



SPEChpc™ 2021 Tiny Result

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Dell Inc.

(Test Sponsor: Texas Advanced Computing Center)

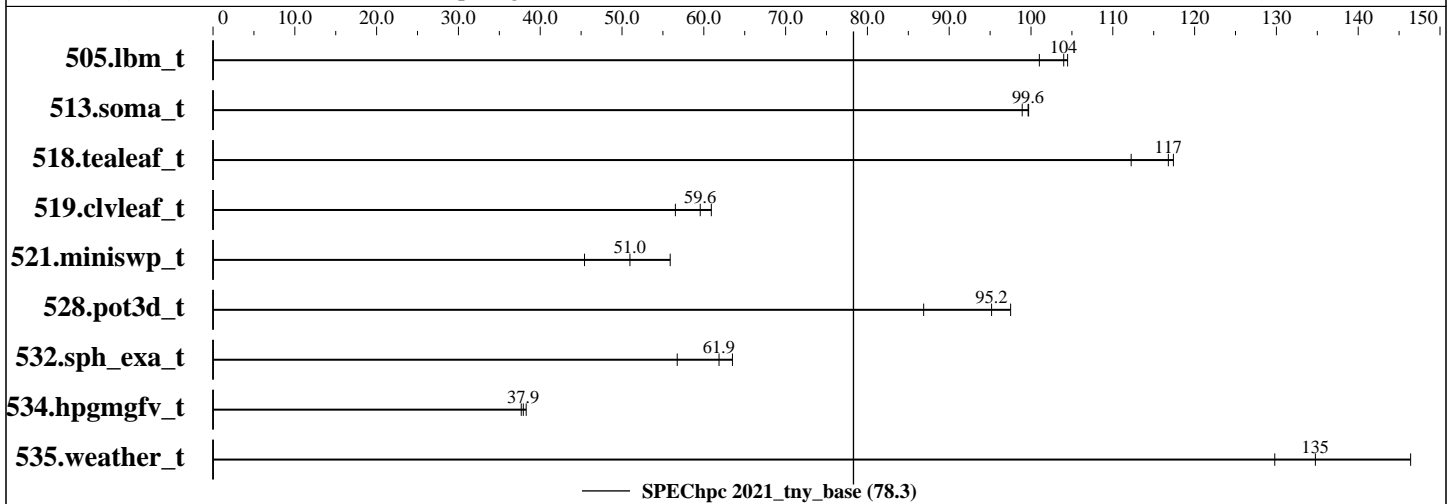
SPEChpc 2021_tny_base = 78.3

Frontera: PowerEdge C6420 (Intel Xeon Platinum 8280)

SPEChpc 2021_tny_peak = Not Run

hpc2021 License: 6340
Test Sponsor: Texas Advanced Computing Center
Tested by: Texas Advanced Computing Center

Test Date: Sep-2021
Hardware Availability: Jun-2019
Software Availability: Dec-2020



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	64	28	22.3	101	<u>21.6</u>	<u>104</u>	21.5	104									
513.soma_t	OMP	64	28	37.4	98.9	<u>37.1</u>	<u>99.6</u>	37.1	99.7									
518.tealeaf_t	OMP	64	28	14.7	112	<u>14.1</u>	<u>117</u>	14.1	117									
519.clvleaf_t	OMP	64	28	27.1	60.9	<u>27.7</u>	<u>59.6</u>	29.2	56.5									
521.miniswp_t	OMP	64	28	<u>31.4</u>	<u>51.0</u>	28.6	55.9	35.2	45.4									
528.pot3d_t	OMP	64	28	21.8	97.5	<u>22.3</u>	<u>95.2</u>	24.5	86.9									
532.sph_exa_t	OMP	64	28	34.4	56.7	30.7	63.5	<u>31.5</u>	<u>61.9</u>									
534.hpgmgfv_t	OMP	64	28	30.7	38.3	<u>31.0</u>	<u>37.9</u>	31.2	37.7									
535.weather_t	OMP	64	28	24.8	130	22.0	146	<u>23.9</u>	<u>135</u>									

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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: PowerEdge C6420
Interconnect: InfiniBand
Compute Nodes Used: 32
Total Chips: 64
Total Cores: 1792
Total Threads: 1792
Total Memory: 6 TB
Max. Peak Threads: --

