SPEChpc™ 2021 Small Result

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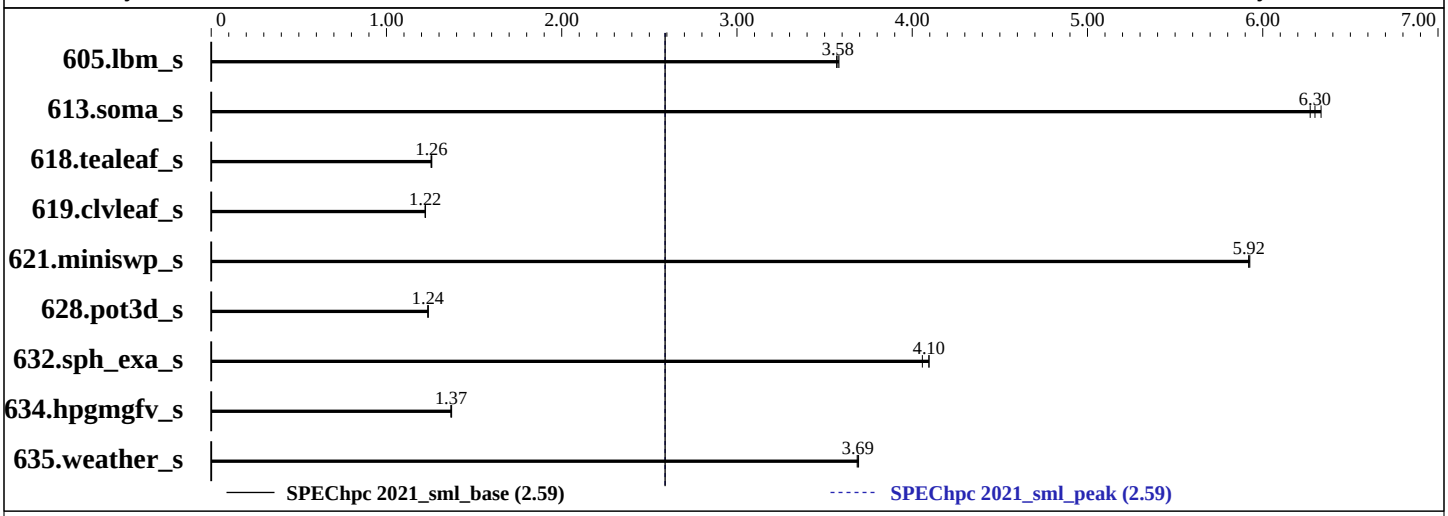
Lenovo
SR860 V4(Intel Xeon 6788P)

SPEChpc 2021_sml_base = 2.59

SPEChpc 2021_sml_peak = 2.59

hpc2021 License: 9017
Test Sponsor: Lenovo
Tested by: Lenovo

Test Date: Sep-2025
Hardware Availability: Sep-2025
Software Availability: Jun-2025



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	8	86	**433**	**3.58**	433	3.58	434	3.57	OMP	8	86	**433**	**3.58**	433	3.58	434	3.57
613.soma_s	OMP	8	86	255	6.27	253	6.33	**254**	**6.30**	OMP	8	86	255	6.27	253	6.33	**254**	**6.30**
618.tealeaf_s	OMP	8	86	**1630**	**1.26**	1629	1.26	1634	1.25	OMP	8	86	**1630**	**1.26**	1629	1.26	1634	1.25
619.clvleaf_s	OMP	8	86	**1351**	**1.22**	1352	1.22	1349	1.22	OMP	8	86	**1351**	**1.22**	1352	1.22	1349	1.22
621.miniswp_s	OMP	8	86	**186**	**5.92**	186	5.93	186	5.92	OMP	8	86	**186**	**5.92**	186	5.93	186	5.92
628.pot3d_s	OMP	8	86	1353	1.24	**1354**	**1.24**	1355	1.24	OMP	8	86	1353	1.24	**1354**	**1.24**	1355	1.24
632.sph_exa_s	OMP	8	86	**562**	**4.10**	562	4.10	567	4.06	OMP	8	86	**562**	**4.10**	562	4.10	567	4.06
634.hpgmgfv_s	OMP	8	86	**712**	**1.37**	711	1.37	713	1.37	OMP	8	86	**712**	**1.37**	711	1.37	713	1.37
635.weather_s	OMP	8	86	**705**	**3.69**	704	3.69	705	3.69	OMP	8	86	**705**	**3.69**	704	3.69	705	3.69

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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-2025

