



How Ori and the Will of the Wisps achieved exceptional performance on the latest consoles

Moon Studios stuns with "Xbox Game of the Year," 4k/120 fps Xbox graphics, and a 60 fps port to Nintendo Switch.





The challenge

To achieve unprecedented graphic performance by pushing hardware and software to the limit

Platforms

PC, Xbox One, Xbox Series X|S, Nintendo Switch

Project Staff

60

Location

Vienna, Austria

How does a small team of highly talented developers and artists produce an award-winning, AAA-quality game for Xbox and then, in less than six months, port an equally impressive version to Nintendo Switch? Inspired by John F. Kennedy's famous "we choose to go to the moon" speech, Moon Studios has always aspired to push further and set new standards for technical and artistic excellence.

Shooting for the moon

Technical director Gennadiy Korol chose Unity as the studio's primary development platform when he founded Moon in 2009. "Unity is cutting edge, flexible for artists and developers, and great for prototypes and multiplatform versions," he says. But to achieve the spectacular graphics and effects in *Ori and the Will of the Wisps*, Moon had to push the platform beyond what most thought possible. To meet their ambitious technical goals and launch Xbox Series X and Nintendo Switch versions on schedule, the studio enlisted the help of Unity's [Accelerate Solutions](#) and [Integrated Success](#) teams.

"Unity's value for multiplatform development is incredible, a huge benefit. It's the difference between expanding to a new platform or not."

– Gennadiy Korol, Technical Director, Moon Studios

The results

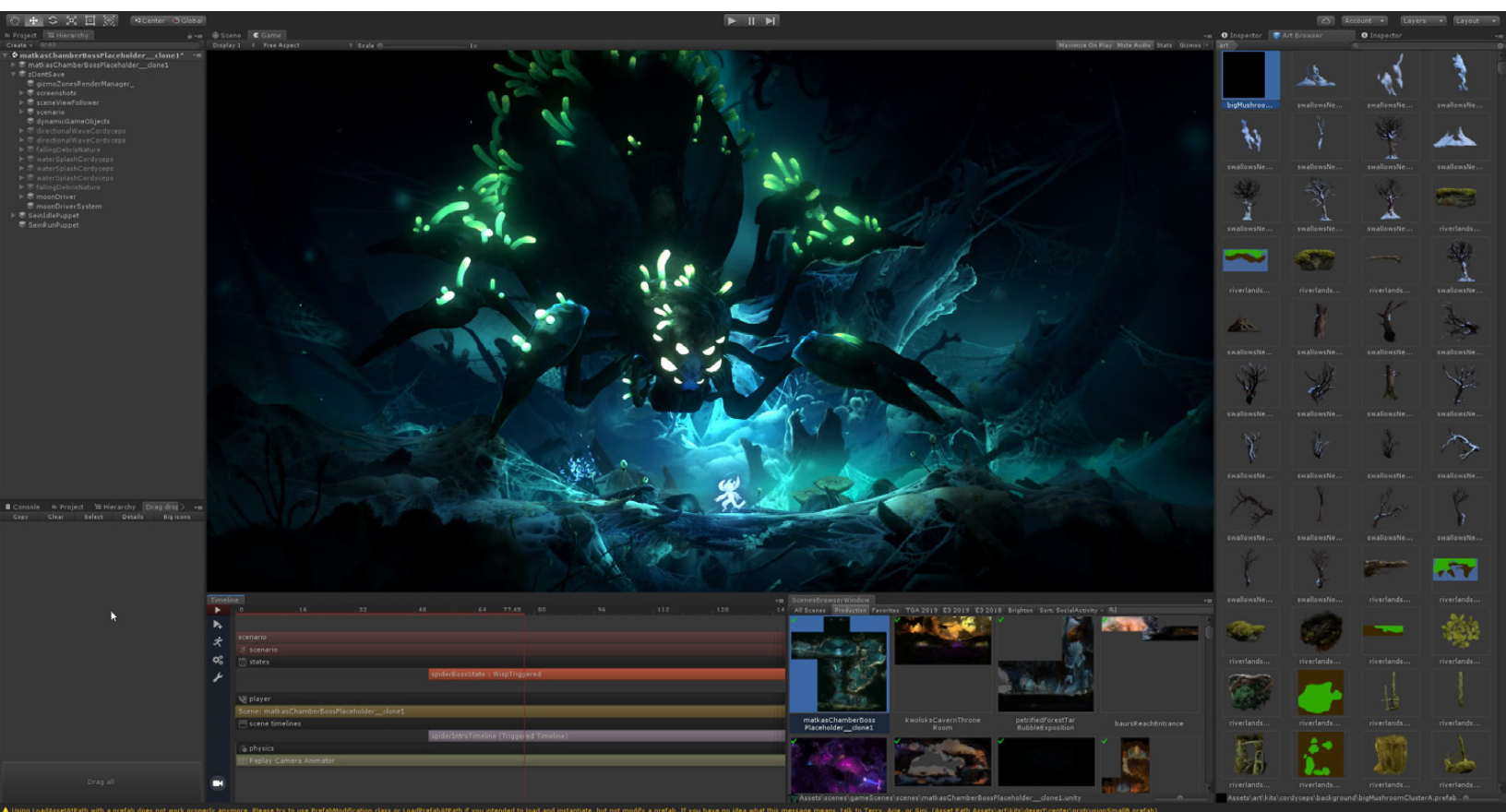
- Achieved native 4k resolution running at 120 fps on Xbox Series X
- Reached 60 fps performance on Nintendo Switch at highest quality while meeting their launch date
- Fit gorgeous 2D art and 3D animation into the extremely tight memory budget on the Nintendo Switch
- Took advantage of Unity's high extensibility and source-code access to integrate proprietary code
- Won Xbox Game of the Year 2020¹
- Appeared on many award lists such as Top 5 Nintendo Switch games for 2021² and Top 10 video games of 2020³

Continuing a tradition of excellence

Ori and the Will of the Wisps, released in March 2020 for Microsoft Xbox One, in September 2020 for Nintendo Switch, and in November 2020 for Xbox Series X, is the metroidvania sequel to *Ori and the Blind Forest*, itself an Xbox Game of the Year winner in 2015.⁴ For the new *Ori*, Moon overhauled the 2D artwork in *Blind Forest* to 3D models played in multilayered backgrounds. The game maintains narrative continuity with *Blind Forest* and introduces new melee combat.

