LEADING PERFORMANCE FOR HPC AND AI

CASCADe LAKE ADVANCED PERFORMANCE

INDUSTRY BENCHMARKS

LINPACK STREAM TRIAD

UP TO 3.4X UP TO 1.3X

vs AMD EPYC 7601
2S configuration

REAL WORLD APPLICATIONS

MILC WRF OPENFOAM* NAMD (APOA1) YASK (ISO3DFD)

UP TO 1.5X UP TO 1.6X UP TO 1.6X UP TO 2.1X UP TO 3.1X

vs AMD EPYC 7601 (2S configuration)

DEEP LEARNING INFERENCE

UP TO 17X IMAGES PER SECOND

vs Intel® Xeon® Platinum Processor at launch

Intel estimated results based on pre-production HW

Performance results are based on testing or projections as of 6/2017 to 11/7/2018 and may not reflect all publicly available security updates. See configuration disclosure in backup for details. No product can be absolutely secure. For more complete information about performance and benchmark results, visit www.intel.com/benchmarks. Intel’s compilers may or may not optimize to the same degree for non-Intel microprocessors for optimizations that are not unique to Intel microprocessors. These optimizations include SSE2, SSE3, and SSSE3 instruction sets and other optimizations. Intel does not guarantee the availability, functionality, or effectiveness of any optimization on microprocessors not manufactured by Intel. Microprocessor-dependent optimizations in this product are intended for use with Intel microprocessors. Certain optimizations not specific to Intel microarchitecture are reserved for Intel microprocessors. Please refer to the applicable product User and Reference Guides for more information regarding the specific instruction sets covered by this notice (Notice Revision #20110804). Data collected with OpenFOAM® Foundation v5.0. This offering is not approved or endorsed by OpenCFD Limited, producer and distributor of the OpenFOAM software via www.openfoam.com, and owner of the OPENFOAM® and OpenCFD® trademarks. Other names and brands may be claimed as the property of others. Configuration details in backup.
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LINFPACK: 2S AMD EPYC 7601: 1-node Supermicro AS-2023US-TR4, 2x AMD EPYC 7601 (2.2GHz, 32cores per socket), 16x32GB DDR4-2666, SMT off, Turbo On, 1 SSD SATA, BIOS ver 1.1a, 4/26/2018, microcode: 0x8001227, Ubuntu 18.04.1 LTS (4.17.0-041700-generic Retropine), High Performance Linpack v2.2, compiled with Intel(R) Parallel Studio XE 2018 for Linux, Intel MPI version 18.0.0.128, AMD BLIS version 0.4.0, Benchmark Config: Nb=232, N=168960, P=4, Q=4, Score = 1095GF/s, tested by Intel on 07/31/2018. 2S Cascade Lake Advanced Performance. Intel projected results based on pre-production hardware using 2x 48-core Cascade Lake Advanced Performance processor on 10/3/2018.

DL Inference: Platform: 2S Intel Xeon Platinum 8180 CPU, Intel Xeon Phi CPU (2.39GHz, 268cores per socket), HT disabled, turbo disabled, scaling governor set to “performance” via intel. battery, 324GB DDR4-2666 ECC REG. CentOS Linux release 7.3.1611 (Core), Intel(R) Intel(R) 64 Compiler 18.0.0.117 Build 20180804, 2S Cascade Lake Advanced Performance: Intel projected results based on pre-production hardware using 2x 48-core Cascade Lake Advanced Performance processor on 10/3/2018.

Online CFDF (higher is better): 2S AMD EPYC 7601: 1-node Supermicro AS-2023US-TR4, 2x AMD EPYC 7601 (2.2GHz, 32cores per socket), 16x16GB DDR4-2666, SMT on (1 thread/core). Turbo on, 1 SSD SATA, BIOS ver 1.1b (08/2018), Microcode: 0x8001227, Oracle Linux Server release 7.5 (3.10.0-862.14.4.a7l.etl.x86_64), MILC version: 7.8.1 “intel-recipe” branch, baseline code (no GPHIX) https://github.com/milc-ode/milc_ode/tree/intel-recipe, compiled with AVX2, Intel Compiler 18.0.3 20180410, Intel MPI 2018 Update 3 Build 20180411, Score = 75 (best performance measured), tested by Intel on 10/17/2018, Intel estimated results based on pre-production hardware using 2x 48-core Cascade Lake Advanced Performance processor, Score=118 on 11/30/2018.

