# ZeroMQ Toolkit 1.5.3

ZeroMQ bindings for GNU Octave.

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## Distribution

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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-1.5.3.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_connect* (*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 *optionid*s 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 is 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 *optionid*s 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

`ZMQ_CONNECT_TIMEOUT`
: Set timeout for connect calls

`ZMQ_IDENTITY`
: Set the identity of a socket (string or uint8 data)

`ZMQ_SOCKS_PROXY`
: Set the socks5 proxy value (string)

`ZMQ_CURVE_SERVER`
: Set whether socket is a curve server (1) or not (0)

`ZMQ_CURVE_PRIVATEKEY`
: Set the curve socket private key (string)

`ZMQ_CURVE_PUBLICKEY`
: Set the curve socket public key (string)

`ZMQ_CURVE_SERVERKEY`
: Set the curve socket public key (string)

`ZMQ_PLAIN_SERVER`
: Set whether socket server will use plain authentication (1) or not (0)

`ZMQ_PLAIN_USERNAME`
: Set the plain socket username (string)

`ZMQ_PLAIN_PASSWORD`
: Set the plain socket password (string)

`ZMQ_GSSAPI_SERVER`
: Set whether socket server will use gssapi authentication (1) or not (0)

`ZMQ_GSSAPI_PLAINTEXT`
: Set whether socket will encrypt gssapi authentication (1) or not (0)

`ZMQ_GSSAPI_PRINCIPAL`
: Set the name of the gssapi principal (string)

`ZMQ_GSSAPI_SERVICE_PRINCIPAL`
: Set the name of the gssapi service principal (string)

**See also:** zmq_getsockopt, ZMQ_SUBSCRIBE, ZMQ_UNSUBSCRIBE, ZMQ_CONNECT_TIMEOUT.

### 4.1.15 zmq_socket

*sock* = `zmq_socket` (*type*) [Loadable Function]

Create a zeromq socket.

*type* - the socket type to create.

Supported socket types are:

`ZMQ_PUB` Publish socket

`ZMQ_SUB` Subscribe socket

`ZMQ_REQ` Request socket

`ZMQ_REP` Reply socket

`ZMQ_PULL` Pull socket

`ZMQ_PUSH` 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] =` [Loadable Function]

zmq_version ()

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_IDENITY` [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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