**SPEC® CFP2006 Result**

**Hewlett-Packard Company**

HP Integrity rx2660  
(1.6GHz/18MB Dual-Core Intel Itanium 2)

<table>
<thead>
<tr>
<th>SPECfp®2006</th>
<th>SPECfp_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.8</td>
<td>17.0</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 03  
**Test sponsor:** Hewlett-Packard Company  
**Tested by:** Hewlett-Packard Company

**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

**Software**

- **Operating System:** HPUX11i-TCOE B.11.23.0609  
- **Compiler:** HP C/aC++ Developer's Bundle C.11.23.12  
- **HP Fortran90 Compiler B.11.23.32**  
- **Auto Parallel:** No  
- **File System:** vxfs  
- **System State:** Multi-user  
- **Base Pointers:** 32-bit  
- **Peak Pointers:** 32-bit  
- **Other Software:** None

**Hardware**

- **410.bwaves**  
- **416.gamess**  
- **433.milc**  
- **434.zeusmp**  
- **435.gromacs**  
- **436.cactusADM**  
- **437.leslie3d**  
- **444.namd**  
- **447.dealII**  
- **450.soplex**  
- **453.povray**  
- **454.calculix**  
- **459.GemsFDTD**  
- **465.tonto**  
- **470.lbm**  
- **481.wrf**  
- **482.sphinx3**

**Test date:** Dec-2006  
**Hardware Availability:** Feb-2007  
**Software Availability:** Feb-2007

Continued on next page

Standard Performance Evaluation Corporation  
info@spec.org  
http://www.spec.org/
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L3 Cache: 9 MB I+D on chip per core
Other Cache: None
Memory: 8 GB (4x2GB DIMMs)
Disk Subsystem: 73GB 10K RPM SAS
Other Hardware: None

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>350 38.8</td>
<td>350 38.8</td>
<td>350 38.8</td>
<td>350 38.8</td>
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<tr>
<td>416.gamess</td>
<td>2244 8.73</td>
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<td>2244 8.73</td>
<td>2243 9.14</td>
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<tr>
<td>433.milc</td>
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<tr>
<td>434.zeusmp</td>
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<td>435.gromacs</td>
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<td>516 13.8</td>
<td>515 15.7</td>
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<td>436.cactusADM</td>
<td>365 32.8</td>
<td>364 32.8</td>
<td>364 32.8</td>
<td>364 32.8</td>
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<tr>
<td>437.leslie3d</td>
<td>456 20.6</td>
<td>456 20.6</td>
<td>456 20.6</td>
<td>456 20.6</td>
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<tr>
<td>444.namd</td>
<td>304 26.4</td>
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<td>304 26.4</td>
<td>304 26.4</td>
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<tr>
<td>447.dealII</td>
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<td>552 20.7</td>
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<td>450.soplex</td>
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<td>943 8.85</td>
<td>811 10.3</td>
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<td>453.povray</td>
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<td>487 10.9</td>
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<tr>
<td>454.calculix</td>
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<td>575 14.3</td>
<td>575 14.3</td>
<td>575 14.3</td>
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<tr>
<td>459.GemsFDTD</td>
<td>697 15.2</td>
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<td>697 15.2</td>
<td>640 16.6</td>
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<tr>
<td>470.lbm</td>
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<td>481.wrf</td>
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<tr>
<td>482.sphinx3</td>
<td>1036 18.8</td>
<td>1036 18.8</td>
<td>1036 18.8</td>
<td>998 19.5</td>
</tr>
</tbody>
</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

Continued on next page
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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.

Although two cores were enabled during testing, the SPEC CPU2006 benchmarks used only one core.

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

Continued on next page
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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

Continued on next page
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Peak Optimization Flags (Continued)

C++ benchmarks:

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,+p1,64M +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,+p1,64M

Fortran benchmarks:

410.bwaves: basepeak = yes
416.gamess: +Ofaster -Wl,-a,archive_shared -Wl,+pd,64M -Wl,+p1,64M
+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,+p1,64M +Odataprefetch=direct -Wl,-N
465.tonto: +Oprofile=collect:all(pass 1) +Oprofile=use(pass 2) +Ofaster
-Wl,-a,archive_shared -Wl,+pd,64M -Wl,+p1,64M +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,+p1,64M +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
### SPEC CFP2006 Result

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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 other inquiries, please contact webmaster@spec.org.

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