SPEC® OMPG2012 Result

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Cisco Systems

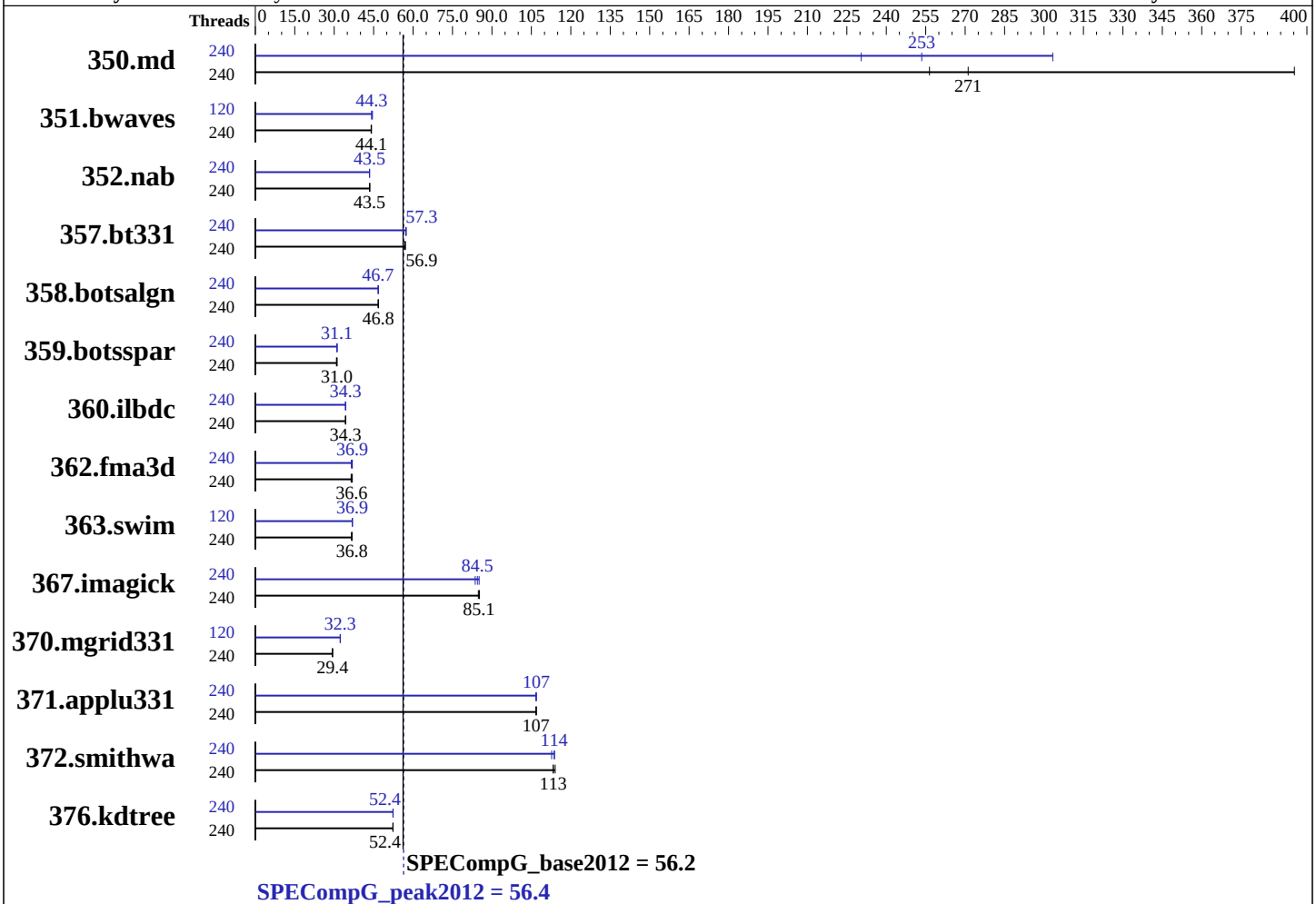
Cisco UCS X210c M7 (Intel Xeon Platinum 8490H)

SPECompG_peak2012 = 56.4

SPECompG_base2012 = 56.2

OMP2012 license: 9019
Test sponsor: Cisco Systems
Tested by: Cisco Systems

Test date: Dec-2022
Hardware Availability: Mar-2023
Software Availability: Nov-2022



Hardware

CPU Name:	Intel Xeon Platinum 8490H
CPU Characteristics:	Intel Turbo Boost Technology up to 3.5 GHz
CPU MHz:	1900
CPU MHz Maximum:	3500
FPU:	Integrated
CPU(s) enabled:	120 cores, 2 chips, 60 cores/chip, 2 threads/core
CPU(s) orderable:	1,2 chip
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
Other Hardware:	None
Base Threads Run:	240
Minimum Peak Threads:	120

