# SPEC® CINT2006 Result

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## Hewlett-Packard Company

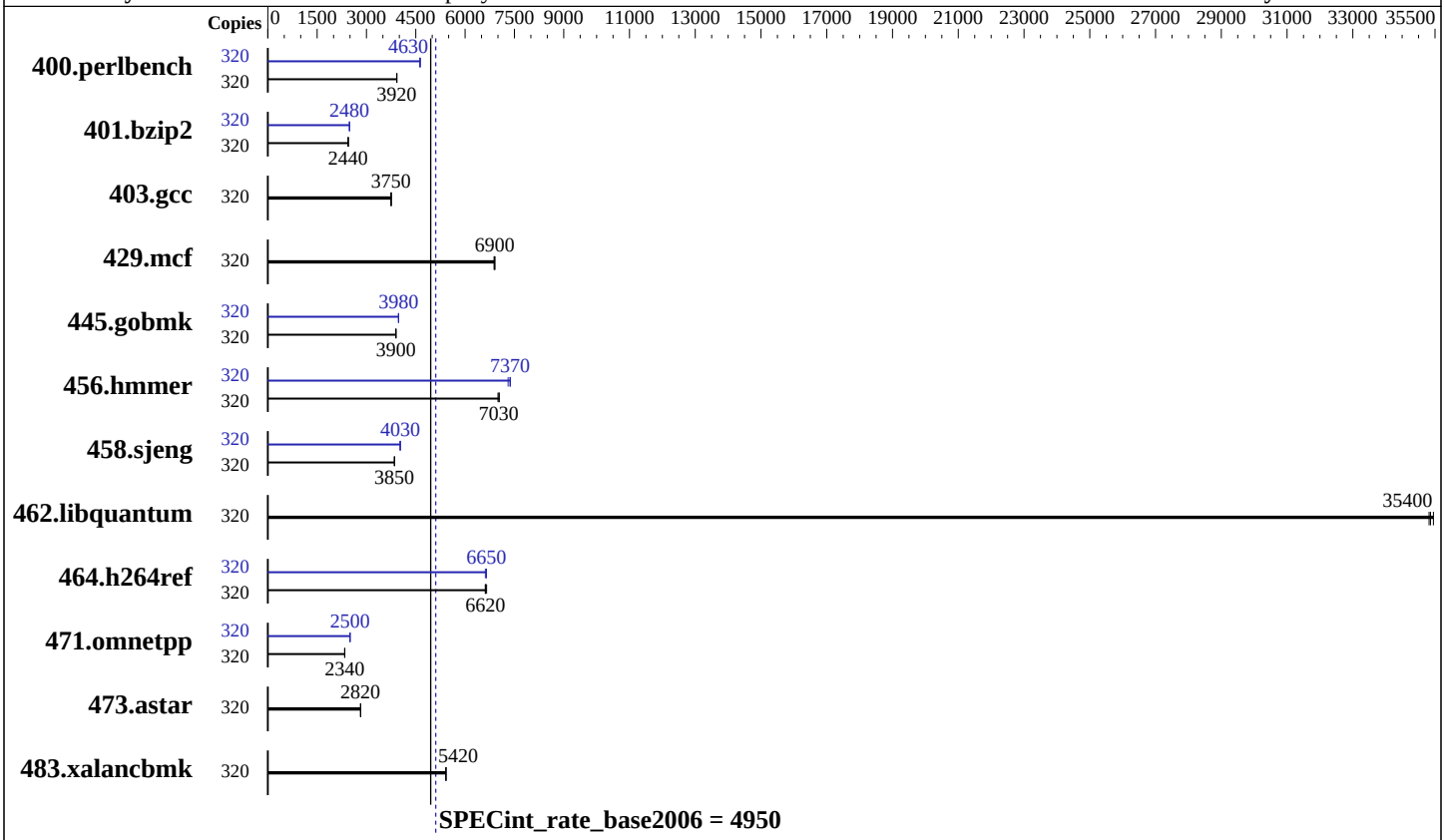
HP Integrity Superdome X
(160 core, 2.20 GHz, Intel Xeon E7-4830 v2)

