SPEC® CINT2006 Result

Lenovo Group Limited

SPECint®_rate2006 = 1050

Lenovo System x3650 M5
(2.20 GHz, Intel Xeon E5-2650 v4)

SPECint_rate_base2006 = 1000
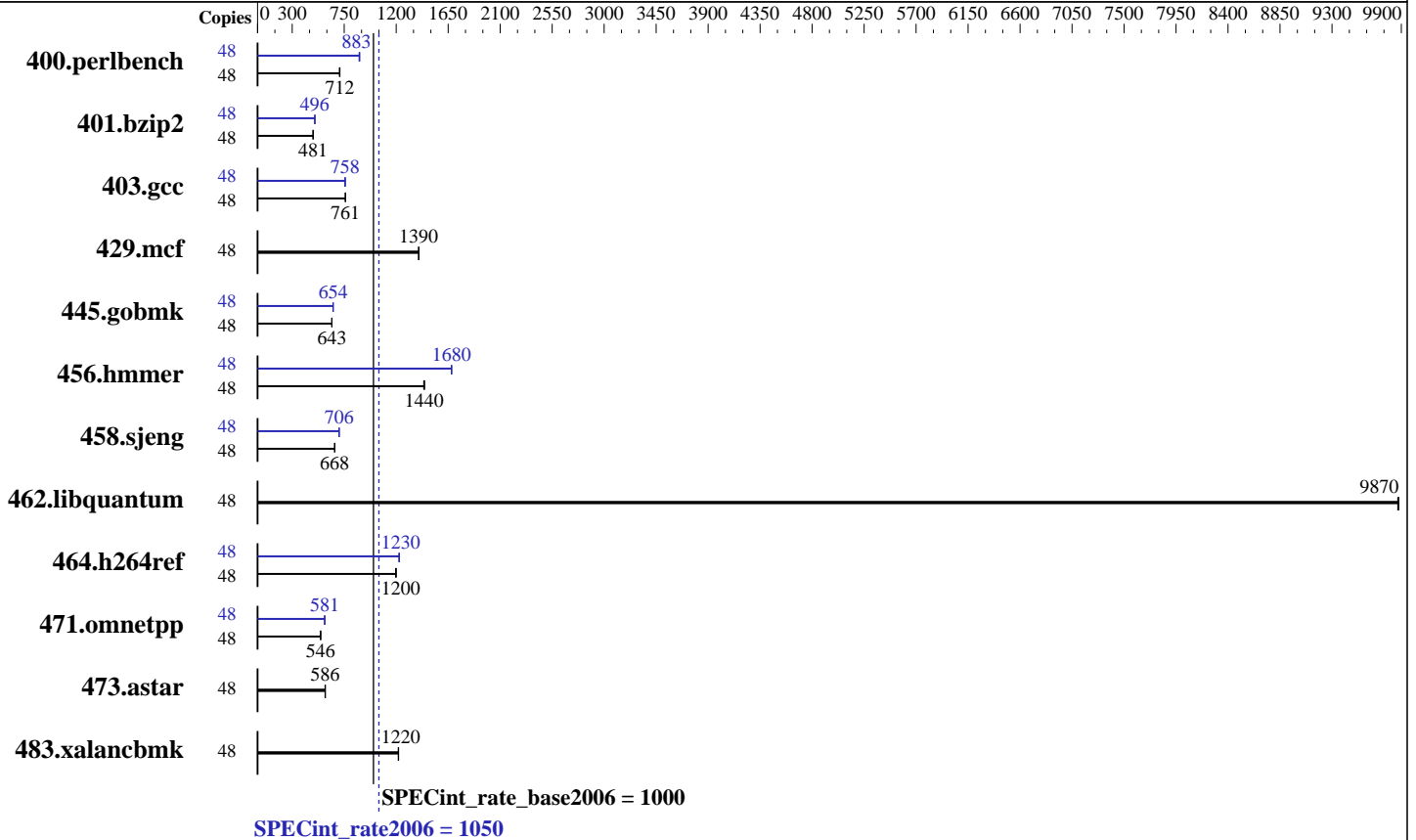
CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

Test date: May-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

Benchmark	Copies	Base	Peak
400.perlbench	48	712	883
401.bzip2	48	481	496
403.gcc	48	761	758
429.mcf	48	1390	
445.gobmk	48	643	654
456.hmmer	48	1440	1680
458.sjeng	48	668	706
462.libquantum	48	9870	
464.h264ref	48	1200	1230
471.omnetpp	48	546	581
473.astar	48	586	
483.xalancbmk	48	1220	

SPECint_rate_base2006 = 1000
SPECint_rate2006 = 1050

Hardware

CPU Name: Intel Xeon E5-2650 v4
CPU Characteristics: Intel Turbo Boost Technology up to 2.90 GHz
CPU MHz: 2200
FPU: Integrated
CPU(s) enabled: 24 cores, 2 chips, 12 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: 30 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 800 GB SATA SSD
Other Hardware: None

Software

Operating System: SUSE Linux Enterprise Server 12 SP1 (x86_64)
Kernel 3.12.49-11-default
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

