SPEC CPU®2017 Integer Rate Result

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Fujitsu

PRIMERGY RX2540 M7, Intel Xeon Platinum 8490H, 1.90GHz

SPECrate®2017_int_base = 964

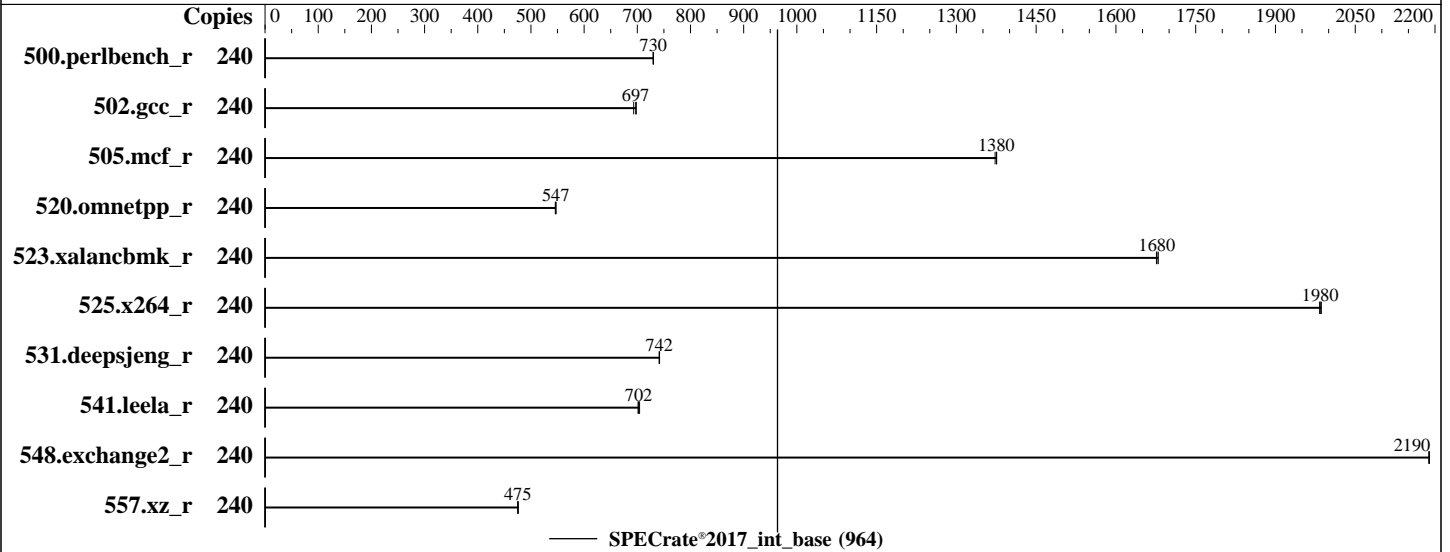SPECrate®2017_int_peak = Not Run

CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Mar-2023

Hardware Availability: Mar-2023

Software Availability: Dec-2022

Benchmark	Copies	Result
500.perlbench_r	240	730
502.gcc_r	240	697
505.mcf_r	240	1380
520.omnetpp_r	240	547
523.xalancbmk_r	240	1680
525.x264_r	240	1980
531.deepsjeng_r	240	742
541.leela_r	240	702
548.exchange2_r	240	2190
557.xz_r	240	475

SPECrate®2017_int_base (964)

Hardware

CPU Name: Intel Xeon Platinum 8490H

Max MHz: 3500

Nominal: 1900

Enabled: 120 cores, 2 chips, 2 threads/core

Orderable: 1,2 chips

Cache L1: 32 KB I + 48 KB D on chip per core

L2: 2 MB I+D on chip per core

L3: 112.5 MB I+D on chip per chip

Other: None

Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)

Storage: 1 x SATA SSD, 1.92TB

Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP4 5.14.21-150400.22-default

Compiler: C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;

Parallel: No

Firmware: Fujitsu BIOS Version V1.0.0.0 R1.10.0 for D3983-A1x. Released Mar-2023 tested as V1.0.0.0 R0.24.1 for D3983-A1x Jan-2023

