



SPEChpc™ 2021 Medium Result

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Intel

Endeavour: Intel Server D50DNP2MFALACB (Intel Xeon Platinum 8480+)

SPEChpc2021_med_base = 1.28

SPEChpc2021_med_peak = 1.33

hpc2021 License: 13

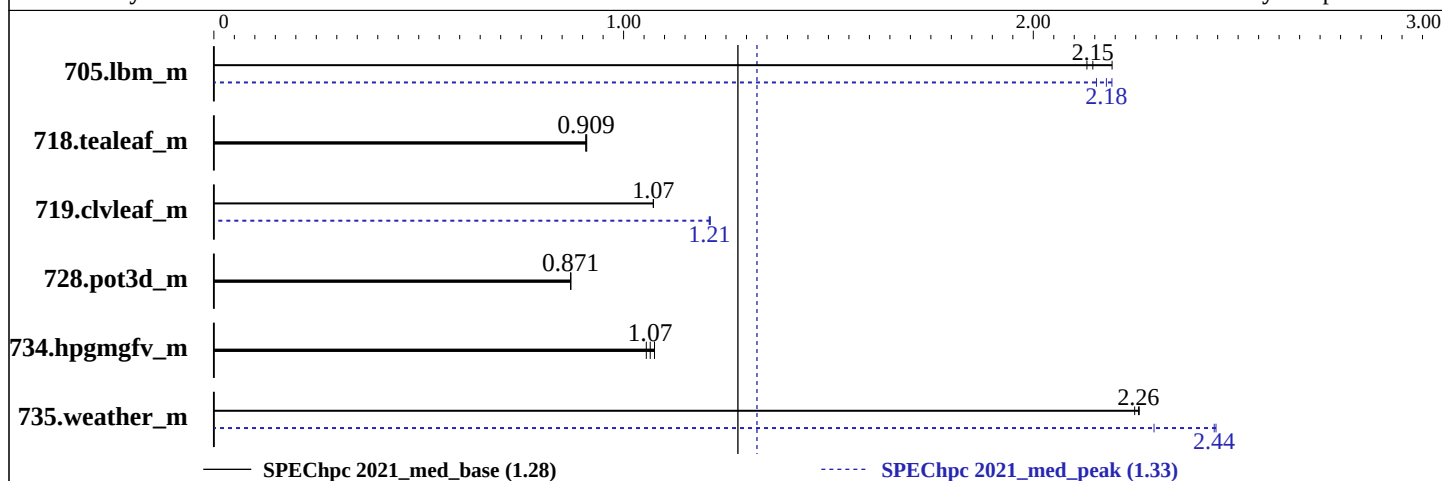
Test Sponsor: Intel

Tested by: Intel

Test Date: Jul-2023

Hardware Availability: Jan-2023

Software Availability: Apr-2023



Results Table

Benchmark	Base								Peak							
	Model	Ranks	Thrds/Rnk	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Model	Ranks	Thrds/Rnk	Seconds	Ratio	Seconds	Ratio
705.lbm_m	OMP	256	7	575	2.13	571	2.15	559	2.19	OMP	1792	1	559	2.19	562	2.18
718.tealeaf_m	OMP	256	7	1483	0.910	1485	0.909	1487	0.908	OMP	256	7	1483	0.910	1485	0.909
719.clvleaf_m	OMP	256	7	1724	1.07	1725	1.07	1725	1.07	OMP	128	14	1527	1.21	1529	1.21
728.pot3d_m	OMP	256	7	2124	0.871	2124	0.871	2124	0.871	OMP	256	7	2124	0.871	2124	0.871
734.hpgmgfv_m	OMP	256	7	947	1.06	930	1.08	939	1.07	OMP	256	7	947	1.06	930	1.08
735.weather_m	OMP	256	7	1063	2.26	1068	2.25	1063	2.26	OMP	256	7	981	2.45	983	2.44

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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.



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Hardware Summary

Type of System: Homogenous Cluster
Compute Node: Intel Server D50DNP2MFALACB (Xeon 8480+)
Interconnect: Mellanox HDR
Compute Nodes Used: 16
Total Chips: 32
Total Cores: 1792
Total Threads: 3584
Total Memory: 8 TB
Total Accelerators: 0
Max. Peak Threads: 14

Software Summary

Compiler: Intel oneAPI Compiler 2023.1.0
MPI Library: Intel MPI Library 2021.9 for Linux OS
Other MPI Info: None
Other Software: None
Base Parallel Model: OMP
Base Ranks Run: 256
Base Threads Run: 7
Peak Parallel Models: OMP
Minimum Peak Ranks: 128
Maximum Peak Ranks: 1792
Max. Peak Threads: 14
Min. Peak Threads: 1

Node Description: Intel Server D50DNP2MFALACB (Xeon 8480+)

Hardware

Number of nodes: 16
Uses of the node: Compute
Vendor: Intel
Model: Intel Server D50DNP2MFALACB (Xeon 8480+)
CPU Name: Intel Xeon Platinum 8480+
CPU(s) orderable: 1, 2 chips
Chips enabled: 2
Cores enabled: 112
Cores per chip: 56
Threads per core: 2
CPU Characteristics: Turbo Boost Technology up to 3.8 GHz
CPU MHz: 2000
Primary Cache: 32 KB I + 48 KB D on chip per core
Secondary Cache: 2 MB I+D on chip per core
L3 Cache: 105 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC5-4800B)
Disk Subsystem: 1 x 1 TB NVMe U.2 2.5" SSD
Other Hardware: None
Accel Count: None
Accel Model: None
Accel Vendor: None
Accel Type: None
Accel Connection: None
Accel ECC enabled: None
Accel Description: None
Adapter: Mellanox ConnectX-6 HDR
Number of Adapters: 1
Slot Type: PCI-Express 4.0 x16
Data Rate: 200Gbit/s
Ports Used: 1
Interconnect Type: Mellanox HDR

