Hewlett-Packard Company

ProLiant BL660c Gen8
(3.30 GHz, Intel Xeon E5-4627 v2)

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

CPU Name: Intel Xeon E5-4627 v2
CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz
CPU MHz: 3300
FPU: Integrated
CPU(s) enabled: 32 cores, 4 chips, 8 cores/chip
CPU(s) orderable: 2,4 chip
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core

Operating System: SUSE Linux Enterprise Server 11 (x86_64) SP3
Compiler: C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux;
Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux
Auto Parallel: Yes
File System: ext3
System State: Run level 3 (multi-user)

SPECfp®2006 = 102
SPECfp_base2006 = 97.7
## SPEC CFP2006 Result

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### Test date:
- Feb-2014

### Hardware Availability:
- Mar-2014

### Software Availability:
- Nov-2013

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>481.wrf</td>
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<td>80.6</td>
</tr>
</tbody>
</table>

### Operating System Notes

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

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

### Platform Notes

**BIOS Configuration:**
- HP Power Regulator was set to HP Static High Performance Mode
- HP Power Profile was set to Maximum Performance
- Thermal Configuration was set to Maximum Cooling
- Collaborative Power Control was set to Disabled
- Dynamic Power Capping Functionality was set to Disabled

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Platform Notes (Continued)

Memory Refresh Rate was set to 1x Refresh
Sysinfo program /home/cpu2006/config/sysinfo.rev6874.hp
$Rev: 6874 $ $Date:: 2013-11-20 #$ e05b96ddac63d74bfe176502a0a2391
running on b1660-b14-rwen Sat Feb 22 00:10:52 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

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-4627 v2 @ 3.30GHz
  4 "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.)
cpu cores : 8
siblings : 8
physical 0: cores 0 1 2 3 4 5 6 7
physical 1: cores 0 1 2 3 4 5 6 7
physical 2: cores 0 1 2 3 4 5 6 7
physical 3: cores 0 1 2 3 4 5 6 7
cache size : 16384 KB

From /proc/meminfo
MemTotal: 264505672 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 11 (x86_64)

From /etc/*release* /etc/*version*
SuSE-release:
  SUSE Linux Enterprise Server 11 (x86_64)
  VERSION = 11
  PATCHLEVEL = 3

uname -a:
  Linux b1660-b14-rwen 3.0.76-0.11-default #1 SMP Fri Jun 14 08:21:43 UTC 2013
  (ccab990) x86_64 x86_64 x86_64 GNU/Linux

run-level 5 Feb 21 03:40 last=S

SPEC is set to: /home/cpu2006
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 ext3 274G 8.3G 264G 4% /

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
Continued on next page
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---

**Platform Notes (Continued)**

hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS HP I32 02/02/2014  
Memory:  
32x HP 712382-071 8 GB 1866 MHz  

(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 = "32"  

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RedHat EL 6.4

---

**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.zeusmp`:
  ```  
  -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
  ```
- `447.dealII`:
  ```  
  -DSPEC_CPU_LP64
  ```
- `450.soplex`:
  ```  
  -DSPEC_CPU_LP64
  ```
- `453.povray`:
  ```  
  -DSPEC_CPU_LP64
  ```
- `454.calculix`:
  ```  
  -DSPEC_CPU_LP64 -nofor_main
  ```

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Base Portability Flags (Continued)

459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.1bm: -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:
-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias

C++ benchmarks:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:
-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:
-xAVX -ipo -O3 -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:

Continued on next page
Peak Optimization Flags (Continued)

```
433.milc: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -prof-use(pass 2) -auto-ilp32
         -ansi-alias

470.lbm: basepeak = yes

482.sphinx3: -xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias
         -parallel
```

C++ benchmarks:

```
444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -prof-use(pass 2) -fno-alias
         -auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias
```

Fortran benchmarks:

```
410.bwaves: basepeak = yes

416.gamess: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -prof-use(pass 2) -unroll2
         -inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -prof-use(pass 2) -unroll2
         -inline-level=0 -opt-prefetch -parallel

465.tonto: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc
         -opt-malloc-options=3 -auto -unroll4
```

Benchmarks using both Fortran and C:

```
435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xAVX -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias
```
### SPEC CFP2006 Result

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#### Peak Optimization Flags (Continued)

481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at:
- [Intel-ic14.0-official-linux64.20140128.html](http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.html)
- [HP-Platform-Flags-Intel-V1.2-revB.20131009.html](http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-revB.20131009.html)

You can also download the XML flags sources by saving the following links:
- [Intel-ic14.0-official-linux64.20140128.xml](http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml)
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For other inquiries, please contact webmaster@spec.org.

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