## CFP2000 Result

Compaq Computer Corporation
AlphaServer GS160 Model 16 68/1001

SPECfp_rate2000 = 8.76
SPECfp_rate_base2000 = 6.79

<table>
<thead>
<tr>
<th>Software</th>
<th>Operating System:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU:</td>
<td>Alpha 21264C</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>1001</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>1 core, 1 chip, 1 core/chip</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1 to 16</td>
</tr>
<tr>
<td>Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>64KB(I)+64KB(D) on chip</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>8MB off chip per CPU</td>
</tr>
<tr>
<td>L3 Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>16GB</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>mfs (Memory File System)</td>
</tr>
<tr>
<td>Other Hardware:</td>
<td>None</td>
</tr>
<tr>
<td>Notes/Tuning Information</td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>C: cc -arch ev6 -fast -O4 ONESTEP</td>
</tr>
<tr>
<td>Fortran:</td>
<td>f90 -arch ev6 -fast -O5 ONESTEP</td>
</tr>
<tr>
<td>Peak:</td>
<td>All use -g3 -arch ev6 -non_shared ONESTEP</td>
</tr>
<tr>
<td></td>
<td>Individual benchmark tuning:</td>
</tr>
<tr>
<td>168.wupwise:</td>
<td>kf77 -fast -O4 -pipeline -unroll 2 +PFB</td>
</tr>
<tr>
<td>171.swim:</td>
<td>f90 -fast -O5</td>
</tr>
<tr>
<td>172.mgrid:</td>
<td>kf77 -O5 -transform_loops -tune ev6 -unroll 8</td>
</tr>
<tr>
<td>173.applu:</td>
<td>f90 -fast -O5 +PFB</td>
</tr>
<tr>
<td>177.mesa:</td>
<td>cc -fast -O4 +CFB +IFB</td>
</tr>
<tr>
<td>178.galgel:</td>
<td>f90 -fast -O5</td>
</tr>
<tr>
<td>179.art:</td>
<td>kcc -fast -O4 -unroll 10 -ckapargs='-arl=4 -ur=4' +PFB</td>
</tr>
<tr>
<td>183.equake:</td>
<td>cc -fast -xtaso_short -assume restricted_pointers -all -ldensemalloc -none +PFB</td>
</tr>
</tbody>
</table>

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org
Notes/Tuning Information (Continued)

187. facerec: f90 -fast -O4 +PFB
188. ammp: 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
            -notransform_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
## CFP2000 Result

**Compaq Computer Corporation**  
**AlphaServer GS160 Model 16 68/1001**  

| SPECfn_rate2000 = | 8.76  
| SPECfn_rate_base2000 = | 6.79  

**SPEC license #:** 2  
**Tested by:** Compaq NH  
**Test date:** Jun-2001  
**Hardware Avail:** Jun-2001  
**Software Avail:** Aug-2001

### Notes/Tuning Information (Continued)


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.

**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