SPEChpc™ 2021 Small Result

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Lenovo Global Technology

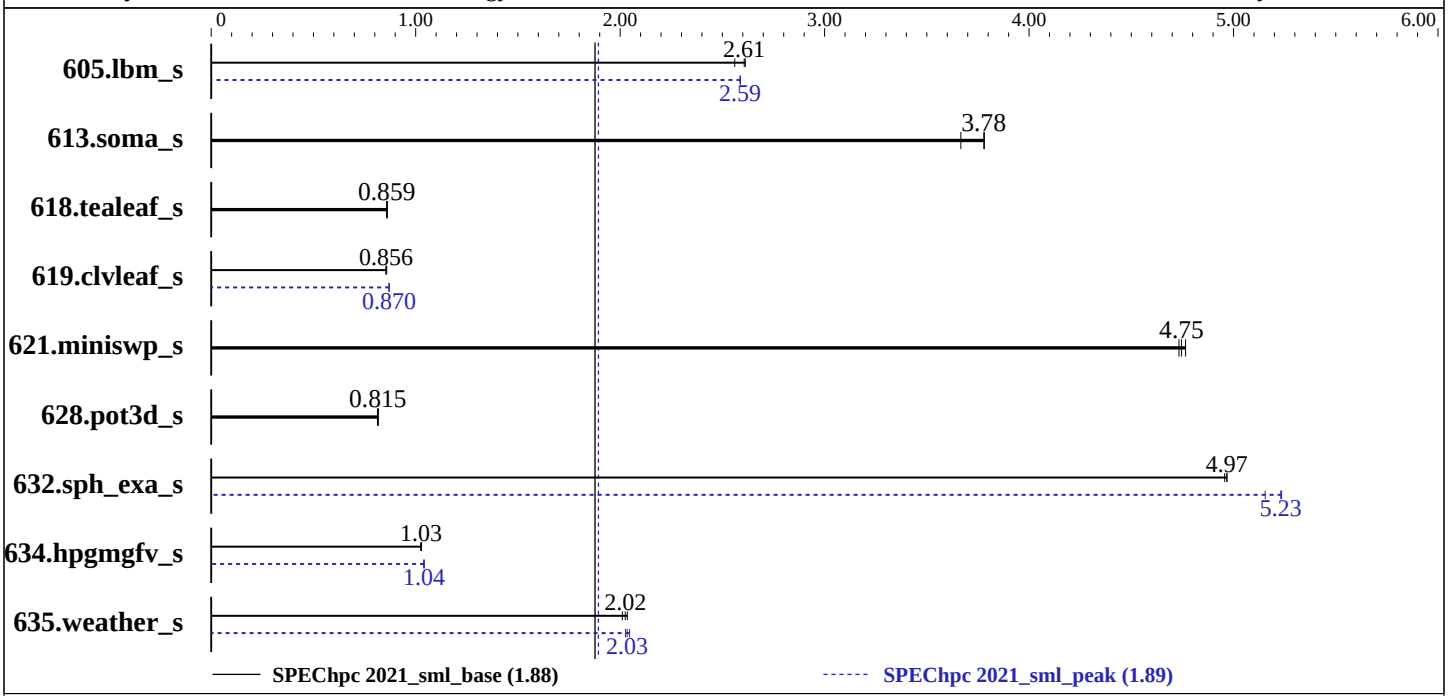
ThinkSystem SR860 V3 (Intel Xeon Platinum 8490H, 1.90 GHz)

SPEChpc 2021_sml_base = 1.88

SPEChpc 2021_sml_peak = 1.89

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

Test Date: Aug-2023
Hardware Availability: Aug-2023
Software Availability: Jun-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	OMP	16	30	**595**	**2.61**	605	2.56	593	2.61	OMP	32	15	599	2.59	599	2.59	**599**	**2.59**
613.soma_s	OMP	16	30	**423**	**3.78**	436	3.67	423	3.78	OMP	16	30	**423**	**3.78**	436	3.67	423	3.78
618.tealeaf_s	OMP	16	30	**2386**	**0.859**	2379	0.862	2388	0.858	OMP	16	30	**2386**	**0.859**	2379	0.862	2388	0.858
619.clvleaf_s	OMP	16	30	**1928**	**0.856**	1931	0.855	1923	0.858	OMP	32	15	1897	0.870	**1896**	**0.870**	1896	0.870
621.miniswp_s	OMP	16	30	**232**	**4.75**	231	4.77	232	4.73	OMP	16	30	**232**	**4.75**	231	4.77	232	4.73
628.pot3d_s	OMP	16	30	2060	0.813	2050	0.817	**2054**	**0.815**	OMP	16	30	2060	0.813	2050	0.817	**2054**	**0.815**
632.sph_exa_s	OMP	16	30	464	4.96	463	4.97	**463**	**4.97**	OMP	32	15	439	5.24	**440**	**5.23**	446	5.15
634.hpgmgfv_s	OMP	16	30	952	1.02	**949**	**1.03**	948	1.03	OMP	32	15	**937**	**1.04**	936	1.04	938	1.04
635.weather_s	OMP	16	30	1293	2.01	1277	2.04	**1284**	**2.02**	OMP	32	15	1283	2.03	**1278**	**2.03**	1271	2.05

