

# 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

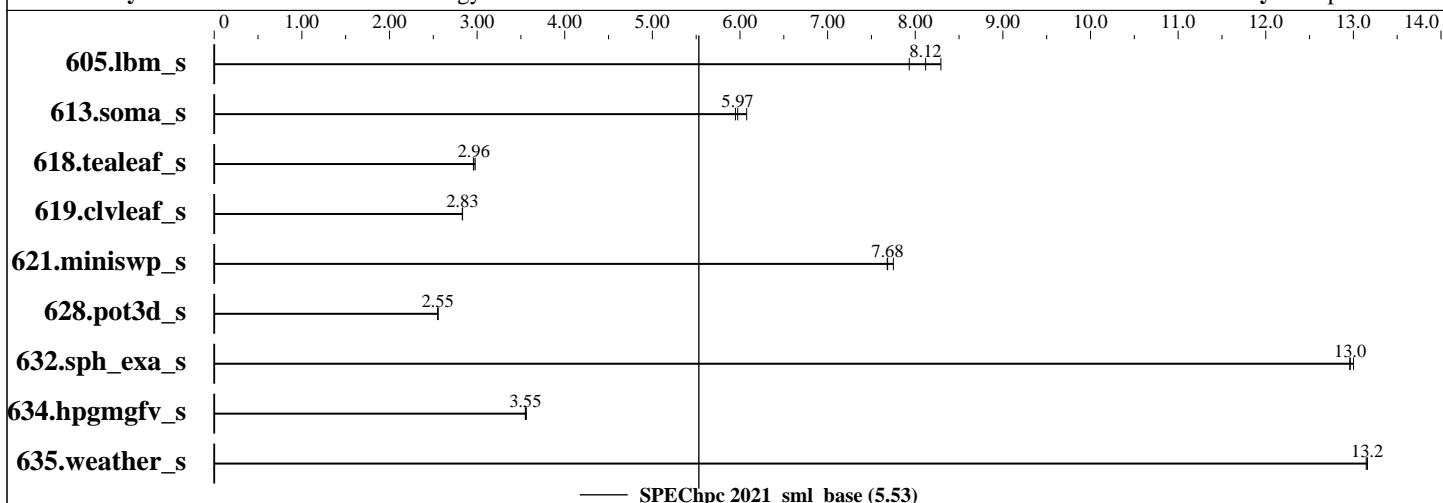
Test Date: Dec-2025

Test Sponsor: The Hong Kong University of Science and Technology

Hardware Availability: Sep-2024

Tested by: Information Technology Services Office

Software Availability: Sep-2024



## Results Table

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

SPEChpc 2021\_sml\_base = 5.53

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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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<b>Hardware Summary</b> <table> <tr><td>Type of System:</td><td>Homogenous Cluster</td></tr> <tr><td>Compute Node:</td><td>DELL PowerEdge R6625 (AMD EPYC 9754)</td></tr> <tr><td>Interconnect:</td><td>Cisco Nexus 9332D-GX2B</td></tr> <tr><td>Compute Nodes Used:</td><td>4</td></tr> <tr><td>Total Chips:</td><td>8</td></tr> <tr><td>Total Cores:</td><td>1024</td></tr> <tr><td>Total Threads:</td><td>1024</td></tr> <tr><td>Total Memory:</td><td>3 TB</td></tr> <tr><td>Total Accelerators:</td><td>0</td></tr> <tr><td>Max. Peak Threads:</td><td>--</td></tr> </table>		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:	--	<b>Software Summary</b> <table> <tr><td>Compiler:</td><td>Intel(R) oneAPI DPC++/C++ Compiler 2025.0.4.20241205</td></tr> <tr><td>MPI Library:</td><td>Open MPI 5.0.6</td></tr> <tr><td>Other MPI Info:</td><td>--</td></tr> <tr><td>Other Software:</td><td>--</td></tr> <tr><td>Base Parallel Model:</td><td>OMP</td></tr> <tr><td>Base Ranks Run:</td><td>128</td></tr> <tr><td>Base Threads Run:</td><td>8</td></tr> <tr><td>Peak Parallel Models:</td><td>Not Run</td></tr> <tr><td>Minimum Peak Ranks:</td><td>--</td></tr> <tr><td>Maximum Peak Ranks:</td><td>--</td></tr> <tr><td>Max. Peak Threads:</td><td>--</td></tr> <tr><td>Min. Peak Threads:</td><td>--</td></tr> </table>	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:	--
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## Node Description: DELL PowerEdge R6625 (AMD EPYC 9754)

<b>Hardware</b>		<b>Software</b>
Number of nodes:	4	Accelerator Driver: None
Uses of the node:	Compute	Adapter: Mellanox ConnectX-6 HDR MT28908
Vendor:	Dell Inc.	Adapter Driver: 24.10-2.1.8.0
Model:	PowerEdge R6625	Adapter Firmware: 20.41.1000
CPU Name:	AMD EPYC 9754 128-Core Processor	Operating System: Rocky Linux 9.5
CPU(s) orderable:	2 chips	5.14.0-503.40.1.el9_5.x86_64
Chips enabled:	2	Local File System: tmpfs
Cores enabled:	256	Shared File System: Dell OneFS via NFS v3
Cores per chip:	128	System State: Run level 5
Threads per core:	1	Other Software: None
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	
Other Cache:	16 MB shared / 8 cores	
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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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

## 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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Hardware Availability: Sep-2024

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Software Availability: Sep-2024

## 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.hpgmfv_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
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.hpgmfv\_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).

Tested with SPEChpc2021 v1.1.10 on 2025-12-25 08:02:46+0800.

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