## SPEC® CINT2006 Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
Synergy 680 Gen9  
(2.20 GHz, Intel Xeon E7-8890 v4)

<table>
<thead>
<tr>
<th>SPECint®_rate2006 = Not Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base2006 = 3540</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 3  
**Test sponsor:** HPE  
**Tested by:** HPE  
**Test date:** Jun-2017  
**Hardware Availability:** Apr-2017  
**Software Availability:** Jul-2017

| Benchmark | Copies | 1500 | 3500 | 5500 | 7500 | 9500 | 11500 | 13500 | 15500 | 17500 | 19500 | 21500 | 23500 | 25500 | 27500 | 29500 | 31500 | 33500 | 35500 | 37500 | 39500 |
|-----------|--------|------|------|------|------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 400.perlbmchen | 192 | | | | | | | | | | | | | | | | | | | | | | | |
| 401.bzip2 | 192 | | | | | | | | | | | | | | | | | | | | | | | |
| 403.gcc | 192 | | | | | | | | | | | | | | | | | | | | | | | |
| 429.mcf | 192 | | | | | | | | | | | | | | | | | | | | | | | |
| 445.gobmk | 192 | | | | | | | | | | | | | | | | | | | | | | | |
| 456.hmmer | 192 | | | | | | | | | | | | | | | | | | | | | | | |
| 458.sjeng | 192 | | | | | | | | | | | | | | | | | | | | | | | |
| 462.libquantum | 192 | | | | | | | | | | | | | | | | | | | | | | | |
| 464.h264ref | 192 | | | | | | | | | | | | | | | | | | | | | | | |
| 471.omnetpp | 192 | | | | | | | | | | | | | | | | | | | | | | | |
| 473.astar | 192 | | | | | | | | | | | | | | | | | | | | | | | |
| 483.xalancbmk | 192 | | | | | | | | | | | | | | | | | | | | | | | |

**Hardware**

- **CPU Name:** Intel Xeon E7-8890 v4  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.40 GHz  
- **CPU MHz:** 2200  
- **FPU:** Integrated  
- **CPU(s) enabled:** 96 cores, 4 chips, 24 cores/chip, 2 threads/core  
- **CPU(s) orderable:** 2.4 chips  
- **Primary Cache:** 32 KB I + 32 KB D on chip per core  
- **Secondary Cache:** 256 KB I+D on chip per core  
- **L3 Cache:** 60 MB I+D on chip per chip  
- **Other Cache:** None  
- **Memory:** 512 GB (32 x 16 GB 2Rx4 PC4-2400T-R, running at 1600 MHz)  
- **Disk Subsystem:** 1 x 300 GB 15 K RPM SAS, RAID 0  
- **Other Hardware:** None

**Software**

- **Operating System:** SUSE Linux Enterprise Server 12 (x86_64) SP2  
- **Kernel:** 4.4.21-68-default  
- **Compiler:** C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux  
- **Auto Parallel:** No  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 32-bit  
- **Peak Pointers:** 32/64-bit  
- **Other Software:** Microquill SmartHeap V10.2
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
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<tr>
<td>400.perlbench</td>
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<td>473.astar</td>
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<td>3560</td>
<td>371</td>
<td>3570</td>
<td>372</td>
<td>3570</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
Transparent Huge Pages enabled with:
  echo always > /sys/kernel/mm/transparent_hugepage/enabled
Filesystem page cache cleared with:
  echo 3 > /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
  numactl --interleave=all runspec <etc>

Platform Notes

BIOS Configuration:
  Power Profile set to Custom
  Power Regulator to Static High Performance Mode
  Minimum Processor Idle Power Core C-State set to C6 State
  Minimum Processor Idle Power Package C-State set to No Package State
  Energy/Performance Bias set to Maximum Performance
  Collaborative Power Control set to Disabled
  QPI Snoop Configuration set to Cluster on Die
  Thermal Configuration set to Maximum Cooling
  Processor Power and Utilization Monitoring set to Disabled
  Memory Refresh Rate set to 1x Refresh

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/
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Platform Notes (Continued)

Sysinfo program /home/cpu2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-x20e Fri Jun 16 21:02:17 2017

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/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E7-8890 v4 @ 2.20GHz
4 "physical id"s (chips)
192 "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 : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
27 28 29
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
27 28 29
physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
27 28 29
physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
27 28 29
cache size : 30720 KB

From /proc/meminfo
MemTotal: 528247788 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP2

From /etc/*release*/etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 2
# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.

os-release:
NAME="SLES"
VERSION="12-SP2"
VERSION_ID="12.2"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"

Continued on next page
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Platform Notes (Continued)

uname -a:
    Linux linux-x20e 4.4.21-68-default #1 SMP Tue Oct 18 18:19:37 UTC 2016
    (633f368) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jun 16 20:53

SPEC is set to: /home/cpu2006
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 238G 93G 145G 40% /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
determined", but the intent may not be met, as there are frequent changes to
hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS HP I40 04/05/2017
Memory:
   64x UNKNOWN NOT AVAILABLE
   32x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz, configured at 1600 MHz

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of
memory is 512 GB and the dmidecode description should have one line reading as:
32x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz, configured at 1600 MHz

General Notes

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2006/lib/ia32:/home/cpu2006/lib/intel64:/home/cpu2006/sh10.2"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.2
NOTE: Although compliant with all of the SPEC runrules restrictions, this result
has not been formally submitted to SPEC and should therefore be considered as
an estimate.

Base Compiler Invocation

C benchmarks:
   icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

C++ benchmarks:
   icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
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Base Portability Flags

400.perlbench: \texttt{-D\_FILE\_OFFSET\_BITS=64 -DSPEC\_CPU\_LINUX\_IA32}
401.bzip2: \texttt{-D\_FILE\_OFFSET\_BITS=64}
403.gcc: \texttt{-D\_FILE\_OFFSET\_BITS=64}
429.mcf: \texttt{-D\_FILE\_OFFSET\_BITS=64}
445.gobmk: \texttt{-D\_FILE\_OFFSET\_BITS=64}
456.hmmer: \texttt{-D\_FILE\_OFFSET\_BITS=64}
458.sjeng: \texttt{-D\_FILE\_OFFSET\_BITS=64}
462.libquantum: \texttt{-D\_FILE\_OFFSET\_BITS=64 -DSPEC\_CPU\_LINUX}
464.h264ref: \texttt{-D\_FILE\_OFFSET\_BITS=64}
471.omnetpp: \texttt{-D\_FILE\_OFFSET\_BITS=64}
473.astar: \texttt{-D\_FILE\_OFFSET\_BITS=64}
483.xalancbmk: \texttt{-D\_FILE\_OFFSET\_BITS=64 -DSPEC\_CPU\_LINUX}

Base Optimization Flags

C benchmarks:
\texttt{-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch}
\texttt{-qopt-mem-layout-trans=3}

C++ benchmarks:
\texttt{-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch}
\texttt{-qopt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh10.2 -lsmartheap}

Base Other Flags

C benchmarks:
\texttt{403.gcc: -Dalloca=_alloca}

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.html
http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-Intel-V1.2-HSW-revG.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml
http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-Intel-V1.2-HSW-revG.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 CPU2006 v1.2.