



SPEC® CINT2006 Result

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Fujitsu

PRIMERGY RX4770 M3, Intel Xeon E7-8891 v4, 2.80 GHz

SPECint®2006 = **75.4**

SPECint_base2006 = **71.3**

CPU2006 license: 19

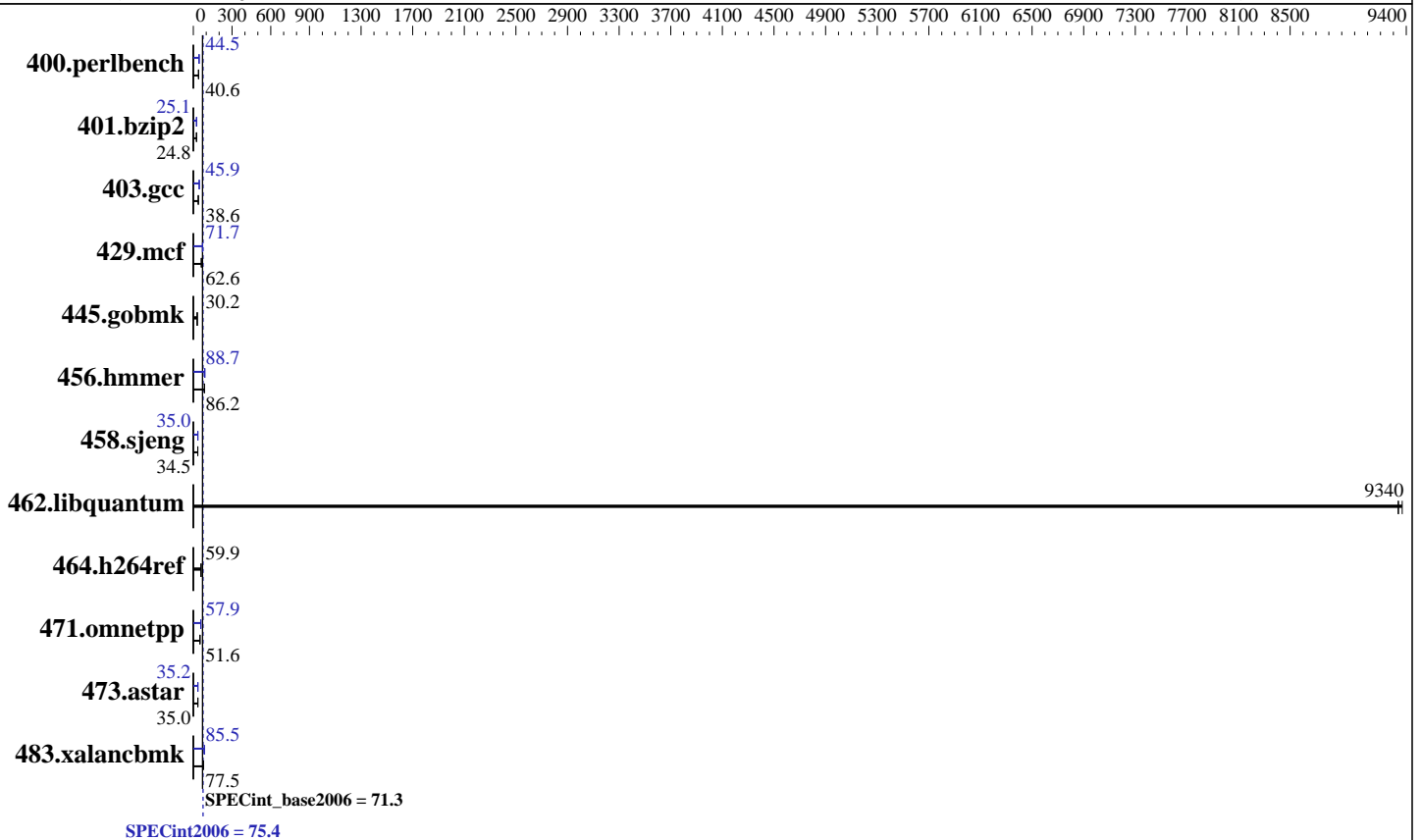
Test sponsor: Fujitsu

Tested by: Fujitsu

Test date: Mar-2017

Hardware Availability: Jun-2016

Software Availability: Dec-2015



Hardware

CPU Name: Intel Xeon E7-8891 v4
 CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz
 CPU MHz: 2800
 FPU: Integrated
 CPU(s) enabled: 40 cores, 4 chips, 10 cores/chip
 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: 1008 GB tmpfs
 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: Yes
 File System: tmpfs
 System State: Run level 3 (multi-user)
 Base Pointers: 32/64-bit
 Peak Pointers: 32/64-bit
 Other Software: Microquill SmartHeap V10.2



