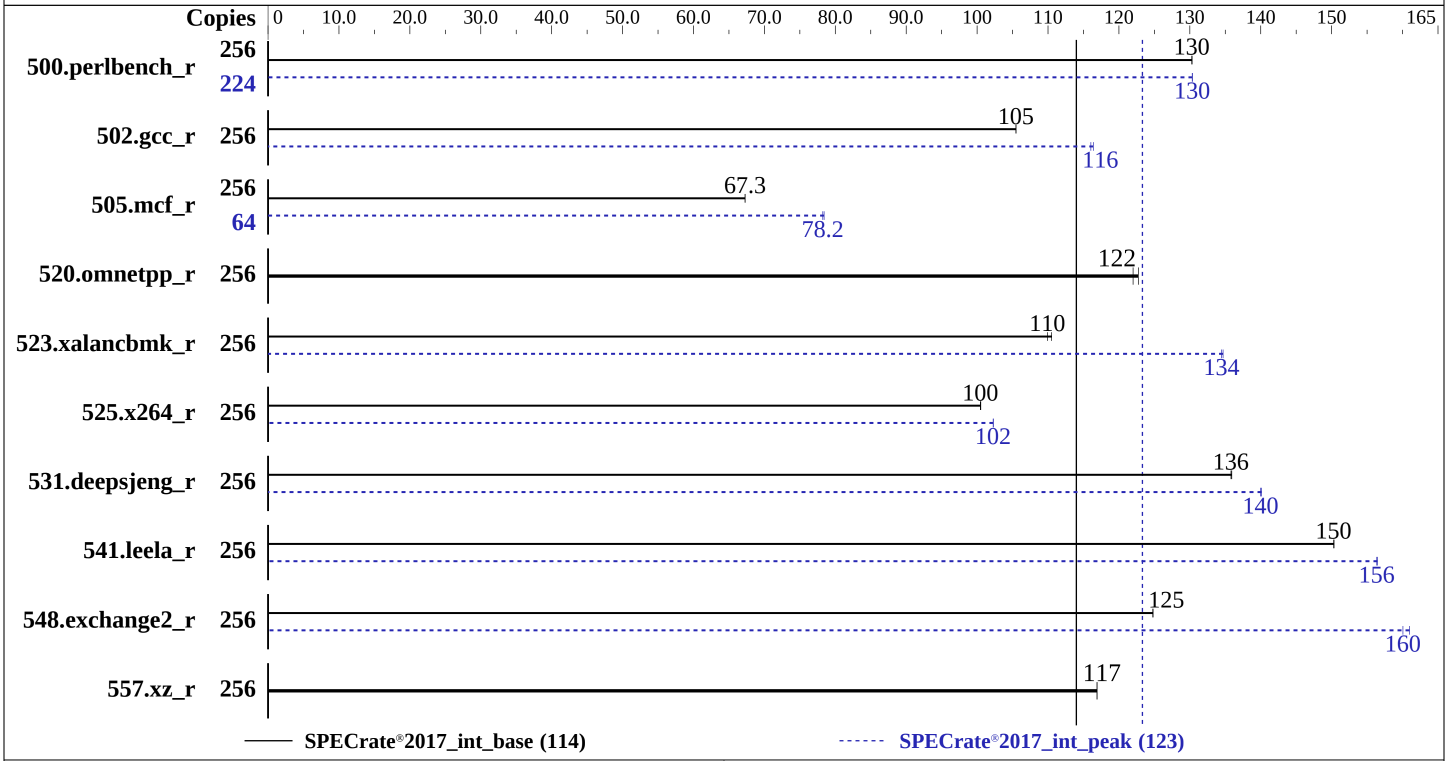
SPEC CPU®2017 Integer Rate Result

Oracle Corporation
1-Chip VM with SPARC M7

SPECrate®2017_int_base = 114
SPECrate®2017_int_peak = 123

CPU2017 License:	6	**Test Date:**	Oct-2016
Test Sponsor:	Oracle Corporation	**Hardware Availability:**	Oct-2015
Tested by:	Oracle Corporation	**Software Availability:**	Jul-2016



