

## Instructions to install and run sniper simulator: (only for linux environment)

Click the following link to download the sniper files

<https://drive.google.com/drive/folders/0By-09HFQd6G0ZjVTQ2RyZHpyaHM?usp=sharing>

Extract or unzip sniper from sniper-latest.tgz

Enter the sniper folder by typing `cd sniper-5.3` and press enter

\*\*\* now you are in Sniper simulator folder

Type `ls` and press enter you can see the following folders inside sniper-5.3

```
avb@avb-ThinkCentre-M73:~/Downloads$ cd sniper-5.3
avb@avb-ThinkCentre-M73:~/Downloads/sniper-5.3$ ls
CHANGELOG  CONTRIBUTORS  LICENSE.interval  pin          scripts      tools
common     Doxyfile      Makefile          README      sift
COMPILATION include       Makefile.config  record-trace standalone
config     LICENSE       NOTICE          run-sniper  test
```

Create “benchmarks” folder using the following command  
type `mkdir benchmarks` and press enter.

### Before installation:

Extract one of the pin kits (pin-2.14, pin-3.0, pin-3.2) given in the google drive into sniper folder and replace the folder name as `pin_kit`.

Set environment variables as follows:

type `export GRAPHITE_ROOT=$(pwd)` and press enter

type `export BENCHMARKS_ROOT=$(pwd)/benchmarks` and press enter

### Installation:

type `make` and press enter

After installation is successful you have to install the benchmarks. Go to benchmarks folder by typing `cd benchmarks` in terminal and press enter.

Type `make` and press enter

Benchmarks will be downloaded from the Internet and installed.

Once the benchmarks are installed sniper simulator is ready.

### Before running sniper (important information):

- config folder contains .cfg files which are used to give the processor configuration (cache size, associativity, replacement policy ...etc) as input to the simulator. Part of a .cfg file is given in the figure below.

```
[perf_model/tlb]
penalty = 30          # Page walk penalty in cycles

[perf_model/itlb]
size = 128            # Number of I-TLB entries
associativity = 4      # I-TLB associativity

[perf_model/dtlb]
size = 64             # Number of D-TLB entries
associativity = 4      # D-TLB associativity

[perf_model/stlb]
size = 512            # Number of second-level TLB entries
associativity = 4      # S-TLB associativity

[perf_model/cache]
levels = 3

[perf_model/l1_icache]
perfect = false
cache_size = 32
associativity = 4
address_hash = mask
replacement_policy = lru
data_access_time = 4
tags_access_time = 1
perf_model_type = parallel
writethrough = 0
shared_cores = 1
```

- Benchmarks folder consists of all the benchmarks needed to run sniper simulator. Basically there are two benchmark suites parsec and splash2 each containing several programs.

- Output statistics are stored in the sim.out file in benchmarks folder once simulation is completed. Part of sim.out file is given in the figure below.

	Core 0
Instructions	1359473516
Cycles	557808721
IPC	2.44
Time (ns)	209702527
Idle time (ns)	17718624
Idle time (%)	8.4%
Branch predictor stats	
num correct	91937018
num incorrect	792542
misprediction rate	0.85%
mpki	0.58
TLB Summary	
I-TLB	
num accesses	141533520
num misses	16
miss rate	0.00%
mpki	0.00
D-TLB	
num accesses	195283163
num misses	934965
miss rate	0.48%
mpki	0.69

## Running sniper simulator with a benchmark:

Type `./run-sniper` and press enter from benchmarks folder and you will see the basic options of sniper simulator.

Command syntax:

```
./run-sniper -p <program> -i <inputsizes (test)> -n <ncores (1)> -m <machines (1)> -d <outputdir (.)> -c  
<config-file> -r <sniper-root-dir> -g <options>
```

Example to run a specific benchmark program:

type the following command press enter

```
./run-sniper -p splash2-barnes -i test -n 1 -c gainestown --cache-only
```

You will see the following data after successful run and output is stored in `sim.out` file in benchmarks folder.

```
jasmine@jasmine-desktop:~/Downloads/sniper-5.3/benchmarks$ ./run-sniper -p splash2-barnes -i test -n 1 -c gainestown --cache-only
[SPLASH] Benchmarks to run: barnes
[SPLASH] [===== Running benchmark barnes =====]
[SPLASH] Setting up run directory: /tmp/tmpfHhs19
[SPLASH] Running 'SNIPER_APP_LD_PRELOAD=$LD_PRELOAD; unset LD_PRELOAD; /home/jasmine/Downloads/sniper-5.3/run-sniper -n 1 -m 'localhost' -d '/home/jasmine/Downloads/sniper-5.3/benchmarks' -c gainestown --cache-only --roi --curdir=/home/jasmine/Downloads/sniper-5.3/benchmarks -- /home/jasmine/Downloads/sniper-5.3/benchmarks/splash2/spl
ash2/codes/apps/barnes/BARNES < input':
[SPLASH] [----- Beginning of output -----]
[SNIPER] Start
[SNIPER] -----
[SNIPER] Sniper using Pin frontend
[SNIPER] Running pre-ROI region in  CACHE_ONLY mode
[SNIPER] Running application ROI in CACHE_ONLY mode
[SNIPER] Running post-ROI region in FAST_FORWARD mode
[SNIPER] -----
[SNIPER] Hack code: Plummer model
[SNIPER]
nbody      dtime      eps      tol      dtout      tstop      fcells      NPROC
1024      0.02500      0.0500      1.00      0.250      0.075      2.00      1
[HOOKS] Entering ROI
[SNIPER] Enabling performance models
COMPUTESTART = 168641846
[SNIPER] Disabling performance models
[SNIPER] Leaving ROI after 51.12 seconds
[SNIPER] Simulated 56.2M instructions, 0.0M cycles, 56160408.00 IPC
[SNIPER] Simulation speed 1098.6 KIPS (1098.6 KIPS / target core - 910.3ns/instr)
[SNIPER] Setting instrumentation mode to FAST_FORWARD
[HOOKS] Leaving ROI
COMPUTEEND = 219721846
COMPUTETIME = 51080000
TRACKTIME = 25456000
PARTITIONTIME = 628000 0.02
TREEBUILDTIME = 3484000 0.14
FORCECALCTIME = 20440000 0.80
RESTIME = 904000 0.04
[SNIPER] End
[SNIPER] Elapsed time: 54.05 seconds
jasmine@jasmine-desktop:~/Downloads/sniper-5.3/benchmarks$ ./run-sniper -p splash2-barnes -i test -n 1 -c gainestown --cache-only
```

For detailed explanation go through `sniper_manual` given in the link or go to the following website <http://snipersim.org>

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