



SPEChpc™ 2021 Small Result

Copyright 2021-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

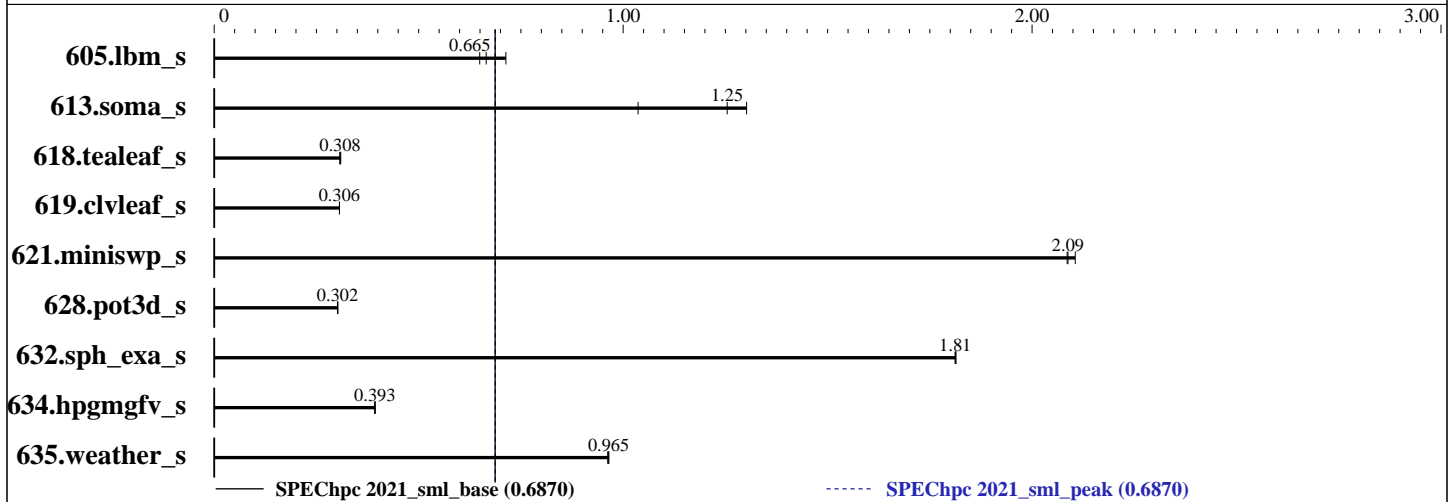
SPEChpc 2021_sml_base = 0.6870

ThinkSystem SR645 (AMD EPYC 7773X)

SPEChpc 2021_sml_peak = 0.6870

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

Test Date: Feb-2022
Hardware Availability: May-2022
Software Availability: Oct-2020



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	16	8	2330	0.665	2173	0.713	2387	0.649	OMP	16	8	2330	0.665	2173	0.713	2387	0.649
613.soma_s	OMP	16	8	1275	1.25	1544	1.04	1229	1.30	OMP	16	8	1275	1.25	1544	1.04	1229	1.30
618.tealeaf_s	OMP	16	8	6674	0.307	6625	0.309	6656	0.308	OMP	16	8	6674	0.307	6625	0.309	6656	0.308
619.clvleaf_s	OMP	16	8	5387	0.306	5387	0.306	5387	0.306	OMP	16	8	5387	0.306	5387	0.306	5387	0.306
621.miniswp_s	OMP	16	8	527	2.09	527	2.09	522	2.11	OMP	16	8	527	2.09	527	2.09	522	2.11
628.pot3d_s	OMP	16	8	5546	0.302	5549	0.302	5548	0.302	OMP	16	8	5546	0.302	5549	0.302	5548	0.302
632.sph_exa_s	OMP	16	8	1268	1.81	1269	1.81	1269	1.81	OMP	16	8	1268	1.81	1269	1.81	1269	1.81
634.hpgmgfv_s	OMP	16	8	2477	0.394	2480	0.393	2485	0.392	OMP	16	8	2477	0.394	2480	0.393	2485	0.392
635.weather_s	OMP	16	8	2695	0.965	2702	0.962	2695	0.965	OMP	16	8	2695	0.965	2702	0.962	2695	0.965

SPEChpc 2021_sml_base = **0.6870**

SPEChpc 2021_sml_peak = **0.6870**

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 = 0.6870

ThinkSystem SR645 (AMD EPYC 7773X)

SPEChpc 2021_sml_peak = 0.6870

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

Test Date: Feb-2022
Hardware Availability: May-2022
Software Availability: Oct-2020

Hardware Summary

Type of System: Homogenous
Compute Node: ThinkSystem SR645
Interconnect: Nvidia Mellanox ConnectX-6 HDR
File Server Node: ThinkSystem SR645
Compute Nodes Used: 1
Total Chips: 2
Total Cores: 128
Total Threads: 128
Total Memory: 1 TB
Max. Peak Threads: 8

Software Summary

Compiler: Intel C/C++/Fortran Compiler 2021.5.0
MPI Library: Intel MPI 2021.5
Other MPI Info: --
Other Software: --
Base Parallel Model: OMP
Base Ranks Run: 16
Base Threads Run: 8
Peak Parallel Models: OMP
Minimum Peak Ranks: 16
Maximum Peak Ranks: 16
Max. Peak Threads: 8
Min. Peak Threads: 8

