

Package ‘BrowserViz’

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Type Package

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

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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>

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

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

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

<code>uri</code>	The http location at which this modest webserver runs
<code>port</code>	An integer port number for the http connection
<code>websocketConnection</code>	An environment managed by the httpuv library on our behalf
<code>quiet</code>	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`

`dispatchMessage`

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

Description

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

Usage

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

Arguments

`ws` a websocket connectin

`msg` the JSON-encoded message from the browser

`quiet` 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 BrowserViz
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

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

obj	An object of class BrowserViz
newTitle	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

 toJSONN

Transform an R data structure into JSON

Description

The semantics of toJSONN 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

```
toJSONN(..., 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

```
toJSONN(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

obj	An object of class BrowserViz
msec	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

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