SPEC® CINT2006 Result
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Fujitsu
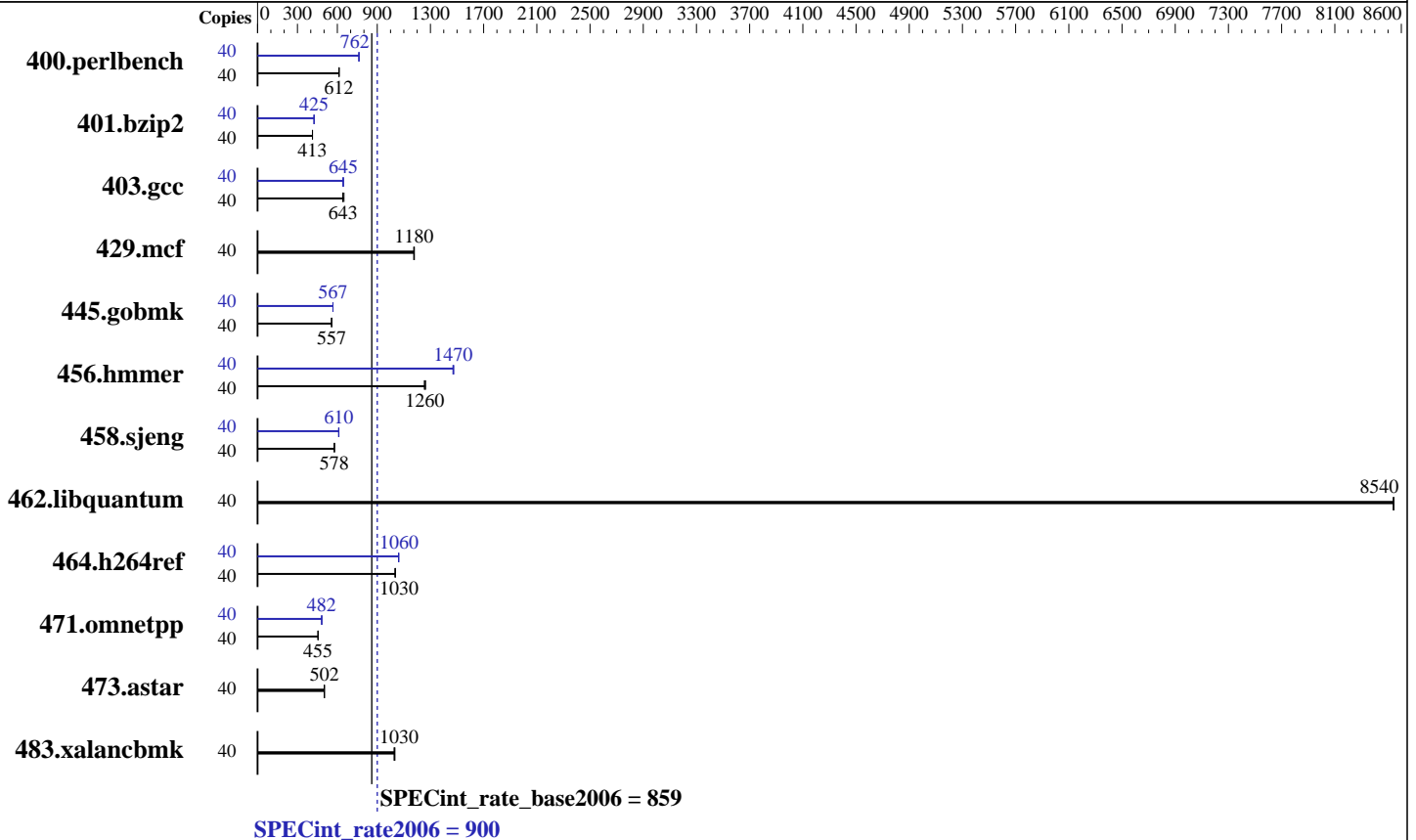
PRIMERGY RX2540 M2, Intel Xeon E5-2640 v4, 2.40 GHz

