



SPEChpc™ 2021 Small Result

Copyright 2021-2025 Standard Performance Evaluation Corporation

Intel

Hatch: Intel Server D50DNP1SB (Xeon Platinum 8480+)

SPEChpc 2021_sml_base = 15.5

SPEChpc 2021_sml_peak = 16.9

hpc2021 License: 13

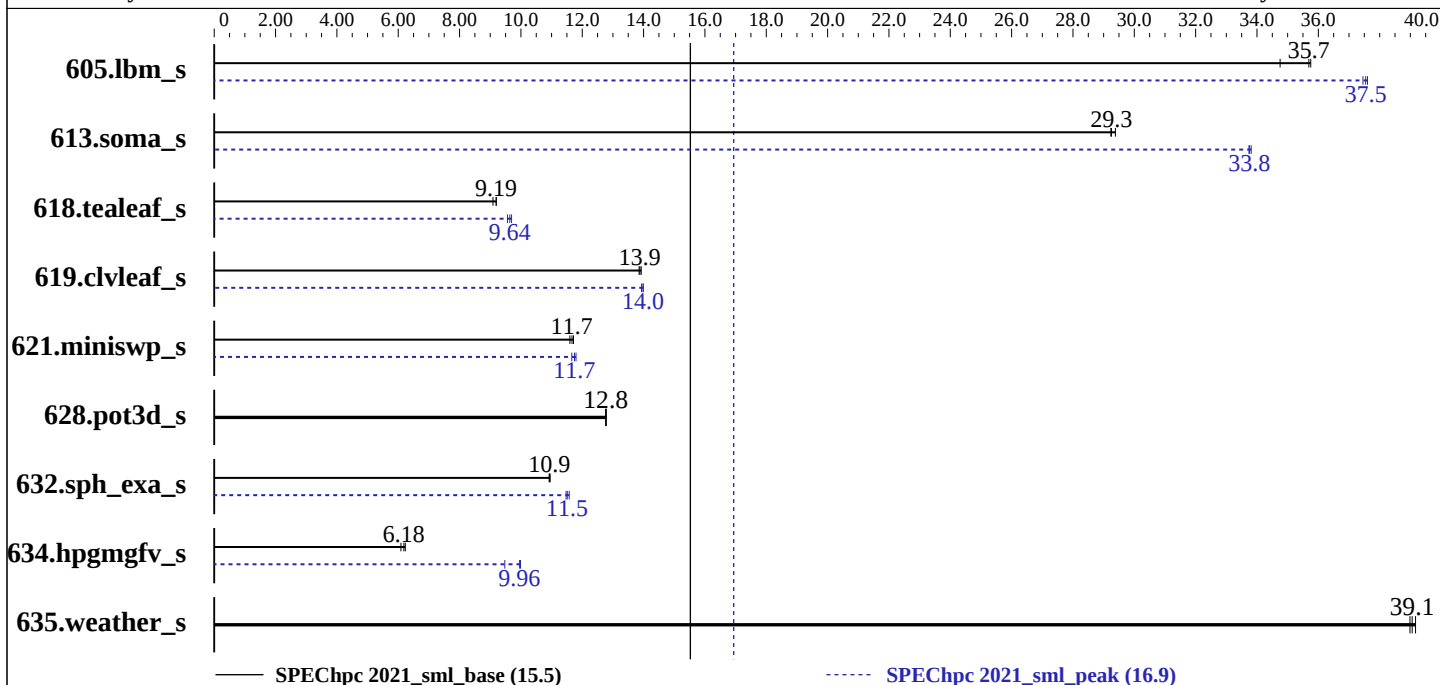
Test Sponsor: Intel

Tested by: Intel

Test Date: Apr-2025

Hardware Availability: Jan-2023

Software Availability: Mar-2025



Results Table

Benchmark	Base								Peak							
	Model	Ranks	Thrds/Rnk	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Model	Ranks	Thrds/Rnk	Seconds	Ratio	Seconds	Ratio
605.lbm_s	TGT	16	1	44.6	34.8	43.4	35.7	43.4	35.8	TGT	16	1	41.4	37.5	41.2	37.6
613.soma_s	TGT	16	1	54.5	29.4	54.7	29.3	54.7	29.2	TGT	16	1	47.4	33.7	47.3	33.8
618.tealeaf_s	TGT	16	1	223	9.20	223	9.19	226	9.09	TGT	16	1	214	9.56	211	9.70
619.clvleaf_s	TGT	16	1	119	13.9	119	13.9	119	13.9	TGT	16	1	118	14.0	118	13.9
621.miniswp_s	TGT	16	1	94.9	11.6	93.9	11.7	94.3	11.7	TGT	16	1	94.3	11.7	93.6	11.7
628.pot3d_s	TGT	16	1	131	12.8	131	12.8	131	12.8	TGT	16	1	131	12.8	131	12.8
632.sph_exa_s	TGT	16	1	211	10.9	210	10.9	210	11.0	TGT	16	1	200	11.5	200	11.5
634.hpgmgfv_s	TGT	16	1	156	6.23	158	6.18	160	6.09	TGT	16	1	103	9.48	97.9	9.96
635.weather_s	TGT	16	1	66.4	39.2	66.7	39.0	66.6	39.1	TGT	16	1	66.4	39.2	66.7	39.0

