SPEChpc™ 2021 Small Result

Copyright 2021-2024 Standard Performance Evaluation Corporation

Intel

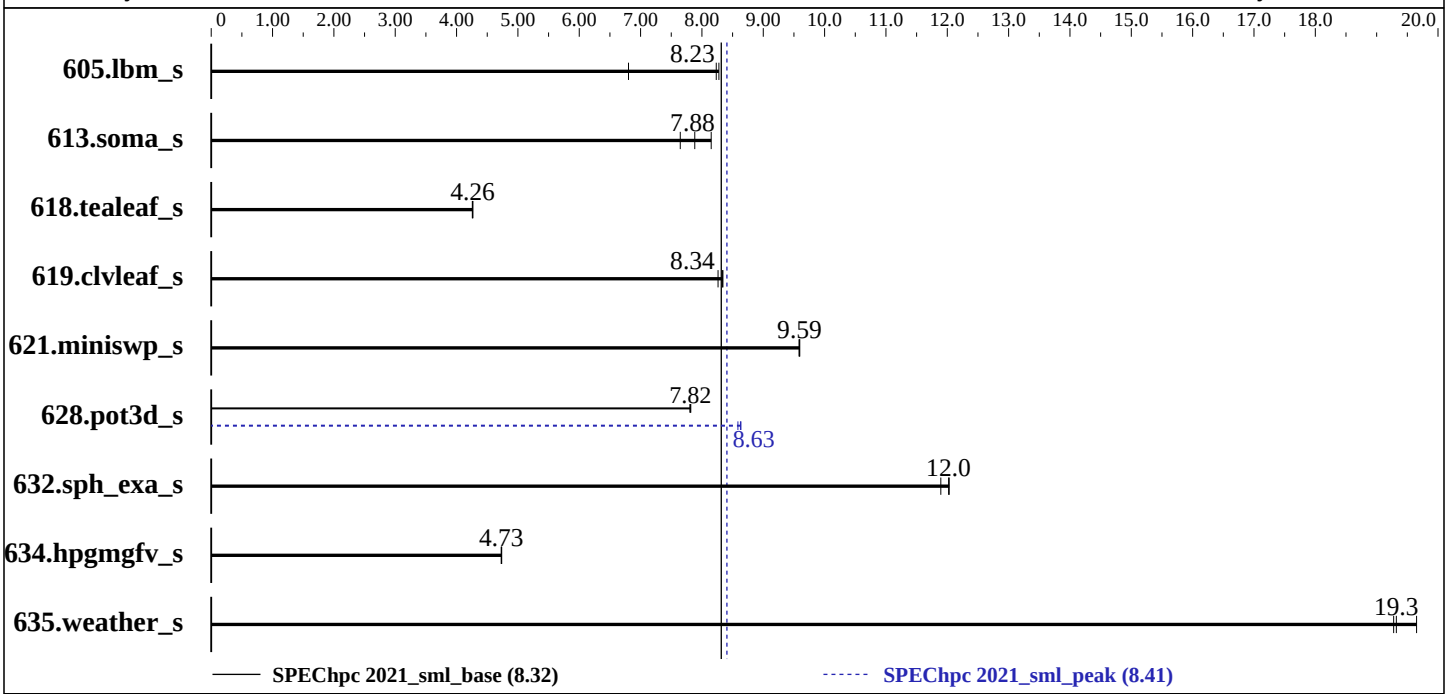
Endeavour: Intel Server D50DNP1SBB (Xeon Max 9480)

SPEChpc 2021_sml_base = 8.32

SPEChpc 2021_sml_peak = 8.41

hpc2021 License: 13
Test Sponsor: Intel
Tested by: Intel

Test Date: Jun-2024
Hardware Availability: Jan-2023
Software Availability: Mar-2024



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	64	14	228	6.80	**188**	**8.23**	187	8.28	OMP	64	14	228	6.80	**188**	**8.23**	187	8.28
613.soma_s	OMP	64	14	196	8.15	209	7.65	**203**	**7.88**	OMP	64	14	196	8.15	209	7.65	**203**	**7.88**
618.tealeaf_s	OMP	64	14	482	4.26	**481**	**4.26**	481	4.26	OMP	64	14	482	4.26	**481**	**4.26**	481	4.26
619.clvleaf_s	OMP	64	14	200	8.26	198	8.34	**198**	**8.34**	OMP	64	14	200	8.26	198	8.34	**198**	**8.34**
621.miniswp_s	OMP	64	14	115	9.59	115	9.58	**115**	**9.59**	OMP	64	14	115	9.59	115	9.58	**115**	**9.59**
628.pot3d_s	OMP	64	14	215	7.80	**214**	**7.82**	214	7.82	OMP	128	7	**194**	**8.63**	195	8.59	194	8.64
632.sph_exa_s	OMP	64	14	193	11.9	191	12.0	**191**	**12.0**	OMP	64	14	193	11.9	191	12.0	**191**	**12.0**
634.hpgmgfv_s	OMP	64	14	206	4.74	**206**	**4.73**	206	4.73	OMP	64	14	206	4.74	**206**	**4.73**	206	4.73
635.weather_s	OMP	64	14	**135**	**19.3**	135	19.3	132	19.7	OMP	64	14	**135**	**19.3**	135	19.3	132	19.7

