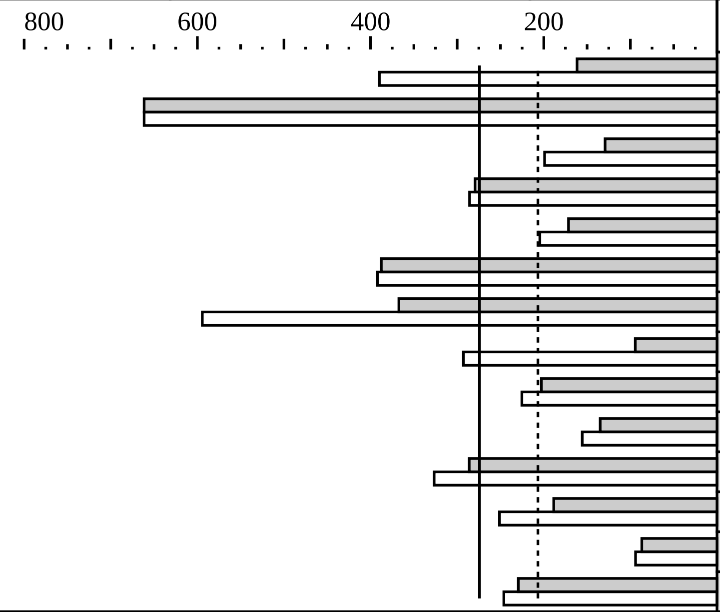
CFP2000 Result

Hewlett-Packard Company
AlphaServer GS1280 7/1150

SPECfp_rate2000 = 274
SPECfp_rate_base2000 = 207

SPEC license #: 2	Tested by: HP	Test date: Dec-2002	Hardware Avail: Jan-2003	Software Avail: Jan-2003



Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
168.wupwise	16	184	162	16	76.2	390
171.swim	16	87.0	661	16	87.0	661
172.mgrid	16	259	129	16	168	199
173.applu	16	139	279	16	136	286
177.mesa	16	152	171	16	127	205
178.galgel	16	139	388	16	137	392
179.art	16	131	367	16	81.2	594
183.equake	16	256	94.3	16	82.4	293
187.facerec	16	174	203	16	157	225
188.ammp	16	303	135	16	262	156
189.lucas	16	130	286	16	114	327
191.fma3d	16	207	189	16	155	251
200.sixtrack	16	235	86.8	16	217	94.0
301.apsi	16	210	229	16	196	246

Hardware

CPU:	Alpha 21364
CPU MHz:	1150
FPU:	Integrated
CPU(s) enabled:	16 cores, 16 chips, 1 core/chip
CPU(s) orderable:	2 to 16
Parallel:	No
Primary Cache:	64KB(I)+64KB(D) on chip
Secondary Cache:	1.75MB on chip per CPU
L3 Cache:	None
Other Cache:	None
Memory:	128GB
Disk Subsystem:	HSV
Other Hardware:	None

Software

Operating System:	Tru64 UNIX V5.1B (Rev. 2650) +IPK
Compiler:	Compaq C V6.5-011-48C5K Spike V5.2 (506A) Compaq Fortran V5.5-2602-48C8L Compaq Fortran 77 V5.5-2602-48C8L KAP Fortran V4.3 k3105171 000607 KAP Fortran 77 V4.1 k310440 980926 KAP C V4.1 k010726 000607
File System:	AdvFS
System State:	Multi-user

Notes/Tuning Information

```
Baseline   C: cc  -arch ev7 -fast -O4 ONESTEP
     Fortran: f90 -arch ev7 -fast -O5 ONESTEP

 Peak:
  All use: -arch ev7 -non_shared ONESTEP
  except these (which use only the tunings shown below):
      173.applu 188.ammp 191.fma3d

  Individual benchmark tuning:
  168.wupwise: kf77 -call_shared -inline all -tune ev67
               -unroll 12 -automatic -align commons -arch ev67
               -fkapargs=' -aggressive=c -fuse
               -fuselevel=1 -so=2 -r=1 -o=1 -interleave
               -ur=6 -ur2=060 ' +PFB
      171.swim: same as base
     172.mgrid: kf90 -call_shared -arch generic -O5 -inline
                manual -nopipeline -transform_loops -unroll 9 -automatic
```

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Notes/Tuning Information (Continued)

```
                 -fkapargs='-aggressive=a -fuse -interleave
                 -ur=2 -ur3=5 -cachesize=128,16000 ' +PFB
     173.applu: kf90  -O5 -transform_loops
                -fkapargs=' -o=0 -nointerleave -ur=14
                -ur2=260 -ur3=18' +PFB
      177.mesa: kcc -fast -O4 +CFB +IFB
    178.galgel: f90 -O5 -fast -unroll 5 -automatic
       179.art: kcc  -assume whole_program -ldensemalloc
                -call_shared -assume restricted_pointers
                -unroll 16 -inline none -ckapargs='
                -fuse -fuselevel=1 -ur=3' +PFB
    183.equake: cc -call_shared -arch generic -fast -O4
                -ldensemalloc -assume restricted_pointers
                -inline speed -unroll 13 -xtaso_short +PFB
   187.facerec: f90 -O4 -nopipeline -inline all
                -non_shared -speculate all -unroll 7
                -automatic -assume accuracy_sensitive
                -math_library fast +IFB
      188.ammp: cc -arch host -O4 -ifo -assume nomath_errno
                -assume trusted_short_alignment -fp_reorder
                -readonly_strings -ldensemalloc -xtaso_short
                -assume restricted_pointers -unroll 9
                -inline speed +CFB +IFB +PFB
     189.lucas: kf90 -O5 -fkapargs='-ur=1' +PFB
     191.fma3d: kf90 -arch ev6 -non_shared -O4 -transform_loops
                -fkapargs='-cachesize=128,16000 ' +PFB
  200.sixtrack: f90 -fast -O5 -assume accuracy_sensitive
                -notransform_loops +PFB
      301.apsi: kf90 -O5 -inline none -call_shared -speculate all
                -align commons -fkapargs=' -aggressive=ab
                -tune=ev5 -fuse -ur=1 -ur2=60 -ur3=20
                -cachesize=128,16000'
```

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
```

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Notes/Tuning Information (Continued)

```
            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.

     vm:
             vm_bigpg_enabled = 1
             vm_bigpg_thresh=16
             vm_swap_eager = 0

     proc:
             max_per_proc_address_space = 0x40000000000
             max_per_proc_data_size = 0x40000000000
             max_per_proc_stack_size = 0x40000000000
             max_proc_per_user = 2048
             max_threads_per_user = 0
             maxusers = 16384
             per_proc_address_space = 0x40000000000
             per_proc_data_size = 0x40000000000
             per_proc_stack_size = 0x40000000000


     Portability: galgel: -fixed

     Information on UNIX V5.1B Patches can be found at
     http://ftp1.service.digital.com/public/unix/v5.1b/

     Processes were bound to CPUs using 'runon'.

     HSV controller with 8 striped 36GB disks.
```