SPEC® OMPG2012 Result

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Supermicro

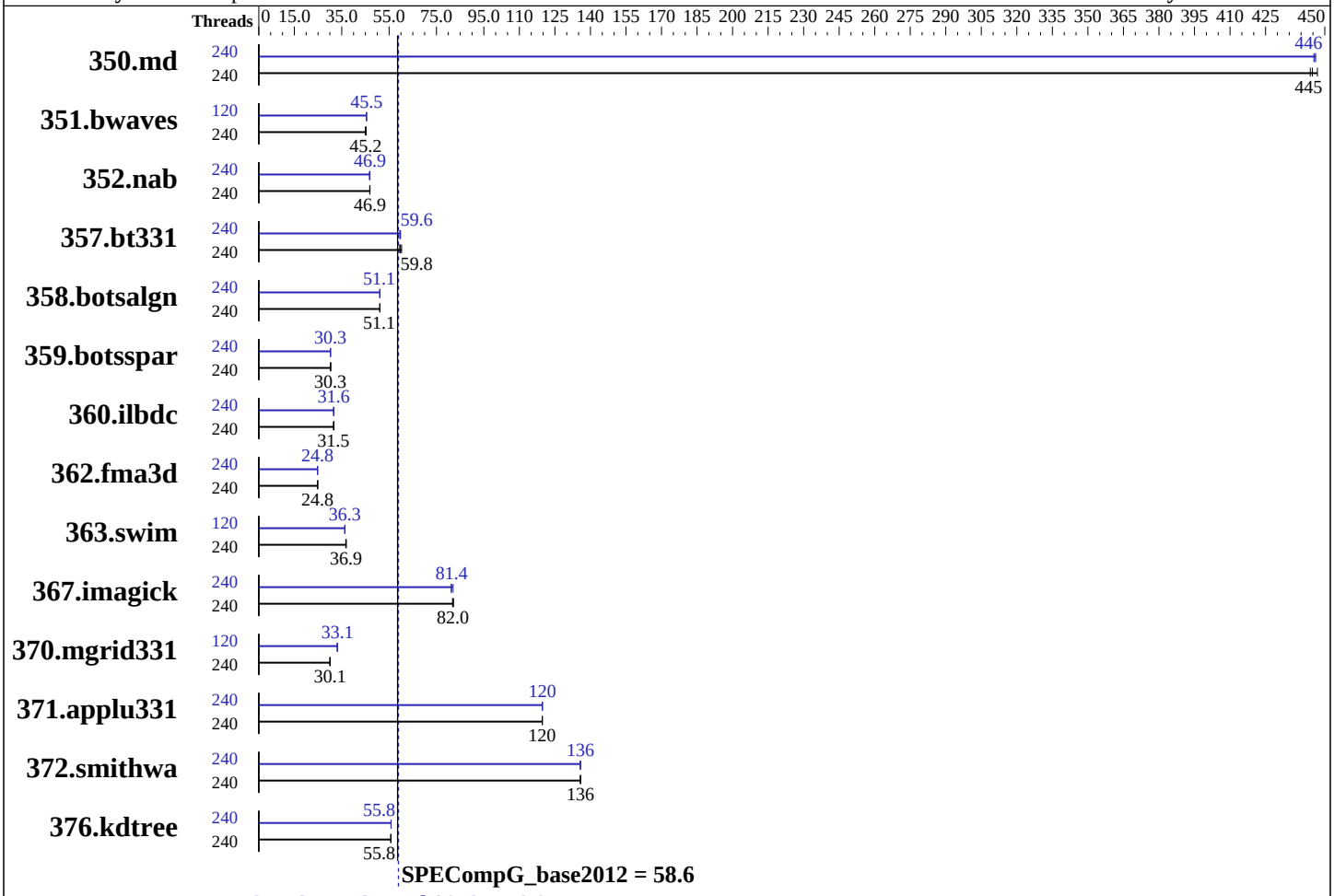
SuperServer SYS-221H-TNR (Intel Xeon Platinum 8490H)

SPECompG_peak2012 = 58.9

SPECompG_base2012 = 58.6

OMP2012 license: 001176
Test sponsor: Supermicro
Tested by: Supermicro

Test date: Jan-2023
Hardware Availability: Jan-2023
Software Availability: Jun-2022



Hardware

CPU Name:	Intel Xeon Platinum 8490H
CPU Characteristics:	Intel Turbo Boost Technology up to 3.50 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:	115200 KB I+D on chip per chip
Other Cache:	None
Memory:	512 GB (16 x 32 GB 2Rx8 PC5-4800B-R)
Disk Subsystem:	1 x 1.90 TB M.2 NVME SSD
Other Hardware:	None
Base Threads Run:	240
Minimum Peak Threads:	120