SPEChpc 2021_sml_base = 15.5

SPEChpc 2021_sml_peak = 16.9

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



SPEChpc™ 2021 Small Result

Copyright 2021-2025 Standard Performance Evaluation Corporation

Intel

Hatch: Intel Server D50DNP1SB (Xeon Platinum 8480+)

SPEChpc 2021_sml_base = 15.5

SPEChpc 2021_sml_peak = 16.9

hpc2021 License: 13

Test Sponsor: Intel

Tested by: Intel

Test Date: Apr-2025

Hardware Availability: Jan-2023

Software Availability: Mar-2025

Hardware Summary

Type of System: Homogenous Cluster
Compute Node: Intel Server D50DNP1SB (Xeon Platinum 8480+)
Interconnect: Mellanox HDR
Compute Nodes Used: 2
Total Chips: 4
Total Cores: 224
Total Threads: 448
Total Memory: 2 TB
Max. Peak Threads: 1

Software Summary

Compiler: Intel oneAPI Compiler 2025.1.0
MPI Library: Intel MPI Library 2021.15 for Linux OS
Other MPI Info: None
Other Software: None
Base Parallel Model: TGT
Base Ranks Run: 16
Base Threads Run: 1
Peak Parallel Models: TGT
Minimum Peak Ranks: 16
Maximum Peak Ranks: 16
Max. Peak Threads: 1
Min. Peak Threads: 1

Node Description: Intel Server D50DNP1SB (Xeon Platinum 8480+)

Hardware

Number of nodes: 2
Uses of the node: Compute
Vendor: Intel
Model: Intel Server D50DNP1SB (2 x Intel Xeon Platinum 8480+, 2.0GHz)
CPU Name: Intel Xeon Platinum 8480+
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 3.8 GHz
CPU MHz: 2000
Primary Cache: 32 KB I + 48 KB D on chip per core
Secondary Cache: 2 MB I+D on chip per core
L3 Cache: 105 MB I+D on chip per chip
Other Cache: None
Memory: 1 TB (16x64 GB DDR5 2Rx4 PC5-4800B-R)
Disk Subsystem: 1 x 1 1TB NVMe M.2 INTEL SSDPELKH010T8
Other Hardware: None
Accel Count: 4
Accel Model: Intel Data Center GPU Max 1550
Accel Vendor: Intel
Accel Type: GPU
Accel Connection: PCIe Gen5 x16
Accel ECC enabled: yes
Accel Description: Intel Data Center GPU Max 1550
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: 25.05.32567
Adapter: Mellanox ConnectX-6 HDR
Adapter Driver: --
Adapter Firmware: 20.38.1900
Operating System: SUSE Linux Enterprise Server 15 SP6
6.4.0-150600.23.42-default
Local File System: lustre
Shared File System: LUSTRE FS
System State: Run level 5
Other Software: None

(Continued on next page)



SPEChpc™ 2021 Small Result

Copyright 2021-2025 Standard Performance Evaluation Corporation

Intel

Hatch: Intel Server D50DNP1SB (Xeon Platinum 8480+)

SPEChpc 2021_sml_base = 15.5

SPEChpc 2021_sml_peak = 16.9

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

Test Date: Apr-2025
Hardware Availability: Jan-2023
Software Availability: Mar-2025

Node Description: Intel Server D50DNP1SB (Xeon Platinum 8480+)

Hardware (Continued)

Interconnect Type: Mellanox HDR

Interconnect Description: Mellanox HDR

Hardware

Vendor: Mellanox
Model: Mellanox HDR
Switch Model: Mellanox Technologies MT28908 Family InfiniBand Switch
Number of Switches: 12
Number of Ports: 40
Data Rate: 200 Gbit/s
Firmware: 20.38.1900
Topology: Fat-tree
Primary Use: MPI Traffic, LustreFS traffic

Software

: --

Submit Notes

The config file option 'submit' was used.

