



Xbox series X

電機系

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Outline

- Introduction
- Technology Analysis
- Feature
- Market analysis & SWOT analysis
- Conclusion
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Introduction

■ Xbox family

	First generation	Second generation	Third generation		Fourth generation	
	Xbox	Xbox 360	Xbox One	Xbox One X	Xbox Series S	Xbox Series X
Xbox console						
release date	North America : 2001/11/15 Japan : 2002/2/22	North America : 2005/11/22 Japan : 2005/12/10	North America : 2013/11/22 Japan : 2014/9/4	2017/11/7	2020/11/10	



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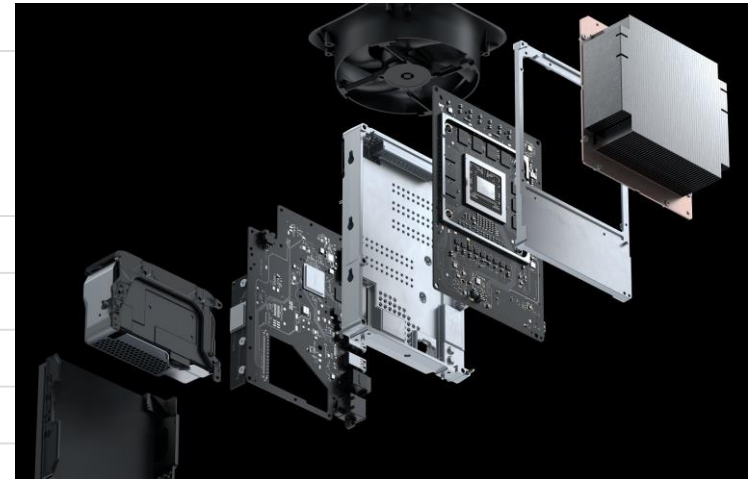
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Technology Analysis

XBOX SERIES X SPECS

Dimensions	301mm (11.85in) tall and 151mm (5.95in) in depth and width
Weight	9.8 pounds
Graphics	12 TFLOPS (teraflops), 52 CUs (compute units) @ 1.825 GHz Custom RDNA 2 GPU
Processor	8x Cores @ 3.8GHz (3.6 GHz w/ SMT) Custom Zen 2 CPU
Memory	16GB GDDR6 (10GB @ 560GB/s fast GPU optimal memory, 3.5GB @ 336GB/s standard memory, 2.5GB @ 336GB/s reserved memory for OS and apps)
Storage	1TB PCIe 4.0 NVME Solid-State Drive (SSD) with speeds of 2.4GB/s (raw) and 4.8GB/s (compressed)
Disc Drive	4K UHD Blu-Ray Drive
Power Supply	300w, internal
HDMI resolution and framerate	1x HDMI 2.1 (out) 4K @ 60fps, , up to 120fps, 8K up to 120fps Variable Refresh Rate (VRR) Auto Low Latency Mode (ALLM)
Networking	Ethernet, Wireless
USB Port	2x USB 3.2
Expandable Storage	1TB Expansion Card
External Storage	USB 3.2 External HDD Support
IR Blaster	No
Ray Tracing	Yes
Audio	Audio out only, through HDMI port





Technology Analysis

■ CPU

- custom 7 nm AMD Zen 2 CPU with eight cores running at a nominal 3.8 GHz or, when simultaneous multithreading (SMT) is used, at 3.6 GHz.

