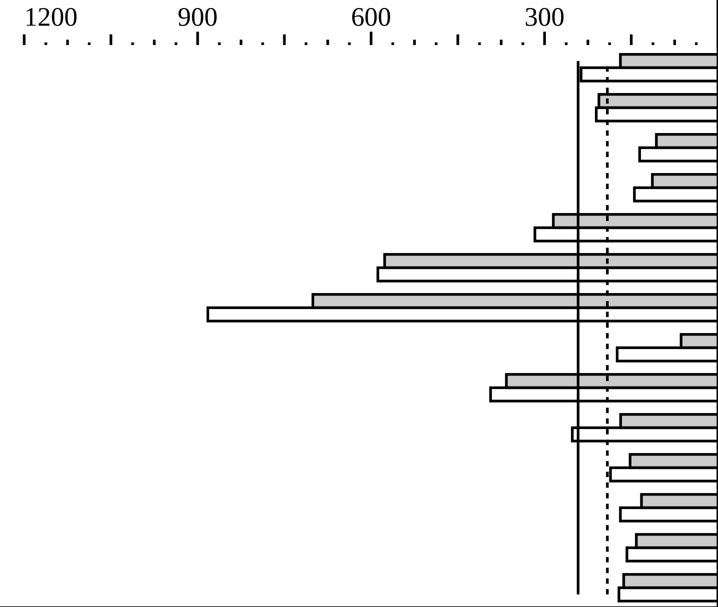
CFP2000 Result

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



Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
168.wupwise	32	352	169	32	251	237
171.swim	32	559	206	32	547	211
172.mgrid	32	627	107	32	493	136
173.applu	32	687	114	32	539	145
177.mesa	32	182	285	32	164	317
178.galgel	32	187	577	32	183	588
179.art	32	138	701	32	109	882
183.equake	32	756	63.8	32	277	174
187.facerec	32	193	366	32	179	393
188.ammp	32	485	168	32	324	252
189.lucas	32	488	152	32	399	186
191.fma3d	32	589	132	32	462	169
200.sixtrack	32	289	141	32	259	158
301.apsi	32	592	163	32	563	171

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
```

Notes/Tuning Information (Continued)

```
      187.facerec: f90 -fast -O4 +PFB
         188.ammp: 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://ftp1.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.
```