# SPEChpc™ 2021 Tiny Result

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## Cisco Systems

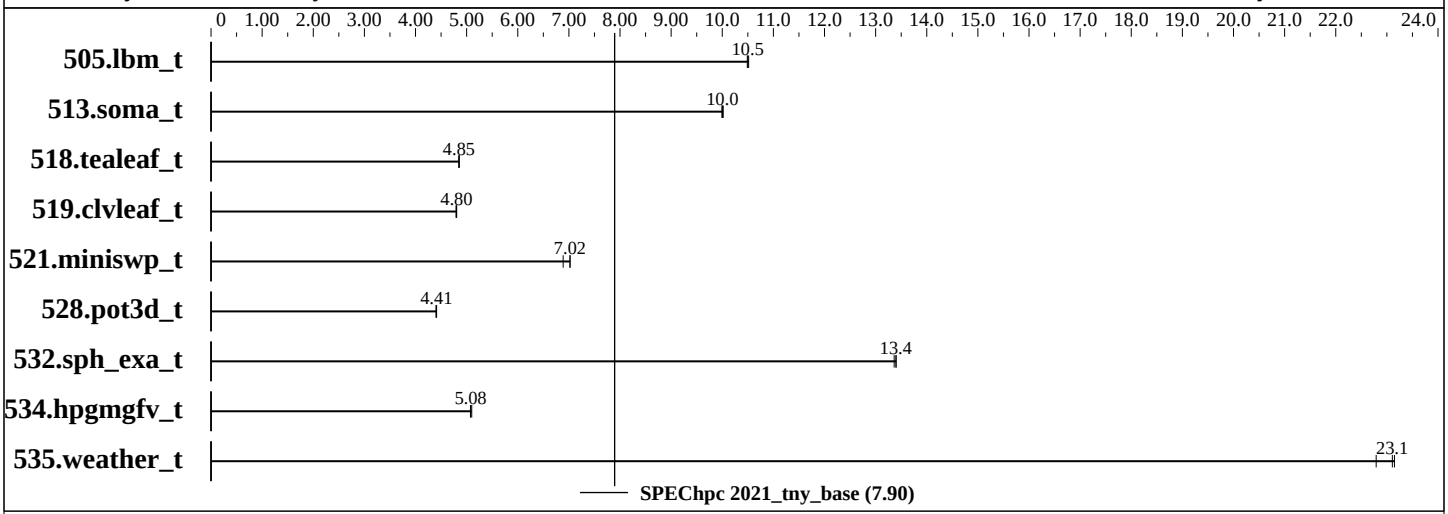
Cisco UCS X210c M7 (Intel Xeon Platinum 8490H)

SPEChpc 2021_tny_base = 7.90

SPEChpc 2021_tny_peak = Not Run

**hpc2021 License:** 9019
**Test Sponsor:** Cisco Systems
**Tested by:** Cisco Systems

**Test Date:** Dec-2022
**Hardware Availability:** Mar-2023
**Software Availability:** Nov-2022




## 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 | MPI | 120 | 1 | **214** | **10.5** | 214 | 10.5 | 214 | 10.5 | | | | | | | | | |
| 513.soma_t | MPI | 120 | 1 | **370** | **10.0** | 369 | 10.0 | 370 | 9.99 | | | | | | | | | |
| 518.tealeaf_t | MPI | 120 | 1 | **340** | **4.85** | 340 | 4.86 | 340 | 4.85 | | | | | | | | | |
| 519.clvleaf_t | MPI | 120 | 1 | 344 | 4.79 | **344** | **4.80** | 343 | 4.80 | | | | | | | | | |
| 521.miniswp_t | MPI | 120 | 1 | **228** | **7.02** | 232 | 6.89 | 228 | 7.02 | | | | | | | | | |
| 528.pot3d_t | MPI | 120 | 1 | 482 | 4.41 | 483 | 4.40 | **482** | **4.41** | | | | | | | | | |
| 532.sph_exa_t | MPI | 120 | 1 | 146 | 13.4 | 146 | 13.4 | **146** | **13.4** | | | | | | | | | |
| 534.hpgmgfv_t | MPI | 120 | 1 | 230 | 5.10 | 232 | 5.07 | **231** | **5.08** | | | | | | | | | |
| 535.weather_t | MPI | 120 | 1 | 142 | 22.8 | 139 | 23.1 | **140** | **23.1** | | | | | | | | | |

**SPEChpc 2021_tny_base = 7.90**

**SPEChpc 2021_tny_peak = Not Run**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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**Software Availability:** Nov-2022

### Hardware Summary

| | |
|---|---|
| Type of System: | Homogenous |
| Compute Node: | Cisco UCS X210c M7 |
| Interconnect: | N/A |
| Compute Nodes Used: | 1 |
| Total Chips: | 2 |
| Total Cores: | 120 |
| Total Threads: | 240 |
| Total Memory: | 1 TB |
| Max. Peak Threads: | -- |

