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osbench-21-10

Intel Core i5-4670K testing with a MSI Z87-G41 PC Mate(MS-7850) v1.0 (V1.8 BIOS) and MSI AMD Radeon RX 470/480/570/570X/580/580X/590 8GB on Ubuntu 21.10 via the Phoronix Test Suite.

Test Systems:

21.10 fresh install, mitigations=on

Processor: Intel Core i5-4670K @ 4.30GHz (4 Cores), Motherboard: MSI Z87-G41 PC Mate(MS-7850) v1.0 (V1.8 BIOS), Chipset: Intel 4th Gen Core DRAM, Memory: 32GB, Disk: 3 x 500GB Samsung SSD 860, Graphics: MSI AMD Radeon RX 470/480/570/570X/580/580X/590 (1303/2000MHz), Audio: Realtek ALC887-VD, Monitor: NS-PMG248, Network: Qualcomm Atheros AR93xx

OS: Ubuntu 21.10, Kernel: 5.13.0-19-generic (x86_64), Desktop: GNOME Shell 40.5, Display Server: X Server + Wayland, Vulkan: 1.2.182, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 3840x1080

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release

```
--enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto
--enable-offload-targets=nvptx-none=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-nvptx/usr,amdgn-amdhsa=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-gcn/usr
--enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64
--with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mc32
--with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
```

Processor Notes: Scaling Governor: intel_cpfreq schedulit - CPU Microcode: 0x28 - Thermal 2.4.6

Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT disabled + mds: Mitigation of Clear buffers; SMT disabled + meltdown: Mitigation of PTI + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swaps barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retpoline IBPB: conditional IBRS_FW STIBP: disabled RSB filling + srbd: Mitigation of Microcode + tsx_async_abort: Not affected

mitigations=off

Processor: Intel Core i5-4670K @ 4.30GHz (4 Cores), Motherboard: MSI Z87-G41 PC Mate(MS-7850) v1.0 (V1.8 BIOS), Chipset: Intel 4th Gen Core DRAM, Memory: 32GB, Disk: 3 x 500GB Samsung SSD 860, Graphics: MSI AMD Radeon RX 470/480/570/570X/580/580X/590 8GB (1303/2000MHz), Audio: Realtek ALC887-VD, Monitor: NS-PMG248, Network: Qualcomm Atheros AR93xx

OS: Ubuntu 21.10, Kernel: 5.13.0-19-generic (x86_64), Desktop: GNOME Shell 40.5, Display Server: X Server + Wayland, OpenGL: 4.6 Mesa 21.2.2 (LLVM 12.0.1), Vulkan: 1.2.182, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 3840x1080

Kernel Notes: Transparent Huge Pages: madvise
 Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --enable-checking=release --enable-clocale=gnu
 --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release
 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto
 --enable-offload-targets=nvptx-none=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-nvptx/usr,amdgn-amdhsa=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-gcn/usr
 --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64
 --with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mc32
 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: intel_cpfreq schedulit - CPU Microcode: 0x28 - Thermal 2.4.6

Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Mitigation of PTE Inversion; VMX: vulnerable SMT disabled + mds: Vulnerable; SMT disabled + meltdown: Vulnerable + spec_store_bypass: Vulnerable + spectre_v1: Vulnerable: __user pointer sanitization and usercopy barriers only; no swapgs barriers + spectre_v2: Vulnerable IBPB: disabled STIBP: disabled + srbd: Vulnerable + tsx_async_abort: Not affected

mitigations=off, preload

Processor: Intel Core i5-4670K @ 4.30GHz (4 Cores), Motherboard: MSI Z87-G41 PC Mate(MS-7850) v1.0 (V1.8 BIOS), Chipset: Intel 4th Gen Core DRAM, Memory: 32GB, Disk: 3 x 500GB Samsung SSD 860 + 0GB SanDisk 3.2Gen1 + 12000GB Elements 25A3, Graphics: MSI AMD Radeon RX 470/480/570/570X/580/580X/590 8GB (1303/2000MHz), Audio: Realtek ALC887-VD, Monitor: NS-PMG248, Network: Qualcomm Atheros AR93xx

OS: Ubuntu 21.10, Kernel: 5.13.0-20-generic (x86_64), Desktop: GNOME Shell 40.5, Display Server: X Server 1.20.13, OpenGL: 4.6 Mesa 21.2.2 (LLVM 12.0.1), Vulkan: 1.2.191, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 3840x1080

