SPEC® CINT2006 Result

Lenovo Group Limited

SPECint®2006 = 53.6

Lenovo NeXtScale nx360 M5
(1.70 GHz, Intel Xeon E5-2650L v4)

SPECint_base2006 = 51.8
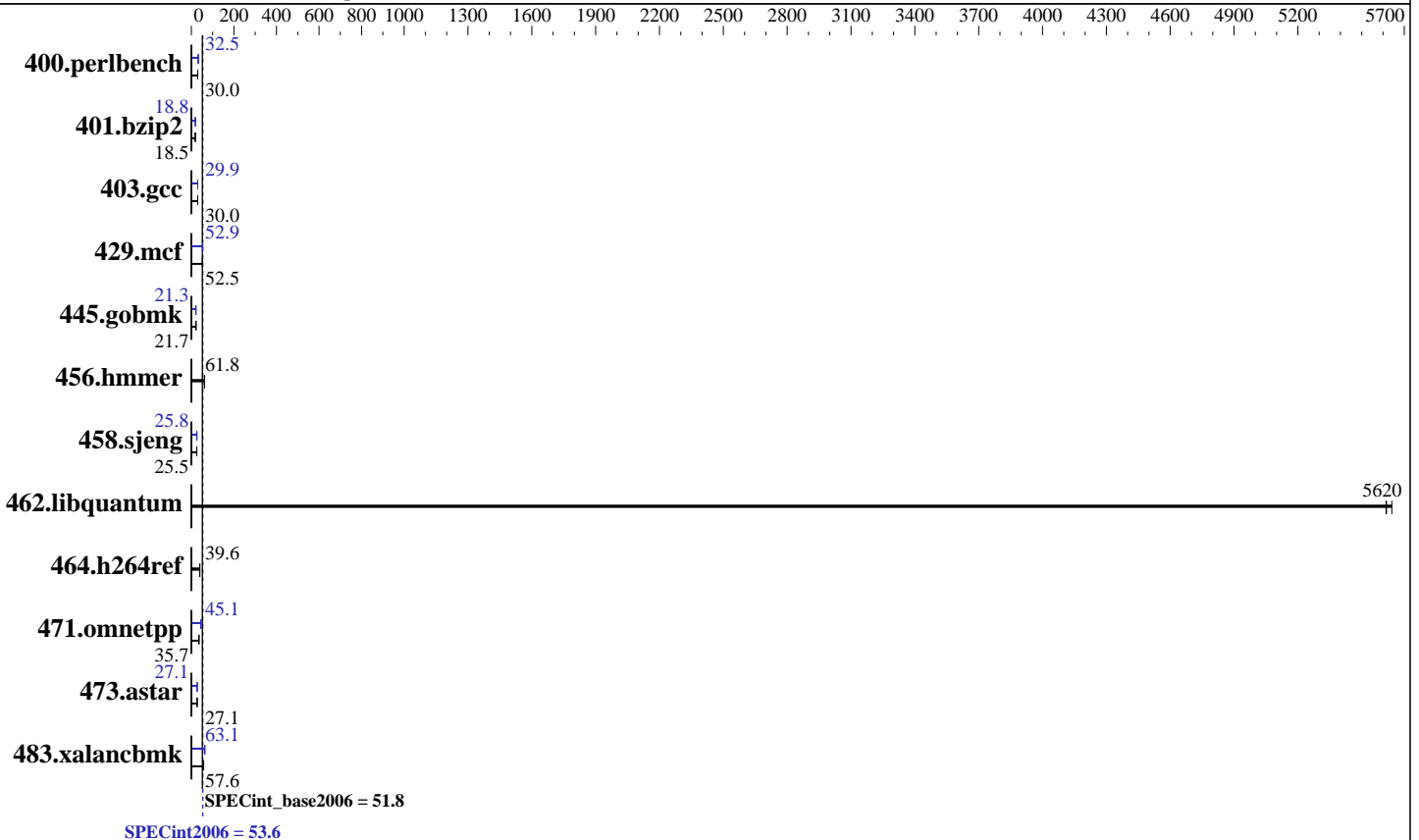
CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

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

Benchmark	Result
400.perlbench	32.5 / 30.0
401.bzip2	18.8 / 18.5
403.gcc	29.9 / 30.0
429.mcf	52.9 / 52.5
445.gobmk	21.3 / 21.7
456.hmmer	61.8
458.sjeng	25.8 / 25.5
462.libquantum	5620
464.h264ref	39.6
471.omnetpp	45.1 / 35.7
473.astar	27.1 / 27.1
483.xalancbmk	63.1 / 57.6

SPECint_base2006 = 51.8
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Hardware

CPU Name:	Intel Xeon E5-2650L v4
CPU Characteristics:	Intel Turbo Boost Technology up to 2.50 GHz
CPU MHz:	1700
FPU:	Integrated
CPU(s) enabled:	28 cores, 2 chips, 14 cores/chip
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:	35 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:	Yes
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	Microquill SmartHeap V10.2

