SPEChpc™ 2021 Small Result

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Lenovo Global Technology

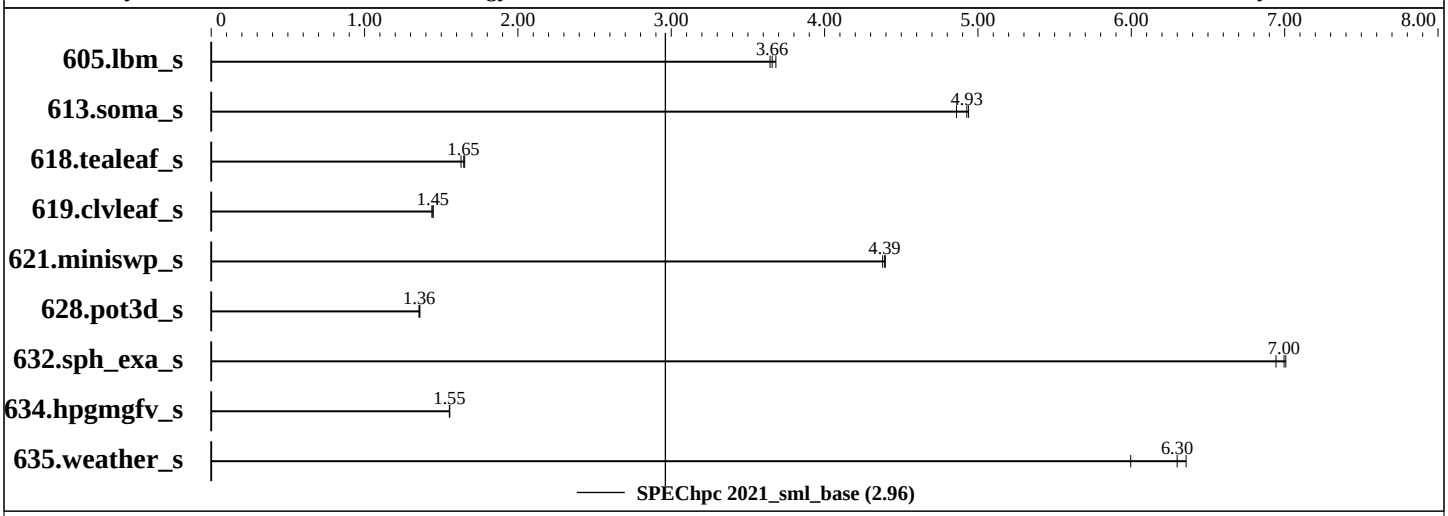
ThinkSystem SR665 (AMD EPYC 7763)

SPEChpc 2021_sml_base = 2.96

SPEChpc 2021_sml_peak = Not Run

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

Test Date: Aug-2021
Hardware Availability: Mar-2021
Software Availability: Oct-2020



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	80	8	421	3.68	**424**	**3.66**	425	3.64									
613.soma_s	OMP	80	8	329	4.86	**325**	**4.93**	324	4.94									
618.tealeaf_s	OMP	80	8	1258	1.63	1240	1.65	**1245**	**1.65**									
619.clvleaf_s	OMP	80	8	**1141**	**1.45**	1147	1.44	1140	1.45									
621.miniswp_s	OMP	80	8	**250**	**4.39**	250	4.40	251	4.38									
628.pot3d_s	OMP	80	8	1236	1.36	1231	1.36	**1234**	**1.36**									
632.sph_exa_s	OMP	80	8	331	6.94	**329**	**7.00**	328	7.01									
634.hpgmgfv_s	OMP	80	8	**627**	**1.55**	627	1.56	628	1.55									
635.weather_s	OMP	80	8	**413**	**6.30**	434	6.00	409	6.36									

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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 SR665
Interconnect:	Nvidia Mellanox ConnectX-6 HDR
File Server Node:	ThinkSystem SR665
Compute Nodes Used:	5
Total Chips:	10
Total Cores:	640
Total Threads:	640
Total Memory:	2560 GB
Max. Peak Threads:	--

Software Summary

Compiler:	Intel C/C++/Fortran Compiler 20.4
MPI Library:	Open MPI 4.0.5
Other MPI Info:	--
Other Software:	--
Base Parallel Model:	OMP
Base Ranks Run:	80
Base Threads Run:	8
Peak Parallel Models:	Not Run
Minimum Peak Ranks:	--
Maximum Peak Ranks:	--
Max. Peak Threads:	--
Min. Peak Threads:	--

