



SPEChpc™ 2021 Tiny Result

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xFusion

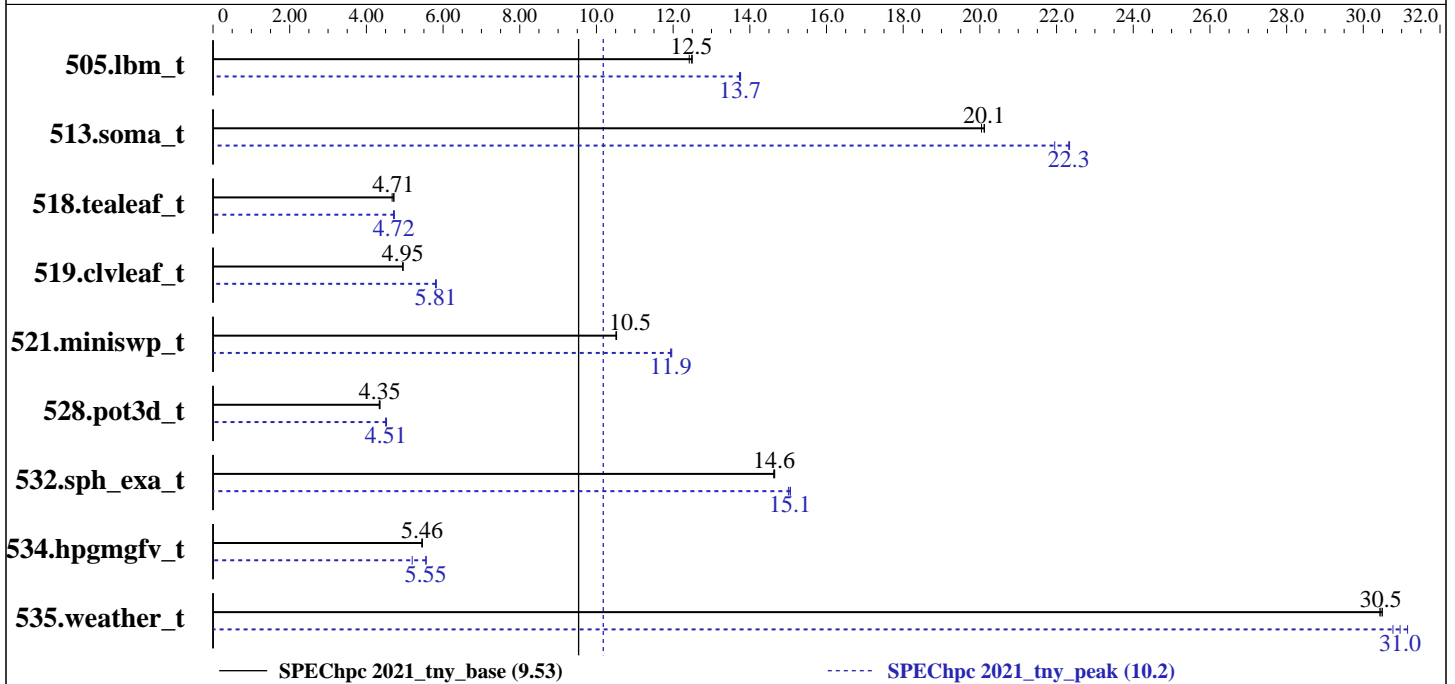
xFusion FusionServer 2288H V7 (Intel Xeon Platinum 8490H)

SPEChpc 2021_tny_base = 9.53

SPEChpc 2021_tny_peak = 10.2

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	OMP	20	12	180	12.5	181	12.4	180	12.5	OMP	60	4	164	13.8	164	13.7	164	13.7
513.soma_t	OMP	20	12	184	20.1	185	20.0	184	20.1	OMP	2	120	166	22.3	169	22.0	166	22.3
518.tealeaf_t	OMP	20	12	353	4.67	350	4.71	350	4.72	OMP	12	20	350	4.71	349	4.73	350	4.72
519.civleaf_t	OMP	20	12	333	4.95	333	4.95	333	4.95	OMP	30	8	284	5.81	283	5.82	284	5.80
521.miniswp_t	OMP	20	12	152	10.5	152	10.5	152	10.5	OMP	4	60	134	11.9	134	12.0	134	11.9
528.pot3d_t	OMP	20	12	488	4.35	489	4.35	490	4.33	OMP	120	2	472	4.51	471	4.51	470	4.53
532.sph_exa_t	OMP	20	12	133	14.6	133	14.6	133	14.6	OMP	30	8	130	15.1	130	15.1	130	15.0
534.hpgmgfv_t	OMP	20	12	216	5.45	215	5.46	215	5.46	OMP	16	15	211	5.56	212	5.55	226	5.19
535.weather_t	OMP	20	12	106	30.4	106	30.5	106	30.5	OMP	40	6	105	30.8	104	31.2	104	31.0

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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: xFusion FusionServer 2288H V7
Interconnect: Mellanox HDR
Node Node: xFusion FusionServer 2288H V7
Compute Nodes Used: 1
Total Chips: 2
Total Cores: 120
Total Threads: 240
Total Memory: 512 GB
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: 20
Base Threads Run: 12
Peak Parallel Models: OMP
Minimum Peak Ranks: 2
Maximum Peak Ranks: 120
Max. Peak Threads: 120
Min. Peak Threads: 2

Node Description: xFusion FusionServer 2288H V7

Hardware

Number of nodes: 1
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



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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, 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 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 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(peak)
-----
ifort (IFORT) 2021.8.0 20221119

```

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Compiler Version Notes (Continued)

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=====
FC 519.clvleaf_t(base) 528.pot3d_t(base, peak) 535.weather_t(base, peak)
=====

ifx (IFORT) 2023.0.0 20221201

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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 -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

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Base Optimization Flags (Continued)

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:

```
mpicc -cc=icx
```

C++ benchmarks:

```
mpicpc -cxx=icpx
```

Fortran benchmarks (except as noted below):

```
mpiifort -fc=ifx
```

```
519.clvleaf_t: mpiifort
```

Peak 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
```

Peak Optimization Flags

C benchmarks:

```
505.lbm_t: -O3 -Ofast -ipo -fiopenmp -xCORE-AVX512
-mprefer-vector-width=512
```

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Peak Optimization Flags (Continued)

505.lbm_t (continued):

-qopt-multiple-gather-scatter-by-shuffles -ffast-math -flto
-funroll-loops

513.soma_t: Same as 505.lbm_t

518.tealeaf_t: Same as 505.lbm_t

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

534.hpgmgfv_t: Same as 505.lbm_t

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:

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

528.pot3d_t: -O3 -Ofast -ipo -fiopenmp -xCORE-AVX512
-mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -ffast-math -flto
-funroll-loops -qopt-streaming-stores=always
-nostandard-realloc-lhs -align array64byte

535.weather_t: -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

Peak Other Flags

C benchmarks:

-Wno-incompatible-function-pointer-types



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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

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

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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