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## Intel Core i5 8400 vs. 9400F Mitigations

Intel Core i5-8400 vss Core i5-9400F Linux CPU vulnerability mitigation benchmarking for a future article by Michael Larabel.

### Automated Executive Summary

*i5-9400F: No Mitigations had the most wins, coming in first place for 65% of the tests.*

*Based on the geometric mean of all complete results, the fastest (i5-8400: No Mitigations) was 1.211x the speed of the slowest (i5-8400: Default Mitigations). i5-8400: No Mitigations was 1.211x the speed of i5-8400: Default Mitigations, i5-9400F: Default Mitigations was 0.826x the speed of i5-8400: No Mitigations, i5-9400F: No Mitigations was 1.21x the speed of i5-9400F: Default Mitigations.*

*The results with the greatest spread from best to worst included:*

*ctx\_clock (Context Switch Time) at 6.528x  
Hackbench (Count: 16 - Type: Process) at 1.727x  
Stress-NG (Test: Socket Activity) at 1.668x  
Hackbench (Count: 8 - Type: Process) at 1.664x  
Hackbench (Count: 16 - Type: Thread) at 1.632x  
Sockperf (Test: Throughput) at 1.603x  
Stress-NG (Test: Context Switching) at 1.485x*

Memcached mcperf (Method: Replace) at 1.443x

Memcached mcperf (Method: Delete) at 1.439x

Memcached mcperf (Method: Get) at 1.43x.

## Test Systems:

### i5-8400: Default Mitigations

### i5-8400: No Mitigations

Processor: Intel Core i5-8400 @ 4.00GHz (6 Cores), Motherboard: MSI B360M GAMING PLUS (MS-7B19) v1.0 (1.10 BIOS), Chipset: Intel Cannon Lake PCH, Memory: 16384MB, Disk: 256GB SAMSUNG MZVPW256HEGL-000H7, Graphics: Intel UHD 630 3GB (1050MHz), Audio: Realtek ALC887-VD, Monitor: Acer B286HK, Network: Intel I219-V

OS: Ubuntu 19.04, Kernel: 5.0.0-15-generic (x86\_64), Desktop: GNOME Shell 3.32.0, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 4.5 Mesa 19.0.2, Compiler: GCC 8.3.0, File-System: ext4

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --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 --with-tune=generic --without-cuda-driver -v

Disk Notes: NONE / errors=remount-ro,relatime,rw

Processor Notes: Scaling Governor: intel\_pstate powersave

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: Mitigation of PTE Inversion; VMX: vulnerable SMT disabled + mds: Vulnerable; SMT disabled + meltdown: Vulnerable + spec\_store\_bypass: Vulnerable + spectre\_v1: Mitigation of \_\_user pointer sanitization + spectre\_v2: Vulnerable IBPB: disabled STIBP: disabled

### i5-9400F: Default Mitigations

### i5-9400F: No Mitigations

Processor: Intel Core i5-9400F @ 4.10GHz (6 Cores), Motherboard: MSI B360M GAMING PLUS (MS-7B19) v1.0 (1.10 BIOS), Chipset: Intel Cannon Lake PCH, Memory: 16384MB, Disk: 256GB SAMSUNG MZVPW256HEGL-000H7, Graphics: MSI NVIDIA NV106 1GB, Audio: Realtek ALC887-VD, Monitor: Acer B286HK, Network: Intel I219-V

OS: Ubuntu 19.04, Kernel: 5.0.0-15-generic (x86\_64), Desktop: GNOME Shell 3.32.0, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 4.3 Mesa 19.0.2, Compiler: GCC 8.3.0, File-System: ext4

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --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 --with-tune=generic --without-cuda-driver -v

Disk Notes: NONE / errors=remount-ro,relatime,rw

Processor Notes: Scaling Governor: intel\_pstate powersave

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: Mitigation of PTE Inversion; VMX: vulnerable SMT disabled + mds: Vulnerable; SMT disabled + meltdown: Vulnerable + spec\_store\_bypass: Vulnerable + spectre\_v1: Mitigation of \_\_user pointer sanitization + spectre\_v2: Vulnerable IBPB: disabled STIBP: disabled

## Intel Core i5 8400 vs. 9400F Mitigations

	i5-8400: Default Mitigations	i5-8400: No Mitigations	i5-9400F: Default Mitigations	i5-9400F: No Mitigations
<b>SQLite - T.S.I (sec)</b>	<b>120</b>	<b>120</b>	<b>123</b>	<b>120</b>
Normalized	100%	100%	97.56%	100%
Standard Deviation	0.2%	0.9%	0.7%	1%
<b>t-test1 - 1 (sec)</b>	<b>19.98</b>	<b>16.56</b>	<b>19.60</b>	<b>16.42</b>
Normalized	82.18%	99.15%	83.78%	100%
Standard Deviation	0.5%	0.7%	0.2%	1.5%
<b>t-test1 - 2 (sec)</b>	<b>6.59</b>	<b>5.62</b>	<b>6.50</b>	<b>5.58</b>
Normalized	84.67%	99.29%	85.85%	100%
Standard Deviation	0.7%	0.1%	0.2%	0.1%
<b>Sockperf - Throughput</b>	<b>481501</b>	755893	507519	<b>771813</b>
Normalized	62.39%	97.94%	65.76%	100%
Standard Deviation	2.8%	1.7%	2.9%	0.6%
<b>Sockperf - Latency Ping Pong (usec)</b>	<b>3.19</b>	2.46	3.11	<b>2.44</b>
Normalized	76.49%	99.19%	78.46%	100%
Standard Deviation	1.2%	1.6%	0.8%	1.3%
<b>Ethr - TCP - Latency - 1 (us)</b>	<b>10.40</b>	7.54	10.27	<b>7.30</b>
Normalized	70.19%	96.82%	71.08%	100%
Standard Deviation	0.6%	0.7%	0.3%	0.5%
<b>Go Benchmarks - http (ns/op)</b>	<b>7988</b>	7510	7918	<b>7205</b>
Normalized	90.2%	95.94%	91%	100%
Standard Deviation	0.6%	0%	0.4%	0.6%
<b>Go Benchmarks - build (ns/op)</b>	<b>13363787445</b>	13080793512	13026473692	<b>12955109674</b>
Normalized	96.94%	99.04%	99.45%	100%
Standard Deviation	2.6%	2.6%	0.3%	2.8%
<b>VP9 libvpx Encoding - v.V.1.V.E (FPS)</b>	<b>122.84</b>	123.15	123	<b>124</b>
Normalized	99.06%	99.31%	99.19%	100%
Standard Deviation	0.1%	0.1%	0.2%	0.6%
<b>Timed GCC Compilation - Time To Compile (sec)</b>	<b>1266</b>	1226	1265	<b>1207</b>
Normalized	95.34%	98.45%	95.42%	100%
<b>Timed Linux Kernel Compilation - Time To Compile (sec)</b>	<b>117</b>	115	<b>118</b>	<b>114</b>
Normalized	97.44%	99.13%	96.61%	100%
Standard Deviation	1.5%	1.3%	1.9%	1.5%
<b>Timed LLVM Compilation - Time To Compile (sec)</b>	<b>653</b>	<b>641</b>	<b>664</b>	654
Normalized	98.16%	100%	96.54%	98.01%
<b>XZ Compression - C.u.1.0.3.s.i.i.C.L.9</b>	46.95	<b>46.69</b>	<b>50.25</b>	50.13
Normalized	99.45%	100%	92.92%	93.14%
Standard Deviation	0.2%	0.2%	0.3%	0.7%
<b>Zstd Compression - C.u.1.0.3.s.i.i.C.L.1 (sec)</b>	28.94	<b>28.88</b>	<b>33.47</b>	33.24
Normalized	99.79%	100%	86.29%	86.88%
Standard Deviation	0.7%	0.5%	0.2%	0.1%
<b>Hackbench - 8 - Thread (sec)</b>	51.36	38.92	<b>51.62</b>	<b>35.01</b>
Normalized	68.17%	89.95%	67.82%	100%
Standard Deviation	2.5%	6%	3.4%	11%
<b>Hackbench - 16 - Thread (sec)</b>	106.53	<b>65.61</b>	<b>107.10</b>	66.82
Normalized	61.59%	100%	61.26%	98.19%
Standard Deviation	1%	2.1%	2.3%	5.9%
<b>Hackbench - 8 - Process (sec)</b>	<b>49.88</b>	<b>29.97</b>	48.73	30.05

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	Normalized	60.08%	100%	61.5%	99.73%
	Standard Deviation	2.6%	1.5%	2.3%	2.9%
<b>Hackbench - 16 - Process (sec)</b>	103.18	62.28	<b>104.10</b>	<b>60.28</b>	
	Normalized	58.42%	96.79%	57.91%	100%
	Standard Deviation	1.1%	4.9%	1.2%	0.9%
<b>Hackbench - 32 - Process (sec)</b>	<b>200</b>	<b>109</b>	198	121	
	Normalized	54.5%	100%	55.05%	90.08%
	Standard Deviation	4.9%	1.1%	5.6%	8.9%
<b>Tachyon - Total Time (sec)</b>	<b>8.61</b>	8.60	<b>8.47</b>	8.57	
	Normalized	98.37%	98.49%	100%	98.83%
	Standard Deviation	0.2%	0.1%	0.7%	1.6%
<b>OpenSSL - R.4.b.P (Signs/sec)</b>	1672	<b>1658</b>	1695	<b>1708</b>	
	Normalized	97.89%	97.07%	99.24%	100%
	Standard Deviation	0.5%	1.6%	0.9%	0.7%
<b>glibc bench - cos (nanoseconds)</b>	<b>49.24</b>	48.88	48.49	<b>47.89</b>	
	Normalized	97.26%	97.97%	98.76%	100%
	Standard Deviation	0.1%	0%	0.5%	0.1%
<b>glibc bench - ffs (nanoseconds)</b>	<b>1.92</b>	1.64	1.88	<b>1.60</b>	
	Normalized	83.33%	97.56%	85.11%	100%
	Standard Deviation	0%	0%	0%	0.1%
<b>glibc bench - sin (nanoseconds)</b>	<b>48.80</b>	48.67	47.81	<b>47.66</b>	
	Normalized	97.66%	97.92%	99.69%	100%
	Standard Deviation	0%	0.5%	0.1%	0.5%
<b>glibc bench - sqrt (nanoseconds)</b>	<b>2.18</b>	1.89	2.13	<b>1.85</b>	
	Normalized	84.86%	97.88%	86.85%	100%
	Standard Deviation	0%	0.1%	0.1%	0.1%
<b>glibc bench - tanh (nanoseconds)</b>	<b>13.17</b>	12.88	12.89	<b>12.61</b>	
	Normalized	95.75%	97.9%	97.83%	100%
	Standard Deviation	0.1%	0%	0.1%	0%
<b>glibc bench - ffssl (nanoseconds)</b>	<b>1.92</b>	1.64	1.88	<b>1.60</b>	
	Normalized	83.33%	97.56%	85.11%	100%
	Standard Deviation	0.1%	0.1%	0.1%	0.1%
<b>glibc bench - pthread_once (nanoseconds)</b>	<b>1.92</b>	1.64	1.88	<b>1.60</b>	
	Normalized	83.33%	97.56%	85.11%	100%
	Standard Deviation	0%	0.1%	0.2%	0.1%
<b>PostgreSQL pgbench - Buffer Test - Normal Load - Read Only (TPS)</b>	<b>103147</b>	115920	104846	<b>117587</b>	
	Normalized	87.72%	98.58%	89.16%	100%
	Standard Deviation	0.3%	0.7%	0.5%	0.6%
<b>PostgreSQL pgbench - Buffer Test - Normal Load - Read Write (TPS)</b>	<b>2069</b>	<b>2108</b>	2085	2097	
	Normalized	98.15%	100%	98.91%	99.48%
	Standard Deviation	0.2%	0.4%	1.8%	0.1%
<b>Darktable - Boat - CPU-only (sec)</b>	13.29	<b>13.20</b>	<b>14.76</b>	14.67	
	Normalized	99.32%	100%	89.43%	89.98%
	Standard Deviation	0.4%	0.1%	0.5%	0.7%
<b>Darktable - Masskrug - CPU-only (sec)</b>	7.93	<b>7.77</b>	<b>8.31</b>	8.16	
	Normalized	97.98%	100%	93.5%	95.22%
	Standard Deviation	0.6%	0.2%	0.3%	0.7%
<b>Darktable - Server Rack - CPU-only (sec)</b>	0.22	<b>0.20</b>	<b>0.23</b>	0.22	
	Normalized	90.91%	100%	86.96%	90.91%
	Standard Deviation	1.7%	0%	0.3%	2.9%

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<b>Darktable - Server Room - CPU-only (sec)</b>	5.53	<b>5.48</b>	<b>5.87</b>	5.78
Normalized	99.1%	100%	93.36%	94.81%
Standard Deviation	0.1%	0.3%	0.4%	0.6%
<b>GIMP - resize (sec)</b>	<b>8.83</b>	8.46	8.76	<b>8.32</b>
Normalized	94.22%	98.35%	94.98%	100%
Standard Deviation	2%	1.7%	2.4%	1.6%
<b>GIMP - rotate (sec)</b>	<b>13.97</b>	13.35	13.76	<b>13.30</b>
Normalized	95.2%	99.63%	96.66%	100%
Standard Deviation	0.2%	0.1%	0.2%	2.9%
<b>GIMP - auto-levels (sec)</b>	14.77	<b>14.12</b>	<b>14.81</b>	14.17
Normalized	95.6%	100%	95.34%	99.65%
Standard Deviation	0.2%	0.5%	1%	0.6%
<b>GIMP - unsharp-mask (sec)</b>	16.65	<b>15.94</b>	<b>16.72</b>	15.95
Normalized	95.74%	100%	95.33%	99.94%
Standard Deviation	0.1%	0.1%	0%	0.6%
<b>Redis - SADD (Req/sec)</b>	<b>2435126</b>	2598066	2469256	<b>2677730</b>
Normalized	90.94%	97.02%	92.21%	100%
Standard Deviation	0.6%	2%	0.9%	2.9%
<b>Redis - LPUSH (Req/sec)</b>	<b>1933087</b>	<b>2063299</b>	1952126	2036125
Normalized	93.69%	100%	94.61%	98.68%
Standard Deviation	0.9%	0.4%	1.4%	2.5%
<b>Redis - GET (Req/sec)</b>	<b>2719966</b>	2952830	2985199	<b>2985944</b>
Normalized	91.09%	98.89%	99.98%	100%
Standard Deviation	0.8%	0.6%	0.8%	2.1%
<b>Redis - SET (Req/sec)</b>	<b>2072644</b>	2229129	2123264	<b>2292952</b>
Normalized	90.39%	97.22%	92.6%	100%
Standard Deviation	2.9%	1.4%	0.9%	2.7%
<b>Stress-NG - Semaphores (Bogo Ops/s)</b>	<b>4857522</b>	5327119	5199954	<b>5595987</b>
Normalized	86.8%	95.2%	92.92%	100%
Standard Deviation	1.8%	3%	1.5%	1.3%
<b>Stress-NG - Memory Copying (Bogo Ops/s)</b>	<b>2161</b>	2150	<b>1811</b>	1822
Normalized	100%	99.49%	83.8%	84.31%
Standard Deviation	0.2%	0.5%	0.3%	0.2%
<b>Stress-NG - Socket Activity (Bogo Ops/s)</b>	<b>3792</b>	6149	3834	<b>6325</b>
Normalized	59.95%	97.22%	60.62%	100%
Standard Deviation	1.4%	1.6%	3%	4.4%
<b>Stress-NG - Context Switching (Bogo Ops/s)</b>	<b>1729665</b>	2505234	1799856	<b>2569154</b>
Normalized	67.32%	97.51%	70.06%	100%
Standard Deviation	0.7%	1.4%	2.7%	2.1%
<b>Stress-NG - S.V.M.P (Bogo Ops/s)</b>	<b>4230501</b>	6358510	4525972	<b>6526944</b>
Normalized	64.82%	97.42%	69.34%	100%
Standard Deviation	6.7%	5.6%	1.6%	4.3%
<b>ctx_clock - C.S.T (Clocks)</b>	818	<b>127</b>	<b>829</b>	128
Normalized	15.53%	100%	15.32%	99.22%
Standard Deviation	0.1%	0.2%	0.8%	1.8%
<b>Memcached mcperf - Add (Operations/sec)</b>	<b>72613</b>	<b>100275</b>	73410	99756
Normalized	72.41%	100%	73.21%	99.48%
Standard Deviation	1.3%	0.2%	0.8%	0.9%

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<b>Memcached mcperf - Get</b>	<b>120345</b>	169930	123983	<b>172050</b>
(Operations/sec)				
Normalized	69.95%	98.77%	72.06%	100%
Standard Deviation	1.9%	1.7%	1.4%	1.8%
<b>Memcached mcperf - Set</b>	<b>72460</b>	<b>99226</b>	73347	98856
(Operations/sec)				
Normalized	73.03%	100%	73.92%	99.63%
Standard Deviation	0.7%	1.7%	0.7%	0%
<b>Memcached mcperf - Append</b>	<b>75757</b>	106798	77693	<b>108127</b>
(Operations/sec)				
Normalized	70.06%	98.77%	71.85%	100%
Standard Deviation	0.2%	1.4%	0.4%	1.3%
<b>Memcached mcperf - Delete</b>	<b>121212</b>	168895	125409	<b>174397</b>
(Operations/sec)				
Normalized	69.5%	96.85%	71.91%	100%
Standard Deviation	0.4%	0.6%	1%	0.8%
<b>Memcached mcperf - Prepend</b>	<b>76184</b>	<b>107008</b>	78028	106358
(Operations/sec)				
Normalized	71.19%	100%	72.92%	99.39%
Standard Deviation	0.5%	0.8%	0.7%	2.3%
<b>Memcached mcperf - Replace</b>	<b>75424</b>	106659	77828	<b>108850</b>
(Operations/sec)				
Normalized	69.29%	97.99%	71.5%	100%
Standard Deviation	1%	1.2%	0.3%	1.7%
<b>NGINX Benchmark - S.W.P.S</b>	<b>34720</b>	46860	35311	<b>47906</b>
(Req/s/sec)				
Normalized	72.48%	97.82%	73.71%	100%
Standard Deviation	0.8%	1.7%	0.8%	0.8%
<b>Selenium - ARES-6 - Firefox (ms)</b>	<b>55.22</b>	52.16	54.81	<b>51.78</b>
Normalized	93.77%	99.27%	94.47%	100%
Standard Deviation	0.5%	0.9%	0.9%	0.3%
<b>Selenium - Octane - Firefox</b>	<b>32402</b>	36885	32920	<b>37378</b>
(Geometric Mean)				
Normalized	86.69%	98.68%	88.07%	100%
Standard Deviation	0.1%	1.1%	1%	0.8%
<b>Selenium - WebXPRT - Firefox (Score)</b>	<b>220</b>	236	222	<b>239</b>
Normalized	92.05%	98.74%	92.89%	100%
Standard Deviation	0.8%		0.7%	0.6%
<b>OSBench - Create Files (us/Event)</b>	13.95	11.33	<b>14.03</b>	<b>11.13</b>
Normalized	79.78%	98.23%	79.33%	100%
Standard Deviation	0.4%	1.1%	0.2%	0.5%
<b>OSBench - Create Threads (us/Event)</b>	<b>11.91</b>	9.50	11.76	<b>9.29</b>
Normalized	78%	97.79%	79%	100%
Standard Deviation	0.4%	1.1%	1%	1%
<b>OSBench - Launch Programs</b>	52.86	45.42	<b>60.06</b>	<b>44.30</b>
Normalized	83.81%	97.53%	73.76%	100%
Standard Deviation	0.2%	0.6%	7.8%	0.7%
<b>OSBench - Memory Allocations</b>	70.19	<b>64.70</b>	<b>73.06</b>	67.99
(Ns/Event)				
Normalized	92.18%	100%	88.56%	95.16%
Standard Deviation	0.6%	0.1%	0.2%	0.3%

Geometric Mean Of All Test Results -	<b>119.414</b>	<b>144.635</b>	119.532	144.632
Result Composite - I.C.i.8.v.9.M				
(Geometric Mean)				

