SPEChpc™ 2021 Tiny Result

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Lenovo Global Technology

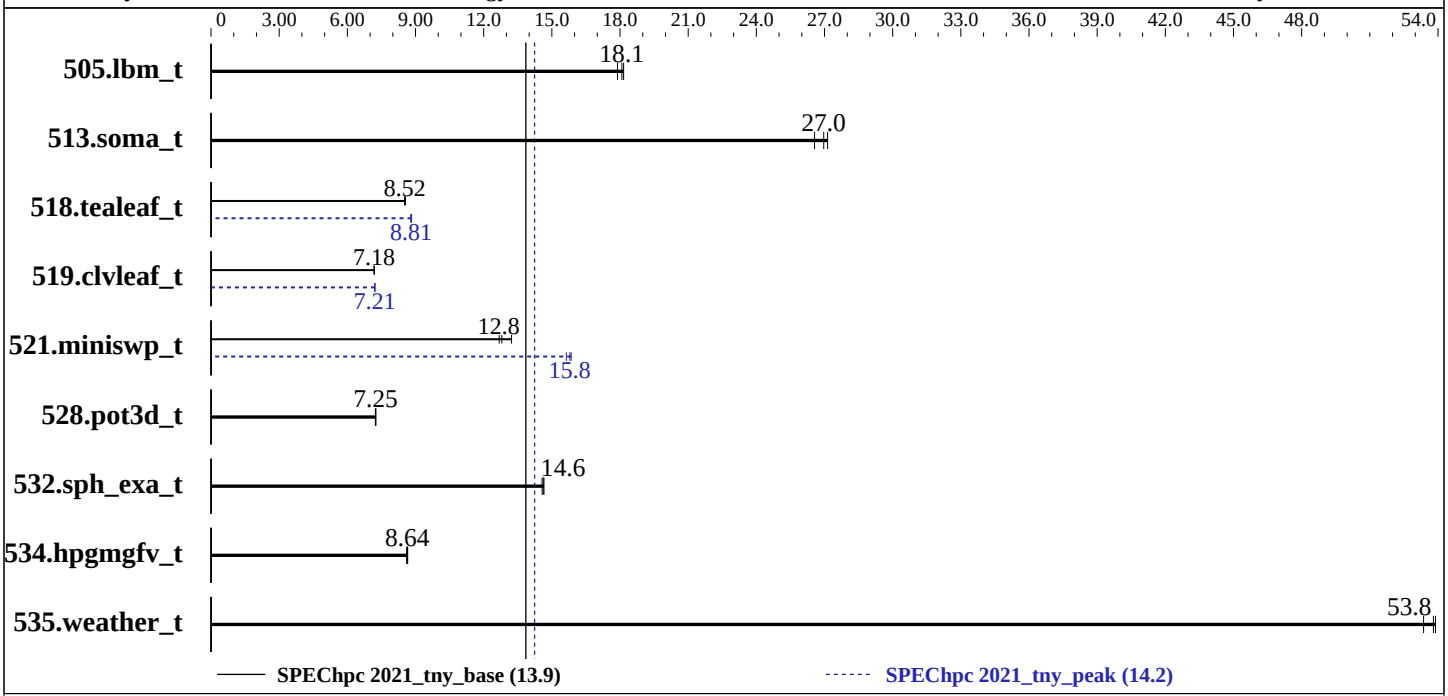
ThinkSystem SR665 V3 (AMD EPYC 9654)

SPEChpc 2021_tny_base = 13.9

SPEChpc 2021_tny_peak = 14.2

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

Test Date: Oct-2022
Hardware Availability: Nov-2022
Software Availability: Nov-2022



