Tutorial: Installing and testing OpenPOWER functional simulator for IBM Power 10 CPU

(Tested with Ubuntu 20.04 on windows subsystem for linux)

Step 1: Installing the simulator

Download the OpenPower functional simulator from
https://www.ibm.com/support/pages/node/6493437

Install the simulator as shown here: https://www.ibm.com/support/pages/node/6493433
The simulated will be installed in `/opt/ibm/systemsim-p10-<version>/` directory on your machine.

Step 2: Booting Linux on POWER 10

As mentioned in `/opt/ibm/systemsim-p10-<version>/examples/linux`

The preferred method to booting Linux on the POWER10 Functional Simulator is using the supported skiboot, kernel and disk image.

When booting Linux using skiboot you will need three things:

1. a suitable disk image

2. a suitable powerpc kernel

3. a suitable skiboot lid

The scripts to fetch the required components are given in `/opt/ibm/systemsim-p10-<version>/examples/linux`

Run the script to get the required components. For ex.

```
cd /opt/ibm/systemsim-p10-<version>/examples/linux
./fetch_skiboot.sh
./fetch_ubuntu_disk_image.sh
//rename the downloaded image to disk.img
./fetch_vmlinux.sh
```

Once you have all three components in place you can use the provided `boot-linux-ubuntu-p10.tcl` from `run/p10/linux/` to boot your simulated POWER10 system. This tcl script expects the disk image to be called `disk.img` in the `/opt/ibm/systemsim-p10/images` directory, so you'll need to either rename your disk image to be `disk.img` or create a symlink to it called disk.img. Make sure "xterm" is installed on your host machine.

Run the simulator (for ex.):

```
atharva@LAPTOP-T6675GDK:/opt/ibm/systemsim-p10-1.2-3/run/p10/linux$ ../power10 -f
boot-linux-ubuntu-p10.tcl
```

If you are getting the errors

```
xterm: Xt error: Can't open display:
```

```
xterm: DISPLAY is not set
```

Run the command below and launch the simulator again.

```
export DISPLAY=localhost:0.0
```

Step 3: Transferring the files from source environment to the simulator

Use `callthru` command to transfer the files from host PC to simulator. Run `callthru` in the simulator. For example

```
callthru source /mnt/c/Users/Desktop/nqueens/nq.c > nq.c
```

```
Use GCC to compile your code and run the code.
```

For more information, refer to the user guide for Power10 functional simulator

https://public.dhe.ibm.com/software/server/powerfuncsim/p10/docs/P10funcsim_ug_v1.0_pub.pdf