



SPEC® CFP2006 Result

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Hewlett-Packard Company

SPECfp®_rate2006 = 664

ProLiant DL585 G7
(2.60 GHz AMD Opteron 6238)

SPECfp_rate_base2006 = 617

CPU2006 license: 3

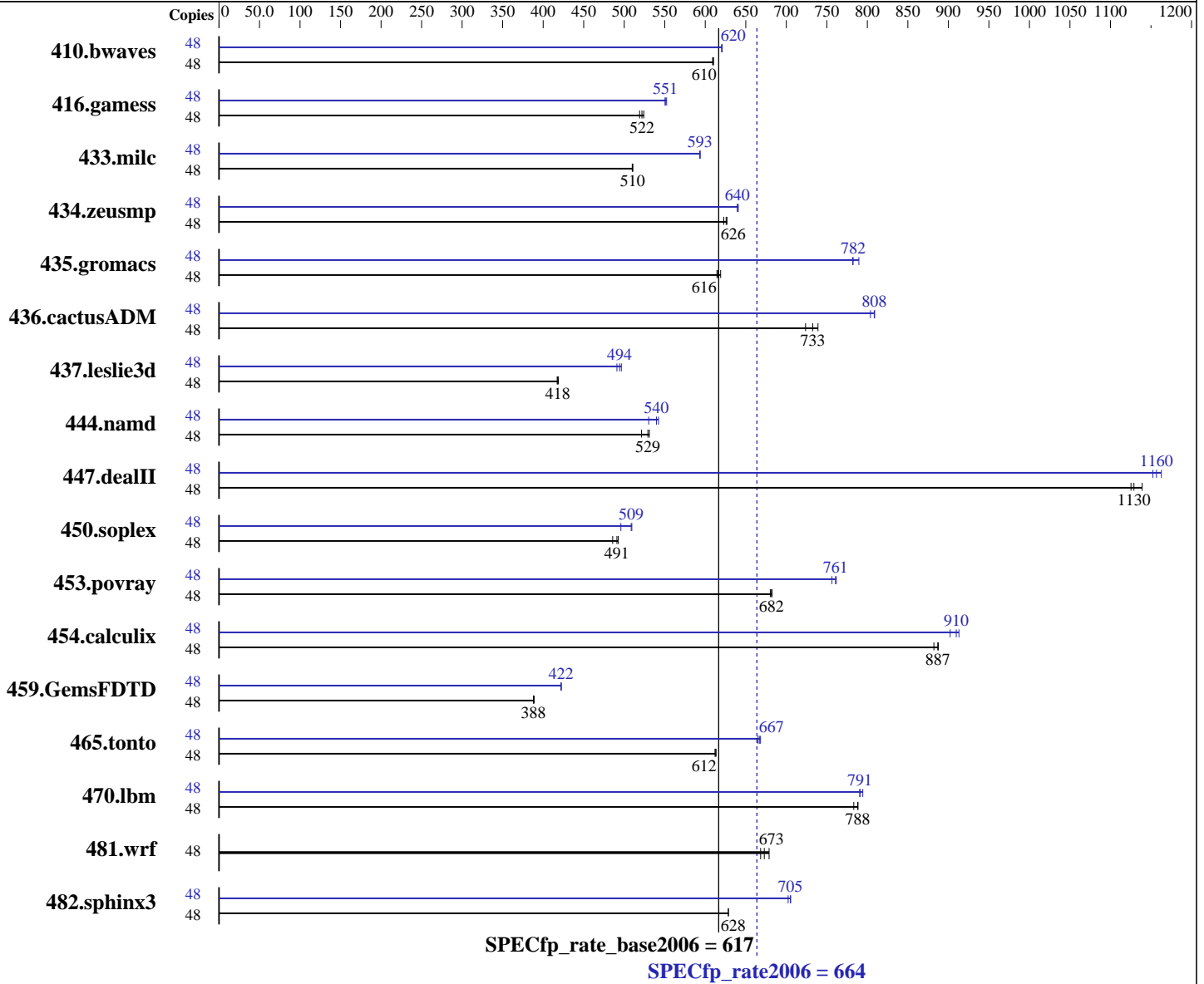
Test date: Apr-2012

Test sponsor: Hewlett-Packard Company

Hardware Availability: Jun-2012

Tested by: Hewlett-Packard Company

Software Availability: Dec-2011



Hardware

CPU Name: AMD Opteron 6238
 CPU Characteristics: AMD Turbo CORE technology up to 3.20 GHz
 CPU MHz: 2600
 FPU: Integrated
 CPU(s) enabled: 48 cores, 4 chips, 12 cores/chip
 CPU(s) orderable: 2,4 chips

Software

Operating System: Red Hat Enterprise Linux Server release 6.2, Kernel 2.6.32-220.el6.x86_64
 Compiler: C/C++/Fortran: Version 4.5.1 of x86 Open64 Compiler Suite (from AMD)
 Auto Parallel: No
 File System: ext3
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit

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Primary Cache: 384 KB I on chip per chip,
64 KB I shared / 2 cores;
16 KB D on chip per core

Secondary Cache: 12 MB I+D on chip per chip, 2 MB shared / 2 cores

L3 Cache: 16 MB I+D on chip per chip, 8 MB shared / 6 cores

Other Cache: None

Memory: 256 GB (16 x 16 GB 2Rx4 PC3-12800R-11, ECC)

Disk Subsystem: 1 x 500 GB 7.2 K SAS

Other Hardware: None

Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	48	1071	609	<u>1070</u>	<u>610</u>	1069	610	48	<u>1051</u>	<u>620</u>	1051	621	1052	620
416.gamess	48	1793	524	<u>1801</u>	<u>522</u>	1811	519	48	<u>1706</u>	<u>551</u>	1702	552	1707	550
