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

**SPECfp®_rate2006 = 745**
**SPECfp_rate_base2006 = 716**

**Hardware**
- **CPU Name:** Dual-Core Intel Itanium 2 9050
- **CPU Characteristics:** 1.6GHz/24MB, 533MHz FSB
- **CPU MHz:** 1600
- **FPU:** Integrated
- **CPU(s) enabled:** 64 cores, 32 chips, 2 cores/chip
- **CPU(s) orderable:** 1-64 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
- **Auto Parallel:** No
- **File System:** vxfs
- **System State:** Multi-user
- **Base Pointers:** 32-bit
- **Peak Pointers:** 32-bit
- **Other Software:** None

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

Continued on next page
**SPEC CFP2006 Result**

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**CPU2006 license:** 03  
**Test sponsor:** Hewlett-Packard Company  
**Tested by:** Hewlett-Packard Company  
**L3 Cache:** 12 MB I+D on chip per core  
**Other Cache:** None  
**Memory:** 256 GB (256x1GB DIMMs)  
**Disk Subsystem:** 3x73GB 15K RPM SCSI (striped)  
**Other Hardware:** None

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base</th>
<th>Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Copies</strong></td>
<td><strong>Seconds</strong></td>
<td><strong>Ratio</strong></td>
</tr>
<tr>
<td>410.bwaves</td>
<td>64 1646</td>
<td>528</td>
</tr>
<tr>
<td>416.gamess</td>
<td>64 2299</td>
<td>545</td>
</tr>
<tr>
<td>433.milc</td>
<td>64 1578</td>
<td>372</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>64 773</td>
<td>754</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>64 534</td>
<td>856</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>64 450</td>
<td>1700</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>64 1320</td>
<td>456</td>
</tr>
<tr>
<td>444.namd</td>
<td>64 317</td>
<td>1620</td>
</tr>
<tr>
<td>447.dealII</td>
<td>64 665</td>
<td>1100</td>
</tr>
<tr>
<td>450.soplex</td>
<td>64 1340</td>
<td>1249</td>
</tr>
<tr>
<td>453.povray</td>
<td>64 612</td>
<td>556</td>
</tr>
<tr>
<td>454.calculix</td>
<td>64 600</td>
<td>881</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>64 1975</td>
<td>344</td>
</tr>
<tr>
<td>465.tonto</td>
<td>64 1040</td>
<td>606</td>
</tr>
<tr>
<td>470.lbm</td>
<td>64 1074</td>
<td>819</td>
</tr>
<tr>
<td>481.wrf</td>
<td>64 1001</td>
<td>714</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>64 1022</td>
<td>1220</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 system was configured as a single partition with 8 cells and 4 processors (8 cores) per cell. Memory was configured as 50% local and 50% interleaved.

The following config file entry was used to bind processes to cells using the HP-UX "mpsched" utility:

submit = let "MYNUM=$SPECCOPYNUM" ; let "LDOM=$MYNUM/8" ; mpsched -l $LDOM $command

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

Continued on next page
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CPU2006 license: 03
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Software Availability: Sep-2006

### Base Optimization Flags (Continued)

- **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(-hp_cc) +Otype_safety=ansi -Wl,-a,archive_shared -Wl,+pd,64M -Wl,+pi,64M +Ofaster(-hp_f90) -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`

- **lbm:**
  
  `basepeak = yes`

- **sphinx3:**
  
  `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
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,+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

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(-hp_cc) +Otype_safety=ansi -Wl,-a,archive_shared
-Wl,+pd,64M -Wl,+pi,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
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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.20090715.06.xml

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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