TRENTON Systems, Inc.
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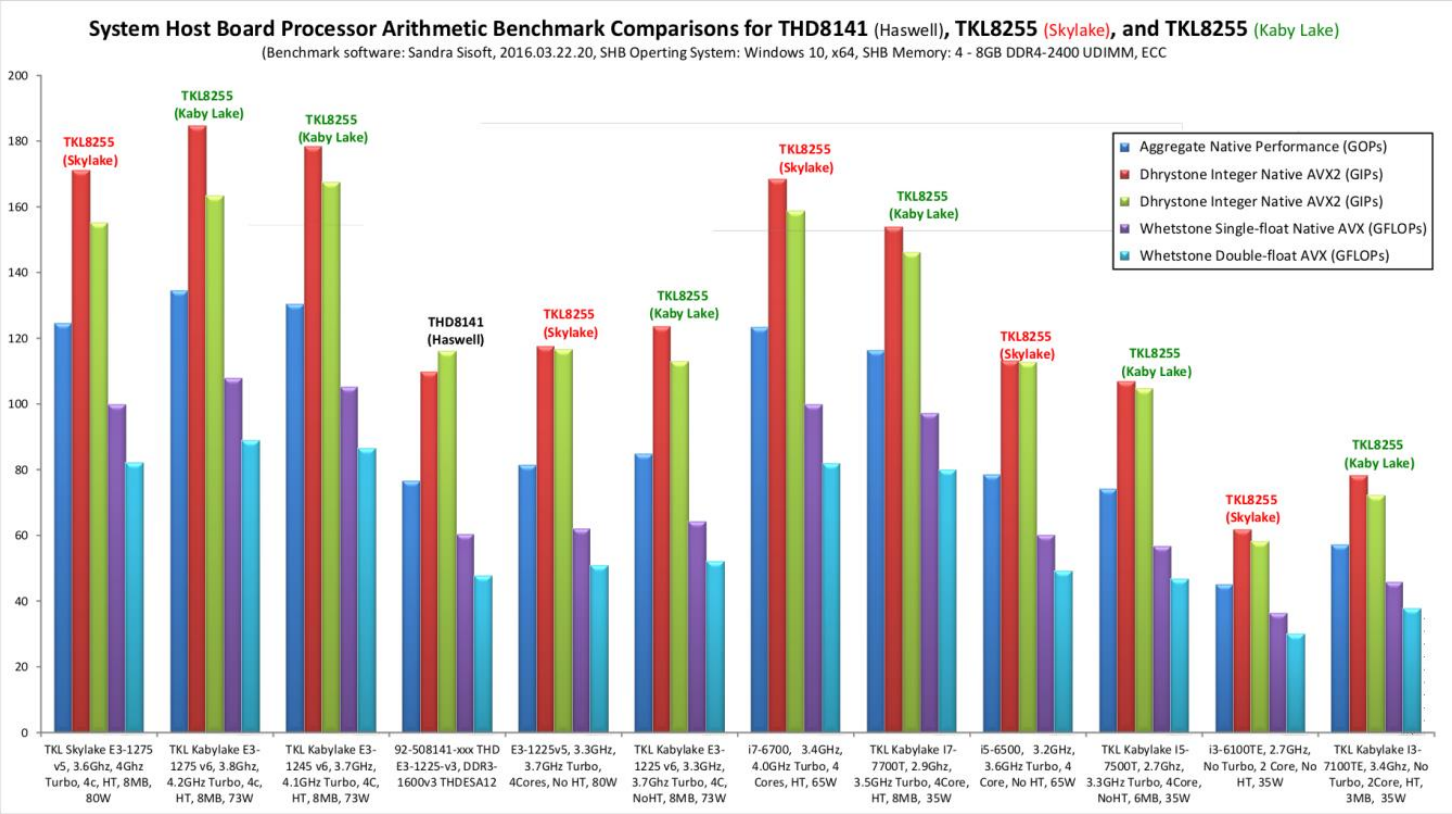
Application Note: Performance Benchmark Comparisons For Trenton's TKL8255 System Host Board Using the Intel® Xeon® E3-1200 v6 and 7th Generation Intel® Core™ Processors (Kaby Lake-S)