File System: xfs

System State: Run level 3 (multi-user)

Base Pointers: 64-bit

Peak Pointers: Not Applicable

Other: None

Power Management: BIOS set to prefer performance at the cost of additional power usage

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	240	523	730	**523**	**730**	523	730							
502.gcc_r	240	487	698	490	693	**488**	**697**							
505.mcf_r	240	**282**	**1380**	283	1370	282	1380							
520.omnetpp_r	240	577	546	576	547	**576**	**547**							
523.xalancbmk_r	240	151	1680	151	1680	**151**	**1680**							
525.x264_r	240	**212**	**1980**	212	1980	212	1990							
531.deepsjeng_r	240	371	742	**371**	**742**	371	741							
541.leela_r	240	**566**	**702**	564	704	567	701							
548.exchange2_r	240	**287**	**2190**	287	2190	287	2190							
557.xz_r	240	546	475	**545**	**475**	544	476							
SPECrate®2017_int_base =		**964**												
SPECrate®2017_int_peak =		**Not Run**												

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

Compiler Notes

```
SPEC has ruled that the compiler used for this result was performing a compilation
that specifically improves the performance of the 523.xalancbmk_r / 623.xalancbmk_s
benchmarks using a priori knowledge of the SPEC code and dataset to perform a
transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4
https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer
publish results using this optimization.

This result is left in the SPEC results database for historical reference.
```

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"
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
    "/home/benchmark/speccpu-1.1.9/lib/intel64:/home/benchmark/speccpu-1.1.9/lib/ia32:/home/benchmark/spec
    cpu-1.1.9/je5.0.1-32"
MALLOC_CONF = "retain:true"
```

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General Notes

```
Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
memory using Red Hat Enterprise Linux 8.4
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3>          /proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
NA: 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.
```

Platform Notes

```
BIOS configuration:
DCU Streamer Prefetcher = Disabled
Package C State limit = C0
CPU Performance Boost = Aggressive
SNC (Sub NUMA) = Enable SNC4
FAN Control = Full

Sysinfo program /home/benchmark/speccpu-1.1.9/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Thu Mar 16 04:57:24 2023

SUT (System Under Test) info as seen by some common utilities.

-----------------------------------------------------------
Table of contents
-----------------------------------------------------------
 1. uname -a
 2. w
 3. Username
 4. ulimit -a
 5. sysinfo process ancestry
 6. /proc/cpuinfo
 7. lscpu
 8. numactl --hardware
 9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
12. Failed units, from systemctl list-units --state=failed
13. Services, from systemctl list-unit-files
14. Linux kernel boot-time arguments, from /proc/cmdline
15. cpupower frequency-info
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS
-----------------------------------------------------------

-----------------------------------------------------------
```

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Platform Notes (Continued)

```
 1. uname -a
   Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222/lp)
   x86_64 x86_64 x86_64 GNU/Linux

   ------------------------------------------------------------
 2. w
    04:57:24 up 3 min,  2 users,  load average: 2.46, 3.65, 1.65
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -                04:55    1:40   0.09s  0.09s -bash
   root     pts/0    192.168.1.112    04:56   11.00s  2.36s  0.22s -bash

   ------------------------------------------------------------
 3. Username
   From environment variable $USER:  root

   ------------------------------------------------------------
 4. ulimit -a
   core file size          (blocks, -c) unlimited
   data seg size           (kbytes, -d) unlimited
   scheduling priority             (-e) 0
   file size               (blocks, -f) unlimited
   pending signals                 (-i) 4125134
   max locked memory       (kbytes, -l) 64
   max memory size         (kbytes, -m) unlimited
   open files                      (-n) 1024
   pipe size            (512 bytes, -p) 8
   POSIX message queues     (bytes, -q) 819200
   real-time priority              (-r) 0
   stack size              (kbytes, -s) unlimited
   cpu time               (seconds, -t) unlimited
   max user processes              (-u) 4125134
   virtual memory          (kbytes, -v) unlimited
   file locks                      (-x) unlimited

