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## ASTC Encoder Xeon

2 x Intel Xeon Silver 4210R testing with a GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS) and ASPEED on Ubuntu 20.04 via the Phoronix Test Suite.

### Test Systems:

**2 x Xeon Gold 6230R V1**

**2 x Xeon Gold 6230R V2**

**2 x Xeon Gold 6230R V3**

Processor: 2 x Intel Xeon Gold 6230R @ 4.00GHz (52 Cores / 104 Threads), Motherboard: GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 378GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: ASPEED, Monitor: VE228, Network: 2 x Intel X722 for 1GbE + 2 x QLogic FastLinQ QL41000 10/25/40/50GbE

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86\_64) 20200720, Desktop: GNOME Shell 3.36.1,

Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --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-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: intel\_pstate performance - CPU Microcode: 0x5000002c

Security Notes: itlb\_multihit: KVM: Mitigation of Split huge pages + I1tf: Not affected + mds: Not affected + meltdown: Not affected + 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 Enhanced IBRS IBPB: conditional RSB filling + srbs: Not affected + tsx\_async\_abort: Mitigation of TSX disabled

## Xeon Gold 6230R V1

## Xeon Gold 6230R V2

## Xeon Gold 6230R V3

Processor: Intel Xeon Gold 6230R @ 4.00GHz (26 Cores / 52 Threads), Motherboard: GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 188GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: ASPEED, Network: 2 x Intel X722 for 1GbE + 2 x QLogic FastLinQ QL41000 10/25/40/50GbE

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86\_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --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-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: intel\_pstate performance - CPU Microcode: 0x5000002c

Security Notes: itlb\_multihit: KVM: Mitigation of Split huge pages + I1tf: Not affected + mds: Not affected + meltdown: Not affected + 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 Enhanced IBRS IBPB: conditional RSB filling + srbs: Not affected + tsx\_async\_abort: Mitigation of TSX disabled

## Xeon Gold 6258R

## Xeon Gold 6258R V2

## Xeon Gold 6258R V3

Processor: Intel Xeon Gold 6258R @ 4.00GHz (28 Cores / 56 Threads), Motherboard: GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 188GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: ASPEED, Network: 2 x Intel X722 for 1GbE + 2 x QLogic FastLinQ QL41000 10/25/40/50GbE

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86\_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --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-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: intel\_pstate performance - CPU Microcode: 0x5000002c

Security Notes: `itlb_multihit`: KVM: Mitigation of Split huge pages + `l1tf`: Not affected + `mds`: Not affected + `meltdown`: Not affected + `spec_store_bypass`: Mitigation of SSB disabled via `prctl` and `seccomp` + `spectre_v1`: Mitigation of `usercopy/swapgs` barriers and `_user` pointer sanitization + `spectre_v2`: Mitigation of Enhanced IBRS IPBP: conditional RSB filling + `srbs`: Not affected + `tsx_async_abort`: Mitigation of TSX disabled

## Xeon Gold 6258R 2P v1

### Xeon Gold 6258R 2P v2

### Xeon Gold 6258R 2P v3

Processor: 2 x Intel Xeon Gold 6258R @ 4.00GHz (56 Cores / 112 Threads), Motherboard: GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 378GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: ASPEED, Network: 2 x Intel X722 for 1GbE + 2 x QLogic FastLinQ QL41000 10/25/40/50GbE

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86\_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: `--build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --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-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: `intel_pstate performance` - CPU Microcode: 0x5000002c  
Security Notes: `itlb_multihit`: KVM: Mitigation of Split huge pages + `l1tf`: Not affected + `mds`: Not affected + `meltdown`: Not affected + `spec_store_bypass`: Mitigation of SSB disabled via `prctl` and `seccomp` + `spectre_v1`: Mitigation of `usercopy/swapgs` barriers and `_user` pointer sanitization + `spectre_v2`: Mitigation of Enhanced IBRS IPBP: conditional RSB filling + `srbs`: Not affected + `tsx_async_abort`: Mitigation of TSX disabled

## Xeon Silver 4210R 2P v1

### Xeon Silver 4210R 2P v2

### Xeon Silver 4210R 2P v3

Processor: 2 x Intel Xeon Silver 4210R @ 3.20GHz (20 Cores / 40 Threads), Motherboard: GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 378GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: ASPEED, Network: 2 x Intel X722 for 1GbE + 2 x QLogic FastLinQ QL41000 10/25/40/50GbE

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86\_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1024x768