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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	**326**	**30.0**	326	30.0	327	29.9	**300**	**32.5**	300	32.6	301	32.5
401.bzip2	526	18.4	**522**	**18.5**	522	18.5	514	18.8	514	18.8	**514**	**18.8**
403.gcc	268	30.0	**268**	**30.0**	268	30.0	**269**	**29.9**	269	29.9	269	30.0
429.mcf	173	52.7	175	52.1	**174**	**52.5**	**172**	**52.9**	171	53.5	173	52.6
445.gobmk	484	21.7	**484**	**21.7**	484	21.7	492	21.3	**492**	**21.3**	492	21.3
456.hmmer	151	61.7	**151**	**61.8**	151	61.8	151	61.7	**151**	**61.8**	151	61.8
458.sjeng	475	25.5	475	25.5	**475**	**25.5**	470	25.8	469	25.8	**469**	**25.8**
462.libquantum	**3.69**	**5620**	3.69	5610	3.67	5640	**3.69**	**5620**	3.69	5610	3.67	5640
464.h264ref	560	39.5	**559**	**39.6**	559	39.6	560	39.5	**559**	**39.6**	559	39.6
471.omnetpp	175	35.8	176	35.5	**175**	**35.7**	139	45.0	138	45.2	**138**	**45.1**
473.astar	**259**	**27.1**	258	27.2	260	27.0	**259**	**27.1**	259	27.1	258	27.2
483.xalancbmk	121	57.1	**120**	**57.6**	119	57.8	109	63.1	**109**	**63.1**	110	63.0

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

Submit Notes

The config file option 'submit' was used.

Operating System Notes

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

Platform Notes

```
    BIOS Configuration:
     Operating Mode set to "Maximum Performance"
     Intel Hyperthreading set to Disabled
     COD Preference set to Disable
     Early Snoop Preference set to Disable
    Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914
    $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
    running on NX360 Fri May 27 13:04:48 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 E5-2650L v4@ 1.70GHz
          2 "physical id"s (chips)
          28 "processors"
       cores, siblings (Caution: counting these is hw and system dependent.  The
       following excerpts from /proc/cpuinfo might not be reliable.  Use with
```

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Platform Notes (Continued)

```
      caution.)
         cpu cores : 14
         siblings  : 14
         physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
         physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
      cache size : 35840 KB

   From /proc/meminfo
      MemTotal:       263966448 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 NX360 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 27 11:44

   SPEC is set to: /home/cpu2006-1.2-ic16.0
      Filesystem      Type  Size  Used Avail Use% Mounted on
      /dev/sda4       xfs   690G  7.5G  683G   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 -[THE124GUS-2.10]- 04/28/2016
      Memory:
      16x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz

   (End of data from sysinfo program)
```

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General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
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"
OMP_NUM_THREADS = "28"

 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
```

Base Compiler Invocation

C benchmarks:
        icc -m64

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:
        -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32

C++ benchmarks:
        -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
        -Wl,-z,muldefs -L/sh -lsmartheap64

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Base Other Flags

C benchmarks:

> 403.gcc: `-Dalloca=_alloca`

Peak Compiler Invocation

C benchmarks (except as noted below):
    `icc -m64`

  400.perlbench: `icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

    445.gobmk: `icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

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

    473.astar: `icpc -m64`

Peak Portability Flags

  400.perlbench: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32`
      401.bzip2: `-DSPEC_CPU_LP64`
        403.gcc: `-DSPEC_CPU_LP64`
        429.mcf: `-DSPEC_CPU_LP64`
     445.gobmk: `-D_FILE_OFFSET_BITS=64`
    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: `-D_FILE_OFFSET_BITS=64`
       473.astar: `-DSPEC_CPU_LP64`
  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) -opt-prefetch`
            `-ansi-alias`

     401.bzip2: `-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)`
            `-ipo(pass 2) -O3(pass 2) -no-prec-div`
            `-par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32`

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Peak Optimization Flags (Continued)

401.bzip2 (continued):
```
-opt-prefetch -ansi-alias
```

403.gcc: `-xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc`
`-opt-malloc-options=3 -auto-ilp32`

429.mcf: `-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel`
`-opt-prefetch -auto-p32`

445.gobmk: `-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)`
`-prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias`

456.hmmer: `basepeak = yes`

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`

462.libquantum: `basepeak = yes`

464.h264ref: `basepeak = yes`

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

473.astar: `-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch`
`-auto-p32 -Wl,-z,muldefs -L/sh -lsmartheap64`

483.xalancbmk: `-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch`
`-ansi-alias -Wl,-z,muldefs -L/sh -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-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-BDW-B.html

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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-Flags-V1.2-BDW-B.xml

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