



SPEC® OMPG2012 Result

Copyright 2012-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR950V3 (Intel Xeon Platinum 8490H, 1.90 GHz)

SPECompG_peak2012 = 138

SPECompG_base2012 = 126

OMP2012 license:9017

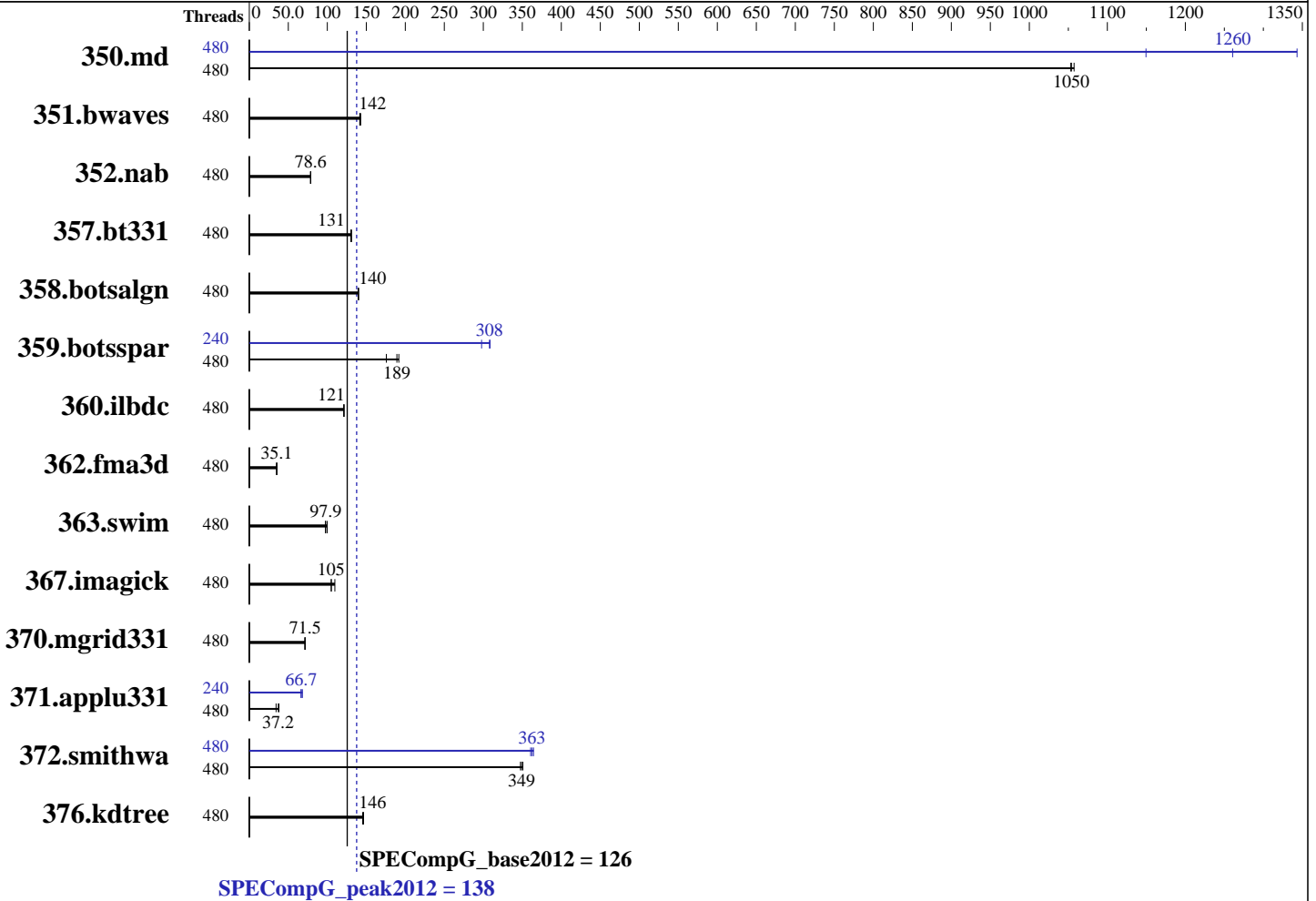
Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: Aug-2024

