SPEC® CINT2006 Result
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IBM Corporation

IBM BladeCenter HX5 (Intel Xeon E7-4870, 2.40 GHz)

$SPECint®2006 =$ 40.9

$SPECint\_base2006 =$ 38.0

CPU2006 license: 11	**Test date:** Feb-2012
Test sponsor: IBM Corporation	**Hardware Availability:** May-2011
Tested by: IBM Corporation	**Software Availability:** Dec-2011

0   100 200 300 400 500 600 700 800 900   1050   1200   1350   1500   1650   1800   1950   2100   2250   2400   2550   2700   3000

400.perlbench 26.2 / 21.9

401.bzip2 16.9 / 16.5

403.gcc 22.3 / 22.0

429.mcf 41.7

445.gobmk 21.3 / 19.1

456.hmmer 41.2 / 40.2

458.sjeng 22.3 / 21.9

462.libquantum 2980

464.h264ref 34.3 / 30.5

471.omnetpp 33.3 / 24.0

473.astar 20.7

483.xalancbmk 38.3 / 36.4

SPECint_base2006 = 38.0

SPECint2006 = 40.9

Hardware

CPU Name:	Intel Xeon E7-4870
CPU Characteristics:	Intel Turbo Boost Technology up to 2.80 GHz
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	40 cores, 4 chips, 10 cores/chip, 2 threads/core
CPU(s) orderable:	1,2,3,4 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:	30 MB I+D on chip per chip
Other Cache:	None
Memory:	256 GB (32 x 8 GB 4Rx8 PC3-8500R-7, ECC)
Disk Subsystem:	4 x 50 GB SSD, RAID 0
Other Hardware:	None

Software

Operating System:	Red Hat Enterprise Linux Server release 6.2 (Santiago) 2.6.32-220.el6.x86_64
Compiler:	C/C++: Version 12.1.0.225 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 V9.01

