# SPEC® CFP2006 Result

## Dell Inc.

**PowerEdge R740 (Intel Xeon Bronze 3104, 1.70 GHz)**

### SPECfp®_rate2006 = Not Run

### SPECfp_rate_base2006 = 324

<table>
<thead>
<tr>
<th>Software</th>
<th>SPECfp_rate_base2006 = 324</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2006 license: 55</td>
<td>Test date: Jun-2017</td>
</tr>
<tr>
<td>Test sponsor: Dell Inc.</td>
<td>Hardware Availability: Jul-2017</td>
</tr>
<tr>
<td>Tested by: Dell Inc.</td>
<td>Software Availability: Nov-2016</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Bronze 3104</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics:</td>
<td></td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>1700</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>12 cores, 2 chips, 6 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1,2 chip</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>1 MB I+D on chip per core</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Operating System:</th>
<th>Red Hat Enterprise Linux Server release 7.3 (Maipo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>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</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
</tbody>
</table>

---

### CactusADM

```
410.bwaves 12
416.gamess 12
433.milc 12
434.zeusmp 12
435.gromacs 12
436.cactusADM 12
437.leslie3d 12
444.namd 12
447.dealII 12
450.soplex 12
453.povray 12
454.calculix 12
459.GemsFDTD 12
465.tonto 12
470.lbm 12
481.wrf 12
482.sphinx3 12
```

---

### Software

- Operating System: Red Hat Enterprise Linux Server release 7.3 (Maipo)
- 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
Dell Inc. PowerEdge R740 (Intel Xeon Bronze 3104, 1.70 GHz)  

SPEC CFP2006 Result

CPU2006 license: 55  
Test sponsor: Dell Inc.  
Tested by: Dell Inc.  
Test date: Jun-2017  
Hardware Availability: Jul-2017  
Software Availability: Nov-2016  

SPECfp_rate2006 = Not Run  
SPECfp_rate_base2006 = 324

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 2133 MT/s)  
Disk Subsystem: 1 x 960 GB SATA SSD  
Other Hardware: None  
System State: Run level 3 (multi-user)  
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>Base</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>12</td>
<td>332</td>
<td>491</td>
<td>332</td>
<td>491</td>
<td>331</td>
<td>492</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>416.gamess</td>
<td>12</td>
<td>936</td>
<td>251</td>
<td>395</td>
<td>251</td>
<td>935</td>
<td>251</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>433.milc</td>
<td>12</td>
<td>248</td>
<td>445</td>
<td>248</td>
<td>444</td>
<td>248</td>
<td>445</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>12</td>
<td>264</td>
<td>413</td>
<td>264</td>
<td>414</td>
<td>264</td>
<td>414</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>435.gromacs</td>
<td>12</td>
<td>311</td>
<td>275</td>
<td>313</td>
<td>274</td>
<td>311</td>
<td>276</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>12</td>
<td>280</td>
<td>513</td>
<td>276</td>
<td>520</td>
<td>276</td>
<td>520</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>12</td>
<td>298</td>
<td>378</td>
<td>298</td>
<td>378</td>
<td>298</td>
<td>378</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>444.namd</td>
<td>12</td>
<td>485</td>
<td>198</td>
<td>485</td>
<td>198</td>
<td>485</td>
<td>198</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>447.dealII</td>
<td>12</td>
<td>367</td>
<td>374</td>
<td>368</td>
<td>373</td>
<td>367</td>
<td>374</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>450.soplex</td>
<td>12</td>
<td>416</td>
<td>241</td>
<td>417</td>
<td>240</td>
<td>417</td>
<td>240</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>453.povray</td>
<td>12</td>
<td>362</td>
<td>177</td>
<td>361</td>
<td>177</td>
<td>360</td>
<td>177</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>454.calculix</td>
<td>12</td>
<td>326</td>
<td>303</td>
<td>327</td>
<td>303</td>
<td>328</td>
<td>302</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>12</td>
<td>492</td>
<td>259</td>
<td>493</td>
<td>258</td>
<td>494</td>
<td>258</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>465.tonto</td>
<td>12</td>
<td>427</td>
<td>277</td>
<td>434</td>
<td>272</td>
<td>426</td>
<td>277</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>470.lbm</td>
<td>12</td>
<td>278</td>
<td>593</td>
<td>277</td>
<td>595</td>
<td>277</td>
<td>595</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>481.wrf</td>
<td>12</td>
<td>356</td>
<td>376</td>
<td>362</td>
<td>370</td>
<td>364</td>
<td>369</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>12</td>
<td>908</td>
<td>258</td>
<td>906</td>
<td>258</td>
<td>902</td>
<td>259</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</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"

Platform Notes

BIOS settings:
Virtualization Technology disabled
System Profile set to Custom
Spec CFP2006 Result

Dell Inc.

PowerEdge R740 (Intel Xeon Bronze 3104, 1.70 GHz)

SPECfp_rate2006 = Not Run
SPECfp_rate_base2006 = 324

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

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
CPU Interconnect Bus Link Power Management disabled
PCI ASPM L1 Link Power Management disabled
Sysinfo program /cpu2006-1.2_ic17u3/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
runiting on localhost.localdomain Fri Jun 9 00:07:36 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) Bronze 3104 CPU @ 1.70GHz
  2 "physical id"s (chips)
  12 "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 : 6
siblings : 6
physical 0: cores 0 1 2 3 4 5
physical 1: cores 0 1 2 3 4 5
cache size : 8448 KB

From /proc/meminfo
MemTotal: 394871028 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
os-release:
  NAME="Red Hat Enterprise Linux Server"
  VERSION="7.3 (Maipo)"
  ID="rhel"
  ID_LIKE="fedora"
  VERSION_ID="7.3"
  PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
  ANSI_COLOR="0;31"
  CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:ga:server"
redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)

uname -a:
Linux localhost.localdomain 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016 x86_64 x86_64 x86_64 GNU/Linux

Continued on next page
Dell Inc.  
PowerEdge R740 (Intel Xeon Bronze 3104, 1.70 GHz)  

**SPEC CFP2006 Result**

<table>
<thead>
<tr>
<th>SPECfp_rate2006</th>
<th>Not Run</th>
<th>SPECfp_rate_base2006</th>
<th>324</th>
</tr>
</thead>
</table>

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

**Platform Notes (Continued)**

run-level 3 Jun 8 16:50

SPEC is set to: /cpu2006-1.2_ic17u3  
Filesystem | Type | Size | Used | Avail | Use% | Mounted on |  
/dev/sda2 | xfs | 838G | 7.4G | 831G | 1% | / |

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. 1.0.0 05/16/2017  
Memory:  
24x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666 MHz, configured at 2133 MHz

(End of data from sysinfo program)

**General Notes**

Environment variables set by runspec before the start of the run:  
LD_LIBRARY_PATH = "/cpu2006-1.2_ic17u3/lib/ia32:/cpu2006-1.2_ic17u3/lib/intel64:/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  
runcspec 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

Benchmarks using both Fortran and C:  
   icc -m64 ifort -m64
SPEC CFP2006 Result

Dell Inc.

PowerEdge R740 (Intel Xeon Bronze 3104, 1.70 GHz)

SPECfp_rate2006 = Not Run
SPECfp_rate_base2006 = 324

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

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

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 -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX512 -ipo -O3 -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

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revB.xml
Dell Inc.  
PowerEdge R740 (Intel Xeon Bronze 3104, 1.70 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>
</tbody>
</table>

**SPECfp_rate2006 = Not Run**  
**SPECfp_rate_base2006 = 324**

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