



# CFP2000 Result

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Hewlett-Packard Company  
AlphaServer GS1280 7/1300

SPECfp2000 = 1684

SPECfp\_base2000 = 1279

SPEC license #: 2 Tested by: HP Test date: Jun-2004 Hardware Avail: Aug-2004 Software Avail: Jul-2004

Benchmark	Reference Time	Base Runtime	Base Ratio	Runtime	Ratio	
168.wupwise	1600	159	1004	66.7	2400	
171.swim	3100	76.0	4080	76.0	4080	
172.mgrid	1800	223	807	148	1214	
173.applu	2100	123	1706	114	1849	
177.mesa	1400	134	1042	117	1195	
178.galgel	2900	122	2386	120	2418	
179.art	2600	114	2289	71.1	3654	
183.earthquake	1300	217	598	72.4	1795	
187.facerec	1900	151	1258	135	1406	
188.amp	2200	263	836	228	965	
189.lucas	2000	117	1710	106	1878	
191.fma3d	2100	182	1154	136	1542	
200.sixtrack	1100	199	553	184	599	
301.apsi	2600	183	1419	173	1506	

### Hardware

CPU: Alpha 21364  
CPU MHz: 1300  
FPU: Integrated  
CPU(s) enabled: 1 core, 1 chip, 1 core/chip  
CPU(s) orderable: 2 to 64  
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: 2GB per CPU; 256MB RIMMs  
Disk Subsystem: AdvFS  
Other Hardware: None

### Software

Operating System: Tru64 UNIX V5.1B-1 + PK4  
Compiler: Compaq C V6.5-011-48C5K  
Program Analysis Tools V2.0  
Spike V5.2 (510 USG)  
HP Fortran V5.5A-3548-48D88  
HP Fortran 77 V5.5A-3548-48D88  
KAP Fortran V4.3 000607  
KAP Fortran 77 V4.1 980926  
KAP C V4.1 000607  
File System: MFS, 8GB  
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 -g3 -arch ev7 -non\_shared ONESTEP  
except these (which use only the tunings shown below):  
173.applu 188.amp 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  
manual -nopipeline -transform\_loops -unroll 9 -automatic



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```

-fkparags='-aggressive=a -fuse -interleave
-ur=2 -ur3=5 -cachesize=128,16000 ' +PFB
173.applu: kf90 -O5 -transform_loops
-fkparags=' -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 -ckparags='
-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.amp: 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 -fkparags='-ur=1' +PFB
191.fma3d: kf90 -O4 -transform_loops -fkparags='-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 -fkparags=' -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_feedback -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}

```



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## Notes/Tuning Information (Continued)

+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 = 6
vm_swap_eager = 0
ubc_maxpercent = 50
```

proc:

```
max_per_proc_address_space = 34359738368
max_per_proc_data_size = 34359738368
max_per_proc_stack_size = 34359738368
max_proc_per_user = 2048
max_threads_per_user = 4096
maxusers = 2048
per_proc_address_space = 34359738368
per_proc_data_size = 34359738368
per_proc_stack_size = 34359738368
```

Portability: galgel: -fixed

Information on UNIX V5.1B Patches can be found at <http://ftpl.service.digital.com/public/unix/v5.1b/>

Processes were bound to CPUs using "runon".