   ------------------------------------------------------------
 5. sysinfo process ancestry
  /usr/lib/systemd/systemd --switched-root --system --deserialize 30
  sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
  sshd: root@pts/0
  -bash
  -bash
  runcpu --nobuild --action validate --define default-platform-flags --define numcopies=240 -c
    ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=120 --define physicalfirst
    --define invoke_with_interleave --define drop_caches --tune base -o all intrate
  runcpu --nobuild --action validate --define default-platform-flags --define numcopies=240 --configfile
    ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=120 --define physicalfirst
    --define invoke_with_interleave --define drop_caches --tune base --output_format all --nopower --runmode
    rate --tune base --size refrate intrate --nopreenv --note-preenv --logfile
    $SPEC/tmp/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0 --from_runcpu 2
  specperl $SPEC/bin/sysinfo
 $SPEC = /home/benchmark/speccpu-1.1.9

   ------------------------------------------------------------
 6. /proc/cpuinfo
    model name      : Intel(R) Xeon(R) Platinum 8490H
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 143
    stepping        : 8
    microcode       : 0x2b000130
```

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Platform Notes (Continued)

```
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
    cpu cores       : 60
    siblings        : 120
    2 physical ids (chips)
    240 processors (hardware threads)
    physical id 0: core ids 0-59
    physical id 1: core ids 0-59
    physical id 0: apicids 0-119
    physical id 1: apicids 128-247
  Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
  virtualized systems.  Use the above data carefully.


  ------------------------------------------------------------
  7. lscpu

From lscpu from util-linux 2.37.2:
  Architecture:            x86_64
  CPU op-mode(s):          32-bit, 64-bit
  Address sizes:           46 bits physical, 57 bits virtual
  Byte Order:              Little Endian
  CPU(s):                  240
  On-line CPU(s) list:     0-239
  Vendor ID:               GenuineIntel
  Model name:              Intel(R) Xeon(R) Platinum 8490H
  CPU family:              6
  Model:                   143
  Thread(s) per core:      2
  Core(s) per socket:      60
  Socket(s):               2
  Stepping:                8
  CPU max MHz:             3500.0000
  CPU min MHz:             800.0000
  BogoMIPS:                3800.00
  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 art arch_perfmon pebs bts rep_good nopl xtopology
                           nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
                           ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1
                           sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand
                           lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cdp_l3
                           invpcid_single intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced
                           tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle
                           avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap
                           avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl
                           xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
                           cqm_mbm_local split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida
                           arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req avx512vbmi umip pku
                           ospke waitpkg avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                           tme avx512_vpopcntdq la57 rdpid bus_lock_detect cldemote movdiri movdir64b
                           enqcmd fsrm md_clear serialize tsxldtrk pconfig arch_lbr avx512_fp16
                           amx_tile flush_l1d arch_capabilities
  Virtualization:          VT-x
  L1d cache:               5.6 MiB (120 instances)
  L1i cache:               3.8 MiB (120 instances)
  L2 cache:                240 MiB (120 instances)
  L3 cache:                225 MiB (2 instances)
  NUMA node(s):            8
  NUMA node0 CPU(s):       0-14,120-134
  NUMA node1 CPU(s):       15-29,135-149
  NUMA node2 CPU(s):       30-44,150-164
```

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Platform Notes (Continued)

```
  NUMA node3 CPU(s):            45-59,165-179
  NUMA node4 CPU(s):            60-74,180-194
  NUMA node5 CPU(s):            75-89,195-209
  NUMA node6 CPU(s):            90-104,210-224
  NUMA node7 CPU(s):            105-119,225-239
  Vulnerability Itlb multihit:  Not affected
  Vulnerability L1tf:           Not affected
  Vulnerability Mds:            Not affected
  Vulnerability Meltdown:       Not affected
  Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
  Vulnerability Spectre v1:     Mitigation; usercopy/swapgs barriers and __user pointer sanitization
  Vulnerability Spectre v2:     Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
  Vulnerability Srbds:          Not affected
  Vulnerability Tsx async abort: Not affected

