SPEChpc™ 2021 Tiny Result

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Lenovo Global Technology

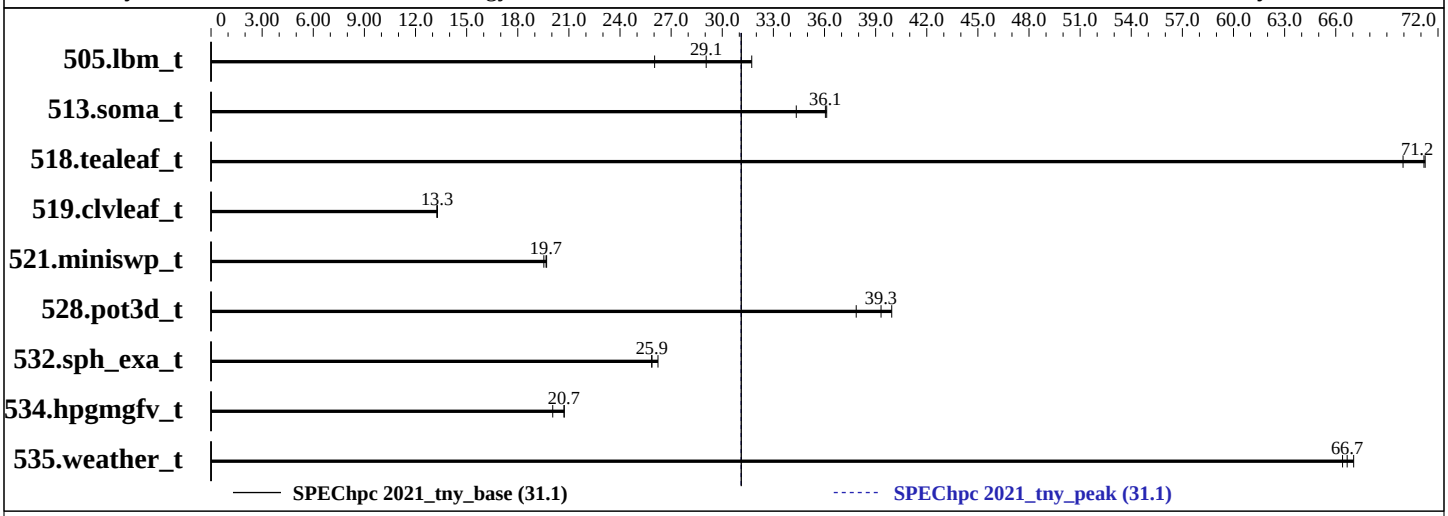
ThinkSystem SR665 (AMD EPYC 7773X)

SPEChpc 2021_tny_base = 31.1

SPEChpc 2021_tny_peak = 31.1

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

Test Date: Jul-2022
Hardware Availability: Jul-2022
Software Availability: Jul-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	OMP	64	8	86.4	26.0	**77.4**	**29.1**	70.9	31.7	OMP	64	8	86.4	26.0	**77.4**	**29.1**	70.9	31.7
513.soma_t	OMP	64	8	102	36.1	**103**	**36.1**	108	34.3	OMP	64	8	102	36.1	**103**	**36.1**	108	34.3
518.tealeaf_t	OMP	64	8	23.6	69.9	**23.2**	**71.2**	23.2	71.2	OMP	64	8	23.6	69.9	**23.2**	**71.2**	23.2	71.2
519.clvleaf_t	OMP	64	8	124	13.3	124	13.3	**124**	**13.3**	OMP	64	8	124	13.3	124	13.3	**124**	**13.3**
521.miniswp_t	OMP	64	8	81.2	19.7	**81.4**	**19.7**	81.9	19.5	OMP	64	8	81.2	19.7	**81.4**	**19.7**	81.9	19.5
528.pot3d_t	OMP	64	8	53.2	39.9	**54.0**	**39.3**	56.1	37.9	OMP	64	8	53.2	39.9	**54.0**	**39.3**	56.1	37.9
532.sph_exa_t	OMP	64	8	74.3	26.2	75.4	25.9	**75.4**	**25.9**	OMP	64	8	74.3	26.2	75.4	25.9	**75.4**	**25.9**
534.hpgmgfv_t	OMP	64	8	56.7	20.7	**56.7**	**20.7**	58.6	20.1	OMP	64	8	56.7	20.7	**56.7**	**20.7**	58.6	20.1
535.weather_t	OMP	64	8	48.6	66.4	48.1	67.1	**48.4**	**66.7**	OMP	64	8	48.6	66.4	48.1	67.1	**48.4**	**66.7**

