SPEChpc™ 2021 Tiny Result

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Intel

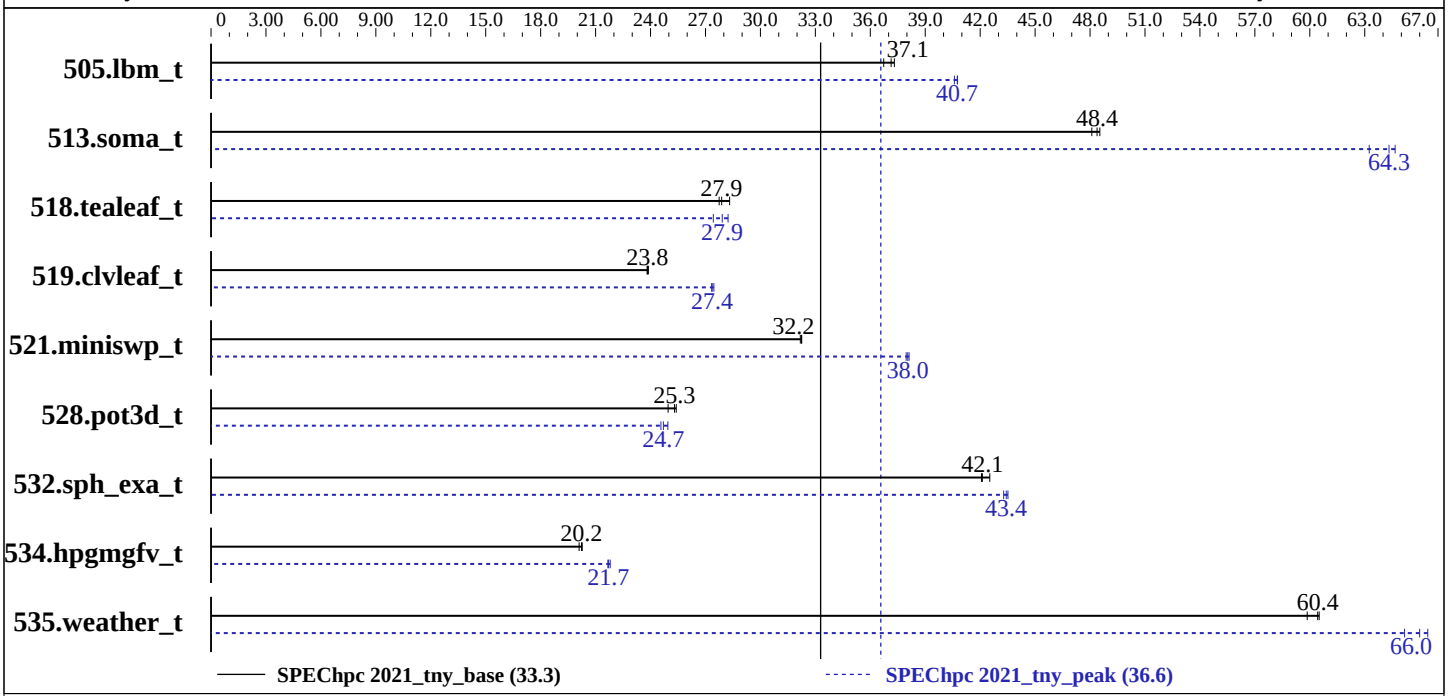
Endeavour: Intel Server M50CYP2UR208 (Intel Xeon Platinum 8360Y)

SPEChpc 2021_tny_base = 33.3

SPEChpc 2021_tny_peak = 36.6

hpc2021 License: 13
Test Sponsor: Intel
Tested by: Intel

Test Date: Sep-2021
Hardware Availability: Jul-2021
Software Availability: Jul-2021



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	64	9	**60.6**	**37.1**	60.3	37.3	61.3	36.7	OMP	16	72	55.4	40.6	55.2	40.8	**55.2**	**40.7**
513.soma_t	OMP	64	9	76.9	48.1	76.2	48.5	**76.5**	**48.4**	OMP	16	72	57.2	64.7	58.5	63.2	**57.5**	**64.3**
518.tealeaf_t	OMP	64	9	58.3	28.3	59.5	27.7	**59.2**	**27.9**	OMP	96	6	60.2	27.4	58.4	28.2	**59.1**	**27.9**
519.clvleaf_t	OMP	64	9	69.3	23.8	**69.2**	**23.8**	69.1	23.9	OMP	16	36	60.1	27.5	**60.3**	**27.4**	60.3	27.3
521.miniswp_t	OMP	64	9	49.6	32.3	49.7	32.2	**49.6**	**32.2**	OMP	16	36	**42.1**	**38.0**	42.2	38.0	42.0	38.1
528.pot3d_t	OMP	64	9	83.6	25.4	85.1	25.0	**84.0**	**25.3**	OMP	96	6	**86.0**	**24.7**	86.5	24.6	85.2	24.9
532.sph_exa_t	OMP	64	9	46.4	42.1	45.9	42.5	**46.3**	**42.1**	OMP	288	2	**44.9**	**43.4**	44.8	43.5	45.1	43.3
534.hpgmgfv_t	OMP	64	9	**58.1**	**20.2**	58.5	20.1	58.0	20.3	OMP	16	36	54.2	21.7	53.9	21.8	**54.1**	**21.7**
535.weather_t	OMP	64	9	53.3	60.5	53.9	59.9	**53.4**	**60.4**	OMP	144	4	48.5	66.4	**48.9**	**66.0**	49.5	65.2

