Lenovo Group Limited

Lenovo ThinkServer TS150
(3.00 GHz, Intel Xeon E3-1220 v5)

**SPECint®2006 =** 67.7
**SPECint_base2006 =** 65.7

<table>
<thead>
<tr>
<th>CPU2006 license:</th>
<th>9017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor:</td>
<td>Lenovo Group Limited</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Group Limited</td>
</tr>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon E3-1220 v5</td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.50 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>3000</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>4 cores, 1 chip, 4 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1 chip</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>256 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache:</td>
<td>8 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>32 GB (4 x 8 GB 2Rx8 PC4-2133P-U)</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>1 x 800 GB SATA SSD</td>
</tr>
<tr>
<td>Other Hardware:</td>
<td>None</td>
</tr>
<tr>
<td>Operating System:</td>
<td>SUSE Linux Enterprise Server 12 (x86_64)</td>
</tr>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 16.0.101 of Intel C++ Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>Yes</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other Software:</td>
<td>Microquill SmartHeap V10.2</td>
</tr>
</tbody>
</table>
Lenovo Group Limited

Lenovo ThinkServer TS150
(3.00 GHz, Intel Xeon E3-1220 v5)

SPECint2006 = 67.7
SPECint_base2006 = 65.7

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>215</td>
<td>45.4</td>
<td>216</td>
<td>45.3</td>
<td>216</td>
<td>45.3</td>
<td>196</td>
<td>49.9</td>
<td>196</td>
<td>49.9</td>
<td>196</td>
<td>49.8</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>352</td>
<td>27.4</td>
<td>353</td>
<td>27.4</td>
<td>354</td>
<td>27.3</td>
<td>349</td>
<td>27.7</td>
<td>349</td>
<td>27.7</td>
<td>348</td>
<td>27.7</td>
</tr>
<tr>
<td>403.mcf</td>
<td>173</td>
<td>46.6</td>
<td>173</td>
<td>46.5</td>
<td>173</td>
<td>46.5</td>
<td>169</td>
<td>47.5</td>
<td>169</td>
<td>47.5</td>
<td>169</td>
<td>47.7</td>
</tr>
<tr>
<td>429.gcc</td>
<td>119</td>
<td>76.6</td>
<td>118</td>
<td>77.4</td>
<td>117</td>
<td>77.9</td>
<td>118</td>
<td>77.2</td>
<td>119</td>
<td>76.9</td>
<td>117</td>
<td>78.1</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>335</td>
<td>31.3</td>
<td>334</td>
<td>31.4</td>
<td>335</td>
<td>31.3</td>
<td>348</td>
<td>30.1</td>
<td>348</td>
<td>30.2</td>
<td>348</td>
<td>30.1</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>102</td>
<td>91.5</td>
<td>102</td>
<td>91.5</td>
<td>102</td>
<td>91.5</td>
<td>102</td>
<td>91.5</td>
<td>102</td>
<td>91.5</td>
<td>102</td>
<td>91.5</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>339</td>
<td>35.7</td>
<td>339</td>
<td>35.7</td>
<td>339</td>
<td>35.7</td>
<td>335</td>
<td>36.2</td>
<td>334</td>
<td>36.2</td>
<td>334</td>
<td>36.2</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>10.1</td>
<td>2060</td>
<td>10.1</td>
<td>2060</td>
<td>10.0</td>
<td>2060</td>
<td>10.1</td>
<td>2060</td>
<td>10.1</td>
<td>2060</td>
<td>10.0</td>
<td>2060</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>340</td>
<td>65.1</td>
<td>339</td>
<td>65.4</td>
<td>340</td>
<td>65.2</td>
<td>340</td>
<td>65.1</td>
<td>339</td>
<td>65.4</td>
<td>340</td>
<td>65.2</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>192</td>
<td>32.5</td>
<td>193</td>
<td>32.4</td>
<td>196</td>
<td>31.9</td>
<td>156</td>
<td>40.0</td>
<td>157</td>
<td>39.8</td>
<td>156</td>
<td>40.1</td>
</tr>
<tr>
<td>473.astar</td>
<td>188</td>
<td>37.3</td>
<td>187</td>
<td>37.5</td>
<td>188</td>
<td>37.4</td>
<td>188</td>
<td>37.4</td>
<td>188</td>
<td>37.4</td>
<td>188</td>
<td>37.3</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>79.7</td>
<td>86.6</td>
<td>79.9</td>
<td>86.3</td>
<td>79.6</td>
<td>86.6</td>
<td>75.8</td>
<td>91.0</td>
<td>76.1</td>
<td>90.7</td>
<td>76.0</td>
<td>90.8</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:
EIST Support set to Enabled
C1E Support set to Enable
C State Support set to Enabled
Turbo Mode set to Enable
Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on TS150 Wed Dec 30 12:09:31 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 E3-1220 v5 @ 3.00GHz
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 Continued on next page
Platform Notes (Continued)