Hardware

CPU Name:	SPARC M7
Max MHz:	4133
Nominal:	4133
Enabled:	32 cores, 1 chip, 8 threads/core
Orderable:	1-16 CMIOU (on host)
Cache L1:	16 KB I + 16 KB D on chip per core
L2:	2 MB I on chip per chip (256 KB / 4 cores); 4 MB D on chip per chip (256 KB / 2 cores)
L3:	64 MB I+D on chip per chip (8 MB / 4 cores)
Other:	None
Memory:	480 GB (16 x 32 GB 2Rx4 PC4-2400T-L, running at 2133, 16-way interleaved)
Storage:	2.4 TB on 16 x 300 GB 10K RPM SAS disks served via COMSTAR over 8 Gb/s Fibre Channel from a Sun Fire X4270M2, arranged as 8 x 2-way mirrors
Other:	None

Software

OS:	Oracle Solaris 11.3.10.5.0
Compiler:	C/C++: Version 12.5 of Oracle Developer Studio; Fortran: Version 12.5 of Oracle Developer Studio; Fortran: Version 6.2.0 of gfortran (548 peak only)
Parallel:	No
Firmware:	Sun System Firmware 9.5.2.g
File System:	zfs
System State:	Default
Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other:	None
Power Management:	--

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Results Table

Benchmark	Base Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
500.perlbench_r	256	3127	130	**3129**	**130**			224	2735	130	**2736**	**130**		
502.gcc_r	256	**3437**	**105**	3436	105			256	**3124**	**116**	3115	116		
505.mcf_r	256	6148	67.3	**6150**	**67.3**			64	**1322**	**78.2**	1319	78.4		
520.omnetpp_r	256	**2753**	**122**	2737	123			256	**2753**	**122**	2737	123		
523.xalancbmk_r	256	**2460**	**110**	2446	111			256	2007	135	**2010**	**134**		
525.x264_r	256	4459	101	**4462**	**100**			256	4382	102	**4383**	**102**		
531.deepsjeng_r	256	**2160**	**136**	2158	136			256	2094	140	**2096**	**140**		
541.leela_r	256	**2821**	**150**	2820	150			256	2710	156	**2711**	**156**		
548.exchange2_r	256	5373	125	**5376**	**125**			256	4166	161	**4191**	**160**		
557.xz_r	256	**2365**	**117**	2365	117			256	**2365**	**117**	2365	117		

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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

```
The peak version of 548.exchange2 was built using GNU Fortran 6.2.0.
GNU Fortran 6.2.0 was built on a SPARC T4 system running Solaris 11.3
using: configure --without-gnu-as --with-as=/usr/bin/as
--without-system-zlib --with-included-gettext --with-gnu-ld
--with-ld=/usr/bin/gld
```

Submit Notes

```
The config file option 'submit' was used.
```

Operating System Notes

```
The ZFS cache was limited to 12% of memory, and the
fsflush daemon was told to run once every 10 seconds,
checking for dirty pages more than 10 minutes old,
using these settings in /etc/system:
set user_reserve_hint_pct=88
set autoup=600
set tune_t_fsflushr=10
```

Platform Notes

```
The System Under Test (SUT),
"1-chip VM with SPARC M7",
contains:
```

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Platform Notes (Continued)

```
   - 1 physical CPU chip
   - 256 virtual CPUs
   - 32 cores
   - 480 GB memory
   - OS: Oracle Solaris 11.3.10.5.0

  The SUT is managed by a HOST with:
   - OS: Oracle Solaris 11.3.5.1.0
   - Oracle VM Server for SPARC v3.3
     (included with Oracle Solaris)
  From the standpoint of the HOST, the SUT is:
   - A Logical Domain (LDom)
   - One CMIOU (CPU, Memory, IO unit), containing:
     - 1 SPARC M7 chip
     - 16x 32 GB memory DIMMs
       - 1x DIMM is reserved
       - Therefore the SUT sees 480 GB, not 512

  The HOST is part of an M7-16 server that has:
    - Sun System Firmware 9.5.2.g 2015/12/07 11:57
    - 16x CMIOUs
    - 4x Domain Configurable Units (DCUs)
       - Each DCU has 4x CMIOUs
       - Each DCU is a Physical Domain (PDom)
  From the standpoint of the M7-16, the HOST
  is one PDom containing one DCU.

  Additional information about SUT, LDom, and
  PDom commands are in the platform flags file.

  For Oracle VM Server information, see
  Oracle Technical Network (OTN)

Sysinfo program /cpu2017/rc3/Docs/sysinfo
Rev: r4961 of 2016-10-02 93f3ce875d5c7794a1fec4785739b79b
running on m7-16-002c-ld3 Wed Oct 12 21:37:47 2016

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
  http://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /usr/sbin/psrinfo
   SPARC-M7 (chipid 3, clock 4133 MHz)
   1 chips
   256 threads
   4133 MHz
```