Node Description: ThinkSystem SR665

Hardware

Number of nodes:	5
Uses of the node:	Compute
Vendor:	Lenovo Global Technology
Model:	ThinkSystem SR665
CPU Name:	AMD EPYC 7763
CPU(s) orderable:	1,2 chips
Chips enabled:	2
Cores enabled:	128
Cores per chip:	64
Threads per core:	1
CPU Characteristics:	Max Boost Clock up to 3.5 GHz
CPU MHz:	2450
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 32 MB shared / 8 cores
Other Cache:	None
Memory:	512 GB (16 x 32 GB 2Rx8 PC4-3200A-R)
Disk Subsystem:	1 x 480 GB 2.5" SSD
Other Hardware:	None
Accel Count:	--
Accel Model:	--
Accel Vendor:	--
Accel Type:	--
Accel Connection:	--
Accel ECC enabled:	--
Accel Description:	--
Adapter:	Mellanox ConnectX-6 HDR
Number of Adapters:	1
Slot Type:	PCI-Express 4.0 x16
Data Rate:	200 Gb/s
Ports Used:	1

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Software

Accelerator Driver:	--
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:	NFS
System State:	Multi-user, run level 3
Other Software:	None

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Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Aug-2021
Hardware Availability: Mar-2021
Software Availability: Oct-2020

Node Description: ThinkSystem SR665

Hardware (Continued)

Interconnect Type: Nvidia Mellanox ConnectX-6 HDR

Node Description: ThinkSystem SR665

Hardware

Number of nodes:	1
Uses of the node:	Fileserver
Vendor:	Lenovo Global Technology
Model:	ThinkSystem SR665
CPU Name:	AMD EPYC 7763
CPU(s) orderable:	1,2 chips
Chips enabled:	2
Cores enabled:	128
Cores per chip:	64
Threads per core:	1
CPU Characteristics:	Max Boost Clock up to 3.5 GHz
CPU MHz:	2450
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 32 MB shared / 8 cores
Other Cache:	None
Memory:	512 GB (16 x 32 GB 2Rx8 PC4-3200A-R)
Disk Subsystem:	1 x 480 GB 2.5" SSD
Other Hardware:	None
Accel Count:	--
Accel Model:	--
Accel Vendor:	--
Accel Type:	--
Accel Connection:	--
Accel ECC enabled:	--
Accel Description:	--
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:	--
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:	N/A
System State:	Multi-User, run level 3
Other Software:	None

Interconnect Description: Nvidia Mellanox ConnectX-6 HDR

Hardware

Vendor:	Nvidia
Model:	Nvidia Mellanox ConnectX-6 HDR
Switch Model:	QM8700 Series
Number of Switches:	1
Number of Ports:	40
Data Rate:	200 Gb/s
Firmware:	3.9.0606
Topology:	Mesh
Primary Use:	MPI Traffic, NFS Access

Software

: --

Submit Notes

```
 The config file option 'submit' was used.
 submit = mpirun ${MPIRUN_OPTS} --allow-run-as-root --oversubscribe
--bind-to numa -map-by numa
-mca coll_hcoll_enable 1 -x HCOLL_ENABLE_NBC=1
-x HCOLL_MAIN_IB=mlx5_0:1 -mca pml ucx
-hostfile /home/HPC2021K35/config/6nodes -npernode 128 -np $ranks $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)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.1.3.304 Build 20200925_000000
Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
icc: NOTE: The evaluation period for this product ends on 11-may-2021 UTC.
------------------------------------------------------------------------------

==============================================================================
 CXXC 632.sph_exa_s(base)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.1.3.304 Build 20200925_000000
```

(Continued on next page)

Compiler Version Notes (Continued)

```
Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
icpc: NOTE: The evaluation period for this product ends on 11-may-2021 UTC.
------------------------------------------------------------------------------

==============================================================================
 FC  619.clvleaf_s(base) 628.pot3d_s(base) 635.weather_s(base)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.1.3.304 Build 20200925_000000
Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
ifort: NOTE: The evaluation period for this product ends on 11-may-2021 UTC.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`mpicc`

C++ benchmarks:
`mpicxx`

Fortran benchmarks:
`mpifort`

Base Portability Flags

613.soma_s: `-DSPEC_NO_VAR_ARRAY_REDUCE`
621.miniswp_s: `-DUSE_KBA -DUSE_ACCELDIR`
632.sph_exa_s: `-DSPEC_USE_LT_IN_KERNELS`

Base Optimization Flags

C benchmarks:
`-Ofast -no-prec-div -march=core-avx2 -ipo -qopenmp -ansi-alias`

C++ benchmarks:
`-Ofast -no-prec-div -march=core-avx2 -ipo -qopenmp -ansi-alias`

Fortran benchmarks:
`-Ofast -no-prec-div -march=core-avx2 -ipo -qopenmp`

The flags file that was used to format this result can be browsed at
http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2021-10-20.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2021-10-20.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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