Hardware Availability: Oct-2023

Software Availability: Jun-2024



Hardware

CPU Name: Intel Xeon 8490H CPU @ 1.90GHz
 CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz
 CPU MHz: 1900
 CPU MHz Maximum: 3500
 FPU: Integrated
 CPU(s) enabled: 480 cores, 8 chips, 60 cores/chip
 CPU(s) orderable: 2,4,8 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
 Other Cache: None
 Memory: 4 TB (64 x 64 GB 2Rx4 PC4-4800V, ECC)
 Disk Subsystem: 1 x 960GB M.2 NVME SSD
 Other Hardware: None
 Base Threads Run: 480
 Minimum Peak Threads: 240

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Software

Operating System: Red Hat Enterprise Linux 9 (x86_64), Kernel 5.14.0-70.22.1.el9_0.x86_64
 Compiler: C/C++/Fortran: Version 2024.2.0.635 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	4.38	1060	4.40	1050	<u>4.39</u>	<u>1050</u>	480	<u>3.67</u>	<u>1260</u>	3.45	1340	4.03	1150
351.bwaves	480	31.7	143	<u>31.9</u>	<u>142</u>	32.0	142	480	31.7	143	<u>31.9</u>	<u>142</u>	32.0	142
352.nab	480	49.5	78.5	49.4	78.8	<u>49.5</u>	<u>78.6</u>	480	49.5	78.5	49.4	78.8	<u>49.5</u>	<u>78.6</u>
357.bt331	480	36.2	131	36.4	130	<u>36.3</u>	<u>131</u>	480	36.2	131	36.4	130	<u>36.3</u>	<u>131</u>
358.botsalgn	480	31.2	140	31.0	140	<u>31.1</u>	<u>140</u>	480	31.2	140	31.0	140	<u>31.1</u>	<u>140</u>
359.botsspar	480	27.4	192	29.9	176	<u>27.7</u>	<u>189</u>	240	17.6	298	17.0	309	<u>17.1</u>	<u>308</u>
360.ilbdc	480	29.4	121	<u>29.4</u>	<u>121</u>	29.3	121	480	29.4	121	<u>29.4</u>	<u>121</u>	29.3	121
362.fma3d	480	<u>108</u>	<u>35.1</u>	109	35.0	108	35.3	480	<u>108</u>	<u>35.1</u>	109	35.0	108	35.3
363.swim	480	<u>46.3</u>	<u>97.9</u>	45.3	99.9	46.4	97.5	480	<u>46.3</u>	<u>97.9</u>	45.3	99.9	46.4	97.5
367.imagick	480	66.9	105	64.1	110	<u>66.9</u>	<u>105</u>	480	66.9	105	64.1	110	<u>66.9</u>	<u>105</u>
370.mgrid331	480	61.7	71.6	<u>61.8</u>	<u>71.5</u>	62.1	71.2	480	61.7	71.6	<u>61.8</u>	<u>71.5</u>	62.1	71.2
371.applu331	480	160	38.0	177	34.3	<u>163</u>	<u>37.2</u>	240	<u>90.9</u>	<u>66.7</u>	91.4	66.3	89.0	68.1
372.smithwa	480	15.3	351	<u>15.4</u>	<u>349</u>	15.4	348	480	14.7	364	14.9	361	<u>14.8</u>	<u>363</u>
376.kdtree	480	30.7	146	31.0	145	<u>30.8</u>	<u>146</u>	480	30.7	146	31.0	145	<u>30.8</u>	<u>146</u>

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 BLR Sun Aug 4 03:00:47 2024

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
8 "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 : 60
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
physical 4: 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 5: 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 6: 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 7: 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:      4226678004 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

From /etc/*release* /etc/*version*

```

os-release:
NAME="Red Hat Enterprise Linux"
VERSION="9.0 (Plow)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="9.0"
PLATFORM_ID="platform:el9"
PRETTY_NAME="Red Hat Enterprise Linux 9.0 (Plow)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 9.0 (Plow)
system-release: Red Hat Enterprise Linux release 9.0 (Plow)
system-release-cpe: cpe:/o:redhat:enterprise_linux:9::baseos

