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Ivy Bridge SNA xf86-video-intel 2.20.6

Intel Ivy Bridge Linux benchmarking between SNA and UXA when using Intel HD 2500 graphics on xf86-video-intel 2.20.6 DDX. Also using latest Mesa 9.0-devel and Linux 3.6 development code. Benchmarking for a future article on Phoronix.com.

Automated Executive Summary

sna/bare had the most wins, coming in first place for 33% of the tests.

Based on the geometric mean of all complete results, the fastest (sna/bare) was 2.556x the speed of the slowest (UXA). sna/compiz was 0.97x the speed of sna/bare, sna/xcompmgr was 0.981x the speed of sna/compiz, sna/gnome-shell was 0.978x the speed of sna/xcompmgr, SNA IvyBridge was 0.698x the speed of sna/gnome-shell, uxa/bare was 0.753x the speed of SNA IvyBridge, UXA was 0.799x the speed of uxa/bare.

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

x11perf (Test: PutImage XY 500x500 Square) at 156.364x
x11perf (Test: Fill 300 x 300px AA Trapezoid) at 95.431x
GtkPerf (GTK Widget: GtkDrawingArea - Pixbufs) at 10.75x
GtkPerf (GTK Widget: GtkToggleButton) at 6.578x
x11perf (Test: Char in 80-char aa line) at 6.341x
Cairo Performance Demos (Demo: Gradients) at 6.161x

Cairo Performance Demos (Demo: Charts) at 6.062x
cairo-perf-trace (Cairo Trace: Poppler) at 4.157x
x11perf (Test: 500px Compositing From Pixmap To Window) at 2.853x
Cairo Performance Demos (Demo: Fish) at 1.87x.

Test Systems:

UXA

SNA IvyBridge

Processor: Intel Core i5-3470 @ 3.20GHz (4 Cores), Motherboard: ECS Z77H2-A2X v1.0, Chipset: Intel Xeon E3-1200 v2/3rd, Memory: 8192MB, Disk: 240GB OCZ VERTEX3, Graphics: Intel Xeon E3-1200 v2/3rd Gen Core, Audio: Realtek ALC892, Monitor: DELL P2210H, Network: Realtek RTL8111/8168B + Intel Centrino Advanced-N 6205

OS: Ubuntu 12.10, Kernel: 3.6.0-999-generic (x86_64), Desktop: Unity 6.2.0, Display Server: X Server 1.12.1.902 (1.12.2 RC 2), Display Driver: intel 2.20.6, OpenGL: 3.0 Mesa 9.0-devel (git-0b90da3), Compiler: GCC 4.7 + LLVM 3.1 + Intel IOC SDK 2012 v1.0.2, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,c++,go,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-arch-32=i686 --with-tune=generic -v
Graphics Notes: SNA
System Notes: Compiz was running on this system.

sna/bare

uxa/bare

sna/compiz

Processor: Intel Core i7-3720QM @ 2.59GHz (8 Cores), Chipset: Intel 3rd Gen Core DRAM, Memory: 8192MB, Disk: 250GB INTEL SSDSC2MH25, Graphics: Intel 3rd Gen Core 1024MB (1250MHz), Audio: Intel 7 /C210, Monitor: DELL P2210H, Network: Intel 82579LM Gigabit Connection + Intel Centrino Advanced-N 6205

OS: Debian unstable, Kernel: 3.6.0-rc4+ (x86_64), Display Server: X Server 1.12.3.902 (1.12.4 RC 2), Display Driver: intel 2.20.6, OpenGL: 3.0 Mesa 8.0.4, Compiler: GCC 4.7, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,c++,go,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-arch-32=i586 --with-tune=generic -v
Graphics Notes: SNA
System Notes: Compiz was running on this system.

sna/gnome-shell

Processor: Intel Core i7-3720QM @ 2.59GHz (8 Cores), Chipset: Intel 3rd Gen Core DRAM, Memory: 8192MB, Disk: 250GB INTEL SSDSC2MH25, Graphics: Intel 3rd Gen Core 1024MB (1250MHz), Audio: Intel 7 /C210, Monitor: DELL P2210H, Network: Intel 82579LM Gigabit Connection + Intel Centrino Advanced-N 6205

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OS: Debian unstable, Kernel: 3.6.0-rc4+ (x86_64), Desktop: GNOME Shell 3.4.2, Display Server: X Server 1.12.3.902 (1.12.4 RC 2), Display Driver: intel 2.20.6, OpenGL: 3.0 Mesa 8.0.4, Compiler: GCC 4.7, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,c++,go,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-arch-32=i586 --with-tune=generic -v
Graphics Notes: SNA

sna/xcompmgr

Processor: Intel Core i7-3720QM @ 2.59GHz (8 Cores), Chipset: Intel 3rd Gen Core DRAM, Memory: 8192MB, Disk: 250GB INTEL SSDSC2MH25, Graphics: Intel 3rd Gen Core 1024MB (1250MHz), Audio: Intel 7 /C210, Monitor: DELL P2210H, Network: Intel 82579LM Gigabit Connection + Intel Centrino Advanced-N 6205

OS: Debian unstable, Kernel: 3.6.0-rc4+ (x86_64), Display Server: X Server 1.12.3.902 (1.12.4 RC 2), Display Driver: intel 2.20.6, OpenGL: 3.0 Mesa 8.0.4, Compiler: GCC 4.7, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,c++,go,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-arch-32=i586 --with-tune=generic -v
Graphics Notes: SNA

	UXA	SNA IvyBridge	sna/bare	uxa/bare	sna/compiz	sna/gnome-shell	sna/xcompmgr
Cairo Performance Demos - Fish (FPS)	**198.39**	218.71	**370.99**	259.30	243.88	259.60	231.46
Normalized	53.48%	58.95%	100%	69.89%	65.74%	69.97%	62.39%
Standard Deviation	1.2%	0.9%	1.2%	1%	17.9%	17.6%	1.2%
Cairo Performance Demos - Gears (FPS)	**188.07**	247.25	**305.10**	211.41	299.09	303.07	273.31
Normalized	61.64%	81.04%	100%	69.29%	98.03%	99.33%	89.58%
Standard Deviation	0.5%	0.9%	0.1%	0.1%	0.1%	0.4%	0.1%
Cairo Performance Demos - Charts (FPS)	**19.34**	**117.24**	95.29	21.18	95.00	94.88	94.13
Normalized	16.5%	100%	81.28%	18.07%	81.03%	80.93%	80.29%
Standard Deviation	0.4%	0.3%	0.9%	0.3%	0.2%	1%	0.6%
Cairo Performance Demos - Gradients (FPS)	70.44	**57.70**	321.66	93.01	**355.49**	344.00	296.77
Normalized	19.81%	16.23%	90.48%	26.16%	100%	96.77%	83.48%
Standard Deviation	3%	18.3%	8.5%	1%	1.8%	0.3%	0.3%
QGears2 - OpenGL - Text (FPS)	**171.16**	206.46	216.20	234.07	**257.93**	243.98	241.16
Normalized	66.36%	80.04%	83.82%	90.75%	100%	94.59%	93.5%
Standard Deviation	23%	0%	2.2%	0.9%	0.7%	1.8%	0.3%
QGears2 - OpenGL - Gears (FPS)	271.25	**258.14**	455.73	456.12	**456.93**	452.12	445.96
Normalized	59.36%	56.49%	99.74%	99.82%	100%	98.95%	97.6%
Standard Deviation	0.9%	0.8%	0.8%	0.6%	1.1%	0.8%	0.2%

