

ZeroMQ Toolkit 1.5.1

ZeroMQ bindings for GNU Octave.

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To download a copy of the GNU Octave zeromq package, please visit <http://octave.sourceforge.net/zeromq/>.

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1 Installing and loading

The ZeroMQ toolkit must be installed and then loaded to be used.

It can be installed in GNU Octave directly from octave-forge, or can be installed in an off-line mode via a downloaded tarball.

The toolkit has a dependency on the zeromq library (<https://zeromq.org>), so it must be installed in order to successfully install the ZeroMQ toolkit.

For fedora: `yum install zeromq-devel`

For ubuntu: `apt install libzmq-dev`

The toolkit must be then be loaded once per each GNU Octave session in order to use its functionality.

1.1 Online Direct install

With an internet connection available, the ZeroMQ package can be installed from octave-forge using the following command within GNU Octave:

```
pkg install -forge zeromq
```

The latest released version of the toolkit will be downloaded and installed.

1.2 Off-line install

With the ZeroMQ toolkit package already downloaded, and in the current directory when running GNU Octave, the package can be installed using the following command within GNU Octave:

```
pkg install zeromq-1.5.1.tar.gz
```

1.3 Loading

Regardless of the method of installing the ZeroMQ toolkit, in order to use its functions, the toolkit must be loaded using the pkg load command:

```
pkg load zeromq
```

The toolkit must be loaded on each GNU Octave session.

2 Basic Usage Overview

The usage is very close to the ZeroMQ library C language bindings for the socket creation and manipulation with the exception of creating a zeromq context, which is automatically done in the bindings internals.

For example, a basic client that does a request / reply from a server on port local port 5555 (available as `zmq_example1.m`):

```
%% Create socket and connect to server
requester = zmq_socket (ZMQ_REQ);
zmq_connect (requester, "tcp://localhost:5555");

%% send some data
zmq_send (requester, uint8("Hello"), 5, 0);
%% try to read up to 10 bytes of reply data.
received = zmq_recv (requester, 10, 0);

zmq_close (requester);
```

An overview of the package can be displayed by running `help zeromq`

Help for each function can be displayed by `help thefunctionname`

ie:

```
help iszmq
```

3 Examples

There are several examples that come with the toolkit.

View example code using `edit examples/example_name`

ie:

```
edit examples/zmq_example1
```

3.1 Example1

Simple client REQ socket example that attempts to connect to a server and send a hello command and get back the response.

```
edit examples/zmq_example1
```

3.2 Example2

Simple server REP socket example that creates the server that the client from example 1 will connect to and responds back to client 'requests'

```
edit examples/zmq_example2
```

3.3 Example3

Simple server PUB socket example that creates 'weather' server sends weather updates for random zip codes.

```
edit examples/zmq_example3
```

3.4 Example4

Simple client SUB socket example that creates client that connects to the 'weather' server and subscribes for weather updates from zip-code 10001.

```
edit examples/zmq_example4
```

3.5 Example5

Simple client STREAM socket example that creates client that connects to octave.org and posts HEAD request.

```
edit examples/zmq_example5
```


4 Function Reference

The functions currently available in the ZeroMQ toolkit are described below;

4.1 ZeroMQ functions

4.1.1 iszmq

`tf = iszmq (h)` [Function File]

Determine whether *h* is a zeromq socket object.

if *h* is a zeromq socket object, returns true, otherwise returns false.

See also: zmq-socket.

4.1.2 zmq_bind

`status = zmq_bind (sock, endpoint)` [Loadable Function]

Bind a zeromq socket to a endpoint.

sock - the socket to bind.

endpoint - the endpoint string.

On success, bind will return a *status* of true

See also: zmq-socket .

4.1.3 zmq_close

`zmq_close (sock)` [Loadable Function]

Close a zeromq socket.

sock - the socket type to close.

See also: zmq-socket .

4.1.4 zmq_connect

`status = zmq_connect (sock, endpoint)` [Loadable Function]

Connect a zeromq socket to a endpoint.

sock - the socket to connect.

endpoint - the endpoint string.

On success, connect will return a *status* of true

See also: zmq-socket.

4.1.5 zmq_curve_keypair

`[publickey, privatekey] = zmq_curve_keypair ()` [Loadable Function]

Generate a random private/public keypair

publickey is a string that is the encoded public key

privatekey is a string that is the encoded private key

See also: zmq-z85-encode .

