



SPEChpc™ 2021 Medium Result

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Lenovo Global Technology

SPEChpc 2021_med_base = 0.4817

ThinkSystem SR665 V3 (AMD EPYC 9654)

SPEChpc 2021_med_peak = 0.4865

hpc2021 License: 28

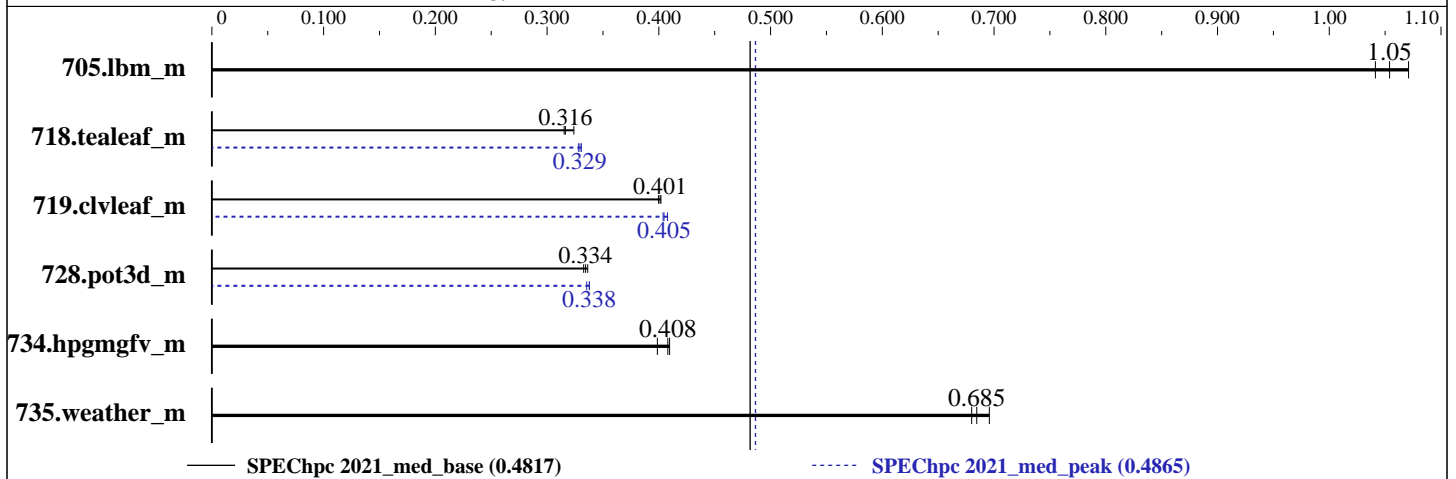
Test Date: Jan-2023

Test Sponsor: Lenovo Global Technology

Hardware Availability: Nov-2022

Tested by: Lenovo Global Technology

Software Availability: Nov-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
705.lbm_m	OMP	144	8	1144	1.07	1162	1.05	1176	1.04	OMP	144	8	1144	1.07	1162	1.05	1176	1.04
718.tealeaf_m	OMP	144	8	4267	0.316	4282	0.315	4167	0.324	OMP	288	4	4116	0.328	4082	0.331	4098	0.329
719.clvleaf_m	OMP	144	8	4612	0.401	4603	0.402	4629	0.400	OMP	288	4	4537	0.408	4572	0.405	4582	0.404
728.pot3d_m	OMP	144	8	5531	0.334	5500	0.336	5560	0.333	OMP	288	4	5515	0.335	5476	0.338	5477	0.338
734.hpgmgfv_m	OMP	144	8	2508	0.399	2441	0.410	2451	0.408	OMP	144	8	2508	0.399	2441	0.410	2451	0.408
735.weather_m	OMP	144	8	3530	0.680	3506	0.685	3449	0.696	OMP	144	8	3530	0.680	3506	0.685	3449	0.696

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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: ThinkSystem SR665 V3
Interconnect: Nvidia Mellanox ConnectX-6 HDR
Compute Nodes Used: 6
Total Chips: 12
Total Cores: 1152
Total Threads: 2304
Total Memory: 9 TB
Max. Peak Threads: 8