Node Description: ThinkSystem SR645

Hardware

Number of nodes: 1
Uses of the node: Compute
Vendor: Lenovo Global Technology
Model: ThinkSystem SR645
CPU Name: AMD EPYC 7773X
CPU(s) orderable: 1,2 chips
Chips enabled: 2
Cores enabled: 128
Cores per chip: 64
Threads per core: 1
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: 1 x 7.68 TB 2.5" 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 Gb/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 8.3,
Kernel 4.18.0-193.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 = 0.6870

ThinkSystem SR645 (AMD EPYC 7773X)

SPEChpc 2021_sml_peak = 0.6870

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

Test Date: Feb-2022
Hardware Availability: May-2022
Software Availability: Oct-2020

Node Description: ThinkSystem SR645

Hardware (Continued)

Interconnect Type: Nvidia Mellanox ConnectX-6 HDR

Node Description: ThinkSystem SR645

Hardware

Number of nodes: 1
Uses of the node: Fileserver
Vendor: Lenovo Global Technology
Model: ThinkSystem SR645
CPU Name: AMD EPYC 7773X
CPU(s) orderable: 1,2 chips
Chips enabled: 2
Cores enabled: 128
Cores per chip: 64
Threads per core: 1
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: 1 x 7.68 TB 2.5" 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 Gb/s
Ports Used: 1
Interconnect Type: Nvidia Mellanox ConnectX-6 HDR

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 8.3
Local File System: xfs
Shared File System: N/A
System State: Multi-User, run level 3
Other Software: None



SPEChpc™ 2021 Small Result

Copyright 2021-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPEChpc 2021_sml_base = 0.6870

ThinkSystem SR645 (AMD EPYC 7773X)

SPEChpc 2021_sml_peak = 0.6870

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

Test Date: Feb-2022
Hardware Availability: May-2022
Software Availability: Oct-2020

Interconnect Description: Nvidia Mellanox ConnectX-6 HDR

Hardware

Software

Vendor: Nvidia : --
Model: Nvidia Mellanox ConnectX-6 HDR
Switch Model: QM8700 Series
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

Submit Notes

The config file option 'submit' was used.
submit = mpirun -host localhost -genv coll_hcoll_enable 1
-genv HCOLL_MAIN_IB=mlx5_0:1 -genv UCX_TLS=sm
-genv pml ucx --map-by numa -np 16

General Notes

Environment variables set by runhpc before the start of the run:
UCX_MEMTYPE_CACHE = "n"
UCX_TLS = "self,shm,cuda_copy"
Numa Information:
available: 16 nodes (0-15)
node 0 cpus: 0 1 2 3 4 5 6 7
node 1 cpus: 8 9 10 11 12 13 14 15
node 2 cpus: 16 17 18 19 20 21 22 23
node 3 cpus: 24 25 26 27 28 29 30 31
node 4 cpus: 32 33 34 35 36 37 38 39
node 5 cpus: 40 41 42 43 44 45 46 47
node 6 cpus: 48 49 50 51 52 53 54 55
node 7 cpus: 56 57 58 59 60 61 62 63
node 8 cpus: 64 65 66 67 68 69 70 71
node 9 cpus: 72 73 74 75 76 77 78 79
node 10 cpus: 80 81 82 83 84 85 86 87
node 11 cpus: 88 89 90 91 92 93 94 95
node 12 cpus: 96 97 98 99 100 101 102 103
node 13 cpus: 104 105 106 107 108 109 110 111
node 14 cpus: 112 113 114 115 116 117 118 119
node 15 cpus: 120 121 122 123 124 125 126 127



SPEChpc™ 2021 Small Result

Copyright 2021-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPEChpc 2021_sml_base = 0.6870

ThinkSystem SR645 (AMD EPYC 7773X)

SPEChpc 2021_sml_peak = 0.6870

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

Test Date: Feb-2022
Hardware Availability: May-2022
Software Availability: Oct-2020

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.
=====

=====
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:
mpiicc

C++ benchmarks:
mpicpc

Fortran benchmarks:
mpiifort

Base Portability Flags

613.soma_s: -DSPEC_NO_VAR_ARRAY_REDUCE



SPEChpc™ 2021 Small Result

Copyright 2021-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPEChpc 2021_sml_base = 0.6870

ThinkSystem SR645 (AMD EPYC 7773X)

SPEChpc 2021_sml_peak = 0.6870

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

Test Date: Feb-2022
Hardware Availability: May-2022
Software Availability: Oct-2020

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

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

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



SPEChpc™ 2021 Small Result

Copyright 2021-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPEChpc 2021_sml_base = 0.6870

ThinkSystem SR645 (AMD EPYC 7773X)

SPEChpc 2021_sml_peak = 0.6870

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

Test Date: Feb-2022
Hardware Availability: May-2022
Software Availability: Oct-2020

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.

Tested with SPEChpc2021 v1.0.1 on 2022-02-12 07:57:22-0500.
Report generated on 2022-03-21 09:05:53 by hpc2021 PDF formatter v1.0.3.
Originally published on 2022-03-21.