

## Installation of required software

Thursday, October 6, 2016 4:02 PM

OF-CONFIG requires certain toolchain to be installed along with some libraries.

Requires Open-Vswitch 2.3.1 which is not compatible with Ubuntu 14. and later versions.  
Nevertheless, trying to get it working with OVS 2.6.

**Libnetconf needs to be installed as per the OF-CONFIG requirement.**

**Instructions are as below:**

<https://github.com/CESNET/libnetconf/blob/0.10.x/INSTALL>

Please note, that master branch of our git repository is supposed to be an unstable branch. For stable code, please switch to the one of the version branches such as 0.10.x.

Prerequisites  
\*\*\*\*\*

You will need to have installed the following software. Header files (-dev or -devel packages) of the following libraries are also needed to compile libnetconf.

Libxml2 and libxml2-dev are installed on Ubuntu.  
Similarly, installed libssh and libssh-dev packages.

DBus- libdbus version 1.0.0 or greater  
libdbus-1-3 was already available on my system, so installed the development package only.  
i.e. libdbus-1-dev

Make sure that libssl-dev is also installed along with the openssl binaries.  
My UBUNTU installation had libssl1.0.0 on the system.

Besides libval (libval-bin) is required along with libval-dev.

libval-bin: DNSSEC validation library (programs)  
Installed as per the package information from Ubuntu.

NOTE: There exists a libval14 shared library also. Need to check if libnetconf compiles with what I've installed.

<http://askubuntu.com/questions/625523/libtool-installed-but-not-on-path-after-installation>  
**had issues with libtool.. So, installed libtool-bin after I referred to some link given above.**

**Libssh2 had to be installed on top of libssh2-1 and libssh2-1-dev were installed.**

**Issue was still not resolved, so followed this link.**

<https://anukulverma.wordpress.com/2016/03/26/configure-error-missing-libssh-0-6-4-libnetconf-installation/>

configure: error: Missing libssh  
(>=0.6.4) – libnetconf installation

If system is not supporting libssh version >=0.6.4, we have to install it from source code

Prerequisites :

Install following packages :

```
yum install libtool libtool-ltdl-devel libxml2-devel libxslt-devel libxslt-python  
libcurl-devel
```

Download and install libssh latest package:

```
wget https://red.libssh.org/attachments/download/195/libssh-0.7.3.tar.xz  
unxz libssh-0.7.3.tar.xz  
tar -xvf libssh-0.7.3.tar  
cd libssh-0.7.3/  
mkdir build  
cd build/  
cmake ..  
make  
make install
```

This is what I had to run eventually to compile the libssh code (latest of course).

**sudo apt-get install libltdl-dev libxml2-dev libxslt1-dev python-libxslt1 libcurl4-openssl-dev**

And rest everything was fine.

Now compiling the libnetconf.

Compilation was successful and I saw that the library was installed under /usr/local/lib

PYANG was installed as required following the same steps as in the document.

OF-CONFIG compilation starts here.

=====

Path to OVS Source package was supplied to ./configure the OF-CONFIG.

But, the ./configure script failed for the first time saying sshd was not found.

Basically, I just installed the ssh server by running sudo apt-get install ssh and then ./configure worked for OF-CONFIG.

## NOTE: Inctool was not generated as xsltproc was missing.

Using a different folder called monitoring-model to auto-generate the files. NOT REQUIRED. I FOLLOWED THIS APPROACH.

pyang -f yin /home/shrikanth/monitoring-model/monitoring-model.yang

Use the below command to auto generate files.

Inctool --model /home/shrikanth/monitoring-model/monitoring-model.yang transapi --paths /home/shrikanth/monitoring-model/paths

monitoring-model.yang \*.yin, \*\_gdefs-config.rng, \*-config.rng and \*-schematron.xml files were generated by Inctool.

Copied the monitoring-model-transapi.c file into server directory. (notice that I appended transapi to the generated file)

Modified the makefile.am in server directory to contain this new filename as well.

