



BRINGING THE FUN OF *SLIME RANCHER* TO NINTENDO SWITCH™

ACCELERATE SOLUTIONS – GAMES → E-BOOK

How Monomi Park and Unity Accelerate Solutions collaborated to bring *Slime Rancher* to Nintendo Switch



MONOMI PARK: A UNITY CASE STUDY



The challenge

Bringing *Slime Rancher* to Nintendo Switch while maintaining the visual fidelity of the game's graphics and the integrity of the game play.

Platform

Xbox One, PlayStation 4, Windows, Mac OS, Linux, Nintendo Switch

Project staff

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Location

San Mateo, U.S.

Since the launch of the original [Slime Rancher](#) in 2017, its legion of fans have had one passionate and (seemingly) simple request: Combine the fun of ranching slimes with the portability of Nintendo Switch.

While giving the people what they want may always seem like the easy choice, it's not so straightforward when it comes to *Slime Rancher* – a game well-loved for its playful graphics, unique animations, and multi-faceted environments.

How does a small but mighty studio answer the call of their community by bringing their Plorts to Nintendo Switch, without compromising gameplay and visual awesomeness? The answer is partnering with a team who knows Unity inside out: [The Unity Accelerate Solutions team](#).

A STEP BACK IN SLIME

Back in 2014, after meeting at Three Rings and collaborating on MMOG games like *Puzzle Pirates* and *Spiral Knights* together, Nick Popovich and Mike Thomas decided to branch out on their own and create a game that brought the fun.

Nick set out to design something outrageous and entertaining and the answer to that was, of course, slimes. Slimes of different colors, sizes, abilities, and cuteness. And so came forth the genesis of Beatrix LeBeau and her journey to become the most successful rancher on a planet called the Far, Far Range.


AN INSTANT HIT THAT MOBILIZED A COMMUNITY

Slime Rancher was released onto Xbox One in 2017 and PlayStation 4 in 2018 to resounding positive reviews from their community. Praised for its whimsical theme, vibrant graphics, and for being a game that is somehow both relaxing and addictive, *Slime Rancher* has generated a loyal fan base of slime lovers.

Many of these fans had one big wish from day one: Capture slimes, feed them, and grow their slime ranch empire – on the go. Encouraged by the community, and their passionate cry for a Nintendo Switch release (which in 2018 actually prompted a change.org petition), Nick and Mike set out to bring their slimes to Nintendo Switch.

Mike Thomas, Monomi Park's CTO and co-founder said: "The opportunity came up to work with Unity and the difference here is that no one knows the Unity Engine like Unity."

And so, Monomi Park ended up at the doorstep of Unity's professional services team, Accelerate Solutions, and their journey to bring *Slime Rancher* to Nintendo Switch the way they envisioned was underway.



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THE RESULTS

- Brought *Slime Rancher* to visual parity with the released versions of the game on other platforms.
- Fixed and optimized shaders, adjusted content to reduce rendering complexity for Nintendo Switch.
- Reduced the overall memory requirements of *Slime Rancher*.
- Final game performance of 30 FPS.

RESULTS → THE RESULTS → THE RESULTS → THE RESULTS → THE RESULTS → THE RESULTS → THE RESULTS → THE RESULTS → THE RESULTS



THE PHYSICS BEHIND *SLIME RANCHER*

Getting the physics of *Slime Rancher* right was about more than just getting the correct level of wobbliness. The core gameplay loops involve correct object acceleration, responsiveness to collision, gravity, and various other forces as things bounce around and get sucked up or launched out of your vacpack.

Fellow Far, Far Range ranchers know that *Slime Rancher* is extremely dynamic and that presents a challenge when shifting platforms.

When Monomi Park built the first iteration of *Slime Rancher*, they organized many of the game's dynamic objects under one common parent or hierarchy, which is a natural way to organize a game, making objects easy to find.

However, because of the number of dynamic objects for the game (slimes everywhere) these common parent hierarchies became problematic for the performance of physics and animation, as it limited how the engine performs operations on multiple CPU cores simultaneously.