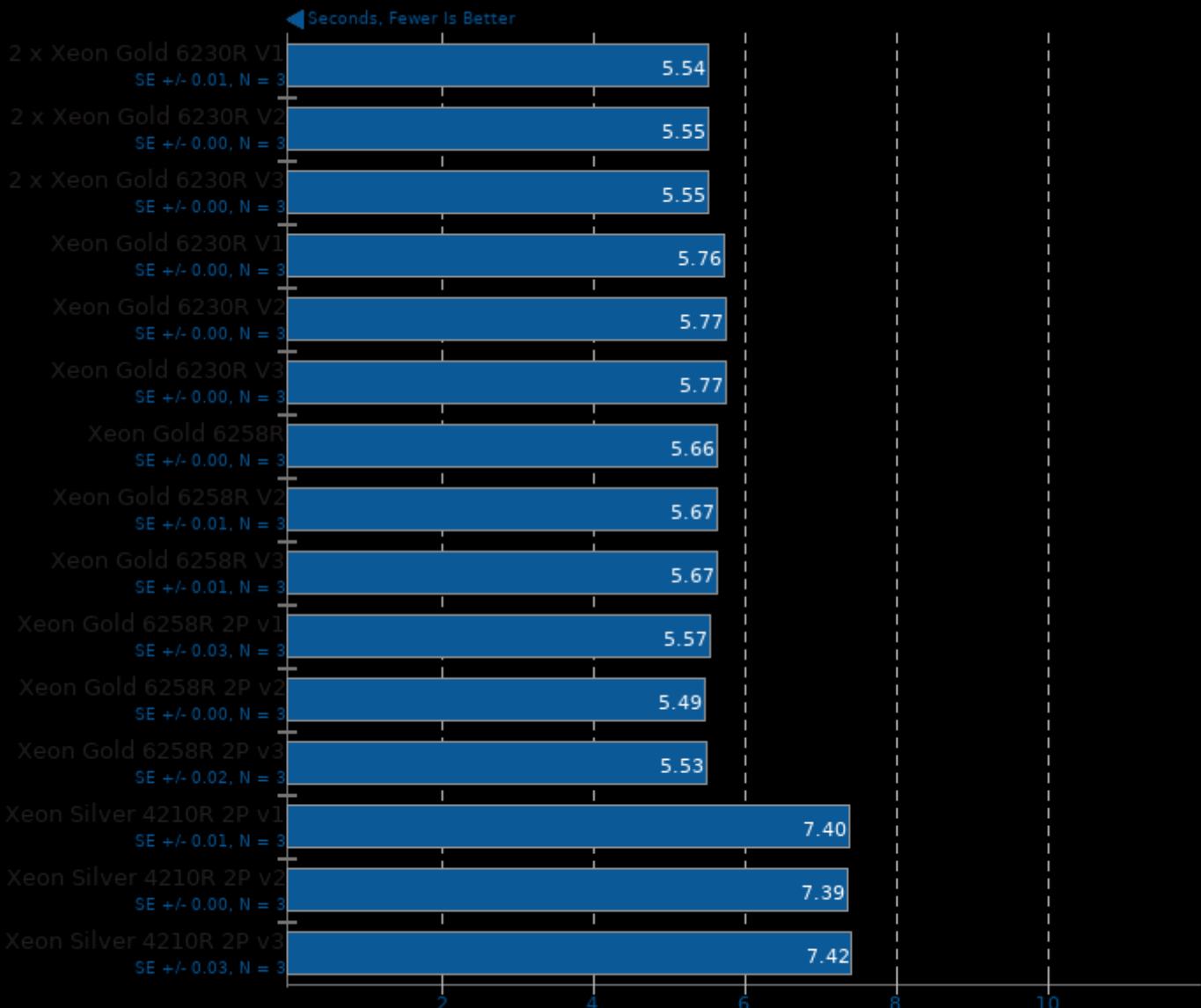
Compiler Notes: `--build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale-gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --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-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: `intel_pstate performance` - CPU Microcode: 0x5000002c  
Security Notes: `itlb_multihit`: KVM: Mitigation of Split huge pages + `l1tf`: Not affected + `mds`: Not affected + `meltdown`: Not affected + `spec_store_bypass`: Mitigation of SSB disabled via `prctl` and `seccomp` + `spectre_v1`: Mitigation of `usercopy/swapgs` barriers and `_user` pointer sanitization + `spectre_v2`: Mitigation of Enhanced IBRS IPBP: conditional RSB filling + `srbs`: Not affected + `tsx_async_abort`: Mitigation of TSX disabled