**So, all fine until now. I need to figure out as to how the capabilities are published to the client.**

*Just started the OVSDb and OVS as below:*

```
sudo ovsdb-server --remote=punix:/usr/local/var/run/openvswitch/db.sock --remote=db:Open_vSwitch,Open_vSwitch,manager_options --pidfile --detach
sudo ovs-vsctl --no-wait init
sudo ovs-vswitchd --pidfile --detach
sudo ovs-vswitchd --version
```

Now start the OF-CONFIG server with db option to connect to the OVSDb and see how it works.

**This is to compile OF-CONFIG**

./configure --disable-dbus PKG\_CONFIG\_PATH=/usr/local/lib/pkgconfig/

From <<https://github.com/openvswitch/of-config/blob/master/INSTALL.md>>

Fixed all the issues in Server.c and could see that OF-CONFIG Server was successfully initialized.

**To start OF-CONFIG : of-server -f -v 3**

**Tried installing NETCONF-GUI, nothing really worked out.**

**So, installing netopeer client.**

Ran into the issue mentioned in this link (80)

80. Compiling cli

If you get this error:

```
checking for readline in -lreadline... no
configure: error: Missing libreadline
```

You might need to install ncurses (<http://ftp.gnu.org/pub/gnu/ncurses/>) and readline (<http://ftp.gnu.org/gnu/readline/>). If you already have these installed, you might need the dev version of the libraries.

```
sudo apt-get install libncurses5-dev
sudo apt-get install libreadline-dev
```

After each step you should do <sudo ldconfig>

Finally:

```
./configure
make
make install
```

Netopeer client is installed.

But not sure how to use OF-CONFIG server and netconf netopeer client.

Looking into this link <https://github.com/openvswitch/of-config/tree/master/netconf-tests>

```
$ netopeer-cli
netconf> connect --login username address
.... prompt for password if required by the remote host ...
netconf> get-config running
.... probably long output with data ...
```

Ideally the above commands should work. But, authentication is failing at the moment.

Ok, used **connect localhost** and I could login with my original username i.e. shrikanth

**netconf> status** command shows all the details of the server-client connection.

I could see monitoring-model URN appearing as a capability when this command is executed.

#### Next steps possible on netopeer client.

From <https://github.com/openvswitch/of-config/tree/master/netconf-tests>

We will be asked for configuration data (in XML) formed with respect to data model. Valid data is sent to OFC and configuration changes. There is of configuration of OVS.

### Testing:

Important observations:

Created a sample xml file sampletest\_state.xml and ran the command

Netconf > edit-config --config= path\_to\_sample\_test\_state.xml running (Got this command from one of the .sh files in the folder netconf.tests of OF-CONFIG repository).

My test xml file currently has <state-machine> element defined.

With this edit-config fails with some weird error. Error is present in gmail draft.

Then I removed this element and tested. **edit-config** was successful.

#### I need to check why it is failing.

OK, grouping was causing the issue. Read it from the RFC that grouping will not insert any node element by that name.

Now created

#### Installation of ZeroMQ:

To build Zero MQ just downloaded the POSIX tarball v4.1.5 and followed the procedure given in this link <http://zeromq.org/intro:get-the-software>

i.e. to run the following commands:

```
./autogen.sh && ./configure && make -j 4
make check && make install && sudo ldconfig
```

Note, there was already libzmq3 present on my system.. on top of the steps I followed earlier, I also installed the libzmq3-dev package using apt package manager. So, I am not

**Library linking failed at this point..** so, defining library links in configure.ac present with OF-CONFIG source code(top-level)

```
monitoring-model-transapi.c:(.text+0x6e): undefined reference to `zmq_close'
monitoring-model-transapi.c:(.text+0x80): undefined reference to `zmq_ctx_destroy'
collect2: error: ld returned 1 exit status
make[2]: * [ofc-server] Error 1
make[1]: * [all-recursive] Error 1
make: * [all] Error 2
```

ok to resolve the library linking, did not change anything in configure.ac, instead added to this line, required library name **ofc\_server\_LDADD=@OVS\_LIBS@ -lzmq** in makefile

ok I uninstalled the libzmq3 on my system and tried the compilation again. Looks like it picked the libzmq on /usr/local/lib and corresponding include files!! this partially solved header file "zhelpers.h"

Got this header file from <https://github.com/booksbyus/zguide/tree/master/examples>

Included that in the server makefile.am and everything seems to be fine as far as compilation is concerned.

