



SPEChpc™ 2021 Small Result

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Lenovo Global Technology

SPEChpc 2021_sml_base = 13.5

SPEChpc 2021_sml_peak = 13.7

ThinkSystem SR675 V3 (AMD EPYC 9654, Nvidia H100-PCIe-80G)

hpc2021 License: 28

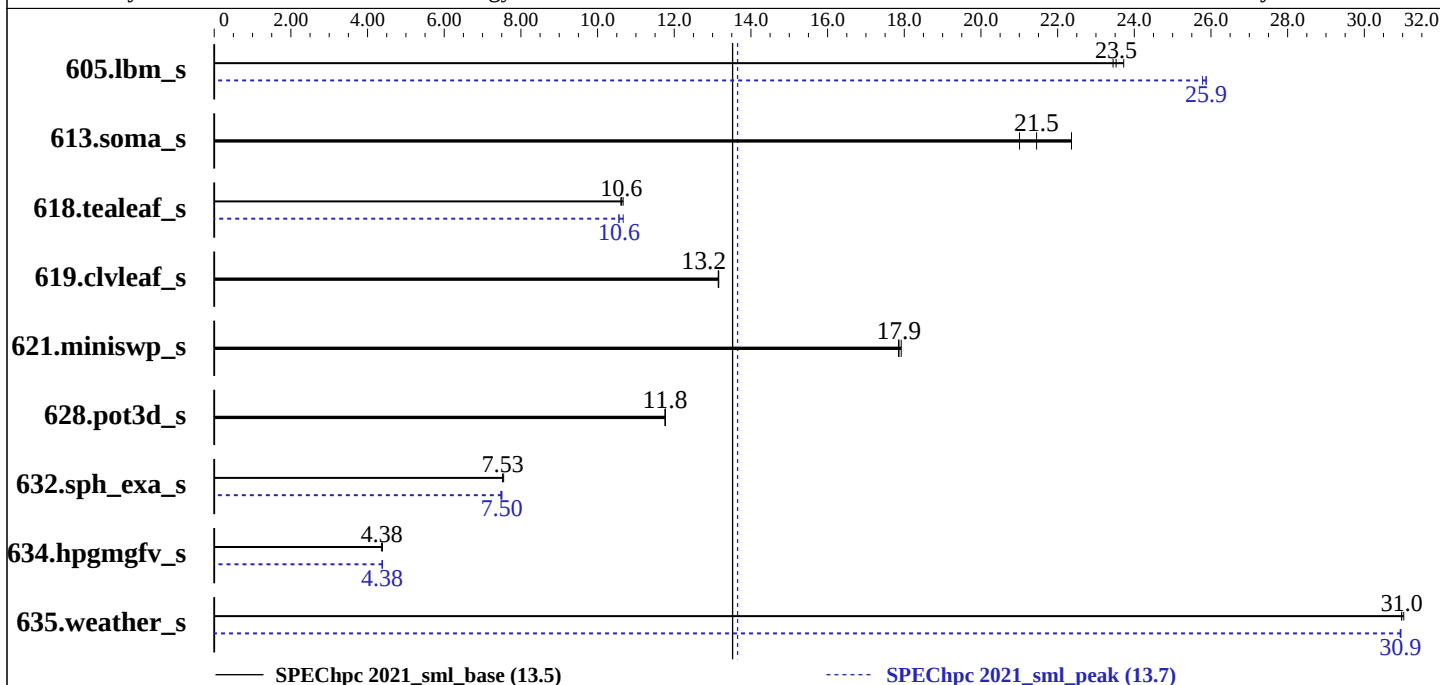
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Oct-2023

Hardware Availability: Oct-2023

Software Availability: Oct-2023



Results Table

Benchmark	Base								Peak							
	Model	Ranks	Thrds/Rnk	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Model	Ranks	Thrds/Rnk	Seconds	Ratio	Seconds	Ratio
605.lbm_s	ACC	8	1	65.3	23.7	66.1	23.4	65.9	23.5	ACC	8	1	59.9	25.9	59.9	25.9
613.soma_s	ACC	8	1	71.6	22.4	76.2	21.0	74.6	21.5	ACC	8	1	71.6	22.4	76.2	21.0
618.tealeaf_s	ACC	8	1	193	10.6	192	10.7	193	10.6	ACC	8	1	194	10.6	194	10.6
619.clvleaf_s	ACC	8	1	125	13.1	125	13.2	125	13.2	ACC	8	1	125	13.1	125	13.2
621.miniswp_s	ACC	8	1	61.4	17.9	61.6	17.8	61.6	17.9	ACC	8	1	61.4	17.9	61.6	17.8
628.pot3d_s	ACC	8	1	142	11.8	142	11.8	142	11.8	ACC	8	1	142	11.8	142	11.8
632.sph_exa_s	ACC	8	1	305	7.55	306	7.52	306	7.53	ACC	8	1	308	7.48	307	7.50
634.hpgmgfv_s	ACC	8	1	222	4.39	223	4.37	223	4.38	ACC	8	1	223	4.38	223	4.38
635.weather_s	ACC	8	1	83.9	31.0	83.8	31.0	83.9	31.0	ACC	8	1	84.0	30.9	84.0	30.9

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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: Homogeneous Cluster
Compute Node: ThinkSystem SR675 V3
Compute Nodes Used: 1
Total Chips: 2
Total Cores: 192
Total Threads: 192
Total Memory: 768 GB
Total Accelerators: 8
Max. Peak Threads: 1