|                         | 2 x    | 2 x    | 2 x    | Xeon        | Xeon         | Xeon        | Xeon         | Xeon        | Xeon        | Xeon |
|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------------|--------------|-------------|--------------|-------------|-------------|------|
|                         | Xeon   | Xeon   | Xeon   | Gold        | Gold         | Gold        | Silver       | Silver      | Silver      |      |
|                         | Gold   | Gold   | Gold   | 6230   | 6230   | 6230   | 6258   | 6258   | 6258   | 6258        | 6258         | 6258        | 4210         | 4210        | 4210        |      |
|                         | 6230   | 6230   | 6230   | R V1   | R V2   | R V3   | R      | R V2   | R V3   | R 2P        | R 2P         | R 2P        | R 2P         | R 2P        | R 2P        |      |
|                         | R V1   | R V2   | R V3   |        |        |        |        |        |        | v1          | v2           | v3          | v1           | v2          | v3          |      |
| <b>ASTC</b>             | 5.54   | 5.55   | 5.55   | 5.76   | 5.77   | 5.77   | 5.66   | 5.67   | 5.67   | 5.57        | <b>5.49</b>  | 5.53        | 7.40         | 7.39        | <b>7.42</b> |      |
| <b>Encoder -</b>        |        |        |        |        |        |        |        |        |        |             |              |             |              |             |             |      |
| <b>Fast (sec)</b>       |        |        |        |        |        |        |        |        |        |             |              |             |              |             |             |      |
| Normalized              | 99.1%  | 98.92% | 98.92% | 95.31% | 95.15% | 95.15% | 97%    | 96.83% | 96.83% | 98.56%      | 100%         | 99.28%      | 74.19%       | 74.29%      | 73.99%      |      |
| Standard                | 0.2%   | 0%     | 0.1%   | 0.1%   | 0%     | 0.1%   | 0.1%   | 0.2%   | 0.2%   | 0.8%        | 0.1%         | 0.7%        | 0.2%         | 0%          | 0.7%        |      |
| <b>Deviation</b>        |        |        |        |        |        |        |        |        |        |             |              |             |              |             |             |      |
| <b>ASTC</b>             | 6.61   | 6.61   | 6.61   | 7.51   | 7.49   | 7.49   | 7.22   | 7.21   | 7.22   | <b>6.43</b> | 6.49         | 6.50        | 9.77         | <b>9.78</b> | <b>9.78</b> |      |
| <b>Encoder -</b>        |        |        |        |        |        |        |        |        |        |             |              |             |              |             |             |      |
| <b>Medium</b>           |        |        |        |        |        |        |        |        |        |             |              |             |              |             |             |      |
| Normalized              | 97.28% | 97.28% | 97.28% | 85.62% | 85.85% | 85.85% | 89.06% | 89.18% | 89.06% | 100%        | 99.08%       | 98.92%      | 65.81%       | 65.75%      | 65.75%      |      |
| Standard                | 0%     | 0.1%   | 0.1%   | 0.4%   | 0%     | 0.1%   | 0.4%   | 0.1%   | 0%     | 0.1%        | 0.7%         | 0.7%        | 0.1%         | 0.1%        | 0.1%        |      |
| <b>Deviation</b>        |        |        |        |        |        |        |        |        |        |             |              |             |              |             |             |      |
| <b>ASTC</b>             | 8.28   | 8.27   | 8.26   | 15.56  | 15.56  | 15.57  | 13.33  | 13.33  | 13.33  | 7.09        | 7.09         | <b>7.08</b> | <b>21.44</b> | 21.43       | 21.42       |      |
| <b>Encoder -</b>        |        |        |        |        |        |        |        |        |        |             |              |             |              |             |             |      |
| <b>Thorough (sec)</b>   |        |        |        |        |        |        |        |        |        |             |              |             |              |             |             |      |
| Normalized              | 85.51% | 85.61% | 85.71% | 45.5%  | 45.5%  | 45.47% | 53.11% | 53.11% | 53.11% | 99.86%      | 99.86%       | 100%        | 33.02%       | 33.04%      | 33.05%      |      |
| Standard                | 0.1%   | 0.1%   | 0.1%   | 0.1%   | 0.1%   | 0.1%   | 0%     | 0%     | 0%     | 0.1%        | 0%           | 0.1%        | 0.1%         | 0%          | 0%          |      |
| <b>Deviation</b>        |        |        |        |        |        |        |        |        |        |             |              |             |              |             |             |      |
| <b>ASTC</b>             | 62.48  | 62.46  | 62.42  | 122.6  | 122.5  | 122.6  | 103.4  | 103.4  | 103.4  | 52.24       | <b>52.23</b> | 52.24       | <b>168.1</b> | 168.0       | 168.1       |      |
| <b>Encoder -</b>        |        |        |        |        |        |        |        |        |        |             |              |             |              |             |             |      |
| <b>Exhaustive (sec)</b> |        |        |        |        |        |        |        |        |        |             |              |             |              |             |             |      |
| Normalized              | 83.59% | 83.62% | 83.68% | 42.59% | 42.62% | 42.6%  | 50.49% | 50.5%  | 50.5%  | 99.98%      | 100%         | 99.98%      | 31.06%       | 31.08%      | 31.07%      |      |
| Standard                | 0.1%   | 0.1%   | 0.1%   | 0.1%   | 0%     | 0%     | 0%     | 0%     | 0%     | 0.1%        | 0%           | 0%          | 0%           | 0%          | 0%          |      |
| <b>Deviation</b>        |        |        |        |        |        |        |        |        |        |             |              |             |              |             |             |      |