Kernel Notes: Transparent Huge Pages: madvise
 Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --enable-checking=release --enable-clocale=gnu
 --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release
 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto
 --enable-offload-targets=nvptx-none=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-nvptx/usr,amdgn-amdhsa=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-gcn/usr
 --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64
 --with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mc32
 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0x28 - Thermal 2.4.6

Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Mitigation of PTE Inversion; VMX: vulnerable SMT disabled + mds: Vulnerable; SMT disabled + meltdown: Vulnerable + spec_store_bypass: Vulnerable + spectre_v1: Vulnerable: __user pointer sanitization and usercopy barriers only; no swapgs barriers + spectre_v2: Vulnerable IBPB: disabled STIBP: disabled + srbd: Vulnerable + tsx_async_abort: Not affected

5.15-rc6 custom kernel, Xorg

Processor: Intel Core i5-4670K @ 4.30GHz (4 Cores), Motherboard: MSI Z87-G41 PC Mate(MS-7850) v1.0 (V1.8 BIOS), Chipset: Intel 4th Gen Core DRAM, Memory: 32GB, Disk: 3 x 500GB Samsung SSD 860, Graphics: MSI AMD

Radeon RX 470/480/570/570X/580/580X/590 8GB (1303/2000MHz), Audio: Realtek ALC887-VD, Monitor: NS-PMG248, Network: Qualcomm Atheros AR93xx

OS: Ubuntu 21.10, Kernel: 5.15-rc6-051500rc6+customidle-generic (x86_64), Desktop: GNOME Shell 40.5, Display Server: X Server 1.20.13, OpenGL: 4.6 Mesa 21.2.2 (LLVM 12.0.1), Vulkan: 1.2.191, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 3840x1080

Kernel Notes: Transparent Huge Pages: madvise

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-gcn/usr --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0x28 - Thermal 2.4.6

Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Mitigation of PTE Inversion; VMX: vulnerable SMT disabled + mds: Vulnerable; SMT disabled + meltdown: Vulnerable + spec_store_bypass: Vulnerable + spectre_v1: Vulnerable: __user pointer sanitization and usercopy barriers only; no swapgs barriers + spectre_v2: Vulnerable IBPB: disabled STIBP: disabled + srbds: Vulnerable + tsx_async_abort: Not affected

5.15-rc6 custom kernel, Wayland

Processor: Intel Core i5-4670K @ 4.30GHz (4 Cores), Motherboard: MSI Z87-G41 PC Mate(MS-7850) v1.0 (V1.8 BIOS), Chipset: Intel 4th Gen Core DRAM, Memory: 32GB, Disk: 3 x 500GB Samsung SSD 860, Graphics: MSI AMD Radeon RX 470/480/570/570X/580/580X/590 8GB (1303/2000MHz), Audio: Realtek ALC887-VD, Monitor: NS-PMG248, Network: Qualcomm Atheros AR93xx

OS: Ubuntu 21.10, Kernel: 5.15-rc6-051500rc6+customidle-generic (x86_64), Desktop: GNOME Shell 40.5, Display Server: X Server 1.20.13 + Wayland, OpenGL: 4.6 Mesa 21.2.2 (LLVM 12.0.1), Vulkan: 1.2.191, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 3840x1080

Kernel Notes: Transparent Huge Pages: madvise

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-gcn/usr --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0x28 - Thermal 2.4.6

