

# 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 = 1.47

SPEChpc 2021\_sml\_peak = Not Run

hpc2021 License: 7401

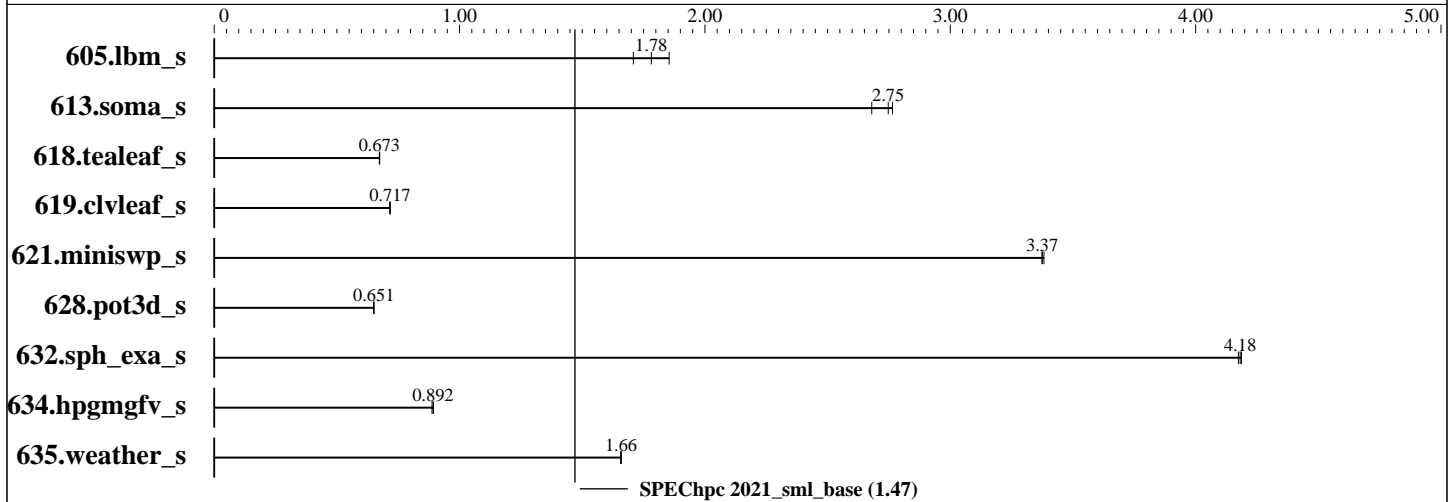
Test Sponsor: The Hong Kong University of Science and Technology

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	32	8	907	1.71	836	1.85	<b>870</b>	<b>1.78</b>									
613.soma_s	OMP	32	8	579	2.76	<b>582</b>	<b>2.75</b>	597	2.68									
618.tealeaf_s	OMP	32	8	3039	0.675	3045	0.673	<b>3044</b>	<b>0.673</b>									
619.clvleaf_s	OMP	32	8	2302	0.717	2303	0.717	<b>2302</b>	<b>0.717</b>									
621.miniswp_s	OMP	32	8	326	3.37	325	3.38	<b>326</b>	<b>3.37</b>									
628.pot3d_s	OMP	32	8	<b>2574</b>	<b>0.651</b>	2576	0.650	2574	0.651									
632.sph_exa_s	OMP	32	8	549	4.19	<b>550</b>	<b>4.18</b>	551	4.17									
634.hpgmgfv_s	OMP	32	8	1098	0.888	1091	0.893	<b>1093</b>	<b>0.892</b>									
635.weather_s	OMP	32	8	<b>1568</b>	<b>1.66</b>	1569	1.66	1568	1.66									

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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: DELL PowerEdge R6625 (AMD EPYC 9754)  
Interconnect: Cisco Nexus 9332D-GX2B  
Compute Nodes Used: 1  
Total Chips: 2  
Total Cores: 256  
Total Threads: 256  
Total Memory: 768 GB  
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: 32  
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: 1  
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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## 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:

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```

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

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## 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](mailto:info@spec.org).

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