SPEChpc™ 2021 Tiny Result

Supermicro

(Test Sponsor: Intel)

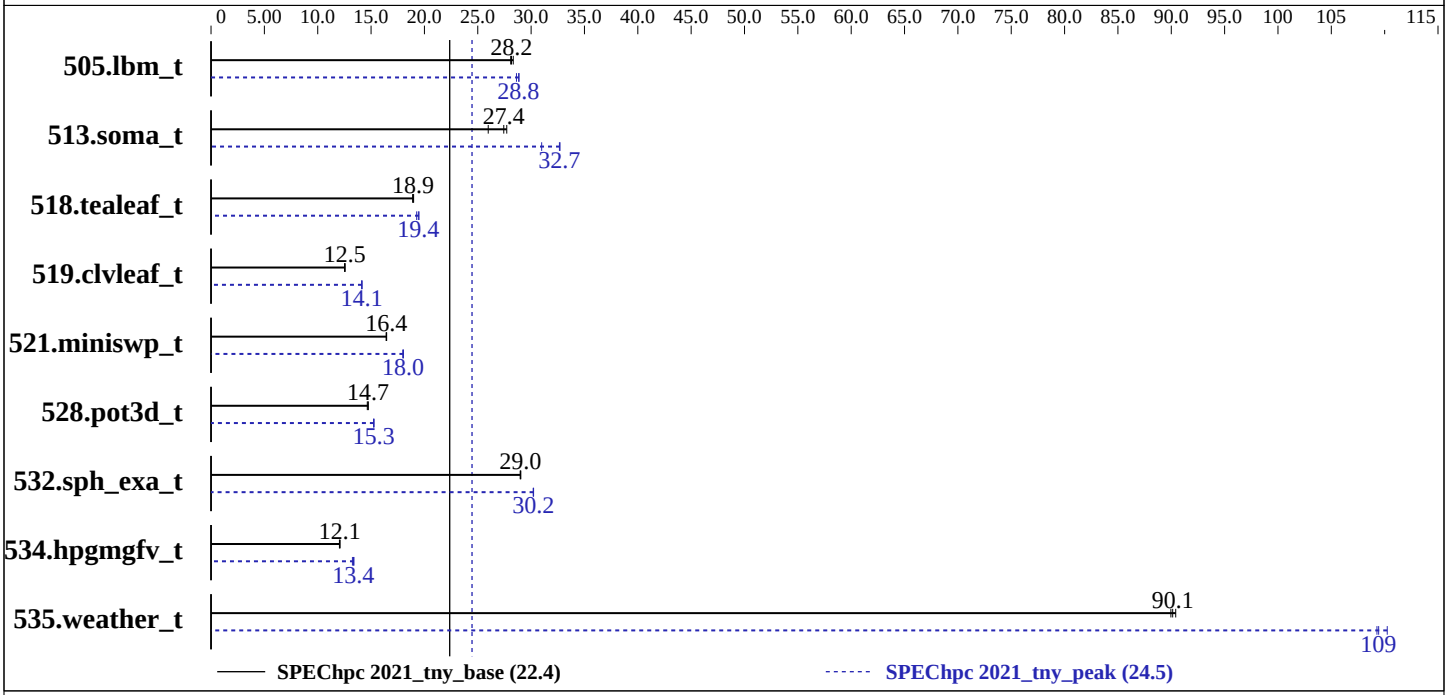
Supermicro SYS-222HA-TN (Intel Xeon 6980P)