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Software

Operating System:	SUSE Linux Enterprise Server 15 SP4 5.14.21-150400.22-default
Compiler:	C/C++/Fortran: Version 2022.2.0.20221020 of Intel oneAPI DPC++/C++
Auto Parallel:	No
File System:	xfs
System State:	Multi-user, run level 3
Base Pointers:	64-bit
Peak Pointers:	64-bit
Other Software:	None

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Maximum Peak Threads: 240

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
350.md	240	11.7	395	18.1	256	**17.1**	**271**	240	**18.3**	**253**	20.1	230	15.3	303
351.bwaves	240	102	44.2	**103**	**44.1**	103	44.0	120	102	44.3	**102**	**44.3**	102	44.6
352.nab	240	89.4	43.5	89.5	43.5	**89.4**	**43.5**	240	**89.5**	**43.5**	89.6	43.4	89.5	43.5
357.bt331	240	83.0	57.1	83.5	56.8	**83.3**	**56.9**	240	82.8	57.2	82.5	57.4	**82.8**	**57.3**
358.botsalgn	240	93.0	46.8	93.0	46.8	**93.0**	**46.8**	240	**93.1**	**46.7**	93.1	46.7	93.0	46.8
359.botsspar	240	170	30.9	169	31.1	**169**	**31.0**	240	**169**	**31.1**	169	31.1	169	31.0
360.ilbdc	240	104	34.3	**104**	**34.3**	104	34.4	240	**104**	**34.3**	104	34.3	104	34.3
362.fma3d	240	103	36.9	104	36.4	**104**	**36.6**	240	**103**	**36.9**	103	36.9	104	36.5
363.swim	240	124	36.6	123	36.8	**123**	**36.8**	120	123	36.9	**123**	**36.9**	123	36.9
367.imagick	240	**82.6**	**85.1**	82.4	85.3	82.9	84.8	240	**83.2**	**84.5**	84.1	83.6	82.6	85.1
370.mgrid331	240	**151**	**29.4**	151	29.4	151	29.4	120	137	32.3	137	32.3	**137**	**32.3**
371.applu331	240	56.8	107	**56.7**	**107**	56.7	107	240	56.8	107	56.7	107	**56.7**	**107**
372.smithwa	240	47.0	114	**47.3**	**113**	47.3	113	240	47.1	114	**47.2**	**114**	47.6	113
376.kdtree	240	85.9	52.4	**85.9**	**52.4**	86.0	52.3	240	85.9	52.4	85.8	52.4	**85.9**	**52.4**

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

Platform Notes

```
Sysinfo program /home/omp2012/Docs/sysinfo
Revision 563 of 2016-06-10 (097295389cf6073d8c3b03fa376740a5)
running on x210m7-Arthur Tue Dec 13 06:30:24 2022

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
  http://www.spec.org/omp2012/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) Platinum 8490H
      2 "physical id"s (chips)
      240 "processors"
   cores, siblings (Caution: counting these is hw and system dependent.  The
   following excerpts from /proc/cpuinfo might not be reliable.  Use with
   caution.)
      cpu cores : 60
      siblings  : 120
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
      22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46
      47 48 49 50 51 52 53 54 55 56 57 58 59
      physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
      22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46
      47 48 49 50 51 52 53 54 55 56 57 58 59
```

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Platform Notes (Continued)

```
      cache size : 115200 KB

   From /proc/meminfo
      MemTotal:       1056457400 kB
      HugePages_Total:       0
      Hugepagesize:       2048 kB

   From /etc/*release* /etc/*version*
      os-release:
         NAME="SLES"
         VERSION="15-SP4"
         VERSION_ID="15.4"
         PRETTY_NAME="SUSE Linux Enterprise Server 15 SP4"
         ID="sles"
         ID_LIKE="suse"
         ANSI_COLOR="0;32"
         CPE_NAME="cpe:/o:suse:sles:15:sp4"

   uname -a:
      Linux x210m7-Arthur 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May
      11 06:57:18 UTC 2022 (49db222) x86_64 x86_64 x86_64 GNU/Linux

   run-level 3 Dec 13 05:59

   SPEC is set to: /home/omp2012
      Filesystem     Type  Size  Used Avail Use% Mounted on
      /dev/sda3      xfs   884G  194G  690G  22% /home
   Additional information from dmidecode:

      Warning: Use caution when you interpret this section. The 'dmidecode' program
      reads system data which is "intended to allow hardware to be accurately
      determined", but the intent may not be met, as there are frequent changes to
      hardware, firmware, and the "DMTF SMBIOS" standard.

     BIOS Cisco Systems, Inc. X210M7.4.2.600.548.1201222205 12/01/2022
     Memory:
      16x 0xAD00 HMCG94MEBRA121N 64 GB 2 rank 4800 MT/s

   (End of data from sysinfo program)
```

General Notes

```
 ========================================================================
  BIOS Setting:
      Sub NUMA Clustering set to Disabled
      ADDDC Sparing set to Disabled
      Processor C6 Report set to Enabled
      UPI Link Enablement 1
      UPI Link Power Management Enabled
      UPI Link Speed 16.0GT/S
```

