



# CINT2000 Result

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SGI

SGI Origin 3400 16X 600MHz R14k

SPECint\_rate2000 = 91.6

SPECint\_rate\_base2000 = 88.6

SPEC license #: 4 | Tested by: SGI | Test date: Feb-2002 | Hardware Avail: Jan-2002 | Software Avail: Nov-2001

Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
164.gzip	16	437	59.4	16	422	61.6
175.vpr	16	249	105	16	236	110
176.gcc	16	249	81.9	16	250	81.6
181.mcf	16	237	141	16	237	141
186.crafty	16	199	93.1	16	205	90.7
197.parser	16	442	75.5	16	420	79.6
252.eon	16	255	94.6	16	235	103
253.perlbnk	16	489	68.4	16	488	68.4
254.gap	16	378	54.1	16	371	55.0
255.vortex	16	287	123	16	252	140
256.bzip2	16	306	91.0	16	289	96.5
300.twolf	16	466	119	16	466	119

### Hardware

CPU: R14000  
 CPU MHz: 600  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 16 chips, 1 core/chip  
 CPU(s) orderable: 4-32  
 Parallel: No  
 Primary Cache: 32KBI + 32KBD on chip  
 Secondary Cache: 8MB(I+D) off chip  
 L3 Cache: N/A  
 Other Cache: N/A  
 Memory: 16 GB  
 Disk Subsystem: 1 x 18 GB FC, 4 x 18 GB FC (striped)  
 Other Hardware: None

### Software

Operating System: IRIX 6.5.14m  
 Compiler: MIPSpro 7.3.1.3m C, C++  
 SCSSL 1.4 Math Library  
 File System: xfs  
 System State: Single-user

## Notes/Tuning Information

Baseline optimization flags (C and C++ use same flags):

PASS1 : -Ofast=ip35 -IPA:use\_intrinsic -fb\_create /tmp/SPEC2000/FBDIR/base/\$(EXEBASE)

PASS2 : -Ofast=ip35 -IPA:use\_intrinsic -fb\_opt /tmp/SPEC2000/FBDIR/base/\$(EXEBASE)

Portability Flags:

176.gcc: -Dalloca=\_\_builtin\_alloca -DMIPS -DHOST\_WORDS\_BIG\_ENDIAN

186.crafty: -DSGI

253.perlbnk: -DSPEC\_CPU2000\_SGI -DI\_FCNTL

252.eon: -lm

254.gap: -DSYS\_IS\_USG -DSYS\_HAS\_TIME\_PROTO -DSYS\_HAS\_SIGNAL\_PROTO -DSYS\_HAS\_IOCTL\_PROTO  
-DSYS\_HAS\_ANSI -DSYS\_HAS\_CALLOC\_PROTO

300.twolf: -DHAVE\_SIGNED\_CHAR

Peak optimization flags:

note: all occurrences of (FEEDBACK) below means compiled with a two-step process:

PASS1 = -fb\_create /tmp/SPEC2000/FBDIR\_peak/\$(EXEBASE)

PASS2 = -fb\_opt /tmp/SPEC2000/FBDIR\_peak/\$(EXEBASE)

164.gzip: -Ofast=ip35 -IPA:space=500:plimit=500 -lmalloc (FEEDBACK)

175.vpr: -Ofast=ip35 -IPA:space=300:plimit=10000:callee\_limit=5000:linear=on

. -LNO:prefetch Ahead=2 -INLINE:aggressive=on

. -OPT:Olimit=0:alias=disjoint:alias=restrict -CG:ld\_latency=10 -lmalloc (FEEDBACK)

181.mcf: basepeak=yes

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## Notes/Tuning Information (Continued)

```

176.gcc: -Ofast=ip35 -CG:ld_latency=4 (FEEDBACK)
186.crafty: -Ofast=ip35 -LNO:prefetch=0 -OPT:goto=off -CG:ld_latency=4 -lmalloc (FEEDBACK)
197.parser: -Ofast=ip35 -IPA:min_hot=14 (FEEDBACK)
252.eon: -Ofast=ip35 -LNO:prefetch=0 -LANG:exceptions=off -CG:ld_latency=4 -lmalloc -lm
      (FEEDBACK)
253.perlbnk: -Ofast=ip35 -IPA:use_intrinsic -Wl,-x (FEEDBACK)
254.gap: -Ofast=ip35 -IPA:use_intrinsic -OPT:unroll_analysis=off:unroll_size=0:unroll_times_max=4
      -OPT:alias=restrict:alias=disjoint -IPA:min_hot=7 -CG:ld_latency=8 -lmalloc (FEEDBACK)
255.vortex: -Ofast=ip35 -IPA:use_intrinsic
      -OPT:unroll_analysis=off:unroll_size=0:unroll_times_max=4 -LNO:opt=0 -CG:ld_latency=5
      -IPA:min_hot=14 -TENV:X=4 -IPA:space=500:plimit=3600 -OPT:goto=off (FEEDBACK)
256.bzip2: -Ofast=ip35 -IPA:min_hot=5:space=500:plimit=2900 -INLINE:aggressive=on (FEEDBACK)
300.twolf: basepeak=yes

```

The following O/S parameters were set:

```

setenv PAGESIZE_DATA 4096 ; setenv PAGESIZE_TEXT 4096 ; setenv PAGESIZE_STACK 4096
system -i ; percent_totalmem_4m_pages = 40 ; percent_totalmem_1m_pages = 7
system -i ; percent_totalmem_256k_pages = 7 ; percent_totalmem_64k_pages = 7
system -i ; r12k_bdiag = 0x4000000
limit stacksize 500000

```

The following is done before building each benchmark that requires (FEEDBACK):

```
rm -rf /tmp/SPEC2000/FBDIR_peak/$baseexe ; mkdir -p /tmp/SPEC2000/FBDIR_peak/$baseexe
```

Jobs are submitted using dplace. Contents of the placement file submit.pf:

```
memories 1 in topology physical near $NODE
```

```
threads 1
```

```
run thread 0 on memory 0 using cpu $CPU
```

The first disk mentioned in the Disk Subsystem is the system disk. A striped XFS filesystem was created using the rest of the disks and the benchmark was run on this.