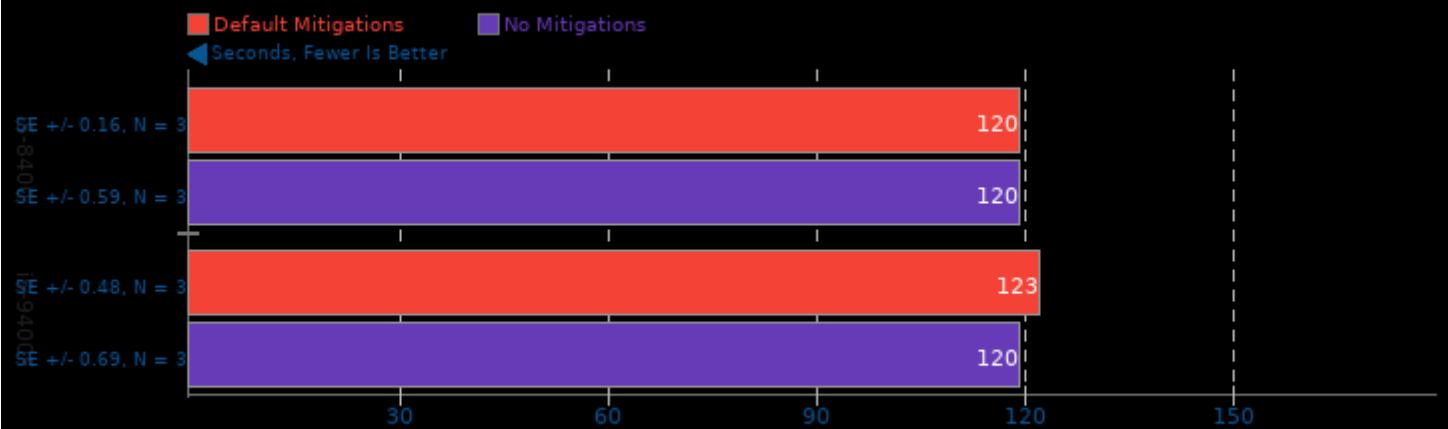
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Normalized	82.56%	100%	82.64%	100%
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## Intel Core i5 8400 vs. 9400F Mitigations

### SQLite 3.22

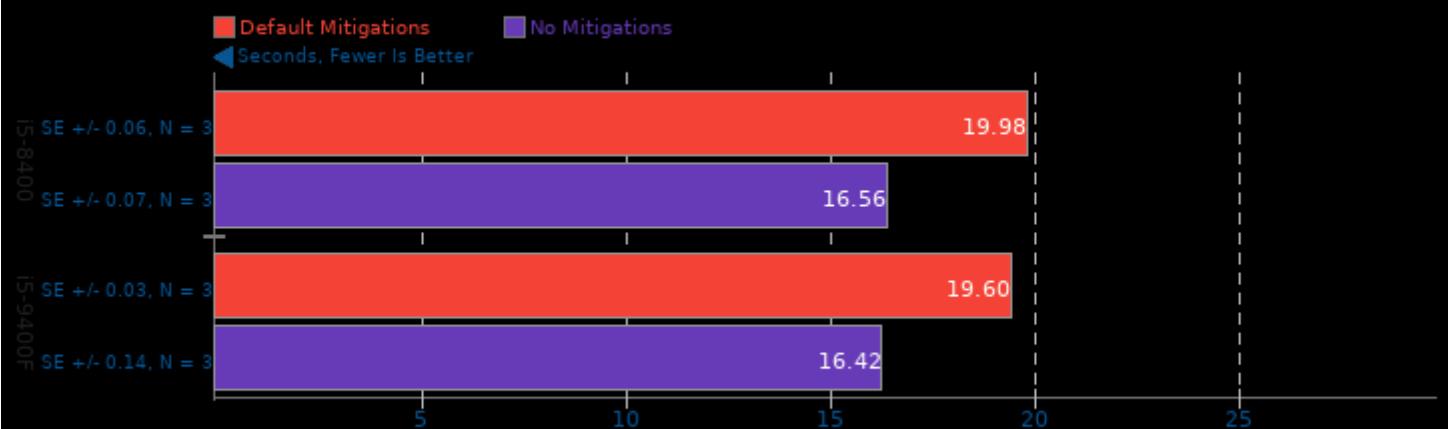
Timed SQLite Insertions



1. (CC) gcc options: -O2 -fPIE -fPIE -fPIE

### t-test1 2017-01-13

Threads: 1

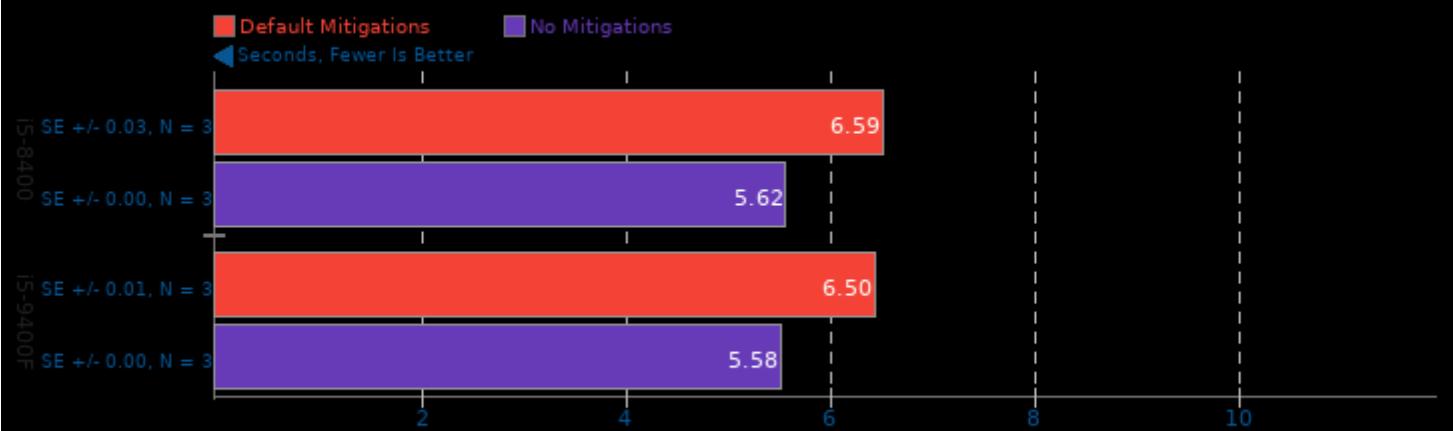


1. (CC) gcc options: -fPIE

## Intel Core i5 8400 vs. 9400F Mitigations

### t-test1 2017-01-13

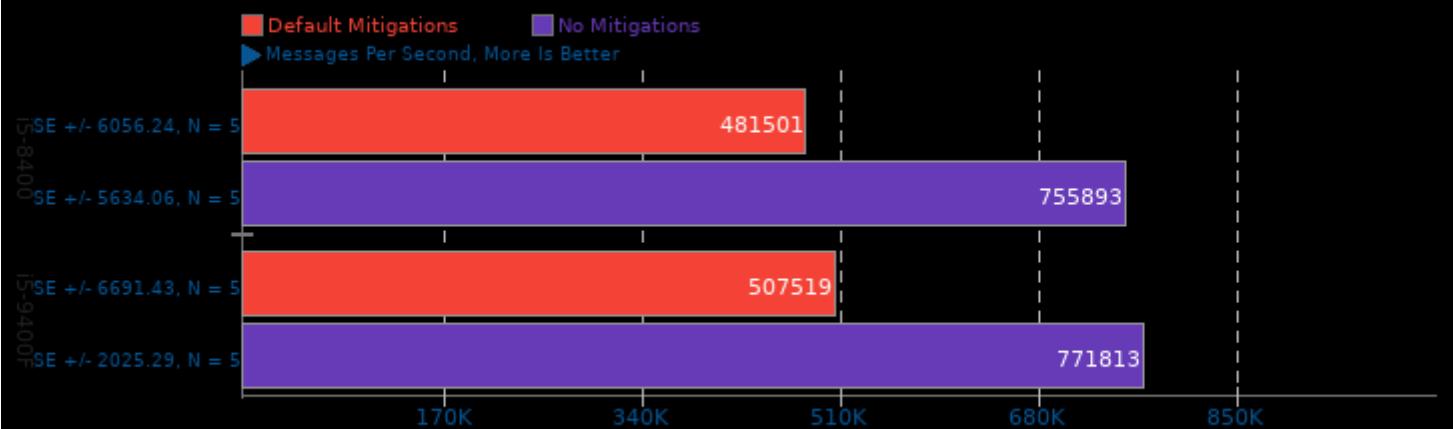
Threads: 2



1. (CC) gcc options: -pthread

### Sockperf 3.4

Test: Throughput

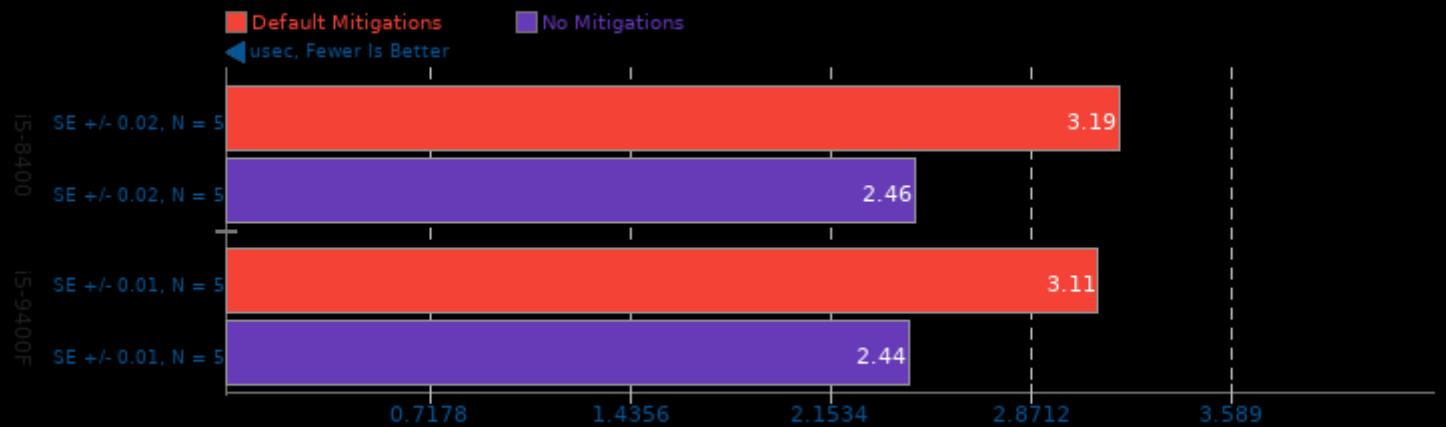


1. (CXX) g++ options: --param -O3 -rdynamic -ldl -pthread

## Intel Core i5 8400 vs. 9400F Mitigations

### Sockperf 3.4

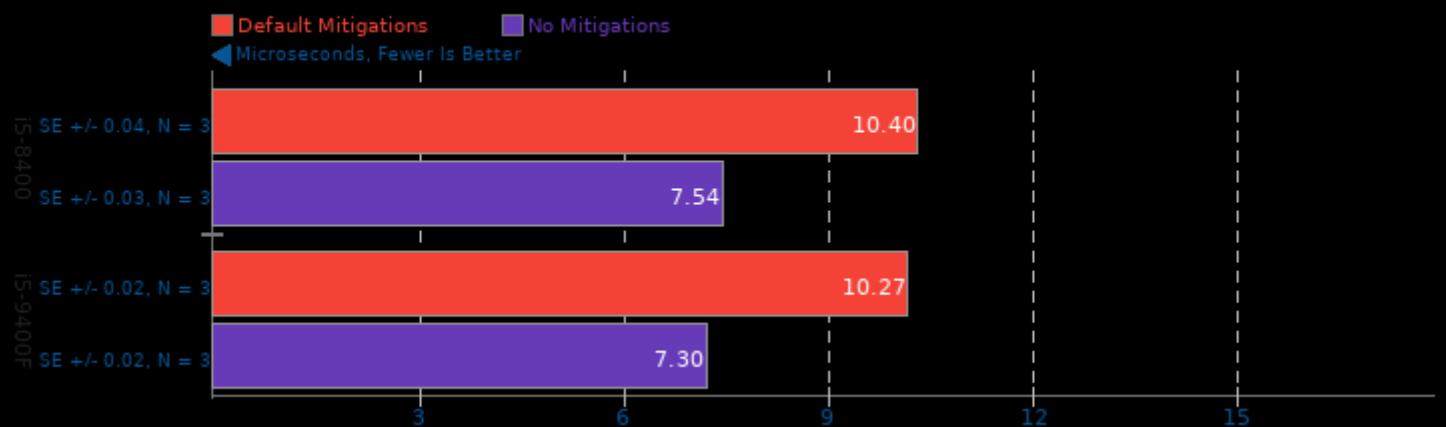
Test: Latency Ping Pong



1. (CXX) g++ options: -param -O3 -rdynamic -ldl -lpthread

### Ethr 2019-01-02

Server Address: localhost - Protocol: TCP - Test: Latency - Threads: 1



### Go Benchmarks

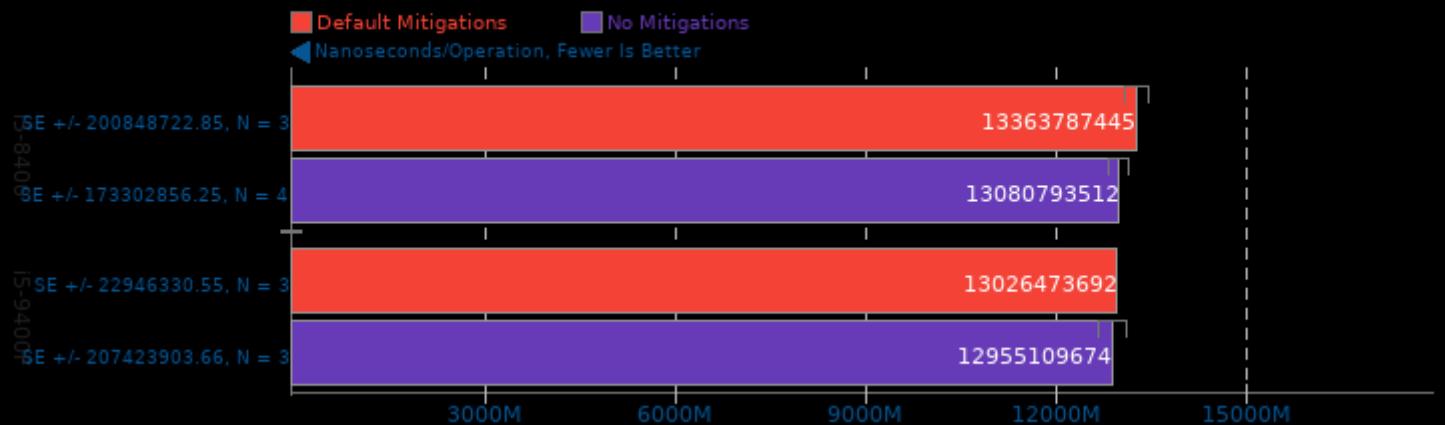
Test: http



## Intel Core i5 8400 vs. 9400F Mitigations

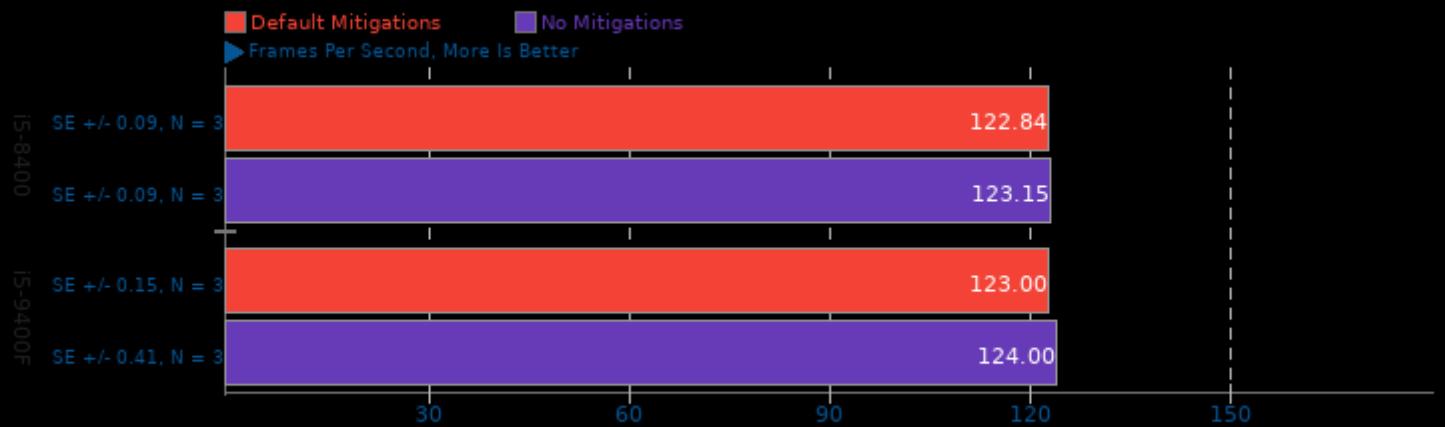
### Go Benchmarks

Test: build



### VP9 libvpx Encoding 1.8.0

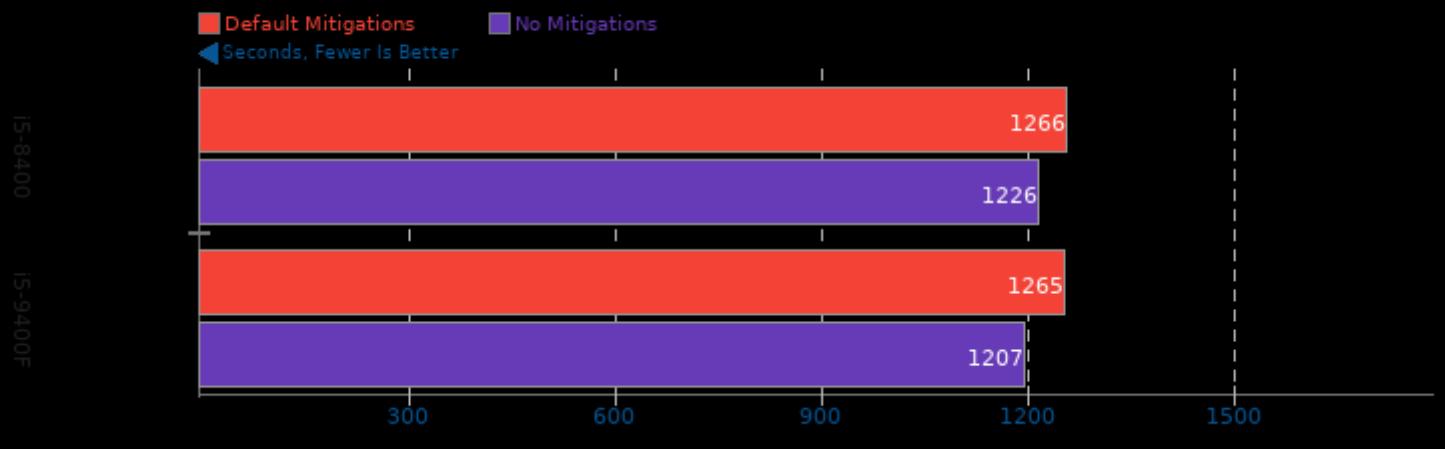
vpxenc VP9 1080p Video Encode



1. (CXX) g++ options: -m64 -lm -lpthread -O3 -fPIC -U\_FORTIFY\_SOURCE -std=c++11

