SPEC® CINT2006 Result
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Fujitsu

PRIMEQUEST 2800E3, Intel Xeon E7-8891 v4, 2.80 GHz

SPECint®2006 = 72.3

SPECint_base2006 = 69.9

CPU2006 license: 19		**Test date:** Jun-2016
Test sponsor: Fujitsu		**Hardware Availability:** Jun-2016
Tested by: Fujitsu		**Software Availability:** Sep-2015

Benchmark results graph (scale 0 to 8100):

- 400.perlbench: 44.8 / 40.5
- 401.bzip2: 25.2 / 24.6
- 403.gcc: 38.6
- 429.mcf: 58.6 / 58.2
- 445.gobmk: 30.2
- 456.hmmer: 86.1
- 458.sjeng: 35.1 / 34.7
- 462.libquantum: 8010
- 464.h264ref: 59.4
- 471.omnetpp: 57.4 / 49.9
- 473.astar: 36.6 / 36.5
- 483.xalancbmk: 86.6 / 77.9

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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:	80 cores, 8 chips, 10 cores/chip
CPU(s) orderable:	2,4,6,8 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:	1 TB (64 x 16 GB 2Rx4 PC4-2400T-R, running at 1600 MHz)
Disk Subsystem:	1 x SATA, 1000 GB, 10000 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:	Yes
File System:	xfs
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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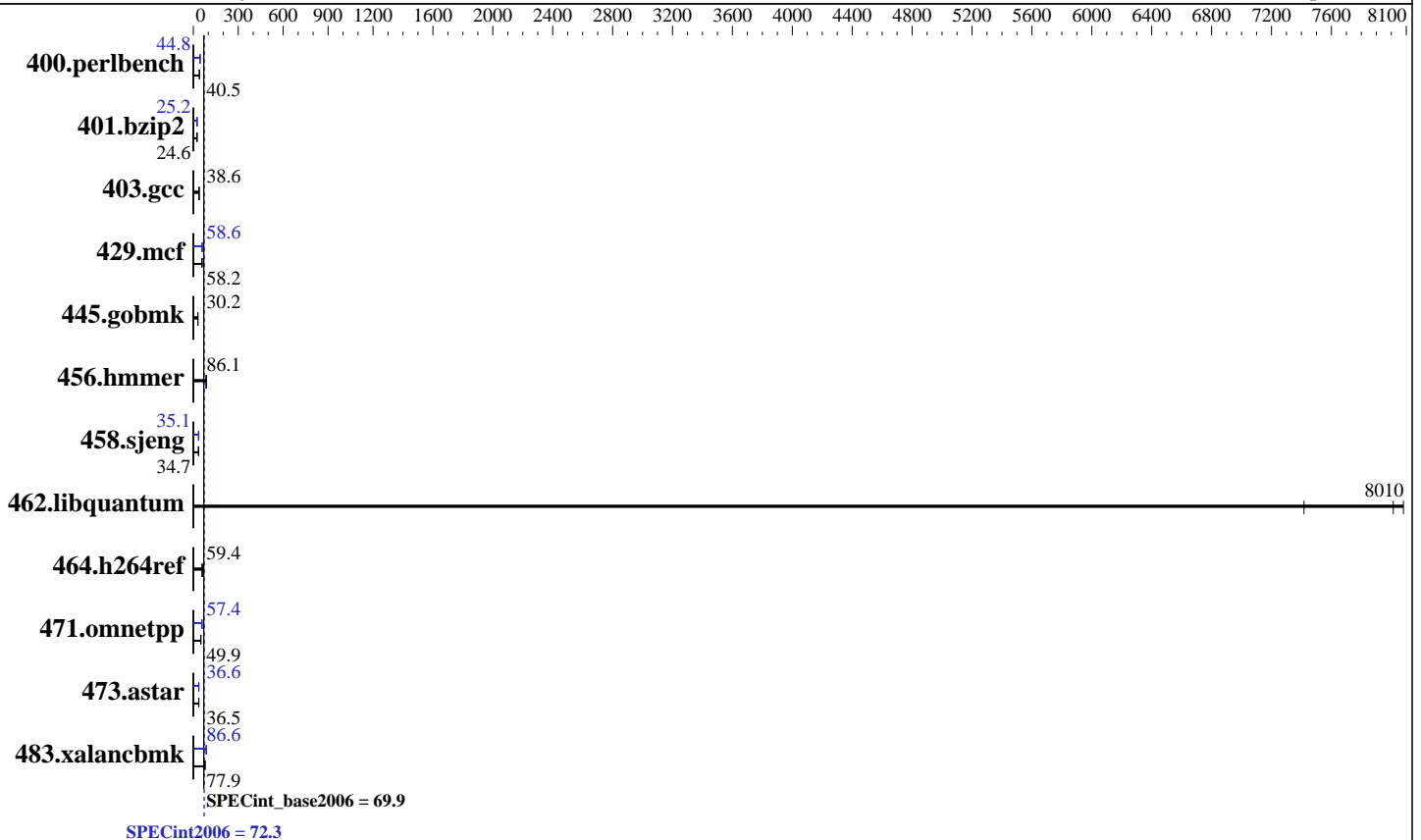
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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	240	40.6	241	40.5	**241**	**40.5**	**218**	**44.8**	218	44.8	218	44.8
401.bzip2	391	24.7	392	24.6	**392**	**24.6**	383	25.2	**383**	**25.2**	384	25.1
403.gcc	209	38.6	208	38.6	**208**	**38.6**	209	38.6	208	38.6	**208**	**38.6**
429.mcf	161	56.5	**157**	**58.2**	157	58.2	154	59.1	156	58.5	**156**	**58.6**
445.gobmk	**347**	**30.2**	346	30.3	347	30.2	**347**	**30.2**	346	30.3	347	30.2
456.hmmer	108	86.1	**108**	**86.1**	108	86.2	108	86.1	**108**	**86.1**	108	86.2
458.sjeng	**349**	**34.7**	349	34.7	348	34.8	344	35.1	**344**	**35.1**	345	35.1
462.libquantum	**2.59**	**8010**	2.79	7420	2.56	8080	**2.59**	**8010**	2.79	7420	2.56	8080
464.h264ref	372	59.4	373	59.3	**372**	**59.4**	372	59.4	373	59.3	**372**	**59.4**
471.omnetpp	125	49.8	**125**	**49.9**	123	50.8	108	57.6	109	57.4	**109**	**57.4**
473.astar	193	36.4	**193**	**36.5**	192	36.6	192	36.6	**192**	**36.6**	192	36.7
483.xalancbmk	89.9	76.8	87.6	78.8	**88.6**	**77.9**	79.6	86.7	**79.7**	**86.6**	79.8	86.5

