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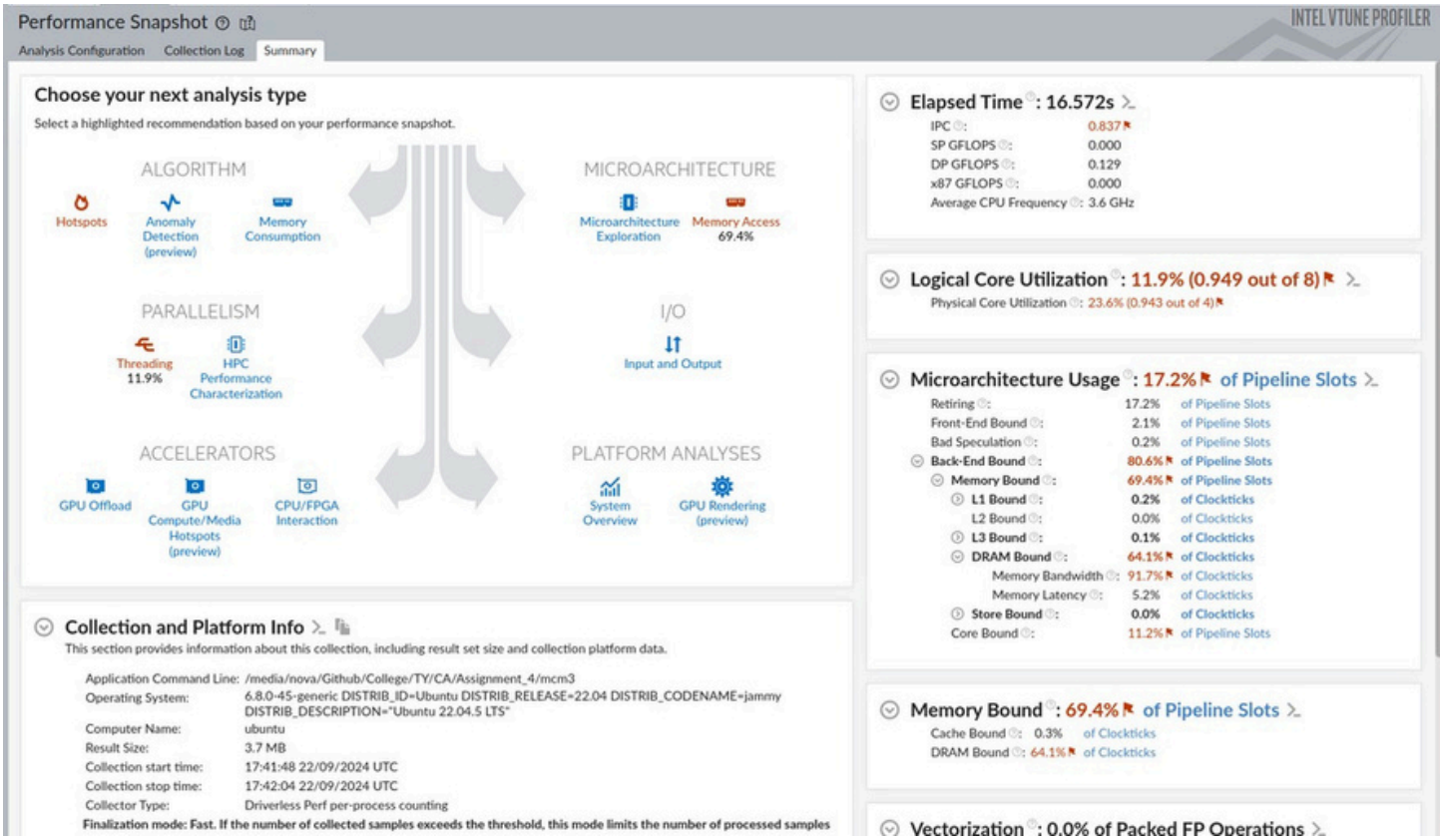
Batch - T4

Course - Computer Algorithm Lab



Hotspots

INTEL VTUNE PROFILER

Analysis Configuration | Collection Log | Summary | Bottom-up | Caller/Callee | Top-down Tree | Flame Graph | Platform

Elapsed Time: 18.626s

- CPU Time: 17.308s
- Total Thread Count: 8
- Paused Time: 0s

Hotspots Insights

If you see significant hotspots in the Top Hotspots list, switch to the Bottom-up view for in-depth analysis per function. Otherwise, use the Caller/Callee or the Flame Graph view to track critical paths for these hotspots.

Explore Additional Insights

Parallelism: 11.6%

Use Threading to explore more opportunities to increase parallelism in your application.

Microarchitecture Usage: 18.8%

Use Microarchitecture Exploration to explore how efficiently your application runs on the used hardware.

INSIGHTS

Top Hotspots

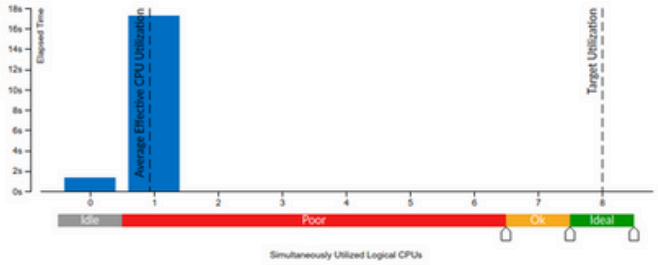
This section lists the most active functions in your application. Optimizing these hotspot functions typically results in improving overall application performance.

