SPEC® OMPG2012 Result

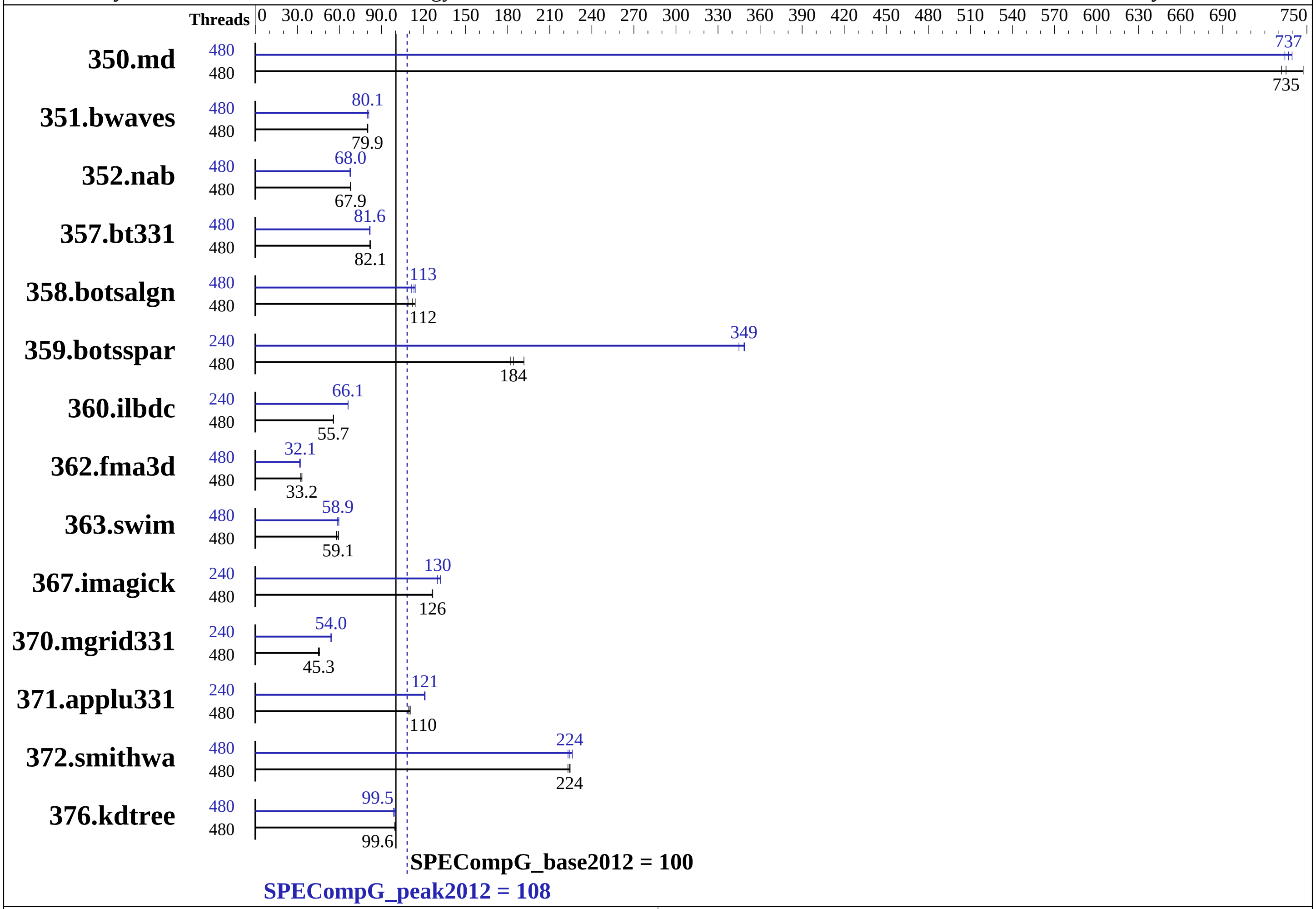
Lenovo Global Technology

ThinkSystem SR860V3 (Intel Xeon Platinum 8490H, 1.90 GHz)

