



# SPEChpc™ 2021 Tiny Result

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## Lenovo Global Technology

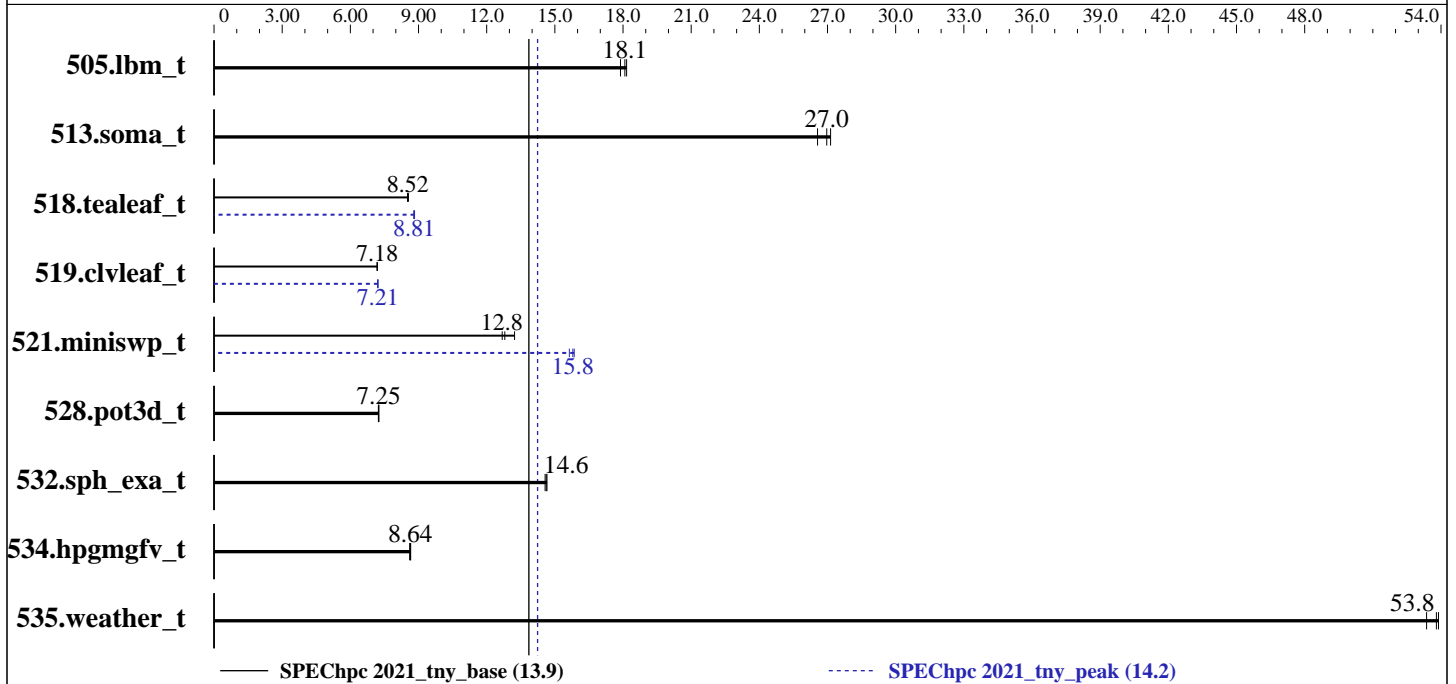
SPEChpc 2021\_tny\_base = 13.9

## ThinkSystem SR665 V3 (AMD EPYC 9654)

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

### 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

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### 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 Chengl2 <jchengl2@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.cvlleaf\_t: -lstdc++  
521.miniswp\_t: -lstdc++  
528.pot3d\_t: -lstdc++  
532.sph\_exa\_t: -lstdc++  
534.hpgmgfv\_t: -lstdc++  
535.weather\_t: -lstdc++



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## 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



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## 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.cvlleaf\_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](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](http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2022-11-10.xml)

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