**SPECint®_rate2006 = 5110**

**SPECint_rate_base2006 = 4950**

**CPU2006 license:** 3
**Test sponsor:** Hewlett-Packard Company
**Tested by:** Hewlett-Packard Company

**Test date:** Mar-2015
**Hardware Availability:** Feb-2015
**Software Availability:** Jul-2014




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E7-4830 v2 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 2.70 GHz |
| CPU MHz: | 2200 |
| FPU: | Integrated |
| CPU(s) enabled: | 160 cores, 16 chips, 10 cores/chip, 2 threads/core |
| CPU(s) orderable: | 8,16 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: | 20 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 4 TB (128 x 32 GB 4Rx4 PC3-14900L-13, ECC, running at 1067 MHz) |
| Disk Subsystem: | 12 x 900 GB 10 K RPM SAS, RAID 6 |
| Other Hardware: | None |

### Software

| | |
|---|---|
| Operating System: | SUSE Linux Enterprise Server 11 (x86_64) SP3 Kernel 3.0.101-0.30-bigsmp |
| Compiler: | C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux |
| Auto Parallel: | No |
| File System: | tmpfs |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 32-bit |
| Peak Pointers: | 32/64-bit |
| Other Software: | Microquill SmartHeap V10.0 |

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## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 400.perlbench | 320 | **797** | **3920** | 796 | 3930 | 798 | 3920 | 320 | 674 | 4640 | **676** | **4630** | 676 | 4620 |
| 401.bzip2 | 320 | 1260 | 2450 | **1264** | **2440** | 1264 | 2440 | 320 | 1244 | 2480 | 1243 | 2480 | **1243** | **2480** |
| 403.gcc | 320 | 685 | 3760 | **687** | **3750** | 688 | 3750 | 320 | 685 | 3760 | **687** | **3750** | 688 | 3750 |
| 429.mcf | 320 | **423** | **6900** | 423 | 6910 | 424 | 6880 | 320 | **423** | **6900** | 423 | 6910 | 424 | 6880 |
| 445.gobmk | 320 | **861** | **3900** | 862 | 3890 | 861 | 3900 | 320 | **844** | **3980** | 845 | 3970 | 844 | 3980 |
| 456.hmmer | 320 | 424 | 7040 | **425** | **7030** | 426 | 7000 | 320 | 409 | 7310 | **405** | **7370** | 405 | 7380 |
| 458.sjeng | 320 | 1005 | 3850 | **1005** | **3850** | 1006 | 3850 | 320 | 963 | 4020 | 960 | 4030 | **962** | **4030** |
| 462.libquantum | 320 | **187** | **35400** | 187 | 35500 | 188 | 35300 | 320 | **187** | **35400** | 187 | 35500 | 188 | 35300 |
| 464.h264ref | 320 | **1070** | **6620** | 1064 | 6650 | 1070 | 6620 | 320 | 1065 | 6650 | **1065** | **6650** | 1070 | 6620 |
| 471.omnetpp | 320 | 856 | 2340 | **855** | **2340** | 854 | 2340 | 320 | 799 | 2500 | **800** | **2500** | 800 | 2500 |
| 473.astar | 320 | 796 | 2820 | 795 | 2830 | **796** | **2820** | 320 | 796 | 2820 | 795 | 2830 | **796** | **2820** |
| 483.xalancbmk | 320 | 407 | 5420 | 408 | 5420 | **408** | **5420** | 320 | 407 | 5420 | 408 | 5420 | **408** | **5420** |

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"
intel_idle.max_cstate=1 appended in kernel command line
Power profile set with:
 cpupower -c all frequency-set -g performance
Benchmark installed under /dev/shm/cpu2006 and mount with:
 mount -o bind /dev/shm/cpu2006 /cpu2006
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

```
 Firmware settings:
  Memory RAS Configuration set to Maximum Performance
Sysinfo program /cpu2006/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on hawk038os1 Mon Mar 30 15:37:34 2015
```

