



SPEChpc™ 2021 Small Result

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Supermicro

(Test Sponsor: Intel)

SPEChpc 2021_sml_base = 2.38

SPEChpc 2021_sml_peak = 2.55

Supermicro SYS-222HA-TN (Intel Xeon 6980P)

hpc2021 License: 13

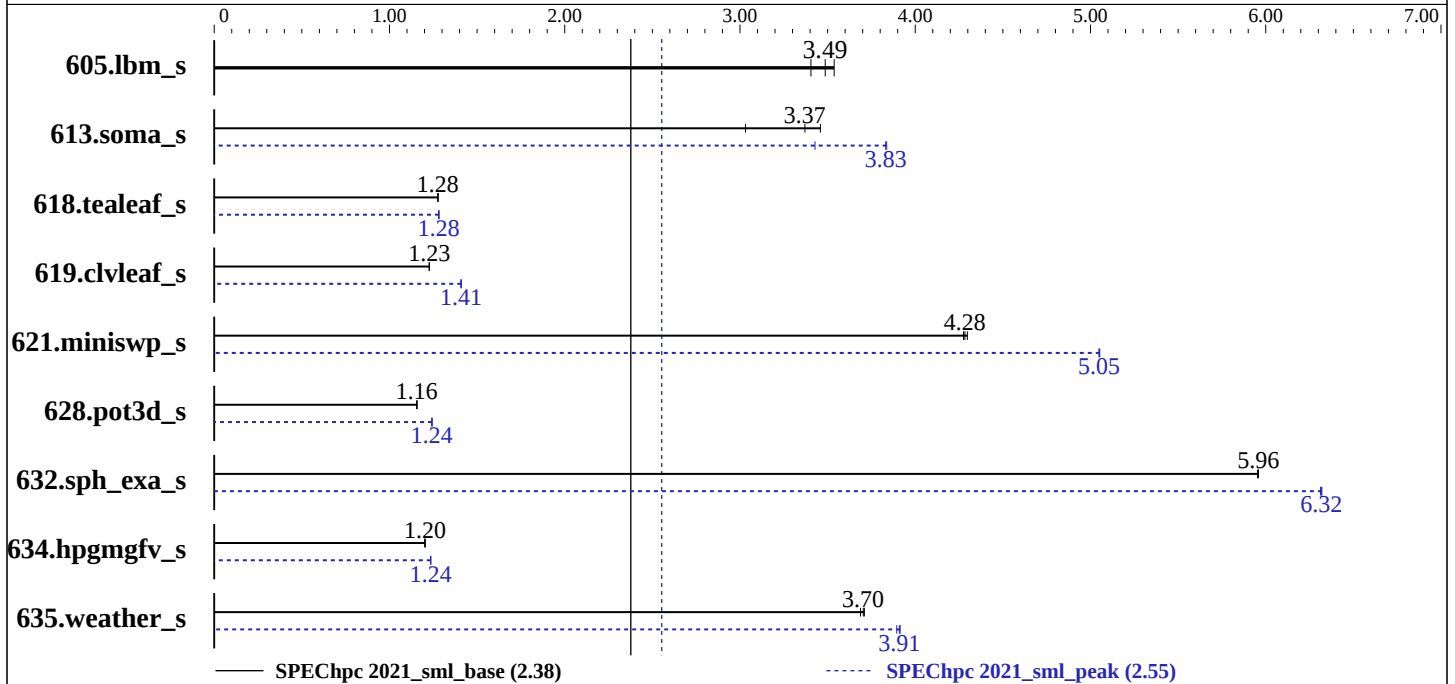
Test Sponsor: Intel

Tested by: Intel

Test Date: Aug-2025

Hardware Availability: Sep-2024

Software Availability: Jun-2025



Results Table

Benchmark	Base										Peak									
	Model	Ranks	Thrds/Rnk	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Model	Ranks	Thrds/Rnk	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
605.lbm_s	OMP	16	16	455	3.40	445	3.49	438	3.54	OMP	16	16	455	3.40	445	3.49	438	3.54		
613.soma_s	OMP	16	16	475	3.37	463	3.46	528	3.03	OMP	2	128	418	3.83	417	3.84	467	3.43		
618.tealeaf_s	OMP	16	16	1605	1.28	1605	1.28	1606	1.28	OMP	6	42	1598	1.28	1601	1.28	1600	1.28		
619.clvleaf_s	OMP	16	16	1345	1.23	1344	1.23	1344	1.23	OMP	126	2	1172	1.41	1171	1.41	1171	1.41		
621.miniswp_s	OMP	16	16	256	4.30	257	4.28	257	4.28	OMP	2	126	218	5.05	218	5.05	218	5.05		
628.pot3d_s	OMP	16	16	1448	1.16	1448	1.16	1448	1.16	OMP	252	1	1348	1.24	1348	1.24	1349	1.24		
632.sph_exa_s	OMP	16	16	386	5.95	386	5.96	386	5.96	OMP	32	8	364	6.32	364	6.31	364	6.32		
634.hpgmgfv_s	OMP	16	16	812	1.20	810	1.20	810	1.20	OMP	256	1	790	1.23	789	1.24	789	1.24		
635.weather_s	OMP	16	16	705	3.69	702	3.70	701	3.71	OMP	64	4	664	3.91	665	3.91	668	3.89		

