

CISC vs CISC

(Intel Xeon W-3175x vs AMD Ryzen Threadripper 3960x)


1. Description

Intel Xeon W-3175X is a 64-bit 28-core x86 enterprise performance workstation microprocessor introduced by Intel in early 2019. This processor is fabricated on an enhanced 14nm++ process based on the Skylake server microarchitecture, operates at 3.1 GHz with a TDP of 255 W and a turbo boost frequency of up to 4.3 GHz. This chip supports up to 512 GiB of hexa-channel DDR4-2666 ECC memory.

Ryzen Threadripper 3960X is a 64-bit tetracos-core high-performance x86 desktop microprocessor introduced by AMD in late 2019. The 3960X, which is based on their Zen 2 microarchitecture, is fabricated on TSMC's 7 nm process. The 3960X operates at a base frequency of 3.8 GHz with a TDP of 280 W and a boost of up to 4.5 GHz. This MPU supports up to 512 GiB of quad-channel DDR4-3200 memory.

2. Specification Comparison (Intel first, AMD second)


Cache



Cache Organization

[\[Edit/Modify Cache Info\]](#)

L1\$	1.75 MiB	L1I\$	896 KiB	28x32 KiB	8-way set associative		
		L1D\$	896 KiB	28x32 KiB	8-way set associative	write-back	
L2\$		28 MiB		28x1 MiB	16-way set associative	write-back	
L3\$		38.5 MiB		28x1.375 MiB	11-way set associative	write-back	



Cache Organization

[\[Edit/Modify Cache Info\]](#)

L1\$	1.5 MiB	L1I\$	768 KiB	24x32 KiB	8-way set associative		
		L1D\$	768 KiB	24x32 KiB	8-way set associative		
L2\$		12 MiB		24x512 KiB	8-way set associative	write-back	
L3\$		128 MiB		8x16 MiB			

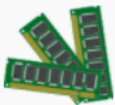
Memory controller



Integrated Memory Controller

[\[Edit/Modify Memory Info\]](#)

Max Type	DDR4-2666	
Supports ECC	Yes	
Max Mem	512 GiB	
Controllers	2	
Channels	6	
Max Bandwidth	119.21 GiB/s	
Bandwidth	Single	19.87 GiB/s
	Double	39.74 GiB/s
	Quad	79.47 GiB/s
	Hexa	119.21 GiB/s



Integrated Memory Controller

[\[Edit/Modify Memory Info\]](#)

Max Type	DDR4-3200	
Supports ECC	Yes	
Max Mem	512 GiB	
Controllers	4	
Channels	4	
Max Bandwidth	95.37 GiB/s	
Bandwidth	Single	23.84 GiB/s
	Double	47.68 GiB/s
	Quad	95.37 GiB/s

Expansions



[\[Edit/Modify Expansions Info\]](#)

Expansion Options


Revision: 3.0
PCIe Max Lanes: 48
Configuration: x16, x8, x4, x1




[\[Edit/Modify Expansions Info\]](#)