From lscpu --cache:
     NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL   SETS PHY-LINE COHERENCY-SIZE
     L1d       48K     5.6M   12 Data            1     64        1             64
     L1i       32K     3.8M    8 Instruction     1     64        1             64
     L2         2M     240M   16 Unified         2   2048        1             64
     L3     112.5M     225M   15 Unified         3 122880        1             64

  -------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 8 nodes (0-7)
  node 0 cpus: 0-14,120-134
  node 0 size: 128562 MB
  node 0 free: 127643 MB
  node 1 cpus: 15-29,135-149
  node 1 size: 129016 MB
  node 1 free: 128628 MB
  node 2 cpus: 30-44,150-164
  node 2 size: 129016 MB
  node 2 free: 128634 MB
  node 3 cpus: 45-59,165-179
  node 3 size: 129016 MB
  node 3 free: 128622 MB
  node 4 cpus: 60-74,180-194
  node 4 size: 129016 MB
  node 4 free: 128537 MB
  node 5 cpus: 75-89,195-209
  node 5 size: 129016 MB
  node 5 free: 128591 MB
  node 6 cpus: 90-104,210-224
  node 6 size: 129016 MB
  node 6 free: 128615 MB
  node 7 cpus: 105-119,225-239
  node 7 size: 128647 MB
  node 7 free: 127942 MB
  node distances:
  node    0    1    2    3    4    5    6    7
    0:   10   12   12   12   21   21   21   21
    1:   12   10   12   12   21   21   21   21
    2:   12   12   10   12   21   21   21   21
    3:   12   12   12   10   21   21   21   21
    4:   21   21   21   21   10   12   12   12
    5:   21   21   21   21   12   10   12   12
    6:   21   21   21   21   12   12   10   12
    7:   21   21   21   21   12   12   12   10
```

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Platform Notes (Continued)

```
      ----------------------------------------------------------
      9. /proc/meminfo
         MemTotal:       1056059508 kB


      ----------------------------------------------------------
      10. who -r
        run-level 3 Mar 16 04:55


      ----------------------------------------------------------
      11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
        Default Target  Status
        multi-user      degraded


      ----------------------------------------------------------
      12. Failed units, from systemctl list-units --state=failed
          UNIT          LOAD   ACTIVE SUB    DESCRIPTION
        * sep5.service loaded failed failed systemd script to load sep5 driver at boot time


      ----------------------------------------------------------
      13. Services, from systemctl list-unit-files
        STATE             UNIT FILES
        enabled           YaST2-Firstboot YaST2-Second-Stage apparmor auditd bluetooth cron display-manager getty@
                          haveged irqbalance iscsi issue-generator kbdsettings kdump kdump-early klog lvm2-monitor
                          nscd postfix purge-kernels rollback rsyslog sep5 smartd sshd wicked wickedd-auto4
                          wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
        enabled-runtime   systemd-remount-fs
        disabled          accounts-daemon appstream-sync-cache autofs autoyast-initscripts blk-availability
                          bluetooth-mesh boot-sysctl ca-certificates chrony-wait chronyd console-getty cups
                          cups-browsed debug-shell ebtables exchange-bmc-os-info firewalld gpm grub2-once
                          haveged-switch-root ipmi ipmievd iscsi-init iscsid iscsiuio issue-add-ssh-keys kexec-load
                          lunmask man-db-create multipathd nfs nfs-blkmap nmb ostree-remount rdisc rpcbind
                          rpmconfigcheck rsyncd rtkit-daemon serial-getty@ smartd_generate_opts smb snmpd snmptrapd
                          speech-dispatcherd systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                          systemd-time-wait-sync systemd-timesyncd udisks2 upower
        indirect          wickedd


      ----------------------------------------------------------
      14. Linux kernel boot-time arguments, from /proc/cmdline
        BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
        root=UUID=0e5beafe-73ba-4cb4-b738-5343b4292867
        splash=silent
        mitigations=auto
        quiet
        security=apparmor
        crashkernel=322M,high
        crashkernel=72M,low