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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: Supermicro SYS-222HA-TN (Intel Xeon 6980P)
Interconnect: None
Compute Nodes Used: 1
Total Chips: 2
Total Cores: 256
Total Threads: 512
Total Memory: 1536 GB
Total Accelerators: 0
Max. Peak Threads: 128

Software Summary

Compiler: Intel oneAPI Compiler 2025.2
MPI Library: Intel MPI Library 2021.16 for Linux OS
Other MPI Info: None
Other Software: None
Base Parallel Model: OMP
Base Ranks Run: 16
Base Threads Run: 16
Peak Parallel Models: OMP
Minimum Peak Ranks: 2
Maximum Peak Ranks: 256
Max. Peak Threads: 128
Min. Peak Threads: 1

Node Description: Supermicro SYS-222HA-TN (Intel Xeon 6980P)

Hardware

Number of nodes: 1
Uses of the node: Compute
Vendor: Intel
Model: Supermicro SYS-222HA-TN (Intel Xeon 6980P)
CPU Name: Intel Xeon 6980P
CPU(s) orderable: 1, 2 chips
Chips enabled: 2
Cores enabled: 256
Cores per chip: 128
Threads per core: 2
CPU Characteristics: Turbo Boost Technology up to 3.9 GHz
CPU MHz: 2000
Primary Cache: 64 KB I + 48 KB D on chip per core
Secondary Cache: 2 MB I+D on chip per core
L3 Cache: 504 MB I+D on chip per chip
Other Cache: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-8800X)
Disk Subsystem: 1 x 3.5 TB NVMe 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: None
Number of Adapters: 0
Slot Type: PCI-Express 5.0 x16
Data Rate: None
Ports Used: 0
Interconnect Type: None

Software

Accelerator Driver: None
Adapter: None
Adapter Driver: None
Adapter Firmware: None
Operating System: Ubuntu 22.04.5 LTS
6.5.0-21-generic
Local File System: ext4
Shared File System: None
System State: Run level 5
Other Software: None



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Interconnect Description: None

Hardware

Vendor: None
Model: None
Switch Model: None
Number of Switches: 0
Number of Ports: 0
Data Rate: None
Firmware: None
Topology: None
Primary Use: MPI Traffic

Software

: --

Submit Notes

The config file option 'submit' was used.

Compiler Version Notes

=====
CXXC 632.sph_exa_s(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler 2025.2.0 (2025.2.0.20250605)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/intel/oneapi/compiler/2025.2/bin/compiler
Configuration file: /opt/intel/oneapi/compiler/2025.2/bin/compiler/./icpx.cfg

=====
CC 605.lbm_s(base, peak) 613.soma_s(base, peak) 618.tealeaf_s(base, peak)
621.miniswp_s(base, peak) 634.hpgmgfv_s(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler 2025.2.0 (2025.2.0.20250605)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/intel/oneapi/compiler/2025.2/bin/compiler
Configuration file: /opt/intel/oneapi/compiler/2025.2/bin/compiler/./icx.cfg

=====
FC 619.clvleaf_s(base, peak) 628.pot3d_s(base, peak) 635.weather_s(base, peak)

ifx (IFX) 2025.2.0 20250605
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Compiler Version Notes (Continued)

Base Compiler Invocation

C benchmarks:

mpiicc -cc=icx

C++ benchmarks:

mpiicpc -cxx=icpx

Fortran benchmarks:

mpiifort -fc=ifx

Base Portability Flags

605.lbm_s: -lstdc++ -std=c++14

613.soma_s: -lstdc++ -std=c++14

618.tealeaf_s: -lstdc++ -std=c++14

621.miniswp_s: -lstdc++ -std=c++14

634.hpgmgfv_s: -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

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



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Base Other Flags

C benchmarks:

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

C++ benchmarks:

-Ispecmpitime

Fortran benchmarks:

619.clvleaf_s: -Ispecmpitime

Peak Compiler Invocation

C benchmarks:

mpiicc -cc=icx

C++ benchmarks:

mpiicpc -cxx=icpx

Fortran benchmarks:

mpiifort -fc=ifx

Peak Portability Flags

605.lbm_s: -lstdc++ -std=c++14

613.soma_s: -lstdc++ -std=c++14

618.tealeaf_s: -lstdc++ -std=c++14

621.miniswp_s: -lstdc++ -std=c++14

634.hpgmgfv_s: -lstdc++ -std=c++14

Peak Optimization Flags

C benchmarks:

605.lbm_s: basepeak = yes

613.soma_s: -O3 -Ofast -xCORE-AVX512 -mprefer-vector-width=512

-qopt-multiple-gather-scatter-by-shuffles -fiopenmp

-ffast-math -flto -funroll-loops

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Peak Optimization Flags (Continued)

618.tealeaf_s: Same as 613.soma_s

621.miniswp_s: Same as 613.soma_s

634.hpgmgfv_s: Same as 613.soma_s

C++ benchmarks:

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

Fortran benchmarks:

619.clvleaf_s: -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

628.pot3d_s: -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

635.weather_s: Same as 619.clvleaf_s

Peak Other Flags

C benchmarks:

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

C++ benchmarks:

-Ispecmpitime

Fortran benchmarks:

619.clvleaf_s: -Ispecmpitime

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

http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2024-12-11.html



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

http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2024-12-11.xml

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

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