$SPECint^{®}_rate2006 = $ **900**

$SPECint_rate_base2006 = $ **859**

CPU2006 license: 19

Test sponsor: Fujitsu

Tested by: Fujitsu

Test date: Mar-2016

Hardware Availability: Apr-2016

Software Availability: Sep-2015

Copies scale: 0 300 600 900 1300 1700 2100 2500 2900 3300 3700 4100 4500 4900 5300 5700 6100 6500 6900 7300 7700 8100 8600

Benchmark	Copies	Peak	Base
400.perlbench	40 / 40	762	612
401.bzip2	40 / 40	425	413
403.gcc	40 / 40	645	643
429.mcf	40		1180
445.gobmk	40 / 40	567	557
456.hmmer	40 / 40	1470	1260
458.sjeng	40 / 40	610	578
462.libquantum	40		8540
464.h264ref	40 / 40	1060	1030
471.omnetpp	40 / 40	482	455
473.astar	40		502
483.xalancbmk	40		1030

SPECint_rate_base2006 = 859

SPECint_rate2006 = 900

Hardware

CPU Name: Intel Xeon E5-2640 v4

CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz

CPU MHz: 2400

FPU: Integrated

CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip, 2 threads/core

CPU(s) orderable: 1,2 chip

Primary Cache: 32 KB I + 32 KB D on chip per core

Secondary Cache: 256 KB I+D on chip per core

L3 Cache: 25 MB I+D on chip per chip

Other Cache: None

Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)

Disk Subsystem: 1 x SATA, 500 GB, 7200 RPM

Other Hardware: None

Software

Operating System: SUSE Linux Enterprise Server 12 SP1 (x86_64) Kernel 3.12.49-11-default

Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux

Auto Parallel: No

File System: xfs

System State: Run level 5 (multi-user)

Base Pointers: 32-bit

Peak Pointers: 32/64-bit

Other Software: Microquill SmartHeap V10.2

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	40	**639**	**612**	636	614	639	612	40	513	762	513	762	**513**	**762**
401.bzip2	40	936	413	934	413	**935**	**413**	40	**908**	**425**	908	425	908	425
403.gcc	40	**501**	**643**	495	650	503	641	40	502	642	**500**	**645**	498	646
429.mcf	40	**310**	**1180**	310	1180	309	1180	40	**310**	**1180**	310	1180	309	1180
445.gobmk	40	753	557	753	557	**753**	**557**	40	**740**	**567**	740	567	740	567
456.hmmer	40	295	1260	298	1250	**296**	**1260**	40	253	1480	**253**	**1470**	254	1470
458.sjeng	40	837	578	839	577	**838**	**578**	40	794	610	**793**	**610**	791	612
462.libquantum	40	97.1	8540	**97.0**	**8540**	97.0	8540	40	97.1	8540	**97.0**	**8540**	97.0	8540
464.h264ref	40	**855**	**1030**	853	1040	857	1030	40	835	1060	833	1060	**835**	**1060**
471.omnetpp	40	549	455	**550**	**455**	550	455	40	518	483	519	482	**518**	**482**
473.astar	40	560	501	558	503	**559**	**502**	40	560	501	558	503	**559**	**502**
483.xalancbmk	40	267	1030	269	1030	**268**	**1030**	40	267	1030	269	1030	**268**	**1030**

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

Submit Notes

　　The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

　　Stack size set to unlimited using "ulimit -s unlimited"

