**CFP2000 Result**

Hewlett-Packard Company  
hp AlphaServer GS160 68/1224  

**SPECfp2000 = NC**  
**SPECfp_base2000 = NC**

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.

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Reference</th>
<th>Base Time</th>
<th>Base Runtime</th>
<th>Base Ratio</th>
<th>Runtime</th>
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<tbody>
<tr>
<td>168.wupwise</td>
<td>1600</td>
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<td>179.art</td>
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</tbody>
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**Hardware**

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

**Software**

- **Operating System:** Compaq Tru64 UNIX T5.1B-6 (Rev. 2610)
- **Compiler:**
  - **C:** Compaq C V6.5-011-48C5K
  - **Fortran:** Spike V5.2 (506 48C5K)
  - **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=-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 -05 -transform_loops
-fkapargs=' -o=0 -pointerleave -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 -fkapargs=' -fuse -fuselevel=1 -ur3=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 -05 -fkapargs=' -ur=1 ' +PFB

191.fma3d: kf90 -04 -transform_loops -fkapargs=' -cachesize=128,16000 ' +PFB

200.sixtrack: f90 -fast -O5 -assume accuracy_sensitive
-notransform_loops +PFB

301.apsi: kf90 -05 -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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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.

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 14:45:20 2002
Submission: cpu2000-20020909-01622.sub