



# SPEChpc™ 2021 Tiny Result

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## xFusion

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

SPEChpc 2021\_tny\_base = 15.4

SPEChpc 2021\_tny\_peak = 15.4

hpc2021 License: 6488

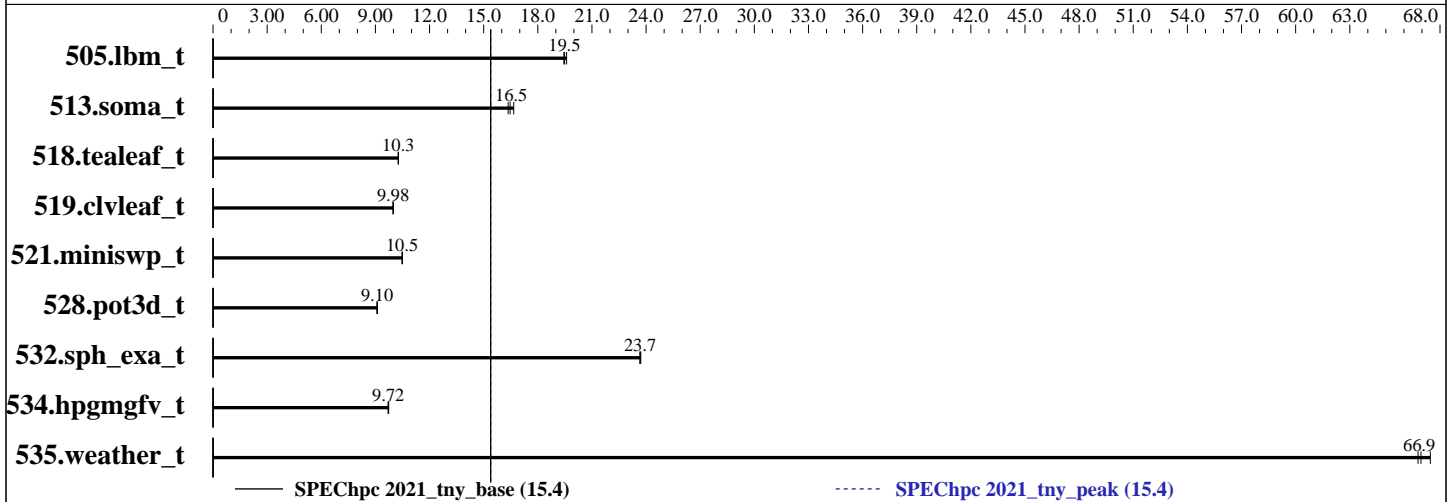
Test Sponsor: xFusion

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	Seconds	Ratio
505.lbm_t	MPI	240	1	115	19.6	116	19.4	<b>115</b>	<b>19.5</b>	MPI	240	1	115	19.6	116	19.4	<b>115</b>	<b>19.5</b>
513.soma_t	MPI	240	1	<b>225</b>	<b>16.5</b>	222	16.7	226	16.4	MPI	240	1	<b>225</b>	<b>16.5</b>	222	16.7	226	16.4
518.tealeaf_t	MPI	240	1	161	10.3	<b>161</b>	<b>10.3</b>	161	10.3	MPI	240	1	161	10.3	<b>161</b>	<b>10.3</b>	161	10.3
519.clvleaf_t	MPI	240	1	165	9.98	<b>165</b>	<b>9.98</b>	165	9.99	MPI	240	1	165	9.98	<b>165</b>	<b>9.98</b>	165	9.99
521.miniswp_t	MPI	240	1	152	10.5	<b>153</b>	<b>10.5</b>	153	10.5	MPI	240	1	152	10.5	<b>153</b>	<b>10.5</b>	153	10.5
528.pot3d_t	MPI	240	1	<b>234</b>	<b>9.10</b>	234	9.09	233	9.10	MPI	240	1	<b>234</b>	<b>9.10</b>	234	9.09	233	9.10
532.sph_exa_t	MPI	240	1	82.4	23.7	82.3	23.7	<b>82.4</b>	<b>23.7</b>	MPI	240	1	82.4	23.7	82.3	23.7	<b>82.4</b>	<b>23.7</b>
534.hpgmgfv_t	MPI	240	1	121	9.71	<b>121</b>	<b>9.72</b>	121	9.74	MPI	240	1	121	9.71	<b>121</b>	<b>9.72</b>	121	9.74
535.weather_t	MPI	240	1	47.8	67.5	48.3	66.8	<b>48.2</b>	<b>66.9</b>	MPI	240	1	47.8	67.5	48.3	66.8	<b>48.2</b>	<b>66.9</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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**Test Date:** Dec-2023  
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**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: 1

### 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: MPI  
Base Ranks Run: 240  
Base Threads Run: 1  
Peak Parallel Models: MPI  
Minimum Peak Ranks: 240  
Maximum Peak Ranks: 240  
Max. Peak Threads: 1  
Min. Peak Threads: 1

## 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 480 GB SATA 2.5" 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



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### 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 532.sph\_exa\_t(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/icpx.cfg  
-----

=====  
CC 505.lbm\_t(base) 513.soma\_t(base) 518.tealeaf\_t(base) 521.miniswp\_t(base)  
534.hpgmgfv\_t(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  
-----

=====  
FC 519.clvleaf\_t(base) 528.pot3d\_t(base) 535.weather\_t(base)  
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ifx (IFORT) 2023.0.0 20221201

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## Compiler Version Notes (Continued)

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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

```
505.lbm_t: -lstdc++ -std=c++14  
513.soma_t: -lstdc++ -std=c++14  
518.tealeaf_t: -lstdc++ -std=c++14  
521.miniswp_t: -lstdc++ -std=c++14  
534.hpgmgfv_t: -lstdc++ -std=c++14
```

## Base Optimization Flags

C benchmarks:

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

C++ benchmarks:

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

Fortran benchmarks:

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



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## Base Other Flags

C benchmarks:

-Wno-incompatible-function-pointer-types

## Peak Optimization Flags

C benchmarks:

505.lbm\_t: basepeak = yes

513.soma\_t: basepeak = yes

518.tealeaf\_t: basepeak = yes

521.miniswp\_t: basepeak = yes

534.hpgmgfv\_t: basepeak = yes

C++ benchmarks:

532.sph\_exa\_t: basepeak = yes

Fortran benchmarks:

519.clvleaf\_t: basepeak = yes

528.pot3d\_t: basepeak = yes

535.weather\_t: basepeak = yes

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)

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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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