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"

Platform Notes

```
    BIOS configuration:
    Hyperthreading = Disabled
    Energy Performance = Performance
    Uncore Frequency Override = Maximum
    CPU C1E Support = Disabled
    Sysinfo program /home/SPECcpu2006/config/sysinfo.rev6914
    $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
    running on linux-8do3 Mon Jun 20 13:01:22 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 E7-8891 v4 @ 2.80GHz
          8 "physical id"s (chips)
          80 "processors"
       cores, siblings (Caution: counting these is hw and system dependent.  The
       following excerpts from /proc/cpuinfo might not be reliable.  Use with
```
Continued on next page

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Platform Notes (Continued)

```
    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
       physical 4: cores 5 9 10 11 13 18 24 26 28 29
       physical 5: cores 5 9 10 11 13 18 24 26 28 29
       physical 6: cores 5 9 10 11 13 18 24 26 28 29
       physical 7: cores 5 9 10 11 13 18 24 26 28 29
    cache size : 61440 KB

  From /proc/meminfo
    MemTotal:       1058678360 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-8do3 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 Jun 20 13:00 last=5

  SPEC is set to: /home/SPECcpu2006
    Filesystem      Type   Size  Used Avail Use% Mounted on
    /dev/sda4       xfs    982G  287G  695G  30% /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
```

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Platform Notes (Continued)

```
    hardware, firmware, and the "DMTF SMBIOS" standard.

  BIOS FUJITSU PRIMEQUEST 2000 Series BIOS Version 81.14 04/18/2016
  Memory:
   64x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz, configured at 1600 MHz
   128x Not Specified Not Specified

 (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/SPECcpu2006/libs/32:/home/SPECcpu2006/libs/64:/home/SPECcpu2006/sh"
OMP_NUM_THREADS = "80"

 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
 For information about Fujitsu please visit: http://www.fujitsu.com
```

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
    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
```

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Base Optimization Flags

C benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-Wl,-z,muldefs -L/sh -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/compiler/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`

Peak Portability Flags

400.perlbench: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32`
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`
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.xalancbmk: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`

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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.bzip2: `-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: basepeak = yes

> 429.mcf: `-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel`
> `-opt-prefetch -auto-p32`

> 445.gobmk: basepeak = yes

> 456.hmmer: basepeak = yes

> 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:

> 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/sh -lsmartheap`

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

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

Peak Other Flags

C benchmarks:

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Peak Other Flags (Continued)

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-BDW-RevB.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-BDW-RevB.xml

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