Analyzing Google Workload Traces in gem5
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Motivation

Warehouse scale computing (WSC) workloads
Google traces released recently for workloads like
WebSearch, Ads, Fleet-Wide, Knowledge Graph [1,2]

WSC workloads have special characteristics
different from traditional workloads
Simulating these traces can provide quick DSE for
WSC architectures

Goal: Enable simulation of Google Workload Traces in gem5 and
explore their behavior.

Want to try?
Visit:

Google Trace Player in gem5

Components involved:

Trace Reader
Traces in drmemtrace format
Separate files for each software thread

Trace Player
Configurable max_ipc and
max_outstanding_mem reqs.

gem5 can simulate these traces at 1
million instructions per host second.

How much these traces stress
memory systems?

How does the change in the number of trace
players impact the observed bandwidth?

Configuration
Feature | Value
--- | ---
Cores | 8
Core width | 8
Frequency | 5GHz
Private L1 I$ | 32KB
Private L1 D$ | 512KB
DRAM | HBM, DDR4/5

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Shared L2 | 8MB

How do these traces compare with
other HPC Benchmarks?

We compare cache miss
rates of different
benchmarks.

High cache miss rates
indicate low locality in Google
Workload Traces compared to
traditional HPC benchmarks.

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References