



# SPEChpc™ 2021 Tiny Result

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## Lenovo Global Technology

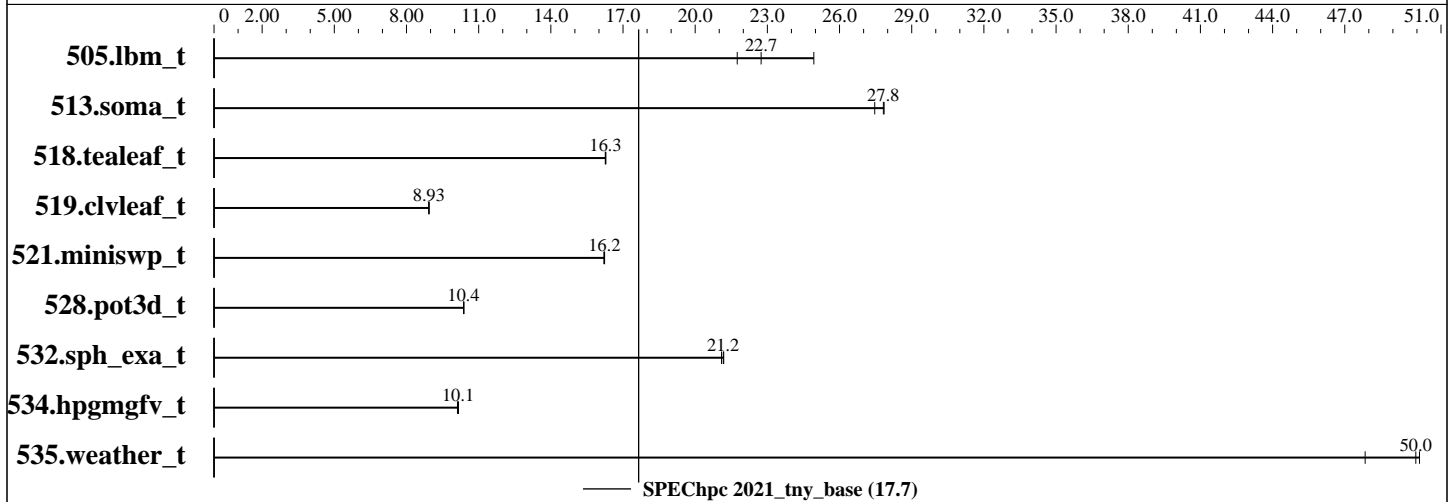
SPEChpc 2021\_tny\_base = 17.7

## ThinkSystem SR665 (AMD EPYC 7763)

SPEChpc 2021\_tny\_peak = Not Run

**hpc2021 License:** 28  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology

**Test Date:** Aug-2021  
**Hardware Availability:** Mar-2021  
**Software Availability:** Oct-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	48	8	<b>98.9</b>	<b>22.7</b>	103	21.7	90.2	24.9									
513.soma_t	OMP	48	8	<b>133</b>	<b>27.8</b>	133	27.9	135	27.5									
518.tealeaf_t	OMP	48	8	101	16.3	101	16.3	<b>101</b>	<b>16.3</b>									
519.clvleaf_t	OMP	48	8	<b>185</b>	<b>8.93</b>	185	8.93	185	8.94									
521.miniswp_t	OMP	48	8	<b>98.6</b>	<b>16.2</b>	98.7	16.2	98.6	16.2									
528.pot3d_t	OMP	48	8	205	10.4	<b>205</b>	<b>10.4</b>	205	10.4									
532.sph_exa_t	OMP	48	8	<b>92.1</b>	<b>21.2</b>	92.0	21.2	92.4	21.1									
534.hpgmgfv_t	OMP	48	8	116	10.1	<b>116</b>	<b>10.1</b>	116	10.2									
535.weather_t	OMP	48	8	<b>64.6</b>	<b>50.0</b>	67.4	47.8	64.4	50.1									

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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  
Compute Node: ThinkSystem SR665  
Interconnect: Nvidia Mellanox ConnectX-6 HDR  
File Server Node: ThinkSystem SR665  
Compute Nodes Used: 3  
Total Chips: 6  
Total Cores: 384  
Total Threads: 384  
Total Memory: 1536 GB  
Max. Peak Threads: --

### Software Summary

Compiler: Intel C/C++/Fortran Compiler 20.4  
MPI Library: Open MPI 4.0.5  
Other MPI Info: --  
Other Software: --  
Base Parallel Model: OMP  
Base Ranks Run: 48  
Base Threads Run: 8  
Peak Parallel Models: Not Run  
Minimum Peak Ranks: --  
Maximum Peak Ranks: --  
Max. Peak Threads: --  
Min. Peak Threads: --

## Node Description: ThinkSystem SR665

### Hardware

Number of nodes: 3  
Uses of the node: Compute  
Vendor: Lenovo Global Technology  
Model: ThinkSystem SR665  
CPU Name: AMD EPYC 7763  
CPU(s) orderable: 1,2 chips  
Chips enabled: 2  
Cores enabled: 128  
Cores per chip: 64  
Threads per core: 1  
CPU Characteristics: Max Boost Clock up to 3.5 GHz  
CPU MHz: 2450  
Primary Cache: 32 KB I + 32 KB D on chip per core  
Secondary Cache: 512 KB I+D on chip per core  
L3 Cache: 256 MB I+D on chip per chip  
32 MB shared / 8 cores  
Other Cache: None  
Memory: 512 GB (16 x 32 GB 2Rx8 PC4-3200A-R)  
Disk Subsystem: 1 x 480 GB 2.5" SSD  
Other Hardware: None  
Accel Count: --  
Accel Model: --  
Accel Vendor: --  
Accel Type: --  
Accel Connection: --  
Accel ECC enabled: --  
Accel Description: --  
Adapter: Mellanox ConnectX-6 HDR  
Number of Adapters: 1  
Slot Type: PCI-Express 4.0 x16  
Data Rate: 200 Gb/s  
Ports Used: 1

