



# SPEChpc™ 2021 Small Result

Copyright 2021-2022 Standard Performance Evaluation Corporation

## Lenovo Global Technology

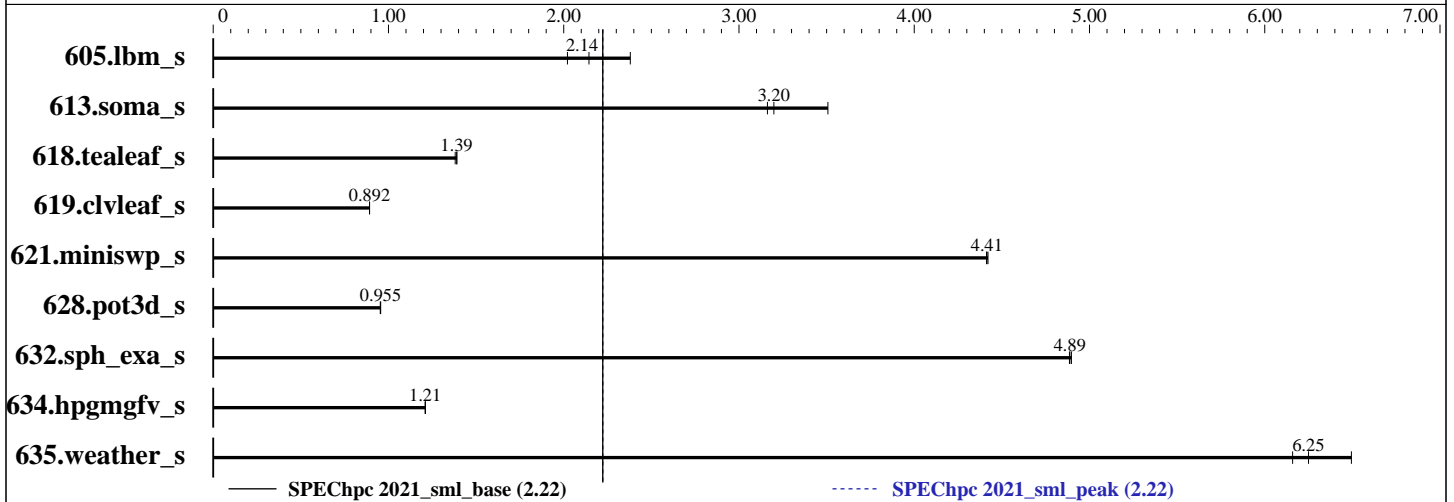
SPEChpc 2021\_sml\_base = 2.22

## ThinkSystem SR665 (AMD EPYC 7773X)

SPEChpc 2021\_sml\_peak = 2.22

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

Test Date: Jul-2022  
Hardware Availability: Jul-2022  
Software Availability: Jul-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	OMP	48	8	651	2.38	767	2.02	<b>723</b>	<b>2.14</b>	OMP	48	8	651	2.38	767	2.02	<b>723</b>	<b>2.14</b>
613.soma_s	OMP	48	8	506	3.16	456	3.51	<b>500</b>	<b>3.20</b>	OMP	48	8	506	3.16	456	3.51	<b>500</b>	<b>3.20</b>
618.tealeaf_s	OMP	48	8	1475	1.39	1485	1.38	<b>1475</b>	<b>1.39</b>	OMP	48	8	1475	1.39	1485	1.38	<b>1475</b>	<b>1.39</b>
619.clvleaf_s	OMP	48	8	1849	0.892	1850	0.892	<b>1850</b>	<b>0.892</b>	OMP	48	8	1849	0.892	1850	0.892	<b>1850</b>	<b>0.892</b>
621.miniswp_s	OMP	48	8	<b>249</b>	<b>4.41</b>	249	4.42	249	4.41	OMP	48	8	<b>249</b>	<b>4.41</b>	249	4.42	249	4.41
628.pot3d_s	OMP	48	8	<b>1754</b>	<b>0.955</b>	1757	0.953	1753	0.955	OMP	48	8	<b>1754</b>	<b>0.955</b>	1757	0.953	1753	0.955
632.sph_exa_s	OMP	48	8	471	4.89	<b>471</b>	<b>4.89</b>	470	4.90	OMP	48	8	471	4.89	<b>471</b>	<b>4.89</b>	470	4.90
634.hpgmgfv_s	OMP	48	8	805	1.21	806	1.21	<b>806</b>	<b>1.21</b>	OMP	48	8	805	1.21	806	1.21	<b>806</b>	<b>1.21</b>
635.weather_s	OMP	48	8	400	6.49	<b>416</b>	<b>6.25</b>	422	6.16	OMP	48	8	400	6.49	<b>416</b>	<b>6.25</b>	422	6.16

