## Hewlett-Packard Company

### HP Integrity rx3600

(1.4GHz/12MB Dual-Core Intel Itanium 2)

<table>
<thead>
<tr>
<th>SPECfp&lt;sup&gt;®&lt;/sup&gt;_rate2006</th>
<th>43.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_rate_base2006</td>
<td>41.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Dual-Core Intel Itanium 2 9020</td>
<td>Operating System: HPUX11i-TCOE B.11.23.0609</td>
</tr>
<tr>
<td>CPU Characteristics: 1.4GHz/12MB, 533MHz FSB</td>
<td>Compiler: HP C/aC++ Developer's Bundle C.11.23.12</td>
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<tr>
<td>CPU MHz: 1400</td>
<td>Auto Parallel: No</td>
</tr>
<tr>
<td>FPU: Integrated</td>
<td>File System: vxfs</td>
</tr>
<tr>
<td>CPU(s) enabled: 4 cores, 2 chips, 2 cores/chip</td>
<td>System State: Multi-user</td>
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<tr>
<td>CPU(s) orderable: 1-2 chips</td>
<td>Base Pointers: 32-bit</td>
</tr>
<tr>
<td>Primary Cache: 16 KB I + 16 KB D on chip per core</td>
<td>Peak Pointers: 32-bit</td>
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<tr>
<td>Secondary Cache: 1 MB I + 256 KB D on chip per core</td>
<td>Other Software: None</td>
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</table>

### CFP2006 Result

<table>
<thead>
<tr>
<th>SPECfp&lt;sup&gt;®&lt;/sup&gt;_rate2006</th>
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<table>
<thead>
<tr>
<th>Test sponsor: Hewlett-Packard Company</th>
<th>Test date: Jan-2007</th>
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<tbody>
<tr>
<td>Hardware Availability: Sep-2006</td>
<td>Software Availability: Sep-2006</td>
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<th>Copies</th>
<th>410.bwaves</th>
<th>416.gamess</th>
<th>433.milc</th>
<th>434.zeusmp</th>
<th>435.gromacs</th>
<th>436.cactusADM</th>
<th>437.leslie3d</th>
<th>444.namd</th>
<th>447.dealII</th>
<th>450.soplex</th>
<th>453.povray</th>
<th>454.calculix</th>
<th>459.GemsFDTD</th>
<th>465.tonto</th>
<th>470.lbm</th>
<th>481.wrf</th>
<th>482.sphinx3</th>
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Hewlett-Packard Company

HP Integrity rx3600
(1.4GHz/12MB Dual-Core Intel Itanium 2)

SPECfp_rate2006 = 43.1
SPECfp_rate_base2006 = 41.7

CPU2006 license: 03
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company
Test date: Jan-2007
Hardware Availability: Sep-2006
Software Availability: Sep-2006

L3 Cache: 6 MB I+D on chip per core
Other Cache: None
Memory: 16 GB (8x2GB DIMMs, AD124A 8-DIMM memory carrier)
Disk Subsystem: 73GB 10K RPM SAS
Other Hardware: None

Results Table

<table>
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<tr>
<th>Benchmark</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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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 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_34839 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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SPECfp_rate2006 = 43.1
SPECfp_rate_base2006 = 41.7

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
maxdsize=3221225472
maxssize=401604608

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

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
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Software Availability: Sep-2006

Peek 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: -DNSOUNDERSCORE +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

477.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
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CPU2006 license: 03
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

Peak Optimization Flags (Continued)

Fortran benchmarks:

410.bwaves: basepeak = yes

416.games: +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

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090715.07.xml