



CFP2000 Result

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Hewlett-Packard Company
hp AlphaServer GS80 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 | 1 | 2 | 3 | 4 | 5 |
|--------------|----------------|--------------|------------|---------|-------|---|---|---|---|---|
| 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.amp | 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 8
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 14:44:17 2002
Submission: cpu2000-20020909-01621.sub
```