



# SPEChpc™ 2021 Small Result

Copyright 2021-2024 Standard Performance Evaluation Corporation

## xFusion

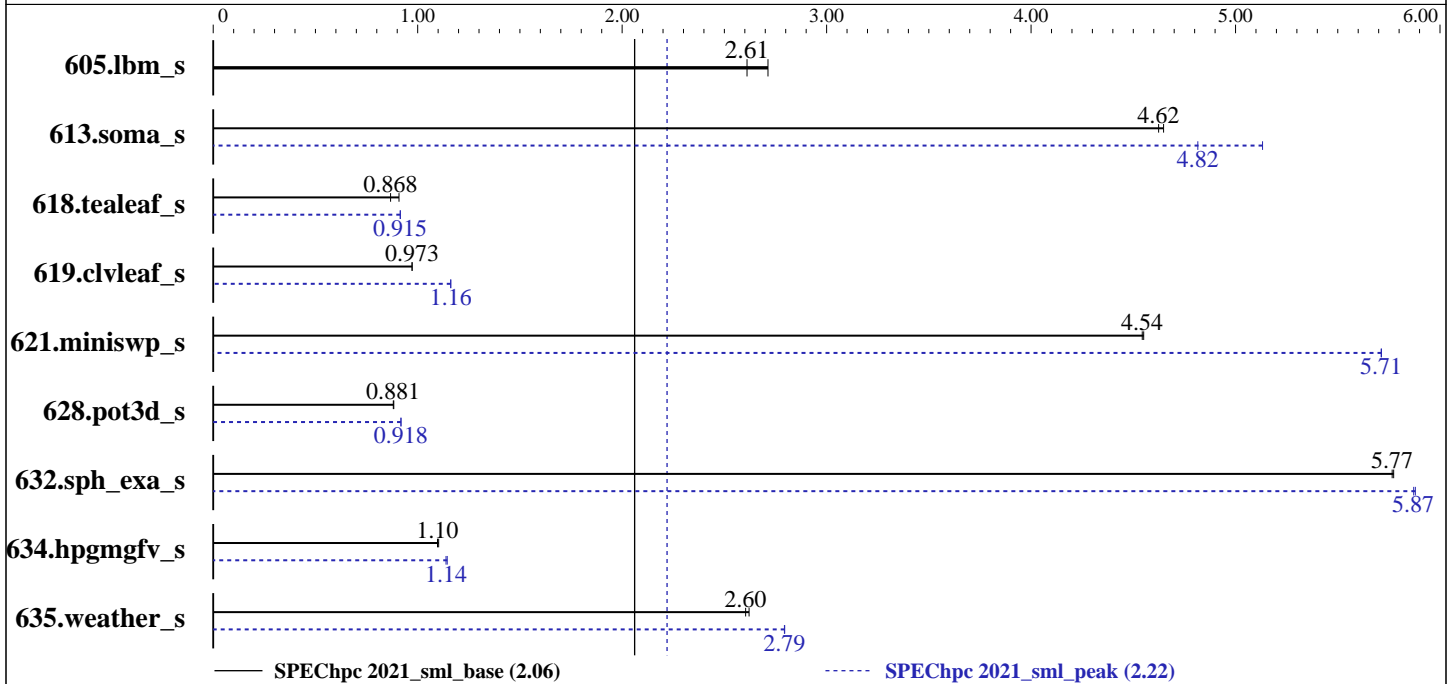
xFusion FusionServer 2288H V7 (Intel Xeon Platinum 8490H)

SPEChpc 2021\_sml\_base = 2.06

SPEChpc 2021\_sml\_peak = 2.22

hpc2021 License: 6488  
Test Sponsor: xFusion  
Tested by: xFusion

Test Date: Dec-2023  
Hardware Availability: Jan-2023  
Software Availability: Apr-2023