### Timed GCC Compilation 8.2

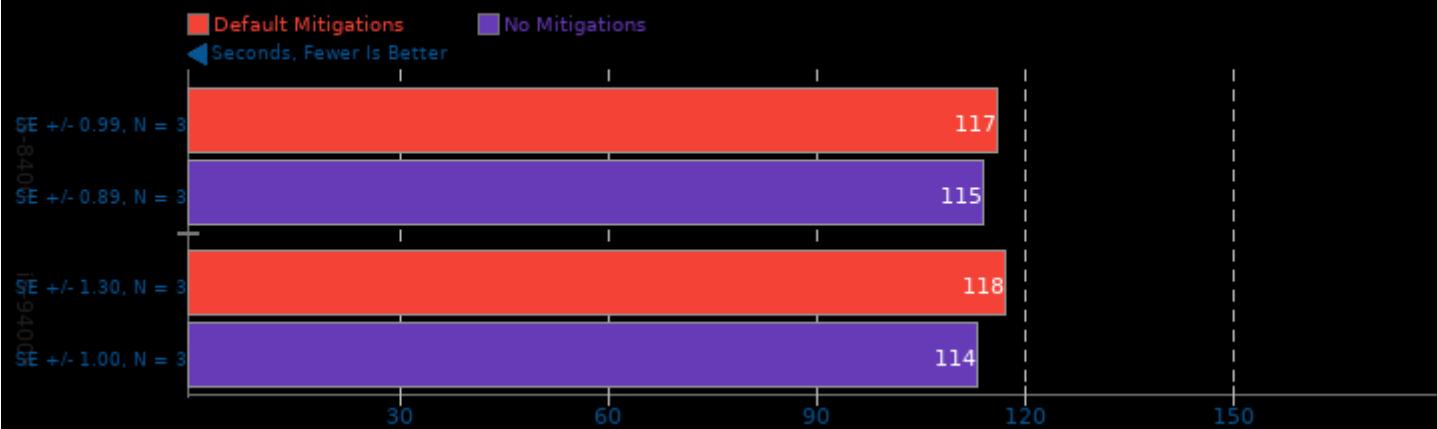
Time To Compile



## Intel Core i5 8400 vs. 9400F Mitigations

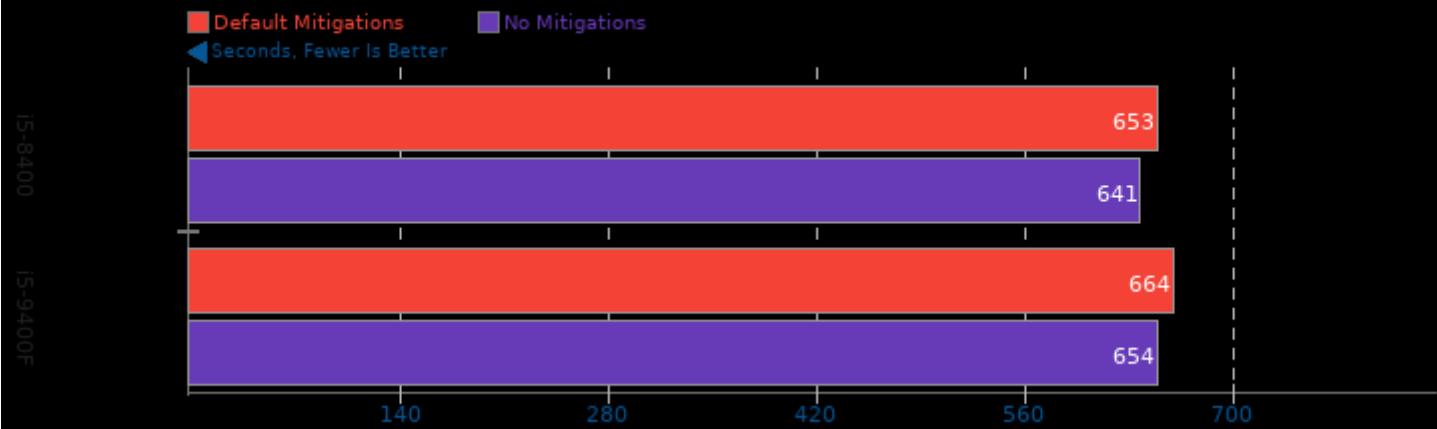
### Timed Linux Kernel Compilation 4.18

Time To Compile



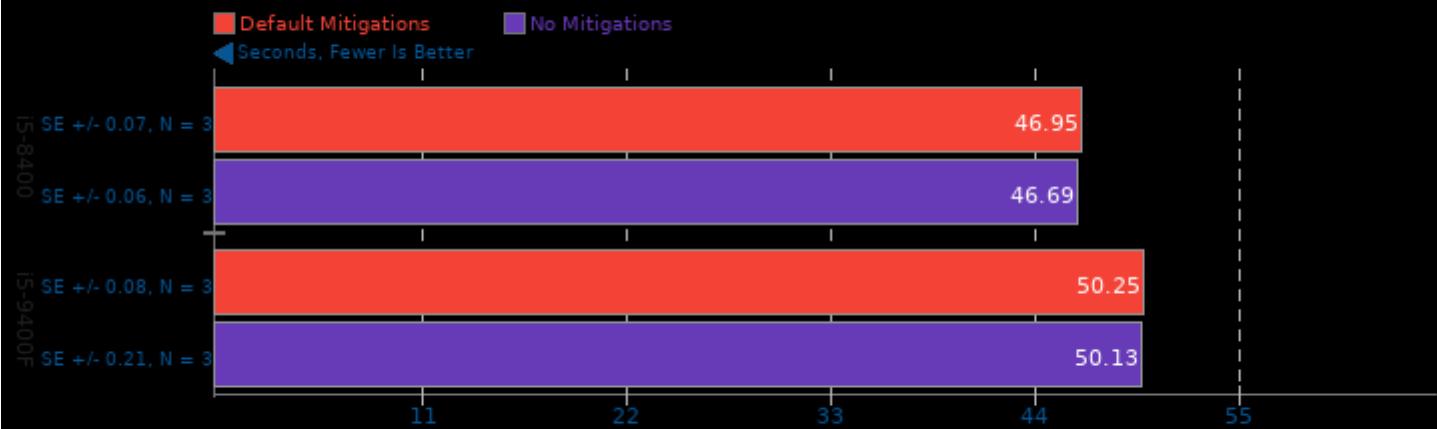
### Timed LLVM Compilation 6.0.1

Time To Compile



### XZ Compression 5.2.4

Compressing ubuntu-16.04.3-server-i386.img, Compression Level 9

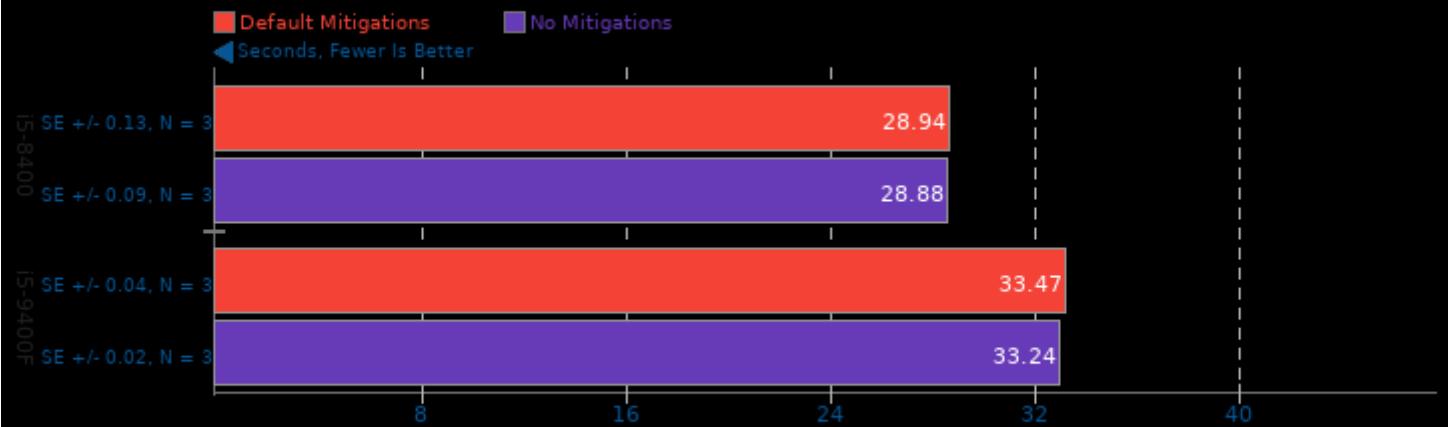


1. (CC) gcc options: -fthread -fvisibility=hidden -O2

## Intel Core i5 8400 vs. 9400F Mitigations

### Zstd Compression 1.3.4

Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19



1. (CC) gcc options: -O3 -pthread -lz

### Hackbench

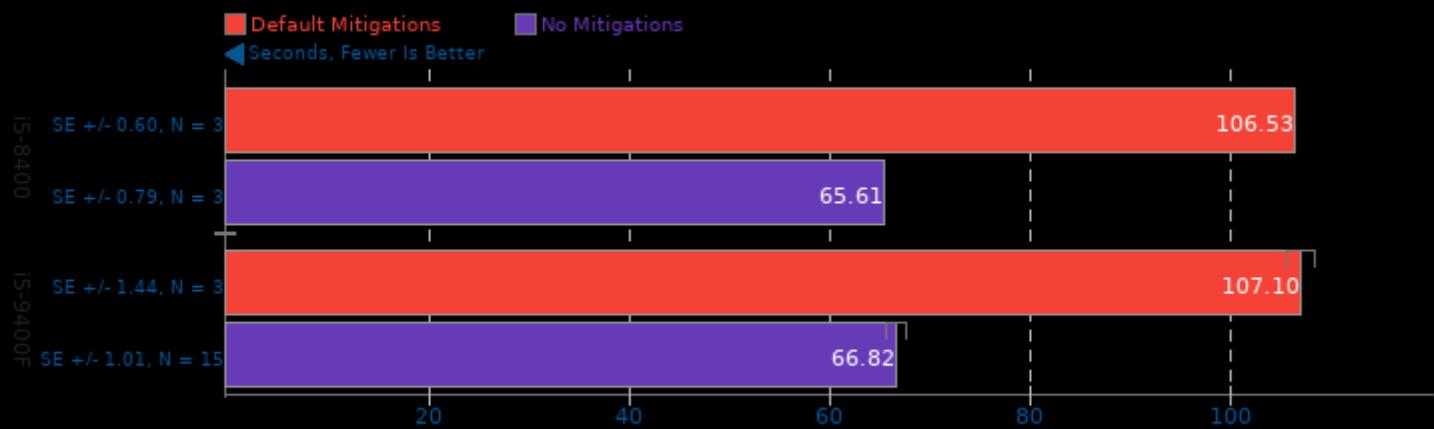
Count: 8 - Type: Thread



1. (CC) gcc options: -lpthread

## Hackbench

Count: 16 - Type: Thread



1. (CC) gcc options: -lpthread

## Hackbench

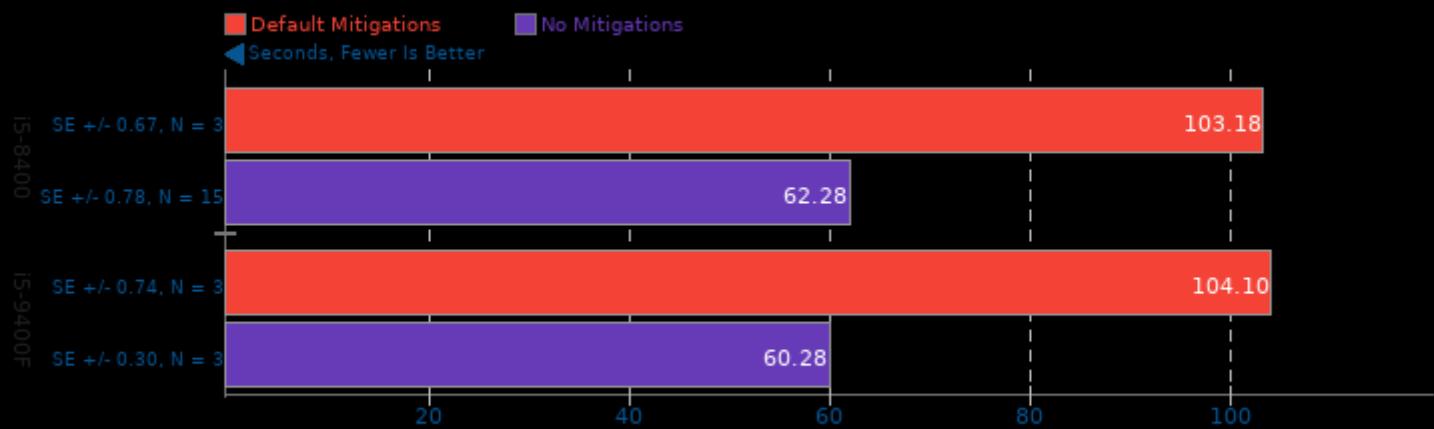
Count: 8 - Type: Process



1. (CC) gcc options: -lpthread

## Hackbench

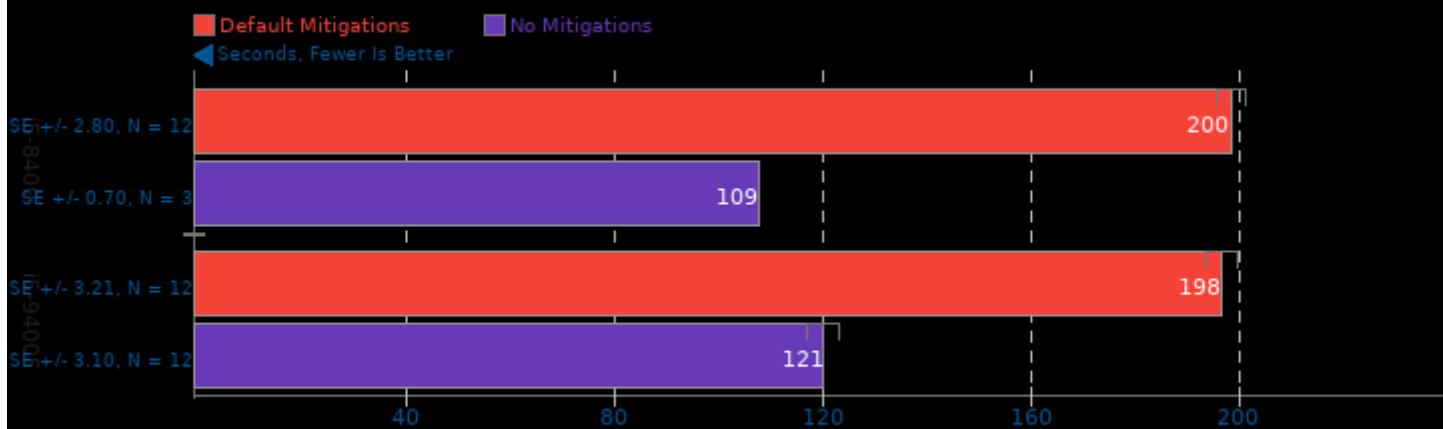
Count: 16 - Type: Process



1. (CC) gcc options: -lpthread

## Hackbench

Count: 32 - Type: Process

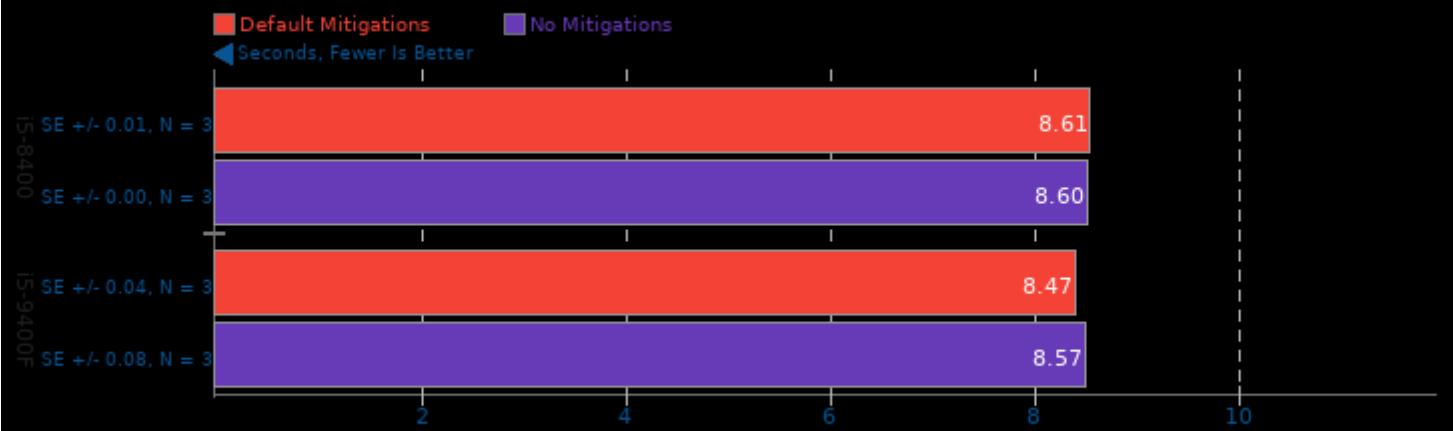


1. (CC) gcc options: -lpthread

## Intel Core i5 8400 vs. 9400F Mitigations

### Tachyon 0.98.9

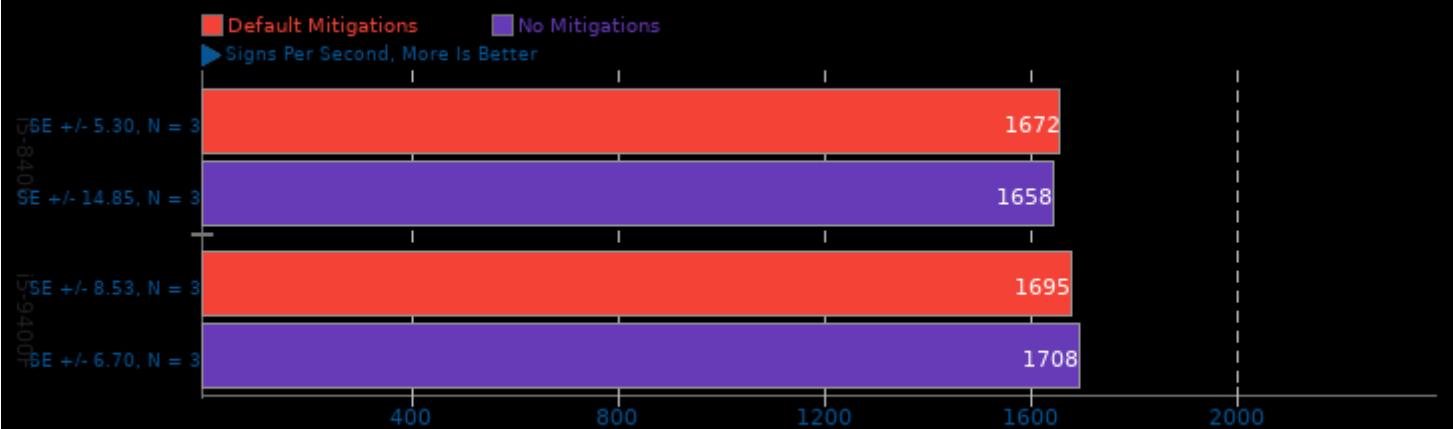
Total Time



1. (CC) gcc options: -m32 -O3 -fomit-frame-pointer -ffast-math -ltachyon -lm -lpthread

