



CFP2000 Result

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Compaq Computer Corporation AlphaServer ES40 Model 6/833

SPECfp2000 = 777
SPECfp_base2000 = 621

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

Benchmark	Reference Time	Base Runtime	Base Ratio	Runtime	Ratio
168.wupwise	1600	312	512	246	650
171.swim	3100	287	1080	287	1079
172.mgrid	1800	462	390	307	587
173.applu	2100	399	527	307	684
177.mesa	1400	211	665	187	748
178.galgel	2900	214	1355	216	1342
179.art	2600	157	1658	125	2075
183.quake	1300	531	245	190	684
187.facerec	1900	212	898	197	965
188.amp	2200	418	526	364	605
189.lucas	2000	296	675	242	825
191.fma3d	2100	397	529	290	724
200.sixtrack	1100	325	338	291	379
301.apsi	2600	484	537	469	554

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.quake: 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.