

SPEChpc™ 2021 Tiny Result

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HKUST HPC Infra. Center: Gigabyte AMD 9754

(Test Sponsor: The Hong Kong University of Science and Technology)

Giga Computing R283-ZFx

AMD EPYC 9754 (2 x 128-Core)

SPEChpc 2021_tny_base = 12.4

SPEChpc 2021_tny_peak = Not Run

hpc2021 License: 7401

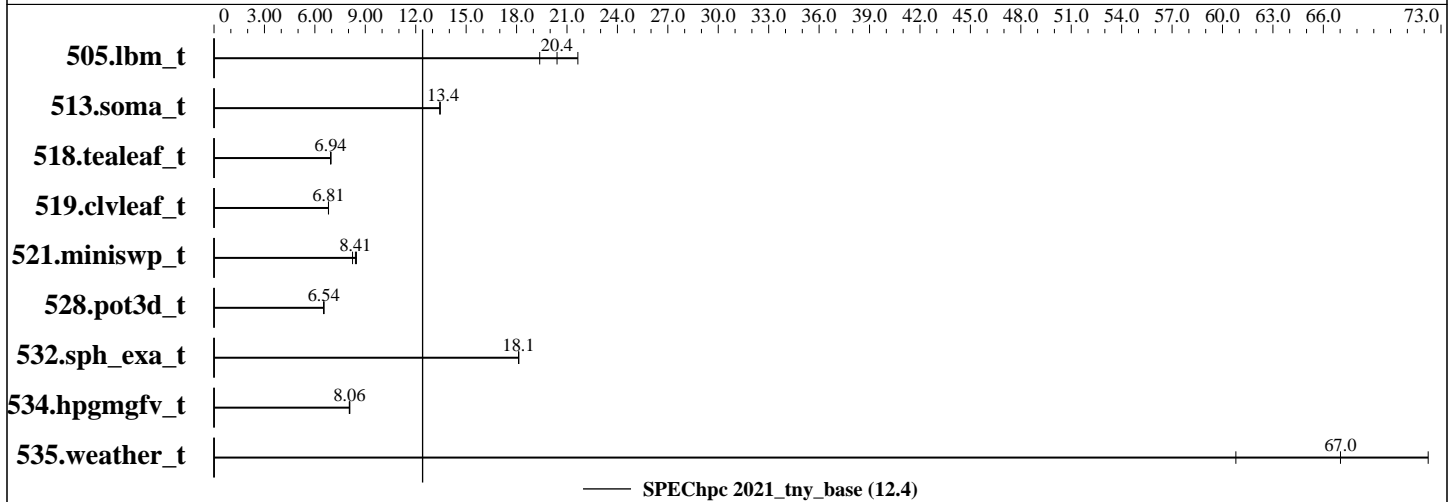
Test Sponsor: The Hong Kong University of Science and Technology

Tested by: Information Technology Services Office

Test Date: Dec-2025

Hardware Availability: Sep-2024

Software Availability: Sep-2024



Results Table

Benchmark	Base								Peak							
	Model	Ranks	Thrds/Rnk	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Model	Ranks	Thrds/Rnk	Seconds	Ratio	Seconds	Ratio
505.lbm_t	MPI	256	1	116	19.4	104	21.6	110	20.4							
513.soma_t	MPI	256	1	275	13.5	275	13.4	275	13.4							
518.tealeaf_t	MPI	256	1	238	6.94	238	6.94	237	6.96							
519.clvleaf_t	MPI	256	1	242	6.81	242	6.81	242	6.81							
521.miniswp_t	MPI	256	1	189	8.47	194	8.24	190	8.41							
528.pot3d_t	MPI	256	1	325	6.54	326	6.52	325	6.54							
532.sph_exa_t	MPI	256	1	108	18.1	108	18.1	108	18.1							
534.hpgmgfv_t	MPI	256	1	146	8.05	145	8.08	146	8.06							
535.weather_t	MPI	256	1	48.1	67.0	53.0	60.8	44.6	72.2							

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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: SMP
Compute Node: Giga Computing R283-ZFx (AMD EPYC 9754)
Interconnect: Cisco Nexus 9332D-GX2B
Compute Nodes Used: 1
Total Chips: 2
Total Cores: 256
Total Threads: 512
Total Memory: 1536 GB
Total Accelerators: 0
Max. Peak Threads: --

Software Summary

Compiler: Intel(R) oneAPI DPC++/C++ Compiler
2025.0.4.20241205
MPI Library: Intel(R) MPI Library for Linux* OS
2021.14.20250213-0d7f579
Other MPI Info: --
Other Software: --
Base Parallel Model: MPI
Base Ranks Run: 256
Base Threads Run: 1
Peak Parallel Models: Not Run
Minimum Peak Ranks: --
Maximum Peak Ranks: --
Max. Peak Threads: --
Min. Peak Threads: --

Node Description: Giga Computing R283-ZFx (AMD EPYC 9754)

