SPEC® CINT2006 Result

Lenovo Global Technology

SPECint®2006 = 72.4

Lenovo ThinkServer RS160
(3.30 GHz, Intel Xeon E3-1225 v6)

SPECint_base2006 = 70.0
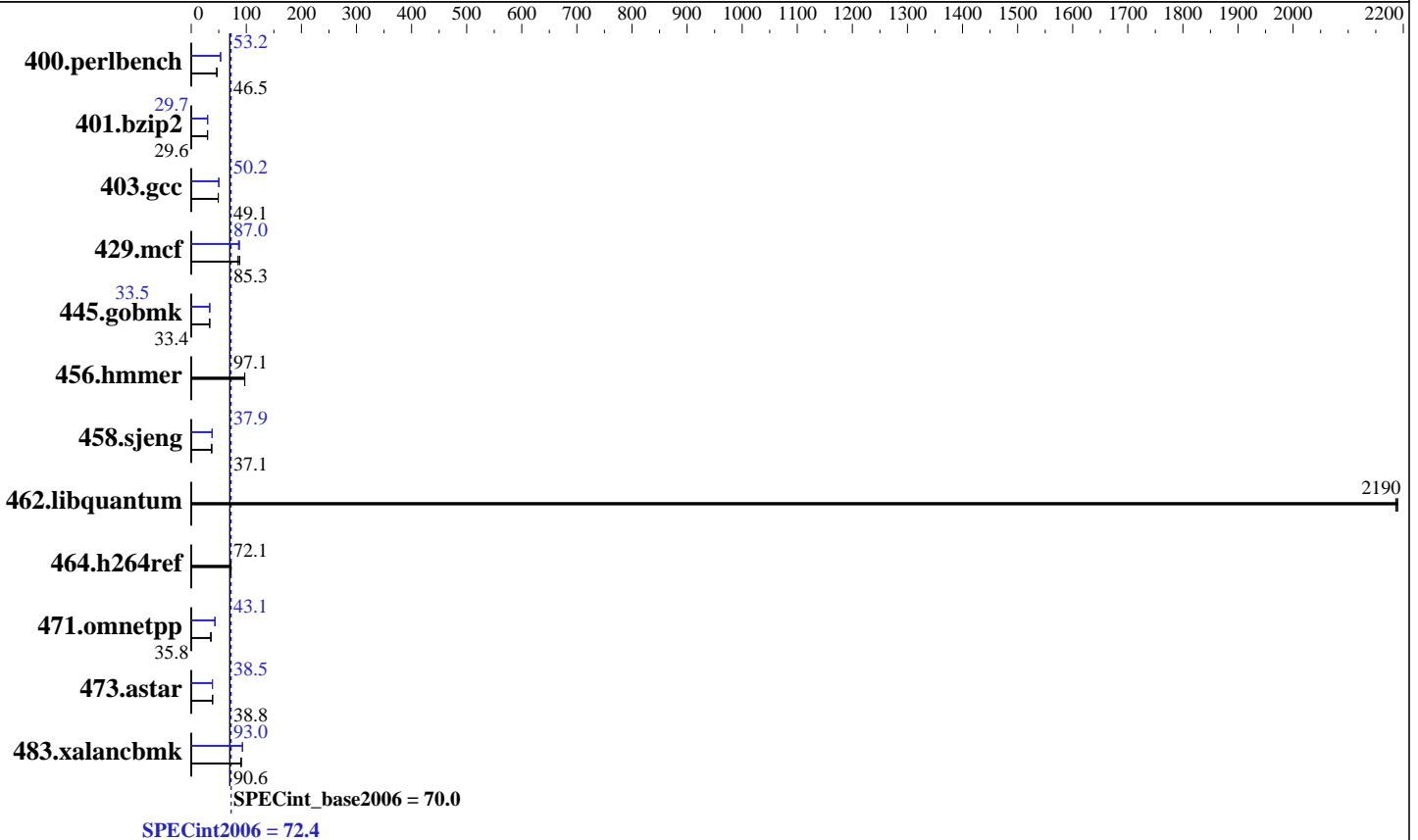
CPU2006 license: 9017
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test date: Jul-2017
Hardware Availability: Jun-2017
Software Availability: Apr-2017

Benchmark results:

Benchmark	Peak	Base
400.perlbench	53.2	46.5
401.bzip2	29.7	29.6
403.gcc	50.2	49.1
429.mcf	87.0	85.3
445.gobmk	33.5	33.4
456.hmmer		97.1
458.sjeng	37.9	37.1
462.libquantum		2190
464.h264ref		72.1
471.omnetpp	43.1	35.8
473.astar	38.5	38.8
483.xalancbmk	93.0	90.6

SPECint_base2006 = 70.0
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Hardware

CPU Name: Intel Xeon E3-1225 v6
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 3300
FPU: Integrated
CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip
CPU(s) orderable: 1 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: 8 MB I+D on chip per chip
Other Cache: None
Memory: 32 GB (2 x 16 GB 2Rx8 PC4-2400T-E)
Disk Subsystem: 1 x 960 GB SATA SSD
Other Hardware: None