### OpenSSL 1.1.1

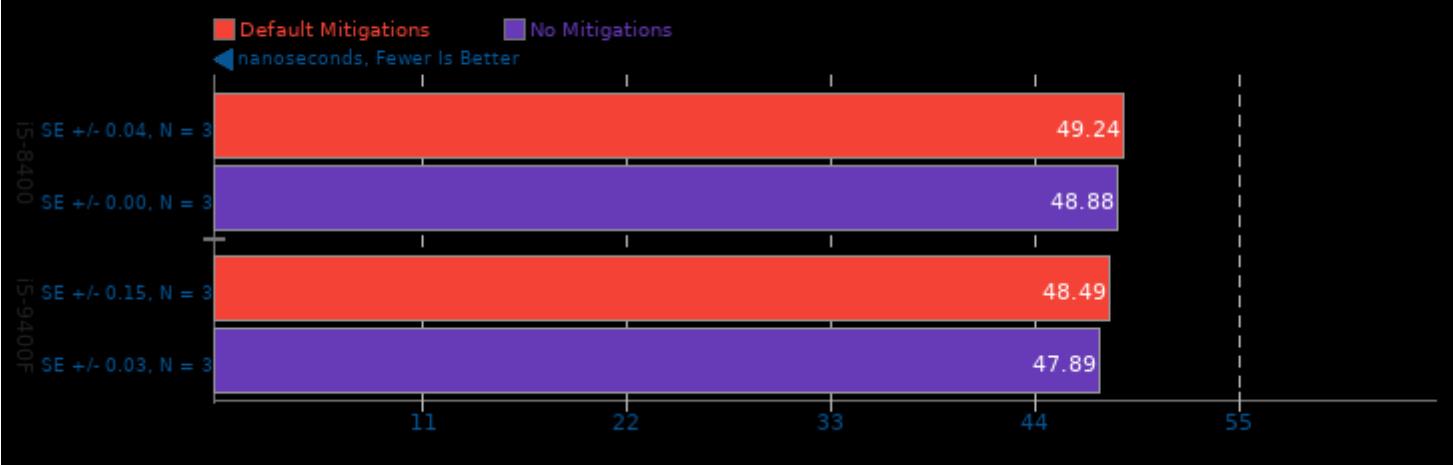
RSA 4096-bit Performance



1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl

### glibc bench 1.0

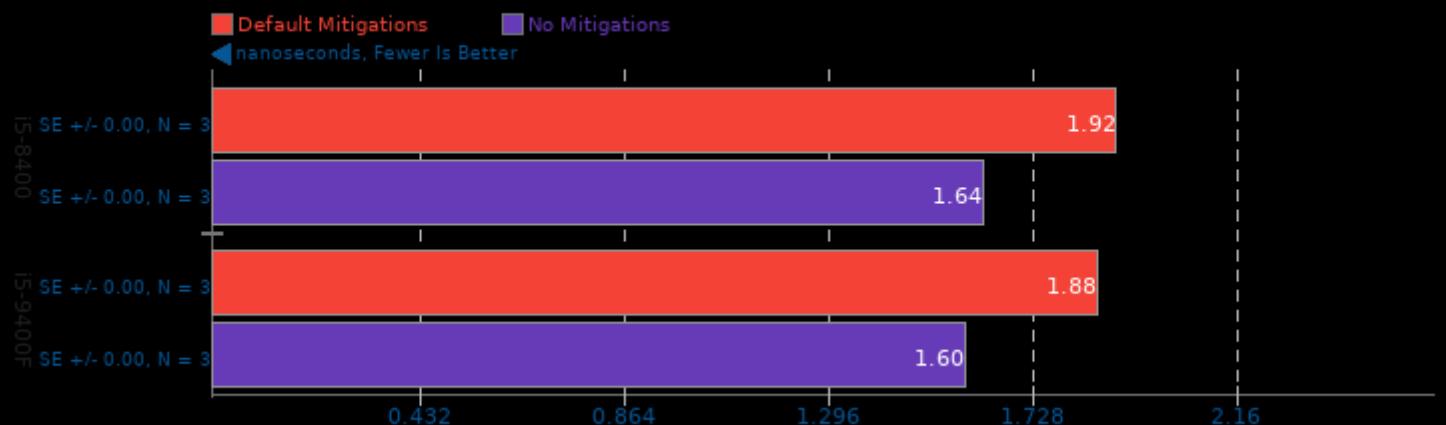
Benchmark: cos



## Intel Core i5 8400 vs. 9400F Mitigations

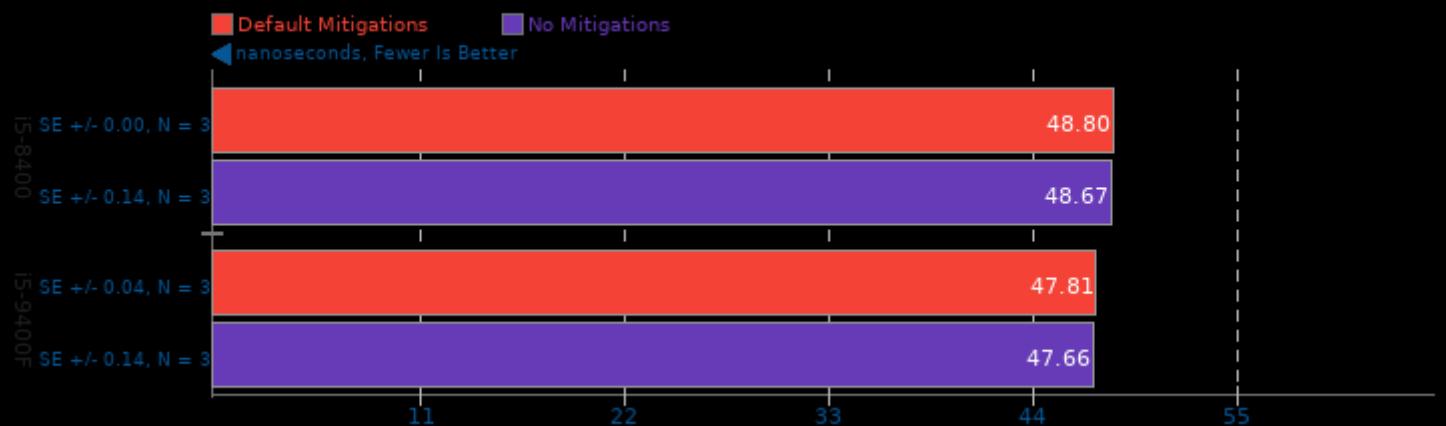
### glibc bench 1.0

Benchmark: ffs



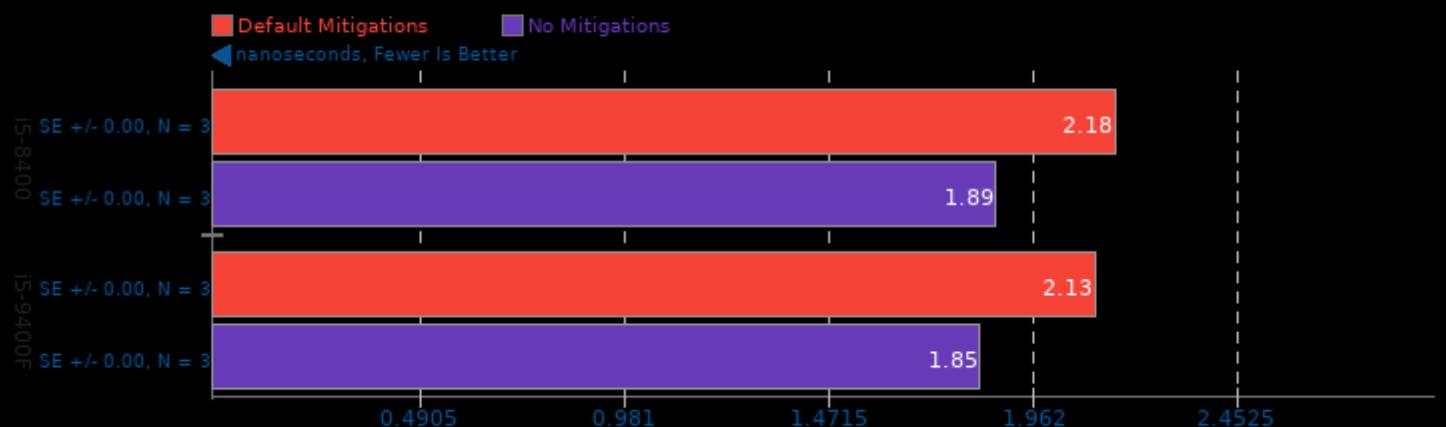
### glibc bench 1.0

Benchmark: sin



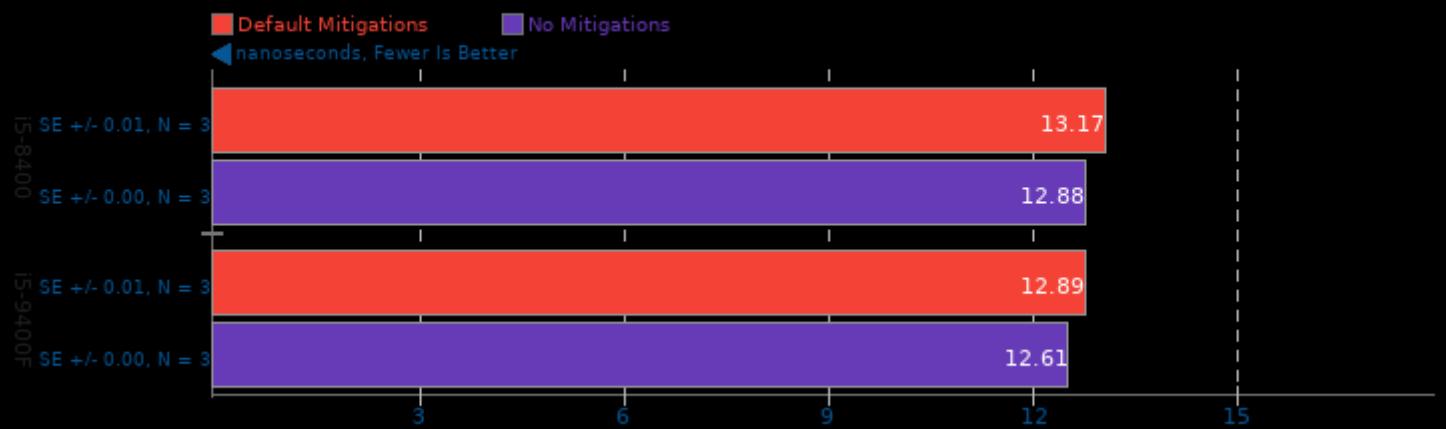
### glibc bench 1.0

Benchmark: sqrt

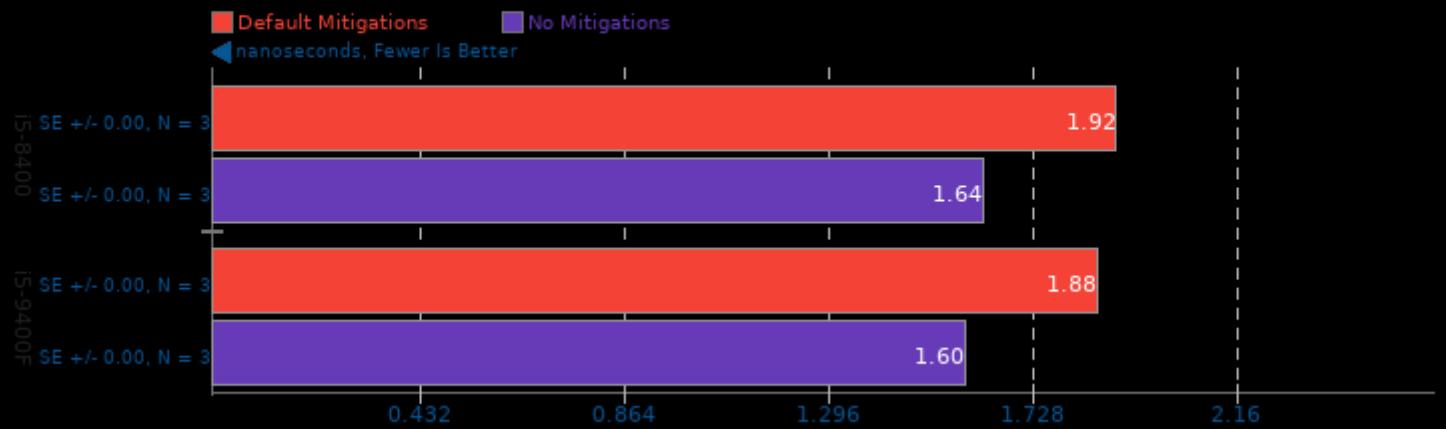


**glibc bench 1.0**

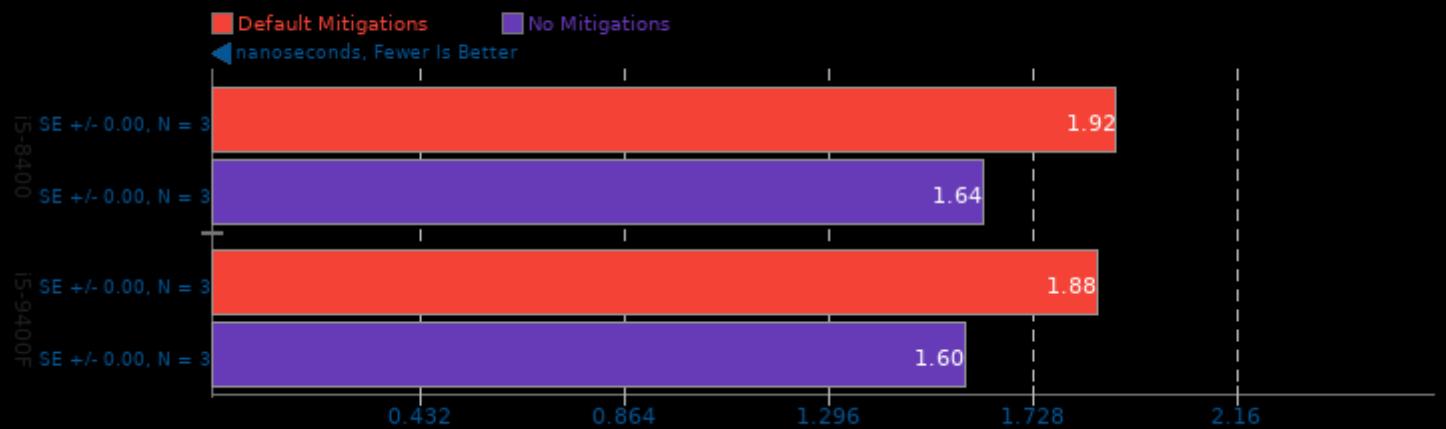
Benchmark: tanh

**glibc bench 1.0**

Benchmark: ffsll

**glibc bench 1.0**

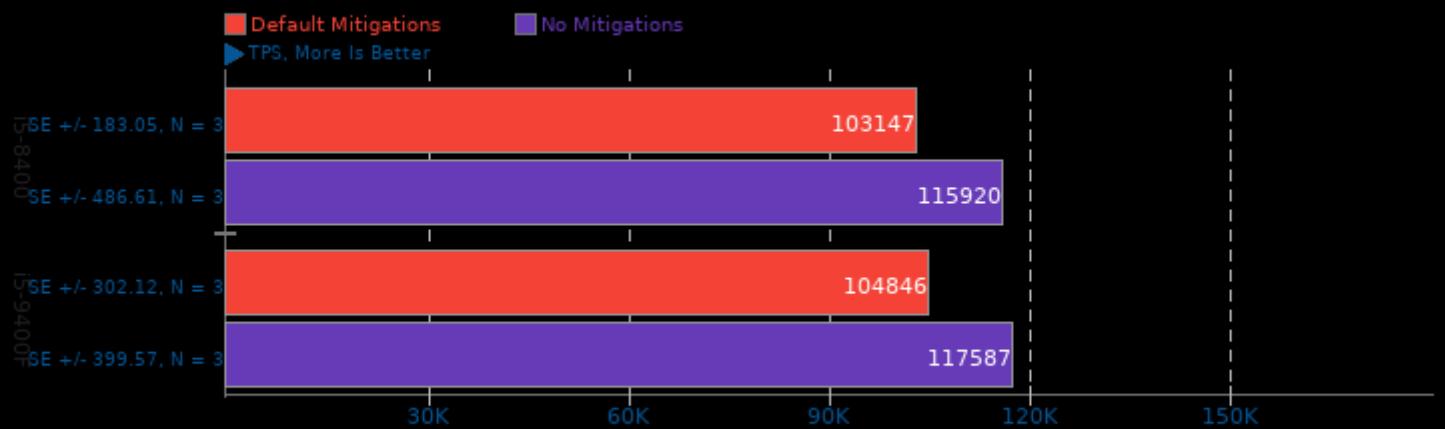
Benchmark: pthread\_once



## Intel Core i5 8400 vs. 9400F Mitigations

### PostgreSQL pgbench 10.3

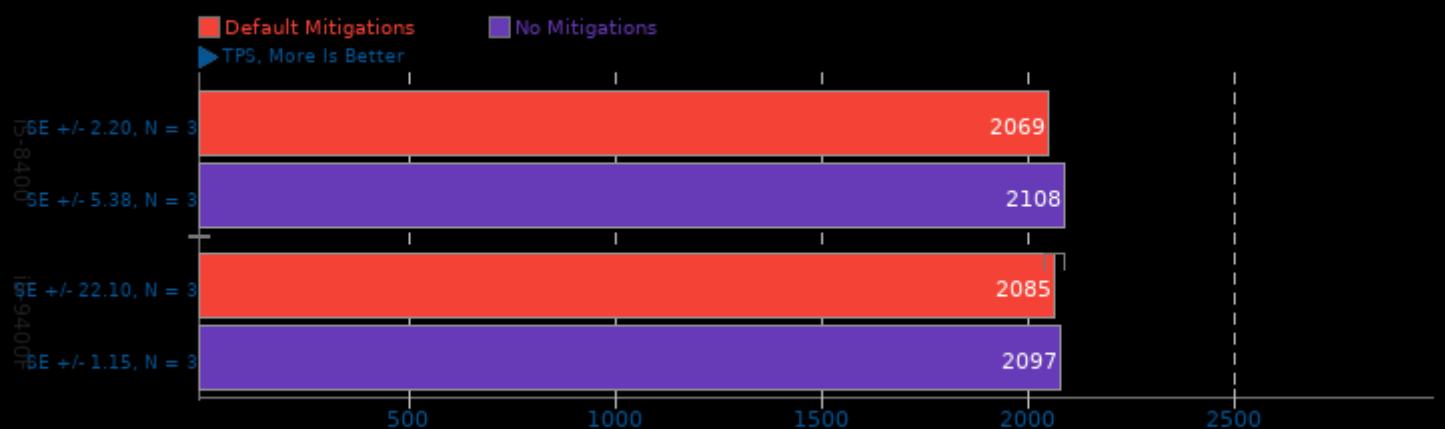
Scaling: Buffer Test - Test: Normal Load - Mode: Read Only



1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lgpgcommon -lgpgport -lpq -lpthread -lrt -lcrypt -ldl -lm

### PostgreSQL pgbench 10.3

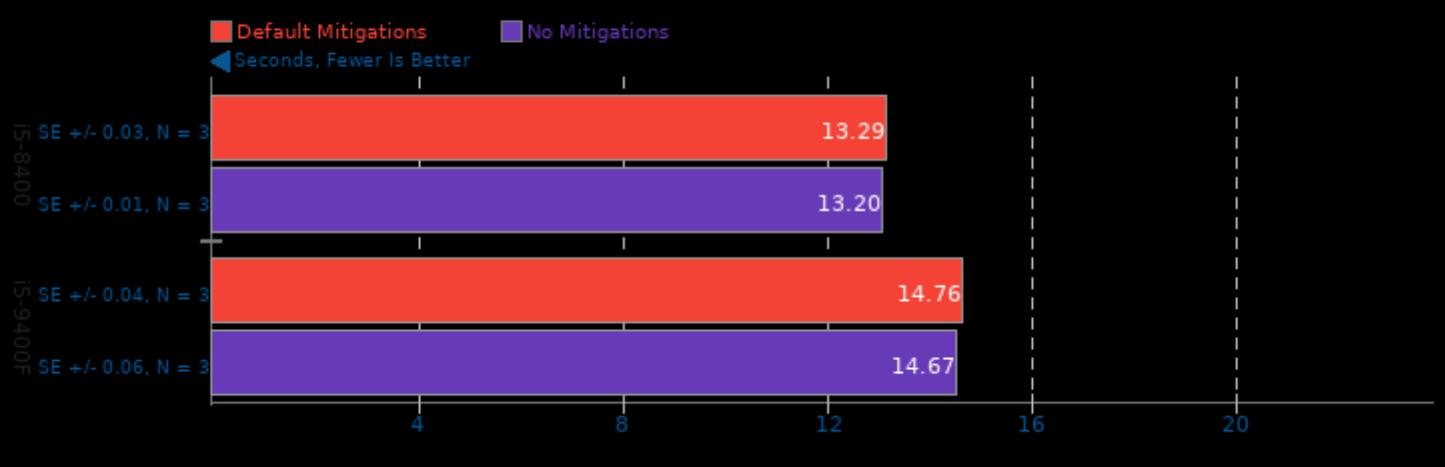
Scaling: Buffer Test - Test: Normal Load - Mode: Read Write



1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lgpgcommon -lgpgport -lpq -lpthread -lrt -lcrypt -ldl -lm