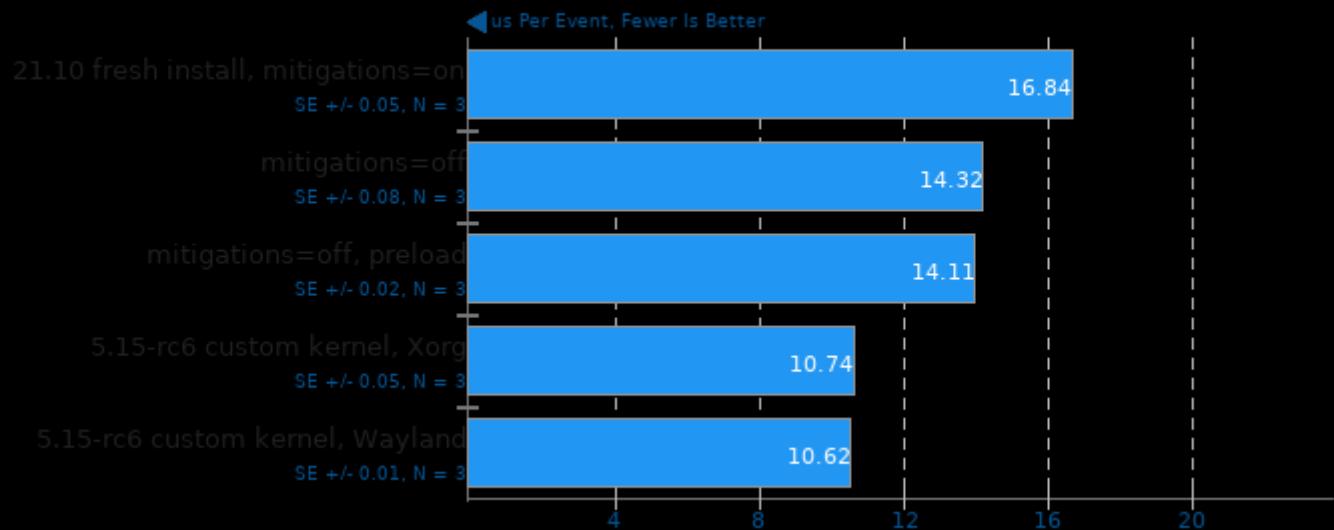
Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Mitigation of PTE Inversion; VMX: vulnerable SMT disabled + mds: Vulnerable; SMT disabled + meltdown: Vulnerable + spec_store_bypass: Vulnerable + spectre_v1: Vulnerable: __user pointer sanitization and usercopy barriers only; no swapgs barriers + spectre_v2: Vulnerable IBPB: disabled STIBP: disabled + srbds: Vulnerable + tsx_async_abort: Not affected

	21.10 fresh install, mitigations=on	mitigations=off	mitigations=off, preload	5.15-rc6 custom kernel, Xorg	5.15-rc6 custom kernel, Wayland
OSBench - Create Files	16.844987	14.317734	14.105976	10.736778	10.620722
Normalized	63.05%	74.18%	75.29%	98.92%	100%
Standard Deviation	0.6%	0.9%	0.3%	0.9%	0.2%
OSBench - Create Threads (us/Event)	12.513002	9.868940	9.760857	7.522106	7.449786
Normalized	59.54%	75.49%	76.32%	99.04%	100%
Standard Deviation	2.5%	0.4%	0.4%	1.7%	0.4%

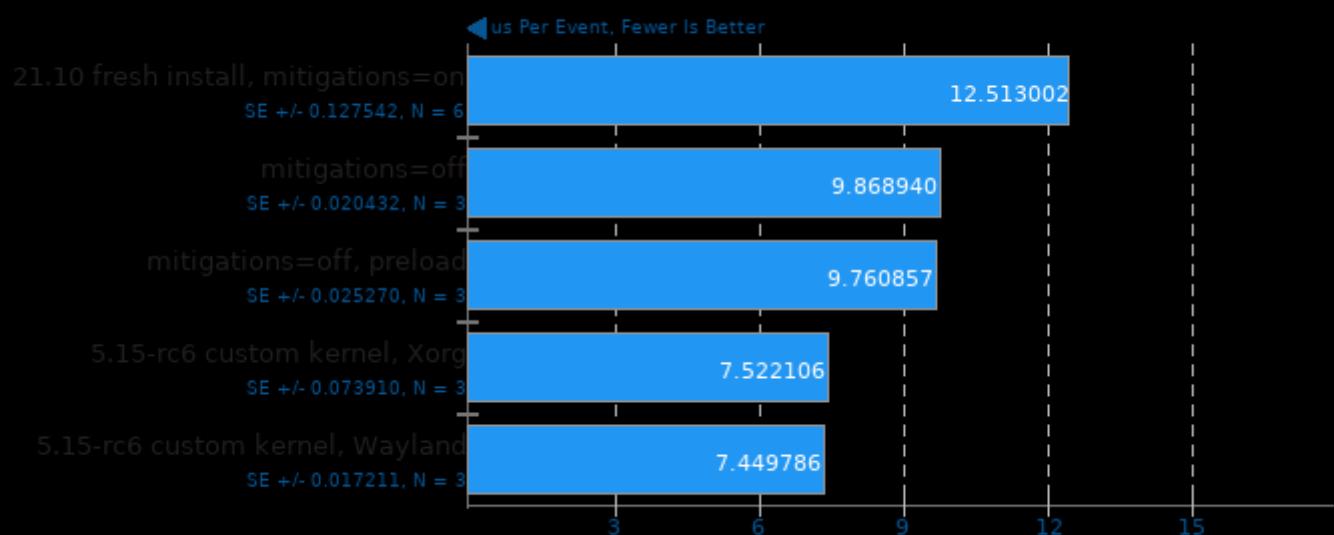
OSBench - Launch Programs	70.930322	61.367353	62.495867	49.013297	48.886935
(us/Event)					
Normalized	68.92%	79.66%	78.22%	99.74%	100%
Standard Deviation	0.3%	0.3%	0.4%	0.6%	0.5%
OSBench - Create Processes	23.123423	21.882852	22.319556	16.530355	16.553402
(us/Event)					
Normalized	71.49%	75.54%	74.06%	100%	99.86%
Standard Deviation	0.3%	1.8%	2.3%	1.8%	1.2%
OSBench - Memory Allocations	74.443420	69.129070	69.157680	67.214648	67.511558
(Ns/Event)					
Normalized	90.29%	97.23%	97.19%	100%	99.56%
Standard Deviation	0.3%	0.2%	0.2%	0.7%	0%