## 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	OMP	24	20	571	2.71	<b>594</b>	<b>2.61</b>			OMP	24	20	571	2.71	<b>594</b>	<b>2.61</b>
613.soma_s	OMP	24	20	344	4.65	<b>346</b>	<b>4.62</b>			OMP	4	120	312	5.13	<b>332</b>	<b>4.82</b>
618.tealeaf_s	OMP	24	20	<b>2363</b>	<b>0.868</b>	2256	0.909			OMP	40	12	2240	0.915	<b>2241</b>	<b>0.915</b>
619.civleaf_s	OMP	24	20	<b>1696</b>	<b>0.973</b>	1696	0.973			OMP	240	2	<b>1420</b>	<b>1.16</b>	1420	1.16
621.miniswp_s	OMP	24	20	242	4.55	<b>242</b>	<b>4.54</b>			OMP	8	60	193	5.71	<b>193</b>	<b>5.71</b>
628.pot3d_s	OMP	24	20	<b>1902</b>	<b>0.881</b>	1897	0.883			OMP	240	2	<b>1825</b>	<b>0.918</b>	1823	0.919
632.sph_exa_s	OMP	24	20	398	5.77	<b>399</b>	<b>5.77</b>			OMP	40	12	391	5.88	<b>392</b>	<b>5.87</b>
634.hpgmgfv_s	OMP	24	20	<b>889</b>	<b>1.10</b>	884	1.10			OMP	32	15	852	1.14	<b>856</b>	<b>1.14</b>
635.weather_s	OMP	24	20	<b>998</b>	<b>2.60</b>	992	2.62			OMP	60	8	930	2.80	<b>931</b>	<b>2.79</b>

SPEChpc 2021\_sml\_base = 2.06

SPEChpc 2021\_sml\_peak = 2.22

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

## xFusion

xFusion FusionServer 2288H V7 (Intel Xeon Platinum 8490H)

SPEChpc 2021\_sml\_base = 2.06

SPEChpc 2021\_sml\_peak = 2.22

**hpc2021 License:** 6488  
**Test Sponsor:** xFusion  
**Tested by:** xFusion

**Test Date:** Dec-2023  
**Hardware Availability:** Jan-2023  
**Software Availability:** Apr-2023

### Hardware Summary

Type of System: Homogenous Cluster  
Compute Node: xFusion FusionServer 2288H V7  
Interconnect: Mellanox HDR  
Node Node: xFusion FusionServer 2288H V7  
Compute Nodes Used: 2  
Total Chips: 4  
Total Cores: 240  
Total Threads: 480  
Total Memory: 1 TB  
Max. Peak Threads: 120

### Software Summary

Compiler: Intel oneAPI Compiler 2023.0.0  
MPI Library: Intel MPI Library 2021.8 for Linux OS  
Other MPI Info: None  
Other Software: None  
Base Parallel Model: OMP  
Base Ranks Run: 24  
Base Threads Run: 20  
Peak Parallel Models: OMP  
Minimum Peak Ranks: 4  
Maximum Peak Ranks: 240  
Max. Peak Threads: 120  
Min. Peak Threads: 2

## Node Description: xFusion FusionServer 2288H V7

### Hardware

Number of nodes: 2  
Uses of the node: Compute Node  
Vendor: xFusion  
Model: xFusion FusionServer 2288H V7  
CPU Name: Intel Xeon Platinum 8490H  
CPU(s) orderable: 1, 2 chips  
Chips enabled: 2  
Cores enabled: 120  
Cores per chip: 60  
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: 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R)  
Disk Subsystem: 1 x 7.68 TB NVMe SSD  
Other Hardware: None  
Accel Count: 0  
Accel Model: None  
Accel Vendor: None  
Accel Type: None  
Accel Connection: None  
Accel ECC enabled: None  
Accel Description: None  
Adapter: MCX653105A-EFAT  
Number of Adapters: 1  
Slot Type: PCI-Express 4.0 x16  
Data Rate: 100 Gb/s  
Ports Used: 1  
Interconnect Type: Mellanox HDR