433.milc	48	863	511	<u>864</u>	<u>510</u>	864	510	48	<u>743</u>	<u>593</u>	743	593	742	594
434.zeusmp	48	<u>698</u>	<u>626</u>	701	623	697	627	48	683	639	<u>683</u>	<u>640</u>	682	641
435.gromacs	48	<u>557</u>	<u>616</u>	558	614	554	619	48	434	790	<u>438</u>	<u>782</u>	438	782
436.cactusADM	48	793	724	776	739	<u>783</u>	<u>733</u>	48	709	809	714	804	<u>709</u>	<u>808</u>
437.leslie3d	48	1077	419	<u>1080</u>	<u>418</u>	1081	417	48	909	496	<u>913</u>	<u>494</u>	919	491
444.namd	48	738	521	<u>727</u>	<u>529</u>	725	531	48	726	530	710	542	<u>713</u>	<u>540</u>
447.dealII	48	482	1140	<u>486</u>	<u>1130</u>	488	1130	48	477	1150	472	1160	<u>475</u>	<u>1160</u>
450.soplex	48	813	493	<u>815</u>	<u>491</u>	824	486	48	807	496	<u>787</u>	<u>509</u>	786	509
453.povray	48	375	680	374	682	<u>375</u>	<u>682</u>	48	<u>336</u>	<u>761</u>	335	762	338	756
454.calculix	48	<u>447</u>	<u>887</u>	449	882	446	888	48	<u>435</u>	<u>910</u>	434	913	439	902
459.GemsFDTD	48	1310	389	1313	388	<u>1312</u>	<u>388</u>	48	1206	422	<u>1206</u>	<u>422</u>	1207	422
465.tonto	48	772	612	<u>771</u>	<u>612</u>	770	613	48	<u>708</u>	<u>667</u>	707	668	710	665
470.lbm	48	836	789	842	783	<u>837</u>	<u>788</u>	48	830	794	834	791	<u>834</u>	<u>791</u>
481.wrf	48	<u>797</u>	<u>673</u>	790	679	802	668	48	<u>797</u>	<u>673</u>	790	679	802	668
482.sphinx3	48	1517	617	<u>1489</u>	<u>628</u>	1488	629	48	<u>1327</u>	<u>705</u>	1326	705	1332	702

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

Submit Notes

The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.