Date: April 13, 2017

The following benchmark comparison charts illustrate the TKL8255 system host board performance differences of the various Intel processors typically used in workstation applications. The workstation processors formally known by the Haswell, Skylake-S and Kaby Lake-S project codenames are compared using the popular Sandra Sisoft, 2016 benchmarking software. The Windows 10 64-bit operating system was running on each system host board during the following benchmarking tests.*

Processor Arithmetic Benchmark



The processor arithmetic benchmark test focuses on the CPU's ability to perform the basic math operations as well as those more advanced computing tasks associated with the AVX instruction set. When comparing exact processor types such as the Intel Xeon E3-1275 v5 (Skylake) to the Intel Xeon E3-1275 v6 (Kaby Lake), the benchmark test results illustrate a noticeable performance improvement when using Kaby Lake especially with the Drystone integer tests.

You'll notice what appears to be a reduction in Kaby Lake performance compared to Skylake in the Core i7 and Core i5 data results. This is because we are comparing the lower wattage (35W TDP) Inter Core i7-7700T and Intel Core i5-7500T Kaby Lake processors to their higher wattage (65W TDP) counter parts in the Skylake performance vector that run at a higher core frequency. The thermal efficiencies gained will likely more than offset the slight benchmark performance gains of the hotter CPUs in advanced compute density applications such as those found in modular blade systems. If we were to compare like 65W processors the Kaby Lake Core i7/i5 CPUs would outperform Skylake processors. This point is illustrated with the Core i3 data that compares two exact Kaby Lake and Skylake processors.

These test results illustrate an aggregate arithmetic performance increase of approximately 6% with the Kaby Lake processor architecture compared to the equivalent Skylake) architecture and an increase of 7% compared to the Haswell processor micro-architecture.

