Christopher Feener's Report
26 May 2017

Research Report for Virtual Memory: VM Size 1G, Workload A
(Revised)
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Summary:

This is the first in a series of experiments done on latency for virtual memory.

Method:

A total of four data points were recorded, with 100k being replaced by 200k for better results. Each data point was done in three trails. The data points were spread logarithmically on the X-axis to quickly look over a large range for any changes in latency.

Results:

For all three graphs, 200k records yielded much higher latencies than lesser records and more records. The "Read" and "Update" sections are almost identical, other than "Update" having higher latency for its 99- and 95-percentiles.

The following graph shows latency during the "Cleanup" section of the experiment's output. Overall, it shows latency increasing as the number of records increases. However, the variance was so large for such small values that any conclusions are questionable.

1G, Workload A, Cleanup Stage
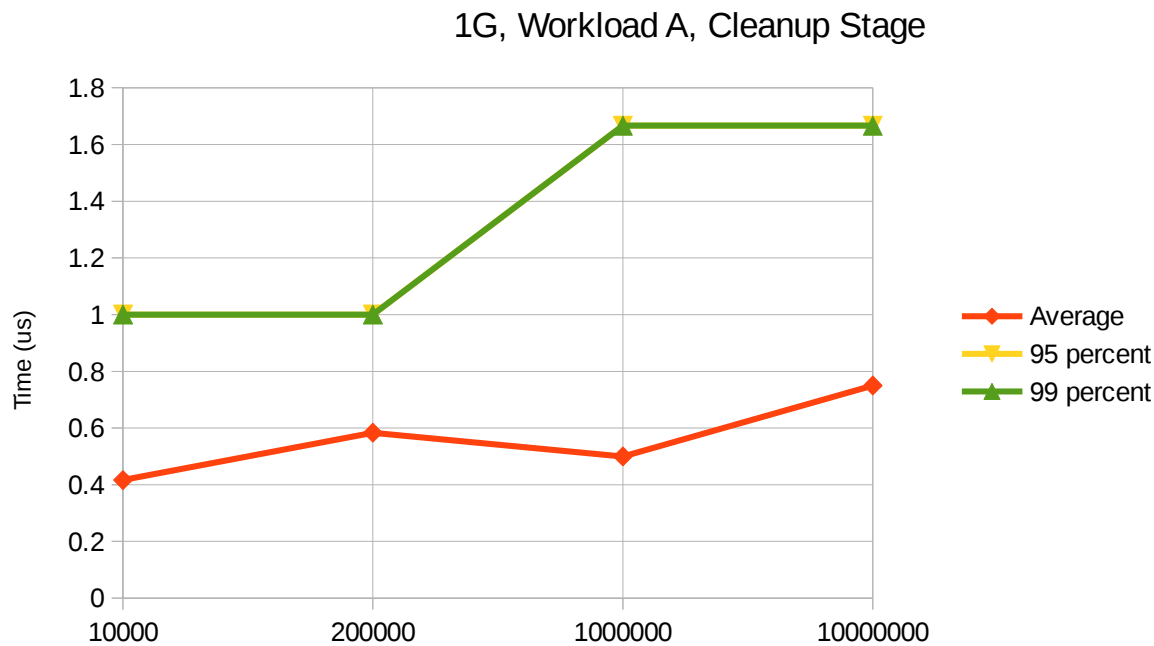
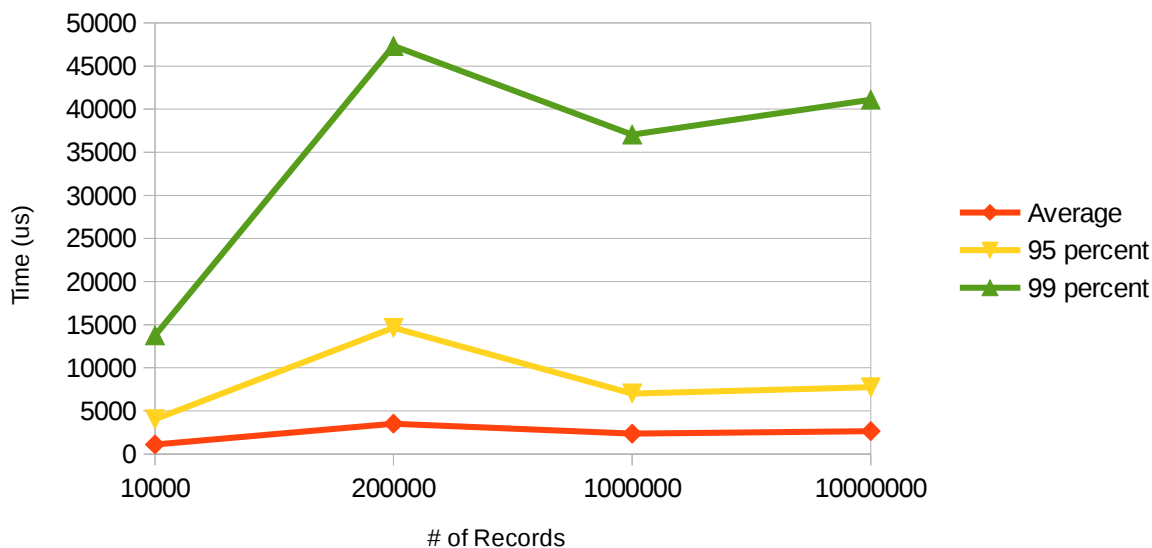| Size of VM = 1 G	# of Records	Average	95 percent	99 percent
Workload A Cleanup	10000	0.4166666667	1	1
	200000	0.58333333	1	1
	1000000	0.5	1.6666666667	1.6666666667
	10000000	0.75	1.6666666667	1.6666666667

