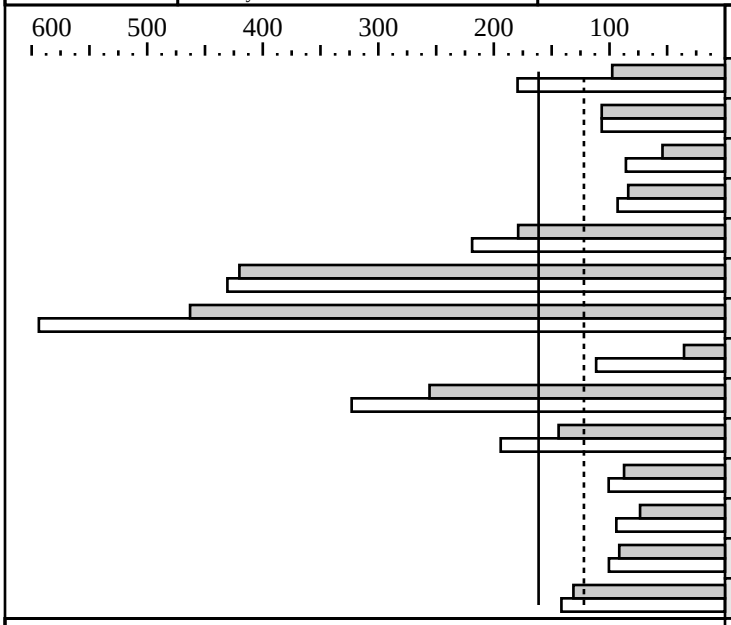
CFP2000 Result

Hewlett-Packard Company
hp AlphaServer GS160 68/1224

SPECfp_rate2000 = 161

SPECfp_rate_base2000 = 122

SPEC license #: 2 | Tested by: HP | Test date: Sep-2002 | Hardware Avail: Aug-2002 | Software Avail: Dec-2002



Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
168.wupwise	16	304	97.6	16	165	180
171.swim	16	539	107	16	539	107
172.mgrid	16	618	54.1	16	390	85.7
173.applu	16	465	83.7	16	419	92.9
177.mesa	16	145	179	16	119	219
178.galgel	16	128	420	16	125	431
179.art	16	104	463	16	81.3	594
183.equake	16	681	35.4	16	216	112
187.facerec	16	138	256	16	109	323
188.ammp	16	284	144	16	210	194
189.lucas	16	425	87.4	16	369	101
191.fma3d	16	530	73.5	16	414	94.0
200.sixtrack	16	223	91.5	16	203	100
301.apsi	16	368	131	16	341	142

Hardware

CPU:	Alpha 21264C
CPU MHz:	1224
FPU:	Integrated
CPU(s) enabled:	16 cores, 16 chips, 1 core/chip
CPU(s) orderable:	1 to 16
Parallel:	No
Primary Cache:	64KB(I)+64KB(D) on chip
Secondary Cache:	16MB off chip per CPU
L3 Cache:	None
Other Cache:	None
Memory:	32GB
Disk Subsystem:	mfs (Memory File System)
Other Hardware:	None

Software

Operating System:	Tru64 UNIX T5.1B
Compiler:	Compaq C V6.5-011-48C5K Spike V5.2 (506 48C5K) Compaq Fortran V5.5-1877-48BBF Compaq Fortran 77 V5.5-1877-48BBF KAP Fortran V4.4 k340504 20010517 KAP Fortran 77 V4.1 k310440 980926 KAP C V4.2 k010737S 010515
File System:	mfs
System State:	Multi-user

Notes/Tuning Information

```
Baseline   C: cc  -arch ev6 -fast -O4 ONESTEP
     Fortran: f90 -arch ev6 -fast -O5 ONESTEP


Peak:
  All use -arch ev6 -non_shared ONESTEP (except applu and ammp)
  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 -unroll 9 -automatic -transform_loops
                -fkapargs='-aggressive=a -fuse -interleave
                -ur=2 -ur3=5 -cachesize=128,16000 ' +PFB
```

Notes/Tuning Information (Continued)

```
      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 -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
                spike oldexe -feedback oldexe -o ${baseexe}

    +PFB: Prefetches are improved by the post-link-time optimizer
```

Notes/Tuning Information (Continued)

```
        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 = 64
            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
    submit = runon cpu
```