SPEC® CINT2006 Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

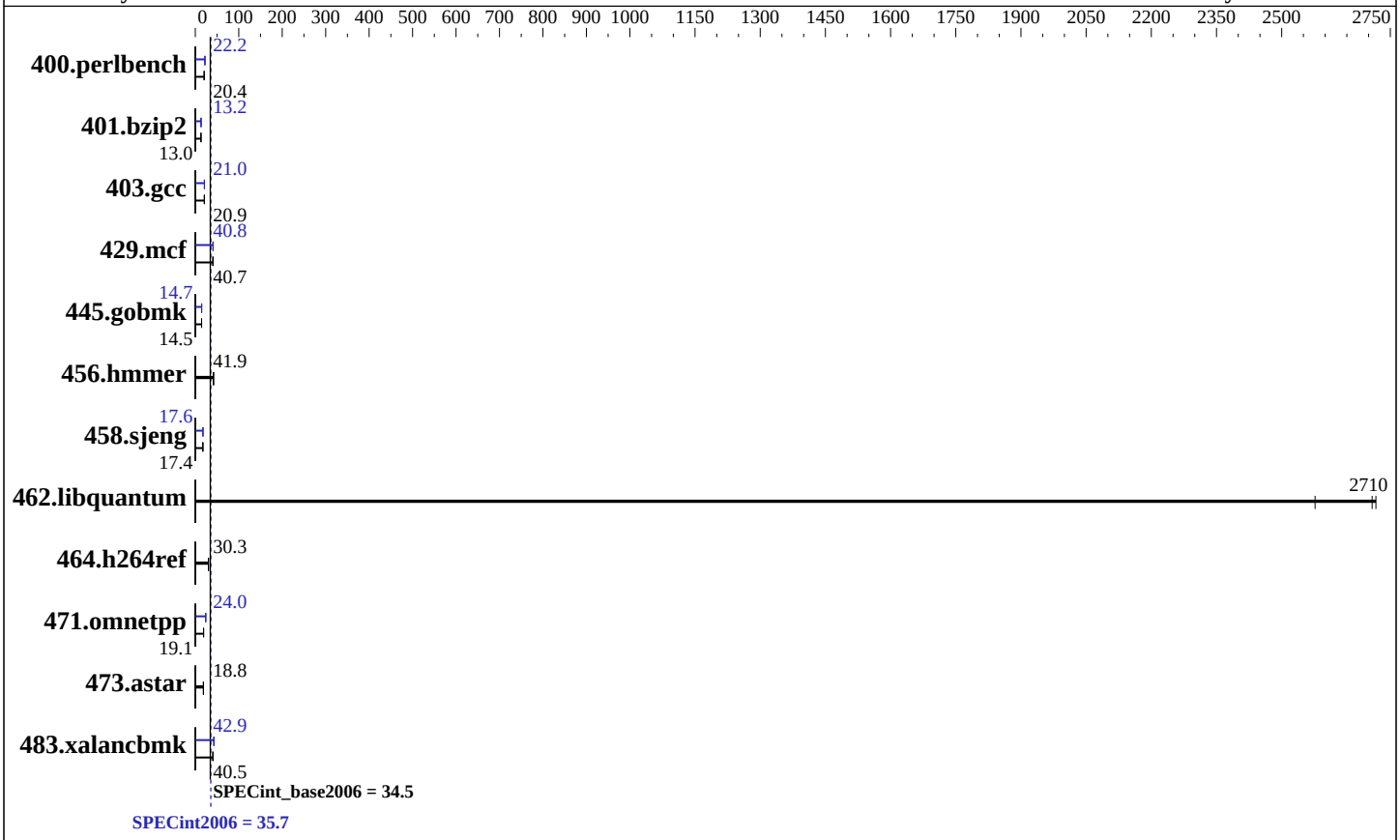
ProLiant DL380 Gen9
(1.70 GHz, Intel Xeon E5-2603 v4)

SPECint®2006 = 35.7

SPECint_base2006 = 34.5

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

Test date: Mar-2016
Hardware Availability: Mar-2016
Software Availability: Nov-2015