Continued on next page

## Platform Notes (Continued)

```
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 E7-4830 v2 @ 2.20GHz
      16 "physical id"s (chips)
      320 "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 3 4 8 9 10 11 12
      physical 1: cores 0 1 2 3 4 8 9 10 11 12
      physical 2: cores 0 1 2 3 4 8 9 10 11 12
      physical 3: cores 0 1 2 3 4 8 9 10 11 12
      physical 4: cores 0 1 2 3 4 8 9 10 11 12
      physical 5: cores 0 1 2 3 4 8 9 10 11 12
      physical 6: cores 0 1 2 3 4 8 9 10 11 12
      physical 7: cores 0 1 2 3 4 8 9 10 11 12
      physical 8: cores 0 1 2 3 4 8 9 10 11 12
      physical 9: cores 0 1 2 3 4 8 9 10 11 12
      physical 10: cores 0 1 2 3 4 8 9 10 11 12
      physical 11: cores 0 1 2 3 4 8 9 10 11 12
      physical 12: cores 0 1 2 3 4 8 9 10 11 12
      physical 13: cores 0 1 2 3 4 8 9 10 11 12
      physical 14: cores 0 1 2 3 4 8 9 10 11 12
      physical 15: cores 0 1 2 3 4 8 9 10 11 12
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:       4235878148 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 11 (x86_64)

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 11 (x86_64)
      VERSION = 11
      PATCHLEVEL = 3

uname -a:
   Linux hawk038os1 3.0.101-0.30-bigsmp #1 SMP Fri May 23 16:16:00 UTC 2014
   (bd1c1f5) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 30 15:12 last=S

SPEC is set to: /cpu2006
```

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## Platform Notes (Continued)

```
    Filesystem     Type   Size  Used Avail Use% Mounted on
    tmpfs          tmpfs  2.0T  3.9G  2.0T   1% /dev/shm

Additional information from dmidecode:
  BIOS HP Bundle: 006.000.022 SFW: 015.095.000 02/20/2015
  Memory:
   128x HP HMT84GL7AMR4C-RD 32 GB 1067 MHz
   256x not defined not defined

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of
memory is 4 TB. The dmidecode description should have one line reading as:
 128x HP HMT84GL7AMR4C-RD 32 GB 1067 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 Core i7-860 CPU + 8GB
 memory using RedHat EL 6.4
```

## Base Compiler Invocation

C benchmarks:
```
icc  -m32
```

C++ benchmarks:
```
icpc -m32
```

## Base Portability Flags

400.perlbench: `-DSPEC_CPU_LINUX_IA32`
462.libquantum: `-DSPEC_CPU_LINUX`
483.xalancbmk: `-DSPEC_CPU_LINUX`

## Base Optimization Flags

C benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -opt-mem-layout-trans=3
```

C++ benchmarks:
```
-xSSE4.2 -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`

400.perlbench: `icc -m64`

401.bzip2: `icc -m64`

456.hmmer: `icc -m64`

458.sjeng: `icc -m64`

C++ benchmarks:
`icpc -m32`

## Peak Portability Flags

400.perlbench: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64`
401.bzip2: `-DSPEC_CPU_LP64`
456.hmmer: `-DSPEC_CPU_LP64`
458.sjeng: `-DSPEC_CPU_LP64`
462.libquantum: `-DSPEC_CPU_LINUX`
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)
`-auto-ilp32`

401.bzip2: `-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 -auto-ilp32 -ansi-alias`

403.gcc: `basepeak = yes`

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# Peak Optimization Flags (Continued)

429.mcf: basepeak = yes

445.gobmk: -xSSE4.2(pass 2) -prof-gen(pass 1) -prof-use(pass 2)
-ansi-alias -opt-mem-layout-trans=3

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

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 -auto-ilp32

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)
-ansi-alias -opt-ra-region-strategy=block -Wl,-z,muldefs
-L/sh -lsmartheap

473.astar: basepeak = yes

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-ic14.0-official-linux64-revC.html
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-Integrity-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64-revC.xml
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-Integrity-revA.xml

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