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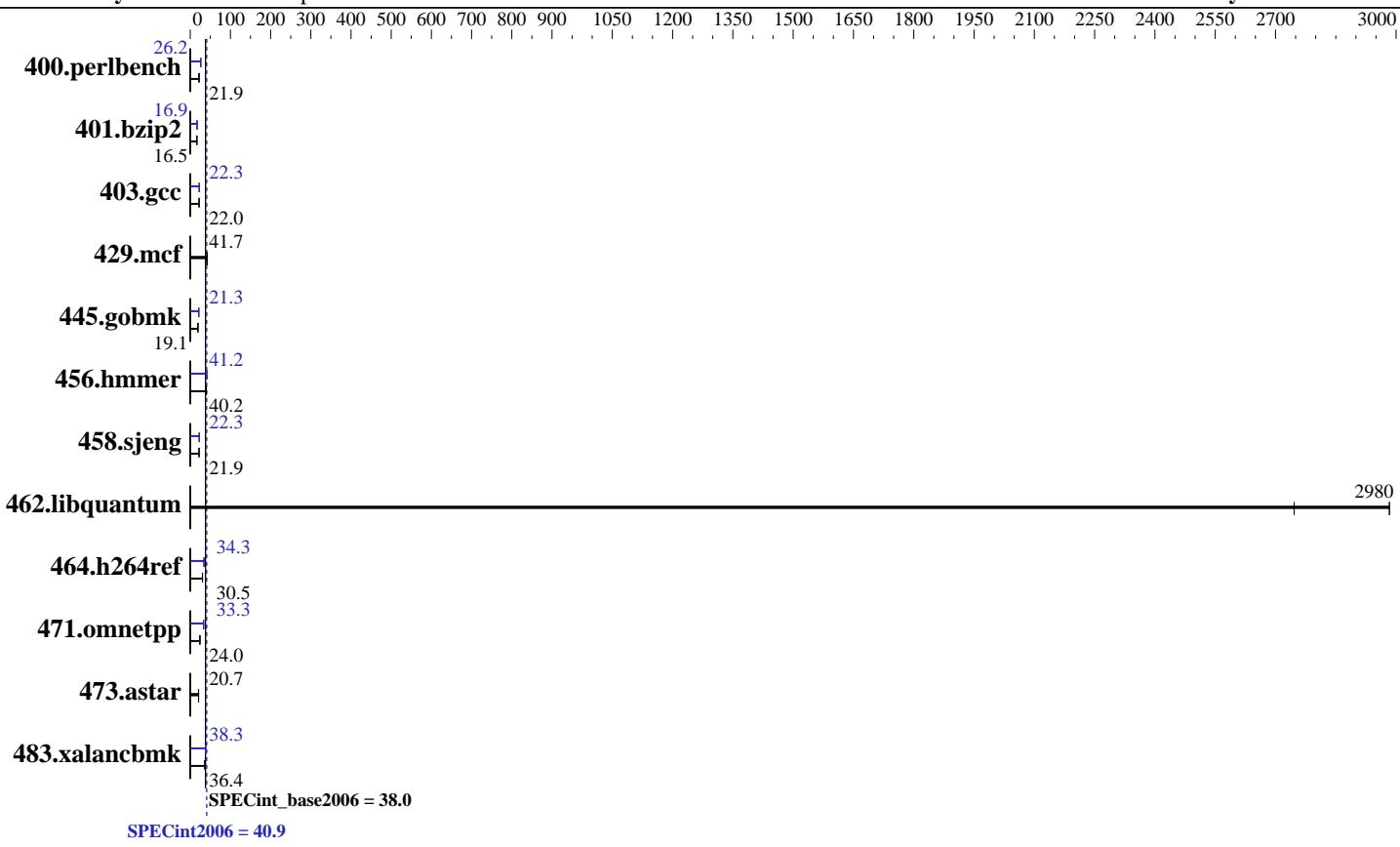| SPECint2006 =	40.9
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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	**447**	**21.9**	446	21.9	447	21.9	**372**	**26.2**	372	26.3	372	26.2
401.bzip2	586	16.5	586	16.5	**586**	**16.5**	**569**	**16.9**	569	17.0	570	16.9
403.gcc	366	22.0	**366**	**22.0**	367	22.0	361	22.3	360	22.3	**361**	**22.3**
429.mcf	**219**	**41.7**	219	41.7	219	41.7	**219**	**41.7**	219	41.7	219	41.7
445.gobmk	549	19.1	548	19.1	**548**	**19.1**	493	21.3	493	21.3	**493**	**21.3**
456.hmmer	232	40.2	232	40.1	**232**	**40.2**	226	41.2	227	41.2	**226**	**41.2**
458.sjeng	**553**	**21.9**	552	21.9	553	21.9	**541**	**22.3**	541	22.4	541	22.3
462.libquantum	7.54	2750	6.94	2980	**6.95**	**2980**	7.54	2750	6.94	2980	**6.95**	**2980**
464.h264ref	**726**	**30.5**	726	30.5	726	30.5	**645**	**34.3**	645	34.3	645	34.3
471.omnetpp	**260**	**24.0**	261	23.9	259	24.2	188	33.3	**188**	**33.3**	188	33.2
473.astar	**339**	**20.7**	341	20.6	337	20.8	**339**	**20.7**	341	20.6	337	20.8
483.xalancbmk	**190**	**36.4**	189	36.4	192	36.0	180	38.3	180	38.3	**180**	**38.3**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

Platform Notes

```
Turbo Boost Power Optimization set to Traditional in BIOS
Sysinfo program /cpu2006.1.2/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
running on hammerhead2n-pete Thu Feb 23 08:44:32 2012

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 E7- 4870 @ 2.40GHz
     4 "physical id"s (chips)
     80 "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 : 10
     siblings  : 20
     physical 0: cores 0 1 2 8 9 16 17 18 24 25
     physical 1: cores 0 1 2 8 9 16 17 18 24 25
     physical 2: cores 0 1 2 8 9 16 17 18 24 25
     physical 3: cores 0 1 2 8 9 16 17 18 24 25
  cache size : 30720 KB
```

