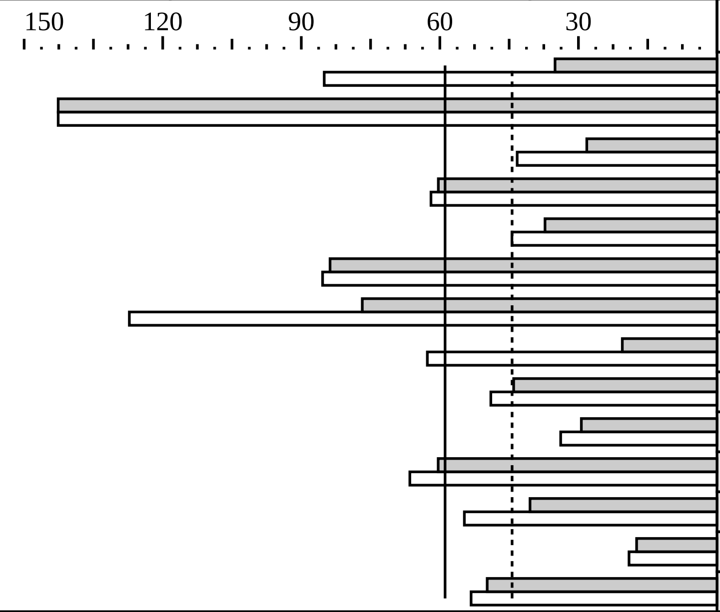
CFP2000 Result

Hewlett-Packard Company
AlphaServer ES80 7/1000

SPECfp_rate2000 = 58.9
SPECfp_rate_base2000 = 44.4

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	4	212	35.1	4	87.3	85.0
171.swim	4	101	143	4	101	143
172.mgrid	4	296	28.2	4	193	43.3
173.applu	4	162	60.3	4	157	61.9
177.mesa	4	174	37.2	4	146	44.4
178.galgel	4	161	83.8	4	158	85.4
179.art	4	157	76.8	4	94.8	127
183.equake	4	294	20.5	4	96.2	62.7
187.facerec	4	200	44.0	4	180	49.0
188.ammp	4	348	29.4	4	302	33.8
189.lucas	4	154	60.4	4	140	66.5
191.fma3d	4	241	40.5	4	178	54.7
200.sixtrack	4	293	17.4	4	268	19.0
301.apsi	4	242	49.8	4	227	53.2

Hardware

CPU:	Alpha 21364
CPU MHz:	1000
FPU:	Integrated
CPU(s) enabled:	4 cores, 4 chips, 1 core/chip
CPU(s) orderable:	2 to 8
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:	16GB
Disk Subsystem:	36GB SCSI
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:	ufs
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
```

Notes/Tuning Information (Continued)

```
                 manual -nopipeline -transform_loops -unroll 9 -automatic
                 -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"):
```

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Notes/Tuning Information (Continued)

```
          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.

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/
```