



SPEC[®] CINT2006 Result

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Fujitsu

SPECint[®]_rate2006 = 3910

PRIMERGY RX4770 M3, Intel Xeon E7-8894 v4, 2.40GHz

SPECint_rate_base2006 = 3760

CPU2006 license: 19

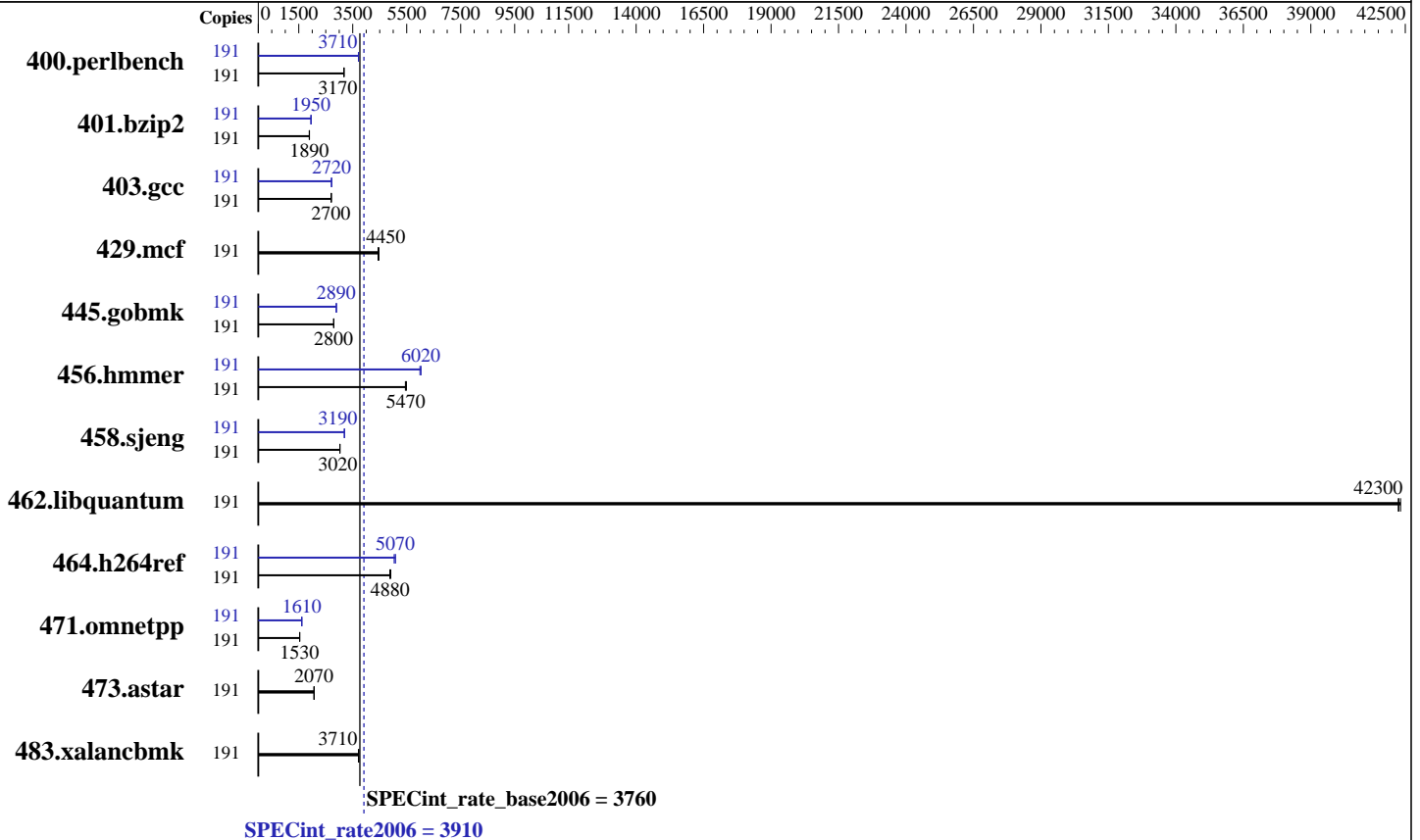
Test sponsor: Fujitsu

Tested by: Fujitsu

Test date: Feb-2017

Hardware Availability: Feb-2017

Software Availability: Nov-2016



Hardware

CPU Name: Intel Xeon E7-8894 v4
 CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz
 CPU MHz: 2400
 FPU: Integrated
 CPU(s) enabled: 96 cores, 4 chips, 24 cores/chip, 2 threads/core
 CPU(s) orderable: 2,4 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: 60 MB I+D on chip per chip
 Other Cache: None
 Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2400T-R, running at 1600 MHz)
 Disk Subsystem: 1006 GB tmpfs
 Other Hardware: None