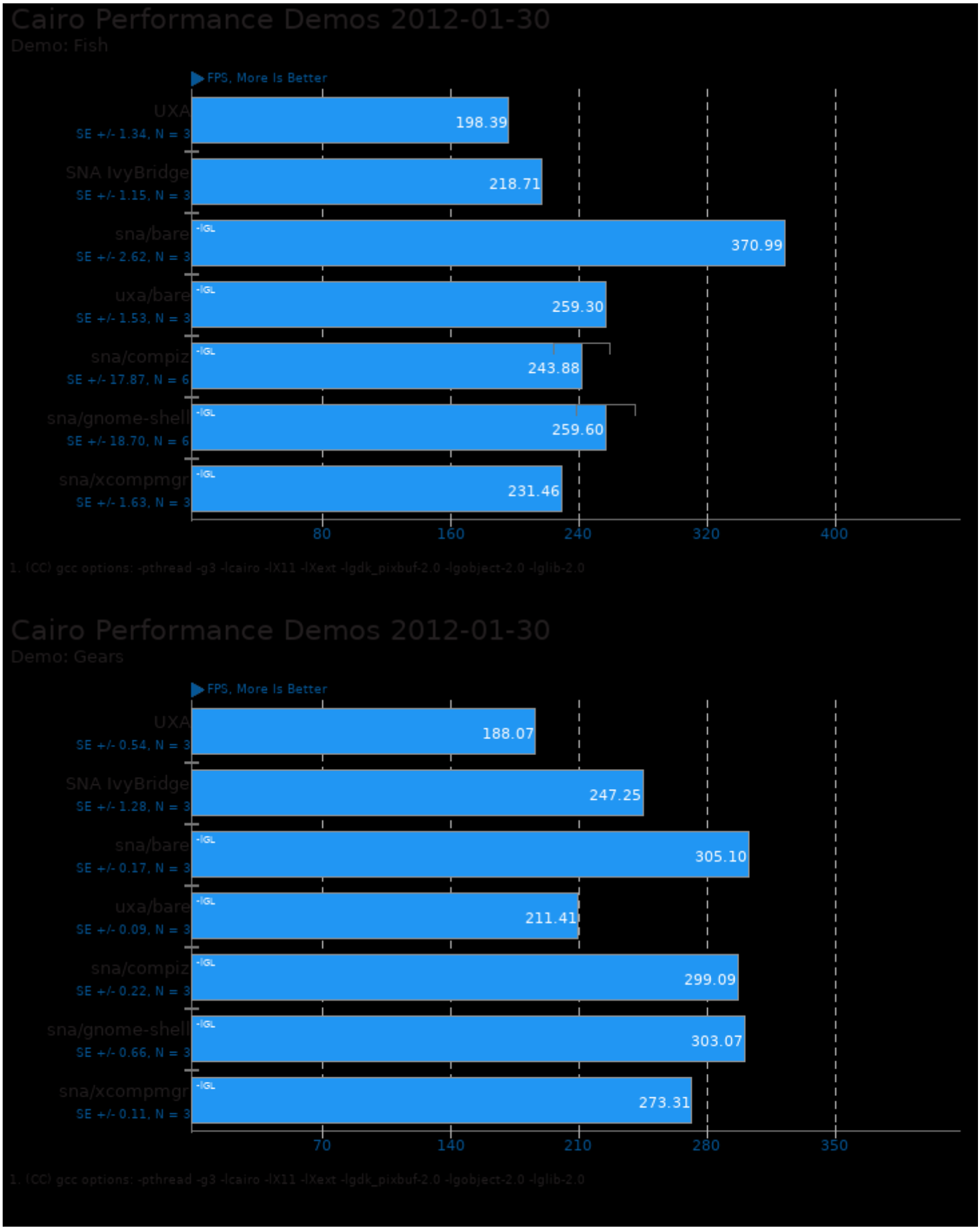
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QGears2 - OpenGL - Image Scaling (FPS)	708.72	628.47	4152	3336	4130	3738	2687
Normalized	17.07%	15.14%	100%	80.34%	99.46%	90.02%	64.73%
Standard Deviation	0.8%	0.1%	13.9%	11.1%	10%	9.8%	4.6%
QGears2 - XRender Extension - Text (FPS)	177.44	182.57	282.19	277.87	282.81	275.88	280.61
Normalized	62.74%	64.56%	99.78%	98.25%	100%	97.55%	99.22%
Standard Deviation	1%	1.2%	0.6%	0.2%	0.2%	0.5%	1.3%
QGears2 - XRender Extension - Gears (FPS)	193.39	195.41	195.70	207.70	206.91	204.35	208.44
Normalized	92.78%	93.75%	93.89%	99.64%	99.27%	98.04%	100%
Standard Deviation	2.7%	1.2%	0.6%	0.3%	0.5%	0.6%	0.8%
QGears2 - XRender Extension - Image Scaling (FPS)	872.45	880.81	1481	1399	1395	999.19	1388
Normalized	58.93%	59.49%	100%	94.49%	94.2%	67.49%	93.76%
Standard Deviation	0.9%	0.3%	0.2%	1.4%	2.5%	0.6%	2.1%
x11perf - 5.P.S (Operations / Second)	3757	4170	4617	3553	3288	3274	2630
Normalized	81.37%	90.32%	100%	76.95%	71.22%	70.91%	56.96%
Standard Deviation	0.2%	0.7%	0.5%	0.6%	3.1%	3.2%	1.4%
x11perf - S.5.x.5.p (Operations / Second)	7457	6457	7070	7110	8427	8427	8420
Normalized	88.49%	76.62%	83.9%	84.37%	100%	100%	99.92%
Standard Deviation	0.1%	0.4%	0%	0%	0.1%	0.1%	0%
x11perf - C.i.8.c.a.l (Operations / Second)	3263333	7553333	18833333	2970000	6326667	6330000	14100000
Normalized	17.33%	40.11%	100%	15.77%	33.59%	33.61%	74.87%
Standard Deviation	0.2%	1.2%	1.6%	1.5%	2.3%	0.7%	0.7%
x11perf - P.X.5.S (Operations / Second)	1.50	150	172	1.10	171	168	166
Normalized	0.87%	87.21%	100%	0.64%	99.42%	97.67%	96.51%
Standard Deviation	0%	0%	0%	0%	0%	0%	0.7%
x11perf - F.3.x.3.A.T (Operations / Second)	2680	188000	140667	1970	138333	140000	136000
Normalized	1.43%	100%	74.82%	1.05%	73.58%	74.47%	72.34%
Standard Deviation	0%	0%	0.4%	0%	0.4%	0%	0%
x11perf - 5.C.F.W.T.W (Operations / Second)	7390	6350	7090	7070	8370	8370	8370
Normalized	88.29%	75.87%	84.71%	84.47%	100%	100%	100%
Standard Deviation	0%	0.3%	0%	0%	0%	0%	0%
x11perf - C.5.F.P.T.P (Operations / Second)	7393	6390	8370	8370	8377	8370	8377
Normalized	88.25%	76.28%	99.92%	99.92%	100%	99.92%	100%
Standard Deviation	0.1%	1.2%	0%	0%	0.1%	0%	0.1%
x11perf - 5.C.F.P.T.W (Operations / Second)	7380	6053	12800	8380	17267	16767	17200
Normalized	42.74%	35.06%	74.13%	48.53%	100%	97.1%	99.61%
Standard Deviation	0%	11.2%	0%	0%	1.3%	1.4%	1%
x11perf - 5.C.F.W.T.W (Operations / Second)	7393	6330	7090	7070	8370	8370	8370
Normalized	88.33%	75.63%	84.71%	84.47%	100%	100%	100%
Standard Deviation	0.1%	0.5%	0%	0%	0%	0%	0%

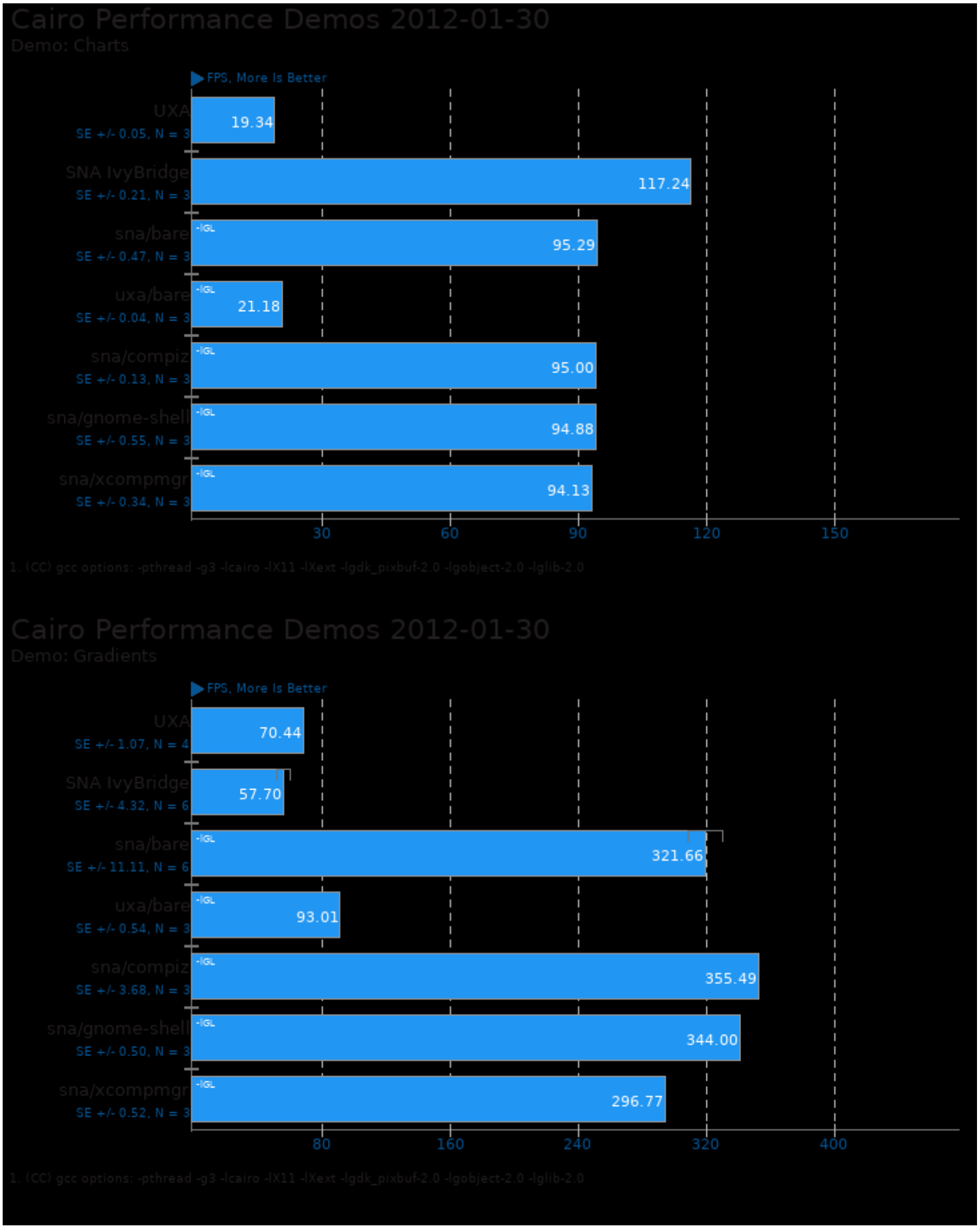
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cairo-perf-trace - Poppler (sec)	3.31	**0.89**	0.98	**3.70**	0.97	0.97	0.97
Normalized	26.89%	100%	90.82%	24.05%	91.75%	91.75%	91.75%
Standard Deviation	0.3%	2.7%	0.8%	0.7%	0.4%	0.2%	0.2%
Render Bench - P.T.S.v.0.0 (sec)	**16.47**	18.26	19.03	18.98	19.14	19.06	**26.75**
Normalized	100%	90.2%	86.55%	86.78%	86.05%	86.41%	61.57%
Standard Deviation	0.9%	3.7%	0.2%	0%	0%	0%	0.1%
GtkPerf - GtkComboBox (sec)	16.48	**16.64**	13.57	14.12	11.81	12.06	**11.43**
Normalized	69.36%	68.69%	84.23%	80.95%	96.78%	94.78%	100%
Standard Deviation	1.6%	1.1%	0.1%	0.7%	0.5%	0.7%	1.4%
GtkPerf - GtkCheckButton (sec)	1.68	**1.70**	**1.26**	1.27	1.27	1.37	**1.26**
Normalized	75%	74.12%	100%	99.21%	99.21%	91.97%	100%
Standard Deviation	2.2%	0.9%	0.5%	0.8%	1.4%	7.2%	0%
GtkPerf - GtkRadioButton (sec)	**2.89**	**2.89**	1.87	**1.86**	**1.86**	1.88	1.87
Normalized	64.36%	64.36%	99.47%	100%	100%	98.94%	99.47%
Standard Deviation	0.9%	0.9%	0%	0.3%	0.3%	1.4%	0.5%
GtkPerf - GtkToggleButton (sec)	**8.42**	8.41	1.30	**1.28**	**1.28**	1.33	**1.28**
Normalized	15.2%	15.22%	98.46%	100%	100%	96.24%	100%
Standard Deviation	0.9%	0.3%	3.5%	0.4%	0.5%	2.6%	1.2%
GtkPerf - GtkComboBoxEntry (sec)	**10.27**	9.53	8.12	8.87	7.66	9.00	**7.41**
Normalized	72.15%	77.75%	91.26%	83.54%	96.74%	82.33%	100%
Standard Deviation	2.7%	1.7%	0.9%	0.3%	2.3%	1.7%	1.7%
GtkPerf - GtkDrawingArea - Pixbufs (sec)	3.18	0.79	**0.32**	**3.44**	0.40	0.53	0.37
Normalized	10.06%	40.51%	100%	9.3%	80%	60.38%	86.49%
Standard Deviation	1%	1.5%	8.7%	0.6%	1.4%	1.1%	10.3%

