



SPEChpc™ 2021 Small Result

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Lenovo Global Technology

SPEChpc 2021_sml_base = 3.42

ThinkSystem SR665 V3 (AMD EPYC 9654)

SPEChpc 2021_sml_peak = 3.42

hpc2021 License: 28

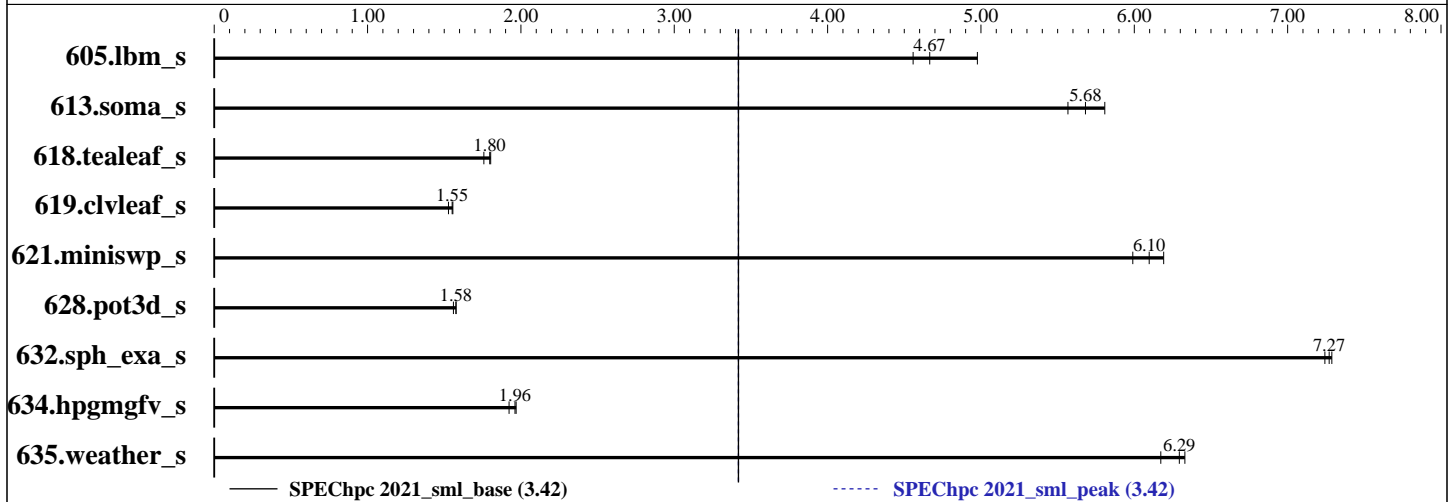
Test Date: Jan-2023

Test Sponsor: Lenovo Global Technology

Hardware Availability: Nov-2022

Tested by: Lenovo Global Technology

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	OMP	72	8	311	4.98	340	4.56	332	4.67	OMP	72	8	311	4.98	340	4.56	332	4.67
613.soma_s	OMP	72	8	287	5.57	275	5.81	282	5.68	OMP	72	8	287	5.57	275	5.81	282	5.68
618.tealeaf_s	OMP	72	8	1166	1.76	1137	1.80	1141	1.80	OMP	72	8	1166	1.76	1137	1.80	1141	1.80
619.cvlleaf_s	OMP	72	8	1080	1.53	1063	1.55	1060	1.56	OMP	72	8	1080	1.53	1063	1.55	1060	1.56
621.miniswp_s	OMP	72	8	184	5.99	180	6.10	178	6.19	OMP	72	8	184	5.99	180	6.10	178	6.19
628.pot3d_s	OMP	72	8	1074	1.56	1062	1.58	1062	1.58	OMP	72	8	1074	1.56	1062	1.58	1062	1.58
632.sph_exa_s	OMP	72	8	316	7.27	318	7.24	316	7.29	OMP	72	8	316	7.27	318	7.24	316	7.29
634.hpgmgfv_s	OMP	72	8	507	1.92	497	1.96	495	1.97	OMP	72	8	507	1.92	497	1.96	495	1.97
635.weather_s	OMP	72	8	421	6.17	411	6.33	413	6.29	OMP	72	8	421	6.17	411	6.33	413	6.29

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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: Homogeneous Cluster
Compute Node: ThinkSystem SR665 V3
Interconnect: Nvidia Mellanox ConnectX-6 HDR
Compute Nodes Used: 3
Total Chips: 6
Total Cores: 576
Total Threads: 1152
Total Memory: 4608 GB
Max. Peak Threads: 8

Software Summary

Compiler: Intel oneAPI Compiler 2022.1.0
MPI Library: Intel MPI Library for Linux OS, Build 20220227
Other MPI Info: --
Other Software: --
Base Parallel Model: OMP
Base Ranks Run: 72
Base Threads Run: 8
Peak Parallel Models: OMP
Minimum Peak Ranks: 72
Maximum Peak Ranks: 72
Max. Peak Threads: 8
Min. Peak Threads: 8

Node Description: ThinkSystem SR665 V3

Hardware

Number of nodes: 3
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: 1536 GB (24 x 64 GB 2Rx4 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: Nvidia 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: Nvidia Mellanox ConnectX-6 HDR
Adapter Driver: 5.7-1.0.2
Adapter Firmware: 20.28.1002
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: 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 = mpiexec -hostfile ${top}/4nodes -np ranks -genv OMP_NUM_THREADS=$threads -ppn %{NRNK} $command
```

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)
-----
```

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]

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Compiler Version Notes (Continued)

=====
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++ -DSPEC_NO_VAR_ARRAY_REDUCE
618.tealeaf_s: -lstdc++
619.clvleaf_s: -lstdc++
621.miniswp_s: -lstdc++
628.pot3d_s: -lstdc++
632.sph_exa_s: -lstdc++
634.hpgmgfv_s: -lstdc++
635.weather_s: -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

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Base Optimization Flags (Continued)

C++ benchmarks (continued):

-ansi-alias

Fortran benchmarks:

-Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp
-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:

619.clvleaf_s: basepeak = yes

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Peak Optimization Flags (Continued)

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

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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