



# SPEC® CINT2006 Result

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**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

**ProLiant XL170r Gen9**

(2.40 GHz, Intel Xeon E5-2680 v4)

**SPECint®2006 =**

**68.3**

**SPECint\_base2006 =**

**65.8**

**CPU2006 license:** 3

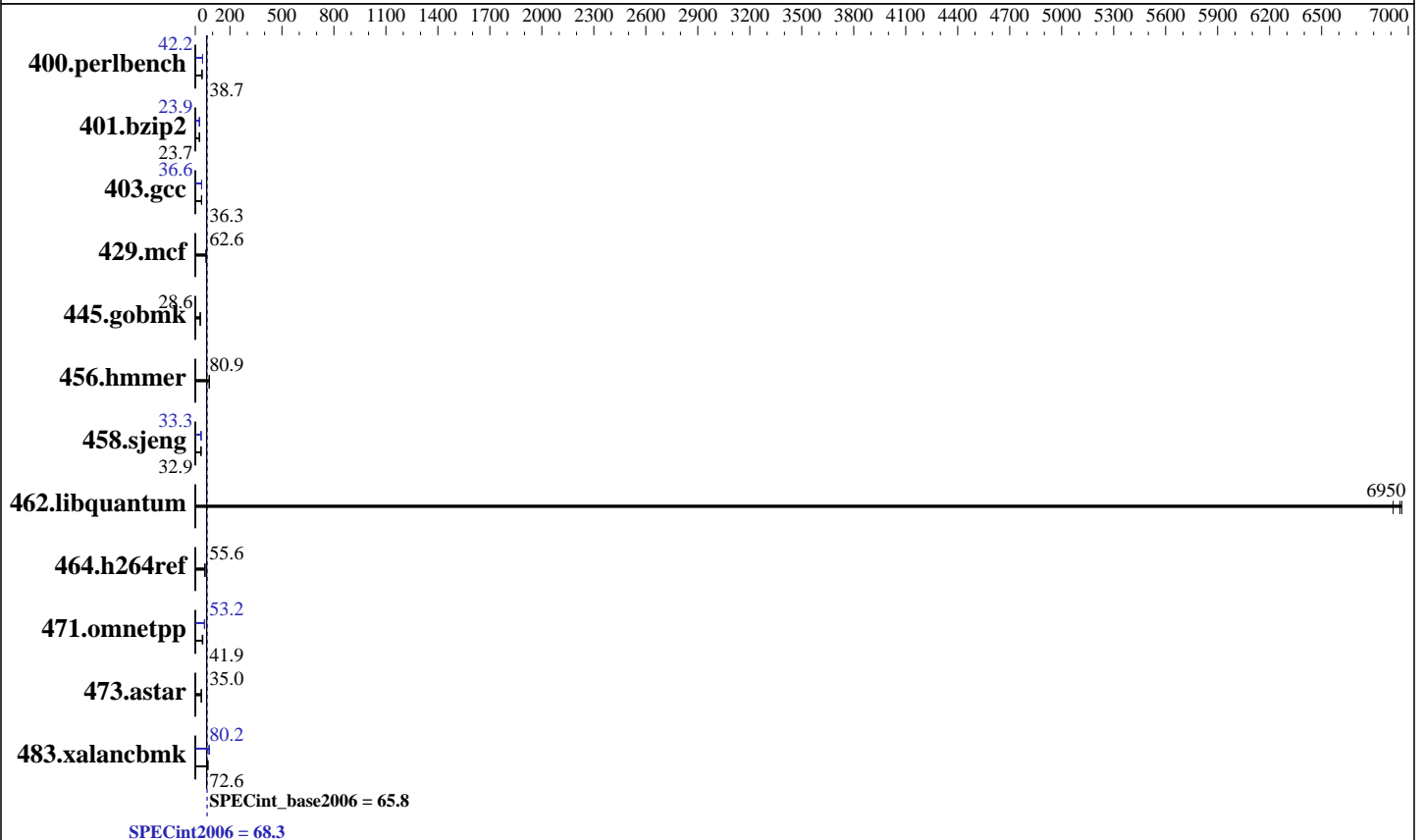
**Test sponsor:** HPE

**Tested by:** HPE

**Test date:** May-2016

**Hardware Availability:** Mar-2016

**Software Availability:** Dec-2015



## Hardware

**CPU Name:** Intel Xeon E5-2680 v4  
**CPU Characteristics:** Intel Turbo Boost Technology up to 3.30 GHz  
**CPU MHz:** 2400  
**FPU:** Integrated  
**CPU(s) enabled:** 28 cores, 2 chips, 14 cores/chip  
**CPU(s) orderable:** 1,2 chips  
**Primary Cache:** 32 KB I + 32 KB D on chip per core  
**Secondary Cache:** 256 KB I+D on chip per core  
**L3 Cache:** 35 MB I+D on chip per chip  
**Other Cache:** None  
**Memory:** 128 GB (8 x 16 GB 2Rx4 PC4-2400T-R)  
**Disk Subsystem:** 2 x 800 GB SSD, RAID 1  
**Other Hardware:** None

