GAIKAI CHOOSES NEW NVIDIA® GEFORCE® GRID TO FUEL EXPLOSIVE GROWTH IN CLOUD GAMING

GAIKAI CASE STUDY

Imagine being able to experience the immersive action, you-are-there visuals, and hair-trigger responsiveness of console-level gaming – but on your tablet, smartphone, or TV. You could be sitting on a train in New York, Taipei, or Amsterdam or just in a favorite corner coffee shop. Envision playing a game on your living room TV, then switching to your tablet or smartphone and walking to the kitchen for a snack, or heading off with friends, all without missing a single move.

Cloud gaming will liberate games from their limiting dependence on consoles, without sacrificing realism, speed, or any other aspect of the true gaming experience. This is a platform-as-a-service approach analogous to video on demand, where players interact via streamed content generated on the game operator's server rather than players' local systems. Cloud gaming is still evolving, but its potential in the world of entertainment is unparalleled.

One of the premier cloud gaming companies is Gaikai (pronounced guy-kai; Japanese for 'open ocean'), an innovator with headquarters in Orange County, California, and the intention to reach every corner of the globe. Gaikai follows a business-to-business model, helping game providers take advantage of cloud technologies to deliver superior gaming experiences to their users. Gaikai's vision is clear: "When video games can be accessed as easily as movies and music, we believe they will become the #1 form of entertainment in the world."

"Gaikai and NVIDIA are working together to create a new chapter in the evolution of video games"

Character image courtesy of Crytek

Since its founding in November 2008, the Gaikai Open Cloud platform has relied on NVIDIA GPUs in its data center servers to power its interactive cloud-based game service, which streams console-like gaming experiences to virtually any device. With the introduction of NVIDIA GeForce® GRID, Gaikai is poised to take its offerings to the next level.

"Gaikai and NVIDIA are working together to create a new chapter in the evolution of video games", said David Perry, CEO and co-founder of Gaikai, "NVIDIA hardware generates incredibly high fidelity experiences and our cloud gaming platform can place those experiences instantly across countless websites, devices, operating systems and even social networks."

Challenge

To date, the main barriers to cloud gaming's performance, compared to console gaming, have been the latency (delay) over broadband networks, the quality of the video images, and the high cost per user. Another challenge for the gaming industry is the limited number of device types able to run specific games.

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"When a blockbuster movie debuts, it runs on multiple devices simultaneously: set-top boxes [STBs], DVD players, smartphones, PCs," said Perry. "When a game like Call of Duty debuts, it can't run on multiple devices, just on consoles and PCs. It means the gaming industry is running with a broken leg, making it too hard to compete directly with Hollywood and the music industry."

At the same time, the gaming market's potential is apparent: "World of Warcraft made more money overall and more money per person than Avatar the movie – and it's only available on PCs," said Perry. "We believe that if all the possible devices were accessible, games would become even bigger and more mass-market than either movies or music."

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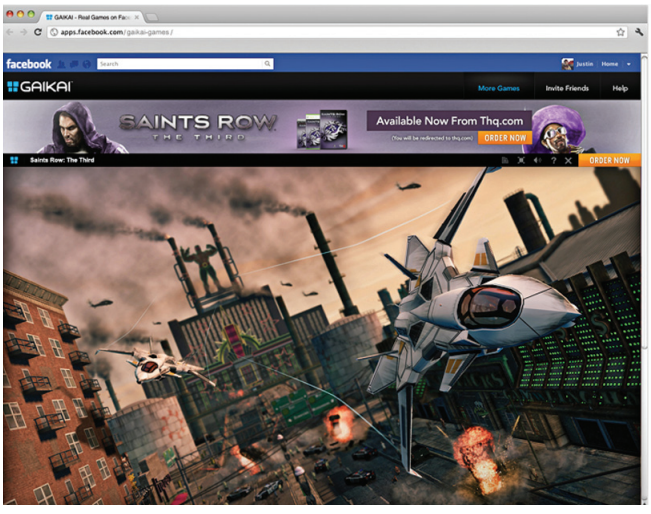
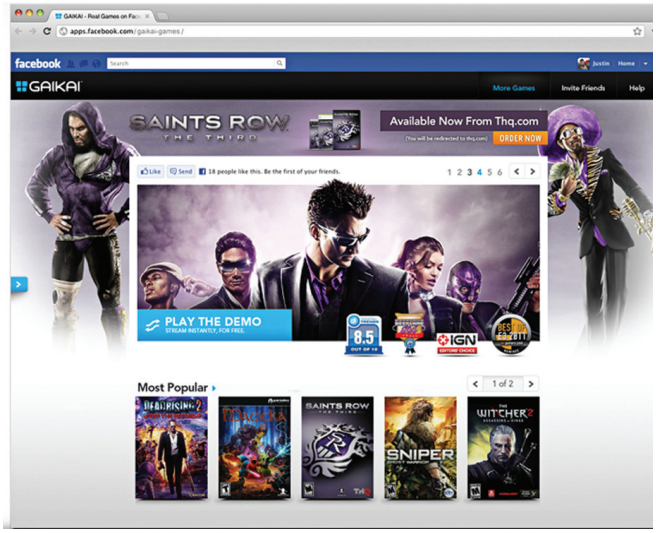
Solution