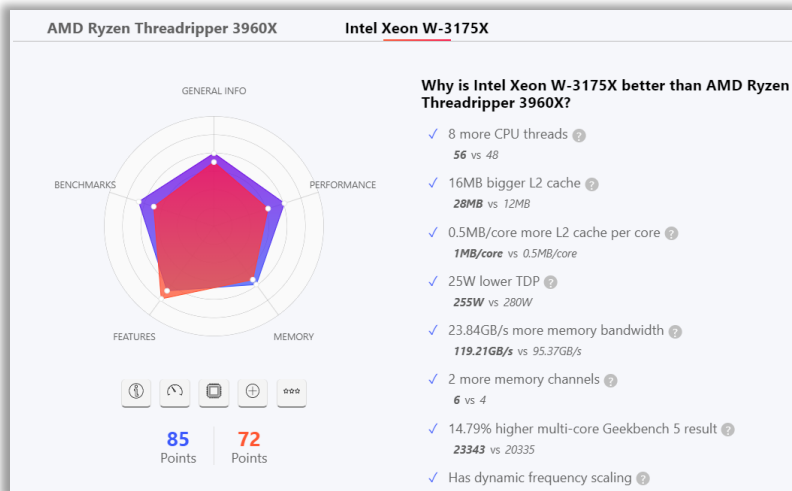
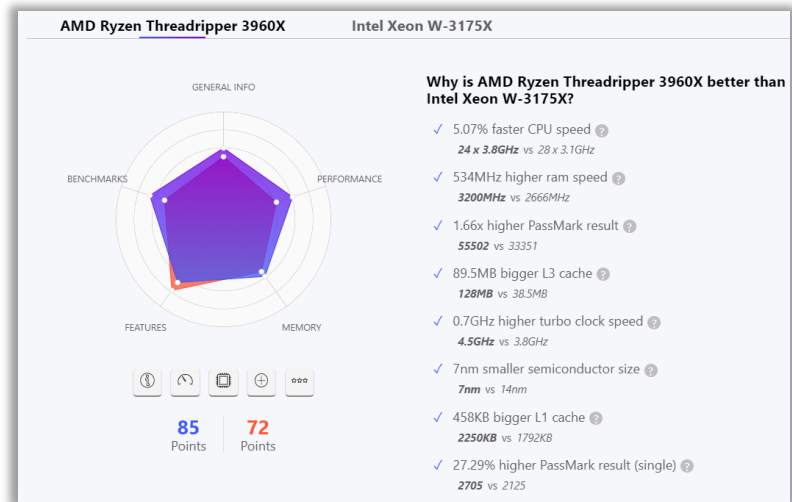
Expansion Options

Revision: 4.0
PCIe Max Lanes: 64
Configuration: 3x16+4x4

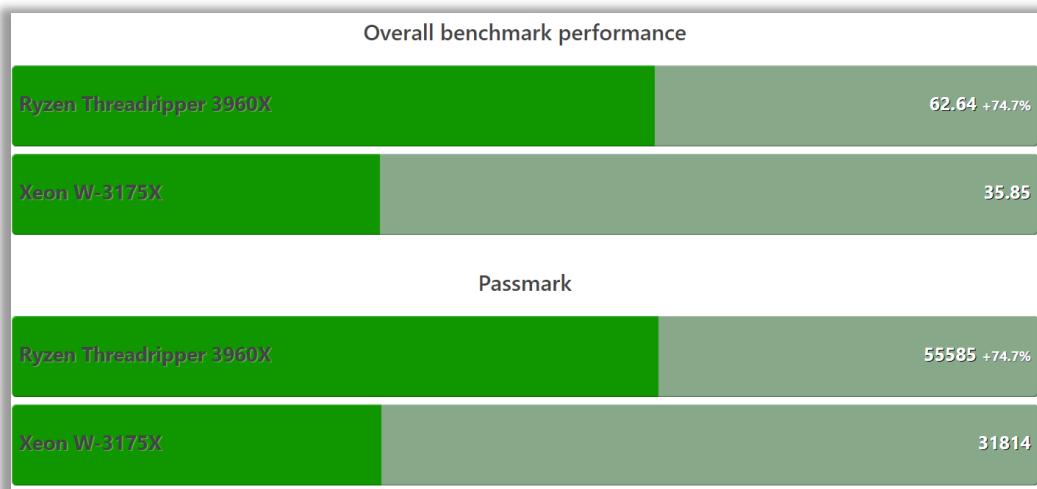
Xeon W-3175X	
General Info	
Designer	Intel
Manufacturer	Intel
Model Number	W-3175X
Part Number	BX80673W3175X, CD8067304237800
S-Spec	SRF6L
Market	Workstation
Introduction	October 8, 2018 (announced) January 30,, 2019 (launched)
Release Price	\$2,999 (tray)
Shop	Amazon 
General Specs	
Family	Xeon W
Series	W-3000
Locked	No
Frequency	3,100 MHz
Turbo Frequency	4,300 MHz (1 core), 3,800 MHz (28 cores)
Bus type	DMI 3.0
Bus rate	4 × 8 GT/s
Clock multiplier	31
Microarchitecture	
ISA	x86-64 (x86)
Microarchitecture	Skylake (server)
Platform	Purley
Chipset	Lewisburg
Core Name	Skylake SP
Core Family	6
Core Stepping	H0
Process	14 nm
Technology	CMOS
Word Size	64 bit
Cores	28
Threads	56
Max Memory	512 GiB
Multiprocessing	
Max SMP	1-Way (Uniprocessor)
Electrical	
TDP	255 W
Packaging	
Package	FCLGA-3647 (FCLGA)
Dimension	76.16 mm × 56.6 mm
Pitch	0.8585 mm × 0.9906 mm
Contacts	3647
Socket	Socket P, LGA-3647

