********Draft********
ZeroMQ
04/12/20
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ZeroMQ requires libsodium

NaCl (pronounced "salt") is an abbreviation for "Networking and Cryptography library", a public domain "...high-speed software library for network communication, encryption, decryption, signatures, etc".[2]

NaCl was created by the mathematician and programmer Daniel J. Bernstein who is best known for the creation of qmail and Curve25519.

Compile, link, and installed libsodium.

The first installation used instructions from

https://github.com/MonsieurV/ZeroMQ-RPi

Revised build

Question why verison libsodium-1.0.3 This version was last updated
Latest commit 63dd054 on May 9, 2015

stable Latest commit 5ce5f2d 5 days ago

https://www.privateinternetaccess.com/blog/libsodium-v1-0-12-and-v1-0-13-security-assessment/#section_3

git clone https://github.com/jedisct1/libsodium.git 1.0.18 instead of using

wget https://github.com/jedisct1/libsodium/releases/download/1.0.3/libsodium-1.0.3.tar.gz

master branch

commit 05e02ecb41d4749296d8fad77dfc076977e0584d (HEAD -> master, origin/master, origin/HEAD)
Author: Frank Denis <github@pureftpd.org>
Date: Fri Apr 10 09:50:51 2020 +0200

Try WASI-SDK-10

stable branch

commit 5ce5f2dce6d97aec807c997120966c93eddc46f3 (HEAD -> stable, origin/stable, origin/next)
Author: Frank Denis <github@pureftpd.org>
Date: Tue Apr 7 11:00:58 2020 +0200

Apparently, wasi-sdk-9 only works on Ubuntu 18.04

cd libsodium

git checkout stable

autogen now required before running configure. This feature appears to merit additional research prehaps to be included in my projects.

./autogen.sh

./configure

The master branch of verison libsodium-1.0.18 gets many warnings

warning: #warning * This is unstable, untested, development code. [-Wcpp]**
 # warning * This is unstable, untested, development code.**

warning: #warning It might be totally insecure. [-Wcpp]
 # warning It might be totally insecure.

warning: #warning Do not use this except if you are planning to contribute code. [-Wcpp]
 # warning Do not use this except if you are planning to contribute code.

make

Rebuilt libzmq

ZeroMQ built against Sodium library 1.0.18 stable

git clone https://github.com/zeromq/libzmq.git

cd libzmq

commit 7b1fef28f91b4fc588792480668c83831c8b5fbb (HEAD -> master, origin/master, origin/HEAD)
Author: Gudmundur Adalsteinsson <ofpgummi@yahoo.com>
Date: Thu Apr 9 22:59:43 2020 +0000

Problem: boilerplate when init msg from data copy (#3860)

*** Problem: boilerplate when init msg from data copy**

Solution: Add zmq_msg_init_buffer to construct
a message by copying memory from buffer.

autogen now required before running configure. This feature appears to merit additional research prehaps to be included in my projects.

