# SPEChpc™ 2021 Tiny Result

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## xFusion

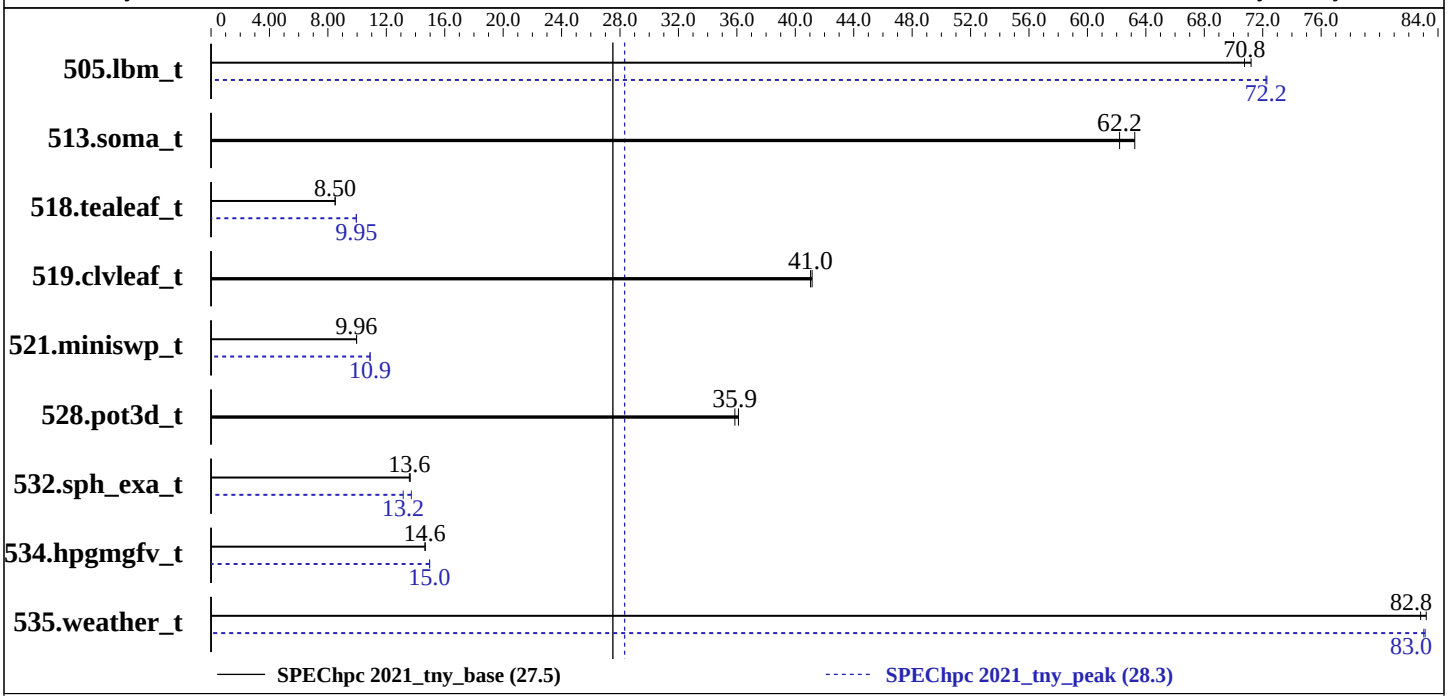
FusionServer G5500 V6 (Intel Xeon Platinum 8380, Nvidia A100-PCIE-80G)