4.1.6 zmq_curve_public

publickey = *zmq_curve_public* (**privatekey**) [Loadable Function]

Derive the public key from a private key

privatekey is a string that is the encoded private key. It must be 40 characters in length

publickey is a string that is the encoded public key

See also: *zmq_curve_keypair*.

4.1.7 zmq_disconnect

status = *zmq_disconnect* (**sock**, **endpoint**) [Loadable Function]

Disconnect a zeromq socket from an endpoint.

sock - the socket to disconnect from.

endpoint - a previously connected endpoint string to disconnect.

On success, disconnect will return a *status* of true

See also: *zmq_socket*, *zmq_connect*.

4.1.8 zmq_errno

errornum = *zmq_errno* () [Loadable Function]

Get the value of errno from zeromq.

errornum is the errno value of the calling thread.

4.1.9 zmq_getsockopt

value = *zmq_getsockopt* (**sock**, **optionid**) [Loadable Function]

Get the current value of an option.

sock - the socket to connect.

optionid - the setsockopt option to set.

value - the value set for the option, or [].

Valid *optionids* are:

ZMQ_RCVMORE

Flag for whether a message has been split into multiple messages. The return value will be either 0 or 1.

ZMQ_TYPE Socket type for zeromq socket created with *zmq_socket*. Valid types are the same as the socket type value specified with *zmq_socket*.

ZMQ_EVENTS

Get the event state of zeromq socket. The returned value is a bit mask that may contain the following set values:

- **ZMQ_POLLIN** set when at least one message available to read and *zmq_recv* will not block.
- **ZMQ_POLLOUT** set when at least one message can be written without *zmq_send* blocking.

ZMQ_IDENTITY

Get the socket identity value

ZMQ_LAST_ENDPOINT

Get the last endpoint the socket was connected to

ZMQ_CONNECT_TIMEOUT
Get the connect timeout value

ZMQ SOCKS_PROXY
Get the socks5 proxy value (string)

ZMQ_CURVE_SERVER
Get whether socket is a curve server (1) or not (0)

ZMQ_CURVE_PRIVATEKEY
Get a the curve socket private key (string)

ZMQ_CURVE_PUBLICKEY
Get a the curve socket public key (string)

ZMQ_CURVE_SERVERKEY
Get a the curve socket public key (string)

ZMQ_PLAIN_SERVER
Get whether socket server will use plain authentication (1) or not (0)

ZMQ_PLAIN_USERNAME
Get the plain socket username (string)

ZMQ_PLAIN_PASSWORD
Get the plain socket password (string)

ZMQ_GSSAPI_SERVER
Get whether socket server will use gssapi authentication (1) or not (0)

ZMQ_GSSAPI_PLAINTEXT
Get whether socket will encrypt gssapi authentication (1) or not (0)

ZMQ_GSSAPI_PRINCIPAL
Get the name of the gssapi principal (string)

ZMQ_GSSAPI_SERVICE_PRINCIPAL
Get the name of the gssapi service principal (string)

ZMQ_MECHANISM
Get the security mechanism (ZMQ_NULL, ZMQ_PLAIN, ZMQ_CURVE, ZMQ_GSSAPI)

See also: `zmq-socket`, `zmq-setsockopt`.

4.1.10 `zmq_has`

`yesno = zmq_has (feature)` [Loadable Function]

Check if the `zmq` library supports a given feature.

feature is the name of feature to check.

Currently known features are:

'ipc'	library supports the ipc:// protocol
'pgm'	library supports the pgm:// protocol
'tipc'	library supports the tipc:// protocol
'norm'	library supports the norm:// protocol
'curve'	library supports the CURVE security mechanism
'gssapi'	library supports the GSSAPI security mechanism
'draft'	library was built with the draft api

Returns the *yesno*, set to true if the feature is available, otherwise false.

4.1.11 zmq_poll

havedata = *zmq_poll* (*sock*, *timeout*) [Loadable Function]

indexlist = *zmq_poll* (*socklist*, *timeout*) [Loadable Function]

Wait up to *timeout* time for received data on socket.

sock - the socket to wait on.

socklist - the array of sockets to wait on.

timeout - timeout time in milliseconds. A value of 0 will return without waiting. A value of -1 will wait until there is data.

havedata - value of 1 if have data.

indexlist - cell array of indexes to sockets that have data.

See also: *zmq_socket*.

4.1.12 zmq_recv

data = *zmq_recv* (*sock*, *len*[, *flags*]) [Loadable Function]

Attempt to receive up to *len* bytes of data from zeromq socket.

sock - the socket to receive from.

len - number of bytes to read.

flags - optional flags to pass to *recv*

The read data is returned as *data* in an uint8 array.

