



SPEChpc™ 2021 Small Result

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Lenovo Global Technology

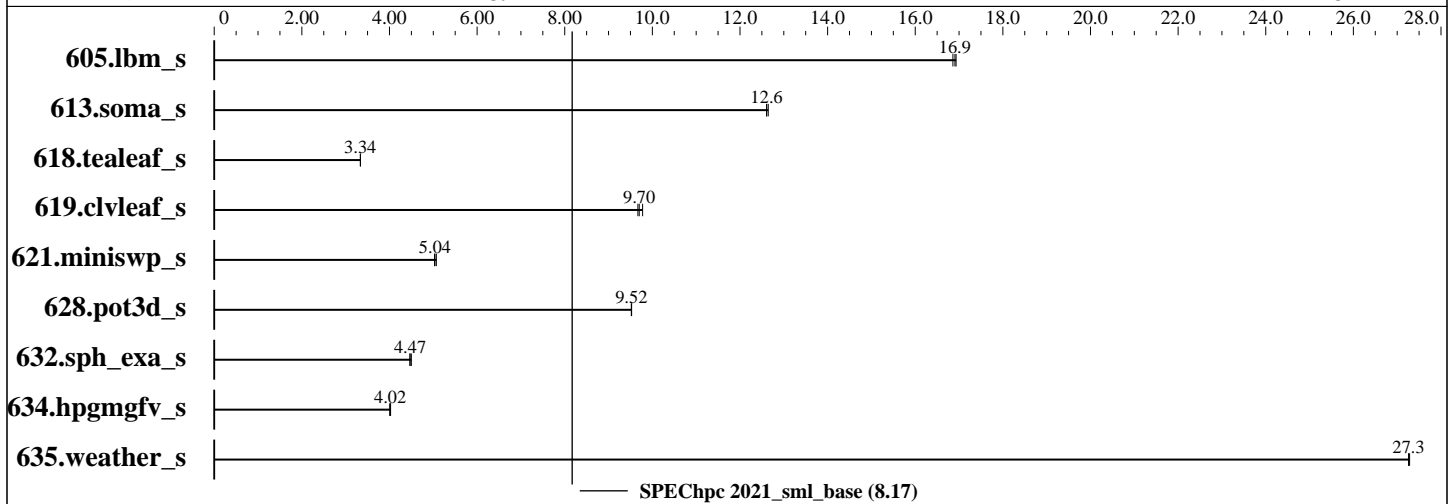
SPEChpc 2021_sml_base = 8.17

SPEChpc 2021_sml_peak = Not Run

ThinkSystem SR670 V2 (Intel Xeon Platinum 8380, Nvidia A100-PCIE-80G)

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
605.lbm_s	ACC	8	1	<u>91.7</u>	<u>16.9</u>	91.9	16.9	91.5	16.9									
613.soma_s	ACC	8	1	<u>127</u>	<u>12.6</u>	127	12.6	127	12.6									
618.tealeaf_s	ACC	8	1	<u>614</u>	<u>3.34</u>	614	3.34	614	3.34									
619.clvleaf_s	ACC	8	1	<u>170</u>	<u>9.70</u>	169	9.78	171	9.67									
621.miniswp_s	ACC	8	1	217	5.07	219	5.03	<u>218</u>	<u>5.04</u>									
628.pot3d_s	ACC	8	1	176	9.52	176	9.53	<u>176</u>	<u>9.52</u>									
632.sph_exa_s	ACC	8	1	<u>514</u>	<u>4.47</u>	515	4.47	511	4.50									
634.hpgmgfv_s	ACC	8	1	<u>243</u>	<u>4.02</u>	243	4.01	242	4.03									
635.weather_s	ACC	8	1	<u>95.4</u>	<u>27.3</u>	95.4	27.3	95.3	27.3									

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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: 8
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 80GB
Accel Vendor: Nvidia Corporation
Accel Type: GPU
Accel Connection: PCIe Gen4 x16
Accel ECC enabled: Yes
Accel Description: Nvidia Tesla A100 PCIe 80GB
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 80GB
Accel Vendor: Nvidia
Accel Type: GPU
Accel Connection: Nvidia Tesla A100 PCIe 80GB
Accel ECC enabled: Yes
Accel Description: Nvidia Tesla A100 PCIe 80GB
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: 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 605.lbm_s(base) 613.soma_s(base) 618.tealeaf_s(base) 621.miniswp_s(base)
    634.hpgmgfv_s(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 632.sph_exa_s(base)
=====

nvc++ 21.5-0 LLVM 64-bit target on x86-64 Linux -tp skylake
NVIDIA Compilers and Tools
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=====
FC 619.clvleaf_s(base) 628.pot3d_s(base) 635.weather_s(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

632.sph_exa_s: --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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