SPEC® CINT2006 Result
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Lenovo Group Limited

Lenovo ThinkServer TD340 (Intel Xeon E5-2470 v2, 2.40 GHz)

SPECint®2006 = 54.6

SPECint_base2006 = 50.9

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


```
400.perlbench    36.1
                 30.3
401.bzip2        22.1
                 21.8
403.gcc          32.4
                 31.6
429.mcf          63.2
445.gobmk        25.2
                 22.4
456.hmmer        53.2
                 55.1
458.sjeng        27.5
                 26.8
462.libquantum   3400
464.h264ref      52.3
                 42.5
471.omnetpp      42.5
                 30.7
473.astar        29.7
                 29.7
483.xalancbmk    52.1
                 53.3
```

SPECint_base2006 = 50.9

SPECint2006 = 54.6

Hardware

CPU Name:	Intel Xeon E5-2470 v2
CPU Characteristics:	Intel Turbo Boost Technology up to 3.20 GHz
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	20 cores, 2 chips, 10 cores/chip, 2 threads/core
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:	25 MB I+D on chip per chip
Other Cache:	None
Memory:	96 GB (12 x 8 GB 2Rx8 PC3L-12800R-11, ECC)
Disk Subsystem:	1 x 400 GB SATA SSD
Other Hardware:	None

Software

Operating System:	Red Hat Enterprise Linux Server release 6.4 (Santiago) 2.6.32-358.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 (Full multiuser with network)
Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	Microquill SmartHeap V10.0

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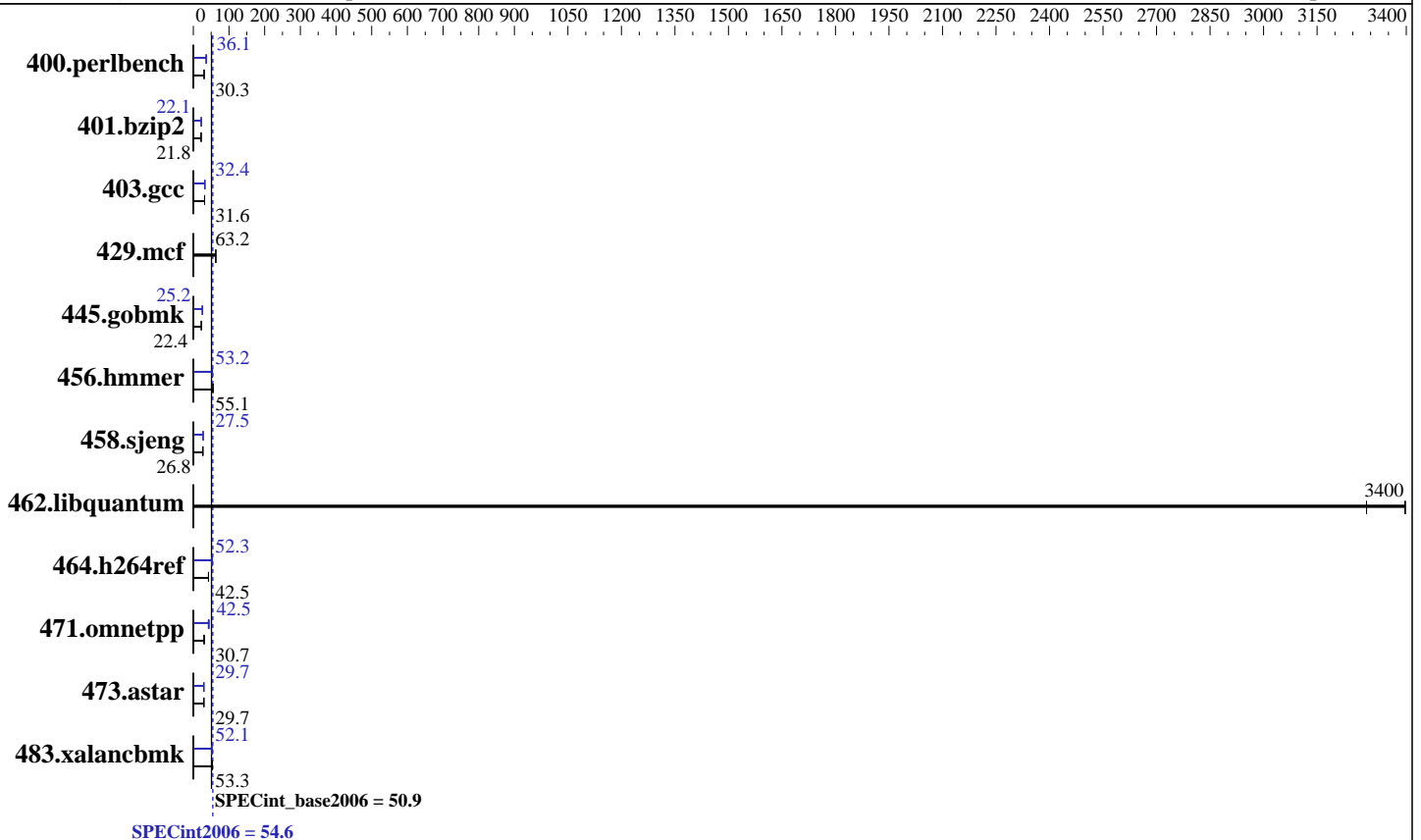
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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	**323**	**30.3**	323	30.3	323	30.2	**271**	**36.1**	271	36.0	270	36.1
401.bzip2	442	21.8	**442**	**21.8**	442	21.8	435	22.2	436	22.1	**436**	**22.1**
403.gcc	**254**	**31.6**	255	31.6	254	31.7	248	32.4	248	32.4	**248**	**32.4**
429.mcf	144	63.2	146	62.5	**144**	**63.2**	144	63.2	146	62.5	**144**	**63.2**
445.gobmk	468	22.4	469	22.4	**469**	**22.4**	417	25.2	417	25.2	**417**	**25.2**
456.hmmer	**169**	**55.1**	170	54.7	168	55.5	173	53.9	176	53.0	**175**	**53.2**
458.sjeng	452	26.8	**452**	**26.8**	451	26.8	439	27.5	440	27.5	**439**	**27.5**
462.libquantum	6.10	3400	6.30	3290	**6.10**	**3400**	6.10	3400	6.30	3290	**6.10**	**3400**
464.h264ref	**521**	**42.5**	519	42.6	521	42.5	423	52.4	**423**	**52.3**	424	52.2
471.omnetpp	212	29.5	203	30.7	**204**	**30.7**	140	44.6	148	42.1	**147**	**42.5**
473.astar	238	29.5	**237**	**29.7**	236	29.8	239	29.4	**237**	**29.7**	236	29.7
483.xalancbmk	130	53.2	**129**	**53.3**	129	53.4	**132**	**52.1**	132	52.1	132	52.1