IMPROVING GAME PERFORMANCE WITH MULTI-THREADING

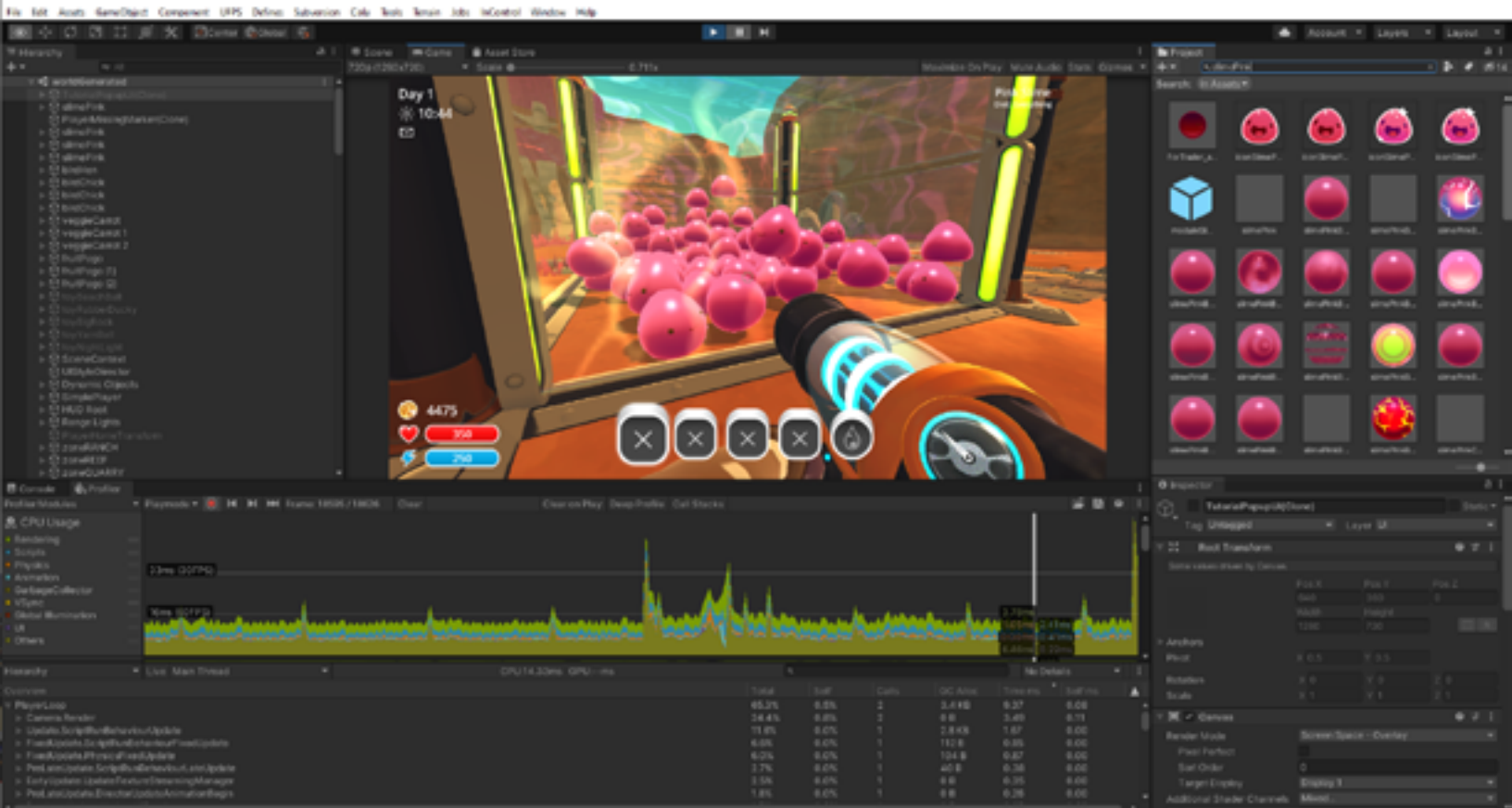
The Monomi Park and Accelerate Solutions teams knew they needed to figure out a way to multi-thread more efficiently so the processors could work in parallel across the three Nintendo Switch cores.

With the help of Unity, Monomi Park was able to reengineer the management of their dynamic objects by reworking the system logic, and flattening the hierarchy of the dynamic objects.

Creating multiple hierarchies allowed the system to run in parallel – meaning that they could multi-thread more effectively and allowed them to update objects simultaneously since they were not connected, which greatly improved CPU performance.

In addition to this, the team also replaced many of the game's physics queries (which detect whether slimes are on the ground, in the air, or that are touching) with newer jobified APIs. By doing this, the Accelerate team was able to improve the game's performance while keeping the heart and soul of *Slime Rancher's* gameplay intact on the Nintendo Switch.





