



# SPEChpc™ 2021 Small Result

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## Lenovo Global Technology

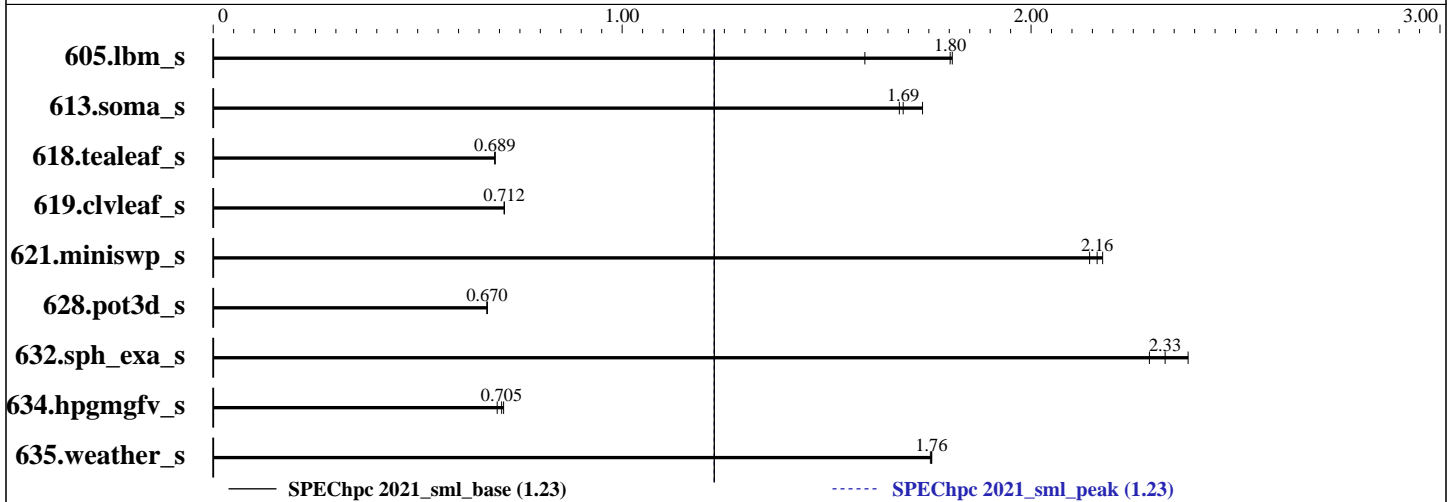
SPEChpc 2021\_sml\_base = 1.23

## ThinkSystem SR665 V3 (AMD EPYC 9654)

SPEChpc 2021\_sml\_peak = 1.23

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
605.lbm_s	MPI	192	1	973	1.59	<b>860</b>	<b>1.80</b>	858	1.81	MPI	192	1	973	1.59	<b>860</b>	<b>1.80</b>	858	1.81
613.soma_s	MPI	192	1	<b>948</b>	<b>1.69</b>	922	1.73	954	1.68	MPI	192	1	<b>948</b>	<b>1.69</b>	922	1.73	954	1.68
618.tealeaf_s	MPI	192	1	<b>2976</b>	<b>0.689</b>	2976	0.689	2974	0.689	MPI	192	1	<b>2976</b>	<b>0.689</b>	2976	0.689	2974	0.689
619.clvleaf_s	MPI	192	1	2318	0.712	<b>2318</b>	<b>0.712</b>	2318	0.712	MPI	192	1	2318	0.712	<b>2318</b>	<b>0.712</b>	2318	0.712
621.miniswp_s	MPI	192	1	<b>509</b>	<b>2.16</b>	513	2.14	506	2.18	MPI	192	1	<b>509</b>	<b>2.16</b>	513	2.14	506	2.18
628.pot3d_s	MPI	192	1	2501	0.670	<b>2501</b>	<b>0.670</b>	2500	0.670	MPI	192	1	2501	0.670	<b>2501</b>	<b>0.670</b>	2500	0.670
632.sph_exa_s	MPI	192	1	1005	2.29	965	2.38	<b>988</b>	<b>2.33</b>	MPI	192	1	1005	2.29	965	2.38	<b>988</b>	<b>2.33</b>
634.hpgmgfv_s	MPI	192	1	1404	0.694	1373	0.710	<b>1382</b>	<b>0.705</b>	MPI	192	1	1404	0.694	1373	0.710	<b>1382</b>	<b>0.705</b>
635.weather_s	MPI	192	1	1480	1.76	<b>1480</b>	<b>1.76</b>	1483	1.75	MPI	192	1	1480	1.76	<b>1480</b>	<b>1.76</b>	1483	1.75

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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: 1

### 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: MPI  
Base Ranks Run: 192  
Base Threads Run: 1  
Peak Parallel Models: MPI  
Minimum Peak Ranks: 192  
Maximum Peak Ranks: 192  
Max. Peak Threads: 1  
Min. Peak Threads: 1

## 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 Cheng12 <jcheng12@lenovo.com>

Submitted: Thu Oct 27 13:16:45 EDT 2022

Submission: hpc2021-20221016-00133.sub

## Compiler Version Notes

```
=====
FC 619.clvleaf_s(base) 628.pot3d_s(base) 635.weather_s(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 605.lbm_s(base) 613.soma_s(base) 618.tealeaf_s(base) 621.miniswp_s(base)
634.hpgmgfv_s(base)
-----
```

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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 632.sph\_exa\_s(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

605.lbm\_s: -lstdc++  
613.soma\_s: -lstdc++  
618.tealeaf\_s: -lstdc++  
619.cvlleaf\_s: -lstdc++  
621.miniswp\_s: -lstdc++  
628.pot3d\_s: -lstdc++  
632.sph\_exa\_s: -lstdc++  
634.hpgmgfv\_s: -lstdc++  
635.weather\_s: -lstdc++



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## Base Optimization Flags

C benchmarks:

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

C++ benchmarks:

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

Fortran benchmarks:

-Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo  
-nostandard-realloc-lhs -align array64byte

## Base Other Flags

C benchmarks:

-Ispecmpitime

C++ benchmarks:

-Ispecmpitime

Fortran benchmarks:

619.clvleaf\_s: -Ispecmpitime

## Peak Optimization Flags

C benchmarks:

605.lbm\_s: basepeak = yes

613.soma\_s: basepeak = yes

618.tealeaf\_s: basepeak = yes

621.miniswp\_s: basepeak = yes

634.hpgmgfv\_s: basepeak = yes

C++ benchmarks:

632.sph\_exa\_s: basepeak = yes

Fortran benchmarks:

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## Peak Optimization Flags (Continued)

619.clvleaf\_s: basepeak = yes

628.pot3d\_s: basepeak = yes

635.weather\_s: 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](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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For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

Tested with SPEChpc2021 v1.1.7 on 2018-06-26 04:06:24-0400.  
Report generated on 2022-11-10 10:17:16 by hpc2021 PDF formatter v1.0.3.  
Originally published on 2022-11-10.