## CFP2000 Result

**Compaq Computer Corporation**  
**AlphaServer GS80 Model 8 68/1001**  

<table>
<thead>
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<th>SPEC license #:</th>
<th>2</th>
<th>Tested by:</th>
<th>Compaq NH</th>
<th>Test date:</th>
<th>Jun-2001</th>
<th>Hardware Avail:</th>
<th>Jun-2001</th>
<th>Software Avail:</th>
<th>Aug-2001</th>
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### SPECfp_rate2000 = 60.0

### SPECfp_rate_base2000 = 48.5

<table>
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<tr>
<th>Benchmark</th>
<th>Base Copies</th>
<th>Base Runtime</th>
<th>Base Ratio</th>
<th>Copies</th>
<th>Runtime</th>
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<td>42.6</td>
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</table>

### Hardware
- CPU: Alpha 21264C  
- CPU MHz: 1001  
- FPU: Integrated  
- Number of Cores: 8  
- Number of Chips: 8  
- L2 Cache: 64KB(I)+64KB(D) on chip  
- L3 Cache: None  
- Memory: 32GB  
- Disk Subsystem: mfs (Memory File System)  
- Other Hardware: None

### Software
- Operating System: Tru64 UNIX V5.1 +Patch Kit 2  
- Compiler: Compaq C V6.4-214-46B59  
- Program Analysis Tools V2.0  
- Spike V5.2 DTK (1.461-46B5P)  
- Compaq Fortran V5.4A-1472-46B2F  
- KAP Fortran V4.3 000607  
- KAP Fortran V5.4A-196-46B2F  
- KAP Fortran V4.1 980926  
- KAP Fortran V4.1 000607  
- File System: mfs  
- System State: Single-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
  - Individual benchmark tuning:
    - 168.wupwise: kf77 -fast -O4 -pipeline -unroll 2 +PFB
    - 171.swim: f90 -fast -O5
    - 172.mgrid: kf77 -O5 -transform_loops -tune ev6 -unroll 8
    - 173.applu: f90 -fast -O5 +PFB
    - 177.mesa: cc -fast -O4 +CFB +IFB
    - 178.galgel: f90 -fast -O5
    - 179.art: kcc -fast -O4 -unroll 10 -ckapargs='-arl=4 -ur=4' +PFB
    - 183.equake: cc -fast -xtaso_short -assume restricted_pointers -all -ldensemalloc -none +PFB

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http://www.spec.org
Notes/Tuning Information (Continued)

187.facerec: f90 -fast -O4 +PFB
188.ammpp: cc -fast -O4 -xtaso_short -assume
restricted_pointers
189.lucas: kf90 -O5 -fkapargs='-ur=1' +PFB
191.fma3d: kf90 -O4 -transform_loops +PFB
200.sixtrack: f90 -fast -O5 -assume accuracy_sensitive
-nottransform_loops +PFB
301.apsi: kf90 -O5 -transform_loops -unroll 8
-fkapargs='-ur=1' +PFB

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       -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.

Portability: galgel: -fixed

Information on UNIX V5.1 Patches can be found at
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SPECfp_rate2000 = 60.0
SPECfp_rate_base2000 = 48.5

Notes/Tuning Information (Continued)


submit = runon <cpu #> $command
sysconfigtab settings:
    max_proc_per_user = 4096
    max_threads_per_user = 4096
    per_proc_data_size = 21474836480
    max_per_proc_data_size = 21474836480
    per_proc_address_space = 21474836480
    max_per_proc_address_space = 21474836480

Spike, and the Program Analysis Tools, are part of the Developers' Tool Kit Supplement, http://www.tru64unix.compaq.com/dtk/. The features used in this SPEC submission will be available at the web site as a beta kit in August, 2001, and as a production release in October, 2001. The C compiler for this SPEC submission has been available at the same location, as a production release, since May, 2001.