

GPU Speed of Light Throughput

High-level overview of the throughput for compute and memory resources of the GPU. For each unit, the throughput reports the achieved percentage of utilization with respect to the theoretical maximum. Breakdowns show the throughput for each individual sub-metric of Compute and Memory to clearly identify the highest contributor. High-level overview of the utilization for compute and memory resources of the GPU presented as a rollout chart.

Compute (SM) Throughput [%]44.35 (-24.43%)Duration [usecond]10.14 (99.11%)Memory Throughput [%]64.12 (+5.05%)Elapsed Cycle [cycle]9,177 (99.40%)L1TEX Cache Throughput [%]53.61 (+18.33%)SM Active Cycles [%]60.80 (53.99%)L2 Cache Throughput [%]64.12 (+27.56%)SM Frequency [cycle/usecond]904.38 (92.33%)L1TEX Hit Rate [%]60.80 (-0.39%)DRAM Frequency [cycle/usecond]4.16 (-30.33%)

Memory is more heavily utilized than Compute. Look at the [Memory Workload Analysis](#) report section to see where the memory system bottleneck is. Check memory replay (coalescing) metrics to make sure you're efficiently utilizing the bytes transferred. Also consider whether it is possible to do more work per memory access (kernel fusion) or whether there are values you can recompute.

**High Memory Throughput** The ratio of peak float (fp32) to double (fp64) performance on this device is 32:1. The kernel achieved 11% of this device's fp32 peak performance and 0% of its fp64 peak performance.

**Compute Workload Analysis** Detailed analysis of the memory resources of the streaming multiprocessors (SM), including the achieved instructions per clock (IPC) and the utilization of each available pipeline. Pipelines with very high utilization might limit the overall performance.

Executed (pc Elapsed [inst/cycle]1.30 (+0.00%)SM Busy [%]39.05 (+32.96%)Executed (pc Active [inst/cycle]1.54 (+9.23%)SM Busy [%]39.05 (+32.96%)Issued (pc Active [inst/cycle]1.56 (+32.56%)SM Busy [%]43.35 (+24.43%)

**Balanced** No pipeline is over-utilized.



	Instructions	Requests	Wavefronts	% Peak	Bank Conflicts
Shared Load	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)
Shared Load Atomic	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)
Shared Store	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)
Shared Atomic	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)
Other	0 (+0.00%)	0 (+0.00%)	4.096 (+99.61%)	3.19 (-34.82%)	0 (+0.00%)
Total	0 (+0.00%)	0 (+0.00%)	4.096 (+99.61%)	3.19 (-34.82%)	0 (+0.00%)

	Instructions	Requests	Wavefronts	% Peak	Sectors	Sectors/Req	Hit Rate	Bytes	Sector Misses to L2	% Peak to L2	Returns to SM	% Peak to SM
Local Load	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)
Global Load	22.352 (+99.53%)	22.352 (+99.53%)	22.352 (+99.53%)	17.40 (-24.08%)	103.541 (+99.53%)	4.63 (-0.62%)	54.12 (-22.24%)	3.313.312 (+99.53%)	37.373 (+99.03%)	29.10 (+61.94%)	22.406 (+99.55%)	17.45 (-24.38%)
Texture Load	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)
Global Store	2.032 (+99.61%)	2.032 (+99.61%)	2.032 (+99.61%)	1.58 (-35.30%)	8.128 (+99.61%)	4 (+0.00%)	0 (+0.00%)	260.096 (+99.61%)	8.128 (+99.61%)	6.33 (-35.30%)	-	-
Local Store	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-
Surface Store	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-
Global Reduction	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-
Global Atomic CAS	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-
Global Atomic ALU	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	see above	see above
Surface Atomic CAS	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	see above	see above
Surface Atomic CAS	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	see above	see above
Loads	22.352 (+99.53%)	22.352 (+99.53%)	22.352 (+99.53%)	17.40 (-24.08%)	103.541 (+99.53%)	4.63 (-0.62%)	54.12 (-22.24%)	3.313.312 (+99.53%)	37.373 (+99.03%)	29.10 (+61.94%)	22.406 (+99.55%)	17.45 (-24.38%)
Stores	2.032 (+99.61%)	2.032 (+99.61%)	2.032 (+99.61%)	1.58 (-35.30%)	8.128 (+99.61%)	4 (+0.00%)	0 (+0.00%)	260.096 (+99.61%)	8.128 (+99.61%)	6.33 (-35.30%)	-	-
Total	24.384 (+99.61%)	24.384 (+99.61%)	24.384 (+99.55%)	18.99 (-25.16%)	111.669 (+99.54%)	4.68 (-0.34%)	59.46 (-21.04%)	3.573.408 (+99.54%)	45.501 (+99.23%)	35.43 (+27.67%)	22.406 (+99.55%)	17.45 (-24.38%)

