SPEChpc™ 2021 Small Result

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Lenovo Global Technology

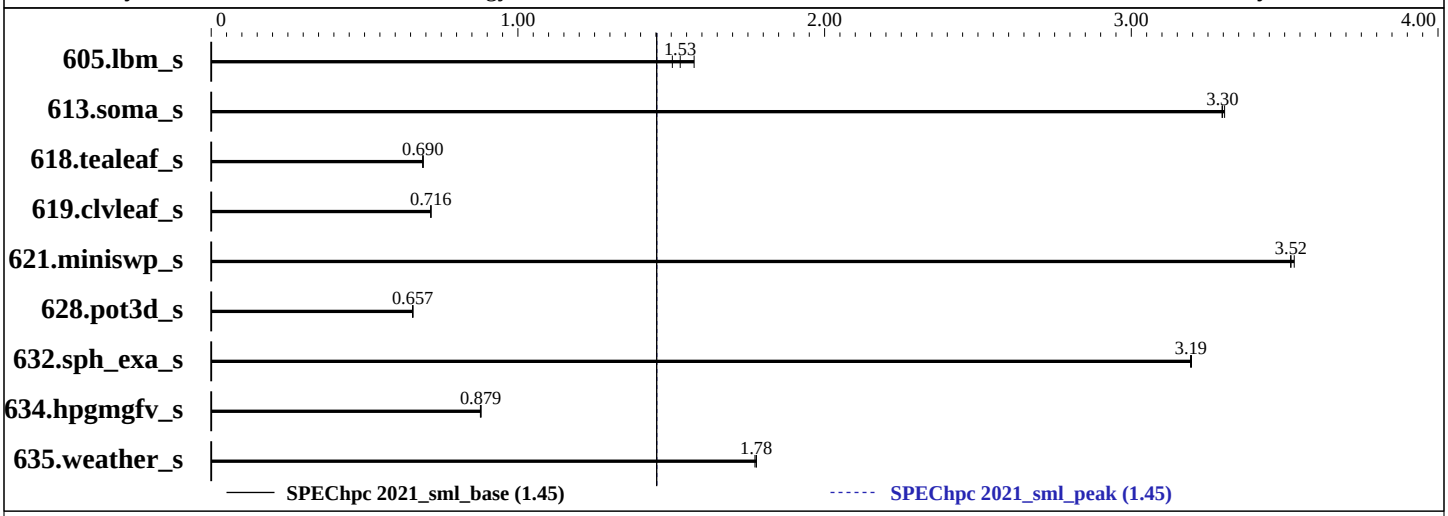
ThinkSystem SR665 V3 (AMD EPYC 9654)

SPEChpc 2021_sml_base = 1.45

SPEChpc 2021_sml_peak = 1.45

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

Test Date: Oct-2022
Hardware Availability: Nov-2022
Software Availability: Nov-2022



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	24	16	1031	1.50	**1014**	**1.53**	984	1.57	OMP	24	16	1031	1.50	**1014**	**1.53**	984	1.57
613.soma_s	OMP	24	16	485	3.30	484	3.30	**485**	**3.30**	OMP	24	16	485	3.30	484	3.30	**485**	**3.30**
618.tealeaf_s	OMP	24	16	**2970**	**0.690**	2965	0.691	2972	0.690	OMP	24	16	**2970**	**0.690**	2965	0.691	2972	0.690
619.clvleaf_s	OMP	24	16	2304	0.716	**2304**	**0.716**	2303	0.716	OMP	24	16	2304	0.716	**2304**	**0.716**	2303	0.716
621.miniswp_s	OMP	24	16	**312**	**3.52**	313	3.52	312	3.53	OMP	24	16	**312**	**3.52**	313	3.52	312	3.53
628.pot3d_s	OMP	24	16	2546	0.658	2552	0.656	**2548**	**0.657**	OMP	24	16	2546	0.658	2552	0.656	**2548**	**0.657**
632.sph_exa_s	OMP	24	16	720	3.19	**720**	**3.19**	720	3.20	OMP	24	16	720	3.19	**720**	**3.19**	720	3.20
634.hpgmgfv_s	OMP	24	16	1111	0.878	**1109**	**0.879**	1108	0.880	OMP	24	16	1111	0.878	**1109**	**0.879**	1108	0.880
635.weather_s	OMP	24	16	1463	1.78	**1463**	**1.78**	1467	1.77	OMP	24	16	1463	1.78	**1463**	**1.78**	1467	1.77

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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-2022
Hardware Availability: Nov-2022
Software Availability: Nov-2022

Hardware Summary

Type of System:	Homogenous
Compute Node:	ThinkSystem SR665 V3
Interconnect:	-
Compute Nodes Used:	1
Total Chips:	2
Total Cores:	192
Total Threads:	384
Total Memory:	768 GB
Max. Peak Threads:	16

