



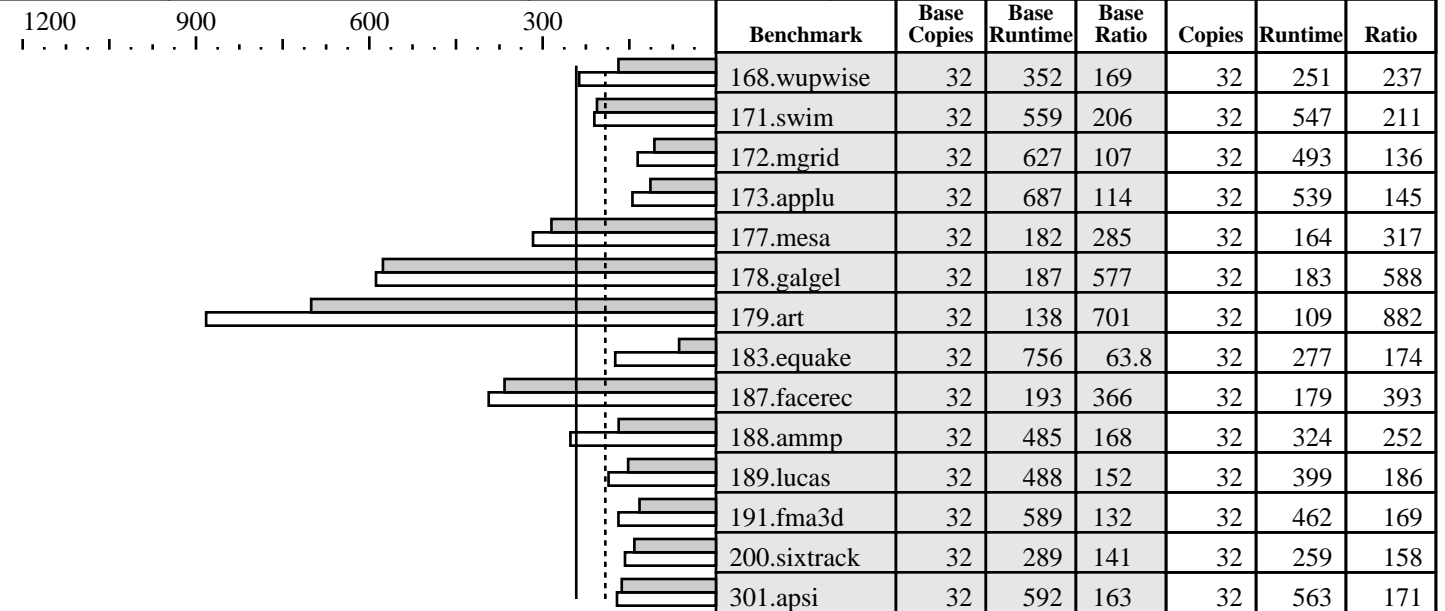
CFP2000 Result

Copyright ©1999-2004, Standard Performance Evaluation Corporation

Compaq Computer Corporation
AlphaServer GS320 Model 32 68/1001

SPECfp_rate2000 = 242
SPECfp_rate_base2000 = 191

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



Hardware

CPU: Alpha 21264C
 CPU MHz: 1001
 FPU: Integrated
 CPU(s) enabled: 32 cores, 32 chips, 1 core/chip
 CPU(s) orderable: 1 to 32
 Parallel: No
 Primary Cache: 64KB(I)+64KB(D) on chip
 Secondary Cache: 8MB off chip per CPU
 L3 Cache: None
 Other Cache: None
 Memory: 256GB
 Disk Subsystem: mfs (Memory File System)
 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: mfs
 System State: Single-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



CFP2000 Result

Copyright ©1999-2004, Standard Performance Evaluation Corporation

Compaq Computer Corporation
AlphaServer GS320 Model 32 68/1001

SPECfp_rate2000 = 242
SPECfp_rate_base2000 = 191

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

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



CFP2000 Result

Copyright ©1999-2004, Standard Performance Evaluation Corporation

Compaq Computer Corporation
AlphaServer GS320 Model 32 68/1001

SPECfp_rate2000 = 242
SPECfp_rate_base2000 = 191

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

Notes/Tuning Information (Continued)

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

```
submit = runon <cpu #> $command
sysconfigtab settings:
    max_proc_per_user = 4096
    max_threads_per_user = 4096
    per_proc_data_size = 21474836480
    max_per_proc_data_size = 21474836480
    per_proc_address_space = 21474836480
    max_per_proc_address_space = 21474836480
```

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.