SPEChpc™ 2021 Small Result

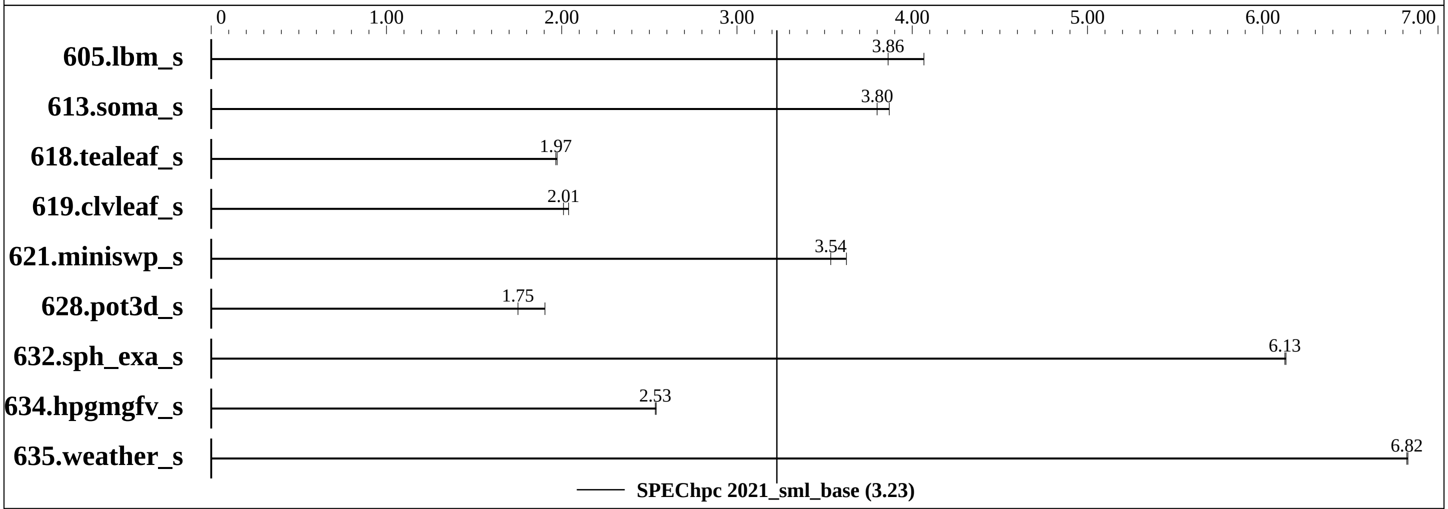
NEC
(Test Sponsor: Helmholtz-Zentrum Dresden - Rossendorf)

Hemera: GIGABYTE H262-Z61 (AMD EPYC 7702)

SPEChpc 2021_sml_base = 3.23

SPEChpc 2021_sml_peak = Not Run

hpc2021 License:	065A	**Test Date:**	Sep-2021
Test Sponsor:	Helmholtz-Zentrum Dresden - Rossendorf	**Hardware Availability:**	Aug-2019
Tested by:	Helmholtz-Zentrum Dresden - Rossendorf	**Software Availability:**	Jul-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	OMP	256	4	381	4.07	**401**	**3.86**											
613.soma_s	OMP	256	4	414	3.87	**421**	**3.80**											
618.tealeaf_s	OMP	256	4	1039	1.97	**1043**	**1.97**											
619.clvleaf_s	OMP	256	4	**821**	**2.01**	809	2.04											
621.miniswp_s	OMP	256	4	**311**	**3.54**	304	3.62											
628.pot3d_s	OMP	256	4	880	1.90	**957**	**1.75**											
632.sph_exa_s	OMP	256	4	375	6.13	**375**	**6.13**											
634.hpgmgfv_s	OMP	256	4	**385**	**2.53**	384	2.54											
635.weather_s	OMP	256	4	381	6.83	**381**	**6.82**											

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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Hardware Summary

Type of System:	Homogenous Cluster
Compute Node:	Compute Node
Interconnect:	Infiniband (EDR)
Compute Nodes Used:	8
Total Chips:	16
Total Cores:	512
Total Threads:	512
Total Memory:	4 TB
Max. Peak Threads:	--

Software Summary

Compiler:	C/C++/Fortran: Version 11.2 of GNU Compilers
MPI Library:	OpenMPI Version 4.0.4
Other MPI Info:	None
Other Software:	None
Base Parallel Model:	OMP
Base Ranks Run:	256
Base Threads Run:	4
Peak Parallel Models:	Not Run
Minimum Peak Ranks:	--
Maximum Peak Ranks:	--
Max. Peak Threads:	--
Min. Peak Threads:	--

