WebSocket Actor Documentation

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Contents

[1 Description 2](#_Toc148106838)

[2 Library 2](#_Toc148106839)

[3 Actors 2](#_Toc148106840)

[3.1 WebSocket Client.lvclass 2](#_Toc148106841)

[3.2 WebSocket Server Manager.lvclass 3](#_Toc148106842)

[3.3 WebSocket Server.lvclass 3](#_Toc148106843)

[3.4 WebSocket Service.lvclass 3](#_Toc148106844)

[3.5 Abstract messages 4](#_Toc148106845)

[3.5.1 WebSocket Connection Handler Msg.lvclass 4](#_Toc148106846)

[3.5.2 WebSocket Server-Service Enqueuer Msg.lvclass 4](#_Toc148106847)

[4 API 4](#_Toc148106850)

[4.1 WebSocket Server Manager 4](#_Toc148106851)

[4.1.1 WebSocket Server Listener Settings 4](#_Toc148106852)

[4.1.2 Launch Server 4](#_Toc148106853)

[4.1.3 Stop a Server 5](#_Toc148106858)

[4.2 WebSocket Server 5](#_Toc148106859)

[4.2.1 Add Service 6](#_Toc148106860)

[4.3 WebSocket Service 7](#_Toc148106861)

[4.3.1 Broadcast 7](#_Toc148106862)

[4.3.2 Send 7](#_Toc148106863)

[WebSocket Client 7](#_Toc148106864)

[4.4 7](#_Toc148106867)

[4.5 Send to Peers 8](#_Toc148106868)

# Description

A library implementing a high-level actor-based implementation of WebSocket communication. An actor can subscribe to the WebSocket Actor to facilitate WebSocket-based communication. It can serve both as a client and a server.

Please note that within this library **resource names** as defined in the WebSocket protocol specification are referred to as **services.**

# Library

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# Actors

## WebSocket Client.lvclass

It forwards packets received from the connected WebSocket Service to its subscriber as "WebSocket Connection Handler Msg" messages. It allows its subscriber to send data to a specified service to which the WebSocket client is connected ("Send to Peer Msg" message" message of the parent "WebSocket Connection" class). Before starting the actor, the subscriber must provide, by means of suitable properties, a data handler message in form of a concrete implementation of the "WebSocket Connection Handler Msg" abstract message used to handle the connection events corresponding to the WebSocket communication, a concrete implementation of the "WebSocket Server-Service Enqueuer Msg" abstract message used to receive the WebSocket service actor enqueuer, and the WebSocket service URI to which the client should connect.

## WebSocket Server Manager.lvclass

This actor's role is solely that of launching and managing the stop of "WebSocket Server" actors listening on at a specific port and interface address ("Launch Server Msg" and "Stop Server Msg" messages). The actor will ensure that the launched "WebSocket Server" doesn’t conflict on interface and port resources. If the server is already running at that port or on the specified interface the method sends just the server enqueuer to the client. If the server is not running it will be launched.

## WebSocket Server.lvclass

Defines a WebSocket Server characterized by an interface and a port on which it listens. Allows for the definition of WebSocket Services. Services can be defined by the server subscriber by sending the "Add Service" message to the actor. The subscriber must provide a concrete implementation of the "WebSocket Server-Service Enqueuer Msg" abstract message used to let its subscriber receive the WebSocket service actor enqueuer and a data handler message in form of a concrete implementation of the "WebSocket Connection Handler Msg" abstract message used to handle the connection events corresponding to the WebSocket communication. For each service defined a "WebSocket Service" actor is started that will send data to the subscriber that has defined the service. The actor listens according to the server specifications on a port and on an interface if not all, when a connection is established, the actor performs the WebSocket handshake. If the service requested is defined in this server, it informs the WebSocket service Actor who will start a corresponding WebSocket connection actor. If either the service is not defined, or the handshake fails, we do nothing, the WebSocket protocol will take care of communicating the failure to the client.

## WebSocket Service.lvclass

It forwards packets received from the connected WebSocket Clients to its subscriber actor as "WebSocket Connection Handler Msg" messages. It allows the subscriber to send data to a specified client ("Send to Peer Msg" message of the parent "WebSocket Connection" class) or to all connected clients (“Broadcast Msg” message). When launching the actor by means of the “WebSocket Server.lvclass” actor, the subscriber must provide a data handler message in form of a concrete implementation of the "WebSocket Connection Handler Msg" abstract message used to handle the connection events corresponding to the WebSocket communication and a concrete implementation of the "WebSocket Server-Service Enqueuer Msg" abstract message used to let the server subscriber actor receive the WebSocket service actor enqueuer.

