



# SPEChpc™ 2021 Small Result

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## Lenovo Global Technology

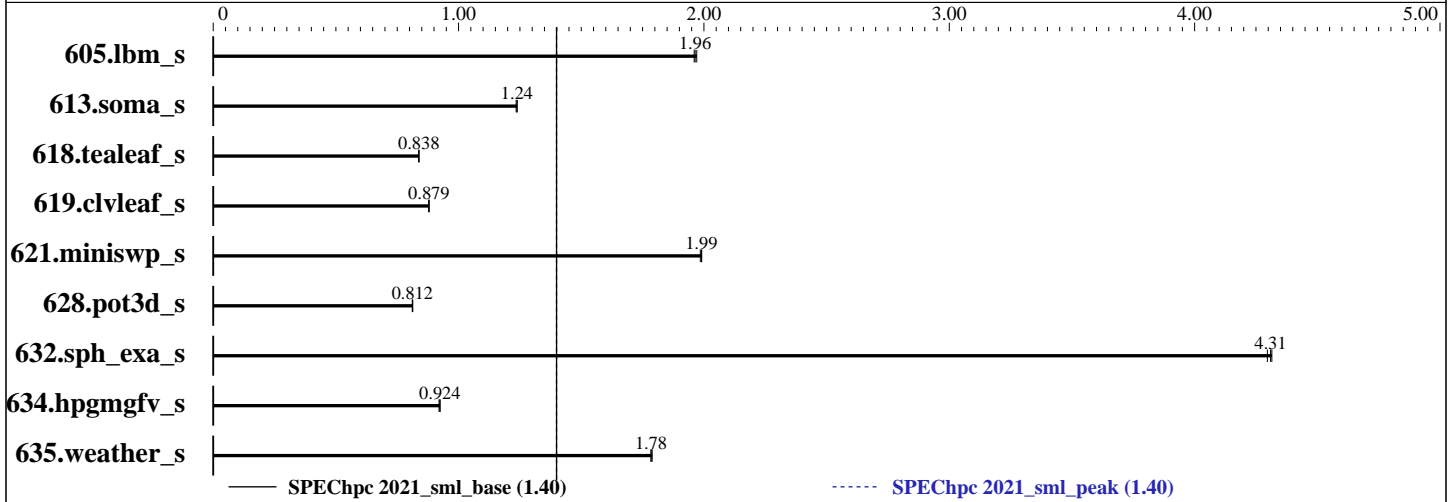
SPEChpc 2021\_sml\_base = 1.40

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

SPEChpc 2021\_sml\_peak = 1.40

**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	MPI	480	1	<b>789</b>	<b>1.96</b>	786	1.97	791	1.96	MPI	480	1	<b>789</b>	<b>1.96</b>	786	1.97	791	1.96
613.soma_s	MPI	480	1	<b>1292</b>	<b>1.24</b>	1296	1.23	1292	1.24	MPI	480	1	<b>1292</b>	<b>1.24</b>	1296	1.23	1292	1.24
618.tealeaf_s	MPI	480	1	2445	0.839	2447	0.838	<b>2446</b>	<b>0.838</b>	MPI	480	1	2445	0.839	2447	0.838	<b>2446</b>	<b>0.838</b>
619.clvleaf_s	MPI	480	1	1877	0.879	<b>1877</b>	<b>0.879</b>	1876	0.880	MPI	480	1	1877	0.879	<b>1877</b>	<b>0.879</b>	1876	0.880
621.miniswp_s	MPI	480	1	<b>553</b>	<b>1.99</b>	553	1.99	554	1.99	MPI	480	1	<b>553</b>	<b>1.99</b>	553	1.99	554	1.99
628.pot3d_s	MPI	480	1	<b>2063</b>	<b>0.812</b>	2064	0.812	2059	0.813	MPI	480	1	<b>2063</b>	<b>0.812</b>	2064	0.812	2059	0.813
632.sph_exa_s	MPI	480	1	<b>534</b>	<b>4.31</b>	533	4.31	535	4.30	MPI	480	1	<b>534</b>	<b>4.31</b>	533	4.31	535	4.30
634.hpgmgfv_s	MPI	480	1	1059	0.920	<b>1055</b>	<b>0.924</b>	1055	0.925	MPI	480	1	1059	0.920	<b>1055</b>	<b>0.924</b>	1055	0.925
635.weather_s	MPI	480	1	1457	1.78	1453	1.79	<b>1457</b>	<b>1.78</b>	MPI	480	1	1457	1.78	1453	1.79	<b>1457</b>	<b>1.78</b>

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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: 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: 1

### 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: MPI  
Base Ranks Run: 480  
Base Threads Run: 1  
Peak Parallel Models: MPI  
Minimum Peak Ranks: 480  
Maximum Peak Ranks: 480  
Max. Peak Threads: 1  
Min. Peak Threads: 1

## 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



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### Submit Notes

The config file option 'submit' was used.

### 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  
2022.2.0 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) 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 2022.2.0 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)  
-----

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:  
mpicc -cc=icx

C++ benchmarks:  
mpiicpc -cxx=icx

Fortran benchmarks:  
mpiifort -fc=ifx



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## 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 -xCORE-AVX512 -ipo -ansi-alias

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

Fortran benchmarks:  
-Ofast -mprefer-vector-width=512 -xCORE-AVX512 -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

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## Peak Optimization Flags (Continued)

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](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](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](mailto:info@spec.org).

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