Software Summary

Compiler: C/C++/Fortran: Version 2020 Update 4 of Intel Compilers for Linux
MPI Library: Intel MPI Library 2019 Update 9 for Linux
Other MPI Info: None
Other Software: None
Base Parallel Model: OMP
Base Ranks Run: 64
Base Threads Run: 28
Peak Parallel Models: Not Run
Minimum Peak Ranks: --
Maximum Peak Ranks: --
Max. Peak Threads: --
Min. Peak Threads: --

Node Description: PowerEdge C6420

Hardware

Number of nodes: 32
Uses of the node: compute
Vendor: Dell Inc.
Model: PowerEdge C6420
CPU Name: Intel Xeon Platinum 8280
CPU(s) orderable: 1 chips
Chips enabled: 2
Cores enabled: 56
Cores per chip: 28
Threads per core: 1
CPU Characteristics: Turbo up to 4.0 GHz
CPU MHz: 2700
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 1 MB I+D on chip per core
L3 Cache: 38.5 MB I+D on chip per chip
Other Cache: None
Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2933Y-R)
Disk Subsystem: 1x 240GB SATA SSD
Other Hardware: None
Accel Count: --
Accel Model: --
Accel Vendor: --
Accel Type: --
Accel Connection: --
Accel ECC enabled: --
Accel Description: --
Adapter: NVIDIA ConnectX-6 VPI Infiniband Adapter Card
Number of Adapters: 1
Slot Type: PCIe 3.0 x16
Data Rate: 100Gb/s
Ports Used: 1

Software

Accelerator Driver: --
Adapter: NVIDIA ConnectX-6 VPI Infiniband Adapter Card
Adapter Driver: 5.1-2.5.8.0
Adapter Firmware: 20.25.7020
Operating System: CentOS Linux release 7.8.2003
3.10.0-1127.19.1.el7.x86_64
Local File System: xfs
Shared File System: 10.6 PB Lustre (DDN SFA18K) over Infiniband HDR100
System State: Multi-user, run level 3
Other Software: None

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Node Description: PowerEdge C6420

Hardware (Continued)

Interconnect Type: Infiniband HDR100

Interconnect Description: InfiniBand

Hardware

Vendor: NVIDIA
Model: NVIDIA Infiniband HDR
Switch Model: Quantum CS8500 HDR Modular Switch
Number of Switches: 6
Number of Ports: 600
Data Rate: 200 Gb/s
Firmware: 27.2000.1386
Switch Model: Quantum QM8790 HDR Edge Switch
Number of Switches: 202
Number of Ports: 40
Data Rate: 200 Gb/s
Firmware: 27.2008.2102
Topology: Fat Tree (blocking factor 22:18)
Primary Use: MPI traffic and Lustre access

Software

: --

Submit Notes

The config file option 'submit' was used.
mpirun -np \$ranks -ppn 2 \$command

General Notes

Environment settings:
ulimit -s unlimited

Compiler Version Notes

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

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.3.304 Build 20200925_000000
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Compiler Version Notes (Continued)

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

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.3.304 Build 20200925_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
=====

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

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.1.3.304 Build 20200925_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
=====

Base Compiler Invocation

C benchmarks:
mpiicc

C++ benchmarks:
mpiicpc

Fortran benchmarks:
mpiifort

Base Portability Flags

505.lbm_t: -std=gnull
513.soma_t: -DSPEC_NO_VAR_ARRAY_REDUCE -std=gnull
518.tealeaf_t: -std=gnull
521.miniswp_t: -DUSE_KBA -DUSE_ACCELDIR -std=gnull
532.sph_exa_t: -DSPEC_USE_LT_IN_KERNELS -std=c++11
534.hpgmgfv_t: -std=gnull

Base Optimization Flags

C benchmarks:
-O3 -no-prec-div -fp-model fast=2 -xCORE-AVX512 -ipo -qopenmp
-ansi-alias

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Base Optimization Flags (Continued)

C++ benchmarks:

```
-O3 -no-prec-div -fp-model fast=2 -xCORE-AVX512 -ipo -qopenmp  
-ansi-alias
```

Fortran benchmarks:

```
-O3 -no-prec-div -fp-model fast=2 -xCORE-AVX512 -ipo -qopenmp
```

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

http://www.spec.org/hpc2021/flags/Intel-ic2021-official-linux64_revA.html

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

http://www.spec.org/hpc2021/flags/Intel-ic2021-official-linux64_revA.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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