SPEC® CFP2006 Result
Hewlett-Packard Company
HP Integrity BL860c
(1.6GHz/18MB Dual-Core Intel Itanium 2)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECfp2006</th>
<th>SPECfp_base2006</th>
</tr>
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<tbody>
<tr>
<td>410.bwaves</td>
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<tr>
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**CPU2006 license:** 03
**Test sponsor:** Hewlett-Packard Company
**Tested by:** Hewlett-Packard Company

**Test date:** Jan-2007
**Hardware Availability:** Feb-2007
**Software Availability:** Feb-2007

**CPU Name:** Dual-Core Intel Itanium 2 9040
**CPU Characteristics:** 1.6GHz/18MB, 533MHz FSB
**CPU MHz:** 1600
**FPU:** Integrated
**CPU(s) enabled:** 2 cores, 1 chip, 2 cores/chip
**CPU(s) orderable:** 1-2 chips
**Primary Cache:** 16 KB I + 16 KB D on chip per core
**Secondary Cache:** 1 MB I + 256 KB D on chip per core

**Operating System:** HPUX11i-TCOE B.11.23.0609
**Compiler:** HP C/aC++ Developer's Bundle C.11.23.12
**Auto Parallel:** No
**File System:** vxfs
**System State:** Multi-user
**Base Pointers:** 32-bit
**Peak Pointers:** 32-bit
**Other Software:** None

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Hewlett-Packard Company

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SPECfp2006 = 17.7
SPECfp_base2006 = 16.9

Results Table

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</table>

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

Operating System Notes

The system had the September 2006 HP-UX 11i v2 Technical Computing Operating Environment (TCOE) and compilers installed, along with the following patches:

- PHSS_34858  linker + fdp cumulative patch
- PHSS_34853  Math Library Cumulative Patch
- PHSS_34854  Integrity Unwind Library
- PHSS_34855  HP C Compiler (A.06.12)
- PHSS_34856  aC++ Compiler (A.06.12)
- PHSS_34857  u2comp/be/plugin library patch
- PHSS_34395  FORTRAN I/O Library [libIO77]
- PHSS_34397  FORTRAN Intrinsics [libF90 B.11.23.17]
- PHSS_34399  Fortran Product Patch, v3.1 to v3.1.1
- PHKL_34020  Perfmon enhancements and Itanium Dual-Core

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Operating System Notes (Continued)

The following kernel tunables were set, in addition to the defaults set by the Technical Computing OE:

dbc_max_pct=20
dbc_min_pct=20
maxdsiz=3221225472
maxssiz=401604608

Platform Notes

The "cpuconfig" EFI command was used prior to booting to deconfigure processors.

Base Compiler Invocation

C benchmarks:
/opt/ansic/bin/cc -Ae

C++ benchmarks:
/opt/aCC/bin/aCC -Aa

Fortran benchmarks:
/opt/fortran90/bin/f90

Benchmarks using both Fortran and C:
/opt/ansic/bin/cc -Ae /opt/fortran90/bin/f90

Base Portability Flags

453.povray: -DSPEC_CPU_NEED_INVHYP
454.calculix: -DSPEC_CPU_NOZMODIFIER
481.wrf: -DNOUNDERSCORE +noppu

Base Optimization Flags

C benchmarks:
+Ofaster +Otype_safety=ansi -Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M -Wl,-N

C++ benchmarks:
+Ofaster +Otype_safety=ansi -Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M -Wl,-N

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Base Optimization Flags (Continued)

Fortran benchmarks:
+Ofaster -Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M -Wl,-N

Benchmarks using both Fortran and C:
+Ofaster +Otype_safety=ansi -Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M -Wl,-N

Peak Compiler Invocation

C benchmarks:
/opt/ansic/bin/cc -Ae

C++ benchmarks:
/opt/aCC/bin/aCC -Aa

Fortran benchmarks:
/opt/fortran90/bin/f90

Benchmarks using both Fortran and C:
/opt/ansic/bin/cc -Ae /opt/fortran90/bin/f90

Peak Portability Flags

453.povray: -DSPEC_CPU_NEED_INVHYP
454.calculix: -DSPEC_CPU_NOZMODIFIER
481.wrf: -DNOUNDERSCORE +noppu

Peak Optimization Flags

C benchmarks:

433.milc: +Oprofile=collect:all(pass 1) +Oprofile=use(pass 2) +Ofaster +Otype_safety=ansi -Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M +Onoparmsoverlap -Wl,-N
470.lbm: basepeak = yes
482.sphinx3: +Oprofile=collect:all(pass 1) +Oprofile=use(pass 2) +Ofaster +Otype_safety=ansi -Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M +Onoparmsoverlap

C++ benchmarks:

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**SPEC CFP2006 Result**

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**Peak Optimization Flags (Continued)**

444.namd: basepeak = yes

447.dealII: basepeak = yes

450.soplex: +Oprofile=collect:all(pass 1) +Oprofile=use(pass 2) +Ofaster  
+Otype_safety=ansi -Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M -Wl,-N  
+Onoparmsoverlap -Wl,-N

453.povray: +Oprofile=collect:all(pass 1) +Oprofile=use(pass 2) +Ofaster  
+Otype_safety=ansi -Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M

**Fortran benchmarks:**

410.bwaves: basepeak = yes

416.gamess: +Ofaster -Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M  
+Odataprefetch=direct -Wl,-N

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: +Oprofile=collect:all(pass 1) +Oprofile=use(pass 2) +Ofaster  
-Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M  
+Odataprefetch=direct -Wl,-N

465.tonto: +Oprofile=collect:all(pass 1) +Oprofile=use(pass 2) +Ofaster  
-Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M  
+Odataprefetch=direct

**Benchmarks using both Fortran and C:**

435.gromacs: +Oprofile=collect:all(pass 1) +Oprofile=use(pass 2) +Ofaster  
+Otype_safety=ansi -Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M -Wl,-N  
+Otype_safety=ansi -Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M  
+Onoparmsoverlap

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes

---

The flags file that was used to format this result can be browsed at

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090715.07.xml
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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.0.
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