Software Summary

Compiler: Nvidia HPC SDK 23.5
MPI Library: Open MPI 4.0.5
Other MPI Info: None
Other Software: --
Base Parallel Model: ACC
Base Ranks Run: 8
Base Threads Run: 1
Peak Parallel Models: ACC
Minimum Peak Ranks: 8
Maximum Peak Ranks: 8
Max. Peak Threads: 1
Min. Peak Threads: 1

Node Description: ThinkSystem SR675 V3

Hardware

Number of nodes: 1
Uses of the node: compute
Vendor: Lenovo Global Technology
Model: ThinkSystem SR655 V3
CPU Name: AMD EPYC 9654
CPU(s) orderable: 1 chips
Chips enabled: 2
Cores enabled: 192
Cores per chip: 96
Threads per core: 1
CPU Characteristics: Intel Turbo Boost Technology 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
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: 8
Accel Model: Tesla H100 PCIe 80GB
Accel Vendor: Nvidia Corporation
Accel Type: GPU
Accel Connection: PCIe Gen5 x16
Accel ECC enabled: Yes
Accel Description: Nvidia Tesla H100 PCIe 80GB
Adapter: Mellanox ConnectX-7 NDR
Number of Adapters: 1
Slot Type: PCI-Express 5.0 x8
Data Rate: 400 Gb/s
Ports Used: 1
Interconnect Type: Nvidia Mellanox ConnectX-7 NDR

Software

Accelerator Driver: 535.54.03
Adapter: Mellanox ConnectX-7 NDR
Adapter Driver: 5.9-0.5.5
Adapter Firmware: 28.33.0508
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: XFS
System State: Multi-user, run level 3
Other Software: None



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Submit Notes

The config file option 'submit' was used.

Compiler Version Notes

```
=====
CC  605.lbm_s(base, peak) 613.soma_s(base, peak) 618.tealeaf_s(base, peak)
    621.miniswp_s(base, peak) 634.hpgmgfv_s(base, peak)
-----
```

nvc 23.5-0 64-bit target on x86-64 Linux -tp zen3

NVIDIA Compilers and Tools

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```
=====
CXXC 632.sph_exa_s(base, peak)
-----
```

nvc++ 23.5-0 64-bit target on x86-64 Linux -tp zen3

NVIDIA Compilers and Tools

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```
=====
FC  619.clvleaf_s(base, peak) 628.pot3d_s(base, peak) 635.weather_s(base,
    peak)
-----
```

nvfortran 23.5-0 64-bit target on x86-64 Linux -tp zen3

NVIDIA Compilers and Tools

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Base Compiler Invocation

C benchmarks:

mpicc

C++ benchmarks:

mpicxx

Fortran benchmarks:

mpif90



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Base Portability Flags

605.lbm_s: -DSPEC_OPENACC_NO_SELF

632.sph_exa_s: - -c++17

Base Optimization Flags

C benchmarks:

-Mfprelaxed -Mnuniform -Mstack_arrays -fast -acc=gpu -Minfo=accel
-DSPEC_ACCEL_AWARE_MPI

C++ benchmarks:

-Mfprelaxed -Mnuniform -Mstack_arrays -fast -acc=gpu -Minfo=accel
-DSPEC_ACCEL_AWARE_MPI

Fortran benchmarks:

-DSPEC_ACCEL_AWARE_MPI -Mfprelaxed -Mnuniform -Mstack_arrays -fast
-acc=gpu -Minfo=accel

Base Other Flags

C benchmarks:

-Ispecmpitime -w

C++ benchmarks:

-Ispecmpitime -w

Fortran benchmarks (except as noted below):

-w

619.clvleaf_s: -Ispecmpitime -w

Peak Compiler Invocation

C benchmarks:

mpicc

C++ benchmarks:

mpicxx

Fortran benchmarks:

mpif90



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Peak Portability Flags

605.lbm_s: -DSPEC_OPENACC_NO_SELF

Peak Optimization Flags

C benchmarks:

605.lbm_s: -fast -acc=gpu -O3 -Mfprelaxed -Mnouniform
-DSPEC_ACCEL_AWARE_MPI

613.soma_s: basepeak = yes

618.tealeaf_s: -fast -acc=gpu -Msafeptr -DSPEC_ACCEL_AWARE_MPI

621.miniswp_s: basepeak = yes

634.hpgmgfv_s: -fast -acc=gpu -static-nvidia -DSPEC_ACCEL_AWARE_MPI

C++ benchmarks:

-fast -acc=gpu -O3 -Mfprelaxed -Mnouniform -Mstack_arrays
-static-nvidia -DSPEC_ACCEL_AWARE_MPI

Fortran benchmarks:

619.clvleaf_s: basepeak = yes

628.pot3d_s: basepeak = yes

635.weather_s: -DSPEC_ACCEL_AWARE_MPI -fast -acc=gpu -O3 -Mfprelaxed
-Mnouniform -Mstack_arrays -static-nvidia

Peak Other Flags

C benchmarks:

-Ispecmpitime -w

C++ benchmarks:

-Ispecmpitime -w

Fortran benchmarks (except as noted below):

-w

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Peak Other Flags (Continued)

619.clvleaf_s: -Ispecmpitime -w

The flags file that was used to format this result can be browsed at

http://www.spec.org/hpc2021/flags/nv2021_flags_v1.0.3.2022-08-24.html

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

http://www.spec.org/hpc2021/flags/nv2021_flags_v1.0.3.2022-08-24.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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