**Lenovo Group Limited**

Lenovo ThinkServer RD450 (Intel Xeon E5-2623 v3, 3.00 GHz)

| SPECint\_rate2006 = 419 | SPECint\_rate\_base2006 = 403 |

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

<table>
<thead>
<tr>
<th>CPU Name</th>
<th>Intel Xeon E5-2623 v3</th>
</tr>
</thead>
<tbody>
<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>8 cores, 2 chips, 4 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>1.2 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>10 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>256 GB (16 x 16 GB 2Rx4 PC4-2133P-R, running at 1866 MHz)</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>
</tbody>
</table>

**Hardware**

**Software**

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Red Hat Enterprise Linux Server release 7.0 (Maipo) 3.10.0-123.el7.x86_64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler</td>
<td>C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel</td>
<td>No</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-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other Software</td>
<td>Microquill SmartHeap V10.0</td>
</tr>
</tbody>
</table>
**Lenovo Group Limited**

Lenovo ThinkServer RD450 (Intel Xeon E5-2623 v3, 3.00 GHz)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base</th>
<th>Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</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>16</td>
<td>534</td>
<td>293</td>
<td>534</td>
<td>293</td>
<td>539</td>
<td>290</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>16</td>
<td>814</td>
<td>190</td>
<td>816</td>
<td>189</td>
<td>815</td>
<td>189</td>
</tr>
<tr>
<td>403.gcc</td>
<td>16</td>
<td>423</td>
<td>305</td>
<td>418</td>
<td>308</td>
<td>420</td>
<td>307</td>
</tr>
<tr>
<td>429.mcf</td>
<td>16</td>
<td>305</td>
<td>478</td>
<td>307</td>
<td>476</td>
<td>305</td>
<td>478</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>16</td>
<td>611</td>
<td>275</td>
<td>611</td>
<td>275</td>
<td>610</td>
<td>275</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>16</td>
<td>243</td>
<td>615</td>
<td>246</td>
<td>608</td>
<td>248</td>
<td>601</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>16</td>
<td>663</td>
<td>292</td>
<td>671</td>
<td>288</td>
<td>665</td>
<td>291</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>16</td>
<td>76.9</td>
<td>4310</td>
<td>76.7</td>
<td>4320</td>
<td>76.7</td>
<td>4320</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>16</td>
<td>758</td>
<td>467</td>
<td>731</td>
<td>485</td>
<td>725</td>
<td>488</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>16</td>
<td>488</td>
<td>205</td>
<td>489</td>
<td>204</td>
<td>488</td>
<td>205</td>
</tr>
<tr>
<td>473.astar</td>
<td>16</td>
<td>477</td>
<td>235</td>
<td>477</td>
<td>235</td>
<td>479</td>
<td>235</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>16</td>
<td>243</td>
<td>454</td>
<td>243</td>
<td>454</td>
<td>243</td>
<td>454</td>
</tr>
</tbody>
</table>

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Platform Notes

BIOS configuration:
- Cluster On Die set to Auto
- Early Snoop set to Auto
- Performance Profile set to Custom
- C1E Support set to Disabled
- Core C3 set to Disabled
- Core C6 set to Disabled
- Thermal Profile set to High Fan Speed
- Memory Power Savings set to Disabled

Sysinfo program /usr/cpu2006/config/sysinfo.rev6914

$Rev: 6914 $ $Date:: 2014-06-25 $ e3fbb8667b5a285932ceab81e28219e1
running on RD450 Thu Dec 18 01:24:17 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

Continued on next page
SPEC CINT2006 Result

Lenovo Group Limited

Lenovo ThinkServer RD450 (Intel Xeon E5-2623 v3, 3.00 GHz)

SPECint_rate2006 = 419
SPECint_rate_base2006 = 403

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

Test date: Dec-2014
Hardware Availability: Dec-2014
Software Availability: Sep-2014

Platform Notes (Continued)

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-2623 v3 @ 3.00GHz
  2 "physical id"s (chips)
  16 "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 : 8
physical 0: cores 0 1 2 3
physical 1: cores 0 1 2 3
cache size : 10240 KB

From /proc/meminfo
MemTotal: 263818552 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
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 RD450 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 Dec 18 01:22

SPEC is set to: /usr/cpu2006

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 741G 98G 644G 14% /

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 VB3TS122 11/26/2014
Memory:
  16x Samsung M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at 1866 MHz

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Lenovo Group Limited

Lenovo ThinkServer RD450 (Intel Xeon E5-2623 v3, 3.00 GHz)

**SPECint_rate2006 = 419**
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<tr>
<td>Tested by: Lenovo Group Limited</td>
<td>Software Availability: Sep-2014</td>
</tr>
</tbody>
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---

**Platform Notes (Continued)**

(End of data from sysinfo program)
RD450 support 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:

LD_LIBRARY_PATH = "/usr/cpu2006/libs/32:/usr/cpu2006/libs/64:/usr/cpu2006/sh"

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
Filesystem page cache cleared with:
echo 1> /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

---

**Base Compiler Invocation**

C benchmarks:

```bash
icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

C++ benchmarks:

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

---

**Base Portability Flags**

400.perlbench: -DSPEC_CPU_LINUX_IA32
462.libquantum: -DSPEC_CPU_LINUX
483.xalancbmk: -DSPEC_CPU_LINUX

---

**Base Optimization Flags**

C benchmarks:

```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

C++ benchmarks:

```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -Wl,-z,muldefs
-L/sh -lsmartheap
```
Lenovo Group Limited

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Base Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
400.perlbench: icc -m64
401.bzip2: icc -m64
456.hmmer: icc -m64
458.sjeng: icc -m64

C++ benchmarks:
icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LINUX
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)
-auto-ilp32

401.bzip2: -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 -auto-ilp32 -ansi-alias

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div

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Lenovo Group Limited

Lenovo ThinkServer RD450 (Intel Xeon E5-2623 v3, 3.00 GHz)

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Hardware Availability: Dec-2014
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Peak Optimization Flags (Continued)

429.mcf: basepeak = yes
445.gobmk: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -prof-use(pass 2)
ansi-alias
462.libquantum: basepeak = yes

C++ benchmarks:
471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2)
ansi-alias -opt-ra-region-strategy=block -Wl, -z, muldefs
-L/sh -lsmartheap

473.astar: basepeak = yes
483.xalancbmk: basepeak = yes

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-HSW-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-HSW-revA.xml
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For other inquiries, please contact webmaster@spec.org.

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