OSBench

Test: Create Files

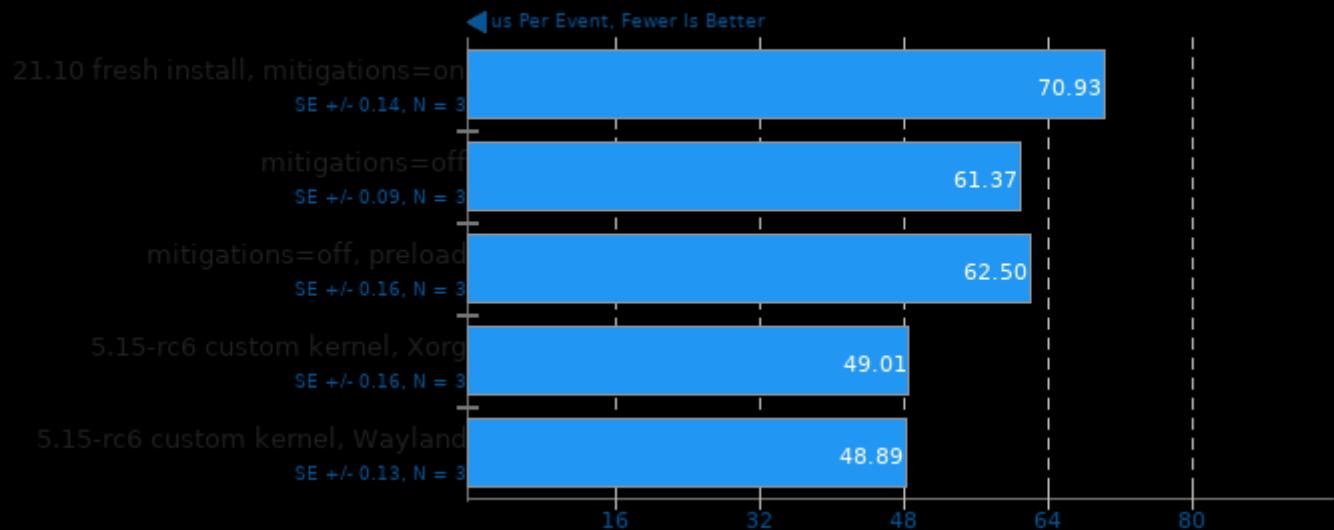
**OSBench**

Test: Create Threads



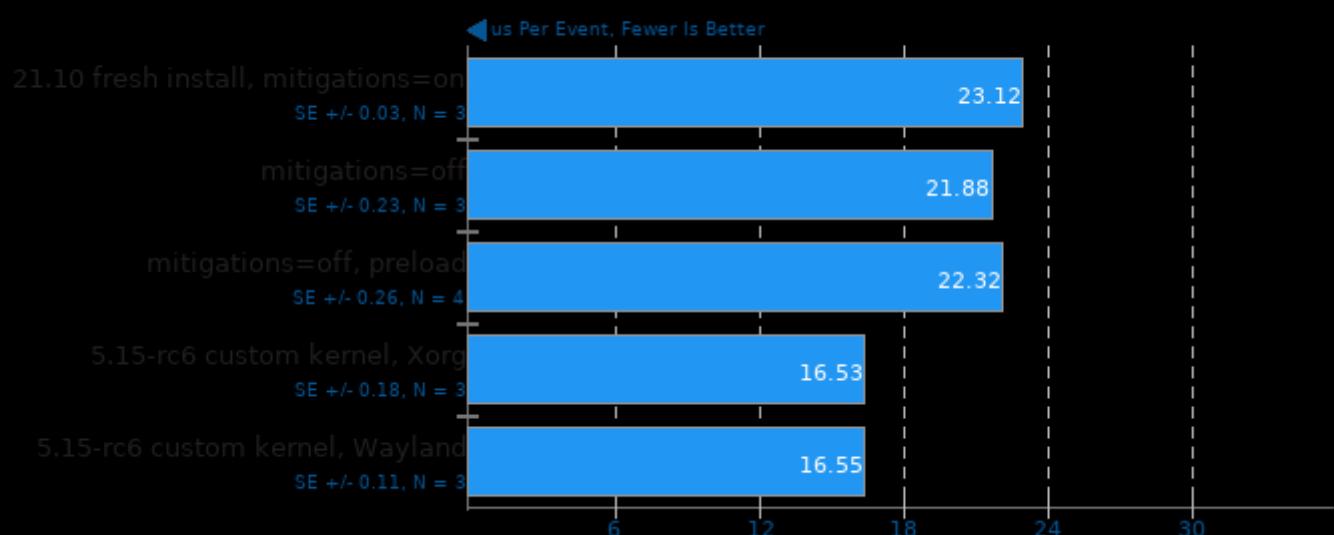
OSBench

Test: Launch Programs