Platform Notes

```
    BIOS configuration:
    Energy Performance = Performance
    Utilization Profile = Unbalanced
    QPI snoop mode: Home Directory Snoop with OSB
        COD Enable = Disabled, Early Snoop = Disabled, Home Snoop Dir OSB = Enabled
    Sysinfo program /home/SPECcpu2006/config/sysinfo.rev6914
    $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
    running on RX2540M2 Wed Mar 16 14:24:19 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/cpu2006/Docs/config.html#sysinfo

    From /proc/cpuinfo
      model name : Intel(R) Xeon(R) CPU E5-2640 v4 @ 2.40GHz
         2 "physical id"s (chips)
         40 "processors"
```

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Platform Notes (Continued)

```
    cores, siblings (Caution: counting these is hw and system dependent.  The
    following excerpts from /proc/cpuinfo might not be reliable.  Use with
    caution.)
       cpu cores : 10
       siblings  : 20
       physical 0: cores 0 1 2 3 4 8 9 10 11 12
       physical 1: cores 0 1 2 3 4 8 9 10 11 12
    cache size : 25600 KB

 From /proc/meminfo
    MemTotal:       264399696 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 /usr/bin/lsb_release -d
    SUSE Linux Enterprise Server 12 SP1

 From /etc/*release* /etc/*version*
    SuSE-release:
       SUSE Linux Enterprise Server 12 (x86_64)
       VERSION = 12
       PATCHLEVEL = 1
       # This file is deprecated and will be removed in a future service pack or
       release.
       # Please check /etc/os-release for details about this release.
    os-release:
       NAME="SLES"
       VERSION="12-SP1"
       VERSION_ID="12.1"
       PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
       ID="sles"
       ANSI_COLOR="0;32"
       CPE_NAME="cpe:/o:suse:sles:12:sp1"

 uname -a:
    Linux RX2540M2 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
    (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

 run-level 5 Mar 16 14:15

 SPEC is set to: /home/SPECcpu2006
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda4      xfs   424G   51G  374G  12% /home
 Additional information from dmidecode:

    Warning: Use caution when you interpret this section. The 'dmidecode' program
    reads system data which is "intended to allow hardware to be accurately
    determined", but the intent may not be met, as there are frequent changes to
    hardware, firmware, and the "DMTF SMBIOS" standard.

    BIOS FUJITSU // American Megatrends Inc. V5.0.0.11 R1.6.0 for D3289-B1x
    03/11/2016
```

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Platform Notes (Continued)

```
     Memory:
       16x Micron 36ASF2G72PZ-2G3A3 16 GB 2 rank 2400 MHz, configured at 2133 MHz
       8x NO DIMM NO DIMM

     (End of data from sysinfo program)
```

General Notes

```
 Environment variables set by runspec before the start of the run:
 LD_LIBRARY_PATH = "/home/SPECcpu2006/libs/32:/home/SPECcpu2006/libs/64:/home/SPECcpu2006/sh"

  Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB
  memory using RedHat EL 7.1
  Transparent Huge Pages enabled with:
  echo always > /sys/kernel/mm/transparent_hugepage/enabled
  Filesystem page cache cleared with:
  echo 1>        /proc/sys/vm/drop_caches
  runspec command invoked through numactl i.e.:
  numactl --interleave=all runspec <etc>
  For information about Fujitsu please visit: http://www.fujitsu.com
```

Base Compiler Invocation

C benchmarks:
```
    icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

C++ benchmarks:
```
    icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

Base Portability Flags

```
     400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
         401.bzip2: -D_FILE_OFFSET_BITS=64
           403.gcc: -D_FILE_OFFSET_BITS=64
           429.mcf: -D_FILE_OFFSET_BITS=64
         445.gobmk: -D_FILE_OFFSET_BITS=64
         456.hmmer: -D_FILE_OFFSET_BITS=64
         458.sjeng: -D_FILE_OFFSET_BITS=64
    462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
       464.h264ref: -D_FILE_OFFSET_BITS=64
       471.omnetpp: -D_FILE_OFFSET_BITS=64
         473.astar: -D_FILE_OFFSET_BITS=64
    483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
```