When one notes closely, the following two graphs are subtly different. However, their characteristics are similar enough to warrant the same explanation. If the 200k were considered an outlier, the graph would resemble a logarithmic curve, which is interesting given that the graph's scale is logarithmic already.

1G, Workload A, Read stage
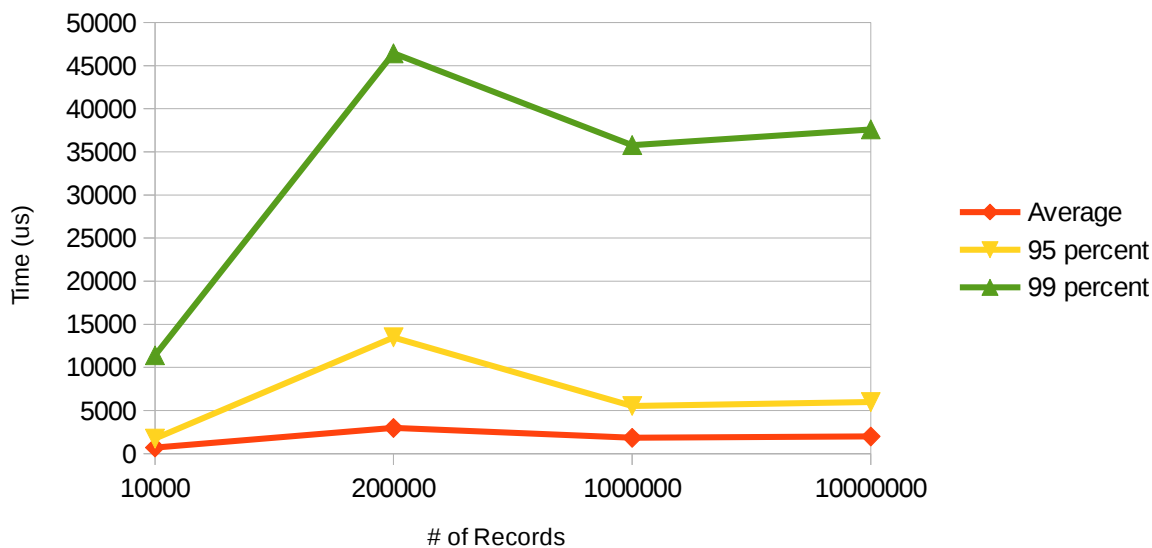
	# of Records	Average	95 percent	99 percent
Read	10000	704.6100628	1738	11391
	200000	2972.6216535	13471	46431
	1000000	1831.9069468	5516.3333333	35785.666667
	10000000	1976.173007	5977.6666667	37599

1G, Workload A, Update stage

	# of Records	Average	95 percent	99 percent
Update	10000	1105.567267	4026.3333333	13764.333333
	200000	3512.1214486	14636.333333	47327
	1000000	2349.6888579	7009.6666667	37044.333333
	10000000	2641.7156323	7736.3333333	41108.333333

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Conclusion:

No clear pattern has been found yet, unless one of the data points (200k or 1G) is an outlier, in which case the results are "doubly" logarithmic.