### Hardware

- **CPU Name:** Dual-Core Intel Itanium 2 9040
- **CPU Characteristics:** 1.6GHz/18MB, 533MHz FSB
- **CPU MHz:** 1600
- **FPU:** Integrated
- **CPU(s) enabled:** 128 cores, 64 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

### Results

<table>
<thead>
<tr>
<th>Test</th>
<th>Copies</th>
<th>SPECfp_rate2006</th>
<th>SPECfp_rate_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>128</td>
<td>1140</td>
<td>1060</td>
</tr>
<tr>
<td>416.gamess</td>
<td>128</td>
<td>1080</td>
<td>1000</td>
</tr>
<tr>
<td>433.milc</td>
<td>128</td>
<td>742</td>
<td>675</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>128</td>
<td>1480</td>
<td>1300</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>128</td>
<td>1990</td>
<td>1730</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>128</td>
<td>3350</td>
<td>3310</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>128</td>
<td>898</td>
<td>898</td>
</tr>
<tr>
<td>444.namd</td>
<td>128</td>
<td>2120</td>
<td>2120</td>
</tr>
<tr>
<td>447.dealII</td>
<td>128</td>
<td>876</td>
<td>876</td>
</tr>
<tr>
<td>450.soplex</td>
<td>128</td>
<td>763</td>
<td>763</td>
</tr>
<tr>
<td>453.povray</td>
<td>128</td>
<td>1390</td>
<td>1130</td>
</tr>
<tr>
<td>454.calculix</td>
<td>128</td>
<td>1740</td>
<td>1740</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>128</td>
<td>710</td>
<td>675</td>
</tr>
<tr>
<td>465.tonto</td>
<td>128</td>
<td>1270</td>
<td>1270</td>
</tr>
<tr>
<td>470.lbm</td>
<td>128</td>
<td>1400</td>
<td>1400</td>
</tr>
<tr>
<td>481.wrf</td>
<td>128</td>
<td>1360</td>
<td>1360</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>128</td>
<td>2310</td>
<td>2310</td>
</tr>
</tbody>
</table>

**Continued on next page**
Hewlett-Packard Company

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

SPECfp_rate2006 = 1440
SPECfp_rate_base2006 = 1380

CPU2006 license: 03
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company
L3 Cache: 9 MB I+D on chip per core
Other Cache: None
Memory: 512 GB (512x1GB DIMMs)
Disk Subsystem: 3x73GB 15K RPM SCSI (striped)
Other Hardware: None

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>128</td>
<td>1643</td>
<td>1060</td>
<td>1641</td>
<td>1060</td>
<td>1642</td>
<td>1060</td>
<td>1641</td>
<td>1060</td>
</tr>
<tr>
<td>416.gamess</td>
<td>128</td>
<td>2314</td>
<td>1080</td>
<td>2322</td>
<td>1080</td>
<td>2301</td>
<td>1090</td>
<td>2204</td>
<td>1140</td>
</tr>
<tr>
<td>433.milc</td>
<td>128</td>
<td>1586</td>
<td>741</td>
<td>1582</td>
<td>743</td>
<td>1585</td>
<td>742</td>
<td>1582</td>
<td>742</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>128</td>
<td>784</td>
<td>1490</td>
<td>787</td>
<td>1480</td>
<td>788</td>
<td>1480</td>
<td>784</td>
<td>1480</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>128</td>
<td>128</td>
<td>128</td>
<td>128</td>
<td>128</td>
<td>128</td>
<td>128</td>
<td>128</td>
<td>128</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>128</td>
<td>453</td>
<td>3380</td>
<td>459</td>
<td>3330</td>
<td>457</td>
<td>3350</td>
<td>453</td>
<td>3380</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>128</td>
<td>1345</td>
<td>894</td>
<td>1339</td>
<td>898</td>
<td>1339</td>
<td>898</td>
<td>1339</td>
<td>898</td>
</tr>
<tr>
<td>444.namd</td>
<td>128</td>
<td>321</td>
<td>3200</td>
<td>310</td>
<td>3310</td>
<td>310</td>
<td>3310</td>
<td>310</td>
<td>3310</td>
</tr>
<tr>
<td>447.dealII</td>
<td>128</td>
<td>691</td>
<td>2120</td>
<td>689</td>
<td>2120</td>
<td>672</td>
<td>2180</td>
<td>672</td>
<td>2180</td>
</tr>
<tr>
<td>450.soplex</td>
<td>128</td>
<td>1541</td>
<td>764</td>
<td>1399</td>
<td>763</td>
<td>1399</td>
<td>763</td>
<td>1399</td>
<td>763</td>
</tr>
<tr>
<td>453.povray</td>
<td>128</td>
<td>605</td>
<td>1130</td>
<td>604</td>
<td>1130</td>
<td>603</td>
<td>1130</td>
<td>603</td>
<td>1130</td>
</tr>
<tr>
<td>454.calculix</td>
<td>128</td>
<td>609</td>
<td>1730</td>
<td>607</td>
<td>1740</td>
<td>607</td>
<td>1740</td>
<td>607</td>
<td>1740</td>
</tr>
<tr>
<td>465.tonto</td>
<td>128</td>
<td>1050</td>
<td>1200</td>
<td>1045</td>
<td>1210</td>
<td>1041</td>
<td>1210</td>
<td>999</td>
<td>1260</td>
</tr>
<tr>
<td>470.lbm</td>
<td>128</td>
<td>1254</td>
<td>1400</td>
<td>1256</td>
<td>1400</td>
<td>1252</td>
<td>1400</td>
<td>1256</td>
<td>1400</td>
</tr>
<tr>
<td>481.wrf</td>
<td>128</td>
<td>1053</td>
<td>1360</td>
<td>1038</td>
<td>1380</td>
<td>1048</td>
<td>1360</td>
<td>1038</td>
<td>1380</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>128</td>
<td>1135</td>
<td>2200</td>
<td>1086</td>
<td>2300</td>
<td>1082</td>
<td>2300</td>
<td>1082</td>
<td>2300</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
Hewlett-Packard Company
HP Integrity Superdome
(1.6GHz/18MB Dual-Core Intel Itanium 2)

SPECfp_rate2006 = 1440
SPECfp_rate_base2006 = 1380

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 16 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
Hewlett-Packard Company
HP Integrity Superdome
(1.6GHz/18MB Dual-Core Intel Itanium 2)

SPECfp_rate2006 = 1440
SPECfp_rate_base2006 = 1380

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

Test date: Oct-2006
Hardware Availability: Sep-2006
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 +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
Hewlett-Packard Company

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

SPEC CFP2006 Result

SPECfp_rate2006 = 1440
SPECfp_rate_base2006 = 1380

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

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

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 +Onoparmssoverlap -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 +Onoparmssoverlap
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.20090715.11.html
### Hewlett-Packard Company

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

**SPECfp_rate2006** = 1440  
**SPECfp_rate_base2006** = 1380

<table>
<thead>
<tr>
<th>CPU2006 license</th>
<th>Test date</th>
<th>Test sponsor</th>
<th>Hardware Availability</th>
<th>Tested by</th>
<th>Software Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>Oct-2006</td>
<td>Hewlett-Packard Company</td>
<td>Sep-2006</td>
<td>Hewlett-Packard Company</td>
<td>Sep-2006</td>
</tr>
</tbody>
</table>

You can also download the XML flags source by saving the following link:  
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090715.11.xml

---

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2006 v1.0.  
Originally published on 15 November 2006.