caution.)
cpu cores : 4
siblings : 4
physical 0: cores 0 1 2 3

cache size : 8192 KB

From /proc/meminfo
MemTotal: 32933544 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
    VERSION = 12
    PATCHLEVEL = 0
# This file is deprecated and will be removed in a future service pack or
release.
# Please check /etc/os-release for details about this release.
os-release:
    NAME="SLES"
    VERSION="12"
    VERSION_ID="12"
    PRETTY_NAME="SUSE Linux Enterprise Server 12"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12"

uname -a:
    Linux TS150 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC 2014 (9879bd4)
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Dec 28 11:32

SPEC is set to: /home/cpu2006-1.2-ic16.0

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 693G 27G 667G 4% /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 LENOVO FWKT32A 12/25/2015
Memory:
    4x Samsung M378A1G43DB0-CPB 8 GB 2 rank 2133 MHz

(End of data from sysinfo program)
SPEC CINT2006 Result

Lenovo Group Limited
Lenovo ThinkServer TS150
(3.00 GHz, Intel Xeon E3-1220 v5)

SPECint2006 = 67.7
SPECint_base2006 = 65.7

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

Test date: Dec-2015
Hardware Availability: Oct-2015
Software Availability: Aug-2015

General Notes

Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2006-1.2-ic16.0/libs/32:/home/cpu2006-1.2-ic16.0/libs/64:/home/cpu2006-1.2-ic16.0/sh"
OMP_NUM_THREADS = "4"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1
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:
  -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
Lenovo Group Limited

Lenovo ThinkServer TS150
(3.00 GHz, Intel Xeon E3-1220 v5)

SPECint2006 = 67.7
SPECint_base2006 = 65.7

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

Test date: Dec-2015
Hardware Availability: Oct-2015
Software Availability: Aug-2015

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_2016/linux/compiler/lib/ia32_lin
445.gobmk: icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

C++ benchmarks (except as noted below):

icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
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: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
  -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
  -par-num-threads=1(pass 1) -prof-use(pass 2) -opt-prefetch
  -ansi-alias

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

Continued on next page
### Lenovo Group Limited

**Lenovo ThinkServer TS150**  
(3.00 GHz, Intel Xeon E3-1220 v5)

<table>
<thead>
<tr>
<th>SPECint2006</th>
<th>67.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_base2006</td>
<td>65.7</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 9017  
**Test date:** Dec-2015  
**Hardware Availability:** Oct-2015

**Test sponsor:** Lenovo Group Limited  
**Software Availability:** Aug-2015

**Tested by:** Lenovo Group Limited  

#### Peak Optimization Flags (Continued)

<table>
<thead>
<tr>
<th>Program</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>401.bzip2 (continued):</td>
<td>-opt-prefetch -ansi-alias</td>
</tr>
<tr>
<td>403.gcc:</td>
<td>-xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc -opt-malloc-options=3 -auto-ilp32</td>
</tr>
<tr>
<td>429.mcf:</td>
<td>-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32</td>
</tr>
<tr>
<td>445.gobmk:</td>
<td>-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) -prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias</td>
</tr>
<tr>
<td>456.hmmer:</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>458.sjeng:</td>
<td>-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4</td>
</tr>
<tr>
<td>462.libquantum:</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>464.h264ref:</td>
<td>basepeak = yes</td>
</tr>
</tbody>
</table>

#### C++ benchmarks:

<table>
<thead>
<tr>
<th>Program</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>471.omnetpp:</td>
<td>-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -par-num-threads=1(pass 1) -prof-use(pass 2) -opt-ra-region-strategy=block -ansi-alias -Wl,-z,muldefs -L/sh -lsmartheap</td>
</tr>
<tr>
<td>473.astar:</td>
<td>-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -Wl,-z,muldefs -L/sh -lsmartheap64</td>
</tr>
<tr>
<td>483.xalancbmk:</td>
<td>-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias -Wl,-z,muldefs -L/sh -lsmartheap</td>
</tr>
</tbody>
</table>

#### Peak Other Flags

<table>
<thead>
<tr>
<th>Program</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>403.gcc:</td>
<td>-Dalloca=_alloca</td>
</tr>
</tbody>
</table>

The flags files that were used to format this result can be browsed at  
Lenovo Group Limited
Lenovo ThinkServer TS150
(3.00 GHz, Intel Xeon E3-1220 v5)

SPECint2006 = 67.7
SPECint_base2006 = 65.7

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

Test date: Dec-2015
Hardware Availability: Oct-2015
Software Availability: Aug-2015

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml

SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2006 v1.2.
Originally published on 9 February 2016.