### SPEC® CPU2017 Integer Rate Result

**Format sp. z o.o.**  
**ASUS RS500-E8-RS4 v2**

<table>
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<tr>
<th>SPECrate2017_int_base</th>
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</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9032  
**Test Sponsor:** Format sp. z o.o.  
**Tested by:** Format sp. z o.o.

**Test Date:** Aug-2018  
**Hardware Availability:** Aug-2018  
**Software Availability:** Apr-2018

| Software | Red Hat Enterprise Linux Server release 7.5 (Maipo)  
|----------|--------------------------------------------------|
| Compiler | C/C++: Version 18.0.0.128 of Intel C/C++  
|          | Compiler for Linux: Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux |
| Parallel | No |
| Firmware | Version 3401 released Jun-2017 |
| File System | xfs |
| System State | Run level 3 (multi-user) |
| Base Pointers | 64-bit |
| Peak Pointers | Not Applicable |
| Other | jemalloc: jemalloc memory allocator library V5.0.1; |

#### Hardware

- **CPU Name:** Intel Xeon E5-2620 v4  
- **Max MHz.:** 3000  
- **Nominal:** 2100  
- **Enabled:** 16 cores, 2 chips, 2 threads/core  
- **Orderable:** 1,2 chip  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **L2:** 256 KB I+D on chip per core  
- **L3:** 20 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R, running at 2133)  
- **Storage:** 1x 800 GB PCIe SSD  
- **Other:** None

#### Software

- **OS:** Red Hat Enterprise Linux Server release 7.5 (Maipo)  
- **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++  
- **Compiler for Linux:** Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux  
- **Parallel:** No  
- **Firmware:** Version 3401 released Jun-2017  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
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- **Other:** jemalloc: jemalloc memory allocator library V5.0.1;
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<table>
<thead>
<tr>
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<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
<td>1093</td>
<td>46.6</td>
<td>1091</td>
<td>46.7</td>
<td>1094</td>
<td>46.6</td>
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<td>798</td>
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<td>505.mcf_r</td>
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<td>651</td>
<td>79.4</td>
<td>660</td>
<td>78.3</td>
<td>674</td>
<td>76.7</td>
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<tr>
<td>520.omnetpp_r</td>
<td>32</td>
<td>973</td>
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<td>977</td>
<td>43.0</td>
<td>976</td>
<td>43.0</td>
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<tr>
<td>523.xalancbmk_r</td>
<td>32</td>
<td>557</td>
<td>60.7</td>
<td>557</td>
<td>60.7</td>
<td>554</td>
<td>61.0</td>
</tr>
<tr>
<td>525.x264_r</td>
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<td>132</td>
<td>422</td>
<td>133</td>
<td>425</td>
<td>132</td>
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<tr>
<td>531.deepsjeng_r</td>
<td>32</td>
<td>633</td>
<td>58.0</td>
<td>633</td>
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<tr>
<td>541.leela_r</td>
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<td>978</td>
<td>54.2</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>32</td>
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<td>122</td>
<td>689</td>
<td>122</td>
<td>687</td>
<td>122</td>
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<tr>
<td>557.xz_r</td>
<td>32</td>
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<td>687</td>
<td>50.3</td>
<td>739</td>
<td>46.8</td>
</tr>
</tbody>
</table>

**Results Table**

**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"

**General Notes**

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

`LD_LIBRARY_PATH = "/usr/cpu2017/lib/ia32:/usr/cpu2017/lib/intel64:/usr/cpu2017/je5.0.1-32:/usr/cpu2017/je5.0.1-64"`

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4

Transparent Huge Pages enabled by default

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets; built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5 sources available via jemalloc.net;
SPEC CPU2017 Integer Rate Result

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ASUS RS500-E8-RS4 v2

SPECrade2017_int_base = 65.2
SPECrade2017_int_peak = Not Run

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Test Sponsor: Format sp. z o.o.
Tested by: Format sp. z o.o.
Test Date: Aug-2018
Hardware Availability: Aug-2018
Software Availability: Apr-2018

Platform Notes

BIOS Configuration:
Optimized Performance Settings: SPECCPU*_rate_base2006
Power Technology: Custom
Config TDP: Enabled
Config TDP Level: Nominal
Energy Performance BIAS setting.: Balanced Performance
Workload Configuration: I/O Sensitive
Sysinfo program /usr/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on localhost.localdomain Mon Aug  6 13:21:04 2018

