SPEC® CINT2006 Result

Lenovo Group Limited

$SPECint^®\_rate2006 = 1120$

IBM Flex System x440
(Intel Xeon E5-4610 v2, 2.70 GHz)

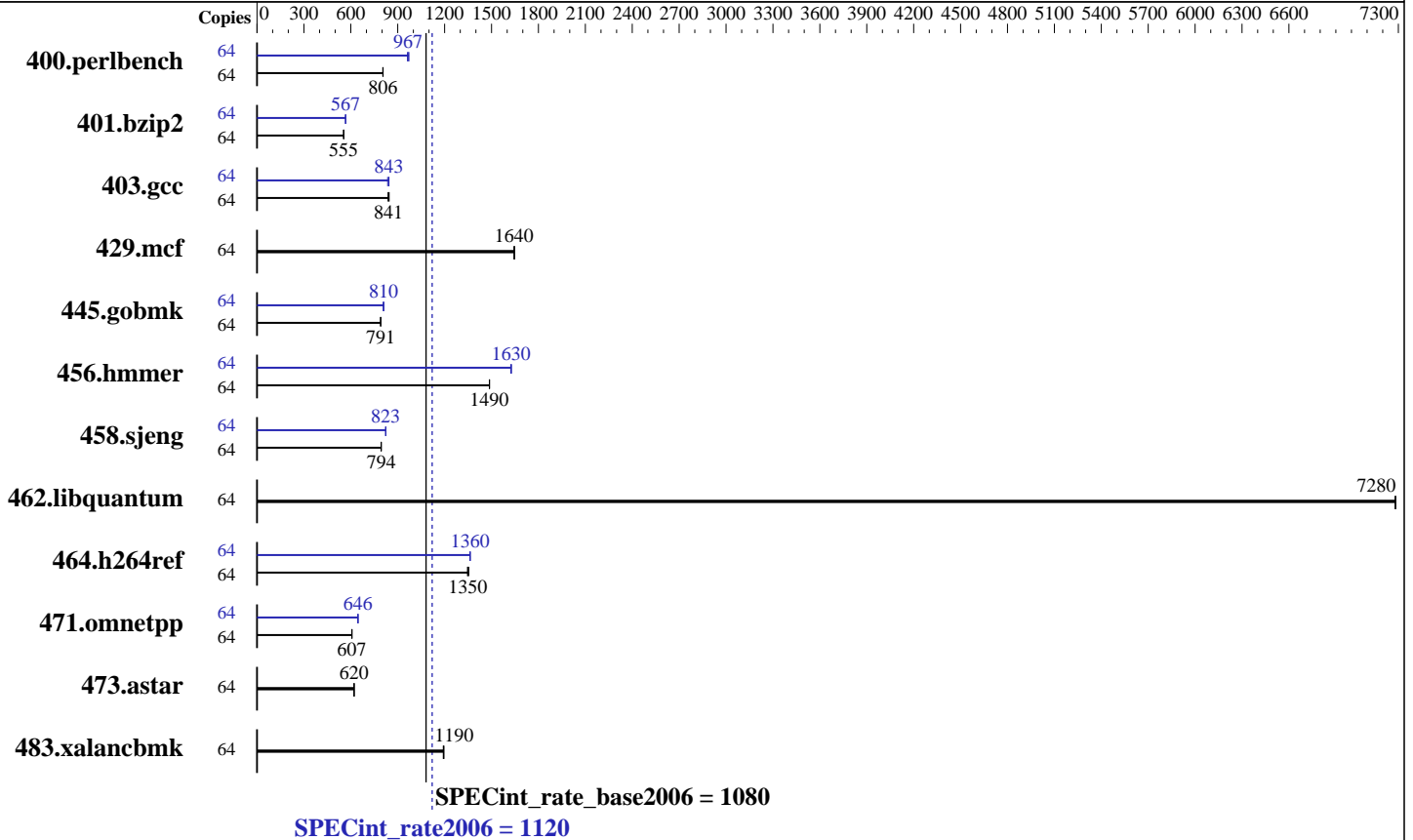$SPECint\_rate\_base2006 = 1080$

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

Test date: Apr-2015
Hardware Availability: Dec-2014
Software Availability: Nov-2013