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Platform Notes (Continued)

```
   From /proc/meminfo
      MemTotal:        264503032 kB
      HugePages_Total:         0
      Hugepagesize:         2048 kB

   /usr/bin/lsb_release -d
      Red Hat Enterprise Linux Server release 6.2 (Santiago)

   From /etc/*release* /etc/*version*
      redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
      system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
      system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

   uname -a:
      Linux hammerhead2n-pete 2.6.32-220.el6.x86_64 #1 SMP Wed Nov 9 08:03:13 EST
      2011 x86_64 x86_64 x86_64 GNU/Linux

   run-level 3 Mar 21 15:41

   SPEC is set to: /cpu2006.1.2
      Filesystem    Type    Size  Used Avail Use% Mounted on
      /dev/mapper/vg_hammerhead2np-lv_root
                    ext4    182G  5.8G  167G   4% /

   Additional information from dmidecode:
     Memory:
       32x Hynix HMT41GV7AMR8C-G7 8 GB 1067 MHz 4 rank

   (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/cpu2006.1.2/libs/32:/cpu2006.1.2/libs/64"
OMP_NUM_THREADS = "40"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RHEL5.5
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
```

Base Compiler Invocation

C benchmarks:
```
    icc  -m64
```

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Base Compiler Invocation (Continued)

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:
```
    -xSSE4.2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32
```

C++ benchmarks:
```
    -xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
    -Wl,-z,muldefs -L/smartheap -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

    445.gobmk: icc -m32

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Peak Compiler Invocation (Continued)

464.h264ref: `icc -m32`

C++ benchmarks (except as noted below):
`icpc -m32`

473.astar: `icpc -m64`

Peak Portability Flags

400.perlbench: `-DSPEC_CPU_LINUX_IA32`
401.bzip2: `-DSPEC_CPU_LP64`
403.gcc: `-DSPEC_CPU_LP64`
429.mcf: `-DSPEC_CPU_LP64`
456.hmmer: `-DSPEC_CPU_LP64`
458.sjeng: `-DSPEC_CPU_LP64`
462.libquantum: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX`
473.astar: `-DSPEC_CPU_LP64`
483.xalancbmk: `-DSPEC_CPU_LINUX`

Peak Optimization Flags

C benchmarks:

400.perlbench: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2)
`-O3`(pass 2) `-no-prec-div`(pass 2) `-prof-use`(pass 2)
`-opt-prefetch -ansi-alias`

401.bzip2: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2)
`-O3`(pass 2) `-no-prec-div -prof-use`(pass 2) `-auto-ilp32`
`-opt-prefetch -ansi-alias`

403.gcc: `-xSSE4.2 -ipo -O3 -no-prec-div -inline-calloc`
`-opt-malloc-options=3 -auto-ilp32`

429.mcf: basepeak = yes

445.gobmk: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-prof-use`(pass 2)
`-ansi-alias`

456.hmmer: `-xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32`
`-ansi-alias`

458.sjeng: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2)
`-O3`(pass 2) `-no-prec-div`(pass 2) `-prof-use`(pass 2)
`-unroll4`

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Peak Optimization Flags (Continued)

462.libquantum: basepeak = yes

464.h264ref: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)`
`-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)`
`-unroll2 -ansi-alias`

C++ benchmarks:

471.omnetpp: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)`
`-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)`
`-opt-ra-region-strategy=block        -ansi-alias`
`-Wl,-z,muldefs -L/smartheap -lsmartheap`

473.astar: basepeak = yes

483.xalancbmk: `-xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias`
`-Wl,-z,muldefs -L/smartheap -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/Intel-ic12.1-official-linux64.20111122.html
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-WSM-C.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-WSM-C.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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