Continued on next page

General Notes (Continued)

```
================================================================================
 General OMP Library Settings:
 ENV_KMP_LIBRARY  = turnaround
 ENV_KMP_BLOCKTIME = infinite
 ENV_OMP_STACKSIZE = 8G
 ENV_KMP_SCHEDULE  = static
 ENV_OMP_THREADS  = 240
 ENV_OMP_DYNAMIC  = FALSE
================================================================================S
     NA: The test sponsor attests, as of date of publication, the CVE-2017-5754 (Meltdown)
      is mitigated in the system as tested and documented.

     Yes: The test sponsor attests, as of date of publication, the CVE-2017-5753 (Spectre variant 1)
      is mitigated in the system as tested and documented.

     Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Spectre variant 2)
      is mitigated in the system as tested and documented.
================================================================================
 OS tunning:
      Stack size set to unlimited using "ulimit -s unlimited"
      Transparent Huge Pages enabled by default
```

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Base Portability Flags

350.md: -mcmodel=medium(*) -FR
351.bwaves: -mcmodel=medium(*)
352.nab: -mcmodel=medium(*)
357.bt331: -mcmodel=medium(-intel_ifort)(*) -mcmodel=medium(-intel_ifort)
358.botsalgn: -mcmodel=medium(*)
359.botsspar: -mcmodel=medium(*)
360.ilbdc: -mcmodel=medium(*)
362.fma3d: -mcmodel=medium(*)
363.swim: -mcmodel=medium(-intel_ifort)(*) -mcmodel=medium(-intel_ifort)
367.imagick: -mcmodel=medium(*) -std=c99
370.mgrid331: -mcmodel=medium(*)
371.applu331: -mcmodel=medium(*)

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Base Portability Flags (Continued)

372.smithwa: `-mcmodel=medium`(*)
376.kdtree: `-mcmodel=medium`(*)

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

Base Optimization Flags

C benchmarks:
`-O3 -xCORE-AVX512 -ipo1 -qopenmp -qopt-zmm-usage=high -ansi-alias -shared-intel -ffast-math -fstrict-enums -fstrict-vtable-pointers -fvirtual-function-elimination`

C++ benchmarks:
`-O3 -xCORE-AVX512 -ipo1 -qopenmp -qopt-zmm-usage=high -ansi-alias -shared-intel -ffast-math -fstrict-enums -fstrict-vtable-pointers`

Fortran benchmarks:
`-O3 -xCORE-AVX512 -ipo1 -qopenmp -qopt-zmm-usage=high -ansi-alias -shared-intel -align array128byte -ffinite-math-only -fno-omit-frame-pointer -m64`

Peak Compiler Invocation

C benchmarks:
`icc`

C++ benchmarks:
`icpc`

Fortran benchmarks:
`ifort`

Peak Portability Flags

`Same as Base Portability Flags`

Peak Optimization Flags

C benchmarks:

352.nab: `-O3 -xCORE-AVX512 -ipo1 -qopenmp -qopt-zmm-usage=high -ansi-alias -shared-intel -ffast-math -fstrict-enums -fstrict-vtable-pointers -fvirtual-function-elimination`

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Peak Optimization Flags (Continued)

352.nab (continued):
-fno-signed-zeros

358.botsalgn: -O3 -xCORE-AVX512 -ipo1 -qopenmp -qopt-zmm-usage=high
-ansi-alias -shared-intel -ffast-math -fstrict-enums
-fstrict-vtable-pointers -fvirtual-function-elimination

359.botsspar: Same as 358.botsalgn

367.imagick: Same as 358.botsalgn

372.smithwa: Same as 358.botsalgn

C++ benchmarks:
-O3 -xCORE-AVX512 -ipo1 -qopenmp -qopt-zmm-usage=high -ansi-alias
-shared-intel -ffast-math -fstrict-enums -fstrict-vtable-pointers

Fortran benchmarks:

350.md: -O3 -xCORE-AVX512 -ipo1 -qopenmp -qopt-zmm-usage=high
-ansi-alias -shared-intel -align array128byte
-ffinite-math-only -fno-omit-frame-pointer -m64

351.bwaves: Same as 350.md

357.bt331: -O3 -xCORE-AVX512 -ipo1 -qopenmp -qopt-zmm-usage=high
-ansi-alias -shared-intel -align array128byte
-ffinite-math-only -fno-omit-frame-pointer -m64 -norecursive

360.ilbdc: Same as 350.md

362.fma3d: Same as 350.md

363.swim: Same as 350.md

370.mgrid331: Same as 350.md

371.applu331: Same as 350.md

The flags file that was used to format this result can be browsed at
http://www.spec.org/omp2012/flags/Cisco-ic2022.linux64-oneAPI.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/omp2012/flags/Cisco-ic2022.linux64-oneAPI.xml

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For other inquiries, please contact webmaster@spec.org.

Tested with SPEC OMP2012 v1.1.
Report generated on Wed Jan 11 14:04:07 2023 by SPEC OMP2012 PS/PDF formatter v541.
Originally published on 11 January 2023.