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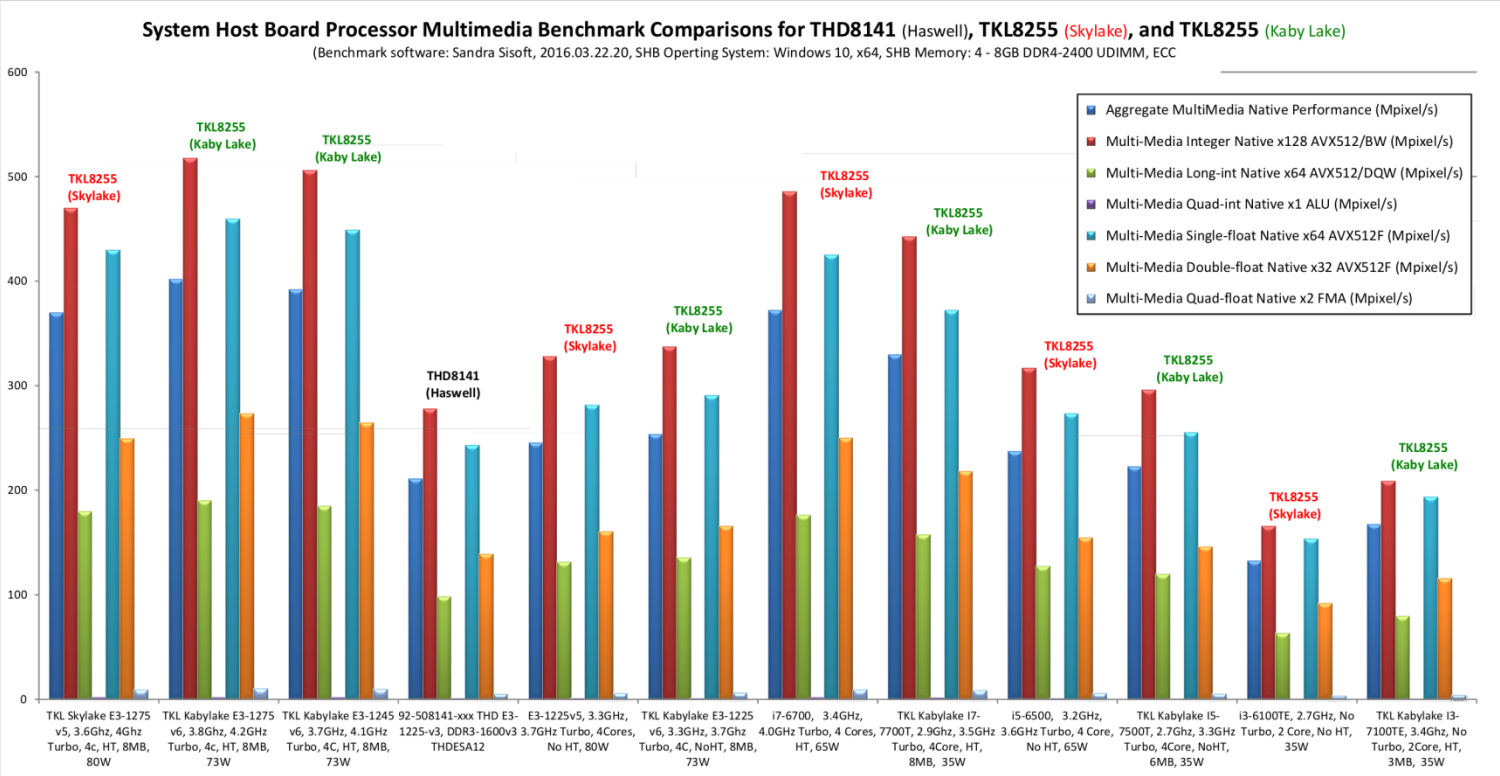
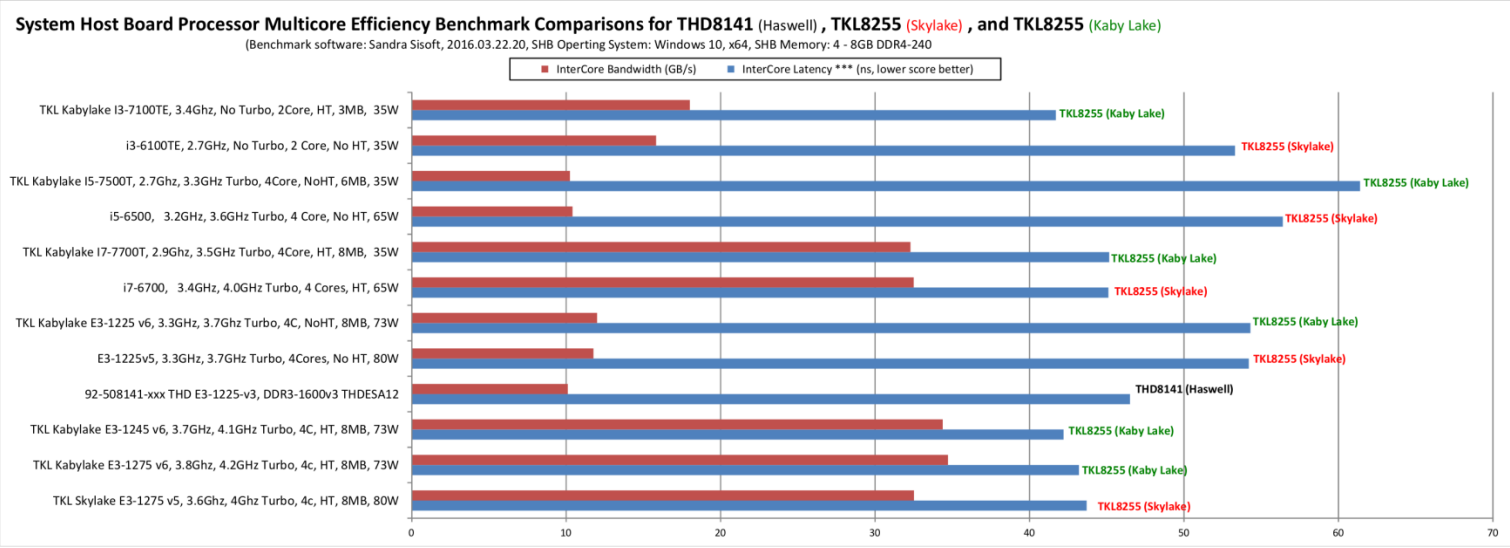
Processor Multimedia Benchmark



The performance data for multimedia also shows a slight Kaby Lake performance increase over Skylake with equivalent processors. The biggest jump comes when comparing Kaby Lake processor performance to Haswell.