./autogen.sh

```
./configure

make

sudo make install
Making install in doc
make[1]: Entering directory '/home/devel/tmp/libzmq/doc'
make[2]: Entering directory '/home/devel/tmp/libzmq/doc'
make[2]: Nothing to be done for 'install-exec-am'.
make[2]: Leaving directory '/home/devel/tmp/libzmq/doc'
make[1]: Leaving directory '/home/devel/tmp/libzmq/doc'
make[1]: Entering directory '/home/devel/tmp/libzmq'
make[2]: Entering directory '/home/devel/tmp/libzmq'
 /bin/mkdir -p '/usr/local/lib'
 /bin/bash ./libtool   --mode=install /usr/bin/install -c   src/libzmq.la '/usr/local/lib'
libtool: install: /usr/bin/install -c src/.libs/libzmq.so.5.2.3 /usr/local/lib/libzmq.so.5.2.3
libtool: install: (cd /usr/local/lib && { ln -s -f libzmq.so.5.2.3 libzmq.so.5 || { rm -f libzmq.so.5
&& ln -s libzmq.so.5.2.3 libzmq.so.5; }; })
libtool: install: (cd /usr/local/lib && { ln -s -f libzmq.so.5.2.3 libzmq.so || { rm -f libzmq.so &&
ln -s libzmq.so.5.2.3 libzmq.so; }; })
libtool: install: /usr/bin/install -c src/.libs/libzmq.lai /usr/local/lib/libzmq.la
libtool: install: /usr/bin/install -c src/.libs/libzmq.a /usr/local/lib/libzmq.a
libtool: install: chmod 644 /usr/local/lib/libzmq.a
libtool: install: ranlib /usr/local/lib/libzmq.a
libtool: finish: PATH="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/sbin"
ldconfig -n /usr/local/lib
----------------------------------------------------------------------
Libraries have been installed in:
   /usr/local/lib

If you ever happen to want to link against installed libraries
in a given directory, LIBDIR, you must either use libtool, and
specify the full pathname of the library, or use the '-LLIBDIR'
flag during linking and do at least one of the following:
   - add LIBDIR to the 'LD_LIBRARY_PATH' environment variable
     during execution
   - add LIBDIR to the 'LD_RUN_PATH' environment variable
     during linking
   - use the '-Wl,-rpath -Wl,LIBDIR' linker flag
   - have your system administrator add LIBDIR to '/etc/ld.so.conf'

See any operating system documentation about shared libraries for
more information, such as the ld(1) and ld.so(8) manual pages.
----------------------------------------------------------------------
 /bin/mkdir -p '/usr/local/bin'
  /bin/bash ./libtool   --mode=install /usr/bin/install -c tools/curve_keygen '/usr/local/bin'
libtool: install: /usr/bin/install -c tools/.libs/curve_keygen /usr/local/bin/curve_keygen
 /bin/mkdir -p '/usr/local/include'
 /usr/bin/install -c -m 644 include/zmq.h include/zmq_utils.h '/usr/local/include'
 /bin/mkdir -p '/usr/local/lib/pkgconfig'
 /usr/bin/install -c -m 644 src/libzmq.pc '/usr/local/lib/pkgconfig'
make[2]: Leaving directory '/home/devel/tmp/libzmq'
```

make[1]: Leaving directory '/home/devel/tmp/libzmq'

Compile Example Code.

cd zeromq

cp ~/mosquittozeromq/src-ex-zeromq/* .

rm -f client helloserver *.o

gcc client.c -lzmq -o client

gcc helloserver.c -lzmq -o helloserver

~~wget https://github.com/jedisct1/libsodium/releases/download/1.0.3/libsodium-1.0.3.tar.gz~~
~~tar -zxvf libsodium-1.0.3.tar.gz~~
~~cd libsodium-1.0.3/~~
~~./configure~~
~~make~~
~~sudo make install~~

~~Compile, link, and installed libzmq~~

~~wget https://github.com/zeromq/libzmq/releases/download/v4.3.2/zeromq-4.3.2.tar.gz~~
~~tar -zxvf zeromq-4.3.2.tar.gz~~
~~cd zeromq-4.3.2/~~
~~./configure~~
~~make~~
~~sudo make install~~
~~sudo ldconfig~~

Hellowserver

```
File  Edit  View  Terminal  Tabs  Help
devel@mypi3-15:~/zeromq $ ./helloserver
Received Hello
Received Hello
Received Hello
Received Hello
Received Hello
Received Hello
Received Hello
Received Hello
Received Hello
Received Hello
```