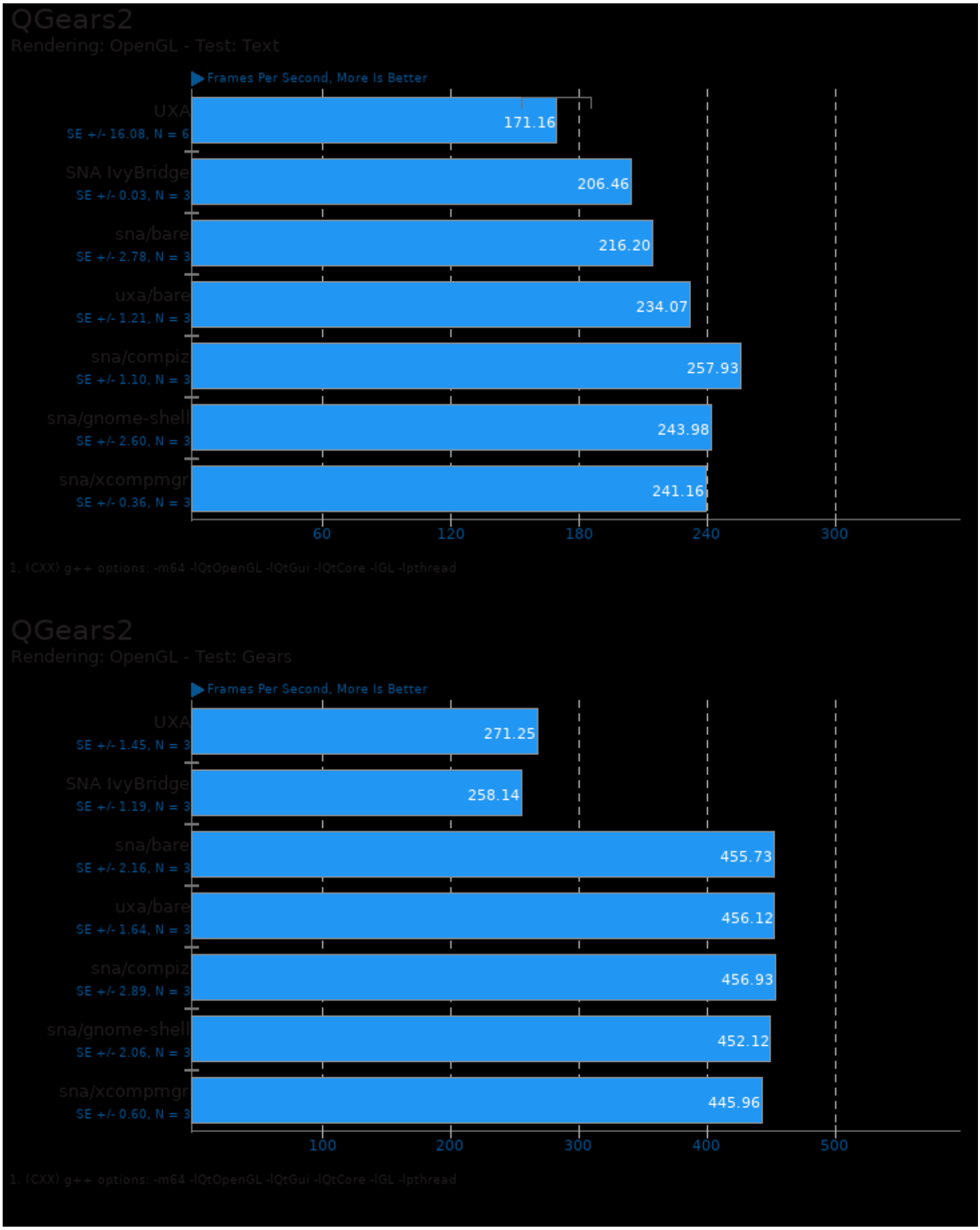
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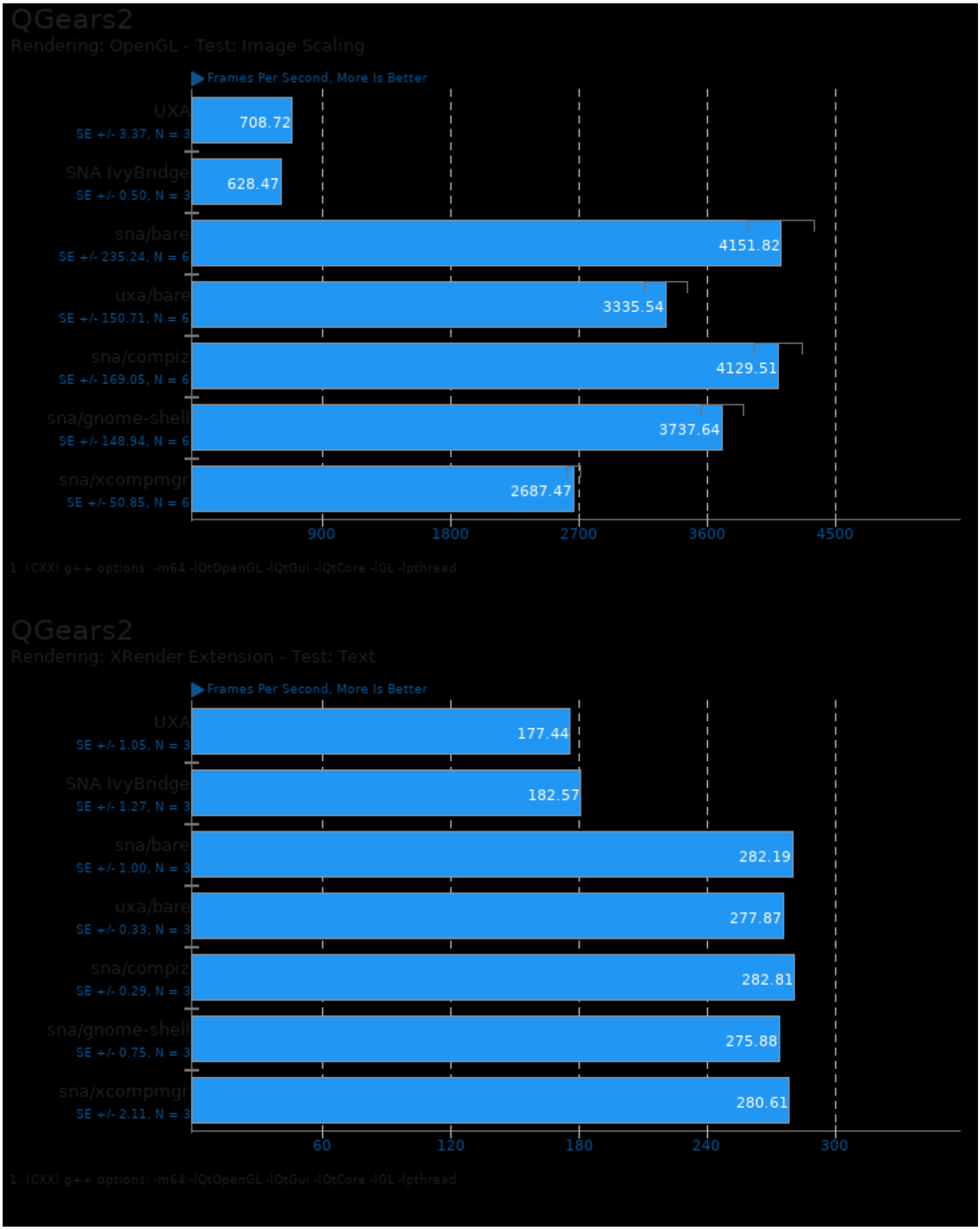
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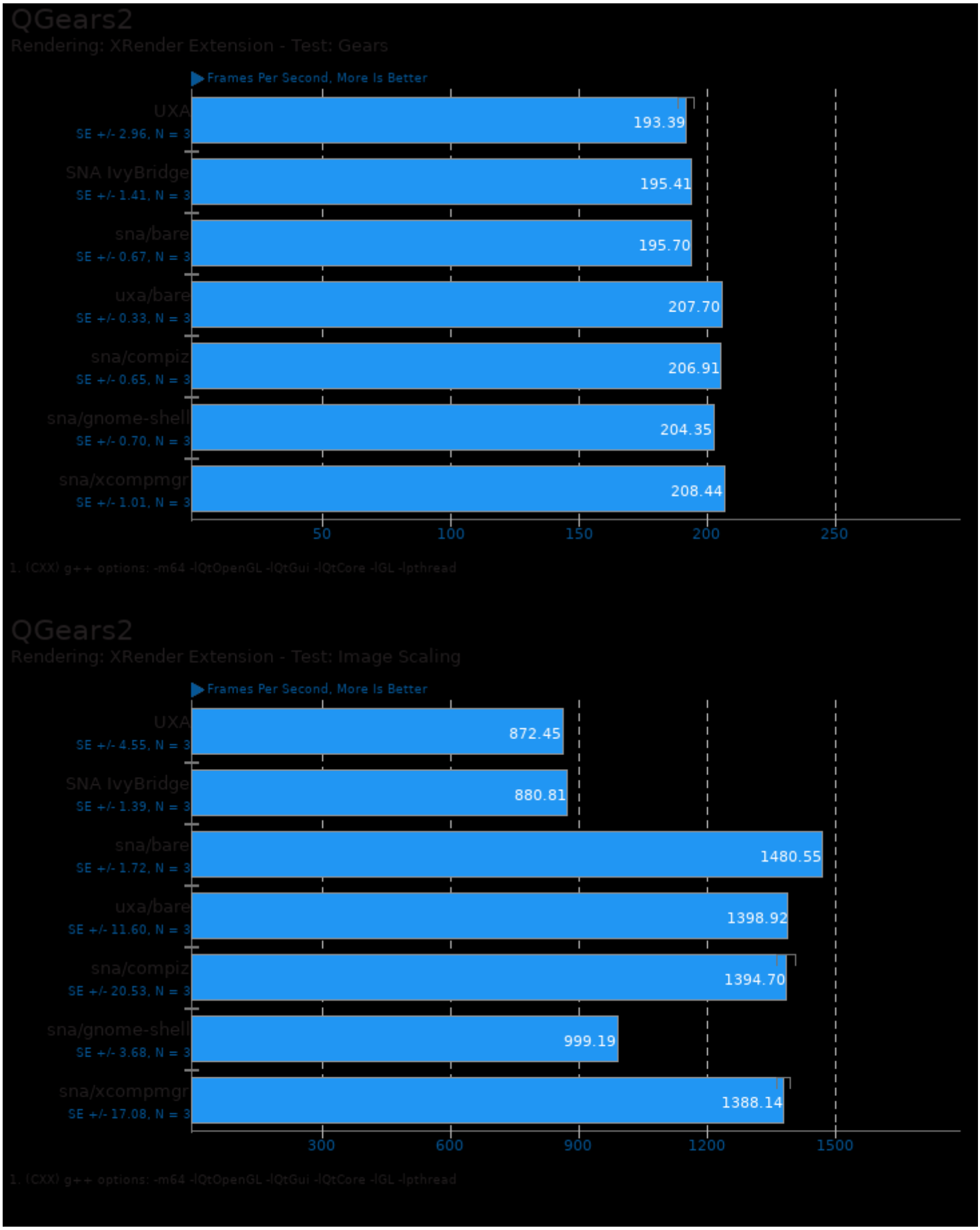
