



# SPEChpc™ 2021 Small Result

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## Lenovo Global Technology

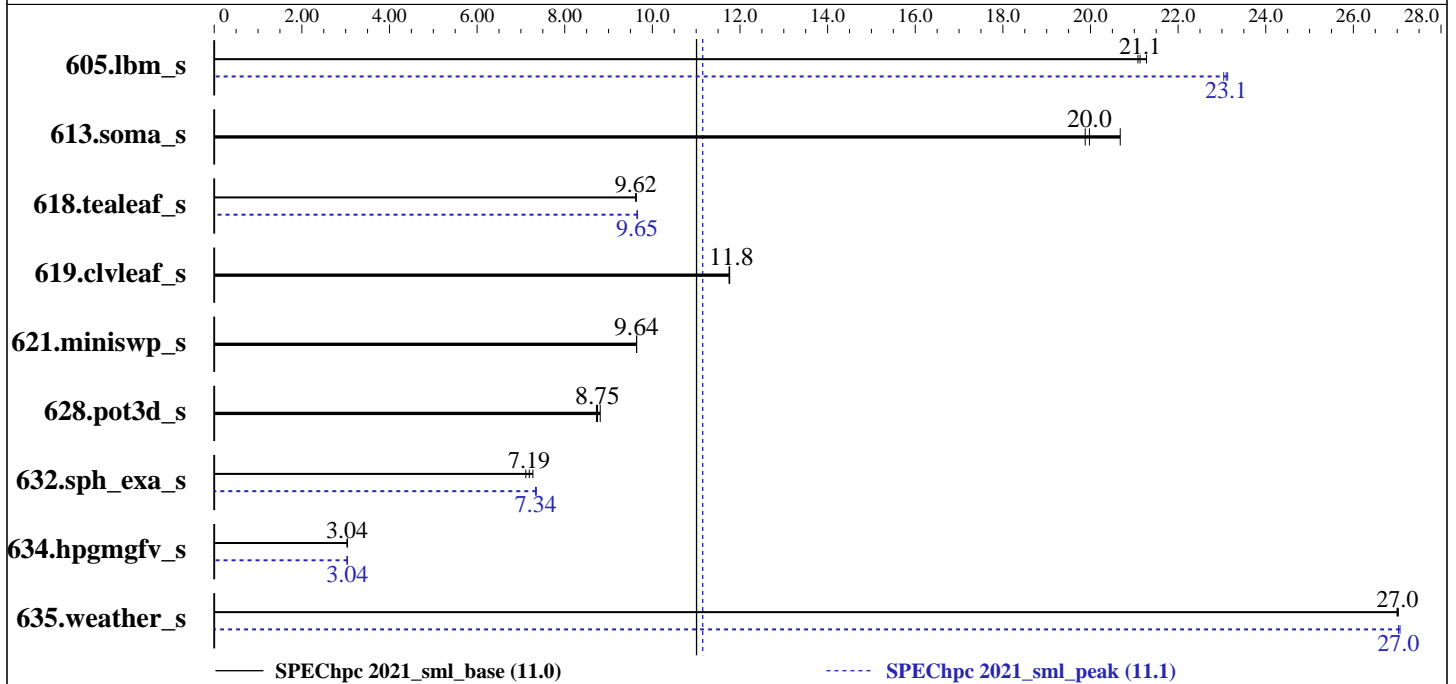
SPEChpc 2021\_sml\_base = 11.0

SPEChpc 2021\_sml\_peak = 11.1

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	Seconds	Ratio
605.lbm_s	ACC	7	1	72.8	21.3	<b>73.4</b>	<b>21.1</b>	73.5	21.1	ACC	7	1	<b>67.1</b>	<b>23.1</b>	67.3	23.0	67.0	23.1
613.soma_s	ACC	7	1	<b>80.1</b>	<b>20.0</b>	80.5	19.9	77.4	20.7	ACC	7	1	<b>80.1</b>	<b>20.0</b>	80.5	19.9	77.4	20.7
618.tealeaf_s	ACC	7	1	213	9.63	213	9.62	<b>213</b>	<b>9.62</b>	ACC	7	1	<b>212</b>	<b>9.65</b>	212	9.65	212	9.66
619.clvleaf_s	ACC	7	1	140	11.8	140	11.8	<b>140</b>	<b>11.8</b>	ACC	7	1	140	11.8	140	11.8	<b>140</b>	<b>11.8</b>
621.miniswp_s	ACC	7	1	114	9.64	<b>114</b>	<b>9.64</b>	114	9.64	ACC	7	1	114	9.64	<b>114</b>	<b>9.64</b>	114	9.64
628.pot3d_s	ACC	7	1	192	8.72	<b>191</b>	<b>8.75</b>	190	8.81	ACC	7	1	192	8.72	<b>191</b>	<b>8.75</b>	190	8.81
632.sph_exa_s	ACC	7	1	<b>320</b>	<b>7.19</b>	323	7.11	316	7.27	ACC	7	1	313	7.35	<b>313</b>	<b>7.34</b>	314	7.34
634.hpgmgfv_s	ACC	7	1	321	3.03	<b>321</b>	<b>3.04</b>	321	3.04	ACC	7	1	322	3.03	320	3.04	<b>321</b>	<b>3.04</b>
635.weather_s	ACC	7	1	96.2	27.0	<b>96.3</b>	<b>27.0</b>	96.3	27.0	ACC	7	1	96.1	27.1	<b>96.2</b>	<b>27.0</b>	96.2	27.0

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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  
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: 7  
Base Threads Run: 1  
Peak Parallel Models: ACC  
Minimum Peak Ranks: 7  
Maximum Peak Ranks: 7  
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  
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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:

-w

C++ benchmarks:

-w

Fortran benchmarks:

-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:

-w

C++ benchmarks:

-w

Fortran benchmarks:

-w



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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](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](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](mailto:info@spec.org).

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