SPEChpc™ 2021 Small Result

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Supermicro

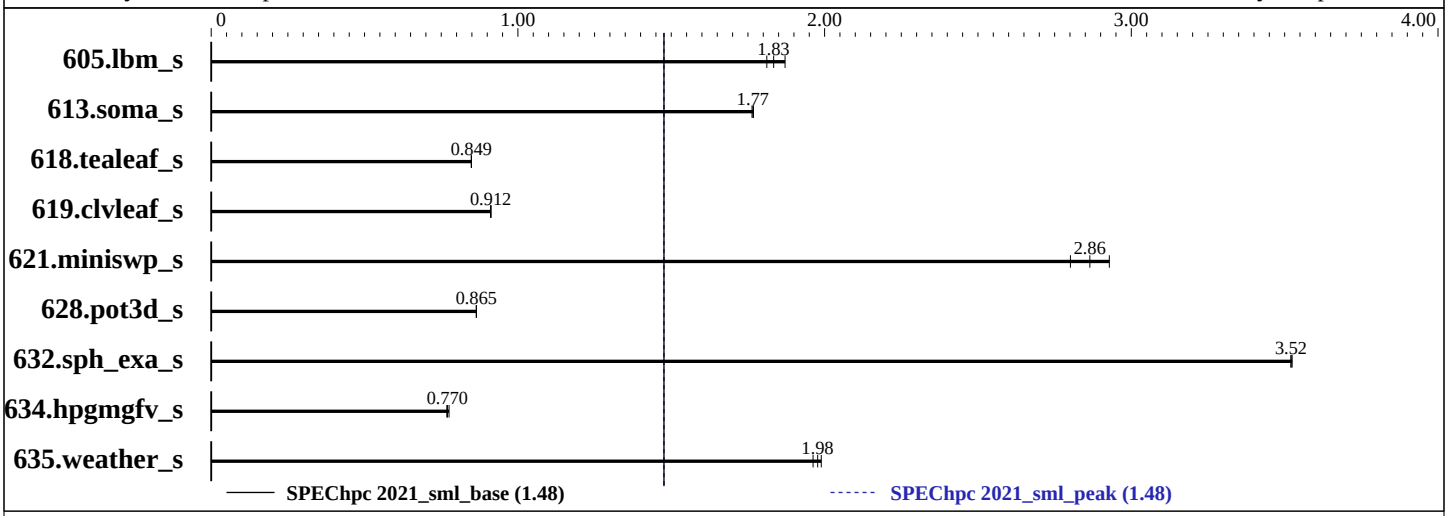
Hyper A+ Server AS -2126HS-TN (AMD EPYC 9555)

SPEChpc 2021_sml_base = 1.48

SPEChpc 2021_sml_peak = 1.48

hpc2021 License: 6569
Test Sponsor: Supermicro
Tested by: Supermicro

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	MPI	128	1	828	1.87	856	1.81	**845**	**1.83**	MPI	128	1	828	1.87	856	1.81	**845**	**1.83**
613.soma_s	MPI	128	1	905	1.77	**906**	**1.77**	907	1.76	MPI	128	1	905	1.77	**906**	**1.77**	907	1.76
618.tealeaf_s	MPI	128	1	2416	0.849	**2416**	**0.849**	2418	0.848	MPI	128	1	2416	0.849	**2416**	**0.849**	2418	0.848
619.clvleaf_s	MPI	128	1	**1810**	**0.912**	1811	0.911	1809	0.912	MPI	128	1	**1810**	**0.912**	1811	0.911	1809	0.912
621.miniswp_s	MPI	128	1	393	2.80	**384**	**2.86**	376	2.93	MPI	128	1	393	2.80	**384**	**2.86**	376	2.93
628.pot3d_s	MPI	128	1	**1937**	**0.865**	1937	0.865	1938	0.864	MPI	128	1	**1937**	**0.865**	1937	0.865	1938	0.864
632.sph_exa_s	MPI	128	1	**653**	**3.52**	653	3.52	653	3.52	MPI	128	1	**653**	**3.52**	653	3.52	653	3.52
634.hpgmgfv_s	MPI	128	1	1269	0.768	**1266**	**0.770**	1257	0.775	MPI	128	1	1269	0.768	**1266**	**0.770**	1257	0.775
635.weather_s	MPI	128	1	1307	1.99	1325	1.96	**1315**	**1.98**	MPI	128	1	1307	1.99	1325	1.96	**1315**	**1.98**

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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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Software Availability: Apr-2024

Hardware Summary

Type of System:	Homogenous
Compute Node:	Hyper A+ Server AS -2126HS-TN
Compute Nodes Used:	1
Total Chips:	2
Total Cores:	128
Total Threads:	128
Total Memory:	1536 GB
Max. Peak Threads:	1

Software Summary

Compiler:	Intel oneAPI DPC++/C++ Compiler 2024.2.1
MPI Library:	Intel MPI Version 2021.13
Other MPI Info:	None
Other Software:	None
Base Parallel Model:	MPI
Base Ranks Run:	128
Base Threads Run:	1
Peak Parallel Models:	MPI
Minimum Peak Ranks:	128
Maximum Peak Ranks:	128
Max. Peak Threads:	1
Min. Peak Threads:	1

Node Description: Hyper A+ Server AS -2126HS-TN

Hardware

Number of nodes:	1
Uses of the node:	compute
Vendor:	Supermicro
Model:	Hyper A+ Server AS -2126HS-TN
CPU Name:	AMD EPYC 9555
CPU(s) orderable:	1,2 chips
Chips enabled:	2
Cores enabled:	128
Cores per chip:	64
Threads per core:	1
CPU Characteristics:	Max. Boost Clock upto 4.4GHz
CPU MHz:	3200
Primary Cache:	32 KB I + 48 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, 32 MB shared / 8 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 SSD
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
Data Rate:	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:	None
System State:	Multi-user, run level 3
Other Software:	None

Node Description: Hyper A+ Server AS -2126HS-TN

Hardware (Continued)

Ports Used: 0
Interconnect Type: None

Submit Notes

```
The config file option 'submit' was used.
mpiexec.hydra -bootstrap ssh -genv OMP_NUM_THREADS $threads -np $ranks -ppn $ranks $command
```

General Notes

```
MPI startup command:
  mpiexec.hydra command was used to start MPI jobs.
```

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
------------------------------------------------------------------------------

==============================================================================
 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)
```

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Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------
ifx (IFX) 2024.2.1 20240711
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`mpiicc -cc=icx`

C++ benchmarks:
`mpiicpc -cxx=icpx`

Fortran benchmarks:
`mpiifort -fc=ifx`

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 -ansi-alias`

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

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

Base Other Flags

C benchmarks:
`-limf`

C++ benchmarks:
`-limf`

Fortran benchmarks:
`-limf`

Peak Compiler Invocation

C benchmarks:
`mpiicc -cc=icx`

C++ benchmarks:
`mpiicpc -cxx=icpx`

Fortran benchmarks:
`mpiifort -fc=ifx`

Peak 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`

Peak Optimization Flags

C benchmarks:

605.lbm_s: `basepeak = yes`

613.soma_s: `basepeak = yes`

618.tealeaf_s: `basepeak = yes`

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Peak Optimization Flags (Continued)

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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