Hewlett-Packard Company

HP Integrity rx6600 (1.6GHz/24MB Dual-Core Intel Itanium 2)

<table>
<thead>
<tr>
<th>SPECfp rate2006</th>
<th>SPECfp rate base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>71.4</td>
<td>69.1</td>
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</tbody>
</table>

Hardware
- CPU Name: Dual-Core Intel Itanium 2 9050
- CPU Characteristics: 1.6GHz/24MB, 533MHz FSB
- CPU MHz: 1600
- FPU: Integrated
- CPU(s) enabled: 8 cores, 4 chips, 2 cores/chip
- CPU(s) orderable: 1-4 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
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

Software

### SPECfp Rate Breakdown

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECfp Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>72.9</td>
</tr>
<tr>
<td>416.gamess</td>
<td>69.5</td>
</tr>
<tr>
<td>433.milc</td>
<td>24.7</td>
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<tr>
<td>434.zeusmp</td>
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<td>435.gromacs</td>
<td>125</td>
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<tr>
<td>436.cactusADM</td>
<td>111</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>30.0</td>
</tr>
<tr>
<td>444.namd</td>
<td>146</td>
</tr>
<tr>
<td>447.dealII</td>
<td>56.1</td>
</tr>
<tr>
<td>450.soplex</td>
<td>50.8</td>
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<tr>
<td>453.povray</td>
<td>87.7</td>
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<tr>
<td>454.calculix</td>
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<tr>
<td>459.GemsFDTD</td>
<td>115</td>
</tr>
<tr>
<td>465.tonto</td>
<td>80.5</td>
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<tr>
<td>470.lbm</td>
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<tr>
<td>482.sphinx3</td>
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SPECfp_rate_base2006 = 69.1

SPECfp_rate2006 = 71.4

Test date: Aug-2006
Hardware Availability: Sep-2006
Software Availability: Sep-2006

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

Copies

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SPECfp_rate_base2006 = 69.1

SPECfp_rate2006 = 71.4

Continued on next page
Hewlett-Packard Company

HP Integrity rx6600 (1.6GHz/24MB Dual-Core Intel Itanium 2)

**SPEC CFP2006 Result**

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</table>

**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

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.
SPEC CFP2006 Result

Hewlett-Packard Company
HP Integrity rx6600 (1.6GHz/24MB Dual-Core Intel Itanium 2)

SPECfp_rate2006 = 71.4
SPECfp_rate_base2006 = 69.1

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

Operating System Notes (Continued)

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

- \texttt{dbc\_max\_pct}=20
- \texttt{dbc\_min\_pct}=20
- \texttt{maxdsiz}=3221225472
- \texttt{maxssiz}=401604608

Base Compiler Invocation

C benchmarks:
\texttt{/opt/ansic/bin/cc \textasciitilde Ae}

C++ benchmarks:
\texttt{/opt/aCC/bin/aCC \textasciitilde Aa}

Fortran benchmarks:
\texttt{/opt/fortran90/bin/f90}

Benchmarks using both Fortran and C:
\texttt{/opt/ansic/bin/cc \textasciitilde Ae /opt/fortran90/bin/f90}

Base Portability Flags

- \texttt{453.povray: -DSPEC\_CPU\_NEED\_INVHYP}
- \texttt{454.calculix: -DSPEC\_CPU\_NOZMODIFIER}
- \texttt{481.wrf: -DNOUNDERSCORE +noppu}

Base Optimization Flags

C benchmarks:
- \texttt{+Ofaster +Otype\_safety=ansi \textasciitilde Wl,-a,archive\_shared \textasciitilde Wl,+pd,64M \textasciitilde Wl,+pi,64M \textasciitilde Wl,-N}

C++ benchmarks:
- \texttt{+Ofaster +Otype\_safety=ansi \textasciitilde Wl,-a,archive\_shared \textasciitilde Wl,+pd,64M \textasciitilde Wl,+pi,64M \textasciitilde Wl,-N}

Fortran benchmarks:
- \texttt{+Ofaster \textasciitilde Wl,-a,archive\_shared \textasciitilde Wl,+pd,64M \textasciitilde Wl,+pi,64M \textasciitilde Wl,-N}

Benchmarks using both Fortran and C:
- \texttt{+Ofaster(-hp\_cc) +Otype\_safety=ansi \textasciitilde Wl,-a,archive\_shared \textasciitilde Wl,+pd,64M \textasciitilde Wl,+pi,64M +Ofaster(-hp\_f90) \textasciitilde Wl,-N}
Hewlett-Packard Company
HP Integrity rx6600 (1.6GHz/24MB Dual-Core Intel Itanium 2)
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Software Availability: Sep-2006

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:
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 +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

Continued on next page
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SPECfp_rate2006 = 71.4
SPECfp_rate_base2006 = 69.1

Test date: Aug-2006
Hardware Availability: Sep-2006

CPU2006 license: 03
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company
Software Availability: Sep-2006

Peak Optimization Flags (Continued)

Fortran benchmarks:

410.bwaves: basepeak = yes

416.games: +Ofaster -Wl,-a,archive_shared -Wl,+p1,64M -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,+p1,64M -Wl,+p1,64M
+Odataprefetch=direct -Wl,-N

465.tonto: +Oprofile=collect:all(pass 1) +Oprofile=use(pass 2) +Ofaster
-Wl,-a,archive_shared -Wl,+p1,64M -Wl,+p1,64M
+Odataprefetch=direct

Benchmarks using both Fortran and C:

435.gromacs: +Oprofile=collect:all(pass 1) +Oprofile=use(pass 2)
+Ofaster(-hp_cc) +Otype_safety=ansi -Wl,-a,archive_shared
-Wl,+p1,64M -Wl,+p1,64M +Onoparmsoverlap +OfasteR(-hp_f90)

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
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090715.06.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090715.06.xml