Operating System Notes

'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2097152' was used to set environment locked pages in memory limit

Set transparent_hugepage=never as a boot parameter in /boot/grub/menu.lst
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Operating System Notes (Continued)

```
Set vm/nr_hugepages=43008 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
```

Platform Notes

BIOS configuration:
HP Power Profile set to Maximum Performance
Thermal Configuration set to Increased Cooling

General Notes

Environment variables set by runspec before the start of the run:

```
HUGETLB_LIMIT = "896"
```

```
LD_LIBRARY_PATH = "/cpu2006/amd1104-rate-libs-revC/32:/cpu2006/amd1104-rate-libs-revC/64"
```

The x86 Open64 Compiler Suite is only available from (and supported by) AMD at <http://developer.amd.com/cpu/open64>

Binaries were compiled on a system with 2x AMD Opteron 6274 chips + 64GB Memory using RHEL 6.1

Base Compiler Invocation

C benchmarks:
openc

C++ benchmarks:
openCC

Fortran benchmarks:
openf95

Benchmarks using both Fortran and C:
openc openf95

Base Portability Flags

```
410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
```

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Base Portability Flags (Continued)

```

447.deallI: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LINUX -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LP64
        -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

```

Base Optimization Flags

C benchmarks:

```

-march=bdver1 -Ofast -OPT:malloc_alg=1 -HP:bd=2m:heap=2m
-IPA:plimit=8000 -IPA:small_pu=100 -mso

```

C++ benchmarks:

```

-march=bdver1 -Ofast -static -CG:load_exe=0 -OPT:malloc_alg=1
-INLINE:aggressive=on -HP:bd=2m:heap=2m -D__OPEN64_FAST_SET

```

Fortran benchmarks:

```

-march=bdver1 -Ofast -LNO:blocking=off -OPT:rsqrt=2
-OPT:unroll_size=256 -HP:bd=2m:heap=2m -mso

```

Benchmarks using both Fortran and C:

```

-march=bdver1 -Ofast -OPT:malloc_alg=1 -HP:bd=2m:heap=2m
-IPA:plimit=8000 -IPA:small_pu=100 -mso -LNO:blocking=off
-OPT:rsqrt=2 -OPT:unroll_size=256

```

Peak Compiler Invocation

C benchmarks:

openc

C++ benchmarks:

openCC

Fortran benchmarks:

openf95

Benchmarks using both Fortran and C:

openc openf95



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Peak Portability Flags

```

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LINUX -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LP64
-fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

```

Peak Optimization Flags

C benchmarks:

```

433.milc: -march=bdver1 -Ofast -CG:movnti=1 -CG:locs_best=on
-HP:bdt=2m:heap=2m -IPA:plimit=7000 -IPA:callee_limit=1200
-OPT:struct_array_copy=2 -OPT:alias=field_sensitive -mso

470.lbm: -march=bdver1 -Ofast -CG:cmp_peep=on
-OPT:unroll_times_max=8 -OPT:unroll_size=256
-OPT:unroll_level=2 -OPT:keep_ext=on -HP:bdt=2m:heap=2m
-IPA:plimit=8000 -IPA:small_pu=100 -mso

482.sphinx3: -march=bdver1 -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -IPA:plimit=1000
-OPT:malloc_alg=2 -CG:cmp_peep=on -CG:local_sched_alg=2
-CG:p2align=0 -INLINE:aggressive=on -LNO:prefetch=2
-LNO:prefetch_ahead=4 -mso

```

C++ benchmarks:

```

444.namd: -march=bdver1 -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -IPA:plimit=3000
-LNO:ignore_feedback=off -CG:local_sched_alg=2
-CG:load_exe=0 -OPT:unroll_size=256 -fno-exceptions
-HP:bdt=2m:heap=2m

447.dealIII: -march=bdver1 -Ofast -D__OPEN64_FAST_SET -static
-INLINE:aggressive=on -LNO:opt=0 -LNO:simd=0
-fno-emit-exceptions -m32 -OPT:unroll_times_max=8
-OPT:unroll_size=256 -OPT:unroll_level=2 -HP:bdt=2m:heap=2m
-GRA:unspill=on -CG:cmp_peep=on -CG:movext_icmp=off