■ GPU

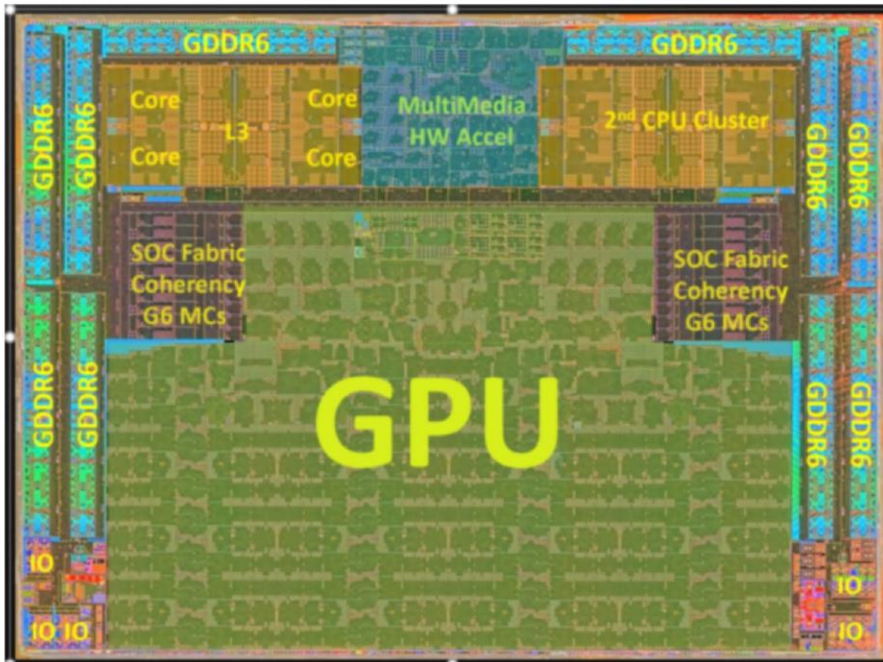
- a custom unit based on AMD's RDNA 2 graphics architecture. It has a total of 56 compute units (CUs) with 3584 cores, with 52 CUs and 3328 cores enabled, and will be running at a fixed 1.825 GHz.

■ Memory

- 16 GB of GDDR6 SDRAM, with 10GB running at 560GB/s primarily to be used with the graphics system and the other 6 GB at 336 GB/s to be used for the other computing functions.

Technology Analysis

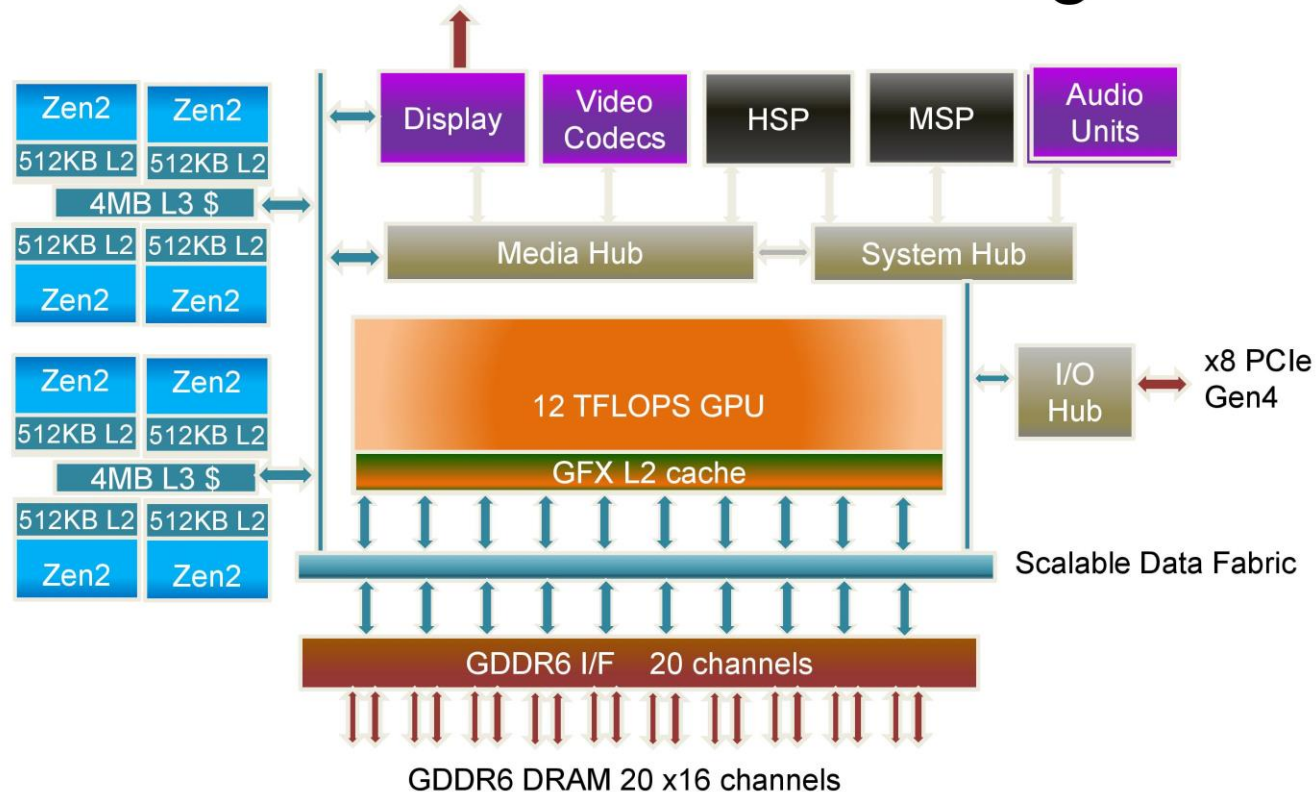
XBOX SERIES X SoC Die Photo & Comparison



