SPEChpc™ 2021 Small Result

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Dell Inc

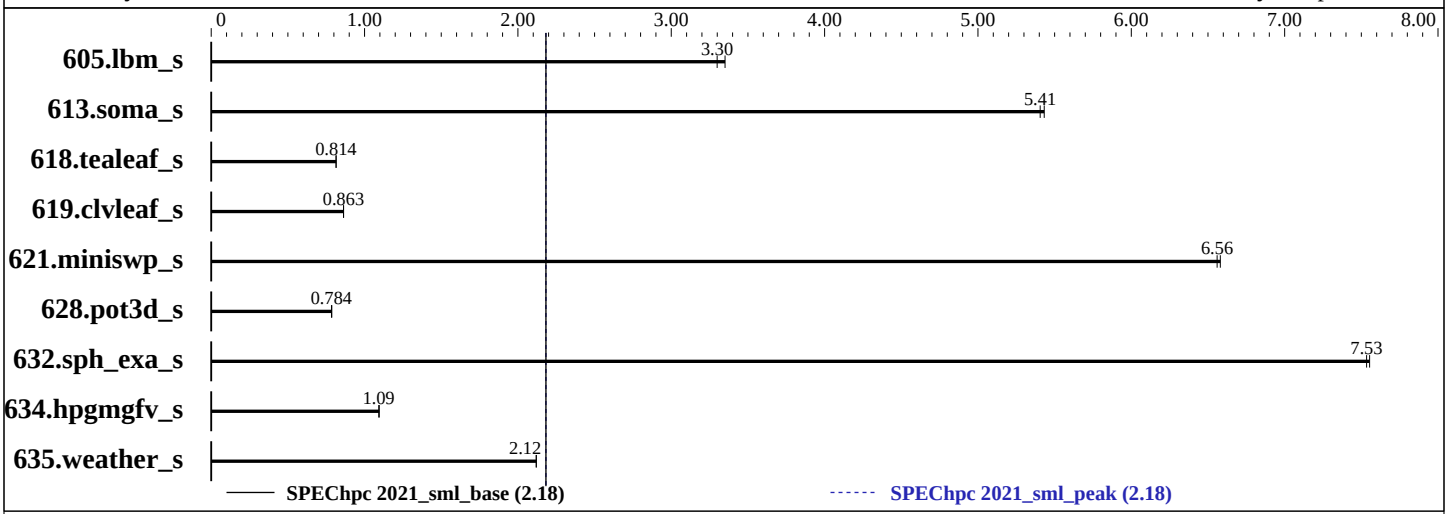
Dell PowerEdge R7725 (AMD EPYC 9965 192-Core Processor)

SPEChpc 2021_sml_base = 2.18

SPEChpc 2021_sml_peak = 2.18

hpc2021 License: 6573
Test Sponsor: Dell Inc
Tested by: Dell Inc

Test Date: Sep-2024
Hardware Availability: Oct-2024
Software Availability: Apr-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	24	32	463	3.35	**470**	**3.30**			OMP	24	32	463	3.35	**470**	**3.30**		
613.soma_s	OMP	24	32	295	5.43	**296**	**5.41**			OMP	24	32	295	5.43	**296**	**5.41**		
618.tealeaf_s	OMP	24	32	2517	0.815	**2518**	**0.814**			OMP	24	32	2517	0.815	**2518**	**0.814**		
619.clvleaf_s	OMP	24	32	**1912**	**0.863**	1912	0.863			OMP	24	32	**1912**	**0.863**	1912	0.863		
621.miniswp_s	OMP	24	32	**168**	**6.56**	167	6.58			OMP	24	32	**168**	**6.56**	167	6.58		
628.pot3d_s	OMP	24	32	**2136**	**0.784**	2130	0.786			OMP	24	32	**2136**	**0.784**	2130	0.786		
632.sph_exa_s	OMP	24	32	304	7.55	**305**	**7.53**			OMP	24	32	304	7.55	**305**	**7.53**		
634.hpgmgfv_s	OMP	24	32	890	1.10	**892**	**1.09**			OMP	24	32	890	1.10	**892**	**1.09**		
635.weather_s	OMP	24	32	1227	2.12	**1227**	**2.12**			OMP	24	32	1227	2.12	**1227**	**2.12**		

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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
Compute Node:	Dell PowerEdge R7725 (AMD EPYC 9965 192-Core Processor)
Compute Nodes Used:	1
Total Chips:	2
Total Cores:	384
Total Threads:	768
Total Memory:	1536 GB
Max. Peak Threads:	32

Software Summary

Compiler:	Intel oneAPI DPC++/C++ Compiler 2024.2.1
MPI Library:	OpenMPI Version 5.0.5
Other MPI Info:	None
Other Software:	None
Base Parallel Model:	OMP
Base Ranks Run:	24
Base Threads Run:	32
Peak Parallel Models:	OMP
Minimum Peak Ranks:	24
Maximum Peak Ranks:	24
Max. Peak Threads:	32
Min. Peak Threads:	32

Node Description: Dell PowerEdge R7725 (AMD EPYC 9965 192-Core Processor)

Hardware

Number of nodes:	1
Uses of the node:	compute
Vendor:	Dell Inc
Model:	Dell PowerEdge R7725 (AMD EPYC 9965 192-Core Processor)
CPU Name:	AMD EPYC 9965
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	384
Cores per chip:	192
Threads per core:	2
CPU Characteristics:	Max. Boost Clock upto 3.7GHz
CPU MHz:	2250
Primary Cache:	32 KB I + 48 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core
L3 Cache:	384 MB I+D on chip per chip, 32 MB shared / 16 cores
Other Cache:	None
Memory:	1536 GB (24 x 64 GB 2Rx4 PC5-6400B-R) running at 6000
Disk Subsystem:	1 x 3.5 TB NVMe
Other Hardware:	None
Accel Count:	None
Accel Model:	None
Accel Vendor:	None
Accel Type:	None
Accel Connection:	None
Accel ECC enabled:	None
Accel Description:	None
Adapter:	None
Number of Adapters:	0
Slot Type:	None

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Software

Accelerator Driver:	--
Adapter:	None
Adapter Driver:	None
Adapter Firmware:	None
Operating System:	Ubuntu 24.04 LTS Kernel 6.8.0-44-generic
Local File System:	ext4
Shared File System:	NFS share
System State:	Multi-user, run level 3
Other Software:	None

Hardware (Continued)

Data Rate: None
Ports Used: 0
Interconnect Type: None

Submit Notes

```
The config file option 'submit' was used.
```

General Notes

```
MPI startup command:
  mpirun command was used to start MPI jobs.

BIOS Settings:
  DIMM Self Healing (Post Package Repair) on Uncorrectable Memory Error: Disabled
  Virtualization Technology: Disabled
  DRAM Refresh Delay : Performance
  NUMA nodes per socket:  NPS4
  L3 cache as NUMA Domain : Enabled
  System Profile : Custom
  CPU Power Management : OS DBPM
  Determinism Control : Manual
  Determinism Slider : Power Determinism
  TDP Control : Manual
  TDP : 500
  PPT Control : Manual
  PPT : 500
```

Compiler Version Notes

```
==============================================================================
 CXXC 632.sph_exa_s(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler 2024.2.1 (2024.2.1.20240711)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir:
  /home/amd/spack/opt/spack/linux-ubuntu24.04-zen4/gcc-13.2.0/intel-oneapi-compilers-2024.2.1-njykuawredfxjir45iz3erssyetxux3c/compiler/2024.2/bin/compiler
Configuration file:
  /home/amd/spack/opt/spack/linux-ubuntu24.04-zen4/gcc-13.2.0/intel-oneapi-compilers-2024.2.1-njykuawredfxjir45iz3erssyetxux3c/compiler/2024.2/bin/compiler/../icpx.cfg
------------------------------------------------------------------------------
```

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Compiler Version Notes (Continued)

```
==============================================================================
 CC  605.lbm_s(base, peak) 613.soma_s(base, peak) 618.tealeaf_s(base, peak)
     621.miniswp_s(base, peak) 634.hpgmgfv_s(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler 2024.2.1 (2024.2.1.20240711)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir:
  /home/amd/spack/opt/spack/linux-ubuntu24.04-zen4/gcc-13.2.0/intel-oneapi-compilers-2024.2.1-njykuawredfxjir45iz3erssyetxux3c/compiler/2024.2/bin/compiler
Configuration file:
  /home/amd/spack/opt/spack/linux-ubuntu24.04-zen4/gcc-13.2.0/intel-oneapi-compilers-2024.2.1-njykuawredfxjir45iz3erssyetxux3c/compiler/2024.2/bin/compiler/../icx.cfg
------------------------------------------------------------------------------

==============================================================================
 FC  619.clvleaf_s(base, peak) 628.pot3d_s(base, peak) 635.weather_s(base,
     peak)
------------------------------------------------------------------------------
ifx (IFX) 2024.2.1 20240711
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------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
mpicc

C++ benchmarks:
mpicxx

Fortran benchmarks:
mpifort

Base Portability Flags

605.lbm_s: -DSPEC_LP64
613.soma_s: -DSPEC_LP64
618.tealeaf_s: -DSPEC_LP64
621.miniswp_s: -DSPEC_LP64
632.sph_exa_s: -DSPEC_LP64
634.hpgmgfv_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
`-Ofast -ipo -mprefer-vector-width=512 -march=skylake-avx512 -mtune=skylake-avx512 -qopenmp -ansi-alias`

C++ benchmarks:
`-Ofast -ipo -mprefer-vector-width=512 -march=skylake-avx512 -mtune=skylake-avx512 -qopenmp -ansi-alias`

Fortran benchmarks:
`-Ofast -ipo -mprefer-vector-width=512 -march=skylake-avx512 -mtune=skylake-avx512 -qopenmp -ansi-alias -nostandard-realloc-lhs -align array64byte`

Base Other Flags

C benchmarks:
`-limf`

C++ benchmarks:
`-limf`

Fortran benchmarks:
`-limf`

Peak Compiler Invocation

C benchmarks:
`mpicc`

C++ benchmarks:
`mpicxx`

Fortran benchmarks:
`mpifort`

Peak Portability Flags

605.lbm_s: `-DSPEC_LP64`
613.soma_s: `-DSPEC_LP64`

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Peak Portability Flags (Continued)

618.tealeaf_s: `-DSPEC_LP64`
621.miniswp_s: `-DSPEC_LP64`
632.sph_exa_s: `-DSPEC_LP64`
634.hpgmgfv_s: `-DSPEC_LP64`

Peak Optimization Flags

C benchmarks:

605.lbm_s: `basepeak = yes`

613.soma_s: `basepeak = yes`

618.tealeaf_s: `basepeak = yes`

621.miniswp_s: `basepeak = yes`

634.hpgmgfv_s: `basepeak = yes`

C++ benchmarks:

632.sph_exa_s: `basepeak = yes`

Fortran benchmarks:

619.clvleaf_s: `basepeak = yes`

628.pot3d_s: `basepeak = yes`

635.weather_s: `basepeak = yes`

Peak Other Flags

C benchmarks:
`-limf`

C++ benchmarks:
`-limf`

Fortran benchmarks:
`-limf`

The flags file that was used to format this result can be browsed at
http://www.spec.org/hpc2021/flags/Intel_compiler_flags_hpc.2024.2024-10-10.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/hpc2021/flags/Intel_compiler_flags_hpc.2024.2024-10-10.xml

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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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