	Requests	Sectors	Sectors/Req	% Peak	Hit Rate	Bytes	Throughput	Sector Misses to Device	Sector Misses to System	Sector Misses to Peer
L1/TEX Load	15.000 (+99.22%)	81.28 (+99.61%)	5.41 (+99.53%)	11.45 (-35.33%)	100 (+0.00%)	260.096 (+99.61%)	25.640.378.548.90 (+56.22%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)
L1/TEX Atomic CAS	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)
L1/TEX Atomic ALU	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)
L1/TEX Atomic CAS	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)
L1/TEX Atomic CAS	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)
L1/TEX Total	17.089 (+99.30%)	45.133 (+99.24%)	2.65 (+99.00%)	63.86 (+27.66%)	49.41 (+26.16%)	1.450.336 (+99.24%)	142.974.763.496.94 (+13.94%)	24.576 (+98.83%)	0 (+0.00%)	0 (+0.00%)
GPU Total	17.232 (+99.30%)	45.302 (+99.24%)	2.64 (+99.53%)	64.12 (+27.56%)	49.41 (+26.02%)	1.456.064 (+99.23%)	143.339.422.176.66 (+13.61%)	24.581 (+98.83%)	0 (+0.00%)	0 (+0.00%)

	Sectors	% Peak	Bytes	Throughput
Load	24.637 (+98.83%)	63.33 (+40.39%)	768.384 (+98.83%)	77.718.242.402.21 (+42.65%)
Store	1.043 (+99.51%)	2.47 (+1.88%)	33.376 (+99.51%)	3.290.220.820.19 (+94.34%)
Total	25.680 (+99.59%)	60.80 (+0.39%)	821.760 (+99.39%)	81.009.463.722.40 (-30.60%)

	Instructions	L1/TEX Requests	% Peak	Hit Rate	L2 Requests	% Peak	L2 Returns	% Peak	L1/TEX Returns	% Peak
Global Load Uncached	22.352 (+99.53%)	22.352 (+99.53%)	17.40 (-24.08%)	54.12 (+22.24%)	-	-	-	-	-	-
Global Load Cached	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-	37.373 (+99.03%)	29.10 (+61.94%)	22.406 (+99.55%)	17.45 (+24.38%)
Local Load Uncached	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-	-	-	-	-
Local Load Cached	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-	-	-	-	-
Texture Load	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)
Global Store	2.032 (+99.61%)	2.032 (+99.61%)	1.58 (-35.30%)	0 (+0.00%)	8.128 (+99.61%)	6.33 (-35.30%)	-	-	-	-
Surface Store	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-	-	-	-	-
Global Reduction	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-	-	-	-	-
Surface Reduction	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-	-	-	-	-
Global Atomic CAS	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-	-	-	-	-
Global Atomic ALU	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-	-	-	-	-
Surface Atomic CAS	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-	0 (+0.00%)	0 (+0.00%)	see above	see above
Surface Atomic CAS	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	0 (+0.00%)	-	-	0 (+0.00%)	0 (+0.00%)	see above	see above
Loads	22.352 (+99.53%)	22.352 (+99.53%)	17.40 (-24.08%)	54.12 (+22.24%)	-	-	37.373 (+99.03%)	29.10 (+61.94%)	22.406 (+99.55%)	17.45 (+24.38%)
Stores	2.032 (+99.61%)	2.032 (+99.61%)	1.58 (-35.30%)	0 (+0.00%)	8.128 (+99.61%)	6.33 (-35.30%)	-	-	-	-
Total	24.384 (+99.61%)	24.384 (+99.61%)	18.99 (-25.16%)	59.46 (+21.04%)	8.128 (+99.61%)	6.33 (-35.30%)	37.373 (+99.03%)	29.10 (+61.94%)	22.406 (+99.55%)	17.45 (-24.38%)

