

# Package ‘BrowserViz’

January 7, 2024

**Type** Package

**Title** BrowserViz: interactive R/browser graphics using websockets and JSON

**Version** 2.24.0

**Date** 2023-09-12

**Author** Paul Shannon

**Maintainer** Arkadiusz Gladki <gladki.arkadiusz@gmail.com>

**Depends** R (>= 3.5.0), jsonlite (>= 1.5), httpuv(>= 1.5.0)

**Imports** methods, BiocGenerics

**Suggests** RUnit, BiocStyle, knitr, rmarkdown

**Description** Interactive graphics in a web browser from R, using websockets and JSON.

**License** GPL-2

**URL** <https://gladkia.github.io/BrowserViz/>

**BugReports** <https://github.com/gladkia/BrowserViz/issues>

**LazyLoad** yes

**biocViews** Visualization, ThirdPartyClient

**NeedsCompilation** no

**VignetteBuilder** knitr

**Encoding** UTF-8

**RoxygenNote** 7.2.1

**git\_url** <https://git.bioconductor.org/packages/BrowserViz>

**git\_branch** RELEASE\_3\_18

**git\_last\_commit** e825c98

**git\_last\_commit\_date** 2023-10-24

**Repository** Bioconductor 3.18

**Date/Publication** 2024-01-07

**R topics documented:**

addRMessageHandler . . . . .	2
browserResponseReady,BrowserViz-method . . . . .	3
BrowserViz constructor . . . . .	3
BrowserViz-class . . . . .	4
closeWebSocket,BrowserViz-method . . . . .	5
dispatchMessage . . . . .	5
displayHTMLInDiv,BrowserViz-method . . . . .	6
fromJSON . . . . .	6
getBrowserInfo,BrowserViz-method . . . . .	7
getBrowserResponse,BrowserViz-method . . . . .	7
getBrowserWindowSize,BrowserViz-method . . . . .	8
getBrowserWindowTitle,BrowserViz-method . . . . .	8
handleResponse . . . . .	9
port,BrowserViz-method . . . . .	9
ready,BrowserViz-method . . . . .	10
roundTripTest,BrowserViz-method . . . . .	10
send,BrowserViz-method . . . . .	11
setBrowserWindowTitle,BrowserViz-method . . . . .	11
show,BrowserViz-method . . . . .	12
toJSON . . . . .	12
wait,BrowserViz-method . . . . .	13
webBrowserAvailableForTesting . . . . .	13
<b>Index</b>	<b>14</b>

---

addRMessageHandler	<i>Supply the name of a function to call, identified by its key</i>
--------------------	---

---

**Description**

Supply the name of a function to call, identified by its key

**Usage**

```
addRMessageHandler(key, functionName)
```

**Arguments**

key	A character string
functionName	A character string

---

browserResponseReady, BrowserViz-method  
*browserResponseReady*

---

### Description

browserResponseReady

### Usage

```
## S4 method for signature 'BrowserViz'  
browserResponseReady(obj)
```

### Arguments

obj                    An object of class BrowserViz

---

BrowserViz constructor  
*Constructor for BrowserViz*

---

### Description

This constructor function:

- creates the BrowserViz object
- initializes the httpuv web server
- prepares that web server to additionally handle websocket traffic
- loads a "browserFile" - an html/javascript/css web page to communicate with in your web browser
- opens websocket communication between your R session and your browser
- installs an optional "httpQueryProcessingFunction" to handle http (non-websocket) requests.

### Usage

```
BrowserViz(  
  host = "localhost",  
  portRange = 10000:10100,  
  title = "BrowserViz",  
  browserFile,  
  quiet = TRUE,  
  httpQueryProcessingFunction = NULL  
)
```

**Arguments**

host	character	The constructor will open an http/websocket port here for web browsers to connect to. localhost by default
portRange		The constructor looks for a free websocket port in this range. 10000:10100 by default
title		Used for the web browser window, "igvR" by default
browserFile		The full path to the bundled html, js and libraries, and css which constitute the browser app
quiet		A logical variable controlling verbosity during execution
httpQueryProcessingFunction		a function, default NULL, provides subclasses with the opportunity to execute code on the http server created here.

**Value**

An object of the BrowserViZ class

---

BrowserViz-class	<i>BrowserViz: a base class providing simple, extensible message passing between your R session and your web browser, for interactive data visualization.</i>
------------------	---

---

**Description**

Many of the best interactive graphics capabilities available today are written in Javascript and run in a web browser. BrowserViz makes these capabilities available in R, using websockets for message passing back and forth between R and the browser. This class connects your R session to your web browser via websockets, using the R httpuv library, which in turn uses the Rook webservice.

