



SPEChpc™ 2021 Tiny Result

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Lenovo Global Technology

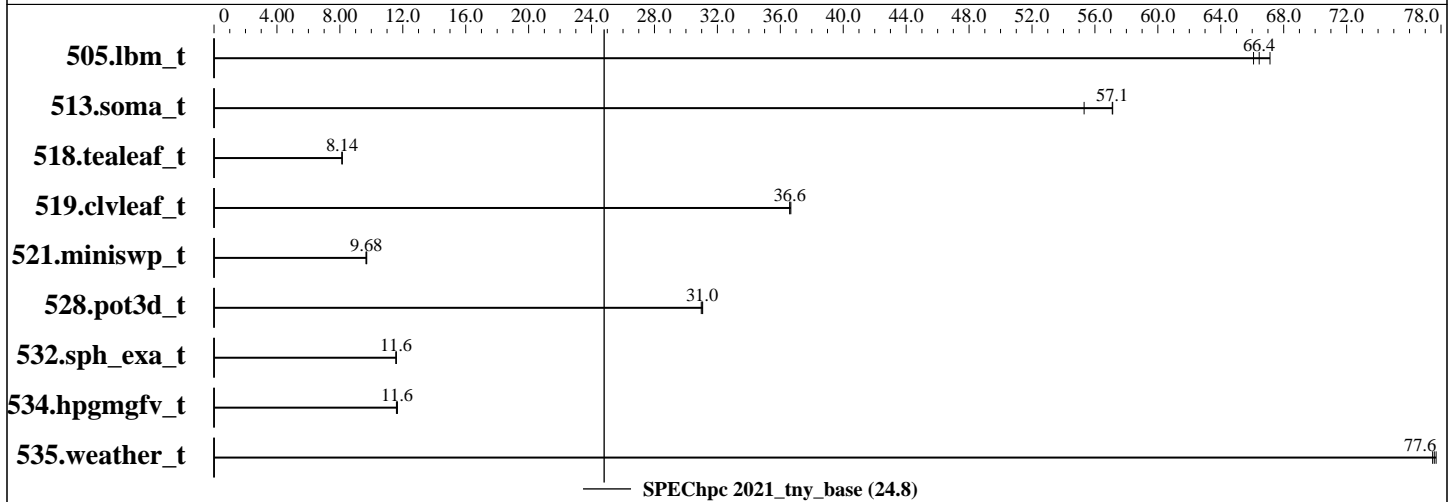
SPEChpc 2021_tny_base = 24.8

SPEChpc 2021_tny_peak = Not Run

ThinkSystem SR670 V2 (Intel Xeon Platinum 8380, Nvidia A100-PCIE-40G)

hpc2021 License: 28
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Aug-2021
Hardware Availability: Aug-2021
Software Availability: Aug-2021



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	33.5	67.1	<u>33.9</u>	<u>66.4</u>	34.0	66.1									
513.soma_t	ACC	3	1	66.9	55.3	<u>64.8</u>	<u>57.1</u>	64.8	57.1									
518.tealeaf_t	ACC	3	1	203	8.14	203	8.14	<u>203</u>	<u>8.14</u>									
519.clvleaf_t	ACC	3	1	45.0	36.7	45.1	36.6	<u>45.1</u>	<u>36.6</u>									
521.miniswp_t	ACC	3	1	166	9.66	<u>165</u>	<u>9.68</u>	165	9.71									
528.pot3d_t	ACC	3	1	68.6	31.0	68.4	31.1	<u>68.5</u>	<u>31.0</u>									
532.sph_exa_t	ACC	3	1	169	11.6	<u>168</u>	<u>11.6</u>	168	11.6									
534.hpgmgfv_t	ACC	3	1	101	11.6	<u>101</u>	<u>11.6</u>	101	11.7									
535.weather_t	ACC	3	1	<u>41.6</u>	<u>77.6</u>	41.6	77.5	41.5	77.7									

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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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Hardware Summary

Type of System: Homogenous
Compute Node: ThinkSystem SR670 V2
Interconnect: None
File Server Node: ThinkSystem SR670 V2
Compute Nodes Used: 1
Total Chips: 2
Total Cores: 80
Total Threads: 80
Total Memory: 512 GB
Max. Peak Threads: --

Software Summary

Compiler: Nvidia HPC SDK 21.5
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: Not Run
Minimum Peak Ranks: --
Maximum Peak Ranks: --
Max. Peak Threads: --
Min. Peak Threads: --

Node Description: ThinkSystem SR670 V2

Hardware

Number of nodes: 1
Uses of the node: compute
Vendor: Lenovo Global Technology
Model: ThinkSystem SR670 V2
CPU Name: Intel Xeon Platinum 8380
CPU(s) orderable: 2 chips
Chips enabled: 2
Cores enabled: 80
Cores per chip: 40
Threads per core: 1
CPU Characteristics: Intel Turbo Boost Technology up to 3.4 GHz
CPU MHz: 2300
Primary Cache: 32 KB I + 48 KB D on chip per core
Secondary Cache: 1280 KB I+D on chip per core
L3 Cache: 60 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC4-3200A-R)
Disk Subsystem: 1 x 4 TB NVMe SSD
Other Hardware: None
Accel Count: 8
Accel Model: Tesla A100 PCIe 40GB
Accel Vendor: Nvidia Corporation
Accel Type: GPU
Accel Connection: PCIe Gen4 x16
Accel ECC enabled: Yes
Accel Description: Nvidia Tesla A100 PCIe 40GB
Adapter: Mellanox ConnectX-6 HDR
Number of Adapters: 1
Slot Type: PCI-Express 4.0 x16
Data Rate: 200 Gb/s
Ports Used: 1
Interconnect Type: Nvidia Mellanox ConnectX-6 HDR