SPECompG_peak2012 = 108

SPECompG_base2012 = 100

OMP2012 license:	9017	**Test date:**	Jul-2023
Test sponsor:	Lenovo Global Technology	**Hardware Availability:**	Jun-2023
Tested by:	Lenovo Global Technology	**Software Availability:**	Jun-2023



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:	240 cores, 4 chips, 60 cores/chip, 2 threads/core
CPU(s) orderable:	1,2,3,4 chips
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 shared 60 cores
Other Cache:	None
Memory:	2 TB (32 x 64 GB 2Rx4 PC4-4800V, ECC)
Disk Subsystem:	1 x 128GB 6Gbps SATA M.2 SSD
Other Hardware:	None
Base Threads Run:	480
Minimum Peak Threads:	240

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Software

Operating System:	SUSE Linux Enterprise for High-Performance Computing 15 SP4 (x86_64) ,Kernel 5.14.21-150400.22-default
Compiler:	C/C++/Fortran: Version 2023.1.0.46401 of Intel oneAPI DPC/C++
Auto Parallel:	No
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	64-bit
Other Software:	None

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Maximum Peak Threads: 480

Results Table

	Base							Peak						
Benchmark	**Threads**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Threads**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**
350.md	480	6.20	747	**6.30**	**735**	6.33	732	480	**6.28**	**737**	6.26	739	6.31	734
351.bwaves	480	56.8	79.8	56.4	80.3	**56.7**	**79.9**	480	**56.5**	**80.1**	56.0	81.0	56.8	79.7
352.nab	480	**57.3**	**67.9**	57.2	68.0	57.3	67.9	480	57.2	68.0	57.7	67.5	**57.2**	**68.0**
357.bt331	480	57.6	82.4	58.0	81.7	**57.8**	**82.1**	480	57.9	81.9	58.2	81.4	**58.1**	**81.6**
358.botsalgn	480	**38.8**	**112**	39.9	109	38.1	114	480	38.1	114	39.0	111	**38.4**	**113**
359.botsspar	480	27.4	192	28.9	182	**28.5**	**184**	240	**15.1**	**349**	15.0	349	15.2	345
360.ilbdc	480	**64.0**	**55.7**	63.8	55.8	64.1	55.6	240	**53.9**	**66.1**	53.8	66.2	53.9	66.1
362.fma3d	480	114	33.3	**115**	**33.2**	118	32.1	480	120	31.6	**119**	**32.1**	118	32.1
363.swim	480	78.3	57.9	**76.6**	**59.1**	76.3	59.4	480	76.0	59.6	**76.9**	**58.9**	77.2	58.7
367.imagick	480	55.8	126	55.5	127	**55.6**	**126**	240	53.2	132	**54.0**	**130**	54.1	130
370.mgrid331	480	96.4	45.8	98.2	45.0	**97.7**	**45.3**	240	82.1	53.9	**81.8**	**54.0**	81.2	54.4
371.applu331	480	**54.9**	**110**	54.8	111	55.4	109	240	50.0	121	**50.1**	**121**	50.3	121
372.smithwa	480	24.0	223	23.9	225	**23.9**	**224**	480	**23.9**	**224**	24.0	223	23.7	226
376.kdtree	480	45.1	99.8	**45.2**	**99.6**	45.2	99.5	480	45.0	99.9	**45.2**	**99.5**	45.6	98.6