BrowserViz is a concrete base class, in that instances can be constructed and run - which we do for testing. The primary use of this BrowserViz is to be subclassed: to facilitate the creation of new browser-based, R-connected interactive graphics capabilities embodied in R packages, written by programmers with some skill in both R and Javascript. Two examples of this can be found in these Bioconductor packages <https://bioconductor.org/packages/devel/bioc/html/igvR.html> and <https://bioconductor.org/packages/devel/bioc/html/RCyjs.html>.

**Slots**

uri	The http location at which this modest webserver runs
port	An integer port number for the http connection
websocketConnection	An environment managed by the httpuv library on our behalf
quiet	Logical variable controlling verbosity during execution

**See Also**[BrowserViz](#)

An S4 class to create and manage a modest webserver for websocket message passing between R and Javascript running in your web browser

---

`closeWebSocket,BrowserViz-method`

*Close the websocket connection - between your R session and your web browser.*

---

**Description**

Close the websocket connection - between your R session and your web browser.

**Usage**

```
## S4 method for signature 'BrowserViz'  
closeWebSocket(obj)
```

**Arguments**

`obj` An object of class `BrowserViz`

---

<code>dispatchMessage</code>	<i>Route the message coming in from the browser to the appropriate R function.</i>
------------------------------	--

---

**Description**

Route the message coming in from the browser to the appropriate R function.

**Usage**

```
dispatchMessage(ws, msg, quiet)
```

**Arguments**

<code>ws</code>	a websocket connectin
<code>msg</code>	the JSON-encoded message from the browser
<code>quiet</code>	logical TRUE or FALSE

---

```
displayHTMLInDiv, BrowserViz-method
```

*Ask the browser to display html markup in the specified div*

---

### Description

Ask the browser to display html markup in the specified div

### Usage

```
## S4 method for signature 'BrowserViz'
displayHTMLInDiv(obj, htmlText, div.id)
```

### Arguments

obj	An object of class <code>BrowserViz</code>
htmlText	A character string with HTML markup
div.id	A character string

---

```
fromJSON
```

*Transform JSON string into a native R object*

---

### Description

Transform JSON string into a native R object

### Usage

```
fromJSON(...)
```

### Arguments

...	Extra arguments passed to this function
-----	---

### Value

a native R data structure

### Examples

```
fromJSON(toJSON(data.frame(a=8:10, b=LETTERS[8:10], stringsAsFactors=FALSE)))
```

---

*getBrowserInfo,BrowserViz-method*

*Retrieve basic attributes of the attached web browser.*

---

### **Description**

Retrieve basic attributes of the attached web browser.

### **Usage**

```
## S4 method for signature 'BrowserViz'  
getBrowserInfo(obj)
```

### **Arguments**

obj                    An object of class BrowserViz

---

*getBrowserResponse,BrowserViz-method*

*Retrieve the response sent by the browser*

---

### **Description**

Retrieve the response sent by the browser

### **Usage**

```
## S4 method for signature 'BrowserViz'  
getBrowserResponse(obj)
```

### **Arguments**

obj                    An object of class BrowserViz

---

getBrowserWindowSize,BrowserViz-method

*Supply the name of a function to call, identified by its key*

---

### **Description**

Supply the name of a function to call, identified by its key

### **Usage**

```
## S4 method for signature 'BrowserViz'  
getBrowserWindowSize(obj)
```

### **Arguments**

obj                    An object of class BrowserViz

---

getBrowserWindowTitle,BrowserViz-method

*Supply the name of a function to call, identified by its key*

---

### **Description**

Supply the name of a function to call, identified by its key

### **Usage**

```
## S4 method for signature 'BrowserViz'  
getBrowserWindowTitle(obj)
```

### **Arguments**

obj                    An object of class BrowserViz



---

handleResponse      *handleResponse*

---

**Description**

handleResponse

**Usage**

handleResponse(ws, msg)

**Arguments**

ws	websocket connection
msg	the JSON-encoded character string returned by the browser

---

port, BrowserViz-method  
*Get the port number*

---

**Description**

Get the port number

**Usage**

```
## S4 method for signature 'BrowserViz'  
port(obj)
```

**Arguments**

obj	An object of class BrowserViz
-----	-------------------------------

**Value**

the port number use in the websocket connection, a numeric value.

ready,BrowserViz-method

*Is the websocket connection to the browser ready for use?*

---

### **Description**

Is the websocket connection to the browser ready for use?

### **Usage**

```
## S4 method for signature 'BrowserViz'  
ready(obj)
```

### **Arguments**

obj            An object of class BrowserViz

---

roundTripTest,BrowserViz-method

*Send data to the browser, ensure that it is returned accurately.*

---

### **Description**

Send data to the browser, ensure that it is returned accurately.

