

Social Gaming Apps Are Real-Time

Behind every successful social game is a high-performance cloud infrastructure partner

Executive Summary

This paper profiles two social game development companies (Digital Chocolate and Mob Science) and one games-as-a-service provider (Sleepy Giant) to illustrate the demands that gaming applications place on their computing infrastructures, and how that translates into the choice of a cloud service provider.

Each of these organizations required market leading performance and resiliency of the infrastructure to ensure that concurrent user counts could spike often without concern for downtime or latency. Technology is not the only decision criteria in choosing a cloud provider. Each organization was also looking for a cloud provider who would work with them to scale, through knowledgeable support while controlling costs.

In each case, Joyent delivered. All three companies credit their selection of Joyent as a key enabler in their success.

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Inside the Joyent Cloud

Joyent has applied its extensive experience with cloud computing infrastructure and services to its entire stack – from operating system and virtualization technology to infrastructure management capabilities. The result is a highly elastic cloud infrastructure that accommodates traffic bursts that other cloud infrastructures cannot.

Joyent architecture has multiple performance and scaling advantages over traditional cloud computing infrastructures:

Software-enabled virtualization.

Joyent machine images have been designed to provide the best possible performance with limited overhead. The operating system (Linux, Windows, or SmartOS) combines virtualization to eliminate redundancy and maximize available RAM for applications.

Unified caching. Joyent makes use of unused double data rate type three (DDR3) memory in the cloud, providing a large adaptive replacement cache (ARC) pool that delivers unparalleled disk I/O. Content traditionally served from disk is cached in high-speed memory without any customer interaction, greatly improving both read and write operations.

Introduction

Social game developers face a big unknown when they start planning their computing infrastructures. What kind of traffic should they plan for? A moderately successful game on Facebook can draw several hundred thousand daily active users (DAUs), while a hit could be played by tens of millions DAUs.

Investing too little in the infrastructure can result in poor game performance, which can spell doom in this crowded market. Investing in sufficient server capacity to support a game that goes viral can mean financial doom for the developer if the game's popularity doesn't pan out.

These are some of the IT considerations facing people who would rather be creating games for people to enjoy. It's not surprising that many of them opt to deliver their games from a cloud-computing platform. Deploying on the cloud minimizes the time spent thinking about infrastructure. It can also be a way to keep costs down and make a game profitable.

Cloud not in question, but which cloud?

Cloud computing has clear advantages for social game developers. What's less clear, especially with so many companies now offering these services, is which provider is the right one.

Which cloud service provider, for example, can handle the bursts in traffic that a game can experience? Which one won't penalize the game developer financially when that happens? Which provider will understand that a game developer is not necessarily an IT expert, and will help in creating the optimal cloud environment?

Finding and partnering with the right cloud provider is critical to giving social games the best-possible chance for success. Below are stories of three social game companies that chose Joyent as their cloud service provider. The stories describe these companies' most critical cloud-related requirements and illustrate how Joyent meets them.

Digital Chocolate's cloud needs: cost control, high performance, adaptability

Digital Chocolate, a leading provider of social games, was founded in 2003 by Trip Hawkins, founder of video game giant, Electronic Arts. Digital Chocolate was the number-one software company in App Store downloads in 2009, and one of the fastest-growing publishers of Facebook social games with virtual goods in 2010. The company has achieved more than 15 million downloads.

At first, supporting the explosive daily active user (DAU) growth was the company's primary focus. But as DAU grew, so did infrastructure costs, even though the company

Inside the Joyent Cloud

CPU bursting. Joyent's implementation of its CPU engine allows on-demand processing cycles from a resource pool of available CPUs. This enables instantaneous vertical scaling, meeting bursts of application demand without costly and time-consuming manual resource provisioning.

Hardware-assisted virtualization. Kernel-based virtualization (KVM) technology is an integral component of the Joyent SmartOS hypervisor. Windows and Linux operating systems can also take advantage of SmartOS capabilities such as unified caching to improve performance and increase operational control of the environment.