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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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Test Date: Jul-2022
Hardware Availability: Jul-2022
Software Availability: Jul-2022

Hardware Summary

Type of System:	Homogenous
Compute Node:	ThinkSystem SR665
Interconnect:	Nvidia Mellanox ConnectX-6 HDR
Compute Nodes Used:	4
Total Chips:	8
Total Cores:	512
Total Threads:	1024
Total Memory:	4 TB
Max. Peak Threads:	8

Software Summary

Compiler:	Intel C/C++/Fortran Compiler 2021.5.0
MPI Library:	Open MPI 4.0.5
Other MPI Info:	--
Other Software:	--
Base Parallel Model:	OMP
Base Ranks Run:	64
Base Threads Run:	8
Peak Parallel Models:	OMP
Minimum Peak Ranks:	64
Maximum Peak Ranks:	64
Max. Peak Threads:	8
Min. Peak Threads:	8

Node Description: ThinkSystem SR665

Hardware

Number of nodes:	4
Uses of the node:	Compute
Vendor:	Lenovo Global Technology
Model:	ThinkSystem SR665
CPU Name:	AMD EPYC 7773X
CPU(s) orderable:	1,2 chips
Chips enabled:	2
Cores enabled:	128
Cores per chip:	64
Threads per core:	2
CPU Characteristics:	Max Boost Clock up to 3.5 GHz
CPU MHz:	2200
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	768 MB I+D on chip per chip 96 MB shared / 8 cores
Other Cache:	None
Memory:	1 TB (16 x 64 GB 2Rx4 PC4-3200A-R)
Disk Subsystem:	1x ThinkSystem 2.5" 5300 480GB 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 Gbits/s
Ports Used:	1

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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 8.5, Kernel 4.18.0-348.el8.x86_64
Local File System:	xfs
Shared File System:	NFS
System State:	Multi-user, run level 3
Other Software:	None

Node Description: ThinkSystem SR665

Hardware (Continued)

Interconnect Type: Nvidia Mellanox ConnectX-6 HDR

Interconnect Description: Nvidia Mellanox ConnectX-6 HDR

Hardware

Vendor:	Nvidia
Model:	Nvidia Mellanox ConnectX-6 HDR
Switch Model:	QM8700
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

Software

: --

Submit Notes

```
The config file option 'submit' was used.
submit = mpirun --allow-run-as-root  --oversubscribe -genv coll_hcoll_enable 1
-x HCOLL_ENABLE_NBC=1 -x HCOLL_MAIN_IB=mlx5_0:1 -mca pml ucx
-hostfile /home/HPC2021F1.0.1/config/4nodes --map-by ppr:16:node:pe=8
```

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 Classic for applications running on Intel(R)
  64, Version 2021.5.0 Build 20211109_000000
Copyright (C) 1985-2021 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 CXXC 532.sph_exa_t(base)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on
  Intel(R) 64, Version 2021.5.0 Build 20211109_000000
Copyright (C) 1985-2021 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
```

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Compiler Version Notes (Continued)

```
 FC  519.clvleaf_t(base) 528.pot3d_t(base) 535.weather_t(base)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
  Intel(R) 64, Version 2021.5.0 Build 20211109_000000
Copyright (C) 1985-2021 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`mpicc`

C++ benchmarks:
`mpicxx`

Fortran benchmarks:
`mpifort`

Base Portability Flags

513.soma_t: `-DSPEC_NO_VAR_ARRAY_REDUCE`

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`

Peak Optimization Flags

C benchmarks:

505.lbm_t: `basepeak = yes`

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Peak Optimization Flags (Continued)

513.soma_t: `basepeak = yes`

518.tealeaf_t: `basepeak = yes`

521.miniswp_t: `basepeak = yes`

534.hpgmgfv_t: `basepeak = yes`

C++ benchmarks:

532.sph_exa_t: `basepeak = yes`

Fortran benchmarks:

519.clvleaf_t: `basepeak = yes`

528.pot3d_t: `basepeak = yes`

535.weather_t: `basepeak = yes`

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`

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`

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

Tested with SPEChpc2021 v1.0.1 on 2022-07-07 03:19:43-0400.
Report generated on 2022-07-26 12:16:21 by hpc2021 PS formatter v1.0.3.
Originally published on 2022-07-26.