Ryzen Threadripper 3960X	
General Info	
Designer	AMD
Manufacturer	TSMC, GlobalFoundries
Model Number	3960X
Part Number	100-000000010
Market	Desktop
Introduction	November 7, 2019 (announced) November 25, 2019 (launched)
Release Price	\$1,399.00
Shop	Amazon 
General Specs	
Family	Ryzen Threadripper
Series	3900
Locked	No
Frequency	3,800 MHz
Turbo Frequency	4,500 MHz
Bus rate	8 × 16 GT/s
Clock multiplier	38
Microarchitecture	
ISA	x86-64 (x86)
Microarchitecture	Zen 2
Chipset	TRX40
Core Name	Castle Peak
Process	7 nm, 12 nm
Transistors	23,540,000,000
Technology	CMOS
MCP	Yes (5 dies)
Word Size	64 bit
Cores	24
Threads	48
Max Memory	512 GiB
Multiprocessing	
Max SMP	1-Way (Uniprocessor)
Electrical	
TDP	280 W
T _{junction}	0 °C – 68 °C
Packaging	
Package	FCLGA-4094 (LGA)
Dimension	58.5 mm × 75.4 mm
Pitch	1.00 mm
Contacts	4094
Socket	Socket sTRX4, LGA-4094

Conclusions

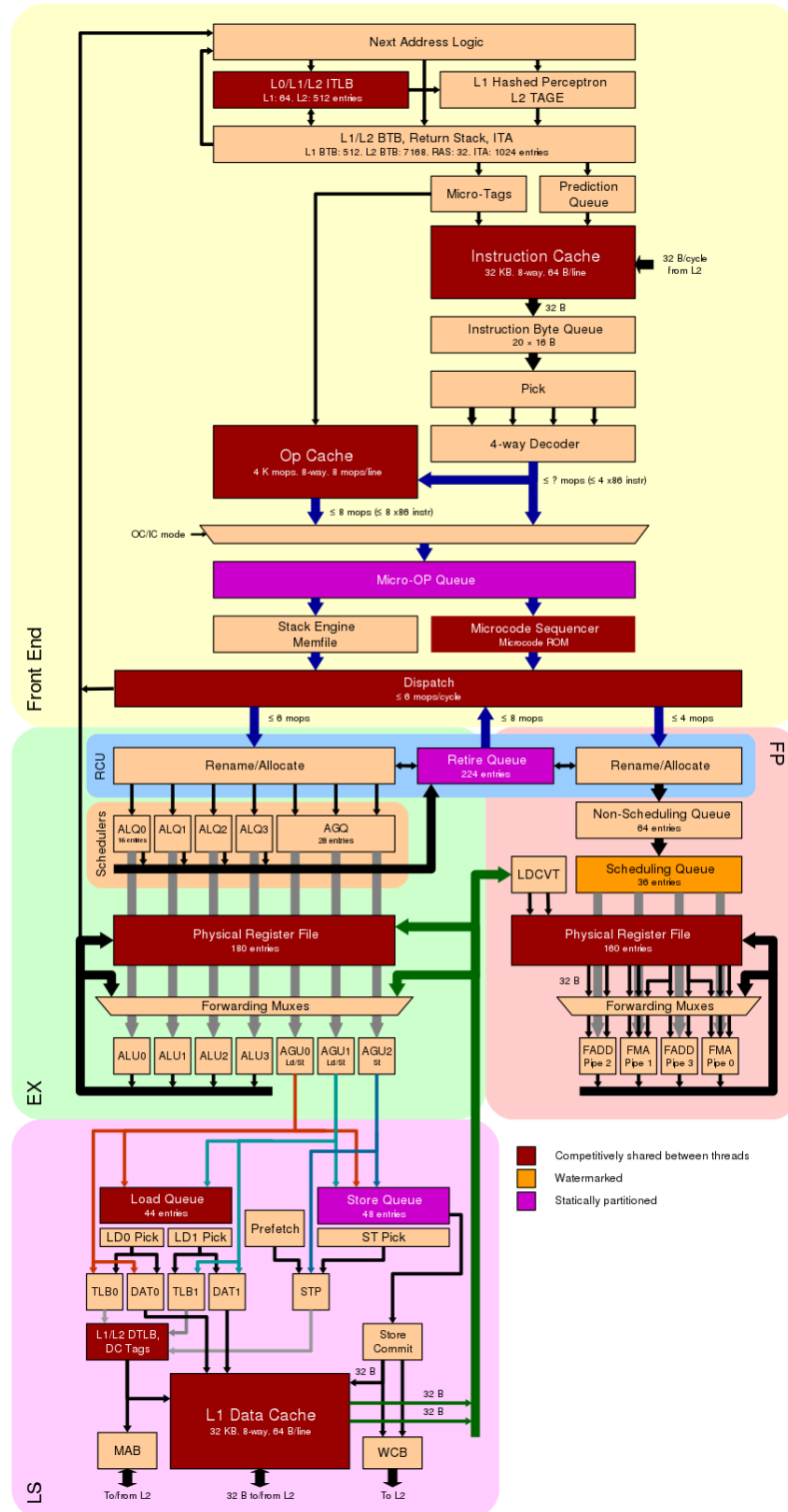


3. Benchmark Performance

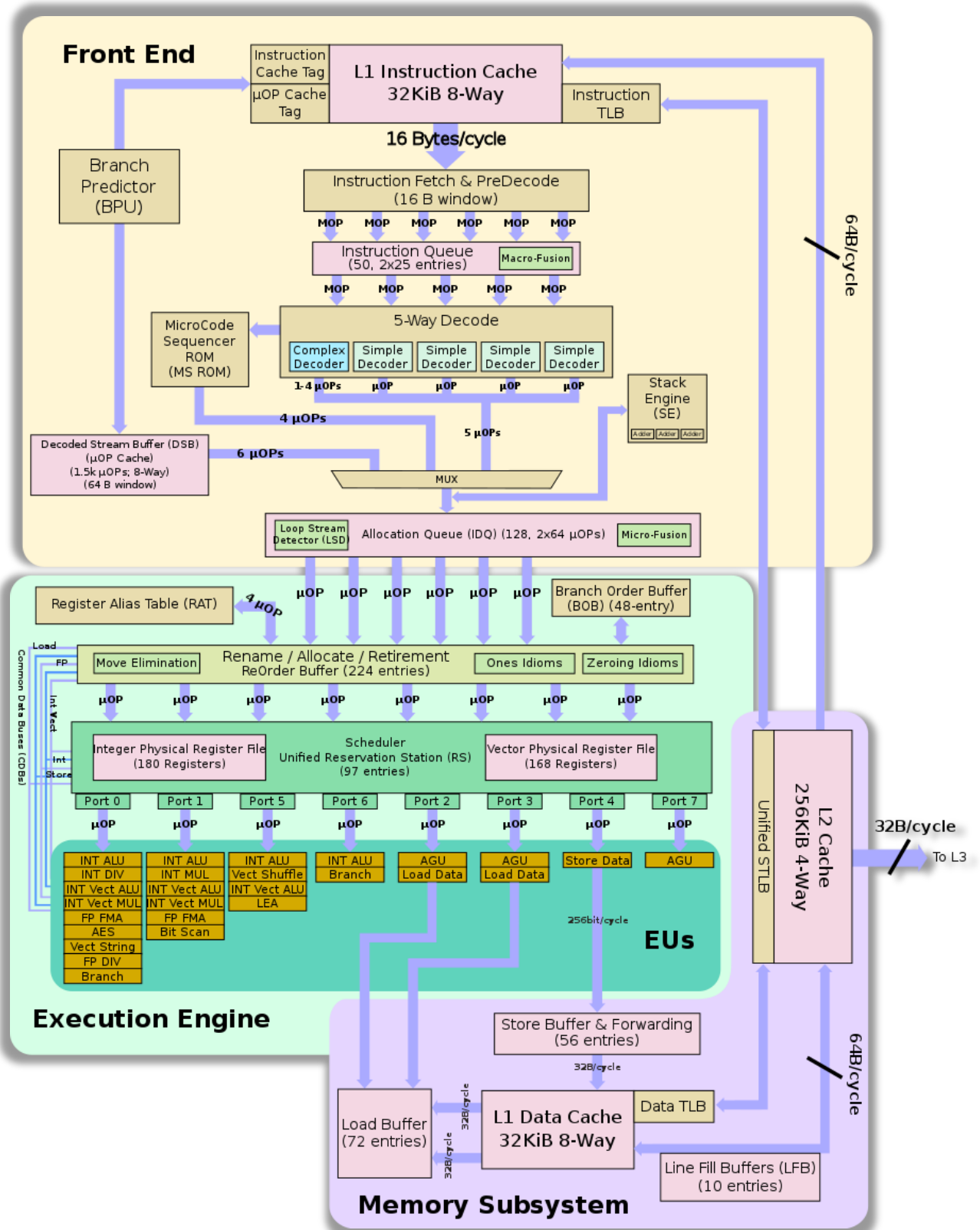


4. Block diagrams

Skylake



Zen 2



AMD TRX40 PLATFORM

THE CONNECTIVITY LEADER FOR CREATORS

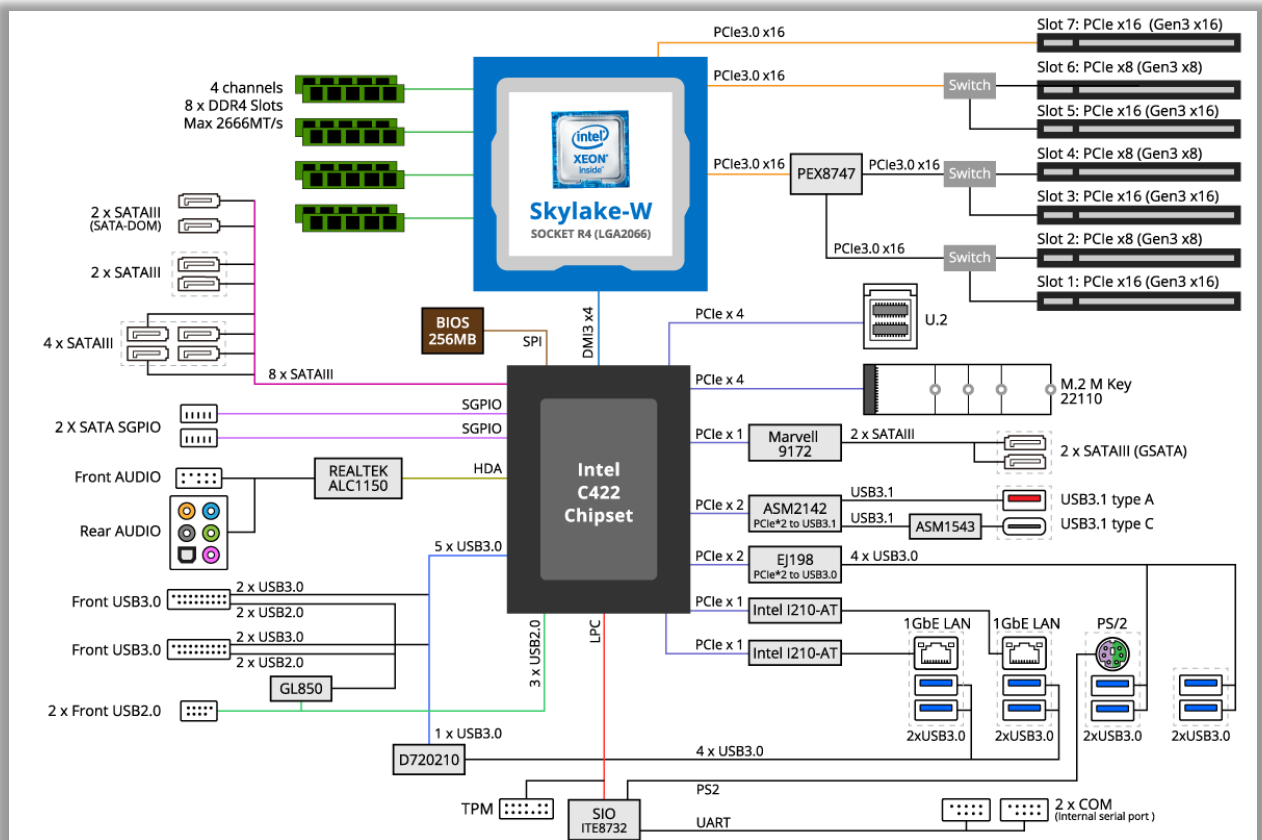


72 Available
PCIe® 4.0 Lanes

4X Bandwidth
⇌ Chipset vs. 2nd Gen

Up to
12X SuperSpeed
USB 10Gbps Ports

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5. Conclusion

That was how the AMD Threadripper Third generation processors compare against the Intel Xeon W 3175X. It goes without saying that the AMD siblings do have a few strong points that make it a better proposition when you compare it to the Intel Xeon processor. We assume the comparison above should have provided you a good enough idea into how effective it can be.