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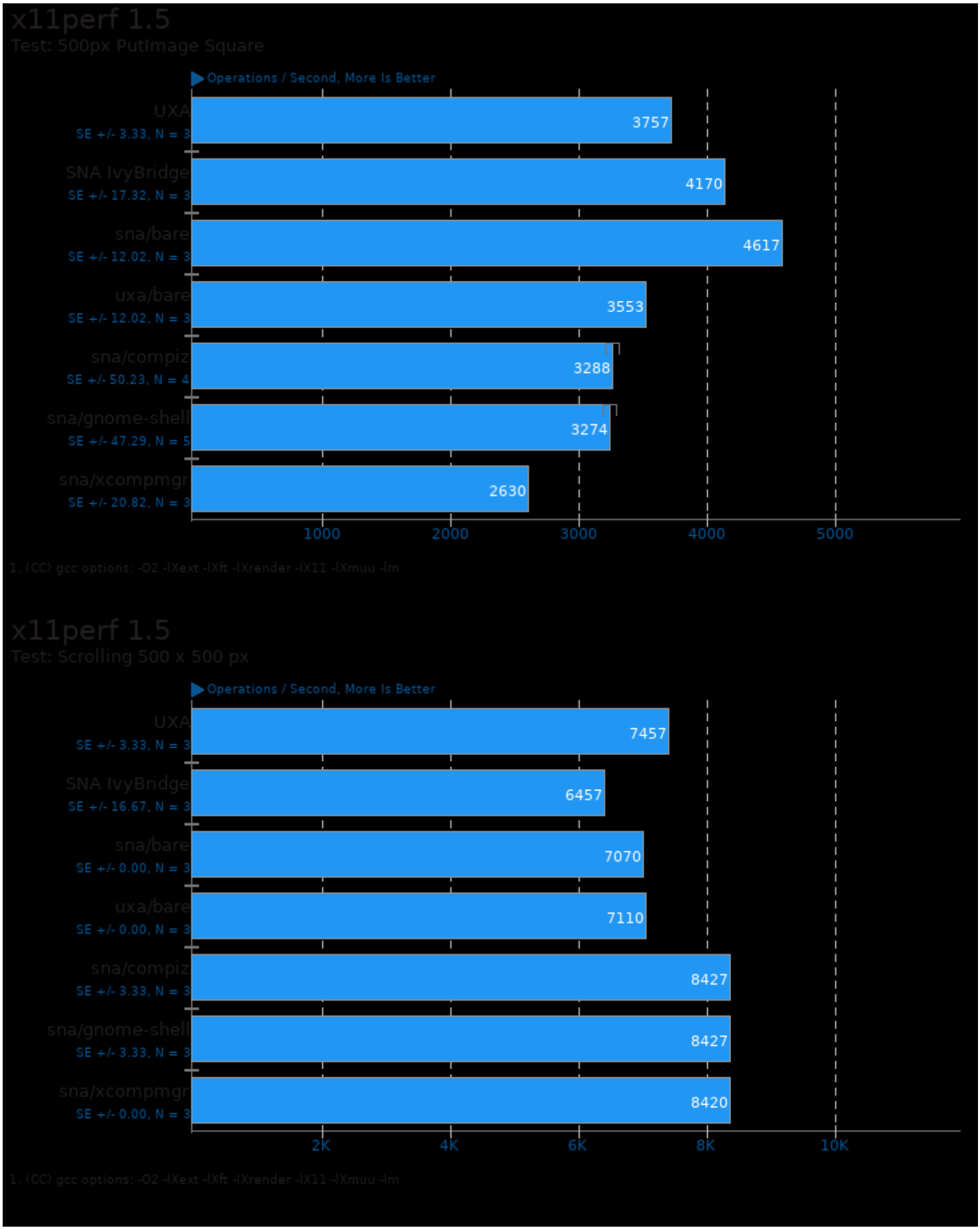
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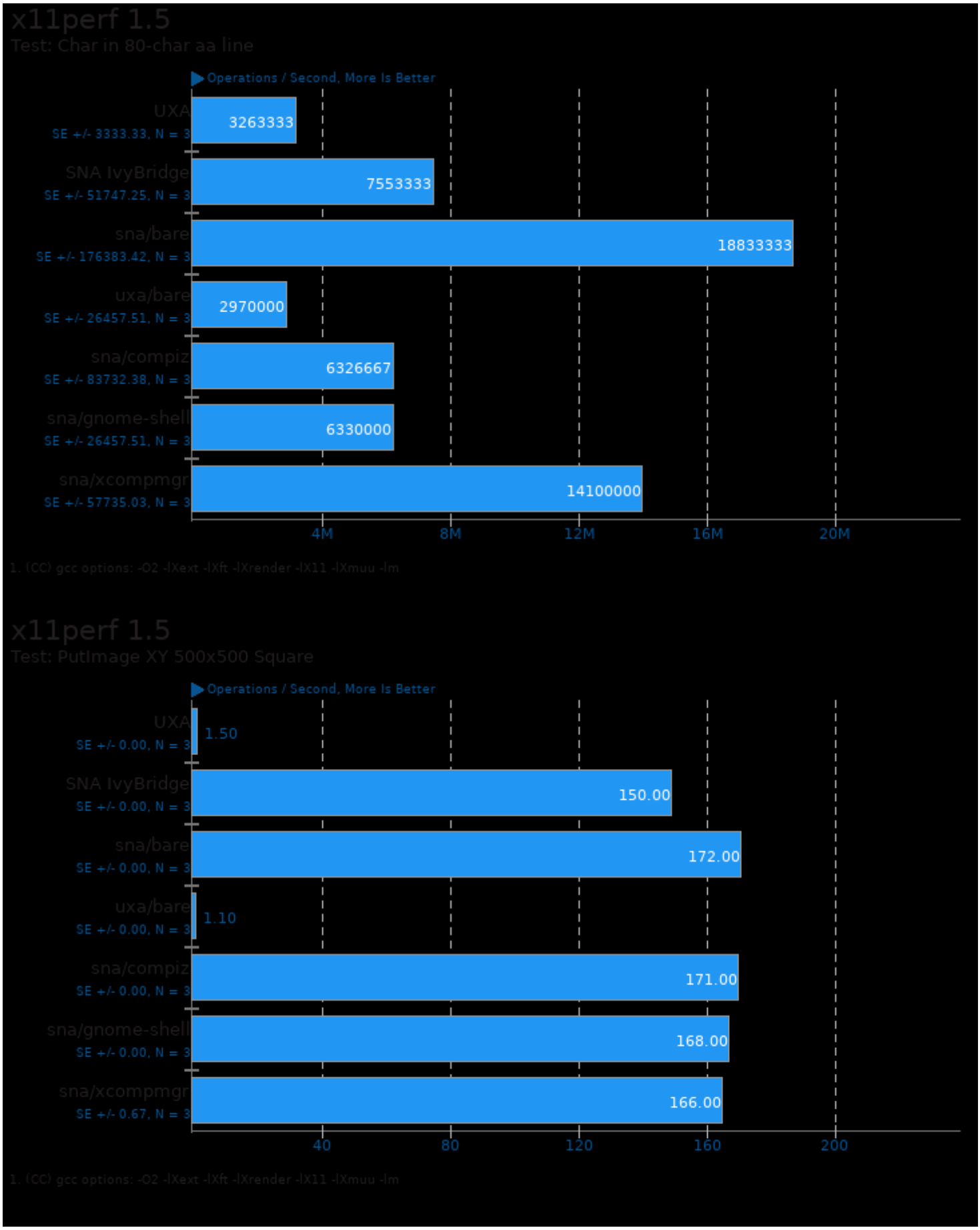
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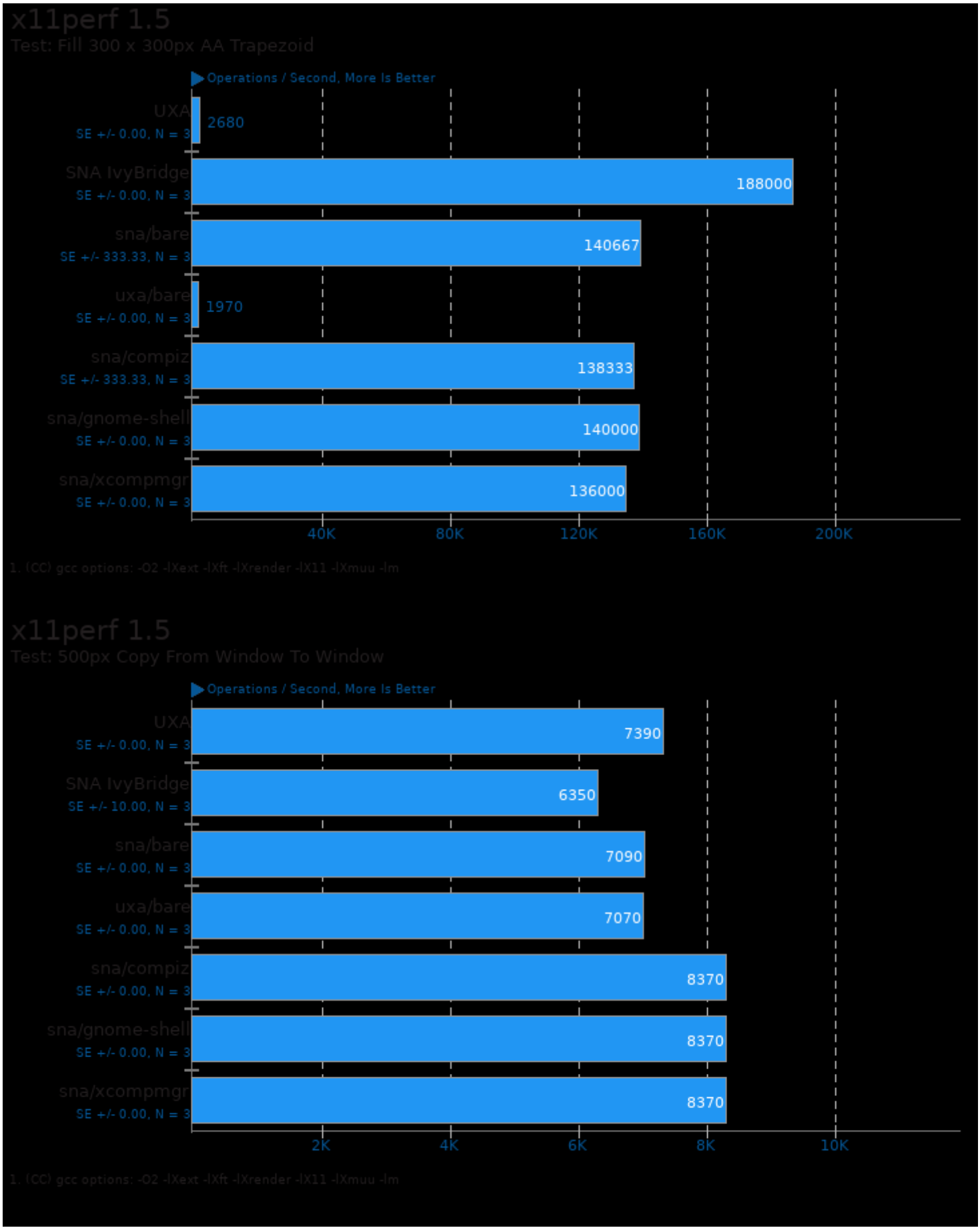
