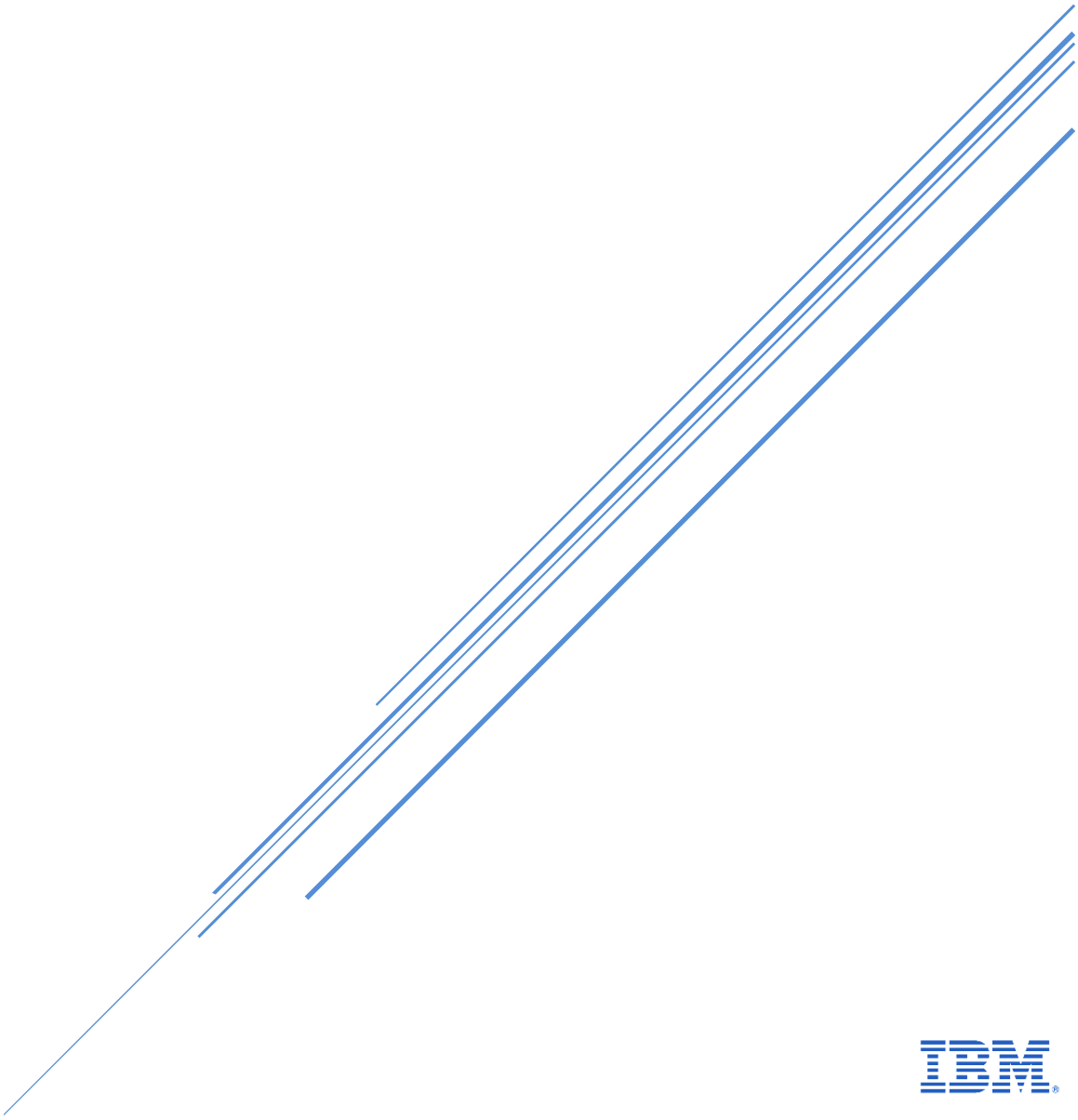
Industry Standard Performance Evaluation Kit

IBM OpenPOWER Performance Enablement

How to run latter.sh



latter.sh

The bash shell script, **latter.sh** is a wrapper script around two industry standard benchmarks, lat_mem_rd and STREAM. This tool is used to measure the performance of all levels of the memory hierarchy. NOTE: lat_mem_rd has been altered from the original source in order to defeat the prefetch characteristics of cache and memory controllers. Therefore, the results are not publishable as specified at the beginning of the code. **NOTE**: root authority is required to control the disabling of prefetch and SMT mode. The prefetch setting and SMT mode will be restored on exit.

Description

Program to measure memory load latency and memory bandwidth latency in nanoseconds. Allocates memory on Chip X, Bind/walk each chip, touch buffer. Latency results should show the symmetry in measurement across all the nodes. Bandwidth is measured using the STREAM benchmark.

Prerequisites

1. numactl
2. numactl-devel (Red Hat) or libnuma-dev (Ubuntu)

For best results, make sure Transparent Huge Pages are enabled:

```
# echo always > /sys/kernel/mm/transparent_hugepage/enabled
```

Building lat_mem_rd and stream

You will need to obtain lat_mem_rd (lmbench3) and stream using the directions posted here in this Github branch.

Running latter.sh

```
# ./latter.sh -h
ERROR: Unrecognized parameter: -h
Usage: latter.sh [-ps set] [-nr runs] [-ni iterations] [-pe event]
                 [-bs buffer_size] [-st stride_size]
Usage: latter.sh [-pp directory]
Where: -ps   Space-separated list of prefetch settings (default: 0 1)
       -nr   Number of runs in each prefetch set (default: 7)
       -ni   Number of iterations in each latter run (default: 11)
       -pe   [PMC set #] (default: 0) ... Gather PMU counter data
       -bs   Buffer size to use (default: 300)
       -st   Stride size to use (default: 256)
       -pp   Redo post-processing on specified directory
```

Runs and iterations should be odd and will be adjusted by the program if they are not.

Examples:

1. Run with default settings. It will run for all the available NUMA nodes. It is HIGHLY recommended to just run this way.

```
# ./latter.sh
```

2. Run with buffer size 512MB and stride of 128 bytes (POWER8 cache line), with prefetching turned off.

```
# ./latter.sh -bs 512 -st 128 -ps 1
```

Results:

Will be stored in the RESULTS directory.

Under each run sub-directory latter_<timestamp>/prefetch.<0|1>, the files listed will have the min, max and mean values in comma separated value (CSV) format for importing into a spreadsheet or parsing with tools such as awk or perl.

```
latency.allruns.latfinal.max.csv
latency.allruns.latfinal.mean.csv
latency.allruns.latfinal.min.csv
```