Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen9
(2.40 GHz, Intel Xeon E5-2640 v4)

SPECint®2006 = 66.4
SPECint_base2006 = 63.2

Hardware

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon E5-2640 v4</td>
</tr>
<tr>
<td>CPU Characteristics</td>
<td>Intel Turbo Boost Technology up to 3.40 GHz</td>
</tr>
<tr>
<td>CPU MHz</td>
<td>2400</td>
</tr>
<tr>
<td>FPU</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>20 cores, 2 chips, 10 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>1.2 chip</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>256 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache</td>
<td>25 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>512 GB (16 x 32 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)</td>
</tr>
<tr>
<td>Disk Subsystem</td>
<td>1 x 400 GB SAS SSD, RAID 0</td>
</tr>
<tr>
<td>Other Hardware</td>
<td>None</td>
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Software

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Operating System</td>
<td>Red Hat Enterprise Linux Server release 7.2, (Maipo)</td>
</tr>
<tr>
<td>Compiler</td>
<td>C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>File System</td>
<td>xfs</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>32-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>32/64-bit</td>
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<tr>
<td>Other Software</td>
<td>Microquill SmartHeap V10.2</td>
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</table>
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL380 Gen9  
(2.40 GHz, Intel Xeon E5-2640 v4)  

**SPEC CINT2006 Result**

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**SPECint2006 = 66.4**  
**SPECint_base2006 = 63.2**

---

**Results Table**

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<tr>
<th>Benchmark</th>
<th>Seconds</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
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<tr>
<td>400.perlbench</td>
<td>245</td>
<td>39.9</td>
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<td>39.9</td>
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<td>401.bzip2</td>
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<td>24.6</td>
<td>391</td>
<td>24.7</td>
<td>391</td>
<td>24.7</td>
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<td>403.gcc</td>
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<td>37.2</td>
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<td>37.3</td>
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<td>429.mcf</td>
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<td>64.9</td>
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<td>65.7</td>
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<td>65.4</td>
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<tr>
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<td>5.21</td>
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<td>464.h264ref</td>
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<td>471.onetcpp</td>
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<td>34.3</td>
<td>183</td>
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<td>34.1</td>
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<td>473.astar</td>
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<td>483.xalancbmk</td>
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<td>83.1</td>
<td>83.4</td>
<td>82.7</td>
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<td></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 C-State set to C1E 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  
Memory Refresh Rate set to 1x Refresh  
Intel Hyperthreading set to Disabled

Sysinfo program `/home/intel_binary/cpu2006/config/sysinfo.rev6914`  
$Rev: 6914 $ $Date:: 2014-06-25 $$ e3fbb8667b5a285932ceab81e28219e1
running on DL380Gen9-Biswa Mon Apr 18 17:18:51 2016

This section contains SUT (System Under Test) info as seen by

---

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

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 E5-2640 v4 @ 2.40GHz
  2 "physical id"s (chips)
  20 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
  following excerpts from /proc/cpuinfo might not be reliable. Use with
cautions.)
  cpu cores : 10
  siblings : 10
  physical 0: cores 0 2 3 4 8 9 10 11 12
  physical 1: cores 0 2 3 4 8 9 10 11 12
cache size : 25600 KB

From /proc/meminfo
MemTotal: 528068188 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
NAME="Red Hat Enterprise Linux Server"
VERSION="7.2 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.2"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:GA:server"

redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)

uname -a:
Linux DL380Gen9-Biswa 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29 EDT
2015 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Apr 18 17:10

SPEC is set to: /home/intel_binary/cpu2006
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda5 xfs 318G 84G 234G 27% /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 P89 03/30/2016

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SPEC CINT2006 Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen9
(2.40 GHz, Intel Xeon E5-2640 v4)

SPECint2006 = 66.4
SPECint_base2006 = 63.2

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

Test date: Apr-2016
Hardware Availability: Mar-2016
Software Availability: Nov-2015

Platform Notes (Continued)

Memory:
8x UNKNOWN NOT AVAILABLE
16x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz, configured at 2133 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:
16x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz, configured at 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 = "10"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1

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 Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen9
(2.40 GHz, Intel Xeon E5-2640 v4)

SPECint2006 = 66.4
SPECint_base2006 = 63.2

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

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 -1smartheap64

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_2016/linux/compiler/lib/ia32_lin
445.gobmk: icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
C++ benchmarks (except as noted below):
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
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: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -D_FILE_OFFSET_BITS=64
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: -xCORE-AVX2(pass 2)  -prof-gen:threadsafe(pass 1)  -ipo(pass 2)  -O3(pass 2)  -no-prec-div(pass 2)  
-par-num-threads=1(pass 1)  -prof-use(pass 2)  -opt-prefetch  
-ansi-alias

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

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

429.mcf: basepeak = yes

445.gobmk: -xCORE-AVX2(pass 2)  -prof-gen:threadsafe(pass 1)  
-ipo(pass 2)  -O3(pass 2)  -no-prec-div(pass 2)  
-par-num-threads=1(pass 1)  -ansi-alias

456.hmmer: basepeak = yes

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

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2)  -prof-gen:threadsafe(pass 1)  
-ipo(pass 2)  -O3(pass 2)  -no-prec-div(pass 2)  
-par-num-threads=1(pass 1)  -prof-use(pass 2)  
-opt-ra-region-strategy=block  -ansi-alias  
-Wl,-z,muldefs -L/sh -lsmartheap

473.astar: basepeak = yes

483.xalancbmk: -xCORE-AVX2  -ipo  -O3  -no-prec-div  -opt-prefetch  
-ansi-alias  -Wl,-z,muldefs -L/sh -lsmartheap

Peak Other Flags

C benchmarks:

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Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL380 Gen9  
(2.40 GHz, Intel Xeon E5-2640 v4)  

**SPECint2006** = 66.4  
**SPECint_base2006** = 63.2

<table>
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<tr>
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<tr>
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<td>Tested by:</td>
<td>HPE</td>
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<tr>
<td>Test date:</td>
<td>Apr-2016</td>
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<td>Hardware Availability:</td>
<td>Mar-2016</td>
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<tr>
<td>Software Availability:</td>
<td>Nov-2015</td>
</tr>
</tbody>
</table>

**Peak Other Flags (Continued)**

403.gcc: -Dalloca=_alloca

The flags files that were used to format this result can be browsed at


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/HP-Platform-Flags-Intel-V1.2-HSW-revE.xml)

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

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