Software Summary

Compiler: Intel oneAPI Compiler 2022.1.0
MPI Library: Intel MPI Library for Linux OS, Build 20220227
Other MPI Info: --
Other Software: --
Base Parallel Model: OMP
Base Ranks Run: 144
Base Threads Run: 8
Peak Parallel Models: OMP
Minimum Peak Ranks: 144
Maximum Peak Ranks: 288
Max. Peak Threads: 8
Min. Peak Threads: 4

Node Description: ThinkSystem SR665 V3

Hardware

Number of nodes: 6
Uses of the node: Compute
Vendor: Lenovo Global Technology
Model: ThinkSystem SR665 V3
CPU Name: AMD EPYC 9654
CPU(s) orderable: 1,2 chips
Chips enabled: 2
Cores enabled: 192
Cores per chip: 96
Threads per core: 2
CPU Characteristics: Max Boost Clock up to 3.7 GHz
CPU MHz: 2400
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 1 MB I+D on chip per core
L3 Cache: 384 MB I+D on chip per chip
32 MB shared / 8 cores
Other Cache: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-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: Nvidia 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: Nvidia Mellanox ConnectX-6 HDR
Adapter Driver: 5.7-1.0.2
Adapter Firmware: 20.28.1002
Operating System: Red Hat Enterprise Linux Server release 8.6,
Kernel 4.18.0-372.9.1.el8.x86_64
Local File System: xfs
Shared File System: None
System State: Multi-user, run level 3
Other Software: None

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Node Description: ThinkSystem SR665 V3

Hardware (Continued)

Interconnect Type: 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 = mpiexec -hostfile ${top}/6nodes -np ranks -genv OMP_NUM_THREADS=$threads -ppn % {NRNK} $command
```

Compiler Version Notes

```
=====
FC 719.clvleaf_m(base, peak) 728.pot3d_m(base, peak) 735.weather_m(base,
peak)
-----
```

```
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
ifx: command line error: no files specified; for help type "ifx -help"
-----
```

```
=====
CC 705.lbm_m(base, peak) 718.tealeaf_m(base, peak) 734.hpgmgfv_m(base,
peak)
-----
```

```
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
clang: warning: -Z-reserved-lib-stdc++: 'linker' input unused
[-Wunused-command-line-argument]
-----
```



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Base Compiler Invocation

C benchmarks:

mpiicc -cc=icx

Fortran benchmarks:

mpiifort -fc=ifx

Base Portability Flags

705.lbm_m: -lstdc++
718.tealeaf_m: -lstdc++
719.cvlleaf_m: -lstdc++
728.pot3d_m: -lstdc++
734.hpgmgfv_m: -lstdc++
735.weather_m: -lstdc++

Base Optimization Flags

C benchmarks:

-Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp
-ansi-alias

Fortran benchmarks:

-Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp
-nostandard-realloc-lhs -align array64byte

Base Other Flags

C benchmarks (except as noted below):

-Ispecmpitime

734.hpgmgfv_m: -Ispecmpitime

Fortran benchmarks:

719.cvlleaf_m: -Ispecmpitime



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Peak Compiler Invocation

C benchmarks:

mpiicc -cc=icx

Fortran benchmarks:

mpiifort -fc=ifx

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

705.lbm_m: basepeak = yes

718.tealeaf_m: -Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo
-fiopenmp -ansi-alias

734.hpgmgfv_m: basepeak = yes

Fortran benchmarks:

719.clvleaf_m: -Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo
-fiopenmp -nostandard-realloc-lhs -align array64byte

728.pot3d_m: Same as 719.clvleaf_m

735.weather_m: basepeak = yes

Peak Other Flags

C benchmarks (except as noted below):

-Ispecmpitime

734.hpgmgfv_m: -Ispecmpitime

Fortran benchmarks:

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Peak Other Flags (Continued)

719.clvleaf_m: -Ispecmpitime

The flags file that was used to format this result can be browsed at
http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2022-11-10.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2022-11-10.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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