SPEChpc™ 2021 Tiny Result

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Lenovo Global Technology

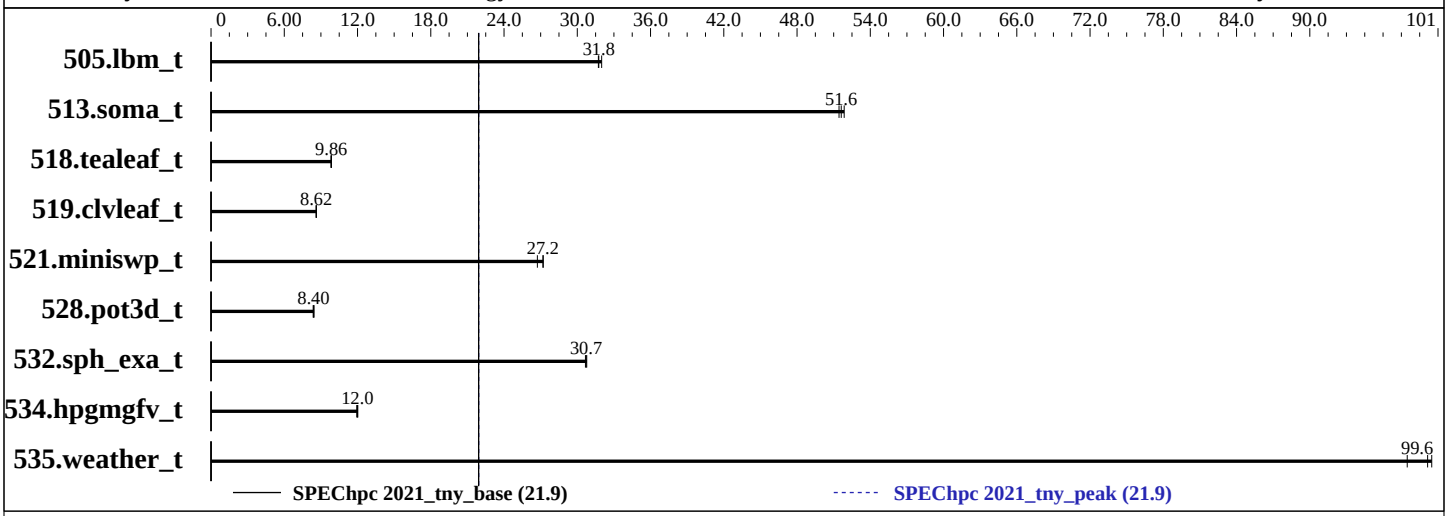
ThinkSystem SD535 V3 (AMD EPYC 9965)

SPEChpc 2021_tny_base = 21.9

SPEChpc 2021_tny_peak = 21.9

hpc2021 License: 28
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Nov-2024
Hardware Availability: Feb-2025
Software Availability: Feb-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	24	32	70.3	32.0	**70.8**	**31.8**	70.9	31.7	OMP	24	32	70.3	32.0	**70.8**	**31.8**	70.9	31.7
513.soma_t	OMP	24	32	71.3	51.9	**71.7**	**51.6**	71.9	51.4	OMP	24	32	71.3	51.9	**71.7**	**51.6**	71.9	51.4
518.tealeaf_t	OMP	24	32	**167**	**9.86**	168	9.82	167	9.86	OMP	24	32	**167**	**9.86**	168	9.82	167	9.86
519.clvleaf_t	OMP	24	32	191	8.62	**191**	**8.62**	191	8.62	OMP	24	32	191	8.62	**191**	**8.62**	191	8.62
521.miniswp_t	OMP	24	32	59.9	26.7	58.8	27.2	**58.9**	**27.2**	OMP	24	32	59.9	26.7	58.8	27.2	**58.9**	**27.2**
528.pot3d_t	OMP	24	32	252	8.44	254	8.37	**253**	**8.40**	OMP	24	32	252	8.44	254	8.37	**253**	**8.40**
532.sph_exa_t	OMP	24	32	63.6	30.7	63.4	30.8	**63.5**	**30.7**	OMP	24	32	63.6	30.7	63.4	30.8	**63.5**	**30.7**
534.hpgmgfv_t	OMP	24	32	98.5	11.9	97.8	12.0	**97.9**	**12.0**	OMP	24	32	98.5	11.9	97.8	12.0	**97.9**	**12.0**
535.weather_t	OMP	24	32	**32.4**	**99.6**	32.9	98.0	32.3	100	OMP	24	32	**32.4**	**99.6**	32.9	98.0	32.3	100

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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 Availability: Feb-2025
Software Availability: Feb-2025

Hardware Summary

Type of System:	Homogenous
Compute Node:	ThinkSystem SD535 V3
Interconnect:	-
Compute Nodes Used:	2
Total Chips:	2
Total Cores:	384
Total Threads:	768
Total Memory:	1536 GB
Max. Peak Threads:	32