SPEChpc 2021\_sml\_base = 2.22

SPEChpc 2021\_sml\_peak = 2.22

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.



# SPEChpc™ 2021 Small Result

Copyright 2021-2022 Standard Performance Evaluation Corporation

## Lenovo Global Technology

SPEChpc 2021\_sml\_base = 2.22

## ThinkSystem SR665 (AMD EPYC 7773X)

SPEChpc 2021\_sml\_peak = 2.22

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

**Test Date:** Jul-2022  
**Hardware Availability:** Jul-2022  
**Software Availability:** Jul-2022

### Hardware Summary

Type of System: Homogenous  
Compute Node: ThinkSystem SR665  
Interconnect: Nvidia Mellanox ConnectX-6 HDR  
Compute Nodes Used: 3  
Total Chips: 6  
Total Cores: 384  
Total Threads: 768  
Total Memory: 3 TB  
Max. Peak Threads: 8

### Software Summary

Compiler: Intel C/C++/Fortran Compiler 2021.5.0  
MPI Library: Open MPI 4.0.5  
Other MPI Info: --  
Other Software: --  
Base Parallel Model: OMP  
Base Ranks Run: 48  
Base Threads Run: 8  
Peak Parallel Models: OMP  
Minimum Peak Ranks: 48  
Maximum Peak Ranks: 48  
Max. Peak Threads: 8  
Min. Peak Threads: 8

## Node Description: ThinkSystem SR665

### Hardware

Number of nodes: 3  
Uses of the node: Compute  
Vendor: Lenovo Global Technology  
Model: ThinkSystem SR665  
CPU Name: AMD EPYC 7773X  
CPU(s) orderable: 1,2 chips  
Chips enabled: 2  
Cores enabled: 128  
Cores per chip: 64  
Threads per core: 2  
CPU Characteristics: Max Boost Clock up to 3.5 GHz  
CPU MHz: 2200  
Primary Cache: 32 KB I + 32 KB D on chip per core  
Secondary Cache: 512 KB I+D on chip per core  
L3 Cache: 768 MB I+D on chip per chip  
96 MB shared / 8 cores  
Other Cache: None  
Memory: 1 TB (16 x 64 GB 2Rx4 PC4-3200A-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: Mellanox ConnectX-6 HDR  
Number of Adapters: 1  
Slot Type: PCI-Express 4.0 x16  
Data Rate: 200 Gbits/s  
Ports Used: 1

### Software

Accelerator Driver: --  
Adapter: Mellanox ConnectX-6 HDR  
Adapter Driver: 5.2-1.0.4  
Adapter Firmware: 20.28.1002  
Operating System: Red Hat Enterprise Linux Server release 8.5,  
Kernel 4.18.0-348.el8.x86\_64  
Local File System: xfs  
Shared File System: NFS  
System State: Multi-user, run level 3  
Other Software: None

(Continued on next page)



