Couchbase

LEVELING UP MOBILE GAMING

Delivering a consistently engaging player experience that can scale quickly and cost-effectively

Industry
- Gaming

Customer application
- Mobile gaming

Solution
- Customer 360

Use case
- User profile store

Product
- Couchbase Server

Key features
- Multi-dimensional scaling
- Cross datacenter replication (XDCR)

SUPER EVIL MEGACORP

Super Evil Megacorp has a simple mission: ruin the productivity of mankind with endlessly entertaining games. The company's Vainglory title is a perfect example of how it just might succeed. Designed for today's mobile devices, this multiplayer online battle arena (MOBA) game enables players to battle with, and against, others in real time, using unique, powerful heroes to achieve glory by destroying the Vain crystal in the enemy base. To deliver a responsive and uninterrupted top-tier player experience on mobile devices even as the number of players grows, the company requires a robust data platform.

CHALLENGES

- Deliver exceptional low-latency performance, enabling players to have an immersive gaming experience
- Scale quickly and cost-effectively so the company can continue to register new players and expand into new geographic regions while controlling costs
- Help ensure high availability, avoiding the downtime that can ruin the gaming experience and drive players to other games

OUTCOMES

- Sub-millisecond latency keeps millions of players engaged and in the moment with real-time interactions
- Easy scalability accommodates large-scale player growth up to 10x
- Cross datacenter replication ensures high availability
- Smaller nodes along with cost-effective disks save 60-70% in monthly database costs

> "With Couchbase, we know we can scale to accommodate even 10x growth.... As a result, we can expand our business into new regions without our technology slowing us down."
>
> **— Dwayn Matthies**
> Senior Platform Engineer, Super Evil Megacorp

SUPER EVIL MEGACORP

To stay ahead of the competition, Super Evil Megacorp needs a data platform that can:

- Deliver exceptional low-latency performance, enabling players to have an immersive gaming experience
- Scale quickly and cost-effectively so the company can continue to register new players and expand into new geographic regions while controlling costs
- Help ensure high availability, avoiding the downtime that can ruin the gaming experience and drive players to other games

THE CHALLENGE: STAY AHEAD OF THE COMPETITION BY CAPTIVATING PLAYERS

"Above all, we want to make sure all our players have a completely engaging, low-latency experience," says Dwayn Matthies, Evil Mastermind (also known as a senior platform engineer) at Super Evil. "Our players need to react in real time to what's going on around them. If their experience is poor, or if there is any significant lag, players will go search out another game to fill that hole in their time."

Unfortunately, the Super Evil team was using a data platform that couldn't deliver that experience consistently. The company had been storing all of its data in Redis—an open-source, in-memory database. But there were significant problems.

"I had serious concerns about data durability and consistency," says Matthies. "What happens when your master dies, or when it bounces and wipes out your slaves in the process? Even with frequent backups, we could still lose the last hour or two of data."

A loss on that scale would have a seriously negative impact on players—and the company. "It's one thing if you lose a transaction or two—customer service can help patch up player frustration," says Matthies. "But if you lose a whole hour's worth of data, in a peak period for a region, that might involve thousands of transactions. It would be a complete public relations nightmare that puts your brand at stake. We knew we had to make a change."

Scaling was also difficult. "Redis is single-threaded, and we were maxing out our CPUs for the Redis threads," says Matthies. "We were reaching 100 percent workload and had nowhere to go. And when we hit that maximum, we ran into serious issues with Redis that caused downtime."

Because the company relies on servers through Amazon Web Services (AWS), scaling the Redis environment up could become costly. "There is an inflection point where costs start to go up exponentially," says Matthies. "We needed a way to support business growth without having to significantly increase our spending."

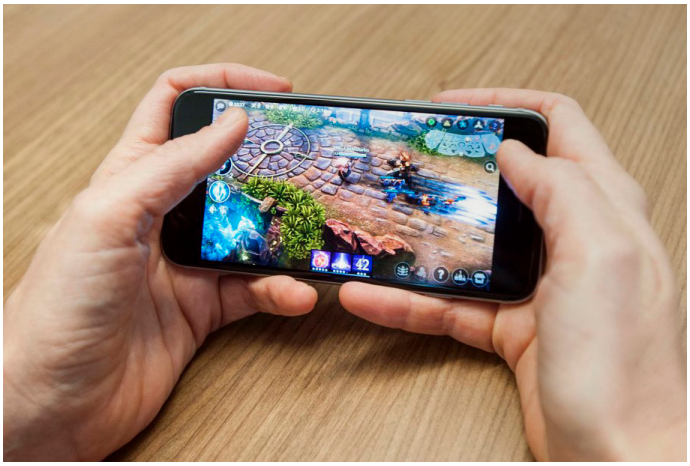
THE SOLUTION: MAKING THE SWITCH TO COUCHBASE

