## Lenovo Global Technology

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

**SPECompG_peak2012** = 108

**SPECompG_base2012** = 100

### Hardware

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon Platinum 8490H</td>
</tr>
<tr>
<td>CPU Characteristics</td>
<td>Intel Turbo Boost Technology up to 3.50 GHz</td>
</tr>
<tr>
<td>CPU MHz</td>
<td>1900</td>
</tr>
<tr>
<td>CPU MHz Maximum</td>
<td>3500</td>
</tr>
<tr>
<td>FPU</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>240 cores, 4 chips, 60 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>1,2,3,4 chips</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB I + 48 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>2 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache</td>
<td>115200 KB I+D on chip per chip shared 60 cores</td>
</tr>
<tr>
<td>Other Cache</td>
<td>None</td>
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<tr>
<td>Memory</td>
<td>2 TB (32 x 64 GB 2Rx4 PC4-4800V, ECC)</td>
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<tr>
<td>Disk Subsystem</td>
<td>1 x 128GB 6Gbps SATA M.2 SSD</td>
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<tr>
<td>Other Hardware</td>
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<tr>
<td>Base Threads Run</td>
<td>480</td>
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<tr>
<td>Minimum Peak Threads</td>
<td>240</td>
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### Software

<table>
<thead>
<tr>
<th>OS</th>
<th>SUSE Linux Enterprise for High-Performance Computing 15 SP4 (x86_64)</th>
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<tbody>
<tr>
<td>Kernel</td>
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<tr>
<td>Compiler</td>
<td>C/C++/Fortran: Version 2023.1.0.46401 of Intel oneAPI DPC/C++</td>
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<td>Auto Parallel</td>
<td>No</td>
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<td>File System</td>
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<td>System State</td>
<td>Run level 3 (multi-user)</td>
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<tr>
<td>Base Pointers</td>
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<td>Peak Pointers</td>
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<td>Other Software</td>
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---

Test date: Jul-2023

Hardware Availability: Jun-2023

Software Availability: Jun-2023

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### Results

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**SPECompG_base2012** = 100

**SPECompG_peak2012** = 108

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Continued on next page
Results Table

<table>
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<tr>
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</table>

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)

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

Continued on next page
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

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*`
```
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 SMIOS" 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)
Lenovo Global Technology

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

**SPECompG_peak2012 = 108**
**SPECompG_base2012 = 100**

**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: -mcmodel=medium
363.swim: -mcmodel=medium

Continued on next page
Lenovo Global Technology

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

<table>
<thead>
<tr>
<th>SPECCompG_peak2012</th>
<th>108</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECCompG_base2012</td>
<td>100</td>
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</table>

**Hardware Availability:** Jun-2023

**Software Availability:** Jun-2023

**Test date:** Jul-2023

**Test sponsor:** Lenovo Global Technology

**Tested by:** Lenovo Global Technology

**OMP2012 license:** 9017

**Base Portability Flags**

367.imagick: -std=c99

**Base Optimization Flags**

**C benchmarks:**
-03 -gopenmp -xSAPPHIRERAPIDS -ipo -fno-alias -ansi-alias
-qopt-zmm-usage=high -ljemalloc
-Wno-implicit-function-declaration
-ffast-math

**C++ benchmarks:**
-03 -gopenmp -xSAPPHIRERAPIDS -ipo -fno-alias -ansi-alias
-qopt-zmm-usage=high -ljemalloc
-Wno-implicit-function-declaration
-ffast-math

**Fortran benchmarks:**

350.md: -03 -gopenmp -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: -03 -gopenmp -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:**
ixc

**C++ benchmarks:**
iixp

**Fortran benchmarks:**
ifort
Lenovo Global Technology

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

SPECompG_peak2012 = 108
SPECompG_base2012 = 100

Peak Portability Flags

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

Peak Optimization Flags

C benchmarks:
-03 -gopenmp -xSAPPHIREAPIDS -ipo -fno-alias -ansi-alias
- qopt-zmm-usage=high -ljemalloc -Wno-implicit-function-declaration
- ffast-math

C++ benchmarks:
-03 -gopenmp -xSAPPHIREAPIDS -ipo -fno-alias -ansi-alias
- qopt-zmm-usage=high -ljemalloc -Wno-implicit-function-declaration
- ffast-math

Fortran benchmarks:
-03 -gopenmp -xSAPPHIREAPIDS -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

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