Dell Inc. 

PowerEdge R740 (Intel Xeon Silver 4112, 2.60 GHz) 

SPECfp®_rate2006 =  Not Run 

SPECfp_rate_base2006 = 364

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Jun-2017
Hardware Availability: Jul-2017
Software Availability: Nov-2016

Copies

<table>
<thead>
<tr>
<th>Software</th>
<th>Copies</th>
<th>SPECfp_rate2006</th>
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<td>416.gamess</td>
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</tr>
<tr>
<td>482.sphinx3</td>
<td>16</td>
<td>364</td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon Silver 4112  
CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz  
CPU MHz: 2600  
FPU: Integrated  
CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip, 2 threads/core  
CPU(s) orderable: 1.2 chip  
Primary Cache: 32 KB I + 32 KB D on chip per core  
Secondary Cache: 1 MB I+D on chip per core  

Software

Operating System: SUSE Linux Enterprise Server 12 SP2  
4.4.21-69-default  
Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux;  
Fortran: Version 17.0.3.191 of Intel Fortran Compiler for Linux  
Auto Parallel: No  
File System: xfs  
System State: Run level 3 (multi-user)  

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**L3 Cache:** 8.25 MB I+D on chip per chip

**Other Cache:** None

**Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2400 MT/s)

**Disk Subsystem:** 1 x 960 GB SATA SSD

**Other Hardware:** None

**Base Pointers:** 32/64-bit

**Peak Pointers:** 32/64-bit

**Other Software:** None

---

**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>453.povray</td>
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<td>457.dealII</td>
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<td><strong>337</strong></td>
<td>923</td>
<td>338</td>
</tr>
</tbody>
</table>

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

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**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"

---

**Platform Notes**

BIOS settings:
Virtualization Technology disabled
System Profile set to Custom

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Dell Inc.

PowerEdge R740 (Intel Xeon Silver 4112, 2.60 GHz)

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---

**Platform Notes (Continued)**

- CPU Performance set to Maximum Performance
- C States set to autonomous
- C1E disabled
- Uncore Frequency set to Dynamic
- Energy Efficiency Policy set to Performance
- Memory Patrol Scrub disabled
- Logical Processor enabled
- CPU Interconnect Bus Link Power Management disabled
- PCI ASPM L1 Link Power Management disabled
- **Sysinfo program** `/home/cpu2006-1.2_ic17u3/config/sysinfo.rev6993`
- Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
  - running on `linux-bgfp Mon Jun  5 23:37:34 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](http://www.spec.org/cpu2006/Docs/config.html#sysinfo)

From `/proc/cpuinfo`

- model name: `Intel(R) Xeon(R) Silver 4112 CPU @ 2.60GHz`
- 2 "physical id"s (chips)
- 16 "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: 4
  - siblings: 8
- physical 0: cores 1 2 4 5
- physical 1: cores 1 2 4 5
- cache size: 8448 KB

From `/proc/meminfo`

- MemTotal: 395699196 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:
  - version: `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"

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---

**Platform Notes (Continued)**

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

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

```bash
run-level 3 Jun 5 17:26
SPEC is set to: /home/cpu2006-1.2_ic17u3
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 405G 8.8G 396G 3% /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 hardware, firmware, and the "DMTF SMBIOS" standard.

**BIOS Dell Inc. 1.0.3 05/30/2017**
Memory:
24x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666 MHz, configured at 2400 MHz

(End of data from sysinfo program)

---

**General Notes**

Environment variables set by runspec before the start of the run:

```bash
LD_LIBRARY_PATH = ""/home/cpu2006-1.2_ic17u3/lib/ia32:/home/cpu2006-1.2_ic17u3/lib/intel64:/home/cpu2006-1.2_ic17u3/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 by default
Filesystem page cache cleared with:
shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

---

**Base Compiler Invocation**

C benchmarks:

```
icc -m64
```

C++ benchmarks:

```
icpc -m64
```

Fortran benchmarks:

```
ifort -m64
```
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Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

```
icc -m64 ifort -m64
```

Base Portability Flags

- 410.bwaves: -DSPEC_CPU_LP64
- 416.gamess: -DSPEC_CPU_LP64
- 433.milc: -DSPEC_CPU_LP64
- 434.zeusmp: -DSPEC_CPU_LP64
- 435.gromacs: -DSPEC_CPU_LP64 -nofor_main
- 436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
- 437.leslie3d: -DSPEC_CPU_LP64
- 444.namd: -DSPEC_CPU_LP64
- 447.dealII: -DSPEC_CPU_LP64
- 450.soplex: -DSPEC_CPU_LP64
- 453.povray: -DSPEC_CPU_LP64
- 454.calculix: -DSPEC_CPU_LP64 -nofor_main
- 459.GemsFDTD: -DSPEC_CPU_LP64
- 465.tonto: -DSPEC_CPU_LP64
- 470.lbm: -DSPEC_CPU_LP64
- 481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
- 482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:

```
-xCORE-AVX512 -ipo -03 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3
```

C++ benchmarks:

```
-xCORE-AVX512 -ipo -03 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3
```

Fortran benchmarks:

```
-xCORE-AVX512 -ipo -03 -no-prec-div -qopt-prefetch
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX512 -ipo -03 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3
```

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-revF.html
<table>
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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)
- [Dell-Platform-Flags-PowerEdge14G-revB.xml](http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revB.xml)

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

Tested with SPEC CPU2006 v1.2.