	L2 Requests	% Peak	L2 Returns	% Peak	Total Bytes	Total Throughput
Global Load Uncached	-	-	-	-	1.195.936 (+93.03%)	117.895.899.053.63 (+5.98%)
Global Load Cached	-	-	-	-	-	-
Local Load Uncached	-	-	-	-	-	-
Local Load Cached	-	-	-	-	-	-
Surface Load	-	-	-	-	0 (+0.00%)	0 (+0.00%)
Texture Load	-	-	-	-	0 (+0.00%)	0 (+0.00%)
Global Store	8.128 (+99.61%)	6.33 (-35.30%)	-	-	260.096 (+99.61%)	25.640.378.548.90 (+56.22%)
Local Store	-	-	-	-	-	-
Surface Store	-	-	-	-	-	-
Global Reduction	-	-	-	-	-	-
Surface Reduction	-	-	-	-	-	-
Global Atomic CAS	-	-	-	-	-	-
Global Atomic ALU	-	-	-	-	-	-
Surface Atomic CAS	-	-	-	-	-	-
Surface Atomic CAS	-	-	-	-	-	-
Loads	-	-	37.373 (+99.03%)	29.10 (+61.94%)	1.195.936 (+93.03%)	117.895.899.053.63 (+5.98%)
Stores	8.128 (+99.61%)	6.33 (-35.30%)	-	-	260.096 (+99.61%)	25.640.378.548.90 (+56.22%)
Total	8.128 (+99.61%)	6.33 (-35.30%)	37.373 (+99.03%)	29.10 (+61.94%)	1.456.032 (+93.23%)	143.536.277.602.52 (+13.61%)

	L2 Requests	% Peak	L2 Returns	% Peak	Total Bytes	Total Throughput
Global Load Uncached	-	-	-	-	1.195.936 (+93.03%)	117.895.899.053.63 (+5.98%)
Global Load Cached	-	-	-	-	-	-
Local Load Uncached	-	-	-	-	-	-
Local Load Cached	-	-	-	-	-	-
Surface Load	-	-	-	-	0 (+0.00%)	0 (+0.00%)
Texture Load	-	-	-	-	0 (+0.00%)	0 (+0.00%)
Global Store	8.128 (+99.61%)	6.33 (-35.30%)	-	-	260.096 (+99.61%)	25.640.378.548.90 (+56.22%)
Local Store	-	-	-	-	-	-
Surface Store	-	-	-	-	-	-
Global Reduction	-	-	-	-	-	-
Surface Reduction	-	-	-	-	-	-
Global Atomic CAS	-	-	-	-	-	-
Global Atomic ALU	-	-	-	-	-	-
Surface Atomic CAS	-	-	-	-	-	-
Surface Atomic CAS	-	-	-	-	-	-
Loads	-	-	37.373 (+99.03%)	29.10 (+61.94%)	1.195.936 (+93.03%)	117.895.899.053.63 (+5.98%)
Stores	8.128 (+99.61%)	6.33 (-35.30%)	-	-	260.096 (+99.61%)	25.640.378.548.90 (+56.22%)
Total	8.128 (+99.61%)	6.33 (-35.30%)	37.373 (+99.03%)	29.10 (+61.94%)	1.456.032 (+93.23%)	143.536.277.602.52 (+13.61%)

	L2 Requests	% Peak	L2 Returns	% Peak	Total Bytes	Total Throughput
Global Load Uncached	-	-	-	-	1.195.936 (+93.03%)	117.895.899.053.63 (+5.98%)
Global Load Cached	-	-	-	-	-	-
Local Load Uncached	-	-	-	-	-	-
Local Load Cached	-	-	-	-	-	-
Surface Load	-	-	-	-	0 (+0.00%)	0