See also: *zmq_socket*.

4.1.13 zmq_send

count = *zmq_send* (*sock*, *data*[, *flags*]) [Loadable Function]

Attempt to send to *data* bytes of data to zeromq socket.

sock - the socket to receive from.

data - data to send - either string or uint8 type.

flags - optional flags to pass to *send*

Returns *count* of bytes written to socket, or -1 on error.

See also: *zmq_socket*.

4.1.14 zmq_setsockopt

status = *zmq_setsockopt* (*sock*, *optionid*, *value*) [Loadable Function]

Set a socket option on a zeromq socket.

sock - the socket to connect.

optionid - the *setsockopt* option to set.

value - the value to set.

On success, *setsockopt* will return *status* of true

Known valid *optionids* are:

ZMQ_SUBSCRIBE

Subscribe to incoming messages matching the value. The value is either a string or a uint8 array that must match the start of any incoming message

ZMQ_UNSUBSCRIBE

Unsubscribe from incoming messages

<code>ZMQ_CONNECT_TIMEOUT</code>	Set timeout for connect calls
<code>ZMQ_IDENTITY</code>	Set the identity of a socket (string or uint8 data)
<code>ZMQ SOCKS_PROXY</code>	Set the socks5 proxy value (string)
<code>ZMQ_CURVE_SERVER</code>	Set whether socket is a curve server (1) or not (0)
<code>ZMQ_CURVE_PRIVATEKEY</code>	Set the curve socket private key (string)
<code>ZMQ_CURVE_PUBLICKEY</code>	Set the curve socket public key (string)
<code>ZMQ_CURVE_SERVERKEY</code>	Set the curve socket public key (string)
<code>ZMQ_PLAIN_SERVER</code>	Set whether socket server will use plain authentication (1) or not (0)
<code>ZMQ_PLAIN_USERNAME</code>	Set the plain socket username (string)
<code>ZMQ_PLAIN_PASSWORD</code>	Set the plain socket password (string)
<code>ZMQ_GSSAPI_SERVER</code>	Set whether socket server will use gssapi authentication (1) or not (0)
<code>ZMQ_GSSAPI_PLAINTEXT</code>	Set whether socket will encrypt gssapi authentication (1) or not (0)
<code>ZMQ_GSSAPI_PRINCIPAL</code>	Set the name of the gssapi principal (string)
<code>ZMQ_GSSAPI_SERVICE_PRINCIPAL</code>	Set the name of the gssapi service principal (string)
See also:	<code>zmq_getsockopt</code> , <code>ZMQ_SUBSCRIBE</code> , <code>ZMQ_UNSUBSCRIBE</code> , <code>ZMQ_CONNECT_TIMEOUT</code> .

4.1.15 `zmq_socket`

<code>sock = zmq_socket (type)</code>	[Loadable Function]
Create a zeromq socket.	
<i>type</i> - the socket type to create.	
Supported socket types are:	
<code>ZMQ_PUB</code>	Publish socket
<code>ZMQ_SUB</code>	Subscribe socket
<code>ZMQ_REQ</code>	Request socket
<code>ZMQ_REP</code>	Reply socket
<code>ZMQ_PULL</code>	Pull socket
<code>ZMQ_PUSH</code>	Push socket

ZMQ_PAIR Pair socket
 ZMQ_DEALER Dealer socket
 ZMQ_ROUTER Router socket
 ZMQ_XPUB Publish socket
 ZMQ_XSUB Subscribe socket
 ZMQ_STREAM Stream socket

`zmq-socket()` returns an instance of *octave_zeromq-socket* class as the result.

See also: ZMQ-PUB, ZMQ-SUB, ZMQ-PUSH, ZMQ-PULL, ZMQ-REQ, ZMQ-REP, ZMQ-PAIR, ZMQ-DEALER, ZMQ-ROUTER, ZMQ-XPUB, ZMQ-XSUB, ZMQ-STREAM.

4.1.16 `zmq_strerror`

`errorstr = zmq_strerror ()` [Loadable Function]
 Get the last error from zeromq.
errorstr is a string representation of the last error

4.1.17 `zmq_unbind`

`status = zmq_unbind (sock, endpoint)` [Loadable Function]
 Unbind a previously bound zeromq socket from a endpoint.
sock - the socket to unbind.
endpoint - the endpoint string to unbind.
 On success, unbind will return a *status* of true
See also: `zmq-socket`, `zmq_bind` .