All set to code the libzmq part of the code!!

### Installation on the switch:

Followed every step described in this link by me:

Trying installation from a USB stick.

Downloaded following stuff from ONL website

- [ONL-2.0.0-ONL-OS-DEB8-2016-09-04.1726-3f30495-AMD64.swi](#)
- [ONL-2.0.0-ONL-OS-DEB8-2016-09-04.1726-3f30495-AMD64-SWI-INSTALLER](#)
- [ONL-2.0.0-ONL-OS-DEB8-2016-09-04.1726-3f30495-AMD64-INSTALLED-INSTALLER](#)

As per the guidelines laid out by ONIE for installation through USB, renamed "ONL-2.0.0-ONL-OS-DEB8-2016-09-04.1726-3f30495-AMD64-INSTALLED-INSTALLER"

This is exactly what I did:

```
linux:~$ sudo mkdir /mnt/usb
```

```
linux:~$ sudo mount /dev/sdb1 /mnt/usb
```

```
linux:~$ sudo cp ONL-2.0.0-ONL-OS-DEB8-2016-09-04.1726-3f30495-AMD64-INSTALLED-INSTALLER /mnt/usb/onie-installer
linux:~$ sudo umount /mnt/usb
Additionally I also copied the other two files(below) in the same path i.e. /mnt/usb
```

- [ONL-2.0.0-ONL-OS-DEB8-2016-09-04.1726-3f30495-AMD64.swi](#)
- [ONL-2.0.0-ONL-OS-DEB8-2016-09-04.1726-3f30495-AMD64-SWI-INSTALLER](#)

Now, I see that the booting process has reached the loader phase.  
Can someone tell me the way forward. I don't see any exhaustive document that describes the process? Below is the output from the Switch.  
I basically get my head around the fundamentals of this process!! Appreciate any pointers.

```
EXT4-fs (sdc6): mounted filesystem with ordered data mode. Opts: (null)
EXT4-fs (sdc3): mounted filesystem with ordered data mode. Opts: (null)
EXT4-fs (sdc4): mounted filesystem with ordered data mode. Opts: (null)
*****
```

```
*
* Open Network Linux Loader
*
*      Version: ONL-2.0.0
*      Id: 2016-09-04.17:26-3f30495
*
*      Platform: x86-64-accton-as5712-54x-r0
*      ma1: cc:37:ab:62:f4:29
*
*****
```

```
[ boot-config ]
NETDEV=ma1
NETAUTO=dhcp
BOOTMODE=INSTALLED
SWI=images:latest
```

Press Control-C now to enter the interactive loader shell.

```
[ Starting Autoboot ]
[ Configuring Interfaces ]
udhcpc (v1.20.2) started
ADDRCONF(NETDEV_UP): ma1: link is not ready
Sending discover...
igb: ma1 NIC Link is Up 100 Mbps Half Duplex, Flow Control: None
ADDRCONF(NETDEV_CHANGE): ma1: link becomes ready
Sending discover...
Sending discover...
Sending discover...
Sending discover...
Sending discover...
Sending discover...
Sending discover...
Sending discover...
Sending discover...
Sending discover...
Sending discover...
Sending discover...
Sending discover...
^C
Welcome to the  shell.
Type 'help' for command help.
```

```
loader# help
```

From <<https://groups.google.com/forum/#itopic/opennetworklinux/7c7r0zj-Thc>>

Now found out that my usb is actually mounted as sdb1 using the command  
fdisk -l

From <<http://askubuntu.com/questions/37767/how-to-access-a-usb-flash-drive-from-the-terminal-how-can-i-mount-a-flash-driv>>

```
Created a mount point under /mnt/onl/usb
Mounted /dev/sdb1 using below commands
Mount /dev/sdb1 /mnt/onl/usb
```

