XBOX ONE X SCORPIO ENGINE
SCORPIO ENGINE

- True 4K, 2160p, 60 Hz games
- 7 billion transistors
- TSMC 16FF+ technology
- 359 mm² die
- 50 mm module
- Developed in partnership with AMD
Physical Layout
GPU

- 4 compute processors, 2 command processors, DX12 firmware, new work distribution
- 4 shader engines: 4.688 G primitives/second (2.6x)
- 4 shader arrays:
  - 6 TFLOPs: 40 compute units x 128 FLOPs x 1.172 GHz (4.3x)
  - 187.5 G bilinear texels/second (4.3x)
- 8 RB color/depth engines: 37.5 G pixels/second (2.6x)
- 2 MB L2 cache with bypass and index buffer access (4x)
- 1 MB parameter cache (4x)
- Conservative occlusion query
- Delta color and depth compression
- Compressed texture access
- OOO rasterization
- Xbox One S and 360 compatibility
CPU

- 8 x86 cores, 2.3 GHz (1.3x)
- 32 KB L1I, 32 KB L1D caches per core
- 4 MB shared L2 cache (2 MB per 4 core cluster)
- Lower main memory latency (up to 20%)
- 12 channels and 192 banks of main memory (3x and 6x)
- 2048 entry L2I TLB and L2D TLB for 4 KB pages (4x)
- 32 entry L1I TLB for 4 KB pages, 8 entry L1I TLB for 2 MB pages
- 40 entry L1D TLB for 4 KB pages, 8 entry L1D TLB for 2 MB pages, 256 entry L2D TLB for 2MB pages
- Page Descriptor Cache of nested translations (up to 4.3% performance)
AV

- Video decoding for cut-scenes and multimedia
  - 4K p60Hz HEVC, VP9, AVC
  - 10-bit high dynamic range HEVC, VP9

- Video encoding for DVR and streaming
  - 4K p60Hz HEVC

- Display
  - 4K, 64-bit, 3-surface resize and blending
  - Pre-multiplied floating point alpha
  - 10-bit high dynamic range
  - DP 1.2a / HDMI 2.0b, HDCP 2.2, two-stream MST

- Audio
  - 8 custom processors, new firmware, e.g. spatial surround (also for Xbox One S)
System

South Bridge
Clocks
System Control

Scorpio SoC

12 GB GDDR5

IR Plug
IR Blaster
IR In
USB 3.0
USB 3.0
USB 3.0
HDMI 1.4b
HDMI 2.0b
S/P DIF
GbE Enet

DP1.2a
2 stream MST
PCIe

PCIe

USB 2.0
USB 2.0
SATA 2
SATA 2
eMMC 4.5

WiFi
Game Controllers

4K UHD Blu-ray
1 TB HD
8 GB Flash

Network
Game Controllers

WiFi

XBOXONE X
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