As Matthies and his team began to evaluate NoSQL data platforms that could replace Redis, they gravitated toward Couchbase. "In my opinion, Couchbase has the right fundamental design. For example, the way it uses vBuckets to organize and efficiently distribute information just makes sense," says Matthies. "We saw a fundamentally sound system that could scale and provide low latency."

Couchbase also offered an opportunity to reduce the hardware requirements compared with running Redis. “We knew Couchbase would run—and run well—on commodity hardware,” says Matthies. “Because Couchbase supports multi-threaded applications and uses disks along with memory, we knew we wouldn’t have to run those huge nodes that we used for Redis. Plus with Multi-Dimensional Scaling, we could easily grow the parts of the infrastructure in a way that best fits our needs.”

To get buy-in for Couchbase from the company’s CTO, Matthies and his team ran a proof of concept. “We demonstrated that the response time of Couchbase was comparable to Redis,” says Matthies. “With Couchbase, we could achieve sub-millisecond latency while getting back more data than before. It was clear that Couchbase would work well for us.”

Super Evil deployed Couchbase on AWS and migration went smoothly across multiple geographic regions. The team began with the game’s guild module (which includes player ID information plus metadata), then moved other game modules, and ultimately migrated the core player data, which involves tens of millions of accounts across the globe. “By conducting hot migrations, we were able to avoid downtime and provide a seamless experience to players,” says Matthies.



THE RESULT: MAINTAINING AN IMMERSIVE PLAYER EXPERIENCE THAT IS READY TO SCALE

Delivering engaging, responsive gameplay on mobile devices

For any gaming company, providing an immersive, low-latency gaming experience is a top priority. “I can’t do business if I can’t provide a great player experience,” says Matthies. “Couchbase gives us sub-millisecond latency that keeps players engaged and in the moment. We can deliver the exciting, real-time interactions that millions of players crave.”

Supporting tremendous scalability for customer growth

Super Evil now has the scalability to accommodate large-scale player growth. That scalability is critical as the company expands into new regions, such as Asia. “We had been holding back our marketing a bit in China because we knew our infrastructure couldn’t handle the expected growth that comes with offering a popular game in the region,” says Matthies. “With Couchbase, we know we can scale to accommodate even 10x growth. To scale Couchbase, we can just add nodes—we don’t have to pay to use larger ones. As a result, we can expand our business without our technology slowing us down.”

About Super Evil Megacorp

Based in Northern California, Super Evil Megacorp brings together master developers from some of the top companies in video gaming. With a lifelong passion for incredible gameplay, the Super Evil team strives to deliver the experience of a full multiplayer online battle arena (MOBA) game to mobile devices. The company's flagship title, Vainglory, is the world's top esport with more than 3,000 teams, 1 billion matches played, and leagues across North America, Europe, and Asia.

Staying focused on innovation

Migrating to Couchbase helps the Super Evil team spend less time dealing with crises and more time on innovation. "We have a small team handling both our platform engineering work and our live ops," says Matthies. "In the past, a large event—like an overload of the single core that Redis was running on—could require our team's attention for several days. In one case, it took us a week to bring a region back online. With Couchbase, we anticipate having more time to work on improving the game's code."

Dramatically reducing database costs

By moving to Couchbase, the Super Evil team also expects to realize huge savings. Instead of using the large, costly nodes that were required for Redis, the company can use smaller nodes along with cost-effective disks for running Couchbase. With seven clusters spread across the globe, the savings will add up fast. "When we complete our migration to Couchbase, we could save 60 to 70 percent of our monthly database spending—that's more than a million dollars a year," says Matthies. "We can reinvest that money into developing new features and producing compelling new games."

Learn more

Visit couchbase.com to learn more about the world's most powerful NoSQL data platform.

Couchbase

At Couchbase, we believe data is at the heart of the enterprise. We empower developers and architects to build, deploy, and run their mission-critical applications. Couchbase delivers a high-performance, flexible and scalable modern database that runs across the data center and any cloud. Many of the world's largest enterprises rely on Couchbase to power the core applications their businesses depend on. For more information, visit www.couchbase.com.