SPEC® CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

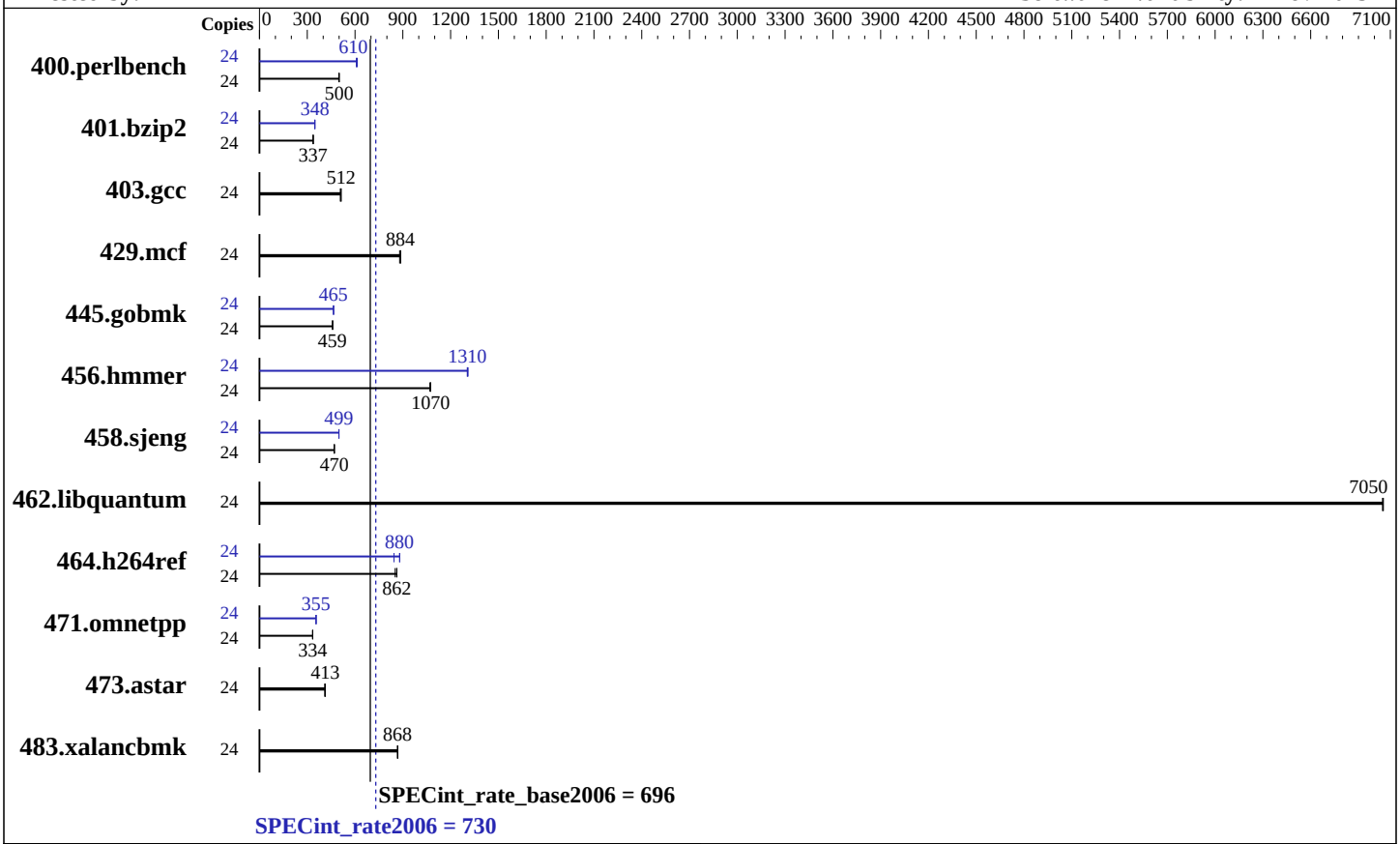
ProLiant XL450 Gen9
(3.40 GHz, Intel Xeon E5-2643 v4)