Now I could access the contents of my pendrive.

```
loader# cd /mnt/onl/usb/
loader# ls
ONL-2.0.0-ONL-OS-DEB8-2016-09-04.1726-3f30495-AMD64-SWI-INSTALLER
ONL-2.0.0-ONL-OS-DEB8-2016-09-04.1726-3f30495-AMD64.swi
lost+found
onie-installer
loader# cp ONL-2.0.0-ONL-OS-DEB8-2016-09-04.1726-3f30495-AMD64.swi /mnt/onl/imag
es/
loader#
```

**Additional information on various partition of the switch:**  
**Sdn**

**Question: How to disable the NETCONF.events file ?**

From <<https://github.com/CESNET/libnetconf/issues/119>>

JackLIN-F commented on Oct 27, 2015

Hi ~  
I found a large file on var/lib/libnetconf/streams/NETCONF.events  
  
How to disable the file ? The file will very large after long time!!  
  
After one day (24hr)

**ls -l**

```
-rw-rw-rw- 1 root root 2344219 Apr 21 22:37 NETCONF.events
-rw-rw-rw- 1 root root 1048576 Apr 20 23:39 NETCONF.rules
```

rkrejci commented on Nov 4, 2015

Collaborator

Hi,  
currently there is no way to disable it. but feel free to delete it. It stores history of events for Notifications replay.



rkrejci closed this on Nov 4, 2015

### For inproc message exchange between threads:

**Here's how to build CZMQ from GitHub (building from packages is very similar, you don't clone a repo but unpack a tarball), including the (ZeroMQ core) libraries:**

Below instructions are saved from README.txt file.

Downloaded czmq 3.0.2 source code from this link <https://github.com/zeromq/czmq/releases>. (make check is hung indefinitely.)

```
git clone git://github.com/jedisct1/libsodium.git
cd libsodium
./autogen.sh
./configure && make check
sudo make install
sudo ldconfig
cd ..
```

```
git clone git://github.com/zeromq/libzmq.git
cd libzmq
./autogen.sh
./configure && make check
sudo make install
sudo ldconfig
cd ..
```

```
git clone git://github.com/zeromq/czmq.git
cd czmq
./autogen.sh
./configure && make check
sudo make install
sudo ldconfig
cd ..
```

NOTE: did not have autogen.sh in czmq folder.

Since the selftest was hung for a longtime on CZMQ, started following the steps on github link.

<https://github.com/zeromq/czmq#toc2-76>

### Cloned the latest version from Github on 20.12.2016

Here's how to build CZMQ from GitHub (building from packages is very similar, you don't clone a repo but unpack a tarball), including the libzmq (ZeroMQ core) library (NOTE: skip ldconfig on OSX):

```
git clone git://github.com/zeromq/libzmq.git
cd libzmq
./autogen.sh
# do not specify "--with-libsodium" if you prefer to use internal tweetnacl security implementation (recommended)
./configure --with-libsodium
make check
sudo make install
sudo ldconfig
cd ..

git clone git://github.com/zeromq/czmq.git
cd czmq
./autogen.sh && ./configure && make check
```

```
sudo make install
sudo ldconfig
cd ..
```

Screen clipping taken: 12/20/2016 9:36 PM

However, libsodium was installed as in earlier method.

**NOTE: I did install libzmq using --with-libsodium option**

```
831 cd zeromq-4.1.5/
832 ls
833 sudo make uninstall
834 ./autogen.sh
835 sudo ./autogen.sh
836 sudo ./configure --with-libsodium
837 sudo make check
838 sudo make install
839 sudo ldconfig
840 cd ..
```

Screen clipping taken: 12/20/2016 10:06 PM

**Below snapshot for CZMQ compilation:**

```
844 git clone https://github.com/zeromq/czmq.git
845 ls
846 cd czmq/
LibreOffice Impress
848 sudo ./autogen.sh
849 history
850 clear
851 sudo ./configure && make check
852 sudo make check
853 history
shrikanth@nds:~/CZMQ/czmq$
```

Screen clipping taken: 12/20/2016 10:06 PM

After this, installation was successful and all the selftest test-cases were also successful.

Further to add VLOG support, decided to integrate the libopenvswitch. I had to change the makefiles for the same.

Zlog library was additionally installed as per the website for logging purposes.

<http://www.wikihow.com/Set-up-an-FTP-Server-in-Ubuntu-Linux> --> FTP server installation.