**SPEC® CINT2006 Result**

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)

**ProLiant ML150 Gen9**  
(2.40 GHz, Intel Xeon E5-2620 v3)

<table>
<thead>
<tr>
<th>SPECint_rate2006 = 527</th>
</tr>
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<tbody>
<tr>
<td>SPECint_rate_base2006 = 502</td>
</tr>
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**CPU2006 license:** 3  
**Test date:** Nov-2015  
**Test sponsor:** HPE  
**Hardware Availability:** Jul-2015  
**Tested by:** HPE  
**Software Availability:** Aug-2015

<table>
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<tr>
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<tr>
<td>400.perlbench</td>
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<tr>
<td>483.xalancbmk</td>
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</table>

**Operating System:**  
Red Hat Enterprise Linux Server release 7.0 (Maipo)  
Kernel 3.10.0-123.el7.x86_64

**Compiler:**  
C/C++: Version 16.0.0.101 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 V10.2

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**CPU Name:** Intel Xeon E5-2620 v3  
**CPU Characteristics:** Intel Turbo Boost Technology up to 3.20 GHz  
**CPU MHz:** 2400  
**FPU:** Integrated  
**CPU(s) enabled:** 12 cores, 2 chips, 6 cores/chip, 2 threads/core  
**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:** 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R, running at 1866 MHz)  
**Disk Subsystem:** 1 x 500 GB 7.2 K SATA, RAID 0  
**Other Hardware:** None

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Standard Performance Evaluation Corporation  
info@spec.org  
http://www.spec.org/
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CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

Results Table

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</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
runcspec command invoked through numactl i.e.:
runcactl --interleave=all runcspec <etc>

Platform Notes

BIOS Configuration:
  HP Power Profile set to Custom
  HP Power Regulator to HP Static High Performance Mode
  Minimum Processor C-State set to C6 State
  Minimum Processor 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

Continued on next page
SPEC CINT2006 Result

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SPECint_rate_base2006 = 502

CPU2006 license: 3
Test sponsor: HPE
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Test date: Nov-2015
Hardware Availability: Jul-2015
Software Availability: Aug-2015

Platform Notes (Continued)

Sysinfo program /cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on localhost Thu Nov 5 08:58:31 2015

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 E5-2620 v3 @ 2.40GHz
  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 : 6
  siblings : 12
  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:       263715320 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 localhost 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 5 08:57

SPEC is set to: /cpu2006
Filesystem      Type Size Used Avail Use% Mounted on
/dev/sda4      xfs 461G 64G 397G 14% /

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program
Continued on next page
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Platform Notes (Continued)
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 P95 07/20/2015  
Memory:  
12x HP 752369-081 16 GB 2 rank 2133 MHz, configured at 1866 MHz  
4x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2133 MHz, configured at 1866 MHz

(End of data from sysinfo program)

General Notes
Environment variables set by runspec before the start of the run:  
LD_LIBRARY_PATH = "/cpu2006/libs/32:/cpu2006/libs/64:/cpu2006/sh"

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 -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

C++ benchmarks:  
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

Base Portability Flags
400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32  
401.bzip2: -D_FILE_OFFSET_BITS=64  
403.gcc: -D_FILE_OFFSET_BITS=64  
429.mcf: -D_FILE_OFFSET_BITS=64  
445.gobmk: -D_FILE_OFFSET_BITS=64  
456.hmmer: -D_FILE_OFFSET_BITS=64  
458.sjeng: -D_FILE_OFFSET_BITS=64  
464.h264ref: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX  
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX  
471.omnetpp: -D_FILE_OFFSET_BITS=64  
473.astar: -D_FILE_OFFSET_BITS=64  
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
SPEC CINT2006 Result

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Base Optimization Flags

C benchmarks:
-\texttt{-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch}
-\texttt{-opt-mem\_layout\_trans=3}

C++ benchmarks:
-\texttt{-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch}
-\texttt{-opt-mem\_layout\_trans=3 \_W1,\_z,\_muldefs \_L/sh \_lsmartheap}

Base Other Flags

C benchmarks:
\texttt{403.gcc: -Dalloca=_alloca}

Peak Compiler Invocation

C benchmarks (except as noted below):
\texttt{icc -m32 -L/opt/intel/compilers\_and\_libraries\_2016/linux/compiler/lib/ia32\_lin}
\texttt{400.perlbench: icc -m64}
\texttt{401.bzip2: icc -m64}
\texttt{456.hmmer: icc -m64}
\texttt{458.sjeng: icc -m64}

C++ benchmarks:
\texttt{icpc -m32 -L/opt/intel/compilers\_and\_libraries\_2016/linux/compiler/lib/ia32\_lin}

Peak Portability Flags

\texttt{400.perlbench: -D_FILE\_OFFSET\_BITS=64 \_DSPEC\_CPU\_LP64 \_DSPEC\_CPU\_LINUX\_X64}
\texttt{401.bzip2: -D_FILE\_OFFSET\_BITS=64 \_DSPEC\_CPU\_LP64}
\texttt{403.gcc: -D_FILE\_OFFSET\_BITS=64}
\texttt{429.mcf: -D_FILE\_OFFSET\_BITS=64}
\texttt{445.gobmk: -D_FILE\_OFFSET\_BITS=64}
\texttt{456.hmmer: -D_FILE\_OFFSET\_BITS=64 \_DSPEC\_CPU\_LP64}
\texttt{458.sjeng: -D_FILE\_OFFSET\_BITS=64 \_DSPEC\_CPU\_LP64}
\texttt{462.libquantum: -D_FILE\_OFFSET\_BITS=64 \_DSPEC\_CPU\_LINUX}
\texttt{464.h264ref: -D\_FILE\_OFFSET\_BITS=64}
\texttt{471.omnetpp: -D\_FILE\_OFFSET\_BITS=64}
\texttt{473.astar: -D\_FILE\_OFFSET\_BITS=64}
Peak Portability Flags (Continued)

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) -auto-ilp32

401.bzip2: -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 -auto-ilp32 -ansi-alias

403.gcc: basepeak = yes

429.mcf: basepeak = yes

445.gobmk: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) -prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias -opt-mem-layout-trans=3

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32

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 -auto-ilp32

462.libquantum: basepeak = yes

464.h264ref: -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) -unroll2 -ansi-alias

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) -ansi-alias -opt-ra-region-strategy=block -Wl,-z,muldefs -L/sh -lsmartheap

473.astar: basepeak = yes
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**Peak Optimization Flags (Continued)**

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-ic16.0-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-ic16.0-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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