

# 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/Enums.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          [XmlAttribute(Name = "static")]
10         Static,
11
12         [XmlAttribute(Name = "dynamic")]
13         Dynamic
14     }
15
16     public enum GraphDefaultEdgeType
17     {
18         [XmlAttribute(Name = "directed")]
19         Directed
20     }
21 }

```

./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    }
16 }
```

```

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 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/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    }

```

./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     }

```

./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     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             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 }

```

./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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