      ----------------------------------------------------------
      15. cpupower frequency-info
        analyzing CPU 0:
          current policy: frequency should be within 800 MHz and 3.50 GHz.
                          The governor "powersave" may decide which speed to use
                          within this range.
          boost state support:
            Supported: yes
            Active: yes


      ----------------------------------------------------------
      16. sysctl
```

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Platform Notes (Continued)

```
    kernel.numa_balancing                1
    kernel.randomize_va_space            2
    vm.compaction_proactiveness         20
    vm.dirty_background_bytes            0
    vm.dirty_background_ratio           10
    vm.dirty_bytes                       0
    vm.dirty_expire_centisecs         3000
    vm.dirty_ratio                      20
    vm.dirty_writeback_centisecs       500
    vm.dirtytime_expire_seconds      43200
    vm.extfrag_threshold               500
    vm.min_unmapped_ratio                1
    vm.nr_hugepages                      0
    vm.nr_hugepages_mempolicy            0
    vm.nr_overcommit_hugepages           0
    vm.swappiness                       60
    vm.watermark_boost_factor        15000
    vm.watermark_scale_factor           10
    vm.zone_reclaim_mode                 0


    ----------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage
   defrag          always defer defer+madvise [madvise] never
   enabled         [always] madvise never
   hpage_pmd_size  2097152
   shmem_enabled   always within_size advise [never] deny force


    ----------------------------------------------------------
18. /sys/kernel/mm/transparent_hugepage/khugepaged
   alloc_sleep_millisecs   60000
   defrag                      1
   max_ptes_none             511
   max_ptes_shared           256
   max_ptes_swap              64
   pages_to_scan            4096
   scan_sleep_millisecs    10000


    ----------------------------------------------------------
19. OS release
   From /etc/*-release /etc/*-version
   os-release SUSE Linux Enterprise Server 15 SP4


    ----------------------------------------------------------
20. Disk information
SPEC is set to: /home/benchmark/speccpu-1.1.9
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda2      xfs   1.8T  116G  1.7T   7% /


    ----------------------------------------------------------
21. /sys/devices/virtual/dmi/id
     Vendor:        FUJITSU
     Product:       PRIMERGY RX2540 M7
     Product Family: SERVER
     Serial:        EWCExxxxxx


    ----------------------------------------------------------
22. dmidecode
   Additional information from dmidecode 3.2 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
```

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Platform Notes (Continued)

```
   "DMTF SMBIOS" standard.
   Memory:
     2x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800
     8x Samsung M321R8GA0BB0-CQKEG 64 GB 2 rank 4800
     6x Samsung M321R8GA0BB0-CQKVG 64 GB 2 rank 4800


   -------------------------------------------------------------
 23. BIOS
 (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:      FUJITSU
     BIOS Version:     V1.0.0.0 R0.24.1 for D3983-A1x
     BIOS Date:        01/06/2023
     BIOS Revision:    0.24
     Firmware Revision: 2.0
```

Compiler Version Notes

```
==============================================================================
C        | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
C++      | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
icx
```

C++ benchmarks:
```
icpx
```

Fortran benchmarks:
```
ifx
```

SPEC CPU®2017 Integer Rate Result

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Fujitsu

PRIMERGY RX2540 M7, Intel Xeon Platinum 8490H, 1.90GHz

SPECrate®2017_int_base =　　964

SPECrate®2017_int_peak = Not Run

CPU2017 License: 19	**Test Date:** Mar-2023
Test Sponsor: Fujitsu	**Hardware Availability:** Mar-2023
Tested by: Fujitsu	**Software Availability:** Dec-2022

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:
```
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc
```

C++ benchmarks:
```
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc
```

The flags files that were used to format this result can be browsed at
  http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-SPR-RevA.html
  http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html

You can also download the XML flags sources by saving the following links:
  http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-SPR-RevA.xml
  http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml

SPEC CPU®2017 Integer Rate Result

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