# CFP2000 Result

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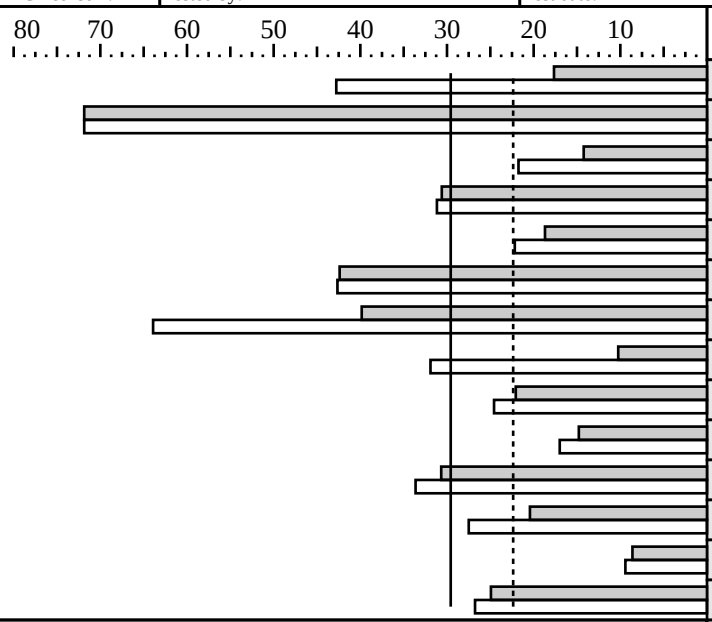
## Hewlett-Packard Company
## AlphaServer ES47 7/1000

SPECfp_rate2000 = 29.6

SPECfp_rate_base2000 = 22.4

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 | 2 | 210 | 17.7 | 2 | 86.8 | 42.8 |
| 171.swim | 2 | 100 | 71.9 | 2 | 100 | 71.9 |
| 172.mgrid | 2 | 294 | 14.2 | 2 | 192 | 21.8 |
| 173.applu | 2 | 159 | 30.6 | 2 | 156 | 31.2 |
| 177.mesa | 2 | 174 | 18.7 | 2 | 146 | 22.2 |
| 178.galgel | 2 | 159 | 42.4 | 2 | 158 | 42.6 |
| 179.art | 2 | 151 | 39.8 | 2 | 94.4 | 63.9 |
| 183.equake | 2 | 294 | 10.2 | 2 | 94.5 | 31.9 |
| 187.facerec | 2 | 200 | 22.1 | 2 | 179 | 24.6 |
| 188.ammp | 2 | 345 | 14.8 | 2 | 300 | 17.0 |
| 189.lucas | 2 | 151 | 30.7 | 2 | 138 | 33.6 |
| 191.fma3d | 2 | 238 | 20.4 | 2 | 177 | 27.5 |
| 200.sixtrack | 2 | 297 | 8.60 | 2 | 271 | 9.42 |
| 301.apsi | 2 | 242 | 24.9 | 2 | 225 | 26.8 |

### Hardware

| | |
|---|---|
| CPU: | Alpha 21364 |
| CPU MHz: | 1000 |
| FPU: | Integrated |
| CPU(s) enabled: | 2 cores, 2 chips, 1 core/chip |
| CPU(s) orderable: | 2 to 4 |
| 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: | 8GB |
| Disk Subsystem: | 36GB SCSI |
| Other Hardware: | None |

### Software

| | |
|---|---|
| Operating System: | Tru64 UNIX V5.1B (Rev. 2650)<br>+IPK |
| Compiler: | Compaq C V6.5-011-48C5K<br>Spike V5.2 (506A)<br>Compaq Fortran V5.5-2602-48C8L<br>Compaq Fortran 77 V5.5-2602-48C8L<br>KAP Fortran V4.3 k3195171 000607<br>KAP Fortran 77 V4.1 k310440 980926<br>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/
```