



OMPM2001 Result

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Hewlett-Packard Company
AlphaServer GS1280 Model M16

SPECompMpeak2001 = 6824

SPECompMbase2001 = 6027

SPEC license #HPG2116 Tested by: Hewlett-Packard Company Test site: Hewlett-Packard Company Test date: Dec-2002 Hardware Avail: Jan-2003 Software Avail: Jan-2003

| Benchmark | Reference Time | Base Runtime | Base Ratio | Peak Runtime | Peak Ratio | |
|------------------|----------------|--------------|------------|--------------|------------|--|
| 310.wupwise_m | 6000 | 1191 | 5036 | 711 | 8435 | |
| 312.swim_m | 6000 | 279 | 21529 | 279 | 21521 | |
| 314.mgrid_m | 7300 | 912 | 8000 | 895 | 8156 | |
| 316.applu_m | 4000 | 394 | 10158 | 378 | 10591 | |
| 318.galgel_m | 5100 | 593 | 8597 | 606 | 8411 | |
| 320.earthquake_m | 2600 | 585 | 4448 | 580 | 4485 | |
| 324.apsi_m | 3400 | 519 | 6549 | 521 | 6529 | |
| 326.gafort_m | 8700 | 1826 | 4765 | 1700 | 5118 | |
| 328.fma3d_m | 4600 | 990 | 4649 | 942 | 4884 | |
| 330.art_m | 6400 | 2401 | 2665 | 1215 | 5266 | |
| 332.ammp_m | 7000 | 2394 | 2924 | 2380 | 2942 | |

Hardware

CPU: Alpha 21364
 CPU MHz: 1150
 FPU: Integrated
 CPU(s) enabled: 16
 CPU(s) orderable: 2 to 16 by 2
 Primary Cache: 64KB(I)+64KB(D) on chip
 Secondary Cache: 1.75MB on chip per CPU
 L3 Cache: None
 Other Cache: None
 Memory: 64GB
 Disk Subsystem: 36GB 10k rpm ufs
 Other Hardware: None

Software

OpenMP Threads: 4
 Parallel: OpenMP
 Operating System: Tru64 UNIX V5.1B (Rev 2650) + IPK
 Compiler: Compaq Fortran X5.5-2602-48C8L
 Compaq C V6.5-011-48C5K
 BETA DCPI - 3.9.6 (20020307 1815)
 SPIKE V5.2 (503DTK) GEM 48C5S LIBMLD 2.4 DATE APR 9 2002
 File System: ufs
 System State: Multi-user

Notes/Tuning Information

Base:

```
cc -arch ev7 -fast -omp -O4
f90 -arch ev7 -fast -omp -O5
```

Peak:

All use -arch ev7 -omp ONESTEP

Individual benchmark tuning:

```
310.wupwise_m: f90 -call_shared -inline all -unroll 12 -align commons +PFB
312.swim_m: f90 -arch ev7 -fast -omp -O5
314.mgrid_m: f90 -O5 -transform_loops -tune ev7 -unroll 8 +PFB
316.applu_m: f90 -fast -O5 -unroll 14 +PFB
318.galgel_m: f90 -fast -O5 -unroll 5 -extend_source +PFB
320.earthquake_m: cc -fast -call_shared -O4 -ldensemalloc -assume restricted_pointers -inline speed -unroll 13 +PFB
324.apsi_m: f90 -O5 -transform_loops -unroll 8 +PFB
326.gafort_m: f90 -fast -O5 -arch ev67 -tune ev67
328.fma3d: f90 -O4 -transform_loops
330.art_m: cc -assume whole_program -ldensemalloc -call_shared -assume restricted_pointers -fast -O4 -unroll 16 -inline none +PFB
332.ammp_m: cc -O4 -ifo -assume nomath_errno -assume trusted_short_alignment -fp_reorder -readonly_strings -ldensemalloc -assume restricted_pointers -unroll 9
```

Portability:

318.galgel_m: -exend_source used in base and peak.

Peak Source:

Available as SPEC OPM source: ompm2001-srcl32bit-20020831.tar.gz



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Notes/Tuning Information (Continued)

For 310.wupwise_m, 312.swim_m, 314.mgrid_m, 316.applu_m, 320.quake_m
324.apsi-m, 326.gafort_m, and 328.fma3d_m

Available as SPEC OPM source: ompm2001-isoc-20020619.tar.gz
For 330.art_m

User Environment:

```
MP_STACK_SIZE = 10000000
OMP_NUM_THREADS=4
PTHREAD_CONFIG=feature=def-scs,d4-scs
4 CPU processor set used (man processor_sets)
Restricts memory accessible to 16 GB
Cpus 0,1,2,3 used.
```

System tunables:

```
4Mb pages used - vm_bigpg_enabled set in sysconfigtab
```

Description of +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 -rf db
mkdir db
dcpid -no_palcode ./db
```

A training run is carried out (in phase "fdo_runN"), and then these commands (in phase "fdo_postN"):

```
dcpiquit
dcpibbb -make-bbdb -pm all -counts -conf_low -db ./db ${baseexe}
spike ${baseexe} -feedback ${baseexe} -o newexe
rm ${baseexe}
mv newexe ${baseexe}
```

Information on UNIX V5.1 Patches can be found at
<http://www.support.compaq.com/patches>

Information on DCPI and SPIKE can be found at
<http://www.tru64unix.compaq.com/dtk>