SPEChpc™ 2021 Tiny Result

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Lenovo Global Technology

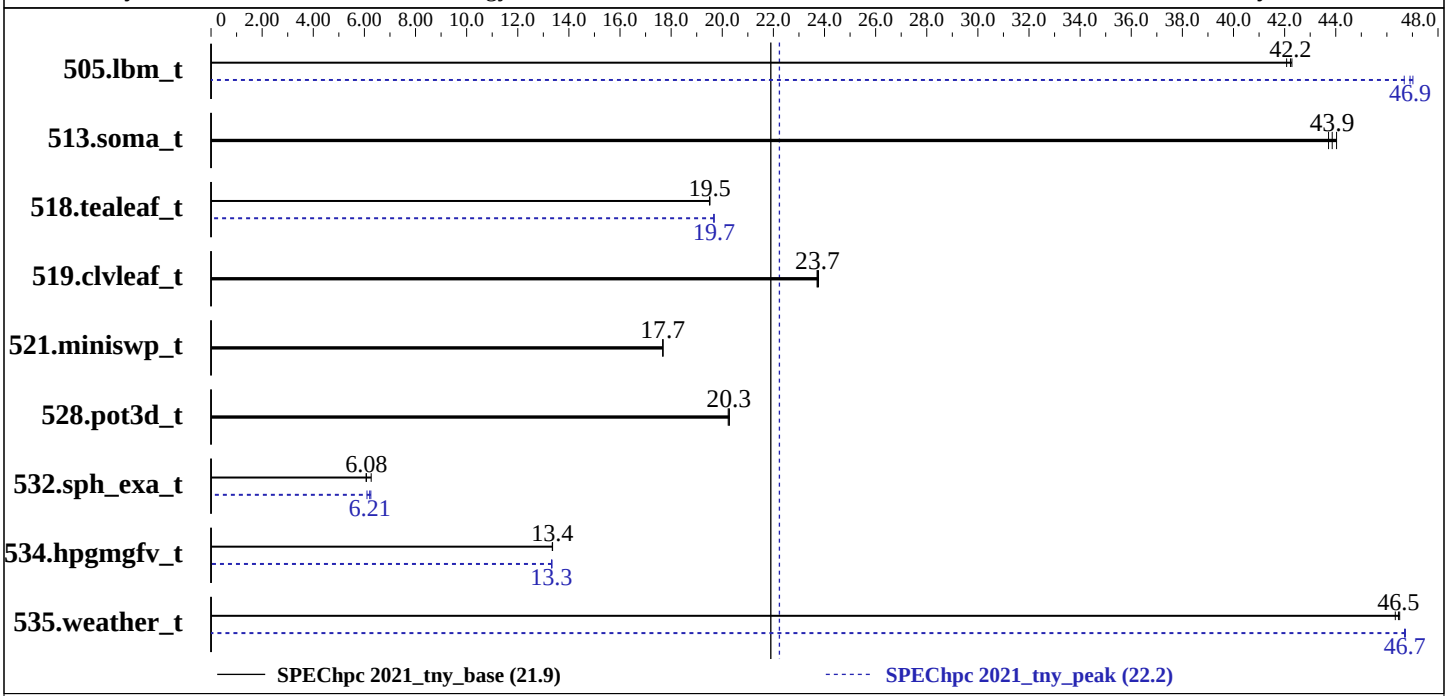
ThinkSystem SD665-N V3 (AMD EPYC 9654, Nvidia H100-SXM5-80G)

SPEChpc 2021_tny_base = 21.9

SPEChpc 2021_tny_peak = 22.2

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	1	1	53.5	42.1	**53.3**	**42.2**	53.2	42.3	ACC	1	1	48.2	46.7	47.9	47.0	**48.0**	**46.9**
513.soma_t	ACC	1	1	**84.4**	**43.9**	84.6	43.7	84.0	44.0	ACC	1	1	**84.4**	**43.9**	84.6	43.7	84.0	44.0
518.tealeaf_t	ACC	1	1	**84.6**	**19.5**	84.6	19.5	84.6	19.5	ACC	1	1	**83.8**	**19.7**	83.9	19.7	83.8	19.7
519.clvleaf_t	ACC	1	1	69.4	23.8	**69.5**	**23.7**	69.6	23.7	ACC	1	1	69.4	23.8	**69.5**	**23.7**	69.6	23.7
521.miniswp_t	ACC	1	1	90.5	17.7	90.5	17.7	**90.5**	**17.7**	ACC	1	1	90.5	17.7	90.5	17.7	**90.5**	**17.7**
528.pot3d_t	ACC	1	1	**105**	**20.3**	105	20.2	105	20.3	ACC	1	1	**105**	**20.3**	105	20.2	105	20.3
532.sph_exa_t	ACC	1	1	**321**	**6.08**	311	6.27	321	6.07	ACC	1	1	312	6.25	320	6.10	**314**	**6.21**
534.hpgmgfv_t	ACC	1	1	88.0	13.4	**88.0**	**13.4**	87.9	13.4	ACC	1	1	88.1	13.3	**88.2**	**13.3**	88.2	13.3
535.weather_t	ACC	1	1	69.6	46.3	69.4	46.5	**69.4**	**46.5**	ACC	1	1	69.1	46.7	69.0	46.7	**69.1**	**46.7**

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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 SD665-N 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:	1
Base Threads Run:	1
Peak Parallel Models:	ACC
Minimum Peak Ranks:	1
Maximum Peak Ranks:	1
Max. Peak Threads:	1
Min. Peak Threads:	1

Node Description: ThinkSystem SD665-N 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:	4
Accel Model:	Tesla H100 SXM5 80GB
Accel Vendor:	Nvidia Corporation
Accel Type:	GPU
Accel Connection:	PCIe Gen5 x16
Accel ECC enabled:	Yes
Accel Description:	Nvidia Tesla H100 SXM5 80GB
Adapter:	Mellanox ConnectX-7 NDR
Number of Adapters:	1
Slot Type:	PCI-Express 5.0 x16
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
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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:
`-w`

C++ benchmarks:
`-w`

Fortran benchmarks:
`-w`

Peak Compiler Invocation

C benchmarks:
`mpicc`

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:
`-w`

C++ benchmarks:
`-w`

Fortran benchmarks:
`-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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