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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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Software Availability: Jun-2023

Hardware Summary

Type of System:	SMP
Compute Node:	ThinkSystem SR860 V3
Compute Nodes Used:	1
Total Chips:	4
Total Cores:	240
Total Threads:	480
Total Memory:	2 TB
Total Accelerators:	0
Max. Peak Threads:	30

Software Summary

Compiler:	Intel oneAPI Compiler 2022.1.0
MPI Library:	Intel MPI Library for Linux OS, Build 20220227
Other MPI Info:	None
Other Software:	None
Base Parallel Model:	OMP
Base Ranks Run:	16
Base Threads Run:	30
Peak Parallel Models:	OMP
Minimum Peak Ranks:	16
Maximum Peak Ranks:	32
Max. Peak Threads:	30
Min. Peak Threads:	15

Node Description: ThinkSystem SR860 V3

Hardware

Number of nodes:	1
Uses of the node:	Compute
Vendor:	Lenovo Global Technology
Model:	ThinkSystem SR860 V3
CPU Name:	Intel Xeon Platinum 8490H
CPU(s) orderable:	4 chips
Chips enabled:	4
Cores enabled:	240
Cores per chip:	60
Threads per core:	2
CPU Characteristics:	Intel Turbo Boost Technology up to 3.5 GHz
CPU MHz:	1900
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	2 MB I+D on chip per core
L3 Cache:	112.5 MB I+D on chip per chip
Other Cache:	None
Memory:	2 TB (32 x 64 GB 2Rx4 PC5-4800V)
Disk Subsystem:	1x ThinkSystem 2.5" 5300 480GB SSD
Other Hardware:	None
Accel Count:	None
Accel Model:	None
Accel Vendor:	None
Accel Type:	None
Accel Connection:	None
Accel ECC enabled:	None
Accel Description:	None
Adapter:	None
Number of Adapters:	0
Slot Type:	None
Data Rate:	None
Ports Used:	0
Interconnect Type:	None

Software

Accelerator Driver:	None
Adapter:	None
Adapter Driver:	None
Adapter Firmware:	None
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

Submit Notes

```
The config file option 'submit' was used.
```

Compiler Version Notes

```
==============================================================================
 FC  619.clvleaf_s(base, peak) 628.pot3d_s(base, peak) 635.weather_s(base,
     peak)
------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
  2022.2.0 Build 20220730
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, peak) 613.soma_s(base, peak) 618.tealeaf_s(base, peak)
     621.miniswp_s(base, peak) 634.hpgmgfv_s(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2022.2.0 Build 20220730
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
icx: warning: -Z-reserved-lib-stdc++: 'linker' input unused
  [-Wunused-command-line-argument]
------------------------------------------------------------------------------

==============================================================================
 CXXC 632.sph_exa_s(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2022.2.0 Build 20220730
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
icx: 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 -xCORE-AVX512 -ipo -fiopenmp -ansi-alias`

C++ benchmarks:
`-Ofast -mprefer-vector-width=512 -xCORE-AVX512 -ipo -fiopenmp -ansi-alias`

Fortran benchmarks:
`-Ofast -mprefer-vector-width=512 -xCORE-AVX512 -ipo -fiopenmp -nostandard-realloc-lhs -align array64byte`

Base Other Flags

C benchmarks:
`-Ispecmpitime`

C++ benchmarks:
`-Ispecmpitime`

Fortran benchmarks:

619.clvleaf_s: `-Ispecmpitime`

Peak Compiler Invocation

C benchmarks:
`mpiicc -cc=icx`

(Continued on next page)

Peak Compiler Invocation (Continued)

C++ benchmarks:
mpiicpc -cxx=icx

Fortran benchmarks:
mpiifort -fc=ifx

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

605.lbm_s: -Ofast -mprefer-vector-width=512 -xCORE-AVX512 -ipo -fiopenmp -ansi-alias

613.soma_s: basepeak = yes

618.tealeaf_s: basepeak = yes

621.miniswp_s: basepeak = yes

634.hpgmgfv_s: Same as 605.lbm_s

C++ benchmarks:
-Ofast -mprefer-vector-width=512 -xCORE-AVX512 -ipo -fiopenmp -ansi-alias

Fortran benchmarks:

619.clvleaf_s: -Ofast -mprefer-vector-width=512 -xCORE-AVX512 -ipo -fiopenmp -nostandard-realloc-lhs -align array64byte

628.pot3d_s: basepeak = yes

635.weather_s: Same as 619.clvleaf_s

Peak Other Flags

C benchmarks:
`-Ispecmpitime`

C++ benchmarks:
`-Ispecmpitime`

Fortran benchmarks:

619.clvleaf_s: `-Ispecmpitime`

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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