SPEChpc™ 2021 Tiny Result

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Lenovo Global Technology

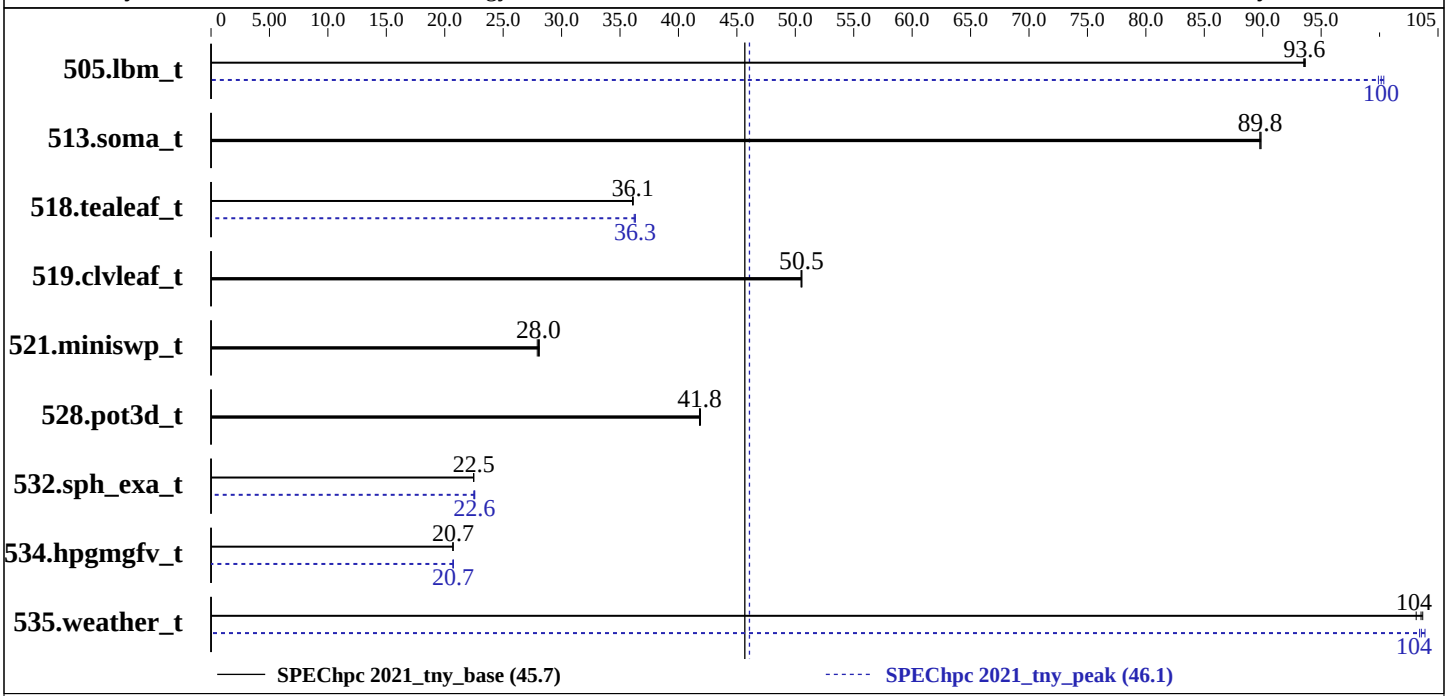
ThinkSystem SR675 V3 (AMD EPYC 9654, Nvidia H100-PCIe-80G)

SPEChpc 2021_tny_base = 45.7

SPEChpc 2021_tny_peak = 46.1

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
505.lbm_t	ACC	3	1	24.0	93.6	24.1	93.5	**24.0**	**93.6**	ACC	3	1	**22.5**	**100**	22.5	99.9	22.4	100
513.soma_t	ACC	3	1	41.2	89.9	**41.2**	**89.8**	41.2	89.8	ACC	3	1	41.2	89.9	**41.2**	**89.8**	41.2	89.8
518.tealeaf_t	ACC	3	1	**45.7**	**36.1**	45.7	36.1	45.7	36.1	ACC	3	1	45.4	36.3	**45.5**	**36.3**	45.6	36.2
519.clvleaf_t	ACC	3	1	**32.6**	**50.5**	32.7	50.5	32.6	50.6	ACC	3	1	**32.6**	**50.5**	32.7	50.5	32.6	50.6
521.miniswp_t	ACC	3	1	57.3	27.9	**57.1**	**28.0**	56.9	28.1	ACC	3	1	57.3	27.9	**57.1**	**28.0**	56.9	28.1
528.pot3d_t	ACC	3	1	**50.8**	**41.8**	50.8	41.8	50.7	41.9	ACC	3	1	**50.8**	**41.8**	50.8	41.8	50.7	41.9
532.sph_exa_t	ACC	3	1	86.7	22.5	86.8	22.5	**86.8**	**22.5**	ACC	3	1	**86.4**	**22.6**	86.7	22.5	86.4	22.6
534.hpgmgfv_t	ACC	3	1	56.8	20.7	56.7	20.7	**56.7**	**20.7**	ACC	3	1	56.7	20.7	56.8	20.7	**56.7**	**20.7**
535.weather_t	ACC	3	1	31.3	103	31.1	104	**31.1**	**104**	ACC	3	1	31.2	103	31.0	104	**31.1**	**104**

