SPEC® CFP2006 Result

Dell Inc.

PowerEdge R330 (Intel Xeon E3-1220 v5, 3.00 GHz)

SPECfp®2006 = 92.6
SPECfp_base2006 = 90.7

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

Hardware

<table>
<thead>
<tr>
<th>Software</th>
<th>Operating System: SUSE Linux Enterprise Server 12 3.12.28-4-default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux; Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux</td>
<td></td>
</tr>
<tr>
<td>Auto Parallel: Yes</td>
<td></td>
</tr>
<tr>
<td>File System: ext4</td>
<td></td>
</tr>
<tr>
<td>System State: Run level 3 multi-user</td>
<td></td>
</tr>
</tbody>
</table>

CPU Name: Intel Xeon E3-1220 v5
CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz
CPU MHz: 3000
FPU: Integrated
CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip
CPU(s) orderable: 1 chip
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core

Dell Inc.

PowerEdge R330 (Intel Xeon E3-1220 v5, 3.00 GHz)

SPECfp®2006 = 92.6
SPECfp_base2006 = 90.7

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

Hardware

<table>
<thead>
<tr>
<th>Software</th>
<th>Operating System: SUSE Linux Enterprise Server 12 3.12.28-4-default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux; Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux</td>
<td></td>
</tr>
<tr>
<td>Auto Parallel: Yes</td>
<td></td>
</tr>
<tr>
<td>File System: ext4</td>
<td></td>
</tr>
<tr>
<td>System State: Run level 3 multi-user</td>
<td></td>
</tr>
</tbody>
</table>

CPU Name: Intel Xeon E3-1220 v5
CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz
CPU MHz: 3000
FPU: Integrated
CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip
CPU(s) orderable: 1 chip
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core
SPEC CFP2006 Result

Dell Inc.

PowerEdge R330 (Intel Xeon E3-1220 v5, 3.00 GHz)

SPECfp2006 = 92.6
SPECfp_base2006 = 90.7

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.
L3 Cache: 8 MB I+D on chip per chip
Other Cache: None
Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2133P-U)
Disk Subsystem: 1 x 500 GB 7200 RPM SATA
Other Hardware: None
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>97.2</td>
<td>140</td>
<td>97.0</td>
<td>140</td>
<td>97.2</td>
<td>140</td>
</tr>
<tr>
<td>416.gamess</td>
<td>434</td>
<td>45.1</td>
<td>434</td>
<td>45.1</td>
<td>434</td>
<td>45.1</td>
</tr>
<tr>
<td>433.milc</td>
<td>86.7</td>
<td>106</td>
<td>87.0</td>
<td>106</td>
<td>86.9</td>
<td>106</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>47.9</td>
<td>190</td>
<td>47.9</td>
<td>190</td>
<td>47.9</td>
<td>190</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>116</td>
<td>61.3</td>
<td>116</td>
<td>61.3</td>
<td>116</td>
<td>61.3</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>34.3</td>
<td>349</td>
<td>34.4</td>
<td>347</td>
<td>34.1</td>
<td>350</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>86.7</td>
<td>108</td>
<td>86.6</td>
<td>109</td>
<td>86.8</td>
<td>108</td>
</tr>
<tr>
<td>444.namd</td>
<td>238</td>
<td>33.7</td>
<td>238</td>
<td>33.7</td>
<td>238</td>
<td>33.7</td>
</tr>
<tr>
<td>447.dealII</td>
<td>155</td>
<td>74.0</td>
<td>155</td>
<td>73.8</td>
<td>155</td>
<td>73.8</td>
</tr>
<tr>
<td>450.soplex</td>
<td>159</td>
<td>52.4</td>
<td>159</td>
<td>52.3</td>
<td>162</td>
<td>51.6</td>
</tr>
<tr>
<td>453.povray</td>
<td>81.2</td>
<td>65.5</td>
<td>80.0</td>
<td>66.5</td>
<td>81.8</td>
<td>65.0</td>
</tr>
<tr>
<td>454.calculix</td>
<td>117</td>
<td>70.7</td>
<td>117</td>
<td>70.7</td>
<td>117</td>
<td>70.6</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>127</td>
<td>83.3</td>
<td>127</td>
<td>83.2</td>
<td>127</td>
<td>83.3</td>
</tr>
<tr>
<td>465.tonto</td>
<td>164</td>
<td>60.1</td>
<td>164</td>
<td>60.1</td>
<td>164</td>
<td>60.1</td>
</tr>
<tr>
<td>470.lbm</td>
<td>72.4</td>
<td>190</td>
<td>72.3</td>
<td>190</td>
<td>72.2</td>
<td>190</td>
</tr>
<tr>
<td>481.wrf</td>
<td>93.2</td>
<td>120</td>
<td>93.3</td>
<td>120</td>
<td>92.9</td>
<td>120</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>210</td>
<td>92.7</td>
<td>208</td>
<td>93.9</td>
<td>208</td>
<td>93.7</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"

Platform Notes

BIOS settings:
Virtualization Technology disabled
System Profile set to Performance
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 $ e3fbb8667b5a285932ceab81e28219e1
running on linux-8px2 Tue Sep 22 13:40:05 2015

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

Continued on next page

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/
**Dell Inc.**

**SPEC CFP2006 Result**

PowerEdge R330 (Intel Xeon E3-1220 v5, 3.00 GHz)  

<table>
<thead>
<tr>
<th>SPECfp2006</th>
<th>92.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>90.7</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 55  
**Test sponsor:** Dell Inc.  
**Test date:** Sep-2015  
**Tested by:** Dell Inc.  
**Hardware Availability:** Nov-2015  
**Software Availability:** Sep-2015

