



SPEC® OMPG2012 Result

Copyright 2012-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

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

SPECompG_peak2012 = 108

SPECompG_base2012 = 100

OMP2012 license:9017

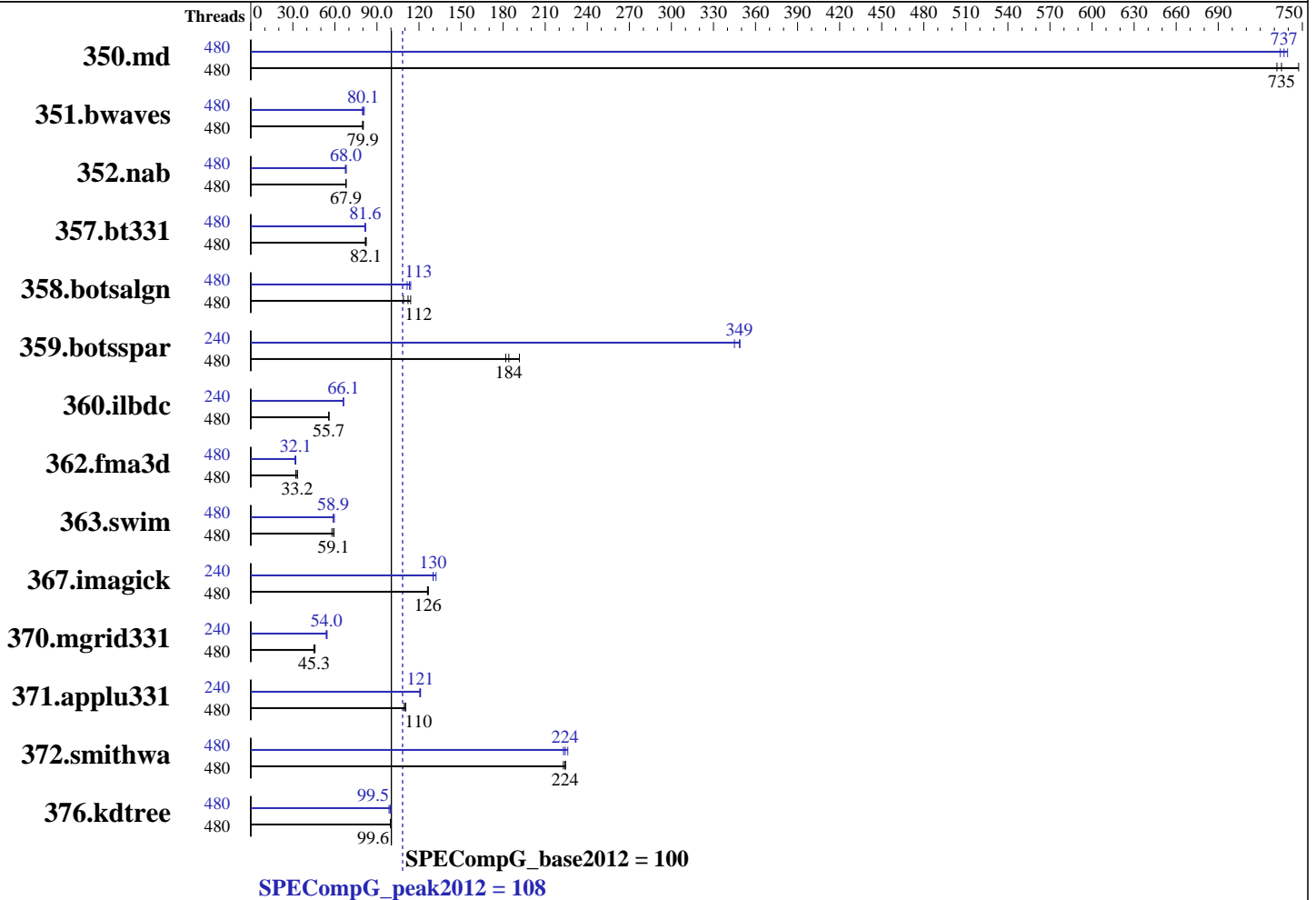
Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: Jul-2023

Hardware Availability: Jun-2023

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

Continued on next page

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

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
350.md	480	6.20	747	<u>6.30</u>	<u>735</u>	6.33	732	480	<u>6.28</u>	<u>737</u>	6.26	739	6.31	734
351.bwaves	480	56.8	79.8	56.4	80.3	<u>56.7</u>	<u>79.9</u>	480	<u>56.5</u>	<u>80.1</u>	56.0	81.0	56.8	79.7
352.nab	480	<u>57.3</u>	<u>67.9</u>	57.2	68.0	57.3	67.9	480	57.2	68.0	57.7	67.5	<u>57.2</u>	<u>68.0</u>
357.bt331	480	57.6	82.4	58.0	81.7	<u>57.8</u>	<u>82.1</u>	480	57.9	81.9	58.2	81.4	<u>58.1</u>	<u>81.6</u>
358.botsalgn	480	<u>38.8</u>	<u>112</u>	39.9	109	38.1	114	480	38.1	114	39.0	111	<u>38.4</u>	<u>113</u>
359.botsspar	480	27.4	192	28.9	182	<u>28.5</u>	<u>184</u>	240	<u>15.1</u>	<u>349</u>	15.0	349	15.2	345
360.ilbdc	480	<u>64.0</u>	<u>55.7</u>	63.8	55.8	64.1	55.6	240	<u>53.9</u>	<u>66.1</u>	53.8	66.2	53.9	66.1
362.fma3d	480	114	33.3	<u>115</u>	<u>33.2</u>	118	32.1	480	120	31.6	<u>119</u>	<u>32.1</u>	118	32.1
363.swim	480	78.3	57.9	<u>76.6</u>	<u>59.1</u>	76.3	59.4	480	76.0	59.6	<u>76.9</u>	<u>58.9</u>	77.2	58.7
367.imagick	480	55.8	126	55.5	127	<u>55.6</u>	<u>126</u>	240	53.2	132	<u>54.0</u>	<u>130</u>	54.1	130
370.mgrid331	480	96.4	45.8	98.2	45.0	<u>97.7</u>	<u>45.3</u>	240	82.1	53.9	<u>81.8</u>	<u>54.0</u>	81.2	54.4
371.applu331	480	<u>54.9</u>	<u>110</u>	54.8	111	55.4	109	240	50.0	121	<u>50.1</u>	<u>121</u>	50.3	121
372.smithwa	480	24.0	223	23.9	225	<u>23.9</u>	<u>224</u>	480	<u>23.9</u>	<u>224</u>	24.0	223	23.7	226
376.kdtree	480	45.1	99.8	<u>45.2</u>	<u>99.6</u>	45.2	99.5	480	45.0	99.9	<u>45.2</u>	<u>99.5</u>	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 HMC94MEBRA121N 64 GB 2 rank 4800 MT/s
2x SK Hynix HMC94MEBRA124N 64 GB 2 rank 4800 MT/s

```

(End of data from sysinfo program)



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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 tuning:
  ulimit -s unlimited
=====

```

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Base Portability Flags

```

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

```

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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



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Peak Portability Flags

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

Peak Optimization Flags

C benchmarks:

-O3 -qopenmp -xSAPPHIRERAPIDS -ipo -fno-alias -ansi-alias
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-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>

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

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