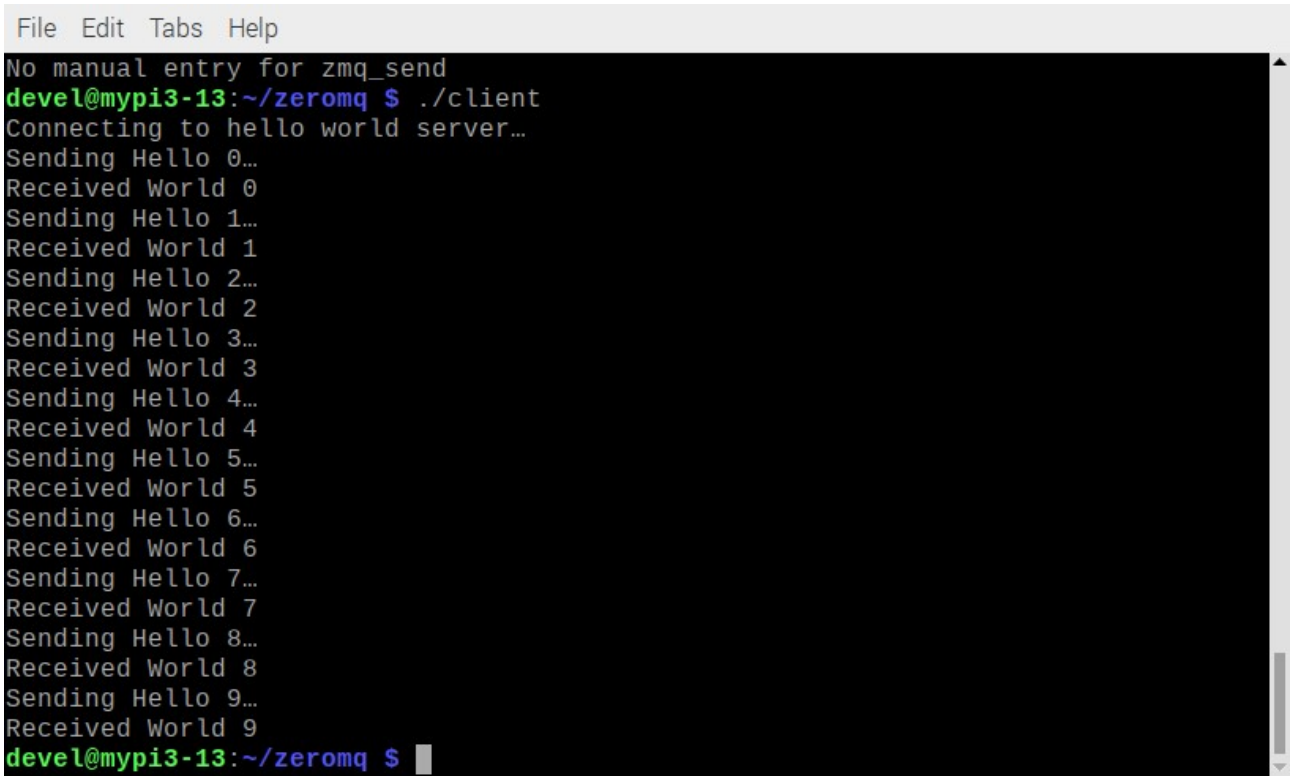
client

```
File  Edit  View  Terminal  Tabs  Help
devel@mypi3-15:~/zeromq $ ./client
Connecting to hello world server…
Sending Hello 0…
Received World 0
Sending Hello 1…
Received World 1
Sending Hello 2…
Received World 2
Sending Hello 3…
Received World 3
Sending Hello 4…
Received World 4
Sending Hello 5…
Received World 5
Sending Hello 6…
Received World 6
Sending Hello 7…
Received World 7
Sending Hello 8…
Received World 8
Sending Hello 9…
Received World 9
devel@mypi3-15:~/zeromq $
```

Made a minior change in the cllient.c

```
devel@mypi3-15:~/mosquittozeromq/src-ex-zeromq $ git diff
diff --git a/doc/zeromq.odt b/doc/zeromq.odt
index 5ad5d0c..e8b095a 100644
Binary files a/doc/zeromq.odt and b/doc/zeromq.odt differ
diff --git a/src-ex-zeromq/client.c b/src-ex-zeromq/client.c
index 6d470f8..a226004 100644
--- a/src-ex-zeromq/client.c
+++ b/src-ex-zeromq/client.c
@@ -9,7 +9,7 @@ int main (void)
     printf ("Connecting to hello world server…\n");
     void *context = zmq_ctx_new ();
     void *requester = zmq_socket (context, ZMQ_REQ);
-    zmq_connect (requester, "tcp://localhost:5555");
+    zmq_connect (requester, "tcp://mypi3-15:5555");

     int request_nbr;
     for (request_nbr = 0; request_nbr != 10; request_nbr++) {
```



Ultibo_Projects/gpsudpserver/RPi2/InitUnitGPS.pas

SendDataTo('192.168.1.215',8888,PChar(MessageText),Length(MessageText));

zmq_connect (requester, "tcp://mypi3-15:5555");

zmq_send (requester, "Hello", 5, 0);
int zmq_send (void *socket, void *buf, size_t len, int flags);