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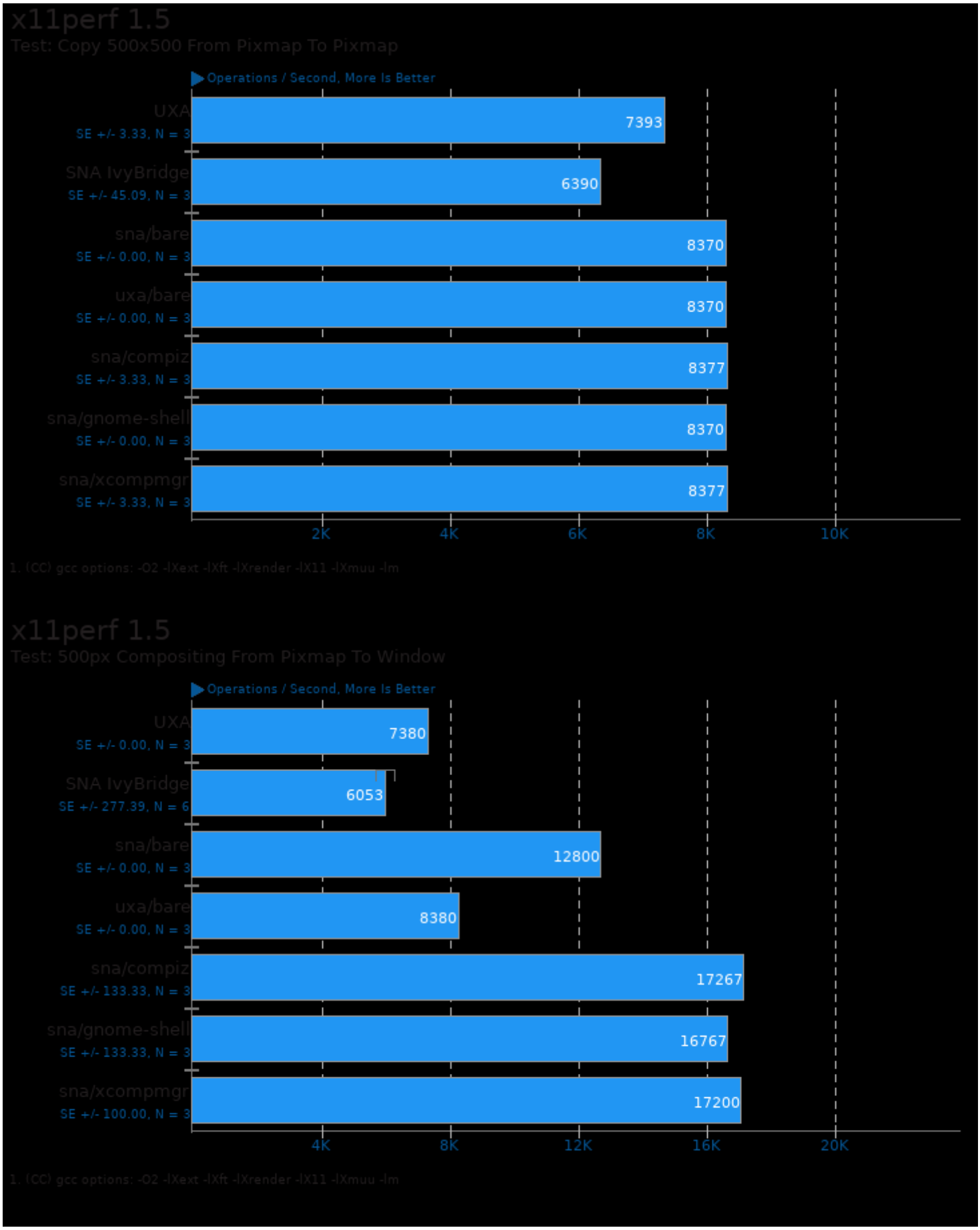
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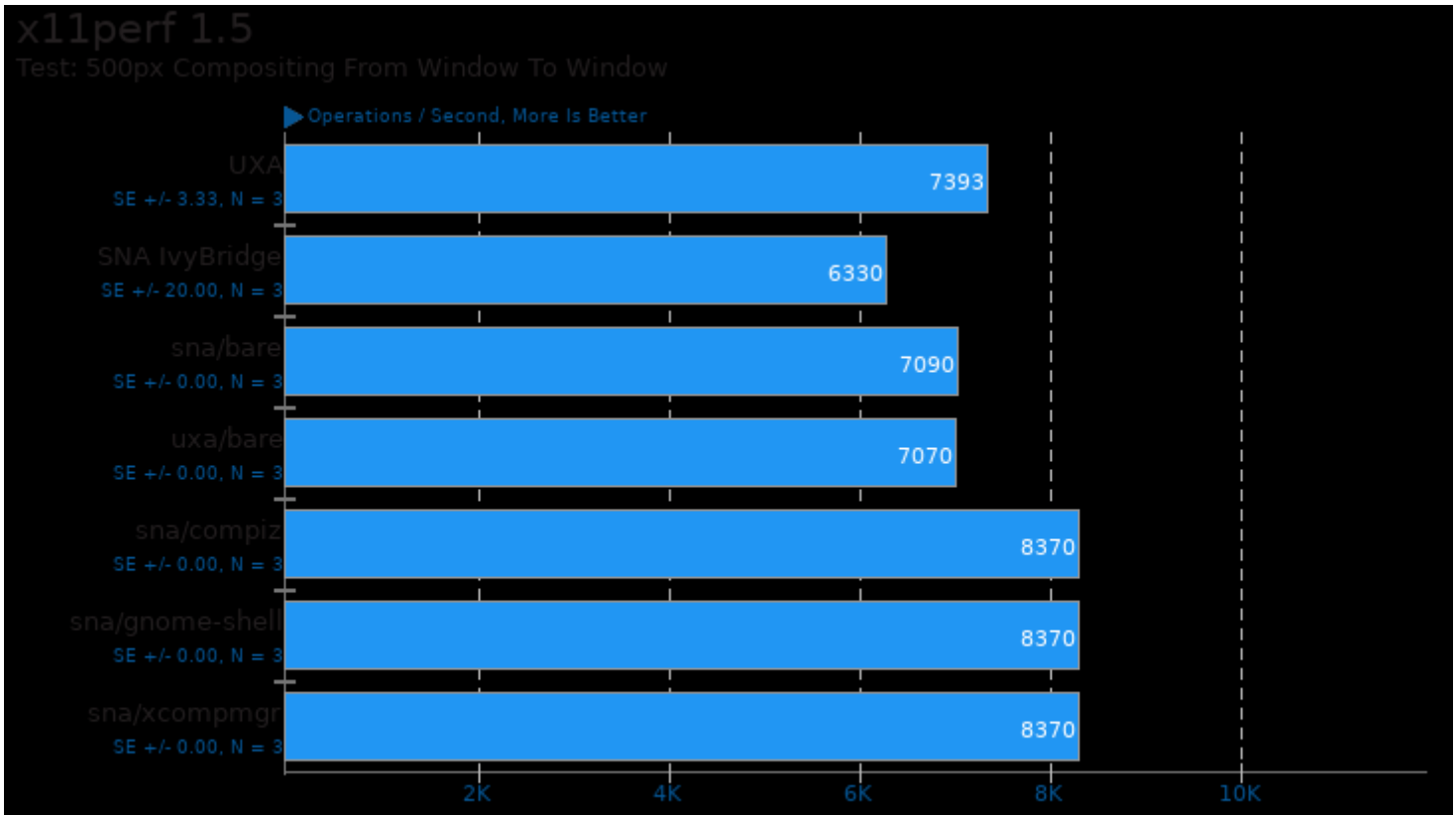
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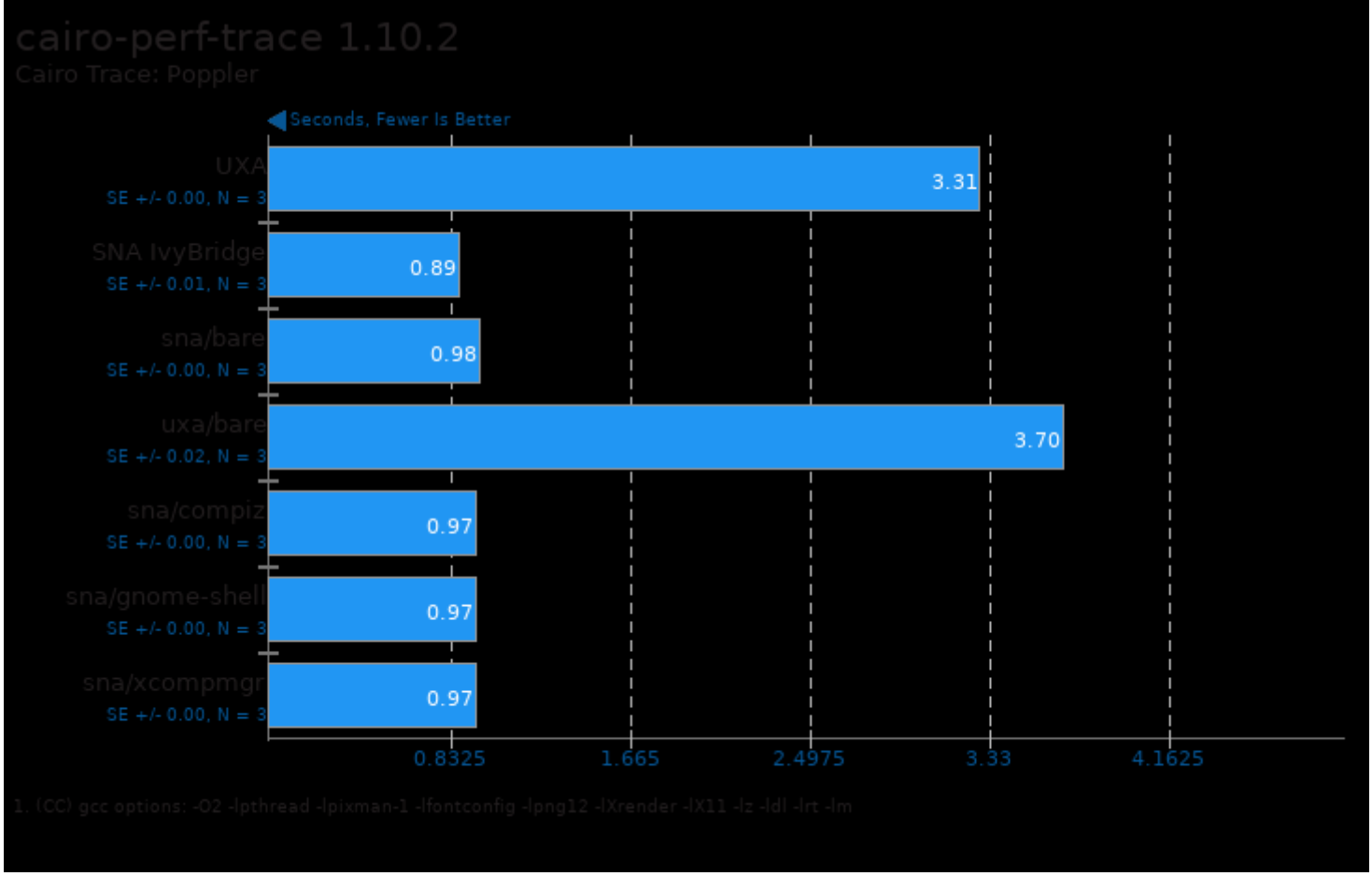


