



# SPEChpc™ 2021 Tiny Result

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## xFusion

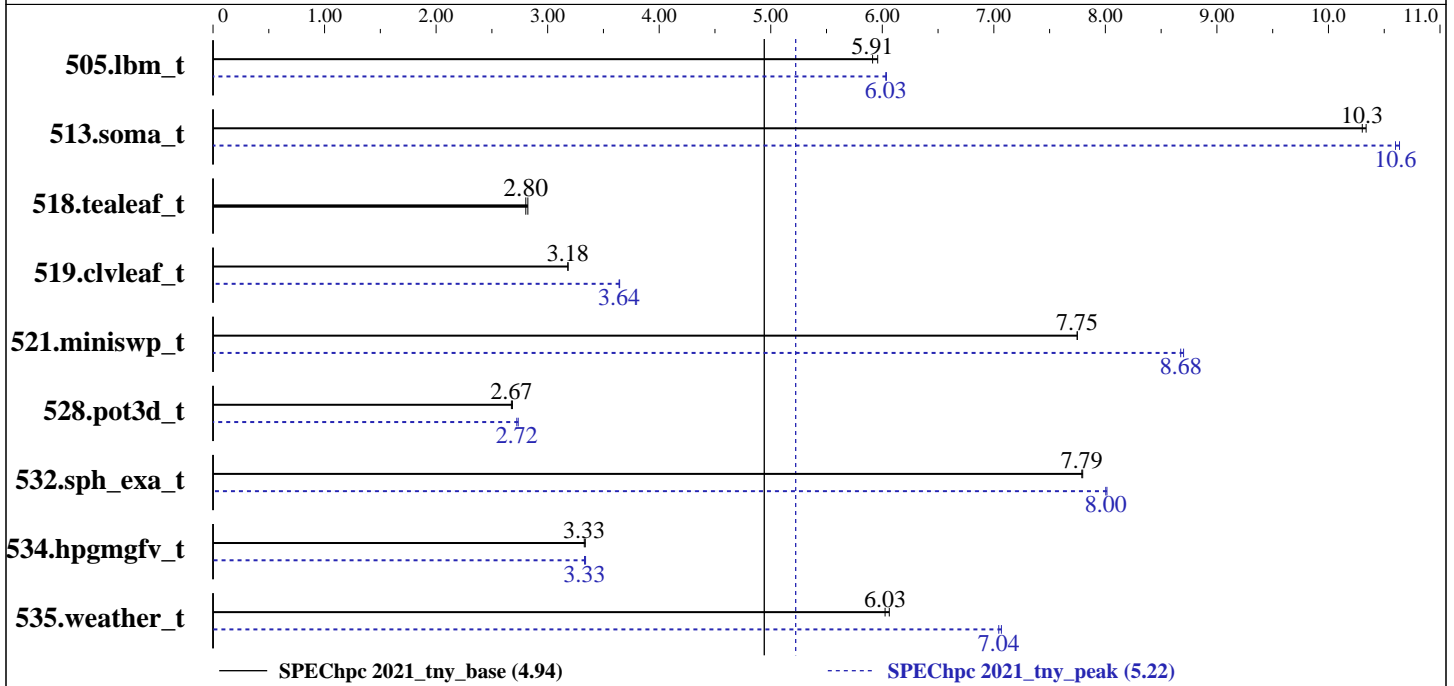
SPEChpc 2021\_tny\_base = 4.94

FusionServer 2288H V6 (Intel Xeon Platinum 8380)

SPEChpc 2021\_tny\_peak = 5.22

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

Test Date: Jul-2022  
Hardware Availability: Apr-2021  
Software Availability: Oct-2021



## 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	OMP	16	10	<b>381</b>	<b>5.91</b>	378	5.96			OMP	4	40	373	6.04	<b>373</b>	<b>6.03</b>		
513.soma_t	OMP	16	10	<b>359</b>	<b>10.3</b>	358	10.3			OMP	2	80	348	10.6	<b>349</b>	<b>10.6</b>		
518.tealeaf_t	OMP	16	10	585	2.82	<b>588</b>	<b>2.80</b>			OMP	16	10	585	2.82	<b>588</b>	<b>2.80</b>		
519.cvlleaf_t	OMP	16	10	518	3.18	<b>519</b>	<b>3.18</b>			OMP	16	10	<b>453</b>	<b>3.64</b>	453	3.65		
521.miniswp_t	OMP	16	10	206	7.75	<b>207</b>	<b>7.75</b>			OMP	4	40	184	8.70	<b>184</b>	<b>8.68</b>		
528.pot3d_t	OMP	16	10	<b>794</b>	<b>2.67</b>	792	2.68			OMP	40	4	777	2.74	<b>780</b>	<b>2.72</b>		
532.sph_exa_t	OMP	16	10	<b>250</b>	<b>7.79</b>	250	7.80			OMP	40	4	243	8.01	<b>244</b>	<b>8.00</b>		
534.hpgmgfv_t	OMP	16	10	352	3.34	<b>353</b>	<b>3.33</b>			OMP	8	20	352	3.34	<b>353</b>	<b>3.33</b>		
535.weather_t	OMP	16	10	<b>535</b>	<b>6.03</b>	532	6.06			OMP	40	4	456	7.07	<b>458</b>	<b>7.04</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: SMP  
Compute Node: FusionServer 2288H V6  
Interconnect: None  
Compute Nodes Used: 1  
Total Chips: 2  
Total Cores: 80  
Total Threads: 160  
Total Memory: 256 GB  
Max. Peak Threads: 80