SPEChpc 2021_tny_base = 22.4

SPEChpc 2021_tny_peak = 24.5

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

Test Date: Jul-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
505.lbm_t	OMP	36	7	79.4	28.3	80.1	28.1	**79.9**	**28.2**	OMP	252	1	78.6	28.6	77.9	28.9	**78.0**	**28.8**
513.soma_t	OMP	36	7	133	27.7	**135**	**27.4**	142	26.0	OMP	6	42	**113**	**32.7**	113	32.7	119	31.0
518.tealeaf_t	OMP	36	7	87.3	18.9	**87.1**	**18.9**	86.9	19.0	OMP	64	4	**84.9**	**19.4**	84.6	19.5	85.6	19.3
519.clvleaf_t	OMP	36	7	132	12.5	**132**	**12.5**	131	12.6	OMP	126	2	117	14.1	**117**	**14.1**	117	14.1
521.miniswp_t	OMP	36	7	**97.4**	**16.4**	97.2	16.5	97.5	16.4	OMP	12	21	89.0	18.0	**88.9**	**18.0**	88.7	18.0
528.pot3d_t	OMP	36	7	145	14.6	**144**	**14.7**	144	14.7	OMP	32	8	**139**	**15.3**	139	15.2	139	15.3
532.sph_exa_t	OMP	36	7	67.3	29.0	67.2	29.0	**67.2**	**29.0**	OMP	256	1	64.5	30.2	64.6	30.2	**64.5**	**30.2**
534.hpgmgfv_t	OMP	36	7	97.6	12.0	97.3	12.1	**97.3**	**12.1**	OMP	256	1	**88.0**	**13.4**	88.7	13.3	87.7	13.4
535.weather_t	OMP	36	7	35.7	90.4	35.8	90.0	**35.8**	**90.1**	OMP	84	3	29.3	110	**29.5**	**109**	29.5	109

SPEChpc 2021_tny_base = 22.4

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

SPEChpc™ 2021 Tiny Result

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

SPEChpc 2021_tny_base = 22.4

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

Test Date: Jul-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:	42

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:	36
Base Threads Run:	7
Peak Parallel Models:	OMP
Minimum Peak Ranks:	6
Maximum Peak Ranks:	256
Max. Peak Threads:	42
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 532.sph_exa_t(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  505.lbm_t(base, peak) 513.soma_t(base, peak) 518.tealeaf_t(base, peak)
     521.miniswp_t(base, peak) 534.hpgmgfv_t(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  519.clvleaf_t(base, peak) 528.pot3d_t(base, peak) 535.weather_t(base,
     peak)
------------------------------------------------------------------------------
ifx (IFX) 2025.2.0 20250605
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.
```

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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

505.lbm_t: `-lstdc++ -std=c++14`
513.soma_t: `-lstdc++ -std=c++14`
518.tealeaf_t: `-lstdc++ -std=c++14`
521.miniswp_t: `-lstdc++ -std=c++14`
534.hpgmgfv_t: `-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 (except as noted below):
`-Ispecmpitime -Wno-incompatible-function-pointer-types`

521.miniswp_t: `-Ispecmpitime/ -Wno-incompatible-function-pointer-types`

534.hpgmgfv_t: `-Ispecmpitime -Wno-incompatible-function-pointer-types`

C++ benchmarks:
`-Ispecmpitime`

Fortran benchmarks:

519.clvleaf_t: `-Ispecmpitime`

Peak Compiler Invocation

C benchmarks:
`mpiicc -cc=icx`

C++ benchmarks:
`mpiicpc -cxx=icpx`

Fortran benchmarks:
`mpiifort -fc=ifx`

Peak Portability Flags

505.lbm_t: `-lstdc++ -std=c++14`
513.soma_t: `-lstdc++ -std=c++14`
518.tealeaf_t: `-lstdc++ -std=c++14`
521.miniswp_t: `-lstdc++ -std=c++14`
534.hpgmgfv_t: `-lstdc++ -std=c++14`

Peak Optimization Flags

C benchmarks:

505.lbm_t: `-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)

513.soma_t: `-O3 -Ofast -xCORE-AVX512 -mprefer-vector-width=512 -qopt-multiple-gather-scatter-by-shuffles -fiopenmp -ffast-math -flto -funroll-loops -qopt-streaming-stores=always`

518.tealeaf_t: `Same as 513.soma_t`

521.miniswp_t: `Same as 505.lbm_t`

534.hpgmgfv_t: `Same as 505.lbm_t`

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

Fortran benchmarks:

519.clvleaf_t: `-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`

528.pot3d_t: `-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`

535.weather_t: `Same as 528.pot3d_t`

Peak Other Flags

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

521.miniswp_t: `-Ispecmpitime/ -Wno-incompatible-function-pointer-types`

534.hpgmgfv_t: `-Ispecmpitime  -Wno-incompatible-function-pointer-types`

C++ benchmarks:
`-Ispecmpitime`

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Peak Other Flags (Continued)

Fortran benchmarks:

519.clvleaf_t: `-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`

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

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