Lenovo Group Limited

Lenovo ThinkServer TD350 (Intel Xeon E5-2650 v3, 2.30 GHz)

SPECint®2006 = 55.8
SPECint_base2006 = 53.1

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

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

CPU Name: Intel Xeon E5-2650 v3
CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz
CPU MHz: 2300
FPU: Integrated
CPU(s) enabled: 20 cores, 2 chips, 10 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: 25 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)
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
Lenovo Group Limited

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Results Table

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<tr>
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<th>Seconds</th>
<th>Ratio</th>
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<tr>
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<td>33.6</td>
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<td>403.mcf</td>
<td>256</td>
<td>31.4</td>
<td>257</td>
<td>31.3</td>
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<td>31.2</td>
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<td>429.gcc</td>
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<td>56.2</td>
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<td>57.1</td>
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<td>56.7</td>
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<td>465</td>
<td>22.5</td>
<td>464</td>
<td>22.6</td>
<td>465</td>
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<td>59.3</td>
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<td>462.libquantum</td>
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<tr>
<td>464.bzip2</td>
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<td>525</td>
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<td>523</td>
<td>42.3</td>
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<td>473.astar</td>
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<td>243</td>
<td>28.4</td>
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<td>120</td>
<td>57.3</td>
<td>119</td>
<td>57.8</td>
<td>120</td>
<td>57.7</td>
</tr>
</tbody>
</table>

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 Max Performance
Memory Power Savings set to Disabled
Sysinfo program /usr/cpu2006/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on TD350 Tue Nov 11 17:59:19 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 E5-2650 v3 @ 2.30GHz
    2 "physical id"s (chips)

Continued on next page
Lenovo Group Limited

Lenovo ThinkServer TD350 (Intel Xeon E5-2650 v3, 2.30 GHz)

**SPECint2006 =** 55.8
**SPECint_base2006 =** 53.1

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**Platform Notes (Continued)**

20 "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 : 10
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
cache size : 25600 KB
```

From /proc/meminfo

```
MemTotal:       264415172 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)
```

```
uname -a:
Linux TD350 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 Nov 11 17:58
```

SPEC is set to: /usr/cpu2006

```
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda2      ext4  730G  11G  682G   2% /
```

**Additional information from dmidecode:**

```
BIOS LENOVO TB5TS110 10/06/2014
Memory:
16x 16 GB
16x Samsung M393A2G40DB0-CPB 16 GB 2133 MHz 2 rank
```

(End of data from sysinfo program)

TD350 supports 4 channels and 8 DIMMs per processor, total 8 channels and 16 DIMMs. All 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 = "20"
```

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB

Continued on next page
## Lenovo Group Limited

Lenovo ThinkServer TD350 (Intel Xeon E5-2650 v3, 2.30 GHz)

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**CPU2006 license:** 9017  
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### General Notes (Continued)

- 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

<table>
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<td>-DSPEC_CPU_LP64</td>
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<td>-DSPEC_CPU_LP64</td>
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<td>-DSPEC_CPU_LP64, -DSPEC_CPU_LINUX</td>
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</table>

### Base Optimization Flags

- **C benchmarks:**
  - -xCORE-AVX2  -ipo  -03  -no-prec-div  -parallel  -opt-prefetch  -auto-p32

- **C++ benchmarks:**
  - -xCORE-AVX2  -ipo  -03  -no-prec-div  -opt-prefetch  -auto-p32  
  - -Wl,-z,muldefs -L/sh -lsmartheap64

### Base Other Flags

- **C benchmarks:**
  - 403.gcc: -Dalloca=_alloca
Lenovo Group Limited
Lenovo ThinkServer TD350 (Intel Xeon E5-2650 v3, 2.30 GHz)

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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
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
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Peak Optimization Flags (Continued)

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-iip32
-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-TD350-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-TD350-revA.xml
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For questions about this result, please contact the tester. For other inquiries, please contact webmaster@spec.org.