```

uname -a:

```

Linux BLR 5.14.0-70.22.1.el9_0.x86_64 #1 SMP PREEMPT Tue Aug 2 10:02:12 EDT
2022 x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Aug 4 01:30

SPEC is set to: /home/omp2012

```

Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/nvme0n1p5 xfs       435G      79G  357G  18% /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

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Platform Notes (Continued)

determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Lenovo EBE105F-2.10 01/31/2024

Memory:

18x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800 MT/s
8x Samsung M321R8GA0BB0-CQKEG 64 GB 2 rank 4800 MT/s
6x Samsung M321R8GA0BB0-CQKVG 64 GB 2 rank 4800 MT/s
32x Samsung M321R8GA0BB0-CQKZH 64 GB 2 rank 4800 MT/s

(End of data from sysinfo program)

General Notes

General OMP Library Settings

KMP_AFFINITY = granularity=tile, proclist=[0-59,60-119,120-179,180-239,240-299,300-359,360-419,420-479],explicit

KMP_LIBRARY = turnaround

KMP_BLOCKTIME = infinite

KMP_SCHEDULE = static,16

KMP_DETERMINISTIC_REDUCTION= 1

OMP_STACKSIZE = 480M

OMP_MAXACTIVE_LEVELS= 1

OMP_NUM_THREADS = 480

OMP_DYNAMIC = FALSE

OMP_PROC_BIND = close

OMP_PLACES = sockets

OMP_DISPLAY = verbose

BIOS Setting notes:

Choose Operating Mode set to Maximum Performance, and change to Custom Mode.

Below items also configured:

Hyper-Threading = Disabled

Page Policy = Adaptive

Patrol Scrub = Disabled

Memory Data Scrambling = Disabled

LLC Prefetch = 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



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Base Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Base Portability Flags

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

Base Optimization Flags

C benchmarks:

-Wno-implicit-function-declaration -O3 -qopenmp -xSAPPHIRERAPIDS
-ipo -foptimize-sibling-calls -ffast-math -ljemalloc

C++ benchmarks:

-O3 -qopenmp -xSAPPHIRERAPIDS -ipo -foptimize-sibling-calls
-ffast-math -ljemalloc

Fortran benchmarks:

-O3 -qopenmp -xSAPPHIRERAPIDS -ipo -foptimize-sibling-calls
-align array128byte -fno-alias

Peak Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx



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

Peak Optimization Flags

C benchmarks:

352.nab: basepeak = yes
358.botsalgn: basepeak = yes
359.botsspar: -Wno-implicit-function-declaration -O3 -qopenmp
-xSAPPHIRERAPIDS -ipo -foptimize-sibling-calls
-qopt-zmm-usage=high -mprefer-vector-width=512 -ffast-math
367.imagick: basepeak = yes
372.smithwa: -Wno-implicit-function-declaration -O3 -qopenmp
-xSAPPHIRERAPIDS -ipo -foptimize-sibling-calls
-mprefer-vector-width=512 -ffast-math

C++ benchmarks:

376.kdtree: basepeak = yes

Fortran benchmarks:

350.md: -O3 -qopenmp -xSAPPHIRERAPIDS -ipo
-foptimize-sibling-calls -mprefer-vector-width=512
-align array128byte -fno-alias
351.bwaves: basepeak = yes
357.bt331: basepeak = yes
360.ilbdc: basepeak = yes
362.fma3d: basepeak = yes
363.swim: basepeak = yes
370.mgrid331: basepeak = yes
371.applu331: -O3 -qopenmp -xSAPPHIRERAPIDS -ipo
-foptimize-sibling-calls -qopt-zmm-usage=high -shared-intel
-align array128byte -fno-alias



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The flags file that was used to format this result can be browsed at

<http://www.spec.org/omp2012/flags/lenovo-omp2012-oneAPI.20240829.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/omp2012/flags/lenovo-omp2012-oneAPI.20240829.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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