### Darktable 2.6.0

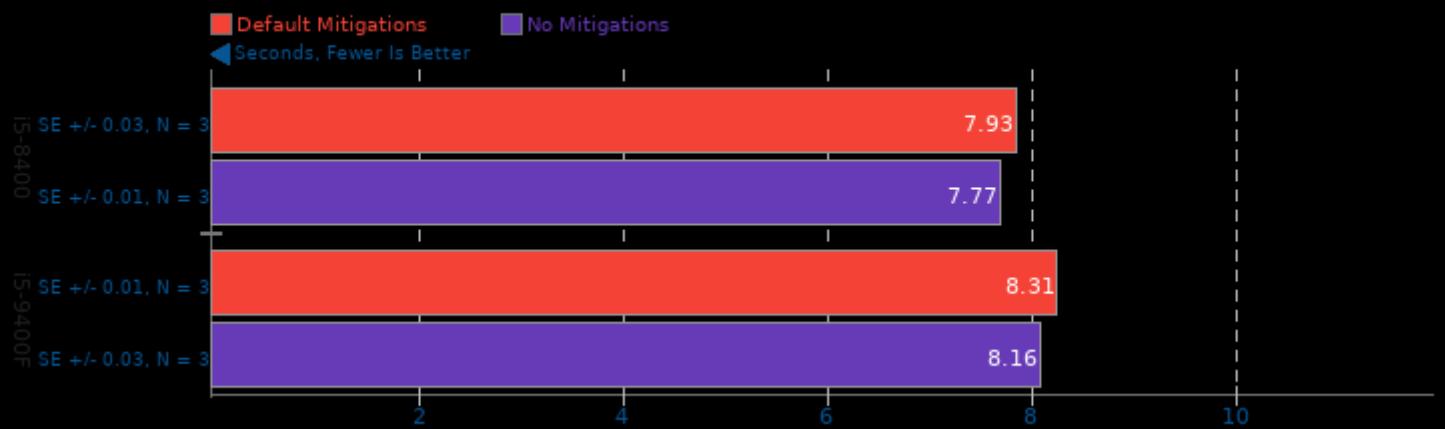
Test: Boat - Acceleration: CPU-only



## Intel Core i5 8400 vs. 9400F Mitigations

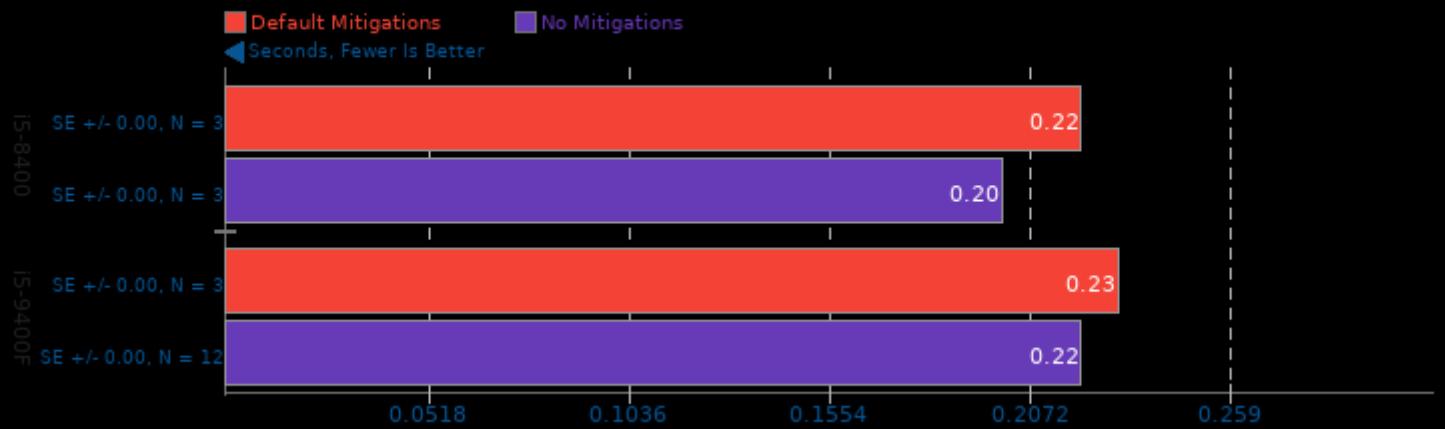
### Darktable 2.6.0

Test: Masskrug - Acceleration: CPU-only



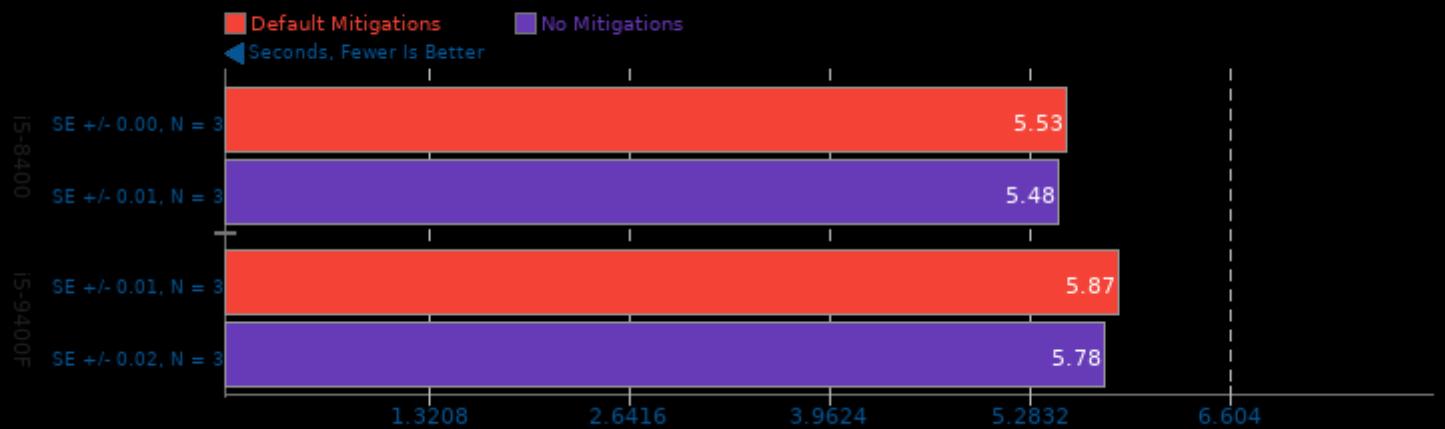
### Darktable 2.6.0

Test: Server Rack - Acceleration: CPU-only



### Darktable 2.6.0

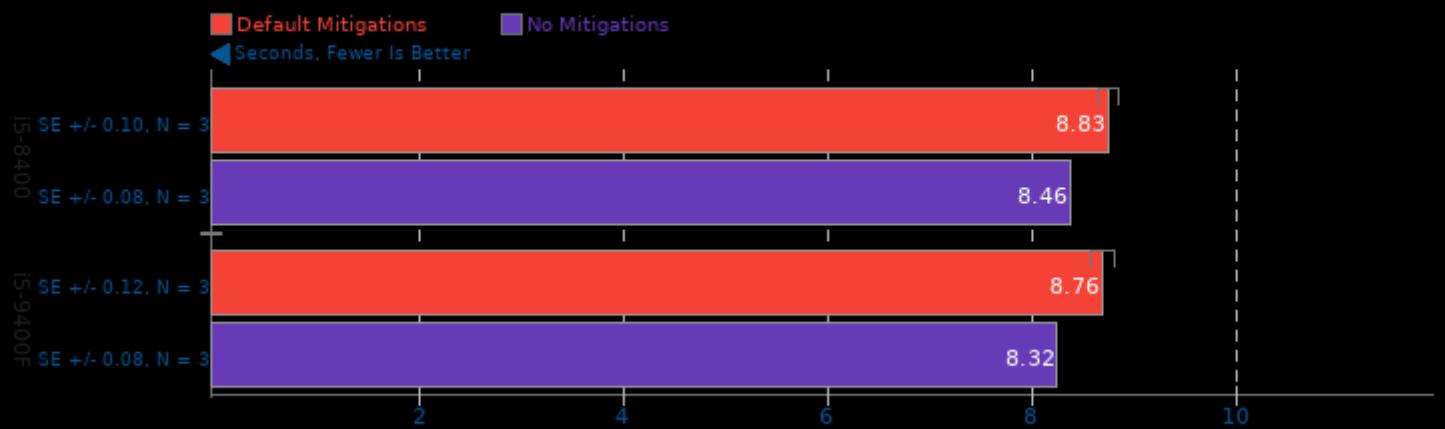
Test: Server Room - Acceleration: CPU-only