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	124	18.2	**124**	**18.1**	OMP	24	16	126	17.9	124	18.2	**124**	**18.1**
513.soma_t	OMP	24	16	136	27.1	139	26.6	**137**	**27.0**	OMP	24	16	136	27.1	139	26.6	**137**	**27.0**
518.tealeaf_t	OMP	24	16	**194**	**8.52**	193	8.56	194	8.52	OMP	24	8	188	8.79	187	8.83	**187**	**8.81**
519.clvleaf_t	OMP	24	16	230	7.18	230	7.18	**230**	**7.18**	OMP	24	8	229	7.21	**229**	**7.21**	229	7.21
521.miniswp_t	OMP	24	16	**125**	**12.8**	121	13.2	126	12.7	OMP	4	96	**101**	**15.8**	101	15.9	102	15.6
528.pot3d_t	OMP	24	16	**293**	**7.25**	294	7.23	293	7.25	OMP	24	16	**293**	**7.25**	294	7.23	293	7.25
532.sph_exa_t	OMP	24	16	133	14.7	134	14.6	**133**	**14.6**	OMP	24	16	133	14.7	134	14.6	**133**	**14.6**
534.hpgmgfv_t	OMP	24	16	136	8.61	136	8.65	**136**	**8.64**	OMP	24	16	136	8.61	136	8.65	**136**	**8.64**
535.weather_t	OMP	24	16	**59.9**	**53.8**	60.4	53.4	59.8	53.9	OMP	24	16	**59.9**	**53.8**	60.4	53.4	59.8	53.9

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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: Nov-2022

Hardware Summary

Type of System:	Homogenous
Compute Node:	ThinkSystem SR665 V3
Interconnect:	-
Compute Nodes Used:	1
Total Chips:	2
Total Cores:	192
Total Threads:	384
Total Memory:	768 GB
Max. Peak Threads:	96

Software Summary

Compiler:	Intel C/C++/Fortran Compiler 2021.6.0
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:	4
Maximum Peak Ranks:	24
Max. Peak Threads:	96
Min. Peak Threads:	8

Node Description: ThinkSystem SR665 V3

Hardware

Number of nodes:	1
Uses of the node:	Compute
Vendor:	Lenovo Global Technology
Model:	ThinkSystem SR665 V3
CPU Name:	AMD EPYC 9654
CPU(s) orderable:	1,2 chips
Chips enabled:	2
Cores enabled:	192
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 (24 x 32 GB 2Rx8 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:	-
Number of Adapters:	0
Slot Type:	-
Data Rate:	None
Ports Used:	0

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Software

Accelerator Driver:	--
Adapter:	-
Adapter Driver:	-
Adapter Firmware:	-
Operating System:	Red Hat Enterprise Linux Server release 8.6, Kernel 4.18.0-372.9.1.el8.x86_64
Local File System:	xfs
Shared File System:	None
System State:	Multi-user, run level 3
Other Software:	None

Node Description: ThinkSystem SR665 V3

Hardware (Continued)

Interconnect Type: -

Interconnect Description: -

Hardware

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:	-

Software

: --

Submit Notes

```
The config file option 'submit' was used.
submit = mpiexec -hosts 192.168.99.16 -np ranks -genv OMP_NUM_THREADS=$threads -ppn %{NRNK} $command
```

General Notes

```
Submitted_by: Jimmy Cheng12 <jcheng12@lenovo.com>
Submitted: Thu Oct 27 13:16:45 EDT 2022
Submission: hpc2021-20221016-00135.sub
```

Compiler Version Notes

```
==============================================================================
 FC  519.clvleaf_t(base, peak) 528.pot3d_t(base, peak) 535.weather_t(base,
     peak)
------------------------------------------------------------------------------
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, peak) 513.soma_t(base, peak) 518.tealeaf_t(base, peak)
     521.miniswp_t(base, peak) 534.hpgmgfv_t(base, peak)
```

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Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------
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]
------------------------------------------------------------------------------

==============================================================================
 CXXC 532.sph_exa_t(base, peak)
------------------------------------------------------------------------------
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
```

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 Compiler Invocation

C benchmarks:
`mpiicc -cc=icx`

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

Fortran benchmarks:
`mpiifort  -fc=ifx`

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

505.lbm_t: basepeak = yes

513.soma_t: basepeak = yes

518.tealeaf_t: -Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp -ansi-alias

521.miniswp_t: Same as 518.tealeaf_t

534.hpgmgfv_t: basepeak = yes

C++ benchmarks:

532.sph_exa_t: basepeak = yes

Fortran benchmarks:

519.clvleaf_t: -Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp -nostandard-realloc-lhs -align array64byte

528.pot3d_t: basepeak = yes

535.weather_t: basepeak = yes

Peak Other Flags

C benchmarks (except as noted below):
-Ispecmpitime

521.miniswp_t: -Ispecmpitime/

534.hpgmgfv_t: -Ispecmpitime

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.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.

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