



SPEC® CINT2006 Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant ML350 Gen9

(2.20 GHz, Intel Xeon E5-2699 v4)

SPECint®2006 =

77.0

SPECint_base2006 =

72.9

CPU2006 license: 3

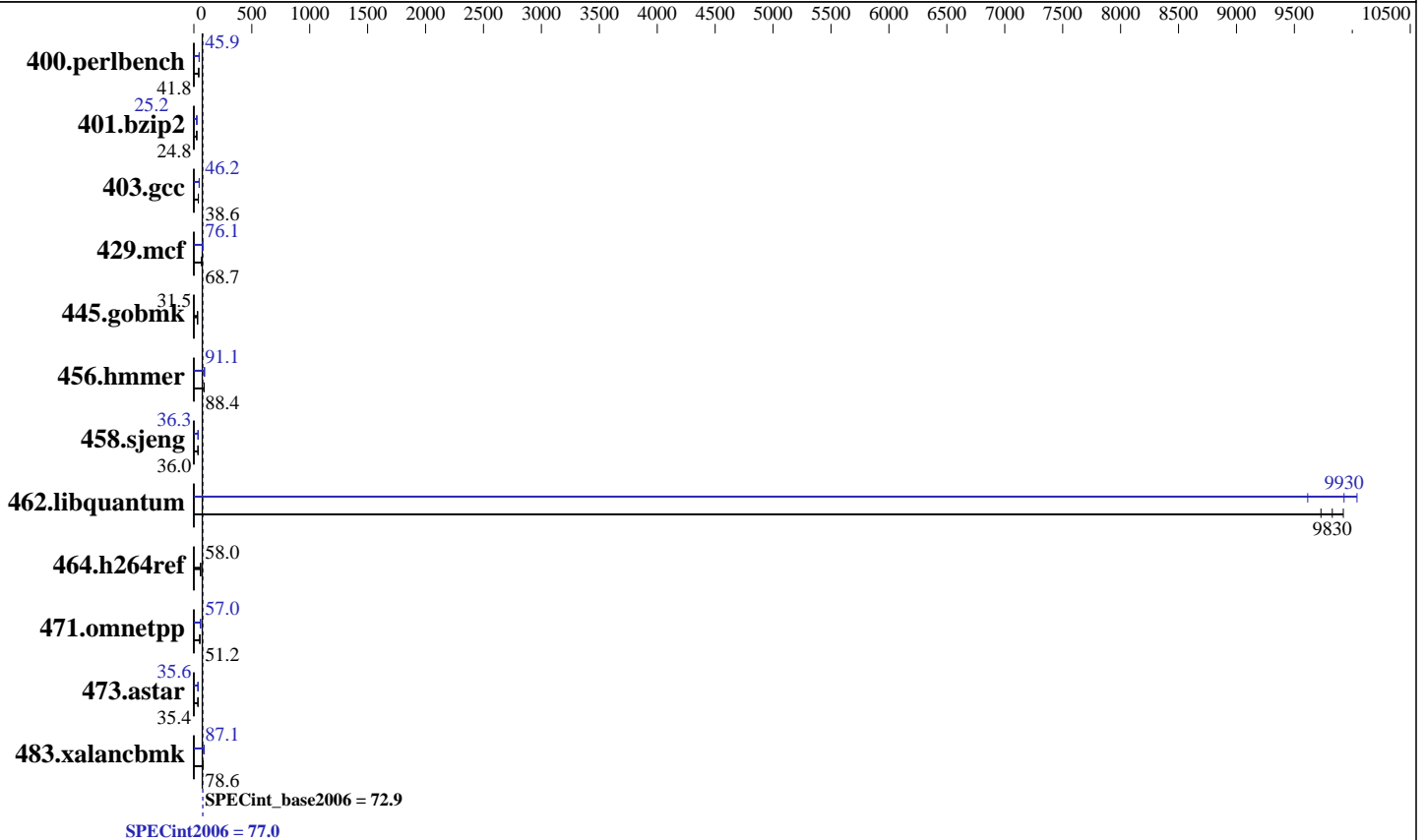
Test sponsor: HPE

Tested by: HPE

Test date: Aug-2016

Hardware Availability: Apr-2016

Software Availability: Dec-2015



Hardware

CPU Name: Intel Xeon E5-2699 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz
CPU MHz: 2200
FPU: Integrated
CPU(s) enabled: 44 cores, 2 chips, 22 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: 55 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 800 GB SAS SSD, RAID 0
Other Hardware: None

