## Lenovo Group Limited

Lenovo System x3500 M5  
(Intel Xeon E5-2667 v3, 3.20 GHz)

| SPECint_rate2006 | 844 |
| SPECint_rate_base2006 | 808 |

| CPU2006 license | 9017 |
| Test sponsor | Lenovo Group Limited |
| Tested by | Lenovo Group Limited |
| CPU Name | Intel Xeon E5-2667 v3 |
| CPU Characteristics | Intel Turbo Boost Technology up to 3.60 GHz |
| CPU MHz | 3200 |
| FPU | Integrated |
| CPU(s) enabled | 16 cores, 2 chips, 8 cores/chip, 2 threads/core |
| CPU(s) orderable | 1.2 chips |
| Primary Cache | 32 KB I + 32 KB D on chip per core |
| Secondary Cache | 256 KB I+D on chip per core |
| L3 Cache | 20 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 960 GB SATA SSD |
| Other Hardware | None |
| 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 | No |
| File System | xfs |
| System State | Run level 3 (multi-user) |
| Base Pointers | 32-bit |
| Peak Pointers | 32/64-bit |
| Other Software | Microquill SmartHeap V10.0 |
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CPU2006 license: 9017
Test date: May-2015
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Hardware Availability: Jan-2015
Tested by: Lenovo Group Limited
Software Availability: Sep-2014

Results Table

<table>
<thead>
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<th>Benchmark</th>
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<th>Seconds</th>
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<td>456.hmmer</td>
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<td>473.astar</td>
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<td>459</td>
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<td>487</td>
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<td>483.xalancbmk</td>
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<td>253</td>
<td>872</td>
<td>32</td>
<td>253</td>
<td>874</td>
<td>252</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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 setting:
Operating Mode set to "Efficiency-Favor Performance"
Sysinfo program /home/SPEC/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 $$ e3fbb8667b5a285932ceab81e28219e1
running on x3500M5 Wed May  6 02:08:03 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 E5-2667 v3 @ 3.20GHz
  2 "physical id"s (chips)
    32 "processors"
  cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
Platform Notes (Continued)

    cpu cores : 8
    siblings  : 16
    physical 0: cores 0 1 2 3 4 5 6 7
    physical 1: cores 0 1 2 3 4 5 6 7
    cache size : 20480 KB

From /proc/meminfo
    MemTotal:       263455832 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 x3500M5 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 May 6 01:53

SPEC is set to: /home/SPEC
    Filesystem            Type  Size  Used Avail Use% Mounted on
    /dev/mapper/rhel-root xfs   927G  138G  789G  15% /

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 IBM -[TAE103F-1.02]- 12/05/2014
    Memory:
        8x Hynix HMA42GR7MF4N-TFT1 16 GB 2 rank 2133 MHz
        8x NO DIMM HMA42GR7MF4N-TFT1 16 GB 2 rank 2133 MHz
        8x NO DIMM Unknown

(End of data from sysinfo program)
## Lenovo Group Limited

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### General Notes

Environment variables set by runspec before the start of the run:

```
LD_LIBRARY_PATH = "~/home/SPEC/libs/32:/home/SPEC/libs/64:/home/SPEC/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:**
```
icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

**C++ benchmarks:**
```
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:**
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

**C++ benchmarks:**
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -Wl,-z,muldefs -L/sh -lsmartheap
```

### Base Other Flags

- 403.gcc: -Dalloca=_alloca
# SPEC CINT2006 Result

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## Peak Compiler Invocation

C benchmarks (except as noted below):

```bash
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:

```bash
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`

429.mcf: `basepeak = yes`

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 -unroll2 -auto-ilp32`

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 -auto-ilp32`

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Peak Optimization Flags (Continued)

462.libquantum: basepeak = yes

464.h264ref:
  -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
  -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
  -unroll2 -ansi-alias

Peak Other Flags

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)
  -ansi-alias -opt-ra-region-strategy=block -Wl,-z,muldefs
  -L/sh -lsmartheap

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

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-Flags-V1.2-HSW-B.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-Flags-V1.2-HSW-B.xml

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

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