



Sophisticated Audio With Great Performance

By Alexandra Pasian

With a small footprint, customization options, as well as memory management systems, Wwise helps studios of every size focus on developing sophisticated audio without impacting performance.

Performance is always a top priority when it comes to any game production. After all, an advanced development tool is great, but, if it has a huge impact on the engine's memory footprint or on CPU usage, it may not be worth it. With Wwise, Audiokinetic has worked tirelessly to ensure that developing sophisticated audio for game titles does not come at the expense of game performance.

Audiokinetic focuses on three key areas to limit the impact that Wwise has on a game's performance. First, it has a relatively small footprint; second, it makes it possible to customize or replace memory management systems; and, third, using Wwise allows developers to monitor and manage performance impact as they go.

Ensemble Studios is now in the final phases of the development process on their current project, and Wwise has enabled the team to create sophisticated sound and music for their game without showing any significant impact on performance. According to David Bettner, Game Developer at Ensemble Studios, "Using Wwise allows us to iterate quickly and to better refine the sound and music experience of our game."

Regarding performance, Bettner says that "Wwise has only a small impact on our CPU performance. The audio shares a single thread with other systems, and so far there has been minimal CPU usage and no performance issues."

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According to Douglas DaSilva, Associate Software Engineer at Blue Fang Games, "The impact that Wwise has on our CPU usage per platform is quite small. It does a good job of allowing us to play multiple sound instances with runtime effects applied with only a small change to the game's performance."

Says DaSilva, "Wwise has a reasonably small footprint for a sound engine, and, although sound resources can often take up a lot of memory, Wwise provides us with an easy way to customize our sound resources on a per platform basis."

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Making Choices

During the extensive evaluation process at Pandemic Studios in Brisbane, Australia, Audio Programmer Chip Bell was responsible for testing the runtime component in Wwise. He tested the feature set in Wwise as well as its performance and ease-of-use for other programmers on both the Xbox 360 and PS3. Bell evaluated all of Pandemic's options, including internally developed technology, and found that Wwise was an excellent choice.

Says Bell, "If we were to continue to develop technology internally, it would not be possible to have a tool that is as polished and feature rich as Wwise in time for this project or even by the end of this project. You can easily see, when using Wwise, that a lot of research and development, as well as quality testing time, has gone into it to ensure that it is stable and does everything that it says it will do."



Wwise also allows studios to develop and customize their own memory management systems. According to Bell, "One of the most impressive features in Wwise is that it can be tailored to many different sizes and types of project even when it comes to memory and CPU usage. Audiokinetic has written the memory and I/O managers so that even small teams can use them right out-of-the-box. From what I have seen, the memory manager is good, but we are not using it."

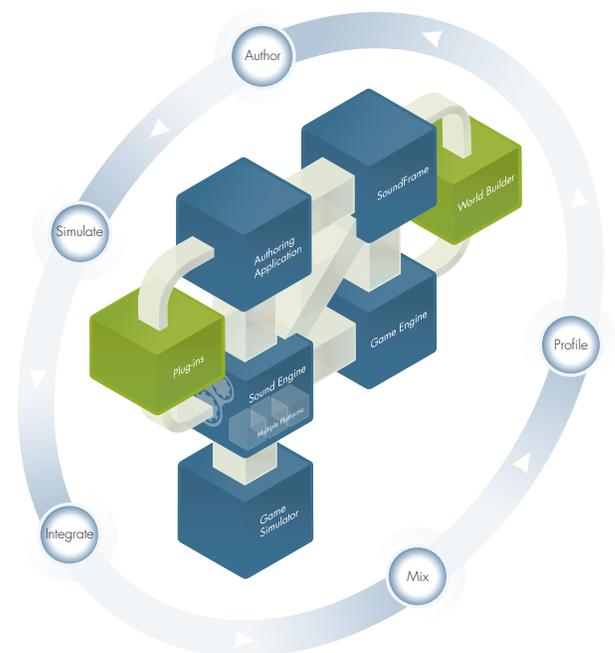
Pandemic's current project has unique requirements for memory and streaming, so, rather than using the manager in Wwise, they elected to use their own customizations. Bell explains that, "Using Wwise, we're able to swap those out and replace them with our own I/O bandwidth and memory management systems. And, even though we've provided a customized implementation to the engine, there is no wasted memory. The whole thing is very well thought out."

The Profiling System

Other studios have, of course, opted to use the memory managers within Wwise and are particularly impressed with its profiling system. Blair Bitonti, Central Audio Software Engineer at Activision, appreciates the fact that the system allows both programmers and designers to monitor memory and CPU throughout the development process.

Says Bitonti, "With Wwise, there are a lot of opportunities to use a lot more resources. The detailed profiling system lets us see up front how much CPU and memory we can use. And, it gives us a benchmark on the number and type of effects we can use. Using any middleware solution can impact performance, but Wwise gives you the tools to monitor all of that."

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