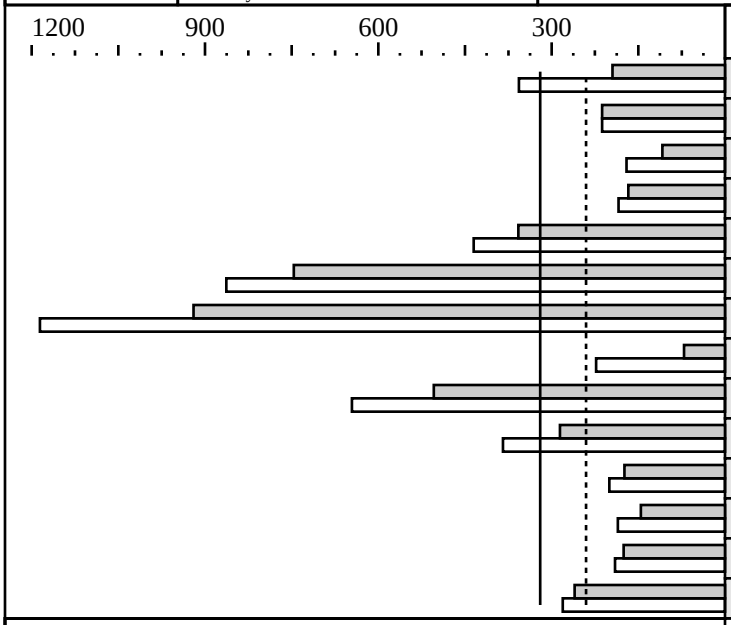
CFP2000 Result

Hewlett-Packard Company
hp AlphaServer GS320 68/1224

SPECfp_rate2000 = 320

SPECfp_rate_base2000 = 241

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	32	305	195	32	167	357
171.swim	32	541	213	32	541	213
172.mgrid	32	617	108	32	392	170
173.applu	32	466	167	32	423	184
177.mesa	32	145	358	32	119	435
178.galgel	32	144	746	32	125	863
179.art	32	105	920	32	81.4	1186
183.equake	32	681	70.9	32	216	223
187.facerec	32	140	504	32	109	645
188.ammp	32	286	286	32	213	384
189.lucas	32	427	174	32	371	200
191.fma3d	32	535	146	32	420	185
200.sixtrack	32	233	175	32	215	190
301.apsi	32	371	260	32	344	281

Hardware

CPU:	Alpha 21264C
CPU MHz:	1224
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:	16MB off chip per CPU
L3 Cache:	None
Other Cache:	None
Memory:	128GB
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=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
    submit = runon cpu
```