SPECint_rate_base2006 = 1080
SPECint_rate2006 = 1120

Hardware

CPU Name:	Intel Xeon E5-4610 v2
CPU Characteristics:	Intel Turbo Boost Technology up to 2.70 GHz
CPU MHz:	2300
FPU:	Integrated
CPU(s) enabled:	32 cores, 4 chips, 8 cores/chip, 2 threads/core
CPU(s) orderable:	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:	16 MB I+D on chip per chip
Other Cache:	None
Memory:	512 GB (32 x 16 GB 2Rx4 PC3-14900R-13, ECC, running at 1600 MHz)
Disk Subsystem:	1 x 300 GB SAS, 15000 RPM
Other Hardware:	None

Software

Operating System:	Red Hat Enterprise Linux Server release 6.5 (Santiago) 2.6.32-431.el6.x86_64
Compiler:	C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux
Auto Parallel:	No
File System:	ext4
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	64	775	807	777	804	**776**	**806**	64	644	972	**647**	**967**	650	962
401.bzip2	64	1111	556	1117	553	**1112**	**555**	64	1089	567	**1090**	**567**	1091	566
403.gcc	64	610	845	**612**	**841**	615	838	64	**611**	**843**	610	844	617	836
429.mcf	64	354	1650	355	1640	**355**	**1640**	64	354	1650	355	1640	**355**	**1640**
445.gobmk	64	**849**	**791**	849	791	848	791	64	**829**	**810**	828	811	832	807
456.hmmer	64	402	1490	**402**	**1490**	402	1490	64	368	1620	367	1630	**367**	**1630**
458.sjeng	64	976	793	974	795	**975**	**794**	64	**941**	**823**	940	824	941	823
462.libquantum	64	182	7280	**182**	**7280**	182	7280	64	182	7280	**182**	**7280**	182	7280
464.h264ref	64	1046	1350	**1050**	**1350**	1052	1350	64	1040	1360	**1039**	**1360**	1039	1360
471.omnetpp	64	659	607	**659**	**607**	659	607	64	620	645	**619**	**646**	619	646
473.astar	64	722	622	724	620	**724**	**620**	64	722	622	724	620	**724**	**620**
483.xalancbmk	64	370	1190	**370**	**1190**	369	1200	64	370	1190	**370**	**1190**	369	1200

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"

Platform Notes

    Operating Mode set to Maximum Perfomance in BIOS
    Sysinfo program /cpu2006.1.2/config/sysinfo.rev6818
    $Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
    running on localhost.localdomain Sat Apr 11 19:38:20 2015

    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 E5-4610 v2 @ 2.30GHz
          4 "physical id"s (chips)
          64 "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 : 8

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Platform Notes (Continued)

```
       siblings  : 16
       physical 0: cores 0 1 2 3 4 5 6 7
       physical 1: cores 0 1 2 3 4 5 6 7
       physical 2: cores 0 1 2 3 4 5 6 7
       physical 3: cores 0 1 2 3 4 5 6 7
    cache size : 16384 KB

 From /proc/meminfo
    MemTotal:        529406328 kB
    HugePages_Total:         0
    Hugepagesize:         2048 kB

 /usr/bin/lsb_release -d
    Red Hat Enterprise Linux Server release 6.5 (Santiago)

 From /etc/*release* /etc/*version*
    redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
    system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

 uname -a:
    Linux localhost.localdomain 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54
    EST 2013 x86_64 x86_64 x86_64 GNU/Linux

 run-level 3 Apr 11 19:37 last=5

 SPEC is set to: /cpu2006.1.2
    Filesystem                     Type  Size  Used Avail Use% Mounted on
    /dev/mapper/VolGroup-lv_root ext4  265G  7.9G  244G   4% /

 Additional information from dmidecode:
   BIOS IBM -[CGE103GUS-1.10]- 03/06/2015
   Memory:
    31x Micron 36JSF2G72PZ-1G9E1 16 GB 1600 MHz 2 rank
    16x Not Specified Not Specified
    1x Samsung M393B2G70QH0-CMA 16 GB 1600 MHz 2 rank

 (End of data from sysinfo program)
```

General Notes

```
 Environment variables set by runspec before the start of the run:
 LD_LIBRARY_PATH = "/cpu2006.1.2/libs/32:/cpu2006.1.2/libs/64:/cpu2006.1.2/sh"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RedHat EL 6.4
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
 Filesystem page cache cleared with:
 echo 1>       /proc/sys/vm/drop_caches
 runspec command invoked through numactl i.e.:
```

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General Notes (Continued)

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

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
```

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Peak Compiler Invocation (Continued)

        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: `-xSSE4.2 -ipo -O3 -no-prec-div`

        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`

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Peak Optimization Flags (Continued)

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-linux64.20140128.html
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-C.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-C.xml

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

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