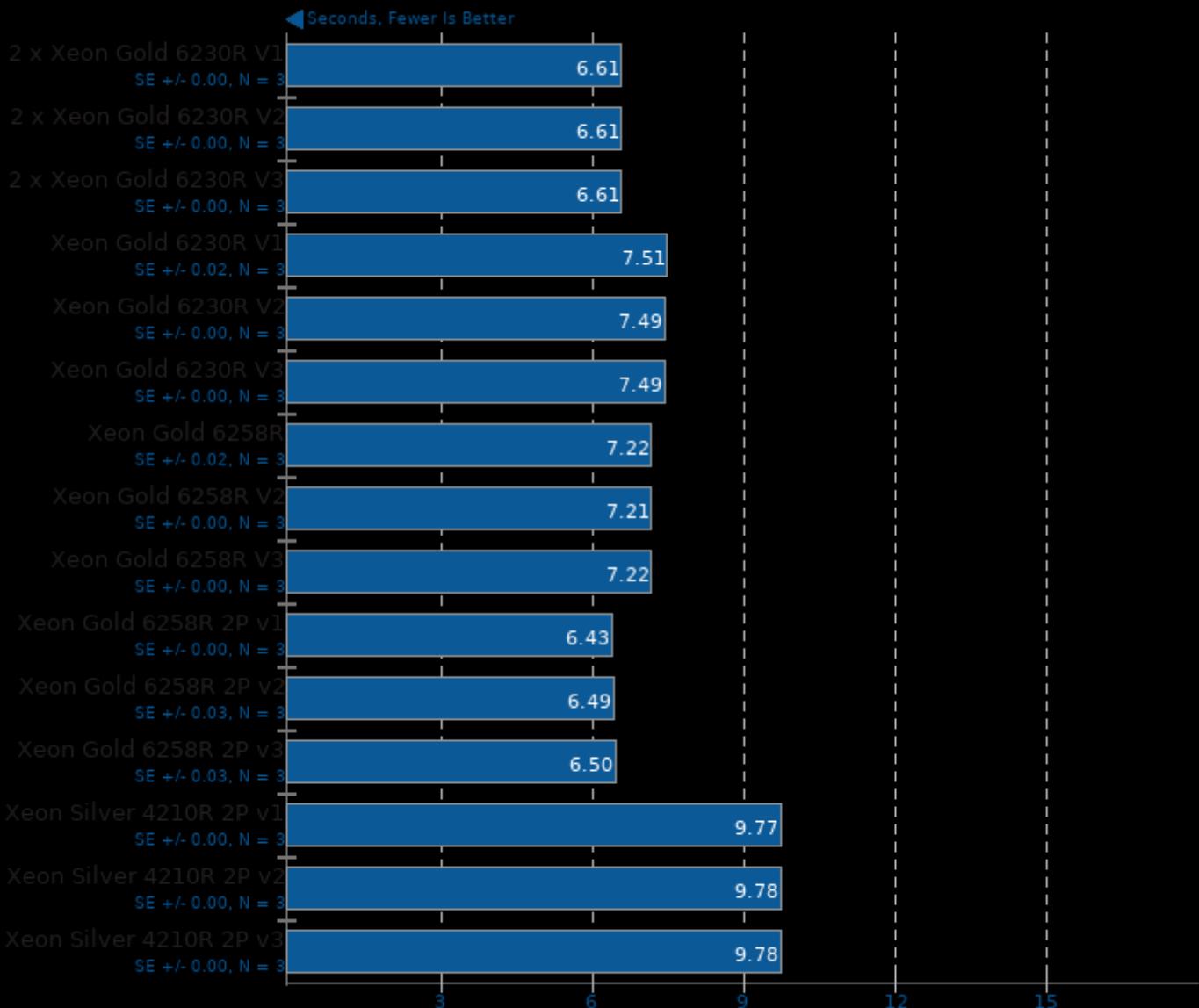
## ASTC Encoder 2.0

Preset: Fast

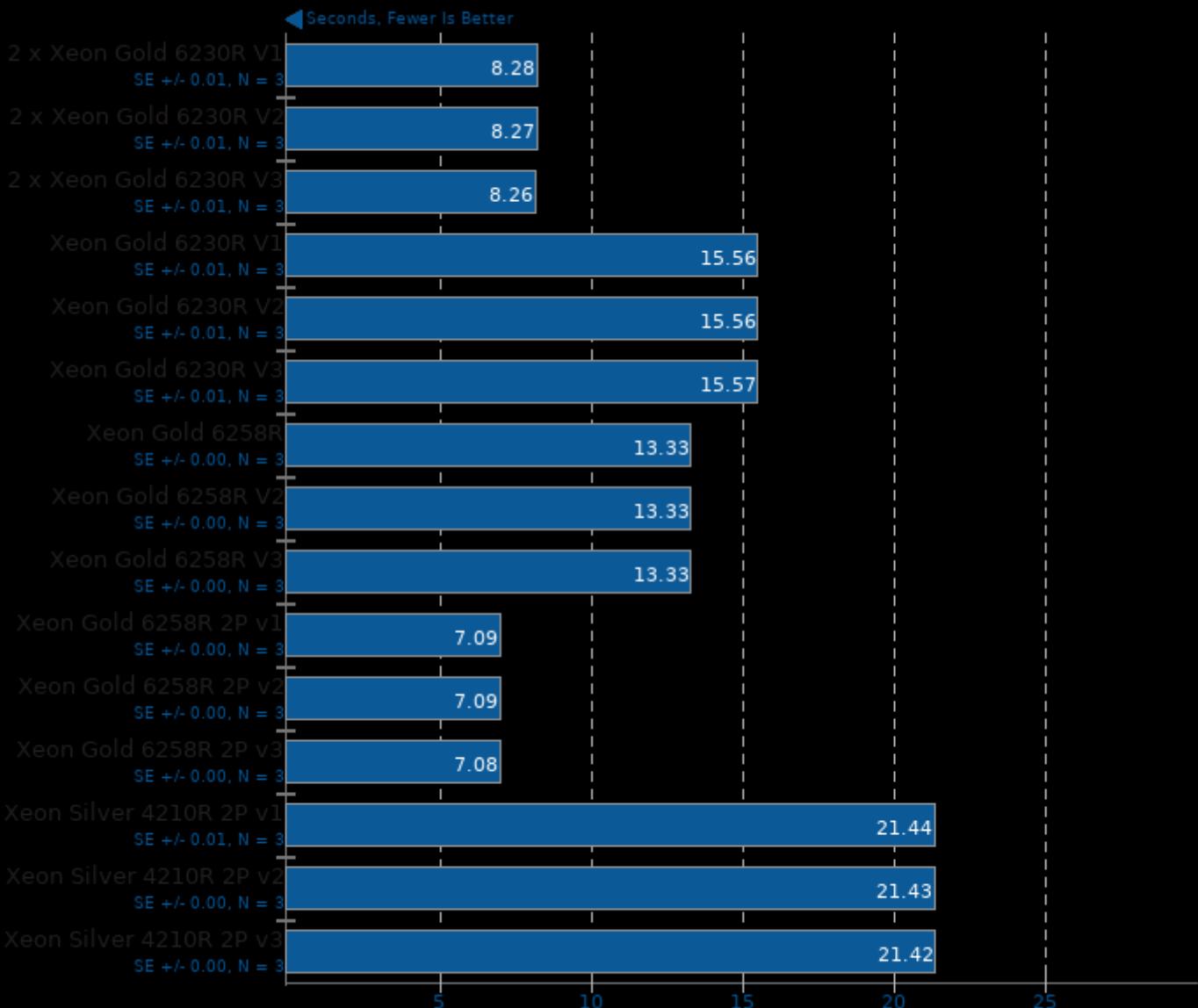


1. (CXX) g++ options: -std=c++14 -fvisibility=hidden -O3 -fno-math-errno -mfpmath=sse -mavx2 -mpopcnt -lpthread