---

**Platform Notes (Continued)**

From `/proc/cpuinfo`:
- model name: Intel(R) Xeon(R) CPU E3-1220 v5 @ 3.00GHz  
  - 1 "physical id"s (chips)  
  - 4 "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: 4  
  - physical 0: cores 0 1 2 3  
  - cache size: 8192 KB

From `/proc/meminfo`:
- MemTotal: 66066084 kB  
- HugePages_Total: 0  
- Hugepagesize: 2048 kB

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

From `/etc/*release* /etc/*version*`:
- SuSE-release:  
  - SUSE Linux Enterprise Server 12 (x86_64)  
  - VERSION = 12  
  - PATCHLEVEL = 0  
  - # 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"  
  - VERSION_ID="12"  
  - PRETTY_NAME="SUSE Linux Enterprise Server 12"  
  - ID="sles"  
  - ANSI_COLOR="0;32"  
  - CPE_NAME="cpe:/o:suse:sles:12"

```
uname -a:
Linux linux-8px2 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC 2014  
(9879bd4) x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Sep 22 09:05
```

**SPEC is set to:** `/root/cpu2006-1.2`

```
Filesystem   Type   Size  Used Avail Use% Mounted on
/dev/sda2    ext4   451G  10G  440G   3%  /
```

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...
**Dell Inc.**

PowerEdge R330 (Intel Xeon E3-1220 v5, 3.00 GHz)

**SPECfp2006 =** 92.6

**SPECfp_base2006 =** 90.7

- **CPU2006 license:** 55
- **Test date:** Sep-2015
- **Test sponsor:** Dell Inc.
- **CPU2006 license:** 55
- **Test sponsor:** Dell Inc.
- **Hardware Availability:** Nov-2015
- **Software Availability:** Sep-2015
- **Tested by:** Dell Inc.

**Platform Notes (Continued)**

- hardware, firmware, and the "DMTF SMBIOS" standard.
- BIOS Dell Inc. 0.3.16 09/09/2015
- Memory:
  - 1x 00AD00000000 HMA82GU7MFR8N-TF 16 GB 2 rank 2133 MHz
  - 2x 00AD0000020B HMA82GU7MFR8N-TF 16 GB 2 rank 2133 MHz
  - 1x 00AD00000800 HMA82GU7MFR8N-TF 16 GB 2 rank 2133 MHz

(End of data from sysinfo program)

**General Notes**

- Environment variables set by runspec before the start of the run:
  - KMP_AFFINITY = "granularity=fine,compact,1,0"
  - LD_LIBRARY_PATH = "/root/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"
  - OMP_NUM_THREADS = 4"

- 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

**Base Compiler Invocation**

- C benchmarks:
  - icc -m64

- C++ benchmarks:
  - icpc -m64

- Fortran benchmarks:
  - ifort -m64

- 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.zesmp: -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

Continued on next page
Dell Inc.

PowerEdge R330 (Intel Xeon E3-1220 v5, 3.00 GHz)

SPECfp2006 = 92.6
SPECfp_base2006 = 90.7

CPU2006 license: 55
Test sponsor: Dell Inc.
Test date: Sep-2015
Tested by: Dell Inc.
Hardware Availability: Nov-2015
Software Availability: Sep-2015

Base Portability Flags (Continued)

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-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
-ansi-alias

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
-ansi-alias

Peak Compiler Invocation

C benchmarks:
icc -m64

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
icc -m64 ifort -m64

Peak Portability Flags

Same as Base Portability Flags
### Dell Inc.

**PowerEdge R330 (Intel Xeon E3-1220 v5, 3.00 GHz)**

<table>
<thead>
<tr>
<th>SPECfp2006</th>
<th>92.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>90.7</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 55  
**Test date:** Sep-2015

**Test sponsor:** Dell Inc.  
**Hardware Availability:** Nov-2015

**Tested by:** Dell Inc.  
**Software Availability:** Sep-2015

### Peak Optimization Flags

**C benchmarks:**

- 433.milc: basepeak = yes
- 470.lbm: basepeak = yes
- 482.sphinx3: basepeak = yes

**C++ benchmarks:**

- 444.namd: -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) -fno-alias -auto-llp32
- 447.dealII: basepeak = yes
- 450.soplex: basepeak = yes
- 453.povray: -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 -ansi-alias

**Fortran benchmarks:**

- 410.bwaves: basepeak = yes
- 416.gamess: -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) -unroll2 -inline-level=0 -scalar-rep-
- 434.zeusmp: basepeak = yes
- 437.leslie3d: basepeak = yes
- 459.GemsFDTD: -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) -unroll2 -inline-level=0 -opt-prefetch -parallel
- 465.tonto: -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) -inline-calloc -opt-malloc-options=3 -auto -unroll4

**Benchmarks using both Fortran and C:**
## Dell Inc.

*PowerEdge R330 (Intel Xeon E3-1220 v5, 3.00 GHz)*

<table>
<thead>
<tr>
<th>CPU2006 license:</th>
<th>55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>Test date:</td>
<td>Sep-2015</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Nov-2015</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Sep-2015</td>
</tr>
</tbody>
</table>

### SPEC CFP2006 Result

- **SPECfp2006** = 92.6
- **SPECfp_base2006** = 90.7

### Peak Optimization Flags (Continued)

- `435.gromacs`: `basepeak = yes`
- `436.cactusADM`: `basepeak = yes`
- `454.calculix`: `-xCORE-AVX2` `-ipo -O3 -no-prec-div` `-auto-llp32 -ansi-alias`
- `481.wrf`: `basepeak = yes`

The flags files that were used to format this result can be browsed at:

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

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2006 v1.2.
Originally published on 17 November 2015.