Software

Operating System: SUSE Linux Enterprise Server 12 SP2 4.4.21-68-default
 Compiler: C/C++: Version 17.0.0.098 of Intel C/C++ Compiler for Linux
 Auto Parallel: No
 File System: tmpfs
 System State: Run level 3 (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	191	587	3180	588	3170	588	3170	191	503	3710	502	3720	503	3710
401.bzip2	191	972	1900	975	1890	975	1890	191	943	1950	943	1960	943	1950
403.gcc	191	570	2700	570	2700	567	2710	191	567	2710	566	2720	566	2720
429.mcf	191	393	4440	390	4470	392	4450	191	393	4440	390	4470	392	4450
445.gobmk	191	717	2800	717	2790	716	2800	191	693	2890	693	2890	693	2890
456.hammer	191	325	5490	326	5470	327	5450	191	298	5990	296	6020	296	6030
458.sjeng	191	764	3020	764	3030	764	3020	191	725	3190	724	3190	724	3190
462.libquantum	191	93.6	42300	93.5	42300	93.7	42200	191	93.6	42300	93.5	42300	93.7	42200
464.h264ref	191	867	4870	865	4880	861	4910	191	833	5070	840	5030	832	5080
471.omnetpp	191	778	1530	778	1530	778	1530	191	741	1610	741	1610	741	1610
473.astar	191	649	2070	649	2070	647	2070	191	649	2070	649	2070	647	2070
483.xalancbmk	191	355	3710	353	3730	355	3710	191	355	3710	353	3730	355	3710

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"
Kernel Boot Parameter set with : nohz_full=1-191 isolcpus=1-191
Turbo mode set with :
cpupower -c all frequency-set -g performance
Tmpfs filesystem can be set with:
mkdir /home/memory
mount -t tmpfs -o size=1006g,rw tmpfs /home/memory
Process tuning setting:
echo 1000000 > /proc/sys/kernel/sched_min_granularity_ns
echo 1500000 > /proc/sys/kernel/sched_wakeup_granularity_ns
echo 0 > /proc/sys/kernel/numa_balancing
cpu idle state set with:
cpupower idle-set -d 2
cpupower idle-set -d 3
cpupower idle-set -d 4
```

Platform Notes

BIOS configuration:
Energy Performance = Performance
QPI snoop mode: Cluster on Die

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Platform Notes (Continued)

Intel Virtualization Technology = Disabled
VT-d = Disabled
QPI Link Frequency Select = 9.6 GT/s
Patrol Scrub = Disabled
Sysinfo program /home/memory/speccpu/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-53n1 Fri Feb 17 07:12:48 2017

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 E7-8894 v4 @ 2.40GHz
 4 "physical id"s (chips)
 192 "processors"
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 : 24
  siblings  : 48
 physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
 27 28 29
 physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
 27 28 29
 physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
 27 28 29
 physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
 27 28 29
cache size : 30720 KB
```

```
From /proc/meminfo
MemTotal: 527983716 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

```
/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP2
```

```
From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 2
# 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-SP2"
VERSION_ID="12.2"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
```

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Platform Notes (Continued)

```
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"
```

```
uname -a:
Linux linux-53n1 4.4.21-68-default #1 SMP Tue Oct 18 18:19:37 UTC 2016
(63cf368) x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Feb 17 06:54
```

```
SPEC is set to: /home/memory/speccpu
Filesystem      Type      Size  Used Avail Use% Mounted on
tmpfs           tmpfs    1006G  3.7G 1003G   1% /home/memory
```

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 R1.8.94 for D3749-A1x 11/11/2016

Memory:
32x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz, configured at 1600 MHz
64x 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/memory/speccpu/libs/32:/home/memory/speccpu/libs/64:/home/memory/speccpu/sh10.2"
```

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.2

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>
```

Base Compiler Invocation

C benchmarks:

```
icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
```

C++ benchmarks:

```
icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
```



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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

```

Base Optimization Flags

C benchmarks:

```

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

```

C++ benchmarks:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh10.2 -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_2017/linux/lib/ia32

```

```

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_2017/linux/lib/ia32

```



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Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
 401.bzip2: -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: -DSPEC_CPU_LP64
 458.sjeng: -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
 483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
 -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
 -no-prec-div(pass 2) -auto-ilp32 -qopt-mem-layout-trans=3

401.bzip2: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
 -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
 -no-prec-div(pass 2) -qopt-prefetch -auto-ilp32
 -qopt-mem-layout-trans=3

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div
 -qopt-mem-layout-trans=3

429.mcf: basepeak = yes

445.gobmk: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
 -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
 -no-prec-div(pass 2) -qopt-mem-layout-trans=3

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32
 -qopt-mem-layout-trans=3

458.sjeng: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
 -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
 -no-prec-div(pass 2) -unroll4 -auto-ilp32
 -qopt-mem-layout-trans=3

462.libquantum: basepeak = yes

464.h264ref: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
 -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
 -no-prec-div(pass 2) -unroll2 -qopt-mem-layout-trans=3

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Peak Optimization Flags (Continued)

C++ benchmarks:

```
471.omnetpp: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
             -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
             -no-prec-div(pass 2)
             -qopt-ra-region-strategy=block
             -qopt-mem-layout-trans=3 -Wl,--z,muldefs
             -L/shl0.2 -lsmartheap
```

473.astar: basepeak = yes

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-ic17.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Fujitsu-Platform-Settings-V1.2-BDW-RevC.20170307.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Fujitsu-Platform-Settings-V1.2-BDW-RevC.20170307.xml>

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