SPEChpc™ 2021 Tiny Result

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Lenovo Global Technology

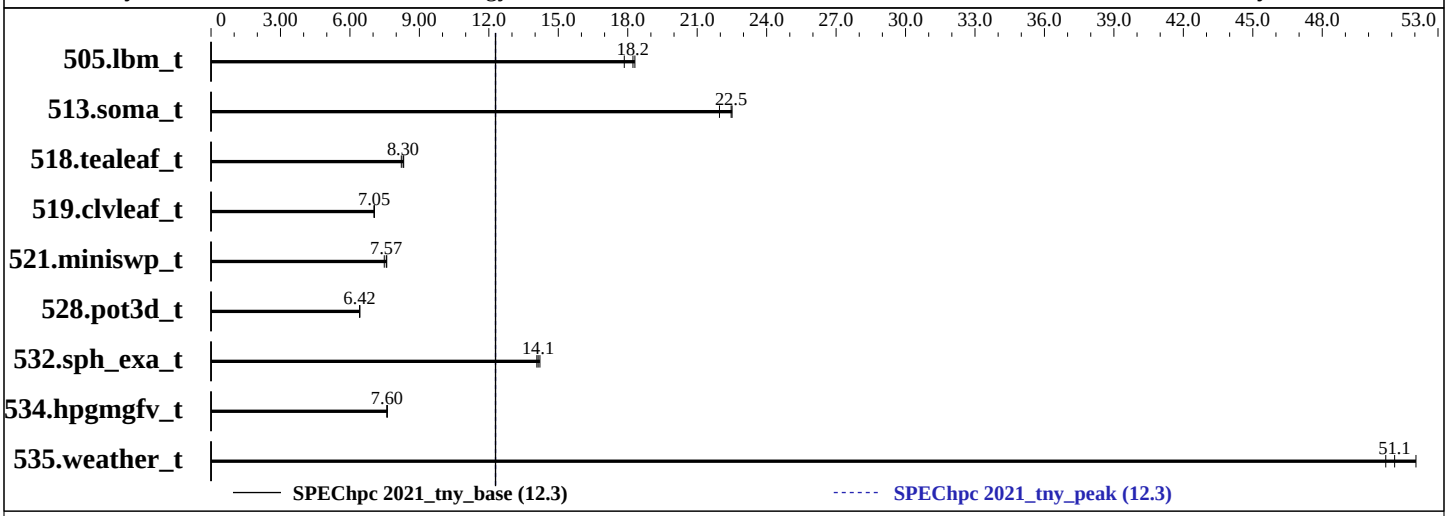
ThinkSystem SR655 V3 (AMD EPYC 9654P)

SPEChpc 2021_tny_base = 12.3

SPEChpc 2021_tny_peak = 12.3

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

Test Date: Jan-2023
Hardware Availability: Feb-2023
Software Availability: Feb-2023



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	16	126	17.9	**123**	**18.2**	123	18.3	OMP	24	16	126	17.9	**123**	**18.2**	123	18.3
513.soma_t	OMP	24	16	168	22.0	164	22.5	**165**	**22.5**	OMP	24	16	168	22.0	164	22.5	**165**	**22.5**
518.tealeaf_t	OMP	24	16	201	8.22	**199**	**8.30**	198	8.32	OMP	24	16	201	8.22	**199**	**8.30**	198	8.32
519.clvleaf_t	OMP	24	16	234	7.05	**234**	**7.05**	234	7.05	OMP	24	16	234	7.05	**234**	**7.05**	234	7.05
521.miniswp_t	OMP	24	16	214	7.48	211	7.59	**211**	**7.57**	OMP	24	16	214	7.48	211	7.59	**211**	**7.57**
528.pot3d_t	OMP	24	16	331	6.42	331	6.42	**331**	**6.42**	OMP	24	16	331	6.42	331	6.42	**331**	**6.42**
532.sph_exa_t	OMP	24	16	139	14.1	137	14.2	**138**	**14.1**	OMP	24	16	139	14.1	137	14.2	**138**	**14.1**
534.hpgmgfv_t	OMP	24	16	155	7.60	154	7.61	**155**	**7.60**	OMP	24	16	155	7.60	154	7.61	**155**	**7.60**
535.weather_t	OMP	24	16	**63.1**	**51.1**	63.6	50.7	62.0	52.0	OMP	24	16	**63.1**	**51.1**	63.6	50.7	62.0	52.0