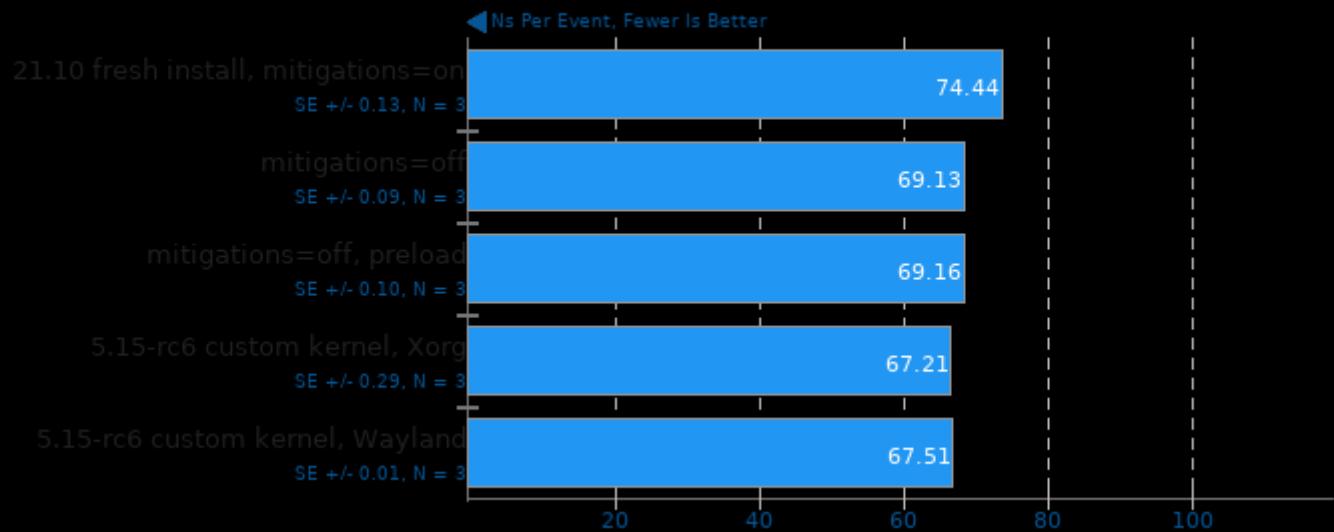
OSBench

Test: Create Processes



OSBench

Test: Memory Allocations



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