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Software

Operating System:	SUSE Linux Enterprise High Performance Computing 15 SP4 5.14.21-150400.22-default
Compiler:	C/C++/Fortran: Version 2023.0.0.20221208 of Intel oneAPI DPC++/C++
Auto Parallel:	No
File System:	xfs
System State:	Jun-2022
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	10.4	444	**10.4**	**445**	10.4	447	240	**10.4**	**446**	10.4	445	10.4	446
351.bwaves	240	**100**	**45.2**	100	45.3	101	45.0	120	99.6	45.5	**99.6**	**45.5**	99.6	45.5
352.nab	240	83.1	46.8	82.9	46.9	**82.9**	**46.9**	240	82.9	46.9	83.4	46.7	**82.9**	**46.9**
357.bt331	240	**79.3**	**59.8**	78.6	60.3	79.7	59.5	240	79.2	59.8	79.6	59.5	**79.5**	**59.6**
358.botsalgn	240	**85.1**	**51.1**	85.1	51.1	85.1	51.1	240	**85.2**	**51.1**	85.2	51.1	85.1	51.1
359.botsspar	240	173	30.4	174	30.2	**173**	**30.3**	240	**173**	**30.3**	174	30.2	173	30.3
360.ilbdc	240	**113**	**31.5**	113	31.5	112	31.8	240	113	31.5	112	31.7	**113**	**31.6**
362.fma3d	240	153	24.9	**153**	**24.8**	153	24.8	240	153	24.8	153	24.8	**153**	**24.8**
363.swim	240	123	36.9	**123**	**36.9**	123	36.7	120	**125**	**36.3**	125	36.3	125	36.4
367.imagick	240	86.0	81.8	**85.7**	**82.0**	85.6	82.2	240	86.6	81.2	85.7	82.0	**86.4**	**81.4**
370.mgrid331	240	**147**	**30.1**	147	30.0	147	30.1	120	**133**	**33.1**	133	33.2	133	33.1
371.applu331	240	**50.6**	**120**	50.7	120	50.6	120	240	**50.6**	**120**	50.6	120	50.6	120
372.smithwa	240	**39.5**	**136**	39.5	136	39.5	136	240	39.5	136	**39.5**	**136**	39.5	136
376.kdtree	240	80.7	55.8	**80.7**	**55.8**	80.8	55.7	240	80.6	55.8	80.5	55.9	**80.6**	**55.8**

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 156-2 Sat Jan 21 05:49:11 2023

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
```

Continued on next page

Platform Notes (Continued)

```
      cache size : 115200 KB

   From /proc/meminfo
      MemTotal:       527567152 kB
      HugePages_Total:       0
      Hugepagesize:       2048 kB

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

   uname -a:
      Linux 156-2 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 Jan 21 05:45 last=5

   SPEC is set to: /home/omp2012
      Filesystem     Type  Size  Used Avail Use% Mounted on
      /dev/nvme0n1p4 xfs   348G  8.4G  340G   3% /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 Supermicro X13DEM 1.1 01/20/2023
     Memory:
      16x Samsung M321R4GA3BB6-CQKMG 32 GB 2 rank 4800 MT/s

   (End of data from sysinfo program)
```

General Notes

```
   ------------------------------------------------------------------------
   BIOS Setting:
       Power Performance Tuning = BIOS Controls EPB
       ENERGY_PERF_BIAS_CFG Mode = Extreme Performance
       Turbo Mode = Disable
   ------------------------------------------------------------------------
   General OMP Library Settings:
      ENV_KMP_LIBRARY          = turnaround
      ENV_KMP_BLOCKTIME        = infinite
```

Continued on next page

General Notes (Continued)

```
    ENV_OMP_STACKSIZE       = 8G
    ENV_OMP_SCHEDULE        = static
    ENV_OMP_THREADS         = 240
    ENV_OMP_DYNAMIC         = FALSE
------------------------------------------------------------------------------
     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"
```

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(*)
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:
```
-O4 -xCORE-AVX512 -ipo1 -qopenmp -qopt-zmm-usage=high -ansi-alias
-shared-intel -ffast-math -fstrict-enums -fstrict-vtable-pointers
-fvirtual-function-elimination
```

C++ benchmarks:
```
-O4 -xCORE-AVX512 -ipo1 -qopenmp -qopt-zmm-usage=high -ansi-alias
-shared-intel -ffast-math -fstrict-enums -fstrict-vtable-pointers
```

Fortran benchmarks:
```
-O4 -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: `-O4 -xCORE-AVX512 -ipo1 -qopenmp -qopt-zmm-usage=high -ansi-alias -shared-intel -ffast-math -fstrict-enums -fstrict-vtable-pointers -fvirtual-function-elimination -fno-signed-zeros`

358.botsalgn: `-O4 -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

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Peak Optimization Flags (Continued)

367.imagick: Same as 358.botsalgn

372.smithwa: Same as 358.botsalgn

C++ benchmarks:
-O4 -xCORE-AVX512 -ipo1 -qopenmp -qopt-zmm-usage=high -ansi-alias
-shared-intel -ffast-math -fstrict-enums -fstrict-vtable-pointers

Fortran benchmarks:

350.md: -O4 -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: -O4 -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 files that were used to format this result can be browsed at
http://www.spec.org/omp2012/flags/Supermicro-ic2022.linux64-oneAPI.html
http://www.spec.org/omp2012/flags/Supermicro-Platform-Settings-V1.2-SPR-revC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/omp2012/flags/Supermicro-ic2022.linux64-oneAPI.xml
http://www.spec.org/omp2012/flags/Supermicro-Platform-Settings-V1.2-SPR-revC.xml

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

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