SPECint®_rate2006 = 730

SPECint_rate_base2006 = 696

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

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



Hardware

CPU Name:	Intel Xeon E5-2643 v4
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz:	3400
FPU:	Integrated
CPU(s) enabled:	12 cores, 2 chips, 6 cores/chip, 2 threads/core
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:	20 MB I+D on chip per chip
Other Cache:	None
Memory:	256 GB (8 x 32 GB 2Rx4 PC4-2400T-R)
Disk Subsystem:	2 x 480 GB SATA SSD, RAID 1
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:	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

SPEC CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant XL450 Gen9
(3.40 GHz, Intel Xeon E5-2643 v4)

SPECint_rate2006 = 730

SPECint_rate_base2006 = 696

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

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

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	24	468	501	**469**	**500**	471	498	24	382	614	**385**	**610**	385	609
401.bzip2	24	**686**	**337**	686	338	689	336	24	**666**	**348**	665	348	668	347
403.gcc	24	**377**	**512**	381	507	377	513	24	**377**	**512**	381	507	377	513
429.mcf	24	247	887	249	880	**248**	**884**	24	247	887	249	880	**248**	**884**
445.gobmk	24	548	459	549	459	**549**	**459**	24	**542**	**465**	542	465	541	465
456.hmmer	24	208	1070	**208**	**1070**	209	1070	24	172	1300	**171**	**1310**	171	1310
458.sjeng	24	617	470	**618**	**470**	619	470	24	582	499	582	499	**582**	**499**
462.libquantum	24	**70.5**	**7050**	70.5	7050	70.5	7060	24	**70.5**	**7050**	70.5	7050	70.5	7060
464.h264ref	24	**616**	**862**	624	852	616	862	24	603	880	629	845	**604**	**880**
471.omnetpp	24	**449**	**334**	449	334	449	334	24	422	356	423	355	**422**	**355**
473.astar	24	**408**	**413**	408	413	411	410	24	**408**	**413**	408	413	411	410
483.xalancbmk	24	191	869	191	866	**191**	**868**	24	191	869	191	866	**191**	**868**

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.:
   numactl --interleave=all runspec <etc>
```

Platform Notes

```
BIOS Configuration:
   Power Profile set to Custom
   Power Regulator set to Static High Performance Mode
   Minimum Processor Idle Power Core C-State set to C6 State
   Minimum Processor Idle Power Package C-State set to Package C6 (retention) State
   Energy/Performance Bias set to Balance Performance
   QPI Snoop Configuration set to Cluster on Die
   Collaborative Power Control set to Disabled
   Thermal Configuration set to Maximum Cooling
   Processor Power and Utilization Monitoring set to Disabled
   Memory Double Refresh Rate set to 1x Refresh
```

Continued on next page

Platform Notes (Continued)

```
Sysinfo program /cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on XL450-G9-node2 Fri Jun 10 15:45:15 2016

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 E5-2643 v4 @ 3.40GHz
      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 6 7
      physical 1: cores 0 1 2 3 6 7
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:       263712268 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 XL450-G9-node2 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 Jun 10 15:26

SPEC is set to: /cpu2006
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda4      xfs   438G   20G  419G   5% /
Additional information from dmidecode:
```

Continued on next page

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 U21 03/10/2016
    Memory:
     8x UNKNOWN NOT AVAILABLE
     8x UNKNOWN NOT AVAILABLE 32 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:
  8x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz
```

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
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
464.h264ref: -D_FILE_OFFSET_BITS=64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -D_FILE_OFFSET_BITS=64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh -lsmartheap
```

Base Other Flags

C benchmarks:

403.gcc: `-Dalloca=_alloca`

Peak Compiler Invocation

C benchmarks (except as noted below):
```
icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

400.perlbench: `icc -m64`

401.bzip2: `icc -m64`

456.hmmer: `icc -m64`

458.sjeng: `icc -m64`

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

Peak Portability Flags

400.perlbench: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64`
401.bzip2: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64`
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 -DSPEC_CPU_LP64`
458.sjeng: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64`
462.libquantum: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`
464.h264ref: `-D_FILE_OFFSET_BITS=64`
471.omnetpp: `-D_FILE_OFFSET_BITS=64`
473.astar: `-D_FILE_OFFSET_BITS=64`

Continued on next page

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

Continued on next page

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`

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.
Report generated on Tue Jul 12 11:03:51 2016 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 12 July 2016.