Parameter	XBOX SERIES X	XBOX ONE X
Technology Node	TSMC 7nm	TSMC 16nm
Transistor Count	15.3B	6.6B
Area	360.4 mm ²	366.9 mm ²
Package type	12 layer (5-2-5)	12 layer (5-2-5)
Package size	52.5 mm x 52.5 mm	50 mm x 50 mm
Ball count	2963	2409
Ball pitch	0.80 mm (minimum)	0.80 mm (minimum)

Technology Analysis

XBOX SERIES X Block Diagram





Technology Analysis

■ Display

- Xbox Series X target performance is to render games at 4K resolution at 60 frames per second and support up to 120 frames per second and can render up to 8K resolution.
- Support real-time ray-tracing and support the new features of the HDMI 2.1 standard including variable refresh rate (VRR) and Auto Low Latency Mode (ALLM) that are currently being incorporated into newer televisions.

Technology Analysis

■ 4th generation Xbox vs 3th generation Xbox

	Xbox Series X	Xbox One X
CPU	8x Zen 2 Cores at 3.8GHz (3.6GHz with SMT)	8x Custom Jaguar Cores at 2.13GHz
GPU	12 TFLOPs, 52 CUs at 1.825GHz, Custom RDNA 2	6 TFLOPs, 40 CUs at 1.172GHz, Custom GCN + Polaris Features
Die Size	360.45mm ²	366.94mm ²
Process	TSMC 7nm Enhanced	TSMC 16nmFF+
Memory	16GB GDDR6	12GB GDDR5
Memory Bandwidth	10GB at 560GB/s, 6GB at 336GB/s	326GB/s
Internal Storage	1TB Custom NVMe SSD	1TB HDD
IO Throughput	2.4GB/s (Raw), 4.8GB/s (Compressed)	120MB/s
Expandable Storage	1TB Expansion Card	-
External Storage	USB 3.2 HDD Support	USB 3.2 HDD Support
Optical Drive	4K UHD Blu-ray Drive	4K UHD Blu-ray Drive
Performance Target	4K at 60fps - up to 120fps	4K at 30fps - up to 60fps

Technology Analysis

■ The fourth generation of Xbox comparison

Component		Series X	Series S
Processors	CPU	Custom AMD Zen 2 8 Cores @ 3.8 GHz (3.66 GHz with SMT)	Custom AMD Zen 2 8 Cores @ 3.6 GHz (3.4 GHz with SMT)
	GPU	Custom RDNA 2 52 CUs @ 1.825 GHz 12 TFLOPS	Custom RDNA 2 20 CUs @ 1.565 GHz 4 TFLOPS
Memory		16 GB GDDR6 with 320-bit bus 10 GB @ 560 GB/s, 6 GB @ 336 GB/s	10 GB GDDR6 with 128-bit bus 8 GB @ 224 GB/s, 2 GB @ 56 GB/s
Storage	Internal	1 TB PCIe Gen 4 custom NVMe SSD 2.4 GB/s raw, 4.8 GB/s compressed	512 GB PCIe Gen 4 custom NVMe SSD 2.4 GB/s raw, 4.8 GB/s compressed
	Expandable	0.5–2 TB expansion card (rear)	
	External	USB 3.1 external HDD support	
Optical drive		Ultra HD Blu-ray	None
Performance target		4K resolution at 60 FPS, up to 120 FPS	1440p at 60 FPS, up to 120 FPS
Dimensions	Size	301 mm × 151 mm × 151 mm (12 in × 5.9 in × 5.9 in)	275 mm × 151 mm × 65 mm (11 in × 5.9 in × 2.6 in)
	Weight	4.45 kilograms (9.8 lb)	1.93 kilograms (4.3 lb)