Function	Module	CPU Time	% of CPU Time
multiply	mcm3	16.548s	95.6%
_printf	libc.so.6	0.260s	1.5%
MPI_Init	libmpi.so.40	0.129s	0.7%
operator new	libc++abi.so	0.100s	0.6%
__libc_start_main_impl	libc.so.6	0.090s	0.5%
[Others]	N/A*	0.181s	1.0%

*N/A is applied to non-summable metrics.

Effective CPU Utilization Histogram

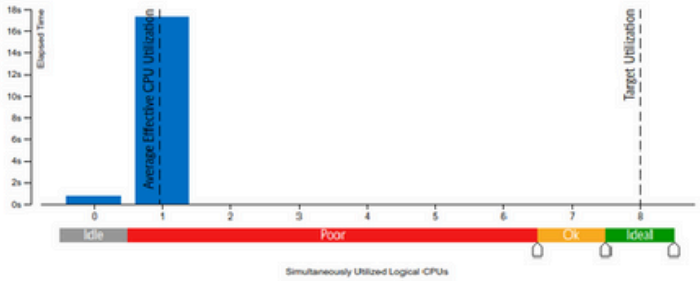
This histogram displays a percentage of the wall time the specific number of CPUs were running simultaneously. Spin and Overhead time adds to the Idle CPU utilization value.



Effective CPU Utilization: 12.0% (0.960 out of 8 logical CPUs)

Effective CPU Utilization Histogram

This histogram displays a percentage of the wall time the specific number of CPUs were running simultaneously. Spin and Overhead time adds to the Idle CPU utilization value.



Total Thread Count: 8

Thread Oversubscription: 0s (0.0% of CPU Time)

Wait Time with poor CPU Utilization: 106.785s (100.0% of Wait Time)

Top Waiting Objects

This section lists the objects that spent the most time waiting in your application. Objects can wait on specific calls, such as sleep() or I/O, or on contended synchronizations. A significant amount of Wait time associated with a synchronization object reflects high contention for that object and, thus, reduced parallelism.

Sync Object	Wait Time with poor CPU Utilization	(% from Object Wait Time)	Wait Count
select	35.345s	100.0%	11
poll	35.282s	100.0%	9
Stream 0x1066984e	35.235s	100.0%	67
Stream 0x6c3e029b	0.424s	100.0%	1
Stream 0x4c6e3554	0.238s	100.0%	9
[Others]	0.262s	100.0%	1,315

*N/A is applied to non-summable metrics.

Spin and Overhead Time: 0s (0.0% of CPU Time)

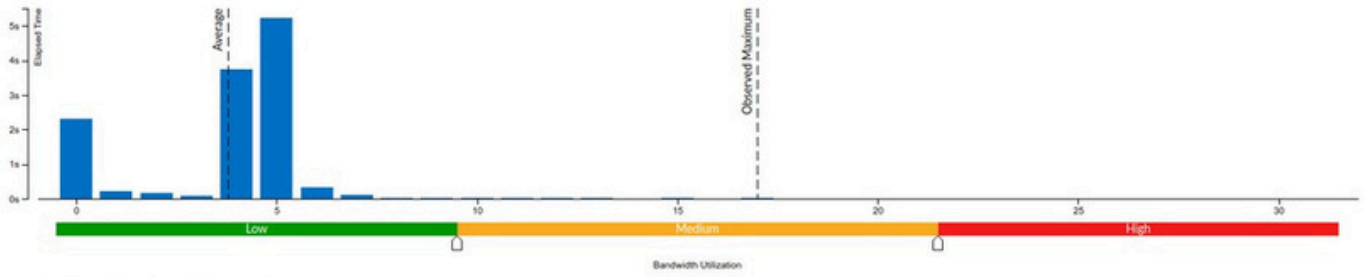
Bandwidth Utilization Histogram

Explore bandwidth utilization over time using the histogram and identify memory objects or functions with maximum contribution to the high bandwidth utilization.

Bandwidth Domain: DRAM, GB/sec

Bandwidth Utilization Histogram

This histogram displays the wall time the bandwidth was utilized by certain value. Use sliders at the bottom of the histogram to define thresholds for Low, Medium and High utilization levels. You can use these bandwidth utilization types in the Bottom-up view to group data and see all functions executed during a particular utilization type. To learn bandwidth capabilities, refer to your system specifications or run appropriate benchmarks to measure them; for example, Intel Memory Latency Checker can provide maximum achievable DRAM and Interconnect bandwidth.



Top Functions with High Bandwidth Utilization

This section shows top functions, sorted by LLC Misses that were executing when bandwidth utilization was high for the domain selected in the histogram area.

No data to show. The collected data is not sufficient.

HPC Performance Characterization

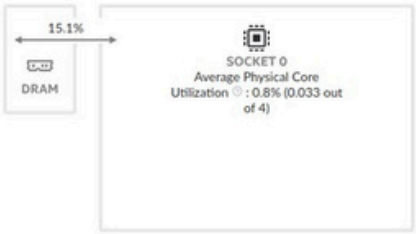
INTEL VTUNE PROFILER

Analysis Configuration | Collection Log | Summary | Bottom-up

Elapsed Time: 17.436s

SP GFLOPS:	0.000
DP GFLOPS:	0.124
x87 GFLOPS:	0.000
CPI Rate:	2.650
Average CPU Frequency:	91.0 GHz
Total Thread Count:	9

Platform Diagram



Effective Physical Core Utilization: 0.8% (0.033 out of 4)

Effective Logical Core Utilization: 0.4% (0.033 out of 8)

Effective CPU Utilization Histogram

Memory Bound: 100.0% of Pipeline Slots

Cache Bound: 1.3% of Clockticks

DRAM Bound: 62.3% of Clockticks

Bandwidth Utilization Histogram

Vectorization: 0.5% of Packed FP Operations

Collection and Platform Info