SPEChpc 2021_sml_base = 8.32

SPEChpc 2021_sml_peak = 8.41

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

SPEChpc™ 2021 Small Result

Copyright 2021-2024 Standard Performance Evaluation Corporation

Intel

Endeavour: Intel Server D50DNP1SBB (Xeon Max 9480)

SPEChpc 2021_sml_base = 8.32

SPEChpc 2021_sml_peak = 8.41

hpc2021 License: 13
Test Sponsor: Intel
Tested by: Intel

Test Date: Jun-2024
Hardware Availability: Jan-2023
Software Availability: Mar-2024

Hardware Summary

Type of System:	Homogenous Cluster
Compute Node:	Intel Server D50DNP1SBB (Xeon Max 9480)
Interconnect:	Mellanox HDR
Compute Nodes Used:	8
Total Chips:	16
Total Cores:	896
Total Threads:	1792
Total Memory:	5 TB
Max. Peak Threads:	14

Software Summary

Compiler:	Intel oneAPI Compiler 2024.1.0
MPI Library:	Intel MPI Library 2021.12 for Linux OS
Other MPI Info:	None
Other Software:	None
Base Parallel Model:	OMP
Base Ranks Run:	64
Base Threads Run:	14
Peak Parallel Models:	OMP
Minimum Peak Ranks:	64
Maximum Peak Ranks:	128
Max. Peak Threads:	14
Min. Peak Threads:	7

Node Description: Intel Server D50DNP1SBB (Xeon Max 9480)

Hardware

Number of nodes:	8
Uses of the node:	Compute
Vendor:	Intel
Model:	Intel Server D50DNP1SBB (Xeon Max 9480)
CPU Name:	Intel Xeon Max 9480
CPU(s) orderable:	1, 2 chips
Chips enabled:	2
Cores enabled:	112
Cores per chip:	56
Threads per core:	2
CPU Characteristics:	Turbo Boost Technology up to 3.5 GHz
CPU MHz:	1900
Primary Cache:	32 KB I + 48 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:	640 GB (16 x 32GB 2Rx8 PC5-4800B-R + 8 x 16GB HBM2 3200 MT/s)
Disk Subsystem:	1 x 1 TB NVMe U.2 2.5" 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:	Mellanox ConnectX-6 HDR
Number of Adapters:	1
Slot Type:	PCI-Express 4.0 x16
Data Rate:	200Gbit/s
Ports Used:	1

Software

Accelerator Driver:	None
Adapter:	Mellanox ConnectX-6 HDR
Adapter Driver:	23.04-0.5.3
Adapter Firmware:	20.37.1014
Operating System:	Rocky Linux 8.8 (Green Obsidian) 4.18.0-477.15.1.el8_8.x86_64
Local File System:	xfs
Shared File System:	PANASAS FS
System State:	Run level 5
Other Software:	None

(Continued on next page)

Node Description: Intel Server D50DNP1SBB (Xeon Max 9480)

Hardware (Continued)

Interconnect Type: Mellanox HDR

Interconnect Description: Mellanox HDR

Hardware

Vendor:	Mellanox
Model:	Mellanox HDR
Switch Model:	Mellanox MQM8790-HS2F Quantum HDR InfiniBand Switch
Number of Switches:	18
Number of Ports:	40
Data Rate:	200 Gbit/s
Firmware:	20.36.1010
Topology:	Fat-tree
Primary Use:	MPI Traffic

Software

: --

Submit Notes

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

General Notes

```
The PANASAS filesystem as described on this result page was formerly
generally available.  At the time of this publication, it may
not be shipping, and/or may not be supported, and/or may fail
to meet other tests of General Availability described in the
SPEC HPG Policy document, http://www.spec.org/hpg/policy.html

HBM is configured as HBM cache mode.
```

Compiler Version Notes

```
==============================================================================
 CXXC 632.sph_exa_s(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler 2024.1.0 (2024.1.0.20240308)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir:
  /global/panfs05/admin5/opt/intel/oneAPI/2024.1.0/compiler/2024.1/bin/compiler
Configuration file:
  /global/panfs05/admin5/opt/intel/oneAPI/2024.1.0/compiler/2024.1/bin/compiler/../icpx.cfg
```

(Continued on next page)

Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------

==============================================================================
 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 2024.1.0 (2024.1.0.20240308)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir:
  /global/panfs05/admin5/opt/intel/oneAPI/2024.1.0/compiler/2024.1/bin/compiler
Configuration file:
  /global/panfs05/admin5/opt/intel/oneAPI/2024.1.0/compiler/2024.1/bin/compiler/../icx.cfg
------------------------------------------------------------------------------

==============================================================================
 FC  619.clvleaf_s(base, peak) 628.pot3d_s(base, peak) 635.weather_s(base,
     peak)
------------------------------------------------------------------------------
ifx (IFX) 2024.1.0 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

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:
```
-Wno-incompatible-function-pointer-types
```

Peak Compiler Invocation

C benchmarks:
```
mpiicc -cc=icx
```

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

Fortran benchmarks:
```
mpiifort -fc=ifx
```

Peak 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`

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: `-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`

635.weather_s: `basepeak = yes`

Peak Other Flags

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

The flags files that were used to format this result can be browsed at
http://www.spec.org/hpc2021/flags/HBM.html
http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2024-12-11.html

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

SPEChpc is a trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEChpc2021 v1.1.8 on 2024-06-19 12:48:59-0400.
Report generated on 2024-12-31 10:30:30 by hpc2021 PS formatter v1.0.3.
Originally published on 2024-12-25.