## Abstract messages

### WebSocket Connection Handler Msg.lvclass

This abstract message is sent by either the WebSocket Client or by the WebSocket Service to the subscriber Actor on four events:

* Connect
* Disconnect
* Message
* Drop

For each caller Actor a concrete subclass of the message should be created by overriding the methods:

* OnConnect
* OnDisconnect
* OnMessage
* OnDrop

The subscriber actor can program the required action for the corresponding event.

### WebSocket Server-Service Enqueuer Msg.lvclass

This abstract message is used either by the WebSocket Server Manager or by the WebSocket Server to send the just launched/added Server/Service Enqueuer to the subscriber actor requesting the operation. Each subscriber actor requesting the operation should subclass this message and then override the Do.vi in which the Server/Service Enqueuer is stored in the requesting actor.

# API

## WebSocket Server Manager

### WebSocket Server Listener Settings

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**timeout ms** specifies the time, in milliseconds, that the function waits for a connection. If a connection is not established in the specified time, the function returns an error. The default value is –1, which indicates to wait indefinitely.

**resolve remote address** indicates whether to call the IP To String function on the remote address.

**net address** specifies on which network address to listen. Specifying an address is useful if you have more than one network card, such as two Ethernet cards, and want to listen only on the card with the specified address. If you do not specify a network address, LabVIEW listens on all network addresses.

**port** is the port number on which you want to listen for a connection.

### Launch Server

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**Message Enqueuer in** specifies the enqueuer of the WebSocket Server Manager actor.

**Listener Settings** specifies the listener settings for the Server.

**Handshake timeout** specifies the timeout of the handshake when the client establishes a WebSocket connection to the server.

**Receive Server Enqueuer Handler** specifies the concrete message (to be created) child of the abstract message “*WebSocket Server-Service Enqueuer Msg.lvclass*”.

### Stop a Server

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**Subscriber Enqueuer** specifies the enqueuer of the actor that has subscribed to the previously launched WebSocket Server actor.

**Message Enqueuer in** specifies the enqueuer of the WebSocket Server Manager actor to be stopped.

**Listener Settings** specifies the listener settings for the previously launched WebSocket Server actor.

**Handshake timeout** specifies the timeout of the handshake when the client establishes a WebSocket connection to the server.

**Receive Server Enqueuer Handler** specifies the concrete message (to be created) child of the abstract message “*WebSocket Server-Service Enqueuer Msg.lvclass*”.

## WebSocket Server

In case the WebSocket Server Actor is manually launched the following properties are available to configure it (the port must be entered) before its launch

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**Listener Settings** specifies the settings for the Server (see definition above).

**Handshake timeout** specifies the timeout of the handshake when the client establishes a WebSocket connection to the server.

### Add Service

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**Receive Connection Enqueuer** specifies the concrete message (to be created) child of the abstract message “*WebSocket Server-Service Enqueuer Msg.lvclass”.*

**Message Enqueuer in** specifies the enqueuer of the WebSocket Server actor.

**Service Name** specifies the name of the service.

**Subscriber Enqueuer** specifies the enqueuer of the actor (to be created) that subscribes to the WebSocket Server Actor.

**WebSocket Data Handler** specifies the concrete message (to be created) child of the abstract message “*WebSocket Connection Handler Msg.lvclass”.*

## WebSocket Service

### Broadcast

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**Message Enqueuer in** specifies the enqueuer of the WebSocket Service actor.

**Data** specifies the data to be sent.

### Send

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**Message Enqueuer in** specifies the enqueuer of the WebSocket Service actor.

**Data** specifies the data to be sent.

**Client ID** ID that identifies the specific WebSocket client to which we want to send the data

## WebSocket Client

The following properties of the WebSocket Client actor must be set before launching it:

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**WS URI** specifies the URI of the client with the following format:

*ws://hostname:port/service*

**Timeout (ms)** is the timeout to establish the connection to the server. A value of –1 indicates to wait indefinitely.

**WebSocket Data Handler** specifies the concrete message (to be created) child of the abstract message “*WebSocket Connection Handler Msg.lvclass”.*

**Subscriber Enqueuer** specifies the enqueuer of the actor (must be created) that subscribes to the WebSocket Client Actor.

## Send to Peers

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**Message Enqueuer in** specifies the enqueuer of the WebSocket Client actor.

**Data Format (Text)** Specifies an Enum allwing top specify if the data format is either “Text” or “Binary”.

**Timeout ms** (5000) is the timeout to establish the connection to the server. A value of –1 indicates to wait indefinitely.