SPEChpc 2021_tny_base = 27.5

SPEChpc 2021_tny_peak = 28.3

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

**Test Date:** Jul-2022
**Hardware Availability:** Apr-2021
**Software Availability:** May-2022




## 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 | ACC | 3 | 1 | 31.6 | 71.2 | **31.8** | **70.8** | | | ACC | 3 | 1 | **31.2** | **72.2** | 31.1 | 72.3 | | |
| 513.soma_t | ACC | 3 | 1 | 58.5 | 63.2 | **59.5** | **62.2** | | | ACC | 3 | 1 | 58.5 | 63.2 | **59.5** | **62.2** | | |
| 518.tealeaf_t | ACC | 3 | 1 | **194** | **8.50** | 194 | 8.50 | | | ACC | 3 | 1 | **166** | **9.95** | 166 | 9.95 | | |
| 519.clvleaf_t | ACC | 3 | 1 | **40.2** | **41.0** | 40.1 | 41.1 | | | ACC | 3 | 1 | **40.2** | **41.0** | 40.1 | 41.1 | | |
| 521.miniswp_t | ACC | 3 | 1 | 161 | 9.97 | **161** | **9.96** | | | ACC | 3 | 1 | 147 | 10.9 | **147** | **10.9** | | |
| 528.pot3d_t | ACC | 3 | 1 | 58.9 | 36.1 | **59.3** | **35.9** | | | ACC | 3 | 1 | 58.9 | 36.1 | **59.3** | **35.9** | | |
| 532.sph_exa_t | ACC | 3 | 1 | 143 | 13.6 | **144** | **13.6** | | | ACC | 3 | 1 | 142 | 13.7 | **148** | **13.2** | | |
| 534.hpgmgfv_t | ACC | 3 | 1 | **80.2** | **14.6** | 80.1 | 14.7 | | | ACC | 3 | 1 | 78.5 | 15.0 | **78.5** | **15.0** | | |
| 535.weather_t | ACC | 3 | 1 | 38.8 | 83.2 | **38.9** | **82.8** | | | ACC | 3 | 1 | 38.8 | 83.1 | **38.8** | **83.0** | | |

**SPEChpc 2021_tny_base = 27.5**

**SPEChpc 2021_tny_peak = 28.3**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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**Test Date:** Jul-2022
**Hardware Availability:** Apr-2021
**Software Availability:** May-2022

### Hardware Summary

| | |
|---|---|
| Type of System: | SMP |
| Compute Node: | FusionServer G5500 V6 |
| Interconnect: | None |
| Compute Nodes Used: | 1 |
| Total Chips: | 2 |
| Total Cores: | 80 |
| Total Threads: | 80 |
| Total Memory: | 1 TB |
| Max. Peak Threads: | 1 |

### Software Summary

| | |
|---|---|
| Compiler: | Nvidia HPC SDK 22.5 |
| MPI Library: | OpenMPI Version 4.0.5, included with NVHPC SDK |
| Other MPI Info: | -- |
| Other Software: | -- |
| Base Parallel Model: | ACC |
| Base Ranks Run: | 3 |
| Base Threads Run: | 1 |
| Peak Parallel Models: | ACC |
| Minimum Peak Ranks: | 3 |
| Maximum Peak Ranks: | 3 |
| Max. Peak Threads: | 1 |
| Min. Peak Threads: | 1 |

## Node Description: FusionServer G5500 V6

### Hardware

| | |
|---|---|
| Number of nodes: | 1 |
| Uses of the node: | compute |
| Vendor: | xFusion |
| Model: | FusionServer G5500 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: | 1 |
| CPU Characteristics: | Intel 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: | 1 TB (16 x 64 GB 2Rx4 PC4-3200A-R) |
| Disk Subsystem: | 1 x 3.2 TB NVMe SSD |
| Other Hardware: | None |
| Accel Count: | 8 |
| Accel Model: | Tesla A100 PCIe 80GB |
| Accel Vendor: | Nvidia Corporation |
| Accel Type: | GPU |
| Accel Connection: | PCIe Gen4 x16 |
| Accel ECC enabled: | Yes |
| Accel Description: | Nvidia Tesla A100 PCIe 80GB |
| Adapter: | None |
| Number of Adapters: | 0 |
| Slot Type: | None |
| Data Rate: | None |
| Ports Used: | 0 |
| Interconnect Type: | None |