Only saving grace, perhaps for the Intel Xeon W 3175X, is that it does not need a motherboard refresh and can work with the existing motherboards. The AMD third gen Threadripper processors would require you to opt for the new TRX40 motherboards, and none of the current motherboards standards are compatible with the 3960X and 3970X (or even the upcoming 3990X).

6. Bibliography

- <https://en.wikichip.org/wiki/amd/microarchitectures/zen>
- https://en.wikichip.org/wiki/amd/ryzen_threadripper/3960x
- https://en.wikichip.org/wiki/intel/xeon_w/w-3175x
- <https://versus.com/en/amd-ryzen-threadripper-3960x-vs-intel-xeon-w-3175x>

RISC vs RISC

(Exynos 1080 vs Snapdragon 888)

1. Description

The **Exynos 1080's** integrated modem adds new levels of speed to downloading content, allowing you to stream and load faster, with minimal latency and lag. The processor is compatible with both types of 5G networks, mmWave and sub-6GHz, enabling downlink speeds of up to 5.1Gbps on the latter.¹ Plus, with support for both Bluetooth® 5.2 and Wi-Fi 6, the Exynos 1080 ensures that you're always connected.

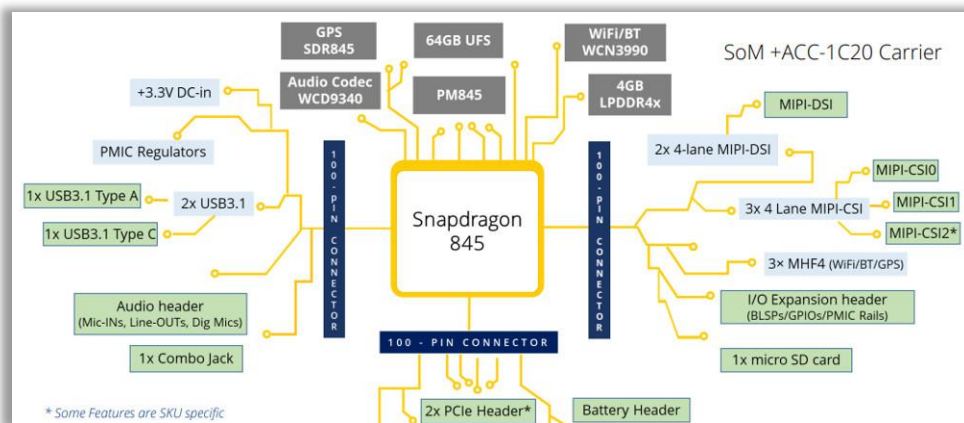
The Qualcomm® **Snapdragon™ 888** 5G Mobile Platform packs industry-leading innovations in 5G, AI, gaming, photography, and the many more premium experiences you deserve. Featuring our completely re-architected 6th gen Qualcomm® Artificial Intelligence (AI) Engine, the Snapdragon 888 5G delivers a total of 26 TOPS performance, 3 times performance-per-watt improvement and 16 times larger shared AI memory.