## Software

**Operating System:** SUSE Linux Enterprise Server 12 SP1 (x86\_64)  
 Kernel 3.12.49-11-default  
**Compiler:** C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux  
**Auto Parallel:** Yes  
**File System:** ext4  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 32/64-bit  
**Peak Pointers:** 32/64-bit  
**Other Software:** Microquill SmartHeap V10.2



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## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	252	38.8	<u>252</u>	<u>38.7</u>	253	38.6	232	42.1	<u>231</u>	<u>42.2</u>	231	42.3
401.bzip2	<u>407</u>	<u>23.7</u>	407	23.7	407	23.7	<u>404</u>	<u>23.9</u>	405	23.9	404	23.9
403.gcc	<u>222</u>	<u>36.3</u>	222	36.3	222	36.2	<u>220</u>	<u>36.6</u>	222	36.3	219	36.7
429.mcf	144	63.4	<u>146</u>	<u>62.6</u>	146	62.5	144	63.4	<u>146</u>	<u>62.6</u>	146	62.5
445.gobmk	<u>367</u>	<u>28.6</u>	367	28.6	368	28.5	<u>367</u>	<u>28.6</u>	367	28.6	368	28.5
456.hammer	115	80.8	<u>115</u>	<u>80.9</u>	115	81.2	115	80.8	<u>115</u>	<u>80.9</u>	115	81.2
458.sjeng	368	32.9	367	33.0	<u>367</u>	<u>32.9</u>	363	33.3	363	33.4	<u>363</u>	<u>33.3</u>
462.libquantum	<u>2.98</u>	<u>6950</u>	3.00	6910	2.98	6960	<u>2.98</u>	<u>6950</u>	3.00	6910	2.98	6960
464.h264ref	398	55.6	<u>398</u>	<u>55.6</u>	399	55.5	398	55.6	<u>398</u>	<u>55.6</u>	399	55.5
471.omnetpp	156	40.1	<u>149</u>	<u>41.9</u>	144	43.5	<u>117</u>	<u>53.2</u>	117	53.5	118	53.1
473.astar	<u>201</u>	<u>35.0</u>	201	35.0	201	35.0	<u>201</u>	<u>35.0</u>	201	35.0	201	35.0
483.xalancbmk	<u>95.0</u>	<u>72.6</u>	95.8	72.0	95.0	72.7	86.2	80.1	<u>86.0</u>	<u>80.2</u>	85.8	80.5

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:

Intel Hyperthreading set to Disabled

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

Energy/Performance Bias set to Maximum Performance

Collaborative Power Control set to Disabled

Thermal Configuration set so Maximum Cooling

Processor Power and Utilization Monitoring set to Disabled

Memory Refresh Rate set to 1x Refresh

Sysinfo program /cpul6/config/sysinfo.rev6914

\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1

running on apollo3114 Tue May 3 08:08:31 2016

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

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info@spec.org

http://www.spec.org/

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## 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 E5-2680 v4@ 2.40GHz
  2 "physical id"s (chips)
  28 "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 : 14
    siblings  : 14
    physical 0: cores 0 2 4 5 6 8 9 10 11 12 13 14
    physical 1: cores 0 2 4 5 6 8 9 10 11 12 13 14
  cache size : 35840 KB

```

```

From /proc/meminfo
MemTotal:      132039652 kB
HugePages_Total:    0
Hugepagesize:    2048 kB

```

```

From /etc/*release* /etc/*version*
SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 1
  # This file is deprecated and will be removed in a future service pack or
  # release.
  # Please check /etc/os-release for details about this release.
os-release:
  NAME="SLES"
  VERSION="12-SP1"
  VERSION_ID="12.1"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp1"

```

```

uname -a:
Linux apollo3114 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 May 3 07:51

```

SPEC is set to: /cpu16
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdal       ext4  734G  209G  488G  30% /

```

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

Continued on next page



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## Platform Notes (Continued)

hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS HP U14 02/22/2016

Memory:

8x HP 809081-081 16 GB 2 rank 2400 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 128 GB and the dmidecode description should have one line reading as:  
8x HP 809081-081 16 GB 2 rank 2400 MHz

## General Notes

Environment variables set by runspec before the start of the run:

KMP\_AFFINITY = "granularity=fine,scatter"

LD\_LIBRARY\_PATH = "/cpul6/libs/32:/cpul6/libs/64:/cpul6/sh"

OMP\_NUM\_THREADS = "28"

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



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## 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/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: -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: -D_FILE_OFFSET_BITS=64  
473.astar: -DSPEC_CPU_LP64  
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`



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## 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: basepeak = yes

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:

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-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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