### Software

Accelerator Driver: --  
Adapter: Mellanox ConnectX-6 HDR  
Adapter Driver: 5.2-1.0.4  
Adapter Firmware: 20.28.1002  
Operating System: Red Hat Enterprise Linux Server release 8.3,  
Kernel 4.18.0-193.el8.x86\_64  
Local File System: xfs  
Shared File System: NFS  
System State: Multi-user, run level 3  
Other Software: None

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### Node Description: ThinkSystem SR665

#### Hardware (Continued)

Interconnect Type: Nvidia Mellanox ConnectX-6 HDR

### Node Description: ThinkSystem SR665

#### Hardware

Number of nodes: 1  
Uses of the node: Fileserver  
Vendor: Lenovo Global Technology  
Model: ThinkSystem SR665  
CPU Name: AMD EPYC 7763  
CPU(s) orderable: 1,2 chips  
Chips enabled: 2  
Cores enabled: 128  
Cores per chip: 64  
Threads per core: 1  
CPU Characteristics: Max Boost Clock up to 3.5 GHz  
CPU MHz: 2450  
Primary Cache: 32 KB I + 32 KB D on chip per core  
Secondary Cache: 512 KB I+D on chip per core  
L3 Cache: 256 MB I+D on chip per chip  
32 MB shared / 8 cores  
Other Cache: None  
Memory: 512 GB (16 x 32 GB 2Rx8 PC4-3200A-R)  
Disk Subsystem: 1 x 480 GB 2.5" SSD  
Other Hardware: None  
Accel Count: --  
Accel Model: --  
Accel Vendor: --  
Accel Type: --  
Accel Connection: --  
Accel ECC enabled: --  
Accel Description: --  
Adapter: Mellanox ConnectX-6 HDR  
Number of Adapters: 1  
Slot Type: PCI-Express 4.0 x16  
Data Rate: 200 Gb/s  
Ports Used: 1  
Interconnect Type: Nvidia Mellanox ConnectX-6 HDR

#### Software

Accelerator Driver: --  
Adapter: Mellanox ConnectX-6 HDR  
Adapter Driver: 5.2-1.0.4  
Adapter Firmware: 20.28.1002  
Operating System: Red Hat Enterprise Linux Server release 8.3  
Local File System: xfs  
Shared File System: N/A  
System State: Multi-User, run level 3  
Other Software: None



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### Interconnect Description: Nvidia Mellanox ConnectX-6 HDR

#### Hardware

#### Software

Vendor: Nvidia : --  
Model: Nvidia Mellanox ConnectX-6 HDR  
Switch Model: QM8700 Series  
Number of Switches: 1  
Number of Ports: 40  
Data Rate: 200 Gb/s  
Firmware: 3.9.0606  
Topology: Mesh  
Primary Use: MPI Traffic, NFS Access

### Submit Notes

The config file option 'submit' was used.  
submit = mpirun \${MPIRUN\_OPTS} --allow-run-as-root --oversubscribe  
--bind-to numa -map-by numa  
-mca coll\_hcoll\_enable 1 -x HCOLL\_ENABLE\_NBC=1  
-x HCOLL\_MAIN\_IB=mlx5\_0:1 -mca pml ucx  
-hostfile /home/HPC2021K35/config/6nodes -npernode 128 -np \$ranks \$command

### General Notes

Environment variables set by runhpc before the start of the run:  
UCX\_MEMTYPE\_CACHE = "n"  
UCX\_TLS = "self,shm,cuda\_copy"

### 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  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
icc: NOTE: The evaluation period for this product ends on 11-may-2021 UTC.  
-----

=====  
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

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## Compiler Version Notes (Continued)

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
icpc: NOTE: The evaluation period for this product ends on 11-may-2021 UTC.

=====

```
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.
ifort: NOTE: The evaluation period for this product ends on 11-may-2021 UTC.
```

## Base Compiler Invocation

C benchmarks:  
mpicc

C++ benchmarks:  
mpicxx

Fortran benchmarks:  
mpifort

## Base Portability Flags

```
513.soma_t: -DSPEC_NO_VAR_ARRAY_REDUCE
521.miniswp_t: -DUSE_KBA -DUSE_ACCELDIR
532.sph_exa_t: -DSPEC_USE_LT_IN_KERNELS
```

## Base Optimization Flags

C benchmarks:  
-Ofast -no-prec-div -march=core-avx2 -ipo -qopenmp -ansi-alias

C++ benchmarks:  
-Ofast -no-prec-div -march=core-avx2 -ipo -qopenmp -ansi-alias

Fortran benchmarks:  
-Ofast -no-prec-div -march=core-avx2 -ipo -qopenmp



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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.2021-10-20.html](http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2021-10-20.html)

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

[http://www.spec.org/hpc2021/flags/Intel\\_compiler\\_flags.2021-10-20.xml](http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2021-10-20.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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