Hewlett Packard Enterprise
(Integrity Superdome X)

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

HPE

Integrity Superdome X
(384 core, 2.20 GHz, Intel Xeon E7-8890 v4)

Specspeed2017_fp_base = 5.37
Specspeed2017_fp_peak = 6.66

Hardware
CPU Name: Intel Xeon E7-8890 v4
Max MHz.: 3400
Nominal: 2200
Enabled: 384 cores, 16 chips, 2 threads/core
Orderable: 2 to 16 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 256 KB I+D on chip per core
L3: 60 MB I+D on chip per core
Other: None
Memory: 4 TB (128 x 32 GB 2Rx4 PC4-2400T-L, running at 1600)
Storage: 8 x C8S59A, 900 GB 10 K RPM SAS
Other: None

Software
OS: SUSE Linux Enterprise Server 12 (x86_64) SP1
Compiler: C/C++: Version 17.0.0.098 of Intel C/C++
Compiler for Linux:
Fortran: Version 17.0.0.098 of Intel Fortran
Compiler for Linux:
Parallel: No
Firmware: HP Bundle: 008.004.084 SFW: 043.025.000 08/16/2016
File System: xfs
System State: Run level 5 (multi-user, w/GUI)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: Microquill SmartHeap V10.2
Hewlett Packard Enterprise
(384 core, 2.20 GHz, Intel Xeon E7-8890 v4)

SPECspeed2017_fp_base = 5.37
SPECspeed2017_fp_peak = 6.66

<table>
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<td>5.97</td>
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<td>7.30</td>
<td>2150</td>
<td>7.32</td>
<td>2146</td>
<td>7.34</td>
</tr>
</tbody>
</table>

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

Operating System Notes

- Stack size set to unlimited using "ulimit -s unlimited"
- intel_idle.max_cstate=3 appended in kernel command line
- Power profile set with:
  - cpupower -c all frequency-set -g performance
- Setting the value of perf-bias:
  - cpupower set -b 0
- Tuned profile set with:
  - tuned-adm profile throughput-performance
- Transparent Huge Pages enabled by default

General Notes

- Environment variables set by runcpu before the start of the run:
  - KMP_AFFINITY = "granularity=fine,compact,1,0"
  - LD_LIBRARY_PATH = "/spec/cpu2017/lib/ia32:/spec/cpu2017/lib/intel64:/spec/cpu2017/sh10.2"
  - OMP_NUM_THREADS = "%{cores}"
  - OMP_STACKSIZE = "192M"

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

Platform Notes

- Memory RAS Configuration set to Maximum Performance
- Sysinfo program /spec/cpu2017/Docs/sysinfo
- r4696 of 2016-07-28 da95b61906f345a0d9942e915810c155
SPEC CPU2017 Floating Point Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Integrity Superdome X
(384 core, 2.20 GHz, Intel Xeon E7-8890 v4)

SPECspeed2017_fp_base = 5.37
SPECspeed2017_fp_peak = 6.66

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Oct-2016
Hardware Availability: Jun-2016
Software Availability: Sep-2016

Platform Notes (Continued)

running on hawk049os1 Sat Oct 15 01:24:42 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/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E7-8890 v4 @ 2.20GHz
  16 "physical id"s (chips)
  768 "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
physical 4: 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 5: 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 6: 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 7: 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 8: 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 9: 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 10: 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 11: 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 12: 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 13: 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 14: 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 15: 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

(Continued on next page)
**SPEC CPU2017 Floating Point Speed Result**

**Hewlett Packard Enterprise**  
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CPU2017 License: 3  
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**Platform Notes (Continued)**

```plaintext
    cache size : 61440 KB

    From /proc/meminfo
        MemTotal: 4235891396 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 hawk049os1 3.12.53-60.30-default #1 SMP Wed Feb 10 14:41:46 UTC 2016
          (e57129f) x86_64 x86_64 x86_64 GNU/Linux

    run-level 5 Oct 14 14:07

    SPEC is set to: /spec/cpu2017

    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 HP Bundle: 008.004.084 SFW: 043.025.000 08/16/2016
```