Lenovo Group Limited

Lenovo System x3650 M5
(2.20 GHz, Intel Xeon E5-2650 v4)

SPECint_rate2006 =   1050

SPECint_rate_base2006 = 1000

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

Test date: May-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

Results Table

Benchmark	Copies	Base Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Peak Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	48	**659**	**712**	662	708	658	713	48	531	884	**531**	**883**	534	879
401.bzip2	48	963	481	**963**	**481**	964	481	48	935	495	933	497	**934**	**496**
403.gcc	48	509	759	507	762	**508**	**761**	48	**510**	**758**	511	757	508	760
429.mcf	48	314	1390	**314**	**1390**	313	1400	48	314	1390	**314**	**1390**	313	1400
445.gobmk	48	783	643	783	643	**783**	**643**	48	770	654	770	654	**770**	**654**
456.hmmer	48	311	1440	**310**	**1440**	310	1450	48	267	1680	**267**	**1680**	267	1680
458.sjeng	48	**870**	**668**	870	668	870	667	48	822	706	823	706	**823**	**706**
462.libquantum	48	**101**	**9870**	101	9870	101	9880	48	**101**	**9870**	101	9870	101	9880
464.h264ref	48	885	1200	889	1190	**886**	**1200**	48	**866**	**1230**	865	1230	868	1220
471.omnetpp	48	549	546	549	546	**549**	**546**	48	515	582	517	580	**516**	**581**
473.astar	48	577	584	574	587	**575**	**586**	48	577	584	574	587	**575**	**586**
483.xalancbmk	48	271	1220	272	1220	**272**	**1220**	48	271	1220	272	1220	**272**	**1220**

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

Platform Notes

BIOS Configuration:
 Operating Mode set to "Maximum Performance"
 COD Preference set to Enable
Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on XinYi-02 Wed May 11 23:10:29 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 E5-2650 v4@ 2.20GHz

Lenovo Group Limited

SPECint_rate2006 =   1050

Lenovo System x3650 M5
(2.20 GHz, Intel Xeon E5-2650 v4)

SPECint_rate_base2006 = 1000

CPU2006 license: 9017

Test sponsor: Lenovo Group Limited

Tested by: Lenovo Group Limited

Test date: May-2016

Hardware Availability: Mar-2016

Software Availability: Dec-2015

Platform Notes (Continued)

```
      2 "physical id"s (chips)
      48 "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 : 12
      siblings  : 24
      physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
      physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
   cache size : 15360 KB

From /proc/meminfo
   MemTotal:       263957076 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 12 (x86_64)
      VERSION = 12
      PATCHLEVEL = 1
      # This file is deprecated and will be removed in a future service pack or
      release.
      # Please check /etc/os-release for details about this release.
   os-release:
      NAME="SLES"
      VERSION="12-SP1"
      VERSION_ID="12.1"
      PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
      ID="sles"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:12:sp1"

uname -a:
   Linux XinYi-02 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
   (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 11 23:09

SPEC is set to: /home/cpu2006-1.2-ic16.0
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda4       xfs   688G  7.6G  681G   2% /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 LENOVO -[TCE124I-2.10]- 04/27/2016
   Memory:
   16x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz
```

SPEC CINT2006 Result

Lenovo Group Limited

Lenovo System x3650 M5
(2.20 GHz, Intel Xeon E5-2650 v4)

SPECint_rate2006 =   1050

SPECint_rate_base2006 = 1000

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

Test date: May-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

Platform Notes (Continued)

```
    8x NO DIMM Unknown

  (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2006-1.2-ic16.0/libs/32:/home/cpu2006-1.2-ic16.0/libs/64:/home/cpu2006-1.2-ic16.0/sh"

 Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB
 memory using RedHat EL 7.1
 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>
```

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
```

SPEC CINT2006 Result

Lenovo Group Limited

Lenovo System x3650 M5
(2.20 GHz, Intel Xeon E5-2650 v4)

SPECint_rate2006 =   1050

SPECint_rate_base2006 = 1000

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

Test date: May-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

Base Optimization Flags (Continued)

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
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
```

SPEC CINT2006 Result

Lenovo Group Limited

Lenovo System x3650 M5
(2.20 GHz, Intel Xeon E5-2650 v4)

SPECint_rate2006 =   1050

SPECint_rate_base2006 = 1000

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

Test date: May-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

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: -xCORE-AVX2 -ipo -O3 -no-prec-div

         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

   483.xalancbmk: basepeak = yes
```

SPEC CINT2006 Result
Copyright 2006-2016 Standard Performance Evaluation Corporation

Lenovo Group Limited

Lenovo System x3650 M5
(2.20 GHz, Intel Xeon E5-2650 v4)

SPECint_rate2006 =   1050

SPECint_rate_base2006 = 1000

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

Test date: May-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

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/Lenovo-Platform-Settings-V1.2-BDW-revC.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/Lenovo-Platform-Settings-V1.2-BDW-revC.xml

---

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 Wed Jun 1 19:11:44 2016 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 1 June 2016.