## Lenovo Global Technology

### ThinkSystem SR655V3 (AMD EPYC 9754, 2.25GHz)

### SPEC® OMPG2012 Result

**SPECompG_peak2012** = 53.4  
**SPECompG_base2012** = 52.7

<table>
<thead>
<tr>
<th>OMP2012 license:</th>
<th>Lenovo Global Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor:</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
</tr>
</tbody>
</table>

| Threads | 5.00 | 10.00 | 15.00 | 20.00 | 25.00 | 30.00 | 35.00 | 40.00 | 45.00 | 50.00 | 55.00 | 60.00 | 65.00 | 70.00 | 75.00 | 80.00 | 85.00 | 90.00 | 95.00 | 100.00 | 105.00 | 110.00 | 115.00 | 120.00 | 125.00 | 130.00 | 135.00 |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 350.md  | 256  |       | 35.2  |       |       |       |       |       |       |       |       |       |       | 102   |       |       |       |       |       |       |       |       |       |       |       |       |
| 351.bwaves | 128  | 256  | 35.0  |       | 46.6  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 352.nab  | 256  | 256  | 46.6  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 357.bt331| 256  | 256  | 63.2  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 358.botsalg| 256  | 256  | 53.5  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 359.botsspar| 256  | 256  | 37.8  |       |       |       |       |       |       |       |       | 37.7  | 37.7  |       |       |       |       |       |       |       |       |       |       |       |       |
| 360.ilbdc| 128  | 256  | 27.3  |       | 37.7  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 362.fma3d| 128  | 128  | 27.2  |       | 35.8  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 363.swim | 128  | 128  | 26.4  |       | 35.9  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 367.imagick| 128  | 128  | 26.8  |       | 35.5  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 370.mgrid331| 128  | 128  | 24.1  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 371.applu331| 128  | 128  | 25.5  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 372.smithwa| 128  | 128  | 114   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 376.kdtree| 256  | 256  | 132   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

###Hardware

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>CPU Name:</td>
<td>AMD EPYC 9754</td>
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<tr>
<td>CPU Characteristics:</td>
<td>Max Boost Clock up to 3.1 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>2250</td>
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<tr>
<td>CPU MHz Maximum:</td>
<td>3100</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>1 MB I+D on chip per core</td>
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<tr>
<td>L3 Cache:</td>
<td>256 MB I+D on chip per chip, 32 MB shared 8 cores</td>
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<tr>
<td>Other Cache:</td>
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<tr>
<td>Memory:</td>
<td>768 GB (12 x 64 GB 2Rx4 PC5-4800B-R)</td>
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<tr>
<td>Disk Subsystem:</td>
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<td>Other Hardware:</td>
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<tr>
<td>Base Threads Run:</td>
<td>256</td>
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<tr>
<td>Minimum Peak Threads:</td>
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###Software

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
<tr>
<td>Operating System:</td>
<td>SUSE Linux Enterprise for High-Performance Computing 15</td>
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<tr>
<td>Compiler:</td>
<td>C/C++/Fortran: Version 2022.2.0.191 of Intel oneAPI oneAPI DPC/C++</td>
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<tr>
<td>Auto Parallel:</td>
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<td>File System:</td>
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<td>System State:</td>
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<tr>
<td>Base Pointers:</td>
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<tr>
<td>Peak Pointers:</td>
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<td>Other Software:</td>
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Lenovo Global Technology

ThinkSystem SR655V3(AMD EPYC 9754, 2.25GHz)

SPECompG_peak2012 = 53.4
SPECompG_base2012 = 52.7

OMP2012 license: 28
Test sponsor: Lenovo Global Technology
Test date: May-2023
Hardware Availability: Aug-2023
Tested by: Lenovo Global Technology
Software Availability: Aug-2023
Maximum Peak Threads: 256

Results Table

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<th>Benchmark</th>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tr>
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</tr>
</tbody>
</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)
running on bergamoA21P Tue May 16 11:01:37 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 : AMD EPYC 9754 128-Core Processor
1 "physical id"s (chips)
256 "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 : 128
siblings : 256
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 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 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127

Continued on next page
Platform Notes (Continued)

```plaintext
cache size : 1024 KB
From /proc/meminfo
   MemTotal:       792101276 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 bergamoA21P 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 May 16 00:45
SPEC is set to: /home/omp2012
Filesystem  Type  Size  Used Avail Use% Mounted on
   /dev/sda3      xfs   413G  325G   89G  79% /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 KAE111I-2.10 05/06/2023
   Memory:
      12x Samsung M321R8GA0BB0-CQKEG 64 GB 2 rank 4800 MT/s
(End of data from sysinfo program)
```