4.1.18 `zmq_version`

`[major, minor, patch] = zmq-version ()` [Loadable Function]
 Get the ZeroMQ library version.
 Returns the *major*, *minor* and *patch* level version of the ZeroMQ library.

4.1.19 `zmq_z85_decode`

`data = zmq_z85_decode (instr)` [Loadable Function]
 Decode a z85 encoded string to a binary key.
instr is a string encoded data
data is uint8 decoded data

4.1.20 `zmq_z85_encode`

`dest = zmq_z85_encode (data)` [Loadable Function]
 Encode a binary key as Z85 printable text.
data is uint8 data that must have a size divisible by 4.
dest is a string encoded data

4.2 ZeroMQ socket type constants

4.2.1 ZMQ_DEALER

ZMQ_DEALER [Command]

Constant for dealer socket type.

See also: zmq_socket.

4.2.2 ZMQ_PAIR

ZMQ_PAIR [Command]

Constant for pair socket type.

See also: zmq_socket.

4.2.3 ZMQ_PUB

ZMQ_PUB [Command]

Constant for publisher type.

See also: zmq_socket.

4.2.4 ZMQ_PULL

ZMQ_PULL [Command]

Constant for pull socket type.

See also: zmq_socket.

4.2.5 ZMQ_PUSH

ZMQ_PUSH [Command]

Constant for push socket type.

See also: zmq_socket.

4.2.6 ZMQ_REP

ZMQ_REP [Command]

Constant for reply socket type.

See also: zmq_socket.

4.2.7 ZMQ_REQ

ZMQ_REQ [Command]

Constant for request socket type.

See also: zmq_socket.

4.2.8 ZMQ_ROUTER

ZMQ_ROUTER [Command]

Constant for router socket type.

See also: zmq_socket.

4.2.9 ZMQ_STREAM

ZMQ_STREAM [Command]

Constant for stream socket type.

See also: zmq-socket.

4.2.10 ZMQ_SUB

ZMQ_SUB [Command]

Constant for subscriber type.

See also: zmq-socket.

4.2.11 ZMQ_XPUB

ZMQ_XPUB [Command]

Constant for publisher type.

See also: zmq-socket.

4.2.12 ZMQ_XSUB

ZMQ_XSUB [Command]

Constant for subscriber type.

See also: zmq-socket.

4.3 ZeroMQ get/setsockopt constants

4.3.1 ZMQ_CONNECT_TIMEOUT

ZMQ_CONNECT_TIMEOUT [Command]

Constant for get/setsockopt connect timeout value

See also: zmq-getsockopt, zmq-setsockopt.

4.3.2 ZMQ_CURVE_PUBLICKEY

ZMQ_CURVE_PUBLICKEY [Command]

Constant for getsockopt and setsockopt CURVE_PUBLICKEY value option

See also: zmq-getsockopt, zmq-setsockopt.

4.3.3 ZMQ_CURVE_SECRETKEY

ZMQ_CURVE_PRIVATEKEY [Command]

Constant for getsockopt and setsockopt CURVE_PRIVATEKEY value option

See also: zmq-getsockopt, zmq-setsockopt.

4.3.4 ZMQ_CURVE_SERVER

ZMQ_CURVE_SERVER [Command]

Constant for getsockopt and setsockopt CURVE_SERVER value option

See also: zmq-getsockopt, zmq-setsockopt.

4.3.5 ZMQ_CURVE_SERVERKEY

ZMQ_CURVE_SERVERKEY [Command]

Constant for getsockopt and setsockopt CURVE_SERVERKEY value option

See also: zmq_getsockopt, zmq_setsockopt.

4.3.6 ZMQ_EVENTS

ZMQ_EVENTS [Command]

Constant for getsockopt EVENTS value option

See also: zmq_getsockopt.

4.3.7 ZMQ_GSSAPI_PLAINTEXT

ZMQ_GSSAPI_PLAINTEXT [Command]

Constant for getsockopt and setsockopt GSSAPI_PLAINTEXT value option

See also: zmq_getsockopt, zmq_setsockopt.

4.3.8 ZMQ_GSSAPI_PRINCIPAL

ZMQ_GSSAPI_PRINCIPAL [Command]

Constant for getsockopt and setsockopt GSSAPI_PRINCIPAL value option

See also: zmq_getsockopt, zmq_setsockopt.