Software

Accelerator Driver: 470.42.01
Adapter: Mellanox ConnectX-6 HDR
Adapter Driver: 5.2-1.0.4
Adapter Firmware: 20.28.1002
Operating System: Red Hat Enterprise Linux Server release 8.3,
Kernel 4.18.0-193.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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Software Availability: Aug-2021

Node Description: ThinkSystem SR670 V2

Hardware

Number of nodes: 1
Uses of the node: Fileserver
Vendor: Lenovo Global Technology
Model: ThinkSystem SR670 V2
CPU Name: Intel Xeon Platinum 8380
CPU(s) orderable: 2 chips
Chips enabled: 2
Cores enabled: 80
Cores per chip: 40
Threads per core: 1
CPU Characteristics: Turbo up to 3.4 GHz
CPU MHz: 2300
Primary Cache: 32 KB I + 48 KB D on chip per core
Secondary Cache: 1280 KB I+D on chip per core
L3 Cache: 60 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC4-3200A-R)
Disk Subsystem: 1 x 4 TB NVMe SSD
Other Hardware: None
Accel Count: 8
Accel Model: Tesla A100 PCIe 40GB
Accel Vendor: Nvidia
Accel Type: GPU
Accel Connection: Nvidia Tesla A100 PCIe 40GB
Accel ECC enabled: Yes
Accel Description: Nvidia Tesla A100 PCIe 40GB
Adapter: Mellanox ConnectX-6 HDR
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Slot Type: PCI-Express 4.0 x16
Data Rate: 200 Gb/s
Ports Used: 1
Interconnect Type: Nvidia Mellanox ConnectX-6 HDR

Software

Accelerator Driver: None
Adapter: Mellanox ConnectX-6 HDR
Adapter Driver: 5.2-1.0.4
Adapter Firmware: 20.28.1002
Operating System: Red Hat Enterprise Linux Server release 8.3
Local File System: xfs
Shared File System: None
System State: Multi-User, run level 3
Other Software: None

Interconnect Description: None

Hardware

Vendor: None
Model: None
Switch Model: None
Number of Switches: 0
Number of Ports: 0
Data Rate: None
Firmware: None
Topology: None

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Software

: --



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Interconnect Description: None

Hardware (Continued)

Primary Use: None

Submit Notes

Individual Ranks were bound to the CPU cores on the same NUMA node as the GPU using 'numactl' within the following "bind.pl" perl script:

```

---- Start bind.pl -----
my %bind;
$bind{0} = "1-3";
$bind{1} = "4-7";
$bind{2} = "8-10";
$bind{3} = "11-14";
$bind{4} = "41-43";
$bind{5} = "44-47";
$bind{6} = "61-63";
$bind{7} = "64-67";
my $rank = $ENV{OMPI_COMM_WORLD_LOCAL_RANK};
my $cmd = "taskset -c $bind{$rank} ";
while (my $arg = shift) {
    $cmd .= "$arg ";
}
my $rc = system($cmd);
exit($rc);
---- End bind.pl -----
The config file option 'submit' was used.
submit = mpirun --allow-run-as-root -x UCX_MEMTYPE_CACHE=n
-host localhost:8 -np $ranks perl $[top]/bind.pl $command

```

General Notes

Environment variables set by runhpc before the start of the run:
UCX_MEMTYPE_CACHE = "n"
UCX_TLS = "self,shm,cuda_copy"

Compiler Version Notes

```

=====
CC 505.lbm_t(base) 513.soma_t(base) 518.tealeaf_t(base) 521.miniswp_t(base)
   534.hpgmgfv_t(base)
-----
nvc 21.5-0 LLVM 64-bit target on x86-64 Linux -tp skylake
NVIDIA Compilers and Tools

```

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Compiler Version Notes (Continued)

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=====
CXXC 532.sph_exa_t(base)
=====

nvc++ 21.5-0 LLVM 64-bit target on x86-64 Linux -tp skylake
NVIDIA Compilers and Tools
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=====
FC 519.clvleaf_t(base) 528.pot3d_t(base) 535.weather_t(base)
=====

nvfortran 21.5-0 LLVM 64-bit target on x86-64 Linux -tp skylake
NVIDIA Compilers and Tools
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Base Compiler Invocation

C benchmarks:
mpicc

C++ benchmarks:
mpicxx

Fortran benchmarks:
mpif90

Base Portability Flags

532.sph_exa_t: --c++17

Base Optimization Flags

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

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Base Optimization Flags (Continued)

C++ benchmarks:

-Mfprelaxed -Mnouniform -Mstack_arrays -fast -acc=gpu
-DSPEC_ACCEL_AWARE_MPI

Fortran benchmarks:

-DSPEC_ACCEL_AWARE_MPI -Mfprelaxed -Mnouniform -Mstack_arrays -fast
-acc=gpu

Base 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.html

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

http://www.spec.org/hpc2021/flags/nv2021_flags.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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