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Platform Notes (Continued)

```
From kstat:        32 cores

From prtconf: 489984 Megabytes

/etc/release:
     Oracle Solaris 11.3 SPARC
uname -a:
   SunOS m7-16-002c-ld3 5.11 11.3 sun4v sparc sun4v

disk: df -h /cpu2017/rc3
Filesystem             Size   Used  Available Capacity  Mounted on
spec/cpu2017/rc3       2.4T   1.2G       1.8T     1%    /cpu2017/rc3

(End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base, peak) 505.mcf_r(base,
        | peak) 525.x264_r(base, peak) 557.xz_r(base, peak)
------------------------------------------------------------------------------
cc: Studio 12.5 Sun C 5.14 SunOS_sparc 2016/05/31
------------------------------------------------------------------------------

==============================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak)
        | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
------------------------------------------------------------------------------
CC: Studio 12.5 Sun C++ 5.14 SunOS_sparc 2016/05/31
------------------------------------------------------------------------------

==============================================================================
Fortran | 548.exchange2_r(peak)
------------------------------------------------------------------------------
Using built-in specs.
COLLECT_GCC=/SW/compilers/GCC/SunOS/sparc/gcc-6.2.0/bin/gfortran
COLLECT_LTO_WRAPPER=/SW/compilers/GCC/SunOS/sparc/gcc-6.2.0/bin/../libexec/gcc/sparc-sun-solaris2.11/6.2.0/lto-wrapper
Target: sparc-sun-solaris2.11
Configured with: /SW/compilers/GCC/build/gcc-6.2.0/configure
  --enable-languages=c,c++,fortran,objc,obj-c++ --enable-lto
  --with-multilib-list=m64,m32 --disable-libvtv --without-gnu-as
  --with-as=/usr/bin/as --without-system-zlib --with-included-gettext
  --with-gnu-ld --with-ld=/usr/bin/gld --with-pkgversion='CDS  22-Aug-2016'
  --prefix=/net/toromondo.us.oracle.com/export/software/compilers/GCC/SunOS/sparc/gcc-6.2.0
  --with-local-prefix=/net/toromondo.us.oracle.com/export/software/compilers/GCC/SunOS/sparc
Thread model: posix
```