Korol characterizes Moon Studios as having “a strong, iterative polishing process.” Industry analysts agree, as they unanimously praise the two Moon titles for phenomenal artistry both in graphics and in music. Gareth Coker composed the *Ori and the Will of the Wisps* soundtrack with passages that include the 72-piece Philharmonia Orchestra, with one critic calling it “a staggering achievement for fully symphonic video game scores.”⁵





Achieving technical success on Next-Gen platforms

The *Ori* franchise is published by Microsoft Xbox Game Studios, and several years ago Moon started work on a version for the new Xbox Series X. Moon's team worked hard to perfect their rendering pipeline, graphics quality settings, audio tech, and overall performance to bring their players the highest quality console version of *Ori and the Will of the Wisps*. Korol says, "We wanted to show our best work on Microsoft's best work, making *Ori* the most remarkable game experience on the new Xbox." They succeeded, but it took some extra work. For example, so that the new Xbox could showcase *Ori*'s most spectacular effects, the biggest challenge was modifying the render pipeline.

By default, Unity includes several rendering options, including the [High Definition Render Pipeline \(HDRP\)](#) for pushing graphics on high-end hardware and the [Universal Render Pipeline \(URP\)](#) for enabling broad platform reach. Both are selectable options in the Unity Editor that satisfy most developers' needs. For more challenging projects, the [Scriptable Render Pipeline \(SRP\)](#) enables even more control with customized C# scripting.

The complexity of what Moon wanted to do with *Ori* on the new Xbox – drawing frames at 120 fps with a 6-layer parallax system – required adding proprietary code to the SRP functionality. "For us, Unity's open extensibility is invaluable. It's the only platform that lets us easily integrate our own tools. We call it Moon-ity,"⁶ says Korol. However, the combination of SRP and Moon's proprietary code still didn't get *Ori* where Moon wanted it to be.

¹Golden Joystick awards

²DigitalTrends.com

³Time Magazine

⁴Golden Joystick awards

⁵Soundtrack-Universe

⁶Eurogamer

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– Gennadiy Korol, Technical Director, Moon Studios





Extending the studio's capability with Unity expertise

Moon developers have been working closely with Unity's Accelerate Solutions and Integrated Success teams for many years. According to Korol, "We love playing with new technologies, trying different things, and in gaming, we have to be at the cutting edge." Unity provided Moon with deep insight into the platform's functionality to help get through sticking points. And Moon's attitude and expertise made them a resource for Unity as well, including providing valuable feedback on some new Unity capabilities.

Moon had bought access to the Unity source code and contracted with Unity Accelerate Solutions to get Ori over the hump and out the door. After several Project Reviews and weeks spent working together on rendering and shader code possibilities, *Ori and the Will of the Wisps* was ready to excel in its Xbox Series X debut.

Porting to Nintendo Switch

From the start of the Ori project, Moon had also planned to launch a Nintendo Switch version that would, as much as possible, equal the stellar visuals they were aiming for on the Xbox Series X version. But it was an ambitious goal. "We honestly didn't know if it would be technically feasible at 60 fps without a huge quality loss," says Korol. And without the quality, Moon wouldn't launch it.

To help tackle the port's technical challenges under mounting launch pressures, Moon and Unity Accelerate Solutions analyzed sections of code together, finding ways to tweak the particle systems and reduce memory usage. "When you're targeting 60 fps on Nintendo Switch, you have to make sure every single aspect is optimized, including simulation, streaming, rendering, and graphics," says Korol.

They also consulted with Unity source-code experts and internal R&D teams for guidance on memory allocations and other issues that surfaced from Ori's unprecedented performance demands.

Together, they succeeded in time for the scheduled launch (two months ahead of the Series X launch) and with 60 fps performance that led one reviewer to say, "It takes the painterly, ethereal look of the original game and turns it up to 11."⁷ Korol adds, "Knowing exactly what was going on 'under the hood' gave us better ways to analyze processes. Without Unity, we probably wouldn't have been able to ship the Nintendo Switch version."



A stunning cross-platform success story

And now that *Ori and the Will of the Wisps* is on PC, Xbox One, Xbox Series X, and Nintendo Switch, reaching eager gamers everywhere, Korol gives Unity's target-platform capabilities kudos for that. "Unity's value for multiplatform development is incredible, a huge benefit. It's the difference between expanding to a new platform or not."

Finally, in summing up Moon's artistic and technical accomplishments so far, one reviewer captured the general consensus: "*Ori and the Will of the Wisps* is a masterpiece that deserves the highest praise that I can give it. Moon Studios is a shining example that a small team working with a lot of heart and passion can create something beautiful, fun, and challenging."⁸ This collaboration between Moon Studios and Unity illustrates perfectly what can be achieved with vision, determination, and expertise.

⁷[DigitalTrends](#)

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