### Software Summary

| | |
|---|---|
| Compiler: | Intel oneAPI Compiler 2022.2.1 |
| MPI Library: | Intel MPI Library for Linux* OS, Version 2022.2.1 Build 20221020 |
| Other MPI Info: | -- |
| Other Software: | -- |
| Base Parallel Model: | MPI |
| Base Ranks Run: | 120 |
| Base Threads Run: | 1 |
| Peak Parallel Models: | Not Run |
| Minimum Peak Ranks: | -- |
| Maximum Peak Ranks: | -- |
| Max. Peak Threads: | -- |
| Min. Peak Threads: | -- |

## Node Description: Cisco UCS X210c M7

### Hardware

| | |
|---|---|
| Number of nodes: | 1 |
| Uses of the node: | Compute |
| Vendor: | Cisco Systems |
| Model: | Cisco UCS X210c M7 |
| CPU Name: | Intel Xeon Platinum 8490H |
| CPU(s) orderable: | 1, 2 chips |
| Chips enabled: | 2 |
| Cores enabled: | 120 |
| Cores per chip: | 60 |
| Threads per core: | 2 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.5 GHz |
| CPU MHz: | 1900 |
| Primary Cache: | 32 KB I + 48 KB D on chip per core |
| Secondary Cache: | 2 MB I+D on chip per core |
| L3 Cache: | 112.5 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R) |
| Disk Subsystem: | 1 x 960 GB M.2 SSD SATA |
| Other Hardware: | None |
| Accel Count: | -- |
| Accel Model: | -- |
| Accel Vendor: | -- |
| Accel Type: | -- |
| Accel Connection: | -- |
| Accel ECC enabled: | -- |
| Accel Description: | -- |
| Adapter: | None |
| Number of Adapters: | 0 |
| Slot Type: | None |
| Data Rate: | None |
| Ports Used: | 0 |

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### Software

| | |
|---|---|
| Accelerator Driver: | -- |
| Adapter: | None |
| Adapter Driver: | None |
| Adapter Firmware: | None |
| Operating System: | SUSE Linux Enterprise Server 15 SP4 , 5.14.21-150400.22-default |
| Local File System: | xfs |
| Shared File System: | None |
| System State: | Multi-user, run level 3 |
| Other Software: | None |

## Node Description: Cisco UCS X210c M7

### Hardware (Continued)

Interconnect Type: None

## Interconnect Description: N/A

### Hardware

| | |
|---|---|
| Vendor: | N/A |
| Model: | N/A |
| Switch Model: | None |
| Number of Switches: | 0 |
| Number of Ports: | 0 |
| Data Rate: | N/A |
| Firmware: | N/A |
| Topology: | N/A |
| Primary Use: | N/A |

### Software

: --

## Submit Notes

```
The config file option 'submit' was used.
export LD_PRELOAD="/usr/lib64/libhugetlbfs.so $LD_PRELOAD"
export OMP_PROC_BIND=true
mpiexec.hydra -bootstrap ssh -hostfile /home/hpc2021/1node --bind-to core -np $ranks -ppn $ppn -genv OMP_NUM_THREADS=$threads $command
```

## Compiler Version Notes

```
==============================================================================
 CC  505.lbm_t(base) 513.soma_t(base) 518.tealeaf_t(base) 521.miniswp_t(base)
     534.hpgmgfv_t(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler 2022.2.1 (2022.2.1.20221020)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /home/tools-intel/compiler/compiler/2022.2.1/linux/bin-llvm
Configuration file:
  /home/tools-intel/compiler/compiler/2022.2.1/linux/bin/icx.cfg
------------------------------------------------------------------------------

==============================================================================
 CXXC 532.sph_exa_t(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler 2022.2.1 (2022.2.1.20221020)
Target: x86_64-unknown-linux-gnu
Thread model: posix
```

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## Compiler Version Notes (Continued)

```
InstalledDir: /home/tools-intel/compiler/compiler/2022.2.1/linux/bin-llvm
Configuration file:
  /home/tools-intel/compiler/compiler/2022.2.1/linux/bin/icx.cfg
------------------------------------------------------------------------------

==============================================================================
 FC  519.clvleaf_t(base) 528.pot3d_t(base) 535.weather_t(base)
------------------------------------------------------------------------------
ifx (IFORT) 2022.2.1 20221020
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

## 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`

## 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`

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# Base Optimization Flags (Continued)

Fortran benchmarks (continued):
`-nostandard-realloc-lhs -align array64byte`

# Base Other Flags

C benchmarks (except as noted below):
`-Ispecmpitime`

521.miniswp_t: `-Ispecmpitime/`

534.hpgmgfv_t: `-Ispecmpitime`

C++ benchmarks:
`-Ispecmpitime`

Fortran benchmarks:

519.clvleaf_t: `-Ispecmpitime`

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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