



# SPEChpc™ 2021 Large Result

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## Intel

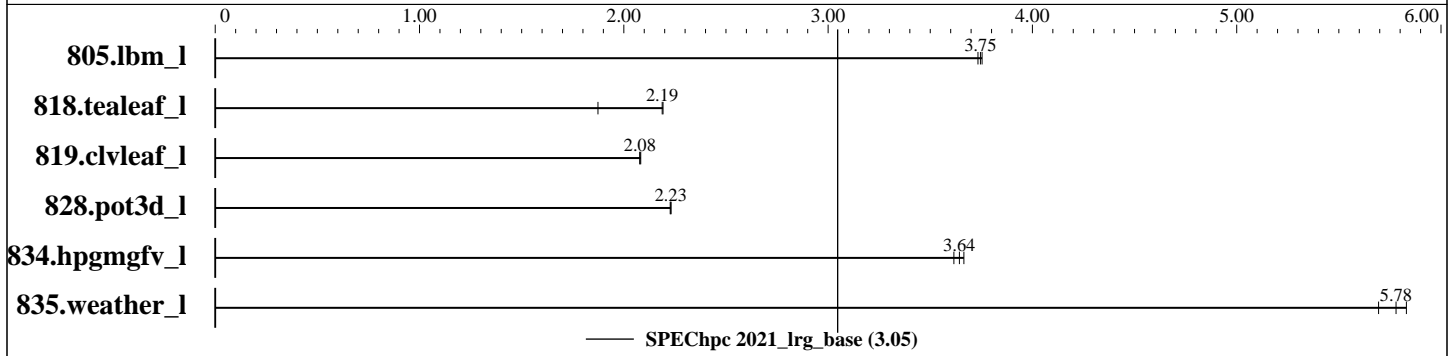
Endeavour: Intel Server D50DNP1SBB (Intel Xeon Platinum 8592+)

SPEChpc 2021\_lrg\_base = 3.05

SPEChpc 2021\_lrg\_peak = Not Run

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

Test Date: Jun-2024  
Hardware Availability: Dec-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
805.lbm_1	OMP	2048	4	726	3.75	<b>728</b>	<b>3.75</b>	730	3.73									
818.tealeaf_1	OMP	2048	4	<b>663</b>	<b>2.19</b>	774	1.87	661	2.19									
819.clvleaf_1	OMP	2048	4	1008	2.08	1010	2.08	<b>1010</b>	<b>2.08</b>									
828.pot3d_1	OMP	2048	4	2043	2.23	2040	2.23	<b>2040</b>	<b>2.23</b>									
834.hpgmgfv_1	OMP	2048	4	<b>920</b>	<b>3.64</b>	927	3.62	914	3.66									
835.weather_1	OMP	2048	4	587	5.83	601	5.69	<b>593</b>	<b>5.78</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: Homogenous Cluster  
Compute Node: Intel Server D50DNP1SBB (Xeon 8592+)  
Interconnect: Mellanox HDR  
Compute Nodes Used: 64  
Total Chips: 128  
Total Cores: 8192  
Total Threads: 16384  
Total Memory: 32 TB  
Max. Peak Threads: --

### 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: 2048  
Base Threads Run: 4  
Peak Parallel Models: Not Run  
Minimum Peak Ranks: --  
Maximum Peak Ranks: --  
Max. Peak Threads: --  
Min. Peak Threads: --

### Node Description: Intel Server D50DNP1SBB (Xeon 8592+)

#### Hardware

Number of nodes: 64  
Uses of the node: Compute  
Vendor: Intel  
Model: Intel Server D50DNP1SBB (Xeon 8592+)  
CPU Name: Intel Xeon Platinum 8592+  
CPU(s) orderable: 1, 2 chips  
Chips enabled: 2  
Cores enabled: 128  
Cores per chip: 64  
Threads per core: 2  
CPU Characteristics: Turbo Boost Technology up to 3.9 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: 320 MB I+D on chip per chip  
Other Cache: None  
Memory: 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R)  
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  
Interconnect Type: Mellanox HDR

#### 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



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## Interconnect Description: Mellanox HDR

### Hardware

### Software

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

: --

## 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>

## Compiler Version Notes

=====  
CC 805.lbm\_1(base) 818.tealeaf\_1(base) 834.hpgmgfv\_1(base)  
=====

Intel(R) oneAPI DPC++/C++ Compiler 2024.0.2 (2024.0.2.20231213)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir:  
/global/panfs05/admin5/opt/intel/oneAPI/2024.0.1/compiler/2024.0/bin/compiler  
Configuration file:  
/global/panfs05/admin5/opt/intel/oneAPI/2024.0.1/compiler/2024.0/bin/compiler/./icx.cfg  
=====

=====  
FC 819.clvleaf\_1(base) 828.pot3d\_1(base) 835.weather\_1(base)  
=====

ifx (IFX) 2024.0.2 20231213  
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=====



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## Base Compiler Invocation

C benchmarks:

```
mpiicc -cc=icx
```

Fortran benchmarks:

```
mpiifort -fc=ifx
```

## Base Portability Flags

```
805.lbm_l: -lstdc++ -std=c++14  
818.tealeaf_l: -lstdc++ -std=c++14  
834.hpgmgfv_l: -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
```

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
```

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

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