SPEChpc 2021_tny_base = 33.3

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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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SPEChpc 2021_tny_base = 33.3

SPEChpc 2021_tny_peak = 36.6

hpc2021 License: 13
Test Sponsor: Intel
Tested by: Intel

Test Date: Sep-2021
Hardware Availability: Jul-2021
Software Availability: Jul-2021

Hardware Summary

Type of System:	Homogenous Cluster
Compute Node:	Intel Server M50CYP2UR208 (Xeon 8360Y)
Interconnect:	Mellanox HDR
File Server Node:	LustreFS
Compute Nodes Used:	8
Total Chips:	16
Total Cores:	576
Total Threads:	1152
Total Memory:	2 TB
Max. Peak Threads:	72

Software Summary

Compiler:	Intel oneAPI Compiler 2021.3.0
MPI Library:	Intel MPI Library for Linux* OS, Version 2021.2 Build 20210302
Other MPI Info:	None
Other Software:	None
Base Parallel Model:	OMP
Base Ranks Run:	64
Base Threads Run:	9
Peak Parallel Models:	OMP
Minimum Peak Ranks:	16
Maximum Peak Ranks:	288
Max. Peak Threads:	72
Min. Peak Threads:	2

Node Description: Intel Server M50CYP2UR208 (Xeon 8360Y)

Hardware

Number of nodes:	8
Uses of the node:	Compute
Vendor:	Intel
Model:	Intel Server M50CYP2UR208 (Xeon 8360Y)
CPU Name:	Intel Xeon Platinum 8360Y
CPU(s) orderable:	1, 2 chips
Chips enabled:	2
Cores enabled:	72
Cores per chip:	36
Threads per core:	2
CPU Characteristics:	Turbo Boost Technology up to 3.5 GHz
CPU MHz:	2400
Primary Cache:	32 KB I + 48 KB D on chip per core
Secondary Cache:	1536 KB I+D on chip per core
L3 Cache:	54 MB I+D on chip per chip
Other Cache:	None
Memory:	256 GB (16 x 16 GB 2Rx8 PC4-3200R)
Disk Subsystem:	1 x 960 GB SATA 2.5" SSD
Other Hardware:	None
Accel Count:	None
Accel Model:	--
Accel Vendor:	None
Accel Type:	None
Accel Connection:	None
Accel ECC enabled:	None
Accel Description:	None
Adapter:	Mellanox ConnectX-6 HDR
Number of Adapters:	1
Slot Type:	PCI-Express 4.0 x16
Data Rate:	200Gbit/s
Ports Used:	1

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Software

Accelerator Driver:	--
Adapter:	Mellanox ConnectX-6 HDR
Adapter Driver:	5.1-2.5.8.0
Adapter Firmware:	20.29.2002
Operating System:	CentOS Linux release 8.4.2105 4.18.0-240.22.1.el8_3.crt2.x86_64
Local File System:	NFS
Shared File System:	Lustre FS
System State:	Multi-user
Other Software:	--

Node Description: Intel Server M50CYP2UR208 (Xeon 8360Y)

Hardware (Continued)

Interconnect Type: Mellanox HDR

Node Description: LustreFS

Hardware

Number of nodes:	1
Uses of the node:	Fileserver
Vendor:	Intel
Model:	Inspur NF5280M5
CPU Name:	Intel Xeon Gold 6244
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	16
Cores per chip:	8
Threads per core:	2
CPU Characteristics:	Intel Xeon Gold
CPU MHz:	3600
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	25344 KB I+D on chip per chip
Other Cache:	None
Memory:	192 GB (12 x 16 GB 2Rx8 PC4-2666R)
Disk Subsystem:	1 x 1 TB 12 Gbps SAS 2.5" SSD
Other Hardware:	None
Accel Count:	--
Accel Model:	--
Accel Vendor:	--
Accel Type:	--
Accel Connection:	--
Accel ECC enabled:	--
Accel Description:	--
Adapter:	Mellanox ConnectX-4 EDR
Number of Adapters:	1
Slot Type:	PCI-Express 4.0 x16
Data Rate:	100 Gb/s
Ports Used:	2
Interconnect Type:	Mellanox EDR