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Compiler Version Notes (Continued)

```
gcc version 6.2.0 (CDS  22-Aug-2016)
------------------------------------------------------------------------------

==============================================================================
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
f90: Studio 12.5 Fortran 95 8.8 SunOS_sparc 2016/05/31
------------------------------------------------------------------------------

==============================================================================
Fortran | 548.exchange2_r(peak)
------------------------------------------------------------------------------
Using built-in specs.
COLLECT_GCC=/SW/compilers/GCC/SunOS/sparc/gcc-6.2.0/bin/gfortran
COLLECT_LTO_WRAPPER=/SW/compilers/GCC/SunOS/sparc/gcc-6.2.0/bin/../libexec/gcc/sparc-sun-solaris2.11/6.2.0/lto-wrapper
Target: sparc-sun-solaris2.11
Configured with: /SW/compilers/GCC/build/gcc-6.2.0/configure
  --enable-languages=c,c++,fortran,objc,obj-c++ --enable-lto
  --with-multilib-list=m64,m32 --disable-libvtv --without-gnu-as
  --with-as=/usr/bin/as --without-system-zlib --with-included-gettext
  --with-gnu-ld --with-ld=/usr/bin/gld --with-pkgversion='CDS  22-Aug-2016'
  --prefix=/net/toromondo.us.oracle.com/export/software/compilers/GCC/SunOS/sparc/gcc-6.2.0
  --with-local-prefix=/net/toromondo.us.oracle.com/export/software/compilers/GCC/SunOS/sparc
Thread model: posix
gcc version 6.2.0 (CDS  22-Aug-2016)
------------------------------------------------------------------------------

==============================================================================
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
f90: Studio 12.5 Fortran 95 8.8 SunOS_sparc 2016/05/31
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
cc

C++ benchmarks:
CC

Fortran benchmarks:
f95

Base Portability Flags

500.perlbench_r: -DSPEC_SOLARIS_SPARC
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -D_FILE_OFFSET_BITS=64
520.omnetpp_r: -DSPEC_GCC_MANGLE -D_FILE_OFFSET_BITS=64
523.xalancbmk_r: -DSPEC_SOLARIS -D_FILE_OFFSET_BITS=64
525.x264_r: -D_FILE_OFFSET_BITS=64
531.deepsjeng_r: -D_FILE_OFFSET_BITS=64
541.leela_r: -D_FILE_OFFSET_BITS=64
548.exchange2_r: -D_FILE_OFFSET_BITS=64
557.xz_r: -D_FILE_OFFSET_BITS=64

Base Optimization Flags

C benchmarks:
-m32 -xpagesize=4M -DSPEC_SUPPRESS_OPENMP -fast -xipo=2
-xthroughput=yes -xalias_level=std -g1 -lfast

C++ benchmarks:
-m32 -xpagesize=4M -std=c++03 -DSPEC_SUPPRESS_OPENMP -fast -xipo=2
-xthroughput=yes -xalias_level=compatible -g -lfast

Fortran benchmarks:
-m32 -xpagesize=4M -DSPEC_SUPPRESS_OPENMP -fast -xipo=2
-xthroughput=yes -g1 -lfast

Base Other Flags

C benchmarks:
-xjobs=64 -errfmt

C++ benchmarks:
-xjobs=64

Fortran benchmarks:
-xjobs=64

Peak Compiler Invocation

C benchmarks:
cc

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Peak Compiler Invocation (Continued)

C++ benchmarks:
CC

Fortran benchmarks:
gfortran

Peak Portability Flags

500.perlbench_r: -DSPEC_SOLARIS_SPARC
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -D_FILE_OFFSET_BITS=64
520.omnetpp_r: -DSPEC_GCC_MANGLE -D_FILE_OFFSET_BITS=64
523.xalancbmk_r: -DSPEC_SOLARIS -D_FILE_OFFSET_BITS=64
525.x264_r: -D_FILE_OFFSET_BITS=64
531.deepsjeng_r: -D_FILE_OFFSET_BITS=64
541.leela_r: -D_FILE_OFFSET_BITS=64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -D_FILE_OFFSET_BITS=64

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -m32 -xpagesize=256M -DSPEC_SUPPRESS_OPENMP -fast
-xipo=2 -xthroughput=yes -xalias_level=layout
-xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -g1 -lfast

502.gcc_r: -m32 -xpagesize=4M -DSPEC_SUPPRESS_OPENMP -fast -xipo=2
-xthroughput=yes -xalias_level=basic
-xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -g1 -lfast

505.mcf_r: -m32 -xpagesize=4M -DSPEC_SUPPRESS_OPENMP -fast -xipo=2
-g1 -lfast

525.x264_r: -m32 -xpagesize=4M -DSPEC_SUPPRESS_OPENMP -fast -xipo=2
-xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -g1 -lfast

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Peak Optimization Flags (Continued)

557.xz_r: `basepeak = yes`

C++ benchmarks:

520.omnetpp_r: `basepeak = yes`

523.xalancbmk_r: `-library=stlport4 -std=sun03 -m32 -xpagesize=4M -DSPEC_SUPPRESS_OPENMP -fast -xipo=2 -xthroughput=yes -xprofile=collect:./feedback`(pass 1) `-xprofile=use:./feedback`(pass 2) `-g -lfast`

531.deepsjeng_r: `-m32 -xpagesize=256M -std=c++03 -DSPEC_SUPPRESS_OPENMP -fast -xipo=2 -xthroughput=yes -xalias_level=compatible -xprofile=collect:./feedback`(pass 1) `-xprofile=use:./feedback`(pass 2) `-g`

541.leela_r: `-m32 -xpagesize=4M -std=c++03 -DSPEC_SUPPRESS_OPENMP -fast -xipo=2 -xthroughput=yes -xalias_level=compatible -xprofile=collect:./feedback`(pass 1) `-xprofile=use:./feedback`(pass 2) `-g`

Fortran benchmarks:
`-m64 -DSPEC_SUPPRESS_OPENMP -g -Ofast -mcpu=niagara4 -mtune=niagara4 -mvis3 -mfmaf -fprofile-generate`(pass 1) `-fprofile-use`(pass 2) `-g1`

Peak Other Flags

C benchmarks:
`-xjobs=64 -errfmt`

C++ benchmarks:
`-xjobs=64`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Oracle-Solaris-Studio12.5.html
http://www.spec.org/cpu2017/flags/gcc.html
http://www.spec.org/cpu2017/flags/Oracle-SPARC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Oracle-Solaris-Studio12.5.xml
http://www.spec.org/cpu2017/flags/gcc.xml
http://www.spec.org/cpu2017/flags/Oracle-SPARC.xml

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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