### Software

| | |
|---|---|
| Accelerator Driver: | NVIDIA UNIX x86_64 Kernel Module 515.43.04 |
| Adapter: | None |
| Adapter Driver: | None |
| Adapter Firmware: | None |
| Operating System: | CentOS Linux release 8.2.2004<br>4.18.0-193.el8.x86_644 |
| Local File System: | xfs |
| Shared File System: | None |
| System State: | Multi-user, run level 3 |
| Other Software: | None |

# Interconnect Description: None

| Hardware | | Software |
|---|---|---|
| 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 | |

## Submit Notes

```
The config file option 'submit' was used.
MPIRUN_OPTS = --allow-run-as-root --bind-to none
submit = mpirun --allow-run-as-root -x UCX_MEMTYPE_CACHE=n -np $ranks perl $[top]/bind.pl $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)
------------------------------------------------------------------------------
nvc 22.5-0 64-bit target on x86-64 Linux -tp skylake-avx512
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------------------------------------------------------------------------------

==============================================================================
 CXXC 532.sph_exa_t(base, peak)
------------------------------------------------------------------------------
nvc++ 22.5-0 64-bit target on x86-64 Linux -tp skylake-avx512
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------------------------------------------------------------------------------

==============================================================================
 FC  519.clvleaf_t(base, peak) 528.pot3d_t(base, peak) 535.weather_t(base,
     peak)
------------------------------------------------------------------------------
nvfortran 22.5-0 64-bit target on x86-64 Linux -tp skylake-avx512
NVIDIA Compilers and Tools
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------------------------------------------------------------------------------
```

## Base Compiler Invocation

C benchmarks:
`mpicc`

C++ benchmarks:
`mpicxx`

Fortran benchmarks:
`mpif90`

## Base Portability Flags

532.sph_exa_t: `--c++17`

## Base Optimization Flags

C benchmarks:
`-fast -acc=gpu -Mfprelaxed -Mnouniform -Mstack_arrays -DSPEC_ACCEL_AWARE_MPI`

C++ benchmarks:
`-fast -acc=gpu -Mfprelaxed -Mnouniform -Mstack_arrays -DSPEC_ACCEL_AWARE_MPI`

Fortran benchmarks:
`-DSPEC_ACCEL_AWARE_MPI -fast -acc=gpu -Mfprelaxed -Mnouniform -Mstack_arrays`

## Base Other Flags

C benchmarks:
`-w`

C++ benchmarks:
`-w`

Fortran benchmarks:
`-w`

## Peak Compiler Invocation

C benchmarks:
`mpicc`

C++ benchmarks:
`mpicxx`

Fortran benchmarks:
`mpif90`

## Peak Optimization Flags

C benchmarks:

505.lbm_t: `-fast -acc=gpu -O3 -Mfprelaxed -Mnouniform -DSPEC_ACCEL_AWARE_MPI`

513.soma_t: `basepeak = yes`

518.tealeaf_t: `-fast -acc=gpu -Msafeptr -DSPEC_ACCEL_AWARE_MPI`

521.miniswp_t: `-fast -acc=gpu -gpu=pinned`

534.hpgmgfv_t: `-fast -acc=gpu -static-nvidia -DSPEC_ACCEL_AWARE_MPI`

C++ benchmarks:
`-fast -acc=gpu -O3 -Mfprelaxed -Mnouniform -Mstack_arrays -static-nvidia -DSPEC_ACCEL_AWARE_MPI`

Fortran benchmarks:

519.clvleaf_t: `basepeak = yes`

528.pot3d_t: `basepeak = yes`

535.weather_t: `-DSPEC_ACCEL_AWARE_MPI -fast -acc=gpu -O3 -Mfprelaxed -Mnouniform -Mstack_arrays -static-nvidia`

## Peak Other Flags

C benchmarks:
`-w`

**(Continued on next page)**

## Peak Other Flags (Continued)

C++ benchmarks:
`-w`

Fortran benchmarks:
`-w`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/hpc2021/flags/nv2021_flags_v1.0.3.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/hpc2021/flags/nv2021_flags_v1.0.3.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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