Cloud-native architecture. Rather than solving application performance issues by adding more and more virtual machines, Joyent has built its architecture with performance and application scaling in mind. Application architecture is supported by several tiers of servers needing low-latency interconnection; Joyent web, app, DB, and cache servers, while completely distributed and fully redundant, are provisioned for the highest possible performance and lowest possible latency. In contrast, traditional cloud solutions merely move physical data-center inefficiencies to virtual, cloud-based inefficiencies.

was already working with a cloud provider. In an effort to find a more suitable cloud solution, Digital Chocolate's management looked for:

1. **Cost control.** With Digital Chocolate's incumbent cloud infrastructure provider, sudden bursts of bandwidth usage often drove up costs, jeopardizing the profitability of some games.
2. **Maximum performance.** With new users discovering Digital Chocolate each day and games' constantly changing user base, the company needed instant scalability.
3. **Adaptability to the company's needs.** Due to the unpredictable and fragmented nature of its user base, Digital Chocolate wanted a cost-effective way to perform iterative load testing. They asked vendors to present pricing scenarios for various service level agreements (SLAs) – but most bidders weren't flexible enough to accommodate the company's wishes.

Mob Science's cloud needs: high performance, scalability, responsive service

Mob Science, founded in 2008, has been building fun and addictive social games since the early days of the industry. The company's games – inFamous Anarchy, Coffee Bar, Snowball Fight, Willy's Sweet Shop, Sea Garden, Christmas Cheer, Halloween Haunting, Drinks On Me, and others – have been played by more than 50 million people. Mob Science is one of the leading game developers on Facebook and one of the first third-party developers chosen as a Zynga platform partner. Its cloud needs included:

1. **High performance/high availability.** For Mob Science, delivering games on Facebook means intense competition, from other Facebook games as well as the nature of Facebook itself. "Gamers are very fickle on Facebook," explained Mob Science CEO, Michael Witz. "There are so many distractions. If you don't have fast performance from your game, the user is one click away from another entertainment activity. In terms of the cloud provider, it's critical that we get fast load times and that our games are always available."
2. **Scalability.** "We reach really large audiences in really short periods of time on Facebook," Witz said, adding that he believes the Zynga game platform represents a similar opportunity. "Zynga has 250 million users a month on their platform. We think it's going to completely change the industry." To succeed on either platform, Mob Science must efficiently handle usage spikes, which requires the ability to immediately scale up the infrastructure when a game becomes a hit.
3. **Responsive service.** "I would have to say support is very key to assessing any cloud offering. If you are running your business in the cloud, support is crucial," Witz noted. Mob Science initially tested Amazon's cloud offering, but the lack of support quickly ruled out that option. "We didn't like the fact that if something goes wrong,

"In Social Games, you either manage your infrastructure or it will manage you, and no other provider did more to truly roll up their sleeves and understand our needs than Joyent."

- Jason Loia
COO, Digital Chocolate

Inside the Joyent Cloud

Joyent's infrastructure provides additional performance and scalability enhancements. Network provisioning includes automatic caching of distributed file systems and load balancing of network traffic, allowing the network to dynamically conform to application demands with no administrator input required – often reducing or eliminating the need for additional physical or virtual resources.

or you have a question about scaling, for instance, they send you to a message board where you have to sift through a bunch of data and get your own answers," Witz said.

Sleepy Giant's cloud needs: effortless scaling, low TCO, reliable support

Sleepy Giant runs games. Working with top developers and publishers in the game industry, Sleepy Giant provides the tools and expertise to design, launch, operate, and expand game user bases. An independent online game company headquartered in Newport Beach, California, Sleepy Giant is the leading market partner in delivering games-as-a-service. When looking for a public cloud solution, Sleepy Giant needed:

1. **Effortless, instantaneous capacity scaling.** Sleepy Giant needed a scalable and high-performance cloud infrastructure to provide high quality experiences for gamers. In the game industry, unpredictable usage spikes occur frequently as a result of organic, viral uptake and paid promotions. When these spikes happen, it is crucial that infrastructure be quickly scaled up. Every millisecond matters. If increased usage is not met with adequate infrastructure, then players suffer from decreased response times, the game experience deteriorates and opportunities are missed.
2. **Knowledgeable and reliable support.** Sleepy Giant needed a support team with the broad knowledge and competence to help build the right infrastructure for its partners. Sleepy Giant was seeking a team that could provide customized solutions and recommend proven options to meet the continuously expanding needs of its diverse projects.
3. **Low total cost of ownership (TCO).** Sleepy Giant wanted to reduce infrastructure costs while continuing to deliver improvements in performance to customers. This meant considerations of alternatives to ownership and management of physical hardware.