Hardware Summary

Type of System:	Homogenous Cluster
Compute Node:	SR860 V4(Intel Xeon 6788P)
Interconnect:	None
Compute Nodes Used:	1
Total Chips:	4
Total Cores:	344
Total Threads:	688
Total Memory:	1 TB
Total Accelerators:	0
Max. Peak Threads:	86

Software Summary

Compiler:	Intel oneAPI Compiler 2025.2.1
MPI Library:	Intel MPI Library 2021.16 for Linux OS
Other MPI Info:	None
Other Software:	None
Base Parallel Model:	OMP
Base Ranks Run:	8
Base Threads Run:	86
Peak Parallel Models:	OMP
Minimum Peak Ranks:	8
Maximum Peak Ranks:	8
Max. Peak Threads:	86
Min. Peak Threads:	86

Node Description: SR860 V4(Intel Xeon 6788P)

Hardware

Number of nodes:	1
Uses of the node:	Compute
Vendor:	Intel
Model:	SR860 V4(Intel Xeon 6788P)
CPU Name:	Intel Xeon 6788P
CPU(s) orderable:	4 chips
Chips enabled:	4
Cores enabled:	344
Cores per chip:	86
Threads per core:	2
CPU Characteristics:	Turbo Boost Technology up to 3.8 GHz
CPU MHz:	2000
Primary Cache:	64 KB I + 48 KB D on chip per core
Secondary Cache:	2 MB I+D on chip per core
L3 Cache:	336 MB I+D on chip per chip
Other Cache:	None
Memory:	1 TB (16 x 64 GB 2Rx4 PC5-6400B-R)
Disk Subsystem:	1 x 1.92 TB NVMe 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:	Ubuntu 24.02.2 LTS 6.8.0-79-generic
Local File System:	ext4
Shared File System:	None
System State:	Run level 5
Other Software:	None

Interconnect Description: None

Hardware		Software
Vendor:	None	: --
Model:	None	
Switch Model:	None	
Number of Switches:	0	
Number of Ports:	0	
Data Rate:	None	
Firmware:	None	
Topology:	None	
Primary Use:	None	

Submit Notes

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

Compiler Version Notes

```
==============================================================================
 CXXC 632.sph_exa_s(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler 2025.2.1 (2025.2.0.20250806)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/intel/oneapi/compiler/2025.2/bin/compiler
Configuration file: /opt/intel/oneapi/compiler/2025.2/bin/compiler/../icpx.cfg
------------------------------------------------------------------------------

==============================================================================
 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 2025.2.1 (2025.2.0.20250806)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/intel/oneapi/compiler/2025.2/bin/compiler
Configuration file: /opt/intel/oneapi/compiler/2025.2/bin/compiler/../icx.cfg
------------------------------------------------------------------------------

==============================================================================
 FC  619.clvleaf_s(base) 628.pot3d_s(base) 635.weather_s(base)
------------------------------------------------------------------------------
ifx (IFX) 2025.2.1 20250806
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------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`mpiicc -cc=icx`

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

Fortran benchmarks:
`mpiifort -fc=ifx`

Base Portability Flags

605.lbm_s: `-lstdc++ -std=c++14`
613.soma_s: `-lstdc++ -std=c++14`
618.tealeaf_s: `-lstdc++ -std=c++14`
621.miniswp_s: `-lstdc++ -std=c++14`
634.hpgmgfv_s: `-lstdc++ -std=c++14`

Base Optimization Flags

C benchmarks:
`-O3 -Ofast -xCORE-AVX512 -mprefer-vector-width=512 -qopt-multiple-gather-scatter-by-shuffles -fiopenmp -ffast-math -flto -funroll-loops`

C++ benchmarks:
`-O3 -Ofast -xCORE-AVX512 -mprefer-vector-width=512 -qopt-multiple-gather-scatter-by-shuffles -fiopenmp -ffast-math -flto -funroll-loops`

Fortran benchmarks:
`-O3 -Ofast -xCORE-AVX512 -mprefer-vector-width=512 -qopt-multiple-gather-scatter-by-shuffles -fiopenmp -ffast-math -flto -funroll-loops -nostandard-realloc-lhs -align array64byte`

Base Other Flags

C benchmarks:
`-Ispecmpitime -Wno-incompatible-function-pointer-types`

(Continued on next page)

Base Other Flags (Continued)

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.2024-12-11.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2024-12-11.xml`

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEChpc2021 v1.1.9 on 2025-09-13 23:44:27-0400.
Report generated on 2025-10-01 13:49:54 by hpc2021 PS formatter v112.
Originally published on 2025-10-01.