



CFP2000 Result

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Compaq Computer Corporation
AlphaServer ES40 Model 6/833

SPECfp_rate2000 = 9.02

SPECfp_rate_base2000 = 7.21

SPEC license #: 2 | Tested by: Compaq NH | Test date: Jun-2001 | Hardware Avail: Jan-2001 | Software Avail: Aug-2001

Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
168.wupwise	1	312	5.94	1	246	7.54
171.swim	1	287	12.5	1	287	12.5
172.mgrid	1	462	4.52	1	307	6.81
173.applu	1	399	6.11	1	307	7.94
177.mesa	1	211	7.71	1	187	8.67
178.galgel	1	214	15.7	1	216	15.6
179.art	1	157	19.2	1	125	24.1
183.equake	1	531	2.84	1	190	7.93
187.facerec	1	212	10.4	1	197	11.2
188.amp	1	418	6.10	1	364	7.01
189.lucas	1	296	7.83	1	242	9.57
191.fma3d	1	397	6.14	1	290	8.40
200.sixtrack	1	325	3.92	1	291	4.39
301.apsi	1	484	6.23	1	469	6.43

Hardware

CPU: Alpha 21264B
 CPU MHz: 833
 FPU: Integrated
 CPU(s) enabled: 1 core, 1 chip, 1 core/chip
 CPU(s) orderable: 1 to 4
 Parallel: No
 Primary Cache: 64KB(I)+64KB(D) on chip
 Secondary Cache: 8MB off chip per CPU
 L3 Cache: None
 Other Cache: None
 Memory: 4GB
 Disk Subsystem: 1x18GB
 Other Hardware: None

Software

Operating System: Tru64 UNIX V5.1
 +Patch Kit 2
 Compiler: Compaq C V6.4-214-46B59
 Program Analysis Tools V2.0
 Spike V5.2 DTK (1.461 46B5P)
 Compaq Fortran V5.4A-1472-46B2F
 Compaq Fortran 77 V5.4A-196-46B2F
 KAP Fortran V4.3 000607
 KAP Fortran 77 V4.1 980926
 KAP C V4.1 000607
 File System: AdvFS
 System State: Multi-user

Notes/Tuning Information

Baseline C: cc -arch ev6 -fast -O4 ONESTEP
 Fortran: f90 -arch ev6 -fast -O5 ONESTEP

Peak:

All use -g3 -arch ev6 -non_shared ONESTEP
 Individual benchmark tuning:
 168.wupwise: kf77 -fast -O4 -pipeline -unroll 2 +PFB
 171.swim: f90 -fast -O5
 172.mgrid: kf77 -O5 -transform_loops -tune ev6 -unroll 8
 173.applu: f90 -fast -O5 +PFB
 177.mesa: cc -fast -O4 +CFB +IFB
 178.galgel: f90 -fast -O5
 179.art: kcc -fast -O4 -unroll 10 -ckapargs='-arl=4
 -ur=4' +PFB
 183.equake: cc -fast -xtaso_short -assume
 restricted_pointers -all -ldensemalloc -none +PFB



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Notes/Tuning Information (Continued)

```
187.facerec: f90 -fast -O4 +PFB
188.amp: cc -fast -O4 -xtaso_short -assume
restricted_pointers
189.lucas: kf90 -O5 -fkapargs='-ur=1' +PFB
191.fma3d: kf90 -O4 -transform_loops +PFB
200.sixtrack: f90 -fast -O5 -assume accuracy_sensitive
-notransform_loops +PFB
301.apsi: kf90 -O5 -transform_loops -unroll 8
-fkapargs='-ur=1' +PFB
```

Most benchmarks are built using one or more types of profile-driven feedback. The types used are designated by abbreviations in the notes:

+CFB: Code generation is optimized by the compiler, using feedback from a training run. These commands are done before the first compile (in phase "fdo_pre0"):

```
mkdir /tmp/pp
rm -f /tmp/pp/${baseexe}*
```

and these flags are added to the first and second compiles:

```
PASS1_CFLAGS = -prof_gen_noopt -prof_dir /tmp/pp
PASS2_CFLAGS = -prof_use -prof_dir /tmp/pp
```

(Peak builds use /tmp/pp above; base builds use /tmp/pb.)

+IFB: Icache usage is improved by the post-link-time optimizer Spike, using feedback from a training run. These commands are used (in phase "fdo_postN"):

```
mv ${baseexe} oldexe
spike oldexe -feedback oldexe -o ${baseexe}
```

+PFB: Prefetches are improved by the post-link-time optimizer Spike, using feedback from a training run. These commands are used (in phase "fdo_post_makeN"):

```
rm -f *Counts*
mv ${baseexe} oldexe
pixie -stats dstride oldexe 1>pixie.out 2>pixie.err
mv oldexe.pixie ${baseexe}
```

A training run is carried out (in phase "fdo_runN"), and then this command (in phase "fdo_postN"):

```
spike oldexe -fb oldexe -stride_prefetch -o ${baseexe}
```

When Spike is used for both Icache and Prefetch improvements, only one spike command is actually issued, with the Icache options followed by the Prefetch options.

Portability: galgel: -fixed

Information on UNIX V5.1 Patches can be found at



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Notes/Tuning Information (Continued)

<http://ftpl.service.digital.com/public/unix/v5.1/>

Spike, and the Program Analysis Tools, are part of the Developers' Tool Kit Supplement, <http://www.tru64unix.compaq.com/dtk/>. The features used in this SPEC submission will be available at the web site as a beta kit in August, 2001, and as a production release in October, 2001. The C compiler for this SPEC submission has been available at the same location, as a production release, since May, 2001.