SPEC® CINT2006 Result

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Lenovo Group Limited

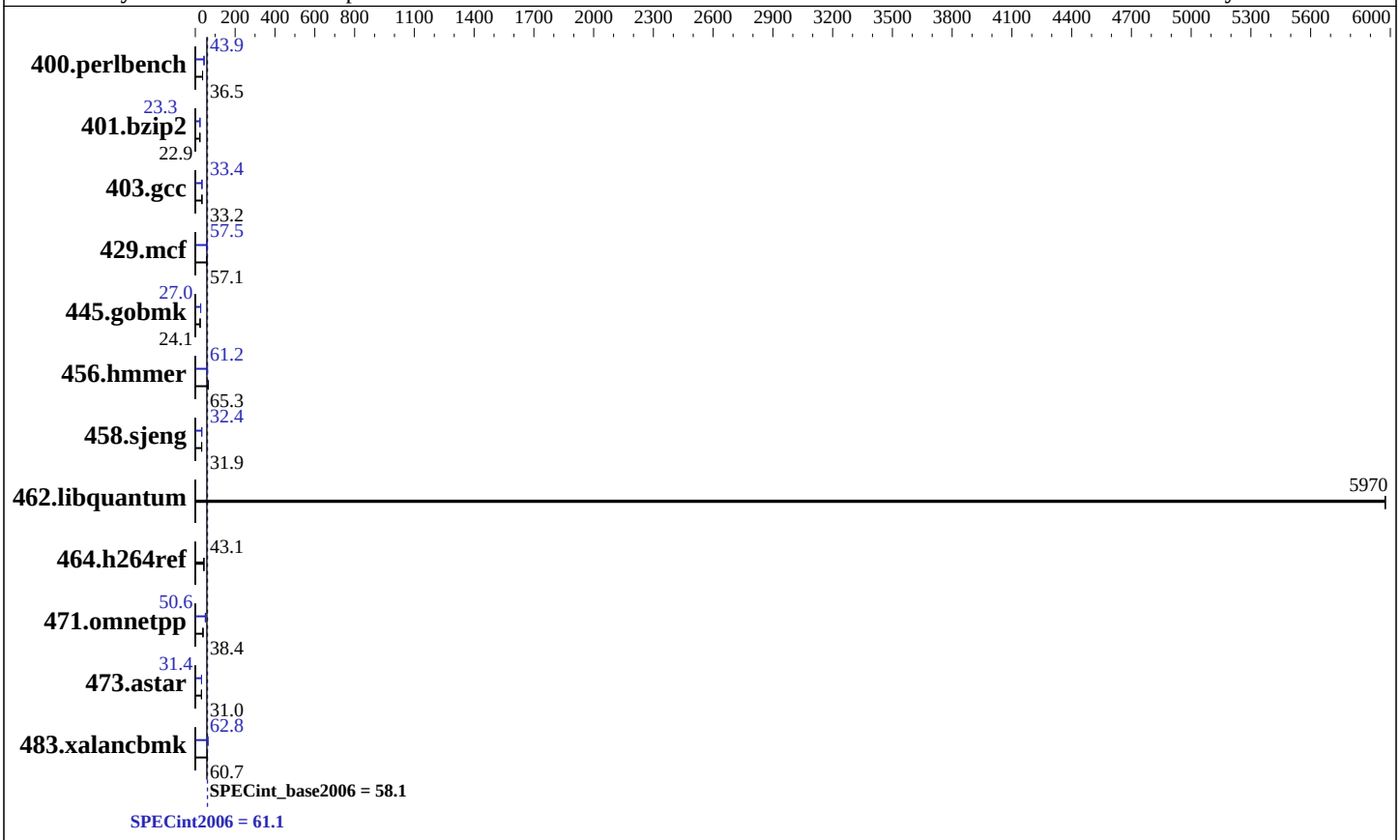
Lenovo ThinkServer RD550 (Intel Xeon E5-2695 v3, 2.30 GHz)

SPECint®2006 = 61.1

SPECint_base2006 = 58.1

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

Test date: Oct-2014
Hardware Availability: Sep-2014
Software Availability: Jan-2014