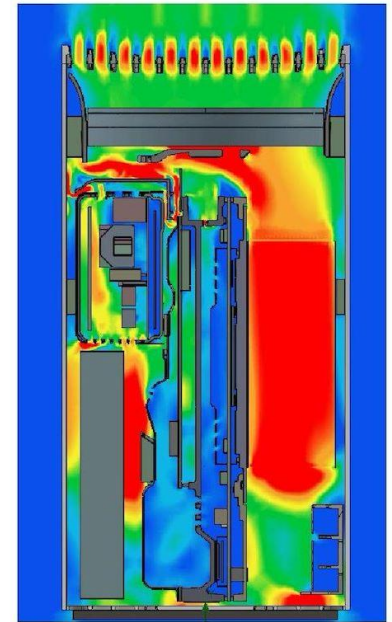
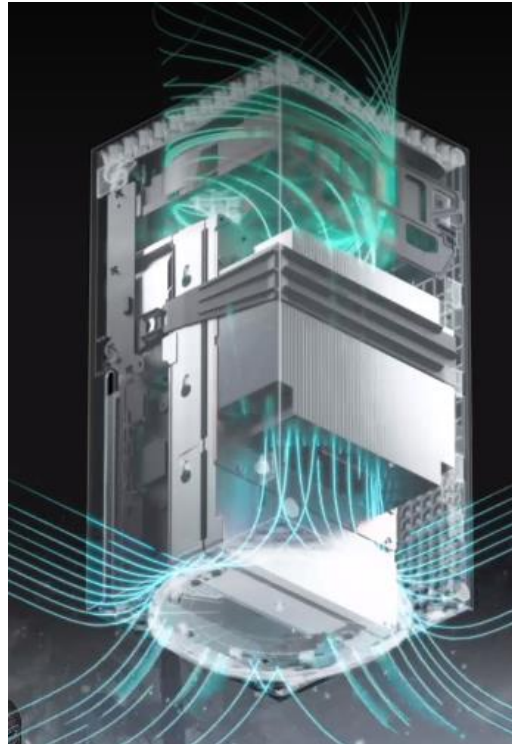


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Feature

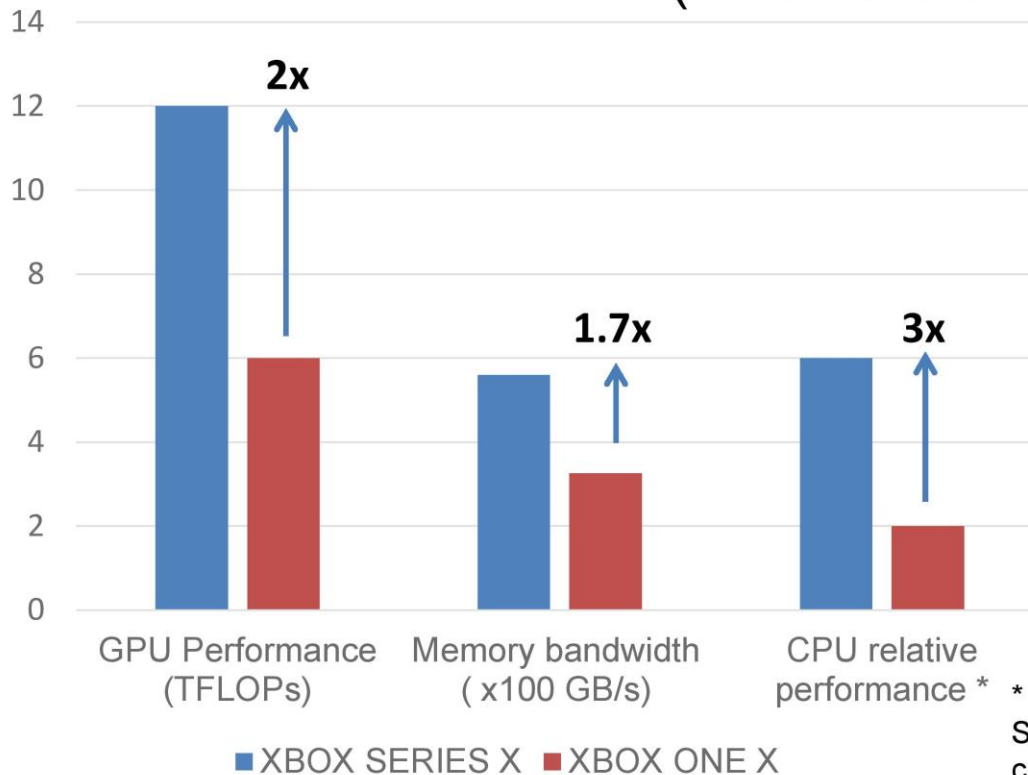
- Support Dolby Vision and Dolby Atmos technologies
- Xbox Parallel Cooling
- Xbox Velocity Architecture
- Quick Resume
- Smart Delivery