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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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Software Availability: Feb-2023

Hardware Summary

Type of System:	Homogeneous Cluster
Compute Node:	ThinkSystem SR655 V3
Interconnect:	-
Compute Nodes Used:	2
Total Chips:	2
Total Cores:	192
Total Threads:	384
Total Memory:	1536 GB
Max. Peak Threads:	16

Software Summary

Compiler:	Intel oneAPI Compiler 2022.1.0
MPI Library:	Intel MPI Library for Linux OS, Build 20220227
Other MPI Info:	--
Other Software:	--
Base Parallel Model:	OMP
Base Ranks Run:	24
Base Threads Run:	16
Peak Parallel Models:	OMP
Minimum Peak Ranks:	24
Maximum Peak Ranks:	24
Max. Peak Threads:	16
Min. Peak Threads:	16

Node Description: ThinkSystem SR655 V3

Hardware

Number of nodes:	2
Uses of the node:	Compute
Vendor:	Lenovo Global Technology
Model:	ThinkSystem SR655 V3
CPU Name:	AMD EPYC 9654P
CPU(s) orderable:	1 chips
Chips enabled:	1
Cores enabled:	96
Cores per chip:	96
Threads per core:	2
CPU Characteristics:	Max Boost Clock up to 3.7 GHz
CPU MHz:	2400
Primary Cache:	32 KB I + 32 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 / 8 cores
Other Cache:	None
Memory:	768 GB (12 x 64 GB 2Rx4 PC5-4800B-R)
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:	Nvidia Mellanox ConnectX-6 HDR
Number of Adapters:	1
Slot Type:	PCI-Express 4.0 x16
Data Rate:	200 Gb/s
Ports Used:	1

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Software

Accelerator Driver:	--
Adapter:	Nvidia Mellanox ConnectX-6 HDR
Adapter Driver:	5.7-1.0.2
Adapter Firmware:	20.28.1002
Operating System:	--
Local File System:	xfs
Shared File System:	None
System State:	Multi-user, run level 3
Other Software:	None

Node Description: ThinkSystem SR655 V3

Hardware (Continued)

Interconnect Type: ConnectX-6 HDR

Interconnect Description: -

Hardware		Software
Vendor:	None	: --
Model:	-	
Switch Model:	None	
Number of Switches:	0	
Number of Ports:	0	
Data Rate:	None	
Firmware:	N/A	
Topology:	N/A	
Primary Use:	-	

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 -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp -ansi-alias`

C++ benchmarks:
`-Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp -ansi-alias`

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Base Optimization Flags (Continued)

Fortran benchmarks:
`-Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp -nostandard-realloc-lhs -align array64byte`

Base Other Flags

C benchmarks (except as noted below):
`-Ispecmpitime`

521.miniswp_t: `-Ispecmpitime/`

534.hpgmgfv_t: `-Ispecmpitime`

C++ benchmarks:
`-Ispecmpitime`

Fortran benchmarks:

519.clvleaf_t: `-Ispecmpitime`

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:

(Continued on next page)

Peak Optimization Flags (Continued)

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.2022-11-10.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2022-11-10.xml`

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

Tested with SPEChpc2021 v1.1.7 on 2018-06-25 15:12:19-0400.
Report generated on 2023-02-22 12:25:50 by hpc2021 PS formatter v1.0.3.
Originally published on 2023-02-22.