Hardware

CPU Name:	Intel Xeon E5-2695 v3
CPU Characteristics:	Intel Turbo Boost Technology up to 3.30 GHz
CPU MHz:	2300
FPU:	Integrated
CPU(s) enabled:	28 cores, 2 chips, 14 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:	35 MB I+D on chip per chip
Other Cache:	None
Memory:	256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)
Disk Subsystem:	1 x 800 GB SATA SSD
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:	Yes
File System:	ext4
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	267	36.6	268	36.5	**267**	**36.5**	223	43.9	223	43.8	**223**	**43.9**
401.bzip2	421	22.9	422	22.9	**422**	**22.9**	413	23.4	415	23.2	**415**	**23.3**
403.gcc	242	33.3	**242**	**33.2**	243	33.2	**241**	**33.4**	241	33.4	242	33.3
429.mcf	**160**	**57.1**	160	57.1	159	57.4	158	57.6	160	57.1	**159**	**57.5**
445.gobmk	**436**	**24.1**	436	24.1	436	24.1	388	27.0	389	26.9	**388**	**27.0**
456.hmmer	148	63.3	142	65.5	**143**	**65.3**	**153**	**61.2**	154	60.6	152	61.3
458.sjeng	380	31.9	379	31.9	**380**	**31.9**	374	32.4	374	32.4	**374**	**32.4**
462.libquantum	3.47	5970	**3.47**	**5970**	3.47	5980	3.47	5970	**3.47**	**5970**	3.47	5980
464.h264ref	514	43.0	**514**	**43.1**	514	43.1	514	43.0	**514**	**43.1**	514	43.1
471.omnetpp	161	38.8	163	38.4	**163**	**38.4**	**123**	**50.6**	121	51.5	124	50.2
473.astar	**227**	**31.0**	227	31.0	226	31.1	225	31.1	223	31.4	**224**	**31.4**
483.xalancbmk	**114**	**60.7**	114	60.3	114	60.8	**110**	**62.8**	110	62.8	109	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:
Hyper-Threading set to Disabled
Performance Profile set to Custom
C1E Support set to Disabled
Core C3 set to Disabled
Core C6 set to Disabled
Thermal Profile set to High Fan Speed
Memory Power Savings set to Disabled
 Sysinfo program /usr/cpu2006/config/sysinfo.rev6818
 $Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
 running on RD550 Fri Oct 24 17:10:40 2014

 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 E5-2695 v3 @ 2.30GHz
       2 "physical id"s (chips)
```

Continued on next page

Platform Notes (Continued)

```
      28 "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 : 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:       264414260 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 RD550 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 Oct 24 17:10

SPEC is set to: /usr/cpu2006
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda2      ext4  730G  113G  581G  17% /

Additional information from dmidecode:
  BIOS LENOVO PB1TS110 10/06/2014
  Memory:
   16x   16 GB
   8x NO DIMM NO DIMM
   16x Samsung M393A2G40DB0-CPB 16 GB 2133 MHz 2 rank

(End of data from sysinfo program)
RD550 support 4 channels and 12 DIMMs per processor, total 8 channels and
24 DIMMs. 16 DIMM slots installed with 16 GB DIMM for this run.
```

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 = "28"
```

Continued on next page

General Notes (Continued)

```
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
runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>
```

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
```

Base Other Flags

C benchmarks:

Continued on next page

Base Other Flags (Continued)

403.gcc: `-Dalloca=_alloca`

Peak Compiler Invocation

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

400.perlbench: `icc -m32`

445.gobmk: `icc -m32`

C++ benchmarks (except as noted below):
`icpc -m32`

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: `-xCORE-AVX2`(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: `-xCORE-AVX2`(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`

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

Continued on next page

Peak Optimization Flags (Continued)

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

445.gobmk: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -prof-use(pass 2) -ansi-alias

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32 -ansi-alias

458.sjeng: -xCORE-AVX2(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: -xCORE-AVX2(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: -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-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-RD550-revA.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/Lenovo-Platform-Settings-V1.2-RD550-revA.xml

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