Processor Multicore Efficiency Benchmark



With the InterCore Latency performance measure, a smaller number indicates a better performance score, i.e. a reduction in inter-core latency delays. These test results show an overall improvement in reduced inter-core latency times of approximately 28% with the Intel® Core™ i3-7100TE (Kaby Lake-S) compared to the equivalent Intel® Core™ i3-6100TE (Skylake-S) processor. A more modest 3.4% improvement is typical within the Intel Xeon performance vector.

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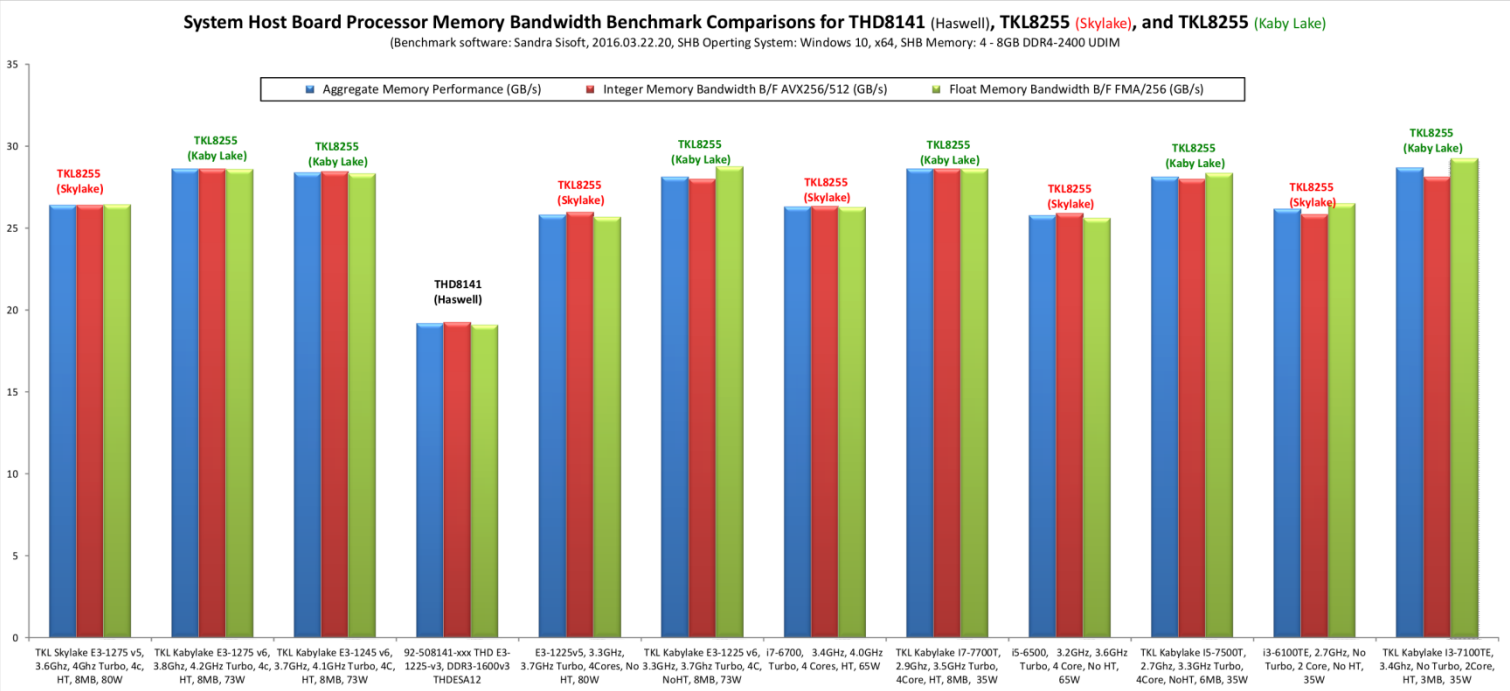
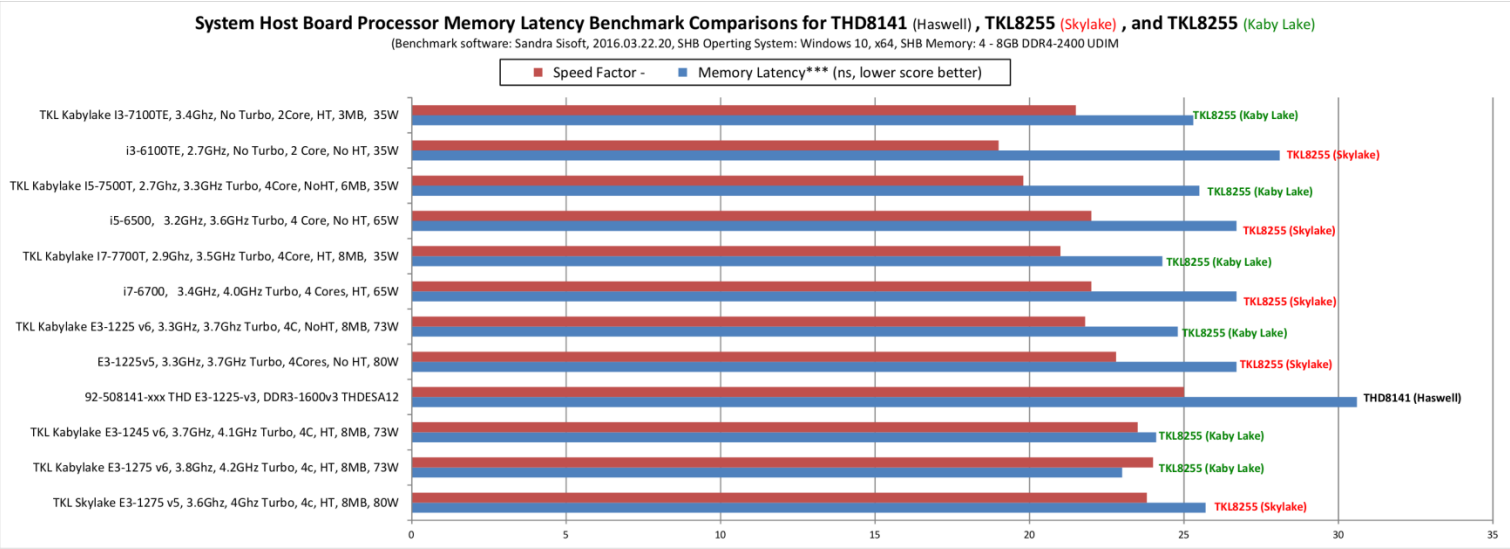
Processor Memory Bandwidth Benchmark



In this test the Kaby Lake micro-architecture processor clearly outperforms the previous generation Haswell micro-architecture. There are modest improvement gains demonstrated between Kaby Lake and Skylake processors.

Processor Memory Latency Benchmark



Again, a smaller number indicates a better performance score (i.e. a reduction in memory interface latency delays) when running this benchmark. This test result shows an average improvement in reduced memory latency times of approximately 12% with the Kaby Lake processors compared to Skylake and 23% when comparing an equivalent Kaby Lake and Haswell processor.

***NOTE:** This benchmark information is provided for comparison purposes only. Actual system performance is application dependent and will vary.

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Hopefully, you find this information helpful as you assess the system performance requirements of your particular system applications. For additional information contact Trenton toll-free in the U.S. at 1-800-875-6031 or worldwide at +1-770-287-3100. Please visit our website at www.TrentonSystems.com or follow us on: