SPEChpc™ 2021 Tiny Result

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Dell Inc

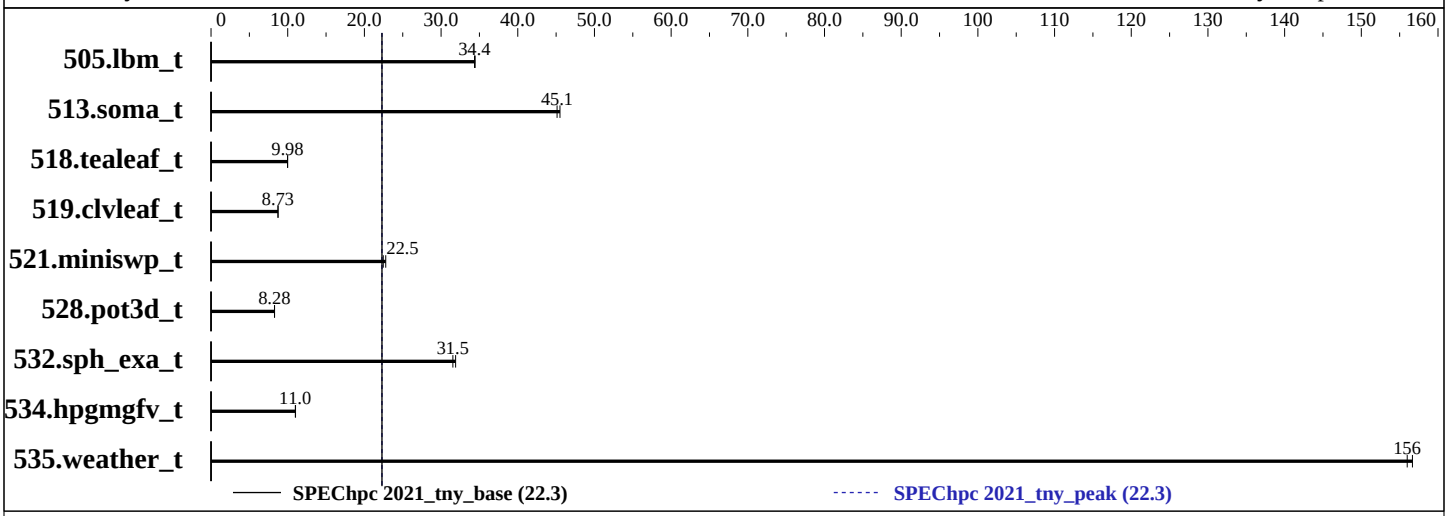
Dell PowerEdge R7725 (AMD EPYC 9965 192-Core Processor)

SPEChpc 2021_tny_base = 22.3

SPEChpc 2021_tny_peak = 22.3

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

Test Date: Sep-2024
Hardware Availability: Nov-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
505.lbm_t	OMP	24	32	65.3	34.4	**65.5**	**34.4**			OMP	24	32	65.3	34.4	**65.5**	**34.4**		
513.soma_t	OMP	24	32	**82.0**	**45.1**	81.3	45.5			OMP	24	32	**82.0**	**45.1**	81.3	45.5		
518.tealeaf_t	OMP	24	32	**165**	**9.98**	165	9.99			OMP	24	32	**165**	**9.98**	165	9.99		
519.clvleaf_t	OMP	24	32	189	8.74	**189**	**8.73**			OMP	24	32	189	8.74	**189**	**8.73**		
521.miniswp_t	OMP	24	32	**71.2**	**22.5**	70.2	22.8			OMP	24	32	**71.2**	**22.5**	70.2	22.8		
528.pot3d_t	OMP	24	32	256	8.29	**257**	**8.28**			OMP	24	32	256	8.29	**257**	**8.28**		
532.sph_exa_t	OMP	24	32	61.1	31.9	**61.8**	**31.5**			OMP	24	32	61.1	31.9	**61.8**	**31.5**		
534.hpgmgfv_t	OMP	24	32	107	11.0	**107**	**11.0**			OMP	24	32	107	11.0	**107**	**11.0**		
535.weather_t	OMP	24	32	**20.7**	**156**	20.6	157			OMP	24	32	**20.7**	**156**	20.6	157		

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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 532.sph_exa_t(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  505.lbm_t(base, peak) 513.soma_t(base, peak) 518.tealeaf_t(base, peak)
     521.miniswp_t(base, peak) 534.hpgmgfv_t(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  519.clvleaf_t(base, peak) 528.pot3d_t(base, peak) 535.weather_t(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

505.lbm_t: -DSPEC_LP64
513.soma_t: -DSPEC_NO_VAR_ARRAY_REDUCE -DSPEC_LP64
518.tealeaf_t: -DSPEC_LP64
521.miniswp_t: -DSPEC_LP64
532.sph_exa_t: -DSPEC_LP64
534.hpgmgfv_t: -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

505.lbm_t: `-DSPEC_LP64`
513.soma_t: `-DSPEC_NO_VAR_ARRAY_REDUCE -DSPEC_LP64`

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Peak Portability Flags (Continued)

518.tealeaf_t: `-DSPEC_LP64`
521.miniswp_t: `-DSPEC_LP64`
532.sph_exa_t: `-DSPEC_LP64`
534.hpgmgfv_t: `-DSPEC_LP64`

Peak Optimization Flags

C benchmarks:

505.lbm_t: `basepeak = yes`

513.soma_t: `basepeak = yes`

518.tealeaf_t: `basepeak = yes`

521.miniswp_t: `basepeak = yes`

534.hpgmgfv_t: `basepeak = yes`

C++ benchmarks:

532.sph_exa_t: `basepeak = yes`

Fortran benchmarks:

519.clvleaf_t: `basepeak = yes`

528.pot3d_t: `basepeak = yes`

535.weather_t: `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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