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Xbox 360 and Playstation 3's Graphics Card (GPU) Compared

CrimsonRayne 11th March 2013 [0 Comments](#)


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The Xbox 360's GPU packs a little more punch than Sony's PS3...

The Playstation 4 and Xbox 720 are getting ever closer to launch, but while we're waiting for more news on specs (especially the xbox, since right now we're completely in the dark apart from a supposed 2011 spec leak) we might as well entertain ourselves by thinking of days past. The "what's faster the Xbox 360 or Playstation 3?" debated raged on between fans of both systems seemingly endlessly – but the reality of the matter is that the Microsoft console came out slightly ahead – although it wasn't a washout by any means.

Graphics card on the XBox 360 is based on an AMD design, and the system has 48 unified shaders, running at 500MHZ. This gives 96 billion shader operations per second on the XBox 360, compared to that of the 74.8 billion shader operations that the PS3 managers, with its 24 pixel shader pipelines and 8 vertex shader pipelines running at 550MHZ per second. In terms of raw performance, the PS3 loses slightly right out of the gate.

That is far from the end of the story however. The Xbox 360 has 10MB of EDRAM which is tied directly onto the GPU (which is similar to how the 2011 spec leak of the Xbox 720 is using similar EDRAM, but the XBox 720 is also tying this to the CPU as well as the GPU). This EDRAM acts as a very fast buffer allowing regularly accessed code to be quickly grabbed for processing. As it turns out, it also means that AA (Anti Aliasing) a lot easier on Microsoft's console too.

Xbox 360 and PS3 GPUs Detailed Breakdown - Xbox 360 and Playstation 3 GPU Specs Compared



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There are a few things to remember before we go further – a lot of the titles now which really push the consoles hardware (now that it's starting to get long in the tooth) are no longer able to internally render the games at the 720P landmark that they were at launch. Many of the titles are at sub 720P internally. Dead Space 3 renders at 1280×720 for example, while other titles fare worse. 880×720 (dynamic Instances of 832×624 – post-AA) is what you'll expect to find on the PS3 version of Call of Duty: Black Ops 2 for example. The Xbox 360 version of the title runs the same resolution (although without the need to reduce to the 823×624 figure) but with the addition of 2xAA to help smooth things off. Crysis 3 on the Xbox 360 runs at 1152×720 (SMAA T2X), while the PS3 version of Crysis 3 runs at only 1024×720. In short, both consoles aren't running the games at the 1280×720 or the 1920×1080 that you've likely set them too.

What about the AA and other multi sampling?

Now that the games industry have moved on and gone on to create far more complex worlds, there's no way that the static technology that's at the heart of either console is able to keep up with the demands – thus, we're often forced to see them running at sub 720P, 30FPS and indeed with an extremely limited FOV (Field of View) to further reduce the load. It's worthy to note that the Xbox 360 isn't just having an easier time of it because of the EDRAM and the higher amount of Shader Operations though, it does have a small on chip design advantage with AA. The PS3 GPU is based on the G7x series (from Nvidia) and this in turn means that the ROPs are capable of handling 2 multisamples per pixel per cycle. In a scenario with basic imagery on screen (or if you prefer, a theoretical one) where bandwidth is unlimited, 2xMSAA or Quincunx would be free with no performance hit. But do note that the double pumped Z-only fill rate is only effective without MSAA and that this can be important for certain effects such as rendering shadows; with 2xMSAA the z-only fill rate falls in line with the colour fill rate.

However, as with all things – reality is different and you'll instead find that the the 22GB per second of bandwidth often comes into effect for framebuffer bandwidth. 4xMSAA would be very costly to fillrates, halving the rates compared to 2xMSAA and also doubling memory bandwidth consumption since the framebuffers scale linearly.

AMD's Xenos is different – Its ROPs are designed to handle 4 multisamples per pixel per cycle. All fill rates are full speed, and the Z-only fill rate is also double pumped. This in combined with the EDRAM gives the Xbox 360 GPU an edge.

Things aren't all limited however to the GPU. The GPU of the PS3 maybe inferior, but the CPU (the Cell) helps offset some of this. The cell CPU in the Playstation 3 helps take some of the load off the GPU by farming it out to the SPU's. These SPU's can then handle various bits and bobs that the GPU cannot (due to not having the power to do so). Understanding how to maximize the Cell's SPU is key to getting the best out of the console – although typically needs to be an exclusive title to really benefit. Certain titles such as Alan Wake for the Xbox 360 did use the CPU for certain effects too however – but overall the console doesn't rely on it to the degree that the PS3 does.

The difference between the 2 systems isn't night and day – and the PS3 certainly kicks the Xbox 360's butt in a few other technical issues (such as size of disc, built in drive among other things) but the GPU is one thing the Xbox 360 has the PS3 beaten on.

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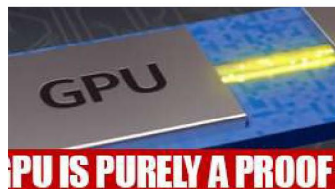
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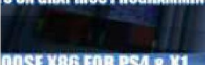
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