Software

Accelerator Driver:	--
Adapter:	Mellanox ConnectX-4 EDR
Adapter Driver:	5.1-2.5.8.0
Adapter Firmware:	20.29.2002
Operating System:	CentOS Linux release 7.8.2003 4.18.0-240.22.1.el8_3.crt2.x86_64
Local File System:	None
Shared File System:	Lustre FS
System State:	Multi-User
Other Software:	None

Interconnect Description: Mellanox HDR

Hardware

Vendor:	Mellanox
Model:	Mellanox HDR
Switch Model:	Mellanox MQM8790-HS2F Quantum HDR InfiniBand Switch
Number of Switches:	18
Number of Ports:	40
Data Rate:	200 Gbit/s
Firmware:	20.29.2002
Topology:	Fat-tree
Primary Use:	MPI Traffic

Software

: --

Submit Notes

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

Compiler Version Notes

```
==============================================================================
 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 2021.3.0 (2021.3.0.20210619)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir:
  /global/panfs01/admin/opt/intel/oneAPI/2021.3.0.3219/compiler/2021.3.0/linux/bin
------------------------------------------------------------------------------

==============================================================================
 CXXC 532.sph_exa_t(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler 2021.3.0 (2021.3.0.20210619)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir:
  /global/panfs01/admin/opt/intel/oneAPI/2021.3.0.3219/compiler/2021.3.0/linux/bin
------------------------------------------------------------------------------

==============================================================================
 FC  519.clvleaf_t(base, peak) 528.pot3d_t(base, peak) 535.weather_t(base,
     peak)
------------------------------------------------------------------------------
ifx (IFORT) 2021.3.0 Beta 20210619
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```

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Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`mpiicc -cc=icx -lstdc++(*)`

C++ benchmarks:
`mpiicpc -cxx=icx -lstdc++(*)`

Fortran benchmarks:
`mpiifort -fc=ifx -lstdc++(*)`

(*) Indicates a compiler flag that was found in a non-compiler variable.

Base Portability Flags

513.soma_t: `-DSPEC_NO_VAR_ARRAY_REDUCE`
521.miniswp_t: `-DUSE_KBA -DUSE_ACCELDIR`
532.sph_exa_t: `-DSPEC_USE_LT_IN_KERNELS`

Base Optimization Flags

C benchmarks:
`-Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512 -fiopenmp -ansi-alias`

C++ benchmarks:
`-Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512 -fiopenmp -ansi-alias`

Fortran benchmarks:
`-Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512 -fiopenmp -nostandard-realloc-lhs -align array64byte`

Peak Compiler Invocation

C benchmarks:
`mpiicc -cc=icx -lstdc++(*)`

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Peak Compiler Invocation (Continued)

C++ benchmarks:
mpiicpc -cxx=icx -lstdc++(*)

Fortran benchmarks:
mpiifort -fc=ifx -lstdc++(*)

(*) Indicates a compiler flag that was found in a non-compiler variable.

Peak Portability Flags

513.soma_t: -DSPEC_NO_VAR_ARRAY_REDUCE
521.miniswp_t: -DUSE_KBA -DUSE_ACCELDIR
532.sph_exa_t: -DSPEC_USE_LT_IN_KERNELS

Peak Optimization Flags

C benchmarks:

505.lbm_t: -Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512 -fiopenmp -ansi-alias

513.soma_t: -Ofast -ipo -xCORE-AVX512 -fiopenmp -ansi-alias

518.tealeaf_t: Same as 505.lbm_t

521.miniswp_t: Same as 505.lbm_t

534.hpgmgfv_t: -Ofast -ipo -fiopenmp -ansi-alias

C++ benchmarks:
-Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512 -fiopenmp -ansi-alias

Fortran benchmarks:

519.clvleaf_t: -Ofast -ipo -xCORE-AVX512 -mllvm -hir-nontemporal-cacheline-count=0 -fiopenmp -nostandard-realloc-lhs -align array64byte

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Peak Optimization Flags (Continued)

528.pot3d_t: `-Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512 -fiopenmp -nostandard-realloc-lhs -align array64byte`

535.weather_t: `Same as 528.pot3d_t`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/hpc2021/flags/Intel-oneAPI-icx2021-official-linux64.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/hpc2021/flags/Intel-oneAPI-icx2021-official-linux64.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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