SPEC® CINT2006 Result
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Lenovo Group Limited

Lenovo ThinkServer RD640 (Intel Xeon E5-2630 v2, 2.60 GHz)

SPECint®2006 = 49.9

SPECint_base2006 = 48.0

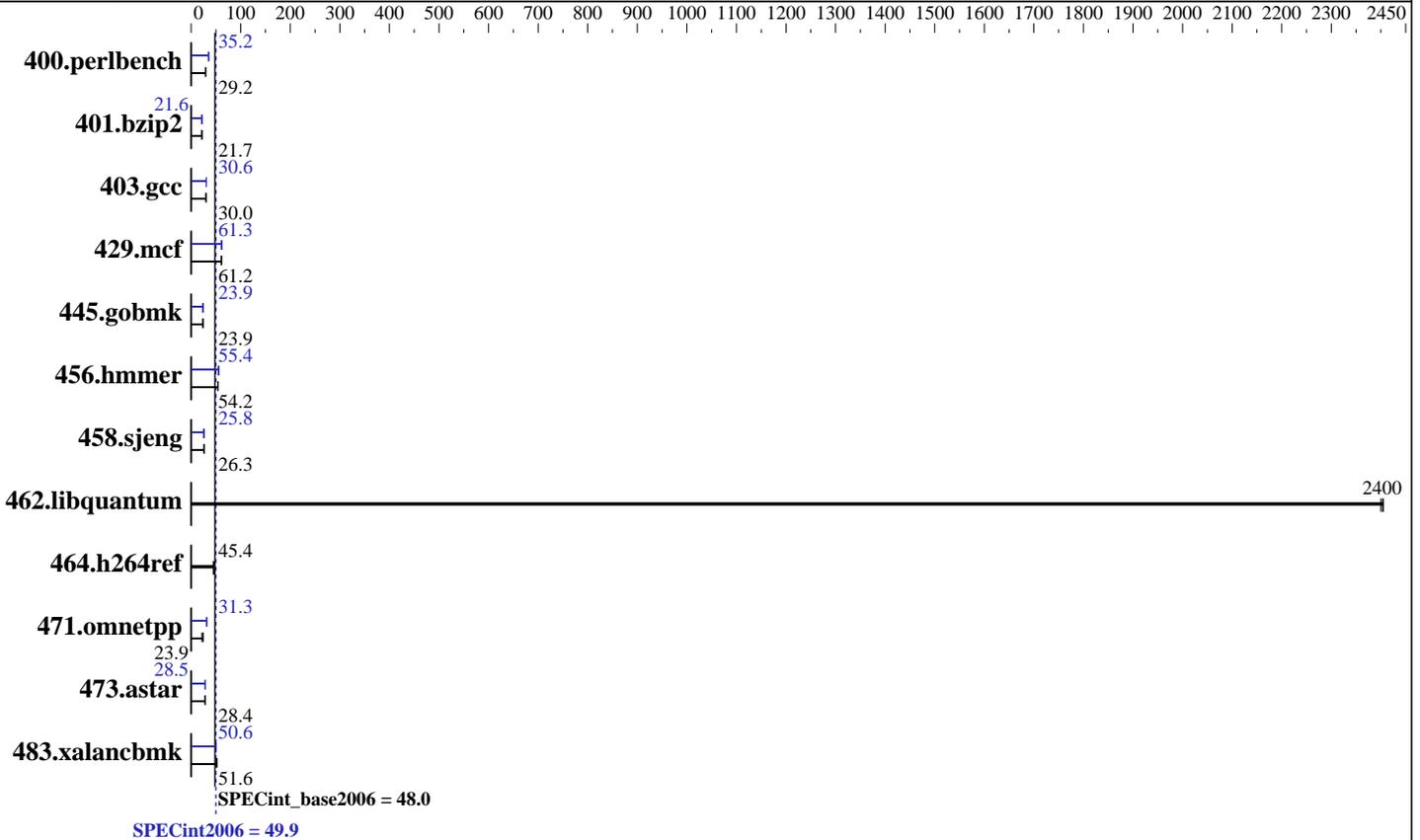|	
CPU2006 license: 9017	**Test date:** Jan-2015
Test sponsor: Lenovo Group Limited	**Hardware Availability:** Sep-2013
Tested by: Lenovo Group Limited	**Software Availability:** Sep-2014

Benchmark results (scale 0 to 2450):

- 400.perlbench: 35.2 / 29.2
- 401.bzip2: 21.6 / 21.7
- 403.gcc: 30.6 / 30.0
- 429.mcf: 61.3 / 61.2
- 445.gobmk: 23.9 / 23.9
- 456.hmmer: 55.4 / 54.2
- 458.sjeng: 25.8 / 26.3
- 462.libquantum: 2400
- 464.h264ref: 45.4
- 471.omnetpp: 31.3 / 23.9
- 473.astar: 28.5 / 28.4
- 483.xalancbmk: 50.6 / 51.6

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Hardware

CPU Name:	Intel Xeon E5-2630 v2
CPU Characteristics:	Intel Turbo Boost Technology up to 3.10 GHz
CPU MHz:	2600
FPU:	Integrated
CPU(s) enabled:	12 cores, 2 chips, 6 cores/chip
CPU(s) orderable:	1,2 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:	15 MB I+D on chip per chip
Other Cache:	None
Memory:	256 GB (16 x 16 GB 2Rx4 PC3-14900R-13, ECC, running at 1600 MHz and CL11)
Disk Subsystem:	1 x 240 SATA SSD
Other Hardware:	None