Hardware

CPU Name:	Intel Xeon E5-2603 v4
CPU Characteristics:	
CPU MHz:	1700
FPU:	Integrated
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:	512 GB (16 x 32 GB 2Rx4 PC4-2400T-R, running at 1866 MHz)
Disk Subsystem:	1 x 400 GB SAS SSD, RAID 0
Other Hardware:	None

Software

Operating System:	Red Hat Enterprise Linux Server release 7.2, (Maipo) Kernel 3.10.0-327.el7.x86_64
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-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	477	20.5	478	20.4	**478**	**20.4**	**441**	**22.2**	441	22.2	440	22.2
401.bzip2	**741**	**13.0**	738	13.1	742	13.0	**729**	**13.2**	727	13.3	729	13.2
403.gcc	386	20.9	386	20.9	**386**	**20.9**	384	21.0	384	21.0	**384**	**21.0**
429.mcf	222	41.0	**224**	**40.7**	227	40.2	222	41.1	**223**	**40.8**	225	40.6
445.gobmk	724	14.5	722	14.5	**723**	**14.5**	716	14.6	716	14.7	**716**	**14.7**
456.hmmer	**223**	**41.9**	223	41.9	222	42.0	**223**	**41.9**	223	41.9	222	42.0
458.sjeng	695	17.4	695	17.4	**695**	**17.4**	**687**	**17.6**	686	17.6	687	17.6
462.libquantum	8.04	2580	**7.65**	**2710**	7.63	2720	8.04	2580	**7.65**	**2710**	7.63	2720
464.h264ref	**729**	**30.3**	731	30.3	729	30.4	**729**	**30.3**	731	30.3	729	30.4
471.omnetpp	328	19.1	328	19.0	**328**	**19.1**	263	23.8	259	24.1	**260**	**24.0**
473.astar	374	18.8	**374**	**18.8**	377	18.6	374	18.8	**374**	**18.8**	377	18.6
483.xalancbmk	170	40.5	**170**	**40.5**	170	40.5	**161**	**42.9**	161	43.0	162	42.5

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:
  HP Power Profile set to Custom
  HP Power Regulator to HP Static High Performance Mode
  Minimum Processor Idle Power Core C-State set to C1E State
  Minimum Processor Idle Power 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

Sysinfo program /home/intel_binary/cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on DL380Gen9allbin Thu Mar 17 22:11:56 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

Platform Notes (Continued)

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

    From /proc/cpuinfo
       model name : Intel(R) Xeon(R) CPU E5-2603 v4 @ 1.70GHz
          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:       528069200 kB
       HugePages_Total:       0
       Hugepagesize:       2048 kB

    From /etc/*release* /etc/*version*
       os-release:
          NAME="Red Hat Enterprise Linux Server"
          VERSION="7.2 (Maipo)"
          ID="rhel"
          ID_LIKE="fedora"
          VERSION_ID="7.2"
          PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
          ANSI_COLOR="0;31"
          CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:GA:server"
       redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
       system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
       system-release-cpe: cpe:/o:redhat:enterprise_linux:7.2:ga:server

    uname -a:
       Linux DL380Gen9allbin 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29 EDT
       2015 x86_64 x86_64 x86_64 GNU/Linux

    run-level 3 Mar 17 21:58

    SPEC is set to: /home/intel_binary/cpu2006
       Filesystem     Type  Size  Used Avail Use% Mounted on
       /dev/sda5      xfs   318G  111G  208G  35% /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 02/22/2016
      Memory:
```

Continued on next page

Platform Notes (Continued)

```
      8x UNKNOWN NOT AVAILABLE
      16x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz, configured at 1866 MHz

   (End of data from sysinfo program)
   Regarding the sysinfo display about the memory installed, the correct amount of
   memory is 512 GB and the dmidecode description should have one line reading as:
   16x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz, configured at 1866 MHz
```

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 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

Base Optimization Flags

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

Continued on next page

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/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

445.gobmk: 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: -D_FILE_OFFSET_BITS=64
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

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

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

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:

Continued on next page

Peak Other Flags (Continued)

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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