The Joyent advantage

Each of the companies profiled here found Joyent to be the best cloud solution for its needs. Here's why:

Outstanding performance

In each company's case, Joyent is delivering the high-level performance it needs, in part due to Joyent's commitment to deploying top-notch hardware (all Nehalem/Westmere Xeon processors, 15k rpm hard disks). Joyent also features in-memory caching for 15X faster I/O.

"We went from a few hundred thousand DAUs to 6 million DAUs. The only reason we survived that is because we had our platform on Joyent."

- Michael Witz
CEO, Mob Science

For Witz and his team at Mob Science, this means they can celebrate the success of a hit game rather than worrying about whether their infrastructure can handle the traffic. "We had one month when our game, Snowball Fight, got really popular," Witz said. "We went from a few hundred thousand daily average users (DAUs) to 6 million DAUs. In one month we were up to 27 million monthly users. The only reason we survived that is because we had our platform on Joyent."

Both Witz and Jason Loia, COO at Digital Chocolate, appreciate the fact that the Joyent cloud allows applications to instantly and automatically burst into large CPU pools. Each Joyent SmartMachine can burst up to 400% instantly to handle large spikes in usage or traffic. This feature takes one worry off their plates. "The biggest advantage is I don't think about IT, or scaling, or what happens if we get a big burst in one of our games if it's a hit," Witz said. "With Joyent, I know that that's going to be taken care of. That's a huge advantage because it allows me to focus on building the best games and not worry about scaling our infrastructure."

Sleepy Giant takes advantage of Joyent Cloud's unique CPU bursting capability to eliminate the need for virtual servers in response to usage spikes. After starting with the deployment of a few servers, Sleepy Giant has grown its footprint to hundreds of Joyent web application servers.

Guidance and responsive support

Joyent continually introduces new and improved ways of solving problems, whether the solution is one of its own offerings or one from a third-party vendor that compliments Joyent's offerings. For Sleepy Giant, Joyent has become the support team the company was looking for, providing up-to-date knowledge and involvement in cutting-edge technology.

Mob Science relies similarly on Joyent's expertise and guidance. "From the time we started talking to Joyent about their offerings to walking through how we would migrate our games on the Joyent's infrastructure, we were able to plan and talk through the steps with Joyent's support team," Witz explained. "Each support engineer we dealt with was very knowledgeable and helped us troubleshoot any issues. You just don't get that level of expertise at your fingertips. We also have grown very quickly, and when we called support to upgrade, engineers took the time to assess our account, and personally emailed us about new features that will help continue to scale. I have been flat-out impressed with Joyent's support engineering."

Loia of Digital Chocolate values Joyent's flexibility and adaptability in how it delivers its services. "We have unique needs in almost every aspect of our business – from pricing to SLAs to environments to inter-team communications – but Joyent stood by its commitments and responded to our needs every step of the way," said Loia. "They truly

Joyent Cloud:

Failures Don't Spread

1. Containers isolate each application environment
2. ZFS manages a storage pool of virtualized physical drives, if a physical drive fails ZFS automatically replicates without disruption to the compute node
3. Thousands of containers can be created on one kernel
4. Containers virtualize the hardware resources

“Joyent is backed by an excellent team of cloud infrastructure specialists. They recommended architectural options and software tools that gave us the ability to be more efficient and focus on our actual game application needs.”

- David Lee
Co-founder, Sleepy Giant

want to understand our business, and they're always willing to try a new approach if it looks like it will benefit both sides.”

Cost savings of up to 50%

Sleepy Giant was able to considerably reduce its total cost of ownership with Joyent's services. This means Sleepy Giant can allocate more resources in other areas that improve the overall game experience.

For Digital Chocolate, an important economic benefit of Joyent is the fact that the CPU bursting capability is provided at no charge, eliminating the penalty for sudden bursts of bandwidth usage and helping ensure the profitability of its games.

Overall, Joyent's cost-effectiveness has completely changed Digital Chocolate's cost structure. The company has experienced a 50% reduction in infrastructure costs since switching to Joyent, dramatically improving the profitability of each of the company's games. With lower overhead and the ability to project its infrastructure costs each month, the company is now in a much healthier position for sustainable growth.

Takeaway

Joyent is a modern high-performance cloud infrastructure company for today's real-time web and mobile applications. As these companies' examples show, our infrastructure-as-a-service (IaaS) offering delivers the superior performance and scaling that enable developers, architects, and business owners to create real-time online and mobile applications that exceed customers' expectations.

To learn more about how Joyent helps innovative companies increase performance, deliver exceptional customer experiences, and reduce costs, visit us at

www.joyent.com.