### Software

Accelerator Driver: None  
Adapter: MCX653105A-EFAT  
Adapter Driver: 5.4-3.1.0  
Adapter Firmware: 20.32.1010  
Operating System: Rocky Linux release 8.7 (Green Obsidian) 4.18.0-425.3.1.el8.x86\_64  
Local File System: xfs  
Shared File System: NFS  
System State: Multi-user, run level 3  
Other Software: N/A



# SPEChpc™ 2021 Small Result

Copyright 2021-2024 Standard Performance Evaluation Corporation

## xFusion

xFusion FusionServer 2288H V7 (Intel Xeon Platinum 8490H)

SPEChpc 2021\_sml\_base = 2.06

SPEChpc 2021\_sml\_peak = 2.22

**hpc2021 License:** 6488  
**Test Sponsor:** xFusion  
**Tested by:** xFusion

**Test Date:** Dec-2023  
**Hardware Availability:** Jan-2023  
**Software Availability:** Apr-2023

### Interconnect Description: Mellanox HDR

#### Hardware

#### Software

Vendor: Mellanox  
Model: Mellanox HDR  
Switch Model: Mellanox MQM8790-HS2F InfiniBand Switch  
Number of Switches: 1  
Number of Ports: 40  
Data Rate: 200 Gbit/s  
Firmware: 27.2010.1202  
Topology: Mesh  
Primary Use: MPI

: --

### Submit Notes

The config file option 'submit' was used.

### Compiler Version Notes

```

=====
CXXC 632.sph_exa_s(base, peak)
-----
Intel(R) oneAPI DPC++/C++ Compiler 2023.0.0 (2023.0.0.20221201)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /share/app/intel/2023.0.0/compiler/latest/linux/bin-llvm
Configuration file:
  /share/app/intel/2023.0.0/compiler/latest/linux/bin-llvm/./bin/icpx.cfg
-----

=====
CC 605.lbm_s(base, peak) 613.soma_s(base, peak) 618.tealeaf_s(base)
   621.miniswp_s(base) 634.hpgmgfv_s(base)
-----
Intel(R) oneAPI DPC++/C++ Compiler 2023.0.0 (2023.0.0.20221201)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /share/app/intel/2023.0.0/compiler/latest/linux/bin-llvm
Configuration file:
  /share/app/intel/2023.0.0/compiler/latest/linux/bin-llvm/./bin/icx.cfg
-----

=====
CC 618.tealeaf_s(peak) 621.miniswp_s(peak) 634.hpgmgfv_s(peak)
-----
icc: remark #10441: The Intel(R) C++ Compiler Classic (ICC) is deprecated and

```

(Continued on next page)



# SPEChpc™ 2021 Small Result

Copyright 2021-2024 Standard Performance Evaluation Corporation

## xFusion

xFusion FusionServer 2288H V7 (Intel Xeon Platinum 8490H)

SPEChpc 2021\_sml\_base = 2.06

SPEChpc 2021\_sml\_peak = 2.22

**hpc2021 License:** 6488  
**Test Sponsor:** xFusion  
**Tested by:** xFusion

**Test Date:** Dec-2023  
**Hardware Availability:** Jan-2023  
**Software Availability:** Apr-2023

### Compiler Version Notes (Continued)

will be removed from product release in the second half of 2023. The Intel(R) oneAPI DPC++/C++ Compiler (ICX) is the recommended compiler moving forward. Please transition to use this compiler. Use '-diag-disable=10441' to disable this message.

icc: command line warning #10148: option '-Wno-incompatible-function-pointer-types' not supported

icc (ICC) 2021.8.0 20221119

Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

=====  
FC 619.clvleaf\_s(peak)

-----  
ifort (IFORT) 2021.8.0 20221119

Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

=====  
FC 619.clvleaf\_s(base) 628.pot3d\_s(base, peak) 635.weather\_s(base, peak)

-----  
ifx (IFORT) 2023.0.0 20221201

Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

### Base Compiler Invocation

C benchmarks:

mpiicc -cc=icx

C++ benchmarks:

mpicpc -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



# SPEChpc™ 2021 Small Result

Copyright 2021-2024 Standard Performance Evaluation Corporation

## xFusion

xFusion FusionServer 2288H V7 (Intel Xeon Platinum 8490H)

