



# SPEChpc™ 2021 Tiny Result

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## Transtec

(Test Sponsor: Helmholtz-Zentrum Dresden - Rossendorf)

SPEChpc 2021\_tny\_base = 13.7

SPEChpc 2021\_tny\_peak = Not Run

Hemera: Supermicro SuperServer 1029GQ-TXRT (Intel Xeon Gold 6136, Tesla P100-SXM2-16GB)

hpc2021 License: 065A

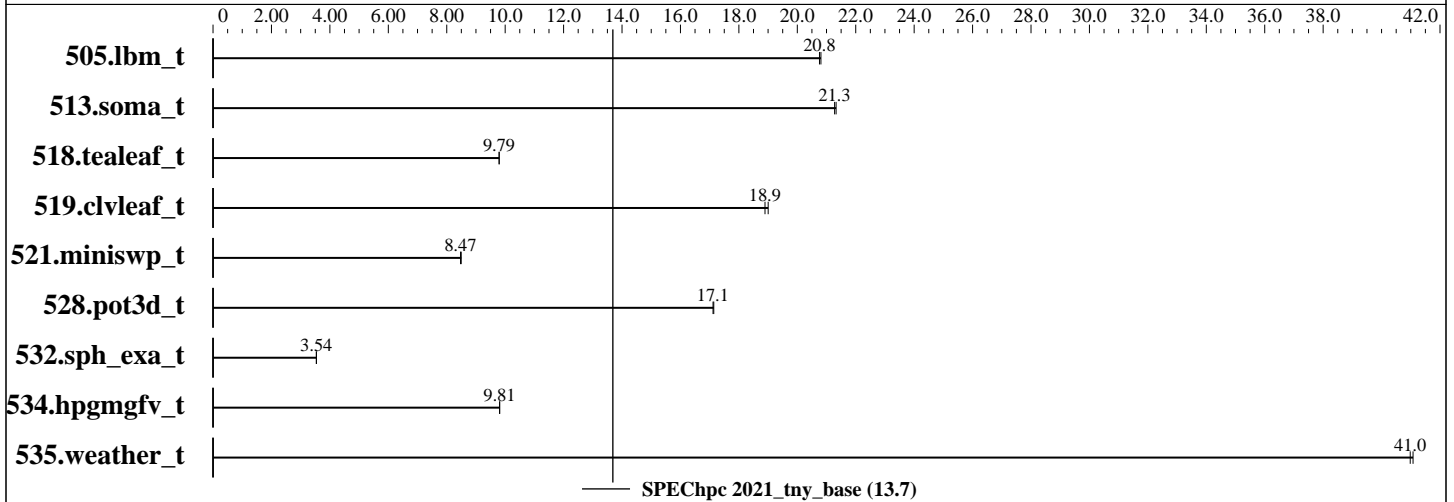
Test Date: Sep-2021

Test Sponsor: Helmholtz-Zentrum Dresden - Rossendorf

Hardware Availability: Jul-2017

Tested by: Helmholtz-Zentrum Dresden - Rossendorf

Software Availability: Jul-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	ACC	4	1	<b>108</b>	<b>20.8</b>	108	20.8											
513.soma_t	ACC	4	1	173	21.3	<b>174</b>	<b>21.3</b>											
518.tealeaf_t	ACC	4	1	168	9.80	<b>168</b>	<b>9.79</b>											
519.clvleaf_t	ACC	4	1	<b>87.3</b>	<b>18.9</b>	86.8	19.0											
521.miniswp_t	ACC	4	1	188	8.50	<b>189</b>	<b>8.47</b>											
528.pot3d_t	ACC	4	1	<b>124</b>	<b>17.1</b>	124	17.1											
532.sph_exa_t	ACC	4	1	551	3.54	<b>551</b>	<b>3.54</b>											
534.hpgmgfv_t	ACC	4	1	<b>120</b>	<b>9.81</b>	120	9.81											
535.weather_t	ACC	4	1	78.5	41.1	<b>78.7</b>	<b>41.0</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: Homogenous Cluster  
 Compute Node: Compute Node  
 Interconnect: Infiniband (EDR)  
 Compute Nodes Used: 1  
 Total Chips: 1  
 Total Cores: 12  
 Total Threads: 12  
 Total Memory: 384 GB  
 Max. Peak Threads: --

### Software Summary

Compiler: C/C++/Fortran: Version 21.7 of NVIDIA HPC SDK for Linux  
 MPI Library: OpenMPI Version 4.0.5  
 Other MPI Info: None  
 Other Software: None  
 Base Parallel Model: ACC  
 Base Ranks Run: 4  
 Base Threads Run: 1  
 Peak Parallel Models: Not Run  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --  
 Max. Peak Threads: --  
 Min. Peak Threads: --

