Hewlett-Packard Company
ProLiant DL360 Gen9
(2.50 GHz, Intel Xeon E5-2680 v3)

SPECint®2006 = 62.3
SPECint_base2006 = 59.8

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

CPU Name: Intel Xeon E5-2680 v3
CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz
CPU MHz: 2500
FPU: Integrated
CPU(s) enabled: 24 cores, 2 chips, 12 cores/chip
CPU(s) orderable: 1.2 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: 30 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)
Disk Subsystem: 1 x 400 GB SSD SAS, RAID 0
Other Hardware: None

Software
Operating System: Red Hat Enterprise Linux Server release 7.0 (Maipo)
Compiler: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux
Auto Parallel: Yes
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: Microquill SmartHeap V10.0
Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>254</td>
<td>38.5</td>
<td>254</td>
<td>38.4</td>
<td>254</td>
<td>38.4</td>
<td>222</td>
<td>44.0</td>
<td>221</td>
<td>44.2</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>411</td>
<td>23.5</td>
<td>412</td>
<td>23.4</td>
<td>411</td>
<td>23.5</td>
<td>407</td>
<td>23.7</td>
<td>407</td>
<td>23.7</td>
</tr>
<tr>
<td>403.gcc</td>
<td>240</td>
<td>33.5</td>
<td>241</td>
<td>33.4</td>
<td>241</td>
<td>33.5</td>
<td>235</td>
<td>34.3</td>
<td>234</td>
<td>34.4</td>
</tr>
<tr>
<td>429.mcf</td>
<td>156</td>
<td>58.8</td>
<td>154</td>
<td>59.3</td>
<td>156</td>
<td>58.4</td>
<td>155</td>
<td>58.9</td>
<td>155</td>
<td>58.9</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>386</td>
<td>27.2</td>
<td>384</td>
<td>27.3</td>
<td>384</td>
<td>27.3</td>
<td>385</td>
<td>27.3</td>
<td>385</td>
<td>27.3</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>143</td>
<td>65.0</td>
<td>143</td>
<td>65.3</td>
<td>143</td>
<td>65.3</td>
<td>143</td>
<td>65.0</td>
<td>143</td>
<td>65.3</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>376</td>
<td>32.2</td>
<td>375</td>
<td>32.2</td>
<td>376</td>
<td>32.2</td>
<td>374</td>
<td>32.3</td>
<td>374</td>
<td>32.4</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>3.28</td>
<td>6320</td>
<td>3.29</td>
<td>6300</td>
<td>3.31</td>
<td>6260</td>
<td>3.28</td>
<td>6320</td>
<td>3.29</td>
<td>6300</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>468</td>
<td>47.3</td>
<td>469</td>
<td>47.2</td>
<td>467</td>
<td>47.3</td>
<td>468</td>
<td>47.3</td>
<td>469</td>
<td>47.2</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>177</td>
<td>35.3</td>
<td>176</td>
<td>35.5</td>
<td>179</td>
<td>34.9</td>
<td>123</td>
<td>50.7</td>
<td>133</td>
<td>47.0</td>
</tr>
<tr>
<td>473.astar</td>
<td>222</td>
<td>31.6</td>
<td>222</td>
<td>31.7</td>
<td>220</td>
<td>32.0</td>
<td>222</td>
<td>31.6</td>
<td>222</td>
<td>31.7</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>111</td>
<td>62.4</td>
<td>111</td>
<td>62.2</td>
<td>111</td>
<td>62.4</td>
<td>110</td>
<td>62.8</td>
<td>110</td>
<td>62.8</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 with:
echo always > /sys/kernel/mm/transparent_hugepage/enabled

Platform Notes

BIOS Configuration:
HP Power Profile set to Custom
HP Power Regulator to HP Static High Performance Mode
Minimum Processor Idle Power Core State set to C6 State
Minimum Processor Idle Power Package State set to No Package State
QPI Snoop Configuration set to Early Snoop
Thermal Configuration set to Maximum Cooling
Collaborative Power Control set to Disabled
Pocessor Power and Utilization Monitoring set to Disabled
Energy/Performance Bias set to Maximum Performance
Memory Refresh Rate set to 1x Refresh
Intel Hyperthreading Options set to Disabled

