SPEChpc™ 2021 Small Result

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Supermicro

(Test Sponsor: Intel)

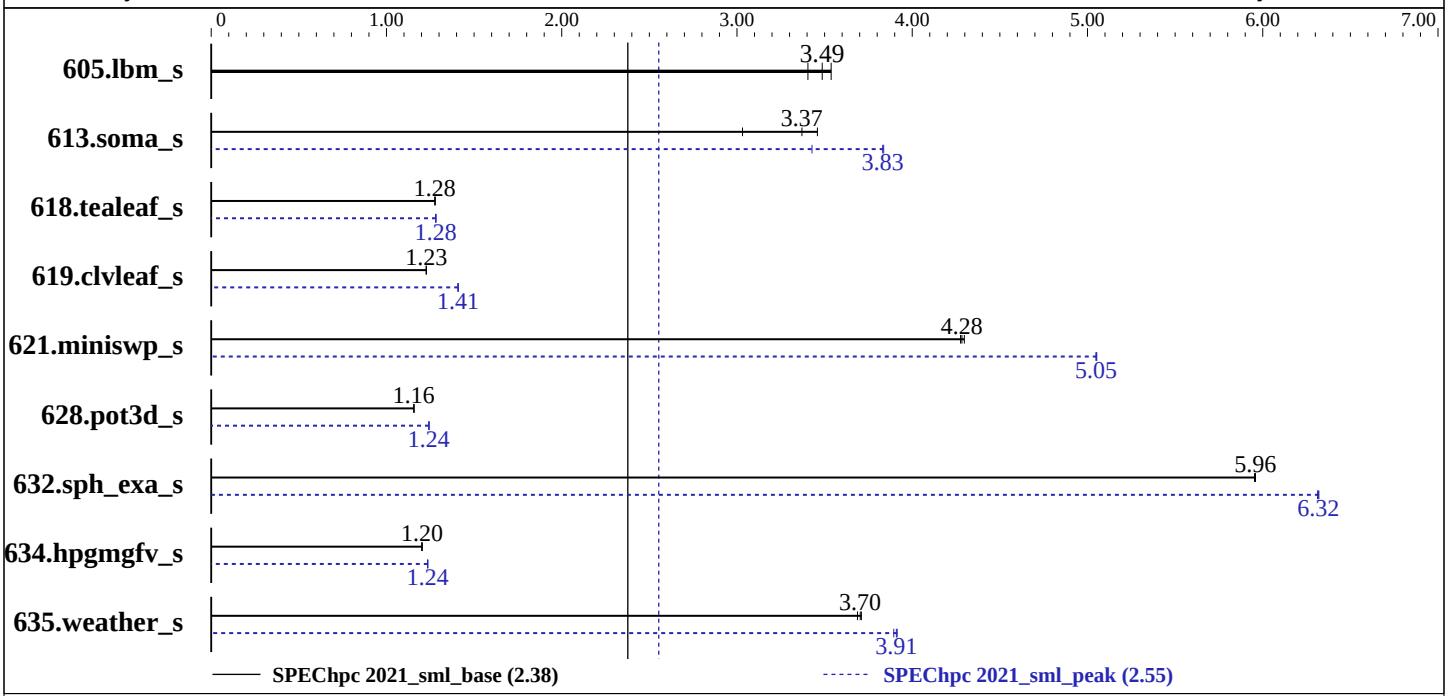
Supermicro SYS-222HA-TN (Intel Xeon 6980P)

SPEChpc 2021_sml_base = 2.38

SPEChpc 2021_sml_peak = 2.55

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
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

SPEChpc 2021_sml_base = 2.38

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

SPEChpc 2021_sml_base = 2.38

SPEChpc 2021_sml_peak = 2.55

hpc2021 License: 13
Test Sponsor: Intel
Tested by: Intel

Test Date: Aug-2025
Hardware Availability: Sep-2024
Software Availability: Jun-2025

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

Interconnect Description: None

Hardware

Vendor:	None
Model:	None
Switch Model:	None
	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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```

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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`

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

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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