## Intel Core i5 8400 vs. 9400F Mitigations

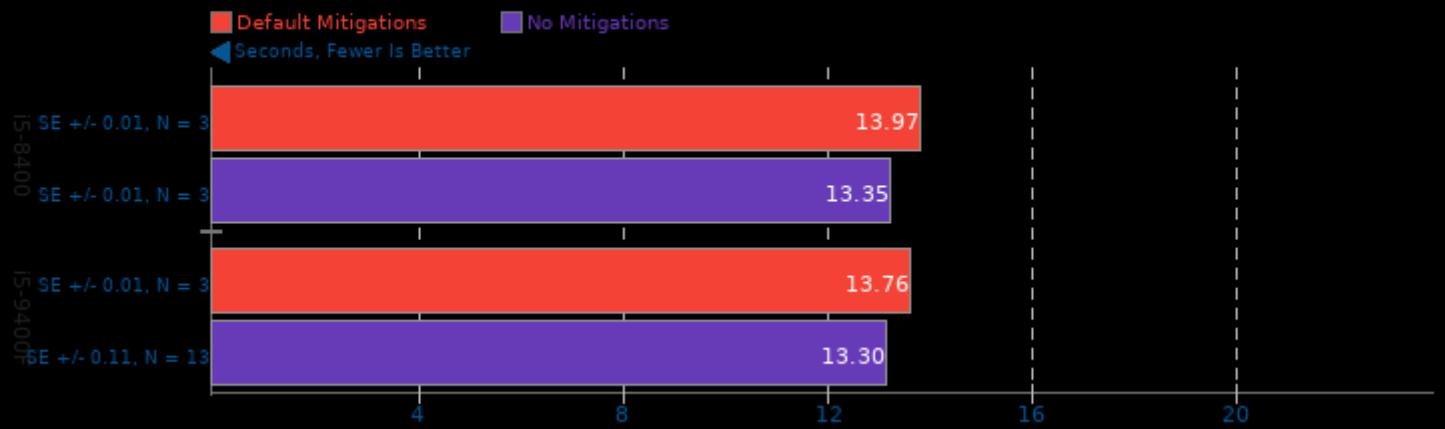
### GIMP 2.10.8

Test: resize



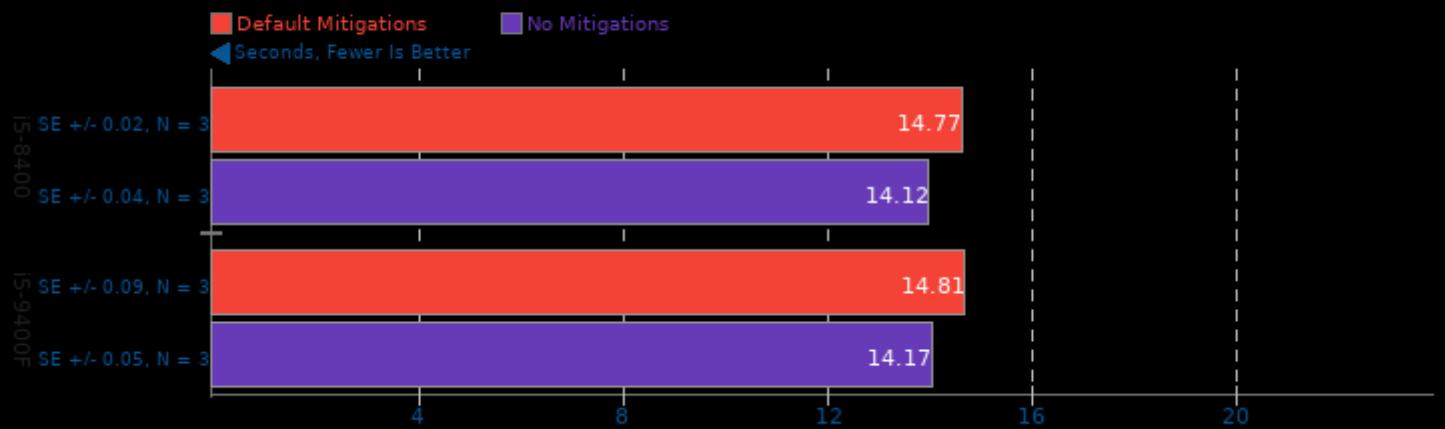
### GIMP 2.10.8

Test: rotate



### GIMP 2.10.8

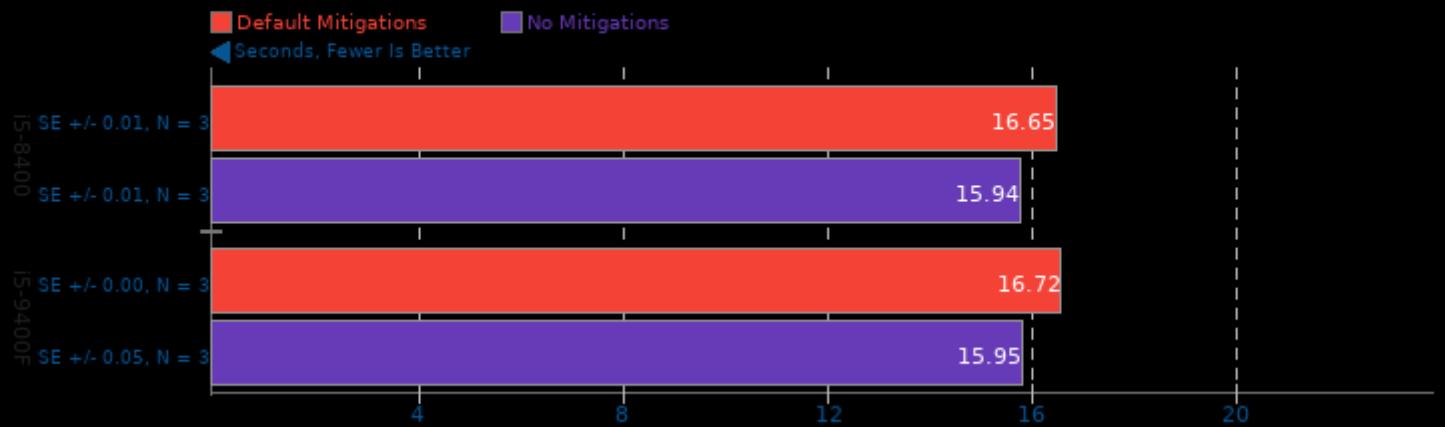
Test: auto-levels



## Intel Core i5 8400 vs. 9400F Mitigations

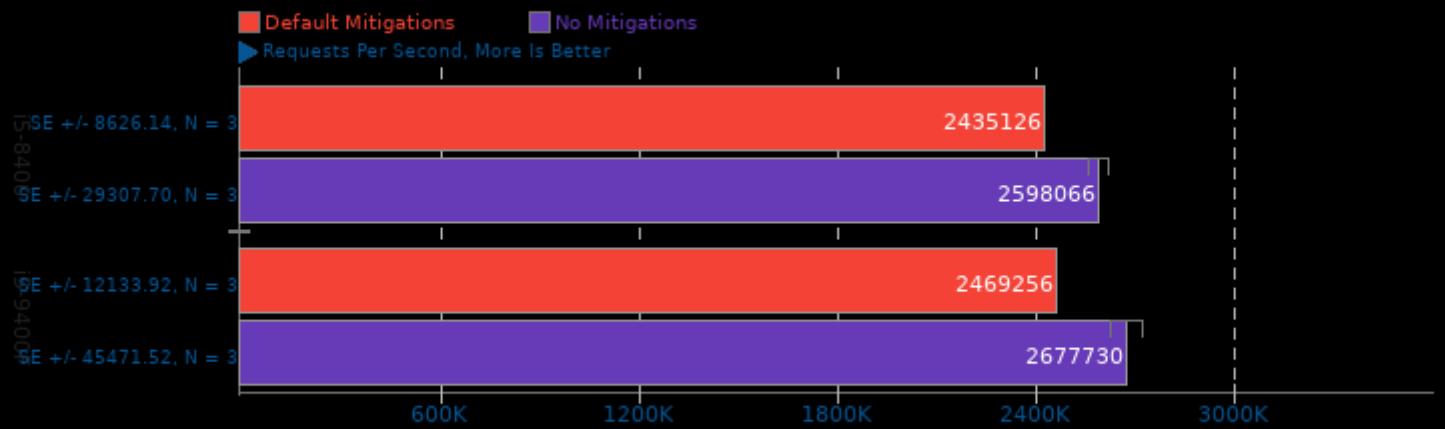
### GIMP 2.10.8

Test: unsharp-mask



### Redis 4.0.8

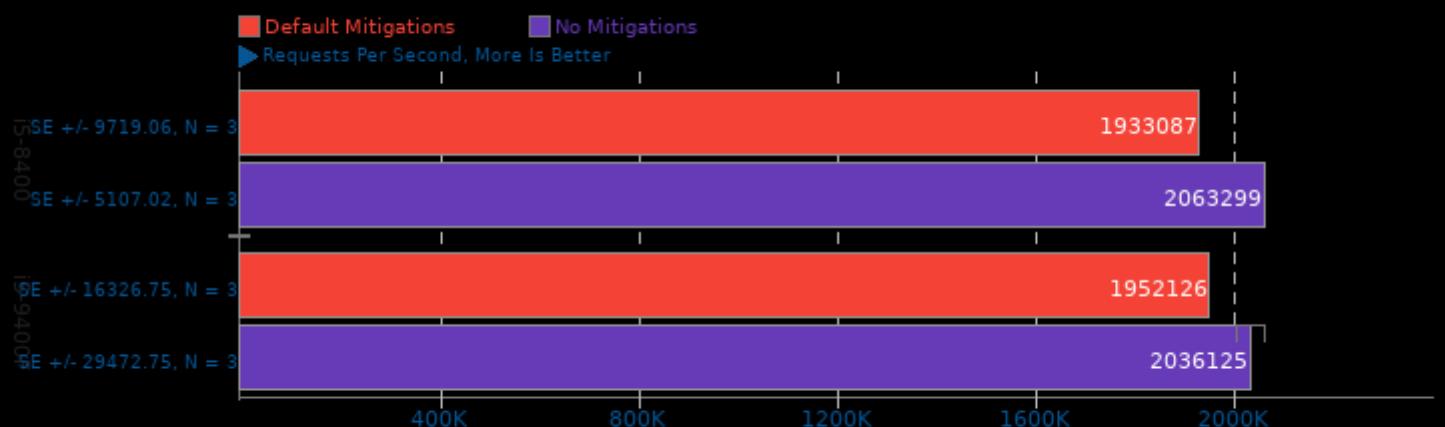
Test: SADD



1. (CC) gcc options: -ggdb -rdynamic -lm -ldl -pthread

### Redis 4.0.8

Test: LPUSH



1. (CC) gcc options: -ggdb -rdynamic -lm -ldl -pthread

## Intel Core i5 8400 vs. 9400F Mitigations

### Redis 4.0.8

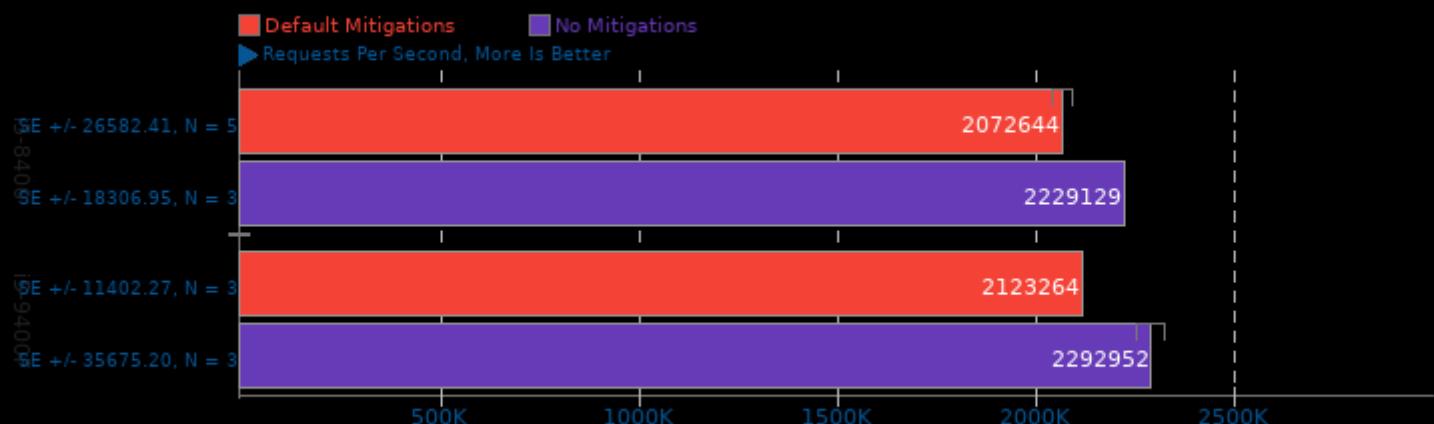
Test: GET



1. (CC) gcc options: -ggdb -rdynamic -lm -ldl -pthread

### Redis 4.0.8

Test: SET

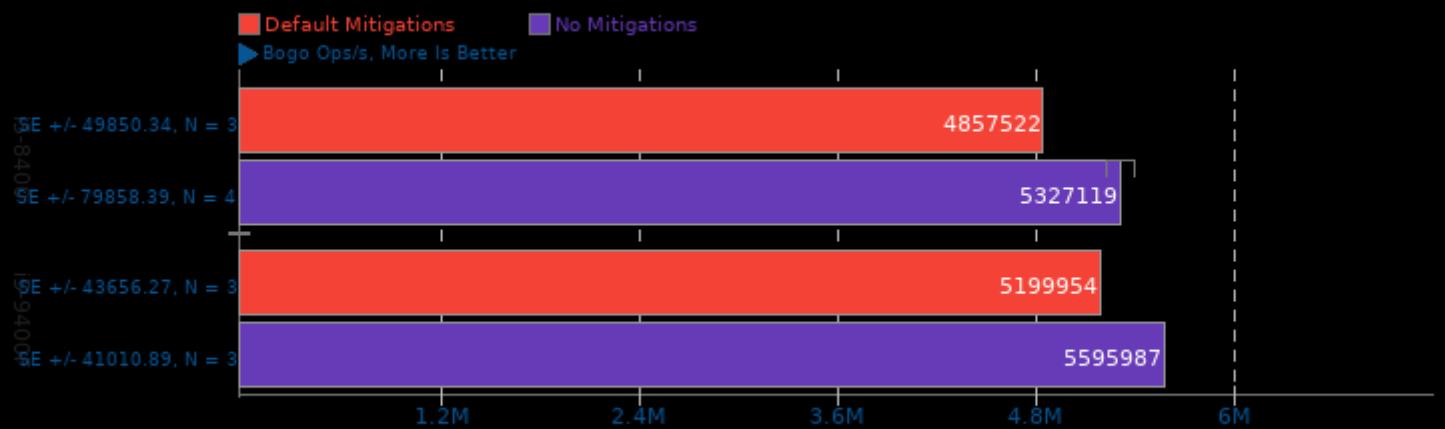


1. (CC) gcc options: -ggdb -rdynamic -lm -ldl -pthread

## Intel Core i5 8400 vs. 9400F Mitigations

### Stress-NG 0.07.26

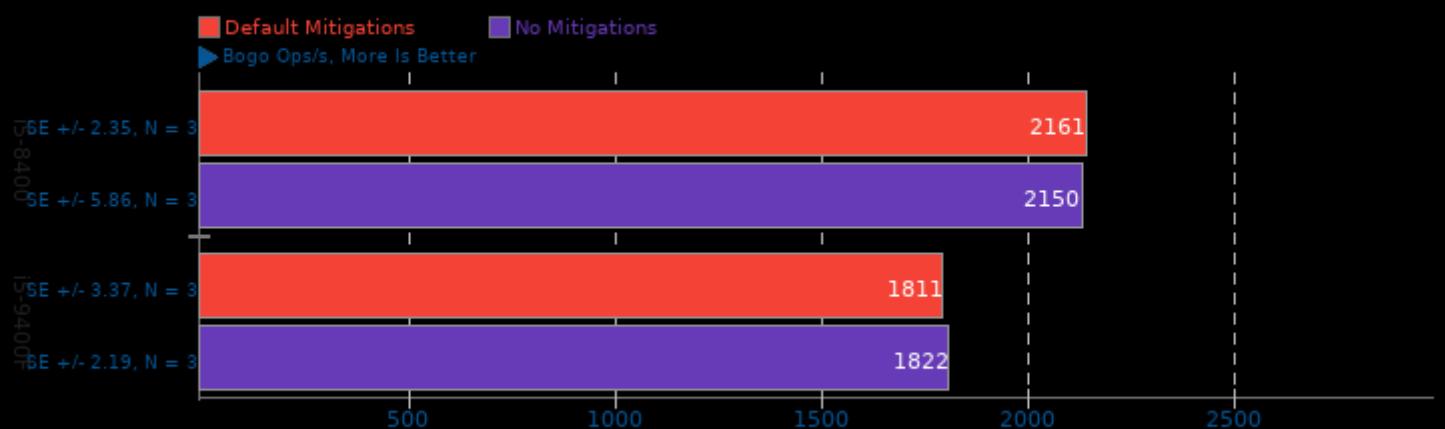
Test: Semaphores



1. (CC) gcc options: -O2 -std=gnu99 -lm -lz -lcrypt -lrt -lpthread -laio -lc

### Stress-NG 0.07.26

Test: Memory Copying

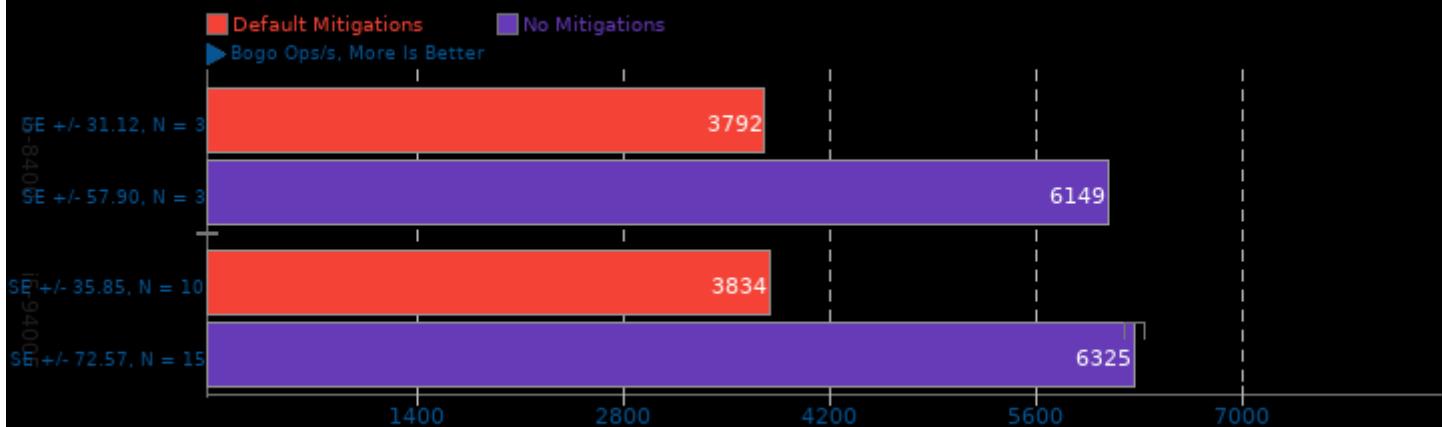


1. (CC) gcc options: -O2 -std=gnu99 -lm -lz -lcrypt -lrt -lpthread -laio -lc

## Intel Core i5 8400 vs. 9400F Mitigations

### Stress-NG 0.07.26

Test: Socket Activity



1. (CC) gcc options: -O2 -std=gnu99 -lm -lz -lcrypt -lrt -lpthread -laio -lc

### Stress-NG 0.07.26

Test: Context Switching



1. (CC) gcc options: -O2 -std=gnu99 -lm -lz -lcrypt -lrt -lpthread -laio -lc

## Intel Core i5 8400 vs. 9400F Mitigations

### Stress-NG 0.07.26

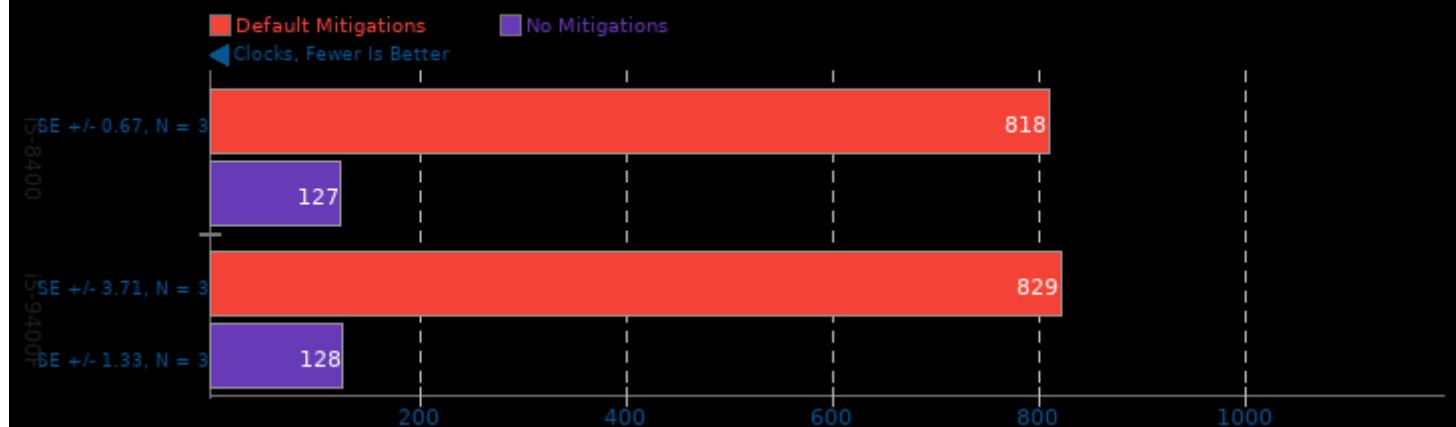
Test: System V Message Passing



1. (CC) gcc options: -O2 -std=gnu99 -lm -lz -lcrypt -lrt -lpthread -lao -lc

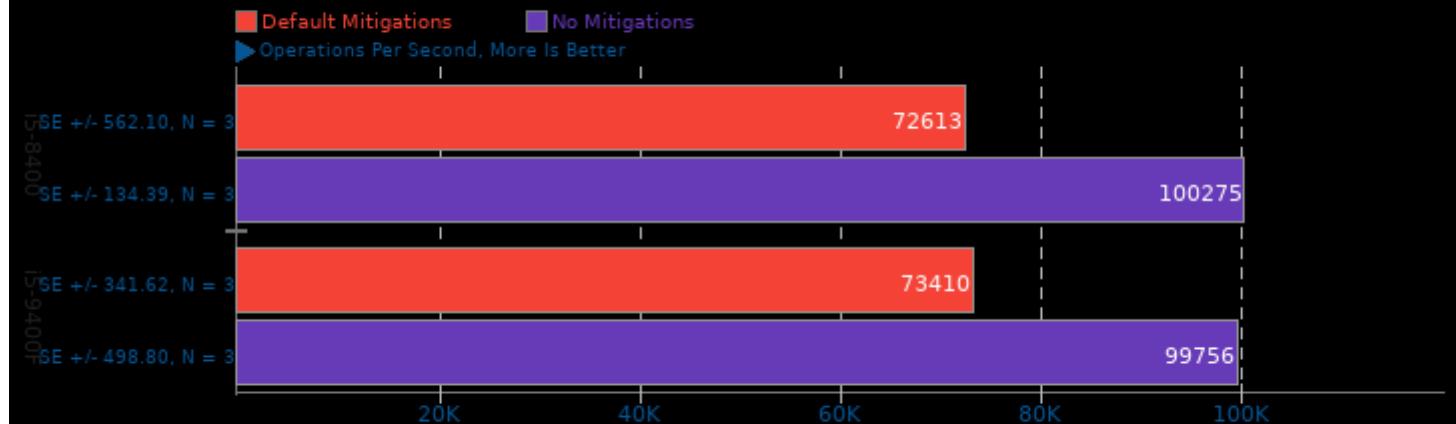
### ctx\_clock

Context Switch Time



### Memcached mcperf 1.5.10

Method: Add

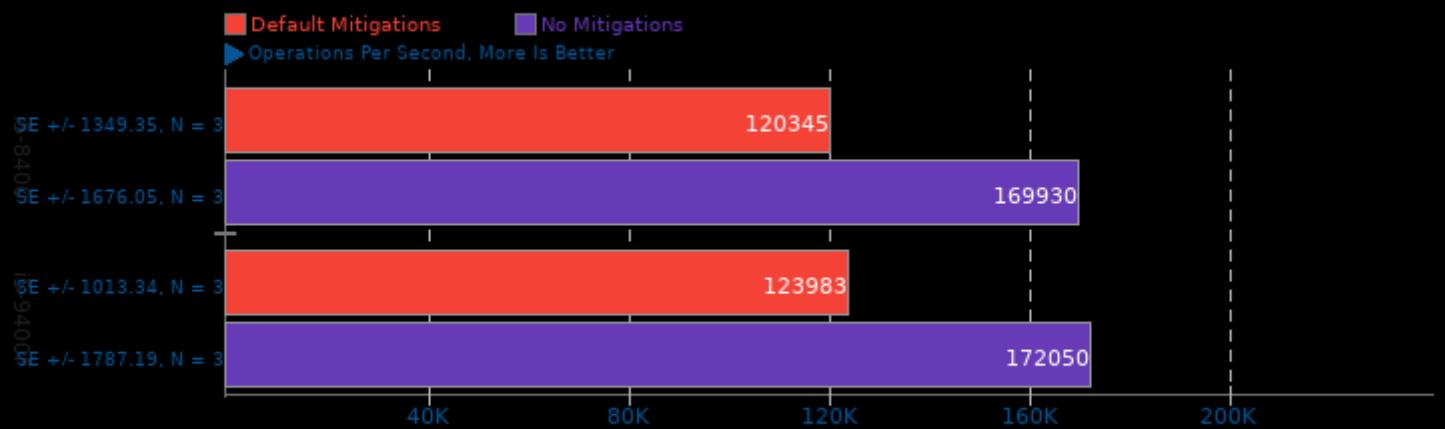


1. (CC) gcc options: -O2 -lm -rdynamic

## Intel Core i5 8400 vs. 9400F Mitigations

### Memcached mcperf 1.5.10

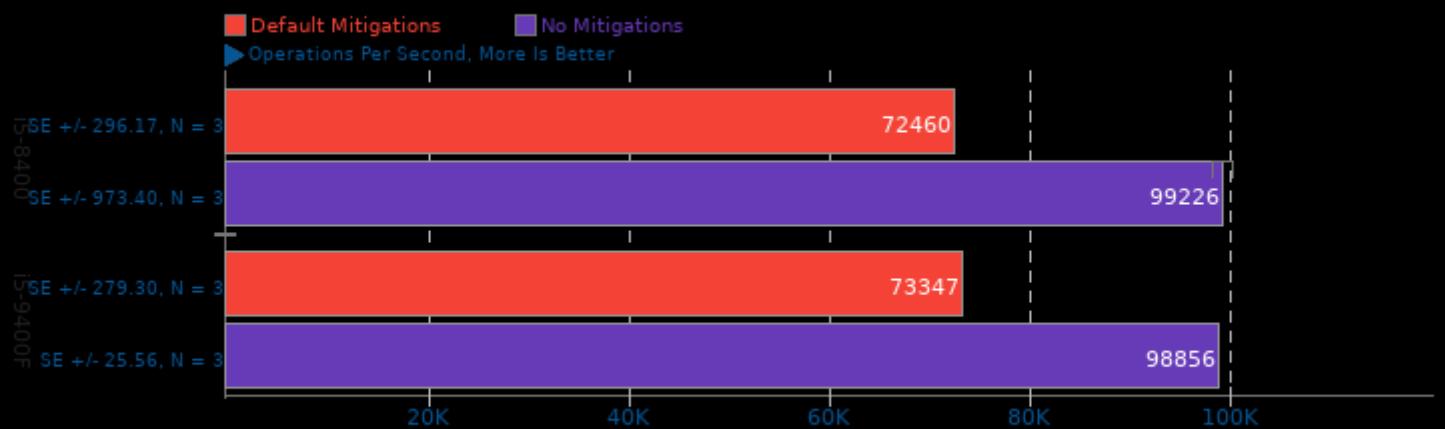