### Software Summary

Compiler: Intel oneAPI Compiler 2021.4.0  
MPI Library: Intel MPI Library for Linux\* OS, Version 2021.4.0 Build 20210831  
Other MPI Info: --  
Other Software: --  
Base Parallel Model: OMP  
Base Ranks Run: 16  
Base Threads Run: 10  
Peak Parallel Models: OMP  
Minimum Peak Ranks: 2  
Maximum Peak Ranks: 40  
Max. Peak Threads: 80  
Min. Peak Threads: 4

## Node Description: FusionServer 2288H V6

### Hardware

Number of nodes: 1  
Uses of the node: Compute  
Vendor: xFusion  
Model: FusionServer 2288H V6  
CPU Name: Intel Xeon Platinum 8380  
CPU(s) orderable: 1, 2 chips  
Chips enabled: 2  
Cores enabled: 80  
Cores per chip: 40  
Threads per core: 2  
CPU Characteristics: Turbo Boost Technology up to 3.4 GHz  
CPU MHz: 2300  
Primary Cache: 32 KB I + 48 KB D on chip per core  
Secondary Cache: 1.25 MB I+D on chip per core  
L3 Cache: 60 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (16 x 16 GB 2Rx8 PC4-3200R)  
Disk Subsystem: 2 x 480 GB SATA 2.5" SSD (RAID 1)  
Other Hardware: None  
Accel Count: None  
Accel Model: --  
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

### Software

Accelerator Driver: --  
Adapter: MCX653105A-EFAT  
Adapter Driver: 5.4-3.1.0  
Adapter Firmware: 20.32.1010  
Operating System: CentOS Linux release 8.2.2004  
4.18.0-193.el8.x86\_644  
Local File System: xfs  
Shared File System: NFS  
System State: Multi-user, run level 3  
Other Software: None

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### Node Description: FusionServer 2288H V6

#### Hardware (Continued)

Interconnect Type: Mellanox HDR

### Interconnect Description: None

#### Hardware

Vendor: None  
Model: None  
Switch Model: None  
Number of Switches: 0  
Number of Ports: 0  
Data Rate: None  
Firmware: None  
Topology: None  
Primary Use: None

#### Software

: --

### Submit Notes

The config file option 'submit' was used.  
export LD\_PRELOAD="/usr/lib64/libhugetlbfs.so \$LD\_PRELOAD"  
export OMP\_PROC\_BIND=true  
mpiexec.hydra -bootstrap ssh -hostfile \${top}/lnode --bind-to core -np \$ranks -ppn \$ppn -genv OMP\_NUM\_THREADS=\$threads \$command

### Compiler Version Notes

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

Intel(R) oneAPI DPC++/C++ Compiler 2021.4.0 (2021.4.0.20210924)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /home/opt/compiler/oneapi/2021.4.0/compiler/latest/linux/bin  
=====

=====  
CXXC 532.sph\_exa\_t(base, peak)  
=====

Intel(R) oneAPI DPC++/C++ Compiler 2021.4.0 (2021.4.0.20210924)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /home/opt/compiler/oneapi/2021.4.0/compiler/latest/linux/bin  
=====

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### Compiler Version Notes (Continued)

```

=====
FC 519.clvleaf_t(base, peak) 528.pot3d_t(base, peak) 535.weather_t(base,
  peak)
=====
ifx (IFORT) 2021.4.0 Beta 20210924
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.
=====

```

### Base Compiler Invocation

C benchmarks:  
`mpiicc -cc=icx -lstdc++(*)`

C++ benchmarks:  
`mpiicpc -cxx=icx -lstdc++(*)`

Fortran benchmarks:  
`mpiifort -fc=ifx -lstdc++(*)`

(\*) Indicates a compiler flag that was found in a non-compiler variable.

### Base Portability Flags

513.soma\_t: -DSPEC\_NO\_VAR\_ARRAY\_REDUCE

### Base Optimization Flags

C benchmarks:  
`-Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512 -fiopenmp -ansi-alias`

C++ benchmarks:  
`-Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512 -fiopenmp -ansi-alias`

Fortran benchmarks:  
`-Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512 -fiopenmp -nostandard-realloc-lhs -align array64byte`



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## Peak Compiler Invocation

C benchmarks:

```
mpiicc -cc=icx -lstdc++(*)
```

C++ benchmarks:

```
mpiicpc -cxx=icx -lstdc++(*)
```

Fortran benchmarks:

```
mpiifort -fc=ifx -lstdc++(*)
```

(\*) Indicates a compiler flag that was found in a non-compiler variable.

## Peak Portability Flags

```
513.soma_t: -DSPEC_NO_VAR_ARRAY_REDUCE
```

## Peak Optimization Flags

C benchmarks:

```
505.lbm_t: -Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512  
-fiopenmp -ansi-alias
```

```
513.soma_t: Same as 505.lbm_t
```

```
518.tealeaf_t: basepeak = yes
```

```
521.miniswp_t: Same as 505.lbm_t
```

```
534.hpgmgfv_t: -Ofast -ipo -fiopenmp -ansi-alias
```

C++ benchmarks:

```
-Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512 -ffast-math  
-fiopenmp -ansi-alias
```

Fortran benchmarks:

```
519.clvleaf_t: -Ofast -ipo -xCORE-AVX512  
-mllvm -hir-nontemporal-cacheline-count=0 -fiopenmp  
-nostandard-realloc-lhs -align array64byte
```

```
528.pot3d_t: -Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512  
-fiopenmp -nostandard-realloc-lhs -align array64byte
```

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## Peak Optimization Flags (Continued)

535.weather\_t: Same as 519.clvleaf\_t

The flags file that was used to format this result can be browsed at

<http://www.spec.org/hpc2021/flags/Intel-oneAPI-icx2021-official-linux64.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/hpc2021/flags/Intel-oneAPI-icx2021-official-linux64.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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