CFP2000 Result

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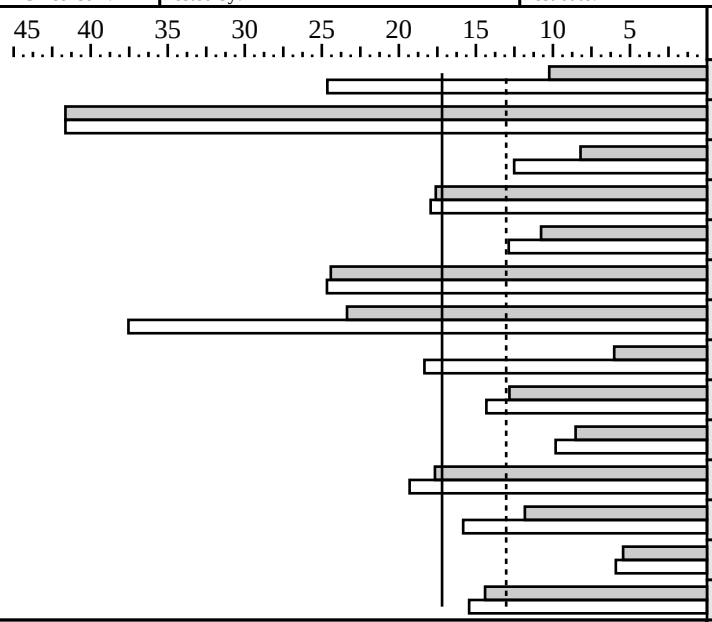
Hewlett-Packard Company
AlphaServer GS1280 7/1150

SPECfp_rate2000 = 17.2

SPECfp_rate_base2000 = 13.0

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	1	181	10.2	1	75.3	24.6
171.swim	1	86.4	41.6	1	86.4	41.6
172.mgrid	1	254	8.21	1	167	12.5
173.applu	1	138	17.6	1	136	17.9
177.mesa	1	151	10.8	1	126	12.9
178.galgel	1	138	24.4	1	136	24.7
179.art	1	129	23.4	1	80.3	37.5
183.equake	1	250	6.02	1	82.2	18.3
187.facerec	1	172	12.8	1	154	14.3
188.ammp	1	299	8.53	1	260	9.82
189.lucas	1	131	17.7	1	120	19.3
191.fma3d	1	206	11.8	1	154	15.8
200.sixtrack	1	234	5.44	1	216	5.92
301.apsi	1	209	14.4	1	195	15.4

Hardware

CPU:	Alpha 21364
CPU MHz:	1150
FPU:	Integrated
CPU(s) enabled:	1 core, 1 chip, 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:	4GB
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
               manual -nopipeline -transform_loops -unroll 9 -automatic
```

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'.

In the GS1280, there are two CPUs per shelf. Each CPU
has its own 4GB of memory. Neither of the CPUs can be
physically removed. For 1 CPU result measurements,
one CPU was turned off at boot time using the
/etc/sysconfigtab setting "cpu_enabled_mask=0". The
second CPU's 4GB of memory was also physically removed.
```