```

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Peak Optimization Flags (Continued)

447.dealIII (continued):

-TENV:frame_pointer=off

450.soplex: -march=bdver1 -fb_create fbdata(pass 1)

-fb_opt fbdata(pass 2) -O3 -LNO:ignore_feedback=off

-INLINE:aggressive=on -OPT:RO=1 -OPT:IEEE_arith=3

-OPT:IEEE_NaN_Inf=off -OPT:fold_unsigned_relops=on

-fno-exceptions -CG:p2align=0 -m32 -HP:bdt=2m:heap=2m

-WOPT:sib=on

453.povray: -march=bdver1 -fb_create fbdata(pass 1)

-fb_opt fbdata(pass 2) -Ofast -CG:pre_local_sched=off

-CG:p2align=0 -CG:p2align_split=on -CG:dsched=on

-INLINE:aggressive=on -HP:bd=2m:heap=2m -OPT:transform=2

-OPT:alias=disjoint -WOPT:aggcm=0

Fortran benchmarks:

410.bwaves: -march=bdver1 -fb_create fbdata(pass 1)

-fb_opt fbdata(pass 2) -Ofast -OPT:Ofast -OPT:treeheight=on

-LNO:blocking=off -LNO:ignore_feedback=off -LNO:fu=4

-LNO:loop_model_simd=on -LNO:simd_rm_unity_remainder=on

-WOPT:aggstr=0 -HP:bdt=2m:heap=2m -CG:cmp_peep=on

416.gamess: -march=bdver1 -fb_create fbdata(pass 1)

-fb_opt fbdata(pass 2) -O3 -LNO:fu=6 -LNO:blocking=0

-LNO:simd=0 -OPT:Ofast -OPT:ro=3 -OPT:unroll_size=256

-OPT:unroll_times_max=2 -CG:local_sched_alg=1

-HP:bdt=2m:heap=2m -WOPT:sib=on

434.zeusmp: -march=bdver1 -Ofast -LNO:blocking=off -LNO:interchange=off

-IPA:plimit=1500 -HP:bdt=2m:heap=2m

437.leslie3d: -march=bdver1 -Ofast -CG:pre_minreg_level=2 -LNO:simd=0

-LNO:fusion=2 -HP:bdt=2m:heap=2m -mso

459.GemsFDTD: -march=bdver1 -Ofast -IPA:plimit=1500 -OPT:unroll_size=0

-LNO:fission=2 -CG:load_exe=0 -CG:local_sched_alg=2 -HP

465.tonto: -march=bdver1 -Ofast -OPT:alias=no_f90_pointer_alias

-LNO:blocking=off -CG:load_exe=1 -IPA:plimit=525

-HP:bdt=2m:heap=2m

Benchmarks using both Fortran and C:

435.gromacs: -march=bdver1 -fb_create fbdata(pass 1)

-fb_opt fbdata(pass 2) -Ofast -OPT:rsqrt=2

-HP:bdt=2m:heap=2m -CG:local_sched_alg=2 -GRA:unspill=ON

-CG:load_exe=3 -LNO:simd=3

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Peak Optimization Flags (Continued)

436.cactusADM: -march=bdver1 -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -LNO:blocking=off
-LNO:prefetch=2 -HP -CG:locs_shallow_depth=1 -CG:load_exe=0
-CG:dsched=on -WOPT:sib=on

454.calculix: -march=bdver1 -Ofast -OPT:unroll_size=256
-GRA:optimize_boundary=on -CG:dsched=on -HP:bdt=2m:heap=2m

481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/x86-open64-451-flags-rate-revC.html>

<http://www.spec.org/cpu2006/flags/HP-Platform-Flags-AMD-V1.2-A.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/x86-open64-451-flags-rate-revC.xml>

<http://www.spec.org/cpu2006/flags/HP-Platform-Flags-AMD-V1.2-A.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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