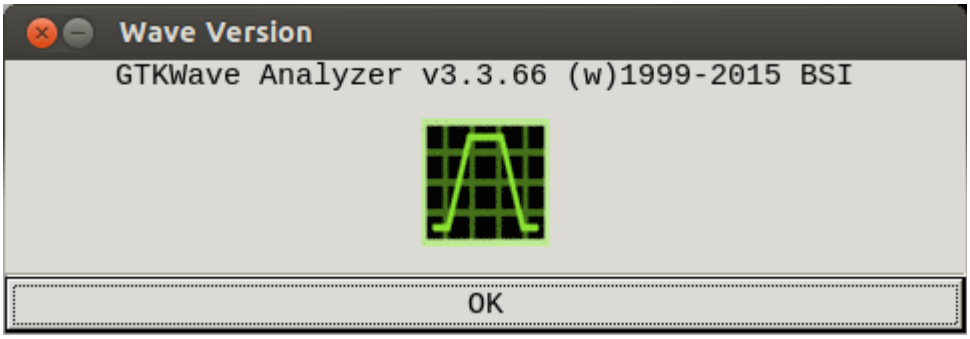
Testing GTKWave, MyHDL Iverilog On a Raspberry Pi 2 B
Created with Yocto

GTKWave, Iverilog were compiled on the Raspberry Pi 2 B. Then a squashfs
-rw-r--r-- 1 vidal vidal 74563584 Aug 13 10:03 add_gtkwave_iverilog_xstools
-rw-r--r-- 1 vidal vidal 234613317 Aug 13 09:34 core-image-sato-raspberrypi2-20150812223843.rootfs.rpi-sdimg.gz. After the image is unzipped it can be put on a 4GB SD card.

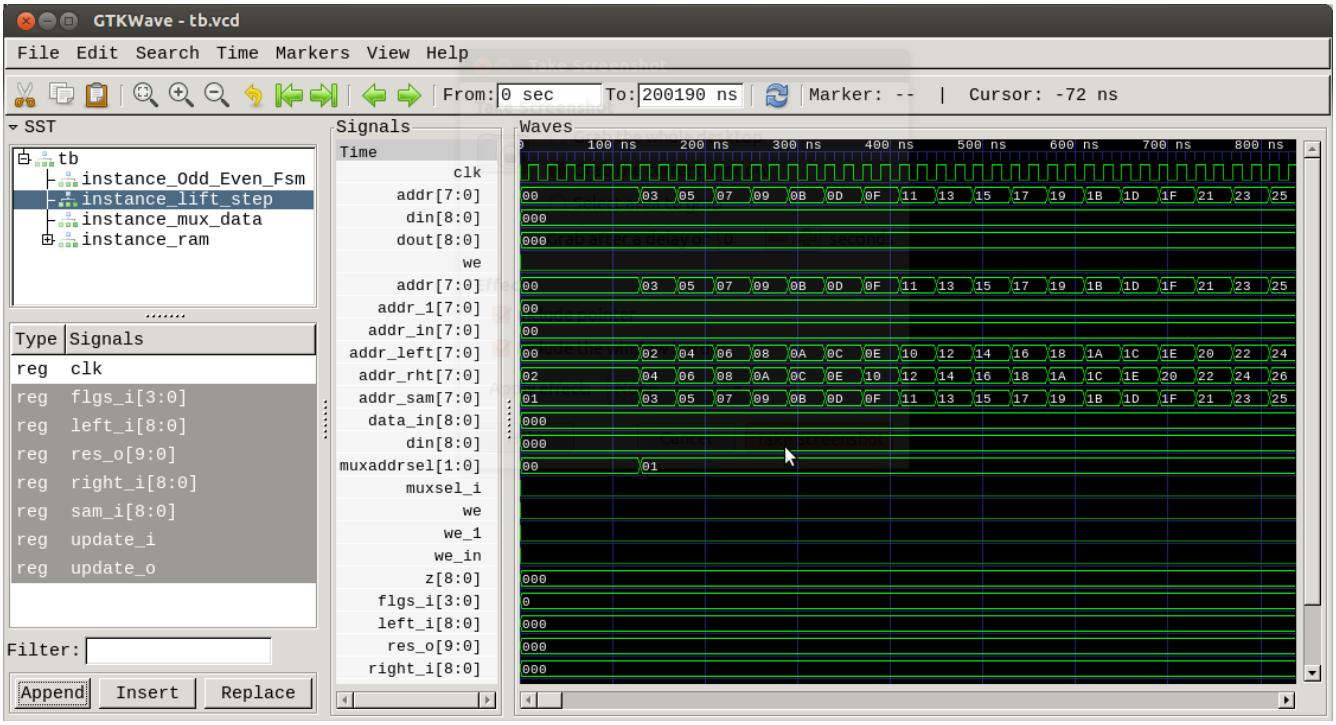
```
root@raspberrypi2:~/jpeg-2000-test/ipython_fixbv# df
Filesystem     1K-blocks    Used Available Use% Mounted on
/dev/root        3581760 1135320   2254348  34% /
devtmpfs          494728       4    494724   1% /dev
tmpfs              40       0       40   0% /mnt/.psplash
tmpfs             499016     280    498736   1% /run
tmpfs             499016     100    498916   1% /var/volatile
/dev/mmcblk0p1     20422   20118       304  99% /run/media/mmcblk0p1
```

```
root@raspberrypi2:~/jpeg-2000-test/ipython_fixbv# cd ~/
root@raspberrypi2:~# ls
add_gtkwave_iverilog_xstools          jpeg-2000-test  xstools_test_files
cosimulation                          pi_pkgs.txt
gtkwave_iverilog_compiled_xtools  test_jpeg
```

