

SPEChpc™ 2021 Small Result

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Information Technology Services Office, HKUST
(Test Sponsor: The Hong Kong University of Science and Technology)
HPC4 - AMD EPYC 9754 (Dual Socket)
Dell PowerEdge R6625

SPEChpc 2021_sml_base = 5.53

SPEChpc 2021_sml_peak = Not Run

hpc2021 License: 7401

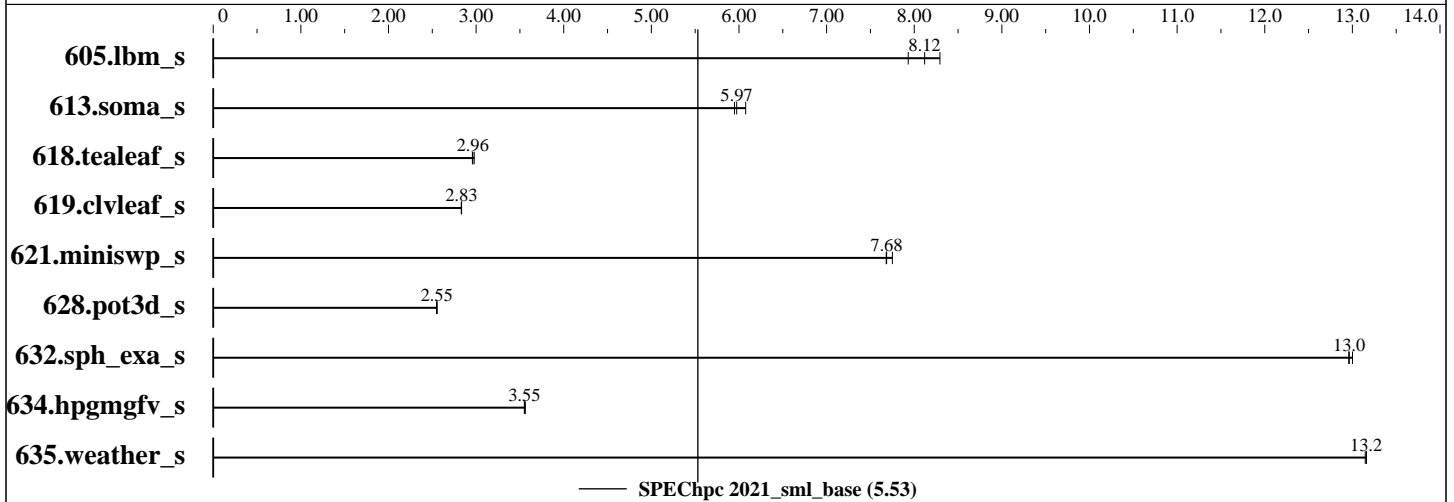
Test Sponsor: The Hong Kong University of Science and Technology

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
605.lbm_s	OMP	128	8	<u>191</u>	<u>8.12</u>	195	7.93	187	8.29									
613.soma_s	OMP	128	8	269	5.95	<u>268</u>	<u>5.97</u>	263	6.08									
618.tealeaf_s	OMP	128	8	688	2.98	693	2.96	<u>692</u>	<u>2.96</u>									
619.clvleaf_s	OMP	128	8	582	2.83	<u>582</u>	<u>2.83</u>	583	2.83									
621.miniswp_s	OMP	128	8	<u>143</u>	<u>7.68</u>	142	7.75	143	7.68									
628.pot3d_s	OMP	128	8	656	2.55	657	2.55	<u>656</u>	<u>2.55</u>									
632.sph_exa_s	OMP	128	8	177	13.0	<u>177</u>	<u>13.0</u>	177	13.0									
634.hpgmgfv_s	OMP	128	8	274	3.56	275	3.55	<u>274</u>	<u>3.55</u>									
635.weather_s	OMP	128	8	198	13.2	<u>198</u>	<u>13.2</u>	198	13.1									

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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 Cluster
Compute Node: DELL PowerEdge R6625 (AMD EPYC 9754)
Interconnect: Cisco Nexus 9332D-GX2B
Compute Nodes Used: 4
Total Chips: 8
Total Cores: 1024
Total Threads: 1024
Total Memory: 3 TB
Total Accelerators: 0
Max. Peak Threads: --

Software Summary

Compiler: Intel(R) oneAPI DPC++/C++ Compiler
2025.0.4.20241205
MPI Library: Open MPI
5.0.6
Other MPI Info: --
Other Software: --
Base Parallel Model: OMP
Base Ranks Run: 128
Base Threads Run: 8
Peak Parallel Models: Not Run
Minimum Peak Ranks: --
Maximum Peak Ranks: --
Max. Peak Threads: --
Min. Peak Threads: --

Node Description: DELL PowerEdge R6625 (AMD EPYC 9754)

Hardware

Number of nodes: 4
Uses of the node: Compute
Vendor: Dell Inc.
Model: PowerEdge R6625
CPU Name: AMD EPYC 9754 128-Core Processor
CPU(s) orderable: 2 chips
Chips enabled: 2
Cores enabled: 256
Cores per chip: 128
Threads per core: 1
CPU Characteristics: 2.25 - 3.1 GHz, HT Disabled
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: 768 GB (24 x 32 GB DDR5-4800 at 4800MHz)
Disk Subsystem: DELL PERC H355 Front (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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Software Availability: Sep-2024

Node Description: DELL PowerEdge R6625 (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.

SLURM Scheduler 22.05

mpirun -n \${ranks} --mca topo ^treematch --bind-to numa numactl -l \$command

General Notes

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

OMP_DYNAMIC = "false"

OMP_PLACES = "cores"

OMP_PROC_BIND = "close"

UCX_TLS = "rc,knem,sm"

Compiler Version Notes

=====
CXXC 632.sph_exa_s(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

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Compiler Version Notes (Continued)

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
```

```
=====  
CC 605.lbm_s(base) 613.soma_s(base) 618.tealeaf_s(base) 621.miniswp_s(base)  
634.hpgmgfv_s(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/./icx.cfg
```

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/./icx.cfg
```

```
=====  
FC 619.clvleaf_s(base) 628.pot3d_s(base) 635.weather_s(base)  
=====
```

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

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

Base Compiler Invocation

C benchmarks:
mpicc

C++ benchmarks:
mpicxx

Fortran benchmarks:
mpifort

Base Portability Flags

```
605.lbm_s: -lstdc++  
613.soma_s: -lstdc++  
618.tealeaf_s: -lstdc++  
621.miniswp_s: -lstdc++  
632.sph_exa_s: -std=c++14 -lstdc++  
634.hpgmgfv_s: -lstdc++
```

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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

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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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