



# OMPM2001 Result

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Hewlett-Packard Company  
AlphaServer GS1280 Model M16

SPECompMpeak2001 = 6324  
SPECompMbase2001 = 5482

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	1105	5432	661	9083	
312.swim_m	6000	287	20906	287	20928	
314.mgrid_m	7300	914	7987	895	8158	
316.applu_m	4000	501	7976	453	8831	
318.galgel_m	5100	870	5862	896	5693	
320.earthquake_m	2600	521	4990	510	5095	
324.apsi_m	3400	869	3911	852	3988	
326.gafort_m	8700	1870	4653	1726	5041	
328.fma3d_m	4600	978	4705	931	4941	
330.art_m	6400	2171	2948	988	6481	
332.ammp_m	7000	2782	2516	2769	2528	

### 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-src132bit-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:

```
8Kb pages used - default
```

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>