General Notes

Environment variables set by runhpc before the start of the run:
LIBOMPTARGET_LEVEL_ZERO_USE_IMMEDIATE_COMMAND_LIST = "all"
I_MPI_FABRICS=shm:ofi
I_MPI_OFFLOAD=1
I_MPI_OFFLOAD_CELL=tile
I_MPI_OFFLOAD_TOPOLIB=level_zero
I_MPI_OFFLOAD_CELL_LIST=0,1,2,3,4,5,6,7
For the following tests src.alt was used in PEAK:
613 618 621 632 634

Platform Notes

Device Vendor	Intel
Device Version	OpenCL 3.0 NEO
Driver Version	25.05.32567
Base clock	900MHZ
Max clock frequency	1600MHZ
Tiles	2
Slices per Tile	1
Max compute units per Tile	512

(Continued on next page)



SPEChpc™ 2021 Small Result

Copyright 2021-2025 Standard Performance Evaluation Corporation

Intel

Hatch: Intel Server D50DNP1SB (Xeon Platinum 8480+)

SPEChpc 2021_sml_base = 15.5

SPEChpc 2021_sml_peak = 16.9

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

Test Date: Apr-2025
Hardware Availability: Jan-2023
Software Availability: Mar-2025

Platform Notes (Continued)

Sub-slices per slice	64
EUs per sub-slice	8
Threads per EU	8
Max work item dimensions	3
Max work item sizes	1024x1024x1024
Max work group size	1024
Preferred work group size multiple	32
Max sub-groups per work group	64
Sub-group sizes	16, 32
L1 Cache per EU	65536
L2 cache size	427819008
Global memory size	137438953472
Address bits	64, Little-Endian

Compiler Version Notes

=====

CXXC 632.sph_exa_s(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler 2025.1.0 (2025.1.0.20250317)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir:
/lfs/lfs17/mknyazev/intel/2025.1/oneapi/compiler/2025.1/bin/compiler
Configuration file:
/lfs/lfs17/mknyazev/intel/2025.1/oneapi/compiler/2025.1/bin/compiler/./icpx.cfg

=====

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 2025.1.0 (2025.1.0.20250317)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir:
/lfs/lfs17/mknyazev/intel/2025.1/oneapi/compiler/2025.1/bin/compiler
Configuration file:
/lfs/lfs17/mknyazev/intel/2025.1/oneapi/compiler/2025.1/bin/compiler/./icx.cfg

=====

FC 619.clvleaf_s(base, peak) 635.weather_s(base, peak)

ifx (IFX) 2025.1.0 20250317
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.

(Continued on next page)



SPEChpc™ 2021 Small Result

Copyright 2021-2025 Standard Performance Evaluation Corporation

Intel

Hatch: Intel Server D50DNP1SB (Xeon Platinum 8480+)

SPEChpc 2021_sml_base = 15.5

SPEChpc 2021_sml_peak = 16.9

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

Test Date: Apr-2025
Hardware Availability: Jan-2023
Software Availability: Mar-2025

Compiler Version Notes (Continued)

=====

```
FC 628.pot3d_s(base, peak)
```

```
ifx: command line warning #10157: ignoring option '-W'; argument is of wrong
type
ifx (IFX) 2025.1.0 20250317
Copyright (C) 1985-2025 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: -DUSE_MPI
613.soma_s: -DUSE_MPI -DSPEC_NO_VAR_ARRAY_REDUCE
618.tealeaf_s: -DUSE_MPI
619.clvleaf_s: -DUSE_MPI
628.pot3d_s: -DUSE_MPI
635.weather_s: -DUSE_MPI
```

Base Optimization Flags

C benchmarks:

```
-O3 -xCORE-AVX512 -flto -mprefer-vector-width=512 -ffast-math
-fopenmp -fopenmp-targets=spir64_gen
-ftarget-register-alloc-mode=pvc:auto
-Xopenmp-target-backend '-device pvc -revision_id 0x2f' -DSPEC_COLLAPSE
-fopenmp-optimistic-collapse
```

(Continued on next page)



SPEChpc™ 2021 Small Result

Copyright 2021-2025 Standard Performance Evaluation Corporation

Intel

Hatch: Intel Server D50DNP1SB (Xeon Platinum 8480+)

SPEChpc 2021_sml_base = 15.5

SPEChpc 2021_sml_peak = 16.9

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

Test Date: Apr-2025
Hardware Availability: Jan-2023
Software Availability: Mar-2025

Base Optimization Flags (Continued)