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Base Optimization Flags

C benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3
```

C++ benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh -lsmartheap
```

Base Other Flags

C benchmarks:

```
403.gcc: -Dalloca=_alloca
```

Peak Compiler Invocation

C benchmarks (except as noted below):
```
icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

400.perlbench: `icc -m64`

401.bzip2: `icc -m64`

456.hmmer: `icc -m64`

458.sjeng: `icc -m64`

C++ benchmarks:
```
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

Peak Portability Flags

```
400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
   401.bzip2: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
     403.gcc: -D_FILE_OFFSET_BITS=64
     429.mcf: -D_FILE_OFFSET_BITS=64
   445.gobmk: -D_FILE_OFFSET_BITS=64
   456.hmmer: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
   458.sjeng: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
  464.h264ref: -D_FILE_OFFSET_BITS=64
  471.omnetpp: -D_FILE_OFFSET_BITS=64
    473.astar: -D_FILE_OFFSET_BITS=64
```

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Peak Portability Flags (Continued)

483.xalancbmk: `-D_FILE_OFFSET_BITS=64` `-DSPEC_CPU_LINUX`

Peak Optimization Flags

C benchmarks:

400.perlbench: `-xCORE-AVX2(pass 2)` `-prof-gen:threadsafe(pass 1)`
`-ipo(pass 2)` `-O3(pass 2)` `-no-prec-div(pass 2)`
`-par-num-threads=1(pass 1)` `-prof-use(pass 2)` `-auto-ilp32`

401.bzip2: `-xCORE-AVX2(pass 2)` `-prof-gen:threadsafe(pass 1)`
`-ipo(pass 2)` `-O3(pass 2)` `-no-prec-div(pass 2)`
`-par-num-threads=1(pass 1)` `-prof-use(pass 2)` `-opt-prefetch`
`-auto-ilp32` `-ansi-alias`

403.gcc: `-xCORE-AVX2` `-ipo` `-O3` `-no-prec-div`

429.mcf: `basepeak = yes`

445.gobmk: `-xCORE-AVX2(pass 2)` `-prof-gen:threadsafe(pass 1)`
`-prof-use(pass 2)` `-par-num-threads=1(pass 1)` `-ansi-alias`
`-opt-mem-layout-trans=3`

456.hmmer: `-xCORE-AVX2` `-ipo` `-O3` `-no-prec-div` `-unroll2` `-auto-ilp32`

458.sjeng: `-xCORE-AVX2(pass 2)` `-prof-gen:threadsafe(pass 1)`
`-ipo(pass 2)` `-O3(pass 2)` `-no-prec-div(pass 2)`
`-par-num-threads=1(pass 1)` `-prof-use(pass 2)` `-unroll4`
`-auto-ilp32`

462.libquantum: `basepeak = yes`

464.h264ref: `-xCORE-AVX2(pass 2)` `-prof-gen:threadsafe(pass 1)`
`-ipo(pass 2)` `-O3(pass 2)` `-no-prec-div(pass 2)`
`-par-num-threads=1(pass 1)` `-prof-use(pass 2)` `-unroll2`
`-ansi-alias`

C++ benchmarks:

471.omnetpp: `-xCORE-AVX2(pass 2)` `-prof-gen:threadsafe(pass 1)`
`-ipo(pass 2)` `-O3(pass 2)` `-no-prec-div(pass 2)`
`-par-num-threads=1(pass 1)` `-prof-use(pass 2)` `-ansi-alias`
`-opt-ra-region-strategy=block` `-Wl,-z,muldefs`
`-L/sh` `-lsmartheap`

473.astar: `basepeak = yes`

Continued on next page

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Peak Optimization Flags (Continued)

483.xalancbmk: basepeak = yes

Peak Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Fujitsu-Platform-Settings-V1.2-HSW-RevA.20160517.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Fujitsu-Platform-Settings-V1.2-HSW-RevA.20160517.xml

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

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