Qualcomm says most Windows games should ‘just work’ on its unannounced Arm laptops

Can Qualcomm replicate Apple’s feat and finally create Arm-based laptops worth buying, 15 years after its first attempts? Here’s one incredibly promising sign it might: Qualcomm is telling game developers their titles should *already work* on a wave of upcoming Snapdragon-powered Windows laptops — no porting required.

In a 2024 Game Developers Conference session titled “Windows on Snapdragon, a Platform Ready for your PC Games,” Qualcomm engineer Issam Khalil drove home that the unannounced laptops will use emulation to run x86/64 games at close to full speed.

Those laptops may be coming fast. Qualcomm has confirmed it will launch Snapdragon X Elite systems this summer, and unannounced consumer versions of the Surface Pro 10 and Surface Laptop 6 are expected in May with those chips, sources told *The Verge*.

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In 2020, we wrote how Apple upended our concept of laptop performance overnight, including how its Rosetta 2 translation layer let those chips run legacy x86 apps without major performance hits. But while Windows has supported x64 emulation for a while, we didn’t get the sense that Qualcomm was this confident about it yet.

With Windows on Snapdragon, devs have three options, Khalil explained:

- They can port their titles to native ARM64 for the best CPU performance and power usage since Qualcomm's scheduler can dynamically lower the CPU's frequency that way.
- They can create a hybrid "ARM64EC" app where Windows and its libraries and Qualcomm's drivers run natively, but the rest of the app is emulated, for "near-native" performance.
- Or, they can do next to nothing, and their game should just work anyhow — using x64 emulation.

He says developers shouldn't need to change the code or assets of their games to get full speed. Most games are graphically bottlenecked by the GPU, not the CPU, and Qualcomm says GPU performance is unaffected. And while Qualcomm sees some slight hit to CPU performance when it's translating or transitioning between x64 and ARM64, it only happens the first time a block of code gets translated — "subsequent passes are direct cache access," Khalil says.

Qualcomm says it has Adreno GPU drivers for DX11, DX12, Vulkan, and OpenCL and will also support DX9 and up to OpenGL 4.6 via mapping layers.

As you can see in the slide above, there are a few caveats: games that rely on kernel-level anti-cheat drivers (which have been growing in popularity, though some players now fear hacks) won't work under emulation. For now, neither will games that use AVX instruction sets, where Khalil suggests developers use SIMDe to get a huge headstart on converting them to NEON code. Those things are true with ARM64EC as well.

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gray-bd dark:[&>a]:shadow-underline-gray”>Photo by Sean Hollister / The Verge
While he wouldn’t name specific games that work or how many games Qualcomm has tested, he says the company’s checking out all the top games on Steam — and that doing so makes Qualcomm confident that most titles should work.

It’s important for Qualcomm to be able to offer existing games, senior director of product management Micah Knapp told me in a recent interview: “In the immediate, near, and not so near future, you have to provide a platform for what people already have.”

“As much as I would love for this to happen, I don’t think all the developers are going to wake up overnight and say we’re going to port all our stuff to Arm tomorrow,” he said.

Mind you, we don’t yet know how fast a Snapdragon X Elite chip really is at playing games, emulation or no. When I asked Knapp if he’s seen Arm run a game faster *and* get better battery life than x86, he told me he’s seen either — not both.

Only about 33 people were in the audience for Qualcomm’s GDC talk, including myself and at least one other Qualcomm employee — but I took some rough pictures of the slide deck that I’ve included above so you can get a look as well.

x86 game portability is having a moment. Valve’s Steam Deck efforts brought more Windows games to Linux, Apple has a tool that brings them to Mac, and now maybe Microsoft and Qualcomm will bring them to a different flavor of Windows, too.

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