

RTX64

Local Memory Performance Comparison

This document provides a performance comparison between local memory allocation and Windows memory allocation.

Testing Environment

System	Intel Core i9-7900X CPU @3.30GHz
RTX64 Control Panel customizations	<i>Zero memory on allocation</i> turned off
RtssRun parameters	<pre>Rtssrun /i 4194292 /e 0 test.rtss</pre> <p><i>/i initial_size</i></p> <p>The initial amount of local memory (allocated at process startup), in kilobytes, within the process MSpace.</p> <p><i>/e expand_size</i></p> <p>The amount of local memory, in kilobytes, by which to expand the process MSpace. A value of 0 disables automatic expansion of the process MSpace.</p>
Source	The source file used for this comparison, RTX64_Local_Memory_Performance.cpp, is available for download from the Support site.

Time to Allocate

Below is a comparison of local memory versus Windows memory of the time to allocate memory of different sizes, in nanoseconds, using C Runtime function malloc.

Size (bytes)	Windows memory	RTX64 3.x local memory	RTX64 4.0 local memory
4194304	9.738229e+03 (ns)	3.754353e+05 (ns)	1.151443e+03 (ns)
2097152	5.387196e+03 (ns)	1.867993e+05 (ns)	7.734124e+02 (ns)
1048576	3.726730e+03 (ns)	9.431061e+04 (ns)	6.273231e+02 (ns)
524288	3.403309e+03 (ns)	4.840634e+04 (ns)	5.675217e+02 (ns)
262144	2.527113e+03 (ns)	2.385355e+04 (ns)	5.886057e+02 (ns)
131072	2.267923e+03 (ns)	1.204788e+04 (ns)	4.882693e+02 (ns)
65536	1.786178e+03 (ns)	6.288335e+03 (ns)	4.132421e+02 (ns)
32768	1.109033e+03 (ns)	3.603063e+03 (ns)	3.878605e+02 (ns)
16384	1.019030e+03 (ns)	2.401609e+03 (ns)	1.775531e+02 (ns)
8192	9.850308e+02 (ns)	1.843240e+03 (ns)	9.158333e+01 (ns)
4096	8.968472e+02 (ns)	1.505717e+03 (ns)	6.433333e+01 (ns)
2048	4.295598e+02 (ns)	1.097725e+03 (ns)	6.451812e+01 (ns)

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Size (bytes)	Windows memory	RTX64 3.x local memory	RTX64 4.0 local memory
1024	2.375393e+02 (ns)	9.312101e+02 (ns)	8.139553e+01 (ns)
512	1.434559e+02 (ns)	7.859831e+02 (ns)	4.982428e+01 (ns)
256	1.197506e+02 (ns)	7.491413e+02 (ns)	9.031643e+01 (ns)
128	8.539010e+01 (ns)	7.061655e+02 (ns)	2.575604e+01 (ns)
64	4.021377e+01 (ns)	6.997458e+02 (ns)	2.315399e+01 (ns)
32	4.290278e+01 (ns)	6.978684e+02 (ns)	2.301449e+01 (ns)
16	3.519143e+01 (ns)	6.960556e+02 (ns)	2.338768e+01 (ns)

Time to Free

Below is a comparison of local memory versus Windows memory of the time to free memory of different sizes, in nanoseconds, using C Runtime function malloc.

Size (bytes)	Windows memory	RTX64 3.x local memory	RTX64 4.0 local memory
4194304	4.112605e+04 (ns)	1.889739e+03 (ns)	9.937319e+02 (ns)
2097152	2.152816e+04 (ns)	1.444077e+03 (ns)	8.180930e+02 (ns)
1048576	1.177847e+04 (ns)	1.154293e+03 (ns)	5.811775e+02 (ns)
524288	2.815152e+03 (ns)	1.147034e+03 (ns)	4.139511e+02 (ns)
262144	2.023338e+03 (ns)	8.473418e+02 (ns)	2.757748e+02 (ns)
131072	1.345579e+03 (ns)	8.631250e+02 (ns)	2.047120e+02 (ns)
65536	9.775628e+02 (ns)	8.024106e+02 (ns)	2.243593e+02 (ns)
32768	8.577470e+02 (ns)	7.860803e+02 (ns)	2.035175e+02 (ns)
16384	7.175637e+02 (ns)	8.557935e+02 (ns)	1.166129e+02 (ns)
8192	4.400477e+02 (ns)	7.699921e+02 (ns)	1.034777e+02 (ns)
4096	2.671546e+02 (ns)	7.465531e+02 (ns)	5.117633e+01 (ns)

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Size (bytes)	Windows memory	RTX64 3.x local memory	RTX64 4.0 local memory
2048	1.470109e+02 (ns)	7.472687e+02 (ns)	3.894867e+01 (ns)
1024	8.696014e+01 (ns)	7.049976e+02 (ns)	2.668418e+01 (ns)
512	5.783696e+01 (ns)	6.854638e+02 (ns)	2.600966e+01 (ns)
256	2.446981e+01 (ns)	6.671135e+02 (ns)	2.672886e+01 (ns)
128	2.153019e+01 (ns)	6.701359e+02 (ns)	2.595652e+01 (ns)
64	2.058575e+01 (ns)	6.826021e+02 (ns)	2.664674e+01 (ns)
32	2.080495e+01 (ns)	7.039994e+02 (ns)	2.591908e+01 (ns)
16	2.379408e+01 (ns)	7.048333e+02 (ns)	2.680978e+01 (ns)