Software Summary

Compiler:	Intel C/C++/Fortran Compiler 2021.6.0
MPI Library:	Intel MPI Library for Linux OS, Build 20220227
Other MPI Info:	--
Other Software:	--
Base Parallel Model:	OMP
Base Ranks Run:	24
Base Threads Run:	16
Peak Parallel Models:	OMP
Minimum Peak Ranks:	24
Maximum Peak Ranks:	24
Max. Peak Threads:	16
Min. Peak Threads:	16

Node Description: ThinkSystem SR665 V3

Hardware

Number of nodes:	1
Uses of the node:	Compute
Vendor:	Lenovo Global Technology
Model:	ThinkSystem SR665 V3
CPU Name:	AMD EPYC 9654
CPU(s) orderable:	1,2 chips
Chips enabled:	2
Cores enabled:	192
Cores per chip:	96
Threads per core:	2
CPU Characteristics:	Max Boost Clock 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 32 MB shared / 8 cores
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:	--
Accel Model:	--
Accel Vendor:	--
Accel Type:	--
Accel Connection:	--
Accel ECC enabled:	--
Accel Description:	--
Adapter:	-
Number of Adapters:	0
Slot Type:	-
Data Rate:	None
Ports Used:	0

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Software

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

Node Description: ThinkSystem SR665 V3

Hardware (Continued)

Interconnect Type: -

Interconnect Description: -

Hardware

Vendor:	None
Model:	-
Switch Model:	None
Number of Switches:	0
Number of Ports:	0
Data Rate:	None
Firmware:	N/A
Topology:	N/A
Primary Use:	-

Software

: --

Submit Notes

```
The config file option 'submit' was used.
submit = mpiexec -hosts 192.168.99.16 -np ranks -genv OMP_NUM_THREADS=$threads -ppn %{NRNK} $command
```

General Notes

```
Submitted_by: Jimmy Cheng12 <jcheng12@lenovo.com>
Submitted: Thu Oct 27 13:16:45 EDT 2022
Submission: hpc2021-20221010-00132.sub
```

Compiler Version Notes

```
==============================================================================
 FC  619.clvleaf_s(base) 628.pot3d_s(base) 635.weather_s(base)
------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
  2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
ifx: command line error: no files specified; for help type "ifx -help"
------------------------------------------------------------------------------

==============================================================================
 CC  605.lbm_s(base) 613.soma_s(base) 618.tealeaf_s(base) 621.miniswp_s(base)
      634.hpgmgfv_s(base)
------------------------------------------------------------------------------
```

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Compiler Version Notes (Continued)

```
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
clang: warning: -Z-reserved-lib-stdc++: 'linker' input unused
  [-Wunused-command-line-argument]
------------------------------------------------------------------------------

==============================================================================
 CXXC 632.sph_exa_s(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
clang: warning: -Z-reserved-lib-stdc++: 'linker' input unused
  [-Wunused-command-line-argument]
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`mpiicc -cc=icx`

C++ benchmarks:
`mpiicpc -cxx=icx`

Fortran benchmarks:
`mpiifort -fc=ifx`

Base Portability Flags

605.lbm_s: `-lstdc++`
613.soma_s: `-lstdc++ -DSPEC_NO_VAR_ARRAY_REDUCE`
618.tealeaf_s: `-lstdc++`
619.clvleaf_s: `-lstdc++`
621.miniswp_s: `-lstdc++`
628.pot3d_s: `-lstdc++`
632.sph_exa_s: `-lstdc++`
634.hpgmgfv_s: `-lstdc++`
635.weather_s: `-lstdc++`

Base Optimization Flags

C benchmarks:
`-Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp -ansi-alias`

C++ benchmarks:
`-Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp -ansi-alias`

Fortran benchmarks:
`-Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp -nostandard-realloc-lhs -align array64byte`

Base Other Flags

C benchmarks:
`-Ispecmpitime`

C++ benchmarks:
`-Ispecmpitime`

Fortran benchmarks:

619.clvleaf_s: `-Ispecmpitime`

Peak Optimization Flags

C benchmarks:

605.lbm_s: `basepeak = yes`

613.soma_s: `basepeak = yes`

618.tealeaf_s: `basepeak = yes`

621.miniswp_s: `basepeak = yes`

634.hpgmgfv_s: `basepeak = yes`

C++ benchmarks:

632.sph_exa_s: `basepeak = yes`

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Peak Optimization Flags (Continued)

Fortran benchmarks:

619.clvleaf_s: `basepeak = yes`

628.pot3d_s: `basepeak = yes`

635.weather_s: `basepeak = yes`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2022-11-10.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2022-11-10.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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