



SPEChpc™ 2021 Small Result

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Intel

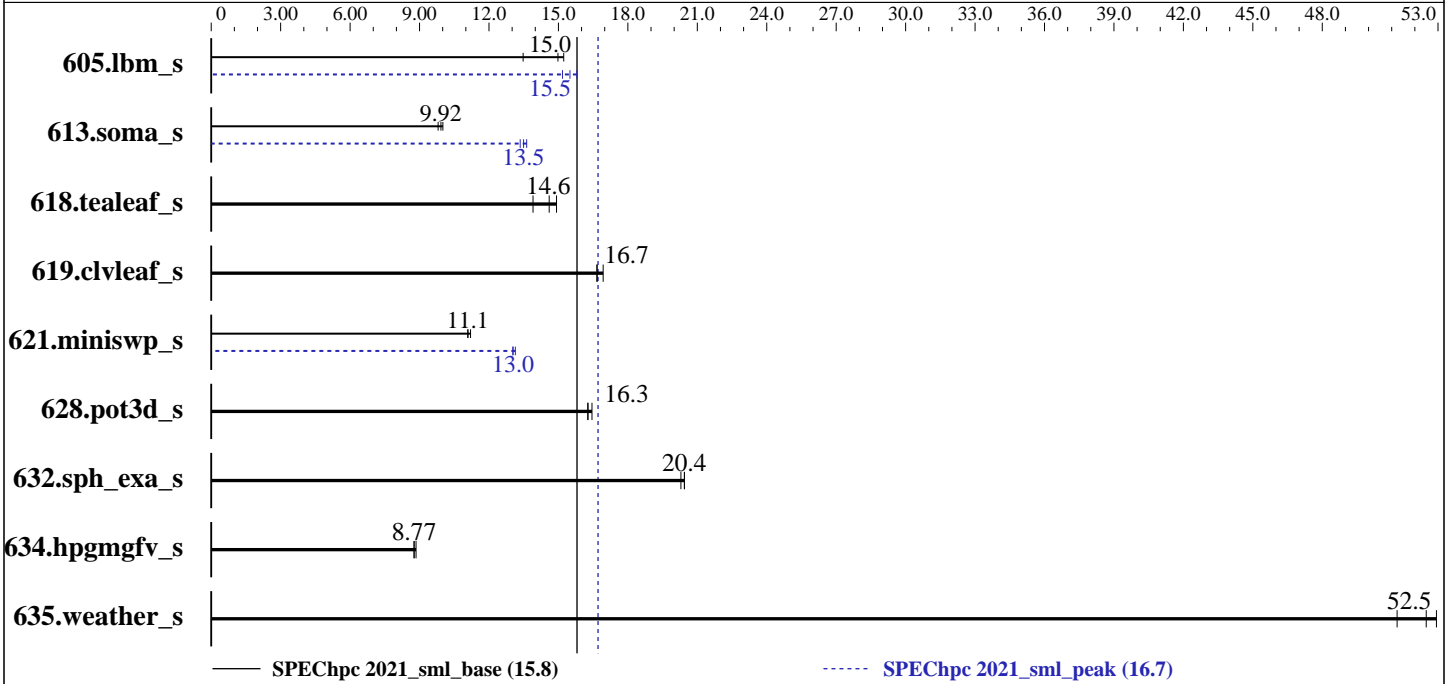
SPEChpc 2021_sml_base = 15.8

SPEChpc 2021_sml_peak = 16.7

Endeavour: Intel Server D50DNP1SBB (Xeon Max 9480)

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	256	7	115	13.5	103	15.0	102	15.2	OMP	128	14	100	15.5	102	15.2	98.1	15.8
613.soma_s	OMP	256	7	160	10.0	163	9.80	161	9.92	OMP	128	14	119	13.5	117	13.6	120	13.3
618.tealeaf_s	OMP	256	7	140	14.6	147	13.9	137	14.9	OMP	256	7	140	14.6	147	13.9	137	14.9
619.civleaf_s	OMP	256	7	99.0	16.7	98.9	16.7	97.4	16.9	OMP	256	7	99.0	16.7	98.9	16.7	97.4	16.9
621.miniswp_s	OMP	256	7	99.2	11.1	98.2	11.2	99.2	11.1	OMP	64	28	83.7	13.1	84.4	13.0	84.3	13.0
628.pot3d_s	OMP	256	7	102	16.5	103	16.3	103	16.3	OMP	256	7	102	16.5	103	16.3	103	16.3
632.sph_exa_s	OMP	256	7	113	20.3	113	20.4	113	20.4	OMP	256	7	113	20.3	113	20.4	113	20.4
634.hpgmgfv_s	OMP	256	7	110	8.85	111	8.76	111	8.77	OMP	256	7	110	8.85	111	8.76	111	8.77
635.weather_s	OMP	256	7	49.5	52.5	49.1	52.9	50.7	51.2	OMP	256	7	49.5	52.5	49.1	52.9	50.7	51.2

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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: Homogenous Cluster
Compute Node: Intel Server D50DNP1SBB (Xeon Max 9480)
Interconnect: Mellanox HDR
Compute Nodes Used: 16
Total Chips: 32
Total Cores: 1792
Total Threads: 3584
Total Memory: 10 TB
Max. Peak Threads: 28

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: 256
Base Threads Run: 7
Peak Parallel Models: OMP
Minimum Peak Ranks: 64
Maximum Peak Ranks: 256
Max. Peak Threads: 28
Min. Peak Threads: 7

Node Description: Intel Server D50DNP1SBB (Xeon Max 9480)

Hardware

Number of nodes: 16
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_x86_64
Local File System: xfs
Shared File System: PANASAS FS
System State: Run level 5
Other Software: None

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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

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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
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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



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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
```



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Peak Optimization Flags

C benchmarks:

```
605.lbm_s: -O3 -Ofast -xCORE-AVX512 -mprefer-vector-width=512  
-qopt-multiple-gather-scatter-by-shuffles -fiopenmp  
-ffast-math -flto -funroll-loops  
-qopt-streaming-stores=always
```

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

618.tealeaf_s: basepeak = yes

621.miniswp_s: Same as 613.soma_s

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

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



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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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