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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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Test Date: Oct-2023
Hardware Availability: Oct-2023
Software Availability: Oct-2023

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:	3
Base Threads Run:	1
Peak Parallel Models:	ACC
Minimum Peak Ranks:	3
Maximum Peak Ranks:	3
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

Submit Notes

```
The config file option 'submit' was used.
```

Compiler Version Notes

```
==============================================================================
 CC  505.lbm_t(base, peak) 513.soma_t(base, peak) 518.tealeaf_t(base, peak)
     521.miniswp_t(base, peak) 534.hpgmgfv_t(base, peak)
------------------------------------------------------------------------------
nvc 23.5-0 64-bit target on x86-64 Linux -tp zen3
NVIDIA Compilers and Tools
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------------------------------------------------------------------------------

==============================================================================
 CXXC 532.sph_exa_t(base, peak)
------------------------------------------------------------------------------
nvc++ 23.5-0 64-bit target on x86-64 Linux -tp zen3
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------------------------------------------------------------------------------

==============================================================================
 FC  519.clvleaf_t(base, peak) 528.pot3d_t(base, peak) 535.weather_t(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`

Base Portability Flags

505.lbm_t: `-DSPEC_OPENACC_NO_SELF`
532.sph_exa_t: `--c++17`

Base Optimization Flags

C benchmarks:
`-Mfprelaxed -Mnouniform -Mstack_arrays -fast -acc=gpu -Minfo=accel -DSPEC_ACCEL_AWARE_MPI`

C++ benchmarks:
`-Mfprelaxed -Mnouniform -Mstack_arrays -fast -acc=gpu -Minfo=accel -DSPEC_ACCEL_AWARE_MPI`

Fortran benchmarks:
`-DSPEC_ACCEL_AWARE_MPI -Mfprelaxed -Mnouniform -Mstack_arrays -fast -acc=gpu -Minfo=accel`

Base Other Flags

C benchmarks (except as noted below):
`-Ispecmpitime -w`

521.miniswp_t: `-Ispecmpitime/ -w`

534.hpgmgfv_t: `-Ispecmpitime -w`

C++ benchmarks:
`-Ispecmpitime -w`

Fortran benchmarks (except as noted below):
`-w`

519.clvleaf_t: `-Ispecmpitime -w`

Peak Compiler Invocation

C benchmarks:
`mpicc`

(Continued on next page)

Peak Compiler Invocation (Continued)

C++ benchmarks:
mpicxx

Fortran benchmarks:
mpif90

Peak Portability Flags

505.lbm_t: -DSPEC_OPENACC_NO_SELF

Peak Optimization Flags

C benchmarks:

505.lbm_t: -fast -acc=gpu -O3 -Mfprelaxed -Mnouniform
-DSPEC_ACCEL_AWARE_MPI

513.soma_t: basepeak = yes

518.tealeaf_t: -fast -acc=gpu -Msafeptr -DSPEC_ACCEL_AWARE_MPI

521.miniswp_t: basepeak = yes

534.hpgmgfv_t: -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:

519.clvleaf_t: basepeak = yes

528.pot3d_t: basepeak = yes

535.weather_t: -DSPEC_ACCEL_AWARE_MPI -fast -acc=gpu -O3 -Mfprelaxed
-Mnouniform -Mstack_arrays -static-nvidia

Peak Other Flags

C benchmarks (except as noted below):
`-Ispecmpitime -w`

521.miniswp_t: `-Ispecmpitime/ -w`

534.hpgmgfv_t: `-Ispecmpitime -w`

C++ benchmarks:
`-Ispecmpitime -w`

Fortran benchmarks (except as noted below):
`-w`

519.clvleaf_t: `-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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