Software

Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP1
 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: xfs
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	<u>234</u>	<u>41.8</u>	233	41.9	234	41.7	213	45.9	<u>213</u>	<u>45.9</u>	212	46.0
401.bzip2	<u>388</u>	<u>24.8</u>	389	24.8	386	25.0	<u>382</u>	<u>25.2</u>	383	25.2	382	25.2
403.gcc	208	38.6	<u>208</u>	<u>38.6</u>	209	38.6	175	45.9	<u>174</u>	<u>46.2</u>	173	46.4
429.mcf	<u>133</u>	<u>68.7</u>	133	68.8	137	66.7	119	76.5	<u>120</u>	<u>76.1</u>	120	75.8
445.gobmk	<u>333</u>	<u>31.5</u>	333	31.5	332	31.6	<u>333</u>	<u>31.5</u>	333	31.5	332	31.6
456.hammer	106	88.4	<u>106</u>	<u>88.4</u>	106	88.2	102	91.2	<u>102</u>	<u>91.1</u>	103	90.9
458.sjeng	<u>336</u>	<u>36.0</u>	337	35.9	336	36.0	<u>333</u>	<u>36.3</u>	333	36.3	334	36.3
462.libquantum	2.13	9730	2.09	9920	<u>2.11</u>	<u>9830</u>	2.06	10000	<u>2.09</u>	<u>9930</u>	2.15	9620
464.h264ref	<u>382</u>	<u>58.0</u>	383	57.8	381	58.1	<u>382</u>	<u>58.0</u>	383	57.8	381	58.1
471.omnetpp	<u>122</u>	<u>51.2</u>	119	52.4	123	50.7	<u>110</u>	<u>57.0</u>	109	57.2	110	56.9
473.astar	199	35.2	198	35.5	<u>198</u>	<u>35.4</u>	<u>197</u>	<u>35.6</u>	198	35.5	197	35.6
483.xalancbmk	87.9	78.5	87.6	78.8	<u>87.7</u>	<u>78.6</u>	79.3	87.1	<u>79.2</u>	<u>87.1</u>	79.0	87.4

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"

Platform Notes

BIOS Configuration:

Intel Hyperthreading Option set to Disabled
 Power Profile set to Custom
 Power Regulator set to Static High Performance Mode
 Minimum Processor Idle Power Core C-State set to C1E State
 Minimum Processor Idle Power Package C-State set to C6 (retention) state
 Collaborative Power Control set to Disabled
 QPI Snoop Configuration set to Home Snoop
 Thermal Configuration set to Maximum Cooling
 Processor Power and Utilization Monitoring set to Disabled
 Memory Double Refresh Rate set to 1x Refresh
 Energy Performance Bias set to Balanced Performance

Sysinfo program

/home/specuser/cpu2006/HP_build_ic16_suite_latest_smartheap_linked/cpu2006/config/sysinfo.rev6914
 \$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1
 running on linux-szds Fri Aug 19 21:03:22 2016

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:

Continued on next page



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Platform Notes (Continued)

<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

From /proc/cpuinfo

model name : Intel(R) Xeon(R) CPU E5-2699 v4 @ 2.20GHz

2 "physical id"s (chips)

44 "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 : 22

siblings : 22

physical 0: cores 0 2 3 4 8 10 11 12 16 17 18 19 20 21 24 25 26 27 28

physical 1: cores 0 2 3 4 8 10 11 12 16 17 18 19 20 21 24 25 26 27 28

cache size : 56320 KB

From /proc/meminfo

MemTotal: 264326744 kB

HugePages_Total: 0

Hugepagesize: 2048 kB

/usr/bin/lsb_release -d

SUSE Linux Enterprise Server 12 SP1

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 linux-szds 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 Aug 19 21:02

SPEC is set to:

/home/specuser/cpu2006/HP_build_ic16_suite_latest_smartheap_linked/cpu2006

Filesystem Type Size Used Avail Use% Mounted on

/dev/sda4 xfs 703G 115G 588G 17% /home

Additional information from dmidecode:

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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 P92 04/12/2016

Memory:

8x UNKNOWN NOT AVAILABLE

16x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz

(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 UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz

General Notes

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

KMP_AFFINITY = "granularity=fine,compact"

ID_LIBRARY_PATH = "/home/specuser/cpu2006/HP_build_ic16_suite_latest_smarheap_linked/cpu2006/lib64:/home/specuser/cpu2006/HP_build_ic16_suite_latest_smarheap_linked/cpu2006/lib64:/home/specuser/cpu2006/HP_build_ic16_suite_latest_smarheap_linked/cpu2006/zh"

OMP_NUM_THREADS = "44"

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.hmmmer: -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

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Base Portability Flags (Continued)

483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-auto-ilp32 -complex-limited-range -qopt-prefetch-issue-excl-hint
-ansi-alias

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -Wl,-z,muldefs
-L/home/experiment/last_test/cpu2006/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/lib/ia32_lin

403.gcc: icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/lib/ia32_lin

429.mcf: icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/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: -D_FILE_OFFSET_BITS=64

429.mcf: -D_FILE_OFFSET_BITS=64

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Peak Portability Flags (Continued)

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

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 -static

429.mcf: -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel
 -opt-prefetch -auto-p32 -complex-limited-range -static

445.gobmk: basepeak = yes

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel
 -opt-prefetch -funroll-all-loops

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: -xCORE-AVX2 -ipo -O3 -no-prec-div -static -parallel
 -opt-prefetch -inline-calloc -opt-malloc-options=3
 -auto-p32

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)

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Peak Optimization Flags (Continued)

471.omnetpp (continued):

```
-opt-ra-region-strategy=block -ansi-alias
-Wl,-z,muldefs
-L/home/experiment/last_test/cpu2006/sh -lsmartheap
```

473.astar: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

```
-auto-p32 -Wl,-z,muldefs
-L/home/experiment/last_test/cpu2006/sh -lsmartheap64
```

483.xalancbmk: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

```
-ansi-alias -Wl,-z,muldefs
-L/home/experiment/last_test/cpu2006/sh -lsmartheap
```

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/HP-Compiler-Flags-Intel-V1.2-HSW-revF.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/HP-Compiler-Flags-Intel-V1.2-HSW-revF.xml>

<http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.xml>

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