**Gem5 and SPEC2017 Integration Doc**

SPEC2017

* SPEC2017 benchmarks are compiled for x86 architecture (as Gem5 is build for x86 architecture). 43 benchmarks are packed in 4 different suites based on their achieved results.
* 4 suites are as follows:
  + intrate
  + intspeed
  + fprate
  + fpspeed
* You can compile these suites using following command:
  + **runcpu --config=try --size=test --copies=1 \**

**> --noreportable --iterations=1 intrate**

Gem5

* We need to run SPEC2017 on the simulated architecture by gem5. For that you will need to modify gem5 such that it will run SPEC2017 in the same process. We have modified “se.py” file present in */home/gem5/configs/example/se.py*
* ***“se.py”*** *-* It is system call emulation mode. In this mode, one only needs to specify the binary file to be simulated. This binary file can be statically/dynamically linked. “se.py” is used for configuring and running simulations in this mode. We configure this file such that we start an Atomic Simple CPU (one process and one thread and start the SPEC2017 application using the same thread)
* **This file has later renamed to “spec17\_config.py”** (present in same directory)
* 2 files are added with following names:
  + *Spec2017\_benchmarks.py* ( present in */home/gem5/configs/example/) -* This file consists of all the required run commands for each benchmark present in the SPEC2017.
  + *run\_gem5\_x86\_spec17\_benchmark.sh* (present in /*home/gem5/) -* This file acts as a wrapper file which helps to wraps Gem5 and SPEC2017 under one single command. This help us to run the gem5 command “./build/ALPHA/gem5.opt” with benchmark name appended to it.

This file provides us with the following command which runs the whole integrated suite together.

**$ ./run\_gem5\_x86\_spec17\_benchmark.sh <benchmark\_name> <output\_directory>**

* + This command has 2 arguments:
    - Benchmark Name – Specify which benchmark from SPEC2017 you want to run
    - Output\_Directory – Specify where you want all the output files of the gem5 and SPEC2017 should be generated.

Example:

**./run\_gem5\_x86\_spec17\_benchmark.sh perflbench */home/gem5/m5.out***