Software

Accelerator Driver: None
Adapter: Mellanox ConnectX-6 HDR
Adapter Driver: 5.9-0.5.5
Adapter Firmware: 20.36.1010
Operating System: Rocky Linux 8.7 (Green Obsidian)
4.18.0-372.32.1.el8_6.crt3.x86_64
Local File System: NFS
Shared File System: PANASAS FS
System State: Multi-user
Other Software: None



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Interconnect Description: Mellanox HDR

Hardware

Vendor: Mellanox
Model: Mellanox HDR
Switch Model: Mellanox MQM8790-HS2F Quantum HDR InfiniBand Switch
Number of Switches: 18
Number of Ports: 40
Data Rate: 200 Gbit/s
Firmware: 20.36.1010
Topology: Fat-tree
Primary Use: MPI Traffic

Software

: --

Submit Notes

The config file option 'submit' was used.

General Notes

The PANASAS filesystem as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC HPG Policy document, <http://www.spec.org/hpg/policy.html>

Compiler Version Notes

=====
CC 705.lbm_m(base, peak) 718.tealeaf_m(base, peak) 734.hpgmgfv_m(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler 2023.1.0 (2023.1.0.20230320)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir:
/global/panfs01/admin/opt/intel/oneAPI/2023.1.0.46401/compiler/2023.1.0/linux/bin-llvm
Configuration file:
/global/panfs01/admin/opt/intel/oneAPI/2023.1.0.46401/compiler/2023.1.0/linux/bin-llvm/./bin/icx.cfg

=====
FC 719.clvleaf_m(peak)

ifort (IFORT) 2021.9.0 20230302
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Compiler Version Notes (Continued)

=====

FC 719.clvleaf_m(base) 728.pot3d_m(base, peak) 735.weather_m(base, peak)

=====

ifx (IFX) 2023.1.0 20230320
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Base Compiler Invocation

C benchmarks:
mpiicc -cc=icx

Fortran benchmarks:
mpiifort -fc=ifx

Base Portability Flags

705.lbm_m: -lstdc++ -std=c++14
718.tealeaf_m: -lstdc++ -std=c++14
734.hpgmgfv_m: -lstdc++ -std=c++14

Base Optimization Flags

C benchmarks:
-O3 -Ofast -xCORE-AVX512 -mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -fiopenmp -ffast-math -flto
-funroll-loops

Fortran benchmarks:
-O3 -Ofast -xCORE-AVX512 -mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -fiopenmp -ffast-math -flto
-funroll-loops -nostandard-realloc-lhs -align array64byte

Base Other Flags

C benchmarks (except as noted below):
-Ispecmpitime -Wno-incompatible-function-pointer-types

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Base Other Flags (Continued)

734.hpgmgfv_m: -Ispecmpitime -Wno-incompatible-function-pointer-types

Fortran benchmarks:

719.clvleaf_m: -Ispecmpitime

Peak Compiler Invocation

C benchmarks:
mpiicc -cc=icx

Fortran benchmarks (except as noted below):
mpiifort -fc=ifx

719.clvleaf_m: mpiifort

Peak Portability Flags

705.lbm_m: -lstdc++ -std=c++14
718.tealeaf_m: -lstdc++ -std=c++14
734.hpgmgfv_m: -lstdc++ -std=c++14

Peak Optimization Flags

C benchmarks:

705.lbm_m: -O3 -Ofast -xCORE-AVX512 -mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -fiopenmp
-ffast-math -flto -funroll-loops

718.tealeaf_m: basepeak = yes

734.hpgmgfv_m: basepeak = yes

Fortran benchmarks:

719.clvleaf_m: -O3 -Ofast -xCORE-AVX512 -ansi-alias -qopenmp -ipo
-qopt-zmm-usage=high

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Peak Optimization Flags (Continued)

719.clvleaf_m (continued):

-qopt-multiple-gather-scatter-by-shuffles
-nostandard-realloc-lhs -align array64byte

728.pot3d_m: basepeak = yes

735.weather_m: -O3 -Ofast -xCORE-AVX512 -mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -fiopenmp
-ffast-math -flto -funroll-loops
-qopt-streaming-stores=always -nostandard-realloc-lhs
-align array64byte

Peak Other Flags

C benchmarks (except as noted below):

-Ispecmpitime -Wno-incompatible-function-pointer-types

734.hpgmgfv_m: -Ispecmpitime -Wno-incompatible-function-pointer-types

Fortran benchmarks:

719.clvleaf_m: -Ispecmpitime

The flags file that was used to format this result can be browsed at

http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2023-08-16.html

You can also download the XML flags source by saving the following link:

http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2023-08-16.xml

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEChpc2021 v1.1.7 on 2023-07-13 03:55:40-0400.

Report generated on 2025-06-06 13:08:52 by hpc2021 PDF formatter v112.

Originally published on 2023-09-06.