



CFP2000 Result

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Hewlett-Packard Company
AlphaServer DS15/1000

SPECfp2000 = 876
SPECfp_base2000 = 682

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

Benchmark	Reference Time	Base Runtime	Base Ratio	Runtime	Ratio	
168.wupwise	1600	251	637	118	1362	
171.swim	3100	274	1133	274	1133	
172.mgrid	1800	381	472	277	650	
173.applu	2100	259	811	228	919	
177.mesa	1400	183	765	151	927	
178.galgel	2900	211	1375	178	1628	
179.art	2600	305	851	228	1138	
183.earthquake	1300	399	326	156	832	
187.facerec	1900	264	720	236	804	
188.amp	2200	447	492	380	579	
189.lucas	2000	236	848	206	970	
191.fma3d	2100	343	613	296	708	
200.sixtrack	1100	289	381	257	428	
301.apsi	2600	312	834	297	875	

Hardware

CPU: Alpha 21264C
CPU MHz: 1000
FPU: Integrated
CPU(s) enabled: 1 core, 1 chip, 1 core/chip
CPU(s) orderable: 1
Parallel: No
Primary Cache: 64KB(I)+64KB(D) on chip
Secondary Cache: 2MB
L3 Cache: None
Other Cache: None
Memory: 2GB; 512MB RIMMs
Disk Subsystem: 36GB Ultra 160 10KRPM
Other Hardware: None

Software

Operating System: Tru64 UNIX V5.1B (Rev. 2650)
+IPK
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: 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 -g3 -arch ev6 -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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Notes/Tuning Information (Continued)

```

-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".