Hardware

Number of nodes: 1
Uses of the node: Compute
Vendor: Gigabyte Technology
Model: R283-ZFx
CPU Name: AMD EPYC 9754
CPU(s) orderable: 2 chips
Chips enabled: 2
Cores enabled: 256
Cores per chip: 128
Threads per core: 2
CPU Characteristics: Base 2.25 GHz, Boost up to 3.1 GHz
CPU MHz: 2250
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 1 MB I+D on chip per core
L3 Cache: 256 MB I+D on chip per chip
16 MB shared / 8 cores
Other Cache: None
Memory: 1536 GB (24 x 64 GB DDR5-4800 at 4800MHz)
Disk Subsystem: BROADCOM MR9560-8i (2TB)
Other Hardware: Immersion Cooling (Direct Liquid Cooling)
Accel Count: --
Accel Model: --
Accel Vendor: --
Accel Type: --
Accel Connection: --
Accel ECC enabled: --
Accel Description: --
Adapter: Mellanox ConnectX-6 HDR MT28908
Number of Adapters: 1
Slot Type: PCIe 4.0 x16

(Continued on next page)

Software

Accelerator Driver: None
Adapter: Mellanox ConnectX-6 HDR MT28908
Adapter Driver: 24.10-2.1.8.0
Adapter Firmware: 20.41.1000
Operating System: Rocky Linux 9.5
5.14.0-503.40.1.el9_5.x86_64
-
Local File System: tmpfs
Shared File System: Dell OneFS via NFS v3
System State: Run level 5
Other Software: None

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Software Availability: Sep-2024

Node Description: Giga Computing R283-ZFx (AMD EPYC 9754)

Hardware (Continued)

Data Rate: 200 Gbit/s

Ports Used: 1

Interconnect Type: RoCE v2

Interconnect Description: Cisco Nexus 9332D-GX2B

Hardware

Vendor: Cisco
Model: Cisco Nexus 9332D-GX2B
Switch Model: RoCE v2 Ethernet Switch
Number of Switches:
Number of Ports: 32
Data Rate: 400 Gbit/s
Firmware: --
Topology: --
Primary Use: MPI & RDMA Traffic, NFS

Software

: --

Submit Notes

The config file option 'submit' was used.
mpirun -genval1 -np \${ranks} numactl -l \$command

General Notes

Environment variables set by runhpc before the start of the run:

```
I_MPI_PIN = "1"  
I_MPI_PIN_PROCESSOR_LIST = "all"  
I_MPI_PIN_RESPECT_CPUSSET = "1"  
I_MPI_PIN_RESPECT_HCA = "0"
```

Compiler Version Notes

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

Intel(R) oneAPI DPC++/C++ Compiler 2025.0.4 (2025.0.4.20241205)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir:

/opt/shared/.spack-edge/opt/spack/linux-rocky9-x86_64_v4/gcc-11.5.0/spack/intel-oneapi-compilers-2025.0.4-sn26au2eyxigpsati3gb5oxmtku6s5uo/compiler/2025.0/bin/compiler

Configuration file:

(Continued on next page)

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Compiler Version Notes (Continued)

```
/opt/shared/.spack-edge/opt/spack/linux-rocky9-x86_64_v4/gcc-11.5.0/spack/intel-oneapi-compilers-2025.0.4-sn26au2eyxigpsati3gb5oxmtku6s5uo/compiler/2025.0/bin/compiler/./icpx.cfg
```

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

```
Intel(R) oneAPI DPC++/C++ Compiler 2025.0.4 (2025.0.4.20241205)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir:
```

```
/opt/shared/.spack-edge/opt/spack/linux-rocky9-x86_64_v4/gcc-11.5.0/spack/intel-oneapi-compilers-2025.0.4-sn26au2eyxigpsati3gb5oxmtku6s5uo/compiler/2025.0/bin/compiler  
Configuration file:
```

```
/opt/shared/.spack-edge/opt/spack/linux-rocky9-x86_64_v4/gcc-11.5.0/spack/intel-oneapi-compilers-2025.0.4-sn26au2eyxigpsati3gb5oxmtku6s5uo/compiler/2025.0/bin/compiler/./icpx.cfg
```

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

```
ifx (IFX) 2025.0.4 20241205
```

```
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.  
=====
```

Base Compiler Invocation

C benchmarks:

```
mpiicc -cc=icx
```

C++ benchmarks:

```
mpiicpc -cxx=icpx
```

Fortran benchmarks:

```
mpiifort -fc=ifx
```

Base Portability Flags

```
505.lbm_t: -lstdc++  
513.soma_t: -lstdc++  
518.tealeaf_t: -lstdc++  
521.miniswp_t: -lstdc++  
532.sph_exa_t: -std=c++14 -lstdc++  
534.hpgmgfv_t: -lstdc++
```

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Base Optimization Flags

C benchmarks:

-march=common-avx512 -Ofast -flto -ffast-math
-mprefer-vector-width=512 -ansi-alias

C++ benchmarks:

-march=common-avx512 -Ofast -flto -ffast-math
-mprefer-vector-width=512 -ansi-alias

Fortran benchmarks:

-march=common-avx512 -Ofast -flto -ffast-math
-mprefer-vector-width=512 -nostandard-realloc-lhs -align array64byte

Base Other Flags

C benchmarks:

-Wno-incompatible-function-pointer-types

C++ benchmarks:

-Wno-incompatible-function-pointer-types

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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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