**Hewlett-Packard Company**

ProLiant ML10 v2 Gen8
(3.10 GHz, Intel Xeon E3-1220 v3)

| SPECfp®2006 | 71.6 |
| SPECfp_base2006 | 69.9 |

**Hardware**

- **CPU Name:** Intel Xeon E3-1220 v3
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.50 GHz
- **CPU MHz:** 3100
- **FPU:** Integrated
- **CPU(s) enabled:** 4 cores, 1 chip, 4 cores/chip
- **Primary Cache:** 32 KB I + 32 KB D on chip per core
- **Secondary Cache:** 256 KB I+D on chip per core

**Software**

- **Operating System:** Red Hat Enterprise Linux Server release 7.0, (Maipo)
  - Kernel 3.10.0-123.el7.x86_64
- **Compiler:** C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;
  - Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux
- **Auto Parallel:** Yes
- **File System:** xfs
Hewlett-Packard Company

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CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

SPECfp2006 = 71.6
SPECfp_base2006 = 69.9

L3 Cache: 8 MB I+D on chip per chip
Other Cache: None
Memory: 16 GB (2 x 8 GB 2Rx8 PC3-12800E-11, ECC)
Disk Subsystem: 1 x 250 GB SATA 7500 RPM, RAID 0
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Test date: Feb-2015
Hardware Availability: Mar-2015
Software Availability: Sep-2014

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>410.bwaves</td>
<td>124</td>
<td>110</td>
<td>123</td>
<td>110</td>
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<tr>
<td>416.gamess</td>
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Results Table

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</tbody>
</table>

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

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled

Platform Notes

BIOS Configuration:
HP Power Profile set to Custom
HP Power Regulator to High Performance Mode
Minimum Processor Idle Power Core C-State set to C6 Package
Minimum Processor Idle Power Package C-State set to No Package State
Collaborative Power Control set to Disabled
Thermal Configuration set to Maximum Cooling
Processor Power and Utilization Monitoring set to Disabled

Continued on next page
Hewlett-Packard Company

ProLiant ML10 v2 Gen8
(3.10 GHz, Intel Xeon E3-1220 v3)

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SPECfp_base2006 = 69.9

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Test date: Feb-2015
Hardware Availability: Mar-2015
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Software Availability: Sep-2014

Platform Notes (Continued)

Memory Double Refresh Rate set to 1x Refresh

Sysinfo program /home/cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on ML10-G8-v2 Wed Feb 25 11:01:31 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 v3 @ 3.10GHz
    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
physical 0: cores 0 1 2 3
cache size : 8192 KB

From /proc/meminfo
MemTotal: 16098992 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 ML10-G8-v2 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 Feb 25 05:50

SPEC is set to: /home/cpu2006

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/mapper/rhel_ml10--g8--v2--home</td>
<td>xfs</td>
<td>175G</td>
<td>7.7G</td>
<td>167G</td>
<td>5%</td>
<td>/home</td>
</tr>
</tbody>
</table>

Additional information from dmidecode:

Continued on next page
**Hewlett-Packard Company**

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**CPU2006 license:** 3  
**Test date:** Feb-2015  
**Test sponsor:** Hewlett-Packard Company  
**Tested by:** Hewlett-Packard Company

---

**Platform Notes (Continued)**

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 HP J10 02/02/2015  
Memory:  
- 2x HP 69239-081 8 GB 2 rank 1600 MHz  
- 2x UNKNOWN NOT AVAILABLE

(End of data from sysinfo program)

---

**General Notes**

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

Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB memory using RedHat EL 7.0

---

**Base Compiler Invocation**

- C benchmarks:  
  - icc -m64

- C++ benchmarks:  
  - icpc -m64

- Fortran benchmarks:  
  - ifort -m64

- Benchmarks using both Fortran and C:  
  - icc -m64 ifort -m64

---

**Base Portability Flags**

- 410.bwaves: -DSPEC_CPU_LP64
- 416.gamess: -DSPEC_CPU_LP64
- 433.milc: -DSPEC_CPU_LP64
- 434.zeusmpi: -DSPEC_CPU_LP64
- 435.gromacs: -DSPEC_CPU_LP64 -nofor_main
- 436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
- 437.leslie3d: -DSPEC_CPU_LP64
- 444.namd: -DSPEC_CPU_LP64

Continued on next page
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Software Availability: Sep-2014

Base Portability Flags (Continued)

447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -parallel -opt-prefetch
-ansi-alias

C++ benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -03 -no-prec-div -parallel -opt-prefetch
-ansi-alias

Peak Compiler Invocation

C benchmarks:
icc -m64

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
icc -m64 ifort -m64

Peak Portability Flags

Same as Base Portability Flags
Peak Optimization Flags

C benchmarks:

433.milc: `xCORE-AVX2` `prof-gen` `ipo` `auto-ilp32` `ansi-alias`
470.lbm: `basepeak = yes`
482.sphinx3: `basepeak = yes`

C++ benchmarks:

444.namd: `xCORE-AVX2` `prof-gen` `ipo` `fno-alias` `auto-ilp32`
447.dealII: `basepeak = yes`
450.soplex: `basepeak = yes`
453.povray: `xCORE-AVX2` `prof-gen` `ipo` `-unroll14` `-ansi-alias`

Fortran benchmarks:

410.bwaves: `basepeak = yes`
416.gamess: `xCORE-AVX2` `prof-gen` `ipo` `-unroll2` `-inline-level=0` `-scalar-rep`
434.zeusmp: `basepeak = yes`
437.leslie3d: `basepeak = yes`

459.GemsFDTD: `xCORE-AVX2` `prof-gen` `ipo` `-unroll2` `-inline-level=0` `-opt-prefetch` `-parallel`
465.tonto: `xCORE-AVX2` `prof-gen` `ipo` `-unroll2` `-inline-calloc` `-opt-malloc-options=3` `-auto -unroll14`

Benchmarks using both Fortran and C:

435.gromacs: `basepeak = yes`
436.cactusADM: `basepeak = yes`
SPEC CFP2006 Result

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Peak Optimization Flags (Continued)

454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias
481.wrf: basepeak = yes

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/HP-Platform-Flags-Intel-V1.2-revD.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/HP-Platform-Flags-Intel-V1.2-revD.xml

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

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