _thread != null)
68         {
69             _receiverRunning = false;
70             _thread.Join();
71             _thread = null;
72         }
73     }
74
75     [MethodImpl(MethodImplOptions.AggressiveInlining)]
76     public string Receive() => _udp.ReceiveString();
77
78     [MethodImpl(MethodImplOptions.AggressiveInlining)]
79     public void ReceiveAndHandle() => _messageHandler(Receive());
80
81     // Функция извлекающая пришедшие сообщения
82     // и работающая в отдельном потоке.
83     private void Receiver()
84     {
85         while (_receiverRunning)
86         {
87             try
88             {
89                 if (Available)
90                 {
91                     ReceiveAndHandle();
92                 }
93             }
94         }
95     }
96 }

```

```

93         else
94         {
95             ThreadHelpers.Sleep();
96         }
97     }
98     catch (Exception exception)
99     {
100         exception.Ignore();
101     }
102 }
103
104
105 protected override void Dispose(bool manual, bool wasDisposed)
106 {
107     if (!wasDisposed)
108     {
109         Stop();
110         _udp.DisposeIfPossible();
111     }
112 }
113 }
114 }

```

./Platform.Communication/Protocol/Udp/UdpSender.cs

```

1  using System.Net;
2  using System.Net.Sockets;
3  using System.Runtime.CompilerServices;
4  using Platform.Disposables;
5
6  #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
7
8  namespace Platform.Communication.Protocol.Udp
9  {
10     /// <summary>
11     /// Represents the sender of messages transferred via UDP protocol.
12     /// Представляет отправителя сообщений по протоколу UDP.
13     /// </summary>
14     public class UdpSender : DisposableBase //-V3073
15     {
16         private readonly UdpClient _udp;
17         private readonly IPEndPoint _ipendpoint;
18
19         public UdpSender(IPEndPoint ipendpoint)
20         {
21             _udp = new UdpClient();
22             _ipendpoint = ipendpoint;
23         }
24
25         public UdpSender(IPAddress address, int port)
26             : this(new IPEndPoint(address, port))
27         {
28         }
29
30         public UdpSender(string hostname, int port)
31             : this(IPAddress.Parse(hostname), port)
32         {
33         }
34
35         public UdpSender(int port)
36             : this(IPAddress.Loopback, port)
37         {
38         }
39
40         [MethodImpl(MethodImplOptions.AggressiveInlining)]
41         public int Send(string message) => _udp.SendString(_ipendpoint, message);
42
43         protected override void Dispose(bool manual, bool wasDisposed)
44         {
45             if (!wasDisposed)
46             {
47                 _udp.DisposeIfPossible();
48             }
49         }
50     }
51 }

```

./Platform.Communication/Protocol/Xml/Serializer.cs

```

1  using System.IO;
2  using System.Text;

```

```

3 using System.Xml.Serialization;
4
5 #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
6
7 namespace Platform.Communication.Protocol.Xml
8 {
9     public static class Serializer<T>
10     {
11         public static readonly XmlSerializer Instance = new XmlSerializer(typeof(T));
12
13         public static T FromFile(string path)
14         {
15             using (var stream = File.OpenRead(path))
16             {
17                 return (T)Instance.Deserialize(stream);
18             }
19         }
20
21         public static T FromString(string xml)
22         {
23             using (var reader = new StringReader(xml))
24             {
25                 return (T)Instance.Deserialize(reader);
26             }
27         }
28
29         public static void ToFile(T @object, string path)
30         {
31             using (var stream = File.OpenWrite(path))
32             {
33                 Instance.Serialize(stream, @object);
34             }
35         }
36
37         public static string ToString(T @object)
38         {
39             var sb = new StringBuilder();
40             using (var writer = new StringWriter(sb))
41             {
42                 Instance.Serialize(writer, @object);
43             }
44             return sb.ToString();
45         }
46     }
47 }

```

./Platform.Communication.Tests/SerializerTests.cs

```

1 using System;
2 using System.IO;
3 using Xunit;
4 using Platform.Singletons;
5 using Platform.Communication.Protocol.Xml;
6
7 namespace Platform.Communication.Tests
8 {
9     public static class SerializerTests
10     {
11         [Fact]
12         public static void SerializeToFileTest()
13         {
14             var tempFilename = Path.GetTempFileName();
15             Serializer<object>.ToFile(Default<object>.Instance, tempFilename);
16             Assert.Equal(File.ReadAllText(tempFilename), $"<?xml
17                 ↪ version=\"1.0\"?>{Environment.NewLine}<anyType
18                 ↪ xmlns:xsi=\"http://www.w3.org/2001/XMLSchema-instance\"
19                 ↪ xmlns:xsd=\"http://www.w3.org/2001/XMLSchema\" />");
20             File.Delete(tempFilename);
21         }
22
23         [Fact]
24         public static void SerializeAsXmlStringTest()
25         {
26             var serializedObject = Serializer<object>.ToString(Default<object>.Instance);
27             Assert.Equal(serializedObject, $"<?xml version=\"1.0\"
28                 ↪ encoding=\"utf-16\"?>{Environment.NewLine}<anyType
29                 ↪ xmlns:xsi=\"http://www.w3.org/2001/XMLSchema-instance\"
30                 ↪ xmlns:xsd=\"http://www.w3.org/2001/XMLSchema\" />");
31         }
32     }
33 }

```

```
26     }
27 }
```

./Platform.Communication.Tests/UdpReceiverTests.cs

```
1  using Xunit;
2  using Platform.Communication.Protocol.Udp;
3
4  namespace Platform.Communication.Tests
5  {
6      public class UdpReceiverTests
7      {
8          [Fact]
9          public static void DisposalTest()
10         {
11             using (var receiver = new UdpReceiver())
12             {
13             }
14         }
15     }
16 }
```


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