Hewlett-Packard Company

ProLiant DL360 Gen9
(2.60 GHz, Intel Xeon E5-2660 v3)

SPECint\textsuperscript{\textregistered}\_rate\textsubscript{2006} = 900
SPECint\_rate\_base\textsubscript{2006} = 867

**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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECint\textsuperscript{\textregistered}_rate\textsubscript{2006}</th>
<th>SPECint_rate_base\textsubscript{2006}</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>900</td>
<td>867</td>
</tr>
<tr>
<td>401.bzip2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>403.gcc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>429.mcf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>445.gobmk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>456.hmmer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>458.sjeng</td>
<td></td>
<td></td>
</tr>
<tr>
<td>462.libquantum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>464.h264ref</td>
<td></td>
<td></td>
</tr>
<tr>
<td>471.omnetpp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>473.astar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon E5-2660 v3
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.30 GHz
- **CPU MHz:** 2600
- **FPU:** Integrated
- **CPU(s) enabled:** 20 cores, 2 chips, 10 cores/chip, 2 threads/core
- **Primary Cache:** 32 KB I + 32 KB D on chip per core
- **Secondary Cache:** 256 KB I+D on chip per core
- **L3 Cache:** 25 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:** No
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 32-bit
- **Peak Pointers:** 32/64-bit
- **Other Software:** Microquill SmartHeap V10.0
**Hewlett-Packard Company**

**ProLiant DL360 Gen9**

(2.60 GHz, Intel Xeon E5-2660 v3)

---

**SPEC CINT2006 Result**

**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

---

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbmk</td>
<td>40</td>
<td>616</td>
<td>634</td>
<td>667</td>
<td>616</td>
<td>634</td>
<td>667</td>
</tr>
<tr>
<td>bzip2</td>
<td>40</td>
<td>429</td>
<td>430</td>
<td>693</td>
<td>429</td>
<td>430</td>
<td>693</td>
</tr>
<tr>
<td>gcc</td>
<td>40</td>
<td>1090</td>
<td>1100</td>
<td>999</td>
<td>1090</td>
<td>1100</td>
<td>999</td>
</tr>
<tr>
<td>gobmk</td>
<td>40</td>
<td>703</td>
<td>703</td>
<td>703</td>
<td>703</td>
<td>703</td>
<td>703</td>
</tr>
<tr>
<td>hammer</td>
<td>40</td>
<td>1250</td>
<td>1230</td>
<td>987</td>
<td>1250</td>
<td>1230</td>
<td>987</td>
</tr>
<tr>
<td>sjeng</td>
<td>40</td>
<td>729</td>
<td>720</td>
<td>982</td>
<td>729</td>
<td>720</td>
<td>982</td>
</tr>
<tr>
<td>libquantum</td>
<td>40</td>
<td>8400</td>
<td>8400</td>
<td>98.2</td>
<td>8400</td>
<td>8400</td>
<td>98.2</td>
</tr>
<tr>
<td>h264ref</td>
<td>40</td>
<td>1020</td>
<td>1040</td>
<td>98.2</td>
<td>1020</td>
<td>1040</td>
<td>98.2</td>
</tr>
<tr>
<td>omnetpp</td>
<td>40</td>
<td>513</td>
<td>513</td>
<td>513</td>
<td>513</td>
<td>513</td>
<td>513</td>
</tr>
<tr>
<td>astar</td>
<td>40</td>
<td>492</td>
<td>492</td>
<td>571</td>
<td>492</td>
<td>492</td>
<td>571</td>
</tr>
<tr>
<td>xalancbmk</td>
<td>40</td>
<td>292</td>
<td>292</td>
<td>292</td>
<td>292</td>
<td>292</td>
<td>292</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 1>       /proc/sys/vm/drop_caches
```

**runspec command invoked through numactl i.e.:**

```
umactl --interleave=all runspec <etc>
```

---

### 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 Package C6 State
- Minimum Processor Idle Power Package C-State set to No Package State
- QPI Snoop Configuration set to Cluster on Die
- 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

Continued on next page
Hewlett-Packard Company
ProLiant DL360 Gen9
(2.60 GHz, Intel Xeon E5-2660 v3)

SPECint_rate2006 = 900
SPECint_rate_base2006 = 867

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

Platform Notes (Continued)

Sysinfo program /home/cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on Pilot-DL360-G9 Mon Nov 17 07:04:11 2014

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 E5-2660 v3 @ 2.60GHz
  2 "physical id"s (chips)
  40 "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 : 5
siblings : 10
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12
cache size : 12800 KB

From /proc/meminfo
MemTotal: 263843532 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 17 07:00

SPEC is set to: /home/cpu2006
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel_pilot--dl360--g9--home xfs 318G 144G 175G 46% /home

Additional information from dmidecode:

Continued on next page
Hewlett-Packard Company
ProLiant DL360 Gen9
(2.60 GHz, Intel Xeon E5-2660 v3)

SPECint_rate2006 = 900
SPECint_rate_base2006 = 867

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

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 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:
LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"

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

Base Compiler Invocation

C benchmarks:
  icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

C++ benchmarks:
  icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

Base Portability Flags

400.perlbmk: -DSPEC_CPU_LINUX_IA32
462.libquantum: -DSPEC_CPU_LINUX
483.xalancbmk: -DSPEC_CPU_LINUX

Base Optimization Flags

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

C++ benchmarks:
  -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -Wl,-z,muldefs
  -L/sh -lsmartheap
Hewlett-Packard Company
ProLiant DL360 Gen9
(2.60 GHz, Intel Xeon E5-2660 v3)

SPECint_rate2006 = 900
SPECint_rate_base2006 = 867

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

Base Other Flags
C benchmarks:
403.gcc: -Dalloca=_alloca

Peak Compiler Invocation
C benchmarks (except as noted below):
  icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
400.perlbench: icc -m64
  401.bzip2: icc -m64
  456.hmmer: icc -m64
  458.sjeng: icc -m64
C++ benchmarks:
  icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

Peak Portability Flags
400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
  401.bzip2: -DSPEC_CPU_LP64
  456.hmmer: -DSPEC_CPU_LP64
  458.sjeng: -DSPEC_CPU_LP64
  462.libquantum: -DSPEC_CPU_LINUX
  483.xalancbmk: -DSPEC_CPU_LINUX

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)
    -auto-ilp32
  401.bzip2: -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 -auto-ilp32 -ansi-alias
  403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div

Continued on next page
SPEC CINT2006 Result

Hewlett-Packard Company
ProLiant DL360 Gen9
(2.60 GHz, Intel Xeon E5-2660 v3)

SPECint_rate2006 = 900
SPECint_rate_base2006 = 867

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 (Continued)

429.mcf: basepeak = yes
445.gobmk: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -prof-use(pass 2)
       -ansi-alias
456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32
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 -auto-ilp32
462.libquantum: basepeak = yes
464.h264ref: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
       -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
       -unroll2 -ansi-alias

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)
       -ansi-alias -opt-ra-region-strategy=block -Wl,-z,muldefs
       -L/sh -lsmartheap
473.astar: basepeak = yes
483.xalancbmk: basepeak = yes

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/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
<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate2006</td>
<td>900</td>
</tr>
<tr>
<td>SPECint_rate_base2006</td>
<td>867</td>
</tr>
</tbody>
</table>

**Hewlett-Packard Company**

**ProLiant DL360 Gen9**

(2.60 GHz, Intel Xeon E5-2660 v3)

**CPU2006 license:** 3

**Test sponsor:** Hewlett-Packard Company

**Tested by:** Hewlett-Packard Company

---

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.