Feature

XBOX SERIES X SoC vs. XBOX ONE X (GPU/MEM/CPU)



Parameter	XBOX SERIES X	XBOX ONE X
GPU performance	12 TFLOPS 52 CUs at 1825 MHz	6 TFLOPS 40 CUs at 1172 MHz
Memory bandwidth	560 GB/s 16 GB GDDR6 20 channels x16 (14 Gb/s)	326 GB/s 12 GB GDDR5 12 channels x32 (6.8 Gb/s)
CPU performance *	8 Hercules cores at 3.8 GHz	8 Jaguar cores at 2.3 GHz

* Relative CPU performance based on SPECint_rate_base2006 estimates using Open64 4.5.2.1-1 compiler, with testing done on preproduction systems














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Market analysis & SWOT analysis

■ Year to Date Sales Comparison (Same Periods Covered)

Current	2019	2020	2021	2022
	-	-	8,148,852	6,663,570
	-	-	4,422,396	5,730,468
	8,848,254	15,478,034	14,125,054	11,565,754
Legacy				
	7,916,556	6,659,919	1,838,072	426,010
	2,173,399	2,061,387	422,541	35,697
	964,447	396,640	29,740	-
Total	19,902,656	24,595,980	28,986,655	24,421,499
Current	2022 v 2020	% up/down	2022 v 2021	% up/down
	-	-	-1,485,282	-18.2%
	-	-	1,308,072	29.6%
	-3,912,280	-25.3%	-2,559,300	-18.1%
Legacy				
	-6,233,909	-93.6%	-1,412,062	-76.8%
	-2,025,690	-98.3%	-386,844	-91.6%
Total	-174,481	-0.7%	-4,565,156	-15.7%

Market analysis & SWOT analysis

■ Total Sales and Market Share for Each Year

Current	2020	2021	2022	Lifetime
	4,390,029 12.5%	12,589,953 27.6%	6,663,570 27.8%	23,643,552 15.4%
	3,036,468 8.6%	8,320,346 18.2%	5,730,468 23.9%	17,087,282 11.1%
	27,758,846 78.9%	24,762,809 54.2%	11,565,754 48.3%	113,290,609 73.6%
Current Total	35,185,343	45,673,108	23,959,792	154,021,443
Legacy	2020	2021	2022	Lifetime
	8,368,159 74.6%	2,207,717 81.9%	426,010 92.3%	117,004,007 69.8%
	2,850,882 25.4%	487,779 18.1%	35,697 7.7%	50,534,689 30.2%
	469,092 -	34,395 -	- -	75,940,755 -
Legacy Total	11,688,133	2,729,891	461,707	243,479,451
All Total	46,873,476	48,402,999	24,421,499	397,500,894

Market analysis & SWOT analysis

■ Strengths

- Impressive backward compatibility
- Good controller
- Deep pockets



■ Weaknesses

- Always right behind PlayStation in sales
- Design

■ Opportunities

- Lowering prices of games
- Exclusive games
- Online Gaming

■ Threats

- Sony and Nintendo competition
- Dropping console sales



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Conclusion

- Xbox series X faster than Xbox one X
- Good feature
 - Quick Resume
 - VRS
 - Compatibility
 - Smart Delivery



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