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-2620 v4 @ 2.10GHz
 2 "physical id"s (chips)
 32 "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 : 8
siblings : 16
physical 0: cores 0 1 2 3 4 5 6 7
physical 1: cores 0 1 2 3 4 5 6 7

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 79
Model name: Intel(R) Xeon(R) CPU E5-2620 v4 @ 2.10GHz
Stepping: 1
CPU MHz: 2095.157
BogoMIPS: 4190.31
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K

(Continued on next page)
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**Test Date:** Aug-2018  
**Hardware Availability:** Aug-2018  
**Software Availability:** Apr-2018

**Platform Notes (Continued)**

```
L3 cache: 20480K
NUMA node0 CPU(s): 0-7,16-23
NUMA node1 CPU(s): 8-15,24-31
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf
eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrnas pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3nowprefetch epb cat_l3 cdp_l3 intel_pt ssgsb fma cx16
ibrp ibp stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle
avx2 smep bmi2 erms invpcid rtm cmq rdt_a rdseed adx smap xsaveopt cmq_llc
cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts spec_ctrl
intel_stibp
```

```
/cache data
```

```
cache size: 20480 KB
```

From `numactl --hardware` WARNING: a numactl 'node' might or might not correspond to a physical chip.
```
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 16 17 18 19 20 21 22 23
node 0 size: 130972 MB
node 0 free: 127614 MB
node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
node 1 size: 131072 MB
node 1 free: 128046 MB
node distances:
  node 0 1
  0: 10 21
  1: 21 10
```

From `/proc/meminfo`
```
MemTotal: 263872152 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

From `/etc/*release*/etc/*version*/
```
os-release:
  NAME="Red Hat Enterprise Linux Server"
  VERSION="7.5 (Maipo)"
  ID=rhel
  ID_LIKE="fedora"
  VARIANT="Server"
  VARIANT_ID="server"
  VERSION_ID="7.5"
  PRETTY_NAME="Red Hat Enterprise Linux"
redhat-release: Red Hat Enterprise Linux Server release 7.5 (Maipo)
```

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---

Platform Notes (Continued)

system-release: Red Hat Enterprise Linux Server release 7.5 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.5:ga:server

uname -a:
Linux localhost.localdomain 3.10.0-862.9.1.el7.x86_64 #1 SMP Wed Jun 27 04:30:39 EDT 2018 x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences
CVE-2017-5715 (Spectre variant 2): Mitigation: Full retpoline

run-level 3 Aug 6 13:17

SPEC is set to: /usr/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-root xfs 50G 27G 24G 54% /

Additional information from dmidecode follows. 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 American Megatrends Inc. 3401 06/22/2017
Memory:
16x <BAD INDEX> <BAD INDEX> 16 GB 2 rank 2400, configured at 2133

(End of data from sysinfo program)

---

Compiler Version Notes

==============================================================================
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
      557.xz_r(base)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
      541.leela_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

(Continued on next page)
### Compiler Version Notes (Continued)

```plaintext
FC  548.exchange2_r(base)
```

ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

### Base Compiler Invocation

- **C benchmarks:**
  - `icc`

- **C++ benchmarks:**
  - `icpc`

- **Fortran benchmarks:**
  - `ifort`

### Base Portability Flags

- **500.perlbench_r:** `-DSPEC_LP64` `-DSPEC_LINUX_X64`
- **502.gcc_r:** `-DSPEC_LP64`
- **505.mcf_r:** `-DSPEC_LP64`
- **520.omnetpp_r:** `-DSPEC_LP64`
- **523.xalancbmk_r:** `-DSPEC_LP64` `-DSPEC_LINUX`
- **525.x264_r:** `-DSPEC_LP64`
- **531.deepsjeng_r:** `-DSPEC_LP64`
- **541.leela_r:** `-DSPEC_LP64`
- **548.exchange2_r:** `-DSPEC_LP64`
- **557.xz_r:** `-DSPEC_LP64`

### Base Optimization Flags

- **C benchmarks:**
  - `-W1,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`
  - `-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

- **C++ benchmarks:**
  - `-W1,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`
  - `-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`
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### Base Optimization Flags (Continued)

For Fortran benchmarks:
- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`  
- `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`  
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

### Base Other Flags

- **C benchmarks:**  
  - `-m64 -std=c11`
- **C++ benchmarks:**  
  - `-m64`
- **Fortran benchmarks:**  
  - `-m64`

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:

---

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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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