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

    Sysinfo program /usr/cpu2006/config/sysinfo.rev6818
    $Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
    running on TD340 Sun Dec 15 19:23:38 2013

    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 E5-2470 v2 @ 2.40GHz
         2 "physical id"s (chips)
         40 "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 : 10
         siblings : 20
         physical 0: cores 0 1 2 3 4 8 9 10 11 12
         physical 1: cores 0 1 2 3 4 8 9 10 11 12

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Platform Notes (Continued)

```
      cache size : 25600 KB

  From /proc/meminfo
     MemTotal:        99029440 kB
     HugePages_Total:        0
     Hugepagesize:        2048 kB

  /usr/bin/lsb_release -d
     Red Hat Enterprise Linux Server release 6.4 (Santiago)

  From /etc/*release* /etc/*version*
     redhat-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
     system-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
     system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

  uname -a:
     Linux TD340 2.6.32-358.el6.x86_64 #1 SMP Tue Jan 29 11:47:41 EST 2013 x86_64
     x86_64 x86_64 GNU/Linux

  run-level 3 Dec 13 20:22

  SPEC is set to: /usr/cpu2006
     Filesystem      Type    Size  Used Avail Use% Mounted on
     /dev/mapper/ddf1_4c53492020202020100000791000926147114711c201014ep1
                     ext4    363G  250G   94G  73% /

  Additional information from dmidecode:
    BIOS LENOVO A3TS0FA 12/05/2013
    Memory:
     12x    8 GB
     12x Samsung M393B1G73QH0-YK0 8 GB 1600 MHz 2 rank

  (End of data from sysinfo program)
  TD340 support 3 channels and 6 DIMMS per CPU, total 6 channels and
  12 DIMMS.  All 12 DIMM slots installed with 8 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 = "20"

   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>
```

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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

Base Other Flags

C benchmarks:

        403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

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

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Peak Compiler Invocation (Continued)

```
400.perlbench: icc -m32

  445.gobmk: icc -m32

 464.h264ref: 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
       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

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

         429.mcf: basepeak = yes

      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
```

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Peak Optimization Flags (Continued)

```
     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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
                -no-prec-div(pass 2) -prof-use(pass 2) -unroll2
                -ansi-alias
```

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-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-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-revA.xml

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

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