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 Charlotte-omp Wed Jul 19 22:39:47 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
      4 "physical id"s (chips)
      480 "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)

```
        physical 2: 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 3: 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
     cache size : 115200 KB

  From /proc/meminfo
     MemTotal:       2113210112 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 Charlotte-omp 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 Jul 19 15:20

  SPEC is set to: /home/omp2012
     Filesystem     Type  Size  Used Avail Use% Mounted on
     /dev/sda3      xfs    85G   52G   34G  61% /var/tmp
  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 Lenovo RSE105E-1.10 05/12/2023
    Memory:
     30x SK Hynix HMCG94MEBRA121N 64 GB 2 rank 4800 MT/s
     2x SK Hynix HMCG94MEBRA124N 64 GB 2 rank 4800 MT/s

  (End of data from sysinfo program)
```

General Notes

```
 ======================================================================
  General OMP Library Settings
  ENV_KMP_AFFINITY  = granularity=fine,compact,1,0
  ENV_KMP_LIBRARY   = turnaround
  ENV_KMP_STACKSIZE  = 2G
  ENV_KMP_BLOCKTIME  = infinite
  ENV_KMP_SCHEDULE  = static
  ENV_OMP_DYNAMIC   = FALSE
  ENV_OMP_MAXACTIVE_LEVELS = 1
  ENV_OMP_THREADS   = 480
  ENV_OMP_WAIT_POLICY  = PASSIVE
 ======================================================================
  BIOS Setting notes:
  Choose Operating Mode set to Maximum Performance, and change to Custom Mode.
  Below items also configured:
   UPI Link Power Management = Enabled
   Page Policy   = Adaptive
  Patrol Scrub   = Disabled
  Memory Data Scrambling  = Disabled

  Yes: 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:
   ulimit -s unlimited
 ===========================================================================
```

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Base Portability Flags

350.md: -FR
357.bt331: -mcmodel=medium
363.swim: -mcmodel=medium

Continued on next page

Base Portability Flags (Continued)

367.imagick: `-std=c99`

Base Optimization Flags

C benchmarks:
`-O3 -qopenmp -xSAPPHIRERAPIDS -ipo -fno-alias -ansi-alias -qopt-zmm-usage=high -ljemalloc -Wno-implicit-function-declaration -ffast-math`

C++ benchmarks:
`-O3 -qopenmp -xSAPPHIRERAPIDS -ipo -fno-alias -ansi-alias -qopt-zmm-usage=high -ljemalloc -Wno-implicit-function-declaration -ffast-math`

Fortran benchmarks:

350.md: `-O3 -qopenmp -xSAPPHIRERAPIDS -ipo -fno-alias -ansi-alias -qopt-zmm-usage=high -ljemalloc -Wno-implicit-function-declaration -m64`

351.bwaves: Same as 350.md

357.bt331: Same as 350.md

360.ilbdc: Same as 350.md

362.fma3d: `-O3 -qopenmp -xSAPPHIRERAPIDS -ipo -fno-alias -ansi-alias -qopt-zmm-usage=high -ljemalloc -Wno-implicit-function-declaration`

363.swim: Same as 350.md

370.mgrid331: Same as 350.md

371.applu331: Same as 350.md

Peak Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifort`

Peak Portability Flags

350.md: -FR
357.bt331: -mcmodel=medium
363.swim: -mcmodel=medium
367.imagick: -std=c99

Peak Optimization Flags

C benchmarks:
-O3 -qopenmp -xSAPPHIRERAPIDS -ipo -fno-alias -ansi-alias
-qopt-zmm-usage=high -ljemalloc -Wno-implicit-function-declaration
-ffast-math

C++ benchmarks:
-O3 -qopenmp -xSAPPHIRERAPIDS -ipo -fno-alias -ansi-alias
-qopt-zmm-usage=high -ljemalloc -Wno-implicit-function-declaration
-ffast-math

Fortran benchmarks:
-O3 -qopenmp -xSAPPHIRERAPIDS -ipo -fno-alias -ansi-alias
-qopt-zmm-usage=high -ljemalloc -Wno-implicit-function-declaration

The flags file that was used to format this result can be browsed at
http://www.spec.org/omp2012/flags/lenovo-omp2012-oneAPI.20230816.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/omp2012/flags/lenovo-omp2012-oneAPI.20230816.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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