



CFP2000 Result

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Hewlett-Packard Company
hp AlphaServer GS320 68/1224

SPECfp2000 = NC
SPECfp_base2000 = NC

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

SPEC has determined that this result was not in compliance with the SPEC CPU2000 run and reporting rules. Specifically, the submitter has reported that the 3 month availability requirement in the SPEC CPU2000 run rules will not be met due to a change in availability date for the operating system.

Benchmark	Reference Time	Base Runtime	Base Ratio	Runtime	Ratio
168.wupwise	1600	NC	NC	NC	NC
171.swim	3100	NC	NC	NC	NC
172.mgrid	1800	NC	NC	NC	NC
173.applu	2100	NC	NC	NC	NC
177.mesa	1400	NC	NC	NC	NC
178.galgel	2900	NC	NC	NC	NC
179.art	2600	NC	NC	NC	NC
183.quake	1300	NC	NC	NC	NC
187.facerec	1900	NC	NC	NC	NC
188.ampp	2200	NC	NC	NC	NC
189.lucas	2000	NC	NC	NC	NC
191.fma3d	2100	NC	NC	NC	NC
200.sixtrack	1100	NC	NC	NC	NC
301.apsi	2600	NC	NC	NC	NC

Hardware

CPU: Alpha 21264C
CPU MHz: 1224
FPU: Integrated
CPU(s) enabled: 1 core, 1 chip, 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: 16GB
Disk Subsystem: 9GB Hard Drive
Other Hardware: None

Software

Operating System: Compaq Tru64 UNIX T5.1B-6 (Rev. 2610)
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: ufs
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)



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Notes/Tuning Information (Continued)

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
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.quake: 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:



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Notes/Tuning Information (Continued)

+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 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
```



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Notes/Tuning Information (Continued)

proc:

```
max_per_proc_address_space = 0x400000000000
max_per_proc_data_size = 0x400000000000
max_per_proc_stack_size = 0x400000000000
max_proc_per_user = 2048
max_threads_per_user = 0
maxusers = 16384
per_proc_address_space = 0x400000000000
per_proc_data_size = 0x400000000000
per_proc_stack_size = 0x400000000000
```

```
Portability: galgel: -fixed
submit = runon cpu
System is single QBB (4-cpu) with only 1 cpu enabled at console
```

```
Submitted_by: "Craig, Steve" <Steve.Craig@hp.com>
Submitted: Mon Sep 9 14:45:51 2002
Submission: cpu2000-20020909-01623.sub
```