Software

Operating System: Red Hat Enterprise Linux Server release 7.3 (Maipo)
Kernel 3.10.0-514.el7.x86_64
Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler 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	210	46.5	209	46.7	**210**	**46.5**	183	53.3	184	53.2	**184**	**53.2**
401.bzip2	326	29.6	**326**	**29.6**	327	29.5	325	29.7	325	29.7	**325**	**29.7**
403.gcc	164	49.1	**164**	**49.1**	164	49.0	161	50.0	160	50.3	**160**	**50.2**
429.mcf	**107**	**85.3**	103	88.2	107	85.0	106	85.7	**105**	**87.0**	104	87.5
445.gobmk	**314**	**33.4**	314	33.4	313	33.5	**313**	**33.5**	313	33.5	313	33.5
456.hmmer	**96.1**	**97.1**	96.1	97.0	96.0	97.2	**96.1**	**97.1**	96.1	97.0	96.0	97.2
458.sjeng	326	37.1	326	37.1	**326**	**37.1**	319	37.9	319	37.9	**319**	**37.9**
462.libquantum	9.48	2190	**9.47**	**2190**	9.46	2190	9.48	2190	**9.47**	**2190**	9.46	2190
464.h264ref	**307**	**72.1**	307	72.0	306	72.3	**307**	**72.1**	307	72.0	306	72.3
471.omnetpp	**175**	**35.8**	175	35.8	176	35.5	146	43.0	145	43.2	**145**	**43.1**
473.astar	181	38.8	**181**	**38.8**	183	38.5	183	38.3	182	38.6	**182**	**38.5**
483.xalancbmk	75.8	91.0	**76.2**	**90.6**	76.6	90.1	74.0	93.3	**74.2**	**93.0**	74.3	92.9

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:
     Boot performance mode set to Turbo Performance
     CPU C3 State Support set to Disabled
    Sysinfo program /home/cpu2006-1.2-ic17.0u3/config/sysinfo.rev6993
    Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
    running on rs160 Sat Jul 22 07:50:22 2017

    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 E3-1225 v6 @ 3.30GHz
          1 "physical id"s (chips)
          4 "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 : 4
```

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Platform Notes (Continued)

```
        siblings  : 4
        physical 0: cores 0 1 2 3
     cache size : 8192 KB

  From /proc/meminfo
     MemTotal:      32890216 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

  From /etc/*release* /etc/*version*
     os-release:
        NAME="Red Hat Enterprise Linux Server"
        VERSION="7.3 (Maipo)"
        ID="rhel"
        ID_LIKE="fedora"
        VERSION_ID="7.3"
        PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
        ANSI_COLOR="0;31"
        CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
     redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
     system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
     system-release-cpe: cpe:/o:redhat:enterprise_linux:7.3:ga:server

  uname -a:
     Linux rs160 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016 x86_64
     x86_64 x86_64 GNU/Linux

  run-level 3 Jul 21 23:17

  SPEC is set to: /home/cpu2006-1.2-ic17.0u3
     Filesystem     Type  Size  Used Avail Use% Mounted on
     /dev/sda4      xfs   838G   12G  827G   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 American Megatrends Inc. VB1TS223 03/16/2017
   Memory:
   2x Micron 18ASF2G72AZ-2G3B1 16 GB 2 rank 2400 MHz
   2x Not Specified Not Specified

  (End of data from sysinfo program)
```

General Notes

```
  Environment variables set by runspec before the start of the run:
  KMP_AFFINITY = "granularity=fine,compact,0,3"
  LD_LIBRARY_PATH = "/home/cpu2006-1.2-ic17.0u3/lib/ia32:/home/cpu2006-1.2-ic17.0u3/lib/intel64:/home/cpu2006-1.2-ic17.0u3/sh10.2"
```

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General Notes (Continued)

```
OMP_NUM_THREADS = "4"

 Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
 memory using Redhat Enterprise Linux 7.2
 Transparent Huge Pages enabled by default.
 Filesystem page cache cleared with:
 shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
```

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 -qopt-prefetch
    -auto-p32
```

C++ benchmarks:
```
    -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
    -Wl,-z,muldefs -L/sh10.2 -lsmartheap64
```

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Test sponsor: Lenovo Global Technology		**Hardware Availability:**	Jun-2017
Tested by: Lenovo Global Technology		**Software Availability:**	Apr-2017

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_2017/linux/lib/ia32`

     445.gobmk: `icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32`

C++ benchmarks (except as noted below):
    `icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32`

      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: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)`
             `-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)`
             `-no-prec-div(pass 2) -qopt-prefetch`

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

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Peak Optimization Flags (Continued)

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

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

445.gobmk: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)`
`-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)`
`-no-prec-div(pass 2)`

456.hmmer: `basepeak = yes`

458.sjeng: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)`
`-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)`
`-no-prec-div(pass 2) -unroll4`

462.libquantum: `basepeak = yes`

464.h264ref: `basepeak = yes`

C++ benchmarks:

471.omnetpp: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)`
`-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)`
`-no-prec-div(pass 2) -qopt-ra-region-strategy=block`
`-Wl,-z,muldefs -L/sh10.2 -lsmartheap`

473.astar: `-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch`
`-auto-p32 -Wl,-z,muldefs -L/sh10.2 -lsmartheap64`

483.xalancbmk: `-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch`
`-Wl,-z,muldefs -L/sh10.2 -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-ic17.0-official-linux64-revF.html
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-KBL-revC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-KBL-revC.xml

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

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