Method: Get



1. (CC) gcc options: -O2 -lm -rdynamic

### Memcached mcperf 1.5.10

Method: Set

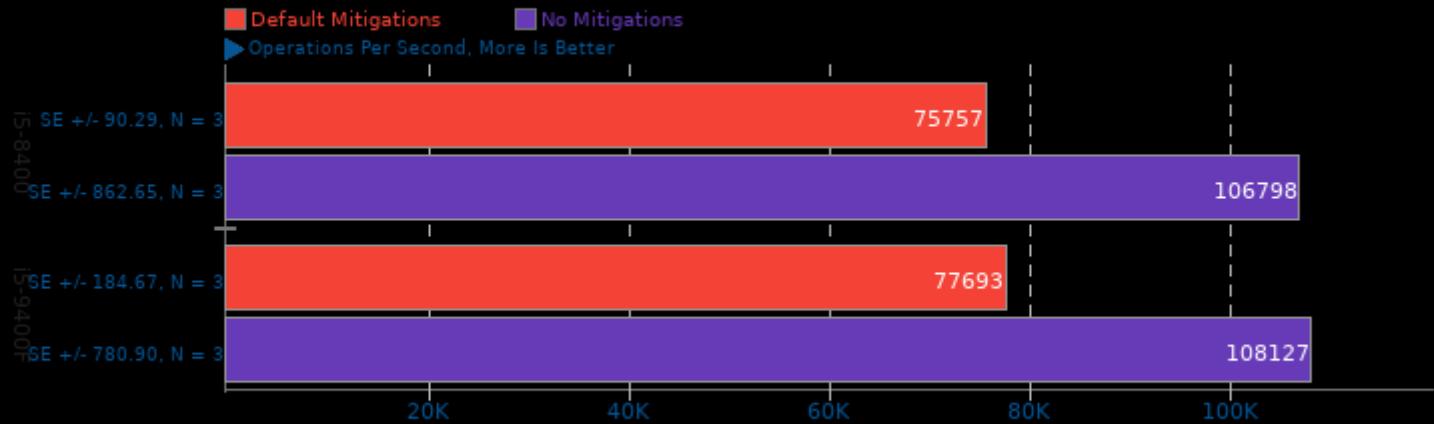


1. (CC) gcc options: -O2 -lm -rdynamic

## Intel Core i5 8400 vs. 9400F Mitigations

## Memcached mcperf 1.5.10

Method: Append



1. (CC) gcc options: -O2 -lm -rdynamic

## Memcached mcperf 1.5.10

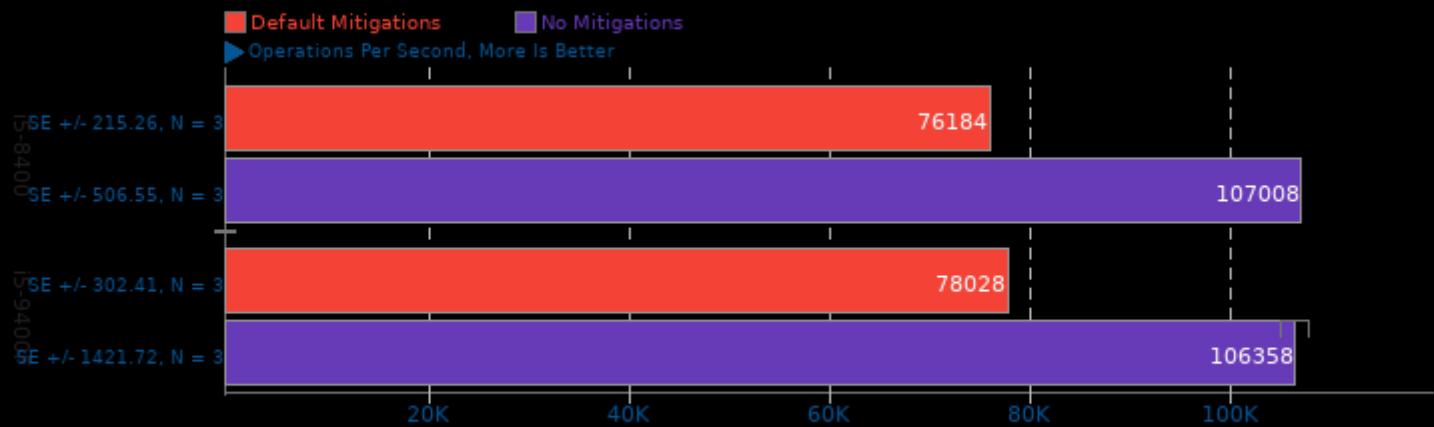
Method: Delete



1. (CC) gcc options: -O2 -lm -rdynamic

## Memcached mcperf 1.5.10

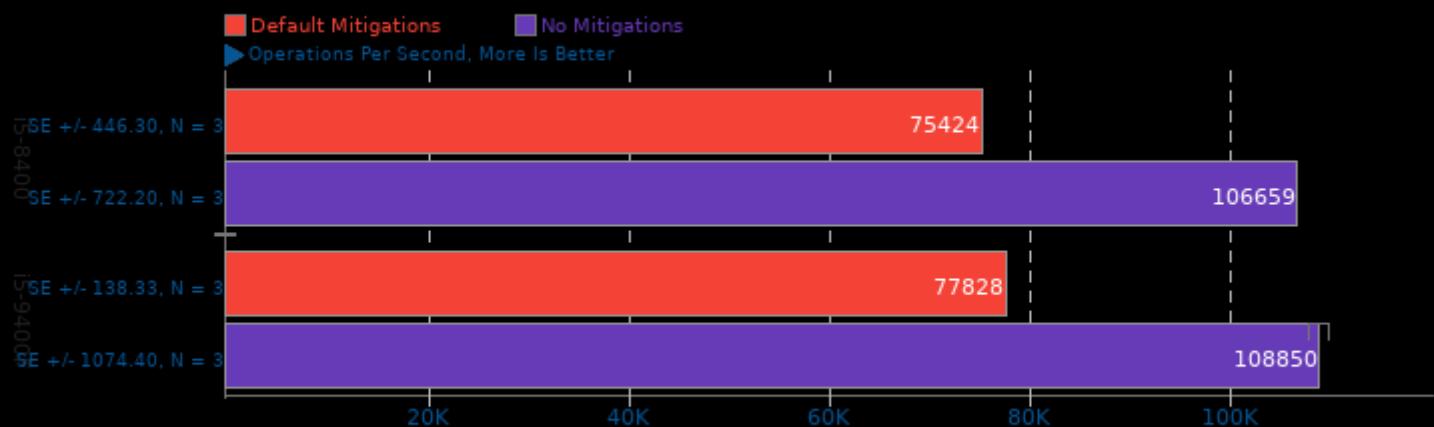
Method: Prepend



1. (CC) gcc options: -O2 -lm -rdynamic

## Memcached mcperf 1.5.10

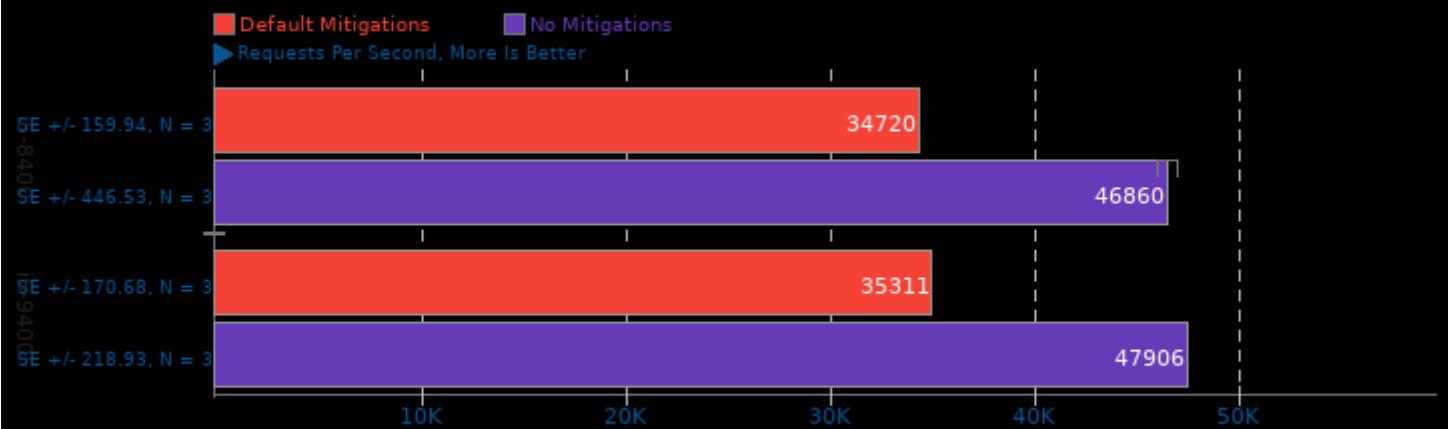
Method: Replace



1. (CC) gcc options: -O2 -lm -rdynamic

## NGINX Benchmark 1.9.9

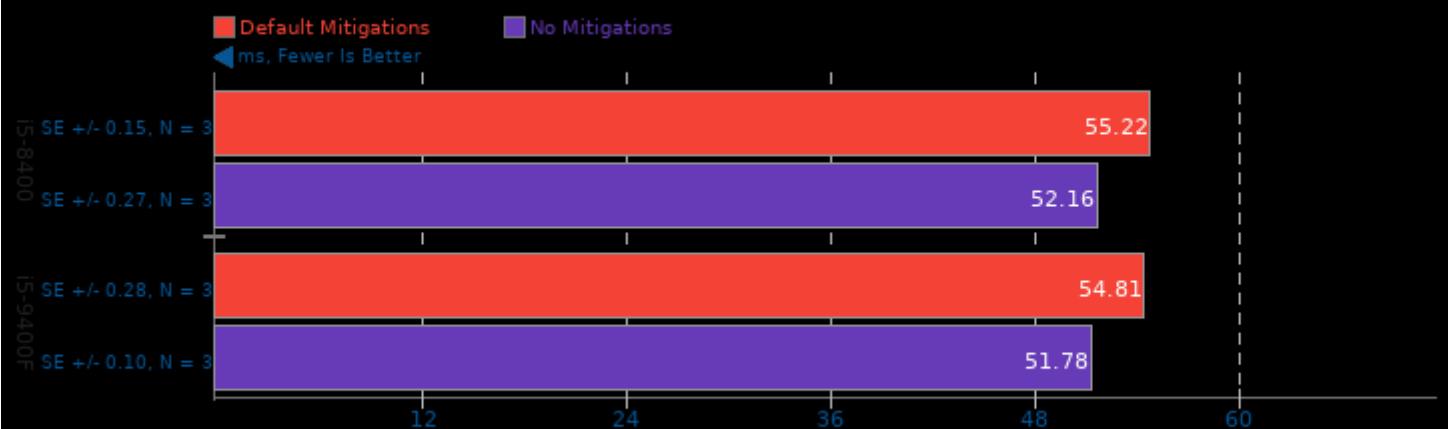
Static Web Page Serving



1. (CC) gcc options: -lpthread -lcrypt -lcrypto -lz -O3 -march=native

## Selenium

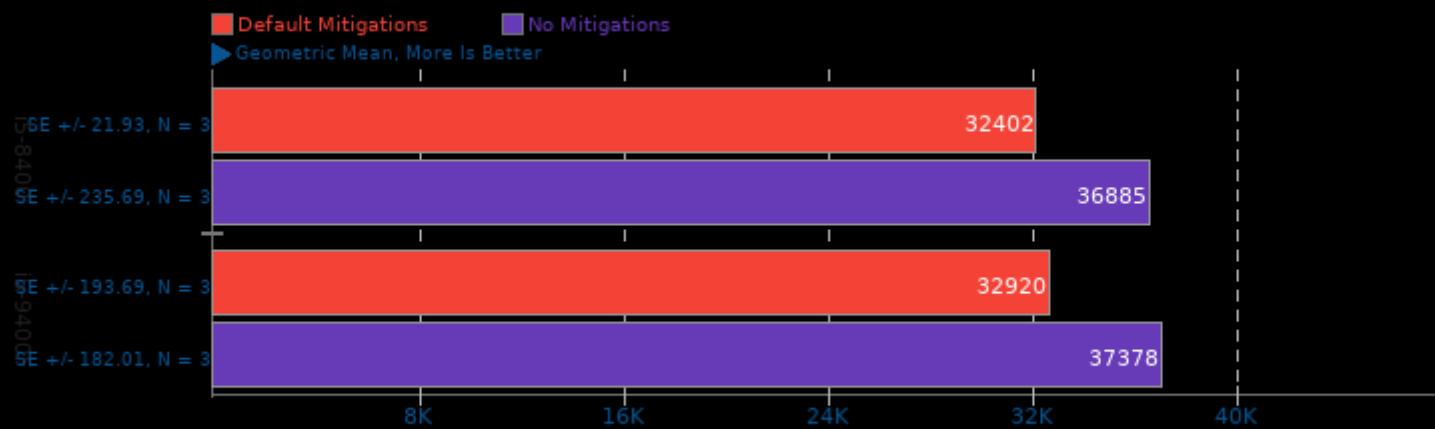
Benchmark: ARES-6 - Browser: Firefox



1. firefox 67.0

## Selenium

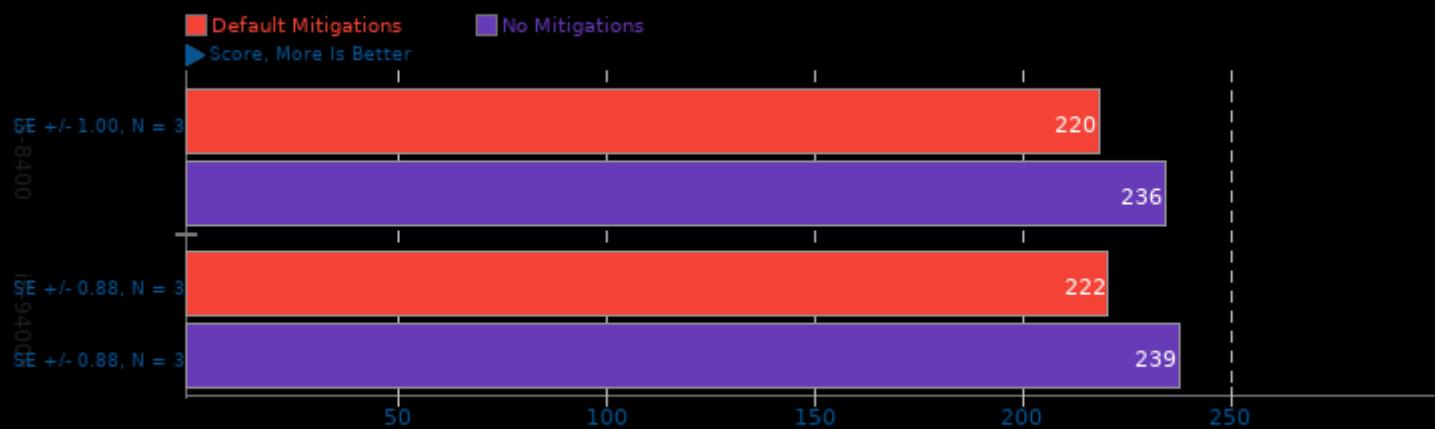
Benchmark: Octane - Browser: Firefox



1. firefox 67.0

## Selenium

Benchmark: WebXPRT - Browser: Firefox

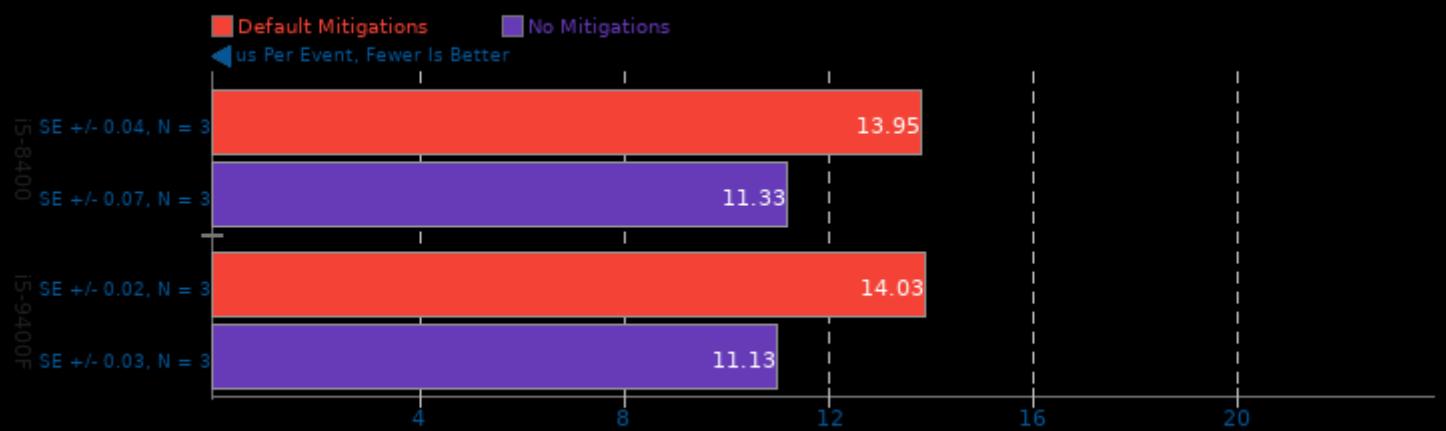


1. firefox 67.0

## Intel Core i5 8400 vs. 9400F Mitigations

### OSBench

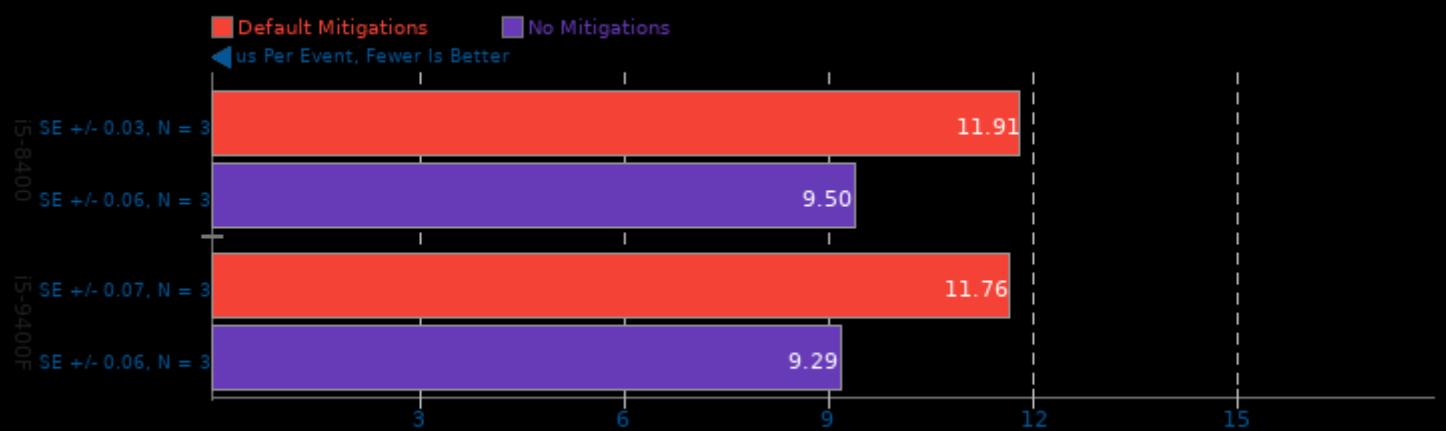
Test: Create Files



1. (CC) gcc options: -lm

### OSBench

Test: Create Threads

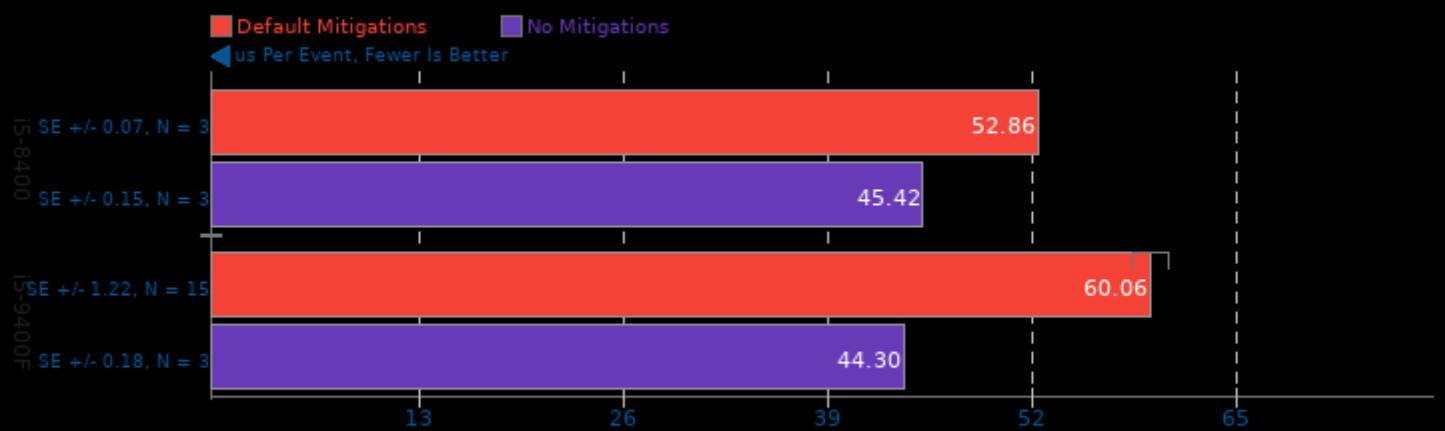


1. (CC) gcc options: -lm

## Intel Core i5 8400 vs. 9400F Mitigations

### OSBench

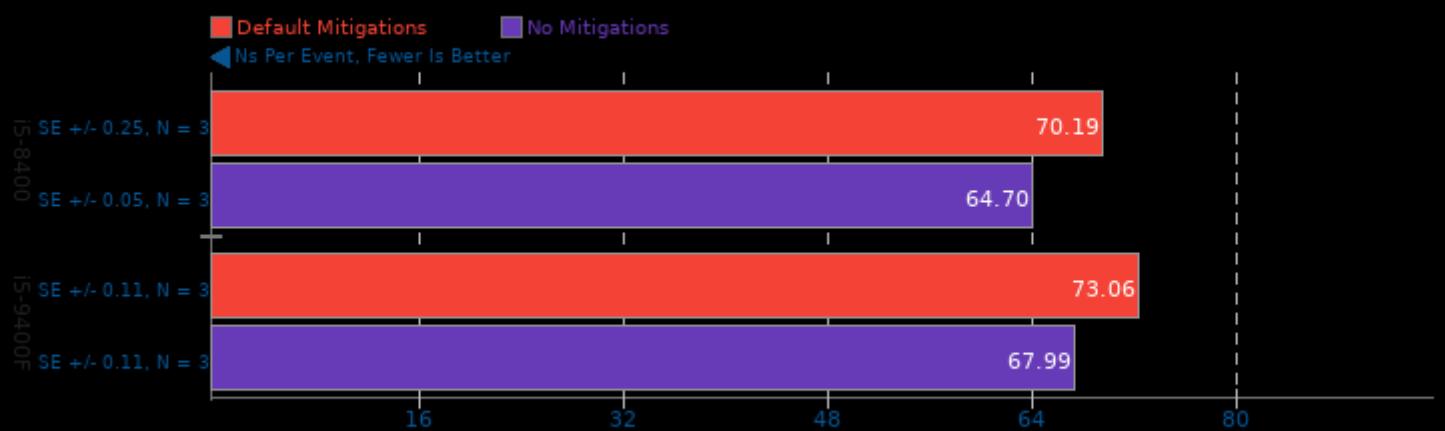
Test: Launch Programs



1. (CC) gcc options: -lm

### OSBench

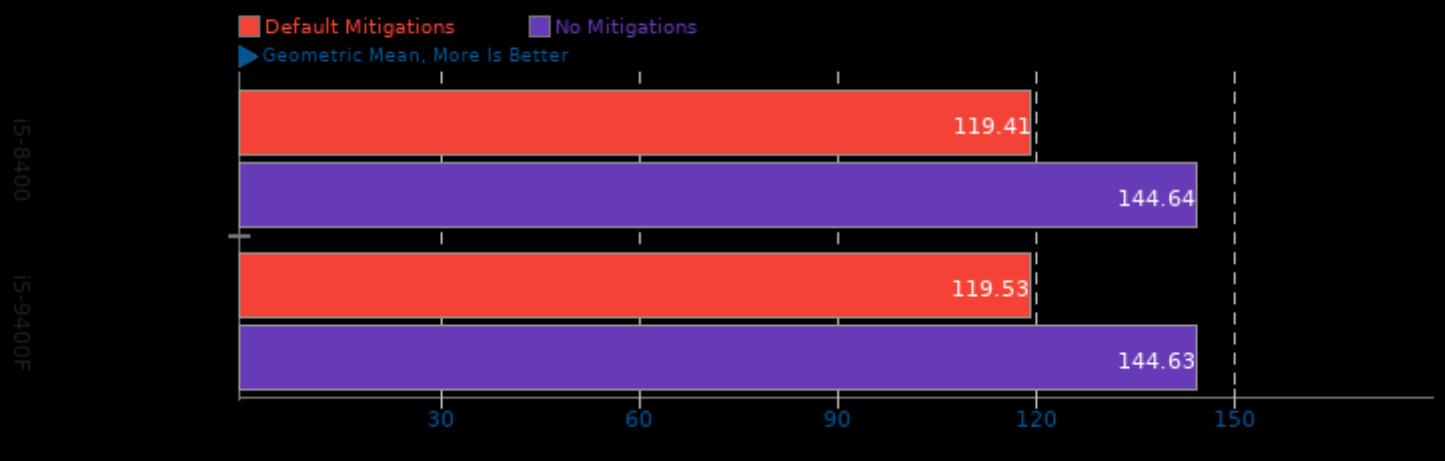
Test: Memory Allocations



1. (CC) gcc options: -lm

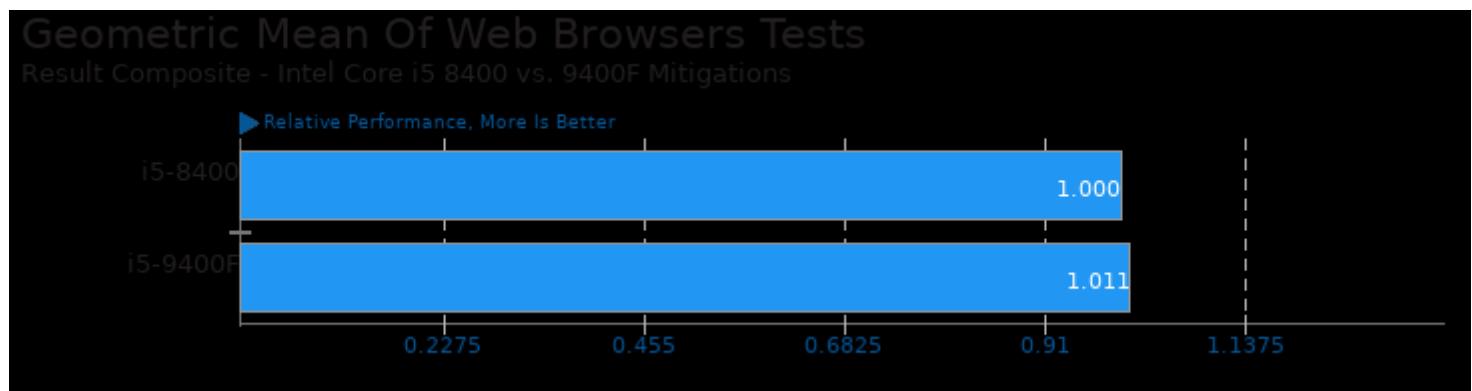
### Geometric Mean Of All Test Results

Result Composite - Intel Core i5 8400 vs. 9400F Mitigations

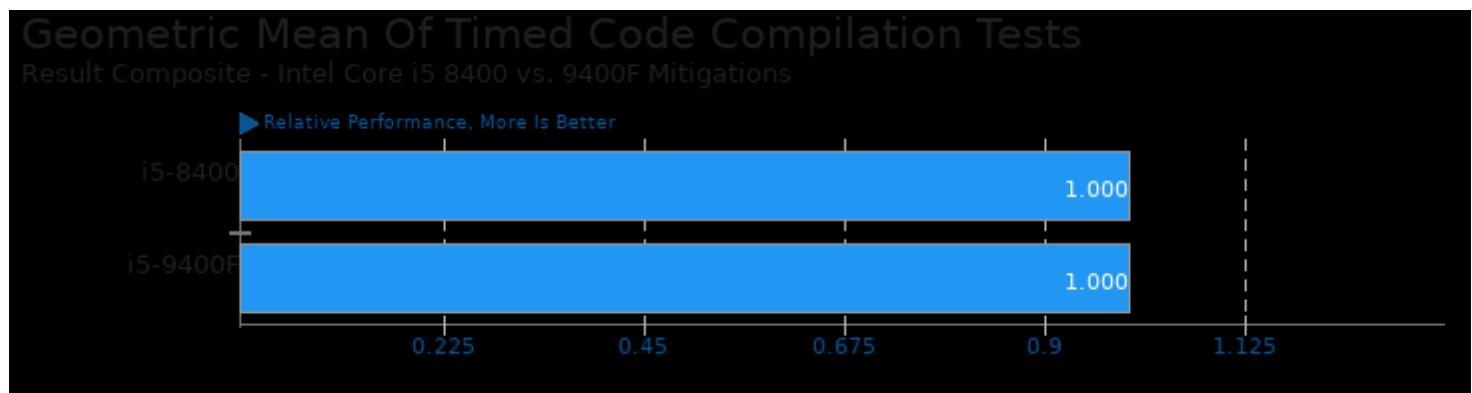


## Intel Core i5 8400 vs. 9400F Mitigations

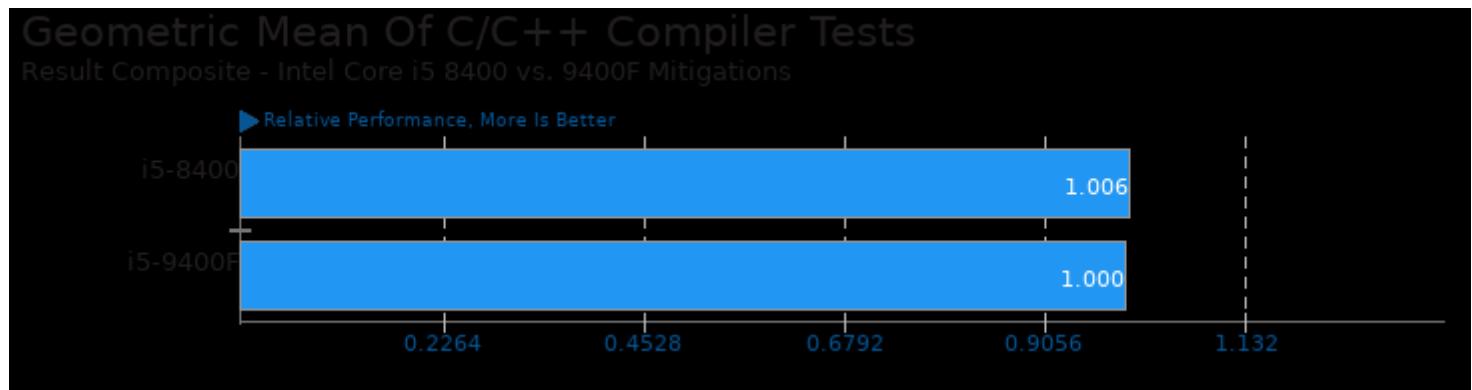
These geometric means are based upon test groupings / test suites for this result file.