Software Summary

Compiler:	Intel C/C++/Fortran Compiler 2022.1.0
MPI Library:	Intel MPI Library for Linux OS, Build 20240701
Other MPI Info:	--
Other Software:	--
Base Parallel Model:	OMP
Base Ranks Run:	24
Base Threads Run:	32
Peak Parallel Models:	OMP
Minimum Peak Ranks:	24
Maximum Peak Ranks:	24
Max. Peak Threads:	32
Min. Peak Threads:	32

Node Description: ThinkSystem SD535 V3

Hardware

Number of nodes:	2
Uses of the node:	Compute
Vendor:	Lenovo Global Technology
Model:	ThinkSystem SD535 V3
CPU Name:	AMD EPYC 9965
CPU(s) orderable:	1 chips
Chips enabled:	1
Cores enabled:	192
Cores per chip:	192
Threads per core:	2
CPU Characteristics:	Max Boost Clock up to 3.7 GHz
CPU MHz:	2250
Primary Cache:	32 KB I + 48 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core
L3 Cache:	384 MB I+D on chip per chip 32 MB shared / 16 cores
Other Cache:	None
Memory:	768 GB (12 x 64 GB 2Rx4 PC5-6400B-R), running at 6000
Disk Subsystem:	1x ThinkSystem 2.5" 5300 480GB SSD
Other Hardware:	None
Accel Count:	--
Accel Model:	--
Accel Vendor:	--
Accel Type:	--
Accel Connection:	--
Accel ECC enabled:	--
Accel Description:	--
Adapter:	ConnectX-7
Number of Adapters:	1
Slot Type:	PCI-Express 5.0 x16
Data Rate:	400 Gb/s

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Software

Accelerator Driver:	--
Adapter:	ConnectX-7
Adapter Driver:	24.07-0.6.1
Adapter Firmware:	28.41.1000
Operating System:	Ubuntu 24.04 LTS Kernel 6.8.0-39-generic
Local File System:	xfs
Shared File System:	None
System State:	Multi-user, run level 3
Other Software:	None

Node Description: ThinkSystem SD535 V3

Hardware (Continued)

Ports Used: 1
Interconnect Type: ConnectX-7 NDR

Interconnect Description: -

Hardware

Vendor: Nvidia
Model: Mellanox NDR
Switch Model: None
Number of Switches: 0
Number of Ports: 0
Data Rate: N/A
Firmware: N/A
Topology: Direct Connect
Primary Use: MPI Traffic

Software

: --

Submit Notes

```
The config file option 'submit' was used.
```

Compiler Version Notes

```
==============================================================================
 FC  519.clvleaf_t(base) 528.pot3d_t(base) 535.weather_t(base)
------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
  2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
ifx: command line error: no files specified; for help type "ifx -help"
------------------------------------------------------------------------------

==============================================================================
 CC  505.lbm_t(base) 513.soma_t(base) 518.tealeaf_t(base) 521.miniswp_t(base)
      534.hpgmgfv_t(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
clang: warning: -Z-reserved-lib-stdc++: 'linker' input unused
  [-Wunused-command-line-argument]
------------------------------------------------------------------------------
```

(Continued on next page)

Compiler Version Notes (Continued)

```
==============================================================================
 CXXC 532.sph_exa_t(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
clang: warning: -Z-reserved-lib-stdc++: 'linker' input unused
  [-Wunused-command-line-argument]
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`mpiicc -cc=icx`

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

Fortran benchmarks:
`mpiifort -fc=ifx`

Base Portability Flags

505.lbm_t: `-lstdc++`
513.soma_t: `-lstdc++ -DSPEC_NO_VAR_ARRAY_REDUCE`
518.tealeaf_t: `-lstdc++`
519.clvleaf_t: `-lstdc++`
521.miniswp_t: `-lstdc++`
528.pot3d_t: `-lstdc++`
532.sph_exa_t: `-lstdc++`
534.hpgmgfv_t: `-lstdc++`
535.weather_t: `-lstdc++`

Base Optimization Flags

C benchmarks:
`-Ofast -march=skylake-avx512 -ipo -mprefer-vector-width=512 -fiopenmp -ansi-alias`

C++ benchmarks:
`-Ofast -march=skylake-avx512 -ipo -mprefer-vector-width=512 -fiopenmp`

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
`-ansi-alias`

Fortran benchmarks:
`-Ofast -march=skylake-avx512 -ipo -mprefer-vector-width=512 -fiopenmp -nostandard-realloc-lhs -align array64byte`

Peak Optimization Flags

C benchmarks:

505.lbm_t: `basepeak = yes`

513.soma_t: `basepeak = yes`

518.tealeaf_t: `basepeak = yes`

521.miniswp_t: `basepeak = yes`

534.hpgmgfv_t: `basepeak = yes`

C++ benchmarks:

532.sph_exa_t: `basepeak = yes`

Fortran benchmarks:

519.clvleaf_t: `basepeak = yes`

528.pot3d_t: `basepeak = yes`

535.weather_t: `basepeak = yes`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2024-12-31.00.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2024-12-31.00.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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