General Notes

`------------------------------------------------------------------------`

General OMP Library Settings
```plaintext
OMP_DYNAMIC= FALSE
OMP_THREADS= 256
KMP_SCHEDULE= static
KMP_LIBRARY= turnaround
KMP_STACKSIZE= 768M
KMP_BLOCKTIME= infinite
KMP_AFFINITY= granularity=fine,proclist=[0-7,8-15,16-23,24-31,32-39,
Continued on next page`
General Notes (Continued)

40-47,48-55,56-63,64-71,72-79,80-87,88-95,96-103,104-111,112-119,120-127,
128-135,136-143,144-151,152-159,160-167,168-175,176-183,184-191,192-199,

uEFI Setting notes:
Choose "Maximum Performance" operating mode and changed to "Custom" operating mode.
Below items also configured:
- NUMA Nodes per Socket = NPS2
- CPPC = Disabled
- DRAM Scrub Time = 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:
  ifx

Base Portability Flags

350.md: -FR
357.bt331: -mcmodel=medium
363.swim: -mcmodel=medium
367.imagick: -std=c99
SPEC OMPG2012 Result

Lenovo Global Technology

ThinkSystem SR655V3(AMD EPYC 9754, 2.25GHz)

SPECompG_peak2012 = 53.4
SPECompG_base2012 = 52.7

OMP2012 license: 28
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test date: May-2023
Hardware Availability: Aug-2023
Software Availability: Aug-2023

Base Optimization Flags

C benchmarks:
-Ofast -fopenmp -march=core-avx2 -fma -ipo -ansi-alias
-fp-model fast=2 -qno-opt-multiple-gather-scatter-by-shuffles
-qopt-zmm-usage=high -ffast-math -fstrict-nums
-fstrict-vtable-pointers -fvirtual-function-elimination

C++ benchmarks:
-Ofast -fopenmp -march=core-avx2 -fma -ipo -ansi-alias
-fp-model fast=2 -qno-opt-multiple-gather-scatter-by-shuffles
-qopt-zmm-usage=high -ffast-math -fstrict-nums
-fstrict-vtable-pointers

Fortran benchmarks:
-Ofast -fopenmp -march=core-avx2 -fma -ipo -ansi-alias
-fp-model fast=2 -qno-opt-multiple-gather-scatter-by-shuffles
-qopt-zmm-usage=high -align array128byte -ffinite-math-only
-fno-omit-frame-pointer -m64 -ipol -foptimize-sibling-calls -vec

Peak Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Peak Portability Flags

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

Peak Optimization Flags

C benchmarks:
-Ofast -fopenmp -march=core-avx2 -fma -ipo -ansi-alias
-fp-model fast=2 -qno-opt-multiple-gather-scatter-by-shuffles
-qopt-zmm-usage=high -ffast-math -fstrict-nums
-fstrict-vtable-pointers -fvirtual-function-elimination

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Lenovo Global Technology  
ThinkSystem SR655V3(AMD EPYC 9754, 2.25GHz)  
SPECompG_peak2012 = 53.4  
SPECompG_base2012 = 52.7

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<th>OMP2012 license:28</th>
<th>Test date:</th>
<th>May-2023</th>
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<td>Test sponsor:</td>
<td>Hardware Availability:</td>
<td>Aug-2023</td>
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<td>Tested by:</td>
<td>Software Availability:</td>
<td>Aug-2023</td>
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<tr>
<td>Lenovo Global Technology</td>
<td>Lenovo Global Technology</td>
<td></td>
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</tbody>
</table>

**Peak Optimization Flags (Continued)**

C++ benchmarks:
- `Ofast`  
- `-fopenmp`  
- `-march=core-avx2`  
- `-fma`  
- `-ipo`  
- `-ansi-alias`  
- `-fp-model fast=2`  
- `-qno-opt-multiple-gather-scatter-by-shuffles`  
- `-qopt-zmm-usage=high`  
- `-ffast-math`  
- `-fstrict-enums`  
- `-fstrict-vtable-pointers`

Fortran benchmarks:
- `Ofast`  
- `-fopenmp`  
- `-march=core-avx2`  
- `-fma`  
- `-ipo`  
- `-ansi-alias`  
- `-fp-model fast=2`  
- `-qno-opt-multiple-gather-scatter-by-shuffles`  
- `-qopt-zmm-usage=high`  
- `-align array128byte`  
- `-ffinite-math-only`  
- `-fno-omit-frame-pointer`  
- `-m64`  
- `-ipo1`  
- `-foptimize-sibling-calls`  
- `-vec`

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.20230222.xml

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

Tested with SPEC OMP2012 v1.1.
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