The add_gtkwave_xstools can be unsquashfsed and a script will perform the final steps of the installation is done.



The simulation was run using https://github.com/develone/jpeg-2000-test.git
After cloning cd jpeg-2000-test/ipython_fixbv/test_lifting_jpeg_step.
“python odd root@raspberrypi2:~/jpeg-2000-test/ipython_fixbv/test_lifting_jpeg_step# python odd_even_fsm.py
190 muxsel_i 0 rst_fsm 1
200190
root@raspberrypi2:~/jpeg-2000-test/ipython_fixbv/test_lifting_jpeg_step# gtkwave tb.vcd



Steps to test MyHDL and Iverilog Co-simulation.
The cosimulation tree was transferred to the Raspberry Pi 2 B.

```
root@raspberrypi2:~/cosimulation/icarus# make
iverilog-vpi myhdl.c myhdl_table.c
Compiling myhdl.c...
myhdl.c: In function 'to_myhdl_calltf':
myhdl.c:159:15: warning: variable 'value_s' set but not used [-Wunused-but-set-variable]
   s_vpi_value value_s;
               ^
Compiling myhdl_table.c...
Making myhdl.vpi from  myhdl.o myhdl_table.o...
root@raspberrypi2:~/cosimulation/icarus# ls -la
total 124
drwxr-xr-x 3 root root  4096 Aug 12 23:28 .
drwxr-xr-x 7 root root  4096 Aug 12 23:28 ..
-rw-r--r-- 1 root root   170 Aug 12 23:28 Makefile
-rw-r--r-- 1 root root  1186 Aug 12 23:28 README.txt
-rw-r--r-- 1 root root 12018 Aug 12 23:28 myhdl.c
-rw-r--r-- 1 root root 11765 Aug 12 23:28 myhdl.c.20030518
-rw-r--r-- 1 root root 26136 Aug 12 23:28 myhdl.o
-rwxr-xr-x 1 root root 28952 Aug 12 23:28 myhdl.vpi
-rw-r--r-- 1 root root 11765 Aug 12 23:28 myhdl_20030518.c
-rw-r--r-- 1 root root   126 Aug 12 23:28 myhdl_table.c
-rw-r--r-- 1 root root  3696 Aug 12 23:28 myhdl_table.o
drwxr-xr-x 2 root root  4096 Aug 12 23:28 test
root@raspberrypi2:~/cosimulation/icarus# cd ~/
root@raspberrypi2:~# ls
```

```
add_gtkwave_iverilog_xstools           pi_pkgs.txt
cosimulation                           xstools_test_files
gtkwave_iverilog_compiled_xtools
root@raspberrypi2:~# git clone https://github.com/cfelton/test_jpeg.git
Cloning into 'test_jpeg'...
remote: Counting objects: 1081, done.
remote: Total 1081 (delta 0), reused 0 (delta 0), pack-reused 1081
Receiving objects: 100% (1081/1081), 816.73 KiB | 983.00 KiB/s, done.
Resolving deltas: 100% (577/577), done.
Checking connectivity... done.
root@raspberrypi2:~# cd test_jpeg/test/
root@raspberrypi2:~/test_jpeg/test# ls
Makefile    setup.cfg  tb_jpegenc.v  test_jpegenc.py
header.hex  support    test_images
root@raspberrypi2:~/test_jpeg/test# cp ~/cosimulation/icarus/myhdl.vpi .
root@raspberrypi2:~/test_jpeg/test# python test_jpegenc.py
Using image ./test_images/color/small4.png
compiling v1 ...
ivl: stmt.cc:1487: int draw_stmt(vhdl_procedural*, stmt_container*, ivl_statement_t, bool): Assertion
`stmt' failed.
sh: line 1:   725 Done                    /usr/local/lib/ivl/ivlpp -L -F"/tmp/ivrlg2b7ad6fe"
-f"/tmp/ivrlgb7ad6fe" -p"/tmp/ivrlib7ad6fe"
      726 Aborted                 | /usr/local/lib/ivl/ivl -C"/tmp/ivrlhb7ad6fe" -C"/usr/local/lib/ivl/vhdl.conf"
-- -
compiling v2 ...
compiling testbench ...
cosimulation setup ...
WARNING: ../hdl/jpegenc_v1/verilog/HeaderRAM.v:41: $readmemh: Standard inconsistency,
following 1364-2005.
WARNING: ../hdl/jpegenc_v1/verilog/HeaderRAM.v:41: $readmemh(./header.hex): Not enough words
in the file for the requested range [0:1023].
LXT2 info: dumpfile vcd/_tb_jpegenc.vcd opened for output.
start simulation ...
V2: encode image <PIL.Image.Image image mode=RGB size=208x112 at 0x763D94E0> 208 x 112
V1: encode image <PIL.Image.Image image mode=RGB size=208x112 at 0x763D93A0> 208 x 112
V2:    200 output, latest EBCFD4A6
V1:    200 output, latest 9F9F9E7C
V2:    400 output, latest D7FCB1CD
V1:    400 output, latest F3F3F3CF
V2:    600 output, latest FF00878F
V2:    800 output, latest A23FF073
V2:   1000 output, latest BFF226F8
V1:    600 output, latest 7E79F3F3
V2:   1200 output, latest 4FB67FA1
V1:    800 output, latest E7F7F9F9
V2:   1400 output, latest 3FB08355
V2:   1600 output, latest BA34DFDA
V2:   1800 output, latest E0DF069F
V1:   1000 output, latest F9F9F9F9
```

