Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 680 Gen9
(2.40 GHz, Intel Xeon E7-8894 v4)

SPEClnt®2006 = 74.0
SPEClnt_base2006 = 69.8

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

Test date: Jan-2017
Hardware Availability: Mar-2017
Software Availability: Nov-2016


Hardware
CPU Name: Intel Xeon E7-8894 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz
CPU MHz: 2400
FPU: Integrated
CPU(s) enabled: 96 cores, 4 chips, 24 cores/chip
CPU(s) orderable: 2.4 chip
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: 1 TB (32 x 32 GB 2Rx4 PC4-2400T-R, running at 1600 MHz)
Disk Subsystem: 1 x 400 GB SAS SSD, RAID 0
Other Hardware: None

Software
Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP2, Kernel 4.4.21-69-default
Compiler: C/C++: Version 17.0.0.098 of Intel C++ Studio XE for Linux
Auto Parallel: Yes
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
Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>256</td>
<td>38.1</td>
<td>257</td>
<td>38.0</td>
<td>258</td>
<td>37.9</td>
<td>227</td>
<td>43.0</td>
<td>227</td>
<td>43.0</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>297</td>
<td>24.3</td>
<td>296</td>
<td>24.4</td>
<td>306</td>
<td>24.3</td>
<td>313</td>
<td>24.5</td>
<td>314</td>
<td>24.5</td>
</tr>
<tr>
<td>403.gcc</td>
<td>220</td>
<td>36.6</td>
<td>220</td>
<td>36.6</td>
<td>231</td>
<td>36.5</td>
<td>221</td>
<td>43.7</td>
<td>221</td>
<td>43.7</td>
</tr>
<tr>
<td>429.mcf</td>
<td>234</td>
<td>63.7</td>
<td>236</td>
<td>63.7</td>
<td>241</td>
<td>64.7</td>
<td>128</td>
<td>71.4</td>
<td>128</td>
<td>71.1</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>363</td>
<td>28.9</td>
<td>363</td>
<td>28.9</td>
<td>363</td>
<td>28.9</td>
<td>363</td>
<td>33.5</td>
<td>363</td>
<td>33.5</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>113</td>
<td>82.2</td>
<td>114</td>
<td>82.2</td>
<td>114</td>
<td>82.2</td>
<td>109</td>
<td>85.4</td>
<td>109</td>
<td>85.6</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>371</td>
<td>32.6</td>
<td>371</td>
<td>32.6</td>
<td>371</td>
<td>32.6</td>
<td>361</td>
<td>33.5</td>
<td>361</td>
<td>33.5</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>1.77</td>
<td>11700</td>
<td>1.76</td>
<td>11800</td>
<td>1.77</td>
<td>11700</td>
<td>1.77</td>
<td>11700</td>
<td>1.77</td>
<td>11700</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>390</td>
<td>56.7</td>
<td>391</td>
<td>56.8</td>
<td>390</td>
<td>56.7</td>
<td>391</td>
<td>56.6</td>
<td>390</td>
<td>56.8</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>127</td>
<td>49.3</td>
<td>125</td>
<td>49.8</td>
<td>128</td>
<td>48.7</td>
<td>114</td>
<td>54.7</td>
<td>113</td>
<td>55.2</td>
</tr>
<tr>
<td>473.astar</td>
<td>206</td>
<td>34.1</td>
<td>206</td>
<td>34.0</td>
<td>207</td>
<td>33.9</td>
<td>205</td>
<td>34.2</td>
<td>209</td>
<td>33.6</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>95.4</td>
<td>72.4</td>
<td>95.1</td>
<td>72.6</td>
<td>96.5</td>
<td>71.5</td>
<td>86.4</td>
<td>79.9</td>
<td>87.4</td>
<td>78.9</td>
</tr>
</tbody>
</table>

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

Submit Notes

The config file option 'submit' was used.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
Transparent Huge Pages enabled by default.

Platform Notes

BIOS Configuration:
  HP Power Profile set to Custom
  HP Power Regulator to HP 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
  QPI Snoop Configuration set to Home Snoop
  Collaborative Power Control set to Disabled
  Thermal Configuration set to Maximum Cooling
  Processor Power and Utilization Monitoring set to Disabled
  Intel Hyper Threading set to Disabled
  Memory Refresh Rate set to 1x Refresh

Sysinfo program /home/cpu2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on synergy680_manju Tue Jan 24 11:16:48 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
Continued on next page
Hewlett Packard Enterprise
(Spec Test Sponsor: HPE)
Synergy 680 Gen9
(2.40 GHz, Intel Xeon E7-8894 v4)