# SPEChpc™ 2021 Small Result

Copyright 2021-2022 Standard Performance Evaluation Corporation

## Lenovo Global Technology

SPEChpc 2021\_sml\_base = 2.22

## ThinkSystem SR665 (AMD EPYC 7773X)

SPEChpc 2021\_sml\_peak = 2.22

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

**Test Date:** Jul-2022  
**Hardware Availability:** Jul-2022  
**Software Availability:** Jul-2022

### Node Description: ThinkSystem SR665

#### Hardware (Continued)

Interconnect Type: Nvidia Mellanox ConnectX-6 HDR

#### Interconnect Description: Nvidia Mellanox ConnectX-6 HDR

##### Hardware

Vendor: Nvidia  
Model: Nvidia Mellanox ConnectX-6 HDR  
Switch Model: QM8700  
Number of Switches: 1  
Number of Ports: 40  
Data Rate: 200 Gb/s  
Firmware: 3.9.0606  
Topology: Mesh  
Primary Use: MPI Traffic, NFS Access

##### Software

: --

### Submit Notes

The config file option 'submit' was used.  
submit = mpirun --allow-run-as-root --oversubscribe -genv coll\_hcoll\_enable 1  
-x HCOLL\_ENABLE\_NBC=1 -x HCOLL\_MAIN\_IB=mlx5\_0:1 -mca pml ucx  
-hostfile /home/HPC2021F1.0.1/config/4nodes --map-by ppr:16:node:pe=8

### Compiler Version Notes

=====  
CC 605.lbm\_s(base) 613.soma\_s(base) 618.tealeaf\_s(base) 621.miniswp\_s(base)  
634.hpgmgfv\_s(base)  
=====

Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)  
64, Version 2021.5.0 Build 20211109\_000000  
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.  
=====

=====  
CXXC 632.sph\_exa\_s(base)  
=====

Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on  
Intel(R) 64, Version 2021.5.0 Build 20211109\_000000  
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.  
=====

(Continued on next page)



# SPEChpc™ 2021 Small Result

Copyright 2021-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPEChpc 2021\_sml\_base = 2.22

ThinkSystem SR665 (AMD EPYC 7773X)

SPEChpc 2021\_sml\_peak = 2.22

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

**Test Date:** Jul-2022  
**Hardware Availability:** Jul-2022  
**Software Availability:** Jul-2022

## Compiler Version Notes (Continued)

FC 619.clvleaf\_s(base) 628.pot3d\_s(base) 635.weather\_s(base)

-----  
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on  
Intel(R) 64, Version 2021.5.0 Build 20211109\_000000  
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.  
-----

## Base Compiler Invocation

C benchmarks:  
mpicc

C++ benchmarks:  
mpicxx

Fortran benchmarks:  
mpifort

## Base Portability Flags

613.soma\_s: -DSPEC\_NO\_VAR\_ARRAY\_REDUCE

## Base Optimization Flags

C benchmarks:  
-Ofast -no-prec-div -march=core-avx2 -ipo -qopenmp -ansi-alias

C++ benchmarks:  
-Ofast -no-prec-div -march=core-avx2 -ipo -qopenmp -ansi-alias

Fortran benchmarks:  
-Ofast -no-prec-div -march=core-avx2 -ipo -qopenmp

## Peak Optimization Flags

C benchmarks:  
605.lbm\_s: basepeak = yes

(Continued on next page)



# SPEChpc™ 2021 Small Result

Copyright 2021-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPEChpc 2021\_sml\_base = 2.22

ThinkSystem SR665 (AMD EPYC 7773X)

SPEChpc 2021\_sml\_peak = 2.22

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

**Test Date:** Jul-2022  
**Hardware Availability:** Jul-2022  
**Software Availability:** Jul-2022

## Peak Optimization Flags (Continued)

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:

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.2021-10-20.html](http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2021-10-20.html)

You can also download the XML flags source by saving the following link:

[http://www.spec.org/hpc2021/flags/Intel\\_compiler\\_flags.2021-10-20.xml](http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2021-10-20.xml)

SPEChpc is a trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEChpc2021 v1.0.1 on 2022-07-07 11:44:09-0400.  
Report generated on 2022-07-26 12:16:13 by hpc2021 PDF formatter v1.0.3.  
Originally published on 2022-07-26.