Sysinfo program /home/cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1

Continued on next page
Hewlett-Packard Company

ProLiant DL360 Gen9
(2.50 GHz, Intel Xeon E5-2680 v3)

<table>
<thead>
<tr>
<th>SPECint2006 =</th>
<th>62.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_base2006 =</td>
<td>59.8</td>
</tr>
</tbody>
</table>

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Test date: Nov-2014
Hardware Availability: Sep-2014
Tested by: Hewlett-Packard Company
Software Availability: Sep-2014

Platform Notes (Continued)

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 E5-2680 v3 @ 2.50GHz
- 2 "physical id"s (chips)
- 24 "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: 12
  - siblings: 12
  - physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
  - physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
- cache size: 30720 KB

From /proc/meminfo
- MemTotal: 263845892 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
- os-release:
  - NAME="Red Hat Enterprise Linux Server"
  - VERSION="7.0 (Maipo)"
  - ID="rhel"
  - ID_LIKE="fedora"
  - VERSION_ID="7.0"
  - PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
  - ANSI_COLOR="0;31"
  - CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
- redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
- system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
- system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

uname -a:
- Linux Pilot-DL360-G9 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57 EDT 2014
- x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Nov 10 09:31

SPEC is set to: /home/cpu2006
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel_pilot--dl360--g9-home xfs 318G 101G 217G 32% /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.

Continued on next page
Hewlett-Packard Company
ProLiant DL360 Gen9
(2.50 GHz, Intel Xeon E5-2680 v3)

SPECint2006 = 62.3
SPECint_base2006 = 59.8

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

Platform Notes (Continued)

BIOS HP P89 07/11/2014
Memory:
16x HP NOT AVAILABLE 16 GB 2 rank 2133 MHz
8x UNKNOWN NOT AVAILABLE

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of memory is 256 GB and the dmidecode description should have one line reading as:
16x HP NOT AVAILABLE 16 GB 2 rank 2133 MHz

General Notes

Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"
OMP_NUM_THREADS = "24"

Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB memory using RedHat EL 7.0

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
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
SPEC CINT2006 Result

Hewlett-Packard Company
ProLiant DL360 Gen9
(2.50 GHz, Intel Xeon E5-2680 v3)

SPECint2006 = 62.3
SPECint_base2006 = 59.8

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Test date: Nov-2014
Tested by: Hewlett-Packard Company
Hardware Availability: Sep-2014
Software Availability: Sep-2014

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-Wl,-z,muldefs -L/sh -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/composer_xe_2015/lib/ia32
  445.gobmk: icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

C++ benchmarks (except as noted below):
  icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
  473.astar: icpc -m64

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LINUX_IA32
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -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
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LINUX
Hewlett-Packard Company
ProLiant DL360 Gen9
(2.50 GHz, Intel Xeon E5-2680 v3)

SPECint2006 = 62.3
SPECint_base2006 = 59.8

CPU2006 license: 3
Test date: Nov-2014
Test sponsor: Hewlett-Packard Company
Hardware Availability: Sep-2014
Tested by: Hewlett-Packard Company
Software Availability: Sep-2014

Peak Optimization Flags

C benchmarks:

400.perlbench: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -opt-prefetch -ansi-alias

401.bzip2: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div -prof-use(pass 2) -auto-1lp32 -opt-prefetch -ansi-alias

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc -opt-malloc-options=3 -auto-1lp32

403.mcf: -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32

445.gobmk: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -prof-use(pass 2) -ansi-alias

456.hmmer: basepeak = yes

458.sjeng: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll14

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

Peak Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca
Spec CINT2006 Result

Hewlett-Packard Company
ProLiant DL360 Gen9
(2.50 GHz, Intel Xeon E5-2680 v3)

<table>
<thead>
<tr>
<th>SPECint2006 = 62.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_base2006 = 59.8</td>
</tr>
</tbody>
</table>

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

Test date: Nov-2014
Hardware Availability: Sep-2014
Software Availability: Sep-2014

The flags files that were used to format this result can be browsed at:
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.html
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.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 December 2014.