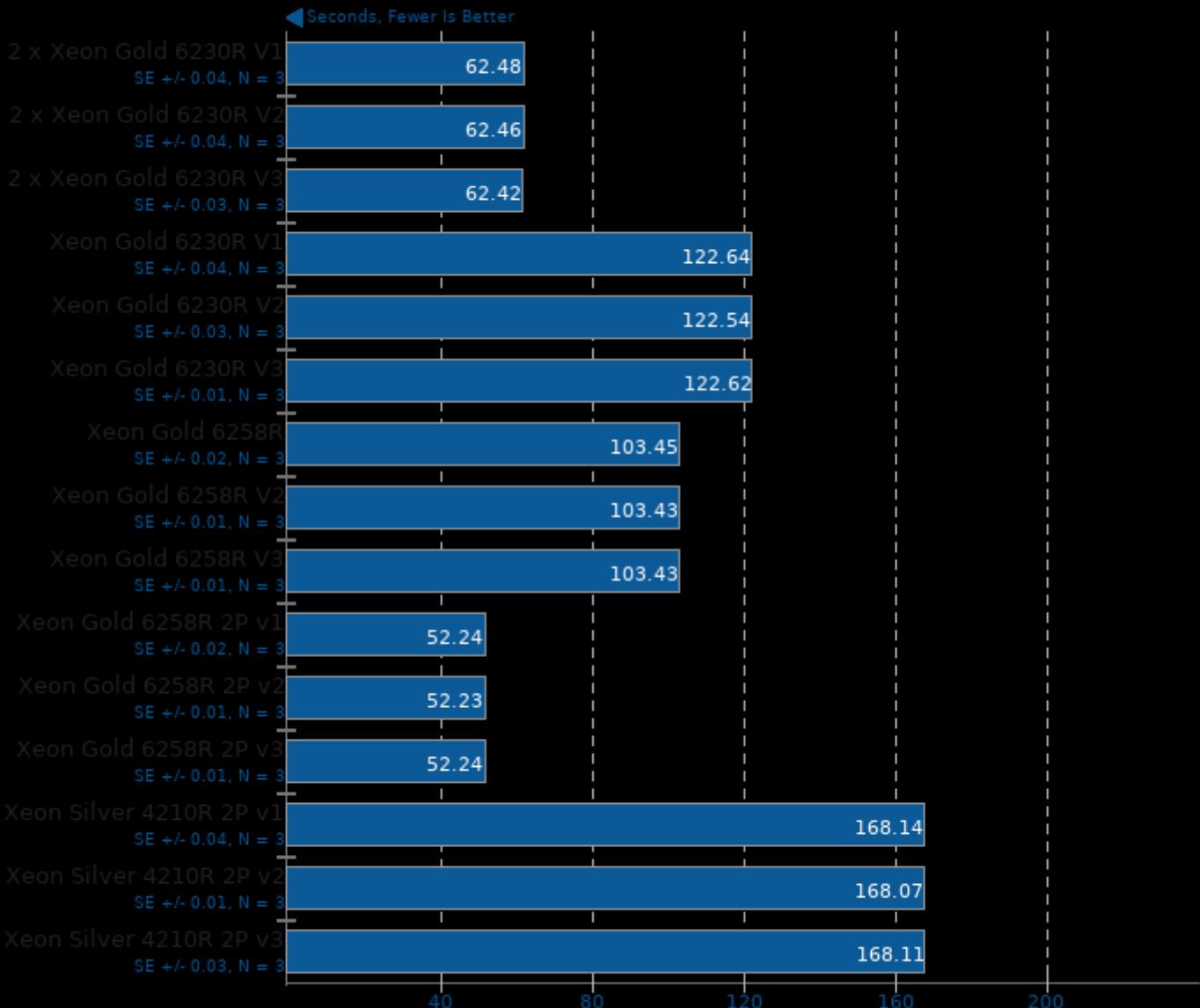
ASTC Encoder 2.0



ASTC Encoder 2.0



ASTC Encoder 2.0



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