Software

Operating System:	Red Hat Enterprise Linux Server release 7.0 (Maipo) 3.10.0-123.el7.x86_64
Compiler:	C/C++: Version 15.0.0.090 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 V10.0

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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	335	29.2	335	29.1	**335**	**29.2**	277	35.3	277	35.2	**277**	**35.2**
401.bzip2	445	21.7	444	21.7	**445**	**21.7**	**446**	**21.6**	446	21.6	446	21.6
403.gcc	**268**	**30.0**	268	30.0	266	30.2	263	30.6	264	30.5	**263**	**30.6**
429.mcf	**149**	**61.2**	151	60.4	149	61.3	149	61.2	148	61.7	**149**	**61.3**
445.gobmk	**440**	**23.9**	440	23.9	440	23.8	438	23.9	**439**	**23.9**	439	23.9
456.hmmer	172	54.3	**172**	**54.2**	172	54.2	169	55.4	**168**	**55.4**	168	55.4
458.sjeng	461	26.3	461	26.2	**461**	**26.3**	470	25.8	469	25.8	**470**	**25.8**
462.libquantum	8.62	2400	8.63	2400	**8.62**	**2400**	8.62	2400	8.63	2400	**8.62**	**2400**
464.h264ref	**487**	**45.4**	487	45.4	488	45.4	**487**	**45.4**	487	45.4	488	45.4
471.omnetpp	262	23.9	**262**	**23.9**	288	21.7	**200**	**31.3**	200	31.3	200	31.2
473.astar	246	28.6	**247**	**28.4**	251	28.0	**247**	**28.5**	246	28.5	248	28.3
483.xalancbmk	133	51.7	**134**	**51.6**	135	51.2	136	50.7	137	50.5	**136**	**50.6**

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
    Hyper-Threading set to Disabled
    C1E Support set to Disabled
     Sysinfo program /usr/cpu2006/config/sysinfo.rev6914
     $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
     running on RD640 Mon Jan 19 09:16:06 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 E5-2630 v2 @ 2.60GHz
           2 "physical id"s (chips)
           12 "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 : 6
```

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Platform Notes (Continued)

```
      siblings  : 6
      physical 0: cores 0 1 2 3 4 5
      physical 1: cores 0 1 2 3 4 5
    cache size : 15360 KB

 From /proc/meminfo
    MemTotal:       263942476 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 From /etc/*release* /etc/*version*
    os-release:
       NAME="Red Hat Enterprise Linux Server"
       VERSION="7.0 (Maipo)"
       ID="rhel"
       ID_LIKE="fedora"
       VERSION_ID="7.0"
       PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
       ANSI_COLOR="0;31"
       CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
    redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
    system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

 uname -a:
    Linux RD640 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57 EDT 2014 x86_64
    x86_64 x86_64 GNU/Linux

 run-level 3 Jan 19 00:35

 SPEC is set to: /usr/cpu2006
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda2      xfs   219G   12G  208G   6% /
 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 A1TS8AA 10/15/2014
  Memory:
  1x DimmA3_Manufacturer DimmA3_PartNumA3
  1x DimmB3_Manufacturer DimmB3_PartNumB3
  1x DimmC3_Manufacturer DimmC3_PartNumC3
  1x DimmD3_Manufacturer DimmD3_PartNumD3
  16x Samsung M393B2G70QH0-CMA 16 GB 2 rank 1600 MHz

 (End of data from sysinfo program)
 RD640 support 4 channels and 12 DIMMs for processor0, 4 channels and 8 DIMMs for processor1,
 total 8 channels and 20 DIMMs. 16 DIMM slots installed with 16 GB DIMM for this run.
```

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General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/usr/cpu2006/libs/32:/usr/cpu2006/libs/64:/usr/cpu2006/sh"
OMP_NUM_THREADS = "12"

 Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB
 memory using RedHat EL 7.0
 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:
    -xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32

C++ benchmarks:
    -xAVX -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/composer_xe_2015/lib/ia32

   445.gobmk: icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

C++ benchmarks (except as noted below):
    icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

   473.astar: icpc -m64

Peak Portability Flags

    400.perlbench: -DSPEC_CPU_LINUX_IA32
    401.bzip2: -DSPEC_CPU_LP64
    403.gcc: -DSPEC_CPU_LP64
    429.mcf: -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
    473.astar: -DSPEC_CPU_LP64
    483.xalancbmk: -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

   400.perlbench: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
                  -no-prec-div(pass 2) -prof-use(pass 2) -opt-prefetch
                  -ansi-alias

   401.bzip2: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
              -no-prec-div -prof-use(pass 2) -auto-ilp32 -opt-prefetch
              -ansi-alias

Continued on next page

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Peak Optimization Flags (Continued)

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

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

445.gobmk: `-xAVX(pass 2) -prof-gen(pass 1) -prof-use(pass 2) -ansi-alias`

456.hmmer: `-xAVX -ipo -O3 -no-prec-div -unroll2 -auto-ilp32 -ansi-alias`

458.sjeng: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4`

462.libquantum: `basepeak = yes`

464.h264ref: `basepeak = yes`

C++ benchmarks:

471.omnetpp: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -opt-ra-region-strategy=block            -ansi-alias -Wl,-z,muldefs -L/sh -lsmartheap`

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

483.xalancbmk: `-xAVX -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-ic15.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-RD640-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-RD640-revA.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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