Fujitsu
PRIMEQUEST 3800E, Intel Xeon Platinum 8180, 2.50GHz

CPU2006 license: 19  
Test sponsor: Fujitsu  
Tested by: Fujitsu  

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Test date: Oct-2017  
Hardware Availability: Nov-2017  
Software Availability: Sep-2017

<table>
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<tr>
<th>Benchmark</th>
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<th>SPECint_rate</th>
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**Hardware**

- **CPU Name:** Intel Xeon Platinum 8180  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.80 GHz  
- **CPU MHz:** 2500  
- **FPU:** Integrated  
- **CPU(s) enabled:** 224 cores, 8 chips, 28 cores/chip, 2 threads/core  
- **CPU(s) orderable:** 2,4,6,8 chips  
- **Primary Cache:** 32 KB I + 32 KB D on chip per core  
- **Secondary Cache:** 1 MB I+D on chip per core  
- **L3 Cache:** 38.5 MB I+D on chip per chip  
- **Other Cache:** None  
- **Memory:** 1536 GB (96 x 16 GB 2Rx4 PC4-2666V-R)  
- **Disk Subsystem:** 768 GB tmpfs  
- **Other Hardware:** 1 x SAS HDD, 900 GB, 10K RPM, used for swap

**Software**

- **Operating System:** SUSE Linux Enterprise Server 12 SP2 4.4.21-69-default  
- **Compiler:** C/C++: Version 18.0.0.128 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:** Not Applicable  
- **Other Software:** Microquill SmartHeap V10.2
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Results Table

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</table>

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"
Set Kernel Boot Parameter: nohz_full=1-447 isolcpus=1-447
Set CPU frequency governor to maximum performance with:
cupower -c all frequency-set -g performance
Set tmpfs filesystem with:
mkdir /home/memory
mount -t tmpfs -o size=768g,rw tmpfs /home/memory
Process tuning settings:
echo 10000000 > /proc/sys/kernel/sched_min_granularity_ns
echo 15000000 > /proc/sys/kernel/sched_wakeup_granularity_ns
echo always > /sys/kernel/mm/transparent_hugepage/enabled
cpu idle state set with:
cupower idle-set -d 2
cupower idle-set -d 3
set affinity of rcu threads to the cpu0:
for i in `pgrep rcu`; do taskset -pc 0 $i; done
Platform Notes

BIOS configuration:
- Intel Virtualization Technology = Disabled
- HWPM Support = Disabled
- DCU Streamer Prefetcher = Disabled
- Stale AtoS = Enabled
- LLC dead line alloc = Disabled
- Sub NUMA Clustering = Enabled
- Fan Control = Full

Sysinfo program /home/memory/speccpu/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-wzbo Mon Oct 30 20:03:28 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) Platinum 8180 CPU @ 2.50GHz
  8 "physical id"s (chips)
  448 "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 : 28
  siblings : 56
  physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
  25 26 27 28 29 30
  physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
  25 26 27 28 29 30
  physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
  25 26 27 28 29 30
  physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
  25 26 27 28 29 30
  physical 4: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
  25 26 27 28 29 30
  physical 5: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
  25 26 27 28 29 30
  physical 6: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
  25 26 27 28 29 30
  physical 7: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
  25 26 27 28 29 30
cache size : 39424 KB

From /proc/meminfo
MemTotal: 1583932372 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

From /etc/*release* /etc/*version*
SPEC CINT2006 Result

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Platform Notes (Continued)

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

uname -a:
(9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 30 19:55
SPEC is set to: /home/memory/speccpu

Filesystem     Type       Size  Used Avail Use% Mounted on
tmpfs          tmpfs    768G   9.6G  759G   2% /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 V1.0.0.0 R90.28.0 for D3858-A1x 10/25/2017
Memory:
48x Hynix HMA42GR7BJR4N-VK 16 GB 2 rank 2666 MHz
48x Samsung M393A2G40EB2-CTD 16 GB 2 rank 2666 MHz

(End of data from sysinfo program)

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General Notes

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/memory/speccpu/lib/ia32:/home/memory/speccpu/icc2018lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/memory/speccpu/sh10.2"

Binaries compiled on a system with 2x Intel Xeon Platinum 8180 CPU + 384GB RAM
memory using SUSE Linux Enterprise Server 12 SP2
Transparent Huge Pages enabled with:
  echo always > /sys/kernel/mm/transparent_hugepage/enabled
Filesystem page cache cleared with:
  shell invocation of 'sync; echo 3 > /proc/sys/vm(drop_caches)' prior to run

Continued on next page
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General Notes (Continued)
runcspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

Base Compiler Invocation

C benchmarks:
   icc -m32 -L/opt/intel/compilers_and_libraries_2018.0.128/linux/compiler/lib/ia32
C++ benchmarks:
   icpc -m32 -L/opt/intel/compilers_and_libraries_2018.0.128/linux/compiler/lib/ia32

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-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
      -qopt-mem-layout-trans=3
C++ benchmarks:
   -xCORE-AVX512 -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
## SPEC CINT2006 Result

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|-----------|----------|-----------------------|----------|-----------------------|----------|

The flags files that were used to format this result can be browsed at:
- [Intel-ic17.0-official-linux64-revF.html](http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.html)
- [Fujitsu-Platform-Settings-V1.2-SKL-RevC.html](http://www.spec.org/cpu2006/flags/Fujitsu-Platform-Settings-V1.2-SKL-RevC.html)

You can also download the XML flags sources by saving the following links:
- [Intel-ic17.0-official-linux64-revF.xml](http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml)
- [Fujitsu-Platform-Settings-V1.2-SKL-RevC.xml](http://www.spec.org/cpu2006/flags/Fujitsu-Platform-Settings-V1.2-SKL-RevC.xml)

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For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.  