SPEChpc™ 2021 Small Result

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Lenovo Global Technology

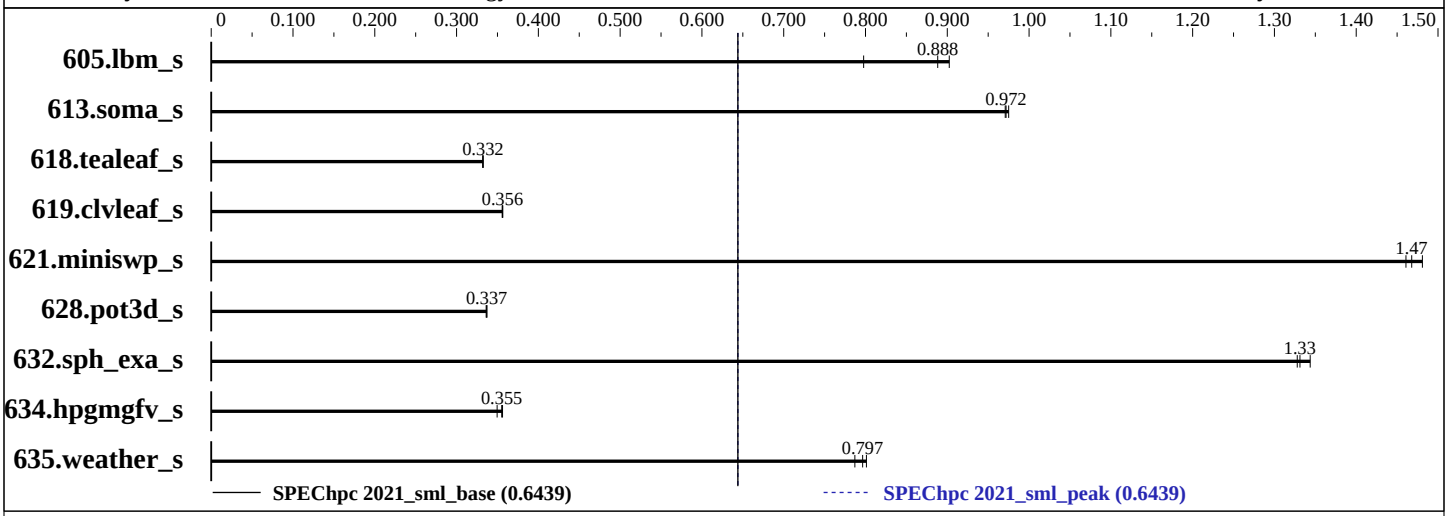
ThinkSystem SR655 V3 (AMD EPYC 9654P)

SPEChpc 2021_sml_base = 0.6439

SPEChpc 2021_sml_peak = 0.6439

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

Test Date: Jan-2023
Hardware Availability: Feb-2023
Software Availability: Feb-2023



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	MPI	96	1	**1745**	**0.888**	1943	0.798	1718	0.902	MPI	96	1	**1745**	**0.888**	1943	0.798	1718	0.902
613.soma_s	MPI	96	1	**1646**	**0.972**	1648	0.971	1641	0.975	MPI	96	1	**1646**	**0.972**	1648	0.971	1641	0.975
618.tealeaf_s	MPI	96	1	6166	0.332	6175	0.332	**6168**	**0.332**	MPI	96	1	6166	0.332	6175	0.332	**6168**	**0.332**
619.clvleaf_s	MPI	96	1	**4632**	**0.356**	4628	0.357	4638	0.356	MPI	96	1	**4632**	**0.356**	4628	0.357	4638	0.356
621.miniswp_s	MPI	96	1	743	1.48	753	1.46	**749**	**1.47**	MPI	96	1	743	1.48	753	1.46	**749**	**1.47**
628.pot3d_s	MPI	96	1	4982	0.336	**4971**	**0.337**	4970	0.337	MPI	96	1	4982	0.336	**4971**	**0.337**	4970	0.337
632.sph_exa_s	MPI	96	1	1732	1.33	**1728**	**1.33**	1712	1.34	MPI	96	1	1732	1.33	**1728**	**1.33**	1712	1.34
634.hpgmgfv_s	MPI	96	1	2789	0.350	**2745**	**0.355**	2737	0.356	MPI	96	1	2789	0.350	**2745**	**0.355**	2737	0.356
635.weather_s	MPI	96	1	3304	0.787	**3264**	**0.797**	3245	0.801	MPI	96	1	3304	0.787	**3264**	**0.797**	3245	0.801

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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 Availability: Feb-2023
Software Availability: Feb-2023

Hardware Summary

Type of System:	Homogeneous Cluster
Compute Node:	ThinkSystem SR655 V3
Interconnect:	Nvidia Mellanox ConnectX-6 HDR
Compute Nodes Used:	1
Total Chips:	1
Total Cores:	96
Total Threads:	192
Total Memory:	768 GB
Max. Peak Threads:	1

Software Summary

Compiler:	Intel oneAPI Compiler 2022.1.0
MPI Library:	Intel MPI Library for Linux OS, Build 20220227
Other MPI Info:	--
Other Software:	--
Base Parallel Model:	MPI
Base Ranks Run:	96
Base Threads Run:	1
Peak Parallel Models:	MPI
Minimum Peak Ranks:	96
Maximum Peak Ranks:	96
Max. Peak Threads:	1
Min. Peak Threads:	1

Node Description: ThinkSystem SR655 V3

Hardware

Number of nodes:	1
Uses of the node:	Compute
Vendor:	Lenovo Global Technology
Model:	ThinkSystem SR655 V3
CPU Name:	AMD EPYC 9654P
CPU(s) orderable:	1 chips
Chips enabled:	1
Cores enabled:	96
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 (12 x 64 GB 2Rx4 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:	Nvidia 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:	Nvidia Mellanox ConnectX-6 HDR
Adapter Driver:	5.7-1.0.2
Adapter Firmware:	20.28.1002
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 SR655 V3

Hardware (Continued)

Interconnect Type: ConnectX-6 HDR

Interconnect Description: Nvidia Mellanox ConnectX-6 HDR

Hardware

Vendor:	Nvidia
Model:	Nvidia Mellanox ConnectX-6 HDR
Switch Model:	QM8700
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 = mpiexec -hostfile $[top]/6nodes -np ranks -genv OMP_NUM_THREADS=$threads -ppn %{NRNK} $command
```

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)
------------------------------------------------------------------------------
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]
------------------------------------------------------------------------------
```

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Compiler Version Notes (Continued)

```
==============================================================================
 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++`
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 -ansi-alias`

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

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Base Optimization Flags (Continued)

Fortran benchmarks:
`-Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -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`

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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