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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	241	40.6	240	40.7	<u>241</u>	<u>40.6</u>	<u>219</u>	<u>44.5</u>	219	44.6	220	44.5
401.bzip2	389	24.8	<u>389</u>	<u>24.8</u>	391	24.7	<u>385</u>	<u>25.1</u>	385	25.1	385	25.1
403.gcc	<u>208</u>	<u>38.6</u>	208	38.7	208	38.6	175	46.0	<u>175</u>	<u>45.9</u>	176	45.8
429.mcf	<u>146</u>	<u>62.6</u>	145	62.9	146	62.3	127	71.7	<u>127</u>	<u>71.7</u>	127	71.8
445.gobmk	347	30.2	<u>347</u>	<u>30.2</u>	348	30.2	347	30.2	<u>347</u>	<u>30.2</u>	348	30.2
456.hammer	<u>108</u>	<u>86.2</u>	108	86.1	108	86.5	105	88.6	<u>105</u>	<u>88.7</u>	105	88.8
458.sjeng	350	34.6	350	34.5	<u>350</u>	<u>34.5</u>	<u>345</u>	<u>35.0</u>	345	35.1	346	35.0
462.libquantum	2.21	9370	<u>2.22</u>	<u>9340</u>	2.22	9340	2.21	9370	<u>2.22</u>	<u>9340</u>	2.22	9340
464.h264ref	369	60.0	<u>369</u>	<u>59.9</u>	372	59.5	369	60.0	<u>369</u>	<u>59.9</u>	372	59.5
471.omnetpp	121	51.6	123	50.8	<u>121</u>	<u>51.6</u>	107	58.1	108	57.9	<u>108</u>	<u>57.9</u>
473.astar	201	35.0	<u>201</u>	<u>35.0</u>	200	35.2	200	35.2	199	35.2	<u>199</u>	<u>35.2</u>
483.xalancbmk	89.7	76.9	88.7	77.8	<u>89.1</u>	<u>77.5</u>	80.7	85.5	80.5	85.7	<u>80.7</u>	<u>85.5</u>

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

Submit Notes

The config file option 'submit' was used.

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
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=1008g,rw tmpfs /home/memory
Process tuning setting:
echo 1000000 > /proc/sys/kernel/sched_min_granularity_ns
echo 15000000 > /proc/sys/kernel/sched_wakeup_granularity_ns
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/transparent_hugepage/enabled
```

Platform Notes

```
BIOS configuration:
Energy Performance = Performance
Utilization Profile = Unbalanced
Uncore Frequency Override = Maximum
Package C State limit = C0
COD Enable = Disabled
Sysinfo program /home/memory/speccpu/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-z26t Sun Mar 5 09:57:43 2017
Continued on next page
```



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Platform Notes (Continued)

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 E7-8891 v4 @ 2.80GHz
 4 "physical id"s (chips)
 40 "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 : 10
  siblings  : 10
  physical 0: cores 5 9 10 11 13 18 24 26 28 29
  physical 1: cores 5 9 10 11 13 18 24 26 28 29
  physical 2: cores 5 9 10 11 13 18 24 26 28 29
  physical 3: cores 5 9 10 11 13 18 24 26 28 29
cache size : 61440 KB
```

```
From /proc/meminfo
MemTotal:      529056500 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 linux-z26t 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 3 Mar 4 01:17
```

SPEC is set to: /home/memory/speccpu

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Platform Notes (Continued)

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
tmpfs	tmpfs	1008G	6.5G	1002G	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:

KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/memory/speccpu/libs/32:/home/memory/speccpu/libs/64:/home/memory/speccpu/sh"
OMP_NUM_THREADS = "40"

Binaries compiled on a system with 4x Intel Xeon E7-8891 v4 CPU + 512GB memory using SUSE 12 SP1
Transparent Huge Paes enabled with:
echo always > /sys/kernel/mm/transparent_hugepage/enabled

Base Compiler Invocation

C benchmarks:
icc -m64

C++ benchmarks:
icpc -m64

Base Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64

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Base Portability Flags (Continued)

462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -DSPEC_CPU_LP64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-auto-ilp32 -complex-limited-range -qopt-prefetch-issue-excl-hint
-ansi-alias

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -Wl,-z,muldefs
-L/sh10.2 -lsmartheap64

Base Other Flags

C benchmarks:
403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64

400.perlbench: icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/lib/ia32_lin
403.gcc: icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/lib/ia32_lin
429.mcf: icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/lib/ia32_lin

C++ benchmarks (except as noted below):
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
473.astar: icpc -m64



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Peak Portability Flags

400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
401.bz2: -DSPEC_CPU_LP64
403.gcc: -D_FILE_OFFSET_BITS=64
429.mcf: -D_FILE_OFFSET_BITS=64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -DSPEC_CPU_LP64
483.xalanbmk: -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) -opt-prefetch
-ansi-alias
401.bz2: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div
-par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32
-opt-prefetch -ansi-alias
403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc
-opt-malloc-options=3 -auto-ilp32 -static
429.mcf: -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel
-opt-prefetch -auto-p32 -complex-limited-range -static
445.gobmk: basepeak = yes
456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel
-opt-prefetch -funroll-all-loops
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
462.libquantum: basepeak = yes
464.h264ref: basepeak = yes

C++ benchmarks:

Continued on next page



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Peak Optimization Flags (Continued)

```

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)
             -opt-ra-region-strategy=block -ansi-alias
             -Wl,-z,muldefs -L/shl0.2 -lsmartheap

473.astar: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
           -auto-p32 -Wl,-z,muldefs -L/shl0.2 -lsmartheap64

483.xalancbmk: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
              -ansi-alias -Wl,-z,muldefs -L/shl0.2 -lsmartheap

```

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/Fujitsu-compiler-flags.ic16.0-linux64.html>
<http://www.spec.org/cpu2006/flags/Fujitsu-Platform-Settings-V1.2-BDW-RevE.html>

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

<http://www.spec.org/cpu2006/flags/Fujitsu-compiler-flags.ic16.0-linux64.xml>
<http://www.spec.org/cpu2006/flags/Fujitsu-Platform-Settings-V1.2-BDW-RevE.xml>

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