Lenovo Group Limited
Lenovo ThinkServer RS160
(3.70 GHz, Intel Xeon E3-1280 v5)

SPEClnt®2006 = 75.2
SPEClnt_base2006 = 73.1

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

Test date: May-2016
Hardware Availability: Sep-2016
Software Availability: Dec-2015

Hardware
- CPU Name: Intel Xeon E3-1280 v5
- CPU Characteristics: Intel Turbo Boost Technology up to 4.00 GHz
- CPU MHZ: 3700
- FPU: Integrated
- CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip
- CPU(s) orderable: 1 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: 8 MB I+D on chip per core
- Other Cache: None
- Memory: 32 GB (4 x 8 GB 2Rx8 PC4-2133P-U)
- Disk Subsystem: 1 x 800 GB SSD
- Other Hardware: None

Software
- Operating System: SUSE Linux Enterprise Server 12 SP1 (x86_64)
  Kernel 3.12.49-11-default
- Compiler: C++: Version 16.0.0.101 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 V10.2
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>51.7</td>
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<td>401.bzip2</td>
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<td>403.gcc</td>
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<td>429.mcf</td>
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<td>85.4</td>
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<td>85.3</td>
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<tr>
<td>445.gobmk</td>
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<td>34.5</td>
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<tr>
<td>462.libquantum</td>
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<td>9.36</td>
<td>2210</td>
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<td>2220</td>
<td>9.35</td>
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<tr>
<td>464.h264ref</td>
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<tr>
<td>471.omnetpp</td>
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<td>166</td>
<td>42.2</td>
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<tr>
<td>483.xalancbmk</td>
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<td>95.7</td>
<td>72.1</td>
<td>95.7</td>
<td>68.7</td>
<td>100</td>
<td>68.4</td>
<td>101</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
Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on RS160-01 Sun May 29 14:13:34 2016

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 E3-1280 v5 @ 3.70GHz
  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 caution.)
cpu cores : 4
siblings : 4

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Platform Notes (Continued)

cache size : 8192 KB

From /proc/meminfo
MemTotal: 32955088 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*
SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 1
  # 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-SP1"
  VERSION_ID="12.1"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp1"

uname -a:
  (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 29 14:12

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

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 VB1TS022 06/21/2016
Memory:
  4x SK Hynix <BAD INDEX> 8 GB 2 rank 2133 MHz

(End of data from sysinfo program)
Lenovo Group Limited

Lenovo ThinkServer RS160 (3.70 GHz, Intel Xeon E3-1280 v5)

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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 = "/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 RS160**  
(3.70 GHz, Intel Xeon E3-1280 v5)

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</tbody>
</table>

### Base Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca

### Peak Compiler Invocation

C benchmarks (except as noted below):

\texttt{icc -m64}

400.perlbench: \texttt{icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin}

445.gobmk: \texttt{icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin}

C++ benchmarks (except as noted below):

\texttt{icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin}

473.astar: \texttt{icpc -m64}

### Peak Portability Flags

400.perlbench: \texttt{-D_FILE_OFFSET_BITS=64} \texttt{-DSPEC_CPU_LINUX_IA32}

401.bzip2: \texttt{-DSPEC_CPU_LP64}

403.gcc: \texttt{-DSPEC_CPU_LP64}

429.mcf: \texttt{-DSPEC_CPU_LP64}

445.gobmk: \texttt{-D_FILE_OFFSET_BITS=64}

456.hmmer: \texttt{-DSPEC_CPU_LP64}

458.sjeng: \texttt{-DSPEC_CPU_LP64}

462.libquantum: \texttt{-DSPEC_CPU_LP64} \texttt{-DSPEC_CPU_LINUX}

464.h264ref: \texttt{-DSPEC_CPU_LP64}

471.omnetpp: \texttt{-D_FILE_OFFSET_BITS=64}

473.astar: \texttt{-DSPEC_CPU_LP64}

483.xalancbmk: \texttt{-D_FILE_OFFSET_BITS=64} \texttt{-DSPEC_CPU_LINUX}

### Peak Optimization Flags

C benchmarks:

400.perlbench: \texttt{-xCORE-AVX2(pass 2)} \texttt{-prof-gen:threadsafe(pass 1)}

\texttt{-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)}

\texttt{-par-num-threads=1(pass 1) -prof-use(pass 2) -opt-prefetch}

\texttt{-ansi-alias}

401.bzip2: \texttt{-xCORE-AVX2(pass 2)} \texttt{-prof-gen:threadsafe(pass 1)}

\texttt{-ipo(pass 2) -O3(pass 2) -no-prec-div}

\texttt{-par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32}

Continued on next page
Lenovo Group Limited
Lenovo ThinkServer RS160
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SPECint2006 = 75.2
SPECint_base2006 = 73.1

Peak Optimization Flags (Continued)

401.bzip2 (continued):
  -opt-prefetch -ansi-alias

403.gcc:
  -xCORE-AVX2 -ipo -O3 -no-prec-div -inline-call
  -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:threadsafe(pass 1)
  -prof-use(pass 2)
  -par-num-threads=1(pass 1) -ansi-alias

456.hmmer:
  basepeak = yes

458.sjeng:
  -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

462.libquantum:
  basepeak = yes

464.h264ref:
  basepeak = yes

C++ benchmarks:

471.omnetpp:
  -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

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-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revC.html
## SPEC CINT2006 Result

### Lenovo Group Limited

**Lenovo ThinkServer RS160**  
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| SPECint2006 | 75.2 |
| SPECint_base2006 | 73.1 |

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You can also download the XML flags sources by saving the following links:

- [http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revC.xml](http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revC.xml)

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For other inquiries, please contact webmaster@spec.org.

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