# Working With Ahmet Inan's Check Node Processor VHDL Code

## Installation on Ubuntu

11/13/19

git clone https://github.com/aicodix/cnp.git

sudo apt-get update
sudo apt-get upgrade
sudo apt-get install gnat gtkwave

git clone https://github.com/ghdl/ghdl.git

To use mcode backend (easiest to build), in the GHDL base directory, configure and build:

```
$ ./configure --prefix=/usr/local
$ make
```

At that place, you can already use the `ghdl_mcode` built in the directory. You can also install GHDL:

```
$ sudo make install
```

sudo ldconfig

GHDL installed to /usr/local/bin/ghdl
The cnp makefile thinks it is in /opt/ghdl/bin/ghdl
I edited the Makefile and it worked.

```
abraxas3d@ghostkitti:~/cnp$ make vec
/usr/local/bin/ghdl -i --workdir=work cnp_bundle.vhd cnp_vector.vhd
cnp_scalar_tb.vhd cnp_vector_tb.vhd ldpc.vhd cnp_scalar.vhd
/usr/local/bin/ghdl -m --workdir=work cnp_vector_tb
/usr/local/bin/ghdl -r --workdir=work cnp_vector_tb
```

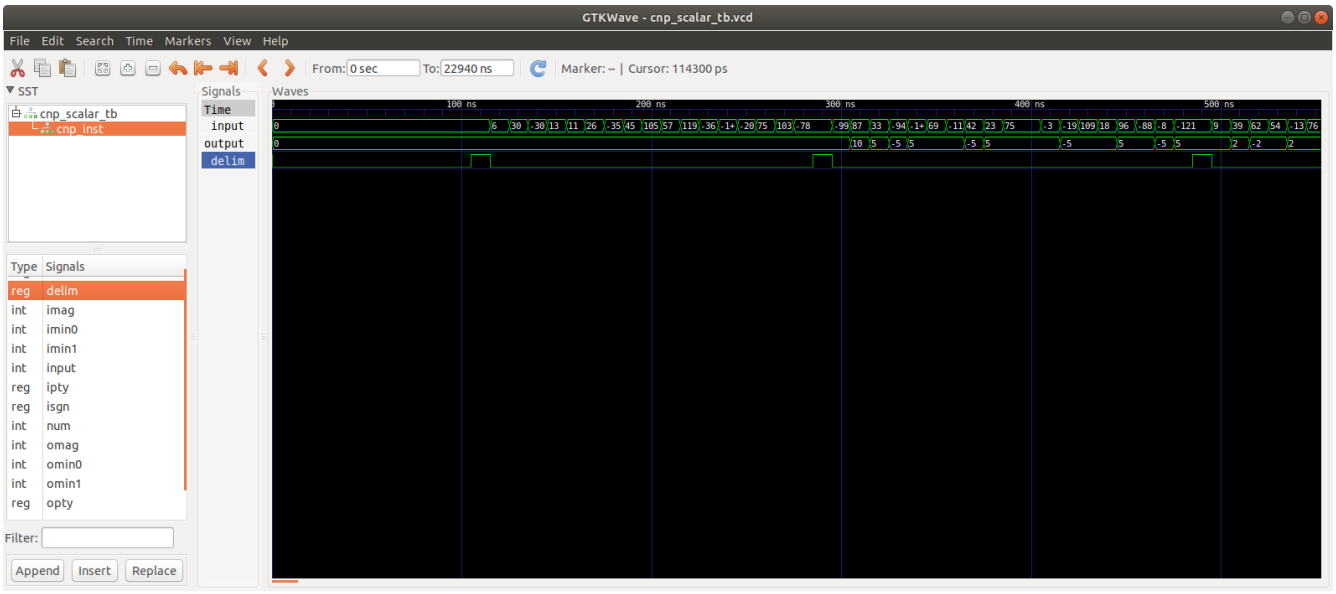
Next, simulate the VHDL!

Following the instructions from the README:

Run `make` to build and simulate scalar version. Compare resulting `scalar_output.txt` with `scalar_expected.txt`. (worked!)

Run `make vcd` to generate waveforms and watch them via `gtkwave cnp_scalar_tb.vcd`.

Here is a screenshot of the results of running vcd:




Run `make vec` to build and simulate vector version. Compare resulting `vector_output.txt` with `vector_expected.txt`. (worked!)

There are sample test vectors included for simulation and verification but you are encouraged to generate your own random test vectors: (coming soon! Possibly tonight.)

Modify the C++ sources to your liking, run `make gen` to build the generators and generate random test vectors. (coming soon! Possibly tonight.)