Geometric mean based upon tests: system/selenium



Geometric mean based upon tests: pts/build-linux-kernel, pts/build-gcc and pts/build-llvm

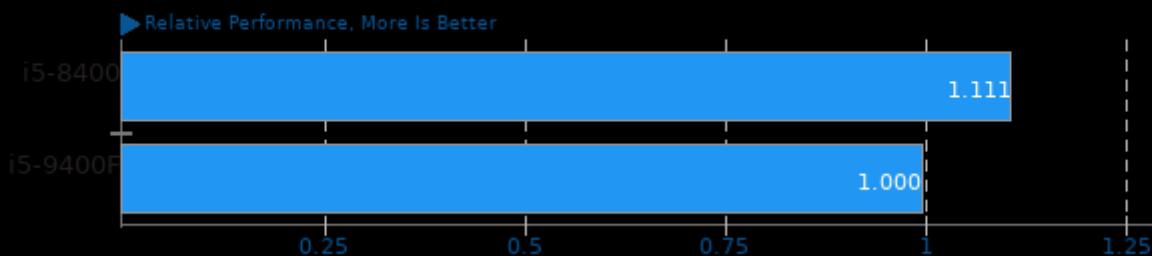


Geometric mean based upon tests: pts/vpxenc, pts/build-llvm, pts/pgbench, pts/compress-xz, pts/compress-zstd, pts/openssl, pts/nginx, pts/tachyon and pts/mcperf

## Intel Core i5 8400 vs. 9400F Mitigations

### Geometric Mean Of Compression Tests

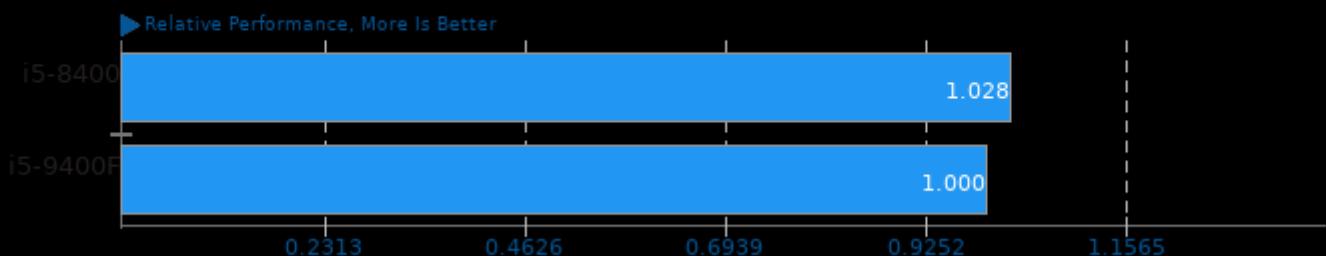
Result Composite - Intel Core i5 8400 vs. 9400F Mitigations



Geometric mean based upon tests: pts/compress-zstd and pts/compress-xz

### Geometric Mean Of Creator Workloads Tests

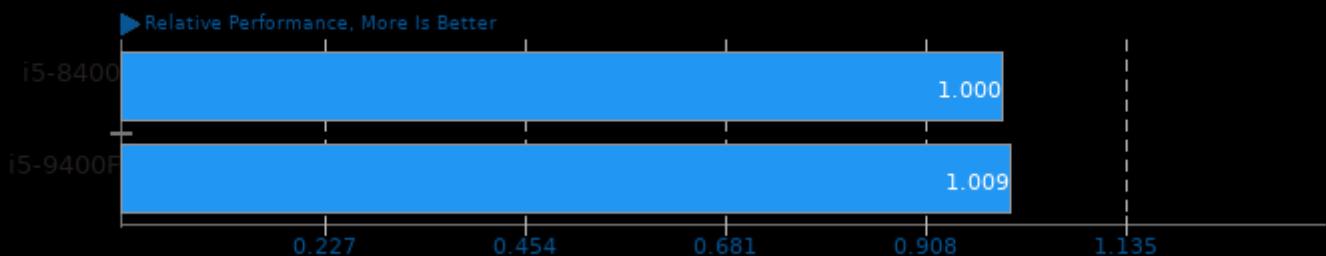
Result Composite - Intel Core i5 8400 vs. 9400F Mitigations



Geometric mean based upon tests: pts/tachyon, pts/vpxenc, system/gimp and system/darktable

### Geometric Mean Of Database Test Suite

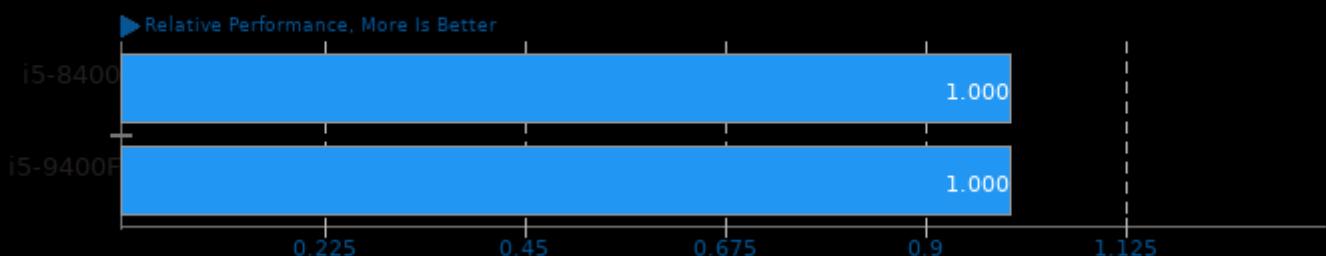
Result Composite - Intel Core i5 8400 vs. 9400F Mitigations



Geometric mean based upon tests: pts/sqlite, pts/redis and pts/pgbench

### Geometric Mean Of Go Language Tests

Result Composite - Intel Core i5 8400 vs. 9400F Mitigations

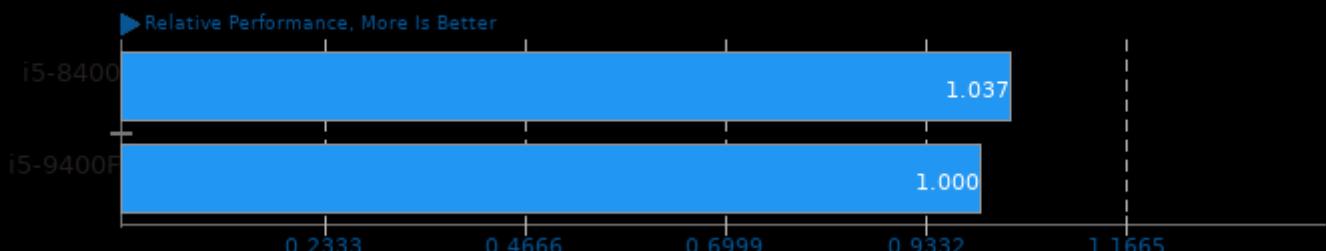


Geometric mean based upon tests: pts/ethr and pts/go-benchmark

## Intel Core i5 8400 vs. 9400F Mitigations

### Geometric Mean Of Imaging Tests

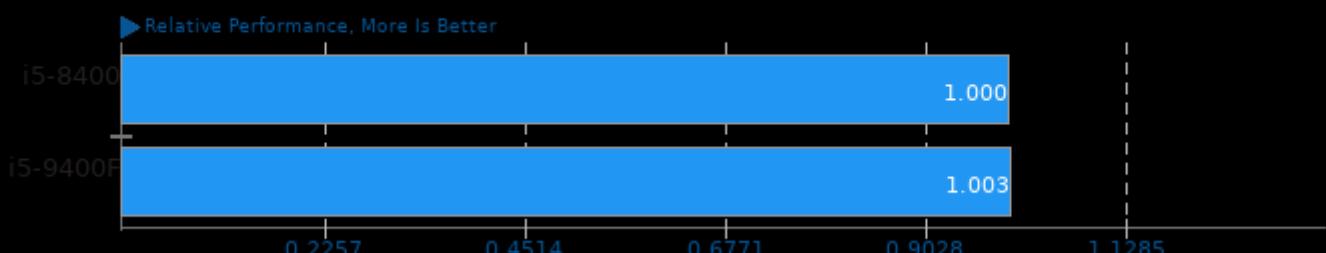
Result Composite - Intel Core i5 8400 vs. 9400F Mitigations



Geometric mean based upon tests: system/gimp and system/darktable

### Geometric Mean Of Common Kernel Benchmarks Tests

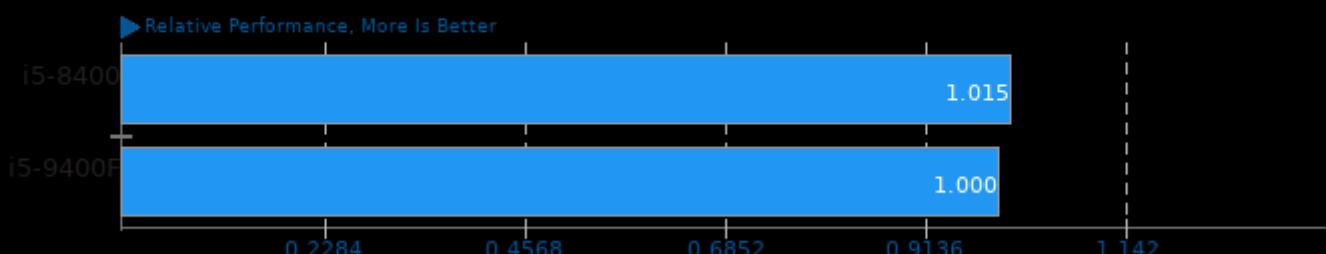
Result Composite - Intel Core i5 8400 vs. 9400F Mitigations



Geometric mean based upon tests: pts/pgbench, pts/t-test1, pts/openssl, pts/ctx-clock, pts/hackbench, pts/stress-ng, pts/osbench and pts/ethr

### Geometric Mean Of Multi-Core Tests

Result Composite - Intel Core i5 8400 vs. 9400F Mitigations

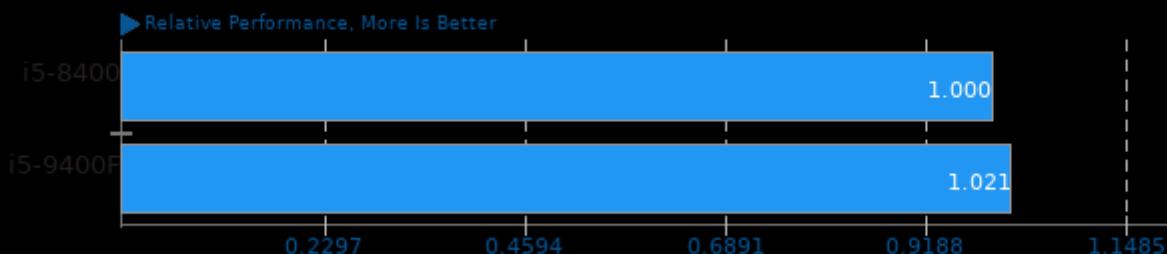


Geometric mean based upon tests: pts/tachyon, pts/vpxenc, pts/compress-zstd, pts/build-linux-kernel, pts/build-gcc, pts/build-llvm and pts/pgbench

## Intel Core i5 8400 vs. 9400F Mitigations

### Geometric Mean Of Networking Test Suite

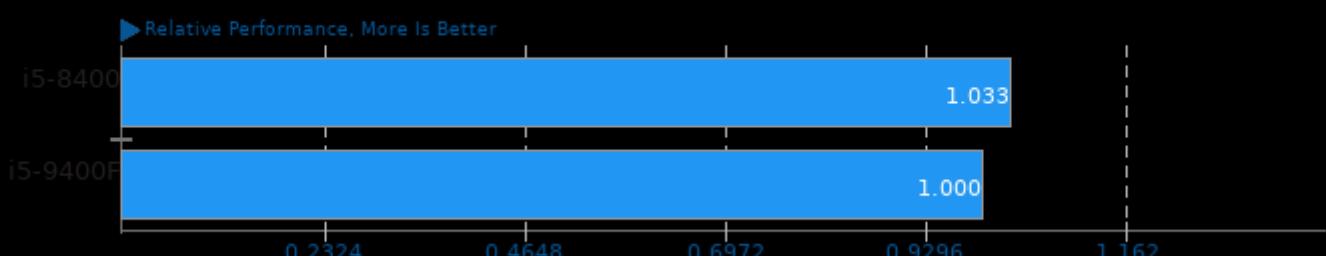
Result Composite - Intel Core i5 8400 vs. 9400F Mitigations



Geometric mean based upon tests: pts/sockperf and pts/ethr

### Geometric Mean Of Programmer / Developer System Benchmarks Tests

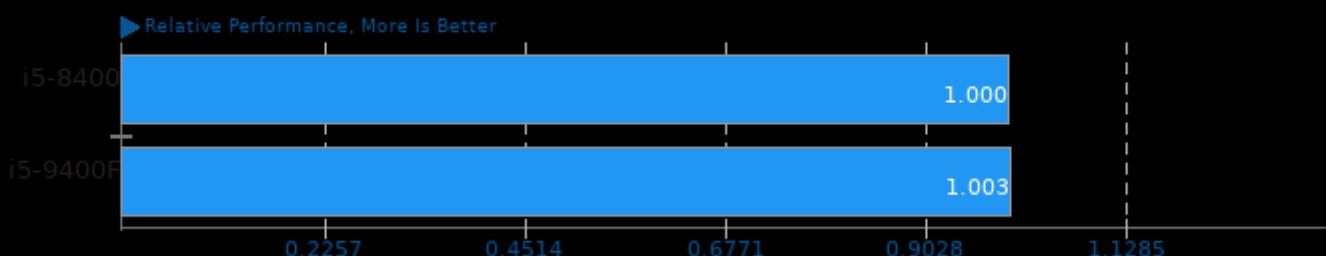
Result Composite - Intel Core i5 8400 vs. 9400F Mitigations



Geometric mean based upon tests: pts/compress-zstd, pts/build-linux-kernel, pts/build-gcc and pts/build-llvm

### Geometric Mean Of Python Tests

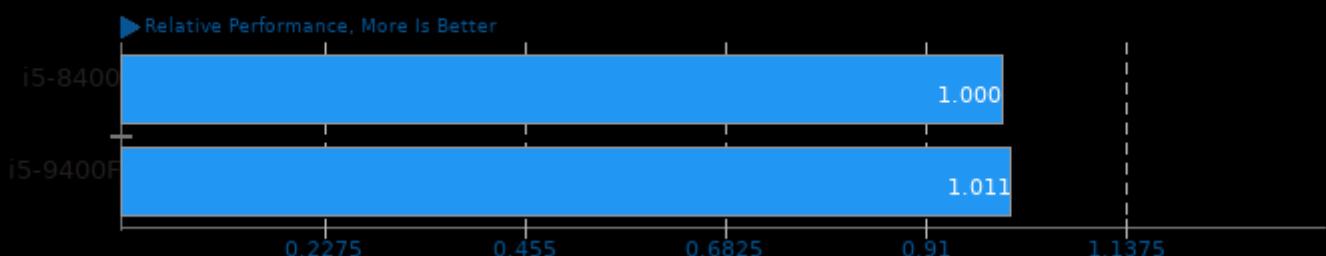
Result Composite - Intel Core i5 8400 vs. 9400F Mitigations



Geometric mean based upon tests: pts/build-llvm and system/selenium

### Geometric Mean Of Server Tests

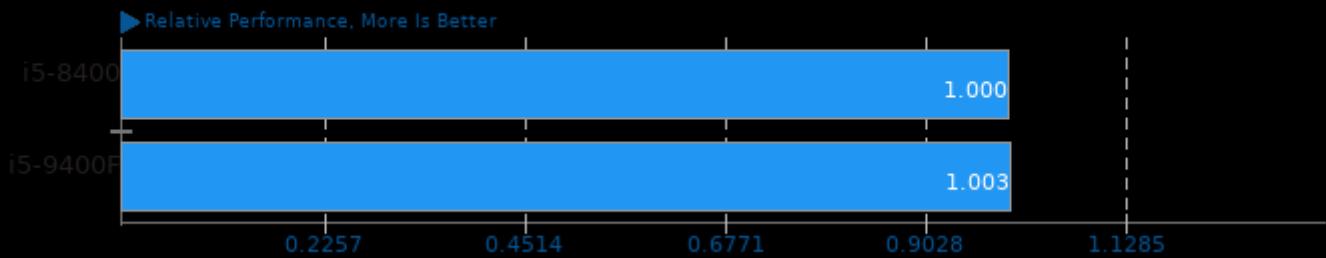
Result Composite - Intel Core i5 8400 vs. 9400F Mitigations



Geometric mean based upon tests: pts/nginx, pts/pgbench, pts/mcperf, pts/redis, pts/openssl and pts/sqlite

### Geometric Mean Of Server CPU Tests

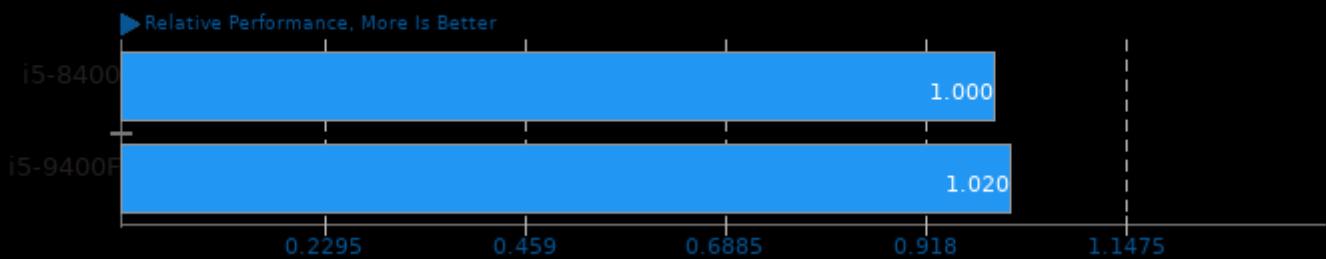
Result Composite - Intel Core i5 8400 vs. 9400F Mitigations



Geometric mean based upon tests: pts/build-gcc, pts/build-linux-kernel, pts/build-llvm, pts/compress-zstd, pts/hackbench, pts/openssl, pts/glibc-bench, system/gimp, pts/redis, pts/stress-ng and pts/ctx-clock

### Geometric Mean Of Single-Threaded Tests

Result Composite - Intel Core i5 8400 vs. 9400F Mitigations



Geometric mean based upon tests: pts/glibc-bench, pts/redis and pts/nginx

*This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 20:54.*