Lenovo Group Limited

Lenovo ThinkServer TS440 (Intel Xeon E3-1286 v3, 3.70 GHz)

SPECint®2006 = 65.7
SPECint_base2006 = 63.8

Test date: Mar-2015
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

CPU2006 license: 9017
Hardware Availability: Jun-2014

CPU Name: Intel Xeon E3-1286 v3
CPU Characteristics: Intel Turbo Boost Technology up to 4.10 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: 16 GB (2 x 8 GB 2Rx8 PC3L-12800E-11, ECC)
Disk Subsystem: 1 x 800 GB SATA SSD
Other Hardware: None

Software
Operating System: Red Hat Enterprise Linux Server release 7.0 (Maipo) 3.10.0-123.el7.x86_64
Compiler: C/C++ Version 15.0.0.090 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 V10.0
# Lenovo Group Limited

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**SPECint2006 = 65.7**

**SPECint_base2006 = 63.8**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
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<tr>
<td>Peak</td>
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<td>400.perlbench</td>
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<td>47.6</td>
<td>206</td>
<td>47.3</td>
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<td>47.2</td>
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<td>30.9</td>
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<td>429.mcf</td>
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<td><strong>80.4</strong></td>
<td>112</td>
<td>81.2</td>
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<td>445.gobmk</td>
<td>307</td>
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<td>456.hmmer</td>
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<td>462.libquantum</td>
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<td>1610</td>
<td>12.7</td>
<td>1630</td>
<td>12.7</td>
<td>1640</td>
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<tr>
<td>464.h264ref</td>
<td>353</td>
<td>62.7</td>
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<td>63.1</td>
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<td>471.omnetpp</td>
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<td>29.2</td>
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<td>29.2</td>
</tr>
<tr>
<td>473.astar</td>
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<td>38.2</td>
<td>182</td>
<td>38.6</td>
<td>183</td>
<td>38.3</td>
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<td>483.xalancbmk</td>
<td>88.8</td>
<td>77.2</td>
<td>89.1</td>
<td>77.5</td>
<td>88.5</td>
<td>77.9</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
- ICE Performance Modes set to Full Speed
- Intel(R) Hyper-Threading-Technology set to Disabled
- C1E Support set to Disabled

Sysinfo program /usr/cpu2006/config/sysinfo.rev6914
- $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
  running on TS440 Mon Mar 9 21:08:38 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](http://www.spec.org/cpu2006/Docs/config.html#sysinfo)

From /proc/cpuinfo
- model name: Intel(R) Xeon(R) CPU E3-1286 v3 @ 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.)

Continued on next page
Lenovo Group Limited

CPU2006 license: 9017
Test date: Mar-2015
Test sponsor: Lenovo Group Limited
Hardware Availability: Jun-2014
Tested by: Lenovo Group Limited
Software Availability: Sep-2014

Platform Notes (Continued)

cpu cores : 4
siblings : 4
physical 0: cores 0 1 2 3
cache size : 8192 KB

From /proc/meminfo
MemTotal: 16155112 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.0 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.0"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

uname -a:
Linux TS440 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57 EDT 2014 x86_64
x86_64 x86_64 GNU/Linux

run-level 3 Mar 9 21:07

SPEC is set to: /usr/cpu2006

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 741G 14G 728G 2% /

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 FBKT99AUS 09/19/2014
Memory:
2x Samsung M391B1G73BH0-YK0 8 GB 2 rank 1600 MHz
2x [Empty] [Empty]

(End of data from sysinfo program)

TS440 support 2 channels and 2 DIMMs per channel, total 4 DIMMs.
2DIMM slots installed with 8 GB DIMM for this run.
Lenovo Group Limited
Lenovo ThinkServer TS440 (Intel Xeon E3-1286 v3, 3.70 GHz)

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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 = "/usr/cpu2006/libs/32:/usr/cpu2006/libs/64:/usr/cpu2006/sh"
   OMP_NUM_THREADS = "4"

   Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB memory using RedHat EL 7.0
   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 TS440 (Intel Xeon E3-1286 v3, 3.70 GHz)**

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**CPU2006 license:** 9017  
**Test sponsor:** Lenovo Group Limited  
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**Test date:** Mar-2015  
**Hardware Availability:** Jun-2014  
**Software Availability:** Sep-2014

### 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/composer_xe_2015/lib/ia32
445.gobmk: icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

C++ benchmarks (except as noted below):

```
icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

```
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
```

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Peak Optimization Flags (Continued)

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

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll12 -auto-ilp32
-ansi-alias

458.sjeng: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -iopo(pass 2)
-03(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)
-03(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-ic15.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-TS440-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-TS440-revA.xml
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