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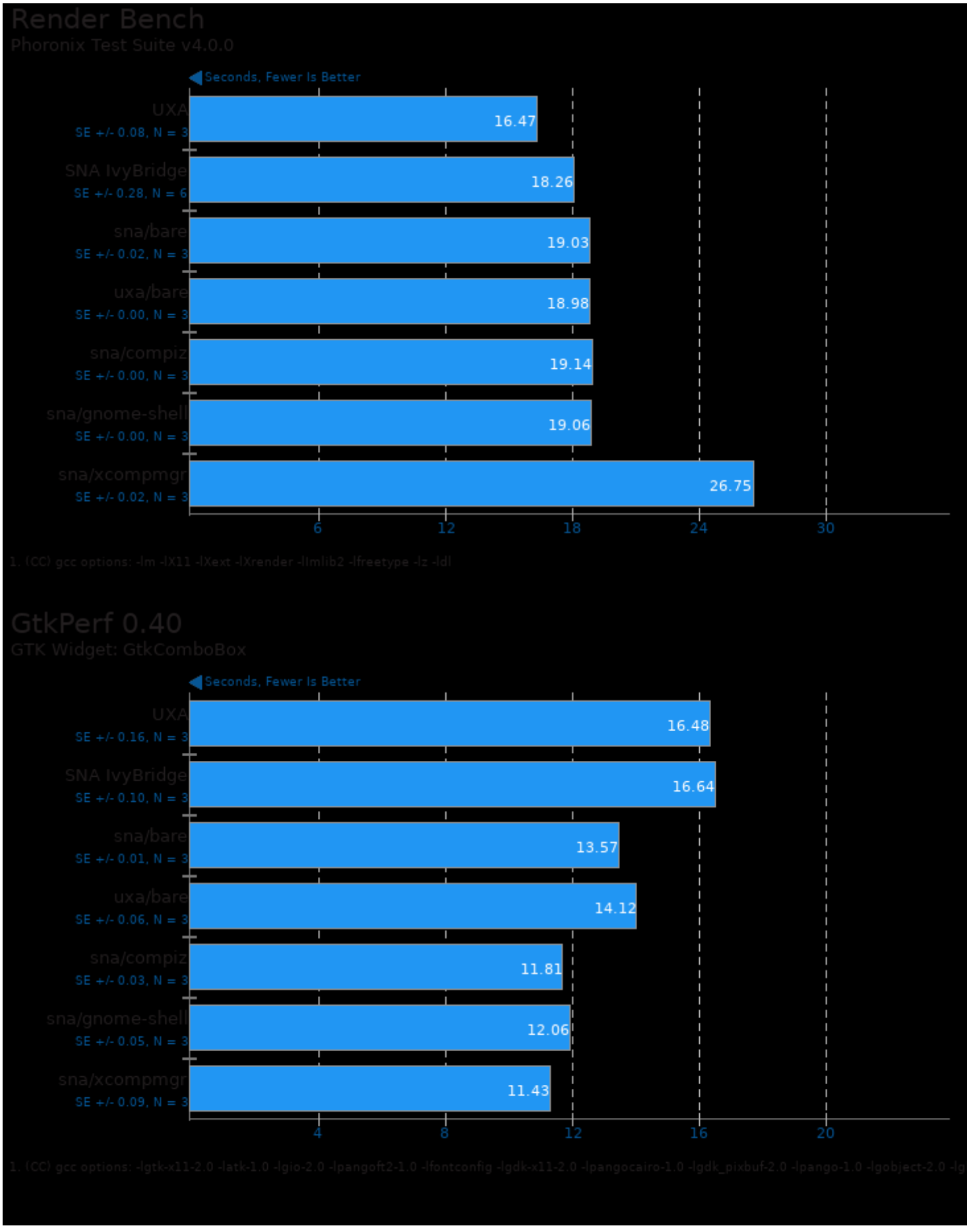


