



# CINT2000 Result

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Hewlett-Packard Company  
AlphaServer GS1280 7/1300

SPECint\_rate2000 = 728  
SPECint\_rate\_base2000 = 661

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

Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
164.gzip	64	214	487	64	212	491
175.vpr	64	152	686	64	148	701
176.gcc	64	115	713	64	104	784
181.mcf	64	226	590	64	143	933
186.crafty	64	90.1	824	64	90.1	824
197.parser	64	310	431	64	245	546
252.eon	64	122	793	64	123	785
253.perlbnk	64	215	622	64	201	666
254.gap	64	155	528	64	138	590
255.vortex	64	156	901	64	139	1014
256.bzip2	64	160	696	64	154	724
300.twolf	64	260	856	64	256	869

Hardware	Software
CPU: Alpha 21364 CPU MHz: 1300 FPU: Integrated CPU(s) enabled: 64 cores, 64 chips, 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: 18GB Ultra 320 15KRPM Other Hardware: None	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) Compaq C++ V6.5-041 File System: AdvFS, 14x18GB, RAID0 System State: Multi-user

## Notes/Tuning Information

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

### Peak:

```

All but 252.eon: cc -g3 -arch ev7 ONESTEP
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: cxx -arch ev7 -O2 -all -ldensemalloc -none
253.perlbnk: -fast -non_shared +CFB +IFB
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

```



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## Notes/Tuning Information (Continued)

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}
```

+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
```



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```
per_proc_address_space = 34359738368  
per_proc_data_size = 34359738368  
per_proc_stack_size = 34359738368
```

```
Portability: gcc: -Dalloca=__builtin_alloca; crafty: -DALPHA  
perlbnk: -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  
<http://ftpl.service.digital.com/public/unix/v5.1b/>

Processes were bound to CPUs using "runon".