SPECint2006 = 74.0
SPECint_base2006 = 69.8

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

Test date: Jan-2017
Hardware Availability: Mar-2017
Software Availability: Nov-2016

Platform Notes (Continued)

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E7-8894 v4 @ 2.40GHz
4 "physical id"s (chips)
96 "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 : 24
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 : 61440 KB

From /proc/meminfo
MemTotal: 1056744324 kB
MemFree: 248051864 kB
MemTotal: 1056744324 kB
MemFree: 248051864 kB

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"

uname -a:
(946f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 24 11:14

SPEC is set to: /home/cpu2006
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 331G 20G 312G 6% /home
Additional information from dmidecode:
Continued on next page
SPEC CINT2006 Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 680 Gen9
(2.40 GHz, Intel Xeon E7-8894 v4)

SPECint2006 = 74.0
SPECint_base2006 = 69.8

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

Test date: Jan-2017
Hardware Availability: Mar-2017
Software Availability: Nov-2016

Platform Notes (Continued)

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 12/08/2016
Memory:
  64x UNKNOWN NOT AVAILABLE
  32x UNKNOWN NOT AVAILABLE 32 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 1 TB and the dmidecode description should have one line reading as: 32x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz, configured at 1600 MHz

General Notes

Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh10.2"
OMP_NUM_THREADS = "96"

Binaries compiled on a system with 1x Intel Core i7-4790K CPU + 32GB RAM memory using Redhat Enterprise Linux 7.2

Base Compiler Invocation

C benchmarks:
  icc -m64

C++ benchmarks:
  icpc -m64

Base Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -DSPEC_CPU_LP64

Continued on next page
Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 680 Gen9
(2.40 GHz, Intel Xeon E7-8894 v4)

SPECint2006 = 74.0
SPECint_base2006 = 69.8

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

Test date: Jan-2017
Hardware Availability: Mar-2017
Software Availability: Nov-2016

Base Portability Flags (Continued)

473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -static -parallel -qopt-prefetch
-auto-1lp32 -complex-limited-range -qopt-prefetch-issue-excl-hint
-ansi-alias

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-Wl,-z,muldefs -L/home/cpu2006/sh10.2 -lsmartheap64

Base Other Flags

C benchmarks:
403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64
400.perlbench: icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
403.gcc: icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
429.mcf: icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

C++ benchmarks (except as noted below):
icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
473.astar: icpc -m64

Peak Portability Flags

400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -D_FILE_OFFSET_BITS=64

Continued on next page
Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 680 Gen9
(2.40 GHz, Intel Xeon E7-8894 v4)

SPECint2006 = 74.0
SPECint_base2006 = 69.8

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

Hardware Availability: Mar-2017
Software Availability: Nov-2016

Peak Portability Flags (Continued)

429.mcf: -D_FILE_OFFSET_BITS=64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -prof-gen=threadsafe(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -qopt-prefetch -ansi-alias

401.bzip2: -prof-gen=threadsafe(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div -auto-ilp32 -qopt-prefetch -ansi-alias

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc -qopt-malloc-options=3 -auto-ilp32 -static

429.mcf: -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch -auto-p32 -complex-limited-range -static

445.gobmk: basepeak = yes

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch -funroll-all-loops

458.sjeng: -prof-gen=threadsafe(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll4

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -prof-gen=threadsafe(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -qopt-ra-region-strategy=block -ansi-alias

Continued on next page
Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 680 Gen9
(2.40 GHz, Intel Xeon E7-8894 v4)

SPECint2006 =  74.0
SPECint_base2006 =  69.8

Peak Optimization Flags (Continued)

471.omnetpp (continued):
   -Wl,-z,muldefs -L/home/cpu2006/sh10.2 -lsmartheap

473.astar:
   -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
   -auto-p32 -Wl,-z,muldefs
   -L/home/cpu2006/sh10.2 -lsmartheap64

483.xalancbmk:
   -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
   -ansi-alias -Wl,-z,muldefs
   -L/home/cpu2006/sh10.2 -lsmartheap

Peak Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.html
http://www.spec.org/cpu2006/flags/HPE-Compiler-Flags-Intel-V1.2-HSW-revH.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.xml
http://www.spec.org/cpu2006/flags/HPE-Compiler-Flags-Intel-V1.2-HSW-revH.xml

SPEC and SPECint are registered trademarks of the Standard Performance
Evaluation Corporation. All other brand and product names appearing in
this result are trademarks or registered trademarks of their respective
holders.

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

Tested with SPEC CPU2006 v1.2.
Originally published on 2 May 2017.