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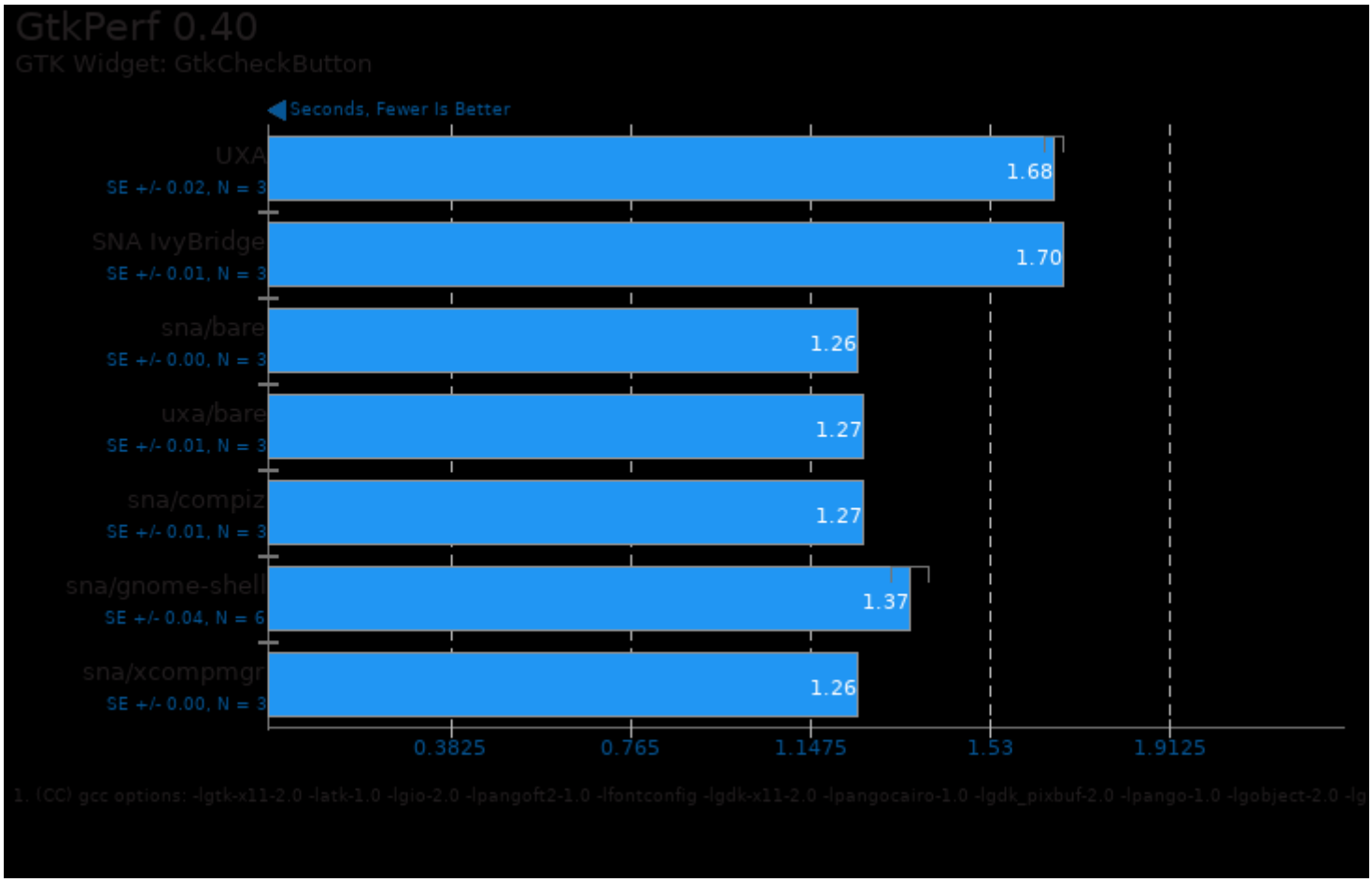