4.3.9 ZMQ_GSSAPI_SERVER

ZMQ_GSSAPI_SERVER [Command]

Constant for getsockopt and setsockopt GSSAPI_SERVER value option

See also: zmq_getsockopt, zmq_setsockopt.

4.3.10 ZMQ_GSSAPI_SERVICE_PRINCIPAL

ZMQ_GSSAPI_SERVICE_PRINCIPAL [Command]

Constant for getsockopt and setsockopt GSSAPI_SERVICE_PRINCIPAL value option

See also: zmq_getsockopt, zmq_setsockopt.

4.3.11 ZMQ_IDENTITY

ZMQ_IDENTITY [Command]

Constant for getsockopt and setsockopt IDENTITY value option

See also: zmq_getsockopt, zmq_setsockopt.

4.3.12 ZMQ_LAST_ENDPOINT

ZMQ_LAST_ENDPOINT [Command]

Constant for getsockopt last endpoint value option

See also: zmq_getsockopt.

4.3.13 ZMQ_MECHANISM

ZMQ_MECHANISM [Command]

Constant for getsockopt and setsockopt MECHANISM value option

See also: zmq_getsockopt, zmq_setsockopt.

4.3.14 ZMQ_PLAIN_PASSWORD

ZMQ_PLAIN_PASSWORD [Command]

Constant for getsockopt and setsockopt PLAIN_PASSWORD value option

See also: zmq-getsockopt, zmq-setsockopt.

4.3.15 ZMQ_PLAIN_SERVER

ZMQ_PLAIN_SERVER [Command]

Constant for getsockopt and setsockopt PLAIN_SERVER value option

See also: zmq-getsockopt, zmq-setsockopt.

4.3.16 ZMQ_PLAIN_USERNAME

ZMQ_PLAIN_USERNAME [Command]

Constant for getsockopt and setsockopt PLAIN_USERNAME value option

See also: zmq-getsockopt, zmq-setsockopt.

4.3.17 ZMQ_RCVMORE

ZMQ_RCVMORE [Command]

Constant for getsockopt RCVMORE value option

See also: zmq-getsockopt.

4.3.18 ZMQ SOCKS_PROXY

ZMQ SOCKS_PROXY [Command]

Constant for getsockopt and setsockopt SOCKS_PROXY value option

See also: zmq-getsockopt, zmq-setsockopt.

4.3.19 ZMQ_SUBSCRIBE

ZMQ_SUBSCRIBE [Command]

Constant for setsockopt subscribe option

See also: zmq-setsockopt, ZMQ_UNSUBSCRIBE.

4.3.20 ZMQ_TYPE

ZMQ_TYPE [Command]

Constant for getsockopt TYPE value option

See also: zmq-getsockopt.

4.3.21 ZMQ_UNSUBSCRIBE

ZMQ_UNSUBSCRIBE [Command]

Constant for setsockopt unsubscribe option

See also: zmq-setsockopt, ZMQ_SUBSCRIBE.

4.4 ZeroMQ ZMQ_EVENTS flags

4.4.1 ZMQ_POLLIN

ZMQ_POLLIN [Command]
Constant bitmask value for getsockopt EVENTS value option
See also: zmq-getsockopt.

4.4.2 ZMQ_POLLOUT

ZMQ_POLLOUT [Command]
Constant bitmask value for getsockopt EVENTS value option
See also: zmq-getsockopt.

4.5 ZeroMQ receive send options

4.5.1 ZMQ_DONTWAIT

ZMQ_DONTWAIT [Command]
Constant for recv flag DONTWAIT
See also: zmq-recv.

4.5.2 ZMQ_SNDMORE

ZMQ_SNDMORE [Command]
Constant for send flag SNDMORE
See also: zmq-send.

4.6 ZeroMQ ZMQ_MECHANISM values

4.6.1 ZMQ_CURVE

ZMQ_CURVE [Command]
Constant value for getsockopt MECHANISM value option
See also: zmq-getsockopt.

4.6.2 ZMQ_GSSAPI

ZMQ_GSSAPI [Command]
Constant value for getsockopt MECHANISM value option
See also: zmq-getsockopt.

4.6.3 ZMQ_NULL

ZMQ_NULL [Command]
Constant value for getsockopt MECHANISM value option
See also: zmq-getsockopt.

4.6.4 ZMQ_PLAIN

ZMQ_PLAIN [Command]
Constant value for getsockopt MECHANISM value option
See also: zmq-getsockopt.

Appendix A GNU General Public License

Version 3, 29 June 2007

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