Hewlett-Packard Company
AlphaServer GS1280 7/1150

**SPEClnt_rate2000 = 313**
**SPEClnt_rate_base2000 = 285**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base Copies</th>
<th>Base Runtime</th>
<th>Base Ratio</th>
<th>Copies</th>
<th>Runtime</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>164.gzip</td>
<td>32</td>
<td>248</td>
<td>210</td>
<td>32</td>
<td>246</td>
<td>211</td>
</tr>
<tr>
<td>175.vpr</td>
<td>32</td>
<td>176</td>
<td>296</td>
<td>32</td>
<td>171</td>
<td>303</td>
</tr>
<tr>
<td>176.gcc</td>
<td>32</td>
<td>134</td>
<td>306</td>
<td>32</td>
<td>120</td>
<td>340</td>
</tr>
<tr>
<td>181.mcf</td>
<td>32</td>
<td>263</td>
<td>254</td>
<td>32</td>
<td>163</td>
<td>410</td>
</tr>
<tr>
<td>186.crafty</td>
<td>32</td>
<td>105</td>
<td>353</td>
<td>32</td>
<td>105</td>
<td>353</td>
</tr>
<tr>
<td>197.parser</td>
<td>32</td>
<td>362</td>
<td>184</td>
<td>32</td>
<td>286</td>
<td>234</td>
</tr>
<tr>
<td>252.eon</td>
<td>32</td>
<td>140</td>
<td>344</td>
<td>32</td>
<td>143</td>
<td>339</td>
</tr>
<tr>
<td>253.perlbmk</td>
<td>32</td>
<td>246</td>
<td>272</td>
<td>32</td>
<td>234</td>
<td>286</td>
</tr>
<tr>
<td>254.gap</td>
<td>32</td>
<td>179</td>
<td>228</td>
<td>32</td>
<td>160</td>
<td>256</td>
</tr>
<tr>
<td>255.vortex</td>
<td>32</td>
<td>180</td>
<td>391</td>
<td>32</td>
<td>166</td>
<td>424</td>
</tr>
<tr>
<td>256.bzip2</td>
<td>32</td>
<td>190</td>
<td>294</td>
<td>32</td>
<td>180</td>
<td>309</td>
</tr>
<tr>
<td>300.twolf</td>
<td>32</td>
<td>304</td>
<td>367</td>
<td>32</td>
<td>301</td>
<td>370</td>
</tr>
</tbody>
</table>

**Notes/Tuning Information**

**Baseline C**: cc -arch ev7 -fast +CFB ONESTEP
C++: cxx -arch ev7 -O2 ONESTEP

**Peak**: The following use: -g3 -arch ev7 ONESTEP
175.vpr 181.mcf 197.parser 253.perlbmk

The following use: -g3 -arch ev6 ONESTEP
164.gzip 176.gcc 254.gap 255.vortex 256.bzip2 300.twolf

Individual benchmark tuning:
164.gzip: -fast -O4 -non_shared +CFB
175.vpr: -fast -O4 -assume restricted_pointers +CFB
176.gcc: -fast -O4 -xtaso_short -all -ldensemalloc -none +CFB +IFB
181.mcf: -fast -xtaso_short +CFB +IFB +PFB
186.crafty: same as base
197.parser: -fast -O4 -xtaso_short -non_shared +CFB
252.eon: -arch ev7 -O2 -all -ldensemalloc -none
253.perlbmk: -fast -non_shared +CFB +IFB

Hardware
- CPU: Alpha 21364
- CPU MHz: 1150
- FPU: Integrated
- CPU(s) enabled: 32 cores, 32 chips, 1 core/chip
- CPU(s) orderable: 2 to 32
- 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: 256GB
- Disk Subsystem: HSV
- 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 (506A) Compaq C++ V6.5-028
- File System: AdvFS
- System State: Multi-user

Standard Performance Evaluation Corporation
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http://www.spec.org
CINT2000 Result
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SPECint_rate2000 = 313
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Notes/Tuning Information (Continued)

254.gap: -fast -O4 -non_shared +CFB +IFB +PFB
255.vortex: -fast -non_shared +CFB +IFB
256.bzip2: -fast -O4 -non_shared +CFB
300.twolf: -fast -O4 -ldensemalloc -non_shared +CFB +IFB

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"):

```bash
mkdir /tmp/pp
rm -f /tmp/pp/$(baseexe)*
```

and these flags are added to the first and second compiles:

```bash
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"):

```bash
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"):

```bash
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"):

```bash
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:

```bash
vm_bigpg_enabled = 1
vm_bigpg_thresh=16
vm_swap_eager = 0
```

proc:
CINT2000 Result
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Notes/Tuning Information (Continued)
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: gcc: -Dalloca=__builtin_alloca; crafty: -DALPHA
perlbmk: -DSPEC_CPU2000_DUNIX; vortex: -DSPEC_CPU2000_LP64
gap: -DSYS_HAS_CALLOC_PROTO -DSYS_IS_BSD -DSYS_HAS_IOCTL_PROTO
    -DSPEC_CPU2000_LP64

Information on UNIX V5.1B Patches can be found at

Processes were bound to CPUs using 'runon'.

HSV controller with 8 striped 36GB disks.