Hewlett-Packard Company

ProLiant DL360 Gen9
(1.60 GHz, Intel Xeon E5-2603 v3)

SPECint®2006 = 30.4
SPECint_base2006 = 29.3

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

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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECint2006</th>
<th>SPECint_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>21.7</td>
<td>18.8</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>11.9</td>
<td>11.7</td>
</tr>
<tr>
<td>403.gcc</td>
<td>17.7</td>
<td>17.2</td>
</tr>
<tr>
<td>429.mcf</td>
<td>13.3</td>
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</tr>
<tr>
<td>445.gobmk</td>
<td>17.2</td>
<td>17.2</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>16.1</td>
<td>16.1</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>16.1</td>
<td>16.1</td>
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<tr>
<td>462.libquantum</td>
<td>26.3</td>
<td>26.3</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>19.0</td>
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</tr>
<tr>
<td>471.omnetpp</td>
<td>15.7</td>
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</tr>
<tr>
<td>473.astar</td>
<td>15.6</td>
<td>15.6</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>32.0</td>
<td>32.0</td>
</tr>
</tbody>
</table>

SPECint_base2006 = 29.3

**Hardware**

CPU Name: Intel Xeon E5-2603 v3
CPU Characteristics: 12 cores, 2 chips, 6 cores/chip
CPU(s) enabled: 12 cores, 2 chips, 6 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: 15 MB I+D on chip per chip
Other Cache: None
Memory: 128 GB (16 x 8 GB 1Rx4 PC4-2133P-R, running at 1600 MHz)
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)
Kernel 3.10.0-123.el7.x86_64
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 Base</th>
<th>Ratio</th>
<th>Seconds Peak</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>400.perlbench</td>
<td>518</td>
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<td>467</td>
<td>17.2</td>
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<td>429.mcf</td>
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<td>445.gobmk</td>
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<td>464.h264ref</td>
<td>838</td>
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<td>841</td>
<td>26.3</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>426</td>
<td>14.7</td>
<td>427</td>
<td>14.6</td>
</tr>
<tr>
<td>473.astar</td>
<td>450</td>
<td>15.6</td>
<td>450</td>
<td>15.6</td>
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<tr>
<td>483.xalancbmk</td>
<td>215</td>
<td>32.1</td>
<td>216</td>
<td>32.0</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 Package C6 (Non-retention) State
- QPI Snoop Configuration set to Early Snoop
- Thermal Configuration set to Maximum Cooling
- Collaborative Power Control set to Disabled
- Processor Power and Utilization Monitoring set to Disabled
- Energy/Performance Bias set to Maximum Performance
- Memory Refresh Rate set to 1x Refresh

`Sysinfo program /home/cpu2006/config/sysinfo.rev6914`


This section contains SUT (System Under Test) info as seen by
Continued on next page
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 E5-2603 v3 @ 1.60GHz
  2 "physical id"s (chips)
  12 "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: 6
    siblings: 6
    physical 0: cores 0 1 2 3 4 5
    physical 1: cores 0 1 2 3 4 5
  cache size: 15360 KB

From /proc/meminfo
  MemTotal: 131734972 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 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 Oct 28 12:54

SPEC is set to: /home/cpu2006
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel_dl360--g9-home xfs 318G 156G 163G 49% /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 07/11/2014

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SPEC CINT2006 Result

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Platform Notes (Continued)

Memory:
16x HP NOT AVAILABLE 8 GB 1 rank 2133 MHz, configured at 1600 MHz
8x UNKNOWN NOT AVAILABLE

(End of data from sysinfo program)

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 = "12"

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

Base Optimization Flags

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

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Base Optimization Flags (Continued)

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 -m64
  471.omnetpp: icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

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_LP64 -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:
Hewlett-Packard Company
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Peak Optimization Flags (Continued)

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-ilp32
-opt-prefetch -ansi-alias

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

429.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)
-unroll4

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-o3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-opt-ra-region-strategy=block -ansi-alias
-Wl,-z,muldefs -L/sh -lsmartheap

473.astar: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-auto-p32 -Wl,-z,muldefs -L/sh -lsmartheap64

483.xalancbmk: basepeak = yes

Peak Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca
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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

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For other inquiries, please contact webmaster@spec.org.

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