Gaikai is developing and delivering a cloud technology platform to put games where they have never been before, including digital TVs, tablets, smartphones, Facebook, and embedded directly into websites. NVIDIA GeForce GRID simplifies this task while simultaneously reducing operational costs. At the core of this solution is the NVIDIA GeForce GRID GPU (graphics processing unit), which features two NVIDIA Kepler GPUs on a single board, each with its own encoder. GeForce GRID enables video encoding





to be moved to the GPU's onboard encoders, which frees up Gaikai's servers to run more games.Gaikai currently operates 24 data centers worldwide, offering its global cloud streaming network as a fully managed platform service. It's live in 88 countries, serving 400 million monthly unique users on hundreds of gaming sites and with retail partners that include Walmart, BestBuy, YouTube, the Electronics Arts' Origin store, Ubisoft's UBIShop, Capcom, and Eurogamer.net. Gaikai will upgrade its data center servers that run the highest-end, most demanding games with NVIDIA GeForce GRID.

The only gaming company with more than a handful of its own data centers, Gaikai provides a global server network that affects both the look and the feel of games.

"The generation of the initial game image, rendered as high-quality as possible, determines the look of the game," said Rui Pereira, Chief Technology Officer (CTO) and co-founder of Gaikai. "And the fast rendering speed of the game drives the perceived responsiveness to different user actions. NVIDIA GeForce GRID dramatically improves both these aspects while actually lowering the power usage, which is absolutely amazing. When we combine this technology with our low-latency, highly distributed cloud platform, the resulting experience for players is quite incredible."

"Not so long ago, engineers said cloud gaming was impossible, and that it was not possible for cloud gaming to be as fast or high-quality as local, console-based gaming," said Perry. "Obviously, they didn't know that Gaikai and NVIDIA would be working together. We're proving the doubters wrong."

Outcome

GeForce GRID running on Gaikai's data center servers will deliver specific benefits for its customers that directly overcome the challenges to, and doubts about, cloud gaming.

Specifically, GeForce GRID enables:

- **Reduced game latency, or lag.** NVIDIA GeForce GRID's NVENC (low-latency encoder), NVFBC (ultra-fast full-frame buffer capture), and NVIFR (ultra-fast frame readback) capabilities capture, scale, and encode a game frame in a single pass. This reduces server latency to as little as 10 milliseconds, or one-tenth the duration of a human blink.

"The traction has begun to take hold. We've got everyone's attention. Now we look forward to continuing to work with NVIDIA, and deploying GeForce GRID, to blow people away with what's possible in the cloud gaming industry."

- **Increased server density.** NVIDIA GeForce GRID reduces power, offloads encoding from the CPU, and enables four or more GPUs to be configured into a single game server (four times the density of today's servers).
- **Lower costs per user.** NVIDIA GeForce GRID reduces cost per user. In addition, the NVIDIA GPU's highly energy-efficient 28-nanometer Kepler architecture cuts the amount of power consumed by each game stream in half. This allows Gaikai to cost-effectively scale their service offerings to support millions of concurrent users.

- **Higher-performance video encoding.** NVIDIA GeForce GRID provides very low-latency video encoding while keeping video quality high. Its GPUs are equipped with on-chip video encoders that can each simultaneously encode up to eight game streams. Using the latest H.264 video protocol, NVIDIA GPUs support multiple video quality profiles according to the bandwidth connection of the user and are capable of 720p30, 720p60, and 1080p60 video modes.

All these technological advances help Gaikai achieve its vision of transforming both the economics and the experience of cloud gaming.

"NVIDIA technology drives more game instances at lower power. As CPU makers add more cores, we can increase the number of games per server or per stream, at lower power per core – so that our cloud gaming service becomes so much more economically viable," said Pereira.

"As a supplier of cloud services to game providers, Gaikai offers a value proposition that rests on our ability to supply technology that lets our customers be competitive," said Perry. "NVIDIA has been our go-to solution from Gaikai's inception, and it's obvious that our two companies share the same compelling vision for the cloud gaming industry: that the potential impact of gaming on the entertainment industry is profound.

"The traction has begun to take hold. We've got everyone's attention," he said. "Now we look forward to continuing to work with NVIDIA, and deploying GeForce GRID, to blow people away with what's possible in the cloud gaming industry."

To learn more about NVIDIA GeForce GRID, go to www.nvidia.com/geforcegrid

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