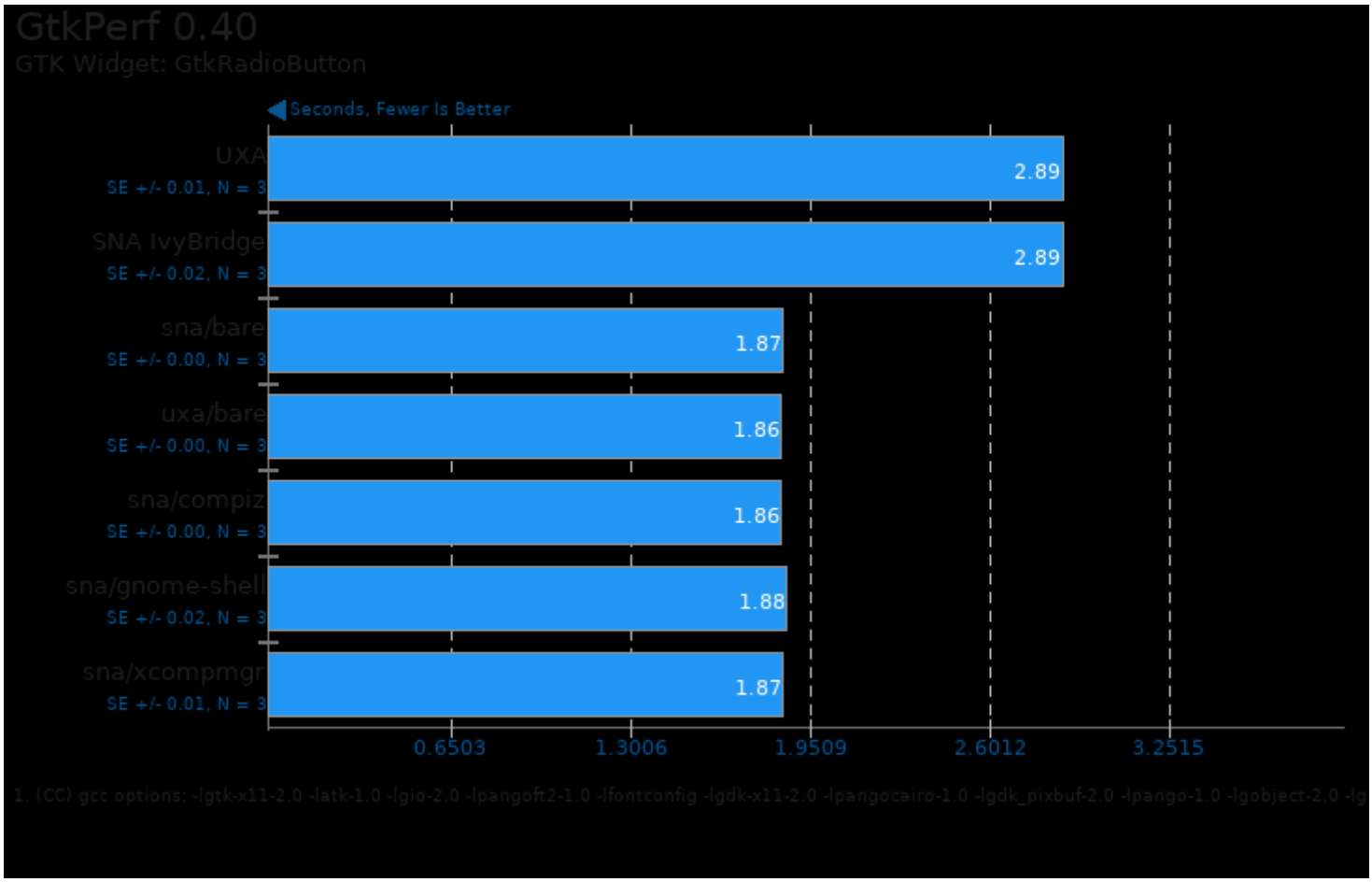
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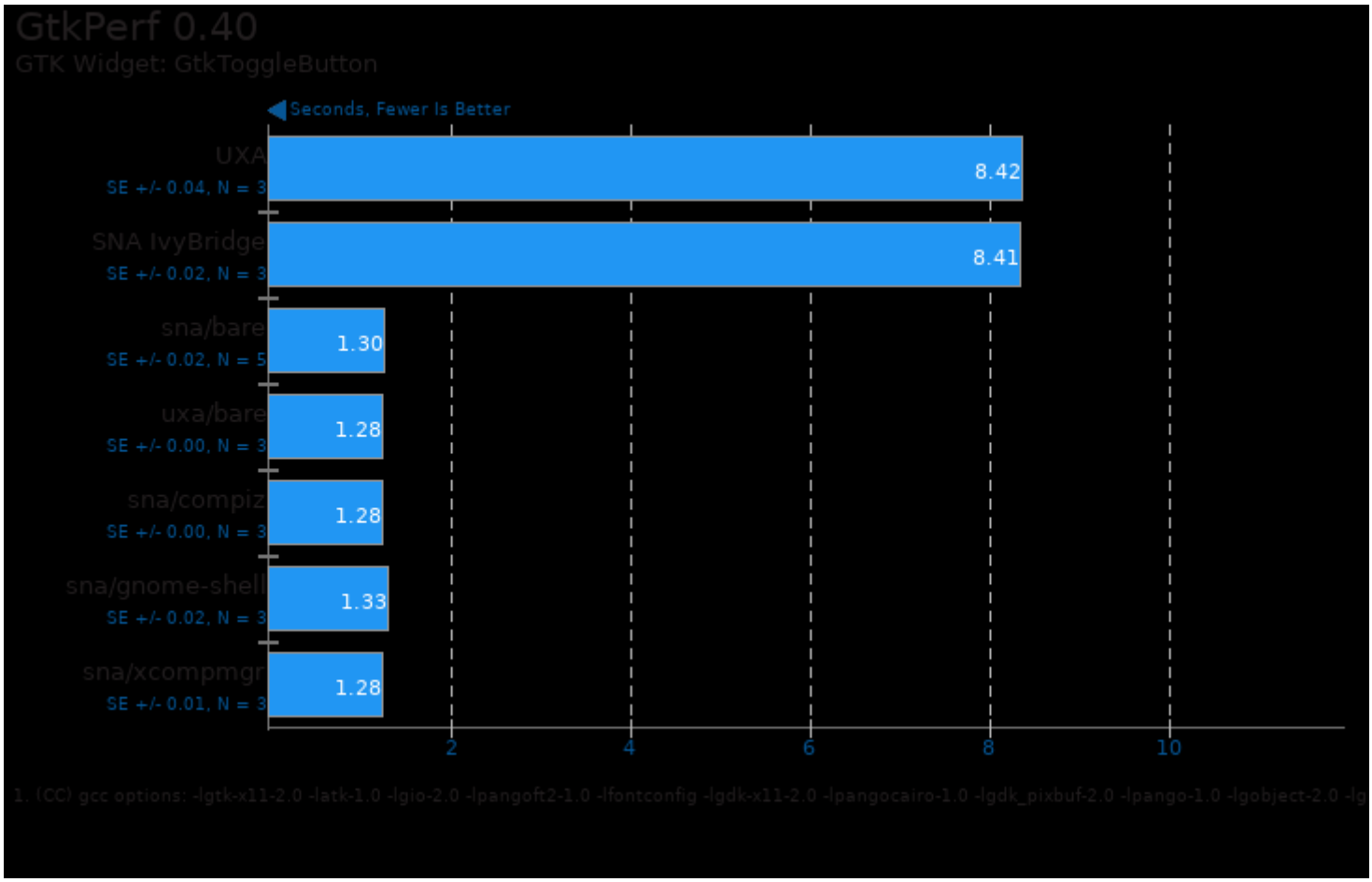
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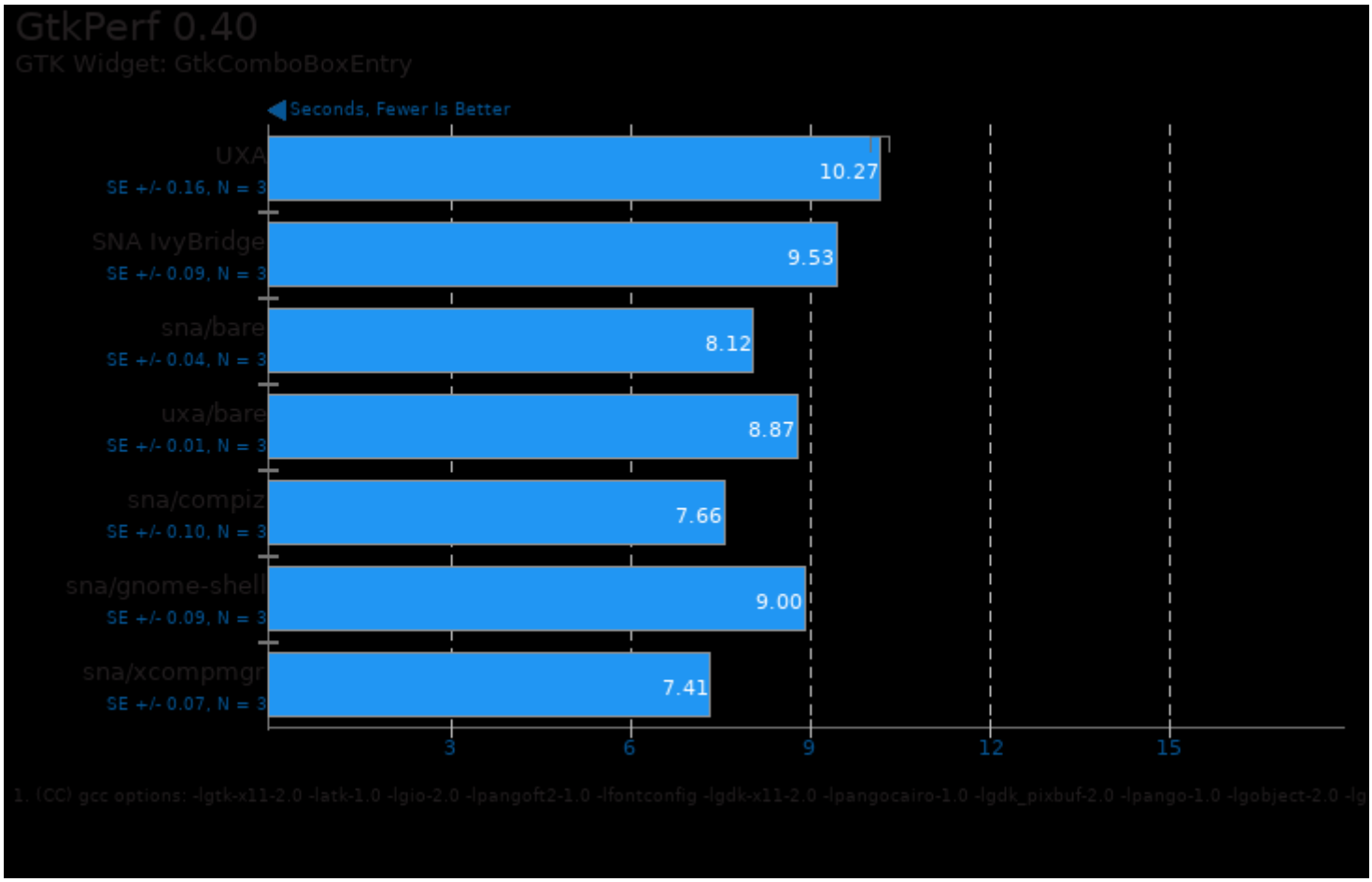
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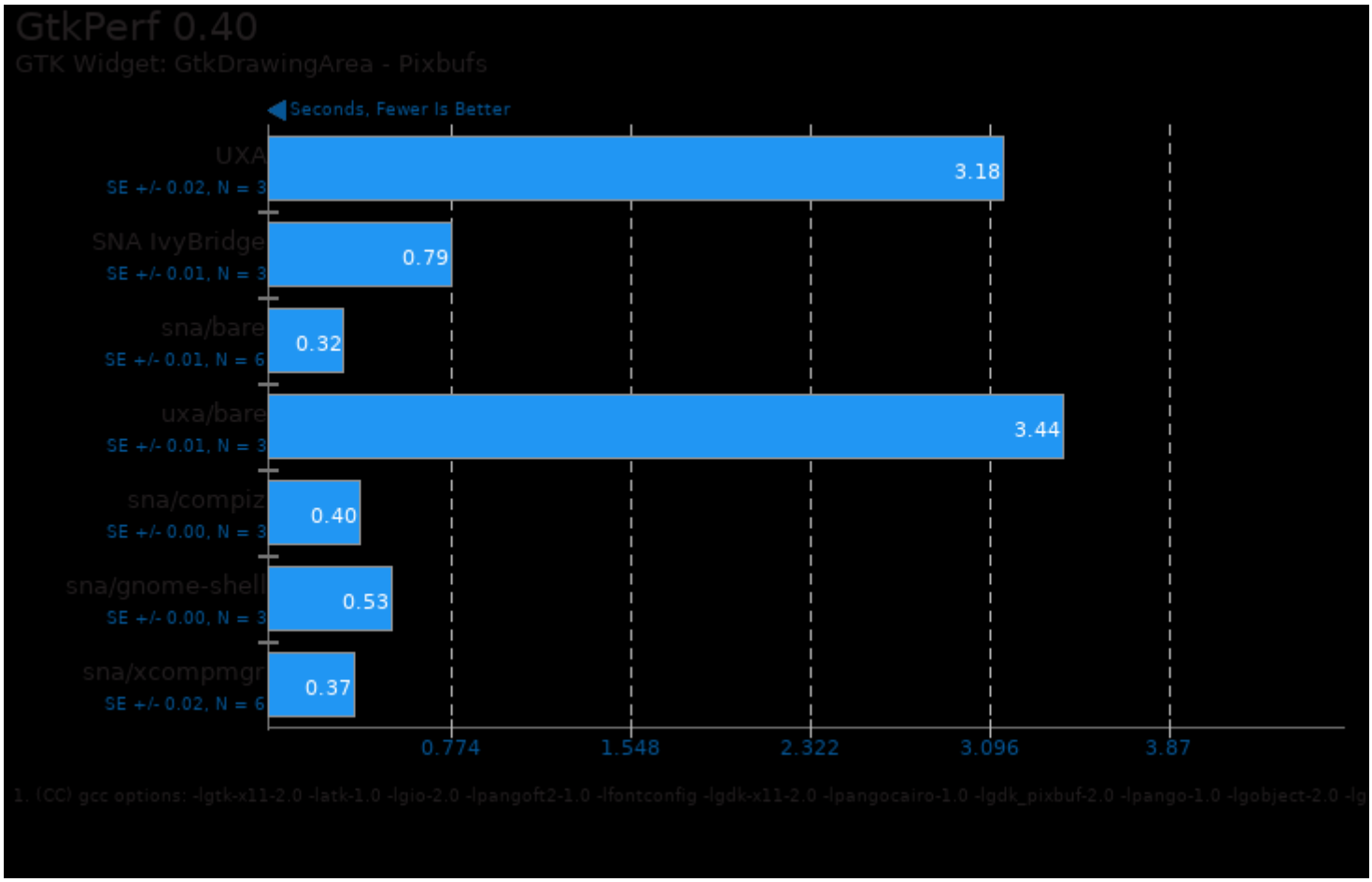
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