ECE 721 Advanced Microarchitecture

Project 4

Phase 1 Testing:

This phase focusses on testing the entire T$ cache project along with the Victim cache. The T$ can be real or perfect and can be with or without Victim cache. The user can also enable this cache along with choosing the size needed.

Extract the 721sim.zip into Grendel.

In the same folder level as like 721sim, create two directories.

1. mkdir build
2. mkdir run
3. Now inside run directory create a folder for storing the corresponding test result. Since we used the 473.astar_rivers_ref.252.0.28.gz benchmark, create as below.
4. cd run
5. mkdir 473.astar_rivers_ref.252.0.28
6. Now go to the same level as 721sim.

Extracting various Graphs:

Graph 1 - IPC VS T$ Assosc. "Use ./test.sh"
Graph 2 - IPC VS T$ size. "Use ./test1.sh"
Graph 3 - IPC VS T$ max branches. "Use ./test2.sh"
Graph 4 - IPC VS T$ line size. "Use ./test3.sh"
Graph 5 - IPC VS V$ size. "Use ./test4.sh"
Graph 6 - IPC VS T$ Assosc Real GaG BP. "Use ./test5.sh". It can only extract data for Real T$ and Real BP (Already done in 721sim). This is saved as test.sh in 721sim-2.zip.

Phase 2 Testing:

This phase focusses on using a GaG real branch predictor with real T$ to solve the pervious bug in simulator where horizontal training of the rows didn't occur.

Extract the 721sim-2.zip into Grendel.

In the same folder level as like 721sim, create two directories.

1. mkdir build
2. mkdir run
3. Now inside run directory create a folder for storing the corresponding test result. Since we used the 473.astar_rivers_ref.252.0.28.gz benchmark, create as below.
4. cd run
5. mkdir 473.astar_rivers_ref.252.0.28
6. Now go to the same level as 721sim.

Extracting various Graphs:

Graph 1: IPC VS T$ Assosc Real BP. “Use ./test.sh”. This can generate data only for Real T$ with Real BP (Gag branch pred) with no V$.

Phase 3 Testing:

This phase focusses on solving the previous horizontal training in the 721sim. The branch predictor is fixed here.

Extract the 721sim-3.zip into Grendel.

In the same folder level as like 721sim, create two directories.

1. mkdir build
2. mkdir run
3. Now inside run directory create a folder for storing the corresponding test result. Since we used the 473.astar_rivers_ref.252.0.28.gz benchmark, create as below.
4. cd run
5. mkdir 473.astar_rivers_ref.252.0.28
6. Now go to the same level as 721sim.

Extracting Data: (Trace Cache hits and IPC).

- cmake -DCMAKE_BUILD_TYPE=RelO3 ../721sim
- make -j$(nproc)
- source /mnt/designkits/spec_2006_2017/O2_fno_bbreorder/activate.bash
- ln -s /mnt/designkits/spec_2006_2017/O2_fno_bbreorder/app_storage/pk .
- atool-simenv mkgen 473.astar_rivers_ref --checkpoint 473.astar_rivers_ref.252.0.28.gz
- make cleanrun SIM_FLAGS_EXTRA='--disambig=1,0,0 --perf=0,1,0,0 -t --fq=64 --cp=64 --al=1024 --lsq=512 --iq=256 --iqnp=16 --fw=16 --dw=16 --iw=16 --rw=16 -e100000000'

Note:
If there are any gen_icache: Permission denied errors, change the permission of this file and all files in this folder in 721sim/riscv-base/gen_icache to 777.