Online CFDF (lower is better): 2S AMD EPYC 7601: 1-node Supermicro AS-2023US-TR4, 2x AMD EPYC 7601 (2.2GHz, 32cores per socket), 16x16GB DDR4-2666, SMT on (1 thread/core). Turbo on, 1 SSD SATA, BIOS ver 1.1b (08/2018), Microcode: 0x8001227, Oracle Linux Server release 7.5 (3.10.0-862.14.4.a7l.etl.x86_64), WRF version 3.9.1.1, Workload: CONUS-2 5km, compiled with AVX2, Intel(R) Parallel Studio XE 2018 Update 3 and Intel MPI 2018 Update 3, Score=2.381 (best performance measured), tested by Intel on 9/27/2018. 2S Cascade Lake Advanced Performance: Intel estimated results based on pre-production hardware using 2x 48-core Cascade Lake Advanced Performance processor, Score=1.445 on 11/5/2018.

NAMD (higher is better): 2S AMD EPYC 7601: Supermicro AS-2023US-TR4, 2x AMD EPYC 7601 (2.2GHz, 32cores per socket), 16x16GB DDR4-2666, SMT On (2 threads/core), Turbo on, 1 SSD SATA, BIOS: 1.1b (08/2018), Microcode: 0x8001227, Oracle Linux Server release 7.5 (3.10.0-862.14.4.a7l.etl.x86_64), Workload: NAMD version 2.12, compiled with -march=znver1, LLVM 5.0, Score apoa=19.55 ns/day (best performance measured), tested by Intel on 10/05/2018. 2S Cascade Lake Advanced Performance: Intel estimated results based on pre-production hardware using 2x 48-core Cascade Lake Advanced Performance processor Score apoa=+2.18 ns/day on 11/3/2018

OpenFOAM® (lower is better): Data collected with OpenFOAM® Foundation v6.0: This offering is not approved or endorsed by OpenCFD Limited, producer and distributor of the OpenFOAM software via www.openfoam.com, and owner of the OPENFOAM® and OpenCFD® trademarks. Data AMD EPYC 7601: Supermicro AS-2023US-TR4, 2x AMD EPYC 7601 (2.2GHz, 32cores per socket), 16x16GB DDR4-2666, SMT On (1 thread/core), Turbo On, 1 SSD SATA, BIOS: 1.1b (08/2018), Microcode: 0x8001227, Oracle Linux Server release 7.5 (3.10.0-862.14.4.a7l.etl.x86_64), Workload: OpenFOAM 2.0M Cell Motorbike, https://github.com/OpenFOAM/OpenFOAM-5-xgcc-4.8.5-Build 20150823, Score=1766 (best performance measured), tested by Intel on 11/10/2018. 2S Cascade Lake Advanced Performance: Intel estimated results based on pre-production hardware using 2x 48-core Cascade Lake Advanced Performance processor, Score=1047 on 11/5/2018.

YAStK (higher is better): 2S AMD EPYC 7601: Supermicro AS-2023US-TR4, 2x AMD EPYC 7601 (2.2GHz, 32cores per socket), 16x16GB DDR4-2666, SMT On (2 threads/core). Turbo on, 1 SSD SATA, BIOS: 1.1b (08/2018), Microcode: 0x8001227, Oracle Linux Server release 7.5 (3.10.0-862.14.4.a7l.etl), Workload: awp/iso3dfdr (https://github.com/Intel/yastk, MIT open-source license), compiled with Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.0.117 Build 20180804, Score iso3dfdr=5.5569 (best performance measured), tested by Intel on 11/2/2018. 2S Cascade Lake Advanced Performance: Intel estimated results based on pre-production hardware using 2x 48-core Cascade Lake Advanced Performance processor, Score iso3dfdr=1.85e10 on 11/2/2018.