2. Specifications

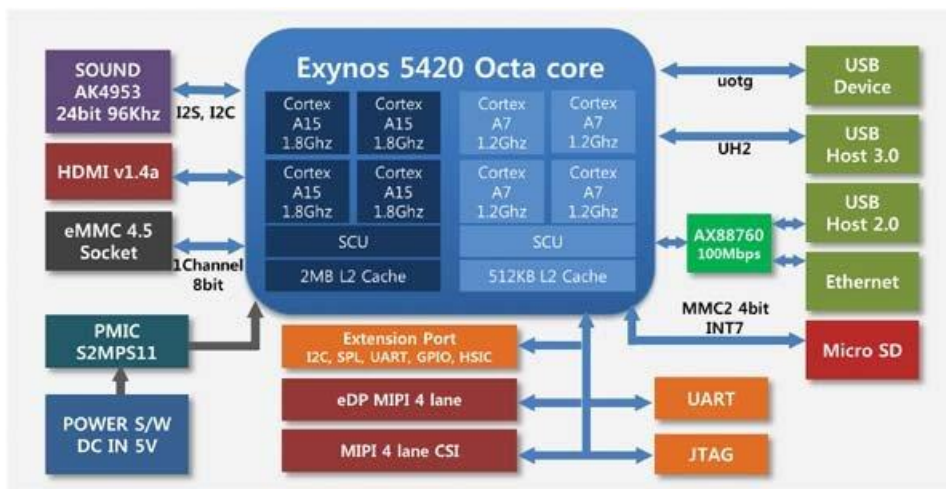
Processor	Exynos 1080	Snapdragon 888
Node size	5nm EUV	5nm
CPU	1 x ARM Cortex-A78 at 2.84 GHz 3x ARM Cortex-A78 at 2.6 GHz 4x ARM Cortex A-55 at 2.0GHz	1 x ARM Cortex-X1 at 2.84GHz 3 x ARM Cortex-A78 at 2.40GHz 4 x ARM Cortex-A55 at 1.8GHz
GPU	Mali-G78 MP10	Adreno 660
ISP	Info not available	Spectra™ 580
AI Engine	Info not available	Hexagon 780
Modem	Info not available	Snapdragon X60 5G
Connectivity	W-Fi 6, Bluetooth 5.2	Wi-Fi 6E, Wi-Fi 6, Bluetooth 5.2