Node Description: Compute Node

Hardware

Number of nodes:	8
Uses of the node:	compute
Vendor:	Gigabyte
Model:	H262-Z61
CPU Name:	AMD EPYC 7702
CPU(s) orderable:	1 or 2 chips per node
Chips enabled:	2
Cores enabled:	64
Cores per chip:	64
Threads per core:	1
CPU Characteristics:	Max Boost Clock up to 3.35 GHz
CPU MHz:	2000
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	256 MB I+D on chip per chip 16 MB shared / 4 cores
Other Cache:	None
Memory:	512 GB (16 x 32GB 2Rx4 PC4-3200AA-RB2-12-RB0)
Disk Subsystem:	1 x 500 GB SSD
Other Hardware:	None
Accel Count:	0
Accel Model:	--
Accel Vendor:	--
Accel Type:	--
Accel Connection:	--
Accel ECC enabled:	--
Accel Description:	--
Adapter:	Mellanox MT4119
Number of Adapters:	2
Slot Type:	PCIe 4.0 16x
Data Rate:	100 Gb/s

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Software

Accelerator Driver:	--
Adapter:	Mellanox MT4119
Adapter Driver:	--
Adapter Firmware:	16.26.1040
Operating System:	CentOS Linux release 7.9.2009 (Core) 3.10.0-1160.6.1.el7.x86_64
Local File System:	xfs
Shared File System:	GPFS Version 5.0.5.0 6 NSD (vendor: NEC) 5 building blocks (vendor: NetApp): 2x (240 x 8 TB HDD) 1x (180 x 12 TB HDD) 1x (240 x 16 TB HDD) 1x (120 x 16 TB HDD)
System State:	Multi-user, run level 3
Other Software:	None

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Node Description: Compute Node

Hardware (Continued)

Ports Used:	2
Interconnect Type:	EDR Infiniband

Interconnect Description: Infiniband (EDR)

Hardware

Vendor:	Mellanox Technologies
Model:	Mellanox SB7790
Switch Model:	36 x EDR 100 Gb/s
Number of Switches:	2
Number of Ports:	36
Data Rate:	100 Gb/s
Firmware:	--
Topology:	Mesh (blocking factor: 8:1)
Primary Use:	MPI Traffic, GPFS

Software

: --

Submit Notes

```
The config file option 'submit' was used.
  MPI startup command:
    mpirun --bind-to l3cache -npersocket 16 -np $ranks $command
```

Compiler Version Notes

```
==============================================================================
 FC  619.clvleaf_s(base) 628.pot3d_s(base) 635.weather_s(base)
------------------------------------------------------------------------------
GNU Fortran (GCC) 11.2.0
Copyright (C) 2021 Free Software Foundation, Inc.
This is free software; see the source for copying conditions.  There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
------------------------------------------------------------------------------

==============================================================================
 CXXC 632.sph_exa_s(base)
------------------------------------------------------------------------------
g++ (GCC) 11.2.0
Copyright (C) 2021 Free Software Foundation, Inc.
This is free software; see the source for copying conditions.  There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
------------------------------------------------------------------------------
```

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Compiler Version Notes (Continued)

```
==============================================================================
 CC  605.lbm_s(base) 613.soma_s(base) 618.tealeaf_s(base) 621.miniswp_s(base)
      634.hpgmgfv_s(base)
------------------------------------------------------------------------------
gcc (GCC) 11.2.0
Copyright (C) 2021 Free Software Foundation, Inc.
This is free software; see the source for copying conditions.  There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`mpicc`

C++ benchmarks:
`mpicxx`

Fortran benchmarks:
`mpif90`

Base Portability Flags

621.miniswp_s: `-DUSE_KBA -DUSE_ACCELDIR`
632.sph_exa_s: `-DSPEC_USE_LT_IN_KERNELS`

Base Optimization Flags

C benchmarks:
`-fopenmp -Ofast -march=native`

C++ benchmarks:
`-fopenmp -Ofast -march=native -std=c++14`

Fortran benchmarks:
`-fopenmp -Ofast -march=native -ffree-line-length-none`
`-fno-stack-protector`

The flags file that was used to format this result can be browsed at
http://www.spec.org/hpc2021/flags/gcc.2021-10-28.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/hpc2021/flags/gcc.2021-10-28.xml

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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