STAYING TRUE TO THE LOOK AND FEEL OF SLIME

During the initial conception of *Slime Rancher*, the Monomi Park team worked hard to give the game environment a vivid and picturesque feel. This custom look was triplanar mapped which is more flexible and memory efficient than traditional UV mapping, but unfortunately comes at a cost of processing on the GPU.

Determined to keep texture resolutions, mesh complexities, and their game lighting at a certain level, the Unity team had to make the necessary asset and graphics optimizations necessary in order to bring *Slime Rancher* to visual parity with the released versions of the game on other platforms.

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FINDING THE SWEET SPOT BETWEEN GRAPHICS AND PERFORMANCE

The Accelerate Solutions team did here what they do best: Optimize game performance. In the case of *Slime Rancher*, the solutions presented by the Unity team were grounded in finding a balance between getting the look and feel of the game right, while hitting performance targets.

In order to find this sweet spot, the team had to investigate all areas that were slowing down the game performance and, additionally, areas where memory could be reduced with minimal effect to the visual aesthetic of the game.

In the instance of *Slime Rancher*, the key to this was technical art. *Slime Rancher* was created using graphical shader editors, which are fantastic tools for empowering artists to design the aesthetics they want, but sometimes at the cost of efficient code.

Knowing this, the Unity lead on this project knew that they needed to add more technical art and coding expertise to the team, which is why she brought in a senior Unity tech artist and a graphics programmer.




OPTIMIZE, OPTIMIZE, OPTIMIZE

The Accelerate Solutions team went through the game and rewrote code to be more efficient and scaled back on the heavy custom shaders to help improve the frame rate. By simplifying and revising models for complicated meshes that were originally used to create the unique look of the foliage, tree canopies, and vines throughout the game, the team was able to reduce the load and lower the impact on the GPU of the game.

The team also helped Monomi Park find little visual compromises throughout the game that would optimize performance. In one instance, the Unity team reworked some of the shaders, so shadows in the game's environment would fade more nicely, in order to offset the lowered shadow draw distance needed to keep the frame rate at a certain level.

The team also introduced a system that dynamically reduced the quality of the slimes based on where they were positioned in the game to the player so that they could take advantage of GPU instancing. Rendering strategies such as this, and adjusting animation strategy (which is controlled by the slime quality system), was also a big gain on the CPU side.

Finally, the Accelerate Solutions team also implemented Dynamic Resolution Scaling as a last line of defense against framerate drops. When the GPU gets too heavily taxed, like when the corrals are full of exploding and sparkling slimes, the game gradually reduces the rendering resolution.