## Node Description: Compute Node

### Hardware

Number of nodes: 1  
 Uses of the node: compute  
 Vendor: Intel  
 Model: SuperServer 1029GQ-TXRT  
 CPU Name: Intel Xeon Gold 6136  
 CPU(s) orderable: 1 chips  
 Chips enabled: 1  
 Cores enabled: 12  
 Cores per chip: 12  
 Threads per core: 1  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.7 GHz  
 CPU MHz: 3000  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 1 MB I+D on chip per core  
 L3 Cache: 25344 KB I+D on chip per chip  
 Other Cache: None  
 Memory: 384 GB (12 x 32GB 2Rx4 PC4-2666V-RB2-12)  
 Disk Subsystem: 1 x 500 GB  
 Other Hardware: None  
 Accel Count: 4  
 Accel Model: Tesla P100-SXM2-16GB  
 Accel Vendor: NVIDIA Corporation  
 Accel Type: GPU  
 Accel Connection: PCIe 3.0 16x  
 Accel ECC enabled: Yes  
 Accel Description: --  
 Adapter: Mellanox MT4115  
 Number of Adapters: 2  
 Slot Type: PCI-Express 3.0 x16  
 Data Rate: 100 Gb/s  
 Ports Used: 2

### Software

Accelerator Driver: --  
 Adapter: Mellanox MT4115  
 Adapter Driver: --  
 Adapter Firmware: 12.28.2006  
 Operating System: CentOS Linux release 7.9.2009 (Core)  
 3.10.0-1160.6.1.el7.x86\_64  
 Local File System: xfs  
 Shared File System: GPFS Version 5.0.5.0  
 6 NSD (vendor: NEC)  
 5 building blocks (vendor: NetApp):  
 2x (240 x 8 TB HDD)  
 1x (180 x 12 TB HDD)  
 1x (240 x 16 TB HDD)  
 1x (120 x 16 TB HDD)  
 System State: Multi-user, run level 3  
 Other Software: None

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## Node Description: Compute Node

### Hardware (Continued)

Interconnect Type: EDR Infiniband

## Interconnect Description: Infiniband (EDR)

### Hardware

Vendor: Mellanox Technologies  
Model: Mellanox SB7790  
Switch Model: 36 x EDR 100 Gb/s  
Number of Switches: 2  
Number of Ports: 36  
Data Rate: 100 Gb/s  
Firmware: --  
Topology: Mesh (blocking factor: 8:1)  
Primary Use: MPI Traffic, GPFS

### Software

: --

## Submit Notes

The config file option 'submit' was used.

MPI startup command:

```
mpirun --bind-to socket -np $ranks ${top}/mpirunCUDA.sh $command
contents of ${top}/mpirunCUDA.sh
#!/bin/bash
export CUDA_VISIBLE_DEVICES=${OMPI_COMM_WORLD_LOCAL_RANK}
$@
```

## Compiler Version Notes

```
=====  
CC 505.lbm_t(base) 513.soma_t(base) 518.tealeaf_t(base) 521.miniswp_t(base)  
534.hpgmgfv_t(base)  
=====
```

```
nvc 21.7-0 64-bit target on x86-64 Linux -tp skylake  
NVIDIA Compilers and Tools  
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=====
```

```
=====  
CXXC 532.sph_exa_t(base)  
=====
```

```
nvc++ 21.7-0 64-bit target on x86-64 Linux -tp skylake  
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```

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## Compiler Version Notes (Continued)

FC 519.clvleaf\_t(base) 528.pot3d\_t(base) 535.weather\_t(base)

nvfortran 21.7-0 64-bit target on x86-64 Linux -tp skylake

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:

-Mfprelaxed -Mnouniform -Mstack\_arrays -fast -acc=gpu -Minfo=accel  
-DSPEC\_ACCEL\_AWARE\_MPI

C++ benchmarks:

-Mfprelaxed -Mnouniform -Mstack\_arrays -fast -acc=gpu -Minfo=accel  
-DSPEC\_ACCEL\_AWARE\_MPI

Fortran benchmarks:

-DSPEC\_ACCEL\_AWARE\_MPI -Mfprelaxed -Mnouniform -Mstack\_arrays -fast  
-acc=gpu -Minfo=accel



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## Base Other Flags

C benchmarks:

-w

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.html](http://www.spec.org/hpc2021/flags/nv2021_flags.html)

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

[http://www.spec.org/hpc2021/flags/nv2021\\_flags.xml](http://www.spec.org/hpc2021/flags/nv2021_flags.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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