C++ benchmarks:

```
-O3 -xCORE-AVX512 -flto -mprefer-vector-width=512 -ffast-math  
-fiopenmp -fopenmp-targets=spir64_gen  
-ftarget-register-alloc-mode=pvc:auto  
-Xopenmp-target-backend '-device pvc -revision_id 0x2f' -DSPEC_COLLAPSE
```

Fortran benchmarks:

```
-DSPEC_COLLAPSE -O3 -xCORE-AVX512 -flto -mprefer-vector-width=512  
-ffast-math -fiopenmp -fopenmp-targets=spir64_gen  
-ftarget-register-alloc-mode=pvc:auto  
-Xopenmp-target-backend '-device pvc -revision_id 0x2f'  
-DSPEC_ACCEL_AWARE_MPI -fopenmp-target-loopopt
```

Base Other Flags

Fortran benchmarks:

```
628.pot3d_s: -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: -DUSE_MPI  
613.soma_s: -DUSE_MPI -DSPEC_NO_VAR_ARRAY_REDUCE  
618.tealeaf_s: -DUSE_MPI  
619.clvleaf_s: -DUSE_MPI  
628.pot3d_s: -DUSE_MPI  
635.weather_s: -DUSE_MPI
```



SPEChpc™ 2021 Small Result

Copyright 2021-2025 Standard Performance Evaluation Corporation

Intel

Hatch: Intel Server D50DNP1SB (Xeon Platinum 8480+)

SPEChpc 2021_sml_base = 15.5

SPEChpc 2021_sml_peak = 16.9

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

Test Date: Apr-2025
Hardware Availability: Jan-2023
Software Availability: Mar-2025

Peak Optimization Flags

C benchmarks:

605.lbm_s: -O3 -xCORE-AVX512 -flto -mprefer-vector-width=512
-ffast-math -fiopenmp -fopenmp-targets=spir64_gen
-ftarget-register-alloc-mode=pvc:large
-Xopenmp-target-backend '-device pvc -revision_id 0x2f'
-fopenmp-optimistic-collapse -DSPEC_COLLAPSE

613.soma_s: -O3 -xCORE-AVX512 -flto -mprefer-vector-width=512
-ffast-math -fiopenmp -fopenmp-targets=spir64_gen
-ftarget-register-alloc-mode=pvc:auto
-Xopenmp-target-backend '-device pvc -revision_id 0x2f'
-DSPEC_COLLAPSE -DSPEC_ACCEL_AWARE_MPI
-fopenmp-optimistic-collapse

618.tealeaf_s: -O3 -xCORE-AVX512 -flto -mprefer-vector-width=512
-ffast-math -fiopenmp -fopenmp-targets=spir64_gen
-ftarget-register-alloc-mode=pvc:auto
-Xopenmp-target-backend '-device pvc -revision_id 0x2f'
-DSPEC_COLLAPSE -fopenmp-optimistic-collapse

621.miniswp_s: Same as 618.tealeaf_s

634.hpgmgfv_s: Same as 613.soma_s

C++ benchmarks:

-O3 -xCORE-AVX512 -flto -mprefer-vector-width=512 -ffast-math
-fiopenmp -fopenmp-targets=spir64_gen
-ftarget-register-alloc-mode=pvc:auto
-Xopenmp-target-backend '-device pvc -revision_id 0x2f' -DSPEC_COLLAPSE

Fortran benchmarks:

619.clvleaf_s: -DSPEC_COLLAPSE -O3 -xCORE-AVX512 -flto
-mprefer-vector-width=512 -ffast-math -fiopenmp
-fopenmp-targets=spir64_gen
-ftarget-register-alloc-mode=pvc:auto
-Xopenmp-target-backend '-device pvc -revision_id 0x2f'
-DSPEC_ACCEL_AWARE_MPI -fopenmp-target-loopopt

628.pot3d_s: basepeak = yes

635.weather_s: basepeak = yes



SPEChpc™ 2021 Small Result

Copyright 2021-2025 Standard Performance Evaluation Corporation

Intel

Hatch: Intel Server D50DNP1SB (Xeon Platinum 8480+)

SPEChpc 2021_sml_base = 15.5

SPEChpc 2021_sml_peak = 16.9

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

Test Date: Apr-2025
Hardware Availability: Jan-2023
Software Availability: Mar-2025

Peak Other Flags

Fortran benchmarks:

628.pot3d_s: -Wno-incompatible-function-pointer-types

The flags file that was used to format this result can be browsed at
http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2025-05-22.00.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2025-05-22.00.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 v1.1.9 on 2025-04-23 15:22:12-0400.
Report generated on 2025-05-22 11:01:22 by hpc2021 PDF formatter v1.0.3.
Originally published on 2025-05-21.