SPEChpc 2021\_sml\_base = 2.06

SPEChpc 2021\_sml\_peak = 2.22

**hpc2021 License:** 6488  
**Test Sponsor:** xFusion  
**Tested by:** xFusion

**Test Date:** Dec-2023  
**Hardware Availability:** Jan-2023  
**Software Availability:** Apr-2023

## Base Optimization Flags

C benchmarks:

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

C++ benchmarks:

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

Fortran benchmarks:

```
-O3 -Ofast -ipo -fiopenmp -xCORE-AVX512 -mprefer-vector-width=512  
-qopt-multiple-gather-scatter-by-shuffles -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 (except as noted below):

```
mpiicc
```

```
605.lbm_s: mpiicc -cc=icx
```

```
613.soma_s: mpiicc -cc=icx
```

C++ benchmarks:

```
mpicpc -cxx=icpx
```

Fortran benchmarks (except as noted below):

```
mpiifort -fc=ifx
```

```
619.clvleaf_s: mpiifort
```



# SPEChpc™ 2021 Small Result

Copyright 2021-2024 Standard Performance Evaluation Corporation

## xFusion

xFusion FusionServer 2288H V7 (Intel Xeon Platinum 8490H)

SPEChpc 2021\_sml\_base = 2.06

SPEChpc 2021\_sml\_peak = 2.22

**hpc2021 License:** 6488  
**Test Sponsor:** xFusion  
**Tested by:** xFusion

**Test Date:** Dec-2023  
**Hardware Availability:** Jan-2023  
**Software Availability:** Apr-2023

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

```
618.tealeaf_s: -O3 -Ofast -xCORE-AVX512 -ansi-alias -qopenmp -ipo
-qopt-zmm-usage=high
-qopt-multiple-gather-scatter-by-shuffles
```

621.miniswp\_s: Same as 618.tealeaf\_s

634.hpgmgfv\_s: Same as 618.tealeaf\_s

C++ benchmarks:

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

Fortran benchmarks:

```
619.clvleaf_s: -O3 -Ofast -xCORE-AVX512 -ansi-alias -qopenmp -ipo
-qopt-zmm-usage=high
-qopt-multiple-gather-scatter-by-shuffles
-nostandard-realloc-lhs -align array64byte
```

```
628.pot3d_s: -O3 -Ofast -ipo -fiopenmp -xCORE-AVX512
-mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -ffast-math -flto
-funroll-loops -nostandard-realloc-lhs -align array64byte
```

```
635.weather_s: -O3 -Ofast -ipo -fiopenmp -xCORE-AVX512
-mprefer-vector-width=512
```

(Continued on next page)



# SPEChpc™ 2021 Small Result

Copyright 2021-2024 Standard Performance Evaluation Corporation

## xFusion

xFusion FusionServer 2288H V7 (Intel Xeon Platinum 8490H)

SPEChpc 2021\_sml\_base = 2.06

SPEChpc 2021\_sml\_peak = 2.22

**hpc2021 License:** 6488  
**Test Sponsor:** xFusion  
**Tested by:** xFusion

**Test Date:** Dec-2023  
**Hardware Availability:** Jan-2023  
**Software Availability:** Apr-2023

## Peak Optimization Flags (Continued)

635.weather\_s (continued):  
-qopt-multiple-gather-scatter-by-shuffles -ffast-math -flto  
-funroll-loops -qopt-streaming-stores=always  
-nostandard-realloc-lhs -align array64byte

## Peak 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.2023-08-16.html](http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2023-08-16.html)

You can also download the XML flags source by saving the following link:  
[http://www.spec.org/hpc2021/flags/Intel\\_compiler\\_flags.2023-08-16.xml](http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2023-08-16.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](mailto:info@spec.org).

Tested with SPEChpc2021 v1.1.8 on 2023-12-25 10:44:25-0500.  
Report generated on 2024-01-10 17:35:01 by hpc2021 PDF formatter v1.0.3.  
Originally published on 2024-01-10.