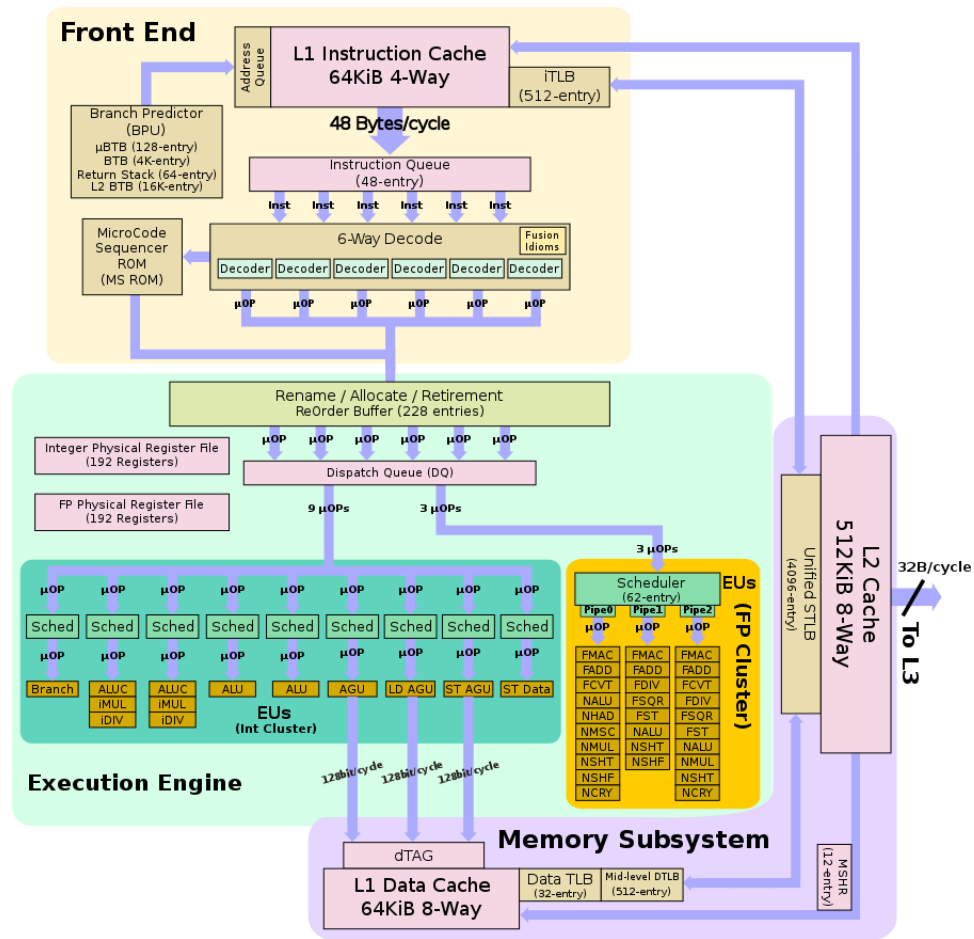
3. Block Diagram

Snapdragon 888



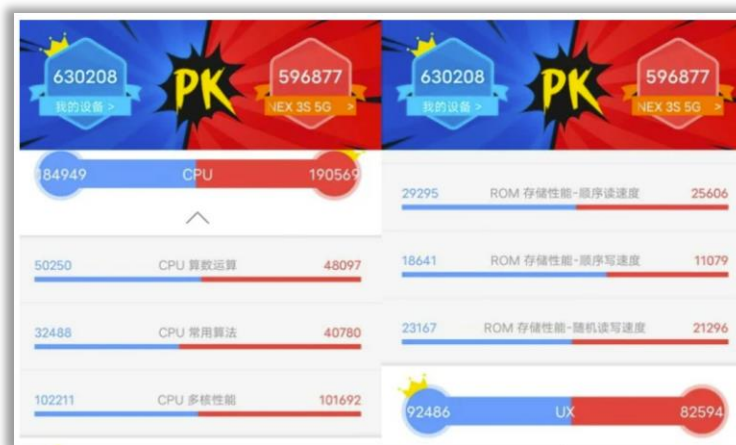
Exynos 1080





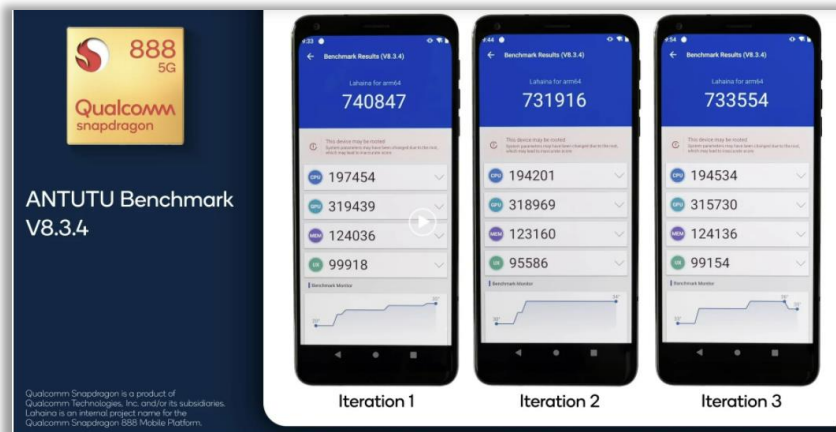
4. Benchmark

Exynos 1080 vs Snapdragon 865





Snapdragon 888



5. Conclusion

Snapdragon 888 is the clear winner, as it outperforms CPU and GPU performance. However, the Exynos 1080 is also an excellent chipset, as it almost holds up against Snapdragon 865 in processor performance and even surpasses it in GPU performance. However, its stronger brother, the Exynos 2100, will be the one to challenge the Snapdragon 888.

6. Bibliography

- <https://www.gizmochina.com/2021/01/06/chip-battle-how-does-the-exynos-1080-compare-to-the-snapdragon-888/#:~:text=The%20Exynos%201080%20not%20only,Cortex%2DA78%20core%20than%20i t.&text=However%2C%20the%20Snapdragon%20888%20has,core%20clocked%20at%202.8 4GHz.>