V2: 2000 output, latest EC5F6CC7
V1: 1200 output, latest F9F9F9E7
V2: 2200 output, latest B18B4FFF
V2: 2400 output, latest 3DFC1FAC
V1: 1400 output, latest 3F3F3F3C
V2: 2600 output, latest C3E32FEC
V2: 2800 output, latest F7456F67
V1: 1600 output, latest E7E79F3F
V2: 3000 output, latest ED5FF1F9
V2: 3200 output, latest 527C7FDF
V1: 1800 output, latest 7E7F7F9F
V2: 3400 output, latest BFF84ABF
V2: 3600 output, latest 7FE7AFFD
V1: 2000 output, latest 7F9F9F9F
V2: max frame rate 1401.662 frames/sec
V2: end pixel stream 0:21:00.569478
V2: end of bitstream 0:21:04.827813
V1: 2200 output, latest 7F9F9F9E
V1: 2400 output, latest F3F3F3F3
V1: 2600 output, latest 7E7E79F3
V1: 2800 output, latest E7E7F7F9
V1: 3000 output, latest F7F9F9F9
V1: 3200 output, latest F7F9F9F9
V1: 3400 output, latest 3F3F3F3F
V1: 3600 output, latest E7E7E79F
V1: 3800 output, latest BE7E7F7F
V1: 4000 output, latest 7F7F9F9F
II: 16512, 80x80
OO: 32608, 40x160
V1: 4200 output, latest 7F7F9F9F
V1: 4400 output, latest F3F3F3F3II: 16512, 80x80
OO: 32608, 40x160
V1: 4200 output, latest 7F7F9F9F
V1: 4400 output, latest F3F3F3F3
V1: 4600 output, latest 7E7E7E79
V1: end pixel stream 0:44:04.744808
V1: 4800 output, latest 3BE7E7F7
V1: 5000 output, latest E7F7F9F9
V1: 5200 output, latest E7F7F9F9
V1: 5400 output, latest 3F3F3F3F
V1: 5600 output, latest E7E7E7E7
V1: 5800 output, latest F3BE7E7F
II: 23296, 112x208
V1: max frame rate 483.606 frames/sec
V1: end of bitstream 0:55:03.123177
V1 bitstream, len 5934 (more than zeros True)
  [0] FFD8FFE0
  [1] 00104A46
  [2] 49460001

```
  [     3]  01000001
  [     4]  00010000
  [     5]  FFC00011
V1 max frame rate  483.606 @ (208, 112)
V2 bitstream, len 3730
  [     0]  FF000FE1
  [     1]  B39EF25F
  [     2]  F8FE16D6
  [     3]  FF008F6F
  [     4]  E5DFF306
  [     5]  BFCD6AFF
V2 max frame rate 1401.662 @ (208, 112)
end simulation 0:55:05.650218
```

During the running of python test_jpegEnc.py

```
top - 00:11:57 up 59 min,  2 users,  load average: 1.09, 1.11, 1.04
Tasks:  96 total,   2 running,  93 sleeping,   0 stopped,   1 zombie
%Cpu(s): 24.6 us,  0.6 sy,  0.0 ni, 74.8 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
KiB Mem :   998036 total,   657744 free,    52820 used,   287472 buff/cache
KiB Swap:        0 total,        0 free,        0 used.   908232 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU %MEM     TIME+ COMMAND
  735 root      20   0   19544  17408   2952 R  85.8  1.7  34:10.72 vvp
  718 root      20   0   13776  10648   5112 S  14.2  1.1   5:38.29 python
```