(Continued on next page)
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Hardware Availability: Jun-2016
Software Availability: Sep-2016

Platform Notes (Continued)
128x HP HMA84GL7MFR4N-UH 32 GB 2 rank 1067 MHz, configured at 1600 MHz
256x not defined not defined

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of memory is 4 TB and the dmidecode description should have one line reading as:
128x HP HMA84GL7MFR4N-UH 32 GB 2 rank 1067 MHz, configured at 1600 MHz

Compiler Version Notes
==============================================================================
CC  607.cactuBSSN_s(base, peak)  619.lbm_s(base, peak)  621.wrf_s(base, peak)
  627.cam4_s(base, peak)  628.pop2_s(base, peak)  638.imagick_s(base, peak)
  644.nab_s(base, peak)
==============================================================================
icc (ICC) 17.0.0 20160721
Copyright (C) 1985-2016 Intel Corporation. All rights reserved.

==============================================================================
CXXC 607.cactuBSSN_s(base, peak)
==============================================================================
icpc (ICC) 17.0.0 20160721
Copyright (C) 1985-2016 Intel Corporation. All rights reserved.

==============================================================================
FC  603.bwaves_s(base, peak)  607.cactuBSSN_s(base, peak)  621.wrf_s(base, peak)
    627.cam4_s(base, peak)  628.pop2_s(base, peak)  638.imagick_s(base, peak)
    649.fotonik3d_s(base, peak)  654.roms_s(base, peak)
==============================================================================
ifort (IFORT) 17.0.0 20160721
Copyright (C) 1985-2016 Intel Corporation. All rights reserved.

Base Compiler Invocation
C benchmarks:
  icc -m64 -std=c11

Fortran benchmarks:
  ifort -m64

Benchmarks using both Fortran and C:
  ifort -m64 icc -m64 -std=c11
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Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -DSPEC_LP64
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
   -assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-qopt-prefetch -qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP

Fortran benchmarks:
-DSPEC_SUPPRESS_OPENMP -qopt-prefetch -qopt-mem-layout-trans=3
   -nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-qopt-prefetch -qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP
   -nostandard-realloc-lhs

Benchmarks using Fortran, C, and C++:
-Wl,-z,muldefs -qopt-prefetch -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -nostandard-realloc-lhs -L/sh10.2 -lsmartheap64

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

(Continued on next page)
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Peak Compiler Invocation (Continued)

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Peak Portability Flags
Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
-prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2 -auto-p32 -ipo
-qopt-prefetch -O3 -no-prec-div -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP

Fortran benchmarks:
-prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP -O2
-xCORE-AVX2 -qopt-prefetch -ipo -O3 -qopt-mem-layout-trans=3
-no-prec-div -nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2 -auto-p32 -ipo
-qopt-prefetch -O3 -no-prec-div -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -nostandard-realloc-lhs

Benchmarks using Fortran, C, and C++:
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2
-auto-p32 -ipo -qopt-prefetch -O3 -no-prec-div
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -nostandard-realloc-lhs
-L/sh10.2 -lsmartheap64
### SPEC CPU2017 Floating Point Speed Result

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<td>Integrity Superdome X</td>
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<tr>
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<td>SPECspeed2017_fp_base = 5.37</td>
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The flags files that were used to format this result can be browsed at:
- [http://www.spec.org/cpu2017/flags/HP-Platform-Flags-Intel-V1.2-Integrity-revC.html](http://www.spec.org/cpu2017/flags/HP-Platform-Flags-Intel-V1.2-Integrity-revC.html)

You can also download the XML flags sources by saving the following links:
- [http://www.spec.org/cpu2017/flags/HP-Platform-Flags-Intel-V1.2-Integrity-revC.xml](http://www.spec.org/cpu2017/flags/HP-Platform-Flags-Intel-V1.2-Integrity-revC.xml)

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

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