SPEChpc™ 2021 Tiny Result

HKUST HPC Infra. Center: Gigabyte AMD 9754

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

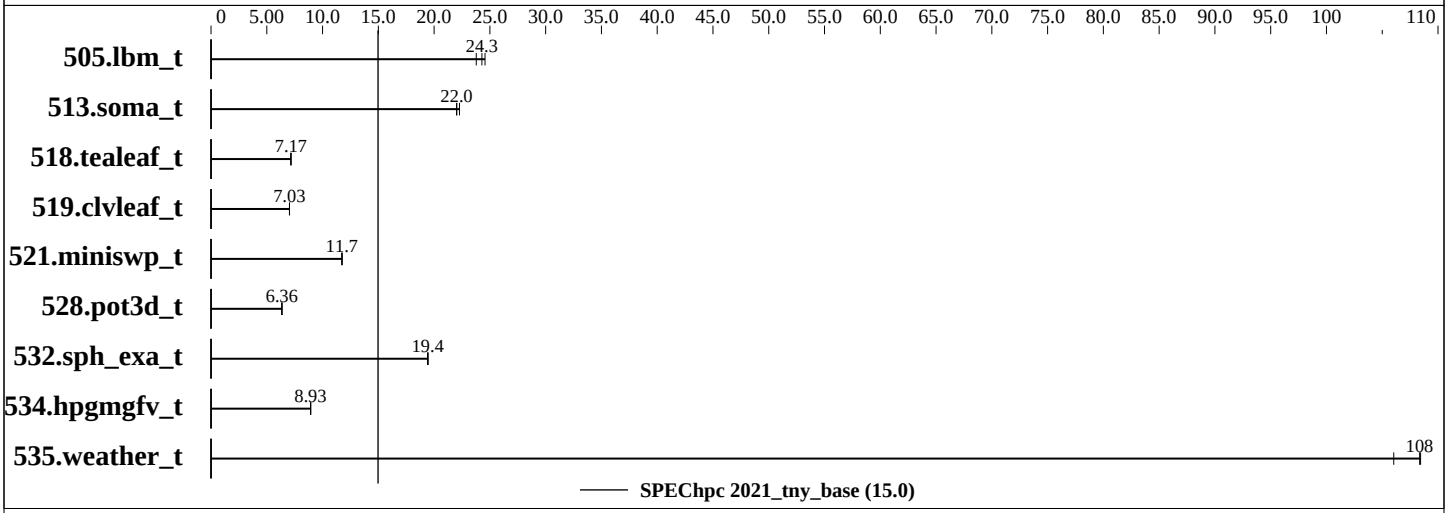
Giga Computing R283-ZFx
AMD EPYC 9754 (2 x 128-Core)

SPEChpc 2021_tny_base = 15.0

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	Seconds	Ratio
505.lbm_t	OMP	32	8	91.6	24.6	**92.7**	**24.3**	94.6	23.8									
513.soma_t	OMP	32	8	168	22.0	**168**	**22.0**	166	22.3									
518.tealeaf_t	OMP	32	8	231	7.16	230	7.17	**230**	**7.17**									
519.clvleaf_t	OMP	32	8	235	7.03	235	7.04	**235**	**7.03**									
521.miniswp_t	OMP	32	8	**136**	**11.7**	136	11.7	136	11.7									
528.pot3d_t	OMP	32	8	335	6.35	**334**	**6.36**	334	6.36									
532.sph_exa_t	OMP	32	8	**100**	**19.4**	100	19.4	100	19.5									
534.hpgmgfv_t	OMP	32	8	**132**	**8.93**	131	8.94	132	8.93									
535.weather_t	OMP	32	8	**29.8**	**108**	29.7	108	30.4	106									

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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:	OMP
Base Ranks Run:	32
Base Threads Run:	8
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

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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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Giga Computing R283-ZFx
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hpc2021 License: 7401
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Test Date: Dec-2025
Hardware Availability: Sep-2024
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 -genvall -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_DOMAIN = "numa"
I_MPI_PIN_RESPECT_CPUSET = "1"
I_MPI_PIN_RESPECT_HCA = "0"
OMP_DYNAMIC = "false"
OMP_PLACES = "cores"
OMP_PROC_BIND = "close"
```

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
```

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Compiler Version Notes (Continued)

```
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/2025.0.0/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/2025.0.0/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/2025.0.0/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/2025.0.0/bin/compiler/../icx.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++`

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Base Portability Flags (Continued)

532.sph_exa_t: `-std=c++14 -lstdc++`
534.hpgmgfv_t: `-lstdc++`

Base Optimization Flags

C benchmarks:
`-march=common-avx512 -Ofast -flto -ffast-math -mprefer-vector-width=512 -qopenmp -ansi-alias`

C++ benchmarks:
`-march=common-avx512 -Ofast -flto -ffast-math -mprefer-vector-width=512 -qopenmp -ansi-alias`

Fortran benchmarks:
`-march=common-avx512 -Ofast -flto -ffast-math -mprefer-vector-width=512 -qopenmp -nostandard-realloc-lhs -align array64byte`

Base Other Flags

C benchmarks:
`-Wno-incompatible-function-pointer-types`

C++ benchmarks:
`-Wno-incompatible-function-pointer-types`

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

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