### **Usage**

```
## S4 method for signature 'BrowserViz'  
roundTripTest(obj, ...)
```

### **Arguments**

obj            An object of class BrowserViz  
...            other arguments

---

`send,BrowserViz-method`*Send the specified message to the browser*

---

**Description**

Send the specified message to the browser

**Usage**

```
## S4 method for signature 'BrowserViz'  
send(obj, msg)
```

**Arguments**

<code>obj</code>	An object of class <code>BrowserViz</code>
<code>msg</code>	A list with four fields: <code>cmd</code> : "someCommand", <code>status</code> : "request", <code>callback</code> : "someFunction", <code>payload</code> : "someData"

---

`setBrowserWindowTitle,BrowserViz-method`*Supply the name of a function to call, identified by its key*

---

**Description**

Supply the name of a function to call, identified by its key

**Usage**

```
## S4 method for signature 'BrowserViz'  
setBrowserWindowTitle(obj, newTitle)
```

**Arguments**

<code>obj</code>	An object of class <code>BrowserViz</code>
<code>newTitle</code>	A character string

---

show, BrowserViz-method

*Display the core attributes of the BrowserViz object to stdout*

---

### Description

Display the core attributes of the BrowserViz object to stdout

### Usage

```
## S4 method for signature 'BrowserViz'
show(object)
```

### Arguments

object            An object of class BrowserViz

---

toJSON

*Transform an R data structure into JSON*

---

### Description

The semantics of toJSON changed between RJSONIO and jsonlite: in the latter, scalars are promoted to arrays of length 1. rather than change our javascript code, and since such promotion – while sensible in the context of R – strikes me as gratuitous, I follow jeroen ooms suggestion, creating this wrapper

### Usage

```
toJSON(..., auto_unbox = TRUE)
```

### Arguments

...            Extra arguments passed to this function  
 auto\_unbox    Logical

### Value

a character string with the JSON representation of the R object

### Examples

```
toJSON(data.frame(a=8:10, b=LETTERS[8:10], stringsAsFactors=FALSE))
```

---

`wait, BrowserViz-method`*Pause for the specified number of milliseconds*

---

**Description**

Pause for the specified number of milliseconds

**Usage**

```
## S4 method for signature 'BrowserViz'  
wait(obj, msec)
```

**Arguments**

<code>obj</code>	An object of class <code>BrowserViz</code>
<code>msec</code>	Numeric

---

`webBrowserAvailableForTesting`*Is there a web browser available for testing?*

---

**Description**

This package's unit tests require a web browser to connect to. our heuristic, though not bullet proof, is that one of three conditions must be met Supply the name of a function to call, identified by its key

**Usage**

```
webBrowserAvailableForTesting()
```

**Value**

Logical TRUE or FALSE

# Index

.BrowserViz (BrowserViz-class), 4

addMessageHandler, 2

browserResponseReady  
(browserResponseReady, BrowserViz-method), 3

browserResponseReady, BrowserViz-method, 3

BrowserViz, 5

BrowserViz (BrowserViz constructor), 3

BrowserViz constructor, 3

BrowserViz-class, 4

closeWebSocket  
(closeWebSocket, BrowserViz-method), 5

closeWebSocket, BrowserViz-method, 5

dispatchMessage, 5

displayHTMLInDiv  
(displayHTMLInDiv, BrowserViz-method), 6

displayHTMLInDiv, BrowserViz-method, 6

fromJSON, 6

getBrowserInfo  
(getBrowserInfo, BrowserViz-method), 7

getBrowserInfo, BrowserViz-method, 7

getBrowserResponse  
(getBrowserResponse, BrowserViz-method), 7

getBrowserResponse, BrowserViz-method, 7

getBrowserWindowSize  
(getBrowserWindowSize, BrowserViz-method), 8

getBrowserWindowSize, BrowserViz-method, 8

getBrowserWindowTitle  
(getBrowserWindowTitle, BrowserViz-method), 8

getBrowserWindowTitle, BrowserViz-method, 8

handleResponse, 9

port (port, BrowserViz-method), 9

port, BrowserViz-method, 9

ready (ready, BrowserViz-method), 10

ready, BrowserViz-method, 10

roundTripTest  
(roundTripTest, BrowserViz-method), 10

roundTripTest, BrowserViz-method, 10

send (send, BrowserViz-method), 11

send, BrowserViz-method, 11

setBrowserWindowTitle  
(setBrowserWindowTitle, BrowserViz-method), 11

setBrowserWindowTitle, BrowserViz-method, 11

show (show, BrowserViz-method), 12

show, BrowserViz-method, 12

toJSON, 12

wait (wait, BrowserViz-method), 13

wait, BrowserViz-method, 13

webBrowserAvailableForTesting, 13