**To compile on the switch**

1. Copy the OpenVswitch library onto the path /mnt/onl/data/libraries/openvswitch- 2.3.1/include/openvswitch/ and the zlog configuration file onto the path /etc/zlog.configuration
2. Uncomment the line in monitor-automata.h //#define opennsl
3. Comment the line #define CHECK\_POLLING\_ACCURACY in monitor-automata.h to not to compile the instrumentation code added for checking the polling accuracy.

**To compile on the Linux system.**

**1.** Update the Makefile.am file present in the path **src/Makefile.am** of the Monitor-automata code repository. // there are two make files, one is src and one in main folder. Make sure to check which one.

From

AM\_CFLAGS += -I/mnt/onl/data/libraries/openvswitch-2.3.1/lib/

AM\_CFLAGS += -I/mnt/onl/data/libraries/openvswitch-2.3.1/include/

AM\_CFLAGS += -I/mnt/onl/data/libraries/openvswitch-2.3.1/include/openvswitch/

TO

M\_CFLAGS += -I/home/mamtha/OVS/openvswitch-2.3.1/lib/

AM\_CFLAGS += -I/home/mamtha/OVS/openvswitch-2.3.1/include/

AM\_CFLAGS += -I/home/mamtha/OVS/openvswitch-2.3.1/include/openvswitch/

Where ‘mamtha’ in the above path -> could be replaced by your name or the name of the home folder owned by the user logged into the machine.

**2.** Also remove -**lopennsl** from the Makefile.am file.

**3**. Comment the line in monitor-automata.h //**#define** **opennsl** -57th line

**4.** **zlog.conf** -> Copy this into **/etc** path of the switch and Ubuntu machine. This is required to set the logging library.

**Monitor-Automata-Source-Code/Monitor-automata** --> Contains the first version of the source code without Timer grouping taken from the repo

**Monitor-Automata-Source-Code/Monitor-automata-Backup** --> Contains the first version of the source code with Timer grouping taken from the repo.

**5.** Now to compile the code – go to the /Monito-automata folder and follow the steps –

* 1. **$ autoreconf -iv**
  2. **$ sudo ./configure // sometimes gives permission error if sudo not given**
  3. **$ sudo make**
  4. **$ sudo make install**
  5. **Monitor-automata** - To start the first version of the code
  6. **Monitor-automata-v2** - To start the second version of the code

**6.** After compiling the code, you should start the netconf server.

The compilation for NETCONF server follows the same methodology irrespective of where it is done (switch or on an Ubuntu machine).

1. **autoreconf -iv**
2. **./configure --disable-dbus PKG\_CONFIG\_PATH=/usr/local/lib/pkgconfig/**
3. **sudo make install**

//disable bus and stuff dint work and I just started the server directly and it worked.

To start the NETCONF server:

1. **sudo ofc-server -v 3 -> starts the server as a background process.**
2. **sudo ofc-server -f -v 3 -> starts the server as a foreground process**

**Netopeer won’t be able to connect if this server is not started.**

**7.** Now, you can run the controller by 2 ways.

1. Netopeer-cli

2. RYU controller

**1. Netopeer-cli -**

But even if you don’t use netopeer as a controller you need it to run the RPC scripts.

Install netopeer on the system first.

<https://anukulverma.wordpress.com/2016/03/27/netopeer-cli-installation-and-configuration/>

1. **$ sudo apt-get update**
2. **$ sudo apt-get install -y git libxml2 libxml2-dev libxslt-dev libssh2-1-dev libcurl4-gnutls-dev libdbus-1-dev doxygen libevent-dev libreadline-dev libncurses-dev libxml++2.6-dev libtool python-libxml2 openssh-server xsltproc cmake build-essential libssl-dev libtool-bin wget python-setuptools vim** // these are the dependencies.
3. **$ apt-get clean**
4. **$ apt-get purge**
5. Install Libssh >= 0.6.4.
6. Install pyang
7. Install libnetconf and lnctool
8. Install netopeer (cli)

After installing, connect to the switch/netconf server through netopeer.

1. **$ netopeer-cli**

It opens like this – netconf>

1. **Netconf> connect - -login root 10.162.96.101** // root- username, ip is of the switch.
2. It gets connect , now you have to run the rpc scripts.
3. **Netconf> user-rpc** // below are the scripts
4. Now, it opens and editor - //open editor - copy paste these - one by one. not all at once.

// editor sucked big time- was not able to copy pasted - frankly annoyed me to hell. so i changed the ediot to nano and used it.

// ANother issue - I copy pasted the msgs from soft copy of shrikanths thesis. But the "-" was in a different format as it was copied from latex so it wasnt ruuning. So check this before running.

**netconf> editor nano** // this sets the editor of netopeer to nano.

// if you want to know all the options then use help. it lists down all the options and you can choose. -> **netconf> help**

1. The scripts are below –

**FP GROUP STATUS Operation**

<rpc xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="101">

<get\_field\_processor\_group\_status xmlns = "http://monitoring-automata.net/sdn-mon-automata">

<fp\_monitoring\_group> TCAM-MONITORING-TABLE </fp\_monitoring\_group>

</get\_field\_processor\_group\_status>

</rpc>

**CONFIGURE TCAM Threshold Operation**

<rpc message-id="101" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">

<set-fp-entry-threshold xmlns = "http://monitoring-automata.net/sdn-mon-automata">

<fp-entry-threshold>

<total-entries-threshold>245</total-entries-threshold>

<total-counters-count>100</total-counters-count>

<min-free-entries-per-device>3755</min-free-entries-per-device>

</fp-entry-threshold>

</se-fp-entry-threshold>

</rpc>

**MONITORING STATUS Operation**

<rpc xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="101">

<mon\_status xmlns="http://monitoring-automata.net/sdn-mon-automata">

<mon-id>200</mon-id>

<device-id>50</device-id>

</mon\_status>

</rpc>

**PORT STATISTICS CLEAR Operation**

<rpc xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="101">

<port\_statistics\_clear xmlns="http://monitoring-automata.net/sdn-mon-automata">

<clear-port-stats>

<port-index>2</port-index>

</clear-port-stats>

</port\_statistics\_clear>

</rpc>

**CONFIGURE DEVICE ID Operation** // if not given then it takes the deault value -1

<rpc message-id="101" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">

<configure-device-id xmlns="http://monitoring-automata.net/sdn-mon-automata">

<switch-identification>10</switch-identification>

</configure-device-id>

</rpc>

**GET PORT STATISTICS Operation**

<rpc xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="101">

<port\_statistics xmlns="http://monitoring-automata.net/sdn-mon-automata">

<port-statistics-get>

<port-index>2</port-index>

</port-statistics-get>

</port\_statistics>

</rpc>

// each type you finish each one of them you can see the ouput on the **monitor-application.log** and also you can an **OK**. Msg on the netopeer-cli terminal.