SPEChpc™ 2021 Tiny Result

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Supermicro

(Test Sponsor: Intel)

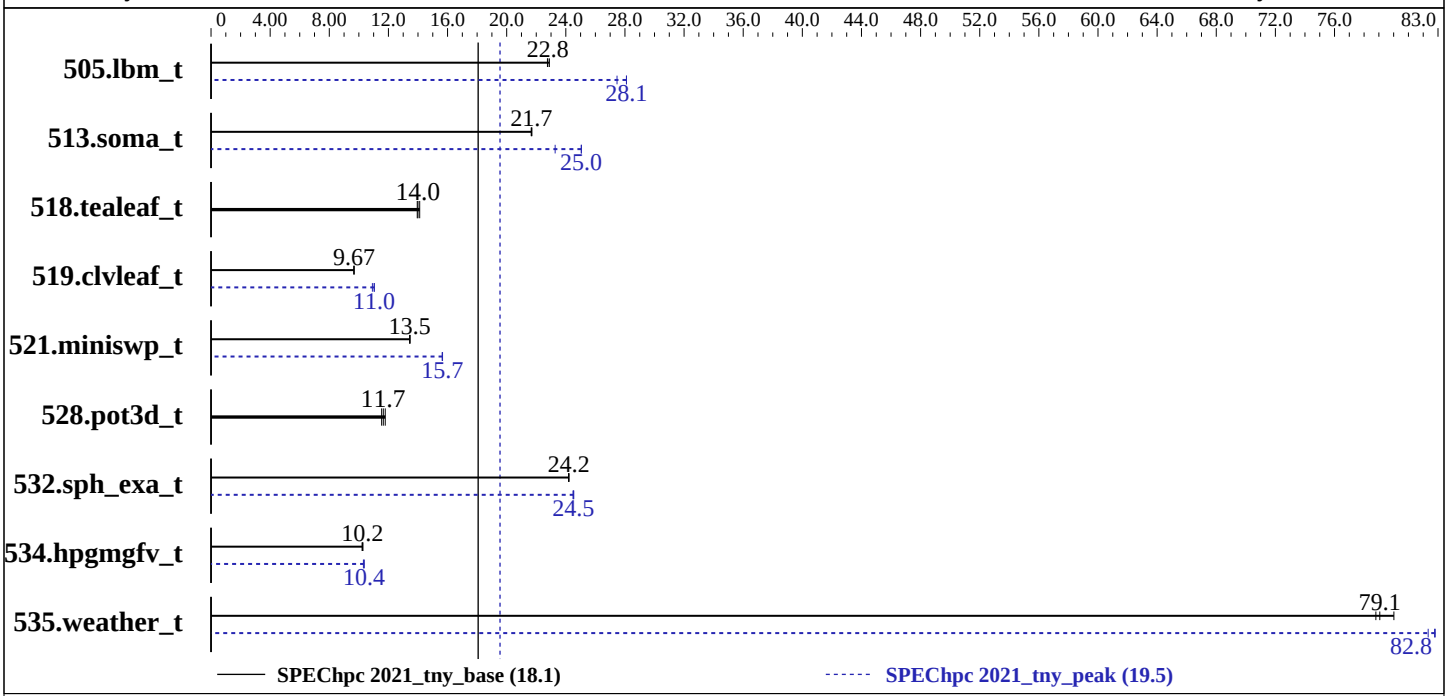
Supermicro SYS-222HA-TN (Intel Xeon 6972P)

SPEChpc 2021_tny_base = 18.1

SPEChpc 2021_tny_peak = 19.5

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	32	6	98.3	22.9	98.9	22.8	**98.8**	**22.8**	OMP	24	8	80.1	28.1	**80.1**	**28.1**	81.9	27.5
513.soma_t	OMP	32	6	171	21.7	**171**	**21.7**	170	21.7	OMP	6	32	148	25.1	**148**	**25.0**	159	23.3
518.tealeaf_t	OMP	32	6	117	14.1	118	13.9	**118**	**14.0**	OMP	32	6	117	14.1	118	13.9	**118**	**14.0**
519.clvleaf_t	OMP	32	6	**171**	**9.67**	171	9.67	171	9.67	OMP	24	8	**149**	**11.0**	151	10.9	149	11.0
521.miniswp_t	OMP	32	6	119	13.5	119	13.4	**119**	**13.5**	OMP	16	12	102	15.7	102	15.6	**102**	**15.7**
528.pot3d_t	OMP	32	6	184	11.5	180	11.8	**182**	**11.7**	OMP	32	6	184	11.5	180	11.8	**182**	**11.7**
532.sph_exa_t	OMP	32	6	80.5	24.2	80.6	24.2	**80.6**	**24.2**	OMP	24	8	**79.5**	**24.5**	79.5	24.5	79.6	24.5
534.hpgmgfv_t	OMP	32	6	**115**	**10.2**	114	10.3	115	10.2	OMP	64	3	**113**	**10.4**	113	10.4	114	10.3
535.weather_t	OMP	32	6	**40.8**	**79.1**	40.9	78.8	40.3	80.0	OMP	64	3	39.2	82.3	38.9	82.8	**39.0**	**82.8**

SPEChpc 2021_tny_base = 18.1

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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 6972P)

SPEChpc 2021_tny_base = 18.1

SPEChpc 2021_tny_peak = 19.5

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 6972P)
Interconnect:	None
Compute Nodes Used:	1
Total Chips:	2
Total Cores:	192
Total Threads:	384
Total Memory:	1536 GB
Total Accelerators:	0
Max. Peak Threads:	32

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:	32
Base Threads Run:	6
Peak Parallel Models:	OMP
Minimum Peak Ranks:	6
Maximum Peak Ranks:	64
Max. Peak Threads:	32
Min. Peak Threads:	3

Node Description: Supermicro SYS-222HA-TN (Intel Xeon 6972P)

Hardware

Number of nodes:	1
Uses of the node:	Compute
Vendor:	Intel
Model:	Supermicro SYS-222HA-TN (Intel Xeon 6972P)
CPU Name:	Intel Xeon 6972P
CPU(s) orderable:	1, 2 chips
Chips enabled:	2
Cores enabled:	192
Cores per chip:	96
Threads per core:	2
CPU Characteristics:	Turbo Boost Technology up to 3.9 GHz
CPU MHz:	2400
Primary Cache:	64 KB I + 48 KB D on chip per core
Secondary Cache:	2 MB I+D on chip per core
L3 Cache:	480 MB I+D on chip per chip
Other Cache:	None
Memory:	1536 GB (24 x 64 GB 2Rx4 PC5-6400B)
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: Same as 505.lbm_t

518.tealeaf_t: basepeak = yes

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: basepeak = yes

535.weather_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

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

Fortran benchmarks:

(Continued on next page)

Peak Other Flags (Continued)

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`

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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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