**“WE SPEAK TO JOE (OUR DRM)
ONCE A WEEK, EVERY WEEK, TO
GO OVER ANYTHING CURRENTLY
THAT IS A PROBLEM...”**

– MIKE THOMAS, CTO, MONOMI PARK

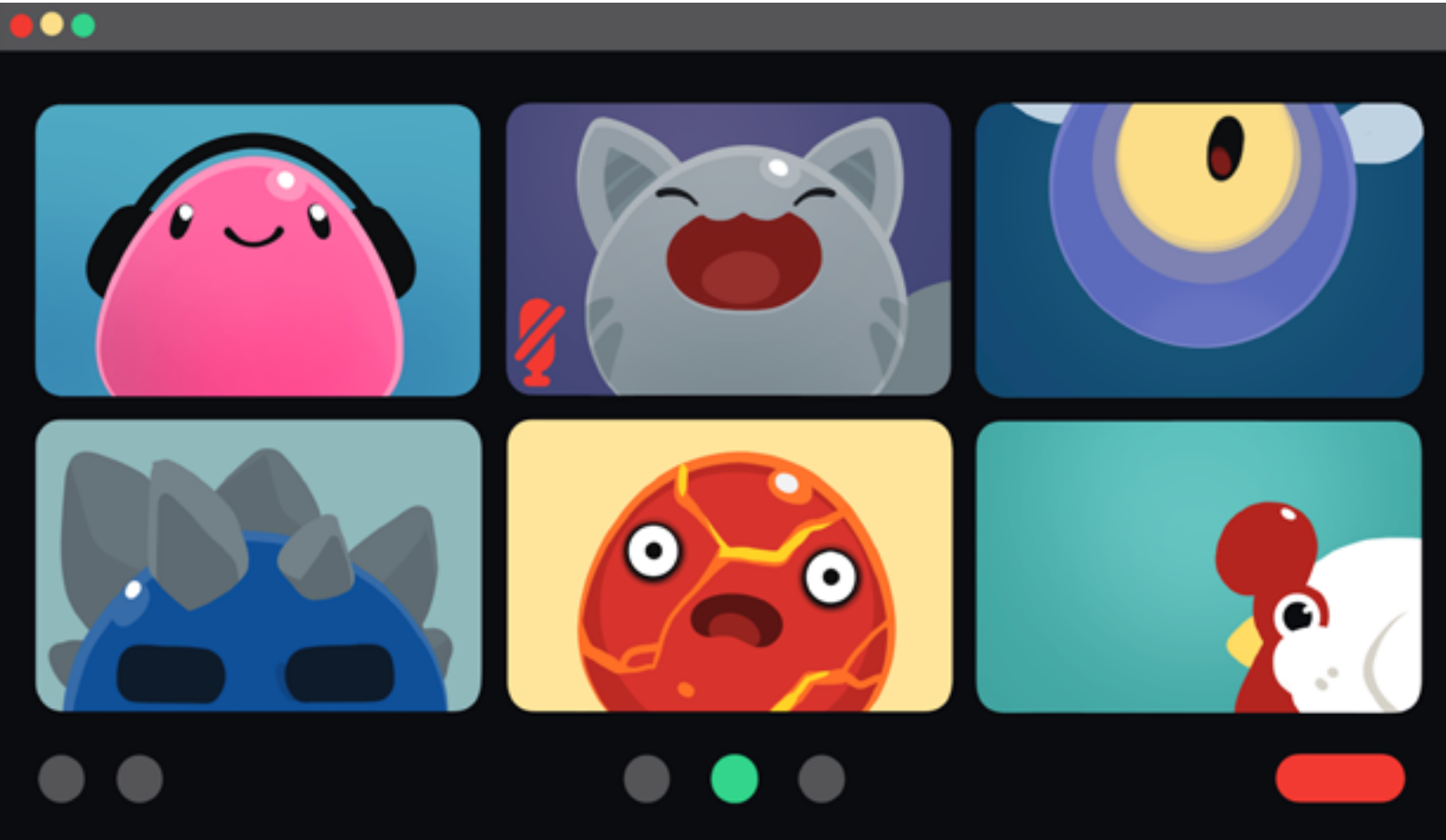
MORE UNITY ASSISTANCE - JUST IN THE NICK OF SLIME

As Monomi Park continues to test and push the boundaries of Unity using and investigating features and tools, such as the [Data-Oriented Technology Stack](#) (DOTS) and the [High Definition Render Pipeline](#) (HDRP), the team realized that they needed more firsthand assistance in answering more complex and technical questions and queries that surfaced during this process.

This led the team to subscribe to [Unity Integrated Success](#), one of three technical support packages offered at Unity. With Integrated Success, the team receives a Developer Relations Manager (DRM) that acts as their dedicated partner in all things Unity.

Their DRM is their go-to for premium technical support, gaining insights on Unity product roadmaps, and for connecting them with specific internal teams for advice and best practices.

Thomas said: “We speak to Joe (our DRM) once a week, every week, to go over anything currently that is a problem and that’s in our way...We have called (technical support) a couple of times where we’ve said: ‘Here’s this thing we’re trying to do, we want to try this, will it affect our game performance?’ And so far, it’s really helped.”



WHAT'S NEXT FOR MONOMI PARK

Another benefit of Integrated Success is that it comes with an annual Project Review. A Project Review is a project deep dive carried out by an Accelerate Solutions software developer and can be used at any time during game development.

This two-week engagement is a deep dive into a designated project with an intent to identify areas for performance optimization and development acceleration. At the end of the engagement, Unity provides a comprehensive report with recommendations on how to execute best practices, resolve roadblocks and mitigate risks.

Currently Monomi Park is developing [Slime Rancher 2](#), and working with our Accelerate Solutions team on a Project Review.

“The Project Review gave us a lot of great insights on things that were slowing down the build, and on GPU, CPU and memory usage...there were a lot of great insights there and gave us a lot of direction and on areas we could improve.” added Thomas.



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UNITY ACCELERATE SOLUTIONS GAMES

The Unity Accelerate Solutions Games team is made up of Unity's most senior software developers. Specializing in performance optimization, development acceleration, game planning and innovation and much more, Accelerate Solutions offers custom consulting and development solutions for game studios of all sizes.

To learn more about Unity Accelerate Solutions and how we can help you achieve your goals, check out [our website](#) or speak to a [Unity sales representative today](#).

